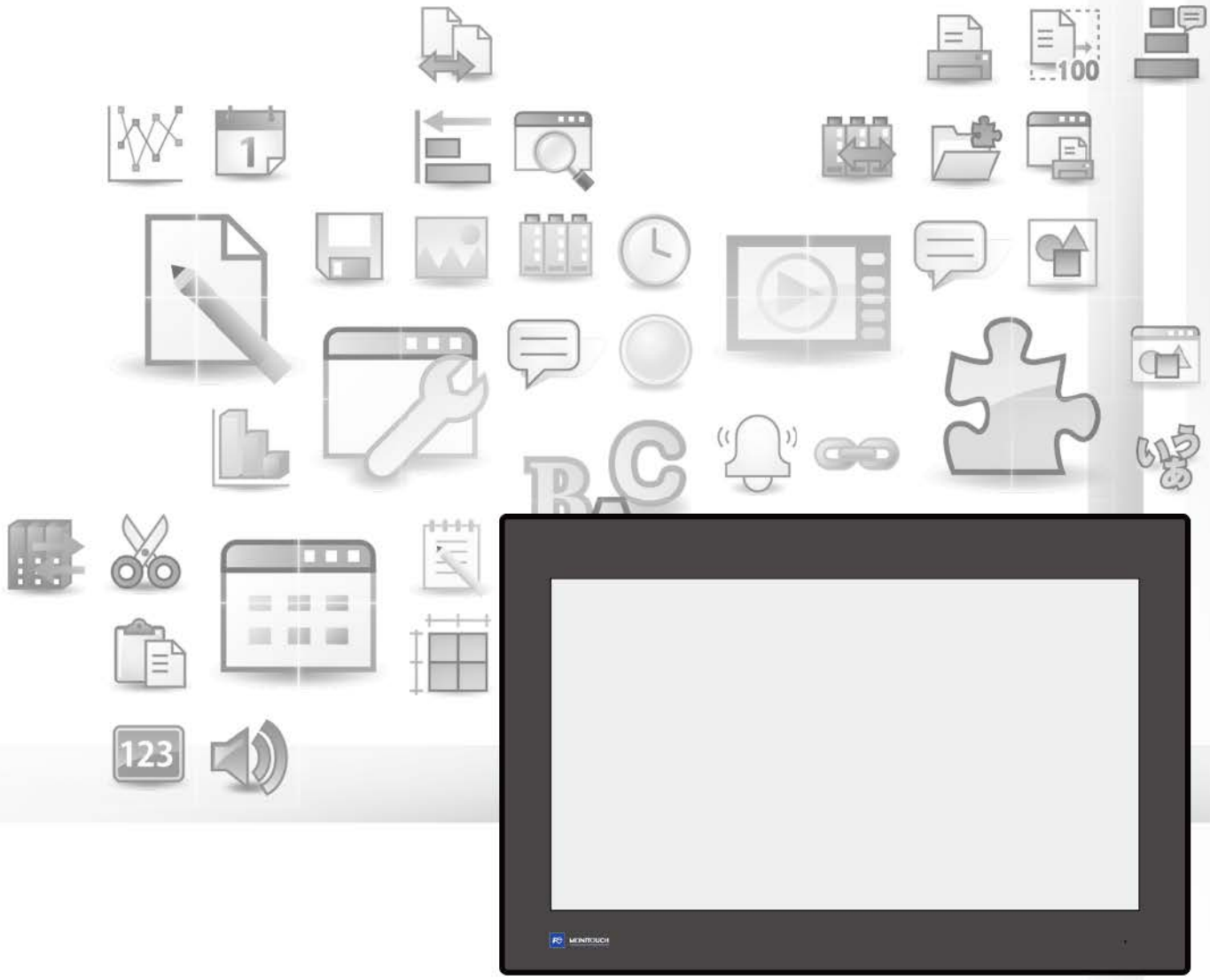
Fuji Electric

MONITOUCH

Reference Manual [1]



X1 Series

Record of Revisions

Reference numbers are shown at the bottom left corner on the back cover of each manual.

Printing Date	Reference No.	Revised Contents
February 2021	1090NE0	First edition
July 2021	1090NE1	Second edition • Chapter 1: Added descriptions for processing cycles and $s device memory • Chapter 3, Chapter 4: N-state lamp • Chapter 5 Table data display: Area transparency • Chapter 6 Entry: Cursor movement with ENT key • Chapter 7 Trends: Copying/pasting of logging blocks, logging, operation and scaling • Chapter 13 Memo pad: Added functions • Chapter 16 Print: Added expanded data sheet, added functions • Partial modifications
December, 2021	1090NE2	Third edition • Chapter 1 Added descriptions for general settings and $s device memory • Chapter 2 Overlap: Hiding an overlap display that has a switch • Chapter 6 Entry: Item select function for entry targets • Chapter 7 Trends: Always display function for real time display • Chapter 8 Alarm: Exporting/importing alarm device memory addresses • Partial modifications
May, 2022	1090NE3	Fourth edition • Chapter 1 Added descriptions for editing size (2-split screen display) and $s device memory • Chapter 3 Switch: On-screen keyboard and task list display • Chapter 8 Alarm: Expanded number of parameters • Chapter 14 Item Show/Hide Function: Added bit OFF to display conditions • Partial modifications

Preface

Thank you for selecting the MONITOUCH X1 series.
This manual describes the functions and operation procedures of the X1 series in detail.
For correct use of the X1 series, you are requested to read through this manual to understand more about the product.
The manuals shown below are related manuals for the X1 series. Refer to them as necessary.

Manual Name	Contents	Reference No.
X1 Series Reference Manual [1] (this manual)	Explains the functions and operation of the X1 series.	1090NE
X1 Series Reference Manual [2]		1091NE
X1 Series Setup Manual	Explains the X1 series setup procedure, the installation procedure of V-SFT version 6, the creation process of basic screen programs as well as how to transfer a created screen program using V-SFT version 6.	1092NE
X1 Series Hardware Specifications	Explains precautions for handling, hardware specifications and operating procedures and provides an error list for the X1 series.	2024NE
X1 Series Connection Manual [1]	Explains the connection and communication parameters for the X1 series and controllers in detail.	2217NE
X1 Series Connection Manual [2]		2218NE
X1 Series Connection Manual [3]		2219NE

For details on devices including PLCs, inverters, and temperature controllers, refer to the manual for each device.

Notes:

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2. The information in this manual is subject to change without prior notice.
3. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries.
4. All other company names or product names are trademarks or registered trademarks of their respective holders.
5. This manual is intended to give accurate information about MONITOUCH. If you have any questions, please contact your local sales representative.

Notes on Safe Usage of MONITOUCH

In this manual, you will find various notes categorized under the following levels with the signal words "DANGER" and "CAUTION".

⚠DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

Note that there is a possibility that items listed with ⚠CAUTION may have serious ramifications.

⚠DANGER

- Never use the output signal of the X1 series for operations that may threaten human life or damage the system, such as signals used in case of emergency. Design the system so that it can cope with a touch switch malfunction. A touch switch malfunction may result in machine accidents or damage.
- Turn off the power supply when you set up the unit, connect new cables, or perform maintenance or inspections. Otherwise, electrical shock or damage may occur.
- Never touch any terminals while the power is on. Otherwise, electrical shock may occur.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If leaked liquid crystal makes contact with skin or clothing, wash it away with soap and water.
- Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions will lead to explosion or ignition.
- Never use a lithium battery that is deformed, leaking, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or ignition.
- Switches on the screen are operable even when the screen has become dark due to a faulty backlight or when the backlight has reached the end of its service life. If the screen is dark and hard to see, do not touch the screen. Otherwise, a malfunction may occur resulting in machine accidents or damage.
- Tighten the mounting screw on the fixtures of the X1 series to an equal torque of 7.08 lbf-in (0.8 N·m).
  Excessive tightening may cause distortion, damage, and incorrect touch switch activation, leading to machine damage and accidents. Insufficient tightening may cause the unit to fall down, malfunction, or short-circuit.

⚠CAUTION

- Check the appearance of the unit when it is unpacked. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage, or malfunction.
- For use in a facility or as part of a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, consult your local sales representative.
- Operate (or store) the X1 series under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage, or deterioration.
- Observe the following environmental restrictions on use and storage of the unit. Otherwise, fire or damage to the unit may result.
  - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids, or cutting oil can come into contact with the unit.
  - Avoid high temperatures, high humidity, and outside weather conditions, such as wind, rain, or direct sunlight.
  - Avoid locations where excessive dust, salt, and metallic particles are present.
  - Avoid installing the unit in a location where vibrations or physical shocks may be transmitted.
- Equipment must be correctly mounted so that the main terminal of the X1 series will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws or nuts may result in fire or malfunction.
- Tighten the terminal screws on the power supply terminal block of the X1 series to an equal torque of 4.43 to 5.31 lbf-in (0.5 to 0.6 N·m). Improper tightening of screws may result in fire, malfunction, or other serious trouble.
- The X1 series has a glass screen. Do not drop the unit or impart physical shocks to the unit. Otherwise, the screen may be damaged.
- Correctly connect cables to the terminals of the X1 series in accordance with the specified voltage and wattage. Overvoltage, overwattage, or incorrect cable connection could cause fire, malfunction, or damage to the unit.
- Always ground the X1 series unit. The FG terminal must be used exclusively for the X1 series unit with the level of grounding resistance being 100 Ω or less. Failure to do so may result in electric shock, fire, prevent correct touch operations or cause malfunctions.
- Prevent any conductive particles from entering into the X1 series unit. Failure to do so may lead to fire, damage, or malfunction.
- Do not attempt to repair, disassemble, or modify the X1 series unit yourself. Contact Hakko Electronics or the designated contractor for repairs.

⚠CAUTION

- Do not repair, disassemble, or modify the X1 series. Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, disassembly, or modification of the unit that was performed by an unauthorized person.
- Do not use sharp-pointed tools to press touch switches. Doing so may damage the display unit.
- Only technicians are authorized to set up the unit, connect cables, and perform maintenance and inspection.
- Lithium batteries contain combustible material such as lithium and organic solvents. Mishandling may cause heat, explosion, or ignition resulting in fire or injury. Read the related manuals carefully and correctly handle the lithium battery as instructed.
- Take safety precautions during operations such as changing settings when the unit is running, forced output, and starting and stopping the unit. Any misoperations may cause unexpected machine movement, resulting in machine accidents or damage.
- In facilities where the failure of the X1 series could lead to accidents that threaten human life or other serious damage, be sure that such facilities are equipped with adequate safeguards.
- When disposing of the X1 series, it must be treated as industrial waste.
- Before touching the X1 series, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- There is a heat sink in the back side of the unit which becomes hot during operation. Take care not to touch during operation.
- Capacitive touch switches are used. Note the following limitations.
  - Use a safety extra-low voltage (SELV) power supply for 24 VDC models. Using the X1 series with an unstable power supply may result in incorrect touch switch activation.
  - Because capacitive touch switches are susceptible to the effects of conductors, do not place conductors, such as metal, near the panel screen or use the touch switch panel when the screen is wet. Otherwise, malfunctions may occur.
  - Calibration is performed upon turning the power on. Do not touch the screen for 10 seconds immediately after turning the power on. Otherwise, malfunctions may occur.

[General Notes]

- Never bundle control cables or input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep control cables and input/output cables at least 200 mm away from high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using the X1 series in an environment where a source of high-frequency noise is present, it is recommended that the FG shielded cable (communication cable) be grounded at each end. However, when communication is unstable, select between grounding one or both ends, as permitted by the usage environment.
- Be sure to plug connectors and sockets of the X1 series in the correct orientation. Failure to do so may lead to damage or malfunction.
- If a LAN cable is inserted into the serial communication connector, the device on the other end may be damaged. Check the connector names on the unit and insert cables into the correct connectors.
- Do not use thinners for cleaning because it may discolor the X1 series unit surface. Use commercially available alcohol.
- Clean the display area using a soft cloth to avoid scratching the surface.
- If a data receive error occurs when the X1 series unit and a counterpart unit (PLC, temperature controller, etc.) are started at the same time, read the manual of the counterpart unit to correctly resolve the error.
- Avoid discharging static electricity on the mounting panel of the X1 series. Static charge can damage the unit and cause malfunctions. Discharging static electricity on the mounting panel may cause malfunction to occur due to noise.
- Avoid prolonged display of any fixed pattern. Due to the characteristic of liquid crystal displays, an afterimage may occur. If prolonged display of a fixed pattern is expected, use the backlight's auto OFF function.
- The X1 series is identified as a class-A product in industrial environments. In the case of use in a domestic environment, the unit is likely to cause electromagnetic interference. Preventive measures should thereby be taken appropriately.
- The signal ground (SG) and frame ground (FG) are connected inside the X1 series unit. Take care when designing systems.
- The X1 series is equipped with a battery that contains lithium metal and therefore observance of transport regulations is necessary. Hakko Electronics ships X1 series units packed in accordance with transport regulations. If there is a need to transport an X1 series unit after it is once unpacked, transport the unit in accordance with the IATA Dangerous Goods Regulations, International Maritime Dangerous Goods (IMDG) Code, and transport regulations of the countries concerned.
  Ask your forwarding agent for details of transport regulations.

[Notes on the LCD]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness, and colors of the X1 series may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the characteristics of liquid crystal.
- Unevenness in brightness and flickering may occur depending on the screen display pattern due to the characteristics of liquid crystal.
- There are variations in brightness and color between units.
- Display colors may vary depending on the viewing angle because a converging lens is used in the backlight unit.

[Notes on the Capacitive Touch Switch]

- Touch switches may be unresponsive if touched with dry fingers. In such a case, use a capacitive stylus pen.
- Touch switches are calibrated each time the power is turned on. Do not touch the screen for 10 seconds immediately after turning the X1 series on. Otherwise, malfunctions may occur.
- When a metal object is near a touch switch for 5 minutes or longer, the touch switch is calibrated to recognize that state as the default state. Note that after the metal object is removed, the touch switch will become inoperable.
- Water droplets or conductive material can cause the sensor to make a false detection and lead to malfunctions.
- When using multi-touch operations, points must be at least 3 cm apart. Points may not be recognized if in close proximity of each other.
- In an environment with excess noise, the responsiveness of touch switches may be lowered and the point that responds may deviate by up to 1 cm. Implement measures such as adding a filter to the input power supply.
- Periodically clean the touch panel surface for optimum touch operations.
  When cleaning, take note of the following points.
  <When cleaning>
  - The panel surface is made of glass. Be sure to clean the surface gently with a cloth or sponge. Otherwise, you may scratch or damage the glass.
  - Take care not to let cleaning detergent to seep into the touch panel unit.
    Do not directly apply or spray cleaning detergent on the panel surface.

[Notes on the Operating System (OS) and Scope of Operation Guarantee]

- The operating system (OS) used on this product is the Windows 10 IoT Enterprise LTSC by Microsoft. Therefore, Windows Update is not applicable to this OS. Also, the apps Cortana, Microsoft Edge, Microsoft Store, and UWP are not supported.
- Custom user apps for use on Windows can be used on this product. Hakko Electronics does not guarantee the operation of apps installed by the customer. Make sure to thoroughly check the operation before actual use.
- Hakko Electronics shall not be held responsible for dealing with trouble or liable for damages stemming from Microsoft products while using this product. When trouble occurs with a Microsoft product or there is a need to check the specifications, refer to the manual of the Microsoft product or contact Microsoft. Refer to the following website to contact Microsoft.
  https://support.microsoft.com/en-us/contactus/

[Notes on Turning Power Off]

The System Configurator built into the X1 series unit provides a write filter function. When the write filter function is enabled, the power of the X1 series unit can be turned off suddenly without damaging system files. If the write filter function is disabled, the shutdown procedure is necessary. Perform the shutdown procedure on System Configurator and after waiting for at least 15 seconds from when the screen has gone out, turn the X1 series unit power off.

[Notes on the Built-in Solid-state Drive (SSD)]

- The X1 series unit has a built-in SSD (C drive). Do not change partitions or split the drive.
- 3D NAND is used in the built-in SSD of the X1 series unit. Keep in mind the service life of the SSD.

[Notes on the Battery]

The X1 series unit has a built-in battery which is used for backing up time data and BIOS settings (retention during power outage). The battery must be replaced within three years after the unit is purchased. Note that the X1 series unit can start up in the same way as usual even if time data and BIOS settings are lost. Time data is reset to the default value in such a case. Set again as necessary.

[Notes on Wireless LAN]

For details regarding supported wireless LAN standards, radio law certifications, and countries where wireless LAN can be used, refer to the “X1 Series Notes on Wireless LAN” manual provided with the X1 series unit at delivery.

[Notes on the Startup Time]

Since a Windows OS is used, the startup time differs depending on the devices that are connected and software that is additionally installed.
Carefully consider devices and software before use.

Contents

1 System

1.1 System Settings

1.1.1 System Setting 1-1
1.1.2 Unit Setting 1-2
Edit Model Selection 1-2
Multi-language Setting 1-3
Unit Setting 1-8
1.1.3 Communication Setting 1-29
Hardware Setting 1-29
Device Memory Map 1-31
Ethernet Communication 1-31
1.1.4 Common Setting 1-32
Global Setting 1-32
Alarm Server 1-32
Logging Server 1-32
Recipe 1-32
Scheduler 1-32
Others 1-32
1.1.5 Settings 1-33
Macro Setting 1-33
Date and Time Display Setting 1-33

1.2 Process Cycle

1.2.1 Setting the Processing Cycle 1-34
1.2.2 Processing Sequence in the X1 Series 1-36
One-cycle Processing 1-37
1.2.3 If Communication is Slow 1-38
Methods for Creating Screens 1-38
Others 1-38

1.3 List of Internal Device Memory

1.3.1 Types of Internal Device Memory 1-39
User Device Memory 1-39
System Device Memory 1-39
1.3.2 System Device Memory Details 1-40

2 Overlap

2.1 Overview

2.1.1 Overlap Displays 2-1
2.1.2 Overlap Display Formats 2-3
Normal Overlap 2-3
Call-overlap 2-4
Multi-overlap 2-5
Global Overlap 2-6
2.1.3 Overlap Auxiliary Functions 2-7
System Buttons 2-7

2.2 Normal Overlap

2.2.1 Creation Procedure 2-8
2.2.2 Detailed Settings 2-9
2.2.3 Show/Hide Settings 2-11

2.3 Call-overlap
2.3.1 Creation Procedure 2-14
2.3.2 Detailed Settings 2-15
2.3.3 Show/Hide Settings 2-16
2.4 Multi-overlap
2.4.1 Creation Procedure 2-18
2.4.2 Detailed Settings 2-19
2.4.3 Show/Hide Settings 2-21
2.5 Global Overlap
2.5.1 Creation Procedure 2-24
2.5.2 Detailed Settings 2-26
2.5.3 Show/Hide Settings 2-28
2.5.4 Notes 2-30

3 Switch
3.1 Switch
3.1.1 Overview 3-1
Basic Function of Switches 3-1
Lamps in Switches 3-4
3.1.2 Setting Examples 3-5
Setting the PLC bit to ON. 3-5
Changing Screens 3-6
Starting the Web Browser 3-7
Starting a User App 3-8
Tiling Running Apps 3-9
3.1.3 Detailed Settings 3-10
3.1.4 Basic Function of Switches 3-25
List of Functions 3-25
Switch Function Examples 3-29
3.1.5 Flowchart 3-31
3.1.6 Coordinate Output 3-35
3.1.7 Notes 3-36
Placement 3-36
3.2 Scroll Bars
3.2.1 Overview 3-37
3.2.2 Setting Examples 3-38
3.2.3 Detailed Settings 3-41
3.2.4 Notes 3-43
3.3 Slider Switch

4 Lamp
4.1 Overview
4.2 Setting Examples
Using Bit Lamps 4-3
Using Lamps with Conditions (N-State Lamp) 4-4
Creating a Three-Pattern Lamp (N-State Lamp) 4-5
Placing 128 Pattern Lamps 4-6
4.3 Detailed Settings
4.4 Draw Mode
4.5 Notes

5 Data Display

5.1 Numerical Display

5.1.1 Overview 5-1
5.1.2 Setting Examples 5-4
Monitoring PLC Device Memory 5-4
5.1.3 Detailed Settings 5-5
5.1.4 Real Numbers (Floating Point Numbers) 5-18

5.2 Character Display

5.2.1 Overview 5-20
5.2.2 Detailed Settings 5-21

5.3 Message Display

5.3.1 Overview 5-29
5.3.2 Detailed Settings 5-30

5.4 Table Data Display

5.4.1 Overview 5-34
5.4.2 Table Data Settings 5-34
5.4.3 Numerical Data Display Settings 5-36
5.4.4 Character Display Settings 5-40
5.4.5 Message Display Settings 5-42
5.4.6 Text Settings 5-43

5.5 Notes

5.5.1 Placing Switches or Lamps Overlaying Other Switches or Lamps 5-44

6 Entry

6.1 Numerical Data Entry

6.1.1 Overview 6-1
6.1.2 Setting Examples 6-2
Placing an Entry Target and Keypad on the Screen 6-2
Showing the Keypad Only When Necessary 6-4
Placing an Entry Display (Value Entry) 6-5
Specifying an Entry Range 6-6
Displaying Input Values Using * (Asterisks) 6-7
Slider Switch 6-8
6.1.3 Detailed Settings 6-9
Keypad 6-9
Entry Target 6-16
Slider Switch 6-20

6.2 Character Input

6.2.1 Overview 6-21
6.2.2 Setting Examples 6-23
Placing an Entry Target and Keyboard on the Screen 6-23
Showing the Keyboard Only When Necessary 6-25
USB Keyboard Entry 6-26
USB Barcode Reader Input 6-27
Password Input 1 (* (Asterisks) Display) 6-28
Password Input 2 (Judgment Result Output) 6-29
6.2.3 Detailed Settings 6-31
Keyboard 6-31
Entry Target 6-33

6.3 Convenient Functions

6.3.1 Item Select Function 6-35
Overview 6-35
Selecting by Tapping the Entry Target 6-35
Item Select with [Input Cursor Movement Control Device] 6-36

7 Trends

7.1 Overview

Historical Display 7-1
Real Time Display 7-1

7.2 Historical Display

7.2.1 Logging Server 7-2
Setting Example 7-3
Detailed Settings 7-7
7.2.2 Graph Display 7-16
Location of Setting 7-17
Detailed Settings 7-17
Notes 7-25
7.2.3 Data Display 7-26
Location of Setting 7-27
Detailed Settings 7-27
Log Printing 7-31

7.3 Real Time Display

7.3.1 Location of Settings 7-34
7.3.2 Detailed Settings 7-34
7.3.3 Plot Point Pitch 7-40
7.3.4 Display Method 7-44
7.3.5 Asynchronous Display of Multiple Trend Graphs 7-46
7.3.6 Background Update 7-49

8 Alarm

8.1 Overview

8.2 Alarm Server

8.2.1 Alarm Server 8-7
8.2.2 Alarm Block Settings 8-9
8.2.3 Action When Alarms Occur 8-22

8.3 Date and Time Display Setting

8.4 Alarm Parts

8.4.1 Detailed Settings 8-33

9 Graph Display

9.1 Bar Graph

9.1.1 Overview 9-1
9.1.2 Setting Examples 9-2
Displaying Current Values (Standard Display) 9-2
Displaying Deviation from a Reference Value to the Current Value (Deviation Display) 9-4
9.1.3 Detailed Settings 9-6

9.2 Pie Graph
9.2.1 Overview 9-11
9.2.2 Setting Examples 9-12
Displaying Current Values (Standard Display) 9-12
Displaying Deviation from a Reference Value to the Current Value (Deviation Display) 9-14
9.2.3 Detailed Settings 9-16
9.3 Closed Area Graphs
9.3.1 Overview 9-21
9.3.2 Setting Examples 9-22
Displaying Current Values 9-22
9.3.3 Detailed Settings 9-24
9.4 Panel Meter
9.4.1 Overview 9-27
9.4.2 Setting Examples 9-28
Displaying Current Values 9-28
9.4.3 Detailed Settings 9-31
Alarm 9-37
Num. Display 9-39
Detail 9-42
9.5 Statistic Bar Graph
9.5.1 Overview 9-47
9.5.2 Setting Examples 9-48
Displaying a Bar Graph of the Ratio of D100 to D104 Values 9-48
Displaying a Numerical Data Display of the Ratio of D100 to D104 Values 9-49
9.5.3 Detailed Settings 9-51
9.6 Statistic Pie Graph
9.6.1 Overview 9-53
9.6.2 Setting Examples 9-54
Displaying a Pie Graph of the Ratio of D100 to D103 Values 9-54
Displaying a Numerical Data Display of the Ratio of D100 to D103 Values 9-55
9.6.3 Detailed Settings 9-57
10 Calendar
10.1 Overview
10.2 Time Display
10.2.1 Overview 10-2
10.2.2 Setting Examples 10-3
Displaying the X1 Series Unit Calendar 10-3
Display Using the Time Display Format Setting 10-4
Displaying Seconds Data Stored in Device Memory in Timer Format 10-6
10.2.3 Detailed Settings 10-7
10.3 Calendar
10.3.1 Detailed Settings 10-10
10.4 Calendar Data Correction
10.4.1 System Configurator 10-14
10.4.2 Changing the PLC Calendar Time Data 10-15

11 Graphics and Animation

11.1 Graphics

11.1.1 Overview 11-1
11.1.2 Detailed Settings 11-3
Operation Select: Switch 11-3
Operation Select: Device (No. Designation) 11-5
Operation Select: Device (Bit Designation) 11-8
11.1.3 Graphic Display Color 11-12
11.1.4 Graphic Library (Parameter Settings) 11-14

11.2 Animation

11.2.1 Overview 11-18
11.2.2 Setting Example 11-19
11.2.3 Detailed Settings 11-24
Registering Animation 11-24
Animation Settings 11-26
11.2.4 Notes 11-34

12 Message

12.1 Message Mode

12.1.1 Overview 12-1
12.1.2 Setting Examples 12-4
Displaying Messages (Page Blocks) 12-4
12.1.3 Detailed Settings 12-7
12.1.4 Registering Messages 12-15
12.1.5 Registering Page Blocks 12-16
12.1.6 Registering Direct Blocks 12-17

12.2 Displaying Comments

12.2.1 Overview 12-18
12.2.2 Setting Examples 12-20
Displaying Comments (Number Designation) 12-20
12.2.3 Detailed Settings 12-22
12.2.4 Registering Comments 12-26

13 Others

13.1 Memo Pad

13.1.1 Overview 13-1
13.1.2 Usage Example 13-2
13.1.3 Detailed Settings 13-3
13.1.4 Memo Pad Data Storage 13-5
Saving to a Storage Folder 13-5

14 Item Show/Hide Function

14.1 Overview

14.2 Setting Examples

14.2.1 Displaying Items when the Corresponding Bit Turns ON 14-2
14.2.2 Displaying Items Using Device Memory Values 14-3
14.2.3 Displaying Items Using the Level of the Security Function 14-4

14.3 Detailed Settings

14.4 Checking Settings

15 Recipes

15.1 Overview

15.1.1 Recipes 15-1
15.1.2 Recipe Function 15-2
Structure 15-2
Operations 15-3

15.2 Creating Recipe Data (BIN/CSV Files)

15.2.1 Using the Screen Configuration Software 15-4
Setting Procedure 15-4
15.2.2 Creating Recipes Using Excel (CSV Files Only) 15-6
Setting Procedure 15-6

15.3 Reading Recipes in Units of Files When the PLC Bit Turns ON

15.3.1 Conceptual Operation 15-7
15.3.2 Setting Procedure 15-7
15.3.3 Operating Procedure 15-7

15.4 Reading Recipes in Units of Files with Switch Operations

15.4.1 Conceptual Operation 15-8
15.4.2 Setting Procedure 15-8
15.4.3 Operating Procedure 15-8
Reading Out by Searching for Filenames (Filtering) 15-9

15.5 Reading Recipes in Units of Records

15.5.1 Specifying Record Numbers for Reading 15-11
Conceptual Operation 15-11
Setting Procedure 15-11
Operating Procedure 15-11

15.6 Writing Recipes in Units of Records

15.6.1 Specifying Record Names for Writing 15-12
Conceptual Operation 15-12
Setting Procedure 15-12
Operating Procedure 15-12
15.6.2 Creating New Records 15-13
Conceptual Operation 15-13
Setting Procedure 15-13
Operating Procedure 15-13
Difference in Operation Between Record Name Designation and Record Number Designation 15-14

15.7 Checking that the Recipe Function is Operating Correctly

15.7.1 Conceptual Operation 15-15
15.7.2 Setting Procedure 15-15
15.7.3 Checking Procedure 15-15

15.8 Detailed Settings

15.8.1 Location of Settings 15-16
15.8.2 Recipe Settings (0 to 255) 15-16
[Standard Operation] Tab Window 15-16
[File Format] Tab Window 15-17
[Recipe Data] Tab Window 15-18
[Transfer Command] Tab Window 15-19

15.9 Switch Operated Functions

15.9.1 Switch Types 15-20
Filter 15-21
New 15-23

15.10 Specifications

Notes 15-26
Recipe Parts 15-27

16 Print

16.1 Overview

16.1.1 Printable Items 16-1
16.1.2 Compatible Printers 16-1

16.2 Connection Method

16.2.1 Printer Driver Installation and Settings 16-2
16.2.2 Hardware Settings (Printer Properties) 16-4

16.3 Hard Copy

16.3.1 Overview 16-5
16.3.2 Printing 16-5

16.4 Printing Data Sheets

16.4.1 Overview 16-7
16.4.2 Detailed Settings 16-10
16.4.3 Printing 16-15
16.4.4 PDF Output 16-17
16.4.5 System Devices 16-19
16.4.6 Notes 16-19

16.5 Connecting to a Sato MR-400 Barcode Printer

16.5.1 Connection Method 16-20
16.5.2 Notes on Memory Cards 16-21
Memory Cards 16-21
16.5.3 Format Tables 16-22
16.5.4 Printing 16-30

1 System

1.1 System Settings

1.2 Process Cycle

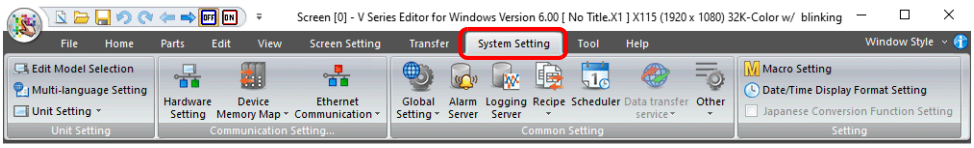
1.3 List of Internal Device Memory

1.1 System Settings

1.1.1 System Setting

System settings cover a variety of settings including those initially required for the X1 series unit to communicate with the PLC, unit settings, and screen program settings. This section only describes the settings important for initial setup.
For details, refer to the relevant item.

Before transferring a screen program to the X1 series unit, be sure to check the system settings.

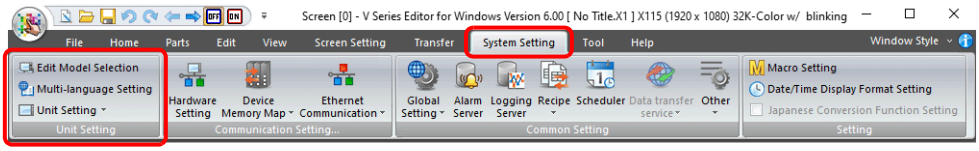


Group	Item		Refer to
Unit Setting	Edit Model Selection		"Edit Model Selection" page 1-2
	Multi-language Setting		"Multi-language Setting" page 1-3
	Unit Setting	SRAM/Clock	"SRAM/Clock" page 1-8
		Backlight	"Backlight" page 1-10
		Buzzer	"Buzzer" page 1-11
		System Display Setting	"System Display Setting" page 1-12
		Blink/Flash	"Blink/Flash" page 1-12
		Overlap	"2 Overlap"
		Sound	X1 Series Reference Manual 2 2 Sound
		General Setting	"General Settings" page 1-13
		Local Mode	"Local Mode Prohibition Setting" page 1-27
		GD-80E/V609E Compatibility Setting	"GD-80E/V609E Compatibility Setting" page 1-28
Communication Setting	Hardware Setting		"Hardware Setting" page 1-29
	Device Memory Map		X1 Series Reference Manual 2 12 Device Memory Map
	Ethernet Communication	Local Port	X1 Series Reference Manual 2 6 Ethernet Communication Function
		Network Table	
		E-Mail	
Common Setting	Global Setting	Global Overlap Setting	"2.5 Global Overlap"
	Alarm Server		"8.2 Alarm Server"
	Logging Server		"7.2.1 Logging Server"
	Recipe	Recipe	"15 Recipes"
		Recipe List	
	Scheduler		X1 Series Reference Manual 2 3 Scheduler
	Other	Storage Setting	X1 Series Reference Manual 2 9 Storage
		MES Setting	6.9 MES Interface Function
		Operation log Setting	4 Operation Log
		Security Setting	5 Security
		Time Display Format Setting	"Time display format setting" page 10-8
		Flowing Message	"8.2 Alarm Server"
		Picture Viewer Setting	X1 Series Reference Manual 2 14 Picture Viewer
		Web Browser Setting	X1 Series Reference Manual 2 8 Convenient Functions
		IIoT Setting	X1 Series Reference Manual 2 7 IIoT Function

Group	Item		Refer to
Common Setting	Other	Multi-Display Settings	X1 Series Reference Manual 2 15 Multi-Display Function
		Start application Setting	X1 Series Reference Manual 2 8 Convenient Functions
Setting	Macro Setting		V9 Series Macro Reference Manual
	Date and Time Display Setting		"8.3 Date and Time Display Setting"

1.1.2 Unit Setting

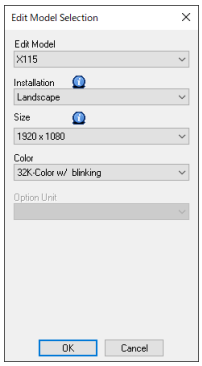
This section explains the items in the [Unit Setting] group.

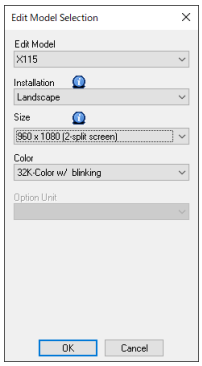


☞ For information on other settings, refer to "1.1.1 System Setting" page 1-1.

Edit Model Selection

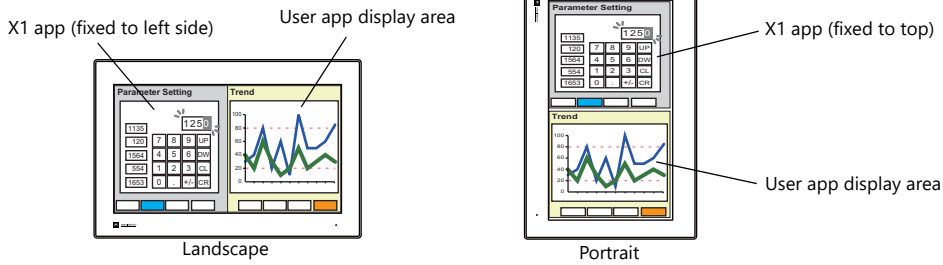
Select the model of the X1 series for which you wish to configure a screen program.
Location of setting: [System Setting] → [Edit Model Selection] or [System Setting] → [Hardware Setting] → [Edit Model]





X1 Series Model	Edit Model	Installation	Size	Color
X1151iSRD X1151iSD	X115	Landscape Portrait	1920 × 1080 910 × 1080 (2-split screen display) *	64K-Color w/o blinking 32K-Color w/ blinking
X1121iSRD X1121iSD	X112		1280 × 800 640 × 800 (2-split screen display) *	

* Editing is performed with the X1 app at half size. This is convenient when using the X1 app in one half of the screen and using the remaining half for displaying user apps.
This is also used when using [Split the screen] in [Multi-Display Settings].

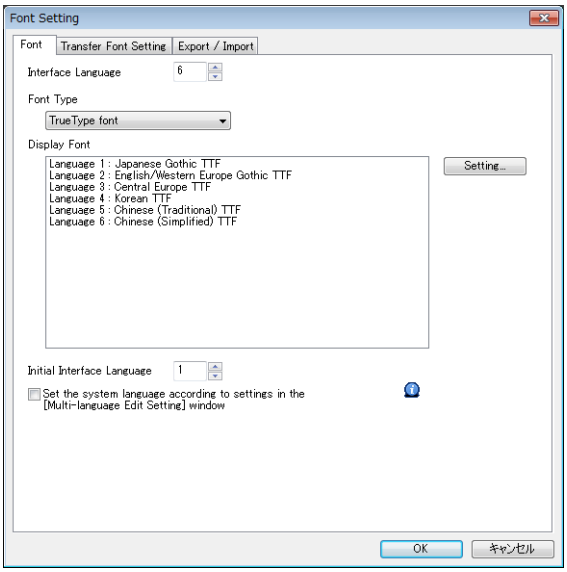


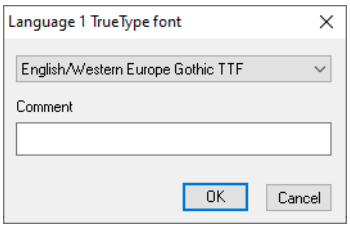
☞
- For details on user apps, refer to "8.4 Starting Applications" in the X1 Series Reference Manual 2.
- For details on the multi-display function, refer to "15 Multi-Display Function" in the X1 Series Reference Manual 2.

An X1 series screen program cannot be converted into an earlier version (e.g., the V9 series, TS2060, V8/V7 series, TELLUS Ver. 4, and TELLUS Ver. 3).

Multi-language Setting

Select the interface language for the X1 app.[*1]
Location of settings: [System Setting] → [Multi-language Setting]



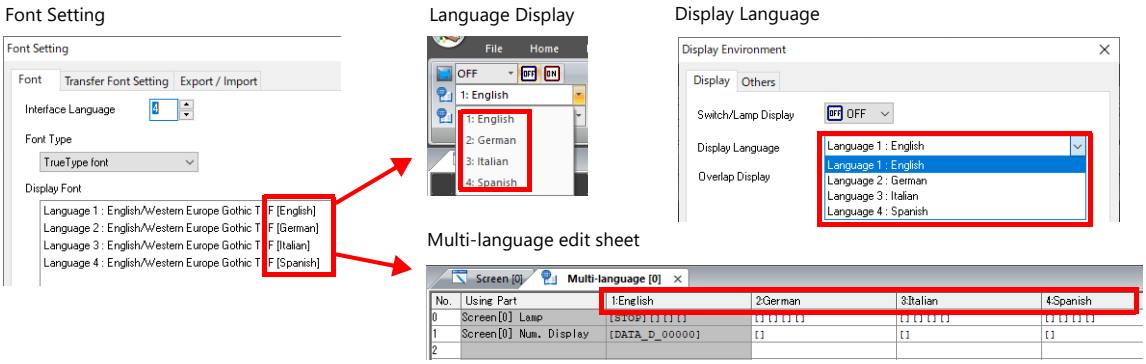


☞ For details, refer to "9 Language Changeover" in the X1 Series Reference Manual 2.

Item	Description
Interface Language	Set the number of interface languages. 1 to 32 Example: Specifying "5" means Languages 1 to 5 can be set.
Font Type	Select a font type from [TrueType font], [Bitmap font], or [Gothic font]. [*2] [*3]
Setting	Set the languages and comments [*4] to use.
Initial Interface Language	Select the initial interface language to use after transferring a screen program. 1 to 32 The interface language is as follows after transfer. Operation / Interface Language: At power ON: The language displayed when the power was turned OFF is displayed. Switching from RUN mode to Local mode: The language used in RUN mode is displayed. Switching from Local mode to RUN mode: The language used in Local mode is displayed. [*5] In Local mode during screen program transfer / In RUN mode during screen program transfer: The language specified for [Initial Interface Language] in the screen program is displayed. Displaying System Configurator from Local mode: The interface language selected in System Configurator is displayed. Switching from System Configurator to the X1 app: The language that was last used on the X1 app is displayed.
Set the system language according to settings in the [Multi-language Edit Setting] window (setting available for two or more interface languages)	Select this checkbox when setting the interface languages of the following screens. (This setting is convenient when all the same fonts are selected using [Setting...].) The supported languages are Japanese, English/Western Europe, Chinese (Simplified), Chinese (Traditional), and Korean. Local mode screen, error message screen, operation log viewer, picture viewer The following settings are required. • Set each language at [Home] → [Registration Item] → [Multi-language] → [Multi-language Edit] → [Multi-language Edit Setting]. • Select the checkboxes of the interface languages at [System Setting] → [Multi-language Setting] → [Transfer Font Setting].

*1 The interface language of Windows functions such as the web browser are set using System Configurator. For details on System Configurator, refer to the X1 Series Hardware Specifications.
*2 Stroke fonts are not supported. Although selection is possible at [Font Type], TrueType fonts will be used instead on the X1 unit.
*3 Of the TrueType fonts, only Japanese, English, Chinese (Simplified), and Chinese (Traditional) support vector rendering. For details on vector rendering, refer to "8.6 Vector Rendering" in the X1 Series Reference Manual 2.

*4 Comments are displayed on the [Language Display] menu, multi-language edit sheets, etc.
This is useful when editing a multi-language screen program with the same font setting.



*5 Exceptions

- Example 1: When the same font is registered multiple times, the language displayed before switching to Local mode is displayed.

  [Interface Language]: 2, [Transfer Font Setting]: Japanese Gothic TTF, [Initial Interface Language]: 1
  - Language 1: Japanese Gothic TTF
  - Language 2: Japanese Gothic TTF

- Example 2: In the following case, the lowest language number in the font settings is displayed.

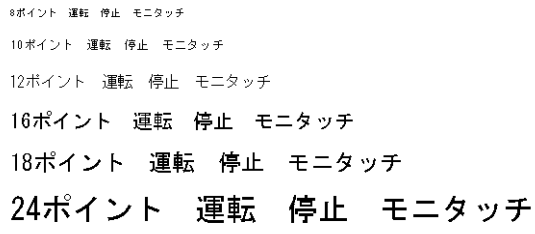
  [Interface Language]: 3, [Transfer Font Setting]: Japanese Gothic TTF, English/Western Europe Gothic TTF, Central Europe TTF, [Initial Interface Language]: 1
  - Language 1: Japanese Gothic TTF
  - Language 2: English/Western Europe Gothic TTF
  - Language 3: Central Europe TTF

  Operation example:

  RUN (Japanese Gothic TTF)
  ↓
  Local mode (switch from Japanese to English)
  ↓
  RUN (Language 2 is displayed)

Font Types

Fonts are roughly divided into three types.
Because the mixed use of fonts is not permitted, select one font type in the [System Setting] → [Multi-language Setting] → [Font Setting] window. *1
However, note that TrueType fonts are always used on the Local mode screen regardless of this setting.

Type *2	Size Specification Method	Features	Image
TrueType font	Point specification	Supports smoothing. Used on the Local mode screen.	
Gothic font		Supports smoothing.	 There are automatic/manual setting restrictions depending on the function.
Bitmap font	XY magnification factor specification	Designed in sizes of 16 × 16 dots and 32 × 32 dots (two-byte characters). Smoothing not supported.	

☞ Windows fonts
No font data is stored on MONITOUCH but the fonts used on Windows, such as “Times New Roman” or “Arial”, are used as image data. Settings can be configured for each item.
For details, refer to the V9 Series Operation Manual.

*1 Stroke fonts are not supported. Although selection is possible on the [Font Setting] window, TrueType fonts will be used instead on the X1 unit.
*2 Of the TrueType fonts, only Japanese, English, Chinese (Simplified), and Chinese (Traditional) support vector rendering. For details on vector rendering, refer to “8.6 Vector Rendering” in the X1 Series Reference Manual 2.

Supported Language List

The following table lists the fonts and corresponding languages supported by the X1 series.

Font Setting [*1]		Supported Language	Supported Character Code	Remarks
TrueType font	Japanese Gothic TTF	Japanese, English	JIS level 1 to level 4 + ANK code	Code 8794 cannot be displayed
	Japanese Times TTF			
	English/Western Europe Gothic TTF	English, Icelandic, Irish, Italian, Dutch, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faroese, French, Swedish	ISO-8859-1: Latin1 (Extended ASCII code)	
	English/Western Europe Times TTF			
	Chinese (Traditional) TTF	Chinese (traditional), English	BIG5 code (A141 to F9FE) + ASCII code	Codes A344 to A373 cannot be displayed
	Chinese (Simplified) TTF	Chinese (simplified), English	GB2312 code (A1A1 to F7FE) + ASCII code	Codes A021 - A07E A6A1 - A6B8 A6C1 - A6D8 A7A1 - A7C0 A7D1 - A7F1 A8BB, A8BD, A8BE, A8C0 cannot be displayed
	Korean TTF	Hangul, English	KS code (A1A1 to FDFE) + ASCII code	Codes A2E6 and A2E7 cannot be displayed Vector rendering not supported
	Central Europe TTF	Croatian, Czech, Hungarian, Polish, Romanian, Slovakian, Slovene, Hrvatska (Croatian)	CP1250 code	Vector rendering not supported
	Cyrillic TTF	Russian, Ukrainian, Bulgarian, Kazakh, Uzbek, Azerbaijani	CP1251 code	
	Greek TTF	Greek	CP1253 code	
	Turkish TTF	Turkish	CP1254 code	
	Baltic TTF	Estonian, Latvian, Lithuanian	CP1257 code	
Bitmap font	Japanese	Japanese, English	JIS level 1, level 2 + ANK code	Vector rendering not supported
	Japanese 32	Japanese, English	JIS level 1 + ANK code	
	English/Western Europe	English, Icelandic, Irish, Italian, Dutch, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faroese, French, Swedish	ISO-8859-1: Latin1 (Extended ASCII code)	
	Chinese (Traditional)	Chinese (traditional), English	BIG5 code (A141 to C67E) + ASCII code	
	Chinese (Simplified)	Chinese (simplified), English	GB2312 code (A1A1 to FEFE) + ASCII code	
	Korean	Hangul, English	KS code (A1A2 to C8FE) + ASCII code	
	Central Europe	Croatian, Czech, Hungarian, Polish, Romanian, Slovakian, Slovene, Hrvatska (Croatian)	CP1250 code	
			ISO code [*2] (ISO-8859-2: Latin2)	
	Cyrillic	Russian, Ukrainian, Bulgarian, Kazakh, Uzbek, Azerbaijani	CP1251 code	
			ISO code [*2] (ISO-8859-5: Latin5)	
	Greek	Greek	CP1253 code	
			ISO code [*2] (ISO-8859-7: Latin7)	
	Turkish	Turkish	CP1254 code	
			ISO code [*2] (ISO-8859-9: Latin9)	
	Baltic	Estonian, Latvian, Lithuanian	CP1257 code	

Font Setting *1		Supported Language	Supported Character Code	Remarks
Gothic font	Gothic	Japanese, English	JIS level 1 + level 2 + ANK code	Vector rendering not supported
	Gothic (IBM Extended Character)	Japanese, English	JIS level 1 + level 2 + IBM extended code (FA40 to FC4B) + ANK code	
	English/Western Europe HK Gothic	English, Icelandic, Irish, Italian, Dutch, Swedish, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faeroese, French	ISO-8859-1: Latin1 (Extended ASCII code)	
	English/Western Europe HK Times			

*1 Different fonts cannot be used together.

*2 Select the [ISO Code] checkbox when selecting the corresponding fonts in the [System Setting] → [Multi-language Setting] → [Font Setting] window.

Unit Setting

The settings to be configured on the X1 series unit are described below. Select the functions to use and configure the required settings.
Location of settings: [System Setting] → [Unit Setting]

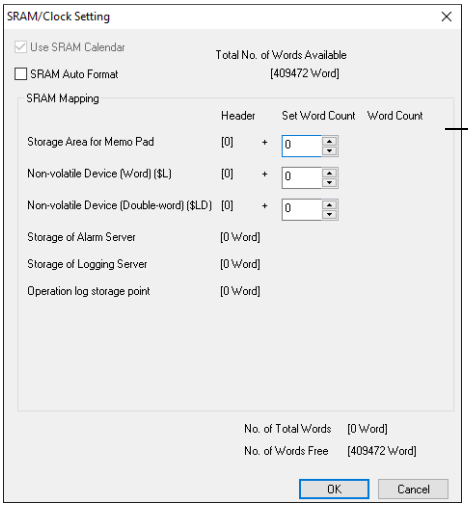
SRAM/Clock

Configure settings when using SRAM.
The following area in the X1 series unit is the SRAM area.

C:\MONITOUCH\X1\0\work\sram

0: Main app in multi-display
1: Sub app in multi-display

Location of settings: [System Setting] → [Unit Setting] → [SRAM/Clock]



The content of the SRAM area is retained after power to the unit is turned off.

Item	Description	Refer to
Use SRAM Calendar	Selected (fixed) The built-in clock of the X1 series unit is used. * The X1 series does not support reading data from a PLC's calendar function.	"10 Calendar"
SRAM Auto Format	Set the SRAM format method. Selected Perform auto-formatting. Unselected Perform formatting on the SRAM Setting screen in Local mode.	"Formatting SRAM" page 1-9
Storage Area for Memo Pad	Allocates an area that stores the memo pad data.	"13.1 Memo Pad"
Non-volatile Device (Word) ($L) Non-volatile Device (Double-word) ($LD)	Allocates areas used by the addresses $L (word area) and $LD (double word area) in user device memory. The available range is determined by the specified device memory address. Example: When the set number of words for $L is 10, $L0 to $L9 can be used.	"Non-volatile $L (word) and non-volatile $LD (double-word)" page 1-9 "Formatting SRAM" page 1-9
Storage of Logging server	When the logging server is used, the required number of words is allocated.	"7.2.1 Logging Server"
Storage of Alarm Server	When the alarm server is used, the required number of words is allocated.	"8.2.1 Alarm Server"
Operation log storage point	When operation logs are used, the required number of words is allocated.	X1 Series Reference Manual 2 4 Operation Log
No. of Total Words No. of Words Free	Indicates the number of used and free words with the current settings. Set the items within the number of words available.	-

Non-volatile $L (word) and non-volatile $LD (double-word)

- Difference
  The difference between "Word" and "Double-word" is whether only the specified address (word) is guaranteed or two words (double-word) from the address are guaranteed when a power failure occurs.

- Data protection when a power failure occurs
  When a power failure occurs while writing data to $L or $LD, the data value just before writing is guaranteed. (In case of $L, the top word of data just before writing is guaranteed; in case of $LD, the top two words of data just before writing is guaranteed.)
  However, note that when performing processing where two or more words for $L and three or more words for $LD are written simultaneously, the data is not guaranteed.

  Example: Character display, "BMOV" macro command, [Screen Setting] → [Screen Setting] → [PLC Device Transfer] etc.

*1 Use $LD to access two word data. To verify whether writing was successful or not, check system device memory addresses $s721 to $s726.

Device Memory	Description	Device Type
$s721	Writing result of $L address where data was written last 0: Normal 1: Error	← X1 (writing from X1 to $s)
$s722	$L address where data was written last if $s721 indicates [1: Error] at power-up	
$s723		
$s724	Writing result of $LD address where data was written last 0: Normal 1: Error	
$s725	$LD address where data was written last if $s724 indicates [1: Error] at power-up	
$s726		

Formatting SRAM

When settings are configured in the [SRAM/Clock Setting] window, always format SRAM in Local mode on the X1 series unit before use.
If not formatted, the message "Screen Data Error. Error: 161 (or 163)" will appear and the screen program will not run.

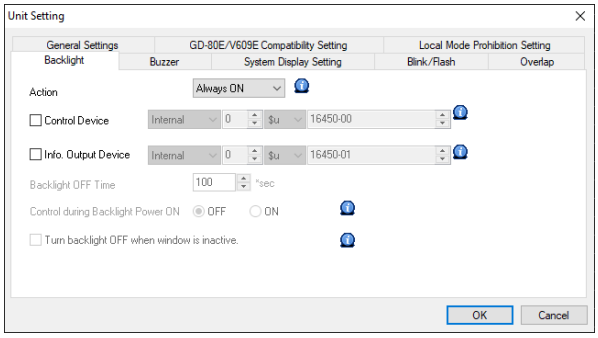
- SRAM auto format
  For example, if the data storage destination or number of words for storage of history data changes in accordance with the logging and alarm functions, the sizes displayed in the [SRAM/Clock Setting] window may also change. In such a case, SRAM needs formatting every time the size changes.
  This formatting can be performed automatically. When the [SRAM Auto Format] checkbox is selected, SRAM will automatically be formatted each time a screen program is transferred. For details, refer to the following table.

  When the [SRAM Auto Format] checkbox is selected

SRAM Area	Condition	Auto Format
Storage Area for Memo Pad	Size increases	No
	Size decreases	Yes
Non-volatile Device (Word) ($L) Non-volatile Device (Double-word) ($LD)	Size increases	Only the increased device memory area is formatted while the existing area is not formatted.
	Size decreases	Only the decreased device memory area is deleted while the existing area is not formatted.
Logging server	Changes to server settings, such as number of saves	Yes (all history data is cleared)
Alarm Server	Changes to server settings, such as number of saves	Yes (all history data is cleared)
Operation log	Changes to settings, such as number of saves	Yes

Backlight

Configure how the backlight is controlled by the X1 series unit.



Item		Description
Action	Always ON	The backlight is always on.
	Auto 1	Backlight OFF conditions: The backlight is turned off when the time specified by [Backlight OFF Time] has elapsed from the instant when all the following conditions are met. *1 • Control device memory: OFF • Screen display (lamp, data display, calendar, etc.): No change • Touch switch: OFF Backlight ON conditions: The backlight is turned on when any of the following conditions is met. *2 • Control device memory: ON (always ON) • Screen display: Changed • Somewhere on the screen is touched. • Normal/call-overlap: ON/OFF_ • Multi-/global overlap: ON/OFF, overlap number changed
	Auto 2	Backlight OFF conditions: The backlight is turned off when the time specified by [Backlight OFF Time] has elapsed from the instant when all the following conditions are met. *1 • Control device memory: OFF • Touch switch: OFF Backlight ON conditions: The backlight is turned on when any of the following conditions is met. *2 • Control device memory: ON (always ON) • Somewhere on the screen is touched.
	Auto 3	Backlight OFF conditions: The backlight is turned off when the time specified by [Backlight OFF Time] has elapsed from the instant when all the following conditions are met. *1 • Control device memory: OFF • Touch switch: OFF Backlight ON conditions: The backlight is turned on when any of the following conditions is met. *2 • Control device memory: ON (always ON) • Screen changeover • Somewhere on the screen is touched. • Normal/call-overlap: ON/OFF • Multi-/global overlap: ON/OFF, overlap number changed
	Manual	Backlight OFF conditions: • Control device memory: OFF (bit changes from 1 to 0) Backlight ON conditions: The backlight is turned on when any of the following conditions is met. *2 • Somewhere on the screen is touched. • Control device memory: ON (bit changes from 0 to 1)
Control Device		This setting is available when an option other than [Always ON] is set. This device memory controls the backlight. 0: Backlight turned off when conditions are met 1: Backlight turned on
Info. Output Device		Stores the ON/OFF state of the backlight. 0: Backlight turned off 1: Backlight turned on * This bit is 1 when the backlight is turned on even if the control device memory is OFF.
Backlight OFF Time		0~65535 (sec) This setting is only available when [Auto 1], [Auto 2] or [Auto 3] is selected for [Action]. Set the length of time that elapses before the backlight is turned off after the OFF conditions have been met.

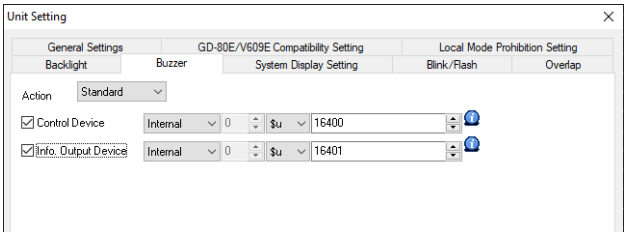
Item	Description
Control during Backlight Power ON	This setting is only available when [Manual] is selected for [Action]. Select the backlight ON/OFF status for when the power is turned on and when the mode changes from STOP to RUN.
Turn backlight OFF when window is inactive.	Set the operation of the backlight for when multiple apps are running and an app other than the X1 app is active (in the foreground). • Unselected (default): The backlight does not turn off when an app other than the X1 app is active (in the foreground). • Selected: The backlight turns off * regardless of which app is active (in the foreground). * If the backlight is off and the X1 app is inactive, the backlight can be turned on by tapping the X1 app window area. When using multiple apps, it is recommended to deselect this setting.

*1 When the entire screen display is refreshed, such as when changing over the entire screen or turning on/off or switching an overlap display, the time measured for [Backlight OFF Time] is cleared.

*2 No switch data is output if a switch is pressed with the backlight off. When a switch is pressed with the backlight off, the backlight is turned on. Switch data is output from switch operations made after 500 ms has elapsed since the backlight was turned on.

*3 Disabled when the control device memory is ON.

Buzzer

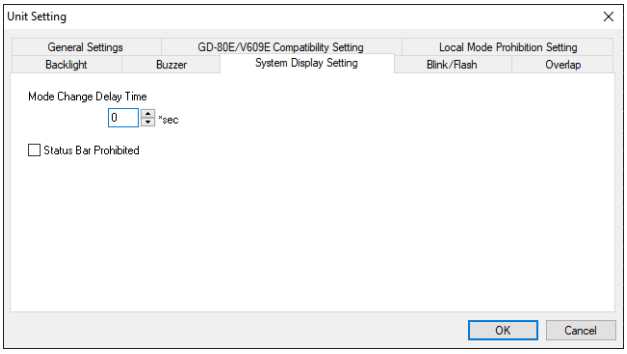


Item	Description
Action	Set the buzzer sound that is output when a switch is pressed.*1 • Standard: 100 msec • Short: 10 msec • Continuous: Continuous • OFF: No buzzer sounding
Control Device	Sound the buzzer using an external command. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 Not used (always set to "0") Continuous buzzer * 1: Execute Error buzzer 0 → 1: Execute Single shot buzzer 0 → 1: Execute * The [Use Continuous Buzzer Sound] checkbox must be selected at [Unit Setting] → [General Settings]. For details, refer to page 1-13.
Info. Output Device	This device memory stores the state of the control device memory. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 Not used (always set to "0") Continuous buzzer Error buzzer Single shot buzzer

*1 If the [Detail] → [A buzzer sounds individually] checkbox is selected in the switch settings window, the setting made on the switch settings window takes priority.
For details on switch settings, refer to "3.1.3 Detailed Settings" page 3-10.

System Display Setting

Configure settings regarding operation changing to Local mode and display of the status bar.



Item	Description
Mode Change Delay Time	0-30 (sec) Set the mode change delay time for switching from RUN mode to Local mode.
Status Bar Prohibited	Prohibit the display of the status bar at the bottom right of the screen.

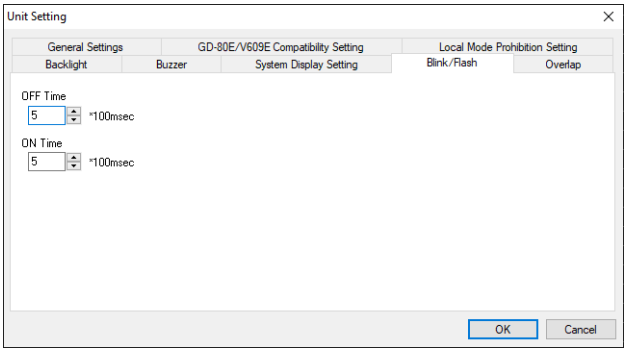
Switching from RUN mode to Local mode

Press one corner of the screen for more than two seconds and release your finger when there is a beep. Next, press a different corner for more than two seconds to display the system menu.
Press the [Local] switch on the system menu for the time set at [Mode Change Delay Time] (0 to 30 seconds) to switch to Local mode.

☞ For details on displaying the system menu and Local mode screens, refer to the X1 Series Hardware Specifications.

Blink/Flash

The blink/flash time for the blink color can be set.



Item	Description
OFF Time (× 100 msec)	0: Blinking at about 500 msec intervals 1 to 100: Blinking at about × 100 msec intervals
ON Time (× 100 msec)	

Overlap

Select the unit for overlap coordinates.

☞ For details, refer to "2 Overlap".

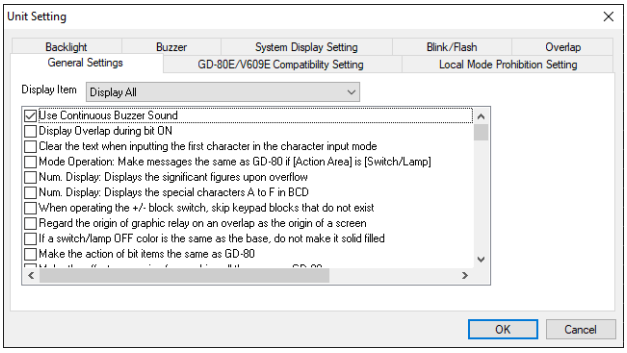
Sound

Configure these settings when selecting a WAV file by designating a device memory address in the sound function.

☞ For details, refer to "2 Sound" in X1 Series Reference Manual 2.

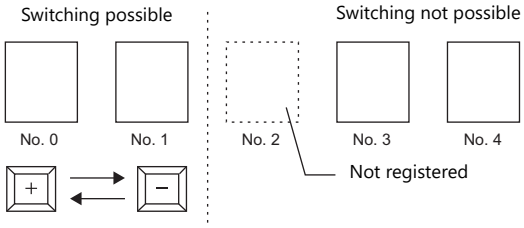
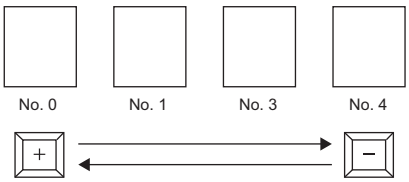
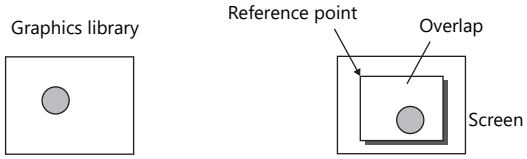
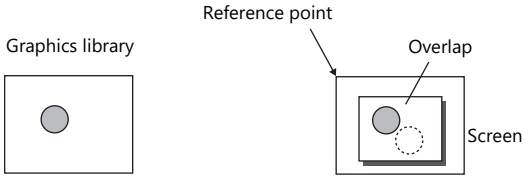
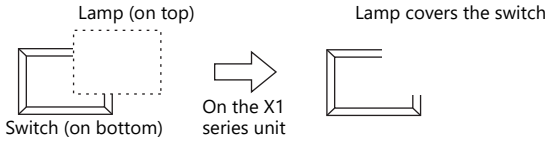
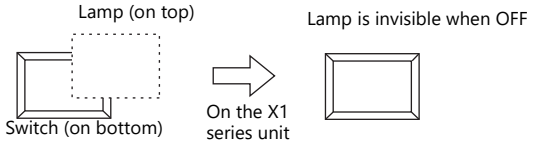
General Settings

These options are classified into two groups: settings compatible with older models, and other additional settings. Settings compatible with older models are set automatically when converting screen programs to the X1 series.



Item	Description
Use Continuous Buzzer Sound	Used to set whether or not to use a continuous buzzer. • Unselected Do not use a continuous buzzer. • Selected The buzzer sounds continuously while the control device memory of the buzzer is ON. For details, refer to page 1-11.
Display Overlap during bit ON	Used to set the operation of normal/call-overlaps (when using control device memory). • Unselected Recognized at the edge. Even if the bit is ON when a screen is opened, the overlap is not displayed. • Selected Recognized at the level. The overlap is displayed while the bit is ON.
Clear the text when inputting the first character in the character input mode	Used to set the operation performed when a character key is first pressed in the character input mode. • Unselected Existing text remains in the entry display part. • Selected Existing text in the entry display part is automatically cleared.
Mode Operation: Make messages the same as GD-80 if [Action Area] is [Switch/Lamp].	This is valid when [Action Area: Switch/Lamp] is selected for bit order alarming, page mode or direct mode. Used to set the message display format on a switch or lamp part. • Unselected Messages are wrapped if they cannot be display on one line. ABCDEFGHIJKLMNOP QRSTU • Selected If a message cannot be display on one line, the part of the message protruding from the area is not shown. ABCDEFGHIJKLMNO
Num. Display: Displays the significant figures upon overflow	Used to set the display on MONITOUCH when an overflow occurs on a numerical display part. Example: When D100 = 1234 • Unselected 4-digit display: “1234” 2-digit display “--” • Selected 4-digit display: “1234” 2-digit display “34”
Num. Display: Displays the special characters A to F in BCD	Used to set the display on MONITOUCH when BCD is selected for a numerical display part.

PLC	Display on MONITOUCH	
	Unselected	Selected
0~9	0~9	0~9
A	0	.
B	0	:
C	0	–
D	0	+
E,F	0	(Space)

Item	Description
When operating the +/–block switch, skip keypad blocks that do not exist	Used to set the operation performed if there is an unregistered block between the block numbers [Min. Block] and [Max. Block] for the target of switching the keypad block. • Unselected Switching is stopped when an unregistered block is encountered.  • Selected Switching is performed while skipping unregistered blocks. 
Regard the origin of graphic relay on an overlap as the origin of a screen	Used to set the reference position when the graphic relay function is set for an overlap. • Unselected Graphics are placed with respect to the origin of the overlap display part.  • Selected Graphics are placed with respect to the origin of the screen. 
If a switch/lamp OFF color is the same as the base, do not make it solid filled	Used to set the OFF color display when the screen background color is the same as the OFF color of a switch or lamp. • Unselected The switch or lamp part placed on top covers the part that is underneath it on both the editor and MONITOUCH.  • Selected The part on top covers the part underneath it on the editor. On MONITOUCH, the OFF color becomes transparent. 
Make the action of bit items the same as GD-80	Select this checkbox when the Hitachi HIDIC-S10 is connected and a screen program created for the GD-80 or V4 series converted for use on a X1 series unit. If this checkbox is not selected, compatibility cannot be retained because bit weights are inverted from the GD-80 and V4 processing when they are converted for use on a X1 series unit.

Item	Description
Make the offset processing for graphic call the same as GD-80	If two or three conditions shown below are present, the graphic display position at bit ON is different from that on the GD-80. To make it the same as the GD-80, select this checkbox. • Graphic relay used • Graphic call used • Graphic call with offset and parameter settings
Use Vertical Text	If you want to place Japanese characters, select this checkbox.
Use Internal Flash ROM as Back-up Area	Select this checkbox to use part of the FROM area on MONITOUCH as a device memory backup area (PLC and internal). This function cannot be used with the station number table. Station number table Station numbers of target devices can be set as desired for PLC communication or temperature control network communication using the following devices. • PLC: Mitsubishi QnA series (Ethernet), 1:n connection only • PLC: Mitsubishi QnH (Q) series (Ethernet), 1:n connection only • PLC: OMRON SYSMAC CS1/CJ1/CJ2/CP series (Ethernet Auto), 1:n connection only • PLC: OMRON SYSMAC CS1/CJ1/CJ2/CP series DNA (Ethernet Auto), 1:n connection only • Temperature controller: Fuji Electric F-MPC04P (loader) • Temperature controller: Fuji Electric F-MPC04S (UM03)
Print Alarm Logging Data (V8 compatible) in the Displayed Format	Used to make print settings for alarm logging. • Unselected Both bit ON data and bit OFF data are printed. • Selected Data is printed in the currently displayed format (if bit ON data is shown, only bit ON data is printed).
Validate the Character Order Setting for Text in JIS Codes	Used to set the display of JIS codes for character display parts. • Unselected Displayed in MSB → LSB format regardless of the setting for [Text Process] ([Char. Display] → [Text Process]). • Selected The setting for [Text Process] ([Char. Display] → [Text Process]) takes effect.
Use 3-D Parts	If a screen program that uses 3D parts for a 128-color monitor has been converted into data for a 64k-color or 32k-color monitor, this checkbox is selected automatically. Use the setting as is.
Convert NULL to Space with the LD/RD Macro	Used to set how NULL data processing is performed when reading a CSV file that contains NULL data. ([Data Type] of recipe format table: CHAR) Applicable commands LD_RECIPE, LD_RECIPE2, LD_RECIPESEL, LD_RECIPESEL2, RD_RECIPE_FILE, RD_RECIPE_COLUMN, RD_RECIPE_LINE • Unselected Loaded as NULL (00H) • Selected Converted into space (20H) and loaded
Permit Double-Word Transfer by BMOV	Used to set the action to be taken when the transfer source (transfer target) device is a double-word device. Example: Fuji Electric MICREX-F series BD (data device) • Unselected: Only the lower-order word is transferred. $u100 = BD100 C:4 (BMOV) $u100 1111H ← BD100 22221111H $u101 3333H ← BD101 44443333H $u102 5555H ← BD102 66665555H $u103 7777H ← BD103 88887777H • Selected: Both the upper- and lower-order words are transferred. $u100 = BD100 C:4 (BMOV) (D) $u100 1111H ← BD100 22221111H $u101 2222H $u102 3333H ← BD101 44443333H $u103 4444H

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Set the Height of the Windows Font to Gothic</td><td>Used to set the font size to be applied when the screen program created using Windows fonts on V-SFT version 2.1.3.0 or earlier is opened on V-SFT version 2.1.4.0 and later.

• Unselected
Created with version 2.1.3.0 or earlier → Opened with version 2.1.4.0 or later
 (Arial 36pt)

• Selected
Retains compatibility with screen programs created with version 2.1.3.0 or earlier.</td></tr>
<tr><td>Decimal Point Compatible in Reading Recipe File</td><td>Used to set the action to take when a CSV file contains values without a decimal point even though “with decimal point” is set on the attribute table.

Example:
Attribute table
Type: DEC, decimal point: 1, word count: 1

CSV file
<table><tr><td>123.4</td><td>12.34</td><td>0.123</td><td>1234</td><td>12340</td></tr></table>
• Unselected: Data is read assuming that the decimal point is specified
<table><tr><td></td><td>D100</td><td>D101</td><td>D102</td><td>D103</td><td>D104</td></tr><tr><td>Data in device memory</td><td>1234</td><td>123</td><td>1</td><td>12340</td><td>57864</td></tr><tr><td>MONITOUCH display</td><td>123.4</td><td>12.3</td><td>0.1</td><td>1234.0</td><td>5786.4</td></tr></table>Overflow

• Selected: Data is read without assuming that the decimal point is specified
<table><tr><td></td><td>D100</td><td>D101</td><td>D102</td><td>D103</td><td>D104</td></tr><tr><td>Data in device memory</td><td>1234</td><td>123</td><td>1</td><td>1234</td><td>12340</td></tr><tr><td>MONITOUCH display</td><td>123.4</td><td>12.3</td><td>0.1</td><td>123.4</td><td>1234.0</td></tr></table></td></tr>
<tr><td>Fix the Width of the Windows Font</td><td>Used when numerical data display or character display parts are created using Windows fonts on Windows XP/Vista/7/8/8.1/10.

• Unselected
Depending on the OS, text width may change on MONITOUCH.

• Selected
Regardless of the OS, text width is standardized on MONITOUCH.</td></tr>
<tr><td>Delete folders from the oldest if Storage is lacking in space for backup</td><td>Used to set the operation that is performed when the storage folder capacity is not sufficient for creating a backup file of logging servers/alarm servers or a PDF output of data sheet printing.

• Unselected
A backup file is not created.

• Selected
- If a folder for the previous day or earlier exists, the folder with the oldest date is retrieved and deleted entirely.
- If only the folder for the current day exists, only the file with the oldest date in the history of the specified logging server or alarm server is retrieved and deleted.
* The setting for automatically deleting folders is also provided at [System Setting] → [Other] → [Storage Setting] → [Deletes the backup folder].</td></tr>
<tr><td>Do Not Delete the Alarm Now Occurring</td><td>Used to set the action to take when the [DEL] key on an alarm display is pressed.

• Unselected
All the alarms being displayed can be deleted using the [DEL] key.

• Selected
The alarms currently occurring cannot be deleted using the [DEL] key.</td></tr>
<tr><td>Adjust the position of Windows Font Multi Text</td><td>Used for position correction when using a Windows Font in multi-text.

• Unselected
Process character height of multi-text as a fixed value.

• Selected (default):
Correct the character height of multi-text so it fits within the specified area.</td></tr>
<tr><td>Follow to the PLC1 setting for the text process in a recipe file.</td><td>Used to determine how to recognize LSB and MSB when processing text strings in recipe files.

• Unselected: Depends on the attribute setting

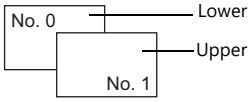
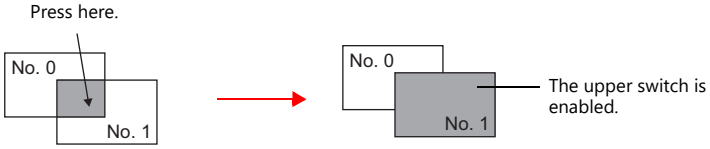
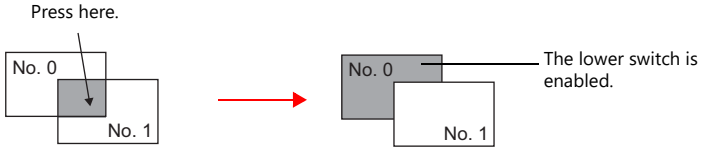
• Selected: Depends on the [Text Process] setting of PLC1</td></tr>
</table>

Item	Description
SW Word Operation (Transfer) Code Conversion	When a switch with [Word Operation] set for [Function] is operated under the following conditions, the action performed depends on this setting. Condition 1: [Hardware Setting] → [PLC Properties] → [BCD] for [Code] Condition 2: [Word Operation] for switch [Function] → [→ (Transfer)] for [Operation Mode] Condition 3: [Constant (DEC/DEC-)] for [Operation Memory] Condition 4: [PLC Device] for [Operand Device] • Unselected The constant (DEC/DEC-) specified in the operation device memory is stored as DEC/DEC- data in the PLC. • Selected The constant (DEC/DEC-) specified in the operation device memory is converted into BCD and stored in the PLC.
Avoid the use of upper three bits in the Read Area (n + 2) (V8 compatible)	This option determines how the three high-order bits in the read area "n + 2" (screen number designation) are treated following specification changes relevant to screen number extension. • Unselected: The three high-order bits are used for screen number designation. • Selected: The three high-order bits are system reserved (0). Screen number designation range - DEC: 0 to 4095 - BCD: 0 to 1999 (values "2000" and after invalid)
File name designation in Recipe Macro (V7 compatible)	This option determines the number of characters used to specify a recipe macro file name. • Unselected: Maximum of 10 characters • Selected: Maximum of 8 characters (same operation as V7) Automatically selected when converted from V7 to X1. <Applicable commands> SET_RECIPEFOLDER, RD_RECIPE_FILE, RD_RECIPE_LINE, RD_RECIPE_COLUMN, WR_RECIPE_FILE, WR_RECIPE_LINE, WR_RECIPE_COLUMN, GET_RECIPE_FILEINFO
Save the pitch setting of the texts of Switch/Lamp	Used to set [Char. Prop.] → [Set line spacing] in the switch and lamp settings window. • Unselected The value specified for line spacing is cleared at the end of screen program editing. The setting is unselected for the next editing. • Selected The value specified for line spacing is saved in the screen program. The setting is selected and the value is also displayed for the next editing.
Maintain the letter alignment of a switch/lamp	Used to set the text alignment in the switch and lamp settings window. • Unselected The text alignment setting is cleared at the end of screen program editing. The alignment setting for every switch and lamp is cleared for the next editing. • Selected The text alignment setting is saved in the screen program. The setting is retained for the next editing.
Allow to use Insert/DELETE keys when entering values	This option is relevant to using the [←] and [→] keys for data insertion and using the [DELETE] and [BS] keys for deletion. For details, refer to "6.1 Numerical Data Entry" "Style" page 6-12.
Format the SRAM forcefully	This option determines the action taken when "error: 163 (SRAM:)" occurs, which indicates an SRAM formatting error, no SRAM data immediately after shipment, or loss of SRAM data due to battery disconnection. • Unselected (default): Formatting the SRAM is executed in Local mode while the battery is connected to the X1 series unit. • Selected A forced formatting is executed. Whether automatic formatting was executed can be checked at $s1085. (After execution, "1" is stored at $s1085. Switching MONITOUCH to Local mode again clears the value to "0".)
Retain compatibility with negative value handling of CVFD macro command	Used to set the action to taken when converting negative values. • Unselected (default): An action according to the value at $s99 is taken. • Selected: A truncation is performed irrespective of the value at $s99. * For details on the "CVFD" macro command and address $s99, refer to the V9 Series Macro Reference Manual.

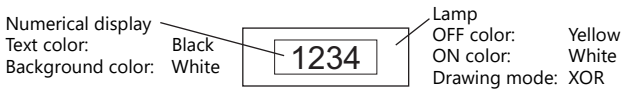
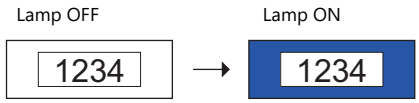
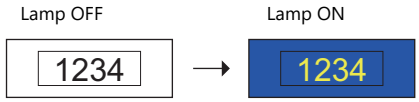
Item	Description
Backup the recipe file	Used to set the action taken when an error occurs in writing to a CSV file in recipe mode. • Unselected (default): No backup file is created. • Selected - Normally ended: A CSV file and backup file "xxx.BAK" are created. - Abnormally ended: A temporary file from "xxx.000" to "xxx.999"* is created. * If temporary files "xxx.000" through "xxx.999" already exist, the oldest file is retrieved and deleted.
Display the recipe mode after executing SV/WR macro commands	Used to set whether or not to update the data in recipe mode when the RECIPE folder in a storage folder is reread at the time of execution of the macro commands given below. • Unselected (default): The recipe mode item is not updated. • Selected The recipe mode item is updated. The recipe mode item is reset to the default status. If editing is disabled by the command device memory, the current display status is kept. Applicable commands SV_RECIPE, SV_RECIPE2, SV_RECIPESEL, SV_RECIPESEL2, WR_RECIPE_FILE, WR_RECIPE_LINE, WR_RECIPE_COLUMN
Return switch prohibited when switching the screen by an external command	Used to set the action taken when a switch with [Return] set for [Function] is used. • Unselected (default): It is possible to go back to the previously displayed screen even if it was switched by an external command. • Selected It is not possible to go back to the previously displayed screen if it was switched by an external command.
Cancel the restriction on the number of registerable characters for Switch and Lamp (127 characters)	Used to set the number of characters that can be displayed on a switch or lamp. • Unselected (default): The number of registerable characters is limited according to the width of the item. • Selected A maximum of 127 characters can be registered regardless of the width of the item. * When the [Char. Prop.] → [Auto-adjust the size according to the style] checkbox is selected in the switch/lamp settings window, the settings of [Auto-adjust the size according to the style] take precedence.
Scale the upper/lower limit of the alarm for num. display	Used to set the range of values associated with issuing alarms for numerical data display. Example: Numerical data display to be colored blue for a value 101 or above Numerical data display device memory : D100 Alarm maximum value device memory : $u1000, Alarm color: Blue Before range change : 0 - 1000 After range change : 0 to 100 (101 or above: Normal color → Blue) • Unselected (default): The maximum and minimum values for alarms are set in the range according to "After range change." - Alarm maximum value: $u1000 = 100 • Selected The maximum and minimum values for alarm are set in the range according to "Before range change." (With constant designated, the operation in the case of "unselected" will take place.) - Alarm maximum value: $u1000 = 1000
Change the display from "00:00 AM/PM" to "12:00 AM/PM"	Used to set the time display to the 12-hour format. Applicable parts Time Display • Unselected Midnight → Displayed as "00:00 AM" Noon → Displayed as "00:00 PM" • Selected (default): Midnight → Displayed as "12:00 AM" Noon → Displayed as "12:00 PM"

Item	Description
Synchronize system cycle and drawing cycle (V8 compatible)	Used to set the processing method of MONITOUCH. • Unselected (default): Perform the system cycle and drawing cycle asynchronously. For details, refer to "1.2 Process Cycle" page 1-34. • Selected Operate using V8 specifications.
Inhibit simultaneous execution of multiple macros (V8 compatible)	Used to set the action taken when execution of multiple macros occur at the same time. • Unselected (default): Process macros simultaneously. • Selected (V8 compatible operation): Finish execution of the current macro before executing the next macro.
Retain the previous picture in graphic mode (V8 compatible)	Used to set the rendering method when using graphic mode. • Unselected (default): Do not retain the image from the last rendering. • Selected (V8 compatible operation) *: Retain the image from the last rendering. * Vector rendering is not possible. When vector parts are used or when [Prioritize drawing of vectors] is selected for text, "Error 400" or "Error 402" is displayed on the X1 series unit after the screen program is transferred.
High speed drawing of the paint in graphic mode	If the drawing of paint in graphic mode/graphic relay display is slow, select this checkbox.
Make the Entry mode operation command the same as V8	Used to allocate [Control Device] and [Info. Output Device] in entry mode (when using a keypad). • Unselected (default): Operate using X1 specifications. For details, refer to "6 Entry". • Selected Operate using V8 specifications.
Inhibit automatic optimization of memory reading operation (V8 compatible)	Used to set the action taken when the X1 series unit reads a PLC device memory. • Unselected (default): Optimize reading in accordance with screen registration. • Selected Operate using V8 specifications.
Invalidate cache for device writing operation (V8 compatible)	Used to set X1 series processing of keypad entry. • Unselected (default): Write to the X1 series unit internally first and then update the display. • Selected Operate using V8 specifications.
Disable Switch Word Operation cache	This option is available when [Invalidate cache for device writing operation (V8 compatible)] is selected. This option sets the cache operation for switches with [Word Operation] selected under [Function]. • Unselected (default) Cache enabled (values in the cache may be displayed) • Selected Cache disabled
Allow max. 8 characters for naming files used in V8 recipe mode (V8 compatible)	Used to set the maximum number of characters available for recipe filenames. • Unselected (default): Maximum of 64 characters • Selected (V8 compatible operation): Maximum of 8 characters <Applicable commands> SET_RECIPEFOLDER, RD_RECIPE_FILE, RD_RECIPE_LINE, RD_RECIPE_COLUMN, WR_RECIPE_FILE, WR_RECIPE_LINE, WR_RECIPE_COLUMN, GET_RECIPE_FILEINFO
Use read/write area (V8 compatible)	Used to set the action taken when changing to the X1 series from V6, V7, and V8 series units. • Unselected (default): Use [System Setting] → [Hardware Setting] → [Control Area]. • Selected Operate using V8 specifications. Use [System Setting] → [Hardware Setting] → [Control Area].

Item	Description
Gray out interlocked switches	Used for display settings of a switch with an interlock set. • Unselected (default): The switch is displayed using the colors specified in the screen program. • Selected The switch is displayed grayed-out during interlock activation.
Retain compatibility of logging server's SRAM storage	Used to set the processing method of MONITOUCH when saving logging history data to SRAM. • Unselected (default) Processing is performed according to V8 specifications to reduce the amount of SRAM used. • Selected Processing is performed according to X1 specifications. * If this setting is changed, the SRAM will require reformatting because the amount of SRAM to be used will change.
Output logging data in binary format	Used to set the processing method of MONITOUCH when saving logging history data to a storage folder. • Unselected Processing is performed according to X1 specifications. • Selected (default) Processing is performed according to V8 specifications to increase the speed of writing to a storage folder.
Retain compatibility of alarm server's SRAM storage	Used to set the processing method of MONITOUCH when saving alarm history data to SRAM. • Unselected (default) Processing is performed according to V8 specifications to reduce the amount of SRAM used. • Selected Processing is performed according to X1 specifications. * If this setting is changed, the SRAM will require reformatting because the amount of SRAM to be used will change.
Output alarm data in binary format	Used to set the processing method of MONITOUCH when outputting alarm history data to a storage folder. • Unselected Processing is performed according to X1 specifications. • Selected (default) Processing is performed according to V8 specifications to increase the speed of writing to a storage folder.
Text/multi text display position (V8 compatible)	Used to set position correction for text and multi-text. • Unselected (default) Text/multi-text is placed at the specified coordinates. • Selected If using a bitmap font and "Shadow" is set in the text properties, text/multi-text is placed at a position shifted by one pixel upward to the left from the coordinates.
Activate auto-scroll display of the alarm	Used to set the operation that is performed when an alarm message is longer than the display area width. • Unselected The alarm message is displayed cut off and automatic scrolling is not performed. • Selected (default) When the message is selected with the cursor, automatic scrolling is performed to display the entire message.
Use the point size specified in the message edit window for alarm parts using Windows fonts.	Used to set the text size of alarm messages. • Unselected (default) Alarm messages are displayed using the size set at [Contents] → [Point] in the alarm settings window. • Selected Alarm messages are displayed using the size set at [Edit] (or right-click menu) → [Char. Prop.] → [Point] in the message editor. * This setting is only available when [Display Mode] → [Alarm History/Event History/Real Time] is selected in the alarm settings window.
No code conversion when using the Device Memory Map (V8 compatible)	Used to set the operation that is performed when "Word" or "Double Word" is set for "Data Type" in a device memory map. • Unselected (default) Data is transferred according to the setting of [System Setting] → [Hardware Setting] → [PLC1 to 8 Properties] → [Code]. • Selected Data is transferred as is without code conversion.

Item	Description
Lower switch is valid when switches are overlapped (V8 compatible)	Used to set the operation that is performed when two switches overlap each other. *1 Applicable parts Switch, Num. Display/Char. Display (with [Function] set to "Entry Target" and the [Display the keyboard] checkbox selected), Slider Switch, Memo Pad, Recipe, Alarm parts, and Trend parts Display on the editor Placement order: Switch No. 0, which was placed earlier is superimposed by switch No. 1 which was placed later.  Operation on MONITOUCH • Unselected (default) *2 The upper switch (No. 1) is enabled.  • Selected *2 The lower switch (No. 0) is enabled.  *1 If any part that is not overlapping is pressed, the operation of the relevant switch is performed. *2 The default setting used after changing the model differs depending on the model and settings prior to the change. - Change from V4/GD-80 series to X1 series Default setting: unselected - Change from V8/V7/V6 series to X1 series Differs depending on whether the [System Setting] → [Unit Setting] → [General Setting] → [If a switch is overlaid on another, enable the upper switch] checkbox is selected for the screen program of the V8/V7/V6 series. (Before change) Default setting when checkbox is selected: Unselected (Before change) Default setting when checkbox is unselected: Selected
Shift subsequent record numbers of recipe data by one after a record is deleted.	Used to set the operation that is performed when deleting records from the recipe list settings window. * Only available when [Record-based transfer] is set for [Transfer Data]. The operation that is performed differs depending on whether the transfer target setting at [System Setting] → [Recipe] → [File Format] is set as data only or the record name and data. • Transfer target: Data - Unselected (default) Record names remain because only data is deleted in the recipe file. - Selected Rows are shifted up because both record names and data are deleted in the recipe file. • Transfer target: Record name and data - Unselected (default) Record names and data are deleted in the recipe file and empty rows remain. - Selected Rows are shifted up because both record names and data are deleted in the recipe file.
Drawing process (V8 compatible)	Used to set the processing for when a screen change occurs. • Unselected (default) * The screen is changed over after all data is ready to be displayed. • Selected When the screen is changed over, 3D parts and items are drawn first. Then data is displayed. * Vector rendering is not possible. When vector parts are used or when [Prioritize drawing of vectors] is selected for text, "Error 400" or "Error 402" is displayed on the X1 series unit after the screen program is transferred.

Item	Description
Draw background when switching screen (V8 compatible)	This option is available when [Drawing process (V8 compatible)] and [Unhiding of items with [Show/Hide] settings (V8 compatible)] are selected. Use this option to set the drawing behavior for drawing items, such as text, shapes, and paint. • Unselected (default) * Draw drawing items as individual parts. Although this prevents screen flickering when using the show/hide function, the display speed may decrease. • Selected Draw drawing items as part of the screen background. Screen flickering will occur when using the show/hide function as on V8 series units. * Vector rendering is not possible. When vector parts are used or when [Prioritize drawing of vectors] is selected for text, "Error 400" or "Error 402" is displayed on the X1 series unit after the screen program is transferred.
Draw switch/lamp at the same timing with numerical data display	This option is available when the [Drawing process (V8 compatible)] checkbox is selected. Used to set the processing for drawing switches and lamps when a screen change occurs. • Unselected (default) Display switches and lamps at the same time as the background (initially OFF display). • Selected Display switches and lamps after displaying the background (display with the bit status reflected).
Allow switch operation during screen switching	This option is available when the [Drawing process (V8 compatible)] checkbox is selected. Used to set switch operation during a screen change. • Unselected (default) Switches are inoperable until a screen change is complete. • Selected Switches are operable during a screen change.
Read every 10 alarm parts	Used to set the number of alarm parts read when displaying alarm parts. • Unselected (default) Read 50 parts at a time. • Selected Read 10 parts at a time (display speed becomes faster when the display area is 10 lines or less).
Read alarm blocks of the same cycle at one time	Used to set the reading operation of alarm blocks. The operation is determined when all of the following conditions are satisfied. Condition 1: [Alarm Device] → [Monitoring Intervals] are the same (excluding 0) Condition 2: [Control Device Settings] is not configured Condition 3: [Others] → [Read Monitoring Device per cycle] is not selected • Unselected Read device memory for each alarm block. • Selected (default) Read all device memory at once.

Item	Description
XOR drawing of switch/lamp	Used to set XOR display of switches and lamps. Applicable parts • Numerical data/message display parts and switches/lamps • Text and switches/lamps • Text (graphic library) and switches/lamps • Patterns and switches/lamps Example: Placing a numerical data display part overlapped with a switch/lamp  • Unselected (default) The numerical data display part is not affected by the ON color of the switch/lamp.  • Selected * Operates according to V8 specifications and the numerical data display part is XOR displayed with the ON color of the switch/lamp.  * Vector rendering is not possible. When vector parts are used or when [Prioritize drawing of vectors] is selected for text, “Error 400” or “Error 402” is displayed on the X1 series unit after the screen program is transferred.
Expand the available area in SRAM for operation logs	Used to set the method for calculating the amount of SRAM to use for operation logs. • Unselected The amount of SRAM to use is calculated using the plain formula. • Selected (default) The amount of SRAM to use is calculated using the formula for gaining an expanded area.
Do not execute CYCLE macro between ON and OFF macros (V8 compatible)	Used to set the action to take when an OFF macro is set to a switch with [Write] selected under [Function] on an overlap display. • Unselected (default) Execute the cycle macro when a write switch is pressed. • Selected Do not execute the cycle macro when a write switch is pressed.
Bring the data display to top (V8 compatible)	Used to set the display order of data displays (numerical data displays, character displays, and message displays). • Unselected (default) Display all items (including data displays) in the order of placement. • Selected Display data displays at the front.
Unhiding of items with [Show/Hide] settings (V8 compatible)	This option determines whether to monitor hidden items when using the show/hide function. • Unselected (default) Include hidden items in cycle reading (X1 specifications). Although flickering is prevented when the screen is updated with the show/hide function used, the performance of screen switching may decrease. • Selected Do not include hidden items in cycle reading (V8 specifications). Flickering occurs when the screen is updated with the show/hide function used.
Synchronize cursor of Entry Target with drawing cycle (V8 compatible)	Used to set cursor behavior in data displays (entry targets). • Unselected (default) Do not synchronize the cursor to the drawing cycle. This will improve keypad responsiveness. • Selected Synchronize the cursor to the drawing cycle. This will provide the same keypad responsiveness as V8 series units.
Restart Automatically If a System Error has Occurred	Used to set the action to take when a system error occurs. • Unselected Stop the unit when the system error screen is displayed. • Selected (default) Automatically restart the unit.

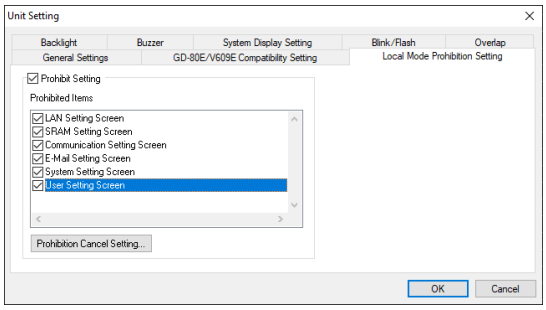
Item	Description
Write Area n+2: timing of screen number updating compatible with V8	This option determines the update timing setting of write area n+2 (screen number). • Unselected (default) Use the X1 update timing (faster than when the checkbox is selected). • Selected Use the same update timing as V8 series units.
Ignore SYS(SET_SCRN) macro being used in the screen currently displayed (V8 compatible)	This option sets the action to take when executing the SYS(SET_SCRN) macro that displays the same screen as the currently displayed screen. * Only the initial occurrence of SYS(SET_SCRN) in a macro sheet is valid. Differences in operation will occur if the SYS(SET_SCRN) macro is registered multiple times in a macro sheet. • Unselected (default) Enable the SYS(SET_SCRN) macro. • Selected Disable the SYS(SET_SCRN) macro.
Draw background when switching an overlap (V8 compatible)	This option sets the library number switching behavior during multi-overlap display. • Unselected (default) Hide overlaps while switching library numbers. • Selected Switch library numbers with overlaps displayed.
Suppress SRAM access of $L/$LD used in macro block	This option determines the writing setting of internal device memory ($L/$LD) in macros. Select this checkbox if $L/$LD writing is slow.
Synchronize interval timer macro and cycle (V8 compatible)	This option determines settings for the interval timer macro and drawing cycle. • Unselected (default) Execute the interval timer macro and drawing cycle at the same time. • Selected Stop the drawing cycle during interval timer macro execution.
Clear the display of overlapping trends when bit for redraw after clear trend graph is ON	This option determines the operation setting of redraw after clear bit when trend graphs areas are placed overlapping *. * [Detail] → [Overlap] checkbox is unselected. • Unselected (default) Only clear the specified graph area (X1 specifications). • Selected Clear all graph areas (V8 specifications).
Reset $T device and execute screen open macro before generating parts on the screen	This option determines the processing order when a screen change occurs. • Unselected (default) Perform operations in the order of screen library device memory → show/hide device memory → device memory of each part → $T reset → open macro/cycle macro * execution. • Selected Perform operations in the order of $T reset → open macro/cycle macro * execution → screen library device memory → show/hide device memory → device memory of each part. * The cycle macro is executed only when the [Synchronize system cycle and drawing cycle] checkbox is selected in the [General Settings] tab window.
Allow use of recipe temporary device memory $R	This option determines the setting when using internal device memory $R in the recipe function. • Unselected (default) $R is not used. • Selected $R is used (65,536 words). When data transfers are executed using the switch functions [Recipe Save Data] and [Recipe Load Data], values can be checked by transferring to $R in advance. $R is an area common to all screens. Clearing occurs upon switching from RUN to STOP and power OFF.
Stop drawing cycle during the switch operation (V8 compatible)	This option determines the drawing cycle setting during switch operation (output, function, ON macro). • Unselected (default) Allow the drawing cycle to occur during switch operation. • Selected Stop the drawing cycle during switch operation (V8 specifications).

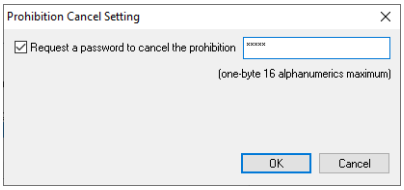
Item	Description
Update info output device (data block No.) of entry mode at the start of switching data block.	This option sets the action to take when switching data blocks and the operation of entry mode information output device memory on overlaps. • Unselected (default) - Perform operations in the order of reading device memory on the data block → storage of block number output device memory of entry mode information output device memory/data block area. - Clear the value of the information output device memory when the overlap display is hidden. • Selected - Perform operations in the order of storage of block number output device memory of entry mode information output device memory/data block area → reading device memory on the data block. Make data block switching wait for the duration of the value held by $s1669. - Hold the value of the information output device memory even when the overlap display is hidden.
Clear the status of Storage Removal when switching a screen (V8 compatible)	This option sets the screen switching operation for switches with [Storage Removal] selected under [Function]. • Unselected (default) Save the removed state after switching screens (X1 specifications). • Selected Clear the removed state after switching screens (V8 specifications).
Overlap display upon switching the screen (V8 compatible)	This option sets the screen switching operation during overlap display via an external command. • Unselected (default) Display overlaps in the initial cycle when switching screens (X1 specifications). • Selected Display overlaps after one cycle when switching screens (V8 specifications).
Graph drawing (V8 compatible)	This option determines the drawing settings of bar graphs, pie graphs, and closed area graphs. • Unselected (default) Do not draw if the current value is less than 1 with respect to the graph width (X1 specifications). • Selected * Draw one dot if the current value is less than 1 with respect to the graph width (V8 specifications). * Vector rendering is not possible. When vector parts are used or when [Prioritize drawing of vectors] is selected for text, “Error 400” or “Error 402” is displayed on the X1 series unit after the screen program is transferred.
Disable the animation effect of the trend (history).	This option sets the animation effect that occurs when selecting trend items ([Display Mode] set to [Historical Display], [Display Method] set to [Graph]). • Unselected (default) Enable animation for smooth display (X1 specifications). • Selected Disable animation for improve display performance (V8 specifications).
Put a message with multiple lines in one cell in CSV created by alarm data.	This option determines the CSV output setting when an alarm message in the alarm history contains multiple lines. • Unselected (default) Divide the message into several cells. • Selected Merge multiple lines into one cell.
Enable transition function by macro commands.	This option determines whether to enable the transition function in macros. • Unselected (default) The transition function is not supported in macros. • Selected The transition function is supported in the SYS (SET_SCRN), SYS (SET_MOVLP), and SYS (OVLP_SHOW) macros. Refer to the V9 Series Macro Reference Manual.
Synchronize the wait for PLC device write of cycle macro by cycle (V8 compatible)	This option determines the PLC writing operation setting in the cycle macro. • Unselected (default) Wait for PLC writing to complete before proceeding to the next processing (X1 specifications). • Selected Proceed to the next processing without waiting for PLC writing to complete (V8 specifications).
Double-word device designation in Bit Order Alarming/Graphic Relay (V8 compatible)	This option sets the operation of bit order alarming and graphic relays. Available when double-word device memory is set to the top device memory. • Unselected (default) Operate using consecutive numbers from the designated bit address (X1 specifications). • Selected Operate using V8 specifications. - When the lower-order 16 bits are designated, ignore the higher-order 16 bits and use the lower-order 16 bits consecutively. - When the higher-order 16 bits are designated, ignore the lower-order 16 bits and use the higher-order 16 bits consecutively.

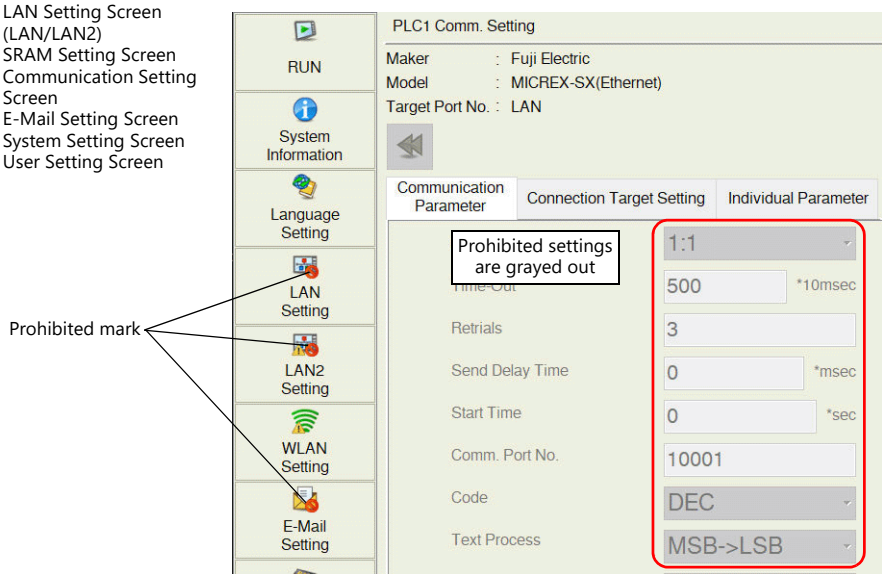
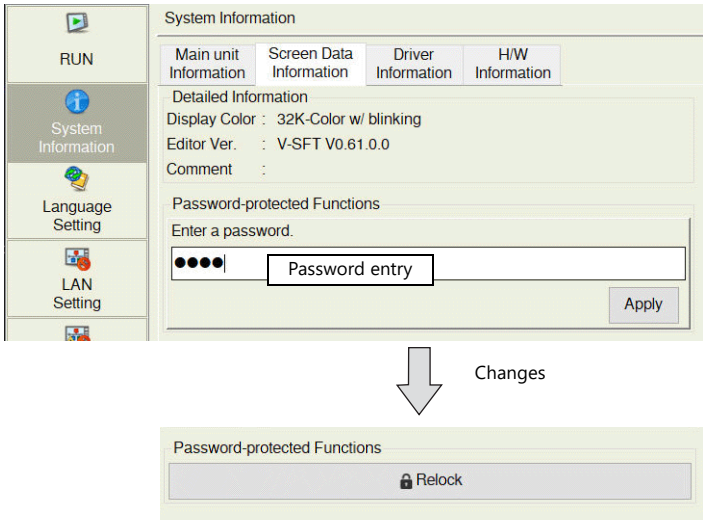
Item	Description
Interlock device reading operation (V8 compatible)	This option sets the reading operation of switch interlock device memory. • Unselected (default) Link with the switch process cycle to increase responsiveness (X1 specifications). Note that switches with [Process Cycle] set to "Refresh" may not function. • Selected Perform interlock judgment upon switch operation (V8 specifications).
Windows fonts (data display), Windows98 compatible	This option sets the character width of Windows fonts (data display, flush right, and no zero suppression). • Unselected (default) Obtain the character width from Windows OS (obtained size differs depending on the OS) (X1 specifications). Note that the display position may shift for screen programs created using versions earlier than Windows 98. • Selected Obtain the character width from bitmap information in the screen program (V8 specifications).
Prohibit touch operation while processing overlap display	This option determines the function of touch operations while processing overlap displays. • Unselected (default) X1 specifications: Touch operations are accepted even while processing overlap displays. • Selected V8 specifications: Touch operations are prohibited while processing overlap displays.
Display logging No. of Data Sampling area (V8 compatible)	This option sets the logging number which appears in a display area of the Trend (data sampling area). • Unselected (default) X1 specifications: to count from 1 and continue counting even when the number of stored data is exceeded. • Selected V8 specifications: to count from 0 and when the number of stored data is exceeded, it returns to 0 and counts again.
Change the display of overlap displays in accordance with the scrolling and magnification changes of the screen.	This option determines how to display overlap displays when enlarging the screen and when the X1 app is shrunk to window view (i.e., not full screen). • Unselected V9 specifications: The position of the overlap display is fixed and the magnification does not change. • Selected (default) X1 specifications: The display position and magnification of overlap displays change according to the display size of the screen and scroll operations.
Yaskawa Memobus special conversion (V8 compatible)	This option specifies whether or not to perform special processing when communicating with a Yaskawa Electric PLC using Memobus (transmission mode: type 1). • Unselected (default) Perform special conversion for all device memory (X1 specifications). • Selected Do not perform special conversion for the following device memory (V8 specifications) <Applicable device memory> Entry mode: Control device memory, information output device memory Recipe mode (V8 compatible): Command device memory "n" Operation log: Control device memory Trend sampling: Graph show/hide control device memory, zoom in/out control device memory Animation: Display command device memory JPEG display: File number designation Audio: File number designation
Make text rendering for printing extended data sheet PDF clear	This option sets whether or not to make text rendering for printing extended data sheet PDF clear. • Unselected (default) All text are output as images. • Selected Text of applicable parts are output using fonts. (printed clearly) <Applicable parts> Numerical data display, character display, message display, text, multi-text, and trend graph <Supported fonts> TrueType font
Double-word access by TBL_WRITE macros (V7 compatible)	This option sets the operation for double-word device memory when executing the "TBL_WRITE" macro command. • Unselected (default) Operate according to X1 specifications (X1 specifications). • Selected Operate according to V7 specifications (V7 specifications).

Local Mode Prohibition Setting

This section explains how to prohibit configuration of settings in Local mode.



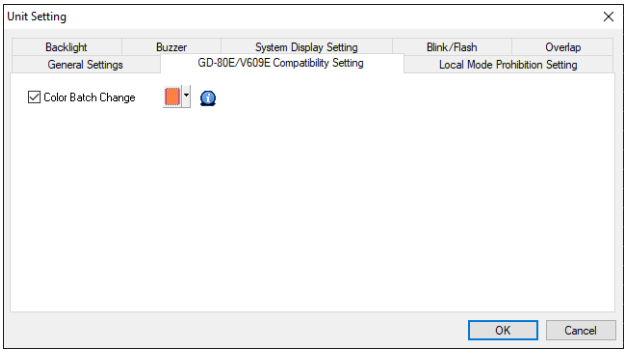


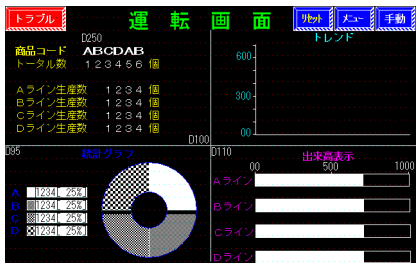
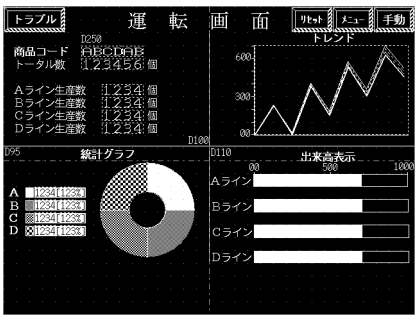
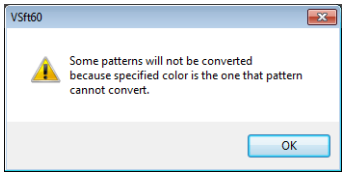
Item	Description
Prohibit Setting	Prohibit configuration of settings in Local mode.
Prohibited Items	Select the screens to prohibit configuration in Local mode. A prohibited mark is displayed on the menu icon of the selected screens and the prohibited settings are grayed out. LAN Setting Screen (LAN/LAN2) SRAM Setting Screen Communication Setting Screen E-Mail Setting Screen System Setting Screen User Setting Screen Prohibited mark 
Prohibition Cancel Setting	Set the password used to disable the prohibition setting for Local mode. Maximum of 16 one-byte alphanumeric characters The password is entered on the [System Information] → [Screen Data Information] screen in Local mode. Press [Relock] to validate the prohibition setting. 

After disabling the prohibition setting, the prohibition setting will be validated when the power is turned off and on again, or a screen program is transferred.
For details on Local mode, refer to the X1 Series Hardware Specifications.

GD-80E/V609E Compatibility Setting

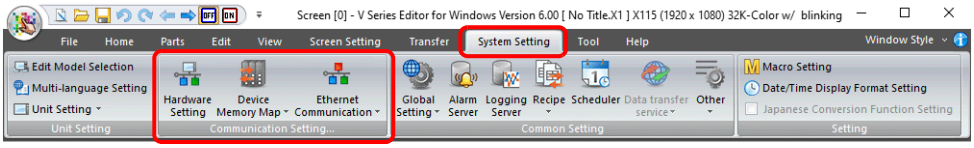
This is a compatibility setting for when an EL-type MONITOUCH, such as the GD-80E or V609E (production discontinued), is to be replaced.



Item	Description
Color Batch Change	Converts any colors other than black into the color specified here to make the display color the same as the one used on GD-80E/V609E (2 colors). GD-80E/V609E data displayed on computer  X1 data displayed on computer  * The color data cannot be restored to the original after conversion. For pattern data, there are some colors that cannot be converted. In such a case, the following dialog box is displayed. 

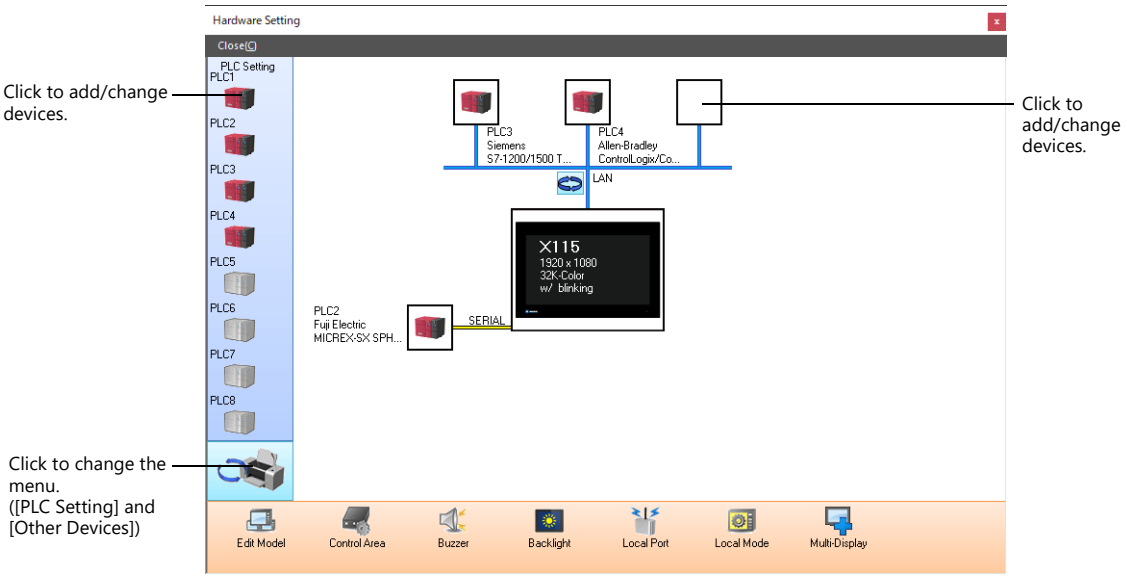
1.1.3 Communication Setting

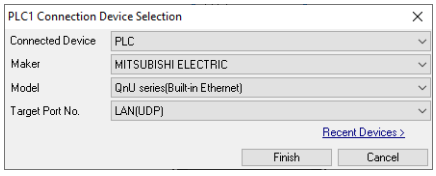
This section explains the items in the [Communication Setting] group.



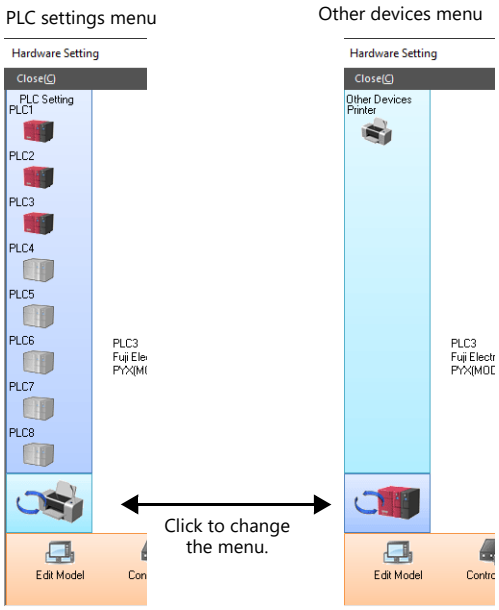
☞ For information on other settings, refer to "1.1.1 System Setting" page 1-1.

Hardware Setting



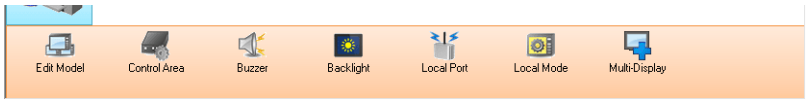


PLC Settings and Other Devices (Left Menu)



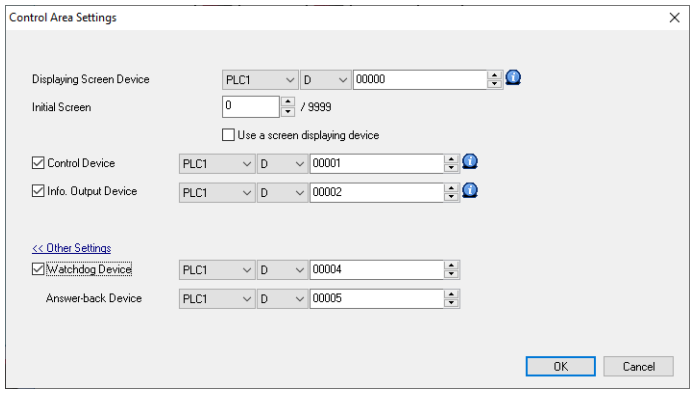
Item	Description	Refer to
PLC1 - 8	Configure settings for PLCs, temperature controllers, and inverters etc. Depending on the device connected, the available connection modes vary.	X1 Series Connection Manual
Printer	Set this option when making hard copies, or when printing data sheets and logging data. Also set this when using the data sheet PDF output function.	"16 Print"

Edit Model and Other Options (Bottom Menu)



Item	Description	Refer to
Edit Model	Select the model of the X1 series for which you wish to configure a screen program.	"Edit Model Selection" page 1-2
Control Area	Configure the control area.	"Control area" page 1-31
Buzzer	Set the buzzer sound used by the X1 series unit.	"Buzzer" page 1-11
Backlight	Configure how the backlight is controlled by the X1 series unit.	"Backlight" page 1-10
Local Port	Configure the Ethernet port number, timeout time and other settings of the X1 series unit. The port number set here is used for EREAD, EWRITE, SEND, and MES macro commands and Ethernet DLL functions.	X1 Series Reference Manual 2 6 Ethernet Communication Function
Local Mode	Prohibit configuration of settings in Local mode.	"Local Mode Prohibition Setting" page 1-27
Multi-Display	Configure the multi-display settings.	X1 Series Reference Manual 2 15 Multi-Display Function

Control area



Item	Description
Displaying Screen Device	This device memory is used for switching the screen via an external command. When a screen number is specified to this device memory, the screen is displayed. Note that the screen number of the currently displayed screen is also stored in this device memory. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 Screen numbers 0 to 9999
Initial Screen	Specify the screen number to display when power to MONITOUCH is turned on. If a nonexistent screen number is specified, the lowest screen number in the screen program is displayed. Use a screen displaying device Display the screen of the number stored in the [Displaying Screen Device] memory.
Control Device	MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Not used (always set to "0") Data read refresh 0 → 1: Execute Change the screen number using a switch 1: Prohibited, 0: Permitted
Change the screen number using a switch	Changeover screens using a switch with [Screen Change-over] or [Return] set for [Function]. [0]: Allow changeover [1]: Prohibit changeover
Data read refresh	All the data display items on the screen are refreshed when the bit changes from 0 to 1. This is applied to every data display item regardless of the setting for [Process Cycle]. For details on [Process Cycle], refer to "1.2 Process Cycle".
Info. Output Device	This device memory stores the state of the [Control Device].
Watchdog Device Answer-back Device	When any data is saved to [Watchdog Device], the same data is also written to [Answer-back Device] after the screen display operation is complete. In addition to watch dog monitoring, these device memory addresses can be used for display scanning.

Device Memory Map

Configure device memory maps when batch transferring addresses between equipment. 128 addresses can be registered to a single device memory map.

☞ For details, refer to "11 Device Memory Map" in X1 Series Reference Manual 2.

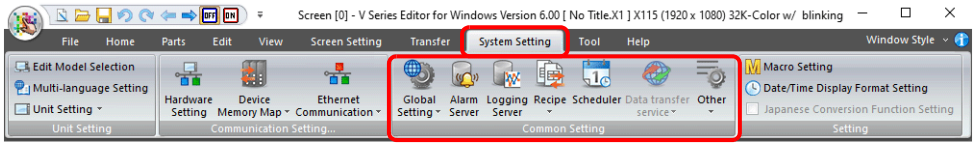
Ethernet Communication

Configure settings to use the Ethernet function for sending e-mails and other communications.

☞ For details, refer to "6 Ethernet Communication Function" in X1 Series Reference Manual 2.

1.1.4 Common Setting

This section explains the common items in the [Common Setting] group.



☞ For information on other settings, refer to "1.1.1 System Setting" page 1-1.

Global Setting

Global Overlap Setting

Configure settings to keep the same overlap display shown even if the screen changes to another screen.

☞ For details, refer to "2.5 Global Overlap".

Alarm Server

Configure settings when using the alarm function.

☞ For details, refer to "8 Alarm".

Logging Server

Configure settings when using the logging function.

☞ For details, refer to "7 Trends".

Recipe

Configure settings when using the recipe function.

☞ For details, refer to "15 Recipes".

Scheduler

Configure settings when executing specific operations at specified times.

☞ For details, refer to "3 Scheduler" in X1 Series Reference Manual 2.

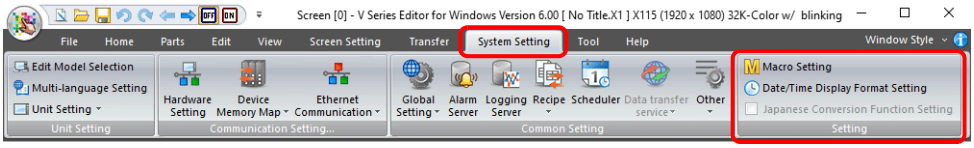
Others

Configure settings when using each function.

Item		Refer to
Others	Storage Setting	"9 Storage Folders" in X1 Series Reference Manual 2
	MES Setting	"6 Ethernet Communication Function" in X1 Series Reference Manual 2
	Operation log Setting	"4 Operation Log" in X1 Series Reference Manual 2
	Security Setting	"5 Security" in X1 Series Reference Manual 2
	Time Display Format Setting	"Time display format setting" page 10-8
	Flowing (scrolling) Message	"8.2 Alarm Server"
	Picture Viewer Setting	"14 Picture Viewer" in X1 Series Reference Manual 2
	Web Browser Setting	"8 Convenient Functions" in X1 Series Reference Manual 2
	IIoT Setting	"7 IIoT Function" in X1 Series Reference Manual 2
	Multi-Display Settings	"15 Multi-Display Function" in X1 Series Reference Manual 2
	Start application Setting	"8 Convenient Functions" in X1 Series Reference Manual 2

1.1.5 Settings

This section explains the items in the [Setting] group.



☞ For information on other settings, refer to "1.1.1 System Setting" page 1-1.

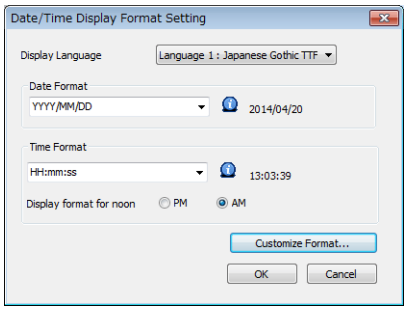
Macro Setting

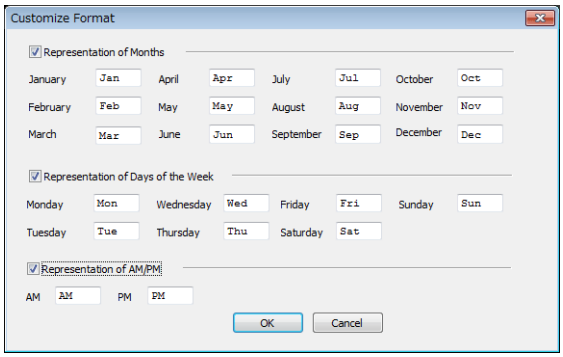
Configure settings when using initial macros, a global macro device memory, or event timer macros.

☞ For details, refer to the V9 Series Macro Reference Manual.

Date and Time Display Setting

Use these settings to define a calendar data format.





☞ For details, refer to "8.3 Date and Time Display Setting".

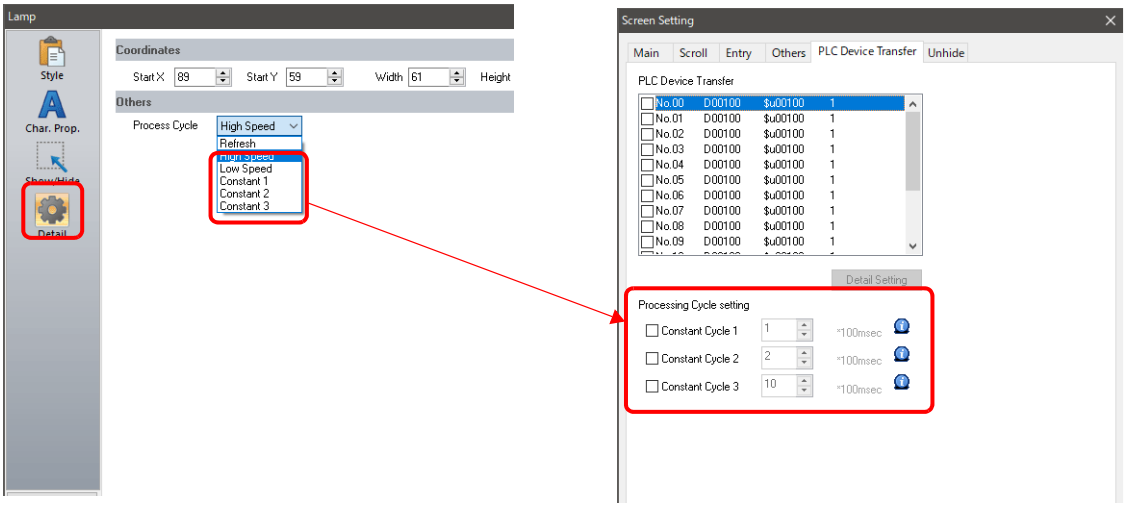
1.2 Process Cycle

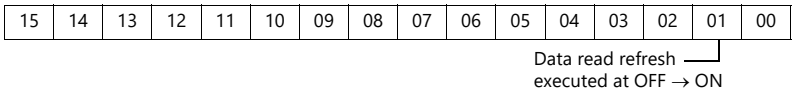
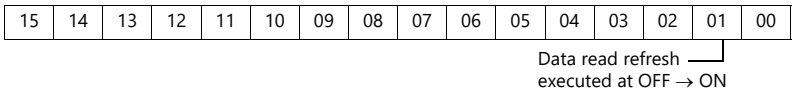
The screen display speed during communication between the X1 series unit and the PLC depends on the number of parts (mainly the number of device memory addresses read from PLC) placed on the screen.

When displaying more parts on the screen, the display speed and switch response may be slower. In such a case, it is possible to speed up the display process by differentiating between the data to be viewed in real time (high speed) and other parts (low speed). This setting can be made at [Detail] → [Process Cycle] in the settings window of each part.

1.2.1 Setting the Processing Cycle

The read timing of PLC device memory addresses can be set. (A lamp part is used in the following example.)



Item	Description
Refresh	• One cycle when the screen is opened • Bit 1 of [Control Device]: OFF → ON *1 
High Speed	• Every cycle
Low Speed	• Once per several cycles. (For details, refer to page 1-37.) • One cycle when the screen is opened • Bit 1 of [Control Device]: OFF → ON *1 
Constant 1 Constant 2 Constant 3 *2	• The cycle specified for each screen at [Screen Setting] → [Screen Setting] → [PLC Device Transfer] → [Processing Cycle setting] Range: 1 to 3600 (100 ms to 360 s) • When unselected, the following cycles are applied. Constant Cycle 1: 100 ms Constant Cycle 2: 200 ms Constant Cycle 3: 1000 ms

*1 Location of [Control Device] settings: [System Setting] → [Hardware Setting] → [Control Area]

☞ For details, refer to "Control area" page 1-31.

- When the [System Setting] → [Unit Setting] → [General Setting] → [Use read/write area] checkbox is selected, bit 15 of the read area "n + 1" is changed from OFF to ON.

*2 Use these settings when reducing communication with connected devices.
If multiple constant cycles are specified for a single connected device, communications may be combined depending on the device address that is used. It is recommended to specify different cycles for each separate connected device.
The settings for the displayed screen are stored at $s1647 to $s1649.

☞ For details, refer to "System Device Memory Details" page 1-40.

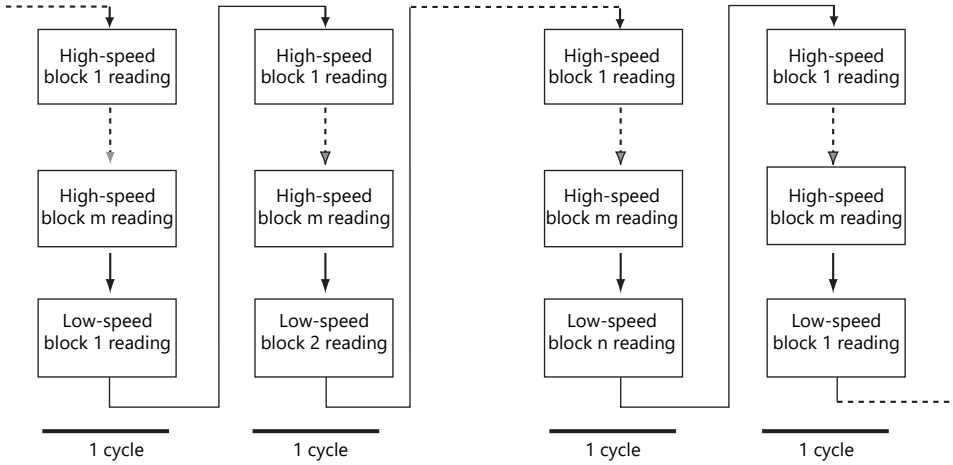
Exceptions

- Regardless of the process cycle setting, all data is read in the first cycle when a screen is opened and when bit 1 of the control device memory changes from OFF to ON. With this operation, all data is displayed on the screen when the screen is opened.
- When [Internal] is selected for the device memory, [High Speed] is automatically selected for [Process Cycle] regardless of any other settings.

1.2.2 Processing Sequence in the X1 Series

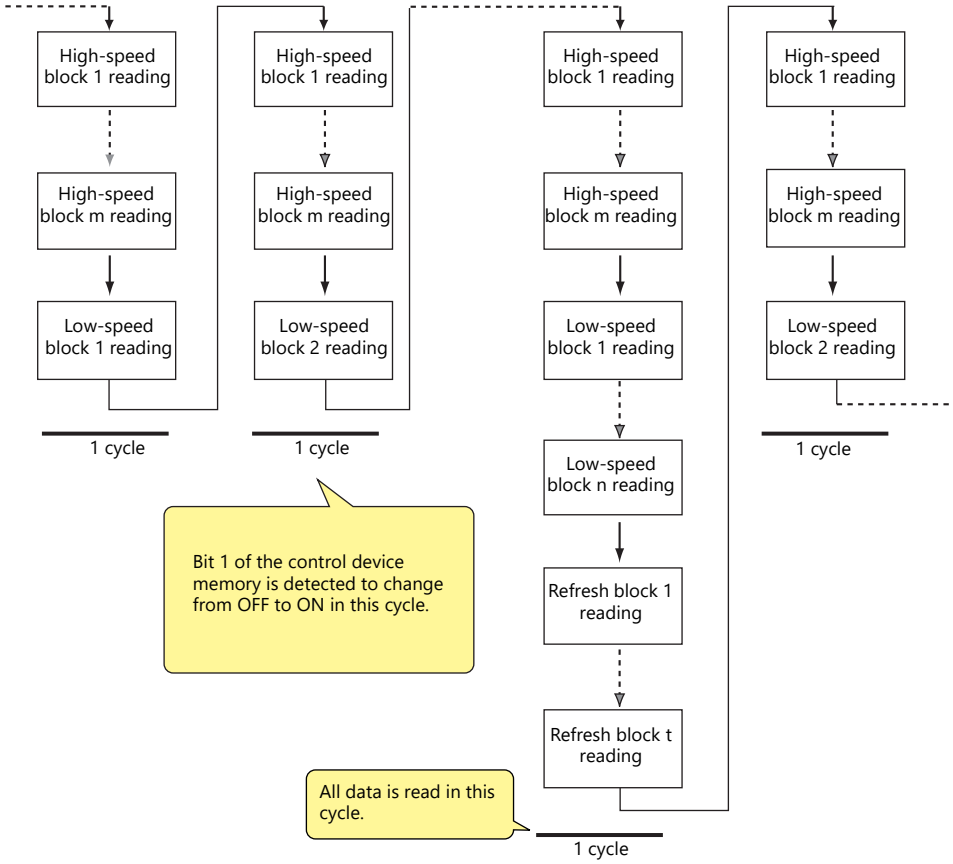
Processing in the X1 series unit is performed in the following order.

- Device memory that frequently perform reading are put into communication cycle blocks and optimized. This improves processing speed.
- PLC device memory registered to a screen are analyzed and put into blocks for reading.
- All blocks corresponding to data set as high-speed are read in one cycle.
- Data set as low-speed is read at one block per cycle. The next block is read in the following cycle.



*** Reading of the control device memory is included in a high-speed block from 1 to m.**

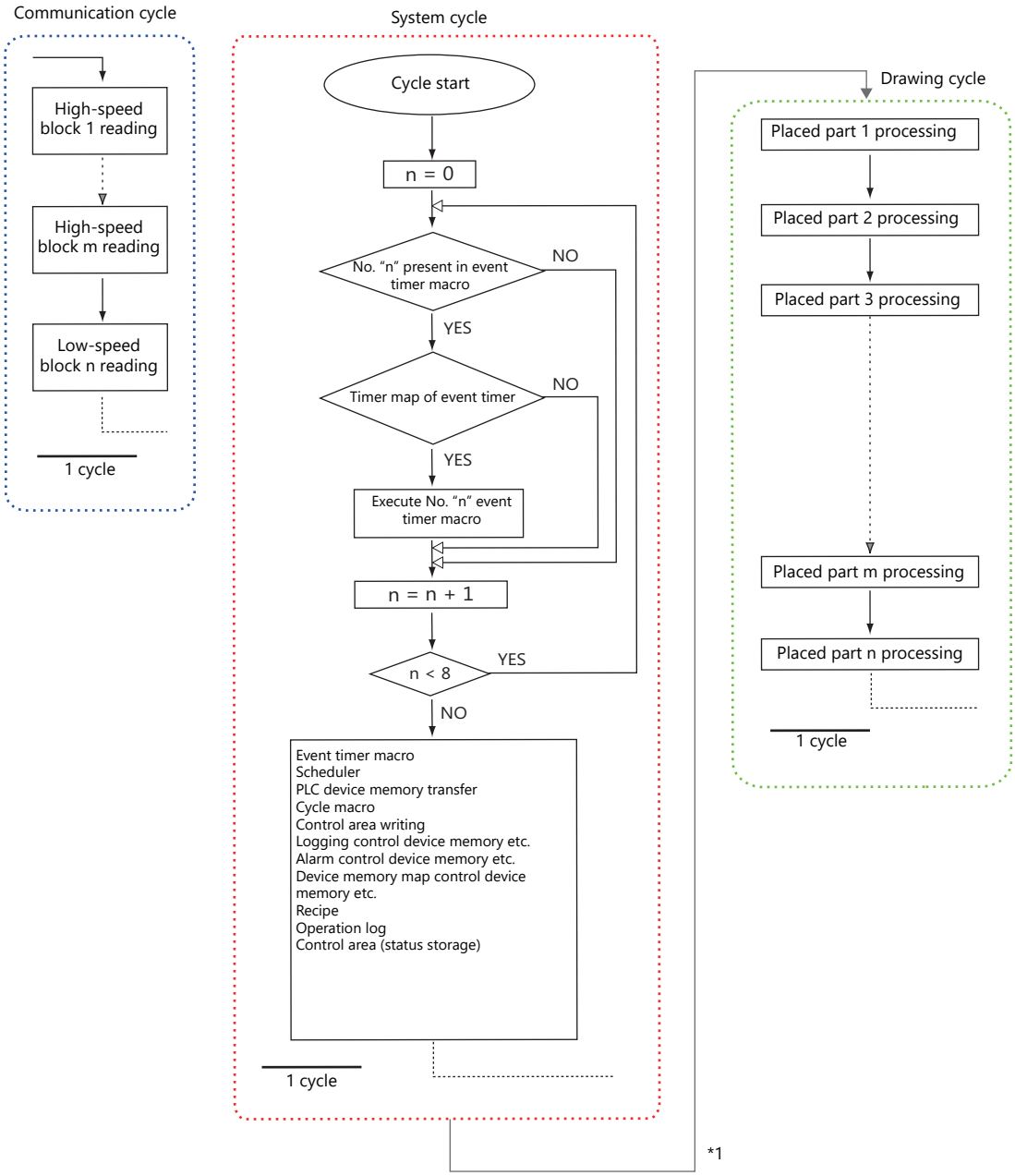
- When bit 1 of [Control Area] → [Control Device] is detected as ON, all data is read in the next cycle regardless of the settings.



- Reading of the device memory required for display and operation is performed at the same time using two programs.
- Writing of switch activation and other operations is performed in the interval between reading blocks.

One-cycle Processing

Communication cycles, system cycles, and drawing cycles are performed independently on the X1 series.
In the communication cycle, the data of device memory set on the currently displayed screen is read. System cycle and drawing cycle processing is performed based on the data read in the communication cycle. On the initial display of screens and multi-/global overlaps, display is performed after reading all of the device memory necessary for display. After display, operation is performed with the following cycles.



*1 When the [System Setting] → [Unit Setting] → [General Setting] → [Synchronize system cycle and drawing cycle (V8 compatible)] checkbox is selected, the drawing cycle is performed after the system cycle is complete.

Notes

Processing is not exactly the same as shown above because for the single cycle executed when the screen is opened, the data of all parts placed on the screen is read in addition to the execution of the screen OPEN macro.

1.2.3 If Communication is Slow

Try the following methods to speed up communication.

Methods for Creating Screens

Method		Effect
Consecutively allocate PLC device memory addresses that are used for the same screen.		The number of blocks decreases so the cycle time can be shorter.
Parts	Change the [Process Cycle] setting. *1	The number of accesses to the PLC can be reduced.
Macro	Refine commands. *2	The number of accesses to the PLC with macros can be reduced.
Logging Alarm	When specifying device memory addresses individually, allocate the addresses consecutively.	The number of blocks decreases so the cycle time can be shorter.

*1 Example of changing [Process Cycle]:

- For data display parts where data is written from such as a keypad, and there are no or hardly any changes in the PLC, select [Refresh].
- For data display parts where the display speed on the X1 series unit does not need to be fast in response to data changes in the PLC, select [Low Speed].
- For data display parts that must be displayed in real time, select [High Speed].

*2 Example of refining macro commands:

[MOV] command, 5 lines
Line No. 0 D200 = $u200 (W)
Line No. 1 D201 = $u201 (W)
Line No. 2 D202 = $u202 (W)
Line No. 3 D203 = $u203 (W)
Line No. 4 D204 = $u204 (W)

PLC is written to five times

Change to the [BMOV] command

[BMOV] command, 1 line
Line No. 0 D200 = $u200 C: 5 (BMOV)

PLC is written to only once.

Others

- Baud rate setting (serial communications)
  Increase the baud rate between the X1 series unit and the PLC. The X1 series unit supports a maximum of 115 kbps. Set the maximum baud rate that the PLC supports.
- Ethernet communication
  The baud rate available with Ethernet communication is 1000 Mbps, 100 Mbps, or 10 Mbps (depending on the PLC model).
  This allows for faster communication than serial communication.
- On the PLC, set a shorter scan time for ladder programs.

1.3 List of Internal Device Memory

Internal device memory is the device memory in the X1 series unit that is available to users.
Since processing is done internally within the X1 series unit, communication speed can be made quicker by using for operations that do not require data communication with a PLC.

1.3.1 Types of Internal Device Memory

Internal device memory can be generally divided into two types: user device memory and system device memory.

- Internal device memory operate with "DEC (with sign)" regardless of the numeric code set via the [System Setting] → [Hardware Setting] window. (Except items for which the numeric code is specified individually.)
- Text processing depends on the setting for [Text Process] under [Communication Setting] in the [System Setting] → [Hardware Setting] window.

User Device Memory

These device memory allow read/write operations and can be used freely by users.

Symbol	Range	Description
$u *1	0 - 65535 (65536 words)	This is an area common to all screens.
$L $LD *2	Depends on user setting	This is an area common to all screens.
$T *1	0 - 1023 (1024 words)	Each screen can have up to 1024 words. When the screen is switched, all the areas are reset to "0". Therefore, these device memory can be used for macro commands executed for each screen.
$M *1	0 - 2047 (2048 words)	Each macro command can have up to 2048 words. When the macro command has been executed, or another macro command is called, all the areas are reset to "0". Therefore, these device memory can be used for macro commands that are executed on a macro basis.
$MC *1	0 - 2047 (2048 bytes)	Each macro command can have up to 2048 bytes. When the macro command has been executed, or another macro command is called, all the areas are reset to "0." Therefore, these device memory can be used for macro commands that are executed on a macro basis. The difference from $M is that these are device memory in byte units, which makes byte access possible.
$C *1	0 - 4095 (4096 words)	These device memory addresses are exclusively used for component parts. These are available only when editing component parts.

*1 $u, $T, $M, $MC and $C are volatile device memory. When switched to Local mode or the power is turned off (reset), data is erased.
*2 $L and $LD are non-volatile device memory. Data is retained even after the power is turned off. To use $L or $LD, it is necessary to make [SRAM/Clock] settings.

☞ For details, refer to "SRAM/Clock" page 1-8.

System Device Memory

This device memory is for use by the system and there two types: device memory for reading and device memory for writing.

Symbol	Range	Description
$s *1	0 - 2047 (2048 words)	This device memory is used for performing input and output with the system using, for example, macro commands. Do not use device memory addresses indicated with "Not used" because they may be reserved for future use.
$P *1	0 - 511 (512 words)	This read/write device memory is used to control 8-way communication or indicate the status of 8-way communication. For details, refer to the X1 Series Connection Manual.

*1 $s and $P are volatile device memory. When switched to Local mode or the power is turned off (reset), data is erased.

☞ For details on $s, refer to "1.3.2 System Device Memory Details" page 1-40.
For details on $P, refer to the X1 Series Connection Manual.

1.3.2 System Device Memory Details

The details of the $s system device memory are shown below.

Meaning of “Device Type” in the table

- ← X1 Data written to $s from MONITOUCH
- → X1 Definitions and settings written to $s by the user

Table

$s	Description		Device Type	Refer to
0	Stores the currently displayed screen number (0 to 9999).		← X1	-
1				
2	Overlap 0	Registration/display status	← X1	page 1-53
3	Overlap 0	Display position X		
4	Overlap 0	Display position Y		
5	Overlap 0	Overlap library number		
6	Overlap 1	Registration/display status		
7	Overlap 1	Display position X		
8	Overlap 1	Display position Y		
9	Overlap 1	Overlap library number		
10	Overlap 2	Registration/display status		
11	Overlap 2	Display position X		
12	Overlap 2	Display position Y		
13	Overlap 2	Overlap library number		
14				
15				
16	Printer status		← X1	page 1-53
17	Backlight status			page 1-53
18				
19				
20	V7 compatible	Buffer 0 Specified number of buffers	← X1	page 1-53
21		Buffer 0 Number of buffers		
22		Buffer 0 Executed number of buffers		
23		Buffer 1 Specified number of buffers		
24		Buffer 1 Number of buffers		
25		Buffer 1 Executed number of buffers		
26		Buffer 2 Specified number of buffers		
27		Buffer 2 Number of buffers		
28		Buffer 2 Executed number of buffers		
29		Buffer 3 Specified number of buffers		
30		Buffer 3 Number of buffers		
31		Buffer 3 Executed number of buffers		
32		Buffer 4 Specified number of buffers		
33		Buffer 4 Number of buffers		
34		Buffer 4 Executed number of buffers		
35		Buffer 5 Specified number of buffers		
36		Buffer 5 Number of buffers		
37		Buffer 5 Executed number of buffers		
38		Buffer 6 Specified number of buffers		
39		Buffer 6 Number of buffers		
40		Buffer 6 Executed number of buffers		
41		Buffer 7 Specified number of buffers		
42		Buffer 7 Number of buffers		
43		Buffer 7 Executed number of buffers		

$s	Description			Device Type	Refer to
44	V7 compatible	Buffer 8	Specified number of buffers	← X1	page 1-53
45		Buffer 8	Number of buffers		
46		Buffer 8	Executed number of buffers		
47		Buffer 9	Specified number of buffers		
48		Buffer 9	Number of buffers		
49		Buffer 9	Executed number of buffers		
50		Buffer 10	Specified number of buffers		
51		Buffer 10	Number of buffers		
52		Buffer 10	Executed number of buffers		
53		Buffer 11	Specified number of buffers		
54		Buffer 11	Number of buffers		
55		Buffer 11	Executed number of buffers		
⋮	(Blank)				
64	Switch function Repeat setting Adds the repeat function to a switch not configured with the repeat function. Set a number other than "0" to the switch ON macro.			→ X1	-
65	Switch function Repeat prohibited setting Prohibits the repeat function for a switch configured with the repeat function. Set a number other than "0" to the switch ON macro.				-
66	Switch ON Macro repeat setting				page 1-53
⋮	(Blank)				
72	Stores the result of the "SYS" (system call) macro command. 0: Normal termination Other than 0 (usually -1): Error (second screen setting, etc.)			← X1	-
73	Result of switch function Stores the operation result of the switch function when the "SWRET" command is used with the switch ON macro. Use this device memory when the next operation varies depending on the result of the switch function. 0: Normal termination Other than 0 (usually -1): Error				-
74					
75	Buzzer sound for overlap			→ X1	page 1-54
76	Keypad overlap AUTO OFF Prohibited If a keypad is placed on an overlap display, it is possible to close the overlap display with the [ENT] key on the keypad. This device memory can be used to prohibit this function. 0: Permitted Other than 0: Prohibited			→ X1	-
77	Exclusive function of overlap display When a value other than "0" is set, the overlap exclusive function is set.				"2 Overlap"
78	Entry mode Display type of entry target			← X1	page 1-54
79	Entry mode Selection of entry target			→ X1	page 1-54
80	Universal serial	Switch output 0	Output codes 0 to 15	← X1	X1 Series Connection Manual
81	Universal serial	Switch output 1	Output codes 16 to 31		
82	Universal serial	Switch output 2	Output codes 32 to 47		
83	Universal serial	Switch output 3	Output codes 48 to 63		
84	Universal serial	Switch output 4	Output codes 64 to 79		
85	Universal serial	Switch output 5	Output codes 80 to 95		
86	Universal serial	Switch output 6	Output codes 96 to 111		
87	Universal serial	Switch output 7	Output codes 112 to 127		
88	Universal serial	Switch output 8	Output codes 128 to 143		
89	Universal serial	Switch output 9	Output codes 144 to 159		
90	Universal serial	Switch output 10	Output codes 160 to 175		
91	Universal serial	Switch output 11	Output codes 176 to 191		
92	Universal serial	Switch output 12	Output codes 192 to 207		
93	Universal serial	Switch output 13	Output codes 208 to 223		
94	Universal serial	Switch output 14	Output codes 224 to 239	← X1	X1 Series Connection Manual
95	Universal serial	Switch output 15	Output codes 240 to 255		
⋮	(Blank)				
99	"CVFD" macro command setting			→ X1	page 1-54

$s	Description	Device Type	Refer to
100	PLC calendar status The calendar status of the PLC (with built-in calendar) is written. 0: Normal 1: Error (The calendar information could not be read correctly.)	← X1	-
101	Setting for writing calendar data to PLC When $s100 = 1, writing calendar data to the PLC is permitted or prohibited. 0: Writing prohibited 1: Writing permitted at all times (No error handling is performed even if an error is detected.)	→ X1	-
102	Stores the execution result of the "HMI-FUNC" macro command. 0: Normal [Other than 0]: Error	← X1	-
103			
104	PLC error handling during macro execution	→ X1	page 1-54
105	(When $s104 is other than 0: Result of error handling is written)	← X1	page 1-54
106	Memo pad Page number storage Stores the operation setting for when a screen change occurs and the memo pad number that is currently displayed.	← X1 → X1	page 13-6
107	Memo pad Data Registered/ Unregistered		page 1-55
108	Memo pad Remaining storage area Stores the amount of remaining storage area for memo pad data. (Unit: bytes)		-
109			-
110			
111	Stores the local port number of the X1 series unit for 1 : n connection on the universal serial port.		
112			
113			
114	V7 compatible 1 : n connection PLC1 down information (port number 32 to 47)	← X1	page 1-55
115	1 : n connection PLC1 down information (port number 48 to 63)		
116	1 : n connection PLC1 down information (port number 64 to 79)		
117	1 : n connection PLC1 down information (port number 80 to 95)		
118	1 : n connection PLC1 down information (port number 96 to 111)		
119	1 : n connection PLC1 down information (port number 112 to 127)		
120	1 : n connection PLC1 down information (port number 128 to 143)		
121	1 : n connection PLC1 down information (port number 144 to 159)		
122	1 : n connection PLC1 down information (port number 160 to 175)		
123	1 : n connection PLC1 down information (port number 176 to 191)		
124	1 : n connection PLC1 down information (port number 192 to 207)		
125	1 : n connection PLC1 down information (port number 208 to 223)		
126	1 : n connection PLC1 down information (port number 224 to 239)		
127	1 : n connection PLC1 down information (port number 240 to 255)		
128	1 : n connection PLC1 down information (port number 0 to 15)		
129	1 : n connection PLC1 down information (port number 16 to 31)		
130	MODBUS TCP/IP sub station information Specify the sub station number with the "MOV" macro command.	→ X1	X1 Series Connection Manual
131			
132	Cycle time (system cycle) Stores the cycle time of the currently displayed screen. (Unit: 10 msec)	← X1	-
⋮	(Blank)		
160	Calendar Year	← X1	page 1-55
161	Calendar Month		
162	Calendar Day		
163	Calendar Hour		
164	Calendar Minute		
165	Calendar Second		
166	Calendar Day of the week (0: Sunday, 1: Monday, 2: Tuesday, ... 6: Saturday)		
167			
168	GMT-based UNIX time Stores the Greenwich Mean Time.	← X1	-
169			
⋮	(Blank)		

$s	Description				Device Type	Refer to
177	V8 compatible	Sampling buffer number			→ X1	page 1-55
178		Overflow flag			← X1	page 1-55
179						
180	V8 compatible	Buffer	Word 0	Average		
181						
182		Buffer	Word 0	Maximum		
183						
184		Buffer	Word 0	Minimum		
185						
186		Buffer	Word 0	Total		
187						
188		Buffer	Word 1	Average		
189						
190		Buffer	Word 1	Maximum		
191						
192		Buffer	Word 1	Minimum		
193						
194		Buffer	Word 1	Total		
195						
196		Buffer	Word 2	Average		
197						
198		Buffer	Word 2	Maximum		
199						
200		Buffer	Word 2	Minimum		
201						
202		Buffer	Word 2	Total		
203						
204 - 211		Buffer	Word 3	Average, maximum, minimum, total		
212 - 219		Buffer	Word 4	Average, maximum, minimum, total		
220 - 227		Buffer	Word 5	Average, maximum, minimum, total	← X1	page 1-55
228 - 235		Buffer	Word 6	Average, maximum, minimum, total		
236 - 243		Buffer	Word 7	Average, maximum, minimum, total		
244 - 251		Buffer	Word 8	Average, maximum, minimum, total		
252 - 259		Buffer	Word 9	Average, maximum, minimum, total		
260 - 267		Buffer	Word 10	Average, maximum, minimum, total		
268 - 275		Buffer	Word 11	Average, maximum, minimum, total		
276 - 283		Buffer	Word 12	Average, maximum, minimum, total		
284 - 291		Buffer	Word 13	Average, maximum, minimum, total		
292 - 299		Buffer	Word 14	Average, maximum, minimum, total		
300 - 307		Buffer	Word 15	Average, maximum, minimum, total		
308 - 315		Buffer	Word 16	Average, maximum, minimum, total		
316 - 323		Buffer	Word 17	Average, maximum, minimum, total		
324 - 331		Buffer	Word 18	Average, maximum, minimum, total		
332 - 339		Buffer	Word 19	Average, maximum, minimum, total		
340 - 347		Buffer	Word 20	Average, maximum, minimum, total		
348 - 355		Buffer	Word 21	Average, maximum, minimum, total		
356 - 363		Buffer	Word 22	Average, maximum, minimum, total		
364 - 371		Buffer	Word 23	Average, maximum, minimum, total		
372 - 379		Buffer	Word 24	Average, maximum, minimum, total		
380 - 387		Buffer	Word 25	Average, maximum, minimum, total		
388 - 395		Buffer	Word 26	Average, maximum, minimum, total		
396 - 403		Buffer	Word 27	Average, maximum, minimum, total		
404 - 411		Buffer	Word 28	Average, maximum, minimum, total		
412 - 419		Buffer	Word 29	Average, maximum, minimum, total		
420 - 427		Buffer	Word 30	Average, maximum, minimum, total		
428 - 435		Buffer	Word 31	Average, maximum, minimum, total		

$s	Description		Device Type	Refer to
436	V8 compatible	Alarm function Auto operation time	← X1	-
437				
438		Alarm function Auto operation stop time		
439				
440		Alarm function Program stop time		
441				
442		Alarm function Number of stops		
443		Alarm Function Rate of operation(XX.X)		
⋮	(Blank)			
456	V8 compatible	Alarm Function Normal Operation Bit	← X1	-
457				
458	V8 compatible	Alarm Function Sampling bit	← X1	-
459				
460	V8 compatible	Read area n	← X1	-
461		Read area n + 1		
462		Read area n + 2		
463				
464	V8 compatible	Write area n	← X1	-
465		Write area n + 1		
466		Write area n + 2		
467				
468	V8 compatible	Memory card Card number	← X1	page 1-56
469		Memory card Card name		
470		Memory card File name No. 0		
471		Memory card File name No. 1		
472		Memory card File name No. 2		
473		Memory card File name No. 3		
474		Memory card File name No. 4		
475		Memory card File name No. 5		
476		Memory card File name No. 6		
477		Memory card File name No. 7		
478		Memory card File name No. 8		
479		Memory card File name No. 9		
480		Memory card File name No. 10		
481		Memory card File name No. 11		
482		Memory card File name No. 12		
483		Memory card File name No. 13		
484		Memory card File name No. 14		
485		Memory card File name No. 15		
⋮	(Blank)			
497	Storage error state		← X1	page 1-56
498	Remaining space on external USB storage Stores the amount of free space on the storage device. (Unit: kilobyte)			-
499				
⋮	(Blank)			
500	[Storage Disconnection] switch status 0: Switch OFF (accessing storage folder) Other than 0: Switch ON (storage folder disconnected)		← X1	-
⋮	(Blank)			
512	Ethernet Port selection Select the port used for sending and receiving Ethernet macro commands (“EREAD”, “EWRITE”, “SEND”, or “MES”). 0: LAN (built-in) 2: LAN2 (built-in) 3: WLAN (wireless)		→ X1	-
513	(Blank)			
514	Ethernet Result of macro wait request_		→ X1	page 1-56
515	Ethernet Macro wait request execution result_		← X1	page 1-56

$s	Description	Device Type	Refer to
516	Ethernet Transmission speed (for built-in LAN port) 0: Auto 1: 10M bps Half 2: 10M bps Full 3: 100M bps Half 4: 100M bps Full 5: 1G bps Full	← X1	-
517	(Blank)		
518	Ethernet Status (LAN) 0: Normal 801: Link down	← X1	X1 Series Connection Manual
519	(Blank)		
520	Network table 0 status	← X1	X1 Series Connection Manual
521	Network table 1 status		
522	Network table 2 status		
⋮	⋮		
617	Network table 97 status		
618	Network table 98 status		
619	Network table 99 status		
⋮	(Blank)		
700	Stores the language number (0 to 31) of the currently displayed language.	← X1	-
⋮	(Blank)		
719	Memo pad Pen color	← X1 → X1	page 13-6
720	SRAM Memo pad save result 0: Normal 1: Data contains an error and is deleted.	← X1	-
721	SRAM Internal device memory $L save result 0: Normal 1: Error		-
722	SRAM Internal device memory $L last written device memory Stores the $L address of the last write operation when $s721 = 1 at power-up.		-
723			-
724	SRAM Internal device memory $LD save result 0: Normal 1: Error		-
725	SRAM Internal device memory $LD last written device memory Stores the $LD device memory of the last write operation when $s724 = 1 at power-up.		-
726			-
727	Memo pad save overflow (judgment result of whether data is of a size that can be saved) 0: Normal 1: Save area insufficient		-
728	FROM_RD/FROM_WR macro execution result 0: Normal 1: Error		-
729	V7 compatible PLC2 Macro execution result	← X1	X1 Series Connection Manual
730	PLC2 Port No. 00 Status		
731	PLC2 Port No. 01 Status		
732	PLC2 Port No. 02 Status		
⋮	⋮		
758	PLC2 Port No. 28 Status		
759	PLC2 Port No. 29 Status		
760	PLC2 Port No. 30 Status		
761	PLC2 Port No. 31 Status		
762	PLC2 Constant/synchronized read Interrupt setting	→ X1	
763	PLC2 TEMP_RD/TEMP_WR macro forced execution setting		
764	PLC2 Constant/synchronized write Interrupt setting		
765	PLC2 Error code	← X1	
766	PLC2 Extended error code 1		
767	PLC2 Extended error code 1		
768	PLC2 Extended error code 1		
⋮	(Blank)		

$s	Description	Device Type	Refer to
800	Modbus slave communication Reference table number	→ X1	Modbus Slave Communication Specifications
801	Modbus slave communication Reference device memory setting		
802	Modbus slave communication Reference device memory setting		
803	Modbus slave communication Reference device memory setting		
804	Modbus slave communication Reference device memory setting		
805	Modbus slave communication Reference device memory setting		
⋮	(Blank)		
810 - 813	Stores the IP address in the LAN settings of the X1 series unit	← X1	-
814 - 817	IP address of another port		page 1-57
818	Network table number designation	→ X1	page 1-57
819			
820	V7 compatible PLC2 Port No. 32 Status	← X1	X1 Series Connection Manual
821	PLC2 Port No. 33 Status		
822	PLC2 Port No. 34 Status		
⋮	⋮		
885	PLC2 Port No. 97 Status		
886	PLC2 Port No. 98 Status		
887	PLC2 Port No. 99 Status		
888			
889			
⋮	(Blank)		
900	Stores the touch switch status.	← X1	"3.1.6 Coordinate Output"
901	Touch switch X coordinate output Stores the X coordinate of the touch switch that is pressed.		
902	Touch switch Y coordinate output Stores the Y coordinate of the touch switch that is pressed.		
⋮	(Blank)		
956	Stores the current brightness adjustment value (0 to 127).	← X1	-
⋮	(Blank)		
965	File transfer communication timeout setting Set the monitoring timeout time for when storage of the X1 series unit is accessed by a client in RUN mode. Setting value is 0: Default of 60 seconds Setting value is other than 0: Setting value × 10 seconds	→ X1	-
⋮	(Blank)		
990	Recipe GET_RECIPE_FILEINFO macro execution result	← X1	V9 Series Macro Reference Manual
⋮	(Blank)		
1000	Audio Stores the remaining seconds of audio playback.	← X1	X1 Series Reference Manual 2 "2 Sound"
1001	Audio Stores the adjusted volume value of channel L.		
1002	Audio Stores the adjusted volume value of channel R.		
1003	(Blank)		
1004			
1005	E-mail send Number of e-mails waiting to be sent	← X1	X1 Series Reference Manual 2 "6.8 E-mail Notification"
1006	E-mail send Error information		
1007	Hard copy Color specification	→ X1	page 16-6
1008	JPEG Used to set accuracy of reduced JPEG images.		X1 Series Reference Manual 2 "1.1 JPEG Display"
1009	Data sheet Consecutive printing (STA_LIST macro command) 0: Prohibited 1: Permitted	→ X1	-
1010	Data sheet Number of data sheets in print queue (STA_LIST macro command)_ Stores the number of data sheets in printing queue.(eight maximum) * Enabled when $s1009 = 1. If the "STA_LIST" macro command is executed while eight data sheets are already in the queue, a macro execution error occurs.	← X1	-

$s	Description	Device Type	Refer to
1011	Data sheet Cancel (STA_LIST macro command) Specifying "1" cancels the printing of data sheets in the queue. The value is automatically reset to "0" after cancellation. * Enabled when $s1009 = 1.	→ X1 ← X1	-
⋮	(Blank)		
1016	Version information acquisition When the value is set with the MOV macro command, the version information is stored in $s 1018. 0: X1 app version 10: PLC1 driver version 11: PLC2 driver version 12: PLC3 driver version 13: PLC4 driver version 14: PLC5 driver version 15: PLC6 driver version 16: PLC7 driver version 17: PLC8 driver version 18: Simulator version	→ X1	-
1017	(Blank)		
1018	Version information Stores version information based on the value set in $s1016.	← X1	-
⋮	(Blank)		
1024	Storage access result Stores the result of when a file located in storage of the X1 series unit is accessed by a client in RUN mode. 0: Normal −1: Error	← X1	-
⋮	(Blank)		
1030	Internal storage "sd" folder Storage error state	← X1	page 1-57
1031	(Blank)		
1032			
1033	Internal storage "sd" folder [Storage Disconnection] switch status 0: Switch OFF (accessing storage) Other than 0: Switch ON (storage disconnected)	← X1	-
1034			
1035	Internal storage "usb" folder / external USB storage Storage error state	← X1	page 1-57
1036	Remaining space on external USB storage Stores the amount of free space on the storage device. (Unit: kilobyte)	← X1	-
1037			
1038	Internal storage "usb" folder / external USB storage [Storage Disconnection] switch status 0: Switch OFF (accessing storage) Other than 0: Switch ON (storage disconnected)	← X1	-
⋮	(Blank)		
1050	Background Storage access Background processing flag	← X1	page 1-57
1051	Background Storage access Background processing completion flag		page 1-57
1052	Background Storage access Background processing error flag		page 1-57
1053	(Blank)		
1054			
1055			
1056	Macro execution result Arithmetic operation	← X1	V9 Series Macro Reference Manual
1057	Macro execution result Conversion, transfer		
1058	Macro execution result Comparison		
1059	Macro execution result Macro operation control		
1060	Macro execution result Printer		
1061	(Blank)		
1062	Macro execution result Storage	← X1	V9 Series Macro Reference Manual
1063	Macro execution result Others		
⋮	(Blank)		
1085	SRAM forced formatting	← X1	page 1-58
⋮	(Blank)		
1098	V8 compatible Sampling macro Background processing selection	→ X1	page 1-58
1099	(Blank)		

$s	Description		Device Type	Refer to
1100	V8 compatible	Buffer No. 0 Stores the number of sampling times set for the primary storage destination.	← X1	page 1-59 when logging (alarm history/event history) is used
1101		Buffer No. 0 Stores the current number of sampling times of the primary storage destination. (Set number of sampling times ($s1100) ≥ current number of sampling times ($s1101))		
1102		Buffer No. 0 Stores the number of sampling times set for the secondary storage target.		
1103				
1104		Buffer No. 0 Stores the current number of sampling times of the secondary storage destination. (Set number of sampling times ($s1102 and1103) ≥ current number of sampling times ($s1104 and 1105))		
1105				
1106		Buffer No. 0 Stores the number of sampling times executed.		
1107				
1108		Buffer No. 0 Secondary storage destination access status		page 1-58
1109		Buffer No. 0 Background processing flag		
1110		Buffer No. 0 Sampling macro executing flag		
1111		Buffer No. 0 Sampling macro execution completion flag		
1112		Buffer No. 0 Sampling macro error flag		
1113		Buffer No. 0 Sampling error flag		
1114		Buffer No. 0 Sampling error forced storage flag	→ X1	
⋮	(Blank)			
1120 - 1134	V8 compatible	Buffer No. 1 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1140 - 1154	V8 compatible	Buffer No. 2 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1160 - 1174	V8 compatible	Buffer No. 3 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1180 - 1194	V8 compatible	Buffer No. 4 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1200 - 1214	V8 compatible	Buffer No. 5 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1220 - 1234	V8 compatible	Buffer No. 6 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1240 - 1254	V8 compatible	Buffer No. 7 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1260 - 1274	V8 compatible	Buffer No. 8 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1280 - 1294	V8 compatible	Buffer No. 9 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1300 - 1314	V8 compatible	Buffer No. 10 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			
1320 - 1334	V8 compatible	Buffer No. 11 (Equivalent to buffer No. 0 $s1100 to 1114)	→ X1 ← X1	Refer to $s1100 - 1114
⋮	(Blank)			

$s	Description	Device Type	Refer to
1360	Security function Stores the security level (0 to 15) of the currently logged-in user.	← X1	-
1361	Security function Stores the user ID of the currently logged-in user.		
1362			
1363			
1364			
1365	Operation log viewer Stores the number of the log file being displayed.	← X1	-
1366	Operation log viewer Stores the number of the log folder being displayed.		-
⋮	(Blank)		
1400	Network table 100 status	← X1	X1 Series Connection Manual
1401	Network table 101 status		
1402	Network table 102 status		
⋮	⋮		
1553	Network table 253 status		
1554	Network table 254 status		
1555	Network table 255 status		
⋮	(Blank)		
1560	Global overlap 3 Registration/display status_	← X1	page 1-58
1561	Global overlap 3 Stores the X coordinate of the global overlap display position. Dot: 0 to 1023 Column: 0 to 127		-
1562	Global overlap 3 Stores the Y coordinate of the global overlap display position. Dot: 0 to 768 Column: 0 to 37		-
1563	Global overlap 3 Stores the global overlap library number. Show: 0 to 9999 Hide: –1		-
⋮	(Blank)		
1600	Drawing cycle time (msec)	← X1	-
1601			
1602	PLC1 read cycle time (msec)	← X1	-
1603	PLC2 read cycle time (msec)		
1604	PLC3 read cycle time (msec)		
1605	PLC4 read cycle time (msec)		
1606	PLC5 read cycle time (msec)		
1607	PLC6 read cycle time (msec)		
1608	PLC7 read cycle time (msec)		
1609	PLC8 read cycle time (msec)		
⋮	(Blank)		
1617	Overlap 4 Registration/display status	← X1	page 1-53
1618	Overlap 4 Display position X		
1619	Overlap 4 Display position Y		
1620	Overlap 4 Overlap library number		
1621	Overlap 5 Registration/display status		
1622	Overlap 5 Display position X		
1623	Overlap 5 Display position Y		
1624	Overlap 5 Overlap library number		
1625	Overlap 6 Registration/display status		
1626	Overlap 6 Display position X		
1627	Overlap 6 Display position Y		
1628	Overlap 6 Overlap library number		
1629	Overlap 7 Registration/display status		
1630	Overlap 7 Display position X		
1631	Overlap 7 Display position Y		
1632	Overlap 7 Overlap library number		
1633	Overlap 8 Registration/display status		
1634	Overlap 8 Display position X		
1635	Overlap 8 Display position Y		

$s	Description	Device Type	Refer to
1636	Overlap 8 Overlap library number	← X1	page 1-53
1637	Overlap 9 Registration/display status		
1638	Overlap 9 Display position X		
1639	Overlap 9 Display position Y		
1640	Overlap 9 Overlap library number		
1641	Screen magnification Stores the current magnification of the screen (unit: %). 100 (includes case when no magnification is set), 150, 200	← X1	X1 Series Reference Manual 2 "8.1 Enlarging and Scrolling Screens"
⋮	(Blank)		
1647	Processing cycle Stores the time set at [Constant Cycle 1] for the currently displayed screen. (Unit: 100 ms)	← X1	page 1-34
1648	Processing cycle Stores the time set at [Constant Cycle 2] for the currently displayed screen. (Unit: 100 ms)		
1649	Processing cycle Stores the time set at [Constant Cycle 3] for the currently displayed screen. (Unit: 100 ms)		
1650	Scheduler Time setting (device memory specification) error flag (No. 0 to 15) Correct: 0, Incorrect: 1	← X1	X1 Series Reference Manual 2 "3 Scheduler"
1651	Scheduler Time setting (device memory specification) error flag (No. 16 to 31) Correct: 0, Incorrect: 1		
1652	Scheduler Time setting (device memory specification) error flag (No. 32 to 47) Correct: 0, Incorrect: 1		
1653	Scheduler Time setting (device memory specification) error flag (No. 48 to 63) Correct: 0, Incorrect: 1		
⋮	(Blank)		
1655	Data sheet PDF output: Error information 0: Successful completion 3: Error	← X1	page 16-20
1656	STA_LIST macro command Specification of data sheet output destination and PDF output method	→ X1	page 1-59
1657	Ethernet Status (LAN2) 0: Normal 801: Link down	← X1	X1 Series Connection Manual
1658	Ethernet Status (WLAN) 0: Normal 801: Link down	← X1	X1 Series Connection Manual
⋮	(Blank)		
1669	Wait time setting for data block switching 0 to 65535 msec * Enabled when the [Update info output device (data block No.) of input mode at the start of switching data block.] checkbox is selected in the [General Settings] tab window.	→ X1	page 1-25
⋮	(Blank)		
1671	Operation designation with the following macro commands SMPL_BAK, SMPL_CSV, SMPL_CSV2, SMPLCSV_BAK, SMPLCSV_BAK2, SYS(SET_BUFNO), SYS (GET_SMPL) 0: V8 compatible operation 1: Logging server designation 2: Alarm server designation 3: Item designation (SYS (GET_SMPL) only)	→ X1	V9 Series Macro Reference Manual
1672	SYS (GET_SMPL) macro command Obtained alarm data type designation (only when $s1671 = 2) 0: Event history data 1: Real time alarm data 2: Alarm history data		
1673	SAMPLE, SMPL_SAVE macro commands Operation designation 0: V8 compatible operation 1: X1 initial operation		
⋮	(Blank)		
1705	SYS(SET_BUFNO) macro command Storage of logging block number (only when $s1671 = 1) Stores the logging block number specified by the macro. Default value: -1	← X1	V9 Series Macro Reference Manual
1706	SYS(SET_BUFNO) macro command Storage of alarm block number (only when $s1671 = 2) Stores the alarm block number specified by the macro.	← X1	V9 Series Macro Reference Manual
⋮	(Blank)		

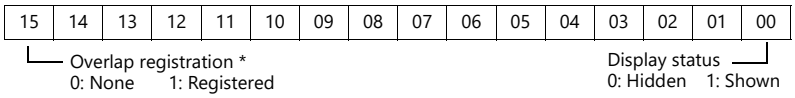
$s	Description	Device Type	Refer to
1720	Function setting for the logging block 0 or the alarm block 0 $s1100 through $s1114 stores the information of block 0 by setting the value with the initial macro. 0: Logging or alarm (V8 compatible) 1: Logging (X1) 2: Alarm history (X1) 3: Event history (X1)	→ X1	page 1-59
1721	Function setting for the logging block 1 or the alarm block 1 $s1120 through $s1134 stores the information of block 1 by setting the value with the initial macro.		
1722	Function setting for the logging block 2 or the alarm block 2 $s1140 through $s1154 stores the information of block 2 by setting the value with the initial macro.		
1723	Function setting for the logging block 3 or the alarm block 3 $s1160 through $s1174 stores the information of block 3 by setting the value with the initial macro.		
1724	Function setting for the logging block 4 or the alarm block 4 $s1180 through $s1194 stores the information of block 4 by setting the value with the initial macro.		
1725	Function setting for the logging block 5 or the alarm block 5 $s1200 through $s1214 stores the information of block 5 by setting the value with the initial macro.		
1726	Function setting for the logging block 6 or the alarm block 6 $s1220 through $s1234 stores the information of block 6 by setting the value with the initial macro.		
1727	Function setting for the logging block 7 or the alarm block 7 $s1240 through $s1254 stores the information of block 7 by setting the value with the initial macro.		
1728	Function setting for the logging block 8 or the alarm block 8 $s1260 through $s1274 stores the information of block 8 by setting the value with the initial macro.		
1729	Function setting for the logging block 9 or the alarm block 9 $s1280 through $s1294 stores the information of block 9 by setting the value with the initial macro.		
1730	Function setting for the logging block 10 or the alarm block 10 $s1300 through $s1314 stores the information of block 10 by setting the value with the initial macro.		
1731	Function setting for the logging block 11 or the alarm block 11 $s1320 through $s1334 stores the information of block 10 by setting the value with the initial macro.		
⋮	(Blank)		
1770 - 1773	Stores the IP address in the LAN2 settings of the X1 series unit	← X1	-
1774 - 1777	Stores the IP address in the WLAN settings of the X1 series unit (when WLAN setting is enabled)	← X1	-
⋮	(Blank)		
1808	Data sheet printing (including PDF output) Operation setting 0: Prioritize speed 1: Prioritize quality	→ X1	-
⋮	(Blank)		
1815	[Comm. Error Handling: Disconnect] Reconnection processing setting 0: After disconnection, reconnection is attempted at the interval set at [Recovery Time] only if there is a need to access a device memory of the disconnected station for the currently displayed screen (X1 specifications). 1: After disconnection, reconnection is attempted at the interval set at [Recovery Time] (V8 specifications).	→ X1	-
⋮	(Blank)		
1840	SAMPLE macro Operation setting 0: Acquire data of the specified logging/alarm block. 1: Acquire data of the logging part that is currently displayed (data of backup files can also be acquired). When cursor is displayed: Data at the cursor position is acquired. When cursor is hidden: The latest value of the currently displayed data is acquired.	→ X1	V9 Series Macro Reference Manual
⋮	(Blank)		
2000	OPC UA server status 0: No OPC UA server setting 1: Successful server startup 2: Failed server startup	← X1	X1 Series Reference Manual 2 “7 IIoT Function”

$s	Description	Device Type	Refer to
2001	MQTT client error information 404: IoT Hub or device ID does not exist 429: Request refused because of request overload by the X1 series unit or the maximum number of messages per day has been exceeded. 500: Internal error	← X1	X1 Series Reference Manual 2 "7 IIoT Function"
2002	This outputs the execution result of the tab number 0 to 8 registered in the [Internal Device Share Settings]. 0: No errors 1: Error	← X1	X1 Series Reference Manual 2 "15 Multi-Display Function"
⋮	(Blank)		
2020	Application startup Application execution result 0: Normal 1: A display position or window size outside the display area was specified. 2: Display position or window size specification error 3: The display position and window size could not be changed because an application is starting up or there is an app that is on standby according to the [Start time] setting.	← X1	X1 Series Reference Manual 2 "8.4 Starting Applications"
2021	Application startup Acquires the execution completed status of specifying the display position and window size of an app. 1: Execution completed	← X1	
2022	Connected status of USB ports 1 to 4 0: Not connected 1: Connected	← X1	page 1-59
⋮	(Blank)		
2047			

Details

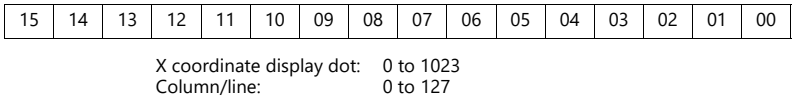
- $s2 - 13, $s1617 - 1640
  Stores the current overlap display status.

n + 0 (Display status)

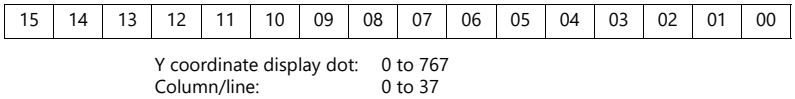


* For multi-overlap display, this bit is set to "1" only during display.
However, the bit remains set to "1" even during display hidden status when [Read PLC Device when OFF] is checked in the [Detail] settings of overlap library settings.

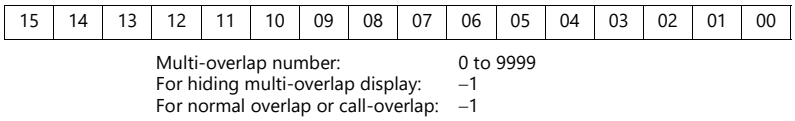
n + 1 (X coordinate)



n + 2 (Y coordinate)

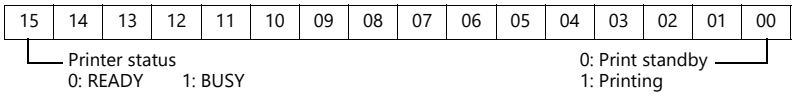


n + 3 (Multi-overlap number)



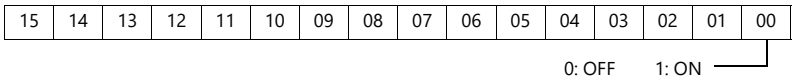
- $s16
  Stores the current printer status.

n + 0 (Printer status)



- $s17
  Stores the current backlight status. Whether the backlight is burnt out is stored.

n + 0 (Backlight status)



- $s20 to 55 (V7 compatible)
  Stores sampling buffer conditions.

Buffer No. 0 to 11	n + 0	[No. of Samples] specified in the [Buffering Area Setting] window
	n + 1	Number of sampling times in buffer (n + 0 ≥ n + 1)
	n + 2	Number of sampling times executed

- $s66
  Repeat the switch ON macro. Set a number other than "0" to $s66 using the ON macro.
  Example: Set the switch ON macro as shown below.

```
$u100 = $u100 + 1
$s66 = 1
RET
```

  While the switch is held down, $u100 is continuously incremented.

  * Before executing the switch ON macro, the system clears addresses $s64 to 66 to "0".
  Set "1" to these addresses as necessary.
  When a macro is repeatedly commanded to repeatedly execute the function of switch, the macro will be prohibited if the function cannot be executed. (For example, when the switch function is [+ Block] and the block number has reached the maximum value.)

- $s75
  This address is used to activate or deactivate the buzzer which sounds when the top overlap display among multiple overlap displays is switched over.
  [0]: Buzzer ON
  [1]: Buzzer OFF

- $s78
  Stores the display format of data in the entry target.

Output Code	Entry Target	Display Format
–2	No entry mode	-
–1	No entry target	-
0	Numerical data display	Decimal without sign
1		Decimal with sign (–)
2		Decimal with sign (+)
3		Hexadecimal
4		Octal
5		Binary
6	Character display	-
7	Message display other than entry target	-
8	Numerical data display	Real number (floating decimal point)

- $s79
  This setting is available when the entry mode is switched through the overlap activation (ON/OFF) or by multi-overlap number change on one screen.
  * Do not set any value other than “0” or “1”.
  [0]: Selects the last entry target selected in the entry mode.
  [1]: The entry target currently selected remains selected even after the mode is switched.

- $s99
  Specify the rounding operation to use with the CVFD macro command.

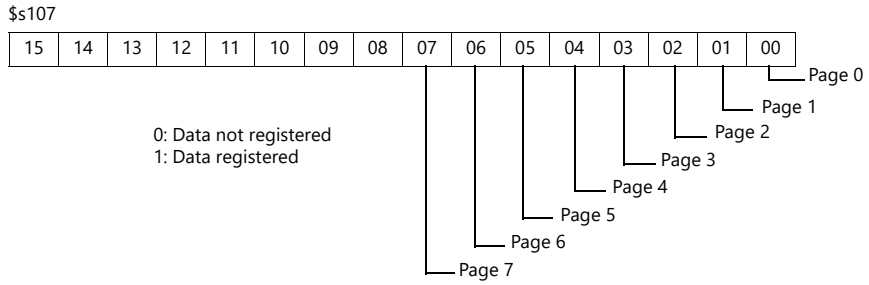
Setting Value	Description	Operations
Other than 1 or 2	Rounding	When the fraction remainder is 0.5 or greater, it is rounded up; when it is less than 0.5, it is rounded down.
1	Rounding down	The fraction remainder is rounded down.
2	Rounding up	The fraction remainder is rounded up unless it is “0”.

- $s104 and $s105
  Specify the error handling performed when an error occurs during the reading/writing of data to the PLC using a macro command via communications.
  Example:
  When an indirect PLC device memory is set as the writing destination using the MOV command, a communication error will occur if the value in the indirect PLC device memory exceeds the range of the PLC device memory.
  Use these addresses to avoid such a communication error.

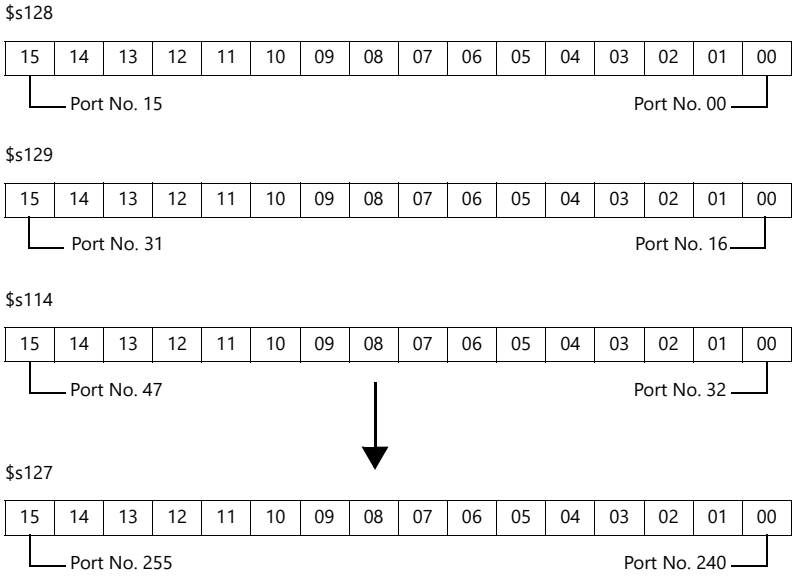
  - $s104: [0]
    When the write macro command is executed, the next command is started without waiting for the result of the macro write command.
    If an error occurs during writing, error handling is performed.
    The error handling to be performed depends on the setting for [Comm. Error Handling] (“Stop” or “Continue”) under [Communication Setting] in the [PLC Properties] window.

  - $s104: Other than [0]
    When the write macro command is executed, the next command is started only after receipt of the result of the write operation. If an error occurs during writing, error handling is not performed and the result is stored in $s105. It will take a longer time compared to when “0” is set.
    $s105: When $s104 ≠ 0, the result of the macro write error is stored.
    [0]: Normal
    Other than [0]: Error

- $s107
  The information of whether or not data is registered in each page of the memo pad (maximum 8 pages) is stored.



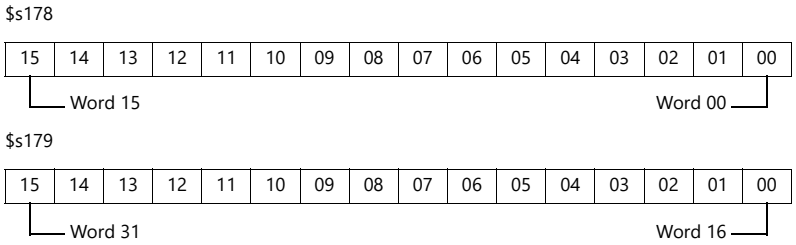
- $s128, 129, 114 to 127 (V7 compatible)
  When the connection mode is [1 : n] and a timeout is detected in communication with PLC1, "1" is set at the related bit. After that, it is not possible to communicate with the PLC on the same screen.
  When the screen display changes, all bits in these device memory are cleared to "0" to enable communication with the PLC set to the screen program.



- $s160 - 166
  Stores the current calendar data.

- $$s177
  Stores the buffer number for which the SET_BUFNO macro command was executed. When the power is turned on, the lowest buffer number in the [Buffering Area Setting] window is stored.

- s178, 179
  When the total value overflows after the execution of the SET_BUFNO macro command, the bits corresponding to sample word numbers 0 to 31 are set to "1".
  Sample buffer word numbers 32 to 128 are not available.



- $s180 - 435
  Stores the result of the SET_BUFNO macro command execution.

- $s468 - 485
  Stores memory card information (card number, card name, file number) to the specified device memory address. Use the MOV macro command.
  The value in $s468 to 485 is always "0".

  - Read: [n = $s468 (to 485)] macro is executed and device memory "n" is monitored.
  - Write: [$s468 (to 485) = n] macro is executed and data in device memory "n" (to n + 16) is stored on the storage device.

  Example 1
  Macro $u100 = $s468
  Stores the card number in $u100.

  Example 2
  Macro $u101 = $s469
  Stores the card name (32 bytes) in $u101 to 116.

  Example 3
  Macro $u117 = $s470
  Stores the file name of the file No. 0 (32 bytes) in $u117 to 132.

- $s497
  Outputs the result of accessing storage.

4 *	External USB storage not mounted
5	Format error
9	JPEG/BMP file read error
12	Write error
15	Disk error (open failure)
16	Read error

  * Enabled when the [System Setting] → [Storage Setting] → [External USB storage] checkbox and [USB storage device] are selected.

- $s514, 515
  These devices are relevant to the EREAD, EWRITE, SEND, and MES macro commands.
  - $s514: Macro wait request
    In the case of successive accesses to the same port on a single macro sheet, always specify a value other than "0" (with wait). If "0" (no wait) is specified, macro commands issued afterward will not be accepted.

    [0]: No wait
    During the execution of a macro command, the execution of the next macro command takes place before the completion of the current command.
    [Other than 0]: With wait_
    During the execution of a macro command, the next macro command is put on hold and is executed after the completion of the current command.

  - $s515: Storage of the macro execution result
    When $s514 is "0", the macro command request is stored (response not included). When a value other than "0" is set, the response returned to the command request is stored.

Code	Description	Solution
0	Normal	-
200 to 2001	Communication error between a device targeted by a macro command and a connected device Target device V9: 801 (link down) V8, TS2060i, V7, V6: 200 to 2001	A communication error code is stored when the device targeted by a macro command and a device are connected via Ethernet. For error contents and solutions, refer to the connection manual of the target device.
−8	Communication unavailable Inaccessible	Check whether the counterpart unit is running normally.
−32	The specified table is not used.	Check the network table settings.
−34	The specified table is in use.	Check whether system device memory address $s514 is set. If not setting $s514, reduce the number of communications.
−40	Setting data error	Check that [Write], [Read], and [Search condition] settings are configured for the specified MES setting number. Check that the configured data is correct.
−51	Specified address error	Check whether the specified address is correct. For a $L address, check whether the address has not been set.
−60 to −65	MES stand-alone error	Refer to "6.9 MES Interface Function" in the X1 Series Reference Manual 2.

- $s814 - 818
  Stores the IP address of the network table number corresponding to the value [*1] set for $s818. If no network table exists, "0.0.0.0" is stored.
  *1 Use the MOV (W) macro command to set the network table number.

- $s1030
  Outputs the result of access to the "sd" folder in the internal storage (drive C:).

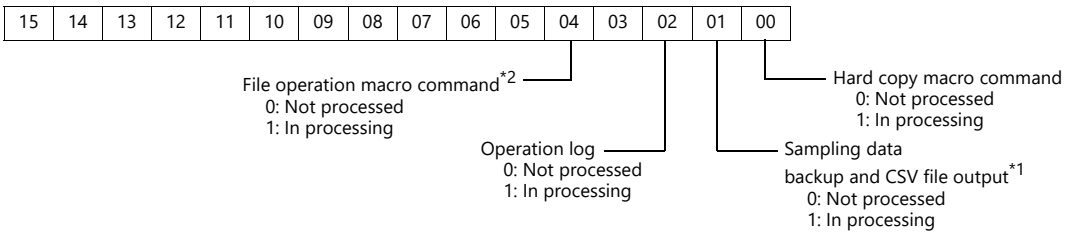
5	Format error
9	JPEG/BMP file read error
12	Write error
15	Disk error (open failure)
16	Read error

- $s1035
  Outputs the result of access to the "usb" folder in the internal storage (drive C:) or external USB storage [*].

4 *	External USB storage not mounted
5	Format error
9	JPEG/BMP file read error
12	Write error
15	Disk error (open failure)
16	Read error

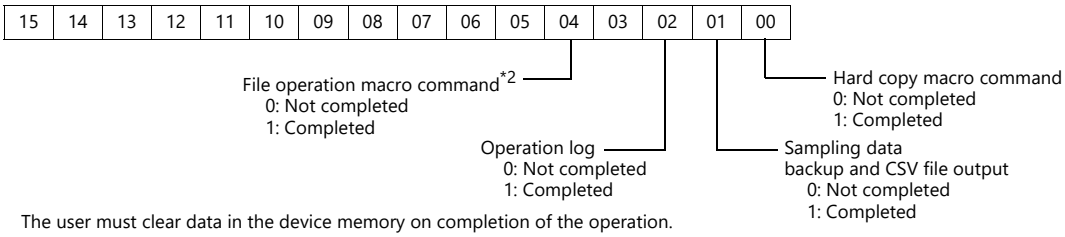
* Enabled when the [System Setting] → [Storage Setting] → [External USB storage] checkbox is selected.

- $s1050
  Outputs the status of operations related to storage.



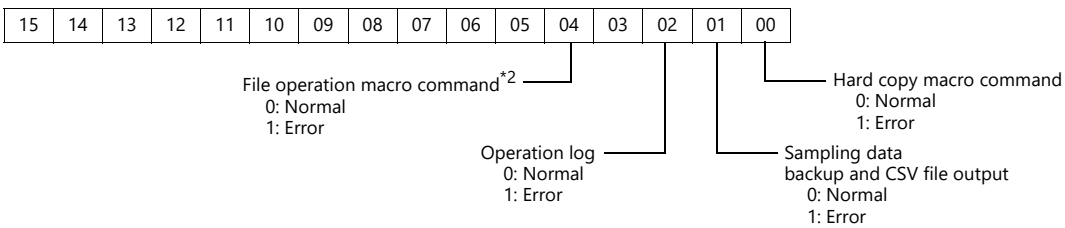
*1 When a screen program contains a V8-compatible logging block or alarm block and a macro command is used to trigger backup or CSV output, $s1098 must be set to a value other than "0".
*2 COPY_FILE, MOVE_FILE, DEL_FILE, READ_FILE, WRITE_FILE

- $s1051[*1]
  Outputs the status of the completed operation related to storage.



*1 The user must clear data in the device memory on completion of the operation.
*2 COPY_FILE, MOVE_FILE, DEL_FILE, READ_FILE, WRITE_FILE

- $s1052[*1]
  If an error occurs on completion of processing related to storage, the result is output.



*1 The user must clear data in the device memory on completion of the operation.
*2 COPY_FILE, MOVE_FILE, DEL_FILE, READ_FILE, WRITE_FILE

- $s1085
  Stores information regarding forced formatting of the SRAM area.
  This is available when the [Format the SRAM forcefully] checkbox is selected in the [General Settings] window.
  [0]: Forced formatting not executed.
  [1]: Forced formatting executed (cleared to "0" when the mode changes from RUN to STOP).

- $s1098
  Other than [0]:
  Executes background processing of the "SMPL_BAK", "SMPL_CSV", and "SMPL_CSV_BAK" macro commands. However, if background processing is being executed to the buffer that has been specified, the next processing is started on completion of the current macro processing.

- $s1108
  The media status at the secondary storage destination, sampling formatting condition, etc. are comprehensively judged and the valid/invalid state of the secondary storage destination is output.
  [0]: Writing or browsing the secondary storage destination is not possible.
  [1]: Writing or browsing the secondary storage destination is possible.

- $s1109
  Outputs the status of creating a backup file or CSV output.
  Other than [0]: Backup file being created or CSV file outputted

- $s1110
  Outputs the status of sampling macro commands when $s1098 is set to other than "0".
  Other than [0]: Execution of the "SMPL_BAK", "SMPL_CSV", or "SMPL_CSV_BAK" macro command is in progress.

- $s1111
  Outputs the status of sampling macro commands.
  Other than [0]: Execution of the "SMPL_BAK", "SMPL_CSV", or "SMPL_CSV_BAK" macro command is complete.
  * This is cleared when $s1110 (executing flag) is set to ON.

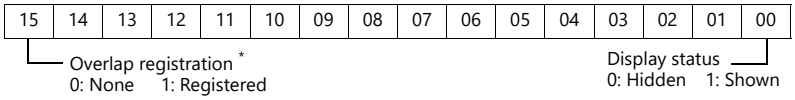
- $s1112
  Outputs the status of sampling macro commands.
  Other than [0]: Execution error of the "SMPL_BAK", "SMPL_CSV", or "SMPL_CSV_BAK" macro command
  * This is cleared when $s1110 (executing flag) is set to ON.

- $s1113
  Outputs the sampling status.
  Other than [0]: A communication error occurred during sampling.
  * This is cleared when sampling is performed normally. Sampling information of device tables is not output.

- $s1114
  Outputs the sampling status.
  Other than [0]: If a communication error occurs during sampling, sampling will continue by resetting the data to "0" in the device memory where the error occurred.
  * Sampling of device tables is performed regardless of the setting of this flag, with the data regarded as "0" in the device memory where an error occurred.

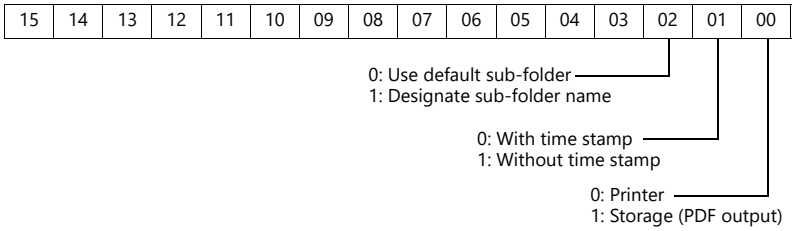
- $s1560
  Stores the global overlap 3 display status.

n + 0 (Display status)



* This bit is set to "1" only during display.
However, the bit remains set to "1" even the display hidden status when [Read PLC Device when OFF] is checked in the [Detail] settings of overlap library settings.

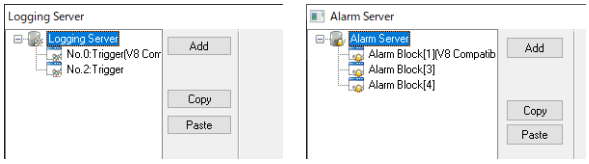
- $s1656
  Selects the data sheet output destination and the output method using bit statuses.
  This setting is available when using the STA_LIST macro.



- $s1720 - 1731
  Used to store information in $s1100 through $s1134 for blocks that do not display (V8 compatible) on the logging/alarm server.

  Set the following value in the initial macro according to the function used in blocks No. 0 to No. 11.
  0: Logging or alarm (V8 compatible)
  1: Logging (X1)
  2: Alarm history (X1)
  3: Event history (X1)

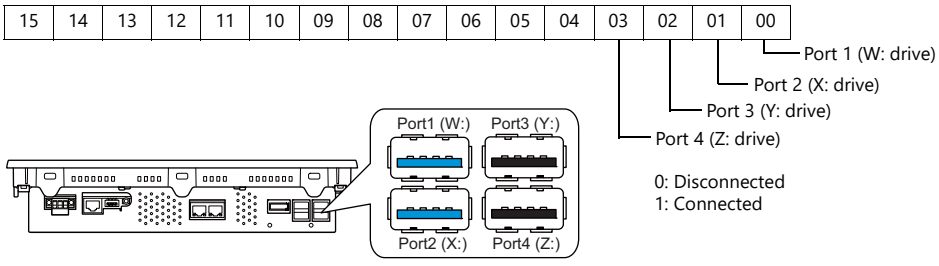
  Example) For the settings shown below:



  Execute the following macro commands in the initial macro.
  $s1722=1(W) ;Logging block No.2
  $s1723=2(W) ;Logging block No.3 Alarm history
  $s1724=3(W) ;Logging block No.4 Event history

  Caution
  - If both the logging server and the alarm server have the same block number, information for either one is stored. If both pieces of information are required, avoid overlapping block numbers.
  - The logging server and alarm server can create 12 blocks each, but the $s to store the information is a total of 12 blocks for logging and alarms.
  - It works by setting the value with the initial macro. Changes made during the RUN mode are invalid.

- $s2022
  Outputs the connected status of USB ports 1 to 4.



2 Overlap

2.1 Overview

2.2 Normal Overlap

2.3 Call-overlap

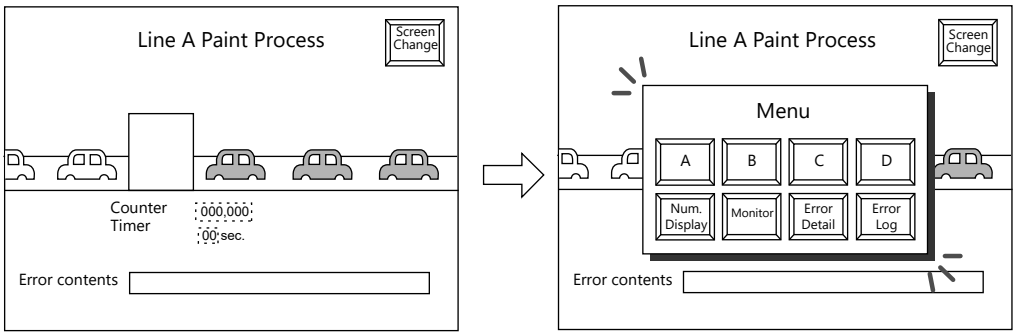
2.4 Multi-overlap

2.5 Global Overlap

2.1 Overview

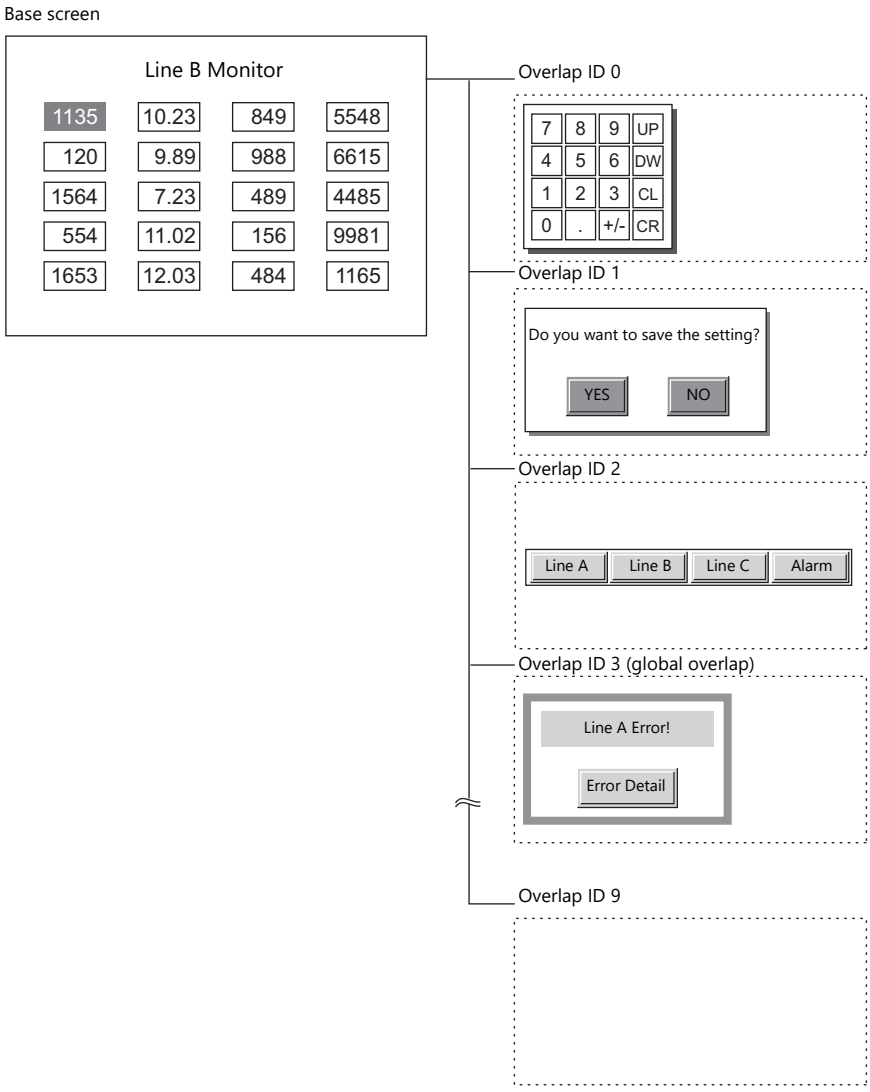
2.1.1 Overlap Displays

Windows can be displayed on the screen. These overlaying windows are called "overlap" displays.

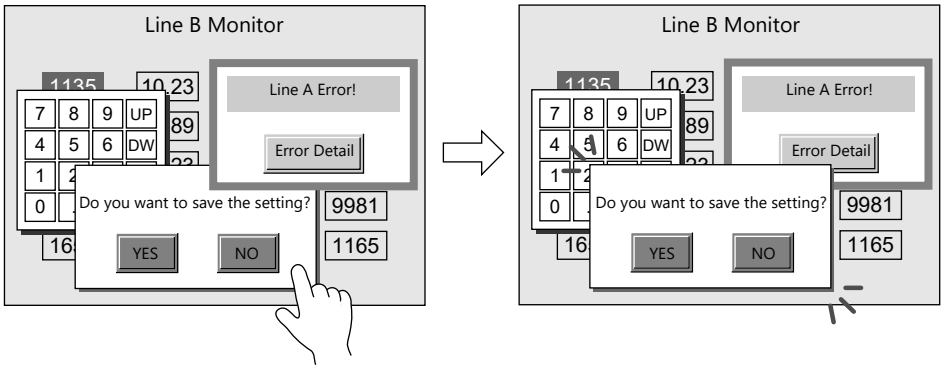


Each screen has an overlap display area ID from 0 to 9, and 10 overlaps can be displayed at once.

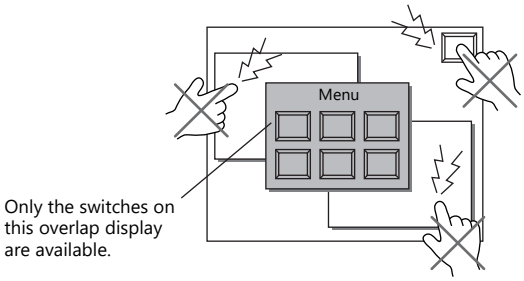
* Overlap ID: An ID that identifies an overlap display on the screen.



When several overlap displays are shown at the same time, it is possible to move an overlap display that is partly behind another to the foreground by touching the screen.

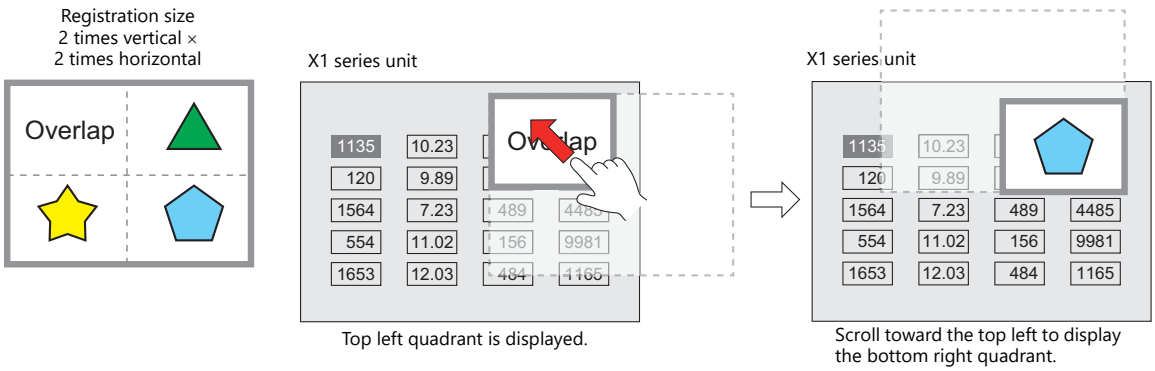


* However, when a value other than "0" is entered for system device memory $s77, only the switches (including system buttons) on the overlap display in the foreground are available (exclusive function).



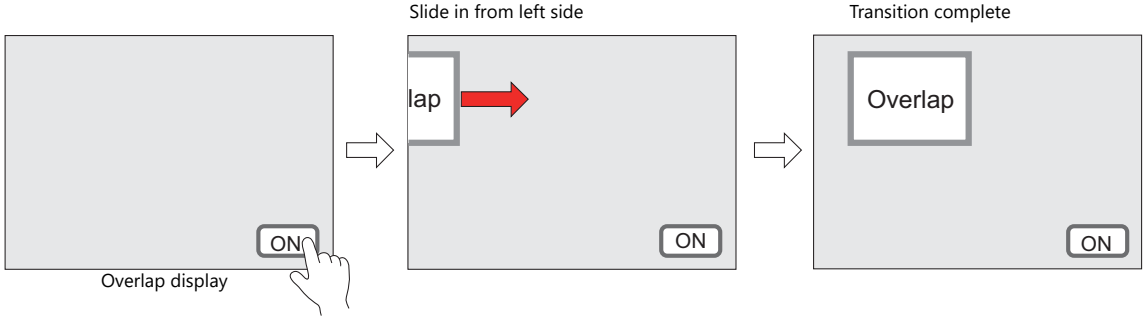
☞ "1.3 List of Internal Device Memory"

- Scrolling function
  Overlap displays up to four times larger than the normal overlap display size can be registered. When an overlap display is partially off-screen, the overlap display can be scrolled to display the off-screen content.



☞ "Scroll" page 2-10

- Transition function
  Slide and fade effects can be added when displaying overlap displays using a switch function.



☞ "Transition" page 3-16

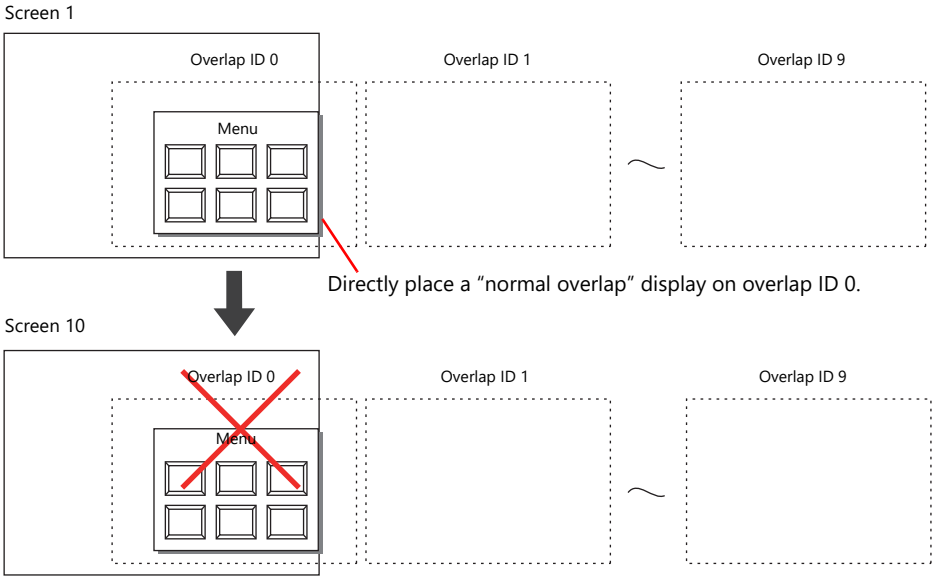
2.1.2 Overlap Display Formats

Overlap displays comprise the following four formats.

Overlap	Refer to
Normal overlap	page 2-3, page 2-8
Call-overlap	page 2-4, page 2-14
Multi-overlap	page 2-5, page 2-18
Global overlap	page 2-6, page 2-24

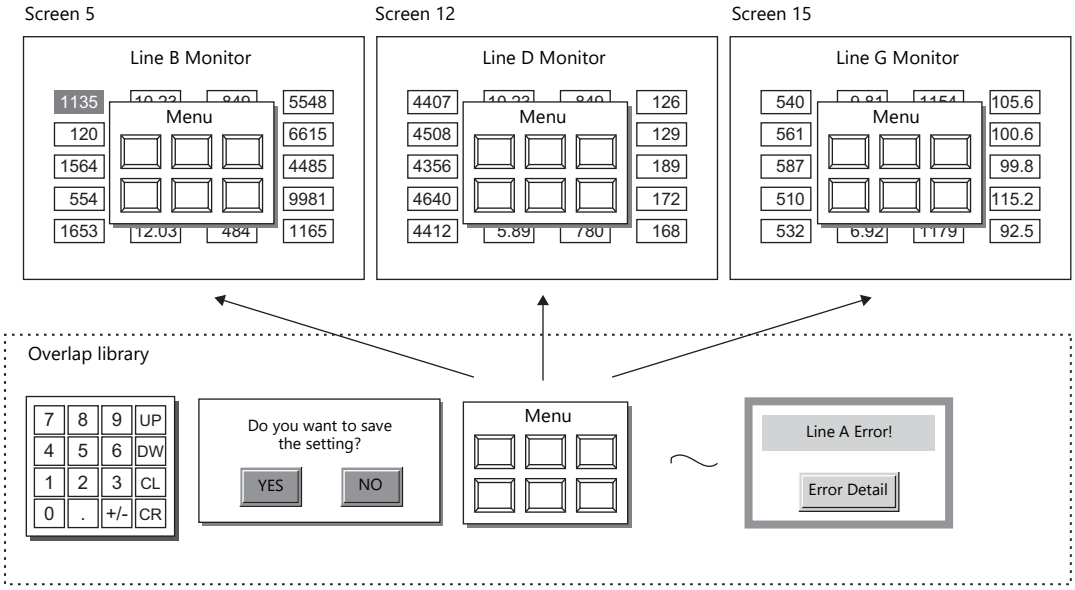
Normal Overlap

This overlap display format is unique to each screen.
An overlap display created for screen 1 cannot be displayed on other screens.
A normal overlap display can be shown or hidden using a switch or command from the PLC.

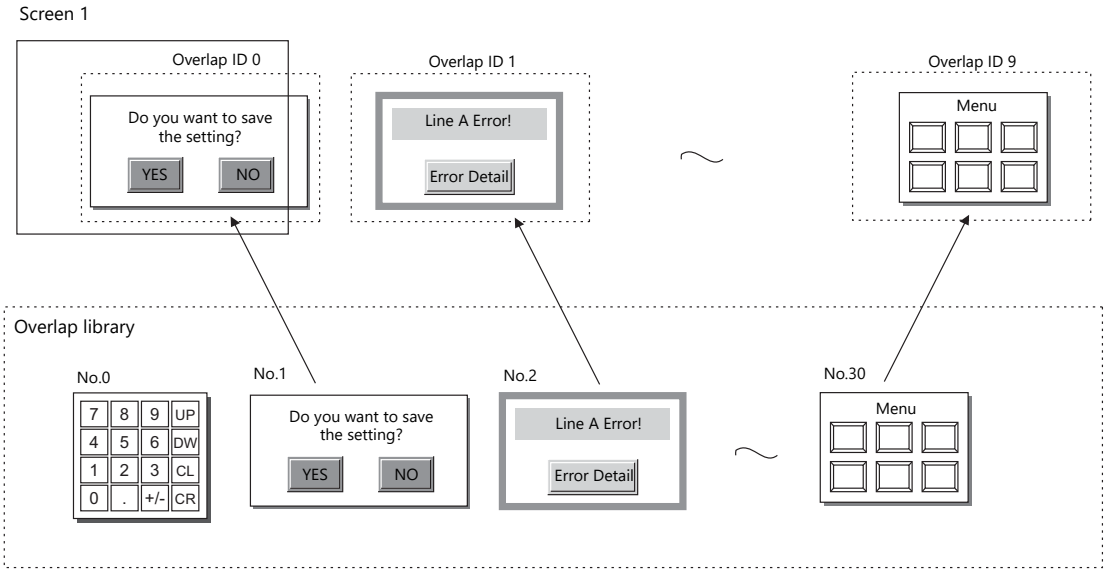


Call-overlap

This overlap display format calls and displays overlaps registered to the overlap library.
Because overlap displays are called from the library, they can be shared between multiple screens.

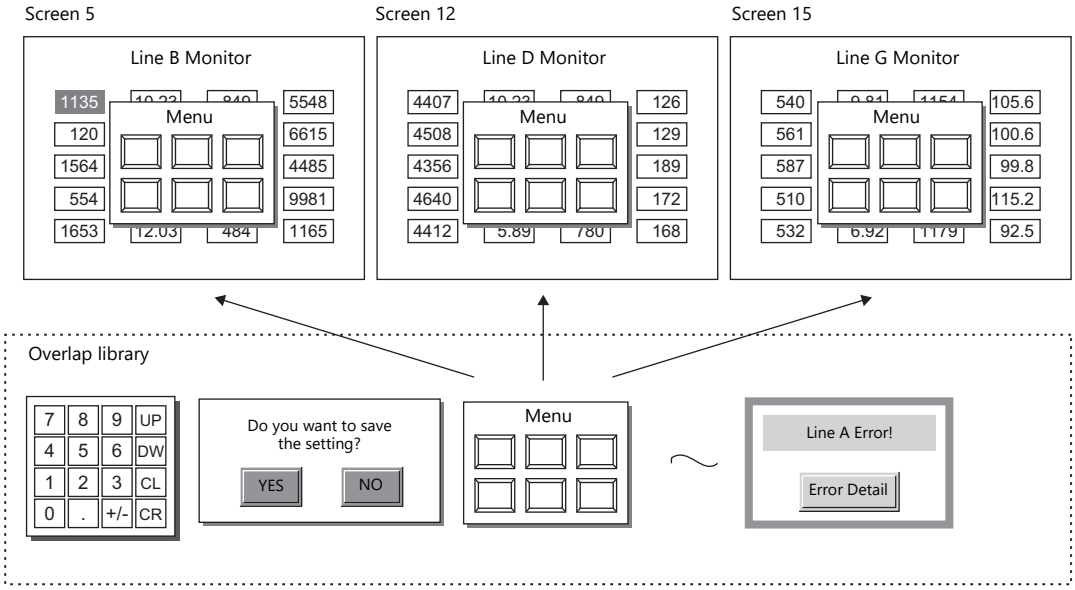


An overlap library number is set with respect to the overlap IDs from 0 to 9 on each screen.
A maximum of ten overlaps can be displayed at once. A call-overlap display can be shown or hidden using a switch or command from the PLC.

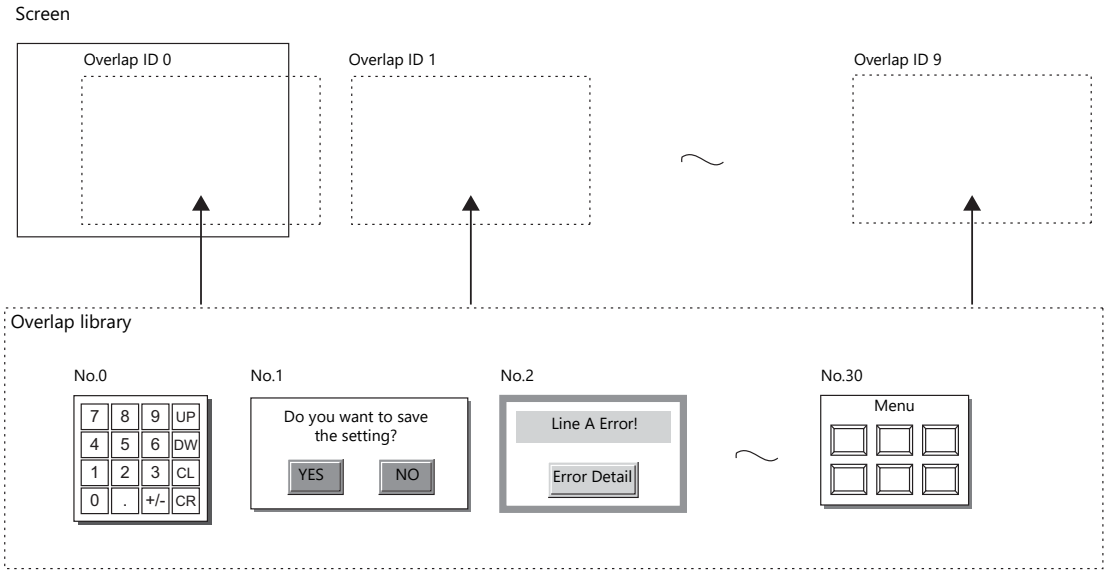


Multi-overlap

This overlap display format calls and displays overlaps registered to the overlap library.
Because overlap displays are called from the library, they can be shared between multiple screens.

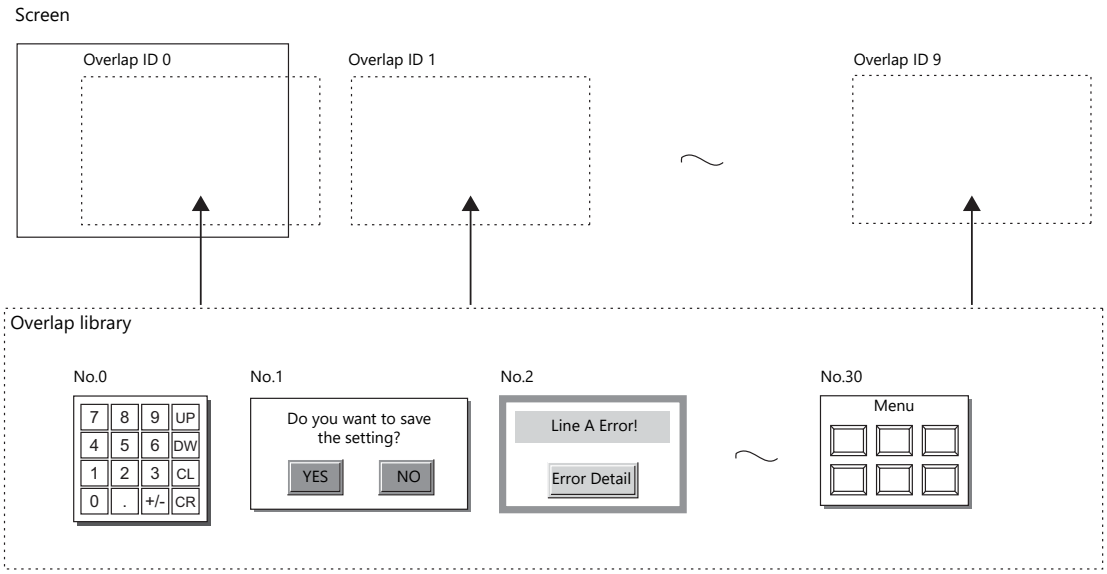


An overlap library number that can be switched between 0 and 9999 can be set with respect to a single overlap ID.
A maximum of 10 overlaps can be displayed at once and 4000 types of overlaps can be selected by switching the overlap library number. A multi-overlap display can be shown or hidden using a switch or command from the PLC.

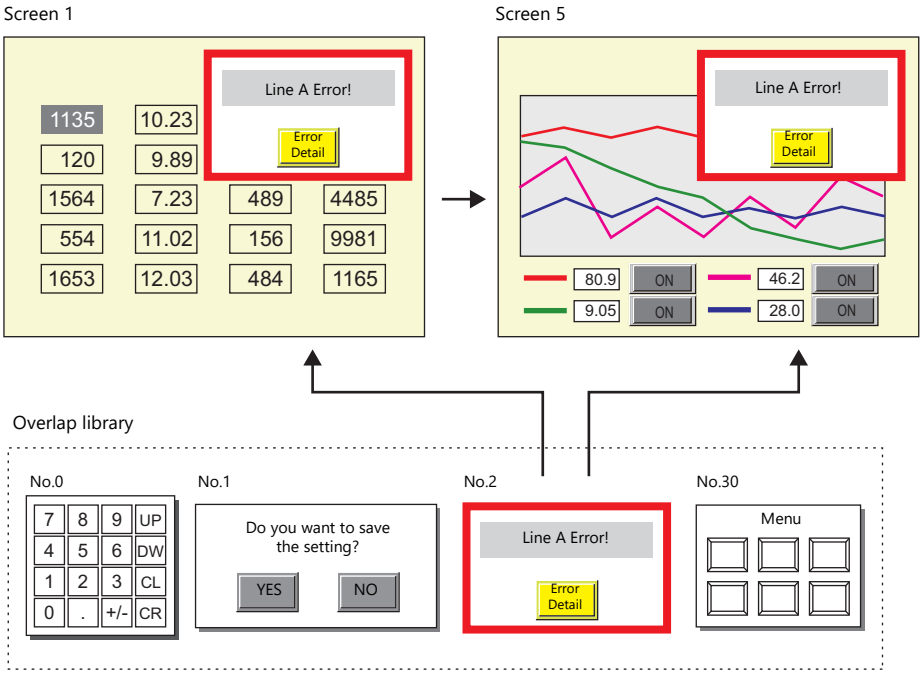


Global Overlap

This overlap display format calls and displays overlaps registered to the overlap library.
Because overlap displays are called from the library, they can be shared between multiple screens.
An overlap library number that can be switched between 0 and 9999 can be set with respect to a single overlap ID. A maximum of 10 overlaps can be displayed at once and 4000 types of overlaps can be selected by switching the overlap library number. A global overlap display can be shown or hidden using a switch or command from the PLC.



The same overlap display is shown even if the screen changes to another screen.
Because this overlap format is not affected by screen changes, it is well suited to high-urgency alarm displays.



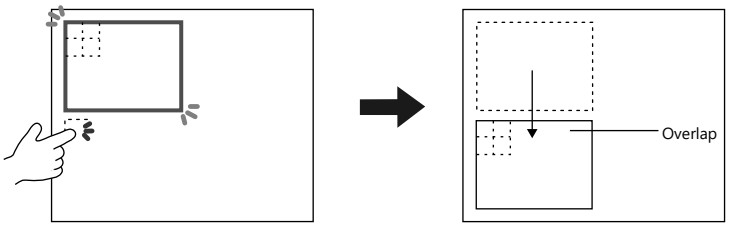
2.1.3 Overlap Auxiliary Functions

System Buttons

The system button overlap auxiliary function operates in the following two ways.

Overlap Movement

Touch the top left corner (2 x 2 switch grid) of the overlap display to make the overlap frame blink.
With the overlap frame blinking, touch a position on the screen once to move the overlap display to that position. (The frame stops blinking after the overlap display is moved.)



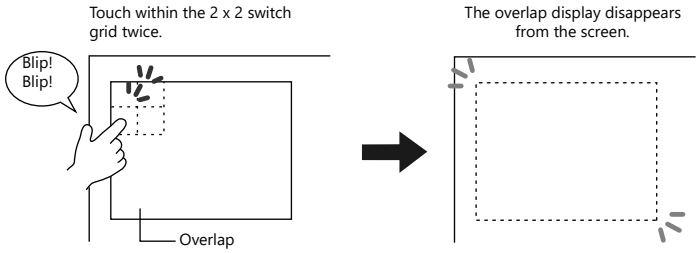
Touch somewhere outside the overlap display on the screen while the frame is blinking.

The overlap display is moved with its top left corner aligned to the touched position and the frame stops blinking.

If the overlap display will protrude off-screen at the new position, the protrusion is automatically adjusted so that the entire overlap display is shown on-screen.
To stop the overlap frame blinking (and cancel the movable state), touch the top left corner of the overlap display again.

Hiding the Overlap Display

Double-touch (touch the screen twice within one second) the top left corner (2 x 2 switch grid) to hide the overlap display.



Setting system buttons

The system button can be set in the [Detail] setting of the setting window for each overlap.

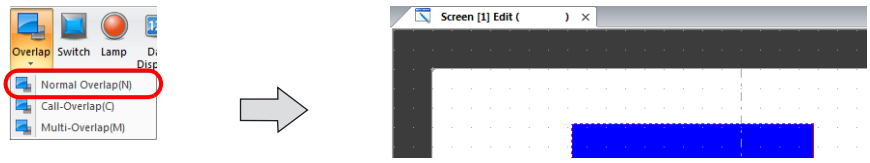
☞ "Detail" page 2-10

2.2 Normal Overlap

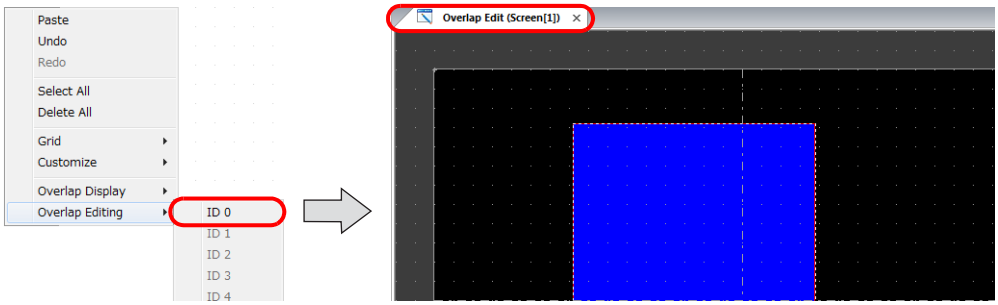
2.2.1 Creation Procedure

Use the following procedure to create a normal overlap.

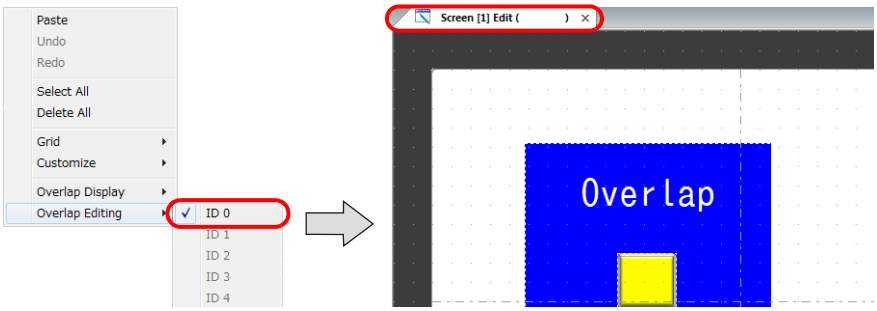
1. Click [Parts] → [Overlap] → [Normal Overlap] and place an overlap.



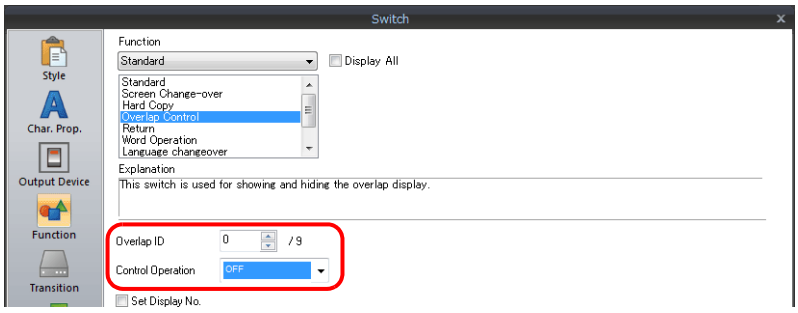
2. Adjust the size of the overlap.
3. Select [Overlap Editing] → [ID 0] on the right-click menu. The overlap editing window is displayed.



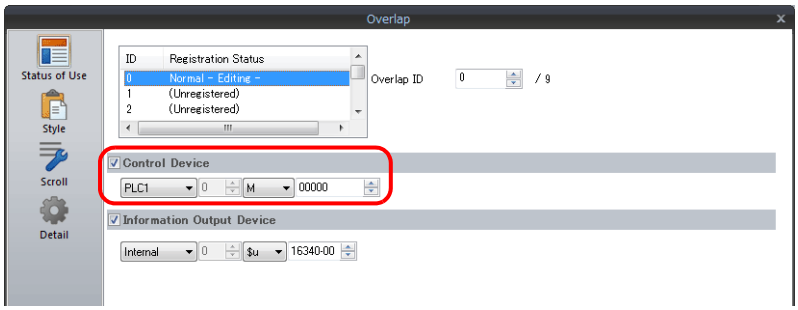
4. Place switches, lamps, and other items on the overlap.
5. Select [Overlap Editing] → [ID 0] on the right-click menu. The user is returned to the screen editing window.



6. If performing showing/hiding with a switch, place a switch. page 2-11

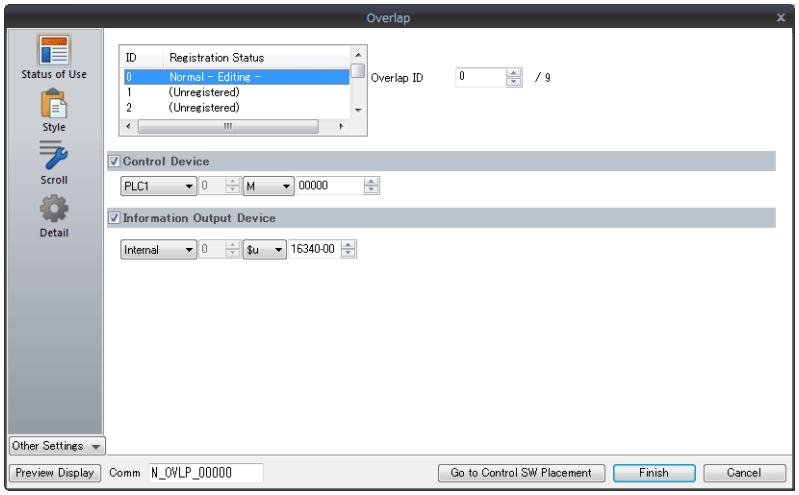


7. If performing showing/hiding with commands from a PLC, configure the [Control Device] settings. page 2-13



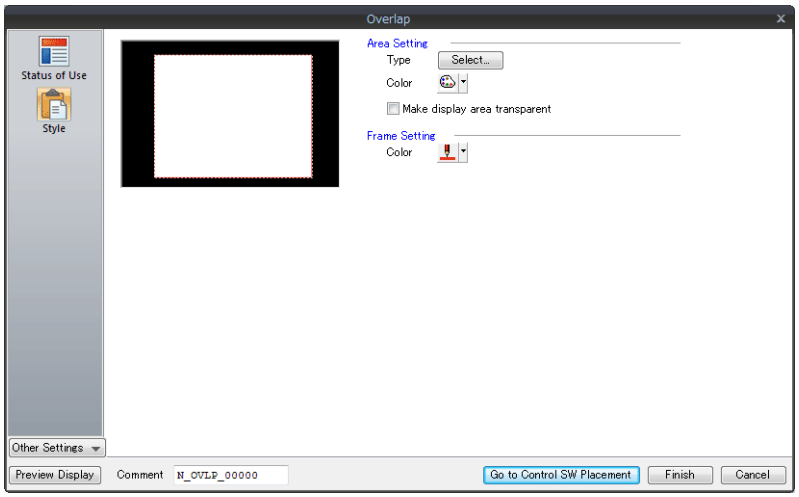
2.2.2 Detailed Settings

Status of Use



Item	Description
Registration Status	Check the registration status of overlap IDs 0 to 9. "- Editing -" is shown for the ID that is currently being edited. The overlap ID can also be changed to an unregistered ID.
Control Device	Specify a device using one bit. Showing and hiding is performed according to the value of the least significant bit. 0 → 1: Show 1 → 0: Hide * Select the [Display Overlap during bit ON] checkbox at [System Setting] → [Unit Setting] → [General Setting] to allow level operation. Refer to page 2-13.
Information Output Device	Specify a device using one bit. Stores the overlap display status. 0: Hide 1: Shown

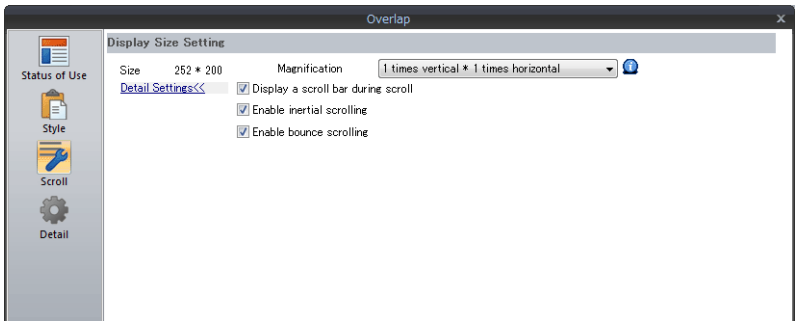
Style

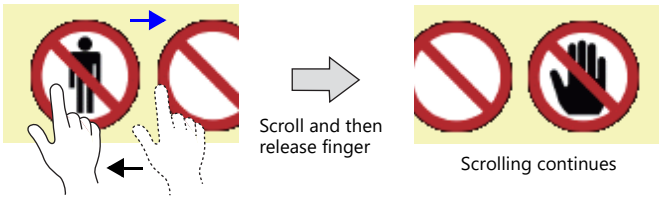
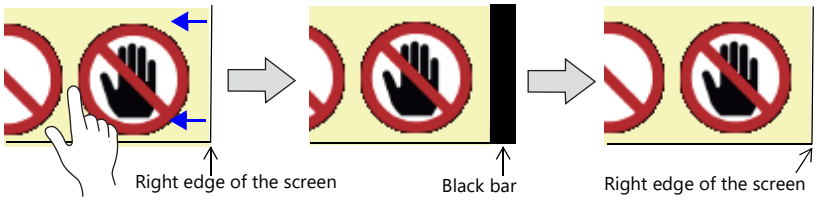


Item		Description
Area Setting Frame		Set the design and color of the area.
	Make display area transparent	Make the overlap area transparent. Only the items placed on the overlap are displayed on the X1 series unit. Placed items cannot be made transparent.

☞ Refer to the V9 Series Operation Manual.

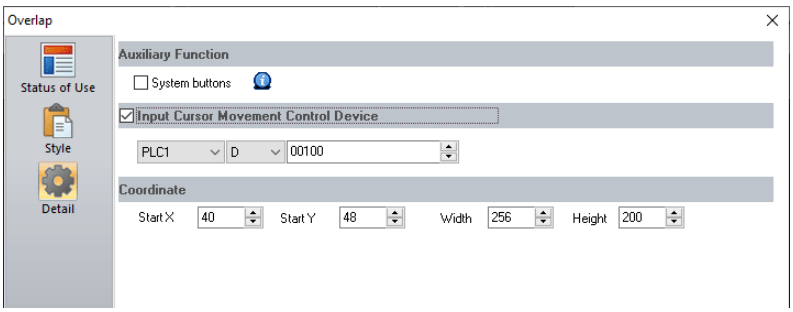
Scroll



Item		Description
Display Size Setting		Use [Magnification] to set the editing size of the overlap. 1 times vertical × 1 times horizontal / 1 times vertical × 2 times horizontal 1 times vertical × 3 times horizontal / 1 times vertical × 4 times horizontal 2 times vertical × 1 times horizontal / 2 times vertical × 2 times horizontal 3 times vertical × 1 times horizontal / 4 times vertical × 1 times horizontal
Detail Settings	Display a scroll bar during scroll	Display a scroll bar at the right edge and bottom when scrolling. The scroll bar itself cannot be operated.
	Enable inertial scrolling	Allow scrolling to continue after releasing your finger from the screen when scrolling. The speed of scrolling gradually decreases until it stops. 
	Enable bounce scrolling	Scrolling will bounce to indicate that movement in the particular direction has reached its limit. A black frame is displayed momentarily. 

☞ Refer to “7.1 Enlarging and Scrolling Screens” in the X1 Series Reference Manual 2.

Detail



Item		Description
Auxiliary Function	System buttons	Select this checkbox to use system buttons. Refer to page 2-7.
Input Cursor Movement Control Device		This setting is required to use the “entry function” on an overlap display. For details, refer to page 6-36.
Coordinate	Start X/Start Y	Set the display position of the overlap using X and Y coordinates.
	Width/Height	Set the size of the overlap.

2.2.3 Show/Hide Settings

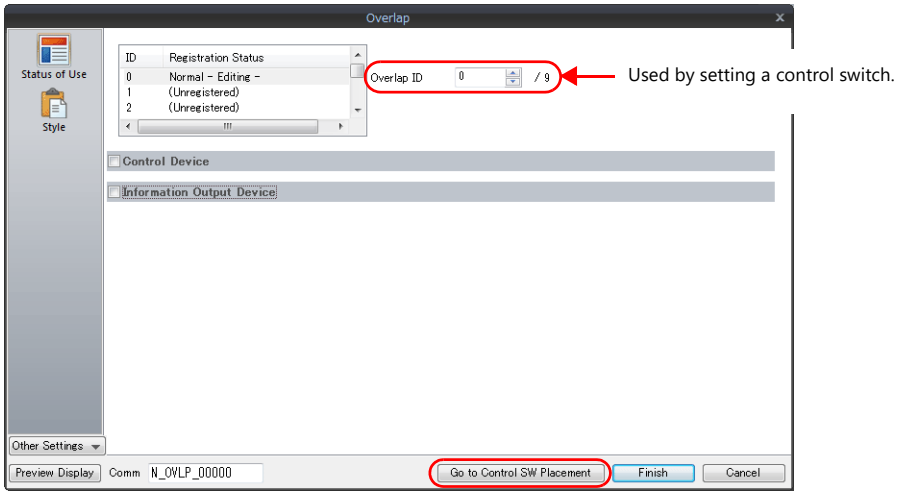
There are three methods for showing and hiding normal overlap displays.

Method		Error Detail	Refer to
Internal command	Switch	Function: Overlap Control Set Display No.: Unselected	page 2-11
	Macro	OVLP_SHOW OVLP_POS	page 2-12
External Command	Control device memory	0 → 1: Show 1 → 0: Hide	page 2-13

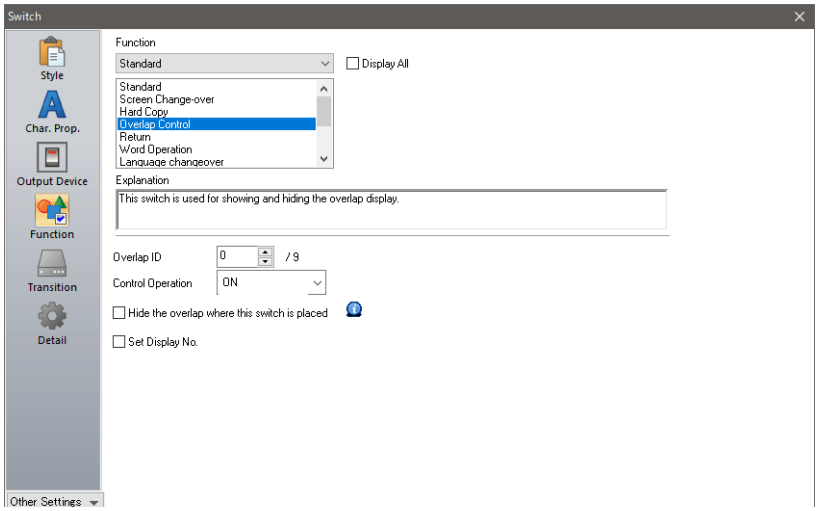
Switch

Settings for showing

1. Display the settings menu of the normal overlap display.
2. Click [Go to Control SW Placement] and place a switch.



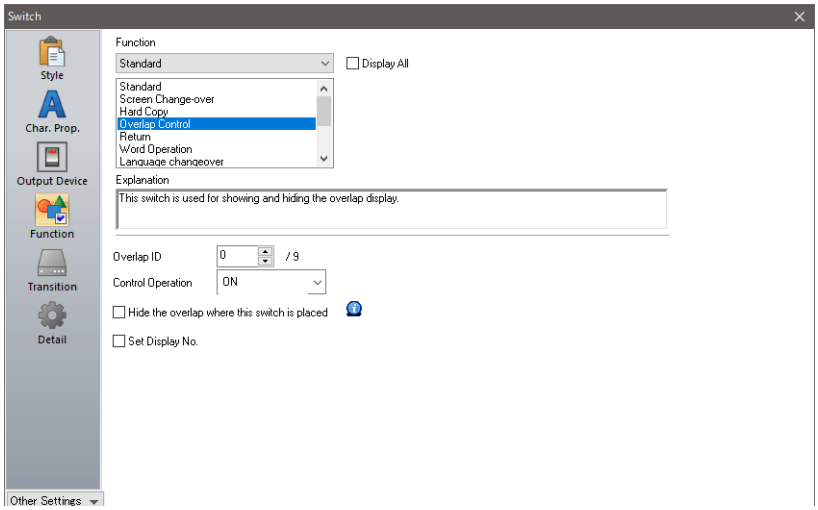
3. Set the function of the switch.



Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the normal overlap.
Control Operation	ON: Show ALT: Alternate between show and hide
Set Display No.	Unselected

Settings for hiding

1. Display the settings menu of the normal overlap display.
2. Click [Go to Control SW Placement] and place a switch.
3. Set the function of the switch.



- Hiding using a switch placed on the base screen

Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the normal overlap.
Control Operation	OFF: Hide ALT: Alternate between show and hide
Hide the overlap where this switch is placed	Unselected
Set Display No.	Unselected

- Hiding using a switch placed on the overlap display

Function	Overlap Control
Hide the overlap where this switch is placed	Selected
Set Display No.	Unselected

Macro

A macro can be used to show and hide normal overlap displays. In this case, use the "OVLP_SHOW" command.
The "OVLP_POS" command is used to specify the display position. For details, refer to the V9 Series Macro Reference Manual.

Setting

1. Creating a macro for showing an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

$u100 = 2 (W)	Set an overlap ID from 0 to 9 (ID2 in this example).
$u101 = 1 (W)	Overlap display
SYS (OVLP_SHOW) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

2. Creating a macro for hiding an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

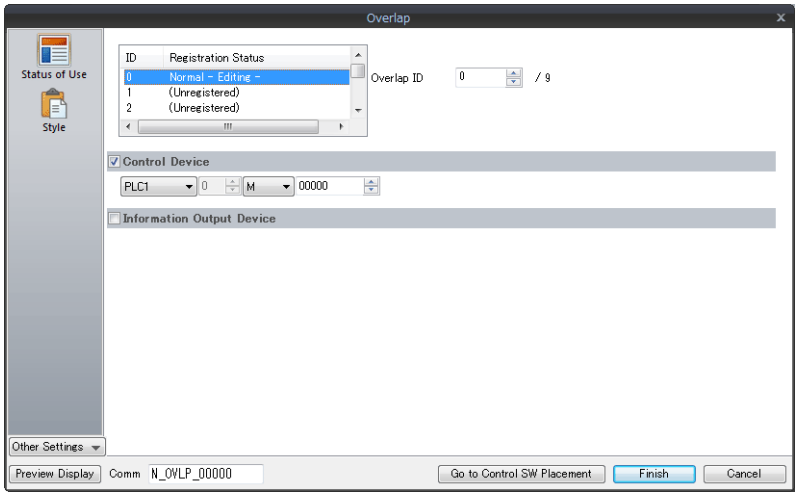
$u100 = 2 (W)	Set an overlap ID from 0 to 9 (ID2 in this example).
$u101 = 0 (W)	Hide the overlap display
SYS (OVLP_SHOW) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

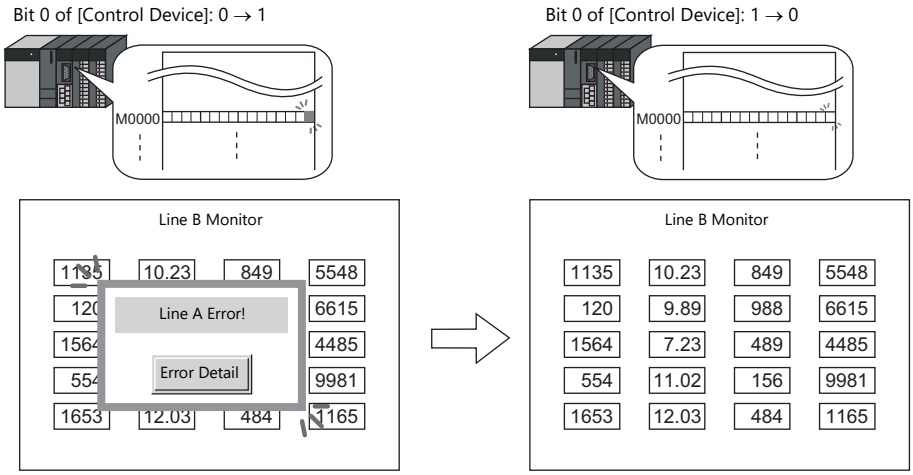
Control Device Memory

Setting

1. In the normal overlap settings menu, click [Status of Use] and configure the [Control Device] settings.



2. The overlap is shown when the [Control Device] bit is ON and hidden when the bit is OFF.



* Recognition of bit status
The method used for bit recognition differs depending on the setting of [Display Overlap during bit ON] on the [General Settings] tab accessible by clicking [System Setting] → [Unit Setting] → [General Setting].

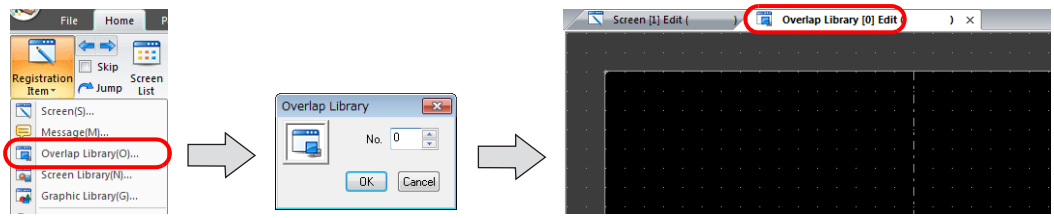
- Unselected:
  The change (edge) from 0 to 1 or 1 to 0 is used to recognize bit status.
- Selected:
  Level recognition is used to determine the bit status.
  Suppose that an overlap display was shown on the screen using an external command, the screen was switched to another screen, and then the first screen is displayed again. In this case, the overlap display that corresponds to the bit being turned ON appears on the screen.

* Notes on showing an overlap display using an external command
A switch for [Function: Overlap Control = OFF] can be used to hide the overlap display. Using this type of switch hides the overlap display with the bit of the control device memory still turned ON. To show the overlap display again, the bit needs to be turned OFF and ON again.

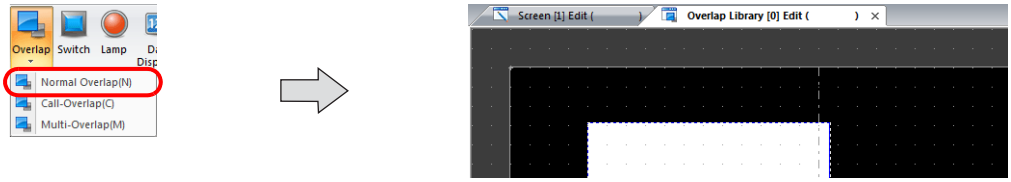
2.3 Call-overlap

2.3.1 Creation Procedure

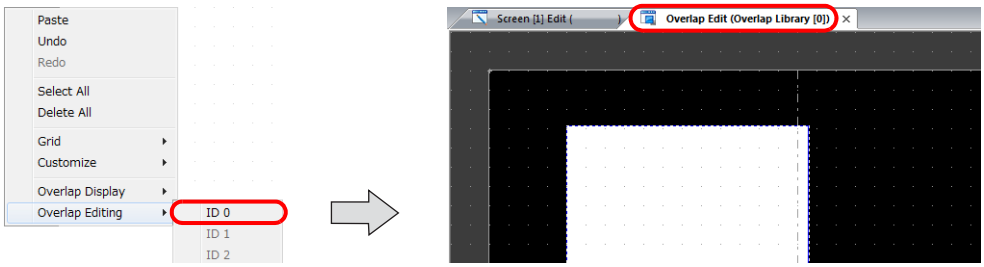
1. Creating from an Overlap Library
   1) Display an [Overlap Library Edit] tab window by clicking [Home] → [Registration Item] → [Overlap Library].



   2) Click [Parts] or [Home] → [Overlap] → [Normal Overlap] and place an overlap.

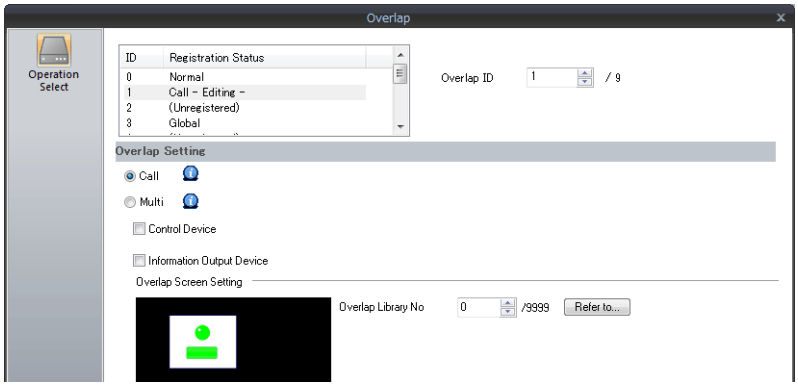


   3) Adjust the size of the overlap.
   4) Select [Overlap Editing] → [ID 0] on the right-click menu. The overlap editing window is displayed.



   5) Place switches, lamps, and other items on the overlap.
   6) Select [Overlap Editing] → [ID 0] on the right-click menu. The user is returned to the screen editing window.

2. Placing Call-Overlaps
   1) In the screen editing window, click [Parts] → [Overlap] → [Call-Overlap] and place an overlap.
   2) Click the icon and display the settings menu.
   3) Configure the [Operation Select] settings.

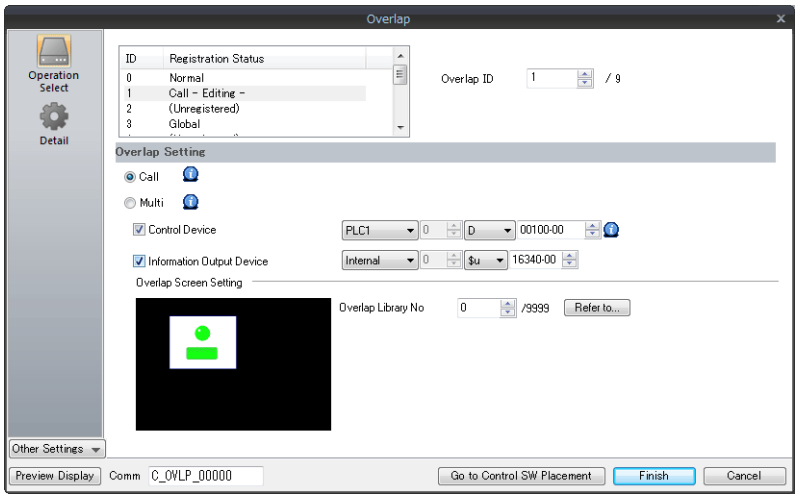


Overlap Setting	Call
Overlap Screen Setting	Set the overlap library number.

3. If performing showing/hiding with a switch, place a switch. page 2-16
4. If performing showing/hiding with commands from a PLC, configure the [Control Device] settings. page 2-15

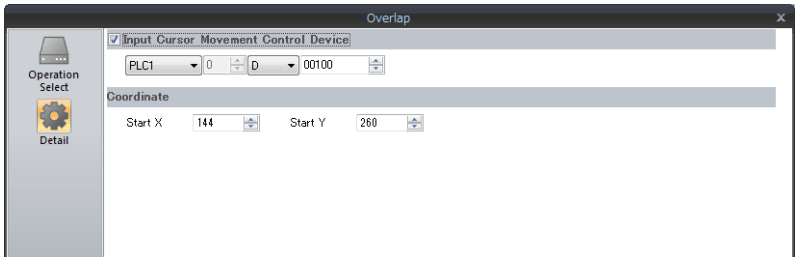
2.3.2 Detailed Settings

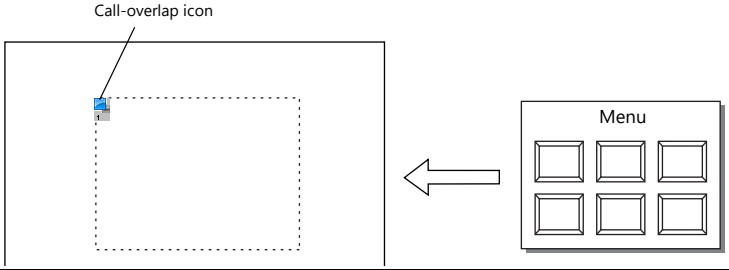
Operation Select



Item	Description
Registration Status	Check the registration status of overlap IDs 0 to 9. "- Editing -" is shown for the ID that is currently being edited. The overlap ID can also be changed to an unregistered ID.
Overlap Setting	Call Overlap library number Set the library number of the overlap for display from those registered in the overlap library. Click [Refer to] to select using a list display or thumbnails.
Control Device	Specify a device using one bit. Showing and hiding is performed according to the value of the least significant bit. 0 → 1: Show 1 → 0: Hide * Select the [Display Overlap during bit ON] checkbox at [System Setting] → [Unit Setting] → [General Setting] to allow level operation. Refer to page 2-13.
Information Output Device	Specify a device using one bit. Stores the overlap display status. 0: Hide 1: Shown

Detail



Item		Description
Input Cursor Movement Control Device		This setting is required to use the "entry function" on an overlap display. For details, refer to page 6-36.
Coordinate	Start X/Start Y	Set the display position of the overlap using X and Y coordinates. 

2.3.3 Show/Hide Settings

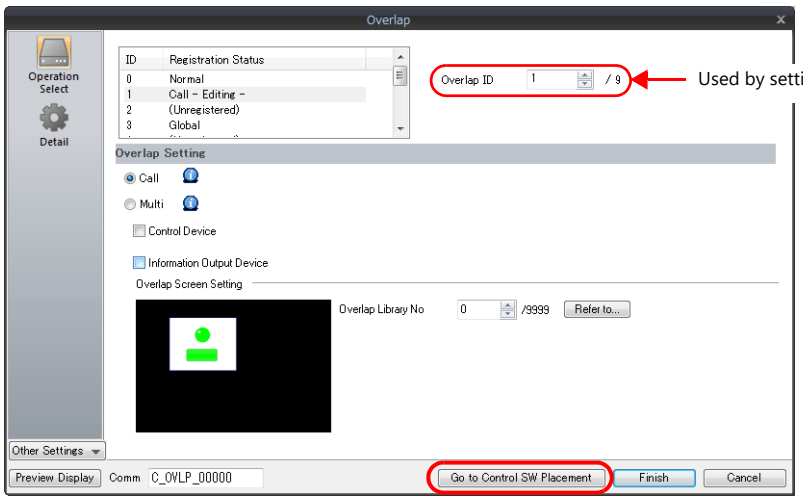
There are three methods for showing and hiding call-overlap displays.

Method		Error Detail	Refer to
Internal command	Switch	Function: Overlap Control Set Display No.: Unselected	page 2-15
	Macro	OVLP_SHOW OVLP_POS	page 2-12
External Command	Control device memory	0 → 1: Show 1 → 0: Hide	page 2-13

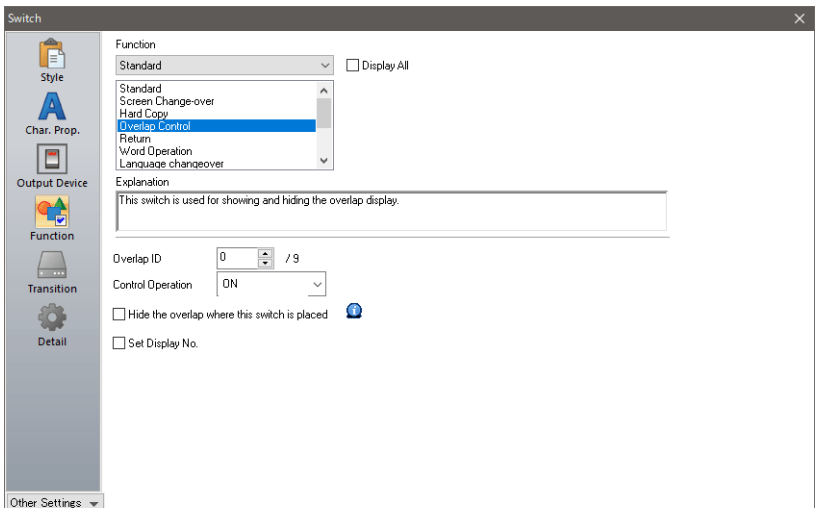
Switch

Settings for showing

1. Display the settings menu of the call-overlap display.
2. Click [Go to Control SW Placement] and place a switch.



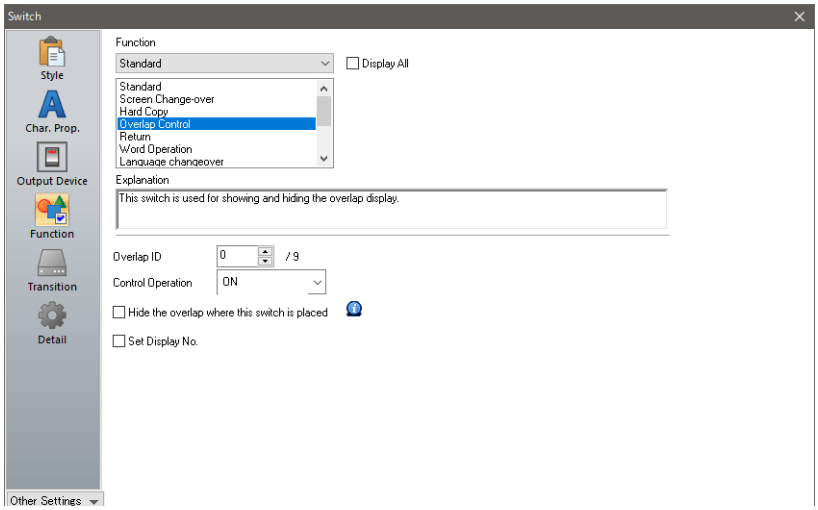
3. Set the function of the switch.



Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the call-overlap.
Control Operation	ON: Show ALT: Alternate between show and hide
Set Display No.	Unselected

Settings for hiding

1. Display the settings menu of the call-overlap display.
2. Click [Go to Control SW Placement] and place a switch.
3. Set the function of the switch.



- Hiding using a switch placed on the base screen

Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the call-overlap.
Control Operation	OFF: Hide ALT: Alternate between show and hide
Hide the overlap where this switch is placed	Unselected
Set Display No.	Unselected

- Hiding using a switch placed on the overlap display

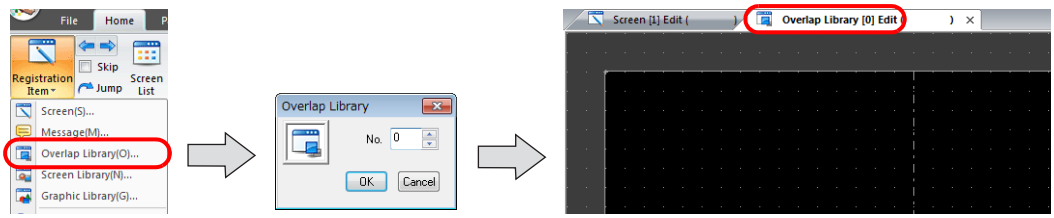
Function	Overlap Control
Hide the overlap where this switch is placed	Selected
Set Display No.	Unselected

2.4 Multi-overlap

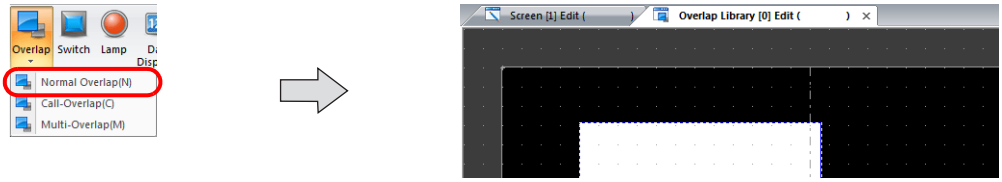
2.4.1 Creation Procedure

1. Creating from an Overlap Library

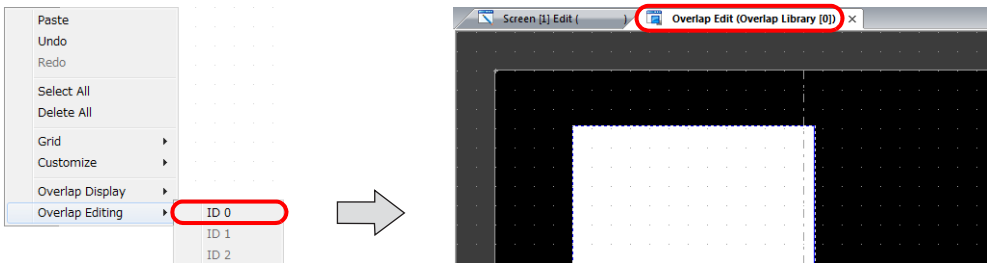
   1) Display an [Overlap Library Edit] tab by clicking [Home] → [Registration Item] → [Overlap Library].



   2) Click [Parts] or [Home] → [Overlap] → [Call-Overlap] and place an overlap.



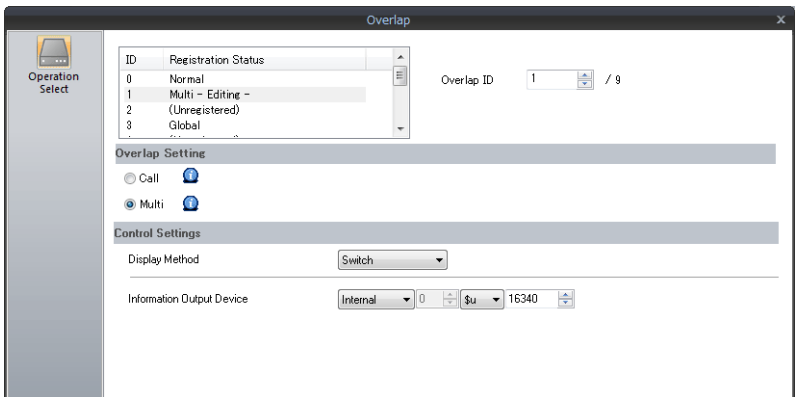
   3) Adjust the size of the overlap.
   4) Select [Overlap Editing] → [ID 0] on the right-click menu. The overlap editing window is displayed.



   5) Place switches, lamps, and other items on the overlap.
   6) Select [Overlap Editing] → [ID 0] on the right-click menu. The user is returned to the screen editing window.

2. Placing a Multi-Overlap

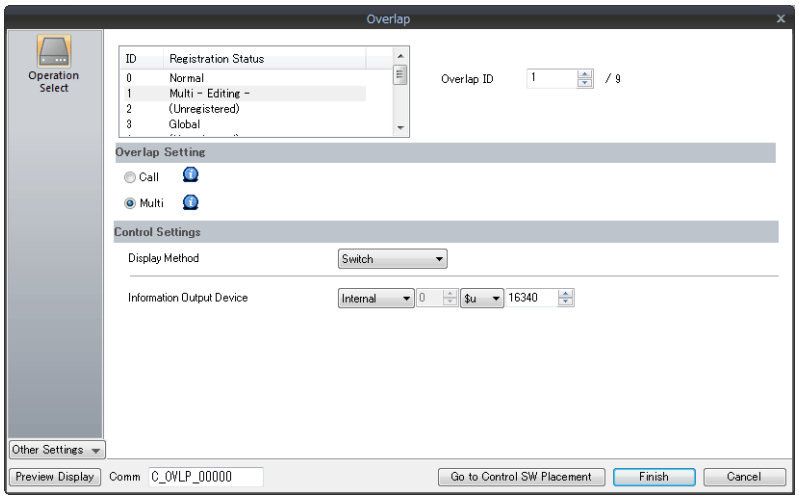
   1) In the screen editing window, click [Parts] → [Overlap] → [Multi-Overlap] and place an overlap.
   2) Click the icon and display the settings menu.
   3) Configure the [Operation Select] settings.



Overlap Setting			Multi
Control Settings	Display Method	Switch	Use switches for showing and hiding. Refer to page 2-21.
		Control Device	Use commands from a PLC for showing and hiding. Refer to page 2-23.

2.4.2 Detailed Settings

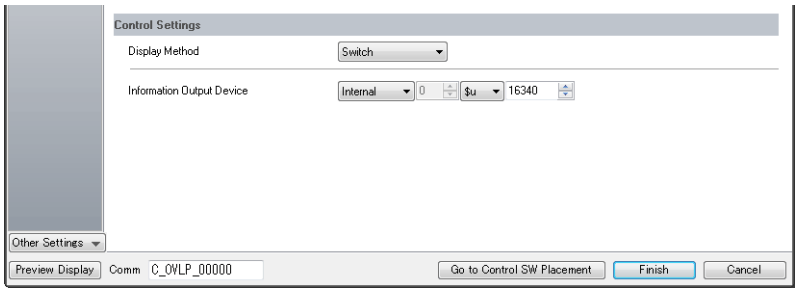
Operation Select



Item	Description
Registration Status	Check the registration status of overlap IDs 0 to 9. "- Editing -" is shown for the ID that is currently being edited. The overlap ID can also be changed to an unregistered ID.
Overlap Setting	Multi
Control Settings	Select the overlap display method (Switch/Control Device).

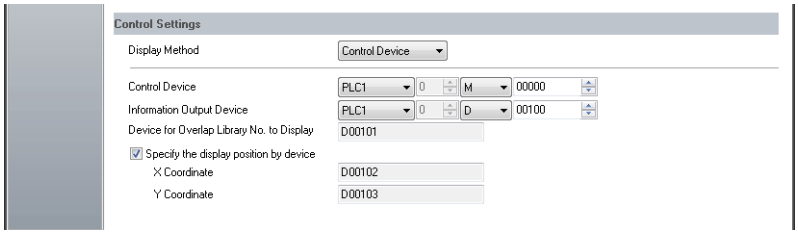
Display method

- Switch



Item	Description
Switch	Control showing and hiding of the overlap using the switch function.
Information Output Device	Store the overlap library number. Show: 0 to 9999 Hide: –1 (FFFFHex)

- Control Device

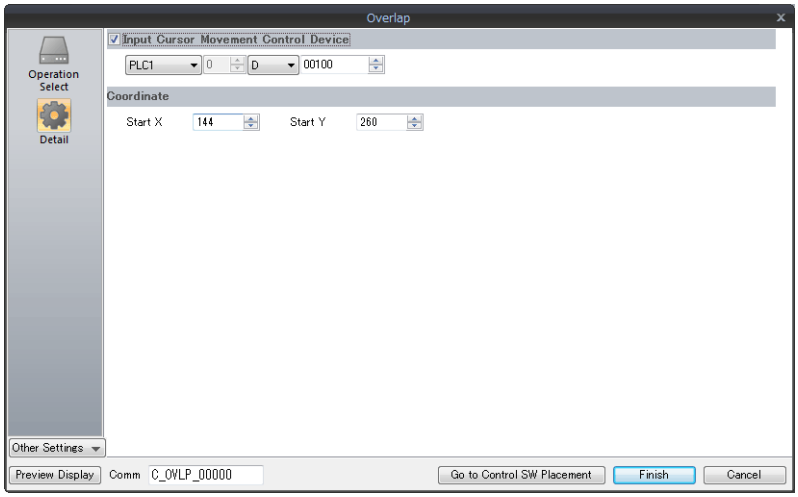


Item	Description
Control Device	Specify a device memory using one bit. Showing and hiding is performed according to the value of the least significant bit. 1 (level): Show 0 (level): Hide
Information Output Device Device for Overlap Library No. to Display Specify the display position by device	Store and set the following information using a maximum of 4 words.

Information Output Device	n	Stores the overlap library number. Show: 0 to 9999 Hide: –1 (FFFFHex)	V →
Device for Overlap Library No. to Display	n+1	Set the overlap library number of the overlap for display.	V ←
Specify the display position by device *1	n+2	Set the X coordinate.	V ←
	n+3	Set the Y coordinate.	V ←

*1 Set the unit of the placement coordinates. [System Setting] → [Unit Setting] → [Overlap] → [Overlap Coordinates]
Line/Column: X coordinate in 8 pixels, Y coordinate in 20 pixels
Dot: X coordinate in 4 pixels, Y coordinate in 1 pixel

Detail



Item	Description
Input Cursor Movement Control Device	This is required for using “entry mode” on an overlap display. For details, refer to page 6-36.
Coordinate	The coordinates of the multi-overlap icon. This setting is unrelated to the operation of MONITOUCH.

2.4.3 Show/Hide Settings

There are three methods for showing and hiding multi-overlap displays.

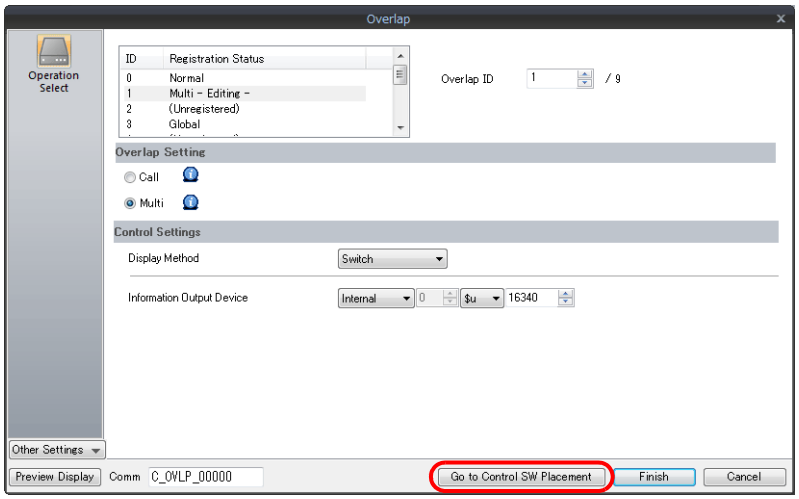
Method			Error Detail		Refer to
Internal command	Switch	Show	Function: Set Display No.:	Overlap Control Selected	page 2-21
		Hide	Function: Control Operation: Set Display No.:	Overlap Control OFF Unselected	
	Macro		SET_MOVLP OVLP_POS		page 2-22
External Command	Control device memory		0: Hide 1: Show		page 2-23

Switch

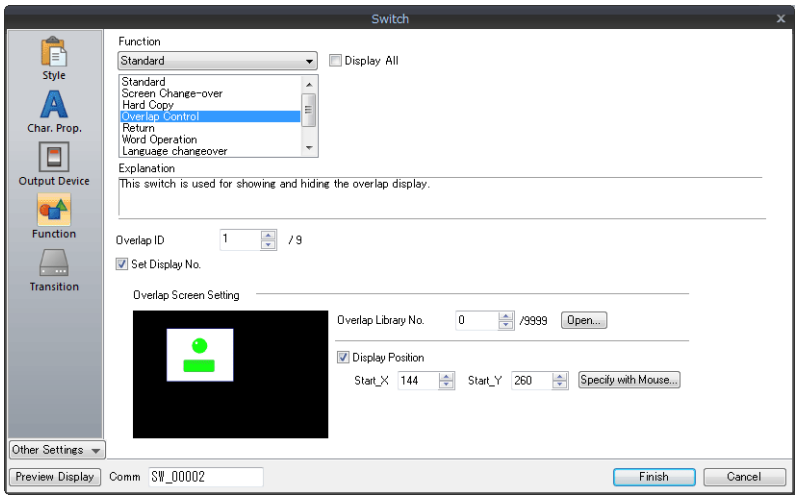
A switch can be used to show and hide multi-overlap displays.

Settings for showing

1. Display the settings menu of the multi-overlap display.
2. Click [Go to Control SW Placement] and place a switch.



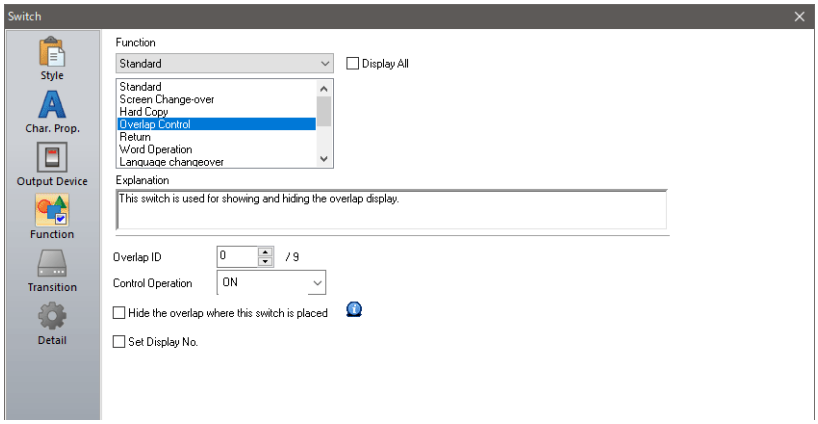
3. Set the function to use.



Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the multi-overlap.
Set Display No.	Selected
Overlap Library No.	Set the overlap library number of the overlap for display.
Display Position	Set the X and Y coordinates.

Settings for hiding

1. Display the settings menu of the multi-overlap display.
2. Click [Go to Control SW Placement] and place a switch.
3. Set the function of the switch.



- Hiding using a switch placed on the base screen

Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the multi-overlap.
Control Operation	OFF: Hide
Hide the overlap where this switch is placed	Unselected
Set Display No.	Unselected

- Hiding using a switch placed on the overlap display

Function	Overlap Control
Hide the overlap where this switch is placed	Selected
Set Display No.	Unselected

Macro

A macro can be used to show and hide multi-overlap displays. Use the “SET_MOVLP” and “OVLP_SHOW” commands.
The “OVLP_POS” command is used to specify the display position. For details, refer to the V9 Series Macro Reference Manual.

Setting

1. Creating a macro for showing an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

$u100 = 2 (W)	Set an overlap ID from 0 to 9 (ID2 in this example).
$u101 = 12 (W)	Set an overlap library number from 0 to 9999 (No. 12 in this example).
$u102 = 150 (W)	X coordinate
$u103 = 50 (W)	Y coordinate
SYS (SET_MOVLP) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

2. Creating a macro for hiding an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

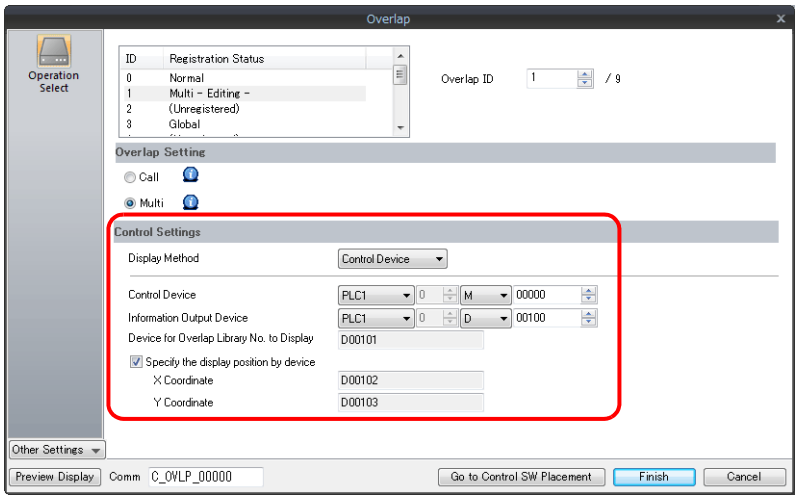
$u100 = 2 (W)	Set an overlap ID from 0 to 9 (ID2 in this example).
$u101 = 0 (W)	Hide the overlap display
SYS (OVLP_SHOW) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

Control Device Memory

Setting

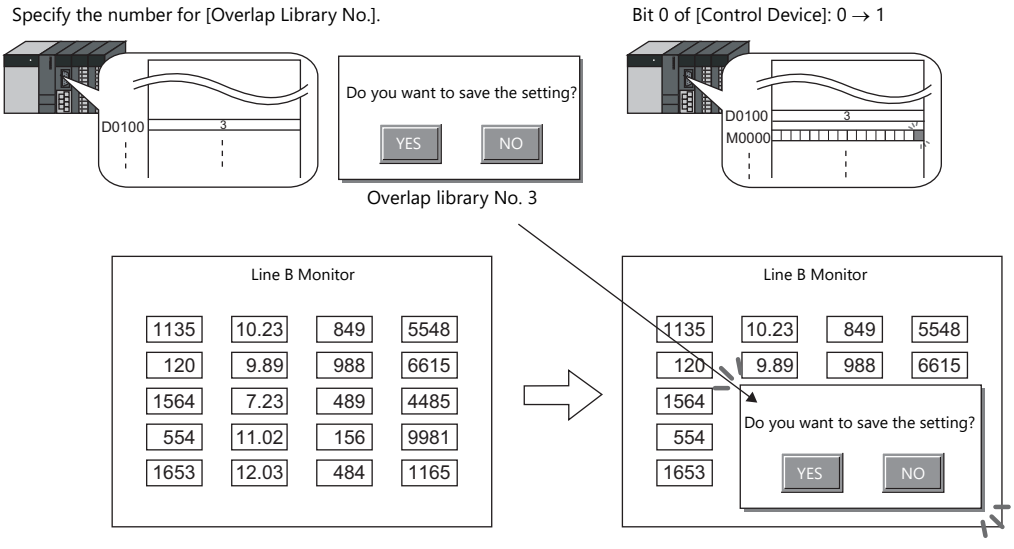
1. In the multi-overlap settings menu, click [Operation Select] and configure the [Control Device] and [Information Output Device] settings under [Control Settings].



2. Set the library number of the overlap for display to the [Device for Overlap Library No. to Display]. When specifying the display position, also set the X and Y coordinates.

Information Output Device	n	Store the overlap library number. Show: 0 to 9999 Hide: –1 (FFFFHex)	V →
Device for Overlap Library No. to Display	n+1	Set the overlap library number of the overlap for display.	V ←
Specify the display position by device	n+2	Set the X coordinate.	V ←
	n+3	Set the Y coordinate.	V ←

3. The overlap is shown when the [Control Device] bit is ON and hidden when the bit is OFF.



*** Notes on showing an overlap display using an external command**

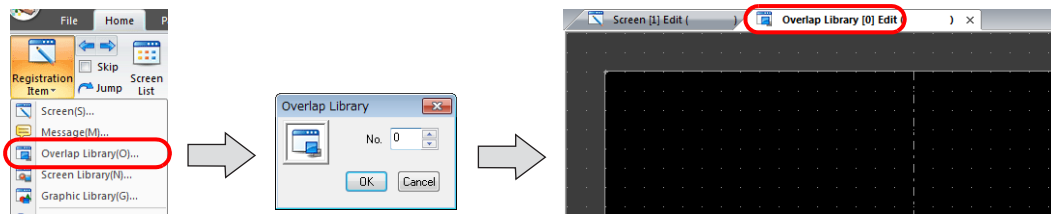
- Suppose that an overlap display was shown on the screen using an external command, the screen was switched to another screen, and then the first screen is displayed again. In this case, the overlap display that corresponds to the bit being turned ON appears on the screen.
- A switch for [Function: Overlap Display = OFF] can be used to hide the overlap display. Using this type of switch hides the overlap display with the bit of the control device memory still turned ON. To show the overlap display again, the bit needs to be turned OFF and ON again.

2.5 Global Overlap

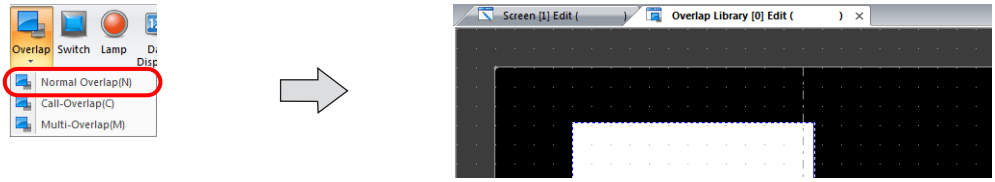
2.5.1 Creation Procedure

1. Creating from an Overlap Library

   1) Display an [Overlap Library Edit] tab window by clicking [Home] → [Registration Item] → [Overlap Library].

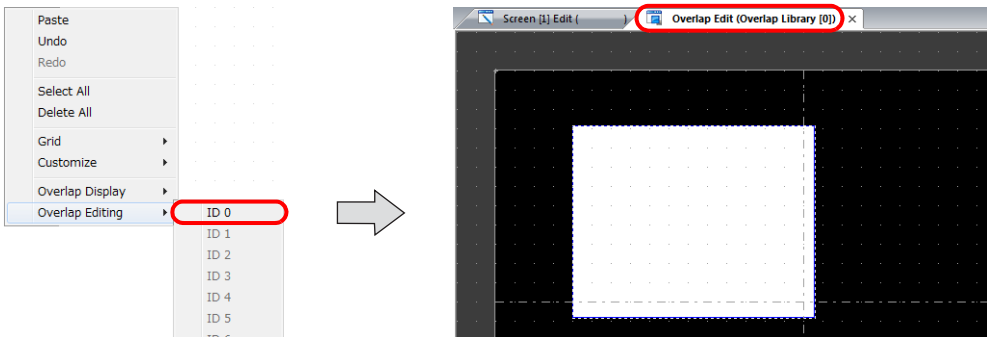


   2) Click [Parts] or [Home] → [Overlap] and place an overlap.



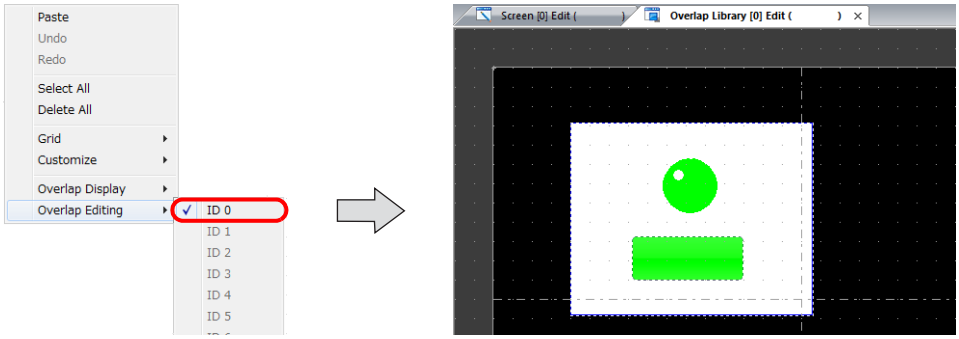
   3) Adjust the size of the overlap.

   4) Select [Overlap Editing] → [ID 0] on the right-click menu. The overlap editing window is displayed.



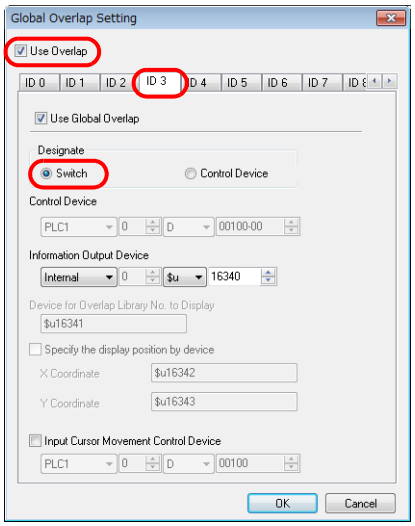
   5) Place switches, lamps, and other items on the overlap.

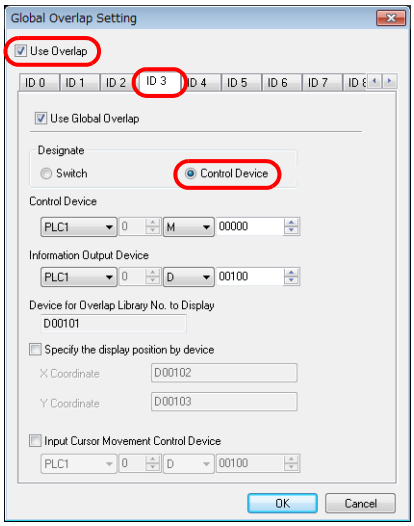
   6) Select [Overlap Editing] → [ID 0] on the right-click menu. The user is returned to the screen editing window.



2. Global Overlaps

1) Click [System Setting] → [Global Setting] → [Global Overlap Setting].
2) Select the [Use Overlap] checkbox.
3) Select the [Use Global Overlap] checkbox on the tab corresponding to the ID to use from IDs 0 to 9.
   * Do not use IDs that are already specified for screens with normal overlaps, call overlaps, or multi-overlaps.





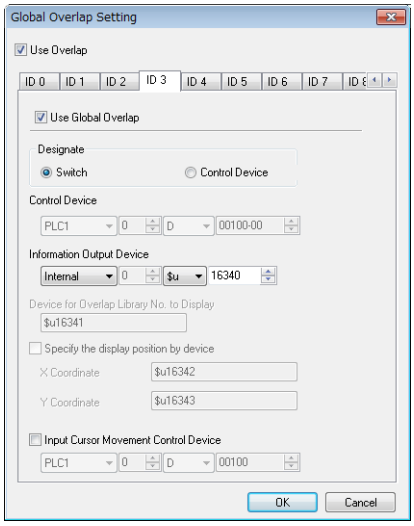
4) Select a display method under [Designate].

Item		Description
Designate	Switch	Use switches for showing and hiding. Refer to page 2-28.
	Control Device	Use commands from a PLC for showing and hiding. Refer to page 2-30.

2.5.2 Detailed Settings

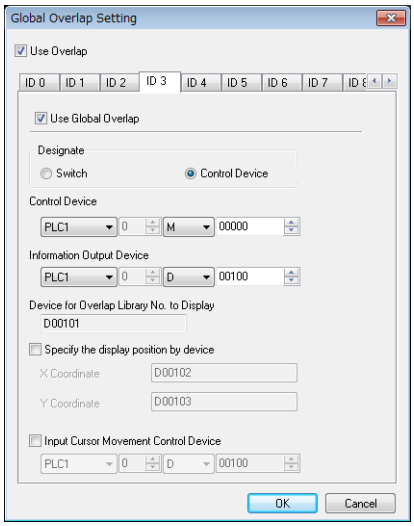
Display Method Selection

- Switch



Item	Description
Switch	Control showing and hiding of the overlap using the switch function.
Information Output Device	Store the overlap library number. Show: 0 to 9999 Hide: –1 (FFFFHex)
Input Cursor Movement Control Device	This setting is required to use the “entry function” on an overlap display. For details, refer to page 6-36.

- Control Device



Item	Description
Control Device	Specify a device using one bit. Showing and hiding is performed according to the value of the least significant bit. 1 (level): Show 0 (level): Hide
Information Output Device Device for Overlap Library No. to Display Display Position	Store and set the following information using a maximum of 4 words.

Information Output Device	n	Stores the overlap library number. Show: 0 to 9999 Hide: –1 (FFFFHex)	V →
Device for Overlap Library No. to Display	n+1	Set the overlap library number of the overlap for display.	V ←
Specify the display position by device *1	n+2	Set the X coordinate.	V ←
	n+3	Set the Y coordinate.	V ←

Item	Description
Input Cursor Movement Control Device	This setting is required to use the “entry function” on an overlap display. For details, refer to page 6-36.

*1 Set the unit of the placement coordinates. [System Setting] → [Unit Setting] → [Overlap] → [Overlap Coordinates]
Line/Column: X coordinate in 8 dots, Y coordinate in 20 dots
Dot: X coordinate in 4 dots, Y coordinate in 1 dot
When the [Specify the display position by device] check box is not selected, the overlap display is shown in the position as registered in the overlap library.

2.5.3 Show/Hide Settings

There are three methods for showing and hiding global overlap displays.

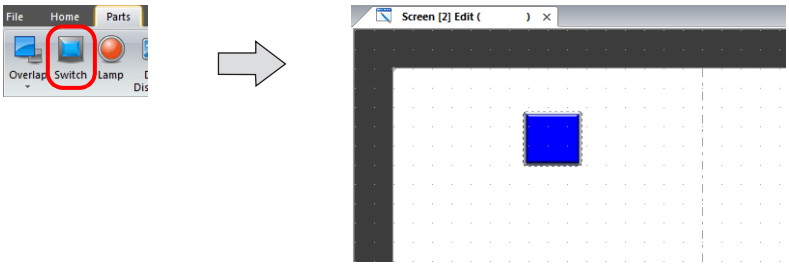
Method		Error Detail	Refer to
Internal command	Switch	Function: Overlap Control Set Display No.: Selected	page 2-28
	Macro	SET_MOVLP OVLP_SHOW OVLP_POS	page 2-29
External Command	Control device memory	0: Hide 1: Show	page 2-30

Switch

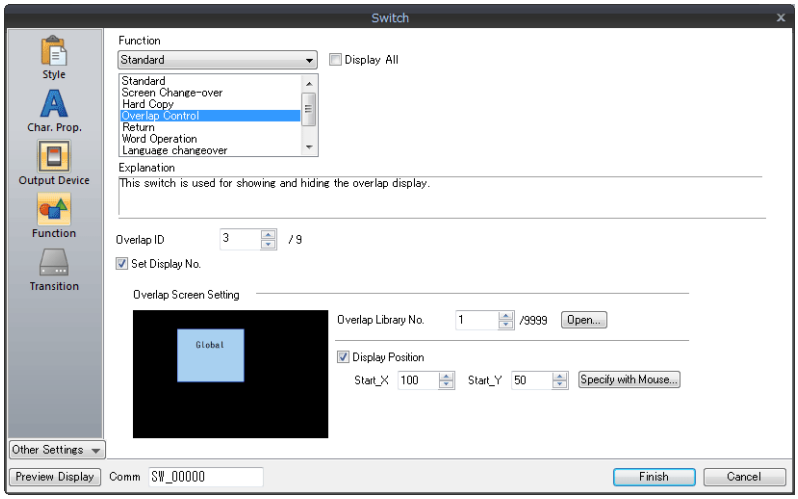
A switch can be used to show and hide global overlap displays.

Settings for showing

1. Click [Parts] → [Switch] and place a switch.



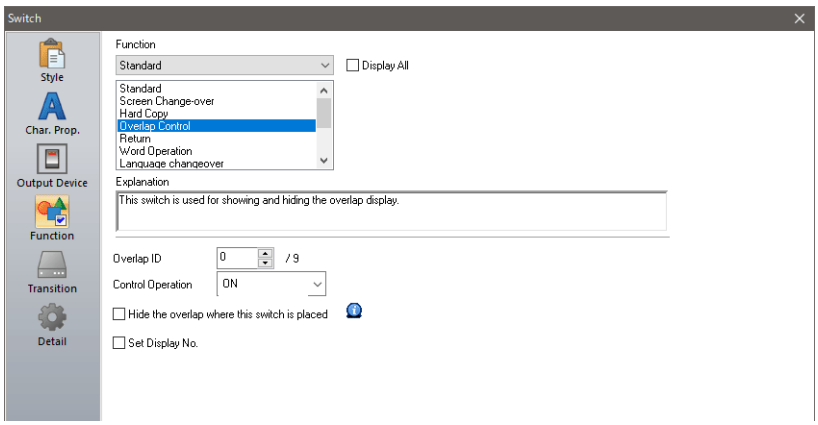
2. Set the function to use.



Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the global overlap.
Set Display No.	Selected:
Overlap Library No.	Set the overlap library number of the overlap for display.
Display Position	Set the X and Y coordinates.

Settings for hiding

1. Click [Home/Parts] → [Switch] and place a switch.
2. Set the function of the switch.



- Hiding using a switch placed on the base screen

Function	Overlap Control
Overlap ID	Specify the same ID as the [Overlap ID] of the global overlap.
Control Operation	OFF: Hide
Hide the overlap where this switch is placed	Unselected
Set Display No.	Unselected

- Hiding using a switch placed on the overlap display

Function	Overlap Control
Hide the overlap where this switch is placed	Selected
Set Display No.	Unselected

Macro

A macro can be used to show and hide global overlap displays. Use the “SET_MOVLP” and “OVLP_SHOW” commands. The “OVLP_POS” command is used to specify the display position. For details, refer to the V9 Series Macro Reference Manual.

Setting

1. Creating a macro for showing an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

$u100 = 3 (W)	Set an overlap ID from 0 to 9 (ID3 in this example).
$u101 = 12 (W)	Set an overlap library number from 0 to 9999 (No. 12 in this example).
$u102 = 150 (W)	X coordinate
$u103 = 50 (W)	Y coordinate
SYS (SET_MOVLP) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

2. Creating a macro for hiding an overlap display
   1) Display the [Macro Block No. Editor] window.
   2) Register the following macro.

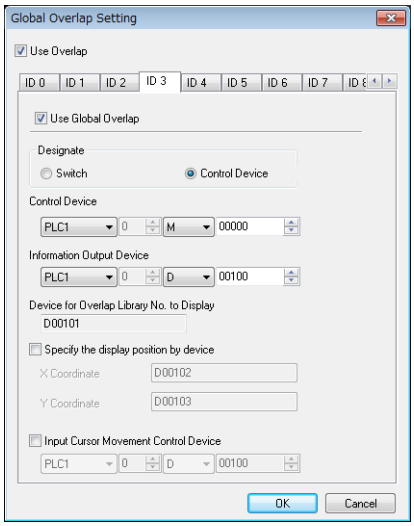
$u100 = 3 (W)	Set an overlap ID from 0 to 9 (ID3 in this example).
$u101 = 0 (W)	Hide the overlap display
SYS (OVLP_SHOW) $u100	Execute the command.

   3) Execute the macro block in a switch ON macro or global macro.

Control Device Memory

Setting

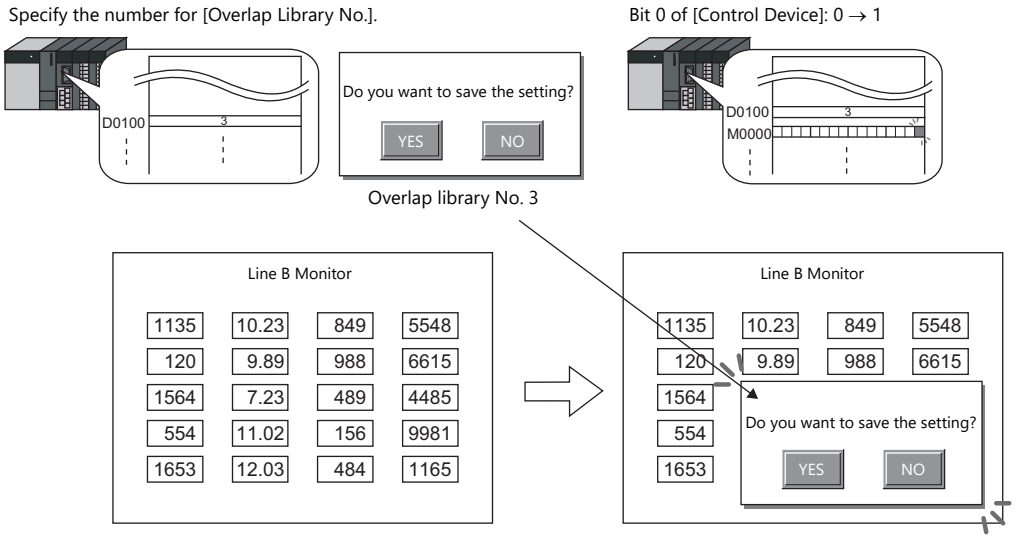
1. In the global overlap settings menu, configure the [Control Device] settings.



2. Set the library number of the overlap for display to the [Device for Overlap Library No. to Display].
When specifying the display position, also set the X and Y coordinates.

Information Output Device	n	Store the overlap library number. Show: 0 to 9999 Hide: −1 (FFFFHex)	V →
Device for Overlap Library No. to Display	n+1	Set the overlap library number of the overlap for display.	V ←
Specify the display position by device	n+2	Set the X coordinate.	V ←
	n+3	Set the Y coordinate.	V ←

3. The overlap is shown when the [Control Device] bit is ON and hidden when the bit is OFF.



* Notes on showing an overlap display using an external command
A switch for [Function: Overlap Display = OFF] can be used to hide the overlap display. Using this type of switch hides the overlap display with the bit of the control device memory still turned ON. To show the overlap display again, the bit needs to be turned OFF and ON again.

2.5.4 Notes

- Global overlaps are redisplayed when the display language is changed.
- Global overlap displays cannot be set for component parts nor called upon from component parts.

3 Switch

3.1 Switch

3.2 Scroll Bars

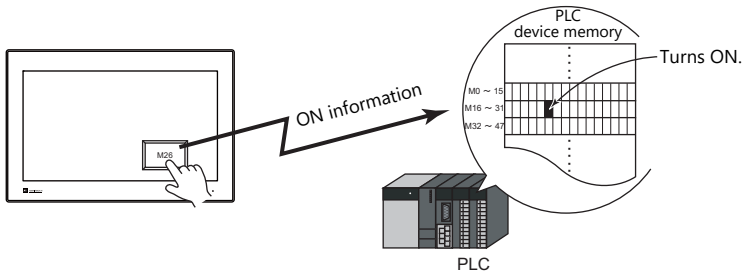
3.3 Slider Switch

3.1 Switch

3.1.1 Overview

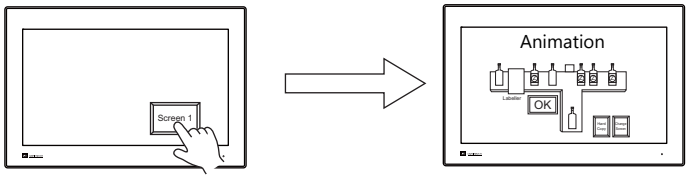
Basic Function of Switches

- Switches can send ON/OFF information to specific bits in PLC or internal device memory.



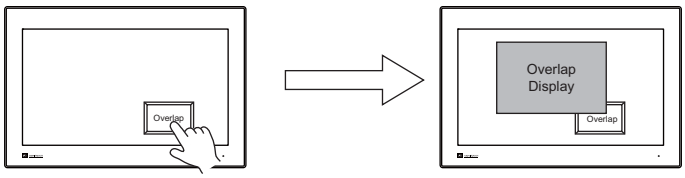
☞ For example settings, refer to "Setting the PLC bit to ON." page 3-5.

- When a switch is pressed, the following processes can be executed:
  - Changing the screen for display

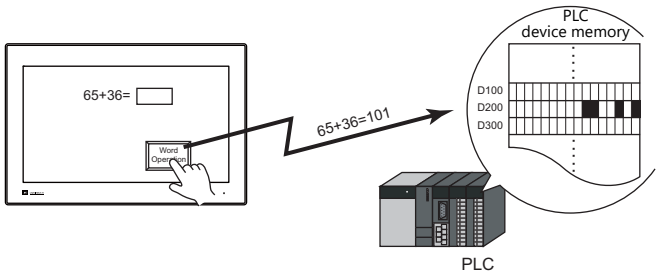


☞ For example settings, refer to "Changing Screens" page 3-6.

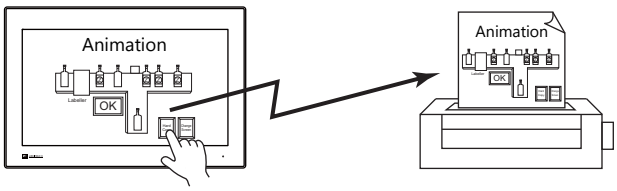
  - Showing an overlap display



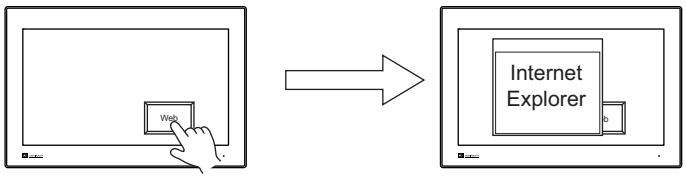
  - Performing the configured calculations and writing the results to the device memory



  - Printing the displayed screen

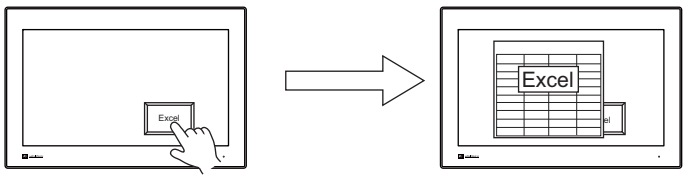


- Starting the web browser



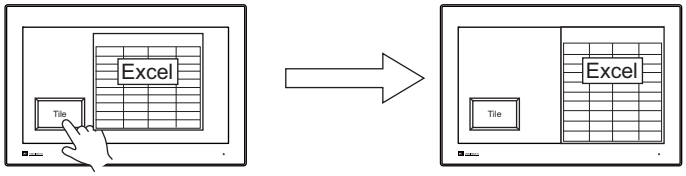
☞ For example settings, refer to "Starting the Web Browser" page 3-7.

- Starting a user app



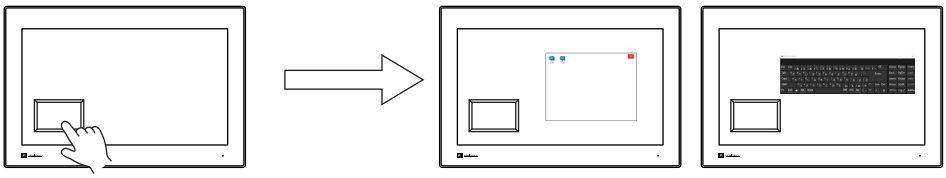
☞ For example settings, refer to "Starting a User App" page 3-8.

- Tiling running apps



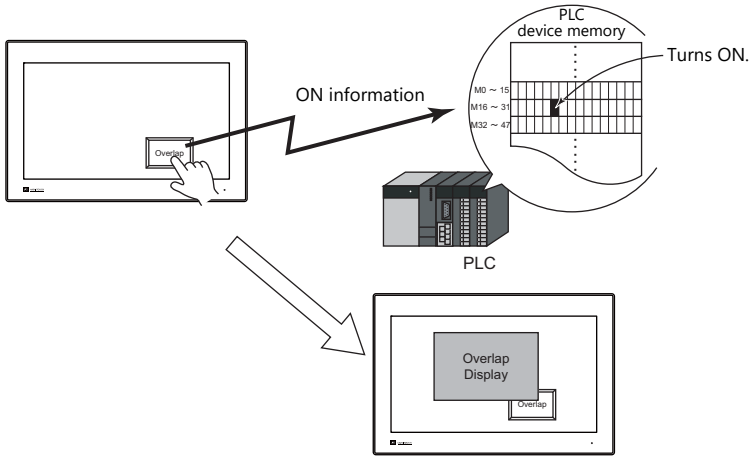
☞ For example settings, refer to "Tiling Running Apps" page 3-9.

- Displaying the on-screen keyboard/task list

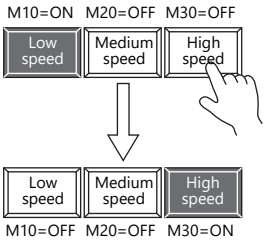


☞ For a setting example, refer to "8.7 Task List and On-Screen Keyboard Display" in the X1 Series Reference Manual 2.

- Turning a device memory bit ON and showing an overlap display at the same time



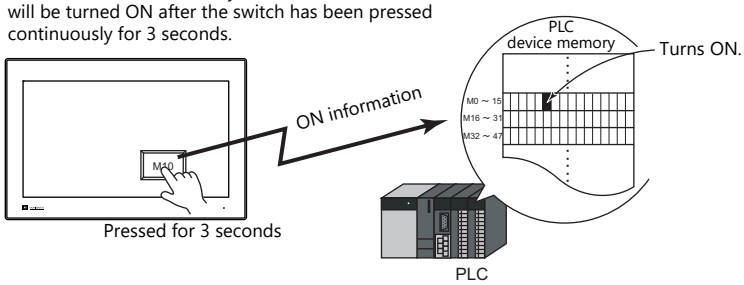
- When a switch is pressed, ON/OFF information or a value can be sent for multiple bits or words at the same time to a PLC device memory or internal device memory.



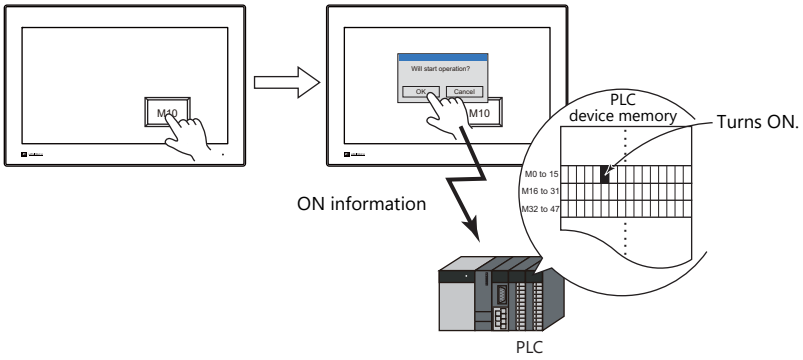
Pressing the [High speed] switch can serve not just to turn M30 ON, but to turn M10 and M20 OFF at the same time.
This makes it simple to create radio buttons.

- A delay function can be added to switches.
  "ON delay" functions can be set, where device memory output cannot occur unless the switch is pressed continuously for a fixed time, and "OFF delay" functions can be set, where the device memory cannot go OFF until a fixed time has elapsed after the switch is released.

For example, on pressing a switch for which [Output Device: M10] and [ON delay: 3 sec] have been set, M10 will be turned ON after the switch has been pressed continuously for 3 seconds.



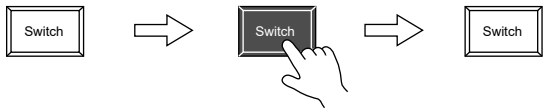
- A confirmation pop-up window, which asks whether to proceed with the operation or cancel the operation ([OK] or [Cancel]), can be configured to be displayed automatically when a switch is pressed.
  These settings for confirmation and operation execution can be configured entirely on the MONITOUCH, without any troublesome programming.



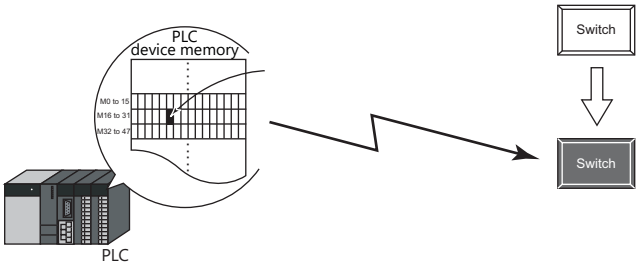
- A macro can be executed when a switch is pressed or released.

Lamps in Switches

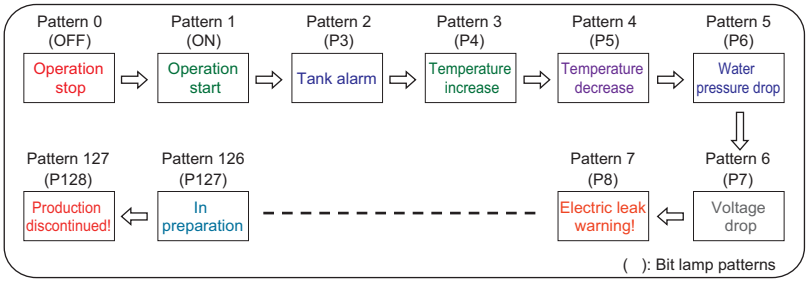
- There are switches available with lamps that light up (ON color) when the switch is pressed and turn off (OFF color) when released.



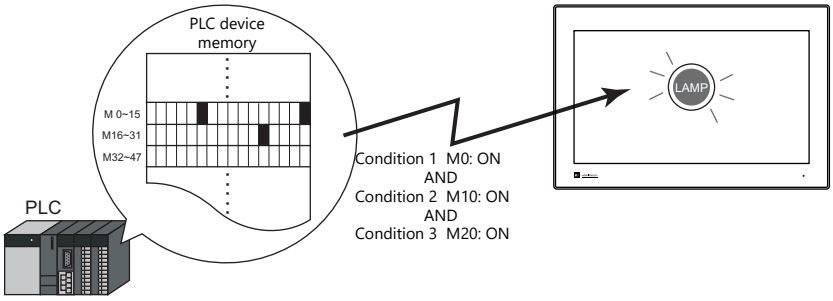
- Lamp activation can be instructed from an external device memory.



- When instructing lamp activation from an external device memory, a maximum of 128 patterns can be registered for a single lamp part.
  This can be done using consecutive device memory addresses or by using desired addresses (N-state lamp).



- Lamps can be set to light up when multiple conditions are satisfied. (N-state lamp)
  Up to four conditions can be defined using AND and OR operators.

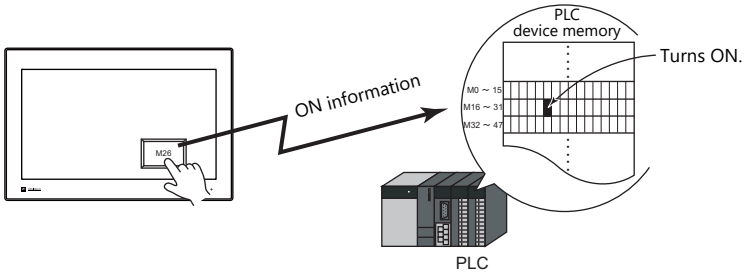


☞ For a detailed setting example, refer to “4 Lamp”.

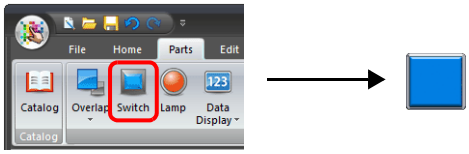
3.1.2 Setting Examples

Setting the PLC bit to ON.

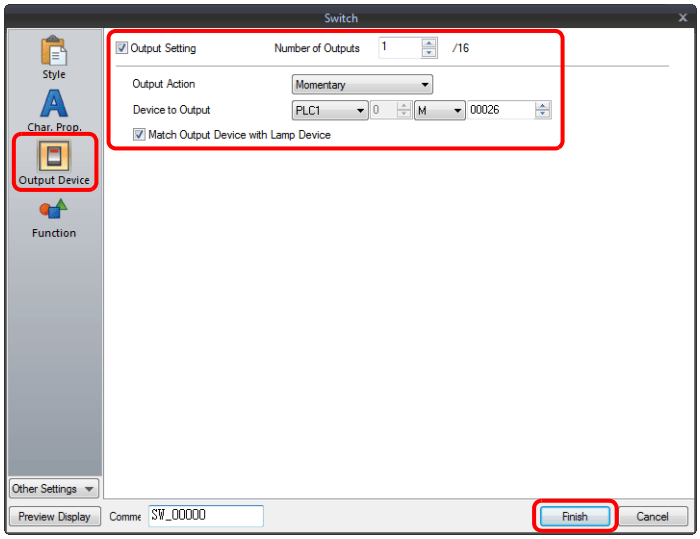
Set PLC device memory M26 to ON while the switch is pressed and OFF after the switch is released.



1. Click [Parts] → [Switch] and place a switch on the screen.



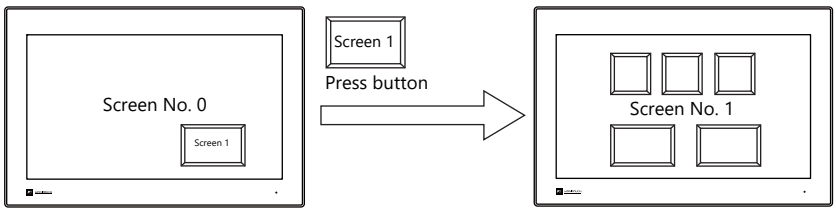
2. Double-click on the switch to display the settings window.
   Configure the following settings for [Output Device] and then click [Finish].



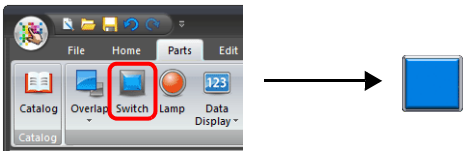
This completes the necessary settings.

Changing Screens

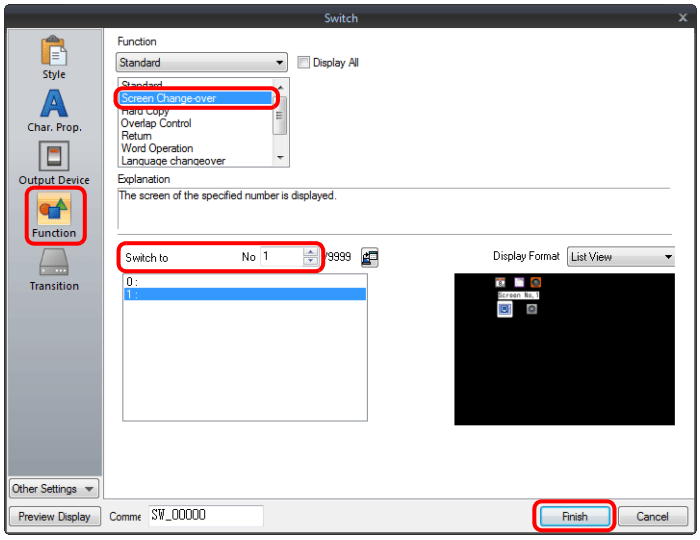
Change to screen No. 1 when the switch is pressed.



1. Click [Parts] → [Switch] and place a switch on the screen.



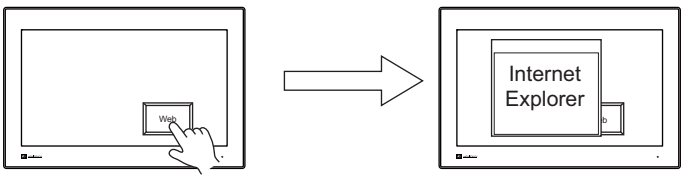
2. Double-click on the switch to display the settings window.
   Configure the following settings for [Function] and then click [Finish].



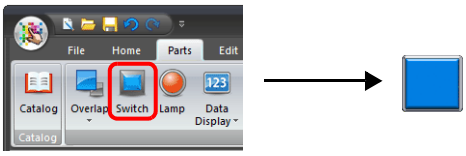
This completes the necessary settings.

Starting the Web Browser

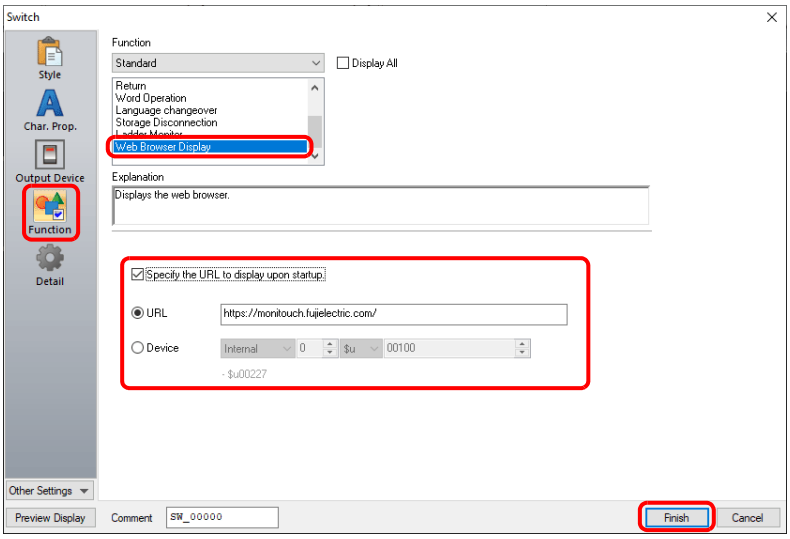
Start the web browser (Internet Explorer) by pressing a switch.



1. Click [Parts] → [Switch] and place a switch on the screen.



2. Double-click on the switch to display the settings window.
   For [Function], select [Web Browser Display] and specify the URL of the site to display when the web browser starts.

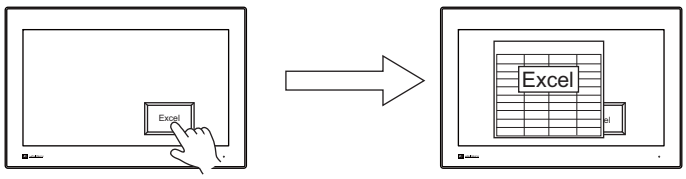


Click [Finish] to complete the settings.

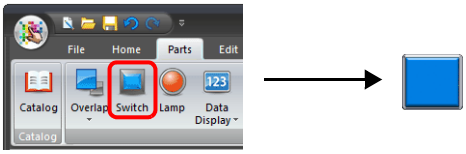
☞ For details, refer to “8.3 Web Browser Display” in the X1 Series Reference Manual 2.

Starting a User App

Start a user app by pressing a switch.

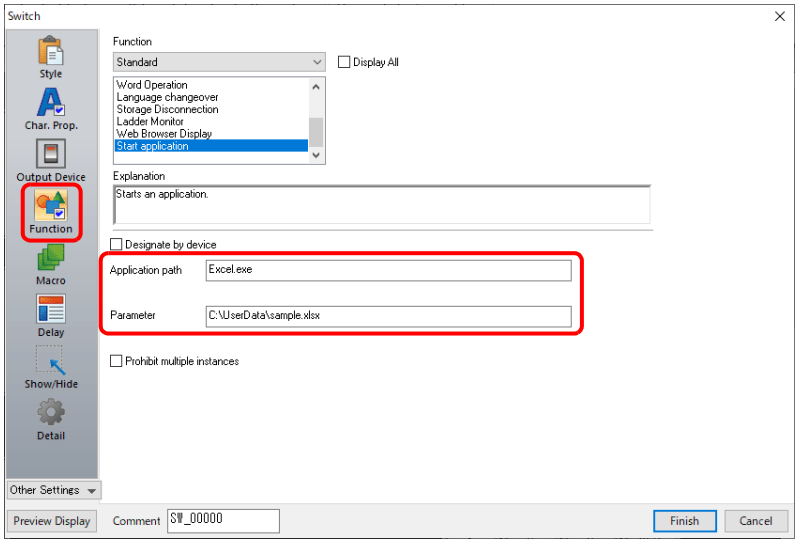


1. Click [Parts] → [Switch] and place a switch on the screen.



2. Double-click on the switch to display the settings window.
   Select [Function] → [Standard] → [Start application] and set the [Application path] and [Parameter] settings.

   - Example: Opening a file named “sample.xslx” and located at “C:\UserData” using Excel

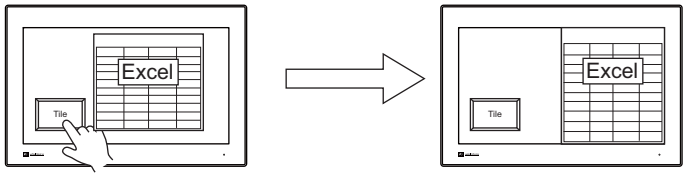


3. Click [Finish] on the switch settings window to complete the settings.

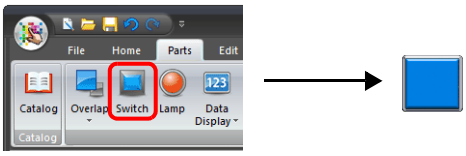
☞ For details, refer to “8.4 Starting Applications” in the X1 Series Reference Manual 2.

Tiling Running Apps

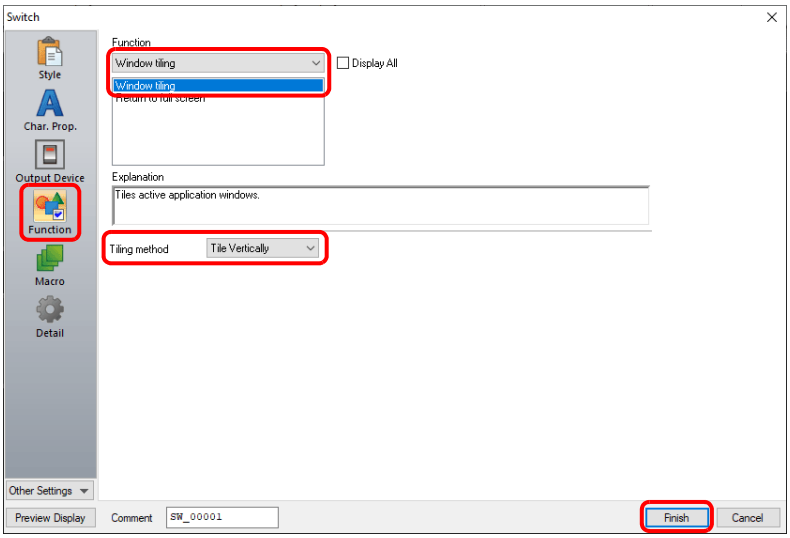
Multiple running apps can be tiled by pressing a switch.



1. Click [Parts] → [Switch] and place a switch on the screen.



2. Double-click on the switch to display the settings window.
   For [Function], select [Window tiling] and specify the tiling method.

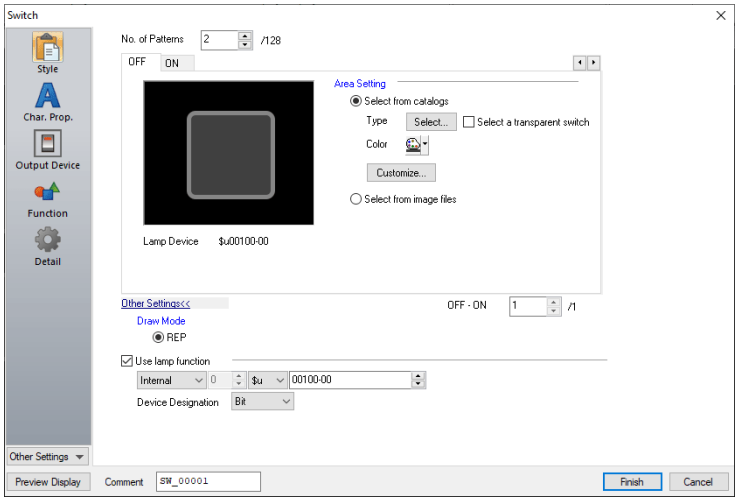


Click [Finish] to complete the settings.

☞ For details, refer to “8.4 Starting Applications” in the X1 Series Reference Manual 2.

3.1.3 Detailed Settings

Style



Item		Description
No. of Patterns (2 to 128)		Set the number of times the display of the switch lamp can be changed.
Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color. Select the [Select a transparent switch] checkbox to change to the transparent design.
	Select from image files *1	Select a PNG or SVG file. SVG and PNG files can be set to all patterns by clicking [Apply to All Patterns].
Frame	Type	Select the frame type of the switch. * Only available with 2D (Square2) parts.
	Color	Select the frame color of the switch. * Only available with 2D (Square2) parts.
Detail Settings	Fix the frame size *2	Set the top, bottom, left, and right dimensions of the frame. Zooming in and out can be performed while maintaining the specified frame size. Applicable parts: Only real type and square type parts with frames and 3D parts (excluding some parts)
Enable flash display function (flashing with OFF pattern)		This item is available when the selected OFF pattern is other than a vector or 3D type*3 (excluding "Sign" and "3D_128" parts). Select this checkbox to flash the display between the selected pattern and the OFF pattern.
Other Settings	Draw Mode REP/XOR	REP: Display using the color set in [Area Setting]. XOR: When the lamp device memory is ON, the frame and text are displayed in the color resulting from an XOR operation. For the difference between REP and XOR, refer to "4.4 Draw Mode" page 4-15.
	Clear graphic displayed before switching (transparency function)	The previous graphic is not retained when the checkbox is selected. * Selection is not possible for vector parts and [Square2] 2D parts. For details, refer to "Notes on the transparency function" page 4-10.
Use lamp function *4		Select this checkbox to change the display in the switch area. Unselected: When the switch is pressed, the lamp lights up automatically. The switch changes to the ON color when pressed and the OFF color when released. Selected: Setting for the lamp device memory become available. Specify a device memory address for the lamp display. *** When placing multiple switches, set up consecutive addresses for the lamp device memory to ensure high-speed processing.** For details, refer to "4 Lamp".
	Device Designation	Bit: The lamp display is changed by setting (ON) and resetting (OFF) bits. The required number of bits depends on the number of display patterns. (127 bits maximum) *** When multiple bits are set (ON), the most significant bit has priority.** Word: The lamp display is changed according to the value specified for the device memory. The range of setting values varies with the number of patterns. (Range: 0 to 127) If a value outside the specified range is set, the lamp display is not changed.
	Input Type (DEC/BCD)	Specify the input format of the device memory.

*1 Different file types cannot be specified for a single part, such as a PNG file for the OFF pattern and an SVG file for the ON pattern.

*2 Multiple frame dimensions can be set at once by selecting the items to change via [Tool] → [Fix 3D parts frame].

*3 Notes on vector, 3D type and 2D type parts
Part shapes differ depending on the selection made in the catalog.

- Vector: Vector
- 3D type: Plain, Animation, Flat, Real, Sign, 3D, 3D_128, HA
- 2D type: 2D

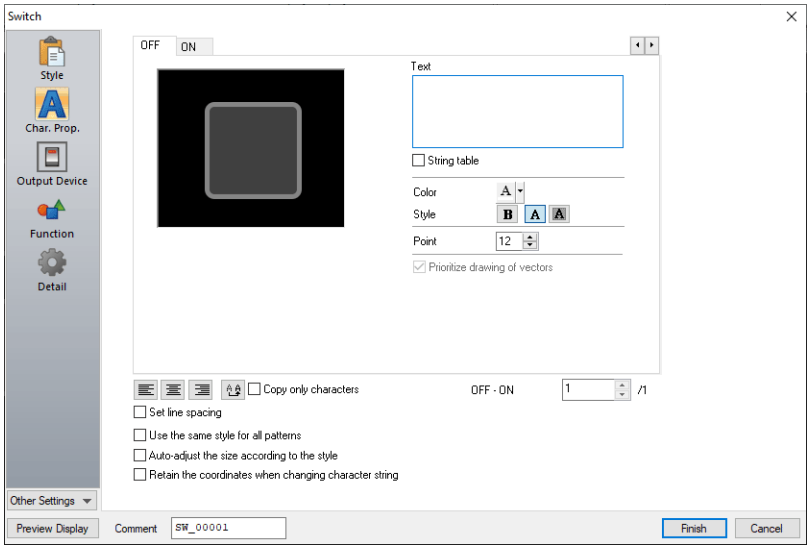
The categorization of an image file depends on the file type.

- SVG file: Vector
- PNG or BMP file: 3D type

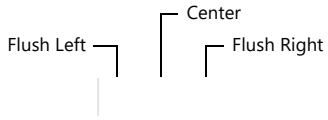
☞ For details on vector rendering, refer to "8.6 Vector Rendering" in the X1 Series Reference Manual 2.

*4 This is linked to [Use lamp function] under [Output Device]. When the [Use N-state lamp] checkbox is selected, the setting is hidden.

Char. Prop.

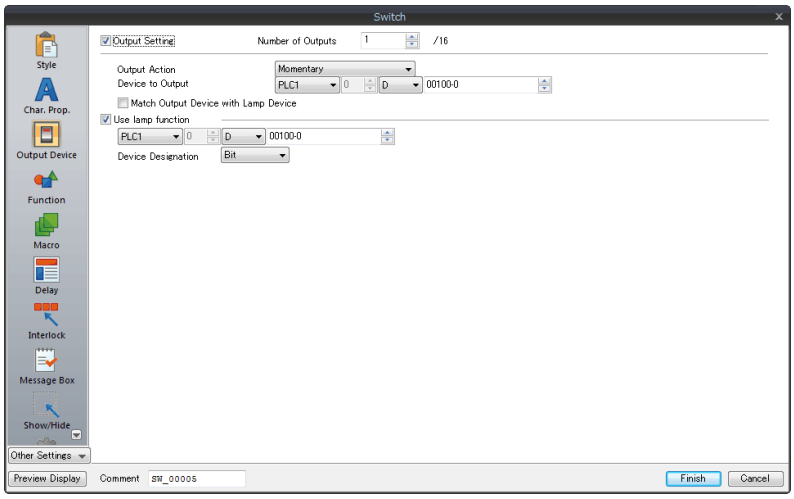


Item	Description
[OFF] [ON] - [P128]	When [Style] → [Other Settings] → [Draw Mode] is [XOR]: Only [OFF] can be selected. Specify the text to be displayed.
Pattern No. (0 to 127)	When [Style] → [Other Settings] → [Draw Mode] is [REP]: Specify the text to be displayed on each pattern.
Text	Enter the text to be displayed on the switch. Up to 4 lines can be registered. Text properties can be set for each line. Text can be justified within the switch part.
String table	Select this checkbox when using strings registered to the string table. For details, refer to the X1 Series Reference Manual 2.
Color (text color, background color)	Set the color for text. The background color can also be set if set as "no transparency" in the following [Style] setting.
Style	Set the text style.
Character Size (1 to 8)	Specify the enlargement factor for text. * When [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Point (6 to 999)	Set the text size. * When a font type other than [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Rotation + Direction	Set the combination of text rotation and direction. * Setting is not available with vector parts. Four combinations are displayed in the drop-down menu. To select any other combination, click the icon at the bottom. A window that allows selection from all combinations is displayed.
Use Windows fonts	Select this checkbox to use a Windows font. * Setting is not available with vector parts.
Smooth Font *1	Smooth the edges of text. (Only settable for TrueType Windows fonts.)

Item	Description
Prioritize drawing of vectors	Indicates whether or not vector rendering is applied to text. * Shown only for vector parts. Selected: Vector rendering is applied. Unselected: Vector rendering is not applied. (Text registration for switches is not available.) * Vector rendering of text is possible only for Japanese, English, Chinese (Simplified), and Chinese (Traditional) when [TrueType font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]. When any other font is selected, operation differs depending on the selected font. - When any TrueType font other than the above is selected: Vector rendering is applied but operation is not guaranteed. - When [Bitmap font] or [Gothic font] is selected: Text input in the [Char. Prop.] settings is not displayed on the X1 series unit. To enable vector rendering, separately place text in front of the switch. For details on vector rendering, refer to "8.6 Vector Rendering" in the X1 Series Reference Manual 2.
Alignment	Set the text alignment. 
Text copy Copy only characters	The text and its attributes for the current pattern (OFF, ON, P3) are copied to the other patterns. Select the [Copy only characters] checkbox to copy text and coordinate information to all other patterns. Note that the text properties will not be copied. If the destination for copy has no text, text properties will also be copied.
Set line spacing	Set the pitch between lines.
Use the same style for all patterns	Select this checkbox to configure the same settings as the opened pattern attributes with respect to all switch patterns (for each respective line if multiple lines are included).
Auto-adjust the size according to the style	Select this checkbox to automatically adjust the switch size to the entered text.
Retain the coordinates when changing character string	Newly registered text is placed by centering. When any registered text is changed while this checkbox is selected, the coordinates remain the same. When a line is added to the existing text while this checkbox is selected, the added line is aligned with the upper line.
4-Line Display	When using Windows fonts, selecting this checkbox divides the text entry area into four lines. This allows different properties to be specified for each line when using Windows fonts.

*1 Cannot be set to transparent.

Output Device



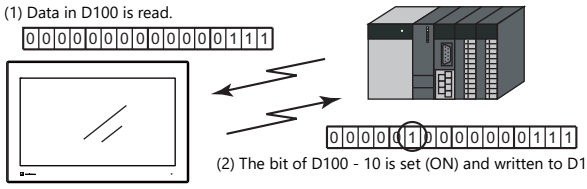
Item		Description
Output Setting		Select this checkbox to execute the specified output operation for the set output device when the switch is pressed.
	Number of Outputs (1 to 16)	A maximum of 16 types of output operations can be executed at once when the switch is pressed. This value sets the number of operations to execute. When the number of outputs is set to "2" or more, output operations are processed in sequence from No. 0. The output operations performed when the switch is released are also processed in sequence from No. 0.

Item		Description
	Output Action *1	Momentary: Set the output device memory to ON. When the switch is released, set the output device memory to OFF. Set: Set the output device memory to ON. Reset: Set the output device memory to OFF. Alternate: Inverse the state of the output device memory (set to OFF if ON, set to ON if OFF). Momentary W: Set the output device memory to ON. When the switch is released, set the output device memory to OFF. Word Operation: Execute the set arithmetic expression. For details, refer to "Word operation" page 3-14.
	Device to Output	Specify a PLC device memory, internal device memory, or tag. Processing speed will be faster when an internal device memory is selected than when a PLC device memory is selected. (Specify a bit for [Device to Output] when [Output Action] is set to a value other than [Word Operation].)
	Match Output Device with Lamp Device	Select this checkbox to set the lamp device memory address to the same address set for [Device to Output]. When [Alternate] is set for [Output Action], the display reflects the status of the output device memory.
Use lamp function *2		Select this checkbox to change the display in the switch area. Unselected When the switch is pressed, the lamp lights up automatically. The switch changes to the ON color when pressed and the OFF color when released. Selected Settings for the lamp device memory become available. Specify a device memory address for the lamp display. *** When placing multiple switches, set up consecutive addresses for the lamp device memory to ensure high-speed processing.** For details, refer to "4 Lamp".
	Device Designation	Bit: The lamp display is changed by setting (ON) and resetting (OFF) bits. The required number of bits depends on the number of display patterns. (127 bits maximum) When multiple bits are set (ON), the most significant bit takes precedence. Word: The lamp display is changed according to the value specified for the device memory. The range of setting values varies with the number of patterns. (Range: 0 to 127) If a value outside the specified range is set, the lamp display is not changed.
	Input Type (DEC/BCD)	Specify the input format of the device memory.

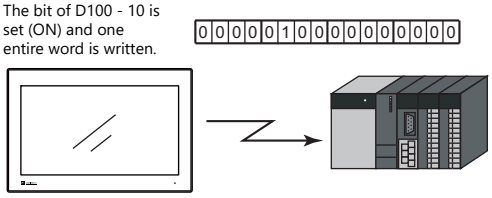
*1 Notes on [Momentary] and [Momentary W] operation
Processing differs depending on the type of PLC device memory specified for output (whether bits are writable or not).
For information on PLC device memory types, refer to the relevant PLC manual.

- When a bit-writable device memory is specified:
  Processing for [Momentary] and [Momentary W] is the same.
- When a non-bit-writable device memory is specified:
  Because processing for switch operations is performed in units of bits on the X1 series, processing differs as described below

  - Processing when [Momentary] is selected:
    (1) One word of [Device to Output] is read.
    (2) The result of [Output Action] is written to one word of [Device to Output].
    (Other bits are kept intact.)
    Example: When [D100 - 10] is specified for [Device to Output]:



  - Processing when [Momentary W] is selected:
    The result is directly written to one word of [Device to Output].
    (Other bits are cleared.)
    Therefore, always secure one-word for [Device to Output].
    Example: When [D100 - 10] is specified for [Device to Output]:



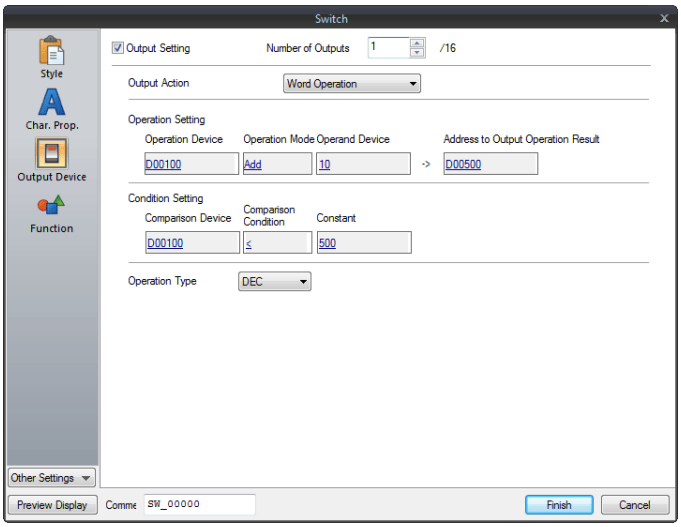
For a bit-writable device memory, select either [Momentary] or [Momentary W]. For a non-bit-writable device memory, it is recommended to select [Momentary W] for high-speed processing.

*2 This is linked to [Use lamp function] under [Style]. When the [Use N-state lamp] checkbox is selected, the setting is hidden.

Word operation

Item			Description
Operation Setting	Operation Device		Specify the device memory address for operation.
	Operation Mode	Transfer	Perform the specified arithmetic operation with [Operation Device] and [Operand Device] and write the result to the device memory set for [Address to Output Operation Result]. When performing division, the quotient is output to the device memory set for [Address to Output Operation Result] and the remainder is output to the device memory set for [Address to Output Operation Result] + 1.
		Add	
		Subtract	
		Multiply	
		Divide	
		OR	Perform the specified logical operation with [Operation Device] and [Operand Device] and write the result to the device memory set for [Address to Output Operation Result].
		AND	
		XOR	
	Operand Device		Specify the device memory address for the operand. It is possible to use a constant.
	Address to Output Operation Result		Specify the device address where the operation result is output.
Condition Setting	Comparison Condition	None	Operation is executed when the switch is pressed.
		=, ≠ <, > ≤, ≥	Set the condition for executing the word operation. Condition satisfied: Word operation is executed. Condition not satisfied: Word operation is not executed.
	Comparison Device		Specify the device memory address where the comparison value is stored.
	Constant		Specify a constant.
Operation Type (DEC/BCD)			Specify the operation format (format of writing to the specified device memory address).

- Usage Example



Operation Setting

Operation Device	Operation Mode	Operand Device		Address to Output Operation Result
D500	Add	10	→	D500

Condition Setting

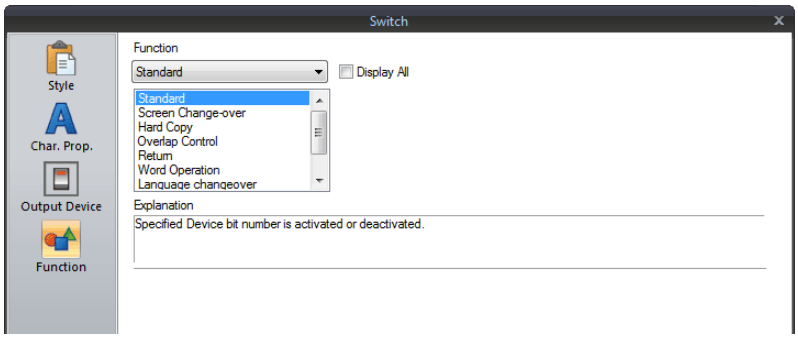
Comparison Device	Comparison Condition	Constant
D100	<	500

Operation Type: DEC

When the data in D100 is less than "500", the operation (D500 + 10 → D500) is executed.

- Notes
  - If the value of the [Address to Output Operation Result] device memory is changed by an external command, the latter value has priority.
  - MONITOUCH processes operations in the following order:
    1) Reads the [Operation Device] and [Operand Device].
    2) Operation processing
    3) Writes the operation result to the [Address to Output Operation Result] device memory.

Function



Item			Description
Function			Select the function to assign to the switch, that is, how the switch should work when pressed.
	Standard	Standard	Set the bit of the specified device memory ON/OFF.
		Screen Change-over *1 *2	Change to the specified screen number (0 to 9999).
		Hard Copy *3	Print the currently displayed screen image. Operations can be performed normally on the screen during printing.
		Overlap Control	Show or hide an overlap. For details, refer to "2 Overlap".
		Return *4 *5	Return to the previously displayed screen. Up to 8 previous screens can be displayed.
		Word Operation	Execute the set arithmetic expression. Select the [Changeover the screen] checkbox to change to the specified screen number after executing an operation. For details on word operations, refer to "Word operation" page 3-14.
		Language changeover	Change the display language. For details, refer to "10 Language Changeover" in the X1 Series Reference Manual 2.
		Storage Disconnection	Stop access to storage. For details, refer to "Storage Disconnection (Stopping Access to Storage)" page 3-30.
		Operation Log Viewer Display	Used in conjunction with the operation log. For details, refer to "4 Operation Log" in X1 Series Reference Manual 2.
		Ladder Monitor	Used in conjunction with the ladder monitor function. For more information, refer to the V9 Series Ladder Monitor Specifications manual.
		Picture Viewer Display	Used in conjunction with the picture viewer. For details, refer to "14 Picture Viewer" in the X1 Series Reference Manual 2.
		Web Browser Display	Show the web browser. For details, refer to "8 Convenient Functions" in the X1 Series Reference Manual 2.
		Start applications	Start a user application. For details, refer to "8 Convenient Functions" in the X1 Series Reference Manual 2.
		Task List Display	Display the task list. For details, refer to "8 Convenient Functions" in the X1 Series Reference Manual 2.
		On-screen keyboard display	Display the on-screen keyboard. For details, refer to "8 Convenient Functions" in the X1 Series Reference Manual 2.
	Recipe	Recipe Data Load	Used in conjunction with the recipe function. For details, refer to "15 Recipes".
		Recipe Data Save	
		Recipe Data Delete	
	Security	Log In	Used in conjunction with the security function. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
		Log Out	
	Window tiling	Window tiling	Tile currently running app windows. Tiling method: Tile Vertically, Tile Horizontally
		Return to full screen	Returns the X1 app window to full-screen display.
Display All			Display all switch functions. For details, refer to "3.1.4 Basic Function of Switches" page 3-25.

*1 When the screen display is changed, all the switches and switch outputs should be turned OFF.
This is to prevent accidental activation of any switch that may be caused by inadvertent contact with the screen.

*2 It is possible to change the screen display without using the switch function by instead using an external command from the PLC.
For information on changing the screen from a PLC, refer to "1.1.3 Communication Setting".

*3 When the screen is printed with a [Function: Hard Copy] switch, the switch is also printed out.
To prevent the switch from appearing on the printout, use an external command or function switch to print instead.
For details on printing using an external command, refer to "16 Print".

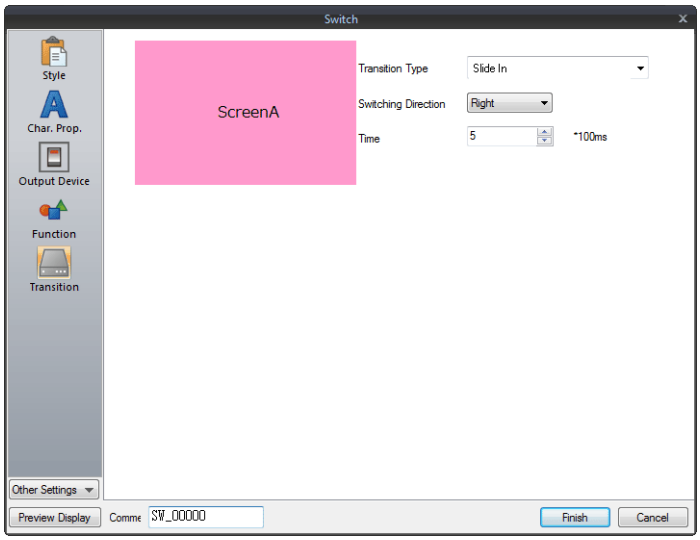
*4 When the screen display reverts using the [Function: Return] switch, the initial screen state is displayed, that is, the state in which no scrolling or block changes have been specified.

*5 It is possible to disable returning for screens that are displayed by an external command.
Navigate to [System Setting] → [Unit Setting] → [General Setting] and select the [Return switch prohibited when switching the screen by an external command] checkbox on the [General Settings] tab. For details, refer to "1.1 System Settings".

Transition

This item is available when [Screen Change-over] or [Overlap Control] is selected for [Function] in the switch settings.

*** Transitions are disabled when performing screen changes or overlap control using a macro or from a PLC.**



Item	Description
Transition Type	Specify the animation effect to use when the screen changes or an overlap is displayed.
Switching Direction (Right, Left, Up, Down)	Specify the switching direction.
Switching Type (Type 1, 2, 3, 4)	Specify the switching type.
Time *	Specify the duration in which to execute the transition.

* The switching time range differs depending on the transition type.

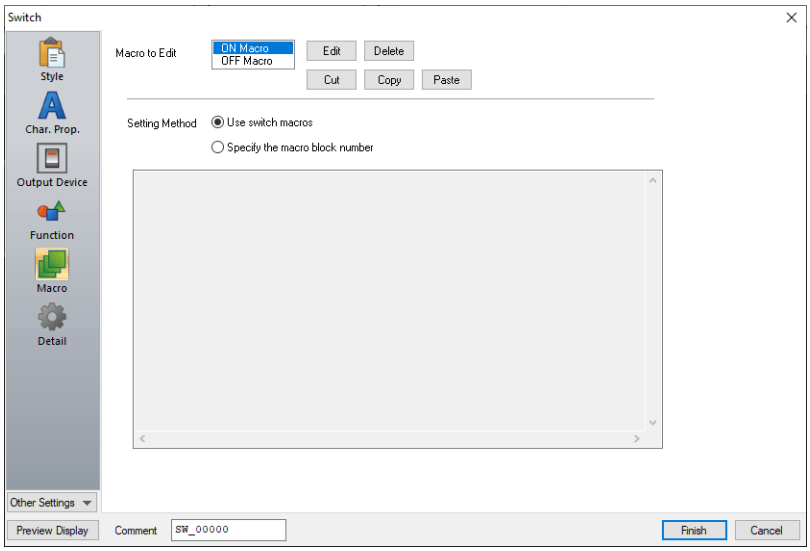
- For [Function: Screen Change-over]:

Transition Type	Time
Slide In	2 to 10 × 100 ms
Box In	
Slide Out	
Box Out	
Slide	
Gallery	5 to 20 × 100 ms

- For [Function: Overlap Control]:

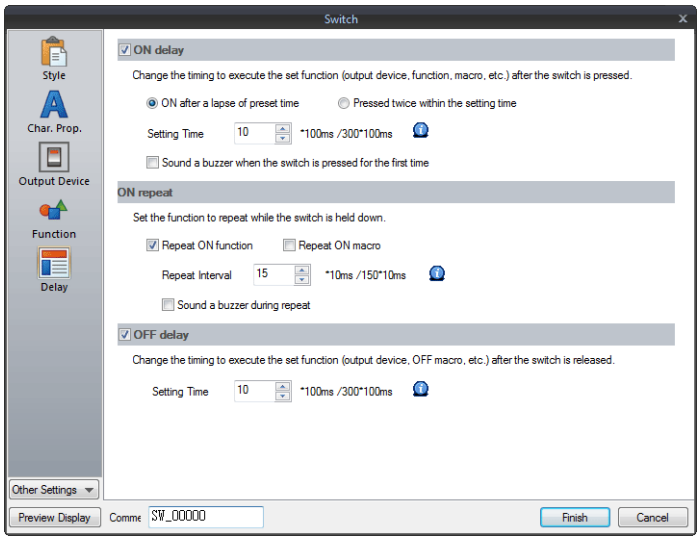
Transition Type	Time
Slide (from outside screen)	2 to 10 × 100 ms

Macro



Item		Description
Macro to Edit	ON Macro	Register a macro command to be executed once when the switch is pressed.
	OFF Macro	Register a macro command to be executed once when the switch is released.
	Edit	Click to start the macro editor. Register the macro command to execute.
	Delete	Delete the macro command.
	Cut	Cut the macro command. This is convenient when copying a macro command to a different switch.
	Copy	Copy the macro command. This is convenient when copying a macro command to a different switch.
	Paste	Paste a copied macro command. This is used when copying a macro command from a different switch.
Setting Method	Use switch macros	Use a macro for the switch itself. Click the [Edit] button to register a macro.
	Specify the macro block number	Specify the macro registered to a macro block. If nothing is registered, click the [Edit] button to register a macro.

Delay

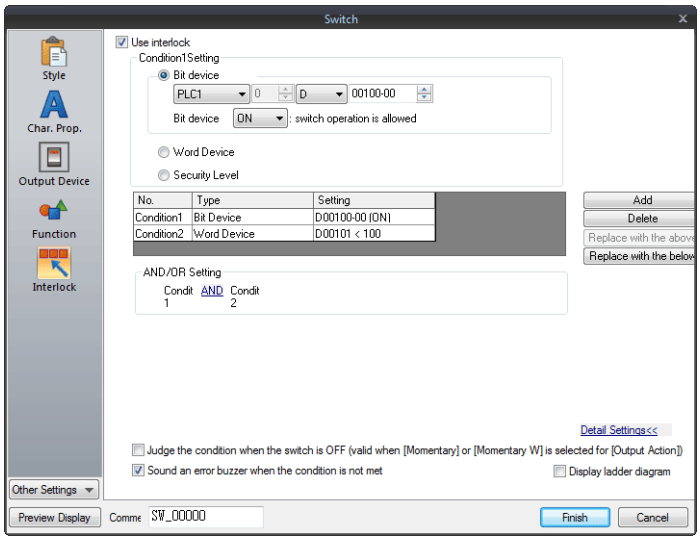


Item		Description
ON delay		Select this checkbox to specify a delay for when the switch is turned ON.
	ON after a lapse of preset time (Setting Time: 1 to 300 × 100 ms)	The switch is activated for the function as specified for [Output Device], [Function], and [Macro] when the switch is held down for the specified time.
	Pressed twice within the setting time (Setting Time: 10 to 300 × 100 ms)	The switch is activated for the function as specified for [Output Device], [Function], and [Macro] when the switch is pressed within the specified time interval. When the switch is pressed once, the frame of the switch starts blinking. The switch is activated when pressed again while blinking. If another switch is pressed or another screen is displayed while the switch frame is blinking, the switch operation is canceled. * If an overlap display is shown while the switch frame is blinking, the switch operation continues.
	Sound a buzzer when the switch is pressed for the first time	Selected: Always sound a buzzer when the switch is pressed. Unselected: When this checkbox is unselected, a buzzer only sounds when the switch is activated after the ON delay time.
ON repeat *1	Repeat ON function (Repeat interval: 15 to 150 × 10 ms)	When this checkbox is selected, the repeat function is added to the switch function.
	Repeat ON macro (Repeat interval: 15 to 150 × 10 ms)	When this checkbox is selected, the repeat function is added to the switch ON macro.
	Sound a buzzer during repeat	Select this checkbox to sound a buzzer when a repeat operation is executed.
OFF delay *2 (Setting Time: 1 to 300 × 100 ms)		Select this checkbox to specify a delay for when the switch is turned OFF. A switch OFF operation (momentary output device memory, OFF macro, etc.) will be processed at the conclusion of the specified time after the switch has been released. * The OFF delay setting can be configured for a maximum of eight switches on a single screen.

*1 If the [Repeat ON function] checkbox is selected and the ON macro repeat function is also set (at $s64 to 66), the repeat operation of the ON macro will be executed first when the switch is pressed.

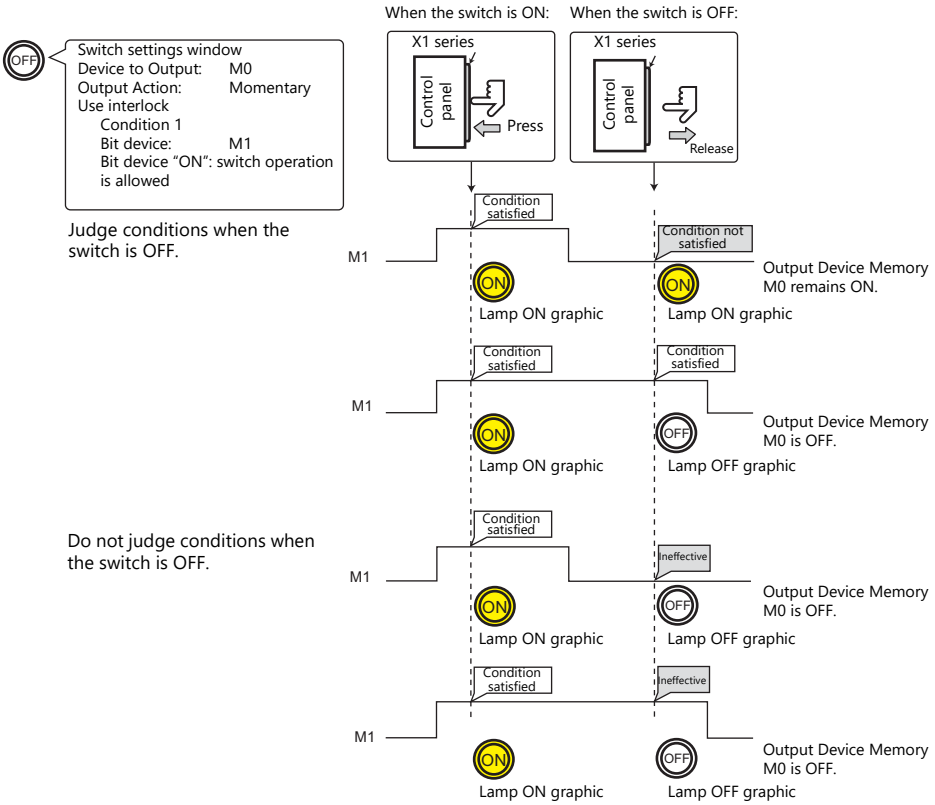
*2 When the screen has a switch currently performing an OFF delay operation, the screen cannot be switched (no switch operation acceptable) until the OFF delay operation is completed.
Likewise, when an overlap display has a switch currently performing an OFF delay operation, the overlap display cannot be switched or cleared until the OFF delay operation is completed.

Interlock



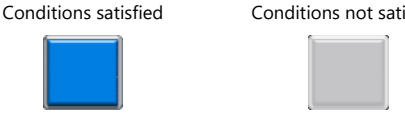
Item			Description
Use interlock			Select this checkbox to enable the interlock function for the switch. Click [Add] to set up to 5 conditions that must be satisfied for the interlock to activate.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for the interlock to activate.
		Bit device	Set the interlock bit address. Bit device “ON”: switch operation is allowed When [Bit device] is OFF, switch operation is prohibited. When [Bit device] is ON, switch operation is allowed. Bit device “OFF”: switch operation is allowed When [Bit device] is OFF, switch operation is allowed. When [Bit device] is ON, switch operation is prohibited.
		Word Device	Set the comparison condition expression of the interlock device memory. Data Length: Set the data length of the condition value. 1-Word/2-Word Constant Display Type: Set the format of the comparison condition expression. [DEC +-]/[DEC]/[BCD]/[HEX] Comparison condition expression: Set a comparison sign, value, and device memory as the conditions for comparison.
		Security Level	Used in conjunction with the security function. Allow users of levels higher than the set level to operate the switch. For details on security functions, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When two or more conditions are set for activating the interlock, set whether to perform AND and OR operations on the conditions.
	Detailed Settings	Judge the condition when the switch is OFF *1	This setting is available when [Momentary/Momentary W] is selected for [Output Action]. Set whether the system judges the conditions for interlock activation when the switch is released (i.e. when your finger is released from the switch). Unselected: The system does not judge the conditions when the switch is OFF. Selected: The system judges the conditions even when the switch is OFF. If the conditions are not satisfied, the switch will not be turned OFF even when your finger is released.
		Sound an error buzzer when the condition is not met	Set whether an error buzzer sounds when the switch is pressed and the conditions are not satisfied. Unselected: A buzzer does not sound. Selected: A buzzer will sound.
	Display ladder diagram		Select this checkbox to display the configured conditions for interlock activation as a ladder diagram.
	Display setting details		Select this checkbox to configure condition settings on the ladder diagram.

*1 Example of operation when the switch is OFF

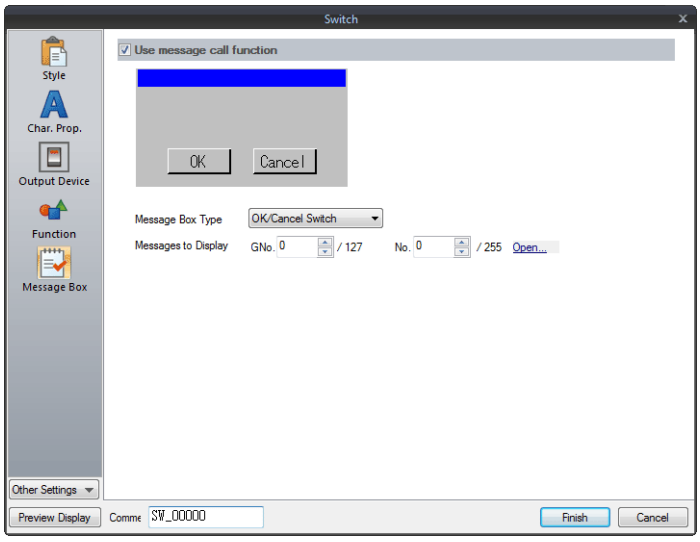


Display when switches are disabled

When the [Gray out interlocked switches] checkbox at [System Setting] → [Unit Setting] → [General Setting] is selected, switches that do not satisfy the interlock conditions can be displayed grayed out.



Message Box

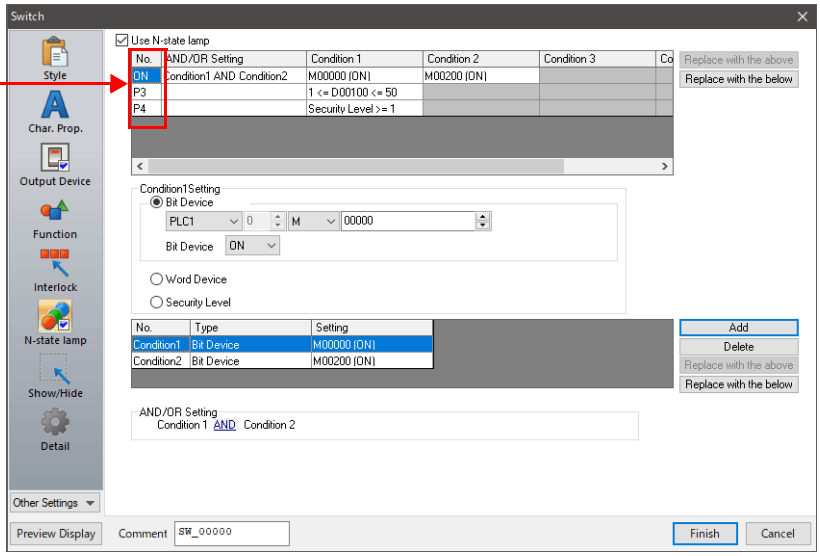


Item		Description
Use message call function		Select this checkbox to automatically display a message dialog box when the switch is pressed. When [OK] is pressed, the switch is activated for the function as specified for [Device to Output], [Function], and [Macro]. When [Cancel] is pressed, no operations are performed and the message dialog box closes.
	Message Box Type	OK/Cancel Switch Use a message dialog box that displays an [OK] and [Cancel] switch.
		OK Switch Use a message dialog box that only displays an [OK] switch.
	Messages to Display	Reference one line of the message registered in the [Message] window. A maximum of 96 one-byte characters (48 two-byte characters) can be displayed. Click [Open] to display the [Message Edit] window. For details on editing messages, refer to the V9 Series Operation Manual.

- While a message dialog box is displayed, no switch operations other than those in the message dialog box are accepted.
- If the screen is changed while a message dialog box is displayed, this has the same effect as pressing [Cancel].

N-State Lamp

The number of patterns specified in the [Style] settings is displayed.



Item			Description
Use N-state lamp			Select this checkbox to use the N-state lamp function. Specify bit device memory or word device memory for each pattern.
	Condition Setting		Set the conditions for operating a lamp. Click [Add] and set up a maximum of four conditions for lighting up the selected pattern.
		Bit Device	Light the lamp by setting the specified bit device memory to ON or OFF.
		Word Device	Light the lamp by setting a conditional expression for the specified word device memory. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Light the lamp according to the security level of the user that is currently logged in. For details, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Precedence

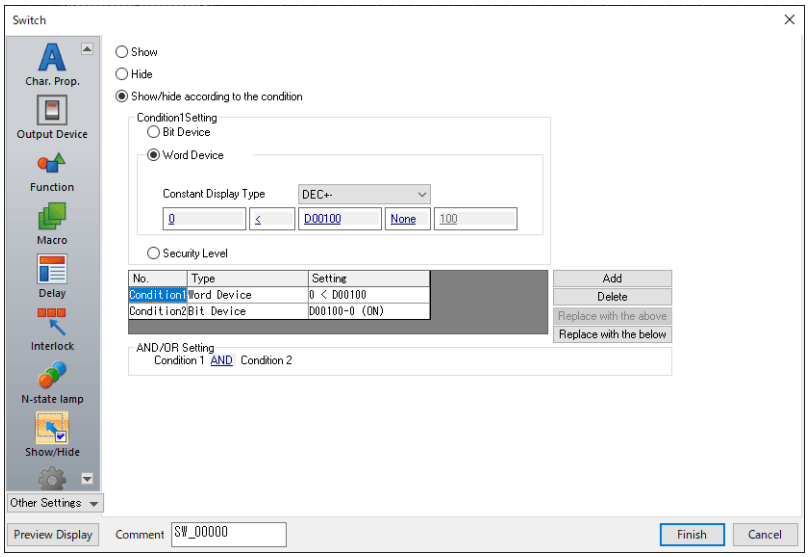
The X1 series unit checks conditions in order starting from ON, P3, P4, and through to P128. The pattern for which conditions are determined to be satisfied the earliest is displayed.

Pattern No.	Precedence
ON	High
P3	↓
:	
P128	Low

If all conditions are not satisfied, the OFF pattern is displayed.

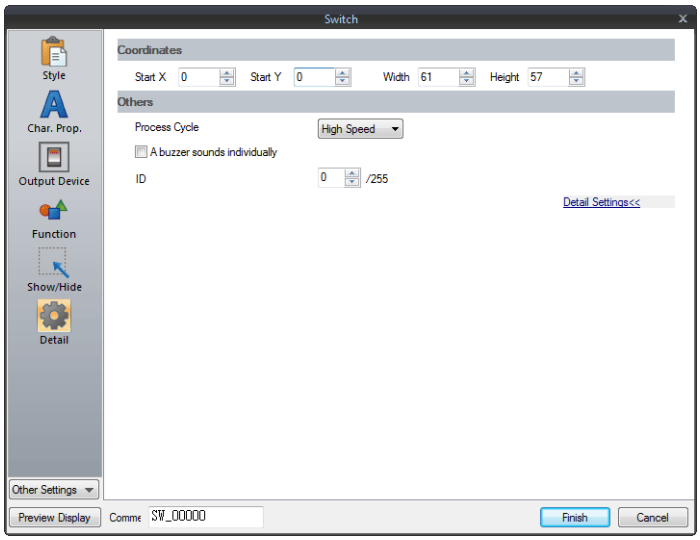
☞ For a detailed setting example, refer to “4 Lamp”.

Show/Hide



Item			Description
Show			Show the part on the screen.
Hide			Do not show the part on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail



Item		Description
Coordinates	Start X/Start Y	Set the display position of the switch using X and Y coordinates.
	Width/Height	Set the size of the switch by specifying width and height.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	A buzzer sounds individually	Unselected: This depends on the setting configured in [System Setting] → [Unit Setting] → [Buzzer]. Selected A buzzer sound is set for each switch. Standard/Short/Continuous/Error *1/OFF
	Save an operation log	Used in conjunction with the operation log. For details, refer to "4 Operation Log" in the X1 Series Reference Manual 2.
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

*1 When the buzzer is set to OFF in [System Setting] → [Unit Setting] → [Buzzer], the setting here is disabled (i.e. buzzer OFF).

3.1.4 Basic Function of Switches

List of Functions

If the [Display All] checkbox is selected next to [Function] in the switch settings, all of the switch functions are displayed for selection.
When nothing is listed in the "Linked Part" column of the table, the switch activates alone with the set function. When one or more functions are listed in the "Linked Part" column, the switch will not perform its set function unless a link is established with a corresponding part (i.e. the IDs of the switch and corresponding part must match).
For details, refer to the relevant pages.

Standard

Name	Description	Linked Part	Refer to
Standard	Set the bit number of the specified device memory ON/OFF.	–	–
Screen Change-over	Change to the screen of the specified screen number.	–	–
Hard Copy	Print the currently displayed screen image.	–	page 16-5
Overlap Control	Control normal/call/multi-/global overlap display.	–	page 2-1
Return	Return to the previous screen (you can go back up to 8 screens).	–	–
Reset	Clear logging and alarm data.	Alarm Trend	page 8-1 page 7-1
Word Operation	Perform operations on device memory data.	–	page 3-14
Item Select	Act as an entry selection switch if data is placed in the same switch.	Entry	page 6-35
Language changeover	Change the display language.	–	*1
Switching to Local Mode	Change to Local mode.	-	-
+Block	Increment the display block by one.	Message mode Graphic Alarm Trend Memo Pad JPEG	page 12-1 page 11-1 page 8-1 page 7-1 page 13-1 *1
– Block	Decrement the display block by one.		
Roll Up	Scroll up.	Message mode Alarm Trend	page 12-1 page 8-1 page 7-1
Roll Down	Scroll down.		
Block Call	Change the display block.	Message mode Graphic Memo Pad	page 12-1 page 11-1 page 13-1
Mode	Display messages that correspond to functions on the switch.	Message mode Alarm	page 12-1 page 8-1
Occupy	Make a 1:1 connection with the PLC (multi-link connection only).	–	–
Storage Format (Buffer)	Format the sampling or logging file in a storage folder	–	–
Storage Disconnection	Stop access to storage.	–	page 3-30
Operation Log Viewer Display	Display the operation log viewer.	–	*1
Ladder Monitor	Display the ladder monitor screen.	–	*2
Web Browser Display	Start the web browser (Internet Explorer).	–	*1
Start application	Start a user application.	–	*1
Task List Display	Display the task list.	–	*1
On-screen keyboard display	Display the on-screen keyboard.	–	*1

*1 For details, refer to the X1 Series Reference Manual 2.
*2 For details, refer to the V9 Series Ladder Monitor.

Entry

Name	Description	Linked Part	Refer to
Character Input	Enter text onto switches.	Entry (DELETE key available for alarm usage)	page 6-1
Write	Write the entry data to the device memory.		
Clear	Clear the entry data.		
Toggle Sign	Invert the entered sign (for numerical input).		
Space	Enter a one-byte space (for character input).		
Back Space	Delete the character to the left of the cursor *1.		
Delete	Delete the character at the cursor position *1*2.		
+1	Increment the number at the cursor position by one (for numerical input).		
–1	Decrement the number at the cursor position by one (for numeric input).		
Add	Add a set number to the number display at the cursor position.		
Subtraction	Subtract a set number from the number display at the cursor position.		
Cancel	Restore the initial display state during entry operation.		
LFT	Move the cursor left *2.		
RGT	Move the cursor right *2.		
UP	Move the cursor to the previous option (–1).		
DW	Move the cursor to the next option (+1).		
>>	Move to the next screen page (+1)		
<<	Move to the previous screen page (–1).		
Graphic Library	Change characters by reading a graphics library.		
80 Compatible HEX Key	Use when converting GD-80 series screen programs		
80 Compatible HEX Key Change			
Max. Value Entry	Display the maximum value at the entry display position.		
Min. Value Entry	Display the minimum value at the entry display position.		
Multi-char. Input	Change the text on the switch.		
Char. Switching (+)	Increment the character entry switch by one.		
Char. Switching (–)	Decrement the character entry switch by one.		

*1 The decimal point and signs cannot be deleted from numerical data displays.

*2 For numerical displays, the [Allow to use Insert/DELETE keys when entering values] checkbox must be selected on the [General Settings] tab of the [Unit Setting] window, which is displayed by navigating to [System Setting] → [Unit Setting]. The above setting applies to the entry modes of all screens.

Logging

Name	Description	Linked Part	Refer to
Graph Return	Return to the latest logging data.	Trend	page 7-1
Print	Print the logging information.		
Zoom in (X Direction)	Increase the display magnification of the currently displayed graph in the X direction.		
Zoom out (X Direction)	Reduce the display magnification of the currently displayed graph in the X direction.		
Zoom in (Y Direction)	Increase the display magnification of the currently displayed graph in the Y direction.		
Zoom out (Y Direction)	Reduce the display magnification of the currently displayed graph in the Y direction.		
Reset Display Magnification	Reset the display magnification to actual size and reset the reference position to its initial state.		
File Select	Display the file selection window.		

Alarm

Name	Description	Linked Part	Refer to
Graph Return	Return to the latest monitoring data.	Alarm	page 8-1
Display Change-over	Change the display between date display and time display.		
Print	Print the alarm information.		
Change Display Order	Change the display order between order of occurrence and newest first.		
Acknowledge	Display the acknowledgement time of the alarm.		
File Select	Display the file selection window.		
Filter Display	Display the filter window.		

Memo Pad

Name	Description	Linked Part	Refer to
Pen Color	Select the pen color.	Memo Pad	page 13-1
Pen Size	Select the pen thickness.		
Line	Draw a straight line.		
Delete Area	Delete the selected area of the memo pad.		
Delete All	Delete all memo pads on the screen.		

Table Data

Name	Description	Linked Part	Refer to
Cursor Movement to Right	Move the cursor right within the table.	Table Data Display	page 5-34
Cursor Movement to Left	Move the cursor left within the table.		
Table Move +	Move the table in the positive direction.		
Table Move –	Move the table in the negative direction.		

Digital Switch

Name	Description	Linked Part	Refer to
Digital Switch +	Increment the selected digit by one.	Numerical Display	page 3-29
Digital Switch –	Decrement the selected digit by one.		
Digital Switch Sign Inversion	Inverse the sign of the numerical data display.		

JPEG

Name	Description	Linked Part	Refer to
File Delete	Delete the JPEG file currently displayed or recipe file currently selected.	JPEG	*1
File Call	Load the JPEG file of the specified number.		
JPEG Search	Set an increment/decrement value for JPEG file selection.		

*1 For details, refer to the X1 Series Reference Manual 2.

Recipe

Name	Description	Linked Part	Refer to
Recipe Data Save	Save the specified recipe data.	–	page 15-1
Recipe Data Load	Load the specified recipe data.		
Recipe Data Delete	Delete the specified recipe data.		

Security

Name	Description	Linked Part	Refer to
Log In	Change the security level.	–	*1
Log Out	Change the security level to “0”.		

*1 For details, refer to the X1 Series Reference Manual 2.

Window Tiling

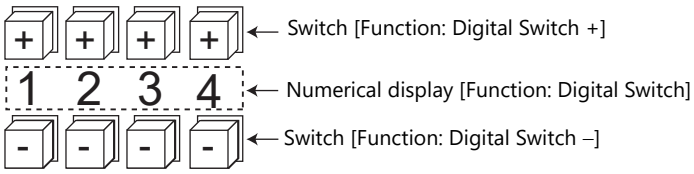
Name	Description	Linked Part	Refer to
Window tiling	Tile currently running app windows. Tiling method: Tile Vertically, Tile Horizontally	–	*1
Return to full screen	Returns the X1 app window to full-screen display.		

*1 For details, refer to the X1 Series Reference Manual 2.

Switch Function Examples

Digital Switch

Usage example



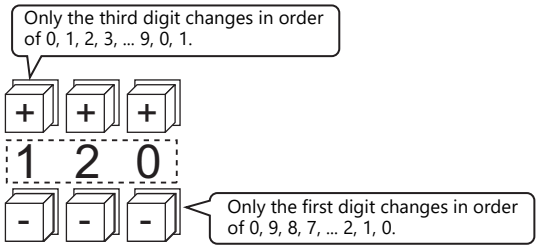
- Switch
  - Function

Item		Description
Digital Switch +	Target digits (1 to 17)	The selected digit is incremented by one.
Digital Switch –	Target digits (1 to 17)	The selected digit is decremented by one.
Digital Switch Sign Inversion	-	Inverse the sign of the numerical data display

  - [Detail] → [Detail settings]
    ID: Same as the numerical data display part.
- Numerical Display
  - [Function: Digital Switch]
    Carryover to higher/lower digits: When selected, carryover to higher/lower digits is performed.
    When not selected, only the specified digit changes.
  - [Detail] → [Detail settings]
    ID: Same as the switch.

Without carryover:

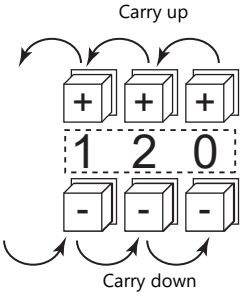
- Without sign or with "+" sign
  Pressing the [+] key on the first digit changes "129" → "120".
  Pressing the [–] key on the first digit changes "120" → "129".



- With "–" sign
  Pressing the [+] key on the first digit changes the display as shown below.
  "–008" → "–009" → "000" → "001" → "002"
  Change the sign using a switch ([Function: Digital Switch Sign Inversion]).

With carryover:

- Without sign or with "+" sign
  Pressing the [+] key changes "129" to "130".
  Pressing the [–] key changes "120" to "119".
- With "–" sign
  Pressing the [+] key changes "-129" to "-128".
  Pressing the [–] key changes "-129" to "-130".



Notes

- Maximum and minimum values can be set when [Alarm] is selected for [Operation/Alarm].
- [Word Operation] and [Scaling] can be used.
- If multiple numerical data display parts ([Function: Digital Switch]) of the same ID exist, the part that is placed first is targeted for operation.

Storage Disconnection (Stopping Access to Storage)

The switch lamp status changes as shown in the following table. Information on the switch status is stored at $s500 in the system device memory.

Lamp	Storage Access Status
OFF	Normal access
Blinking ON/OFF	Data writing triggered by switch turning ON
ON	Access stopped

* If the [Upon storage disconnect] checkbox is selected in the storage output settings of the alarm server or logging server, alarm/logging data is output in CSV format.

Notes

- The [Storage Disconnection (All)] switch function stops access to all of the following folders.
  - For internal storage
    C:\MONITOUCH\X1\0\work\strage\sd

    0: Main app in multi-display
    1: Sub app in multi-display

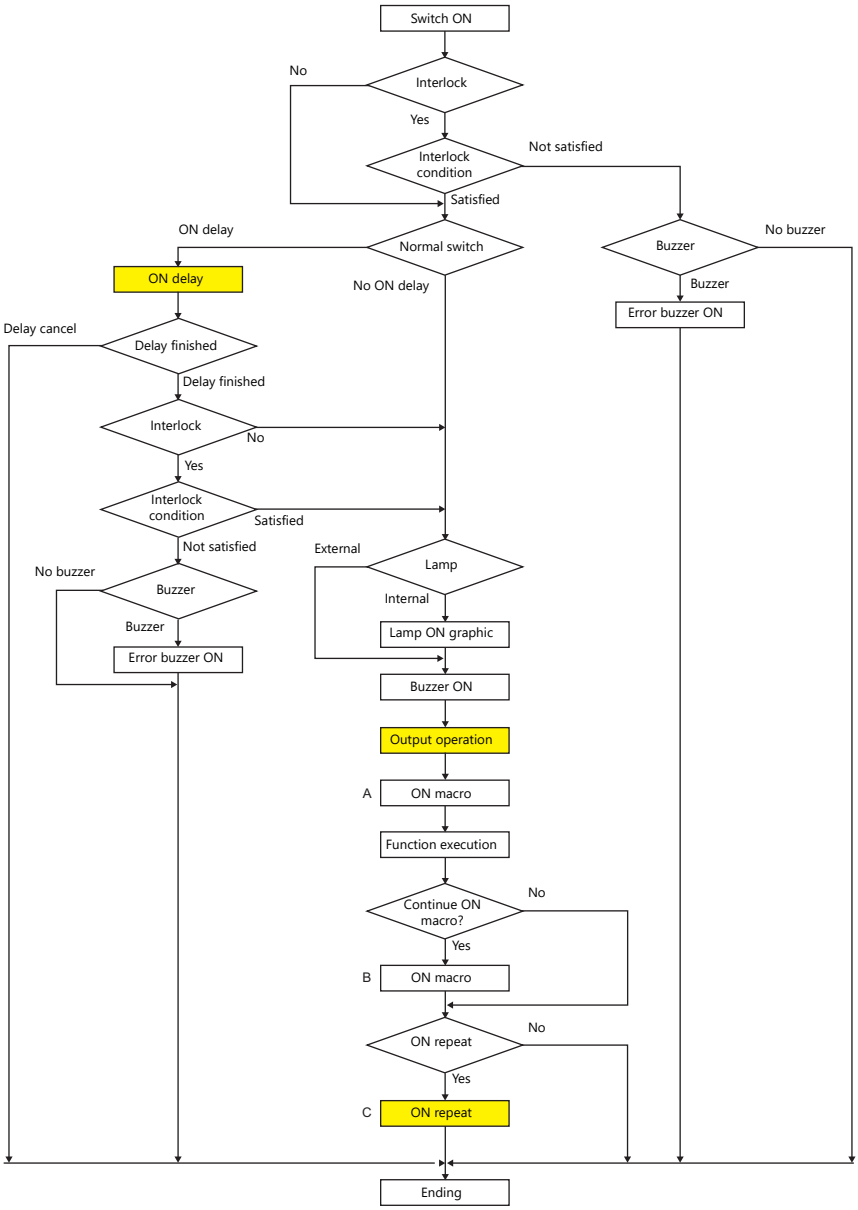
    C:\MONITOUCH\X1\0\work\strage\usb

    0: Main app in multi-display
    1: Sub app in multi-display
  - For external USB storage
    Drive selected at [System Setting] → [Other] → [Storage Setting] → [External USB storage]

  To individually stop accessing storage, specify [Storage folder] in the [Storage Disconnection] switch function.
- The following macro commands cannot be stopped from accessing storage even after executing storage disconnection. Check that these macro commands are definitely not accessing storage by changing to Local mode or using $s1050 to $s1052 (page 1-57).
  - HDCOPY
  - HDCOPY2
  - HDCOPY3
  - COPY_FILE
  - MOVE_FILE
  - DEL_FILE
  - READ_FILE
  - WRITE_FILE
- When intending to cancel the switch ON status (access stopped) and start accessing storage, press the switch again.
- If the screen is changed when the switch is ON, the state of the storage folder does not automatically return to the accessing state.
  Always press the switch to change it to the OFF state (accessing).
  However, if the [Clear the status of Storage Removal when switching a screen (V8 compatible)] checkbox is selected under [System Setting] → [Unit Setting] → [General Setting], the storage folder will automatically return to the accessing state.
- The lamp device memory address specified for the switch becomes unavailable.

3.1.5 Flowchart

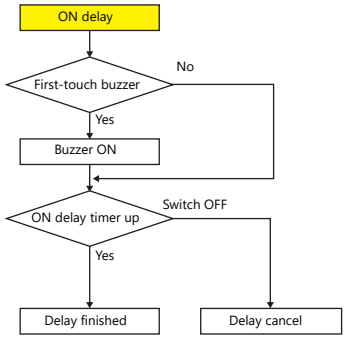
When the Switch is ON (Pressed)



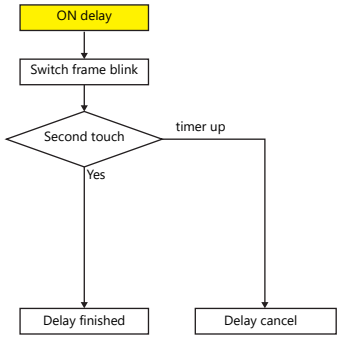
*1 [Output Action] or [Macro] should be selected for execution.
*2 Macro B starts after macro A is finished with the "SWRET" command.
For details on macro commands, refer to the V9 Series Macro Reference Manual.
*3 The switch function is executed after the ON macro is executed. However, the "SET_SCRN," "SET_MOVLP," "OVLP_SHOW," and "OVLP_POS" commands are executed after the switch function has been executed.
*4 Operation "C" is repeated until the switch is turned OFF (released).

ON delay

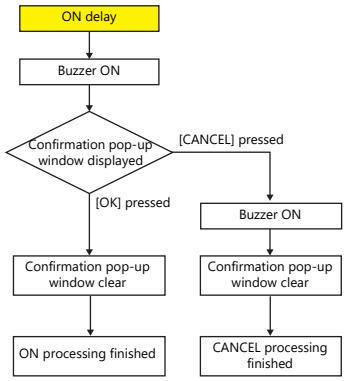
ON delay



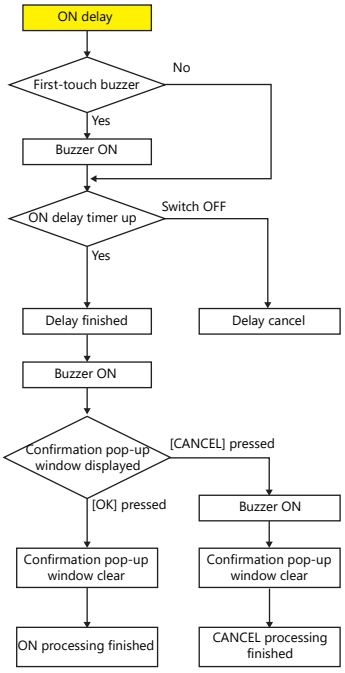
Double-touch



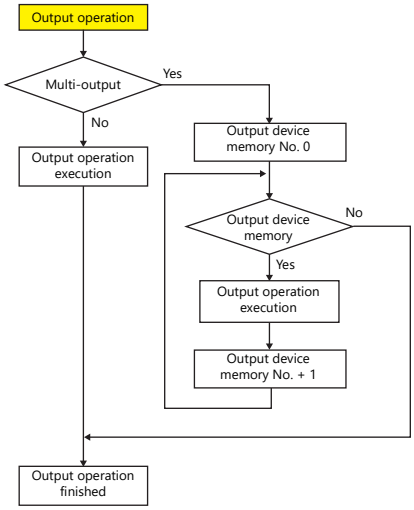
Message dialog box



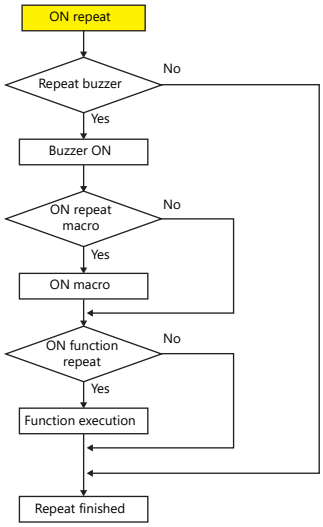
ON delay + message dialog box



Output action

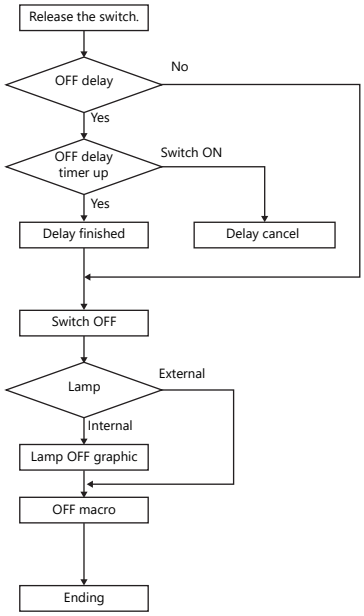


ON repeat

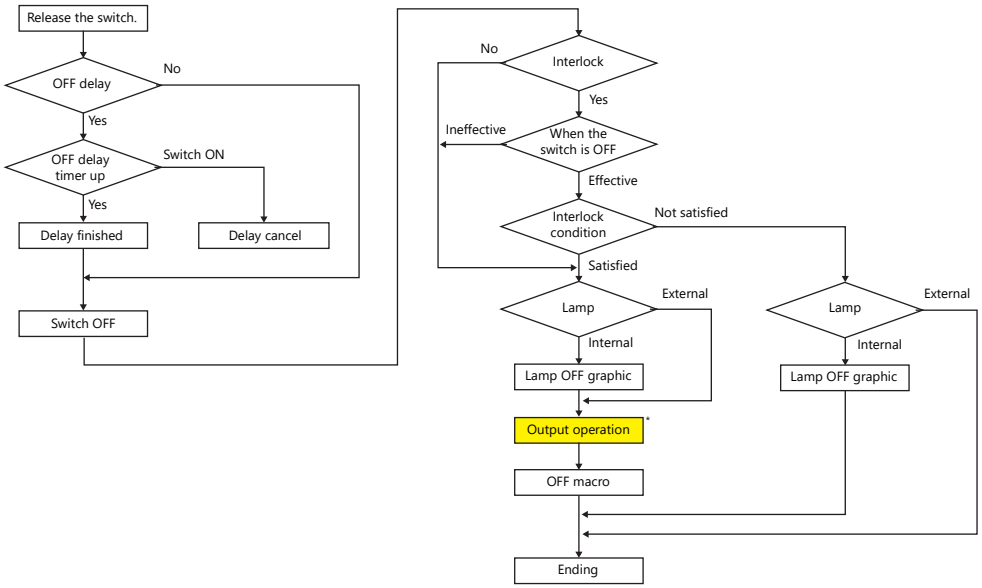


When the Switch is OFF (Released)

Set, reset, alternate



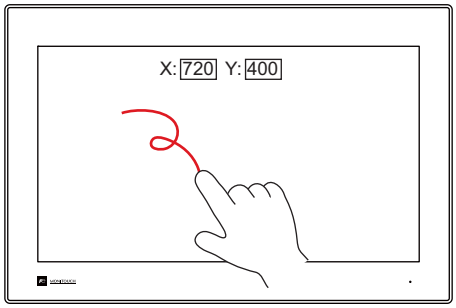
Momentary, momentary W



* For details on [Output Action] settings, refer to "Notes on [Momentary] and [Momentary W] operation" page 3-13.

3.1.6 Coordinate Output

The current touch switch information is output to $s900 to 902 of the system device memory.
This information is useful when linking to an image processing device.



- $s900
  Touch switch status

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Not used

0: Switch OFF
1: Switch ON

- $s901
  X coordinate (absolute)
- $s902
  Y coordinate (absolute)

3.1.7 Notes

Do not use switches where they could cause injury to people or damage machinery. Moreover, do not use switches as emergency switches.

Placement

Minimum Switch Size and Maximum Number of Switches

- Minimum size: 2 pixels × 2 pixels
  (For safety reasons, however, using switches greater than 18 pixels × 14 pixels is recommended.)
- Maximum number of switches: 4096
  * This includes scroll bars and slide switches.

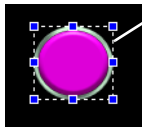
Placing Switches Overlaying Other Switches

Do not overlay one switch on another switch.

- If switches are overlaid, the top switch will always be enabled and the bottom switch disabled.

Switch Area

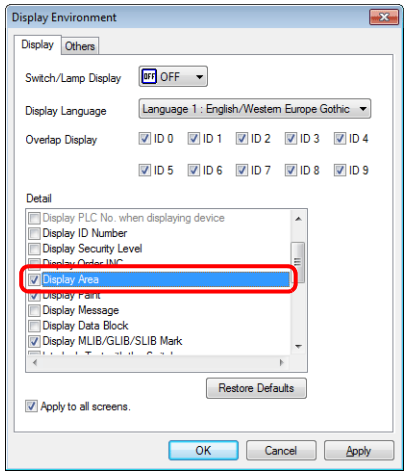
The operable area that is sensitive to screen presses is basically identical to the switch part area. However, the operable area may differ depending on the part type, placement method, and enlargement or reduction.



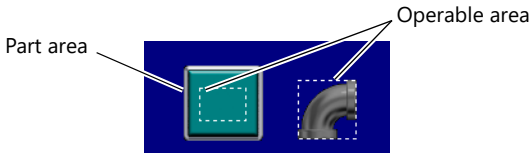
Check the action area as described below.

Location of settings

[View] → [Display Environment] → [Display] tab → [Display Area] checkbox



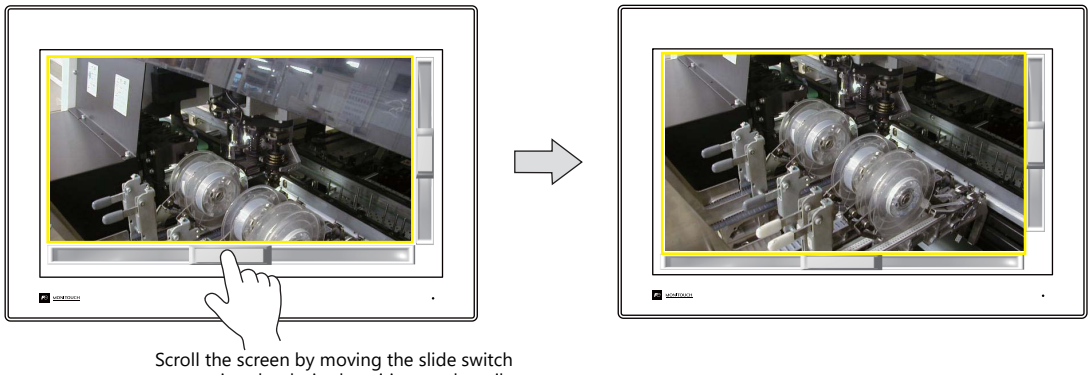
When the [Display Area] checkbox is selected, a dotted box is shown around each placed switch part as shown below. This dotted box indicates the switch's operable area. Pressing within the switch's operable area will activate the switch.
The outline of each switch part is called the "part area" of the switch. Pressing anywhere outside of this area does not activate the switch.



3.2 Scroll Bars

3.2.1 Overview

Scroll bars can be used to display portions of messages or JPEG images that lie off screen.



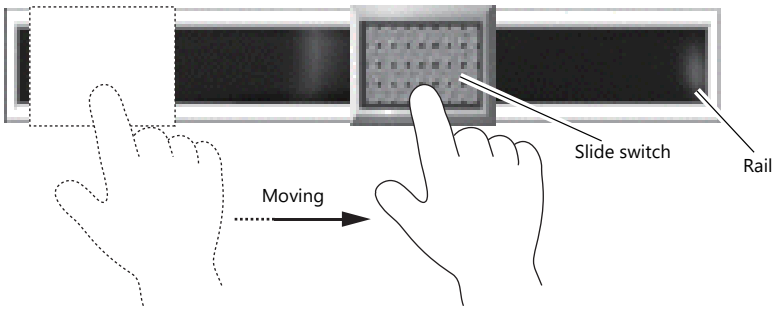
Scroll the screen by moving the slide switch or pressing the desired position on the rail.

Position to press and data write timing

- The scroll bar operates when either the slide switch or rail is pressed.
- Writing of a value occurs when the slide or rail is released.

Conceptual diagram of slide switch movement

- The slide switch moves together with your finger during movement.



*** The X1 series allows scrolling by dragging the display area instead of using a scroll bar. For details, refer to "7.1 Enlarging and Scrolling Screens" in the X1 Series Reference Manual 2.**

Applicable Items

Item	Scroll Direction
JPEG	Vertical and horizontal
Alarm sub-display *1	Vertical and horizontal
Message Mode	Vertical and horizontal
Trend graph/sampling	Vertical or horizontal *2

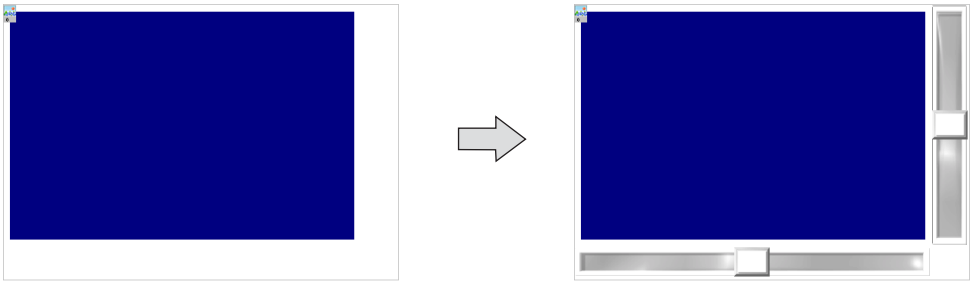
*1 The scroll bar is not supported for other alarm items.
(Scrolling is performed automatically for long messages.)

*2 The scrolling direction depends on the [Direction] setting in the [Trend Graph] window.
[↑] [↓]: vertical scrolling, [→] [←]: horizontal scrolling

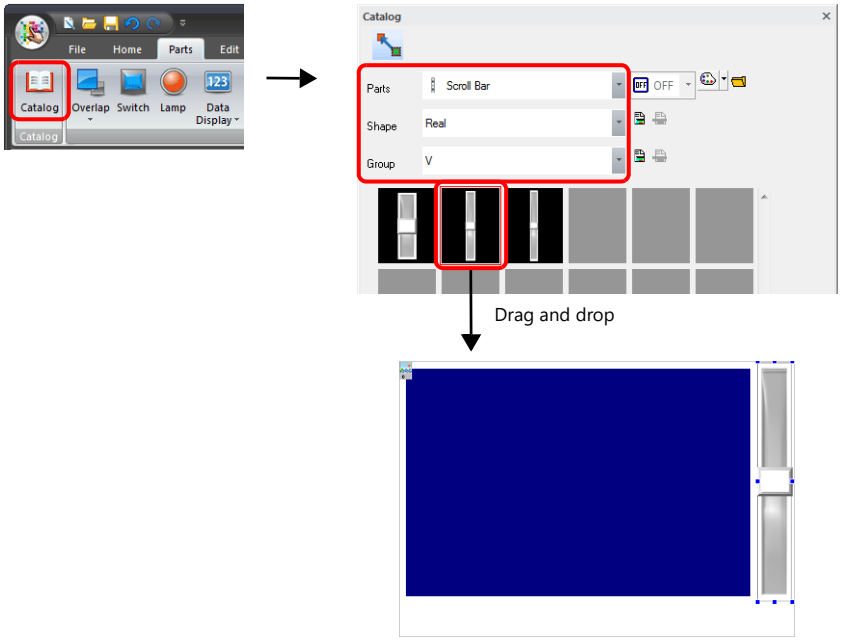
3.2.2 Setting Examples

Scroll bars can be added to screens that display JPEG images.

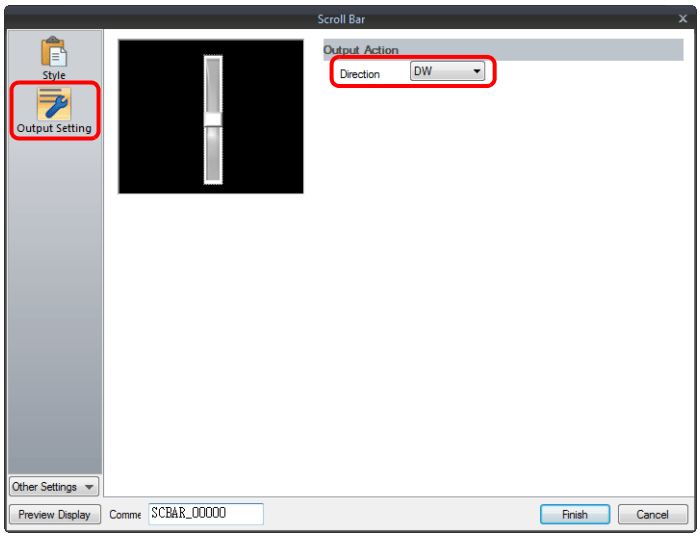
*** For details on JPEG display settings, refer to "1.1 JPEG Display" in the X1 Series Reference Manual 2.**



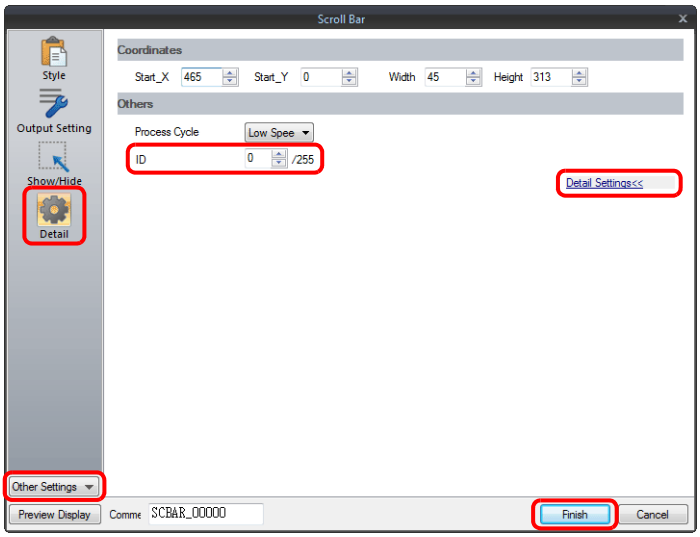
1. Click [Parts] → [Catalog] to display the catalog window.
   Configure the following settings and drag and drop a vertical scroll bar onto the screen.



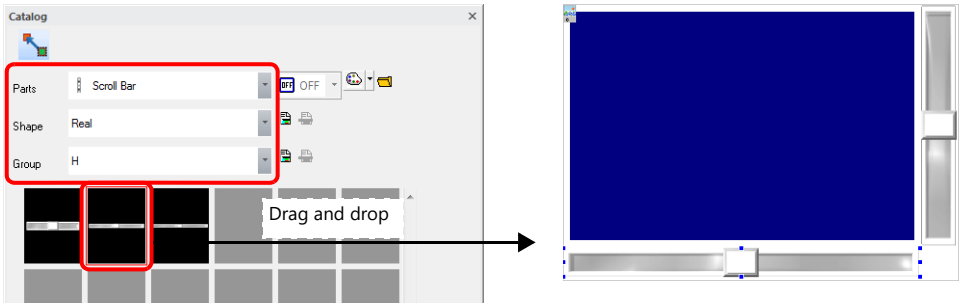
2. Double-click on the scroll bar to display the settings window.
   Configure the [Output Setting] settings as shown below.



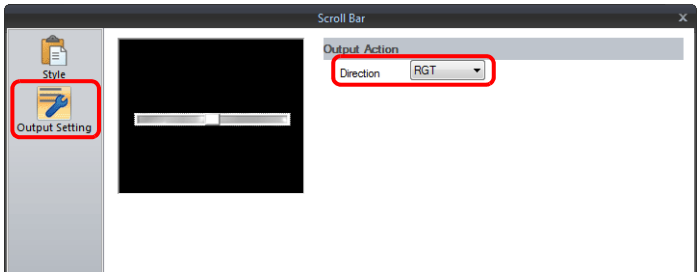
3. Click [Other Settings] → [Detail].
   Click [Detail] → [Detail Settings], link [ID] to the ID of the JPEG display, and then click [Finish].



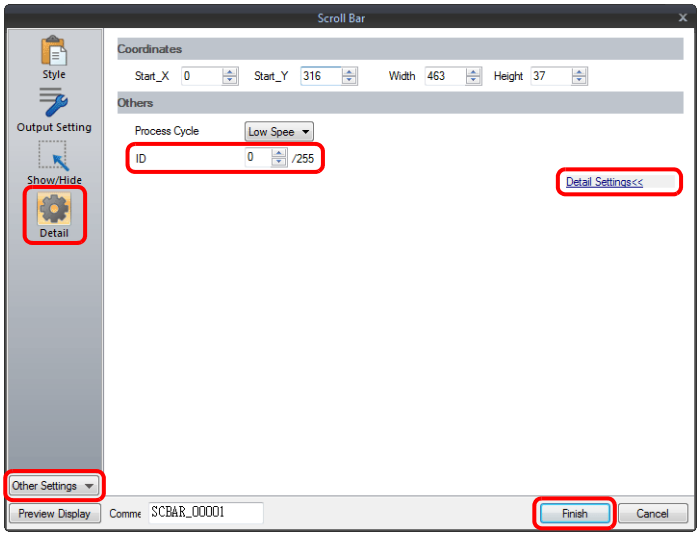
4. Drag and drop a horizontal scroll bar onto the screen from the catalog window in the same manner as step 1.



5. Double-click on the scroll bar to display the settings window.
   Configure the [Output Setting] settings as shown below.



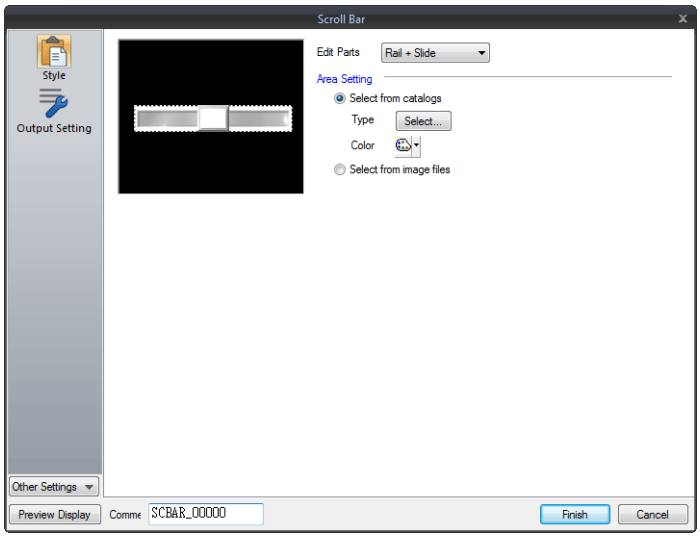
6. Click [Other Settings] → [Detail].
   Click [Detail] → [Detail Settings], link [ID] to the ID of the JPEG display, and then click [Finish].



This completes the necessary settings.

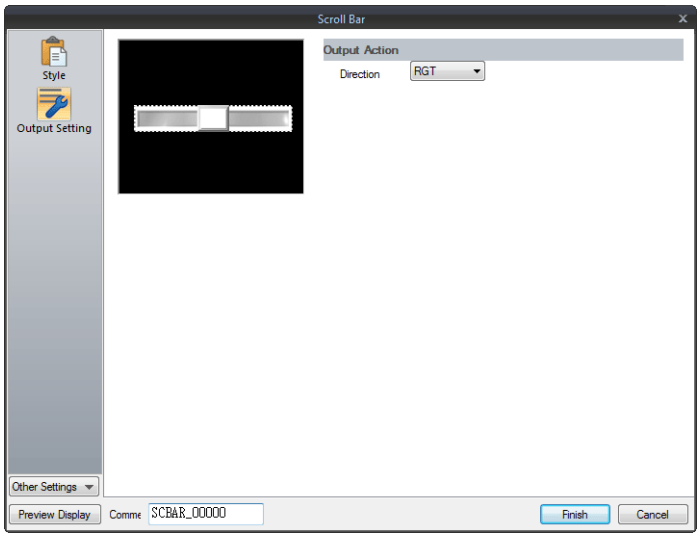
3.2.3 Detailed Settings

Style



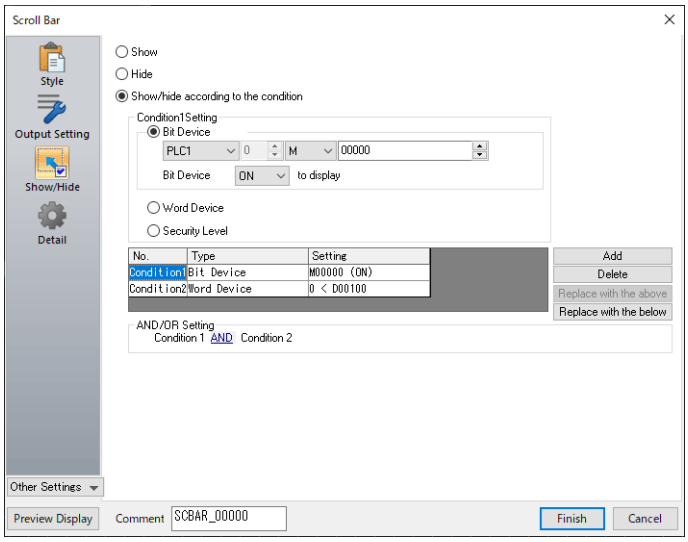
Item		Description
Edit Parts		Select the parts to edit (rail/slide).
Area Setting	Select from catalogs	Select the part design of each pattern. After selecting the part, select the part color.
	Select from image files	Select a PNG file.

Output Setting



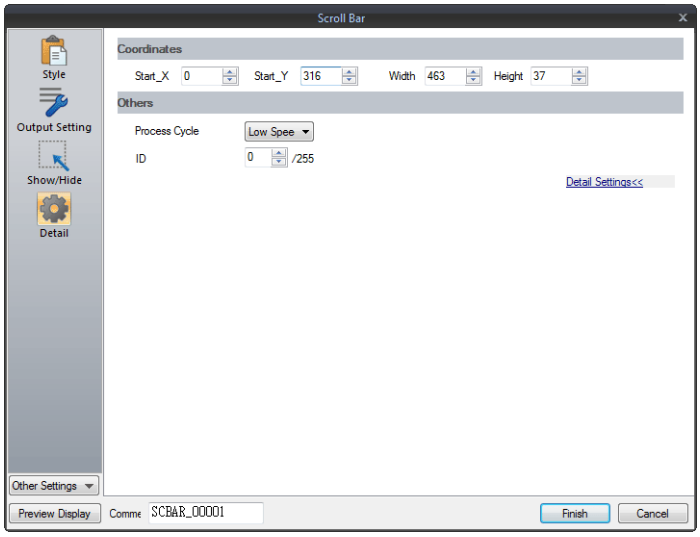
Item		Description
Output Action	Direction (RGT, LFT, UP, DW)	Select the scrolling direction.

Show/Hide



Item			Description
Show			Show the part on the screen.
Hide			Do not show the part on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail



Item		Description
Coordinates	Start X/Start Y	Set the display position of the scroll bar using X and Y coordinates.
	Width/Height	Set the size of the scroll bar by specifying width and height.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

3.2.4 Notes

- A maximum of 4096 parts (including switches and slide switches) can be placed on one screen.
- Scrolling is performed in pixel units.
- If multiple scroll bars are placed that have the same ID and are not linked to other items, the scroll bar in the foreground takes effect.

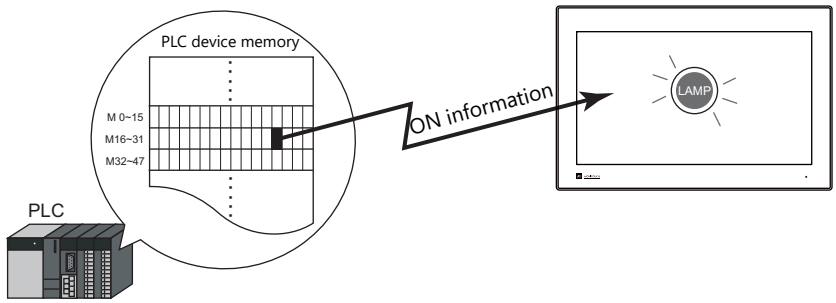
3.3 Slider Switch

Slider switches are used in conjunction with numeric data entry.
For details on slider switches, refer to "6.1 Numerical Data Entry".

4 Lamp

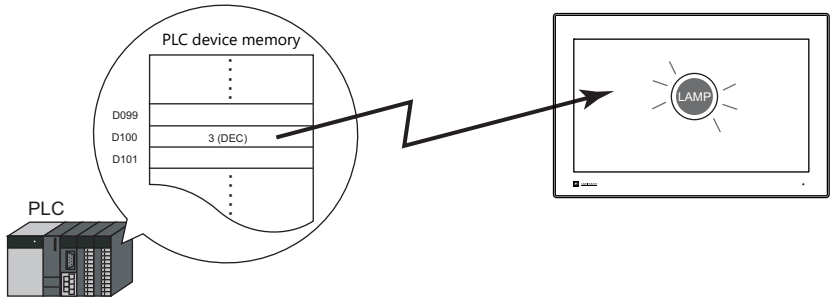
4.1 Overview

- The displayed patterns of lamps are switched in response to data changes in the lamp device memory.
  There are lamps called "bit lamps" that are switched according to bit setting (ON) and resetting (OFF) and "word lamps" that are switched according to the values placed in device addresses.
  - Bit lamp
    Lamp device memory: M19

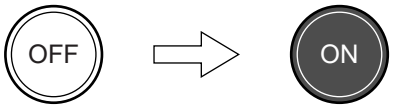


☞ For example settings, refer to "Using Bit Lamps" page 4-3.

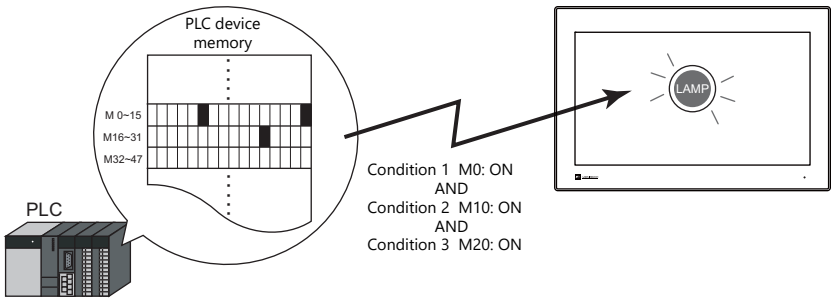
  - Word lamp
    Lamp device memory: D100



- Colors can be set on a pattern-by-pattern basis. For a [Draw Mode: REP] lamp, the text on the lamp can also be set for each pattern.

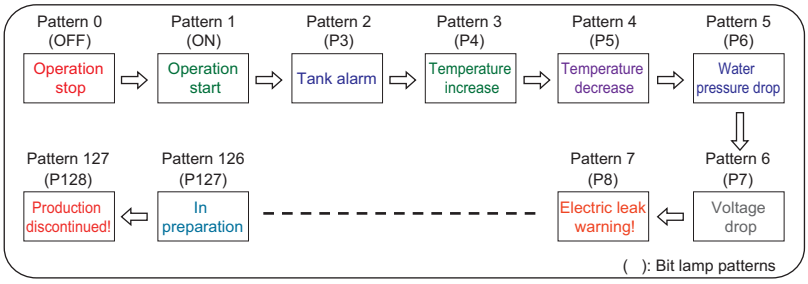


- Lamps can be set to light up when multiple conditions are satisfied. (N-state lamp)
  Up to four conditions can be defined using AND and OR operators.



☞ For example settings, refer to "Using Lamps with Conditions (N-State Lamp)" page 4-4.

- A single lamp can change between a maximum of 128 patterns.
  This can be done using consecutive device memory addresses or by using any desired addresses (N-state lamp).

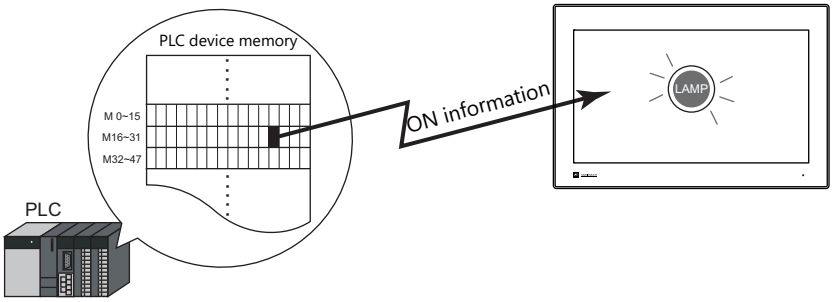


☞ For an example on setting device memory addresses as desired, refer to "Creating a Three-Pattern Lamp (N-State Lamp)" page 4-5.
For an example on setting consecutive device memory addresses, refer to "Placing 128 Pattern Lamps" page 4-6.

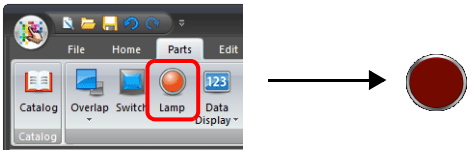
4.2 Setting Examples

Using Bit Lamps

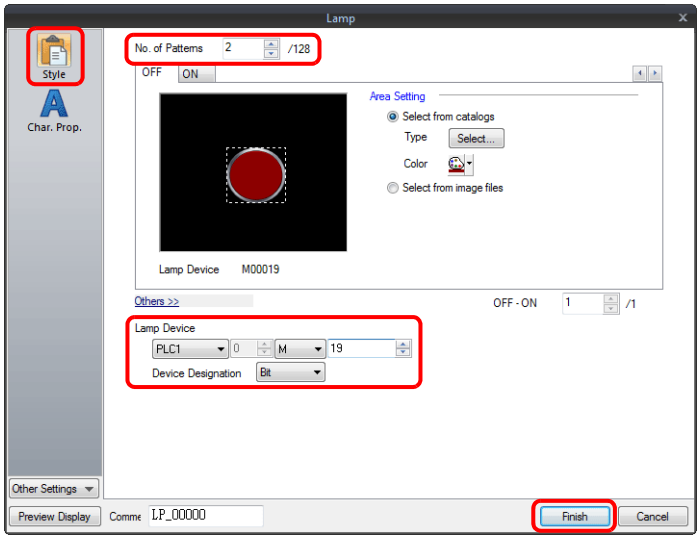
When the M19 bit of the PLC device memory is ON, the lamp turns on, and when the M19 bit is OFF the lamp turns off.
Lamp device memory: M19



1. Click [Parts] → [Lamp] and place a lamp on the screen.



2. Double-click on the lamp to display the settings window.
Configure the following settings for [Style] and then click [Finish].

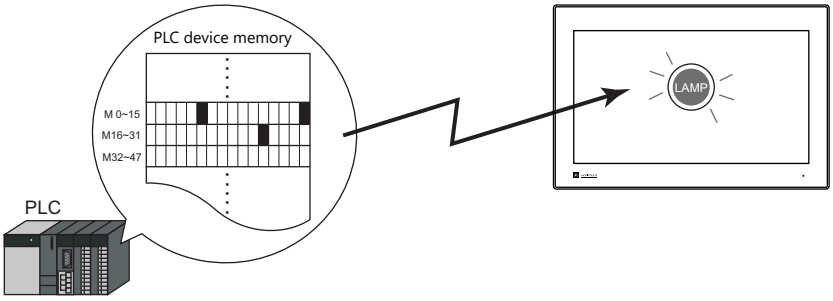


This completes the necessary settings.

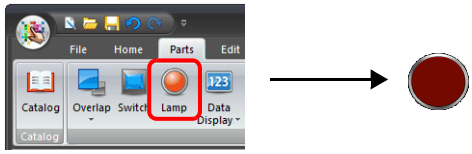
Using Lamps with Conditions (N-State Lamp)

Set a lamp that lights up when the M0, M10, and M20 bits of PLC device memory all turn ON.

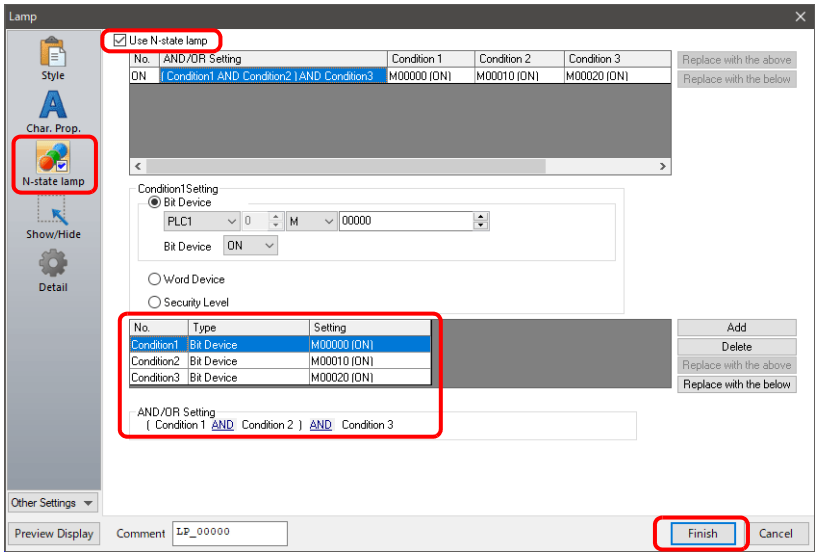
Condition 1: M0 (ON)
Condition 2: M10 (ON)
Condition 3: M20 (ON)



1. Click [Parts] → [Lamp] and place a lamp on the screen.



2. Double-click on the lamp to display the settings window.
   Configure the [N-state lamp] settings as shown below and then click [Finish].

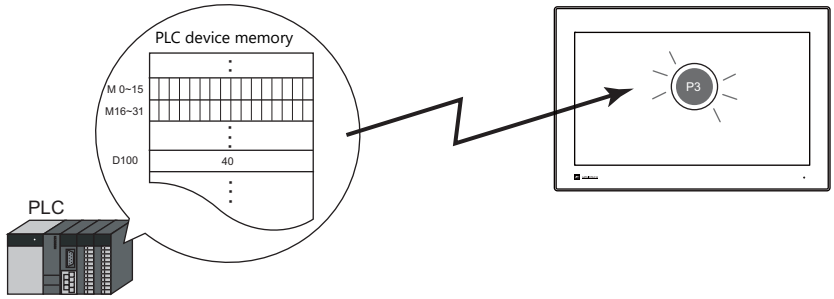


This completes the necessary settings.

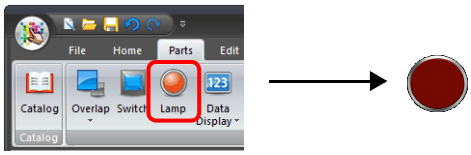
The lamp lights up when the M0, M10, and M20 bits all turn ON.

Creating a Three-Pattern Lamp (N-State Lamp)

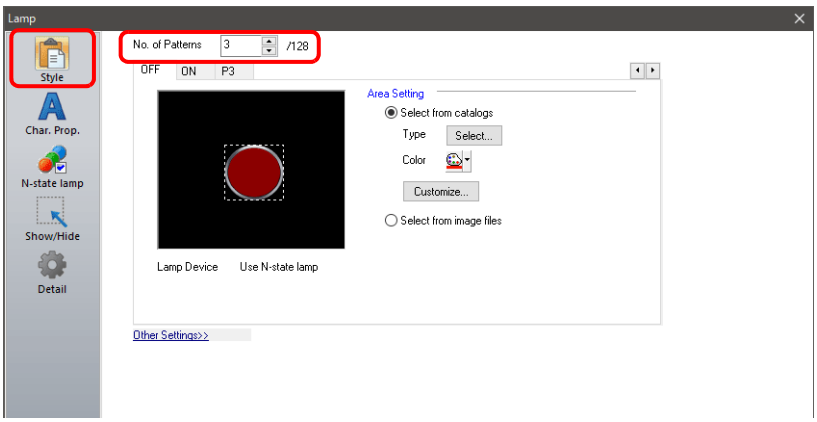
Set a lamp that shows the ON pattern when the M0 bit of the PLC device memory turns ON and the P3 pattern when the D100 value is between "1" and "50".



1. Click [Parts] → [Lamp] and place a lamp on the screen.

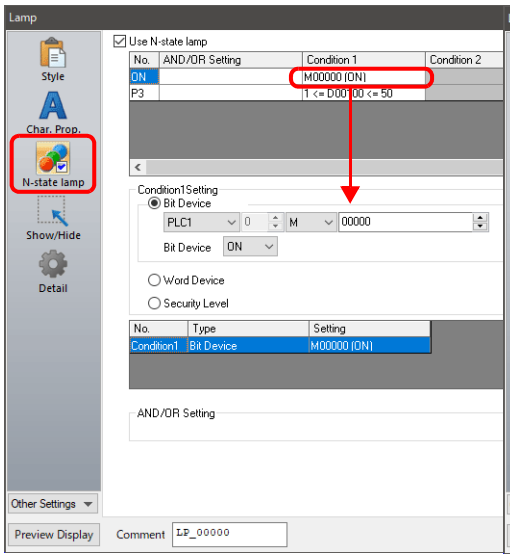


2. Double-click on the lamp to display the settings window.
   Set the [No. of Patterns] to "3" in the [Style] settings.

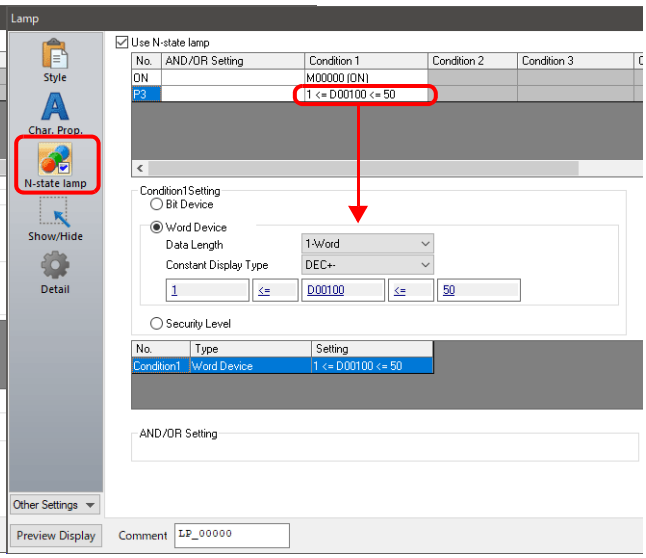


3. Configure the [N-state lamp] settings as shown below and then click [Finish].

Conditions for showing ON pattern



Conditions for showing P3 pattern

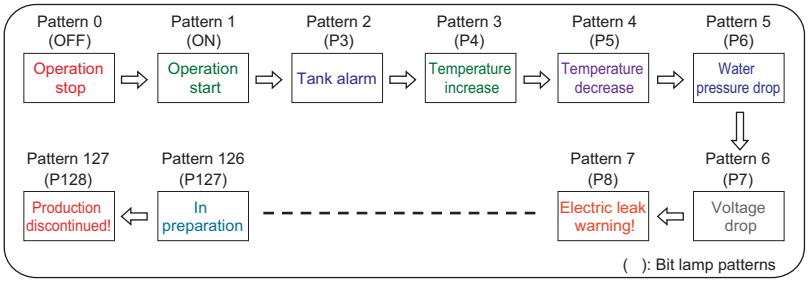


This completes the necessary settings.

The X1 series unit checks conditions in order starting from ON, P3, P4, and through to P128. The pattern for which conditions are determined to be satisfied the earliest is displayed.
If all conditions are not satisfied, the OFF pattern is displayed.

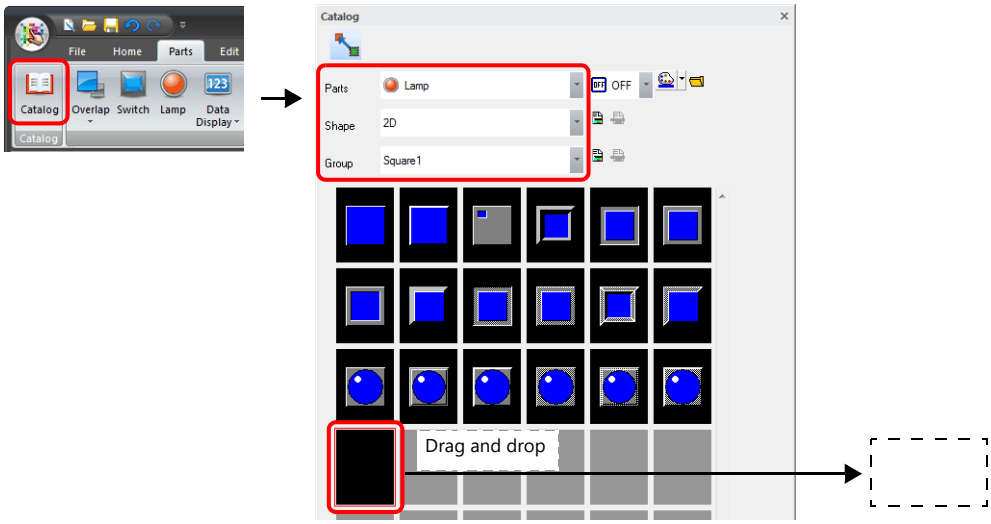
Placing 128 Pattern Lamps

Set a 128 pattern lamp, like the one shown in the figure below.

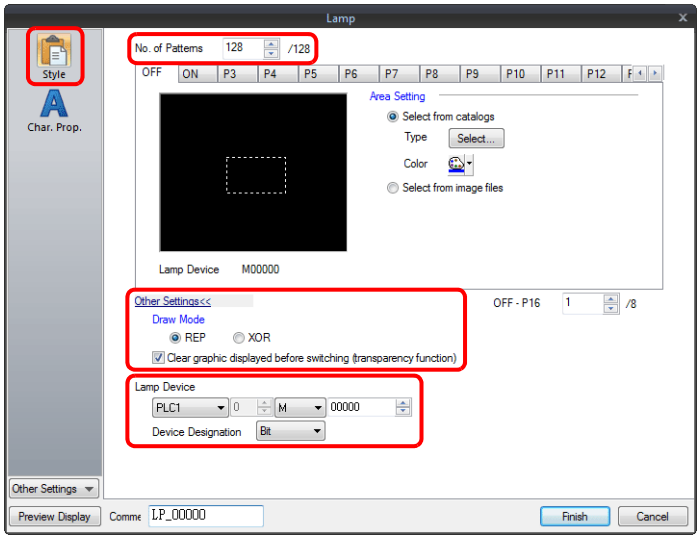


Setting procedure

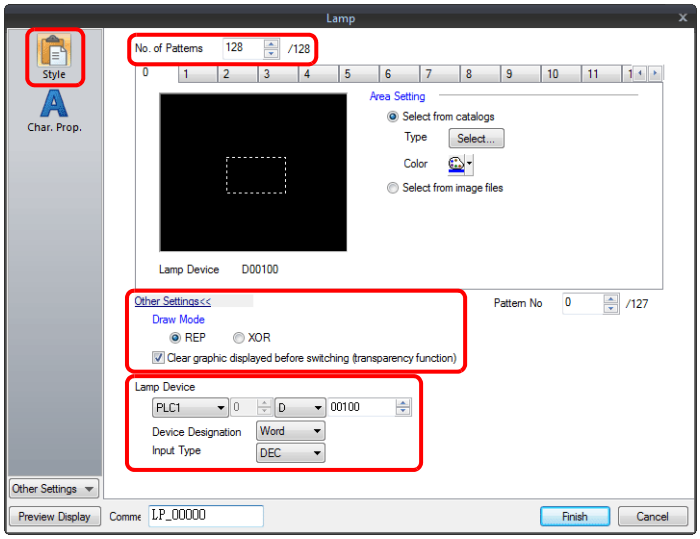
1. Click [Parts] → [Catalog] to display the catalog window.
   Configure the following settings and drag and drop a lamp onto the screen.



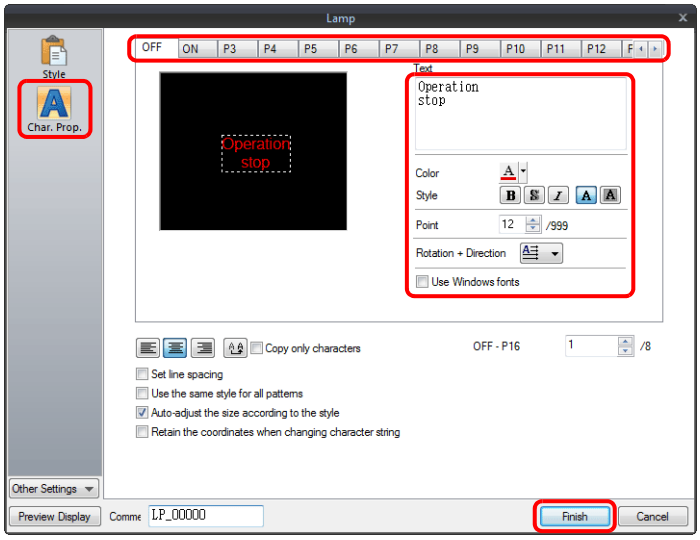
2. Double-click on the lamp to display the settings window.
   Configure the [Style] settings as shown below.
   - Bit lamp
     Lamp device memory: M0
     (Used lamp device memory range: M0 to M126)



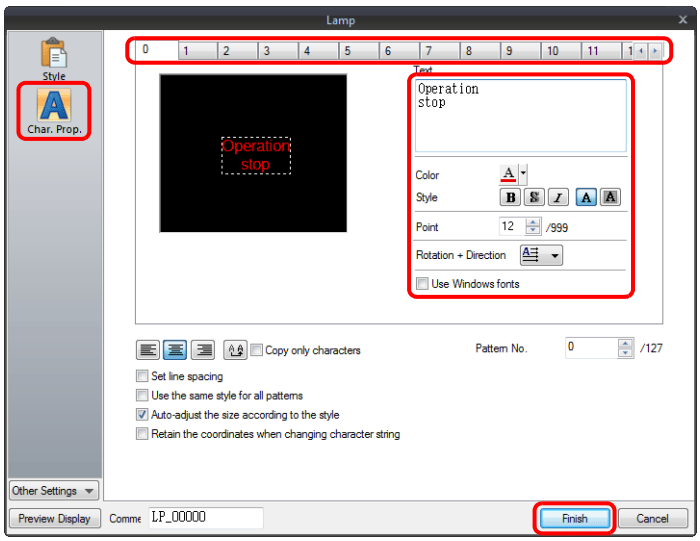
- Word lamp
  Lamp device memory: D100



3. Configure the [Char. Prop.] settings as shown below.
   Change between the [OFF] to [P128] tab and [0] to [127] tab to register text for each pattern and then click [Finish].
   - Bit lamp



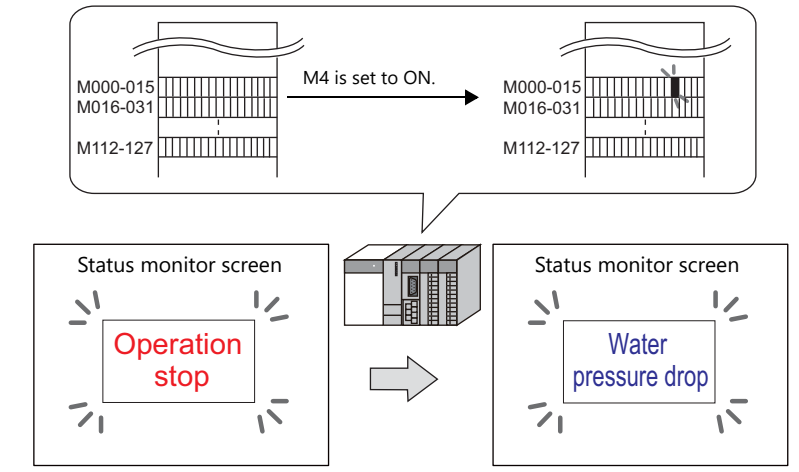
   - Word lamp



This completes the necessary settings.

Display example

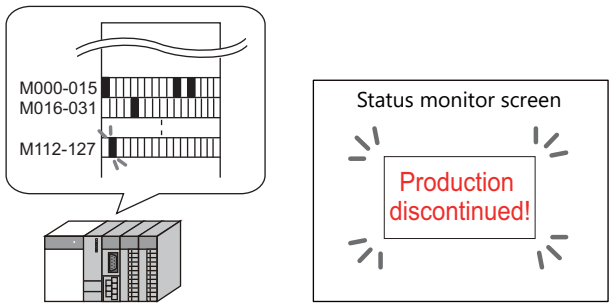
- Bit lamp



When M0 to 126 is set to "OFF" in the PLC device memory, pattern 0 (OFF) is displayed.

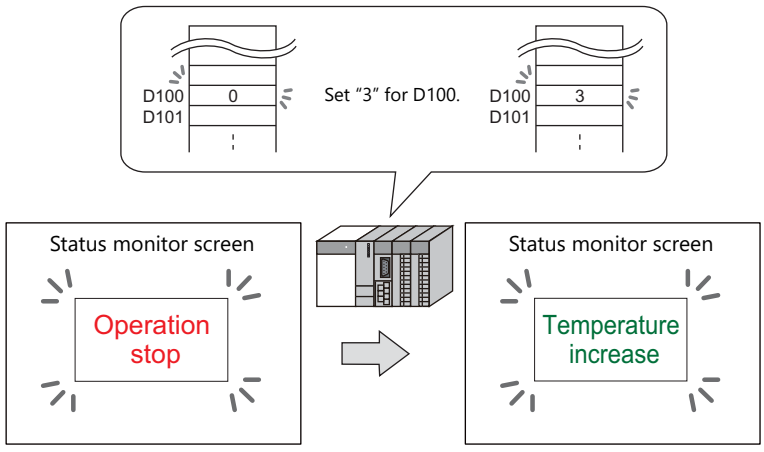
Set M4 in the PLC device memory to ON. Pattern 5 (P6) is displayed.

*** When multiple bits are set to ON, a pattern is displayed according to the most significant bit.**



Pattern 127 (P128) is displayed.

- Word lamp



When D100 is set to "0" in the PLC device memory, pattern 0 is displayed.

Set "3" for D100 in the PLC device memory. Pattern 3 is displayed.

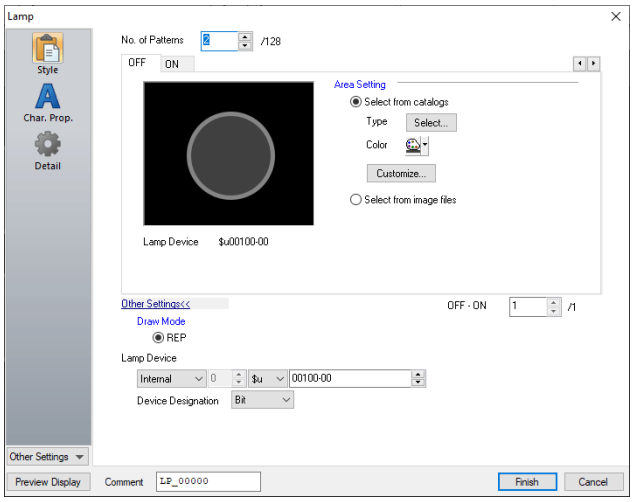
*** If a value outside the specified range is set for the lamp device memory, the lamp display is not changed.**

Notes

- When placing multiple lamps, set up consecutive addresses for the lamp device memory to ensure high-speed processing.
- When placing multiple lamps that have a different number of screen patterns and the lamp device memory are allocated with consecutive addresses, be careful configuring the settings of the lamp device memory. The required number of bits varies depending on the number of patterns.

4.3 Detailed Settings

Style



Item		Description
No. of Patterns (2 - 128)		Set the number of patterns that the lamp can display.
Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color.
	Select from image files *1	Select a PNG or SVG file. PNG and SVG files can be set to all patterns by clicking [Apply to All Patterns].
Frame	Type	Select the frame type of the lamp. * Only available with 2D (Square2) parts.
	Color	Select the frame color of the lamp. * Only available with 2D (Square2) parts.
Detail Settings	Fix the frame size *2	Zoom in and out while maintaining the dimensions specified for the top, bottom, left, and right of the frame. Applicable parts: Only real type and square type parts with frames and 3D parts (excluding some parts)
Enable flash display function (flashing with OFF pattern)		This item is available when the selected OFF pattern is other than a vector or 3D type*3 (excluding "Sign" and "3D_128" parts). Select this checkbox to flash the display between the selected pattern and the OFF pattern.
Other Settings	Draw Mode REP/XOR	REP: Display using the color set in [Area Setting]. XOR: When the lamp device memory is ON, the frame and text are displayed in the color resulting from an XOR operation. For the difference between REP and XOR, refer to "4.4 Draw Mode" page 4-15.
	Clear graphic displayed before switching (transparency function)	The previous graphic is not retained when the checkbox is selected. * Selection is not possible for vector parts and [Square2] 2D parts. For details, refer to "Notes on the transparency function" page 4-10.
Lamp Device*4	Device Designation	Bit: The lamp display is changed by setting (ON) and resetting (OFF) bits. The required number of bits depends on the number of display patterns. (127 bits maximum) *** When multiple bits are set (ON), the most significant bit has priority.** Word: The lamp display is changed according to the value specified for the device memory address. The range of setting values varies with the number of patterns. (Range: 0 to 127) If a value outside the specified range is set, the lamp display is not changed.
	Input Type (DEC/BCD)	Specify the input format of the device memory.

*1 Different file types cannot be specified for a single part, such as a PNG file for the OFF pattern and an SVG file for the ON pattern.

*2 Multiple frame dimensions can be set at once by selecting the items to change via [Tool] → [Fix 3D parts frame].

*3 Notes on vector, 3D type and 2D type parts

Part shapes differ depending on the selection made in the catalog.

- Vector: Vector
- 3D type: Plain, Animation, Flat, Real, Sign, 3D, 3D_128, HA
- 2D type: 2D

The categorization of an image file depends on the file type.

- SVG file: Vector
- PNG or BMP file: 3D type

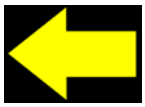
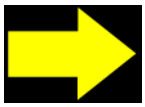
☞ For details on vector rendering, refer to “8.6 Vector Rendering” in the X1 Series Reference Manual 2.

*4 When the [Use N-state lamp] checkbox is selected, the setting is hidden

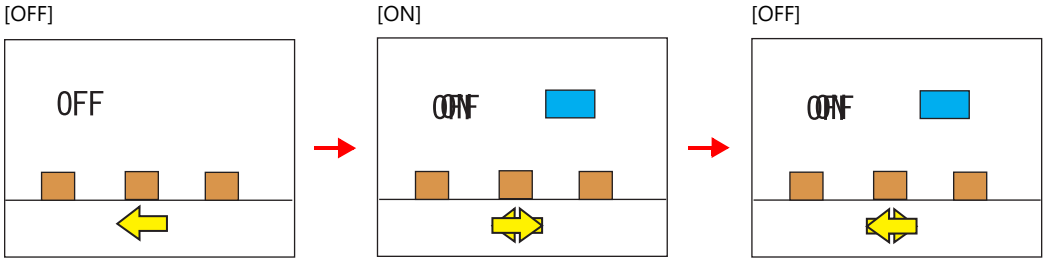
Notes on the transparency function

The transparency function is used to create parts that are only displayed when ON or parts only consisting of characters.

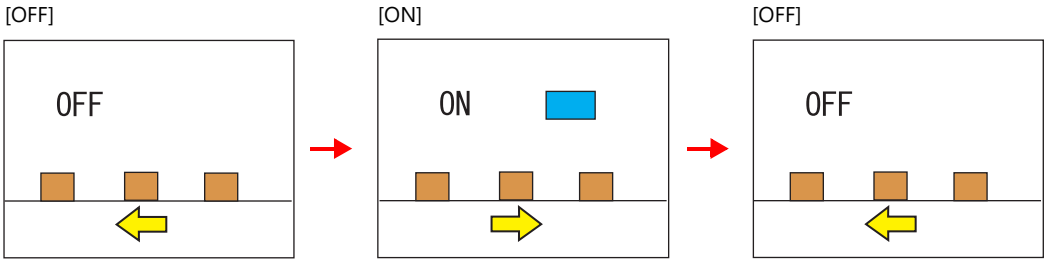
The following shows how parts with transparency placed on the screen are displayed.

	OFF	ON
Part only displayed when ON	Hide	
Only characters displayed		
Custom parts (Black: transparent color)		

- Clear graphic displayed before switching (transparency function) Unselected
  The previously displayed image remains.



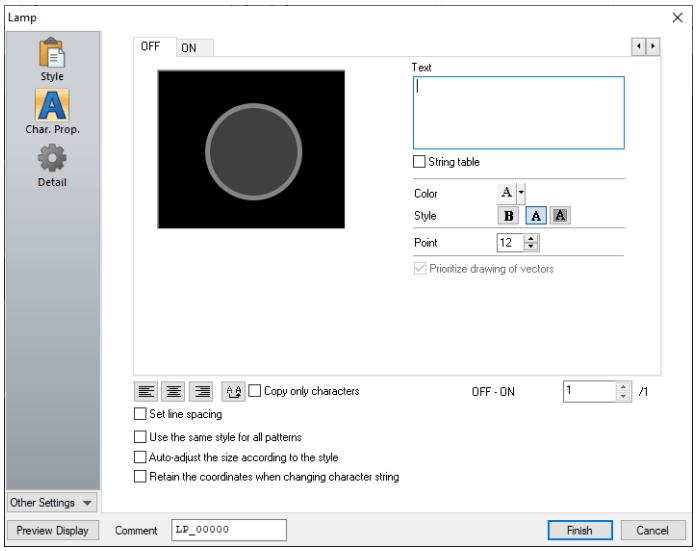
- Clear graphic displayed before switching (transparency function) Selected
  The previously displayed image does not remain. Parts can be displayed even with graphics placed in the background.

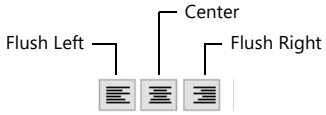


Notes

- For vector parts, operation is fixed to that when [Clear graphic displayed before switching (transparency function)] is selected.
- Transparency cannot be set for [Lamp] → [Shape: 2D] → [Group: Square2] parts in the catalog window.

Char. Prop.

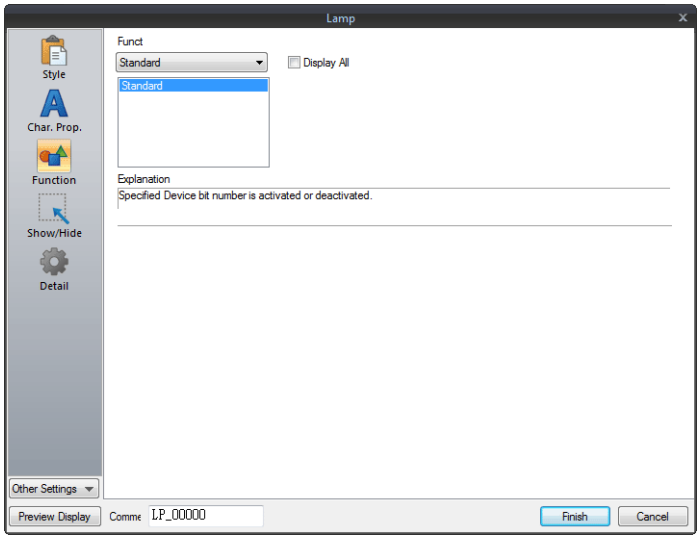


Item	Description
[OFF] [ON] - [P128]	When [Style] → [Other Settings] → [Draw Mode] is [XOR]: Only [OFF] can be selected. Specify the text to be displayed.
Pattern No. (0 - 127)	When [Style] → [Other Settings] → [Draw Mode] is [REP]: Specify the text to be displayed on each pattern.
Text	Enter text to be displayed on the lamp. Up to 4 lines can be registered. Text properties can be set for each line. Text can be justified within the lamp part.
String table	Select this checkbox when using strings registered to the string table. For details, refer to the X1 Series Reference Manual 2.
Color (text color, background color)	Set the color for text. The background color can also be set if set as “no transparency” in the following [Style] setting.
Style	Set the text style.
Character Size (1 to 8)	Specify the enlargement factor for text. * When [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Point (6 to 999)	Set the text size. * When a font type other than [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Rotation + Direction	Set the combination of text rotation and direction. * Setting is not available with vector parts. Four combinations are displayed in the drop-down menu. To select any other combination, click the icon at the bottom. A window that allows selection from all combinations is displayed.
Use Windows fonts	Select this checkbox to use a Windows font. * Setting is not available with vector parts.
Smooth Font[*1]	Smooth the edges of text. (Only settable for TrueType Windows fonts.)
Prioritize drawing of vectors	Indicates whether or not vector rendering is applied to text. * Shown only for vector parts. Selected: Vector rendering is applied. Unselected: Vector rendering is not applied. (Text registration for lamps is not available.) * Vector rendering of text is possible only for Japanese, English, Chinese (Simplified), and Chinese (Traditional) when [TrueType font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]. When any other font is selected, operation differs depending on the selected font. - When any TrueType font other than the above is selected: Vector rendering is applied but operation is not guaranteed. - When [Bitmap font] or [Gothic font] is selected: Text input in the [Char. Prop.] settings is not displayed on the X1 series unit. To enable vector rendering, separately place text in front of the lamp. For details on vector rendering, refer to “8.6 Vector Rendering” in the X1 Series Reference Manual 2.
Alignment	Set the text alignment. 
Text copy Copy only characters	The text and its attributes for the current pattern (OFF, ON, P3) are copied to the other patterns. Select the [Copy only characters] checkbox to copy text and coordinate information to all other patterns. Note that the text properties will not be copied. If the destination for copy has no text, text properties will also be copied.

Item	Description
Set line spacing	Set the pitch between lines.
Use the same style for all patterns	Select this checkbox to configure the same settings as the opened pattern attributes with respect to all lamp patterns (for each respective line if multiple lines are included).
Auto-adjust the size according to the style	Select this checkbox to automatically adjust the lamp size to the entered text.
Retain the coordinates when changing character string	Newly registered text is placed by centering. When any registered text is changed while this checkbox is selected, the coordinates remain the same. When a line is added to the existing text while this checkbox is selected, the added line is aligned with the upper line.
4-Line Display	Select this checkbox to divide the text entry area into four lines. This allows different properties to be specified for each line when using Windows fonts.

*1 Cannot be set to transparent.

Function



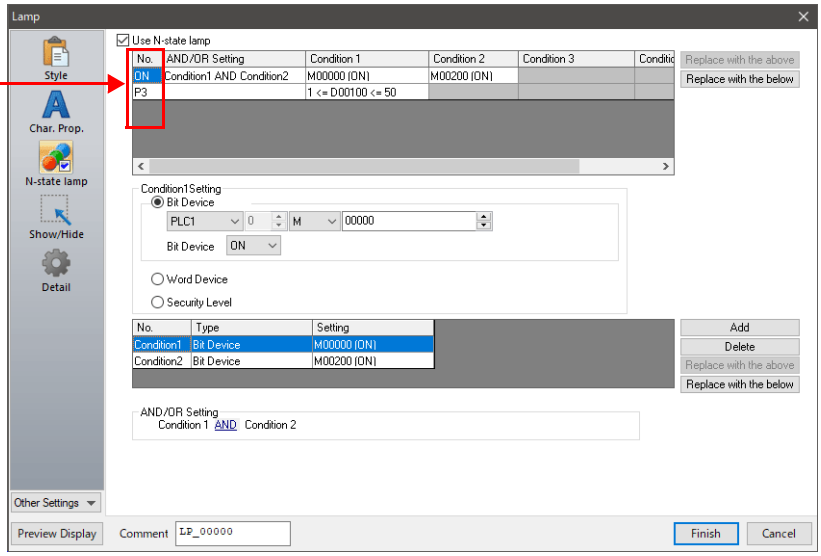
Item			Description
Function			Set the type of operation to be performed by the lamp.
	Standard	Standard	Use as a standalone part without any dependencies on other parts.
Display All			Select this checkbox to display all of the available lamp functions. *1

*1 The following function is added when the [Display All] checkbox is selected.

Name		Description	Linked Part	Refer to
Standard	Mode	Display a message on the lamp.	Alarm Message mode	page 8-1 page 12-1

N-State Lamp

The number of patterns specified in the [Style] settings is displayed.



Item			Description
Use N-state lamp			Select this checkbox to use the N-state lamp function. Specify bit device memory or word device memory for each pattern.
	Condition Setting		Set the conditions for operating a lamp. Click [Add] and set up a maximum of four conditions for lighting up the selected pattern.
		Bit Device	Light the lamp by setting the specified bit device memory to ON or OFF.
		Word Device	Light the lamp by setting a conditional expression for the specified word device memory. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Light the lamp according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

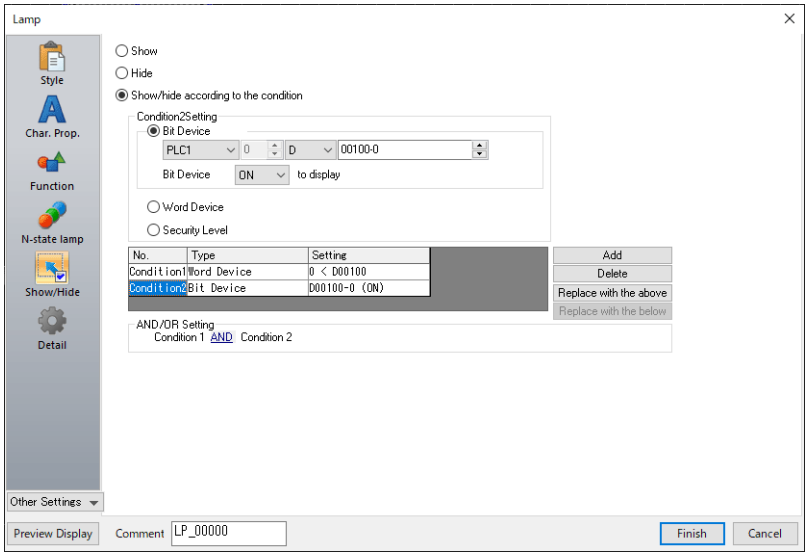
Precedence

The X1 series unit checks conditions in order starting from ON, P3, P4, and through to P128. The pattern for which conditions are determined to be satisfied the earliest is displayed.

Pattern No.	Precedence
ON	High
P3	↓
:	
P128	Low

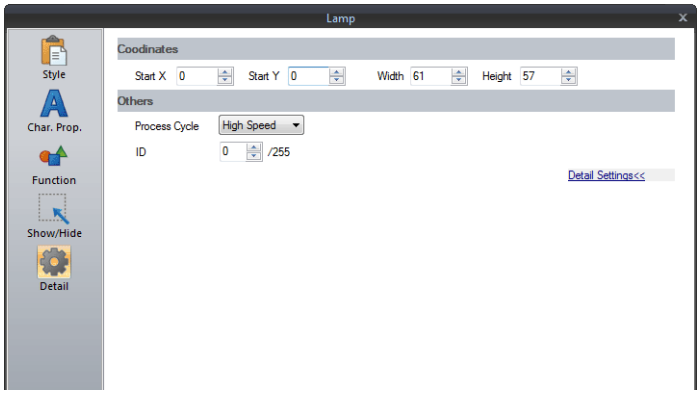
If all conditions are not satisfied, the OFF pattern is displayed.

Show/Hide



Item			Description
Show			Show the part on the screen.
Hide			Do not show the part on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail

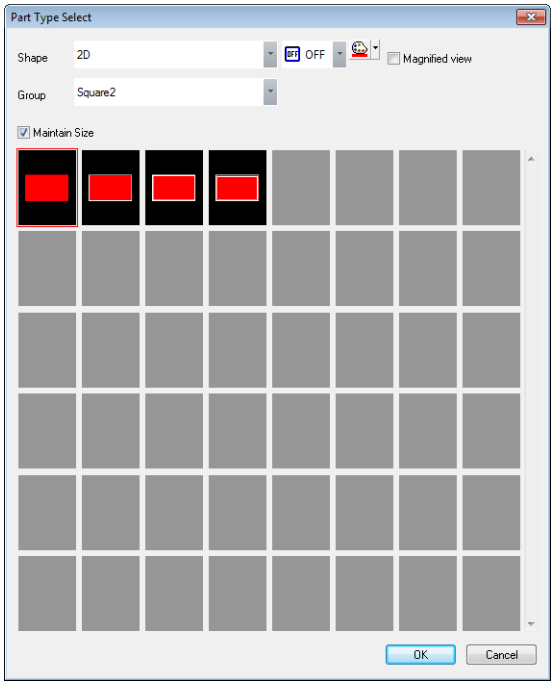


Item		Description
Coordinates	Start X/Start Y	Set the display position of the lamp using X and Y coordinates.
	Width/Height	Set the size of the lamp by specifying width and height.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

4.4 Draw Mode

XOR

Shape: 2D, group: square2

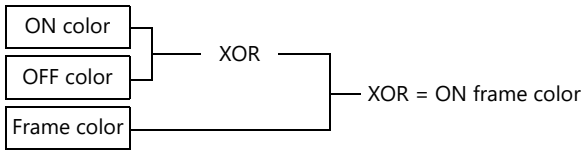


Text

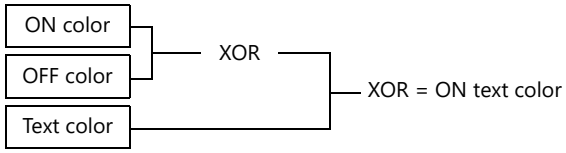
When setting text on a lamp, the same text is displayed for both OFF and ON statuses.
Set text on the [OFF] tab of [Char. Prop.].

Color

- OFF frame color/ON color/OFF color
  Set the lamp color via [Style] in the lamp settings window.
- OFF text color
  Set the text color via [Char. Prop.] in the lamp settings window.
- ON frame color
  The frame color to use when the lamp is ON cannot be set. It is automatically determined by an XOR operation as shown below.



- ON text color
  The text color to use when the lamp is ON cannot be set. It is automatically determined by an XOR operation as shown below.
  The text displayed when the lamp is ON is the same as that displayed when the lamp is OFF.



Display example

★[OFF color: Yellow]
[ON color: Red]
[Frame color: White] The frame color displayed when the lamp is ON

OFF color (yellow) (setting) A
OFF color (red) (setting) B
Frame color (white) (setting) D
→ XOR → Green C → XOR → Purple = ON frame color

			B					D
	Bla	Blu	R	Mag	Gre	C	Y	W
Bla	Bla	Blu	R	Mag	Gre	C	Y	W
Blu	Blu	Bla	Mag	R	C	Gre	W	Y
R	R	Mag	Bla	Blu	Y	W	Gre	C
Mag	Mag	R	Blu	Bla	W	Y	C	Gre
C Gre	Gre	C	Y	W	Bla	Blu	R	Mag
C	C	Gre	W	Y	Blu	Bla	Mag	R
A Y	Y	W	Gre	C	R	Mag	Bla	Blu
W	W	Y	C	Gre	Mag	R	Blu	Bla

C

★[OFF color: Yellow]
[ON color: Red]
[Text color: Blue] The text color displayed when the lamp is ON

OFF color (yellow) (setting) A
OFF color (red) (setting) B
OFF color (blue) (setting) D
→ XOR → Green C → XOR → Light blue = ON text color

		D	B					
	Bla	Blu	R	Mag	Gre	C	Y	W
Bla	Bla	Blu	R	Mag	Gre	C	Y	W
Blu	Blu	Bla	Mag	R	C	Gre	W	Y
R	R	Mag	Bla	Blu	Y	W	Gre	C
Mag	Mag	R	Blu	Bla	W	Y	C	Gre
C Gre	Gre	C	Y	W	Bla	Blu	R	Mag
C	C	Gre	W	Y	Blu	Bla	Mag	R
A Y	Y	W	Gre	C	R	Mag	Bla	Blu
W	W	Y	C	Gre	Mag	R	Blu	Bla

C

For parts other than [Shape: 2D], [Group: Square2]

Text

When setting text on a lamp, the same text is displayed for both OFF and ON statuses.
Set text on the [OFF] tab of [Char. Prop.].

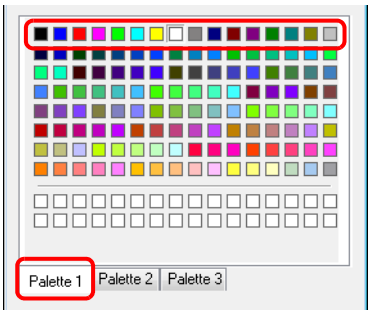
Color

- OFF color
  Set the lamp color via [Style] in the lamp settings window.
- ON color
  The color resulting from an XOR operation on the color specified for [Style] and the OFF color (explained above) is displayed.
- P3 to P128 color
  As with the ON color, the color resulting from an XOR operation on the color specified in the settings window and the OFF color is displayed.

Notes

Draw mode: When an XOR operation is performed, the colors that can be used are the 16 colors displayed on [Custom Color] → [Palette 1].
If a color other than the following 16 colors is selected, the XOR color may not be displayed correctly.

[Palette 1]



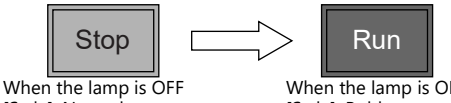
REP

Shape: 2D, group: square2

Text

When placing text on a lamp part in “REP” draw mode, the following two modes are available.

- When displaying different text when the lamp is ON and OFF:
  OFF text
  Set text on the [OFF] tab of [Char. Prop.].
  ON text
  Set text on the [ON] tab of [Char. Prop.].

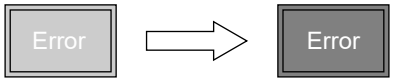


The text property can be set as shown.

When the lamp is OFF
[Style]: Normal

When the lamp is ON
[Style]: Bold

- When displaying the same text when the lamp is ON and OFF:
  OFF text
  Set text on the [OFF] tab of [Char. Prop.].
  ON text
  Nothing is set for the text on the [OFF] tab of [Char. Prop.].
  The text set in the character input box [OFF] is displayed when the lamp is ON.



Color

- ON frame color, OFF frame color, ON color, OFF color
  Set the lamp color via [Style] in the lamp settings window.
  The same frame color is used when the lamp is ON and OFF.
- OFF text color
  Set color on the [OFF] tab of [Char. Prop.].
- ON text color
  Set color on the [ON] tab of [Char. Prop.].
  The part is displayed in the selected colors.

For parts other than [Shape: 2D], [Group: Square2]

This case is mostly the same as when [Group] is set to “Square2”. (Refer to page 4-17.)
Differences

- ON frame color, ON color
  Set the lamp color via [Style] in the lamp settings window.
  A color different from the OFF frame color can be set.
- For P3 to P128, the selected colors are shown.

Notes

- When the OFF text color and the ON color are the same, the text cannot be shown when the lamp is turned ON.

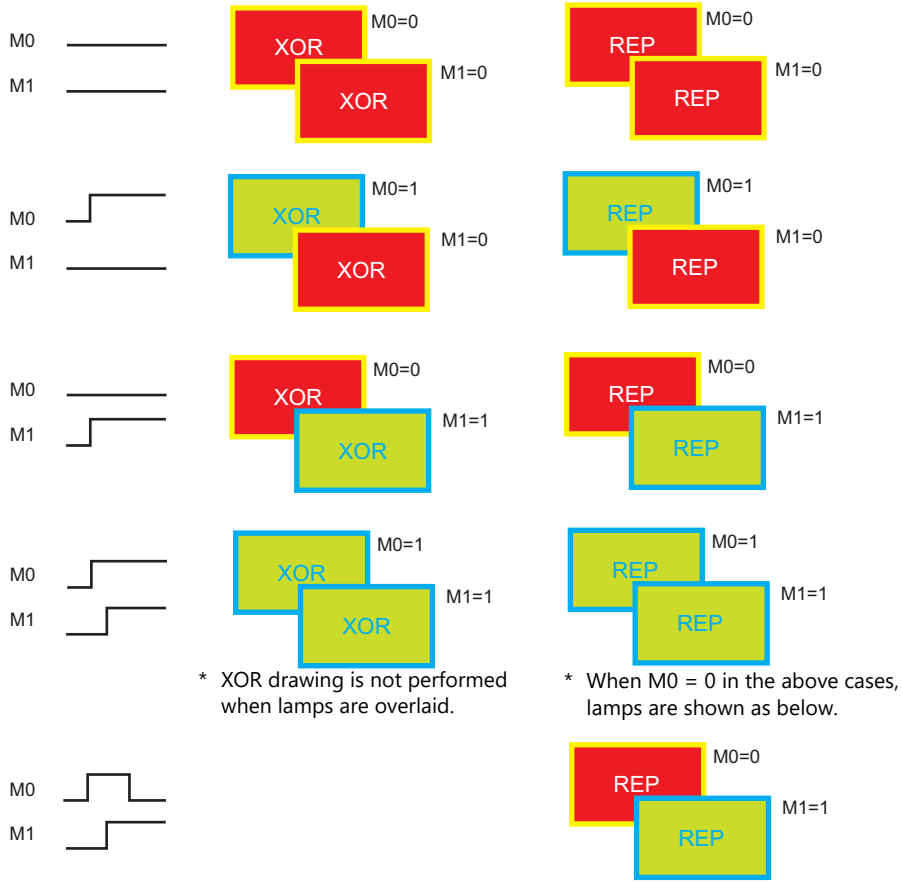
4.5 Notes

Number of lamps

A maximum of 4096 lamp parts can be created on a single screen.
For details, refer to the V9 Series Operation Manual.

Placing multiple lamp parts

When placing lamps overlaid, they are displayed as shown in the editor.
Take the following operations into consideration when creating screens.



* XOR drawing is not performed when lamps are overlaid.

* When M0 = 0 in the above cases, lamps are shown as below.

5 Data Display

5.1 Numerical Display

5.2 Character Display

5.3 Message Display

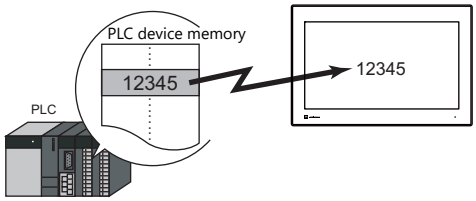
5.4 Table Data Display

5.5 Notes

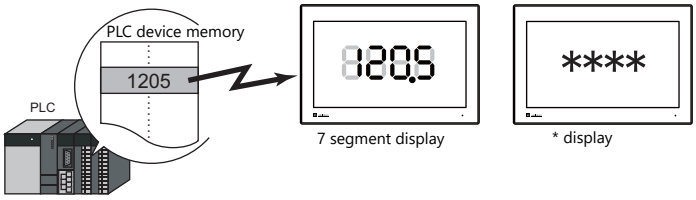
5.1 Numerical Display

5.1.1 Overview

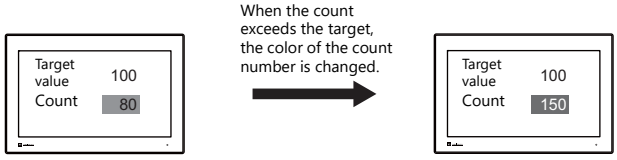
- Numerical data read from the PLC is displayed in real time on the screen in any of the following formats: DEC (w/o sign), DEC (with sign –), DEC (with sign +–), HEX (hexadecimal), OCT (octal), BIN (binary) and Real Number Type (decimal floating-point).



- Data read from the PLC can be shown on a 7 segment display and using * (asterisks).

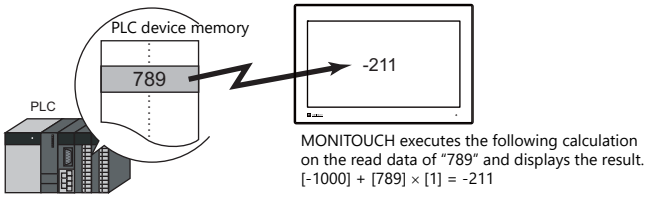


- It is possible to show data in a different color when it exceeds or falls short of a specific range. This setting can easily attract the operator's attention to the situation.

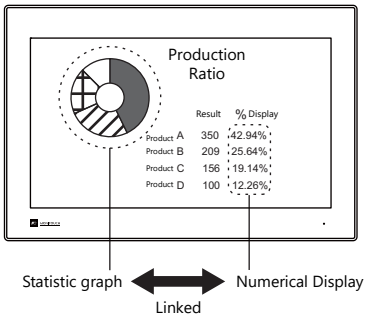


☞ For example settings, refer to "Monitoring PLC Device Memory" page 5-4.

- MONITOUCH can read data from the PLC, perform calculations, and display the result on the MONITOUCH screen.



- In addition to using numerical data displays ([Num. Display]) independently, they can also be linked to other parts. For example, in order to indicate data as a percentage in the statistic graph as shown below, it is necessary to link [Num. Display] with [Statistic Graph].
  This allows the percentage value to automatically reflect changes in the data of the statistic graph.



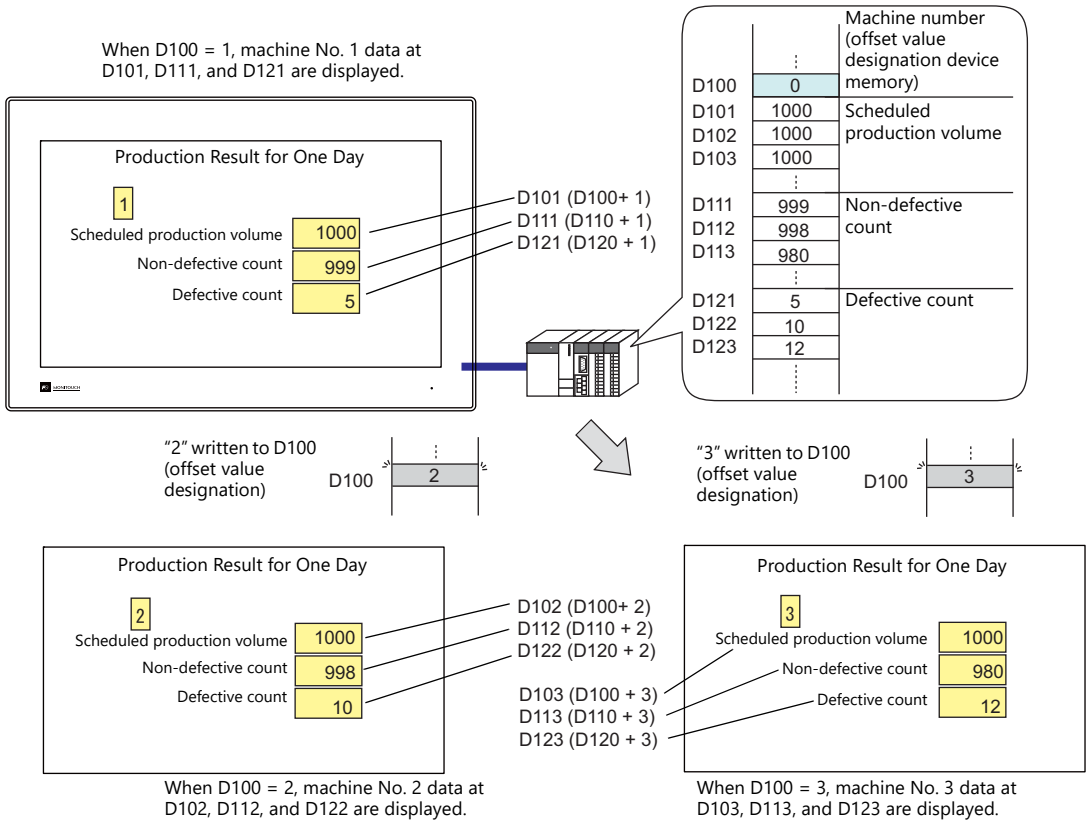
☞ For details, refer to "9.5 Statistic Bar Graph" "9.6 Statistic Pie Graph".

- Device memory for offset value designation
  A single numerical display part can be used to show different data by switching the device memory address assigned to the part. This can help to reduce the number of screens or parts used and facilitate screen maintenance.

  Example: Displaying scheduled production volume, non-defective count, and defective count for a machine selected from No. 1 to 3

  Numerical Display

Machine number:	D100 (device memory)
Scheduled production volume:	D100 (base), D100 (offset value designation)
Non-defective count:	D110 (base), D100 (offset value designation)
Defective count:	D120 (base), D100 (offset value designation)



- Specifying attributes using device memory
  The attributes (number of digits, decimal point, display type, or text color) of numerical display parts are easily changeable while MONITOUCH is in RUN mode.

  Example: Numerical data display D100 (no transparency)
  Change the decimal place from 0 to 1, text color from black to red, and background color from white to yellow.

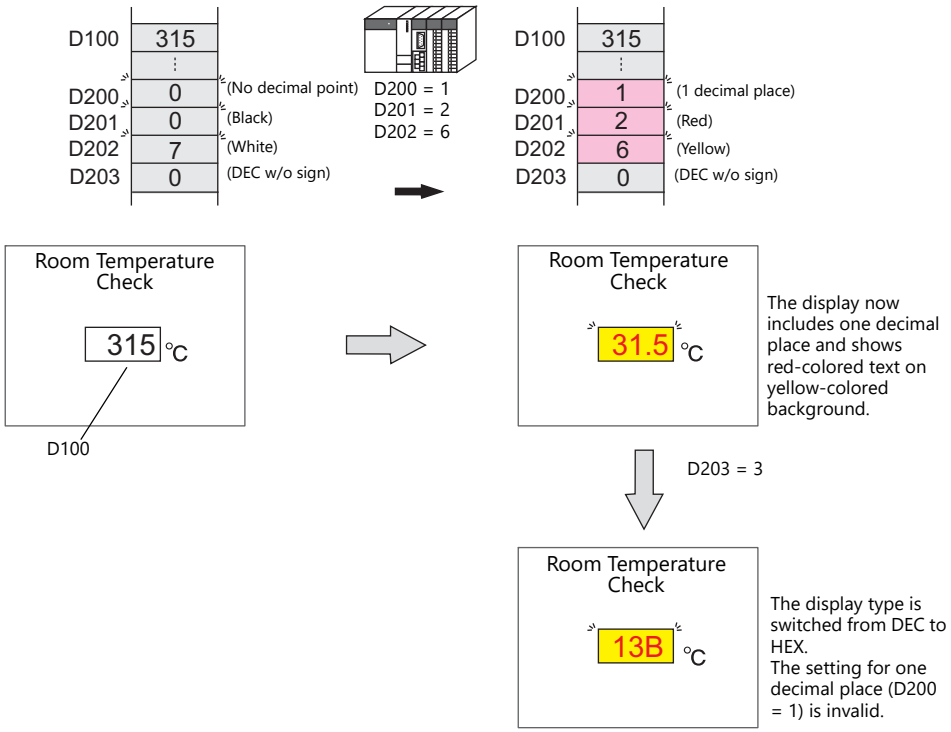
  Device memory addresses for changing attributes

  Decimal Point: D200

  Text color: D201

  Back Color: D202

  Display Type: D203

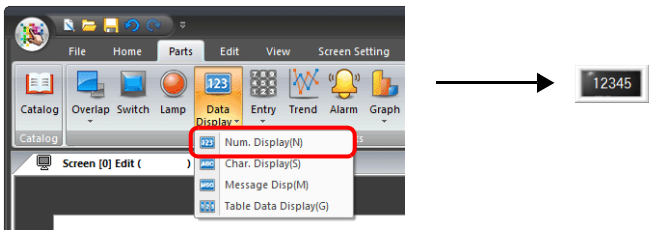


5.1.2 Setting Examples

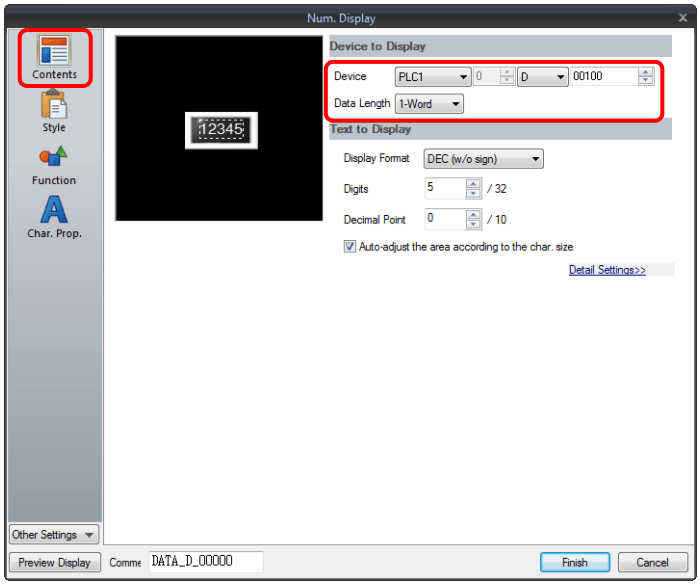
Monitoring PLC Device Memory

This example explains monitoring of a PLC device memory D100.
The numerical data display is shown in red when the value is less than “100” and yellow when the value exceeds “1000”.

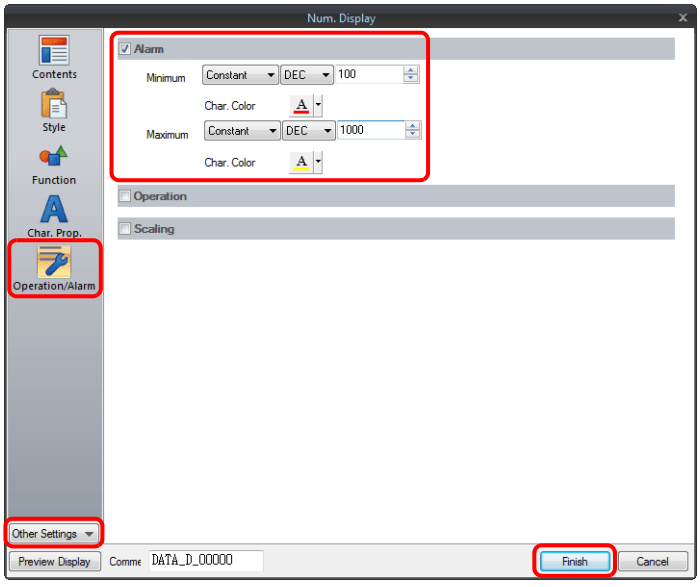
1. Click [Parts] → [Data Display] → [Num. Display] and place a numerical data display on the screen.



2. Double-click on the switch to display the settings window.
Configure the [Contents] settings as shown below.



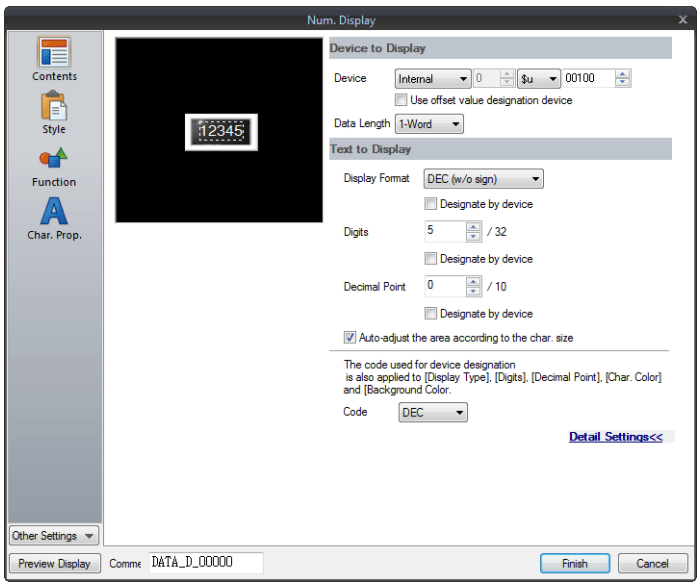
3. Click [Other Settings] → [Operation/Alarm].
Configure the following settings for [Operation/Alarm] and then click [Finish].



This completes the necessary settings.

5.1.3 Detailed Settings

Contents

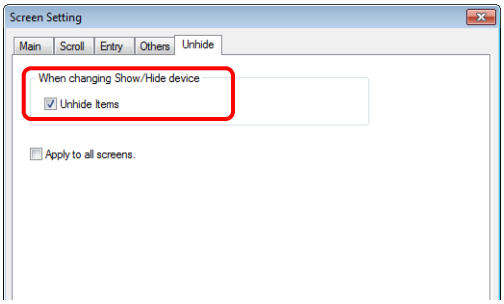


Item		Description
Device to Display	Device (base device memory)	Specify the device memory address to use for numerical data display.
	Use offset value designation device *1 *2	Set the device memory address and the code used for storing an offset value with respect to the value in the base device memory.
	Data Length *3 1-Word/2-Word	Select the data length used for this part.
Text to Display	Display Format	Select the format of numbers to be displayed on the screen.
	Designate by device *4	Select this checkbox to change the display format according to the value specified for the device memory address. * This item cannot be used when "Real Number Type" is specified above for [Display Format].
	Digits *5	Specify the number of digits for the numerical data display.
	Designate by device *4	Select this checkbox to change the number of digits according to the value specified for the device memory address.
	Decimal Point	Specify the decimal place. The number of decimal places must be smaller than the number of digits. When no decimal point is required, set "0".
	Designate by device *4	Select this checkbox to change the decimal point according to the value specified for the device memory address.
	Auto-adjust the area according to the char. size	Select this checkbox to automatically adjust the item size based on the [Digits] and [Decimal Point] settings.
	Code	When a [Designate by device] checkbox is selected, set the code used when reading values from the device memory address. This setting applies to [Display Format], [Digits], [Decimal Point], [Char. Color], and [Background].

Code	Setting Range
DEC	0 - 65535
BCD	0 - 9999
Real Number Type (DEC)	0 - 65535

*1 The device memory for offset value designation is read every cycle, regardless of the item processing cycle. Screen updates depend on the setting of the [Redraw the screen] checkbox in [Screen Setting] → [Screen Setting] → [Unhide] → [Unhide Items].

- Selected:
  Update the screen when the value in the device memory for offset value designation changes.
  Only update the items on the screen whose value changed in the device memory for offset value designation (the screen is not redrawn).
- Unselected:
  The screen is updated at the following times.
  Screen change/screen redraw/multi-overlap change (when there are parts placed on multi-overlap)



*2 Notes on using the device memory for offset value designation

- When the screen is updated, the device memory for offset value designation is read for the items placed on the screen. This means that for a screen that includes multiple addresses of the device memory for offset value designation, the updated screen is displayed upon completion of reading all of these device memory addresses. If screen updates are taking too long, use of the internal device memory is recommended.
- When setting offset values on a screen, the setting needs to be completed before the screen is changed to another screen. In a case where an offset value is designated in an OPEN macro, the offset value is not valid when the screen is open, but becomes valid when the screen is updated.
- An error occurs if a value set to the device memory for offset value designation is outside the permissible range. Observe the specified range for setting.

*3 Relationship between data length and display format

Code Format	1-word Display Range	2-word Display Range
DEC (w/o sign)	0 - 65535	0 - 4294967295
DEC (with sign –)	–32768 - 32767	–2147483648 - 2147483647
DEC (with sign +–)	–32768 - +32767	–2147483648 - +2147483647
HEX	0 - FFFF	0 - FFFFFFFF
OCT	0 - 177777	0 - 37777777777
BIN (Binary)	0 - 1111111111111111	0 - 11111111111111111111111111111111

*4 For details on the method for specifying attributes using device memory, refer to "Specifying attributes using device memory" page 5-7.

*5 When a value exceeding the set number of digits is entered:

Code Format	DEC	HEX/OCT/BIN
Display	Overflow display	Numbers from the right
E.g.: Data length: 1 word Digits: 3 Entered value: 1010	– – –	010

Specifying attributes using device memory

When a [Designate by device] checkbox in [Contents] → [Detail Settings] or a [Designate by device] checkbox in [Char. Prop.] → [Detail Settings] is selected, the corresponding attribute can be changed by specifying a value using a device memory address.

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td>Contents</td><td>Display Format</td><td>Specify the display format for the numerical data display.
Set a value according to the following.

0: DEC (w/o sign)
1: DEC (w/ –sign)
2: DEC (w/ +–sign)
3: HEX
4: OCT
5: BIN
6: FLOAT*
7: BCD (w/o sign)
8: BCD (w/ –sign)
9: BCD (w/ +–sign)

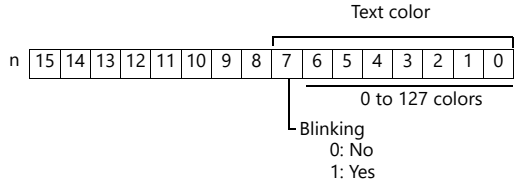
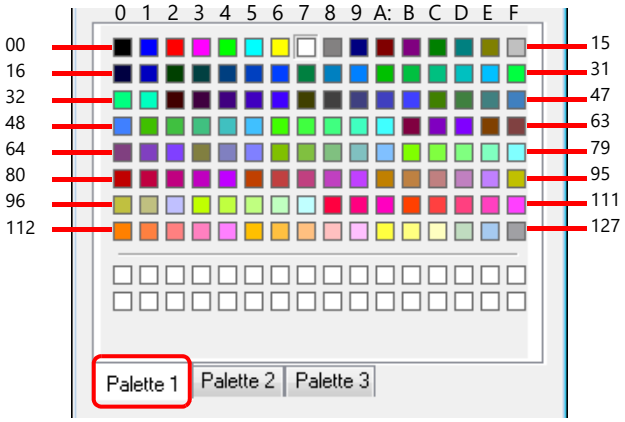
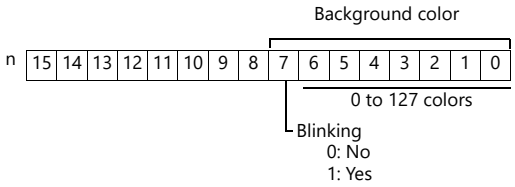
* This setting is enabled when “2-Word” is set for [Contents] → [Data Length].</td></tr>
<tr><td></td><td>Digits</td><td>When the numerical data display includes decimal places, specify the total number of digits including the number of decimal places.

<table>
<tr><th>Display Type</th><th>Digits</th></tr>
<tr><td>DEC</td><td>1 - 10</td></tr>
<tr><td>HEX</td><td>1 - 8</td></tr>
<tr><td>OCT</td><td>1 - 11</td></tr>
<tr><td>BCD</td><td>1 - 8</td></tr>
<tr><td>BIN</td><td>1 - 32</td></tr>
<tr><td>FLOAT</td><td>1 - 32</td></tr>
</table>

* If a read value exceeds the limit specified for the number of digits, hyphens are displayed to indicate that an overflow occurred.</td></tr>
<tr><td></td><td>Decimal Point</td><td>Specify the number of decimal places for the numerical data display.

<table>
<tr><th>Display Type</th><th>Digits</th></tr>
<tr><td>DEC</td><td>0 - 9</td></tr>
<tr><td>BCD</td><td>0 - 7</td></tr>
<tr><td>FLOAT</td><td>0 - 31</td></tr>
<tr><td>HEX/OCT/BIN*</td><td>-</td></tr>
</table>

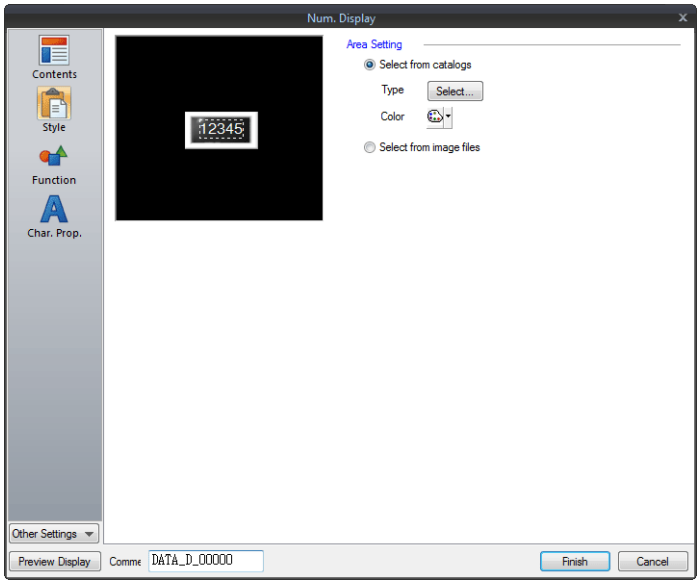
* The number of decimal places must be smaller than the total number of digits. An overflow will occur if the number of decimal places is the same or more than the total number of digits.
When [Display Format] is set to “HEX”, “OCT”, or “BIN (Binary)”, the decimal point setting does not take effect.
Even if a value is set for [Decimal Point] in such a case, it is assumed to be zero.</td></tr>
</table>

Item		Description
Char. Prop.	Char. Color	Set the color for text. Bits 0 to 6: Color Bit 7: Blinking (0: No, 1: Yes)  A color can be selected from the 128 colors (and blinking) on [Palette 1] in the [Custom Color] window. Colors correspond to the following color codes. [Palette 1] 
	Background	Specify the background color of text. Bits 0 to 6: Color Bit 7: Blinking (0: No, 1: Yes)  A color can be selected from the 128 colors (and blinking) on [Palette 1] in the [Custom Color] window. For details on color codes, refer to the “Char. Color” section. * **However, note that the background color setting does not take effect when [Char. Prop.] → [Style] is set to “transparent”.**

Notes on changing attributes using device memory

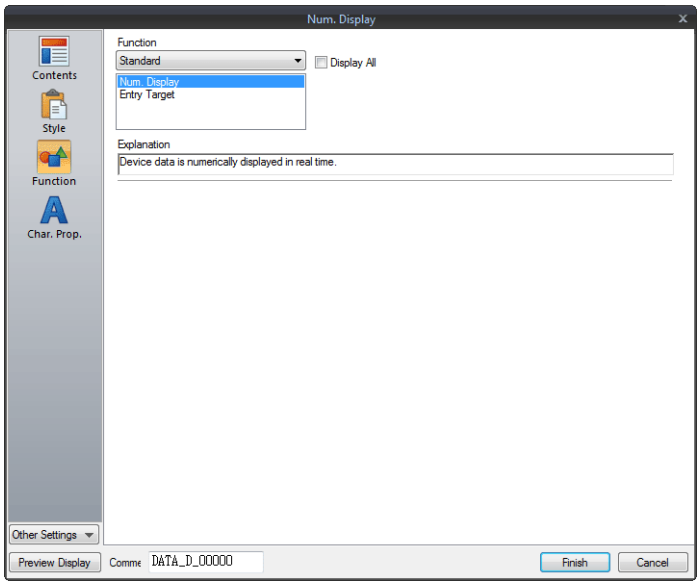
- The update timing depends on the setting of [Detail] → [Process Cycle] of each part.
- For parts with a frame, the frame size does not change according to the setting of [Digits], [Decimal Point], or [Display Format].
  For this reason, the maximum number of digits in the screen program must be set in advance.
- When [Char. Prop.] → [Style] is set to “not transparent”, the drawing range of the background drawing area will be affected by changes to the settings of [Digits], [Decimal Point], and [Display Format]. This means that if the set number of digits decreases, the background color will remain on the screen.
  For this reason, the maximum number of digits in the screen program must be set in advance. Alternatively, update the display by executing the “SYS (RESET_SCRN)” macro command or by changing the screen.
- If a displayed value has become higher than the maximum or lower than the minimum specified for alarm, the value is shown in the color specified for the alarm.
- The “CHG_DATA” macro command cannot be used with numerical data displays for which a [Designate by device] checkbox is selected.
- When “Entry Target” is set for [Function], the display is switched when the cursor is moved from the display field.

Style



Item		Description
Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color.
	Select from image files	Select a PNG or SVG file.

Function

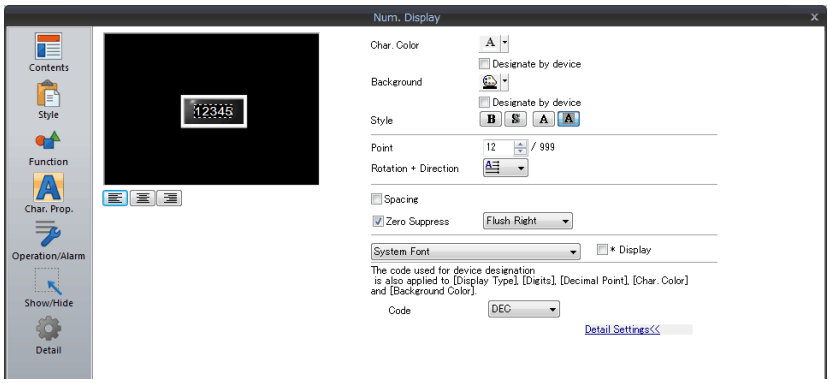


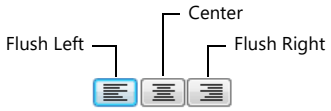
Item			Description
Function			Set the type of operation performed by the numerical data display.
	Standard	Num. Display	Display device memory values on the numerical data display in real time.
		Entry Target	Used in conjunction with the entry function. For details, refer to "6.1 Numerical Data Entry".
Display All			Select this checkbox to display all of the available numerical data display functions. *1

*1 The following function is added when the [Display All] checkbox is selected.

Name		Description	Linked Part	Refer to
Standard	Entry Display Part	Temporarily display values entered using a keypad.	Entry	page 6-1
	Max. Value Display Part	Display the maximum value that can be entered using a keypad.		
	Min. Value Display Part	Display the minimum value that can be entered using a keypad.		
	Statistic Graph % Display	Display statistical data on the graph as a percentage.	Statistic graph Statistic pie graph	page 9-47 page 9-53
	Digital Switch	Display a digital switch value.	Switch	page 3-29
Logging	Logging Count Display	Display the number of logging entries or the number of the logged data within the trend data currently selected using the cursor.	Trend	page 7-1
	Logging Time Display	Display the last logging time or the logging time of the trend data currently selected using the cursor.		
	Mean Value Display	Display the average value of all data stored in the logging block.		
	Max. Display	Display the maximum value of all data stored in the logging block.		
	Min. Display	Display the minimum value of all data stored in the logging block.		
	Total Display	Display the total value of all data stored in the logging block.		
	Display start time	Display the logging time of the oldest data on the currently displayed graph.		
	Display end time	Display the logging time of the newest data on the currently displayed graph.		
	Currently Selected Value Display	Display the latest logging value or the cursor point value of each graph currently selected using the cursor.		
Alarm	Count Display	Display the number of alarm logs or the No. of the sampled data within the log data currently selected using the cursor.	Alarm	page 8-1
	Time Display	Display the last alarm log time or the sampling time of the log data currently selected using the cursor.		

Char. Prop.

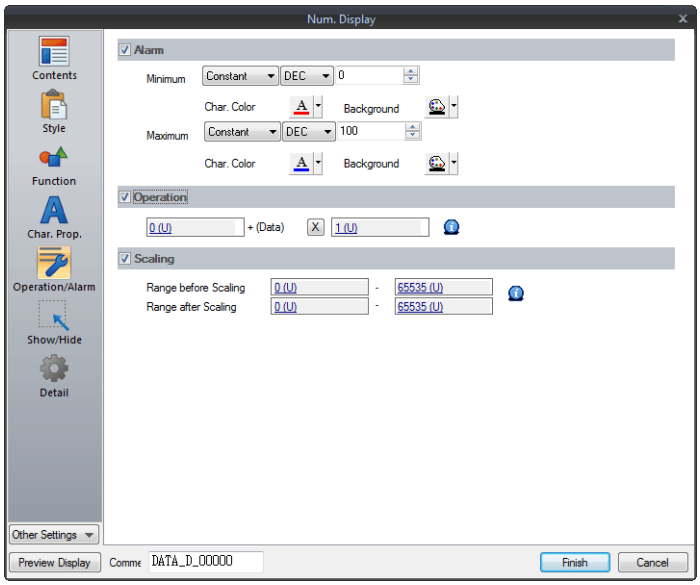


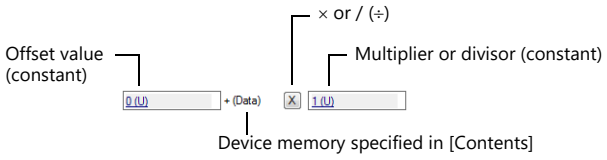
Item	Description
Alignment	Set the text alignment. 
Value to Display on Preview	This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the value to display on the editor.
Char. Color	Set the color for text.
Designate by device *1	Select this checkbox to change the text color according to the value specified for the device memory address.
Background	Set the background color of text.
Designate by device *1	Select this checkbox to change the background color according to the value specified for the device memory address.
Style	Set the text style.
Character Size (1 - 8)	Specify the enlargement factor for text. * When [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Point (6 - 999)	Set the text size. * When a font type other than [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Rotation + Direction *2	Set the combination of text rotation and direction. Four combinations are displayed in the drop-down menu. When selecting an option other than the above, click the icon at the bottom. The window that allows selection from all options is displayed.
Spacing *2	Select this checkbox to specify the spacing between characters.
Zero Suppress	Select this checkbox to use zero suppression. Spaces [☑ Zero Suppress] (Flush Right) → 123 [☐ Zero Suppress] → 000123 When this checkbox is checked, select either [Flush Left] or [Flush right]. Flush Left → 123 Flush Right → 123
Prioritize drawing of vectors	Indicates whether or not vector rendering is applied to text. * Shown only for vector parts. Selected: Vector rendering is applied. Unselected: Vector rendering is not applied. * Vector rendering of text is possible only for Japanese, English, Chinese (Simplified), and Chinese (Traditional) when [TrueType font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]. When any other font is selected, operation differs depending on the selected font. - When any TrueType font other than the above is selected: Vector rendering is applied but operation is not guaranteed. - When [Bitmap font] or [Gothic font] is selected: Vector rendering is not applied to text. For details on vector rendering, refer to “8.6 Vector Rendering” in the X1 Series Reference Manual 2.

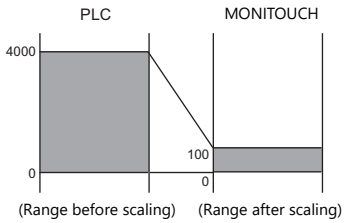
Item			Description
System Font Windows Font *2 7-segment Font *2			Select the font to use for the numerical data display. When "7-segment Font" is selected, select the [Display light-out segments] checkbox to display unlit segments.
	Smooth Font *3		When "Windows Font" is selected, select this checkbox to smooth the edges of text. (Only settable for TrueType Windows fonts.)
	Display light-out segments *4		When "7-segment Font" is selected, select this checkbox to display unlit segments.
* Display			Select this checkbox to display * (asterisks) instead of numbers.
Code			When a [Designate by device] checkbox is selected, set the code used when reading values from the device memory. This setting applies to [Display Format], [Digits], [Decimal Point], [Char. Color], and [Background].

*1 For details on the method for specifying attributes using device memory, refer to "Specifying attributes using device memory" page 5-7.
*2 Setting is not available with vector parts.
*3 Cannot be set to transparent.
*4 Featuring digital display fonts by Yourname, Inc.

Operation/Alarm



Item			Description
Alarm			Select this checkbox to display data in a different color when it exceeds or falls short of a specific range. When "Entry Target" is selected for [Function], the range of values that can be entered using a keypad can be set. For details on numerical value entry, refer to "6.1 Numerical Data Entry".
	Minimum		Set the minimum value used to trigger an alarm.
		Use offset value designation device	Set the device memory and code used for storing an offset value for the minimum value.
		Char. Color	Set the color for text.
		Background	Set the background color of text.
	Maximum		Set the maximum value used to trigger an alarm.
		Use offset value designation device	Set the device memory and code used for storing an offset value for the maximum value.
		Char. Color	Set the color for text.
		Background	Set the background color of text.
Operation *1			Select this checkbox to perform an operation on the value of the device memory specified in [Contents]. 

Item		Description
Scaling *2		Select this checkbox to display data after automatically converting the data read from the PLC ([Range before Scaling]) to the specified range ([Range after Scaling]). This eliminates the need for correction programs for data read from the PLC when displaying information such as temperature, rotation speed, etc. 
	Range before Scaling	Specify the data to be read from the PLC.
	Range after Scaling	Specify the range of data to be shown on MONITOUCH.

*1 Operations

Example: Data read from PLC is "789".

- When "BCD" is selected for [Input Type] and negative numbers are displayed
  (Negative numbers do not exist in the BCD format.)
  Select either [DEC (with sign –)] or [DEC (with sign +–)] for [Contents] → [Display Type].

[offset value]		+	(data)	[×]	[multiplier]	=	display data
[0]		+	(789)	[×]	[–1]	=	–789
Or	[–1000]	+	(789)	[×]	[1]	=	–211

- Example of multiplication

[offset value]	+	(data)	[×]	[multiplier]	=	display data
[1000]	+	(789)	[×]	[1]	=	1789
[0]	+	(789)	[×]	[100]	=	78900

- Example of division with a decimal point
  When "2" is entered for [Decimal Point] in [Contents], "7.89" is read into MONITOUCH.

[offset value]	+	(data)	[÷]	[divisor]	=	display data
[0]	+	(7.89)	[÷]	[100]	=	0.0789

Data is rounded down to two decimal places to display "0.07".

- Example of division without a decimal point

[offset value]	+	(data)	[÷]	[divisor]	=	display data
[0]	+	(789)	[÷]	[–100]	=	–7.89

Data is rounded to a whole number to display "–7".

[offset value]	+	(data)	[÷]	[divisor]	=	display data
[200]	+	(789)	[÷]	[100]	=	207.89

Data is rounded to a whole number to display "207".

Example: When an operation is set for "Entry Target" (entry mode)

- The value entered using a keypad is displayed (= result of operation).
  The value (i.e. data) stored in the device memory is the source value used in the operation.

[offset value]	+	(data)	[×]	[multiplier]
[0]	+	(A)	[×]	[100]

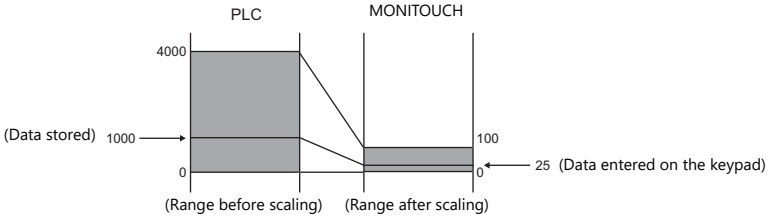
Input of "100"	→	100 = (A) × 100	→ (A) = 1
Input of "550"	→	550 = (A) × 100	→ (A) = 5 (remainder of 50 is ignored, "500" is displayed)
Input of "1340"	→	1340 = (A) × 100	→ (A) = 13 (remainder of 40 is ignored, "1300" is displayed)

[offset value]	+	(data)	[÷]	[divisor]
[0]	+	(A)	[÷]	[100]

Input of "100"	→	100 = (A) / 100	→ (A) = 10000
Input of "550"	→	550 = (A) / 100	→ (A) = 55000
Input of "1340"	→	1340 = (A) / 100	→ (A) = 2928 (A word exceeds 5 digit display)

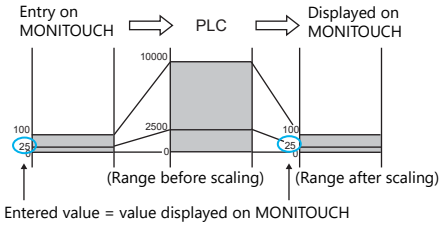
*2 Scaling

- If data in the PLC device memory multiplied by the maximum value specified for [Range after Scaling] is greater than a double-word, it cannot be displayed correctly.
- Example: Numerical data display
  When data in the PLC device memory address D100 is "2000" with a range of 0 to 4000 specified for [Range before Scaling] and a range of 0 to 100 specified for [Range after Scaling], "50" is displayed on MONITOUCH.
- Example: When scaling is set for "Entry Target" (entry mode)
  When "25" is entered using a keypad and a range of 0 to 4000 is specified for [Range before Scaling] and a range of 0 to 100 is specified for [Range after Scaling], "1,000" is written to the PLC device memory address D100.

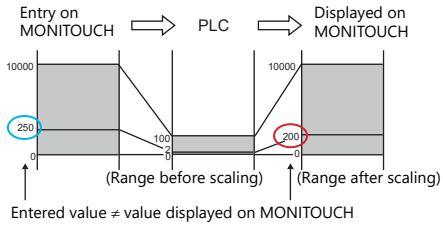


- Notes on using entry targets (entry mode)
  Errors may occur when using entry targets. The entered value will be displayed correctly if [Range before Scaling] is greater than [Range after Scaling].

If [Range before Scaling] > [Range after Scaling], the entered value is displayed correctly.



If [Range before Scaling] < [Range after Scaling], the entered value is not displayed correctly.

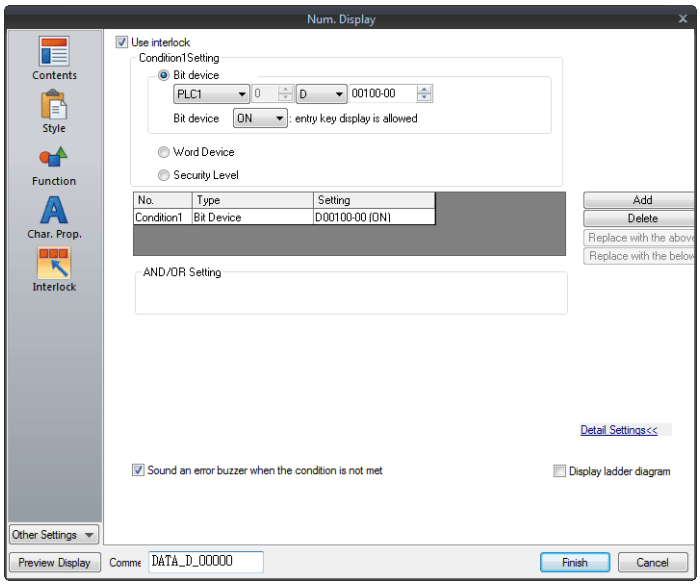


When comparing [Range before Scaling] with [Range after Scaling], remove the decimal point from the display range.

Example: 0 to 10000 for [Range before Scaling] and 0.00 to 500.00 for [Range after Scaling]
The range after scaling is converted to 0 to 50000, which means [Range before Scaling] < [Range after Scaling] and the entered value is not displayed correctly.

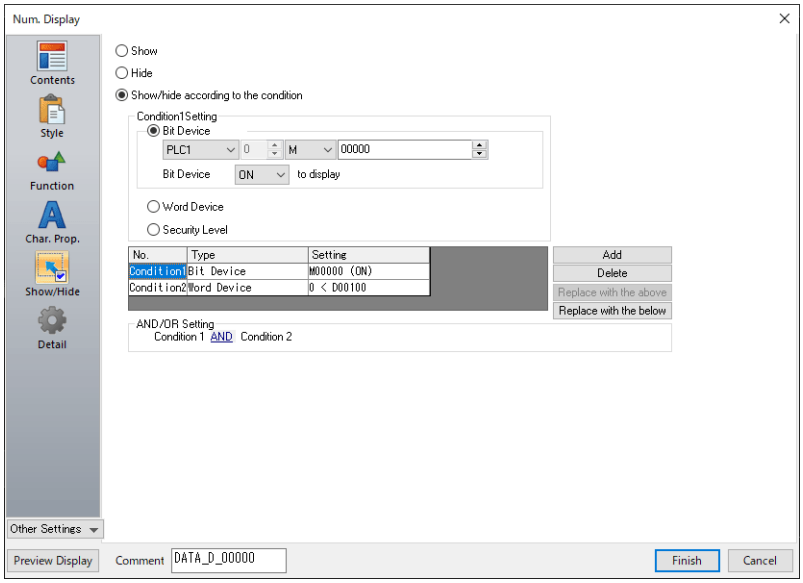
Interlock

This setting is only available when [Function] for a numerical data display is set to “Entry Target” and the [Display the keyboard] checkbox is selected.



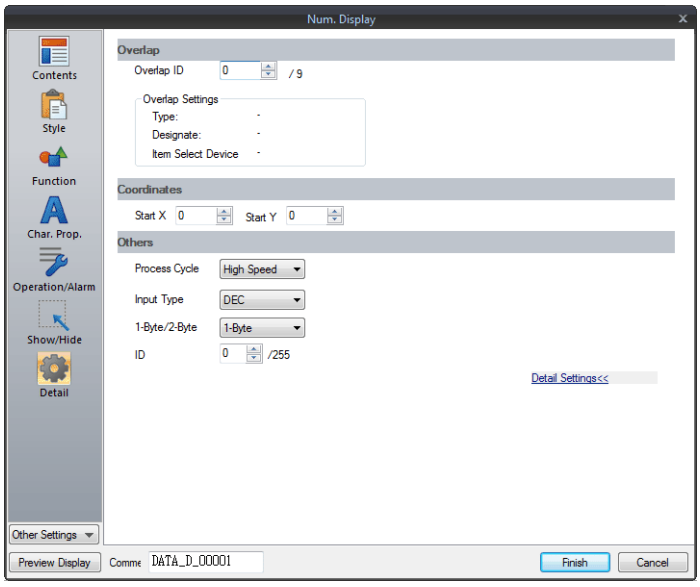
Item			Description
Use interlock			Select this checkbox to add an interlock to the overlap display function of a numerical data display. Click [Add] to set up to 5 conditions that must be satisfied for the interlock to activate.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for the interlock to activate.
		Bit device	Set the interlock bit address. Bit device “ON”: overlap display is allowed When [Bit device] is OFF, overlap display is prohibited. When [Bit device] is ON, overlap display is allowed. Bit device “OFF”: overlap display is allowed When [Bit device] is OFF, overlap display is allowed. When [Bit device] is ON, overlap display is prohibited.
		Word Device	Set the comparison condition expression of the interlock device memory. Data Length: Set the data length of the condition value. 1-Word/2-Word Constant Display Type: Set the format of the comparison condition expression. [DEC +–]/[DEC]/[BCD]/[HEX] Comparison condition expression: Set a comparison sign, value, and device memory as the conditions for comparison.
		Security Level	Used in conjunction with the security function. Allow users of levels higher than the set level to display overlaps. For details on security functions, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When two or more conditions are set for activating the interlock, set whether to perform AND and OR operations on the conditions.
	Detailed Settings	Sound an error buzzer when the condition is not met	Set whether an error buzzer sounds when the numerical display is pressed although conditions are not satisfied. Deselected: A buzzer does not sound. Selected: A buzzer will sound.
	Display ladder diagram		Select this checkbox to display the configured conditions for interlock activation as a ladder diagram.
	Display setting details		Select this checkbox to configure condition settings on the ladder diagram.

Show/Hide



Item			Description
Show			Show the item on the screen.
Hide			Do not show the item on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail



Item		Description
Overlap	Overlap ID (0 - 9)	When the [Function] for a numerical data display is set to "Entry Target" and the [Display the keyboard] checkbox is selected, specify the overlap ID for displaying the keyboard.
Coordinates	Start X/Start Y	Set the display position of the numerical data display using X and Y coordinates.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	Input Type	Select the code to use when reading data from the PLC device memory address. BCD, DEC, Actual Number *1
	1-Byte / 2-Byte	Select one-byte or two-bytes for displaying numerical data.
	Save an operation log	Used in conjunction with the operation log. For details, refer to "4 Operation Log" in X1 Series Reference Manual 2.
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

*1 For details on real numbers (floating point data), refer to "5.1.4 Real Numbers (Floating Point Numbers)" page 5-18.

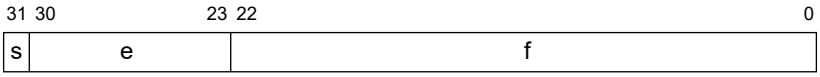
5.1.4 Real Numbers (Floating Point Numbers)

MONITOUCH can handle real numbers specified by the IEEE 754 standard (32-bit single precision real number format).

Overview

IEEE 754 standard (32-bit single precision real number format)

32 bits are defined in the following format.



The above format expresses decimal floating-point data as shown below.

- Normalized numbers

$$(-1)^{s} \times 2^{(e-127)} \times (1.f)$$

Symbol	Name	Description
s	Sign	0: Positive 1: Negative
e	Exponent	0 - 255 * However, if "255" is specified, it cannot be regarded as a decimal floating-point number. If "0" is specified, it is regarded as a denormalized number.
f	Significand	This is a binary fraction less than 1. The final significand can be calculated using the following formula: $[1.f] = [1 + f \times 2^{-23}]$

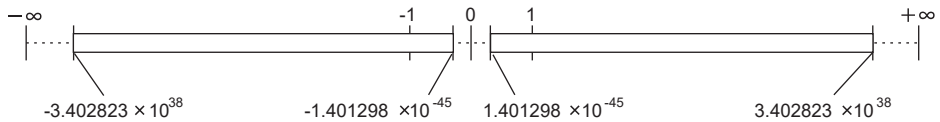
- Denormalized numbers (e = 0)

$$(-1)^{s} \times 2^{-126} \times (0.f)$$

Symbol	Name	Description
s	Sign	0: Positive 1: Negative
e	Exponent	Since e = 0, the exponent will be "-126".
f	Significand	$f \neq 0$ This is a binary fraction less than 1. The final significand can be calculated using the following formula: $[0.f] = [f \times 2^{-23}]$

Applicable range

$-3.402823 \times 10^{38} \leq n \leq -1.401298 \times 10^{-45}$
$1.401298 \times 10^{-45} \leq n \leq 3.402823 \times 10^{38}$
(Significant digits: approx. 7 (in decimal))

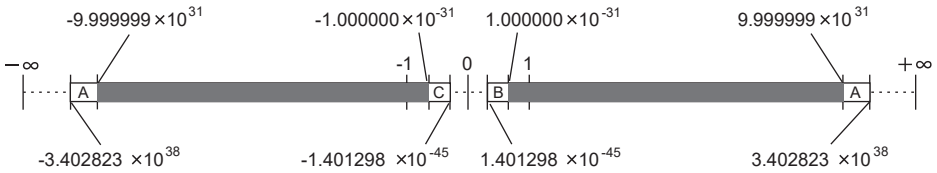


When the value satisfies the following conditions, it cannot be handled as a decimal floating-point number.

e = 255, $f \neq 0$ (non-numerical)
e = 255, f = 0, s = 0 (+∞)
e = 255, f = 0, s = 1 (−∞)
e = (0)

MONITOUCH display range

$-9.999999 \times 10^{31} \leq n \leq -1.000000 \times 10^{-31}$
$1.000000 \times 10^{-31} \leq n \leq 9.999999 \times 10^{31}$

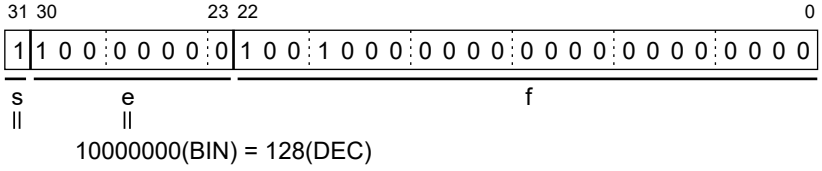


A: Overflow display (- - - -)
B: 0
C: –0

Decimal Floating-point Data Example

Example 1

When the following 32-bit data is displayed as decimal floating-point data, it is calculated as shown below.



$$(-1)^{s} \times 2^{(e-127)} \times (1.f)$$

$$[1 + f \times 2^{-23}]$$
$$= [1 + (2^{22} + 2^{19}) \times 2^{-23}] = [1 + (2^{22-23} + 2^{19-23})]$$
$$= [1 + 2^{-1} + 2^{-4}] = [1 + 0.5 + 0.0625]$$
$$= 1.5625$$

$$2^{(128-127)} = 2^{1} = 2$$

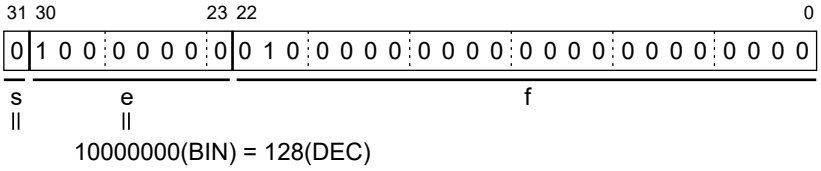
$$(-1)^{1} = -1$$

$$-1 \times 2 \times 1.5625 = -3.125$$

As a result, a value of "-3.125" is shown on MONITOUCH.

Example 2

When the following 32-bit data is displayed as decimal floating-point data, it is calculated as shown below.



$$(-1)^{s} \times 2^{(e-127)} \times (1.f)$$

$$[1 + f \times 2^{-23}]$$
$$= [1 + (2^{21}) \times 2^{-23}] = [1 + 2^{-2}]$$
$$= [1 + 0.25] = 1.25$$

$$2^{(128-127)} = 2^{1} = 2$$

$$(-1)^{0} = 1$$

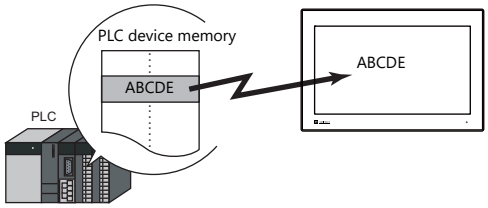
$$1 \times 2 \times 1.25 = 2.5$$

As a result, a value of "2.5" is shown on MONITOUCH.

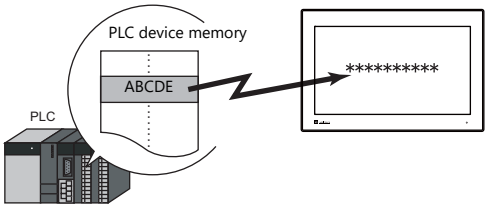
5.2 Character Display

5.2.1 Overview

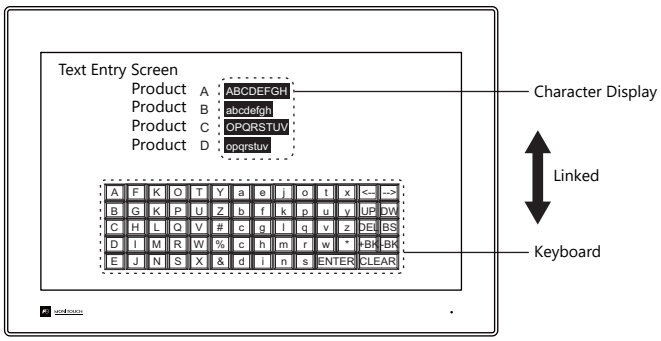
- Data read from the PLC is displayed in the form of characters on the MONITOUCH screen in real time. ANK codes are assigned to one-byte characters and Shift-JIS codes are assigned to two-byte characters.



- Read data can also be displayed using * (asterisks). This can be used to hide passwords.



- In addition to using a character display ([Char. Display]) independently, it can also be linked with another part.
  For example, when a character key set up in [Entry] mode is pressed, the character is entered in the [Char. Display] part specified as "entry target." This is made possible by linking [Char. Display] with the [Entry] mode.



☞ For details, refer to "6.2 Character Input".

- Device memory for offset value designation
  A single character display part can be used to show different data by switching the device memory address assigned to the part. This can help to reduce the number of screens or parts used and facilitate screen maintenance.

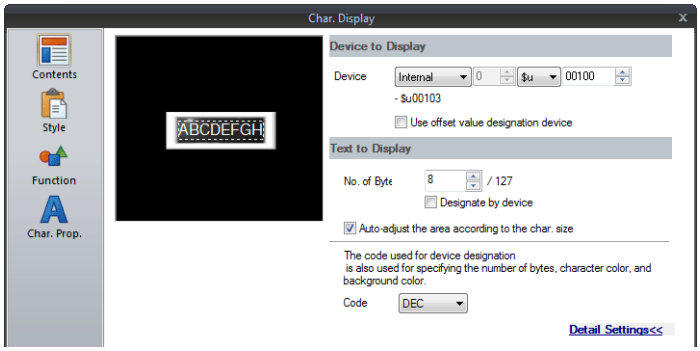
☞ For details, refer to page 5-2.

- Device memory for changing attributes
  The attributes (number of bytes or text color) of character display parts are easily changeable while MONITOUCH is in RUN mode.

☞ For details, refer to page 5-3.

5.2.2 Detailed Settings

Contents



Item		Description
Device to Display	Device *1 (base device memory)	Specify the device memory address to use for character display.
	Use offset value designation device *2 *3	Set the device memory address and the code used for storing an offset value with respect to the value in the base device memory.
Text to Display	No. of Bytes (1 - 127)	Specify the number of bytes used by this part.
	Designate by device *4	Select this checkbox to change the number of bytes according to the value specified for the device memory address.
	Auto-adjust the area according to the char. size	Select this checkbox to automatically adjust the item size based on the [Digits] and [Decimal Point] settings.
	Code	When a [Designate by device] checkbox is selected, set the code used when reading values from the device. This setting applies to [No. of Bytes], [Char. Color], and the [Background] color.

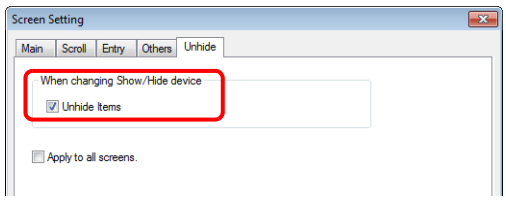
Code	Setting Range
DEC	0 - 65535
BCD	0 - 9999
Real Number Type (DEC)	0 - 65535

*1 Code used for storing text of character display parts

- 1-byte characters: ANK code
- 2-byte characters: Shift-JIS code

*2 The device memory for offset value designation is read every cycle, regardless of the item processing cycle. Screen updates depend on the setting of the [Redraw the screen] checkbox in [Screen Setting] → [Screen Setting] → [Unhide] → [Unhide Items].

- Selected:
  Update the screen when the value in the device memory for offset value designation changes.
  Only update the items on the screen whose value changed in the device memory for offset value designation (the screen is not redrawn).
- Unselected:
  The screen is updated at the following times.
  Screen change/screen redraw/multi-overlap change (when there are parts placed on multi-overlap)



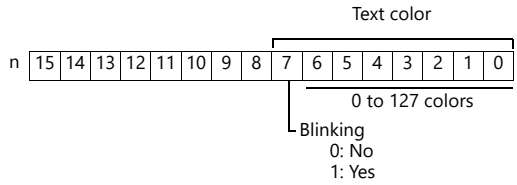
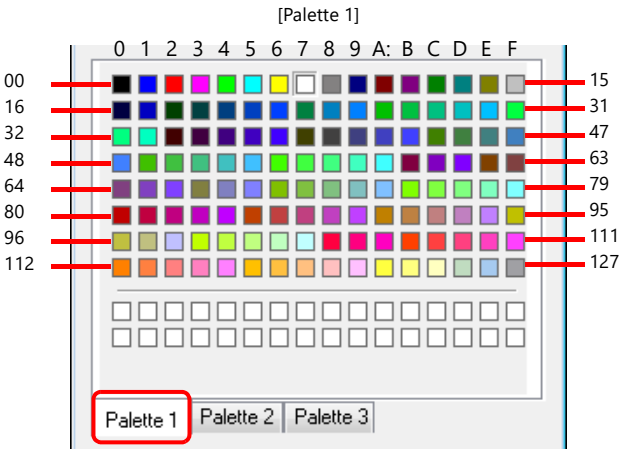
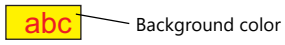
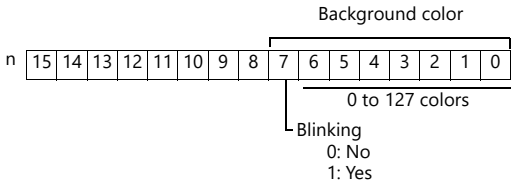
*3 Notes on using the device memory for offset value designation

- When the screen is updated, the device memory for offset value designation is read for the items placed on the screen. This means that for a screen that includes multiple addresses of the device memory for offset value designation, the updated screen is displayed upon completion of reading all of these device memory addresses. If screen updates are taking too long, use of the internal device memory is recommended.
- When setting offset values on a screen, the setting needs to be completed before the screen is changed to another screen. In a case where an offset value is designated in an OPEN macro, the offset value is not valid when the screen is open, but becomes valid when the screen is updated.
- An error occurs if a value set to the device memory for offset value designation is outside the permissible range. Observe the specified range for setting.
  PLC device memory: Communication error Format
  Internal device memory: Error: 46

*4 For details on the method for specifying attributes using device memory, refer to "Specifying attributes using device memory" page 5-22.

Specifying attributes using device memory

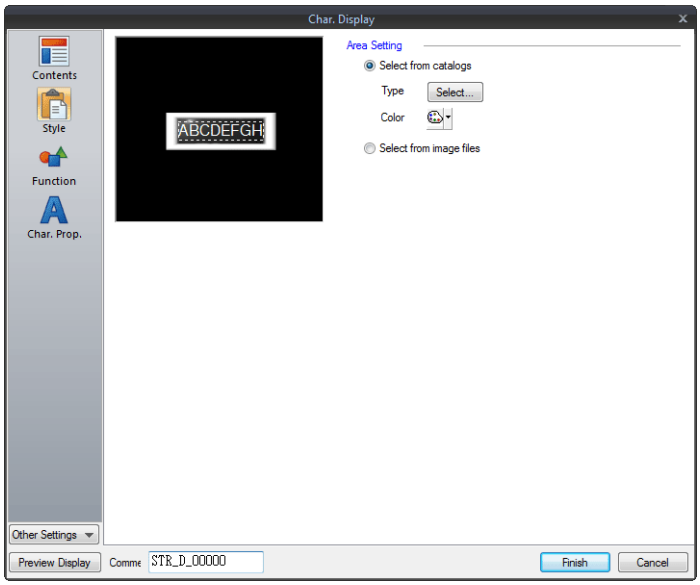
When a [Designate by device] checkbox in [Contents] → [Detail Settings] or a [Designate by device] checkbox in [Char. Prop.] → [Detail Settings] is selected, the corresponding attribute can be changed by specifying a value using a device memory address.

Item		Description
Contents	No. of Bytes	Specify the number of bytes of the character display. No. of Bytes: 1 to 127 * **Regardless of the setting for [No. of Bytes], 127 bytes (64 words) will always be read.**
Char. Prop.	Char. Color	Set the color for text. Bits 0 to 6: Color Bit 7: Blinking (0: No, 1: Yes)  A color can be selected from the 128 colors (and blinking) on [Palette 1] in the [Custom Color] window. Colors correspond to the following color codes. 
	Background	Specify the background color of text.  Bits 0 to 6: Color Bit 7: Blinking (0: No, 1: Yes)  A color can be selected from the 128 colors (and blinking) on [Palette 1] in the [Custom Color] window. For details on color codes, refer to the “Char. Color” section. * **However, note that the background color setting does not take effect when [Char. Prop.] → [Style] is set to “transparent”.**

Notes on changing attributes using device memory

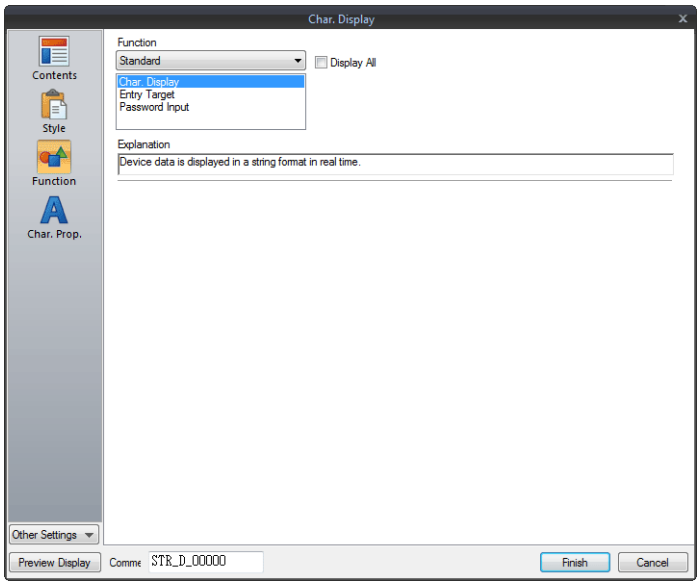
- The update timing depends on the setting of [Detail] → [Process Cycle] of each part.
- For parts with a frame, the frame size does not change according to the setting of [Digits], [Decimal Point], or [Display Format].
  For this reason, the maximum number of bytes in the screen program must be set in advance.
- When [Char. Prop.] → [Style] is set to "not transparent", the drawing range of the background color will be affected by changes to the number of bytes. This means that if the set number of bytes decreases, the background color will remain on the screen.
  For this reason, the maximum number of bytes in the screen program must be set in advance. Alternatively, update the display by executing the "SYS (RESET_SCRN)" macro command or by changing the screen.
- The "CHG_DATA" macro command cannot be used with numerical data displays for which a [Designate by device] checkbox is selected.
- When "Entry Target" is set for [Function], the display is switched when the cursor is moved from the display field.

Style



Item		Description
Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color.
	Select from image files	Select a PNG or SVG file.

Function

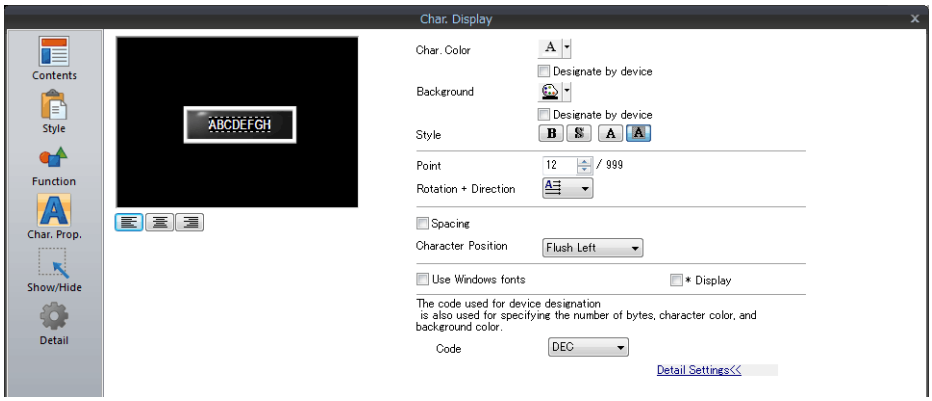


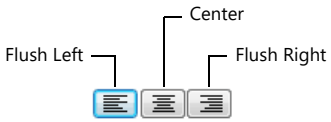
Item			Description
Function			Set the function of the character display.
	Standard	Char. Display	Display device memory values on the character display in real time.
		Entry Target	Used in conjunction with the entry function. For details, refer to "6.2 Character Input".
		Password Input	
Display All			Select this checkbox to display all of the available character display functions. *1

*1 The following function is added when the [Display All] checkbox is selected.

Name		Description	Linked Part	Refer to
Standard	Entry Display Part	Temporarily display values entered using character keys.	Entry	page 6-21
Alarm	Status Display	Display the currently displayed status (ON/OFF, ON, or OFF).	Alarm	page 8-1

Char. Prop.



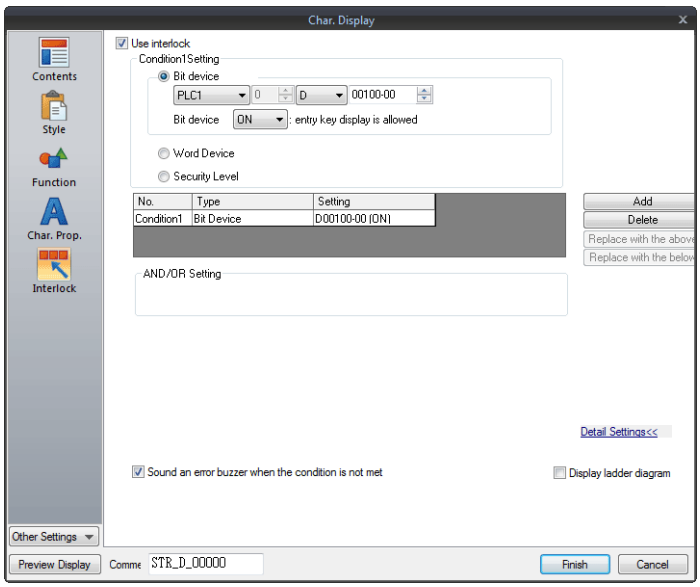
Item	Description
Alignment	Set the text alignment. 
Text to Display on Preview	This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the text to display on the editor.
Char. Color	Set the color for text.
Designate by device *1	Select this checkbox to change the text color according to the value specified for the device memory address.
Background	Set the background color of text.
Designate by device *1	Select this checkbox to change the background color according to the value specified for the device memory address.
Style	Set the text style.
Character Size (1 - 8)	Specify the enlargement factor for text. * When [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Point (6 - 999)	Set the text size. * When a font type other than [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Rotation + Direction *2	Set the combination of text rotation and direction. Four combinations are displayed in the drop-down menu. When selecting an option other than the above, click the icon at the bottom. The window that allows selection from all options is displayed.
Spacing *2	Select this checkbox to specify the spacing between characters.
Character Position	Select [Flush Left] or [Flush Right]. Flush-left → ABC Flush-right → ABC
Prioritize drawing of vectors	Indicates whether or not vector rendering is applied to text. * Shown only for vector parts. Selected: Vector rendering is applied. Unselected: Vector rendering is not applied. * Vector rendering of text is possible only for Japanese, English, Chinese (Simplified), and Chinese (Traditional) when [TrueType font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]. When any other font is selected, operation differs depending on the selected font. - When any TrueType font other than the above is selected: Vector rendering is applied but operation is not guaranteed. - When [Bitmap font] or [Gothic font] is selected: Vector rendering is not applied to text. For details on vector rendering, refer to “8.6 Vector Rendering” in the X1 Series Reference Manual 2.
Use Windows fonts *2	Select this checkbox to use a Windows font.
Smooth Font *3	When “Windows Font” is selected, select this checkbox to smooth the edges of text. (Only settable for TrueType Windows fonts.)
Windows Font Registration *4	Register a Windows font to use to display text.
* Display	Select this checkbox to display * (asterisks) instead of characters.

Item	Description
Code	When a [Designate by device] checkbox is selected, set the code used when reading values from the device memory address. This setting applies to [No. of Bytes], [Char. Color], and the [Background] color.

*1 For details on the method for specifying attributes using device memory, refer to "Specifying attributes using device memory" page 5-7.
*2 Setting is not available with vector parts.
*3 Cannot be set to transparent.
*4 For details on registering Windows fonts, refer to the V9 Series Operation Manual.

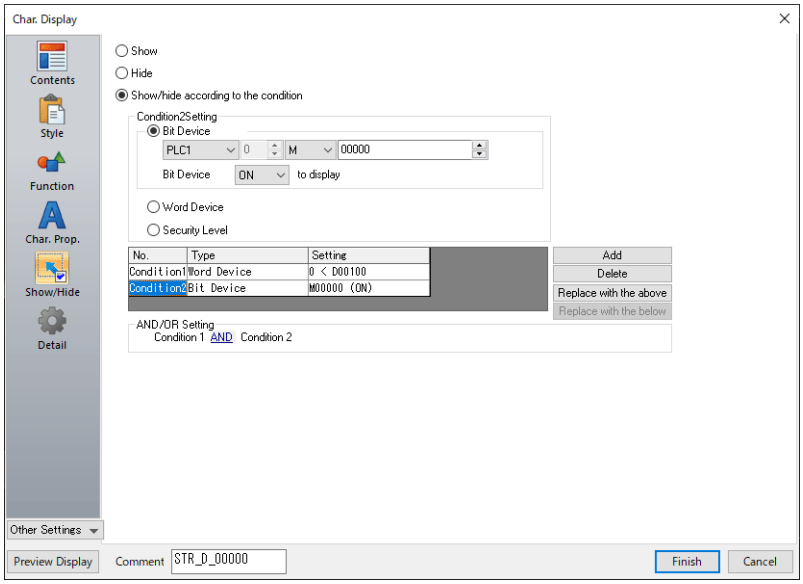
Interlock

This setting is only available when [Function] for a character display part is set to "Entry Target" and the [Display the keyboard] checkbox is selected.



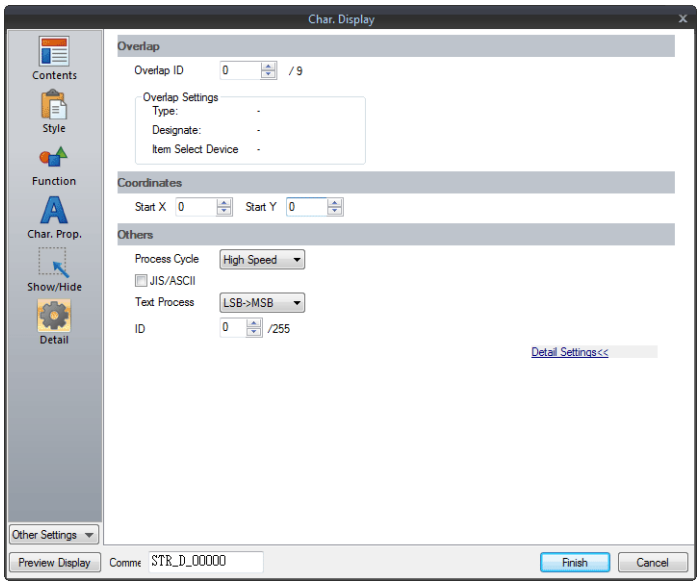
Item	Description
Use interlock	Select this checkbox to add an interlock to the overlap display function of a character display. Click [Add] to set up to 5 conditions that must be satisfied for the interlock to activate. For details on each item, refer to "Interlock" page 5-15.

Show/Hide



Item			Description
Show			Show the item on the screen.
Hide			Do not show the item on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. **Constant Display Type**: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] **Condition expression**: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail

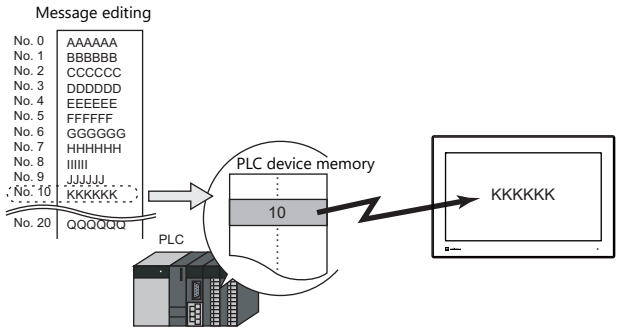


Item		Description
Overlap	Overlap ID (0 - 9)	When the [Function] for a character display is set to "Entry Target" and the [Display the keyboard] checkbox is selected, specify the overlap ID for displaying the keyboard.
Coordinates	Start X/Start Y	Set the display position of the character display using X and Y coordinates.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	Text Process	Set the order of the first and second bytes in words. [LSB → MSB] 15 MSB LSB 0 2nd byte 1st byte [MSB → LSB] 15 LSB MSB 0 1st byte 2nd byte
	Save an operation log	Used in conjunction with the operation log. For details, refer to "4 Operation Log" in X1 Series Reference Manual 2.
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

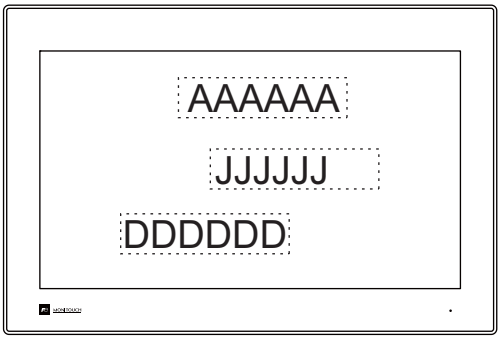
5.3 Message Display

5.3.1 Overview

- Use the message edit screen to register messages for display on the screen in advance. When a message registration number is specified for a device memory address, the corresponding message is displayed on the screen in real time.

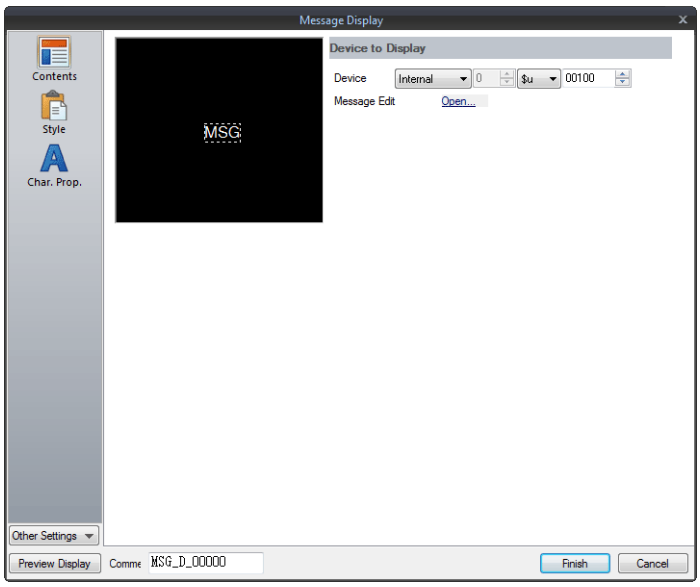


- Single line message can be displayed at any position.



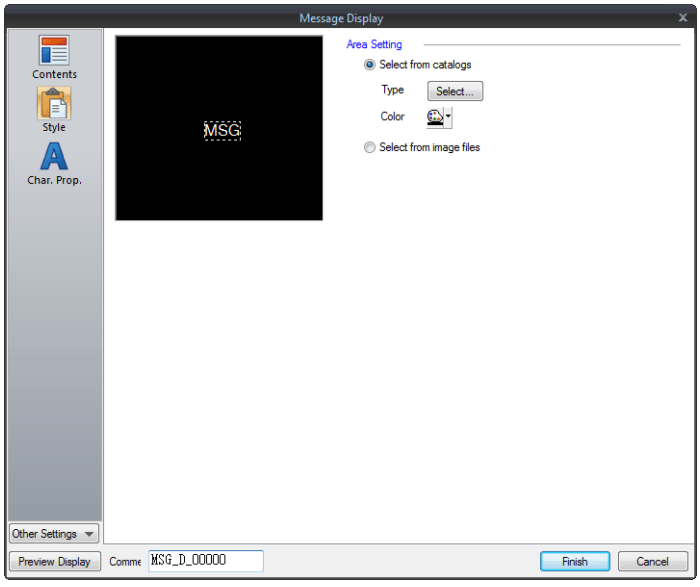
5.3.2 Detailed Settings

Device Memory



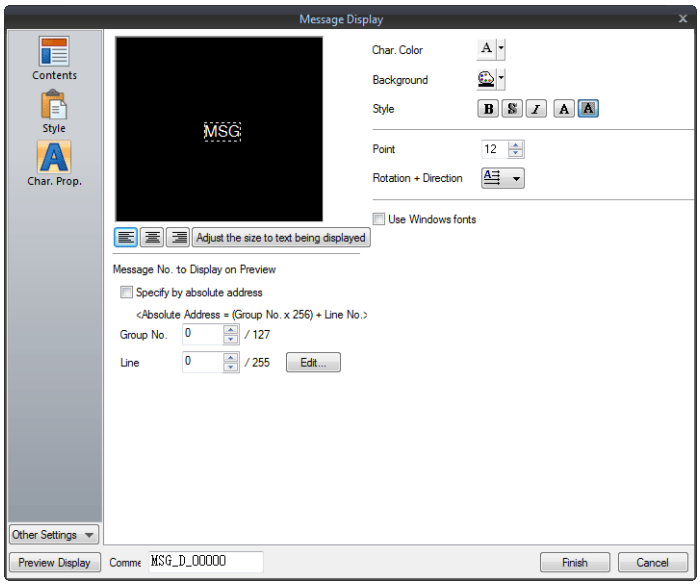
Item	Description
Device	One word is used for device memory specification. The message that corresponds to data contained at the specified device memory address is displayed on the screen. *** Specify a message number using its absolute address (range: 0 to 32767).** **For details on absolute addresses, refer to the V9 Series Operation Manual.**
Message Edit	Click [Open] to display the [Message Edit] window. For details on editing messages, refer to the V9 Series Operation Manual.

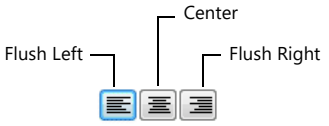
Style



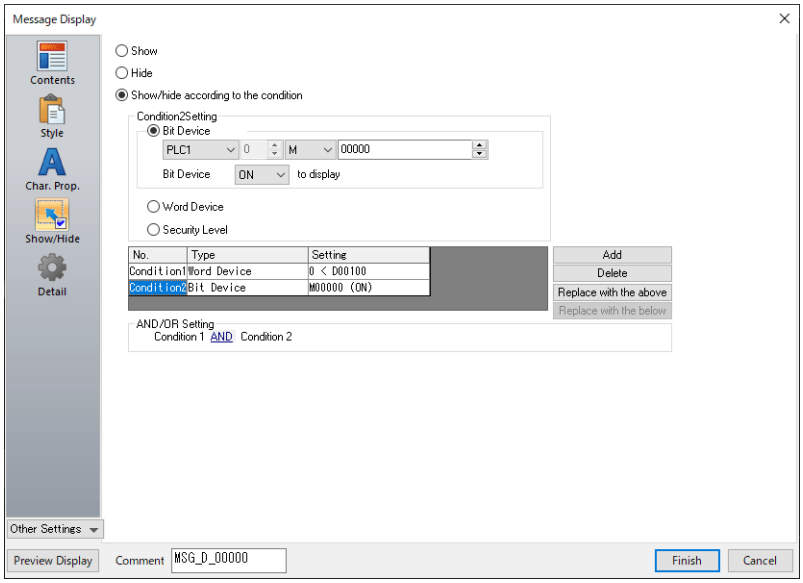
Item		Description
Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color.
	Select from image files	Select a PNG file.

Char. Prop.



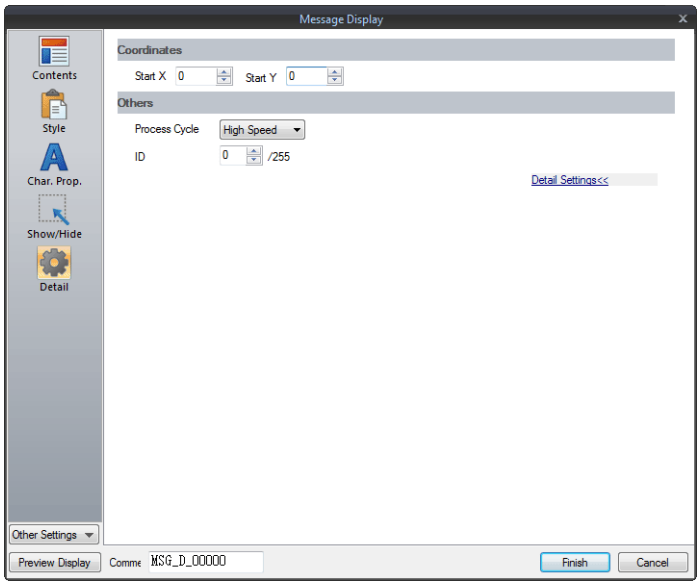
Item		Description
Alignment		Set the text alignment. 
Message No. to Display on Preview		This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the message to display using the editor.
	Specify by absolute address	Unselected: Specify the message using the group number and line number. Selected: Specify the message using the absolute address. (absolute address = (group number × 256) + line number)
Char. Color		Set the color for text.
Background		Set the background color of text.
Style		Set the text style.
Character Size (1 - 8)		Specify the enlargement factor for text.
Point (6 - 999)		Set the text size.
Rotation + Direction		Set the combination of text rotation and direction. Four combinations are displayed in the drop-down menu. When selecting an option other than the above, click the icon at the bottom. The window that allows selection from all options is displayed.
Use Windows fonts		Select this checkbox to use a Windows font.

Show/Hide



Item			Description
Show			Show the item on the screen.
Hide			Do not show the item on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail



Item		Description
Coordinates	Start X/Start Y	Set the display position of the message display using X and Y coordinates.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

5.4 Table Data Display

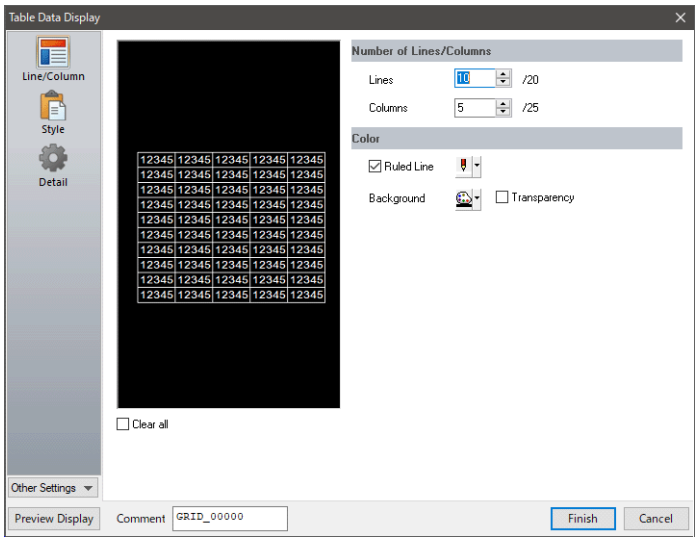
5.4.1 Overview

- Sets of data can be displayed in tabular format with ease.
- Select from number display, character display, message display, or text for the data display part.
- The properties of multiple data display parts can be changed at once.
- Average, maximum, minimum, and total values can be displayed.
- Table data display parts can be set as an entry target for entry mode.

	No.1	No.2	No.3	No.4	No.5	Average
1	100	150	120	130	200	140
2	120	100	180	190	200	158
3	130	120	160	100	150	132
4	50	60	40	150	20	64

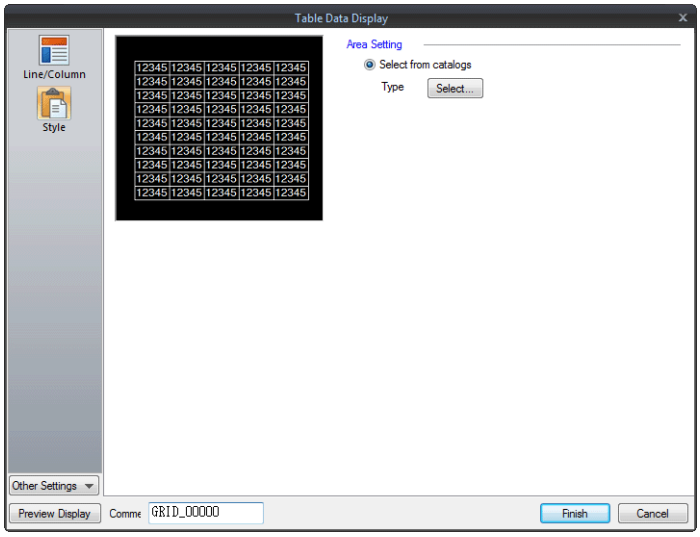
5.4.2 Table Data Settings

Lines and Columns



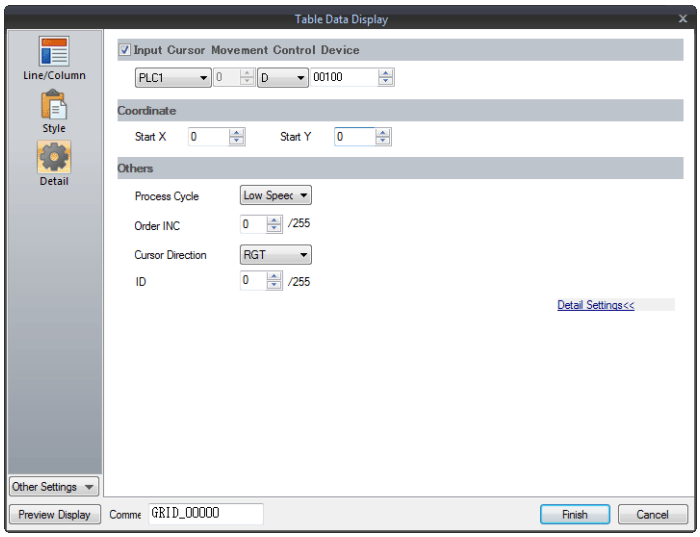
Item		Description
Number of Lines/Columns	Lines (1 to 20)	Specify the number of lines.
	Columns (1 to 25)	Specify the number of columns.
Color	Ruled Line	Select this checkbox to display ruled lines. The color of ruled lines can be specified when the checkbox is selected.
	Background	Select a background color for the table data.
	Transparency	Make the background color transparent.
Clear all		Set all cells to blank with [cell format: Text].

Style



Item		Description
Area Setting	Select from catalogs	Select the part design.

Detail

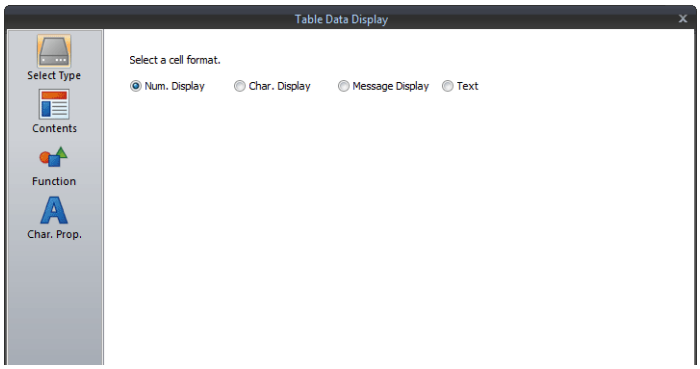


Item		Description
Input Cursor Movement Control Device		Select this checkbox when using the item selection function. For details on the item selection function, refer to "6.3.1 Item Select Function".
Coordinate	Start X/Start Y	Set the display position of the table data display using X and Y coordinates.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	Order INC (0 - 255)	When the table data display contains multiple table data display parts for which [Function] is set to "Entry Target", specify the order of precedence of each table data display part.
	Cursor Direction (RGT/DWN)	This setting is available when [Cursor Moved by] is set to "UP/DW Switch" in the entry mode and bit 14 (cursor movement) of [Control Device] is set to ON. This option determines the direction in which the cursor moves when the [Write] key is pressed.
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

5.4.3 Numerical Data Display Settings

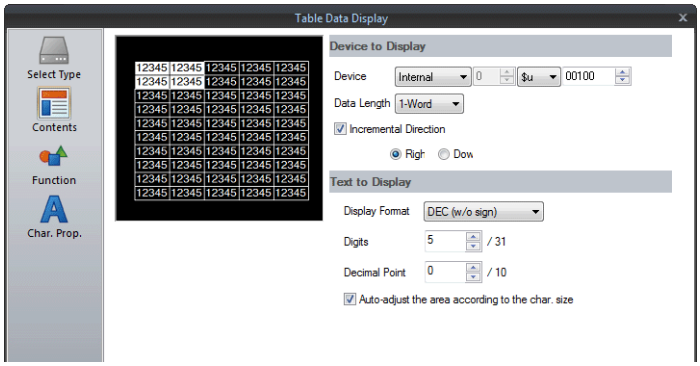
Each data cell can be selected to display a settings window for the corresponding cell.
(For details on the editing procedure, refer to the V9 Series Operation Manual.)
This section explains the case when [Num. Display] is selected for [Select Type].

Select Type



Item	Description
Num. Display Char. Display Message Display Text	Select [Num. Display].

Contents



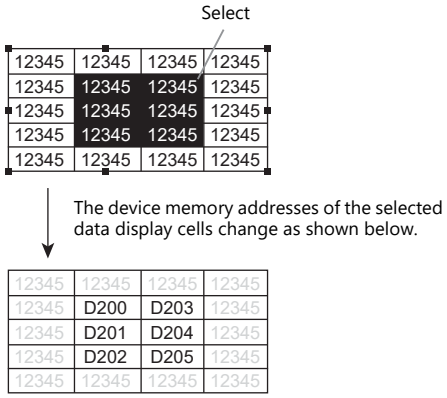
Item		Description
Device to Display	Device	Specify the device memory address to use for numerical data display.
	Data Length *1 1-Word/2-Word	Select the data length used for this part.
	Incremental Direction *2	This setting is available when multiple data in the table are selected. For details, refer to page 5-37.
Text to Display	Display Format *1	Select the format of numbers to be displayed on the screen.
	Digits *3	Specify the number of digits for the numerical data display.
	Decimal Point	Specify the decimal place. The number of decimal places must be smaller than the number of digits. When no decimal point is required, set "0".
	Auto-adjust the area according to the char. size	Select this checkbox to automatically adjust the item size based on the [Digits] and [Decimal Point] settings.

*1 Relationship between data length and display format

Code Format	1-word Display Range	2-word Display Range
DEC (w/o sign)	0 to 65535	0 to 4294967295
DEC (with sign –)	–32768 to 32767	–2147483648 to 2147483647
DEC (with sign +–)	–32768 to +32767	–2147483648 to +2147483647
HEX	0 to FFFF	0 to FFFFFFFF
OCT	0 to 177777	0 to 37777777777
BIN (Binary)	0 to 1111111111111111	0 to 11111111111111111111111111111111

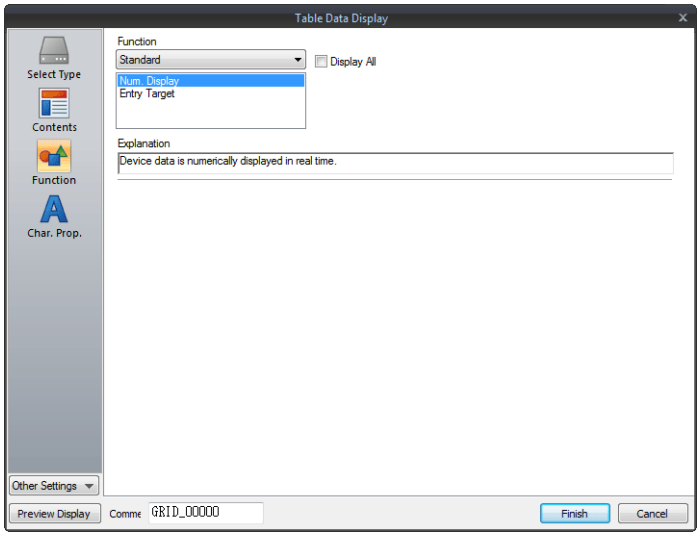
*2 Incremental Direction

Example:
Device memory: D200
[Incremental Direction] checkbox: selected (Down)



*3 Digits
For details, refer to page 5-6.

Function



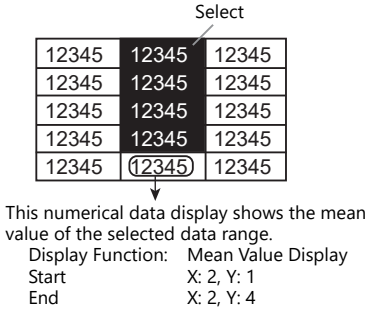
Item			Description
Function			Set the type of operation performed by the numerical data display.
	Standard	Numerical data display	Display device memory values on the numerical data display in real time.
		Entry Target	Used in conjunction with the entry function. For details, refer to "6.1 Numerical Data Entry".
Display All			Select this checkbox to display all of the available numerical data display functions. *1

*1 The following functions are added when the [Display All] checkbox is selected.

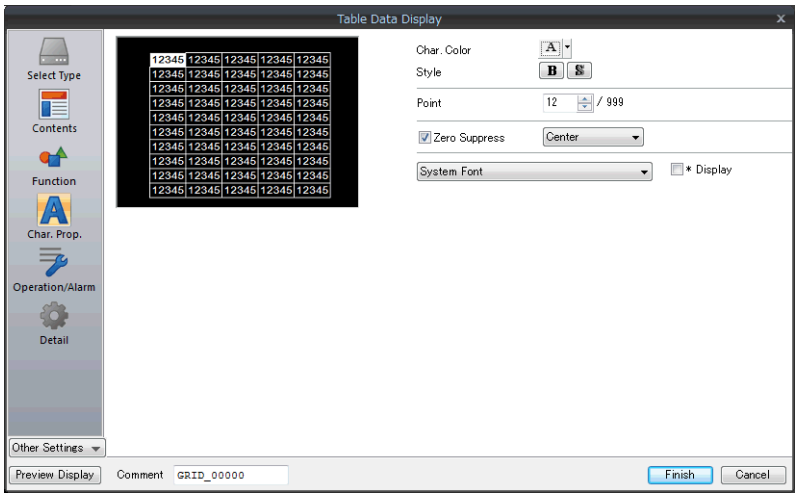
Name			Description
Standard	Mean Value Display	Start X/Y, End X/Y *2	Display the mean value of the selected data range.
	Max. Value Display Part	Start X/Y, End X/Y *2	Display the maximum value of the selected data range.
	Min. Value Display Part	Start X/Y, End X/Y *2	Display the minimum value of the selected data range.
	Total Display	Start X/Y, End X/Y *2	Display the total value of the selected data range.

*2 Start X/Y, End X/Y

X:1,Y:1	X:2,Y:1	X:3,Y:1
X:1,Y:2	X:2,Y:2	X:3,Y:2
X:1,Y:3	X:2,Y:3	X:3,Y:3
X:1,Y:4	X:2,Y:4	X:3,Y:4
X:1,Y:5	X:2,Y:5	X:3,Y:5



Char. Prop.

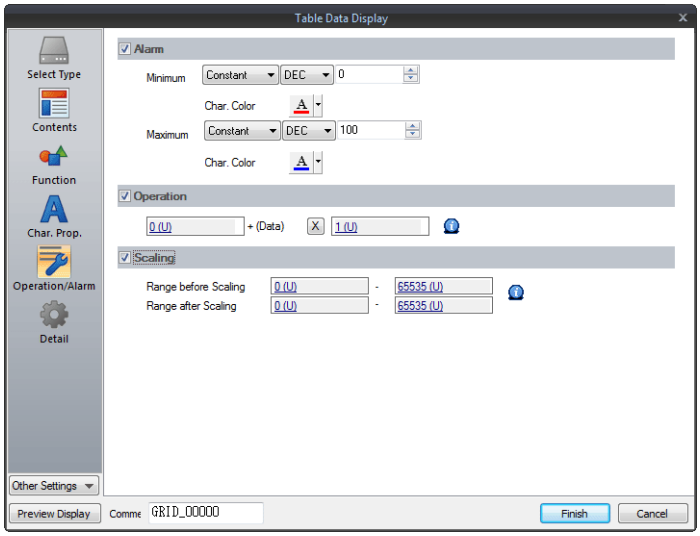


Item	Description
Value to Display on Preview	This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the value to display on the editor.
Char. Color	Set the color for text.
Background	Set the background color of text.
Style	Set the text style.
Character Size (1 - 8)	Specify the enlargement factor for text.
Point (6 - 999)	Set the text size.
Zero Suppress	Select this checkbox to use zero suppression. Spaces [☑ Zero Suppress] (Flush Right) → ␣␣␣123 [☐ Zero Suppress] → 000123 When this checkbox is selected, specify [Flush Left], [Center] or [Flush Right]. Flush Left → 123 Center → 123 Flush Right → 123
System Font Windows Font 7-segment Font	Select the font to use for the numerical data display. When "7-segment Font" is selected, select the [Display light-out segments] checkbox to display unlit segments.
Smooth Font *1	When "Windows Font" is selected, select this checkbox to smooth the edges of text. (Only settable for TrueType Windows fonts.)
Display light-out segments *2	When "7-segment Font" is selected, select this checkbox to display unlit segments.
* Display	Select this checkbox to display * (asterisks) instead of numbers.

*1 Cannot be set to transparent.

*2 Featuring digital display fonts by Yourname, Inc.

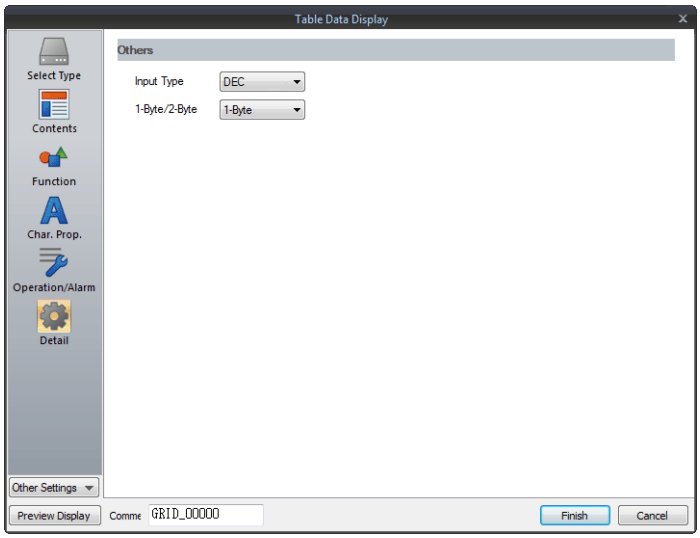
Operation/Alarm



Item			Description
Alarm			Select this checkbox to display data in a different color when it exceeds or falls short of a specific range. When "Entry Target" is selected for [Function], the range of values that can be entered using a keypad can be set. For details on numerical value entry, refer to "6.1 Numerical Data Entry".
	Minimum		Set the minimum value used to trigger an alarm.
		Char. Color	Set the color for text.
	Maximum		Set the maximum value used to trigger an alarm.
		Char. Color	Set the color for text.
Operation *1			Select this checkbox to perform an operation on the value of the device memory address specified in [Contents].
Scaling *2			Select this checkbox to display data after automatically converting the data read from the PLC ([Range before Scaling]) to the specified range ([Range after Scaling]). This eliminates the need for correction programs for data read from the PLC when displaying information such as temperature, rotation speed, etc.
	Range before Scaling		Specify the data to be read from the PLC.
	Range after Scaling		Specify the range of data to be shown on MONITOUCH.

*1 For details on operations, refer to page 5-13.
*2 For details on scaling, refer to page 5-14.

Detail

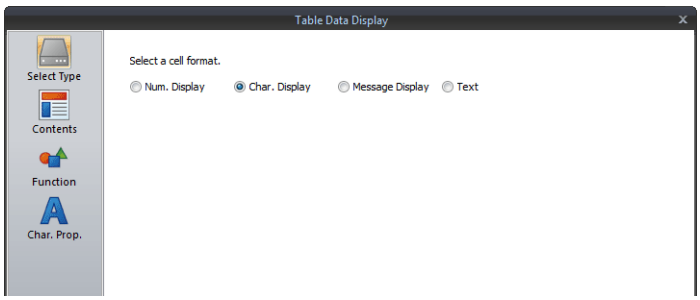


Item		Description
Others	Input Type	Select the code to use when reading data from the PLC device memory address. BCD/DEC
	1-Byte / 2-Byte	Select one-byte or two-bytes for displaying numerical data.

5.4.4 Character Display Settings

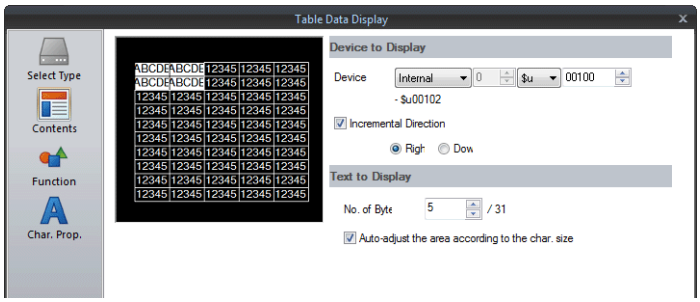
Each data cell can be selected to display a settings window for the corresponding cell.
(For details on the editing procedure, refer to the V9 Series Operation Manual.)
This section explains the case when [Char. Display] is selected for [Select Type].

Select Type



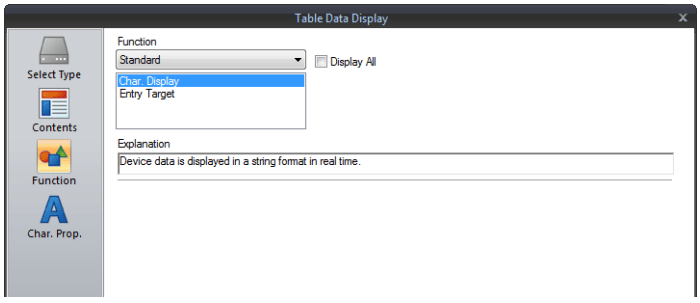
Item	Description
Num. Display Char. Display Message Display Text	Select [Char. Display].

Contents



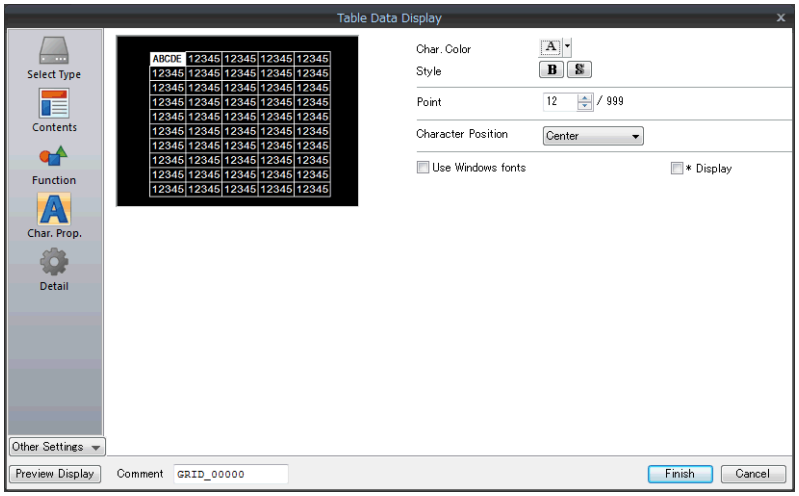
Item		Description
Device to Display	Device	Specify the device memory address to use for character display.
	Incremental Direction	This setting is available when multiple data in the table are selected. For details, refer to page 5-37.
Text to Display	No. of Bytes	Specify the number of characters to be displayed.
	Auto-adjust the area according to the char. size	Select this checkbox to automatically adjust the item size based on the [Digits] and [Decimal Point] settings.

Function



Item			Description
Function			Set the function of the character display.
	Standard	Char. Display	Display device memory values on the character display in real time.
		Entry Target	Used in conjunction with the entry function. For details, refer to "6.2 Character Input".

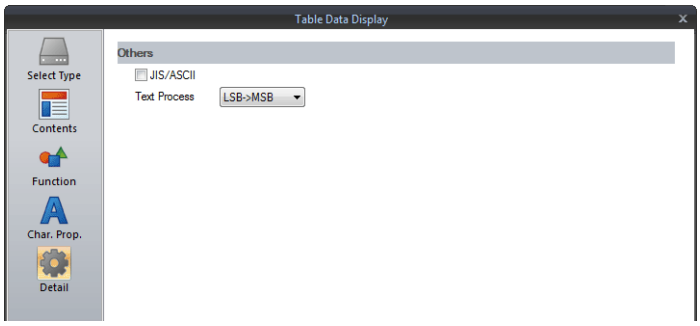
Char. Prop.



Item		Description
Text to Display on Preview		This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the text to display using the editor.
Char. Color		Set the color for text.
Background		Set the background color of text.
Style		Set the text style.
Character Size (1 - 8)		Specify the enlargement factor for text.
Point (6 - 999)		Set the text size.
Character Position		The character position in the cell can be selected. Flush Left → 123 Center → 123 Flush Right → 123
Use Windows fonts		Select this checkbox to use a Windows font.
	Smooth Font *1	When "Windows Font" is selected, select this checkbox to smooth the edges of text. (Only settable for TrueType Windows fonts.)
	Windows Font Registration *2	Register a Windows font to use to display text.
* Display		Select this checkbox to display * (asterisks) instead of characters.

*1 Cannot be set to transparent.
*2 For details on registering Windows fonts, refer to the V9 Series Operation Manual.

Detail

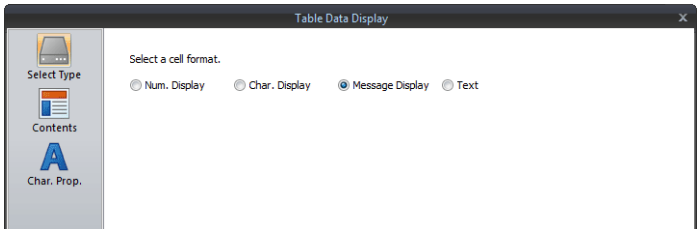


Item		Description
Others	Text Process	Set the order of the first and second bytes in words. [LSB → MSB] 15 0 | MSB | LSB | (2nd byte, 1st byte) [MSB → LSB] 15 0 | LSB | MSB | (1st byte, 2nd byte)

5.4.5 Message Display Settings

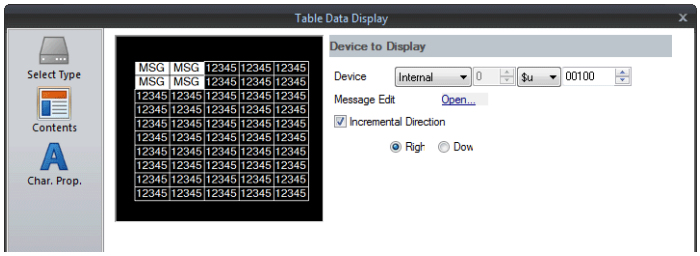
Each data cell can be selected to display a settings window for the corresponding cell.
(For details on the editing procedure, refer to the V9 Series Operation Manual.)
This section explains the case when [Message Display] is selected for [Select Type].

Select Type



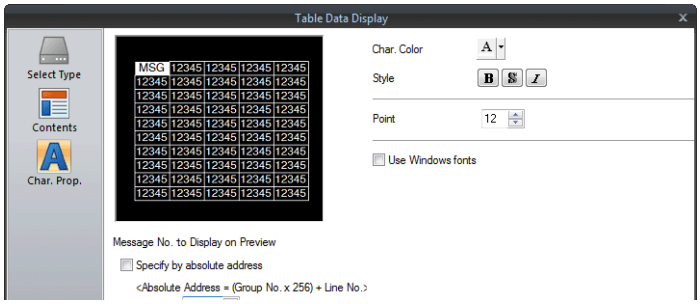
Item	Description
Num. Display Char. Display Message Display Text	Select [Message Display].

Contents



Item	Description
Device	Specify the device memory address to use for message display.
Message Edit	Click [Open] to display the [Message Edit] window. For details on editing messages, refer to the V9 Series Operation Manual.
Incremental Direction	This setting is available when multiple data in the table are selected. For details, refer to page 5-37.

Char. Prop.

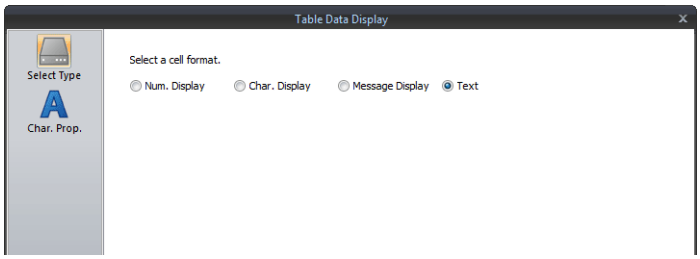


Item	Description
Message No. to Display on Preview	This item is available when the [Display for the editor] checkbox is selected on the [View] → [Display Environment] → [Display] tab. Set the message to display using the editor.
Char. Color	Set the color for text.
Background	Set the background color of text.
Style	Set the text style.
Character Size (1 - 8)	Specify the enlargement factor for text.
Point (6 - 999)	Set the text size.
Use Windows fonts	Select this checkbox to use a Windows font.

5.4.6 Text Settings

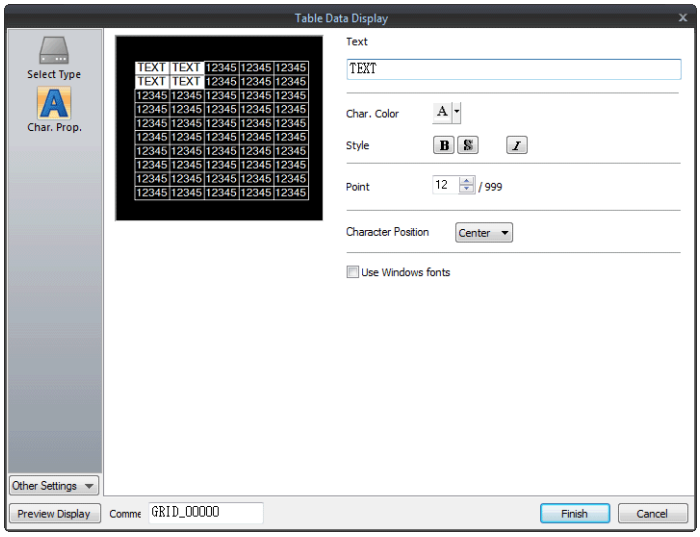
Each data cell can be selected to display a settings window for the corresponding cell.
(For details on the editing procedure, refer to the V9 Series Operation Manual.)
This section explains the case when [Text] is selected for [Select Type].

Select Type



Item	Description
Num. Display Char.Display Message Display Text	Select [Text].

Char. Prop.



Item	Description
Text	Enter the text for display.
Char. Color	Set the color for text.
Background	Set the background color of text.
Style	Set the text style.
Character Size (1 - 8)	Specify the enlargement factor for text.
Point (6 - 999)	Set the text size.
Character Position	The character position in the cell can be selected. Flush Left → 123 Center → 123 Flush Right → 123
Use Windows fonts	Select this checkbox to use a Windows font.
Smooth Font *1	When "Windows Font" is selected, smooth the edges of text. (Only settable for TrueType Windows fonts.)

*1 Cannot be set to transparent.

5.5 Notes

5.5.1 Placing Switches or Lamps Overlaying Other Switches or Lamps

Take the following points into consideration when placing parts.

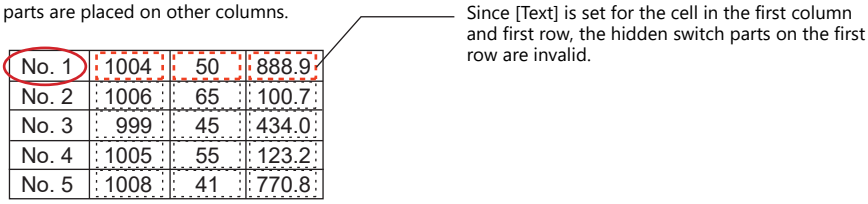
Placing Numerical Data Displays, Character Displays, and Message Displays

Parts are displayed in the order that they are placed using the editor. This means that switch and lamp parts should be placed in the background and numerical data displays, character displays, and message displays should be placed in the foreground.

Placing Table Data (with Switches)

When [Text] is selected for the cell in the first column and first row of the table data, the entire first row is assigned the switch function.
Consequently, any switch part placed on the first row will not be recognized correctly because it is the same as placing a switch on a switch. (In this case, the switch function of the table data has priority.)

Example:
If [Text] is selected for the first column and hidden switch parts are placed on other columns.



6 Entry

6.1 Numerical Data Entry

6.2 Character Input

6.3 Convenient Functions

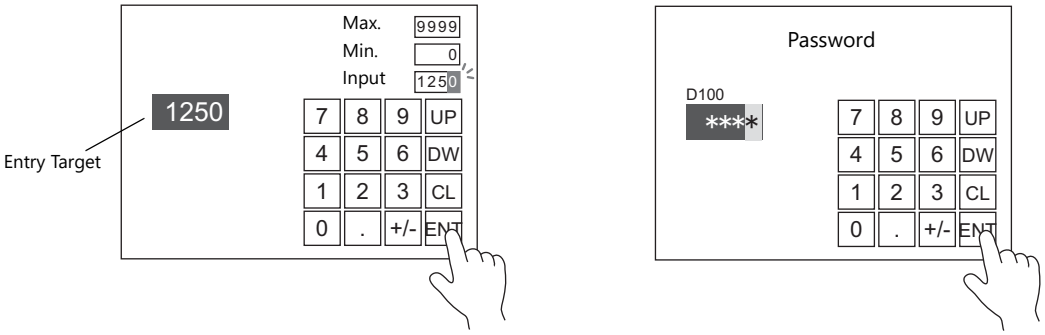
6.1 Numerical Data Entry

6.1.1 Overview

Numerical data can be entered using keypads and slider switches and then written to specified device memory addresses.
If the target data display is a numerical data display when entering data using a keypad, enter numerical data.

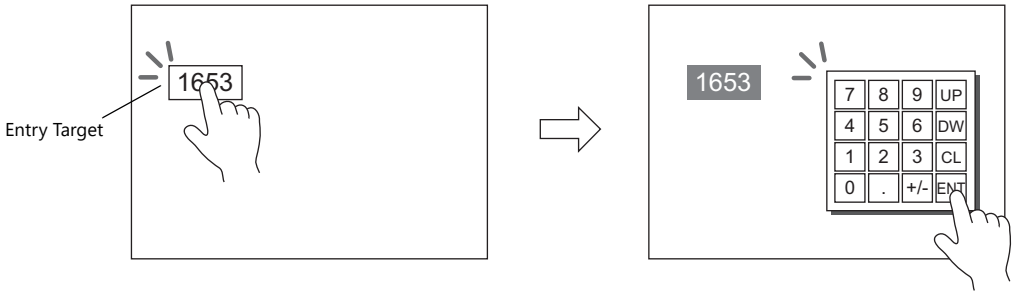
Keypad

- Enter numerical data with respect to the entry target using a keypad placed on the screen.
  The keypad display can be configured to show the value being entered and include allowable input ranges.
  Entered values can be displayed as * (asterisks) if you need to hide the entered password.

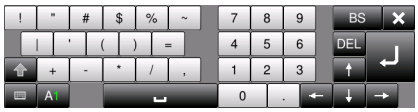


☞ For setting examples, refer to "Placing an Entry Target and Keypad on the Screen" page 6-2, "Specifying an Entry Range" page 6-6, and "Displaying Input Values Using * (Asterisks)" page 6-7.

- A keypad can be displayed when needed and numerical data can be entered with respect to the entry target. The keypad can remain hidden at other times.



The system keyboard can also be used.



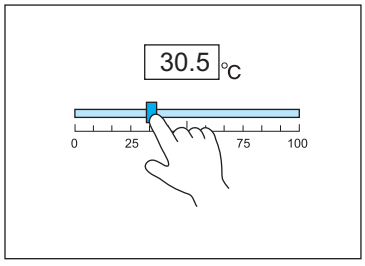
☞ For setting examples, refer to "Showing the Keypad Only When Necessary" page 6-4.

- Cursor movement can be limited to certain entry targets.

☞ For details, refer to "6.3.1 Item Select Function" page 6-35.

Slider switch

Numerical data can be entered using slider switches.



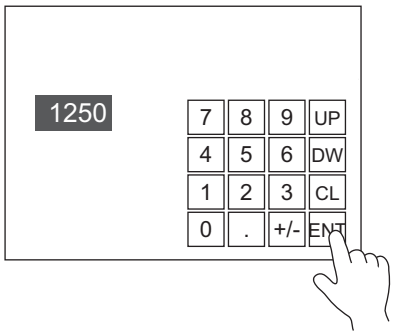
Move the slider switch while holding it down and release it to write the data change.

☞ For setting examples, refer to "Slider Switch" page 6-8.

6.1.2 Setting Examples

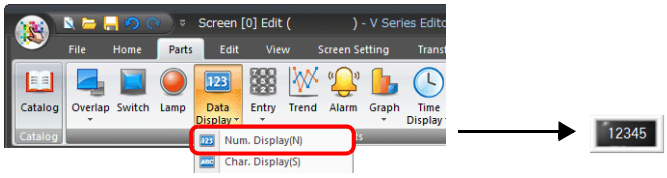
Placing an Entry Target and Keypad on the Screen

There are two methods for placing these parts: placement using an entry target or placement using a keypad. Each procedure is described below using an example.

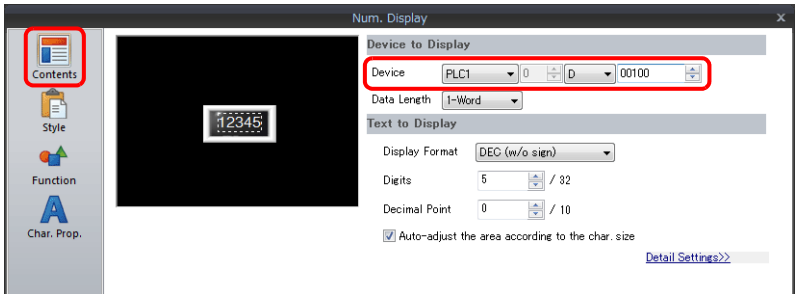


Placement Using an Entry Target

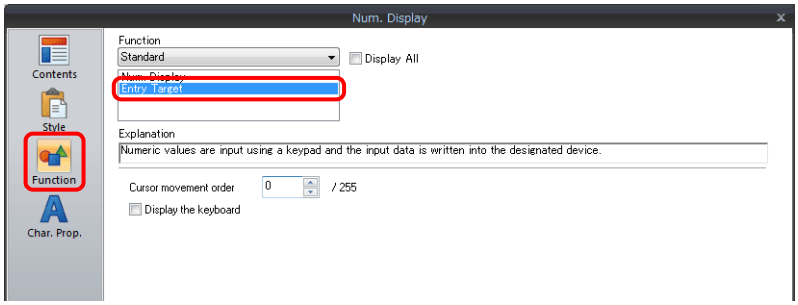
1. Click [Parts] → [Data Display ▼] → [Num. Display] and place a numerical data display on the screen.



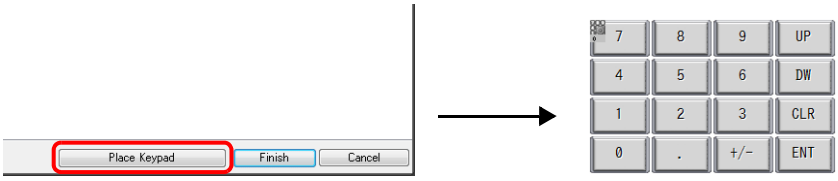
2. Display the settings window for the numerical data display and set the device memory for writing via [Contents] → [Device].



3. Set [Function] to "Entry Target".



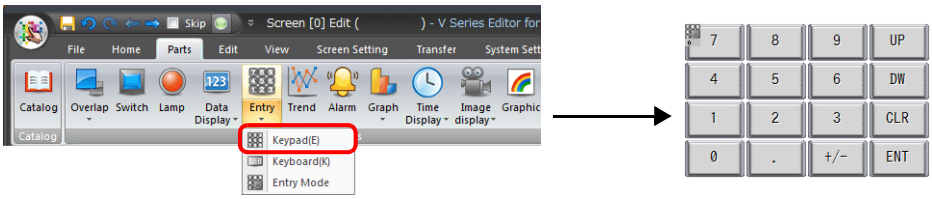
4. Click [Place Keypad] to place a keypad.



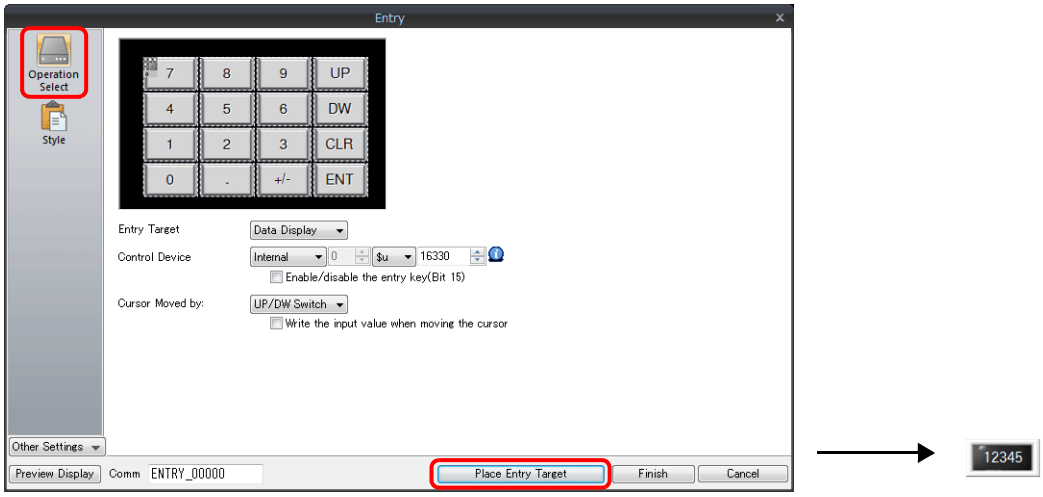
This completes the necessary settings.

Placement Using a Keypad

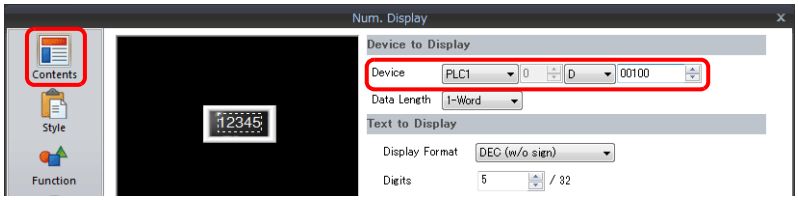
1. Click [Parts] → [Entry ▼] → [Keypad] and place a keypad on the screen.



2. Display the settings window for the keypad, click the [Place Entry Target], and place an entry target.



3. Display the settings window for the entry target and set the device memory for writing via [Contents] → [Device].

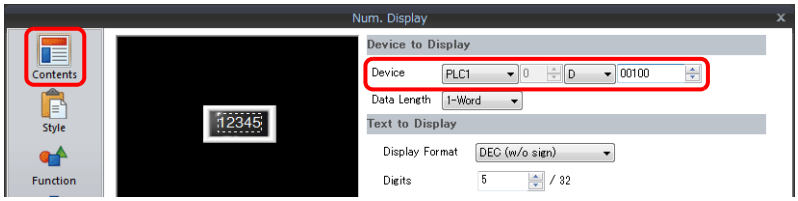


This completes the necessary settings.

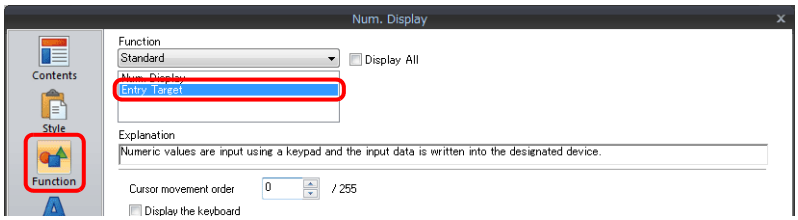
* An entry target can also be placed according to the following procedure.

1) Click [Parts] → [Data Display ▼] → [Num. Display] and place a numerical data display on the screen.

2) Display the settings window for the numerical data display and set the device memory for writing via [Contents] → [Device].

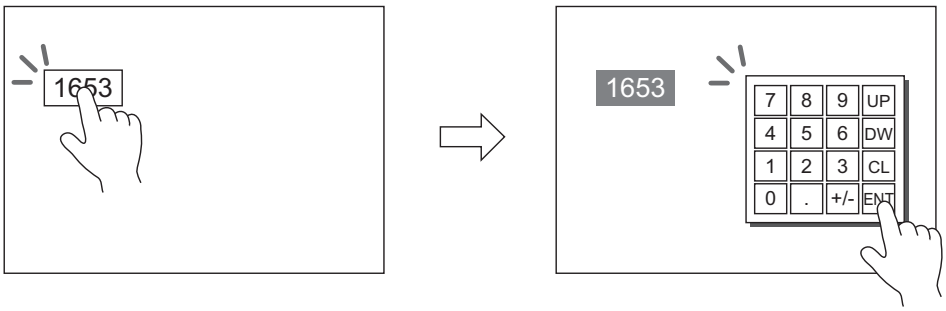


3) Set [Function] to “Entry Target”.

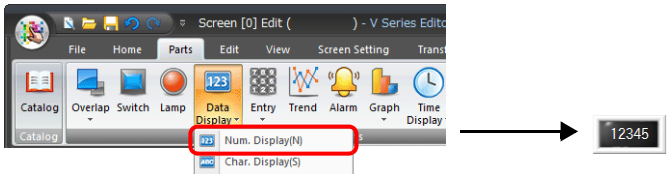


Showing the Keypad Only When Necessary

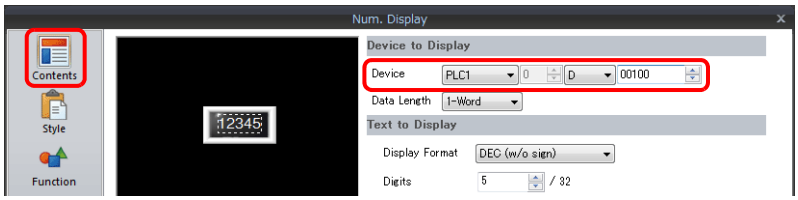
This procedure is described below using an example. (The keypad disappears after entry.)



1. Click [Parts] → [Data Display ▼] → [Num. Display] and place a numerical data display on the screen.

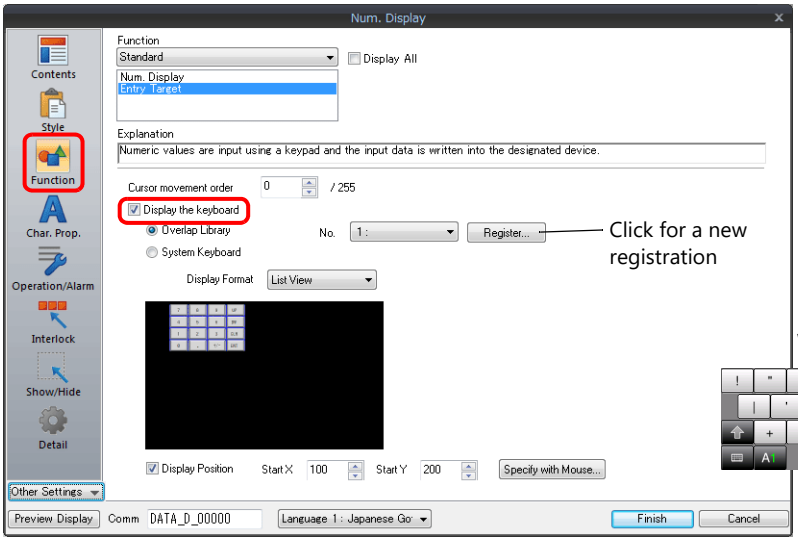


2. Display the settings window for the numerical data display and set the device memory for writing via [Contents] → [Device].



3. Set [Function] to “Entry Target”.

4. Select the [Display the keyboard] checkbox and select a keypad.
When registering a new keypad, click [Register] and select a keypad.



When [System Keyboard] is selected

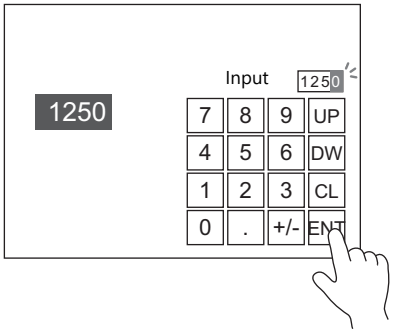
5. Select the [Display Position] checkbox and set the display position of the keypad.
(The display position cannot be set when the system keyboard is selected.)

This completes the necessary settings.

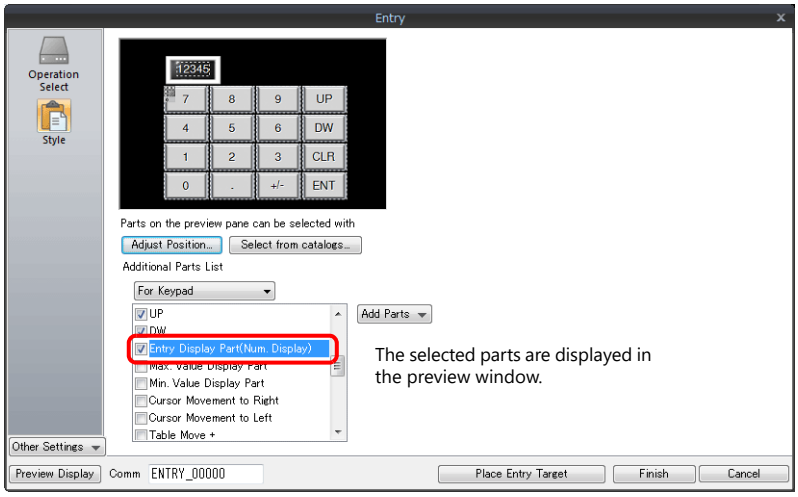
This setting cannot be performed for table data display entry targets.

Placing an Entry Display (Value Entry)

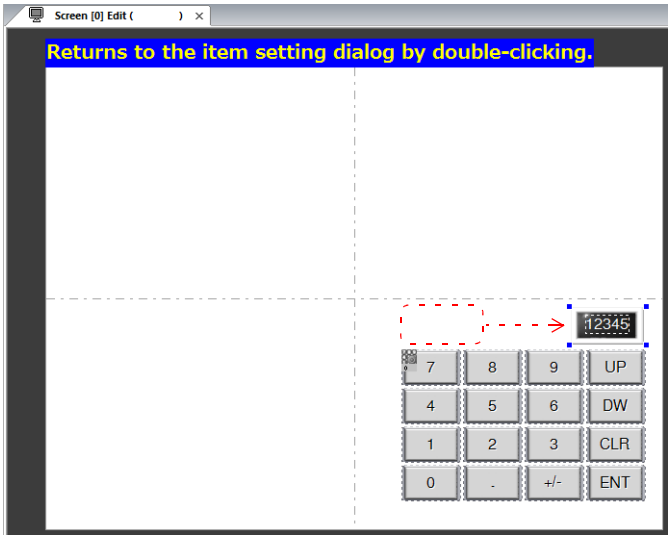
This procedure is described below using an example.



1. Double-click the keypad placed on the screen to display the settings window.
2. Select the [Entry Display Part (Num. Display)] checkbox in [Style] → [Additional Parts List].



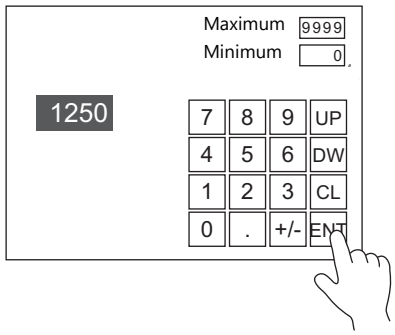
3. Click [Adjust Position] to specify the position of the part.



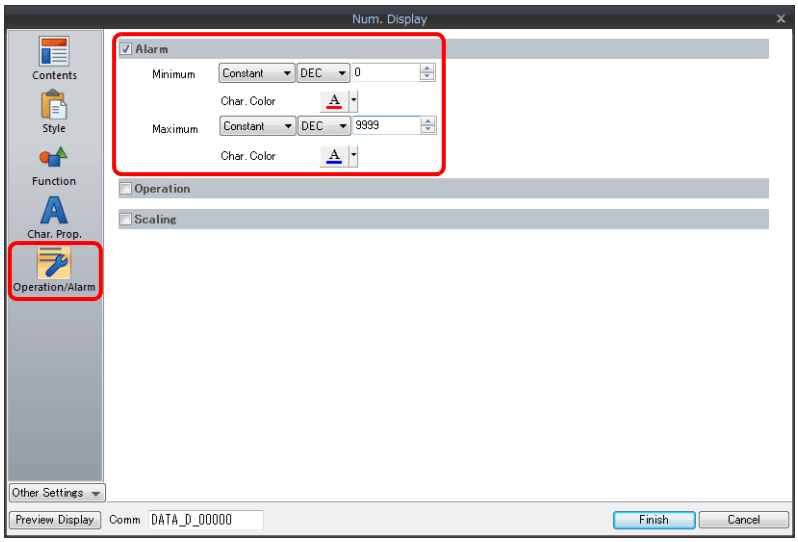
This completes the necessary settings.

Specifying an Entry Range

This procedure is described below using an example. Example: Entry range: 0 to 9999

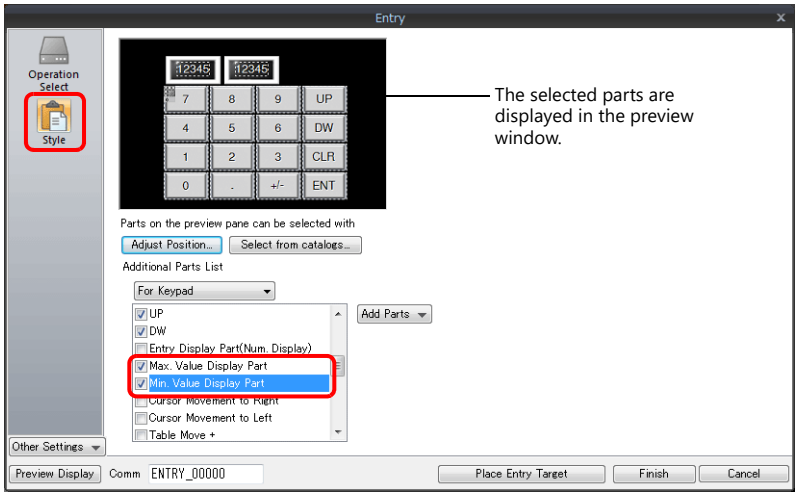


1. Display the numerical data display settings window, click [Operation/Alarm] → [Alarm], and set "0" for the minimum value and "9999" for the maximum value.



2. Double-click the keypad placed on the screen to display the settings window.

3. Select the [Max. Value Display Part] and [Min. Value Display Part] checkboxes in [Style] → [Additional Parts List].

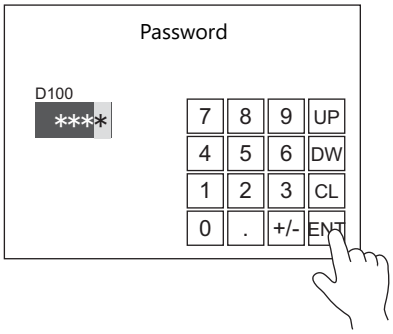


4. Click [Adjust Position] to specify the position of the part.

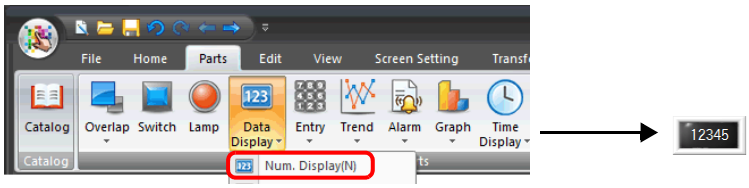
This completes the necessary settings.

Displaying Input Values Using * (Asterisks)

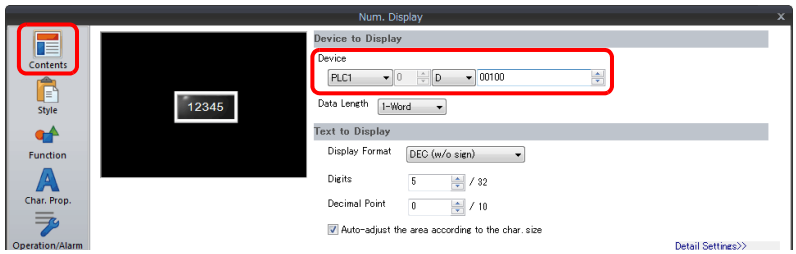
This procedure is described below using an example.
Values are written to D100 using the keypad. The input values can be hidden on the X1 unit by displaying them using * (asterisks).
OK/NG validation of input values is determined by a ladder or macro.



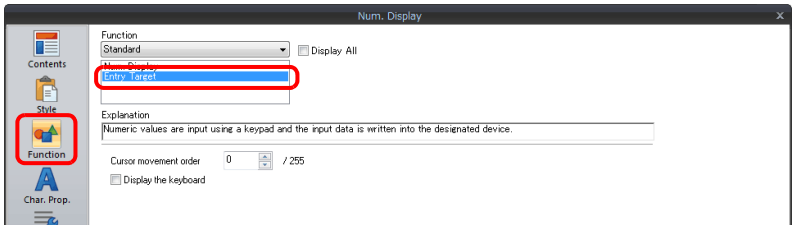
1. Click [Parts] → [Data Display ▼] → [Num. Display] and place a numerical data display on the screen.



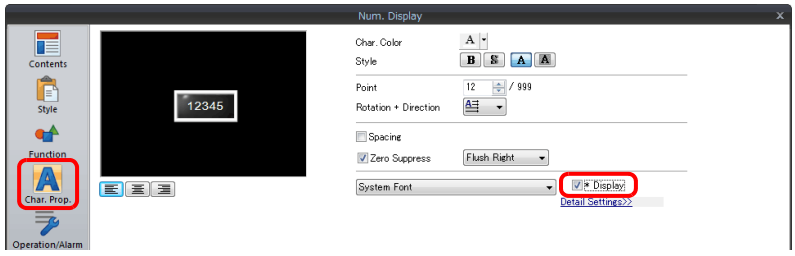
2. Display the settings window for the numerical data display and set the device memory for writing via [Contents] → [Device].



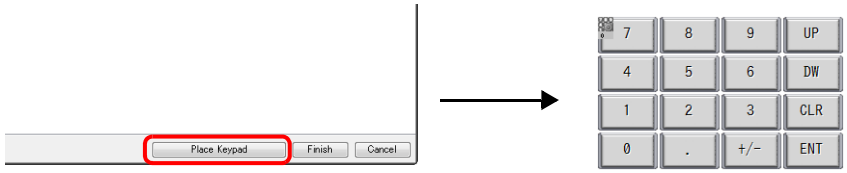
3. Set [Function] to "Entry Target".



4. Select the [* Display] checkbox in the [Char. Prop.] window.



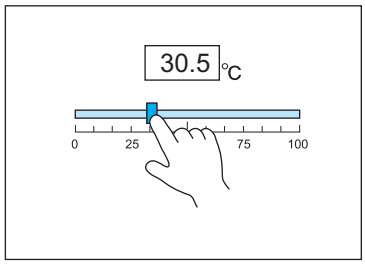
5. Click [Place Keypad] to place a keypad.



This completes the necessary settings.

Slider Switch

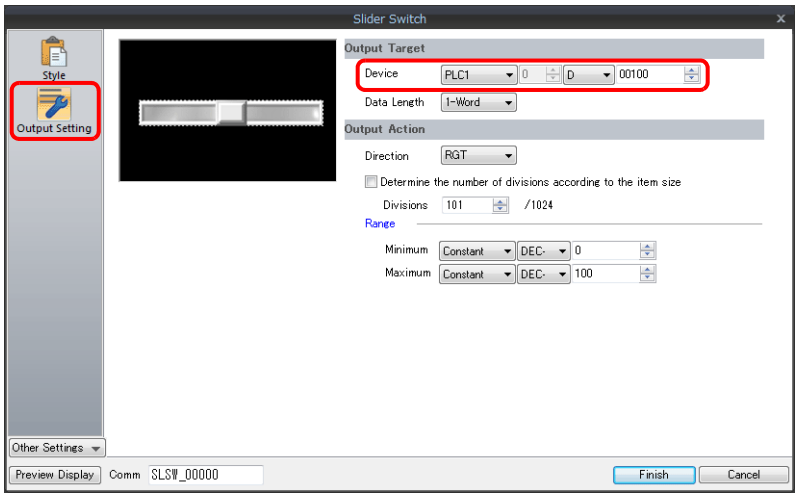
This procedure is described below using an example.



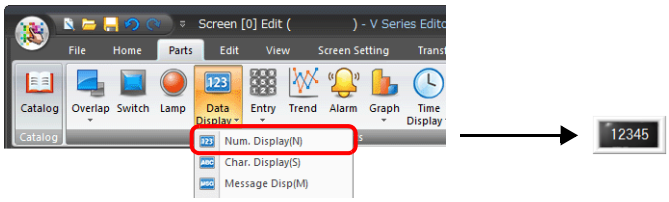
Move the slider switch while holding it down and release it to write the data change.

1. Click [Parts] → [Others] → [Slider Switch] and place a slider switch on the screen.

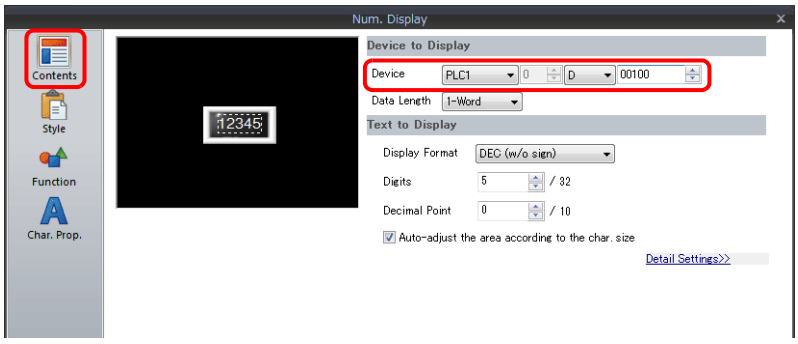
2. Display the settings window for the slider switch and set the device memory for writing via [Output Setting] → [Device].



3. Click [Parts] → [Data Display ▼] → [Num. Display] and place a numerical data display on the screen.



4. Display the settings window for the numerical data display and set the same device memory as in step 2 for [Contents] → [Device].

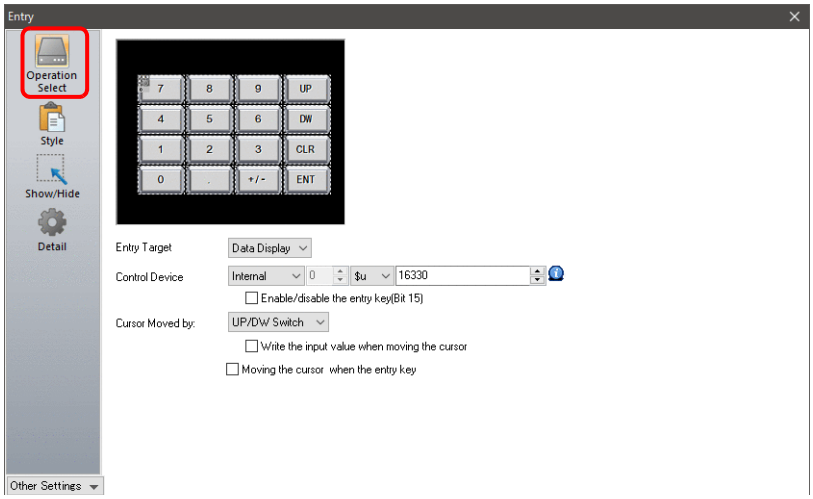


This completes the necessary settings.

6.1.3 Detailed Settings

Keypad

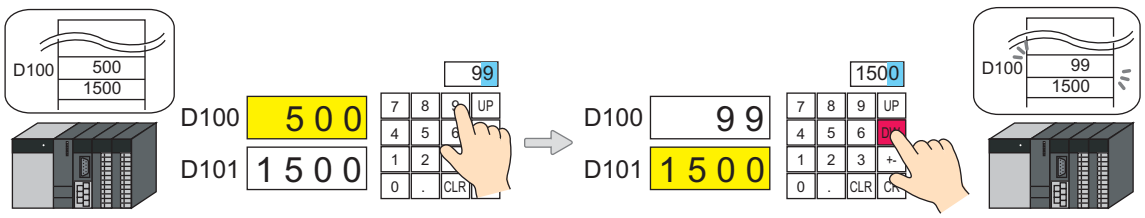
Operation Select



Item			Description
Entry Target			Data Display Enter data with respect to an entry target placed on the screen or an overlap.
Control Device (PLC → V series)			This device memory controls entry. For details, refer to page 6-10.
Enable/disable the entry key (Bit 15)			Select this checkbox to use the 15th bit of the control device memory to prohibit entry key writing. For details, refer to page 6-10.
Cursor Moved by	UP/DW Switch		Perform entry target selection and cursor movement using [UP] and [DW] switches.
		Write the input value when moving the cursor	Write the entry value to the corresponding device memory when moving the cursor to the next entry target. For details, refer to page 6-9.
		Moving the cursor when the entry key	The cursor automatically moves to the next item when the [ENT] key is pressed. Bit 14 (cursor movement) of [Control Device] is invalid when this checkbox is selected.
	Control Device		Perform cursor movement and entry target selection by specifying a cursor movement order number for the control device memory. In this case, the [UP] and [DW] switches cannot be used. For details, refer to page 6-10.

Write the input value when moving the cursor

Selecting this option will write the entry value to the corresponding device memory and the cursor is moved to the next entry target using an up or down switch instead of the [ENT] key.



- List of applicable switches

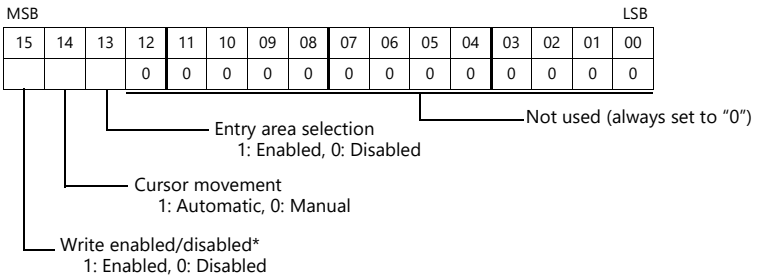
Function	Description	Function	Description
↑	Move the cursor to the previous entry target. (Cursor movement order number – 1)	Table Move +	Move the cursor to the next table data display. (Cursor movement order number + 1)
↓	Move the cursor to the next entry target. (Cursor movement order number + 1)	Table Move –	Move the cursor to the previous table data display. (Cursor movement order number – 1)
Cursor Movement to Right	Move the cursor to the right in the table data display.		
Cursor Movement to Left	Move the cursor to the left in the table data display.		

- Note
  When pressing an entry target to call a keypad, the keypad is not hidden after writing is set to occur in conjunction with cursor movement. However, the keypad is hidden after writing completes when the [ENT] key is pressed.

Control device memory

Control device memory controls entry. Consecutive addresses are used.
The method of control differs depending on the setting of [Operation Select] → [Cursor Moved by].

- [Cursor Moved by]: UP/DW Switch

<table>
<tr><th>Device Memory</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">n</td><td colspan="2">


* The [Enable/disable the entry key (Bit 15)] checkbox must be selected.
</td></tr>
<tr><td>Entry area selection</td><td>Specify the cursor movement range for the entry target.

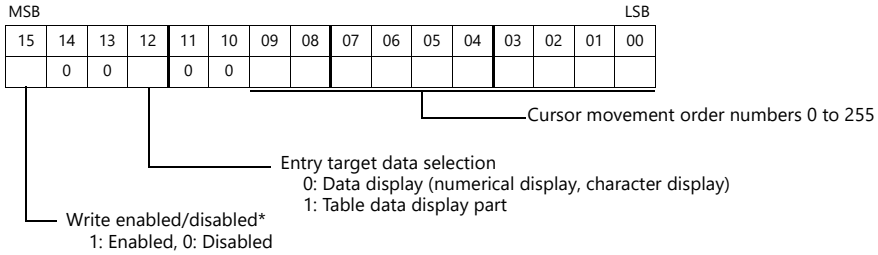
0: Disabled
The cursor moves between areas in the following order:
1) Screen
2) Overlap ID 0
3) Overlap ID 1
:
1: Enabled
Only move the cursor in the single specified range. The range is specified as “control device memory n + 1”.</td></tr>
<tr><td>Cursor movement</td><td>Control cursor movement when the [ENT] key is pressed.
This can be used when “UP/DW Switch” is set for [Cursor Moved by].
This bit is invalid if the [Moving the cursor when the entry key] checkbox is selected.
The cursor moves automatically at all times.

0: Manual
The cursor remains in the same position even when the [ENT] key is pressed. Use the [UP] and [DW] switches to move the cursor.
1: Auto
Press the [ENT] key to simultaneously write the entry value to the device memory and move the cursor to the next entry target.</td></tr>
<tr><td>Write enabled/disabled</td><td>This can be used when the [Enable/disable the entry key (Bit 15)] checkbox is selected.

0: Disabled
Operation of all entry switches is prohibited. If an entry key is pressed, an error beep sounds and no entry is possible. However, cursor movement can be performed with the [UP] and [DW] switches.
1: Enabled
Operation of entry switches is allowed.</td></tr>
<tr><td>n+1</td><td colspan="2">The following are used when the value specified for entry area selection is “1” (enabled). Specify the range of cursor movement.

0: Screen
1: Overlap ID 0
2: Overlap ID 1
3: Overlap ID 2
4: Overlap ID 3
5: Overlap ID 4
6: Overlap ID 5
7: Overlap ID 6
8: Overlap ID 7
9: Overlap ID 8
10: Overlap ID 9</td></tr>
</table>

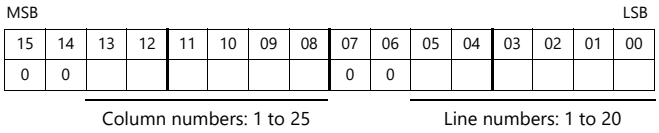
- [Cursor Moved by]: Control Device

<table>
<tr><th>Device Memory</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">n</td><td colspan="2">


* The [Enable/disable the entry key (Bit 15)] checkbox must be selected.
</td></tr>
<tr><td>Cursor movement order number</td><td>Specify the cursor movement order number for the data display (numerical display, character display) or table data display entry target. The following bits are used.
- For DEC specification: Bits 0 to 7
- For BCD specification: Bits 0 to 9</td></tr>
<tr><td>Entry target data selection</td><td>Select the type of data targeted for cursor movement.

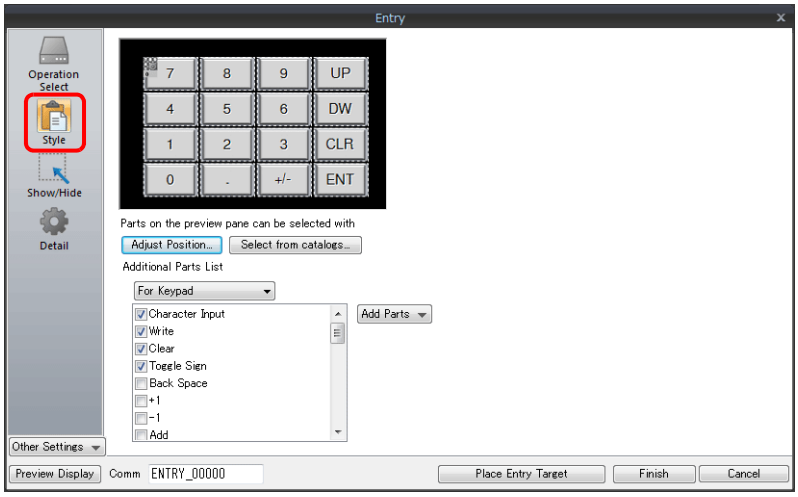
0: Data display (numerical display, character display)
1: Table data display part
For lines and columns in the table, specify using “control device memory n + 2”.</td></tr>
<tr><td>Write enabled/disabled</td><td>This can be used when the [Enable/disable the entry key (Bit 15)] checkbox is selected.

0: Disabled
Operation of all entry switches is prohibited. If an entry key is pressed, an error beep sounds and no entry is possible.
1: Enabled
Operation of entry switches is allowed.</td></tr>
<tr><td>n+1</td><td colspan="2">Specify the range of cursor movement.

0: Screen
1: Overlap ID 0
2: Overlap ID 1
3: Overlap ID 2
4: Overlap ID 3
5: Overlap ID 4
6: Overlap ID 5
7: Overlap ID 6
8: Overlap ID 7
9: Overlap ID 8
10: Overlap ID 9</td></tr>
<tr><td>n+2</td><td colspan="2">The following are used when the value specified for entry target data selection is “1” (table data display part). Specify the line numbers and column numbers of the table.


</td></tr>
</table>

Style



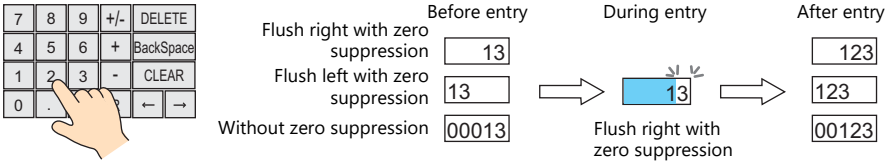
Item	Description
Adjust Position	Change the layout of the keypad and other added parts.
Select from catalogs	Change the keypad part.
Additional Parts List *	Select [For Keypad]. Use this list to add or remove entry-related parts.

* The following switches can be used on keypads.

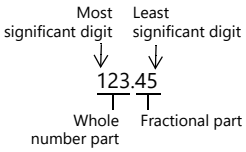
Part	Function	Description
Switch	Character Input	Enter numerical values or character codes corresponding to the text on the switch.
	Write	Transfer the entered data to the specified device memory address. The screen can be changed after the execution of data writing.
	Clear	Clear the entered data.
	Toggle Sign	Invert the sign of the entered data.
	Back Space *1	Delete the character to the left of the cursor.
	DELETE *1	Delete the character at the current cursor position.
	+1	Increment the number at the current cursor position by one.
	-1	Decrement the number at the current cursor position by one.
	Add	Add the specified constant value. (Data is written when the [ENT] key is pressed.)
	Subtraction	Subtract the specified constant value. (Data is written when the [ENT] key is pressed.)
	Cancel	Restore the initially displayed value (the value prior to entry) during an entry operation.
	LFT *1	Move the cursor left.
	RGT *1	Move the cursor right.
	UP *2	Move the cursor to the previous entry target. (Cursor movement order number –1)
	DW*2	Move the cursor to the next entry target. (Cursor movement order number + 1)
	Cursor Movement to Right *2	Move the cursor to the right in the table data display.
	Cursor Movement to Left *2	Move the cursor to the left in the table data display.
	Table Move + *2	Move the cursor to the next table data display. (Cursor movement order number + 1)
	Table Move – *2	Move the cursor to the previous table data display. (Cursor movement order number – 1)
	Max. Value Entry	Press this switch for an entry target with an alarm setting to display the maximum value on the entry display. Pressing the [ENT] key will write the maximum value to the entry target.
	Min. Value Entry	Press this switch for an entry target with an alarm setting to display the minimum value on the entry display. Pressing the [ENT] key will write the minimum value to the entry target.
Numerical data display	Entry Display Part	Temporarily display the entered value.
	Max. Value Display Part	Display the maximum value set for the entry target.
	Min. Value Display Part	Display the minimum value set for the entry target.

*1 This setting is available when the [Allow to use Insert/DELETE keys when entering values] checkbox is selected in [System Setting] → [Unit Setting] → [General Setting].
This allows insertion by moving the cursor with the [LFT] and [RGT] function switches and deletion using the delete and backspace switches. This setting is enabled for keypads on all screens. However, take the following points into consideration.

- During entry operations, entered values are displayed in flush-right format with zero suppression regardless of the display format of the numerical data display. The display returns to the specified display format after value entry is complete.



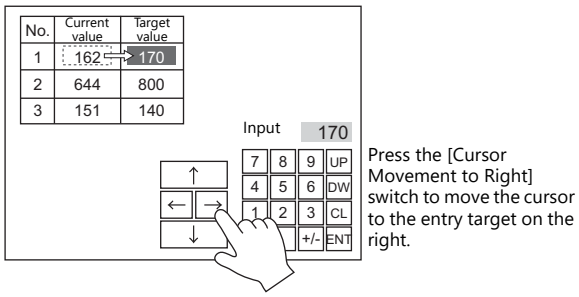
- Insertion at the whole number part
Values are inserted to the right of the cursor. When values exist at all places, entering a new value deletes the most significant digit.
Additionally, entering a value at the most significant digit of the whole number part overwrites the current value.



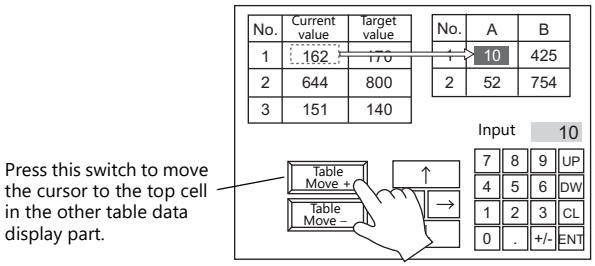
- Insertion at the fractional part
Values are inserted to the left of the cursor. When values exist at all places, entering a new value deletes the least significant digit of the fractional part.
Additionally, entering a value at the least significant digit of the fractional part overwrites the current value.

*2 Cursor movement for table data display parts

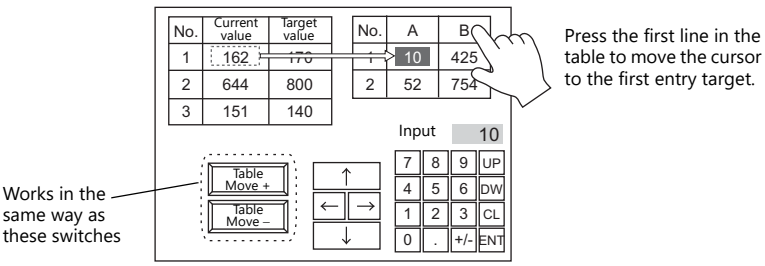
- If there are multiple entry targets in a table data display part, move the cursor using the [DW] and [UP] function switches or [Cursor Movement to Right] and [Cursor Movement to Left] function switches.



- If there are multiple table data entry targets, move the cursor between the table data display parts using the [Table Move +] and [Table Move –] function switches.

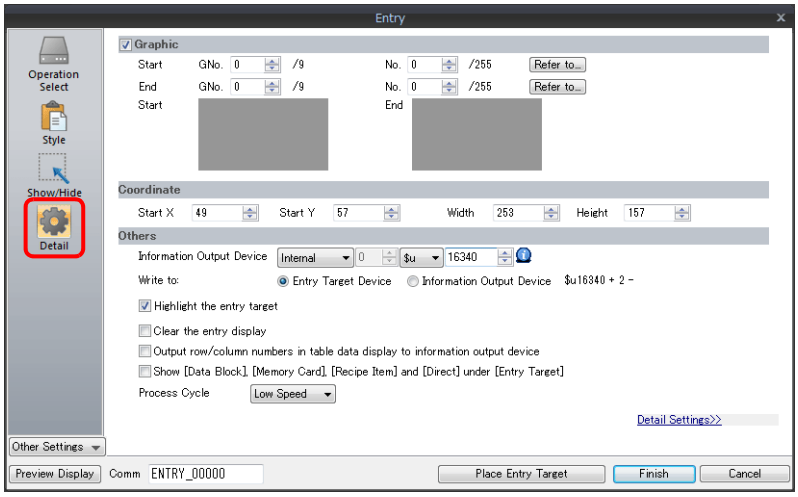


- Special functions
Setting the cell on the first line of the first column (“No.” in the example below) of a table data display part that has entry targets to a text value will add switch functionality to the first line.
When the first line is pressed, the cursor moves to the first entry target cell in the table data display part.
(This works in the same way as the [Table Move +] and [Table Move –] function switches.)



This function is enabled when [Operation Select] → [Entry Target] is set to “Data Display” for the keypad.

Detail

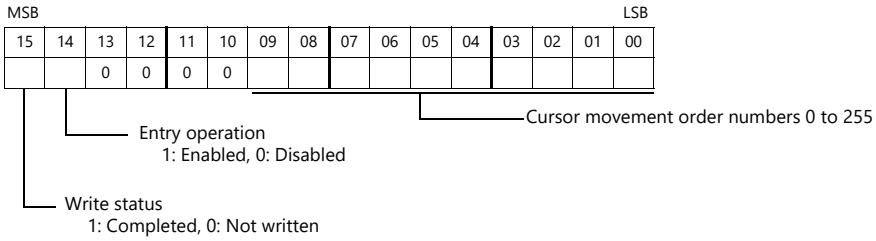


Item		Description
Graphic		The text placed on the graphic library can be regarded as entry text. Change between multiple graphic libraries using a switch that has [Function] set to "Graphic Library".
Coordinates		Set the placement position of the keypad.
Others	Information Output Device (V series → PLC)	This is the device memory that stores the entry state. Processing differs depending on the setting of [Detail] → [Output row/column numbers in table data display to information output device]. For details, refer to page 6-15.
	Write to	Entry Target Device. Data from the entry target is written to the specified device memory address. Information Output Device For numerical data entry → n+2, n+3 For text entry → n+2 onwards (number of bytes ÷ 2 = number of words used) - Example: Text Entering one-byte 10 characters into PLC device memory starting at D100: 10 ÷ 2 = 5 words D100 to D104 of the PLC device memory are used.
	Highlight the entry target	Highlight the display of the entry target selected with the cursor.
	Clear the entry display	Clear the data value on the entry display each time the [ENT] key is pressed.
	Output row/column numbers in table data display to information output device	This setting is available when the entry target is a table data display part. Select this checkbox to store line and column numbers of table data in the device memory specified for [Information Output Device] n + 1. For details, refer to page 6-15.
	Show [Data Block], [Memory Card], [Recipe Item] and [Direct] under [Entry Target]	The number of types listed for [Operation Select] → [Entry Target] increases. Data Block Use when entering data into a data block area. Memory Card Use on a keypad to perform name editing in memory card mode. Recipe Item Use on a keypad to perform name editing in recipe mode. Direct Use when controlling all processing up to the data write operation using external commands.
Process Cycle		Set a cycle for the X1 series to read the PLC data while it is communicating with the PLC. For details, refer to "1.2 Process Cycle".
ID		Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

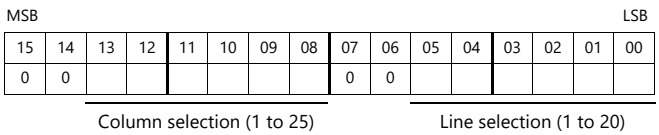
Information output device memory

This is the device memory that stores the entry mode state. Consecutive addresses are used.
Processing differs depending on the setting of [Detail] → [Output row/column numbers in table data display to information output device].

- [Output row/column numbers in table data display to information output device]: Unselected

Device Memory	Description	
n		
	Cursor movement order number	The cursor movement order number of the currently selected entry target is stored. The following bits are used. - For DEC specification: Bits 0 to 7 - For BCD specification: Bits 0 to 9
	Entry operation	If multiple keypad parts are displayed, the bit of the keypad in the foreground is set to "1" and the keypad becomes available for entry. If only one keypad is displayed, it is always set to "1".
	Write status	This bit shows whether the [ENT] key has been pressed or not. 0: Not written Indicates that the [ENT] key has not been pressed. 1: Completed Indicates that the [ENT] key was pressed and data was written to the device memory. Unless the cursor moves to another entry target, this bit remains set to "1". It is recommended to clear this bit to "0" after confirmation.
n+1	The currently selected cursor movement range is stored. 0: Screen 1: Overlap ID 0 2: Overlap ID 1 3: Overlap ID 2 4: Overlap ID 3 5: Overlap ID 4 6: Overlap ID 5 7: Overlap ID 6 8: Overlap ID 7 9: Overlap ID 8 10: Overlap ID 9	
n+2	When [Operation Select] → [Entry Target] is set to "Data Block", the currently displayed data block number is stored. No. 0 - 1023	
n+3 - n+m	When [Detail] → [Write to] is set to "Information Output Device", the entered value is stored. Numerical value: 2 words maximum Text: Number of bytes ÷ 2 words (if the number of bytes is odd, 1 byte is added.)	

- [Output row/column numbers in table data display to information output device]: Selected

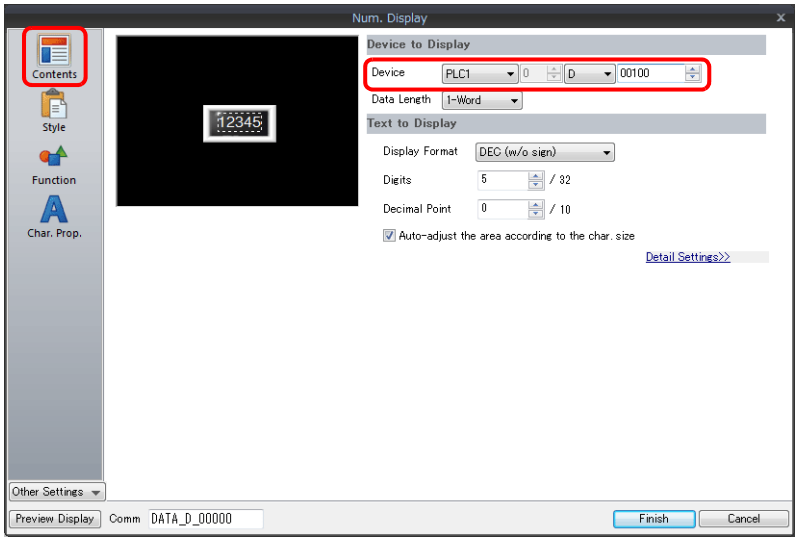
Device Memory	Description
n n+1	This is the same as "[Output row/column numbers in table data display to information output device]: Unselected" page 6-15.
n+2	The line and column numbers of the selected table data cell are stored. 
n+3	When [Operation Select] → [Entry Target] is set to "Data Block", the currently displayed data block number is stored. No. 0 - 1023
n+4 - n+m	When [Detail] → [Write to] is set to "Information Output Device", the entered value is stored. Numerical value: 2 words maximum Text: Number of bytes ÷ 2 words (if the number of bytes is odd, 1 byte is added.)

Entry Target

This section only explains the essential entry settings.

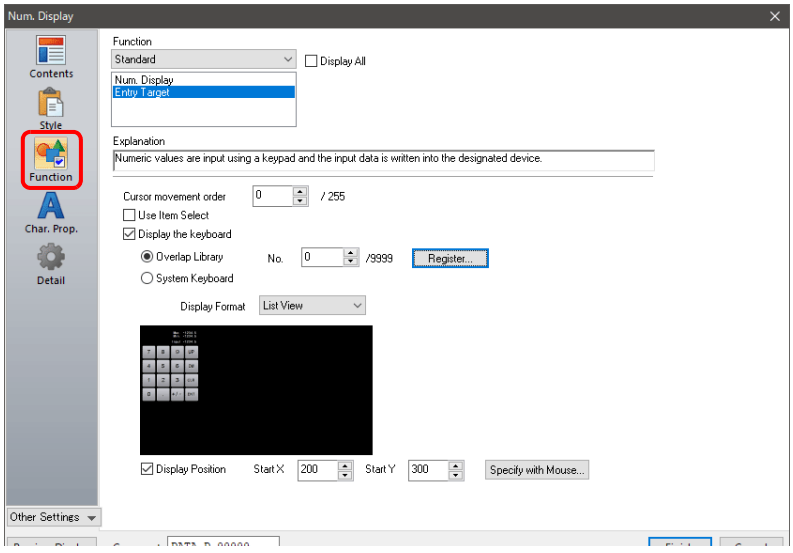
Numerical Data Display

Contents



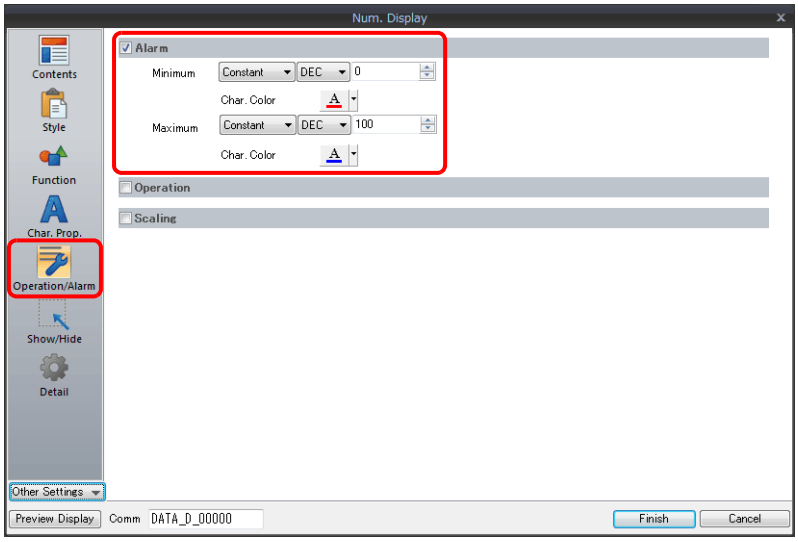
Item	Description
Device	Set the device memory for writing.

Function



Item	Description
Function	Set the entry target.
Cursor movement order	Set the cursor movement order. The cursor can be moved with the [UP] and [DW] switches or using a control device memory.
Use Item Select	Select this checkbox to use the item select function. The cursor moves to the entry target that is tapped. For details on the operation and notes, refer to "Selecting by Tapping the Entry Target" page 6-35.
Display the keyboard	Select a keypad. Click [Register] when registering a new keypad part.
Display Format	Change the list view of the overlap library.
Display Position	Unselected: Display using the position of the keypad registered in the overlap library. Selected: Specify the keypad display position. The display coordinates can be set with the mouse by clicking [Specify with Mouse].

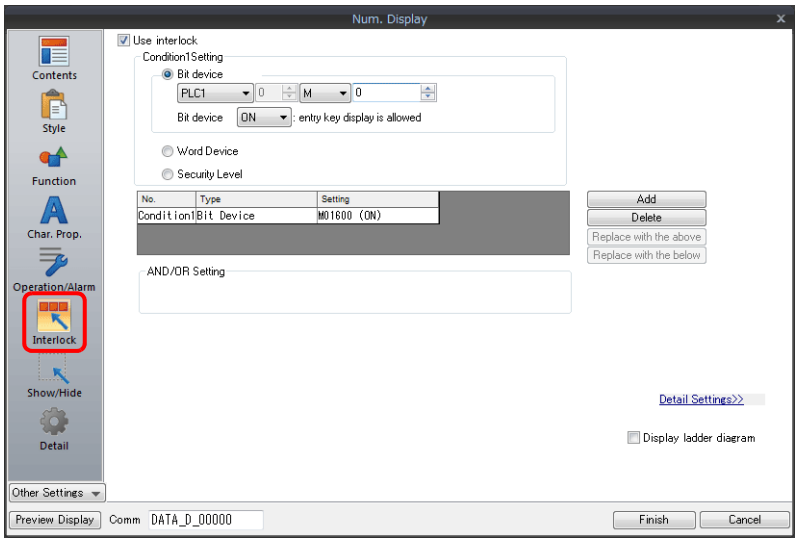
Operation/Alarm



Item	Description
Alarm	Set the entry range. Data can be entered within the range of the minimum and maximum values. If data that exceeds the specified range is entered using an external command (other than a keypad), the entry target is displayed in the specified color.

Interlock

This is used to control the calling of keypads.



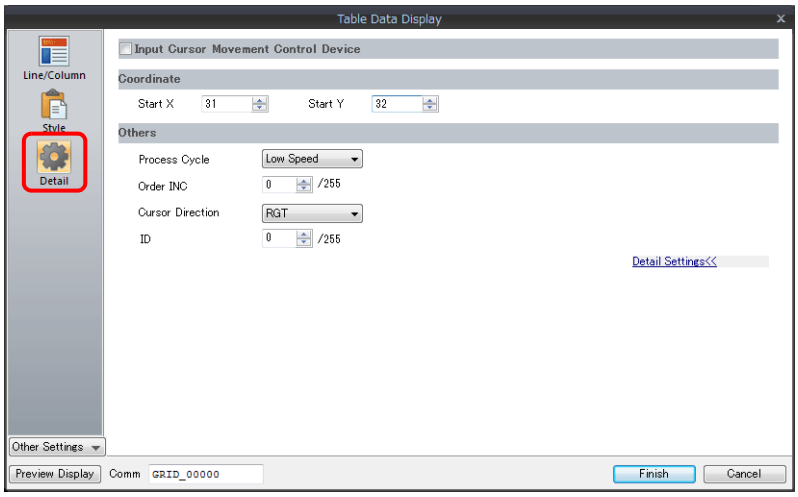
☞ For details, refer to " Interlock" page 3-19.

Table Data Display

General settings

Location of settings: Double-click on the table data display

- Detail

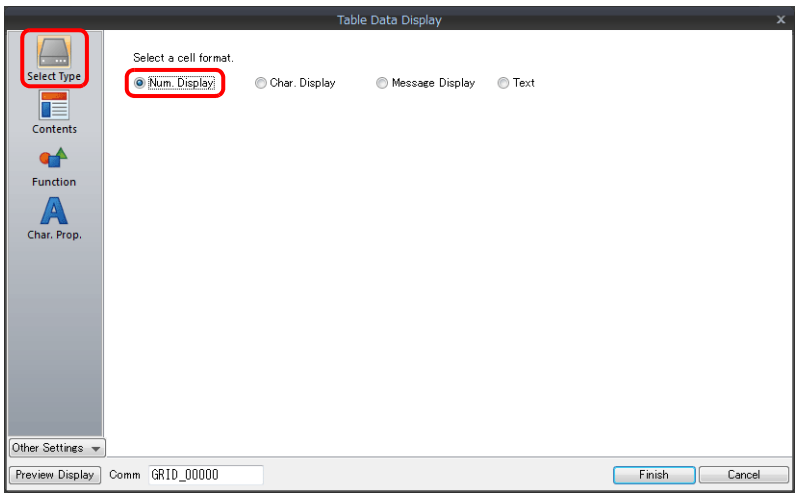


Item	Description
Input Cursor Movement Control Device	Perform cursor movement control. For details, refer to "6.3.1 Item Select Function" page 6-35.
Order INC	When the table data display contains multiple table data display parts for which [Function] is set to "Entry Target", this determines the order of precedence of each table data display part.
Cursor Direction	Select the direction in which the cursor moves when the [ENT] key is pressed. This setting is available when [Operation Select] → [Cursor Moved by] is set to "UP/DW Switch" for the keypad and bit 14 (cursor movement) of [Control Device] is set to ON.
ID	Set an ID number.

Table cells

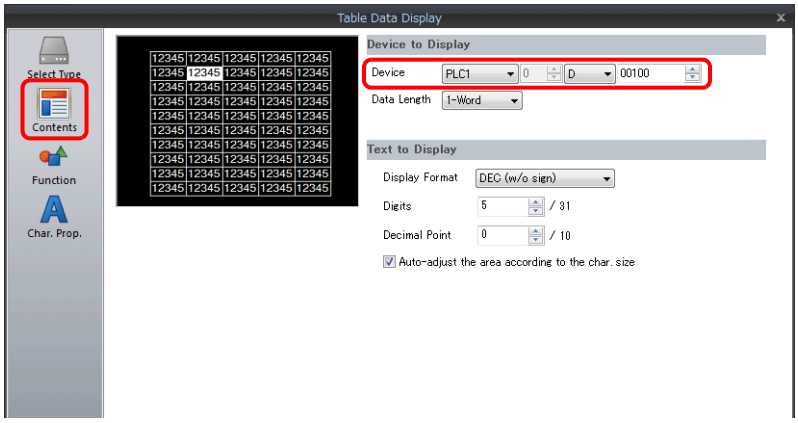
Location of settings: Right-click on table cell → right-click menu → [Detail Setting]

- Select Type



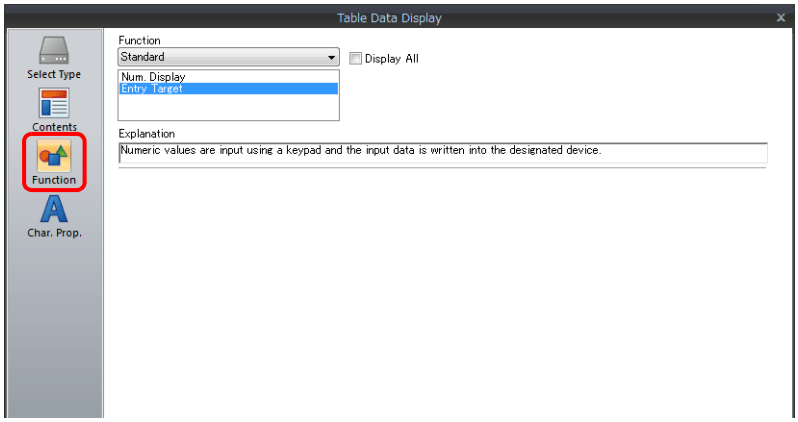
Item	Description
Select Type	Set the display format to [Num. Display].

- Contents



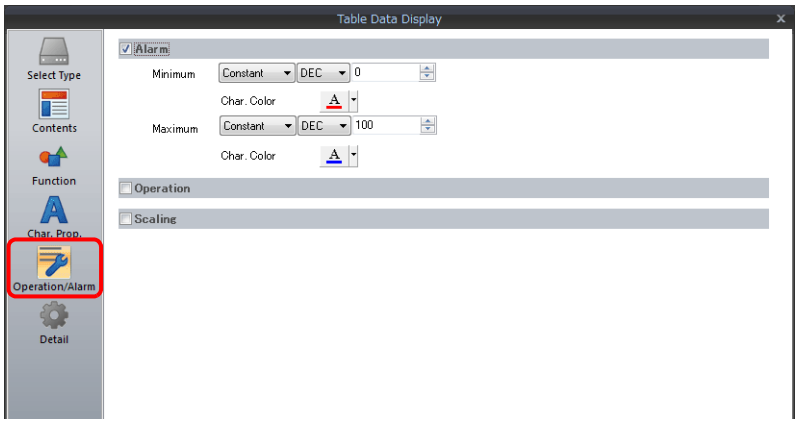
Item	Description
Device	Set the device memory for writing.

- Function



Item	Description
Function	Set the entry target.

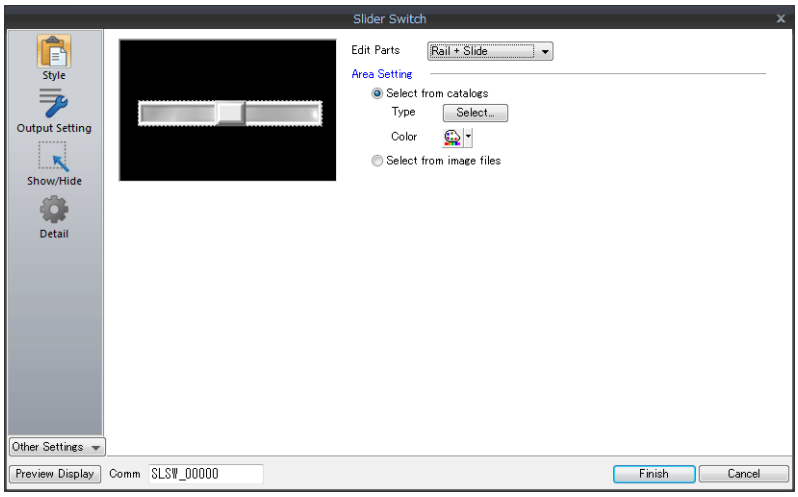
- Operation/Alarm



Item	Description
Alarm	Set the entry range. Data can be entered within the range of the minimum and maximum values. If data that exceeds the specified range is entered using an external command (other than a keypad), the entry target is displayed in the specified color.

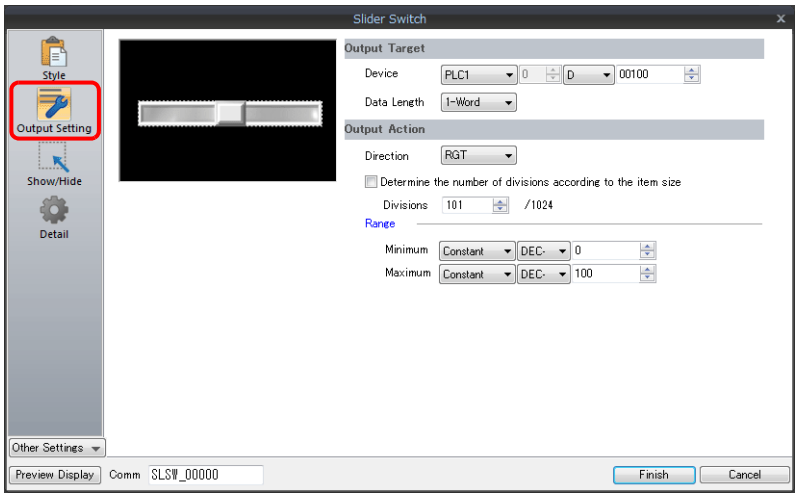
Slider Switch

Style



Item	Description
Area Setting	Set the part design.

Output Setting



Item	Description
Device	Set the device memory for writing data.
Data Length	Set data length for the device memory. (1-Word/2-Word)
Direction	Set the sliding direction.
Determine the number of divisions according to the item size	Select this checkbox to automatically define the number of divisions for the rail according to the size and scale value of the rail.
Divisions	Set the number of rail divisions. (2 to 1024) * If the rail size is smaller than the number of divisions, the rail is divided by the set number in the same manner as when the [Determine the number of divisions according to the item size] checkbox is selected.
Range	Set the writable range of the slider switch. This range can be changed by switching to device memory specification.

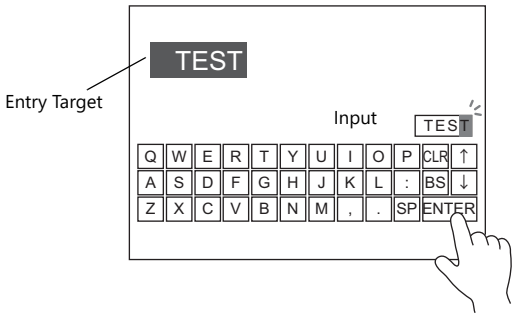
6.2 Character Input

6.2.1 Overview

A keyboard (or USB keyboard) or barcode reader can be used to enter text data (ASCII code data) to be written to the specified device memory address.
If the target data display is a character display when entering data using a keyboard, enter text data.

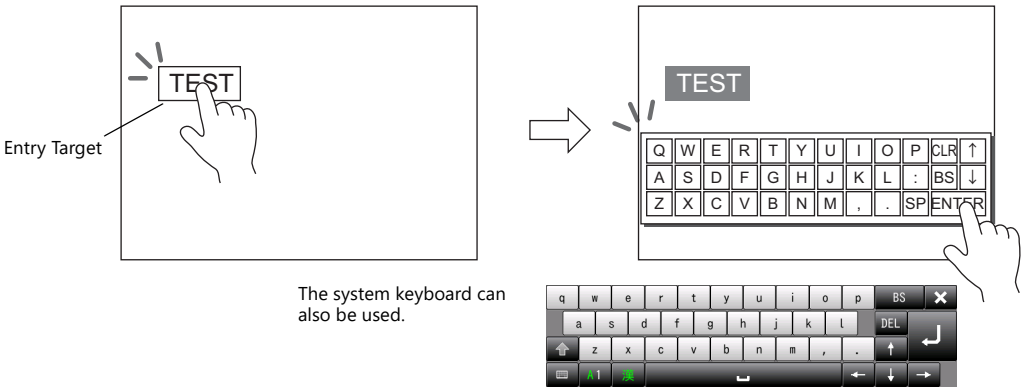
Keyboard

- Enter characters with respect to the entry target using a keyboard placed on the screen.



☞ For setting examples, refer to "Placing an Entry Target and Keyboard on the Screen" page 6-23.

- A keyboard can be displayed when needed and character data can be entered with respect to the entry target. The keyboard can remain hidden at other times.



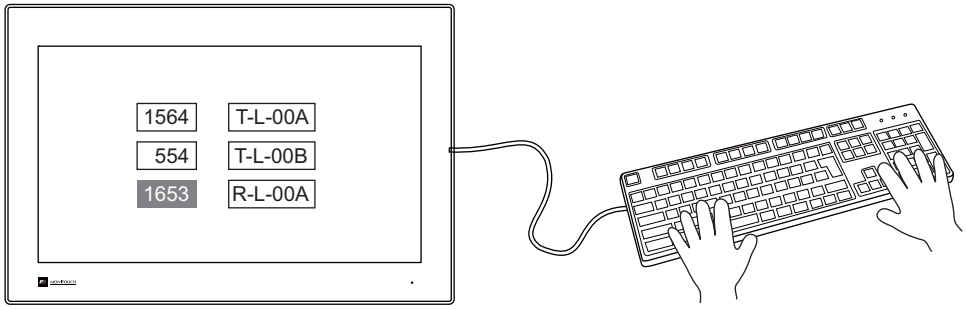
☞ For setting examples, refer to "Showing the Keyboard Only When Necessary" page 6-25.

- Cursor movement can be limited to certain entry targets.

☞ For details, refer to "6.3.1 Item Select Function" page 6-35.

USB keyboard

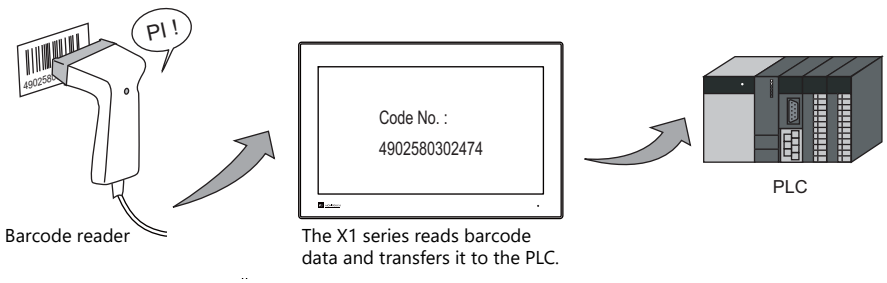
- Text can be entered with respect to the entry target using a USB keyboard connected to the USB-A port.



☞ For setting examples, refer to "USB Keyboard Entry" page 6-26.

Barcode reader

The X1 series reads barcode data, converts the necessary data into ASCII code, and stores the result in the input target. If a PLC device memory address is specified as the input target, various information can be transferred instantaneously from barcodes to a PLC.



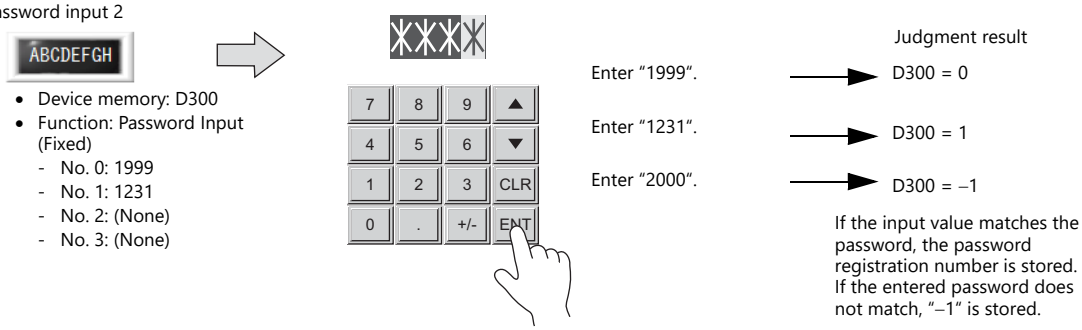
☞ For example settings, refer to "USB Barcode Reader Input" page 6-27.

Password

A password entry screen can be created using a character display.
There are two methods for handling passwords: displaying the input value using * (asterisks) and performing OK/NG validation using a ladder or macro (password input 1), and registering the correct password in advance and outputting the match/mismatch result to the specified address (password input 2).

- Password input 1

- Password input 2

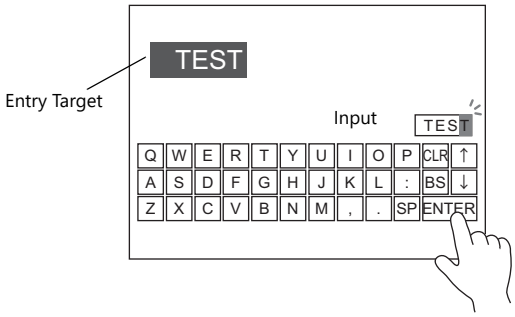


☞ For details on the setting procedure, refer to "Password Input 1 (* (Asterisks) Display)" page 6-28, and "Password Input 2 (Judgment Result Output)" page 6-29.

6.2.2 Setting Examples

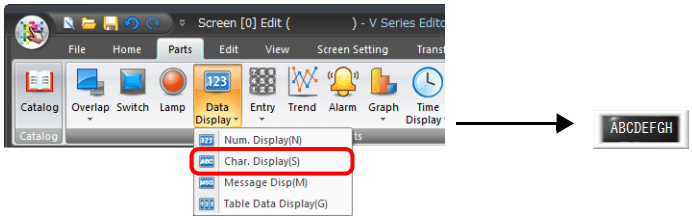
Placing an Entry Target and Keyboard on the Screen

There are two methods for placing these parts: placement using an entry target or placement using a keyboard. Each procedure is described below using an example.

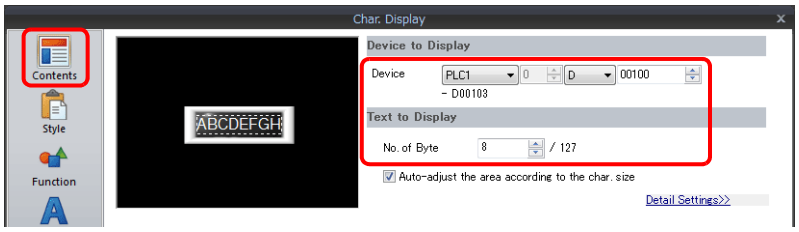


Placement Using an Entry Target

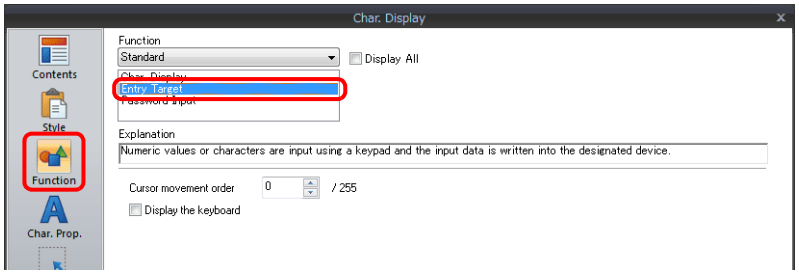
1. Click [Parts] → [Data Display ▼] → [Char. Display] and place a character display on the screen.



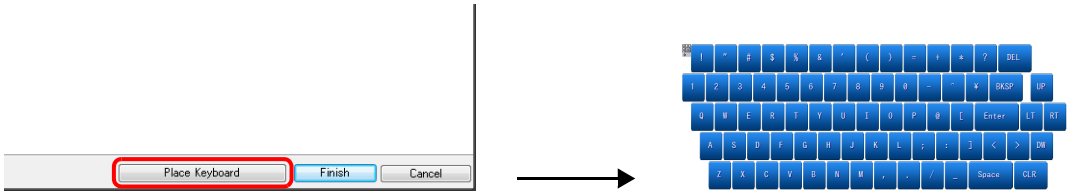
2. Display the settings window for the character display and set the [Contents] → [Device] and [No. of Bytes] settings.



3. Set [Function] to "Entry Target".



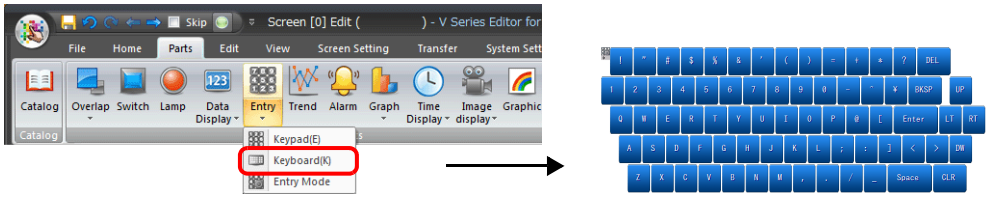
4. Click [Place Keyboard] to place a keyboard.



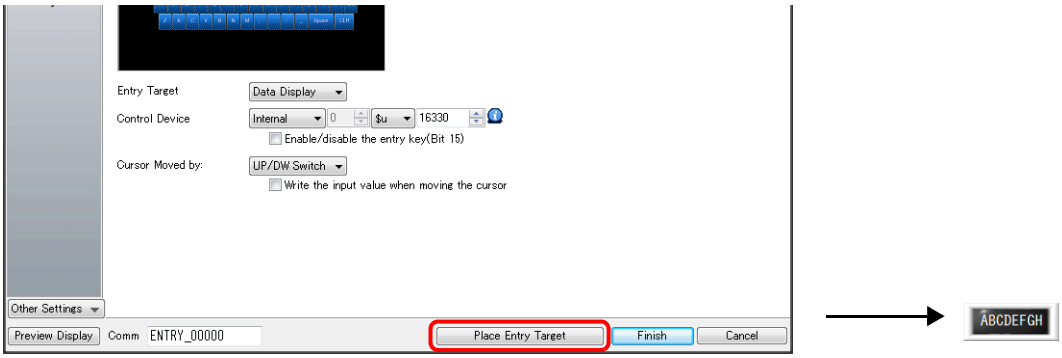
This completes the necessary settings.

Placement Using a Keyboard

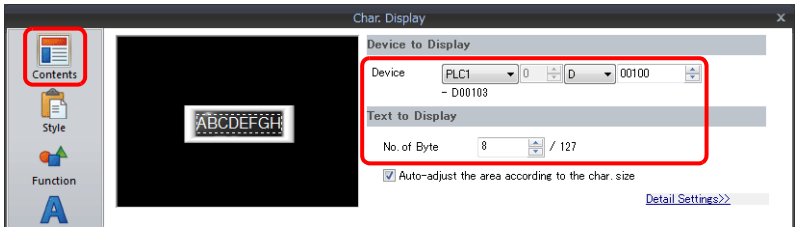
1. Click [Parts] → [Entry ▼] → [Keyboard] and place a keyboard on the screen.



2. Display the settings window for the keyboard, click the [Place Entry Target], and place an entry target.



3. Display the settings window for the entry target (character display) and set the [Contents] → [Device] and [No. of Bytes] settings.

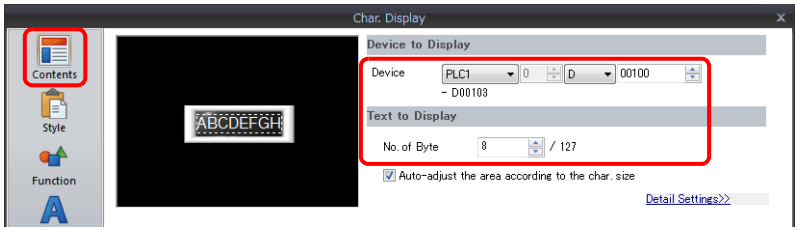


This completes the necessary settings.

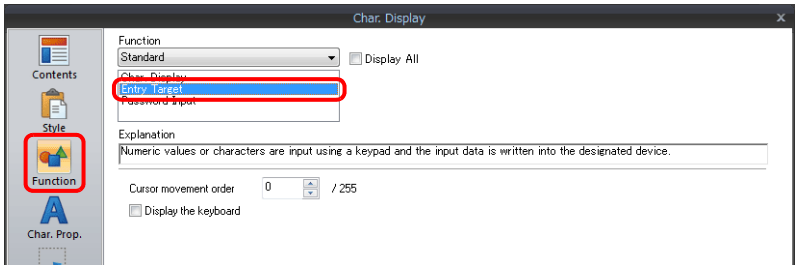
* An entry target can also be placed according to the following procedure.

1) Click [Parts] → [Data Display ▼] → [Char. Display] and place a character display on the screen.

2) Display the settings window for the character display and set the device memory for writing via [Contents] → [Device].

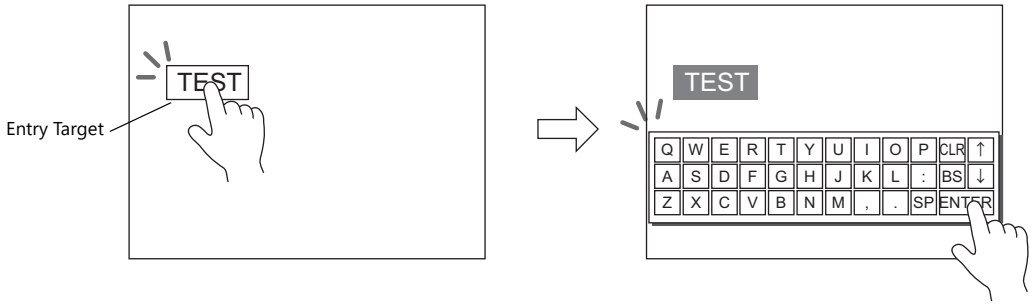


3) Set [Function] to "Entry Target".

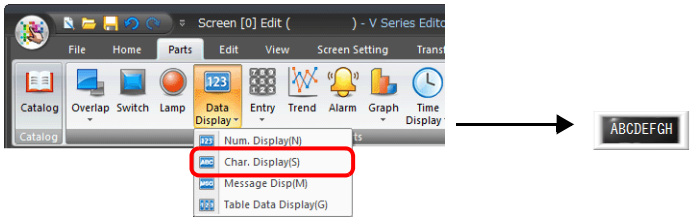


Showing the Keyboard Only When Necessary

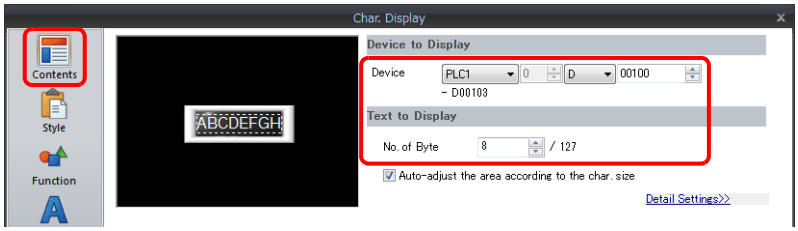
This procedure is described below using an example. (The keyboard disappears after entry.)



1. Click [Parts] → [Data Display ▼] → [Char. Display] and place a character display on the screen.

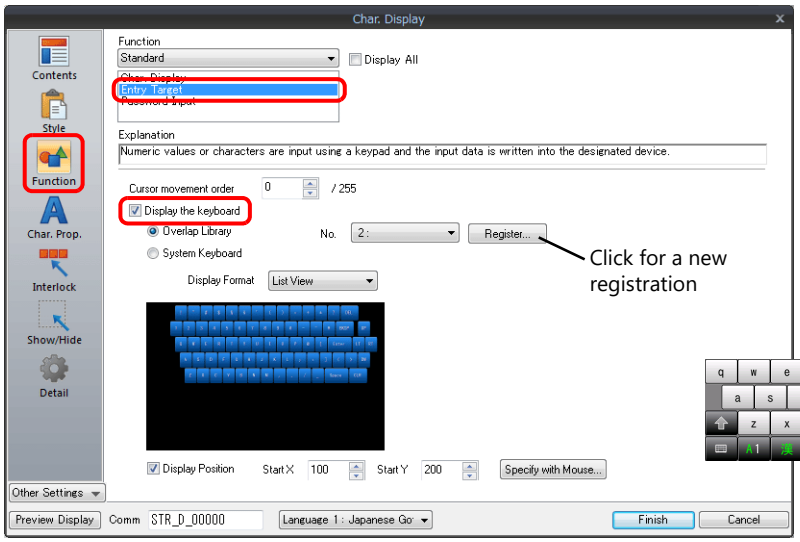


2. Display the settings window for the character display and set the device memory for writing via [Contents] → [Device].



3. Set [Function] to "Entry Target".

4. Select the [Display the keyboard] checkbox and select a keyboard.
When registering a new keyboard, click [Register] and select a keyboard.



When [System Keyboard] is selected

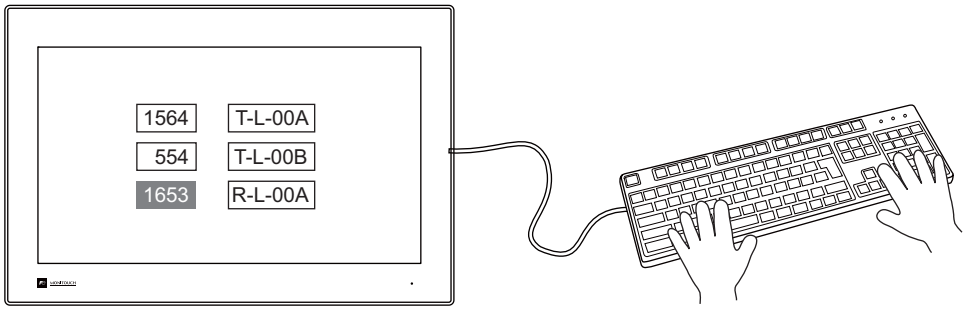
5. Select the [Display Position] checkbox and set the display position of the keyboard.
(The display position cannot be set when the system keyboard is selected.)

This completes the necessary settings.

This setting cannot be performed for table data display entry targets.

USB Keyboard Entry

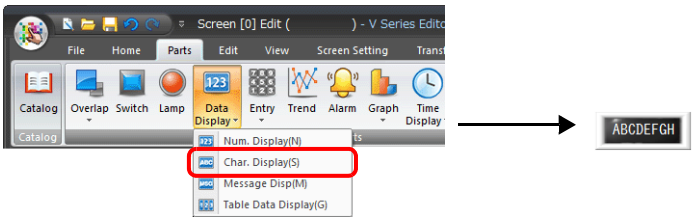
Text can be entered with respect to the entry target using a USB keyboard connected to the USB-A port.



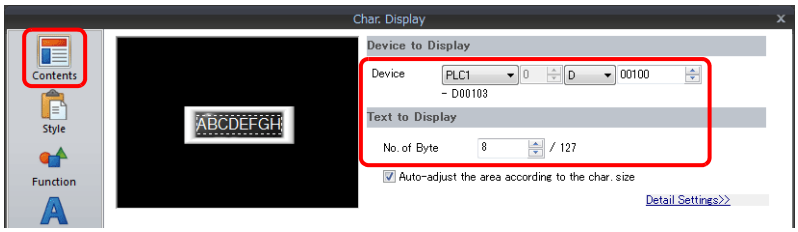
V-SFT Settings

Settings must be made for a target character display with [Entry Target] selected for [Function] and [Entry] icon must be registered on the screen on which the keyboard will be used.

1. Click [Parts] → [Data Display ▼] → [Char. Display] and place a character display on the screen.

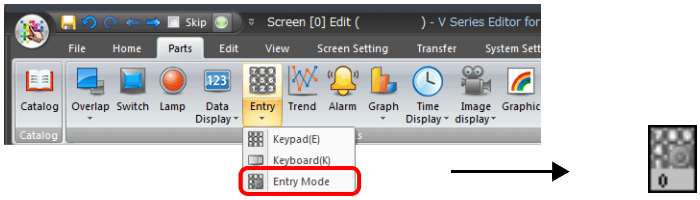


2. Display the settings window for the character display and set the device memory for writing via [Contents] → [Device].



3. Set [Function] to "Entry Target" and click [Finish].

4. Click [Parts] → [Entry] → [Entry Mode] and place an icon on the screen.



This completes the necessary settings.

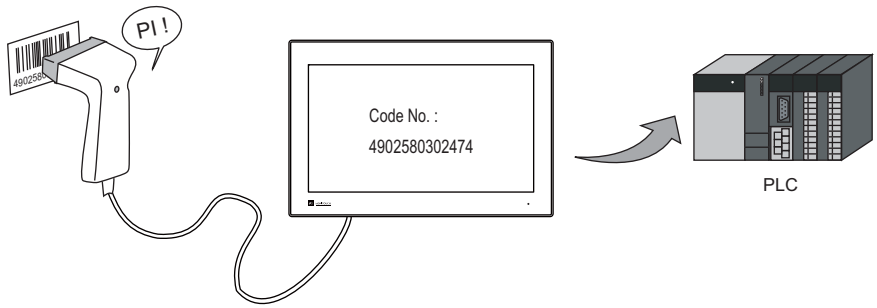
* Supported USB keyboard functions are shown below.

USB keyboard	Description
Character keys	Character Input
Enter	Write
– (minus)	Toggle Sign
Space	Space, conversion
Back Space	Back Space
Delete	Delete the character at the cursor position
Esc	Restore the initial display state during entry operation.

USB keyboard	Description
←	Move the cursor left
→	Move the cursor right
↑	Move the cursor to the previous option (–1)
↓	Move the cursor to the next option (+1)
Page Up	Move to the next screen page (+1)
Page Down	Move to the previous screen page (–1)
Caps Lock	Switching between uppercase and lowercase letters

USB Barcode Reader Input

Barcode data can be read and input from a USB barcode reader connected to the USB-A port.



Supported USB Barcode Readers

USB HID class barcode readers

V-SFT Settings

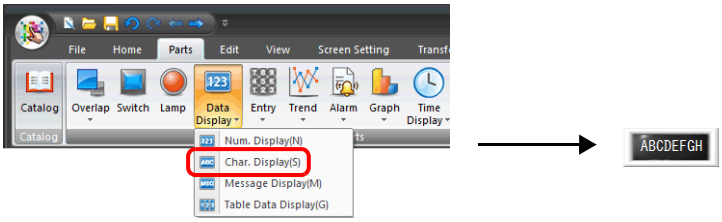
Settings are the same as that for USB keyboard entry.

☞ For details, refer to "USB Keyboard Entry" page 6-26.

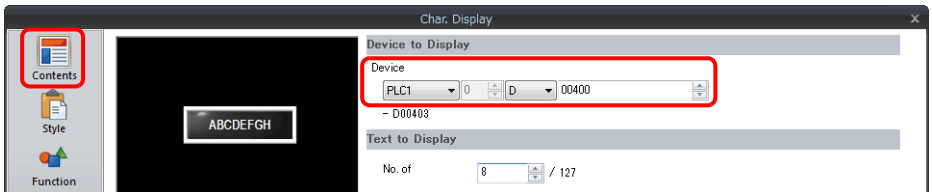
Password Input 1 (* (Asterisks) Display)

This procedure is described below using an example.
Characters are written to D400 on the password input screen. The input values can be hidden on the X1 by displaying them using * (asterisks).
OK/NG validation of input values is determined by a ladder or macro.

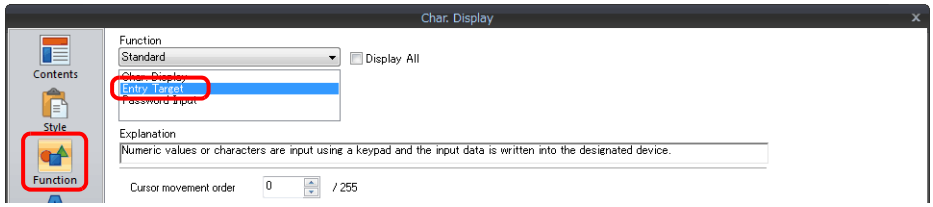
1. Click [Parts] → [Data Display ▼] → [Char. Display] and place a character display on the screen.



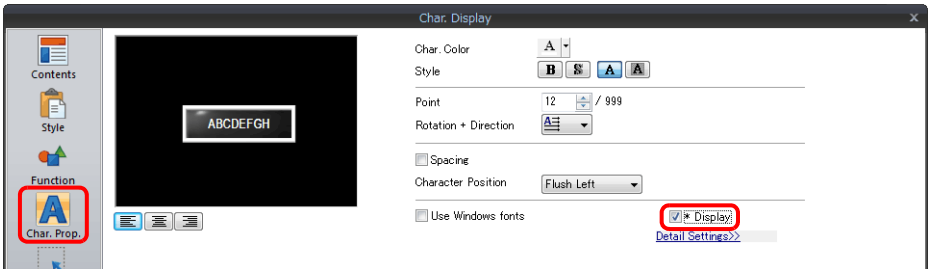
2. Display the settings window for the character display and set the device memory for writing via [Contents] → [Device].



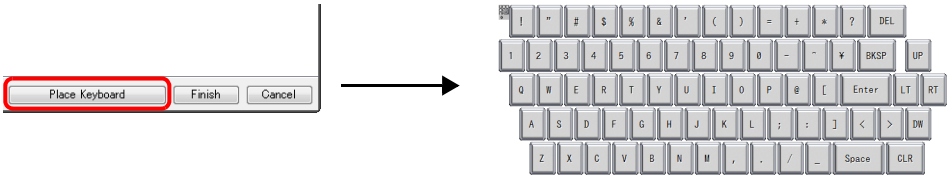
3. Set [Function] to "Entry Target".



4. Select the [* Display] checkbox in the [Char. Prop.] window.



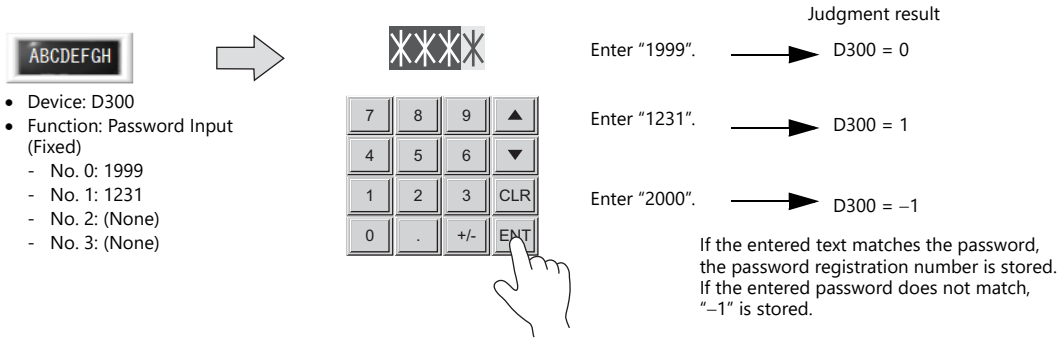
5. Click [Place Keyboard] and place a keyboard. A keypad can be placed when only numerical input is required.



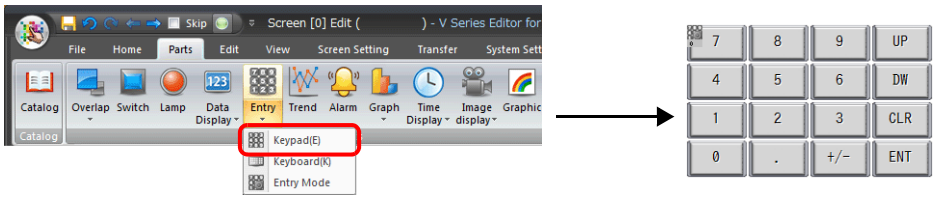
This completes the necessary settings.

Password Input 2 (Judgment Result Output)

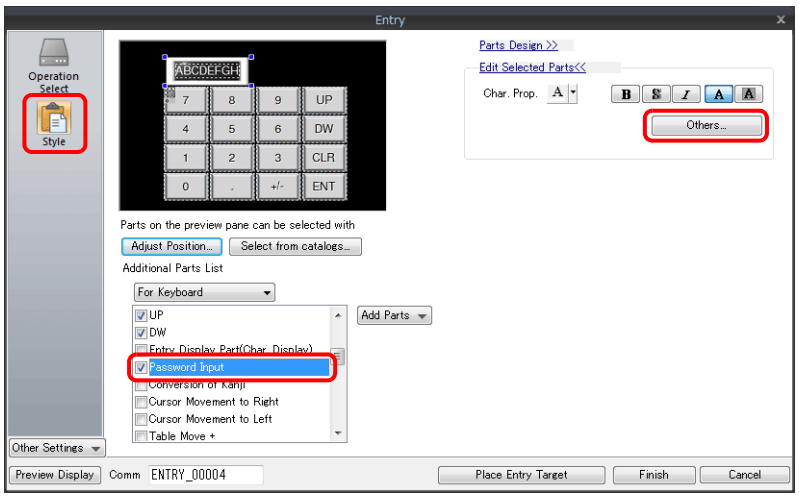
This procedure is described below using an example.
Register the correct password to the character display in advance and output the match/mismatch result with the input value to the specified address.



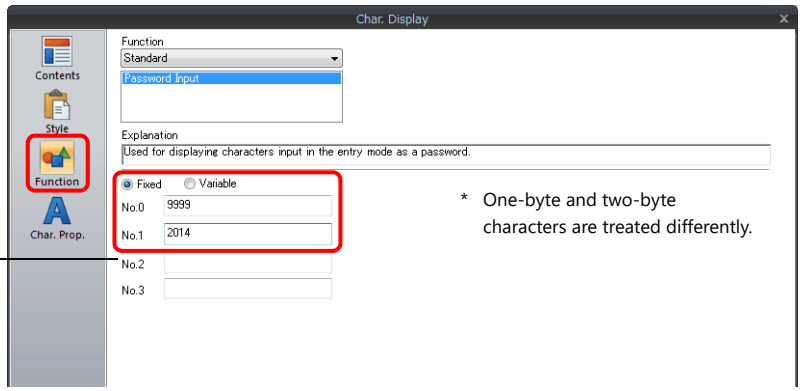
1. Click [Parts] → [Entry ▼] → [Keypad] and place a keypad on the screen.



2. Display the settings window for the keypad, select the [Style] → [Additional Parts List] → [For Keyboard] → [Password Input] checkbox, and then click [Others].

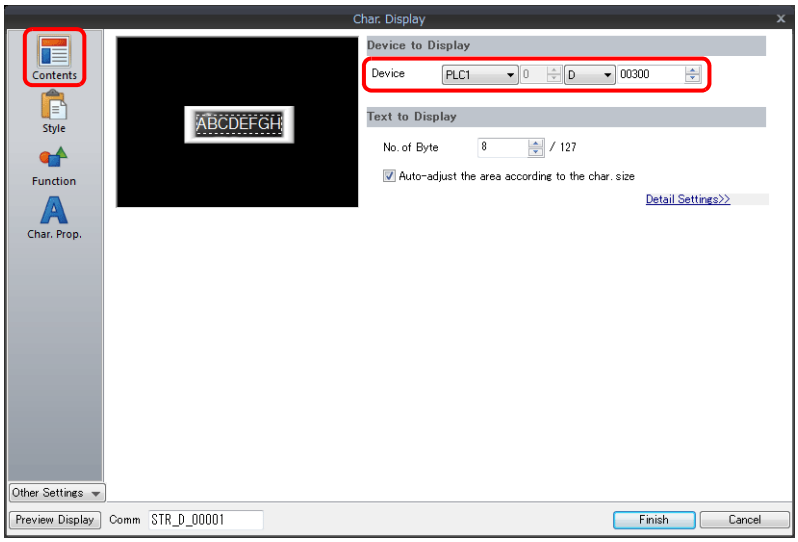


3. Register a password in the settings window of the character display under [Function].



Fixed	Register the number of passwords required using the four provided password fields numbered 0 to 3 (maximum of 32 one-byte alphanumeric characters).
Variable	Select the checkboxes of the four provided passwords numbered 0 to 3 as required and store the password as an ASCII code at the specified device memory address.

4. Set the device memory for outputting the password judgment result with [Contents] → [Device]. E.g. D300.



This completes the necessary settings.
The password judgment result is stored in D300.

- Password matches: When the password is accepted, No. 0 to 3 is stored.
- Password does not match: -1 (FFFF H) is stored.

6.2.3 Detailed Settings

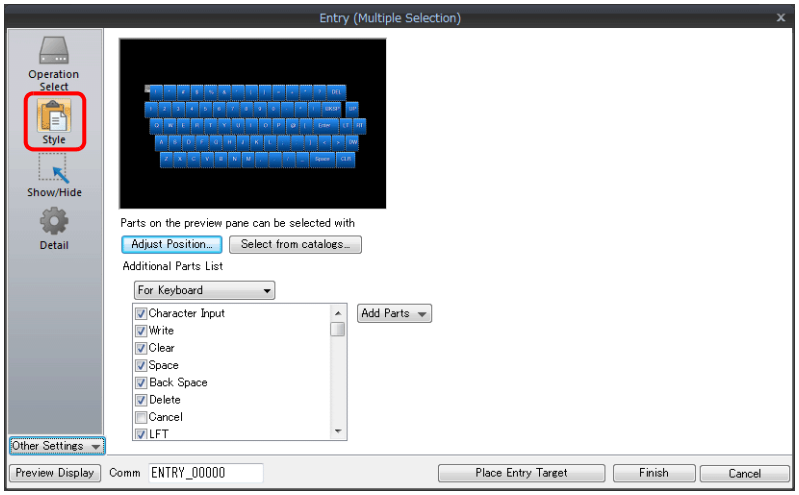
Keyboard

Operation Select / Detail

These are the same as for the keypad.

☞ For details, refer to "Operation Select" page 6-9 and "Detail" page 6-14.

Style



Item	Description
Adjust Position	Change the layout of the keyboard and other added parts.
Select from catalogs	Change the keyboard part.
Additional Parts List *	Select [For Keyboard]. Use this list to add or remove entry-related parts.

* The following switches can be used on a keyboard.

Part	Function	Description
Switch	Character Input	Enter numerical values or character codes corresponding to the text on the switch.
	Write	Transfer the entered data to the specified device memory address. The screen can be changed after the execution of data writing.
	Clear	Clear the entered data.
	Spaces	One-byte space is entered.
	Back Space	Delete the character to the left of the cursor.
	DELETE	Delete the character at the current cursor position.
	Cancel	Restore the initially displayed value (the value prior to entry) during an entry operation.
	LFT	Move the cursor left.
	RGT	Move the cursor right.
	UP	Move the cursor to the previous entry target. (Cursor movement order number –1)
	DW	Move the cursor to the next entry target. (Cursor movement order number + 1)
	Copy	Copies to the clipboard the text that is being input. *1 The information that is copied last is retained while in RUN mode.
	Paste	Inserts text from the clipboard to the left of the cursor. *2
	Cursor Movement to Right	Move the cursor to the right in the table data display. For details, refer to page 6-13.
	Cursor Movement to Left	Move the cursor to the left in the table data display. For details, refer to page 6-13.
	Table Move +	Move the cursor to the next table data display. (Cursor movement order number + 1)
	Table Move –	Move the cursor to the previous table data display. (Cursor movement order number – 1)

Part	Function	Description
Character display	Entry Target	Temporarily display the entered value.
	Password Input	Displays input values as asterisks. This can be used for password inputs. For details, refer to page 6-28.

*1 Copying is not possible in the following situations. An error buzzer will sound.

- When a character display part with [Function] set to [Password Input] is selected
- When a character display part with [Function] set to [Entry Target] is selected and the [*Display] checkbox is selected in the [Char. Prop.] settings
- When a range is selected (The buzzer does not sound.)
- When using the system keyboard
- When the [Enable/disable the entry key (Bit 15)] checkbox is selected and bit 15 is OFF

*2 Pasting is not possible in the following situations. An error buzzer will sound.

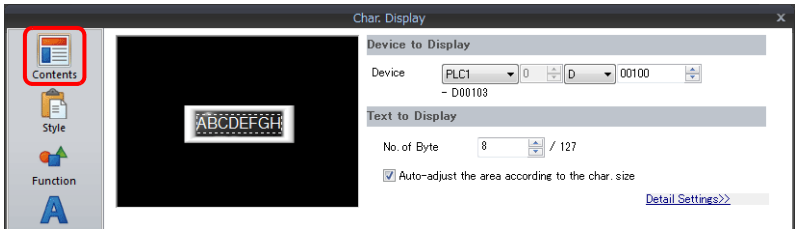
- When there are not enough bytes at the paste destination
- When line break, tab or control characters are included
- When an empty string is copied and pasted
- When the language of the copied text differs from the paste destination (The buzzer does not sound.)
- When using the system keyboard
- When the [Enable/disable the entry key (Bit 15)] checkbox is selected and bit 15 is OFF

Entry Target

This section only explains the essential entry settings.

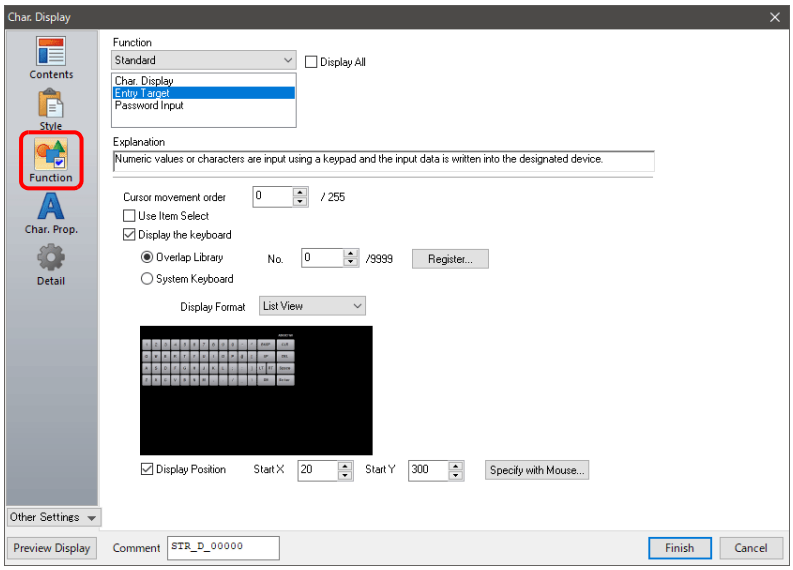
Character Display

Contents



Item	Description
Device	Set the device memory for writing.
No. of Bytes	Specify the number of bytes (number of characters).

Function



Item	Description
Function	Set the entry target.
Cursor movement order	Set the cursor movement order. The cursor can be moved with the [UP] and [DW] switches or using a control device memory.
Use Item Select	Select this checkbox to use the item select function. The cursor moves to the entry target that is tapped. For details on the operation and notes, refer to "Selecting by Tapping the Entry Target" page 6-35.
Display the keyboard	Select a keyboard. Click [Register] when registering a new keyboard part.
Display Format	Change the list view of the overlap library.
Display Position	Unselected: Display using the position of the keyboard registered in the overlap library. Selected: Specify the keyboard display position. The display coordinates can be set with the mouse by clicking [Specify with Mouse].

Interlock

These are the same as for the keypad.

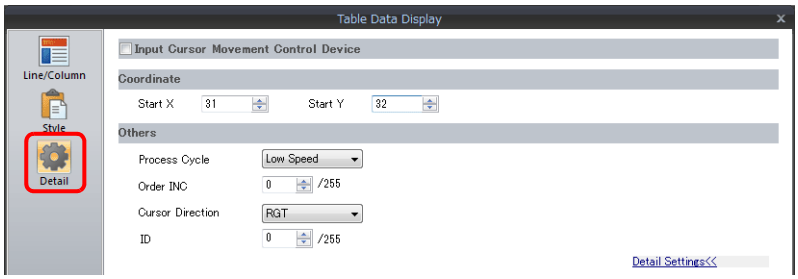
☞ For details, refer to "Interlock" page 6-17.

Table Data Display

General settings

Location of settings: Double-click on the table data display

- Detail



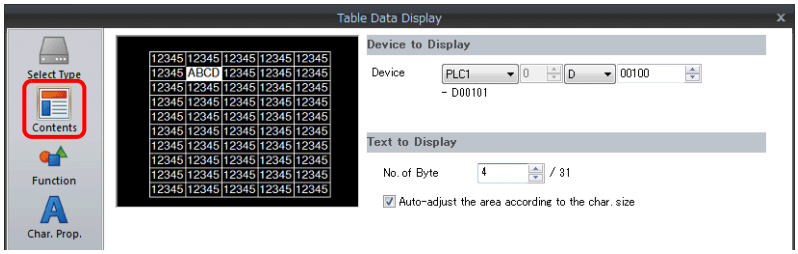
Item	Description
Input Cursor Movement Control Device	Perform cursor movement control. For details, refer to "6.3.1 Item Select Function" page 6-35.
Order INC	When the table data display contains multiple table data display parts for which [Function] is set to "Entry Target", this determines the order of precedence of each table data display part.
Cursor Direction	Select the direction in which the cursor moves when the [ENT] key is pressed. This setting is available when [Operation Select] → [Cursor Moved by] is set to "UP/SW Switch" and bit 14 (cursor movement) of [Control Device] is set to ON.
ID	Set an ID number.

Table cells

- Select Type

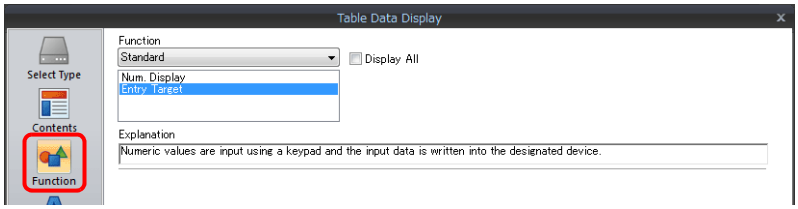
Item	Description
Select Type	Select [Char. Display].

- Contents



Item	Description
Device	Set the device memory for writing.
No. of Bytes	Specify the number of bytes (number of characters).

- Function



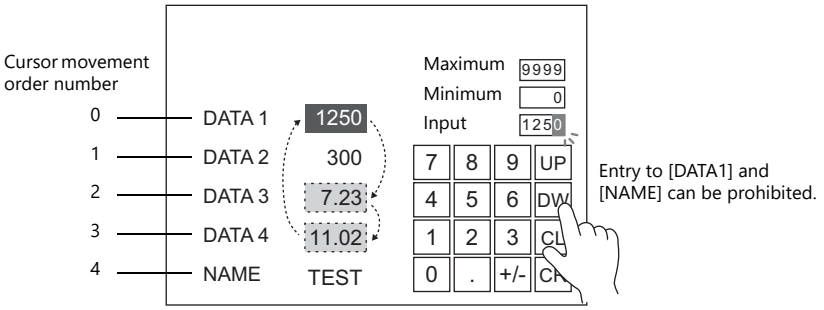
Item	Description
Function	Set the entry target.

6.3 Convenient Functions

6.3.1 Item Select Function

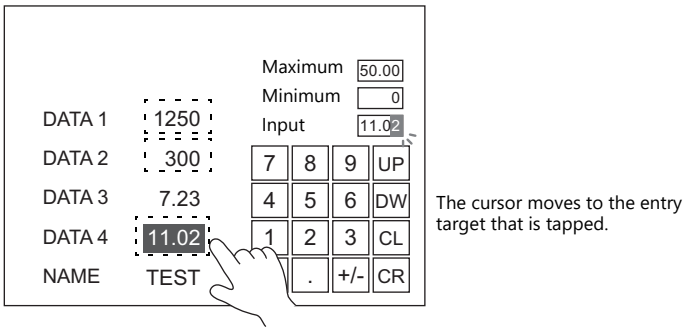
Overview

The cursor can be moved to a specific entry target. This is called the "item select function."
There are two methods for moving the cursor: using a switch or using an external command from the device memory specified for [Input Cursor Movement Control Device] (page 6-36).



Selecting by Tapping the Entry Target

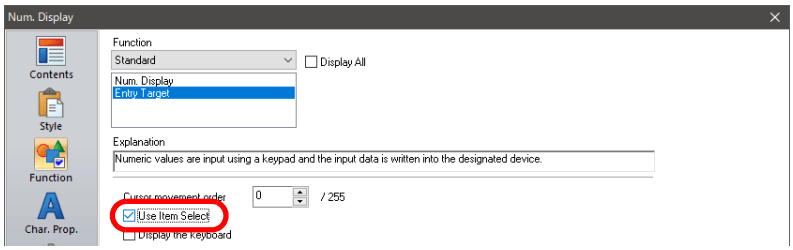
The cursor can be moved to a specific entry target by tapping the entry target.



Setting Procedure

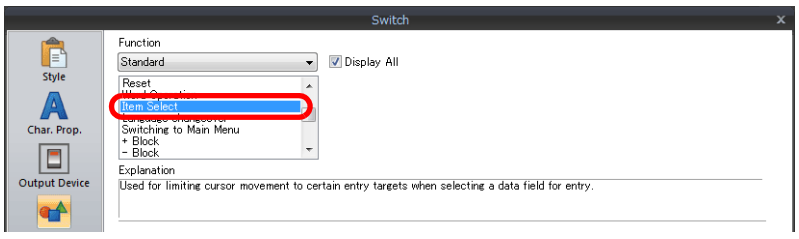
When enabling the item select function for an entry target

Select the [Function] → [Use Item Select] checkbox of the data display part to be set as an entry target.



When placing a switch so that it overlaps an entry target

1. Set [Function] to "Item Select" for the switch.



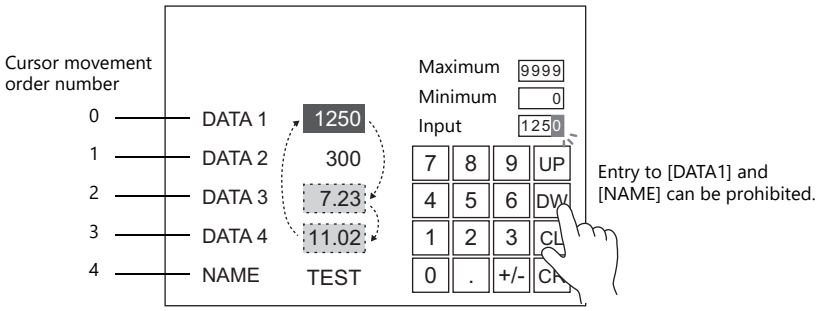
2. Place the switch so that it overlaps an entry target.

Notes

- Place the switch set with "Item Select" for [Function] on the same editing layer (screen, overlap ID 0 to 9) as the keypad.
- For the keypad, set [Operation Select] → [Entry Target] to "Data Display" and [Cursor Moved by] to "UP/DW Switch".

Item Select with [Input Cursor Movement Control Device]

Set a [Input Cursor Movement Control Device] at the position of the placed entry target. The cursor can be moved to the specific entry target by setting the relevant [Input Cursor Movement Control Device] bit either ON or OFF.



Location of Setting

The location of this setting differs depending on the placement location of the entry target. Specify the top device memory address for [Input Cursor Movement Control Device] at the location of this setting.

Entry Target		Location of the [Input Cursor Movement Control Device] Setting
Type	Placement Location	
Numerical Data Display Character Display	Screen	[Screen Setting] → [Screen Setting] → [Entry] → [Input Cursor Movement Control Device]
	Normal overlap	Normal overlap settings window → [Detail] → [Input Cursor Movement Control Device]
	Multi-overlap	Multi-overlap settings window → [Detail] → [Input Cursor Movement Control Device]
	Call-overlap	Call-overlap settings window → [Detail] → [Input Cursor Movement Control Device]
	Global overlap	Global overlap settings window → [Detail] → [Input Cursor Movement Control Device]
	Data Block Area	Data block area settings window → [Detail] → [Input Cursor Movement Control Device] under [Device Setting]
Table Data Display	-	Table data display settings window → [Detail] → [Input Cursor Movement Control Device]

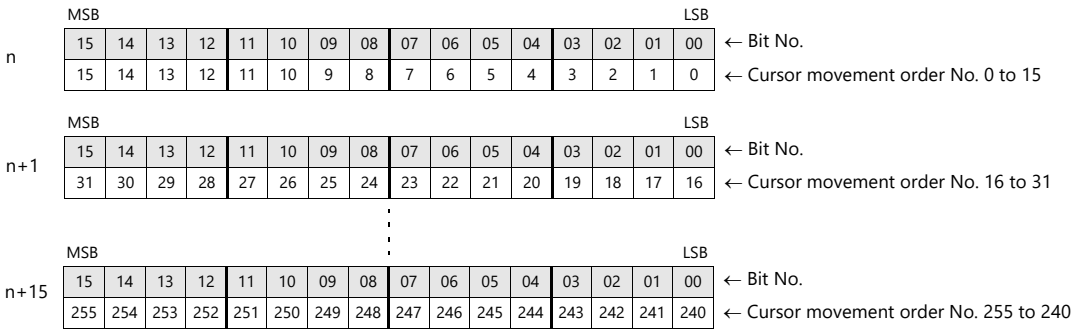
Details of the [Input Cursor Movement Control Device] Setting

The control method differs depending on whether the entry target is a numerical data display, character display, or table data display.
One bit is assigned to each entry target and cursor movement is controlled by the ON/OFF state of this bit.

When the entry target is a numerical number display or character display

[Input Cursor Movement Control Device] is associated with [Entry Target] and the [Cursor movement order] number in the following way.

0: Cursor movement prohibited
1: Cursor movement allowed

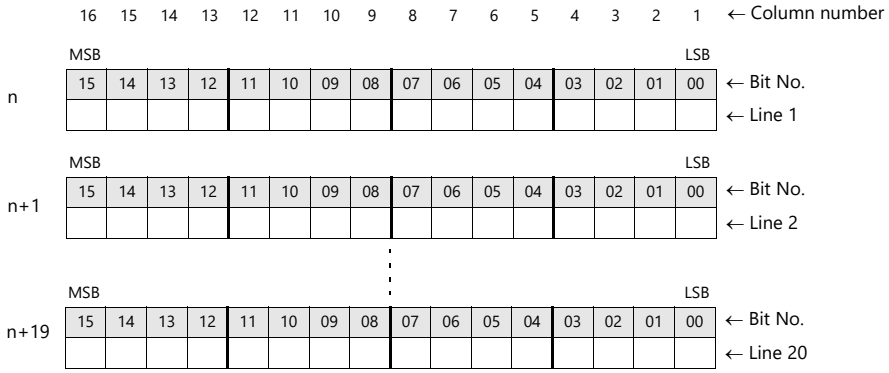


When the entry target is a table data display

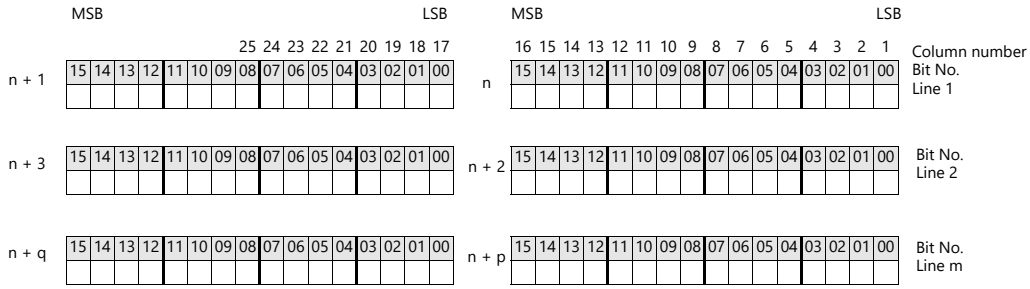
Assignment depends on the number of columns of the table data display part.

0: Cursor movement prohibited
1: Cursor movement allowed

- Table with 1 to 16 columns
  For a table with 1 to 16 columns, one word is used for each line.
  The total number of words used is the same as the number of lines.



- Table with 17 to 25 columns
  For a table with 17 or more columns, 2 words are used for each line.
  The total number of words used is "2 ÷ number of lines".

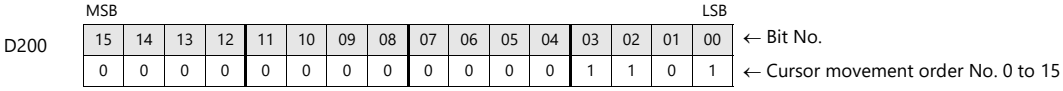


Usage Example

An example of when a numerical data display or character display entry target and a keypad are placed on the screen is explained below.

1. Set [Screen Setting] → [Screen Setting] → [Entry] → [Input Cursor Movement Control Device]. Example: PLC device memory D200

2. Only the 0th, 2nd, and 3rd bits of the device memory for input cursor movement control are set to ON from the unit.



The cursor moves according to the cursor movement order numbers 0, 2, and 3.

Notes

In this case, the [Cursor movement order] number of each table data display is ignored.
The line and column numbers are also assigned to those consisting of text only.

7 Trends

7.1 Overview

7.2 Historical Display

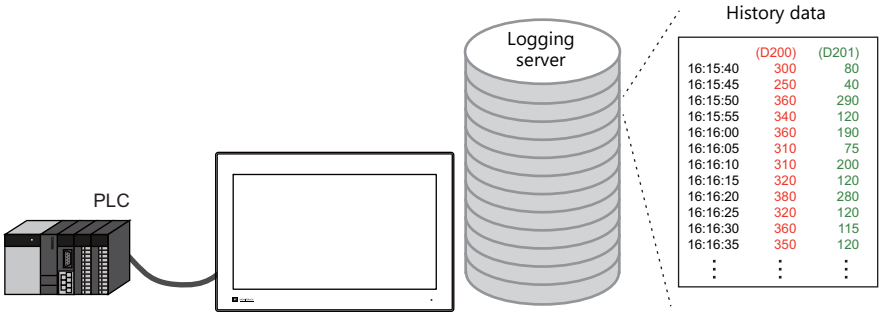
7.3 Real Time Display

7.1 Overview

There are two types of trend sampling: historical display (logging server) and real time display.

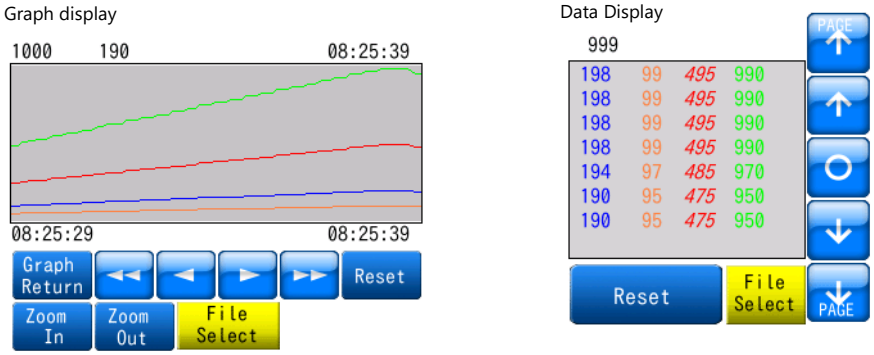
Historical Display

- The values of device memory addresses registered to a logging server can be saved as history. Logging can be performed at a fixed cycle or using a trigger bit (0 → 1).



☞ For details, refer to "7.2 Historical Display" page 7-2.

- History data saved to a logging server using trend sampling parts can be displayed on a graph or as data.

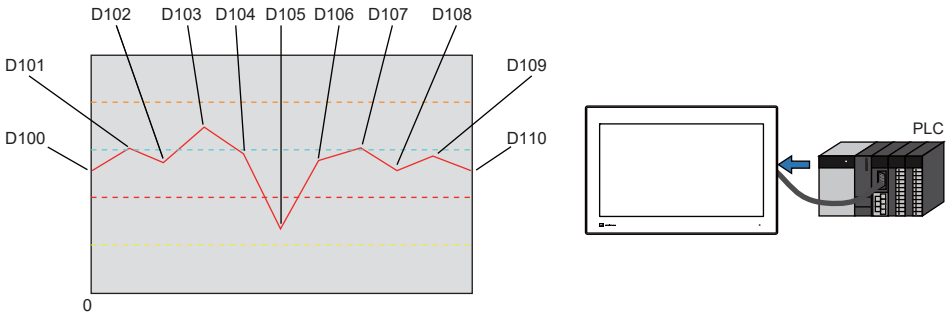


☞ For details, refer to the following references.
- "7.2.2 Graph Display" page 7-16
- "7.2.3 Data Display" page 7-26

Real Time Display

Values in consecutive device memory addresses can be expressed on a line graph.

Example: Graph display of data in addresses D100 to D110

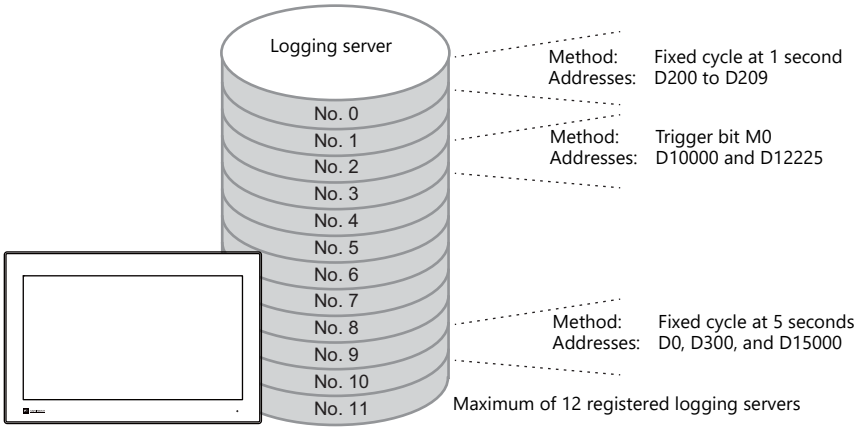


☞ For details, refer to "7.3 Real Time Display" page 7-33.

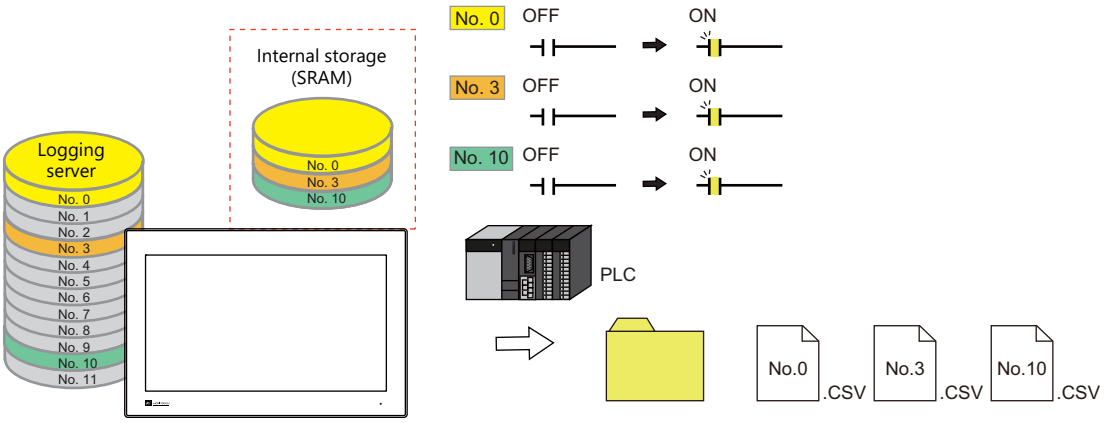
7.2 Historical Display

7.2.1 Logging Server

- The area for saving logged data is referred to as the logging server. A maximum of 12 logging servers can be registered. Logging is performed using a fixed cycle or a trigger bit (0 → 1) and device memory can be freely configured.



- CSV/backup output
  - History data saved to a logging server can be output to X1 internal storage ("sd" folder, "usb" folder) or external USB storage as a CSV or backup file.



☞ For details, refer to "Outputting CSV/Backup Files" page 7-5.

- History data saved to a logging server using trend sampling parts can be displayed on a graph or as data.

☞ For details, refer to the following references.
- "7.2.2 Graph Display" page 7-16
- "7.2.3 Data Display" page 7-26

Setting Example

Logging Methods

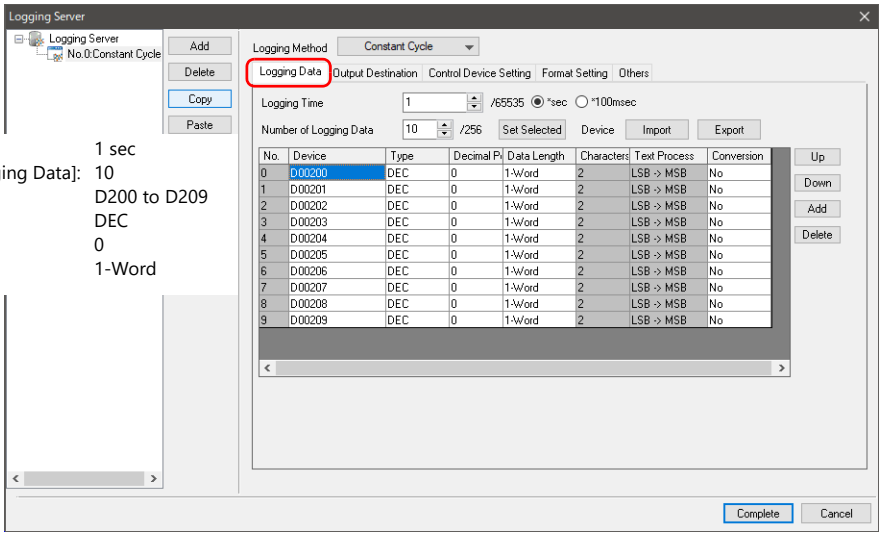
There are two logging methods: logging performed at a fixed cycle and logging performed upon triggering of a trigger bit (0 → 1).

Fixed cycle

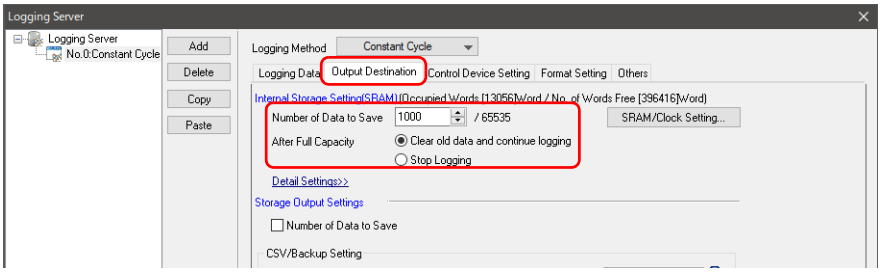
This section explains logging with a fixed cycle using an example of logging data from device memory addresses D200 to D209 at 1 second intervals.

1. Display the [System Setting] → [Logging Server] window.
2. Click [Add] and set an unregistered number.
3. Set [Logging] to [Constant Cycle].
4. Configure the [Logging Data] tab window settings as shown below.

- [Logging Time]: 1 sec
- [Number of Logging Data]: 10
- [Device]: D200 to D209
- [Type]: DEC
- [Decimal Point]: 0
- [Data Length]: 1-Word



5. Set [Number of Data to Save] on the [Output Destination] tab window.



Number of Data to Save	Set the number of data entries to save in logging.
After Full Capacity	Set the operation to perform when the value of [Number of Data to Save] is exceeded. Erase old data entries and continue or stop logging.

This completes the necessary settings.

☞ To output as a CSV or backup file, refer to "Outputting CSV/Backup Files" page 7-5.

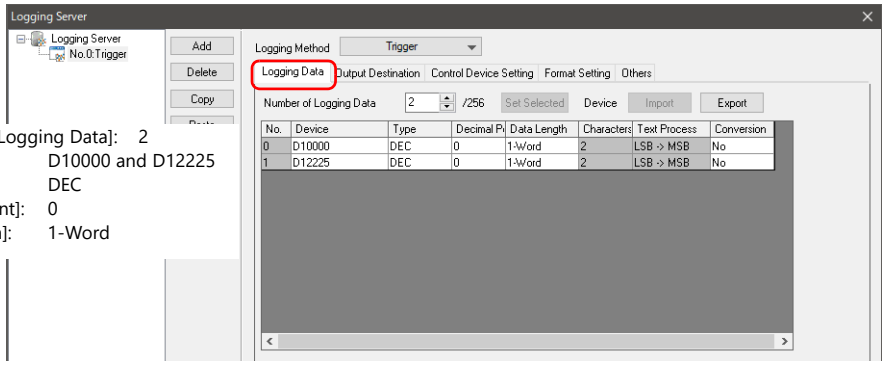
☞ To display logging data on a graph or as data, refer to the following references.

- "7.2.2 Graph Display" page 7-16
- "7.2.3 Data Display" page 7-26

Trigger

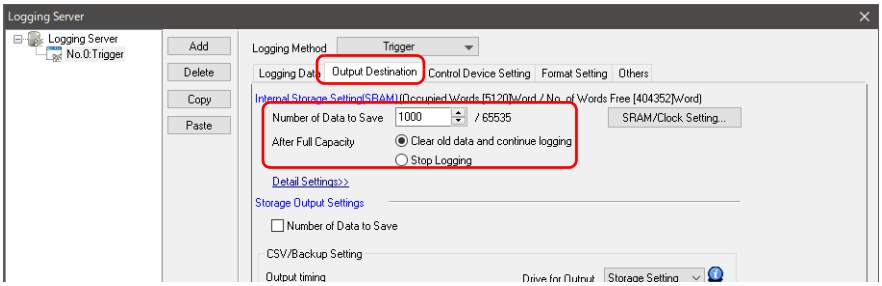
This section explains logging with a trigger using an example of logging data from device memory addresses D10000 and D12225 when trigger bit M0 changes from 0 to 1.

1. Display the [System Setting] → [Logging Server] window.
2. Click [Add] and set an unregistered number.
3. Set [Logging] to [Trigger].
4. Configure the [Logging Data] tab window settings as shown below.



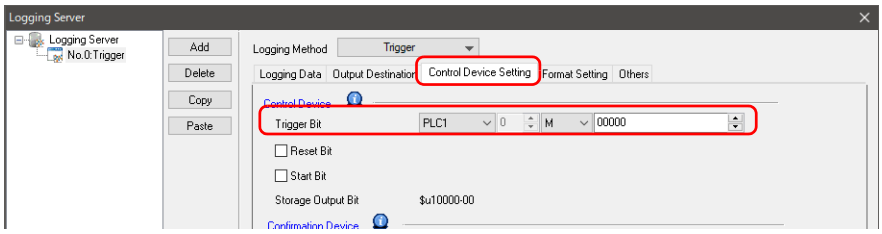
- [Number of Logging Data]: 2
- [Device]: D10000 and D12225
- [Type]: DEC
- [Decimal Point]: 0
- [Data Length]: 1-Word

5. Set [Number of Data to Save] on the [Output Destination] tab window.



Number of Data to Save	Set the number of data entries to save in logging.
After Full Capacity	Set the operation to perform when the value of [Number of Data to Save] is exceeded. Erase old data entries and continue or stop logging.

6. Set [Trigger Bit] on the [Control Device Setting] tab window. M0



This completes the necessary settings.

☞ To output to storage, refer to "Outputting CSV/Backup Files" page 7-5.

☞ To display logging data on a graph or as data, refer to the following references.

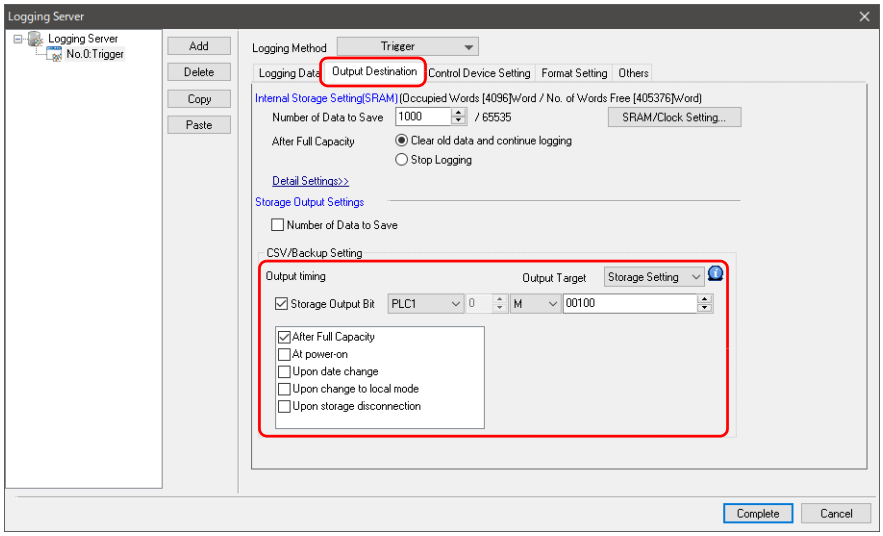
- "7.2.2 Graph Display" page 7-16
- "7.2.3 Data Display" page 7-26

Outputting CSV/Backup Files

Logging data saved in SRAM (DRAM) can be output to storage as a CSV or backup file.

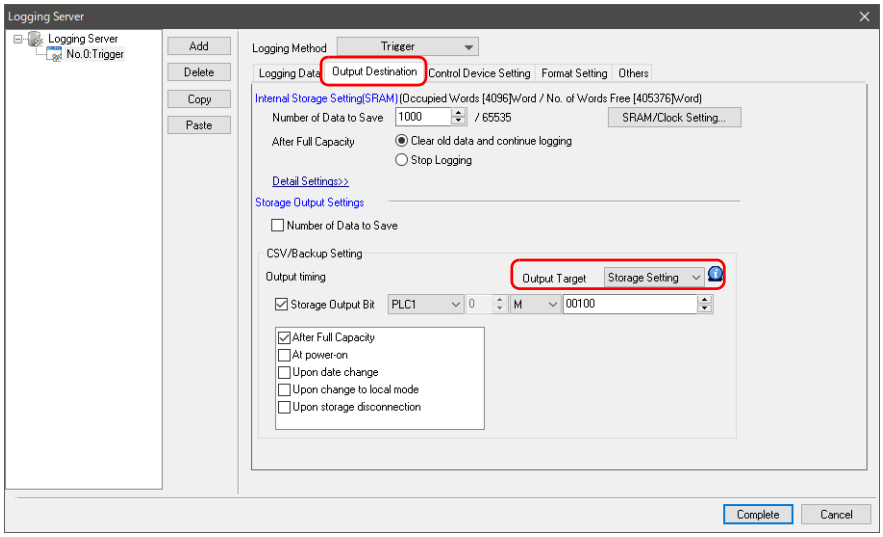
☞ For an example on setting the logging method, refer to the following references.
- "Fixed cycle" page 7-3
- "Trigger" page 7-4

1. Display the [System Setting] → [Logging Server] window and specify a logging server number.
2. Set the settings under [CSV/Backup Setting] → [Output timing] on the [Output Destination] tab window.



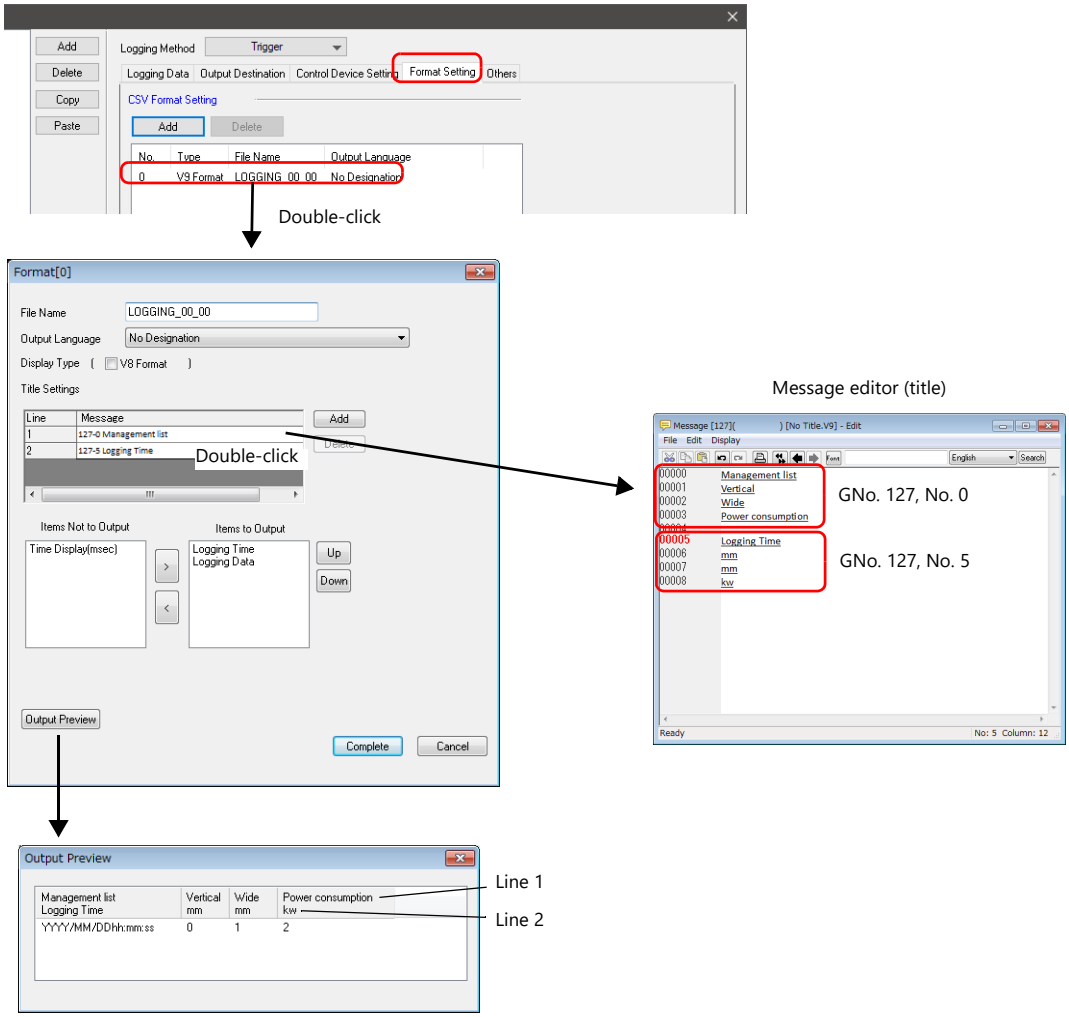
Output timing	Storage Output Bit (0 → 1) After Full Capacity At power-on Upon date change Upon change to local mode (when mode is changed from RUN to Local) Upon storage disconnection (when storage disconnection switch is pressed)

3. Set the save destination with [Output Target].



Output Target	Storage Setting	Storage specified at [System Setting] → [Other] → [Storage Setting]
	C: sd Folder (internal storage)	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\LOGGING └0: Main app in multi-display 1: Sub app in multi-display
	D: usb Folder (internal storage)	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\LOGGING └0: Main app in multi-display 1: Sub app in multi-display
	W/X/Y/Z: USB storage device *	External USB storage (Drive name):\X1_Storage\LOGGING

4. Double-click the format number on the [Format Setting] tab window and set the format of the CSV file.



File Name	Set the name of the CSV file.
Output Language	Set the language used in the CSV file. No Designation: Output using the displayed language. Language 1 to 16
Title Setting	Add a title to the first line of the CSV file. (Max. 10 lines) Double-click a cell under [Message] and register text in the [Message Edit] window.
Items Not to Output Items to Output ← →	Use the [←] and [→] buttons to set the items to output to the CSV file. Logging Time Time Display (msec) Logging Data * Logging time and time display are output separately.
Output Preview	Display a preview of CSV file to be output.

This completes the necessary settings.
A CSV file/backup file is output at the timing set in step 2.

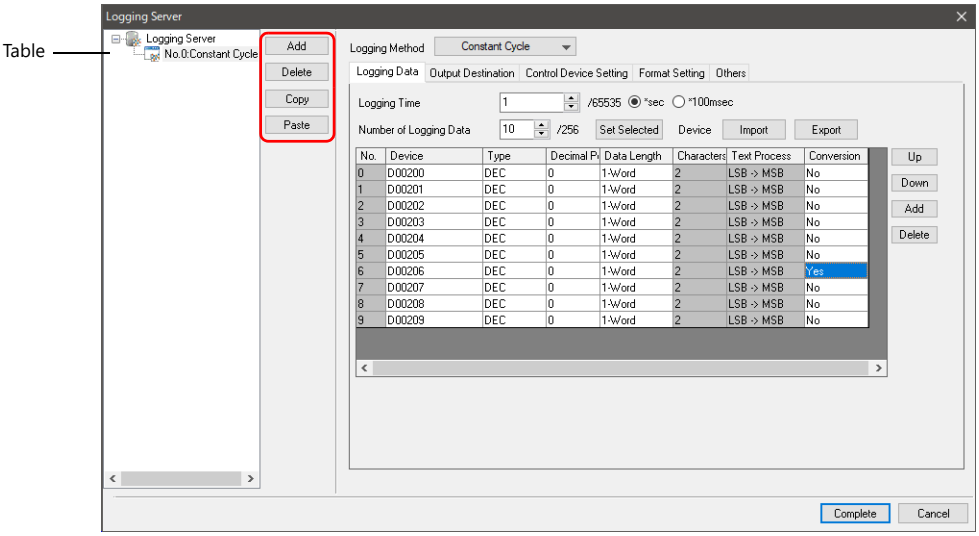
☞ For details on folder configuration, refer to "Storage output settings" page 7-10.

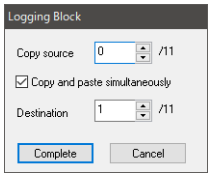
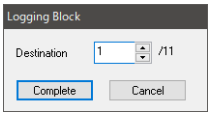
To only output a CSV file, select the [Others] → [Do not output backup files] checkbox.

Detailed Settings

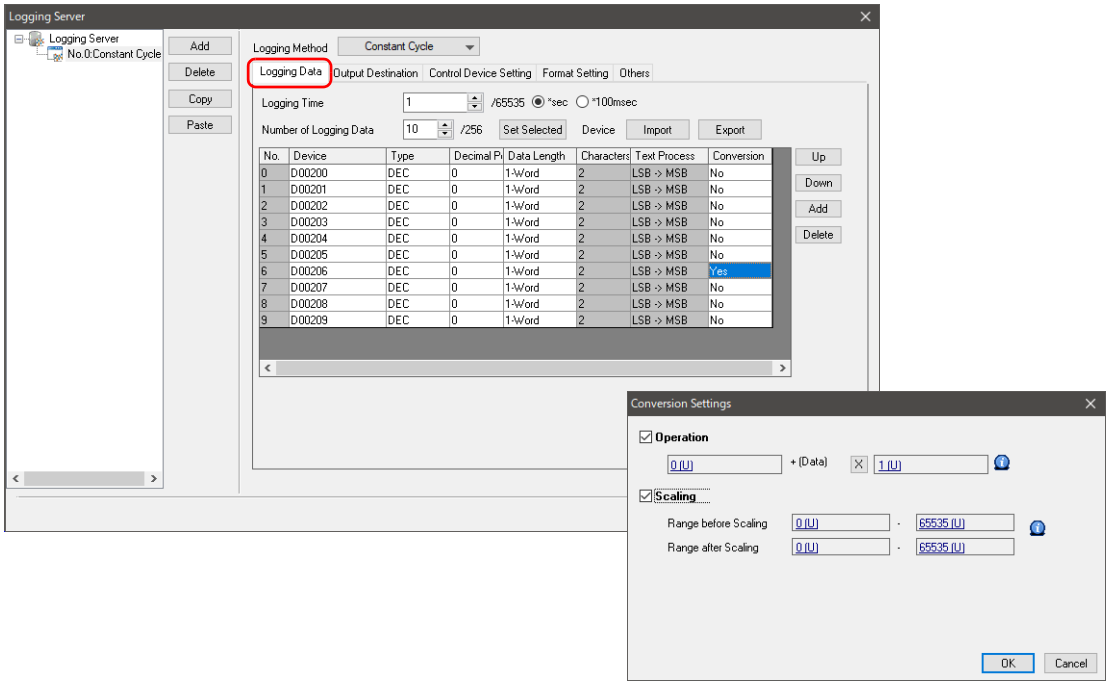
Location of settings: [System Setting] → [Logging Server]

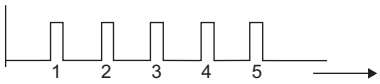
Table



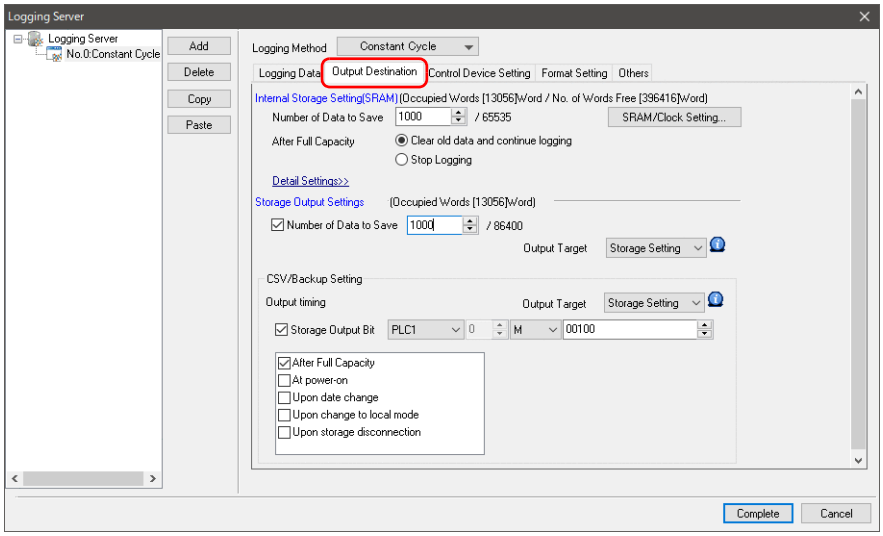
Item	Description
Add	Create a new logging server. A maximum of 12 logging servers can be registered.
Delete	Delete the selected logging server.
Copy	The following dialog box is displayed.  **Item** / **Description** Copy source — The specified block is copied. Copy and paste simultaneously — When selected, copying and pasting are done simultaneously. The paste destination is specified at [Destination]. * Be sure to deselect this checkbox when copying and pasting to a different file. Destination — This setting is valid when [Copy and paste simultaneously] is selected. Specify the block number of the destination for pasting the copied content.
Paste	The following dialog box is displayed. The content copied using the [Copy] button is pasted to the specified number. 

Logging Data



Item		Description
Logging Method		Set the logging method. Trigger Perform logging when the [Trigger Bit] device memory changes from 0 to 1. Location of setting:"Control Device Setting" page 7-13 Constant Cycle Perform logging at the cycle set for [Logging Time]. 
Logging Time		Set the logging frequency. 0 to 65535 (0 means every cycle) Units: Seconds or 100 milliseconds
Number of Logging Data		Set the total number of points to log. Max. 256 points.
Device		Set the logging device memory.
	Type	Set the data type.
	Decimal Point	Set the number of decimal places.
	Data Length	Set the data length of the set device memory. 1-Word/2-Word
	Characters	Set the number of characters (1 character = 1 byte).
	Text Process	Set the order of the first and second bytes within one word. LSB → MSB, MSB → LSB
	Conversion	No The value of the device memory address is logged as is. Yes The value of the device memory address after operation/scaling is logged.
Set Selected		Batch copy the settings of the selected cell. For device memory addresses, automatic increment is performed.
Import		Import logging device memory of the selected and subsequent numbers from a CSV file. If the number of lines in the CSV file exceeds the number of logging entries, the device memory is not extended.
Export		Export all logging device memory to a CSV file.
Up, Down		Move the selected line.
Add		Add a new line below the selected line.
Delete		Delete the selected line.

Output Destination



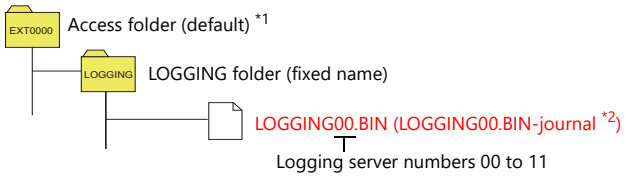
Internal storage settings

Configure the settings for storing to SRAM (DRAM).

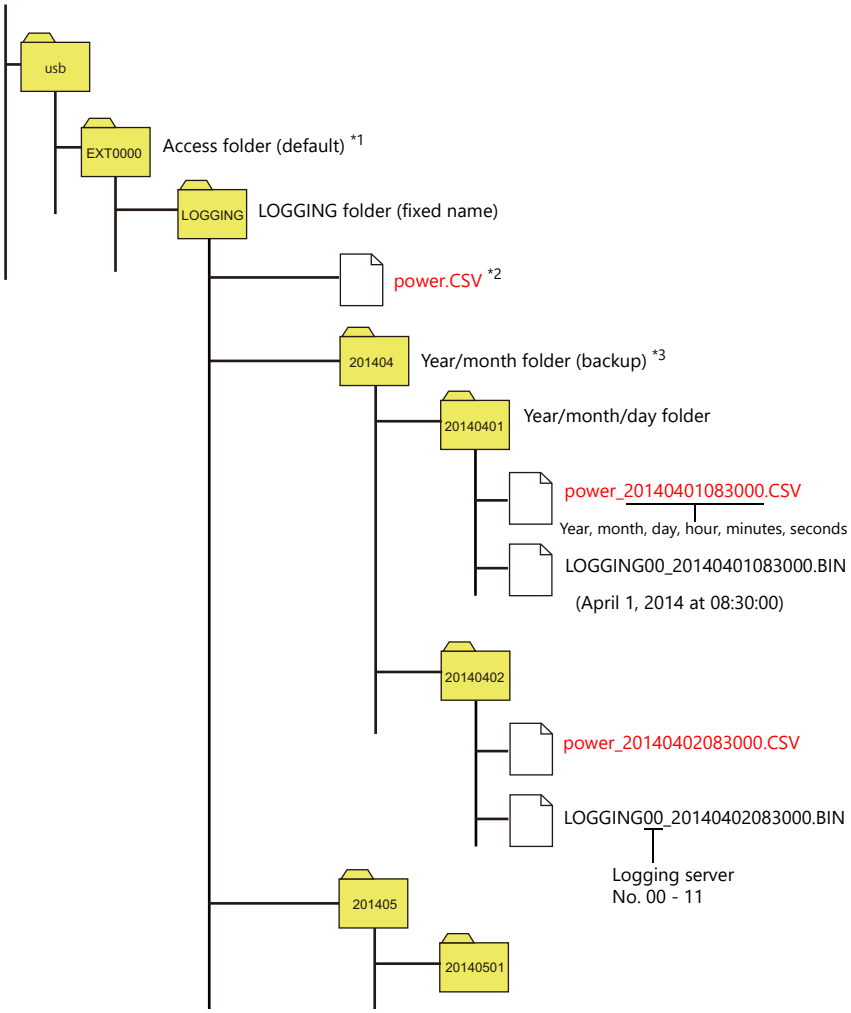
Item	Description
Number of Data to Save	Set the number of data entries to save in logging.
After Full Capacity	Set the operation to perform when the value of [Number of Data to Save] is exceeded. Erase old data entries and continue or stop logging.
Device Type	Set the save destination for logging. SRAM Back up history data when power to the unit is OFF (on battery power) and when changing between RUN and Local mode. The amount of free space and total used space can be checked via [SRAM/Clock Setting]. DRAM All history data is cleared when power to the unit is turned OFF or when changing between RUN and Local mode.

Storage output settings

Configure the settings for outputting to storage.

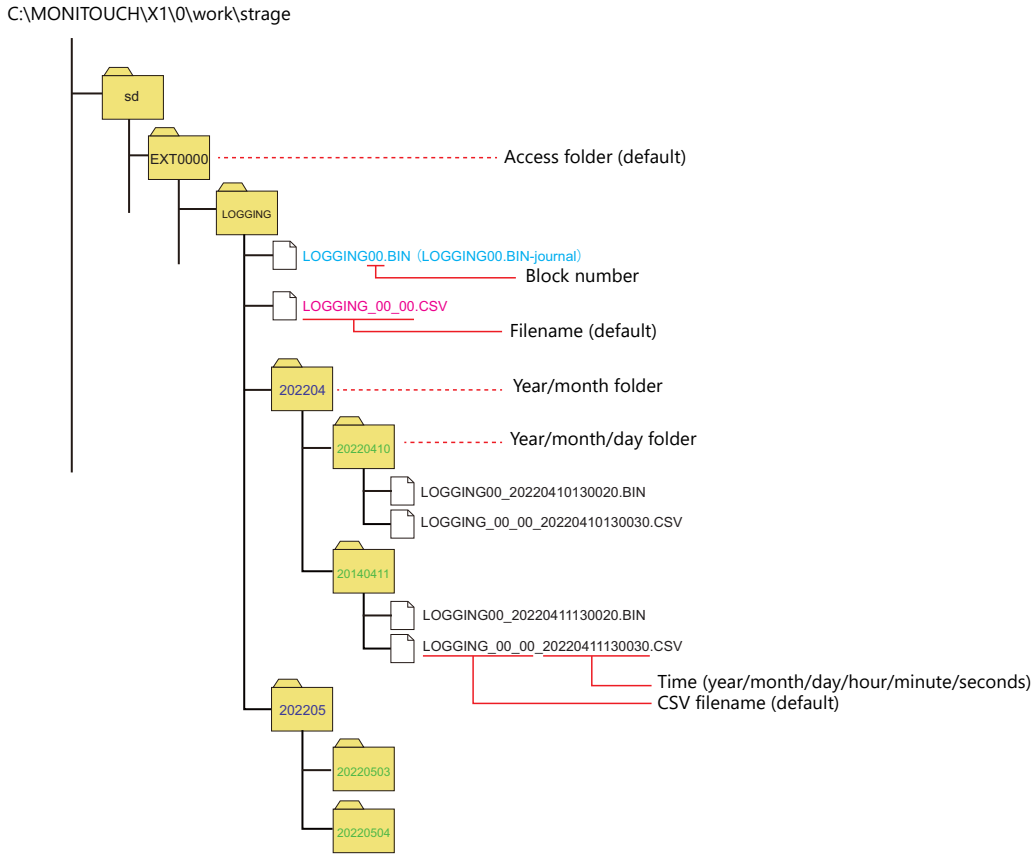
<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Number of Data to Save</td><td>Set the amount of data saved in the internal storage settings to save to a BIN file. The output timing is as follows.
The timing of file output is as follows.
- When amount of saved internal storage settings data has reached its limit
- When switching the X1 series unit from RUN to STOP, or when turning power ON (only when SRAM is selected)
- When the [Storage Disconnection] switch is pressed
- When a reset is performed (reset switch/reset bit ON)
- When the SAMPLE macro (V8 compatible) is executed
(To only output CSV and backup files, this setting is not required. Configure the CSV/backup settings.)</td></tr>
<tr><td></td><td>Output Target</td><td>Select the output target.
<table>
<tr><th>Output Target</th><th>Details</th></tr>
<tr><td>Storage Setting</td><td>Storage specified at [System Setting] → [Other] → [Storage Setting]</td></tr>
<tr><td>C: sd Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\sd
└ 0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>D: usb Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\usb
└ 0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *</td><td>External USB storage (Drive name):\X1_Storage\</td></tr>
</table>
* Available when the [System Setting] → [Other] → [Storage Setting] → [External USB storage] checkbox is selected.
In this case, selection of the “usb Folder” option is disabled.
The folder configuration of storage is as follows.
BIN file output destination: (output destination)\(access folder)\LOGGING folder
 

*1 The folder name can be changed at [System Setting] → [Other] → [Storage Setting].
*2 Temporary file created during data update. This file is created temporarily only when the [System Setting] → [Unit Setting] → [General Setting] → [Output logging data in binary format] checkbox is unselected.</td></tr>
</table>

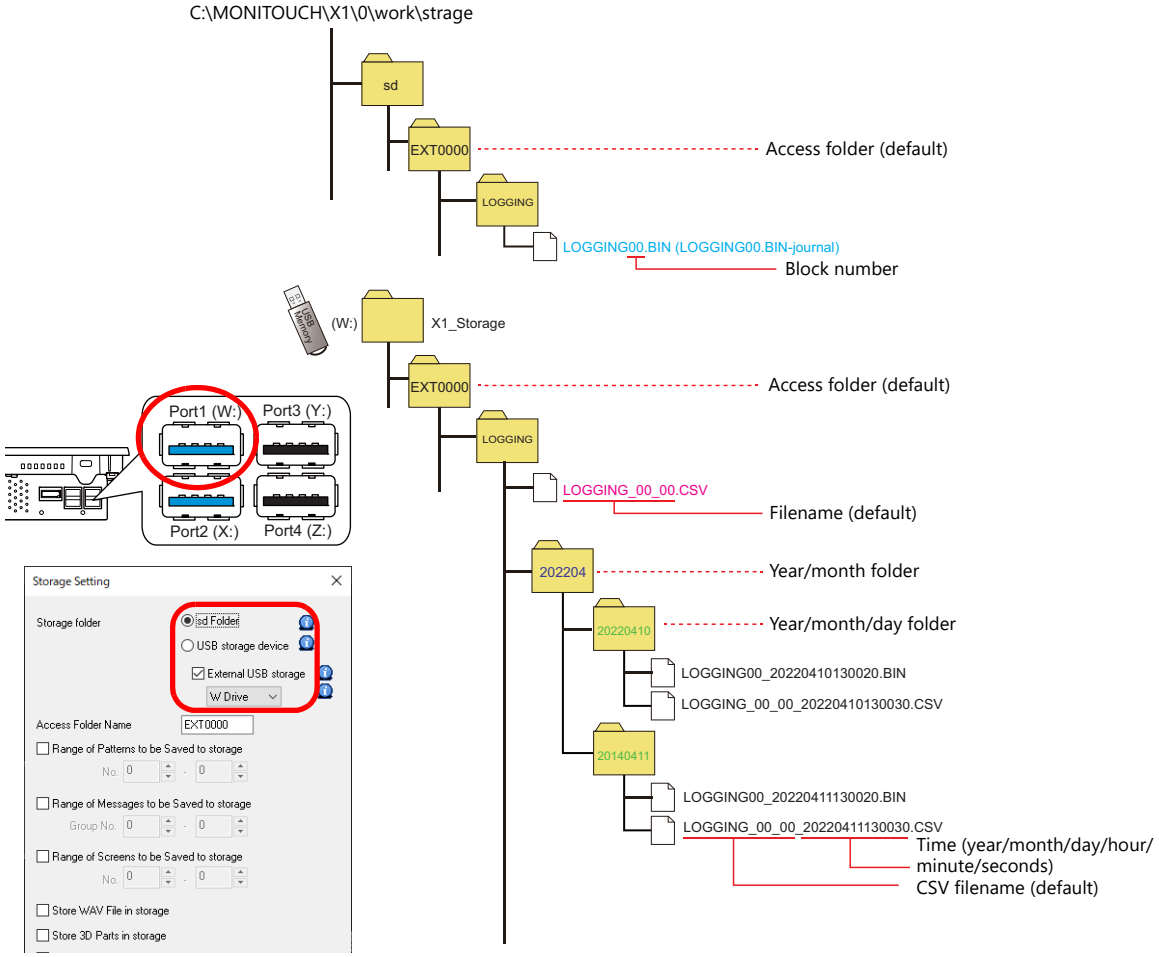
<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">CSV/Backup Setting</td><td>Output data saved in the internal storage settings to storage as a CSV/backup file.</td></tr>
<tr><td></td><td>Output timing</td><td>Set the timing for outputting to storage.
Storage Output Bit (0 → 1) / After Full Capacity / At power-on / Upon date change / Upon change to local mode / Upon storage disconnection</td></tr>
<tr><td></td><td>Output Target</td><td>Select the output destination.
<table>
<tr><th>Output Target</th><th>Details</th></tr>
<tr><td>Storage Setting</td><td>Storage specified at [System Setting] → [Other] → [Storage Setting]</td></tr>
<tr><td>C: sd Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\sd
└0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>D: usb Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\usb
└0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *</td><td>External USB storage (Drive name):\X1_Storage\</td></tr>
</table>
* Selection is possible when the [System Setting] → [Other] → [Storage Setting] → [External USB storage] checkbox is selected.
In this case, selection of the "usb Folder" option is disabled.
The folder structure of the output destination is as follows.
• CSV file output destination
(output destination)\(access folder)\LOGGING folder
• Backup file output destination
(output destination)\(access folder)\LOGGING\(year month folder)\(year month day folder)
Example: Logging server number 0, CSV filename: power, Output destination: D: usb Folder
C:\MONITOUCH\X1\0\work\strage
 

*1 The folder name can be changed at [System Setting] → [Other] → [Storage Setting].
*2 For details on changing the filename, refer to "Format Setting" page 7-14.
*3 If a backup is not required, select the [Others] → [Do not output backup files] checkbox.
For details, refer to "Others" page 7-15.</td></tr>
</table>

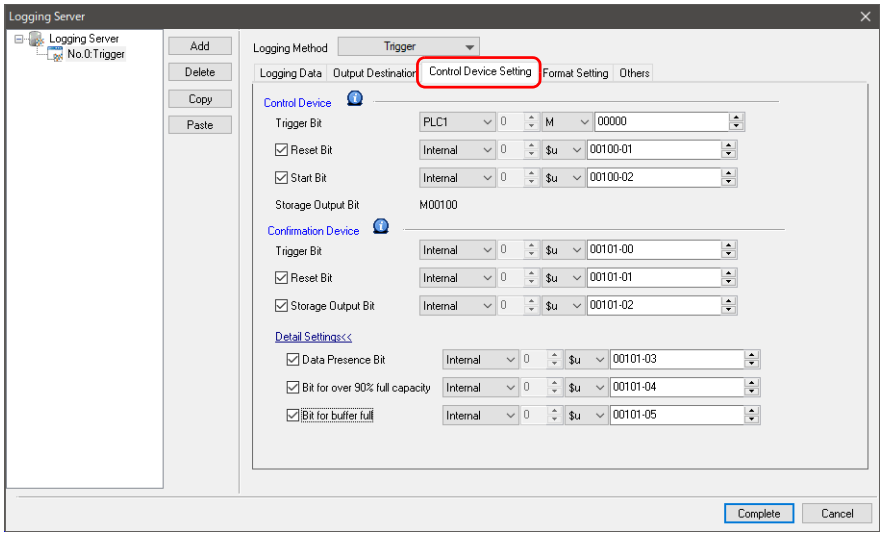
- Example of storage output
  - Logging block number 0, output destination (“sd” folder), CSV/backup file output destination (“sd” folder)



  - Logging block number 0, output destination (“sd” folder), CSV/backup file output destination (W: USB storage device)



Control Device Setting



Control device

Item	Description
Trigger Bit	Set the trigger bit to use when [Logging] is set to [Trigger]. Logging is performed when the trigger bit changes from 0 to 1. 0 → 1: Perform logging once.
Reset Bit	Clear the history data. 1: Reset (logging is stopped while "1")
Start Bit	Control starting and stopping of logging. 0: Stop 1: Start
Storage Output Bit	Display the storage output bit. Change the device via [Output Destination] → [Storage Output Bit]. For details, refer to page 7-9.

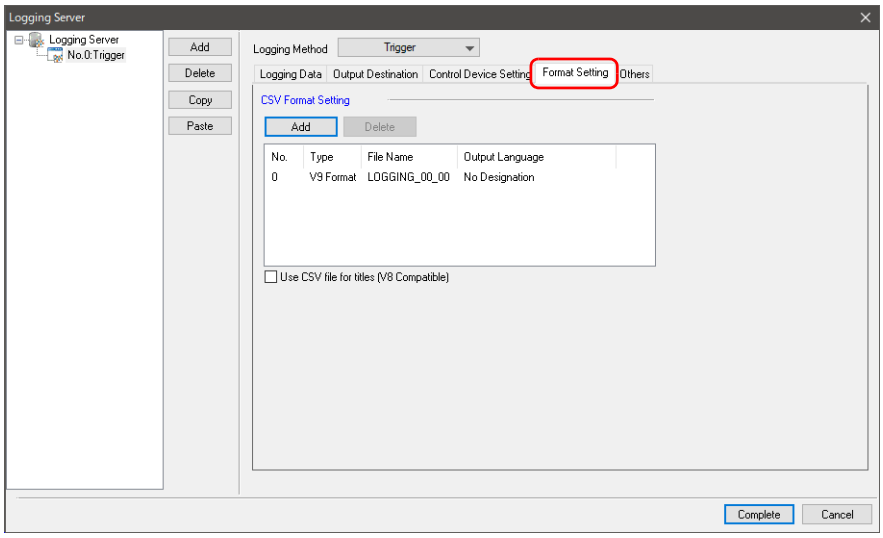
Confirmation device

This device memory stores the execution result of the control device memory.

Item	Description
Trigger Bit	Stores the trigger bit status.
Reset Bit	This bit changes to "1" after a reset is complete.
Storage Output Bit	This bit changes to "1" after the storage output bit turns ON.
Data Presence Bit	This bit changes to "1" when there is history data present at the saving destination.
Bit for capacity over 90% full	This bit changes to "1" when the saving destination is 90% full with history data.
Bit for buffer full	This bit changes to "1" when the saving destination is full.

Format Setting

Format list

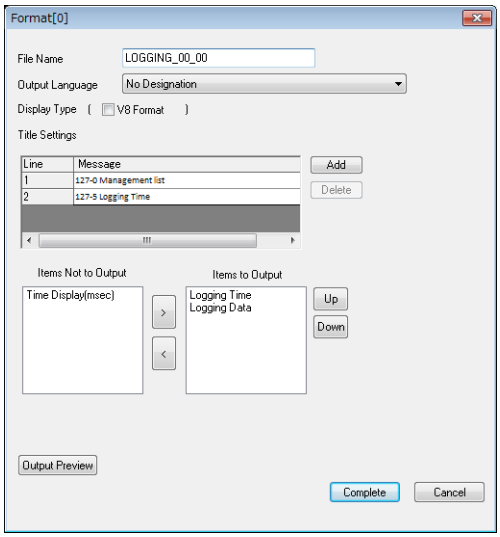


Item		Description
CSV Format Setting		These settings are for saving history to CSV files. Multiple CSV formats can be registered using the [Add] button.
	Use CSV file for titles (V8 Compatible) *1	Add title lines using SMHxxxx.csv (xxxx: 0000 to 0011). Place any CSV files into the "LOGGING" folder in storage in advance. The CSV format is only valid for No. 0 (V8 format).

*1 While there are no restrictions on the number of rows and columns in the SMHxxxx.csv files, the maximum file size is 239 kbytes.
If there is a mistake in the settings or a SMHxxxx.csv file cannot be read, the logging block number is added to the title line.

Format window

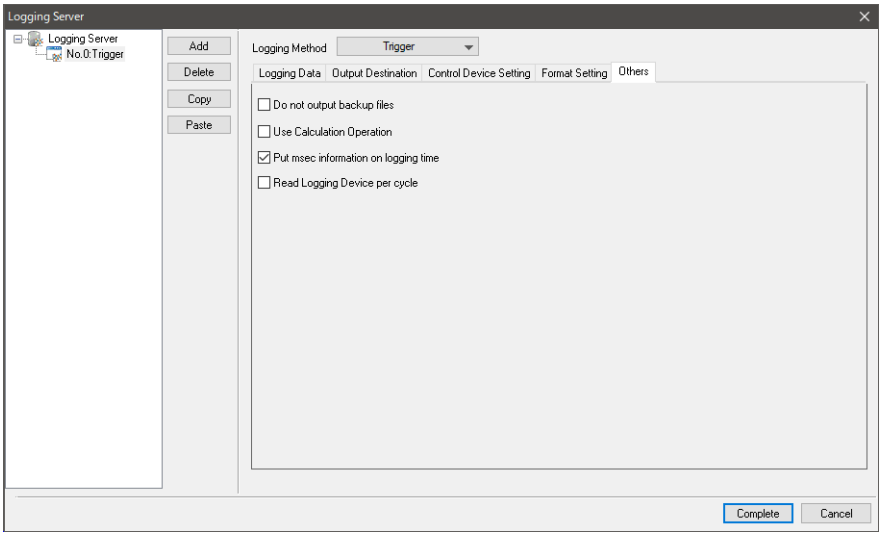
Double-click a format number in the list to display this window.



Item	Description
File Name	Set the name of the CSV file. Default: LOGGING_xx_yy.CSV (xx: logging server number, yy: format number) * For details on file output destinations, refer to page 7-9.
Output Language	Set the language used in the CSV file. Language 1 to 16 No Designation: Language displayed on the unit.
Display Type	Switch to the V8 series (previous model) settings menu.

Item	Description
Title Settings	Add a title to the first line of the CSV file. Click [Add] to register up to 10 lines of titles. Double-click a cell under [Message] and register text in the [Message Edit] window. (GNo., No. designation)
Items Not to Output Items to Output ← →	Use the [←] and [→] buttons to set the items to output to the CSV file. Logging Data, Logging Time, Display Time (msec) * Output all logging data. Cells are divided into logging time and time display (msec).
Up, Down	Set the item order in the CSV file. Select an item under [Items to Output] and use the [Up] and [Down] buttons to move it. Items are displayed from the left in the file in the descending order of the list.
Output Preview	Display a preview of CSV file to be output.

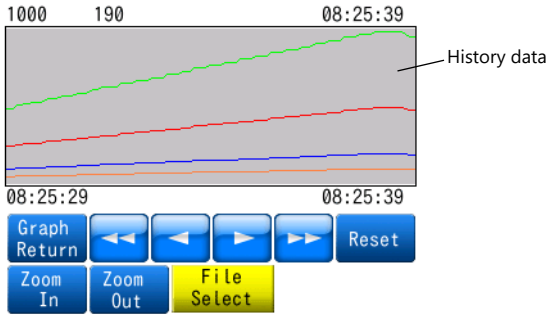
Others



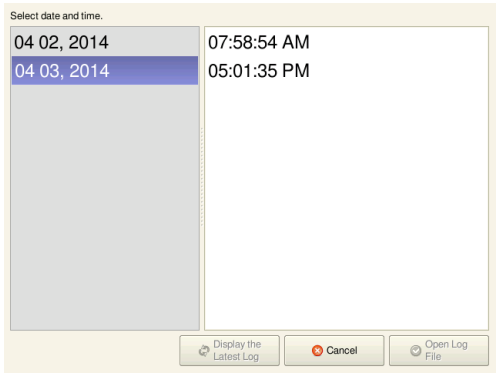
Item	Description
Do not output backup files	No backup folder or file is created when outputting to a storage folder. For details on folder configuration, refer to page 7-10.
Use Calculation Operation	Select this checkbox to display [Mean Value Display/Max. Display/Min. Display/Total Display] for a numerical data display for which [Function] is set to "Logging".
Put msec information on logging time	This is a V8 compatible setting. Select this checkbox to output the logging time in milliseconds when using a V8 sample macro.
Read Logging Device per cycle	Unselected (default) Read the logging device memory at the frequency specified for [Logging Time]. Selected Read the logging device memory according to the communication cycle.

7.2.2 Graph Display

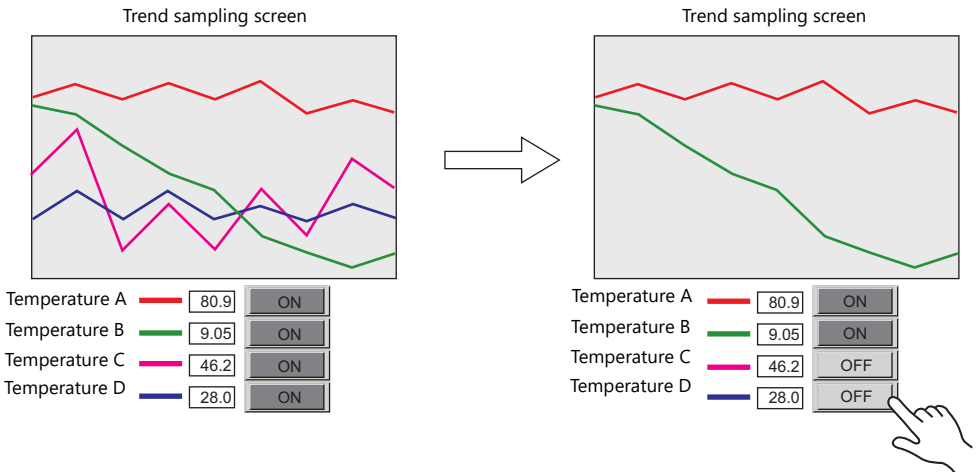
- History data saved to a logging server can be displayed as a line graph or rectangular waves.
- A maximum of 16 graph lines can be displayed in one graph area.



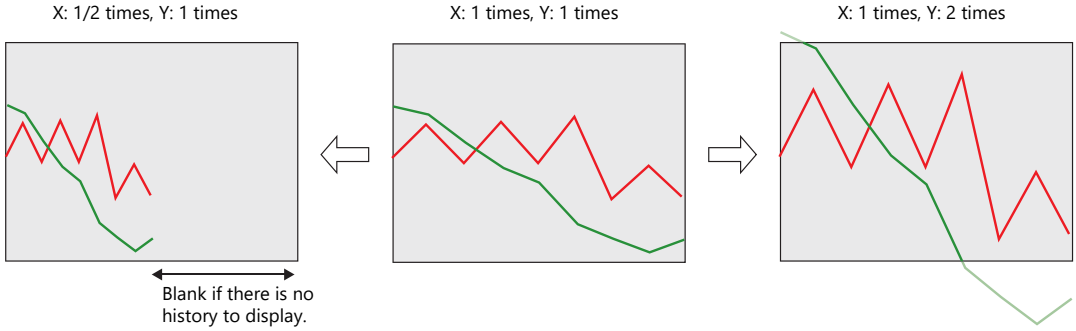
- Backup files output to storage can be selected for display.



- Each graph line can be shown or hidden. Showing or hiding graphs can be easily changed as necessary, according to operating conditions.

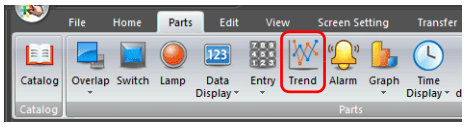


- The display magnification of the X and Y axes of graphs can be increased or reduced (1/8 to 8 times).



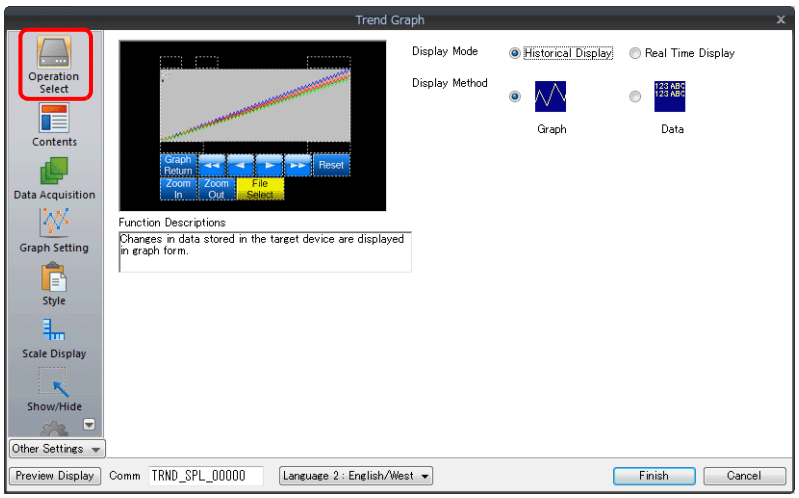
Location of Setting

Click [Parts] → [Trend] and place a graph on the screen.



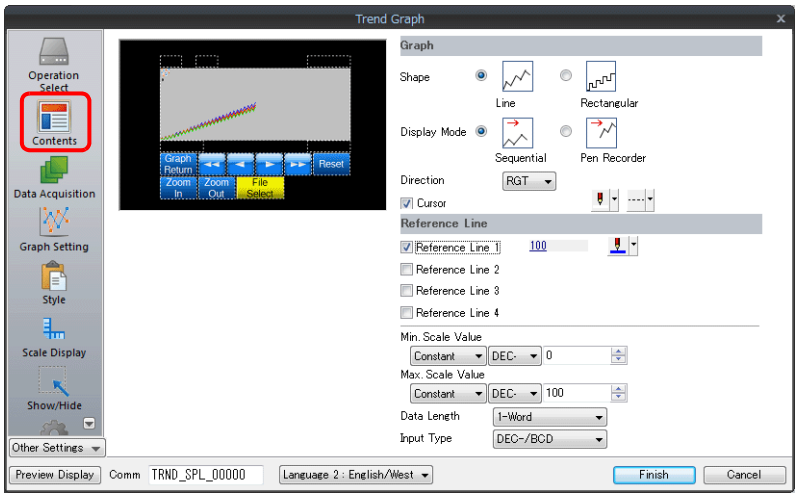
Detailed Settings

Operation Select

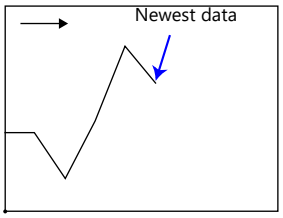
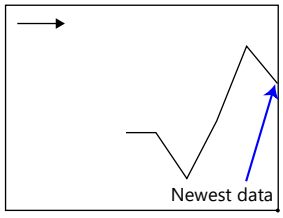
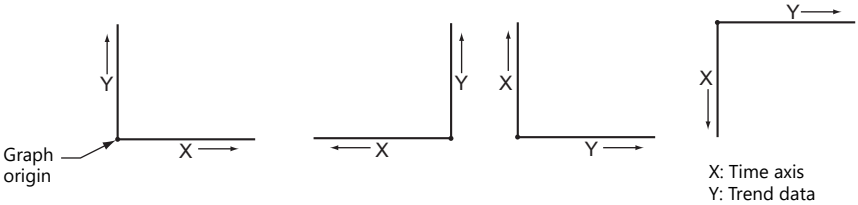


Item	Description
Display Mode	Select [Historical Display].
Display Method	Select [Graph].

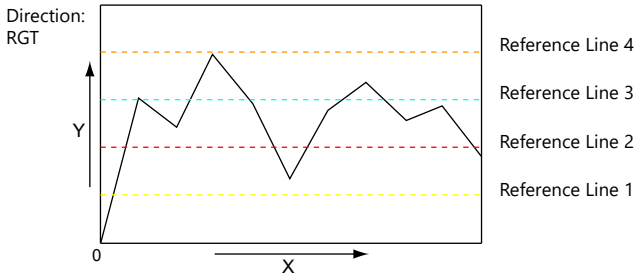
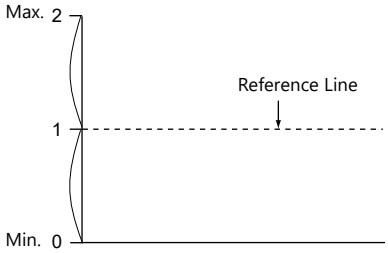
Contents



Graph

Item	Description
Shape	Set the graph shape. Line/Rectangular
Display Mode	Sequential Draw the graph in the direction of movement. Pen Recorder Display a pen recorder type graph. Newest data is always on the right. [Direction]: RGT, [Display Mode]: Sequential  [Direction]: RGT, [Display Mode]: Pen Recorder 
Direction	Set the direction of graph lines. • RGT (right) • LFT (left) • UP (upward) • DW (downward) 
Cursor	Set the color and line type of the cursor.

Reference line

Item	Description
Reference Line 1 Reference Line 2 Reference Line 3 Reference Line 4	A maximum of four reference lines can be displayed at once. The line type is fixed to a dotted line. *1 The line color and the value where to display each reference line can be specified. 
Min. Scale Value Max. Scale Value *2	Set the scale values for calculating the position where the reference line should be drawn in the graph area. Negative values can also be specified. To draw a reference line in the center of a trend graph: Reference Line 1 - Min. Scale Value: 0 - Max. Scale Value: 2 Specifying "1" for reference line 1 will display a line at the center. 
Data Length	Set a data length when specifying device memory (other than [Constant]) for reference lines or the minimum and maximum scale values. Set data length for the device memory. 1-Word/2-Word
Input Type	Set the data type of the scale values. DEC-/BCD *3/FLOAT *4

*1 When device memory is specified for a [Reference Line], the reference line is updated at the [High Speed] process cycle setting. However, if the [Show/hide graph data] checkbox is selected in the [Detail] settings, updating is dependent on the specified process cycle.

*2 When device memory is specified for the minimum and maximum scale values and the values in the device memory is changed in RUN mode, the change will be updated to the graph when the graph is displayed or when the "TREND_REFRESH" macro command is executed.

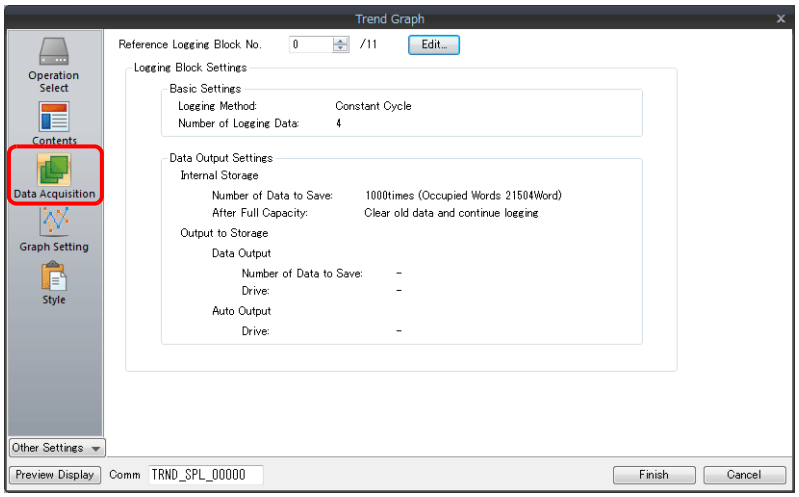
☞ For details on the "TREND_REFRESH" macro command, refer to the V9 Series Macro Reference Manual.

*3 When [DEC-/BCD] is selected, the setting at [System Setting] → [Hardware Setting] → [PLC Properties] → [Code] takes effect.

*4 If any specified value (non-numeric inclusive) is outside the range usable on the X1 series unit, the line cannot be displayed.

☞ For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

Data Acquisition



Item	Description
No.	Set the number registered to the logging server. The registration details are shown below.
Edit	Edit the logging server. For details, refer to "Detailed Settings" page 7-7.

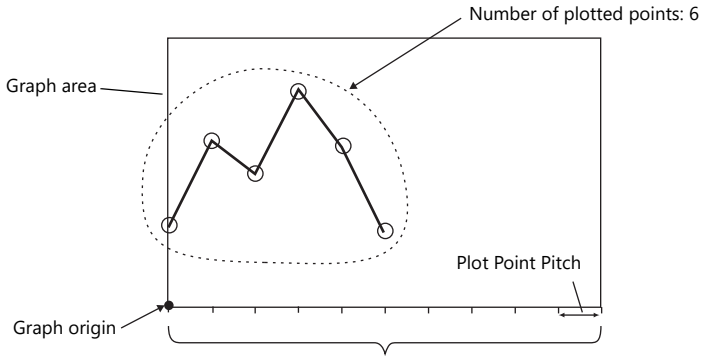
Graph Setting

Item	Description
Points to Display *1	Set the number of plot points along the horizontal axis. - For 1920 × 1080 dots: 3 to 1920 - For 1280 × 800 dots: 3 to 1280
Number of Graphs	Set the number of graph lines.
Set Selected	Use this button to configure settings for all displayed graph lines at once when the data length, data type, minimum value, and maximum value are all the same.
Logging Word No. *2	Specify which word the data corresponds to in the number of words specified for the logging server.

Item	Description
Device	Displays the logging device memory. The device memory can be changed in the settings of the logging server set in the [Data Acquisition] settings.
Input Format	Select the format for display on the screen. DEC-/BCD, Actual Number DEC-/BCD This is determined by the setting at [System Setting] → [Hardware Setting] → [PLC Properties] → [Code]. Actual Number If any specified value (non-numeric inclusive) is outside the range usable on the X1 series unit, it cannot be displayed. For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".
Data Length	Set data length for the device memory. 1-Word/2-Word
Max., Min. *3	Set the minimum and maximum values of the graph. * An error will occur if the same value is set. Make sure to set valid values.
Display Format	Set the graph type. Line Graph/Marker
Type	Set the line type.
Color	Set the line color.

*1 Number of display points

Direction: RGT



If a value larger than the X size (dots) of the graph area is specified for [Points to Display], the graph will not be drawn correctly.

*2 Example: 8 words set for the logging server

To display the logging data of the 3rd word in the logging server, specify "2" for [Logging Word No.].
Even if [Data Length] is different, the corresponding device memory is the same.

[Data Length]: 1-Word

	Logging Word No.
1st word	0
2nd word	1
3rd word	2
4th word	3
5th word	4
6th word	5
7th word	6
8th word	7

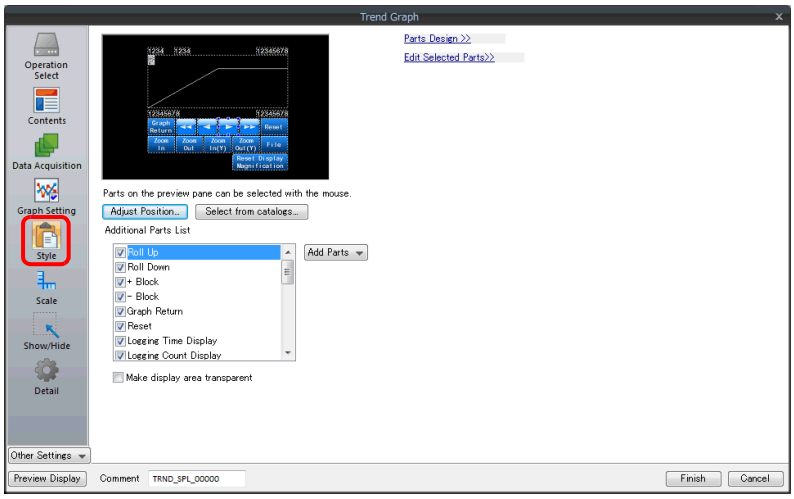
[Data Length]: 2-Word

	Logging Word No.
1st word	0
2nd word	
3rd word	2
4th word	
5th word	4
6th word	
7th word	6
8th word	

*3 When device memory is specified for the minimum and maximum graph values and the values at the device memory are changed in RUN mode, the changes will be updated to the graph when the graph is displayed or when the "TREND_REFRESH" macro command is executed.

☞ For details on the "TREND_REFRESH" macro command, refer to the V9 Series Macro Reference Manual.

Style



Item	Description
Adjust Position	Change the layout of parts.
Select from catalogs	Change the trend sampling parts.
Add Parts	Add new parts. New parts are added to the [Addition Parts List].
Make display area transparent	Make the display area transparent. (only when [Graph] is selected for [Display Method])

- The additional parts are listed below.

Function	Description
Roll Up	Move the cursor to the next point.
Roll Down	Move the cursor to the previous point.
+ Block	Display the next page.
– Block	Display the previous page.
Graph Return	Blinks while the cursor is displayed when a switch such as [+ Block] or [– Block] is pressed. Press this switch when it is blinking to stop it from blinking and return to the latest display.
Reset	Press once and the switch blinks. Press again within two seconds to clear the history and resume logging. If not pressed again within 2 seconds, the switch is turned off and resetting is nullified.
Logging Time Display *1	Display the last logging time or selected logging time.
Logging Count Display	Display the current history number or the count value of the selected history data.
Zoom in (X Direction)	Increase the display magnification of the currently displayed graph in the X direction (1/8 → 1/4 → 1/2 → 1 → 2 → 4 → 8 times).
Zoom out (X Direction)	Reduce the display magnification of the currently displayed graph in the X direction (8 → 4 → 2 → 1 → 1/2 → 1/4 → 1/8 times).
Zoom in (Y Direction)	Increase the display magnification of the currently displayed graph in the Y direction (1/8 → 1/4 → 1/2 → 1 → 2 → 4 → 8 times).
Zoom out (Y Direction)	Reduce the display magnification of the currently displayed graph in the Y direction (8 → 4 → 2 → 1 → 1/2 → 1/4 → 1/8 times).
Reset Display Magnification	Reset the display magnification to actual size and reset the reference position to its initial state.
Display start time *1	Display the logging time of the oldest history data on the currently displayed graph.
Display end time *1	Display the logging time of the newest history data on the currently displayed graph.
Currently Selected Value Display *2	Display the latest history data or the selected history data.
File Select	Select and display a backup file saved in storage.
Mean Value Display	Display the average value of the history data of each graph.
Total Display	Display the total value of the history data of each graph.
Max. Display	Display the maximum value of the history data of each graph.
Min. Display	Display the minimum value of the history data of each graph.

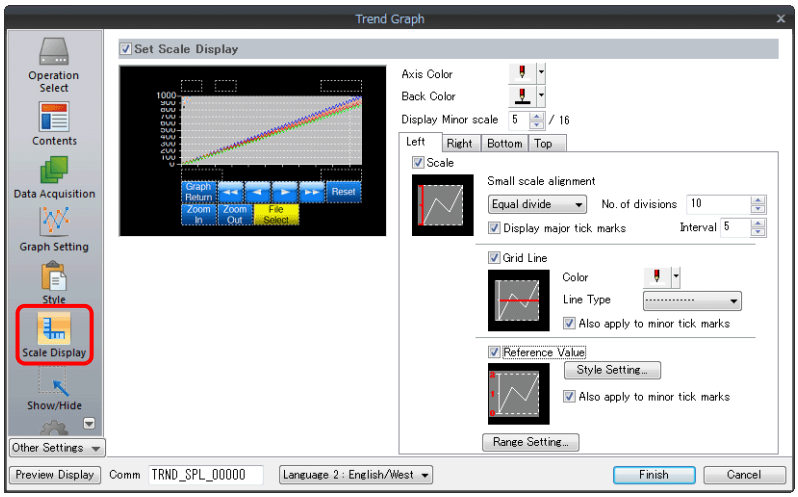
*1 Up to the year, month, and day can be displayed if enough digits are specified.

Less than 8 digits	No display
8 to 11 digits	Hour, minutes, and seconds
12 to 13 digits	Hour, minutes, seconds, and milliseconds
14 to 17 digits	Month, day, hour, minutes, and seconds
18 digits	Month, day, hour, minutes, seconds, and milliseconds
19 to 22 digits	Year Month Day Hour Minute Second
23 digits or more	Year, month, day, hour, minutes, seconds, and milliseconds

*2 Only for monitoring. To store these values in device memory, use the “SAMPLE” macro command.

☞ For details, refer to the V9 Series Macro Reference Manual.

Scale Display



Item		Description
Axis Color		Select the color of the major and minor tick marks, and axis lines of the scale. This setting is common to all left, right, bottom, and top sides.
Back Color		
Display Minor scale		Set the length of the minor tick marks of the scale. Range: 1 to 16 This setting is common to all left, right, bottom, and top sides. The thickness of the markings is fixed.
[Scale] in [Left], [Right], [Bottom], and [Top] tab windows		Displays the scale, grid line, and reference value settings for each side. Default: Selected on [Left] and [Bottom] tab windows
Small scale alignment		Equal divide (unit based on [No. of divisions]) Minor tick marks are equally spaced according to the specified number of divisions along the axis line. Equal interval (unit based on [Interval]) Minor tick marks are equally spaced according to the specified interval from the zero point along the axis line within the following range.
Display major tick marks		Display major tick marks on the scale. (Unit: [Interval]) Length: Twice the minor tick marks Thickness: Fixed
Grid Line		Grid lines are drawn at the major and minor tick marks of the scale.
	Color, Line Type	Set the color and line type of grid lines.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display grid lines. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Reference Value		Select this checkbox to display reference values at major and minor tick marks on the scale.
	Property	Set the number of digits or the color of reference values shown at tick marks.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display reference values. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Range Setting		Use when [Small scale alignment] is set to [Equal divide] or when the [Reference Value] checkbox is selected. Match with the specified graph The range changes according to the following combinations. Set Value Specify the minimum and maximum values using constants or device memory addresses. *

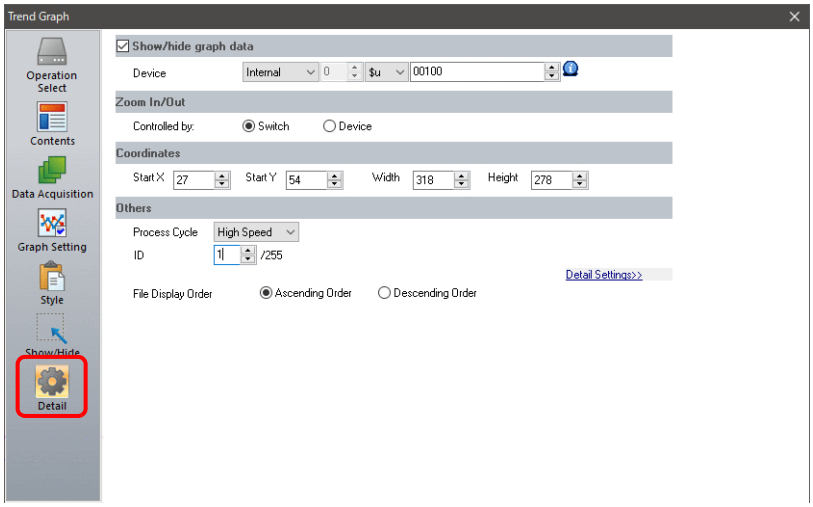
Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of horizontal axis points or scale of [Range Setting]
DW/UP	Left/Right	
LFT/RGT	Left/Right	Scale of [Range Setting]
DW/UP	Top/Bottom	

Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of horizontal axis points
DW/UP	Left/Right	
LFT/RGT	Left/Right	Maximum and minimum values specified for the selected graph number *
DW/UP	Top/Bottom	

* If the minimum and maximum values are specified with device memory addresses (other than [Constant]) in the [Range Setting] window and these values are changed in RUN mode, the changes are updated at the following timings:

- When the screen is redrawn
- Upon execution of the "TREND_REFRESH" macro command

Detail



Item		Description
Show/hide graph data		Set the device memory used to show/hide graph line numbers 0 to 15. *1
	Device (word designation)	These bits control whether each graph is shown or hidden. MSB 15 .. .. 04 03 02 01 00 LSB Graph number 15 Graph number 3 Graph number 2 Graph number 1 Graph number 0 1: Show 0: Hide
	Process Cycle	Set the cycle used to read the device memory. High Speed, Low Speed, Refresh
Zoom In/Out		Set the method for zooming in and out of graphs. The magnification can be specified for the X and Y directions respectively. *2
	Switch	Specify the display magnification using the switch function. Zoom in: 1/8 → 1/4 → 1/2 → 1 → 2 → 4 → 8 times Zoom out: 8 → 4 → 2 → 1 → 1/2 → 1/4 → 1/8 times
	Device X Device Y Device	Set the display magnification using a device memory value. 0: 1 times 1: 2 times 2: 4 times 3: 8 times 4: 1/2 times 5: 1/4 times 6: 1/8 times
Coordinates		Select a display position and size.
ID		Set an ID number.
File Display Order		Set the order for displaying files when using the [File Select] switch to display backup files. Ascending Order: Display files in order from old to new. Descending Order: Display files in order from new to old.

*1 Notes on the [Show/hide graph data] setting

- Even if all the graph lines are hidden, the switches for [Roll Up], [Roll Down], [+ Block], [– Block] and [Graph Return] still work. The moved cursor point is also retained. (But the cursor is hidden.)
- When graph lines are shown or hidden, flickering associated with graph redrawing will occur momentarily.

*2 Notes on [Zoom In/Out]

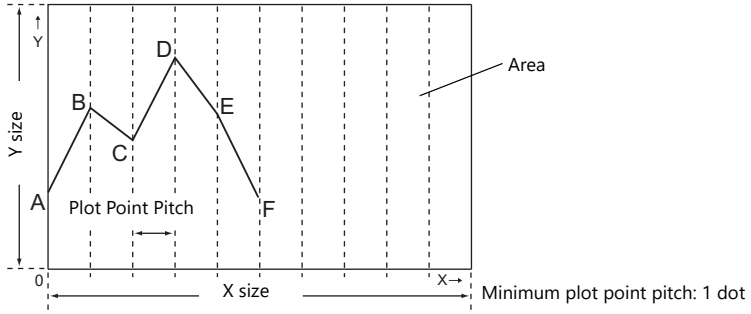
- If zooming out results in a data interval less than one dot, thinning is employed to display the data.
- Zooming in and out in the Y direction is performed centered on the cursor value. If the cursor value is not a valid real number, zooming is performed based on the central value of the scale.
- If multiple graphs are displayed, zooming is performed based on the graph with the smallest graph number of those displayed. If all graphs are hidden, zooming is performed based on the central value of the displayed scale.
- If the reference position shifts when returning to actual size, use a [Reset Display Magnification] switch to return to actual size.
- Pinch-to-zoom gestures are supported. When zooming in and out with pinch-to-zoom gestures, display at magnifications between 1/8 and 8 times with reference to the central value of the scale is possible. Note that zooming occurs at the same magnification for both the X and Y directions.

Notes

Relationship Between Area and Plot Points

The X1 series automatically calculates the plot point pitches for drawing graph lines as follows:

Formula: Point pitch (dots) = X size (dots) ÷ ([Points to Display] – 1)



Number of display points = Maximum number of points (11)

Example: X size: 270 (dots), [Points to Display]: 10

270 ÷ (10 – 1) = 30

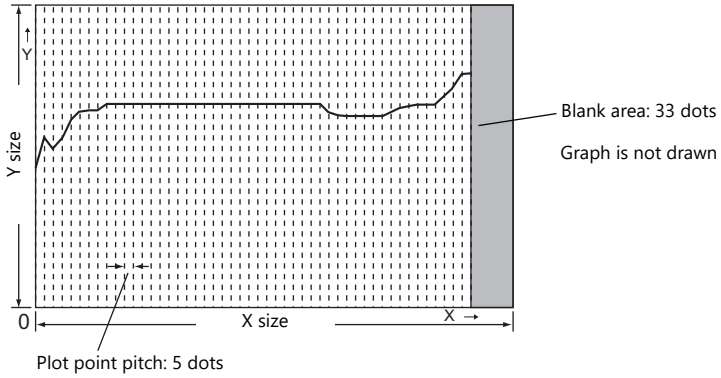
The plot point pitch is "30".

When adjusting the size of an area after setting [Points to Display], it is automatically enlarged or reduced so that there will be no remainder left.
However, if the value for [Points to Display] is changed after the part is placed and adjusted in size, a remainder may result. The remainder dots will be shown as a blank area.

Example: X size: 278 (dots), [Points to Display]: 50

278 ÷ (50 – 1) = 5, remainder 33

The plot point pitch is 5 dots and the remainder (33 dots) becomes a blank area.



After setting the number of points for display, correct the X size of the display area to eliminate the blank area.

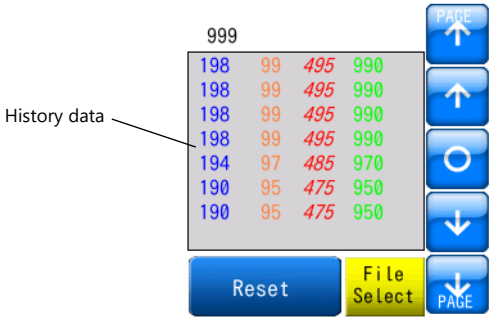
Relationship between Graph Direction and X/Y Axes

The orientation of the X direction and Y direction changes depending on the setting of [Direction] in the [Contents] window.

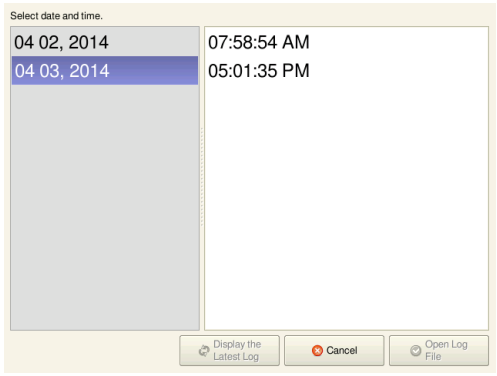
Graph Direction	X Direction	Y Direction	Image
→ / ←	Horizontal axis	Vertical axis	
↑ / ↓	Vertical axis	Horizontal axis	

7.2.3 Data Display

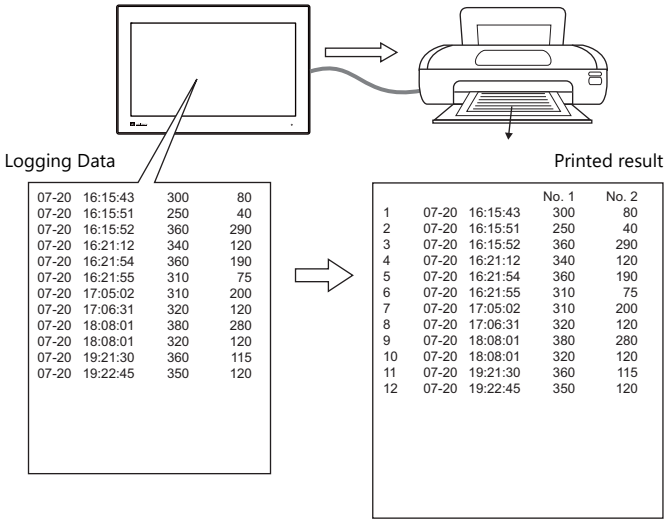
- History data saved to a logging server can be displayed as numerical data or character data.
- A maximum of 16 entries of data can be displayed in a single display area.



- Backup files output to storage can be selected for display.

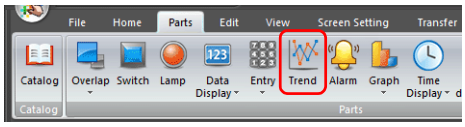


- History data saved to a logging server can be printed (log printing).



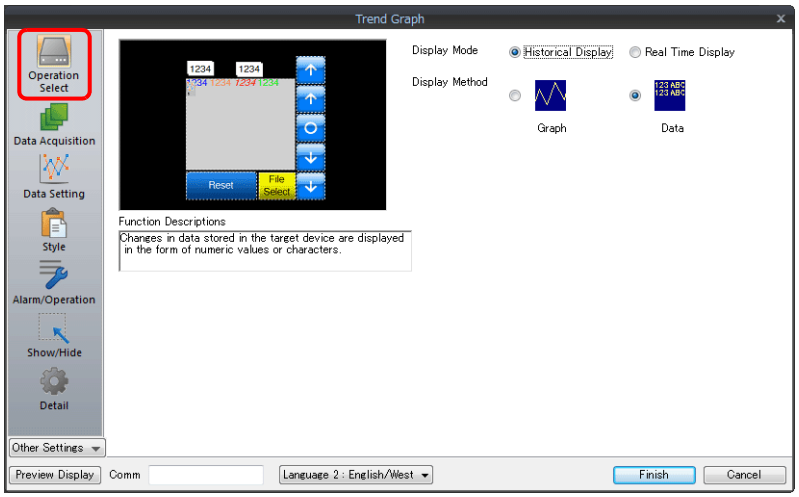
Location of Setting

Click [Parts] → [Trend] and place a graph on the screen.



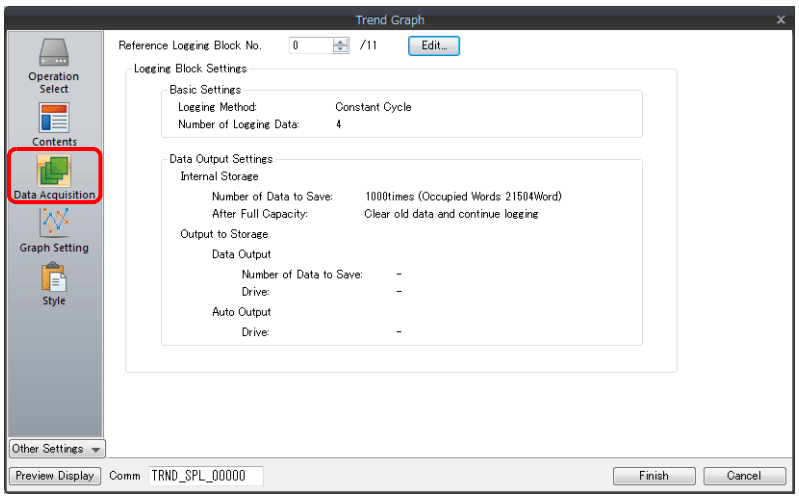
Detailed Settings

Operation Select



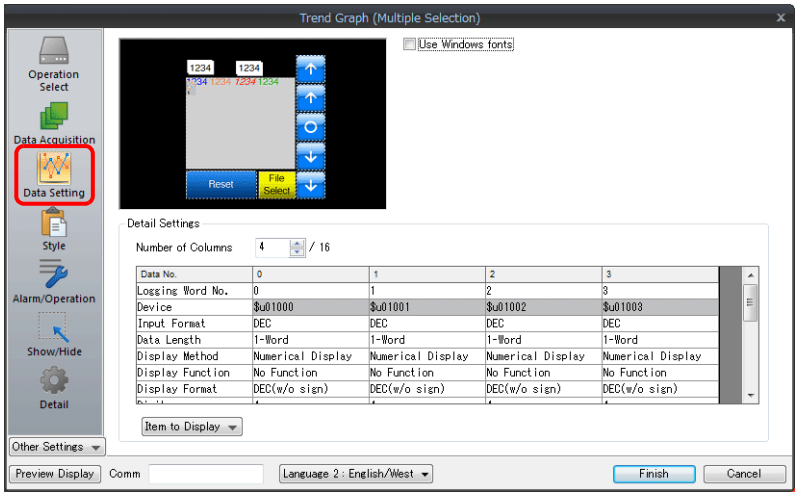
Item	Description
Display Mode	Select [Historical Display].
Display Method	Select [Data].

Data Acquisition



Item	Description
No.	Set the number registered to the logging server. The registration details are shown below.
Edit	Edit the logging server. For details, refer to " Detailed Settings" page 7-7.

Data Setting



Item	Description
Use Windows fonts	Display history data using a Windows font. Register all text to display via [Windows Font Registration].
Number of Columns	Set the number of data entries to display.
Logging Word No. *1	Specify which word the data corresponds to in the number of words specified for the logging server.
Device	Displays the logging device memory. The device memory can be changed in the settings of the logging server set in the [Data Acquisition] settings.
Input Format	Select the code type to use when reading data from the PLC device. The selection here also applies to [Alarm], [Operation], and [Scaling]. DEC/BCD/Actual Number *2
Data Length	Set the data length.
Display Method	Select the data display method. Numerical Display/Char. Display
Display Function	No function Display the logged data. Logging No. Display This display type is compatible with earlier MONITOUCH models. For details, refer to the File Conversion manual.
Display Format	Select the format for display on the screen. DEC (w/o sign), DEC (with sign –), DEC (with sign +–), HEX, OCT, BIN (Binary)
Digits *3	Set the number of digits for numerical data display.
Decimal Point	Set the number of decimal places. When no decimal point is required, set "0".
Char. Color	Set the text properties.
Back Color	
Bold	
Shadow	
1/4	
Italic	
Transparent	
Character Size	

Code Format	1-word Display Range	2-word Display Range
DEC (w/o sign)	0 - 65535	0 - 4294967295
DEC (with sign –)	–32768 - 32767	–2147483648 - 2147483647
DEC (with sign +–)	–32768 - +32767	–2147483648 - +2147483647
HEX	0 - FFFF	0 - FFFFFFFF
OCT	0 - 177777	0 - 37777777777
BIN	0 - 1111111111111111	0 - 11111111111111111111111111111111

Display Format	Digits	Decimal Point
DEC	1 - 10	0 - 9
HEX	1 - 8	–
OCT	1 - 11	–
BIN	1 - 32	–

Item	Description
Zero Suppress	Set the display method for numerical values that do not satisfy the specified digits condition. Selected: Do not display zeros in front of the value Unselected: Display zeros in front of the value
Char. Place	Select either flush-left or flush-right for character display.
Text Process	Set the order of the first and second bytes in words.

*1 Example: 8 words set for the logging server
To display the logging data of the 3rd word in the logging server, specify "2" for [Logging Word No.].
Even if [Data Length] is different, the corresponding device memory is the same.

[Data Length]: 1-Word

	Logging Word No.
1st word	0
2nd word	1
3rd word	2
4th word	3
5th word	4
6th word	5
7th word	6
8th word	7

[Data Length]: 2-Word

	Logging Word No.
1st word	0
2nd word	
3rd word	2
4th word	
5th word	4
6th word	
7th word	6
8th word	

*2 If any value (non-numeric inclusive) specified is outside the range usable on MONITOUCH, the value cannot be displayed.

☞ For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

*3 Values entered that exceed the set number of digits are displayed as shown in the following table.

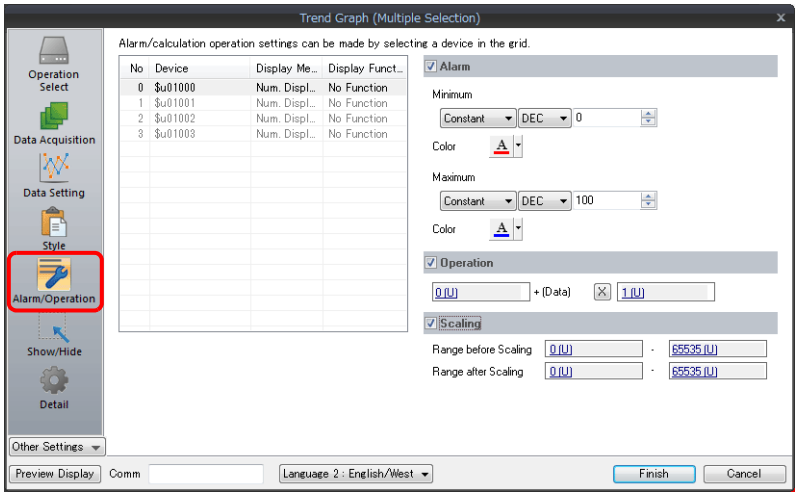
Display Format	DEC	HEX/OCT/BIN
Display	Overflow display	Numbers from the right
[Data Length]: 1-Word [Digits]: 3 Entered value: 1010	– – –	010

Style

Same as graph history display.

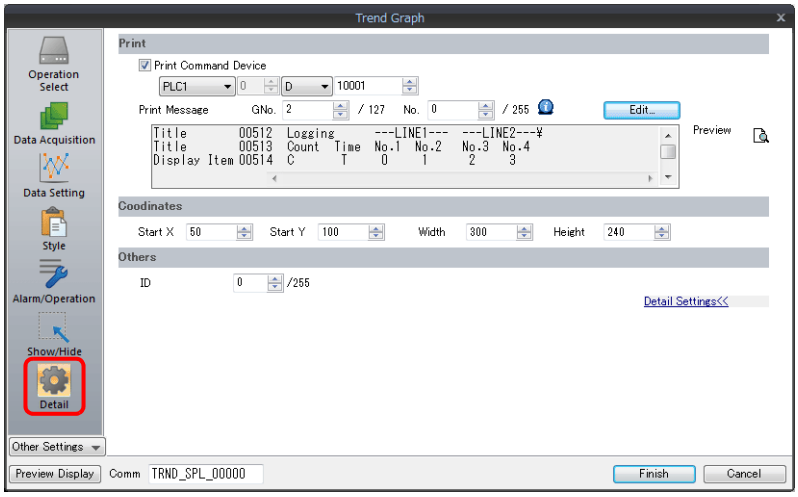
☞ For details, refer to "Style" page 7-21.

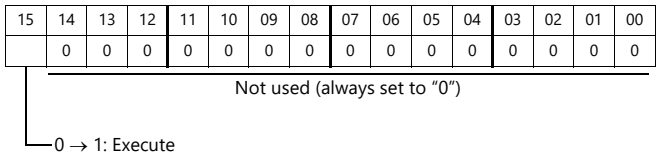
Alarm/Operation



Item	Description
Alarm	If a value is outside the range of the maximum and minimum values, the color for display can be changed.
Operation	Perform an operation on the value of the device memory.
Scaling	Data (Range before Scaling) that the PLC has read is converted into the set range (Range after Scaling) that is set.

Detail

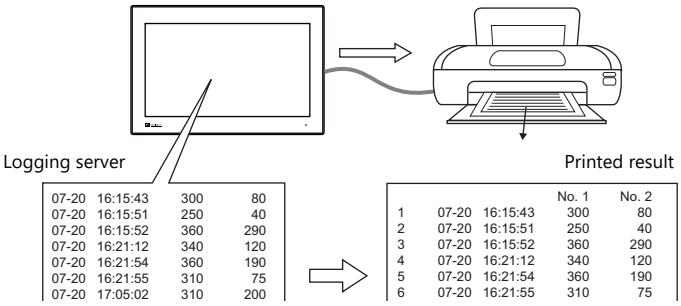


Item	Description
Print Command Device	Print the logged data. Set one word. 
Print Message	Specify the top number of the message registered with the layout and titles (text) for printing. Click [Edit] to display the [Message Edit] window. For details, refer to "Log Printing" page 7-31.
Preview	Check a preview of the data for printing.
Coordinates	Set the coordinates.
ID	Set an ID number.

Log Printing

Overview

History data saved to a logging server can be printed.

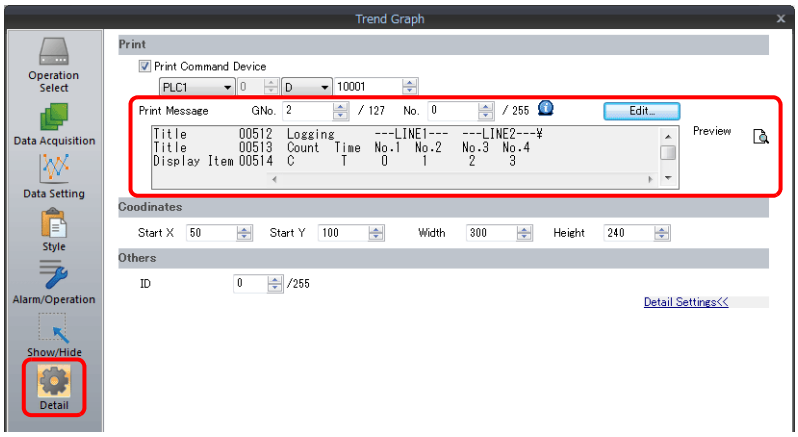


☞ For details on printing, such as printer compatibility and print setting procedures, refer to "16 Print".

Registering Print Messages

Location of registration

[Trend Graph] settings window → [Detail] → [Print Message]



Registration details

- The top line in the specified print message contains the title for printing.
  To use two or more lines for titles, insert a one-byte "\" character at the end of the line. The next line will be recognized as a part of the title. Note that the "\" on the end of the line is not printed.
- On the line following the titles, specify the positions to indicate count, time, and logging data.
  Use one-byte characters "C", "T", and "0" to "15".

  C: Sampling count print position
  T: Sampling time print position
  0 - 15: Print positions of data numbers 0 to 15

  Alignment of C, T and 0 to 15 depends on the formats set for [Logging Count Display], [Logging Time Display] and [Trend] parts place on the screen.

- If [Zero Suppress] and [Flush Right] are selected for these parts, the values are printed with the lowest digit in alignment. If [Zero Suppress] and [Flush Left] are selected for these parts, the values are printed with the highest digit in alignment. If [Zero Suppress] is not checked, the values are printed without zero suppression.

  [Zero Suppress] checked
  [Flush Left]

C	T	0	1
↓	↓	↓	↓
0	0	12345	12345

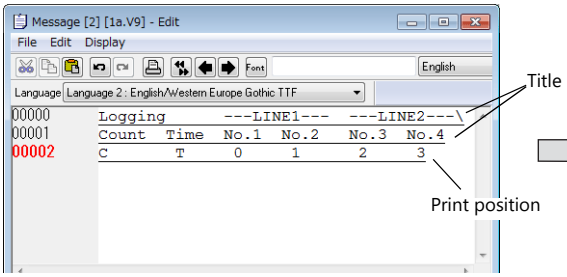
- The registered message is printed as the header at the top of each page.

Even when "C" (count) and "T" (time) are registered in the print message, the count and time are not printed if [Logging Count Display] and [Logging Time Display] parts are not placed on a screen.

Registration example

[Print Message] Message GNo. 2 : No. 0
[Zero Suppress] unselected
[Flush Left]

Message GNo. 2 editing



Printed result

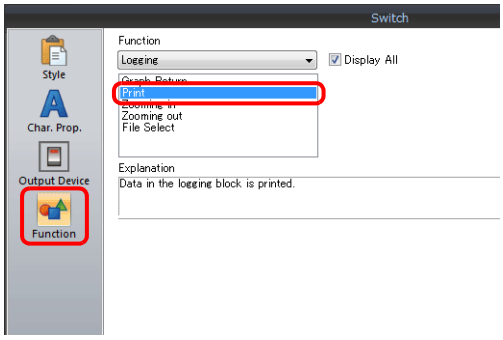
Logging count	Time	---LINE1--- No. 1	No. 2	---LINE2--- No. 3	No. 4
1	06-04 13:14:20	1234	4562	1111	224
2	06-04 13:34:20	2457	2346	3464	456
3	06-04 13:54:20	1240	6548	5648	984
4	06-04 13:74:20	4563	7683	6713	777
⋮	⋮	⋮	⋮	⋮	⋮
50	06-04 15:14:20	9997	8764	8127	265

Execution Method

There are two methods for printing logging data.

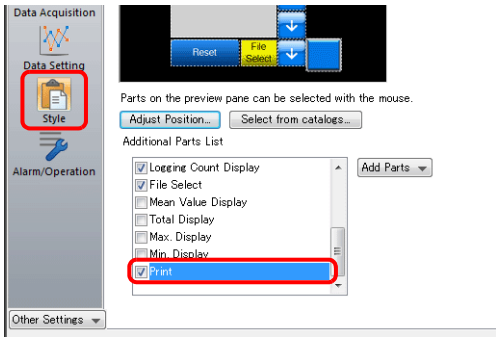
- Switch function: [Logging] → [Print]

Switch

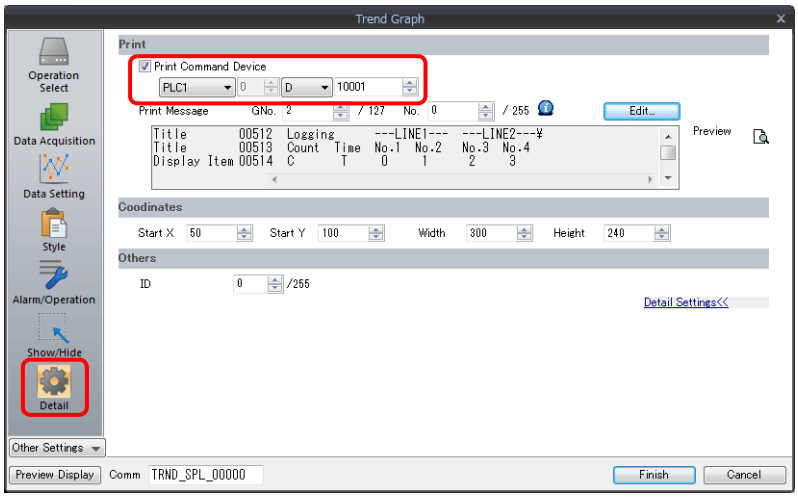


or

Trend [Style]



- Print Command Device

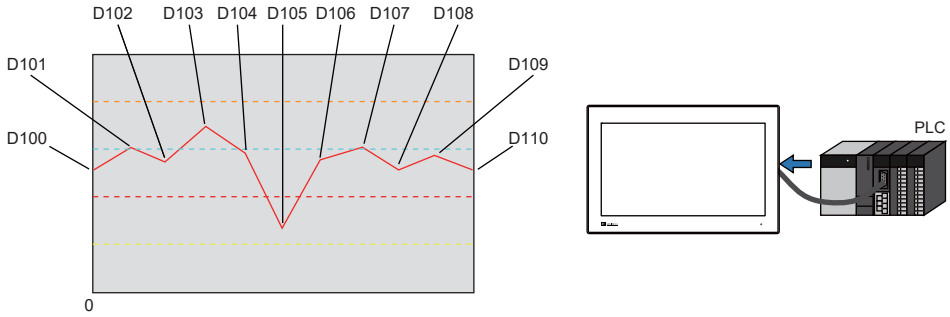


Item	Description
Print Command Device	Print the logged data. Set one word. 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Not used (always set to "0") 0 → 1: Execute

7.3 Real Time Display

- Values in consecutive device memory addresses can be expressed on a line graph.
  Subsidiary lines can be drawn for easier recognition of data changes.

Example: Graph display of data in addresses D100 to D110

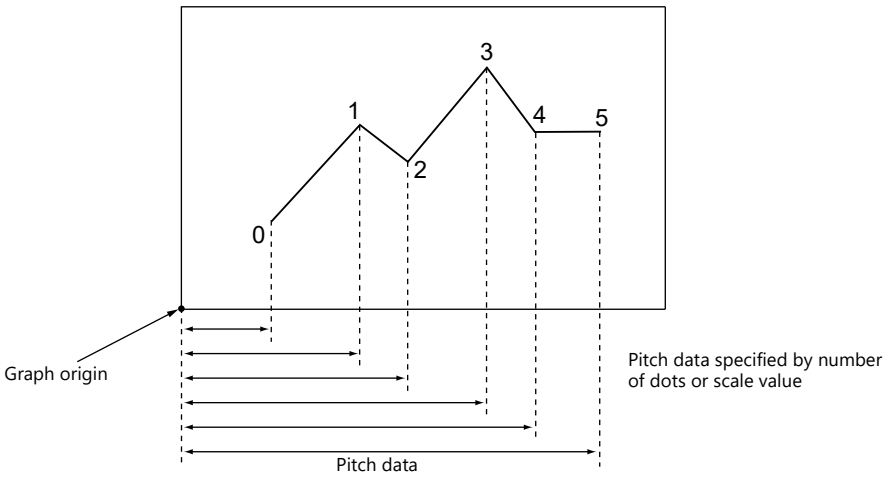


☞ Refer to "7.3.1 Location of Settings" page 7-34.

☞ Refer to "7.3.4 Display Method" page 7-44.

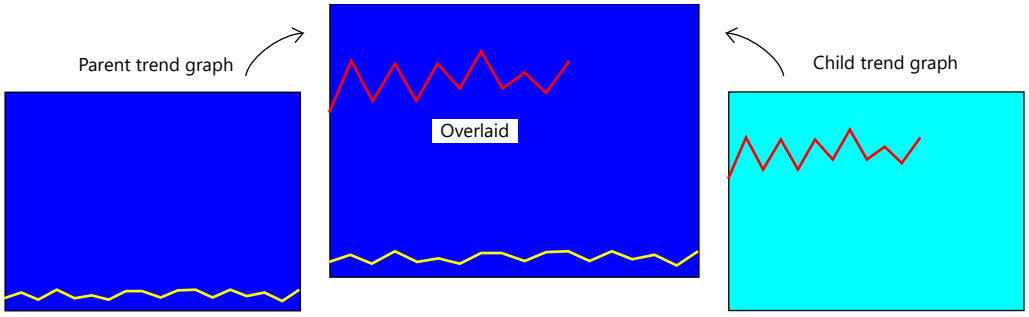
- A maximum of 16 trends (lines) can be displayed.
- Negative values can also be displayed on graphs.
- The interval between each point (point pitch) can be changed between equal pitch or an arbitrary pitch.

Example: When specifying the number of dots or the scale



☞ For details, refer to "Plot Point Pitch" page 7-40.

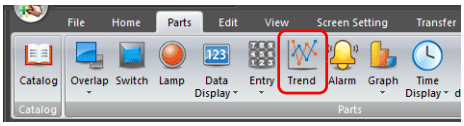
- Parent/child trends (overlay)
  Asynchronous graphs can be displayed in the same graph area.



☞ For details, refer to "Asynchronous Display of Multiple Trend Graphs" page 7-46.

7.3.1 Location of Settings

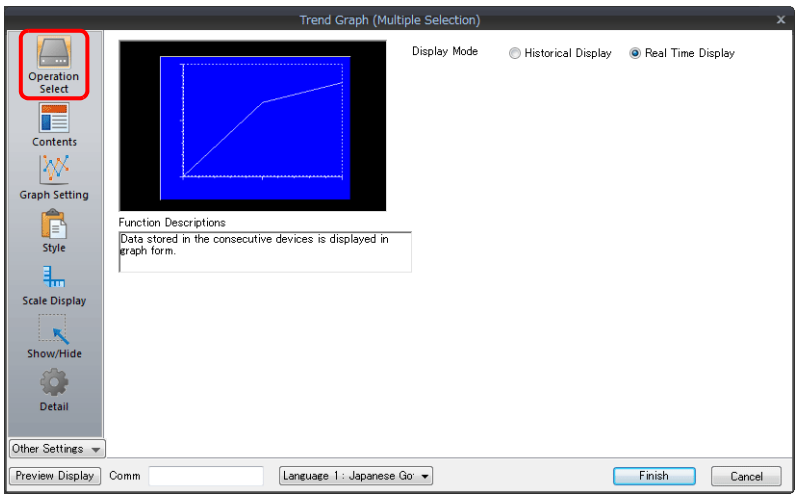
Click [Parts] → [Trend] and place a graph on the screen.



☞ For details on the display method, refer to "7.3.4 Display Method" page 7-44.

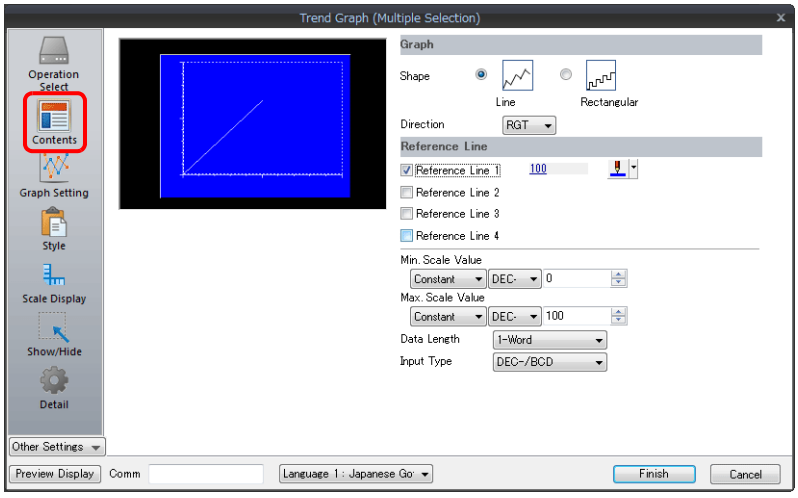
7.3.2 Detailed Settings

Operation Select

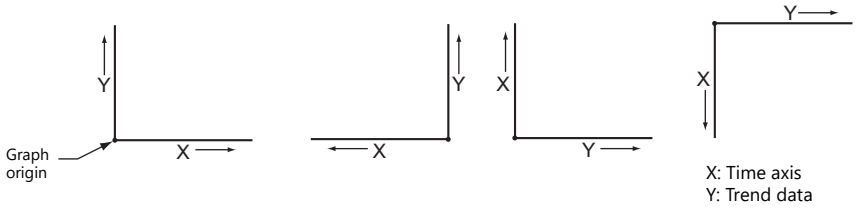


Item	Description
Display Mode	Select [Real Time Display].

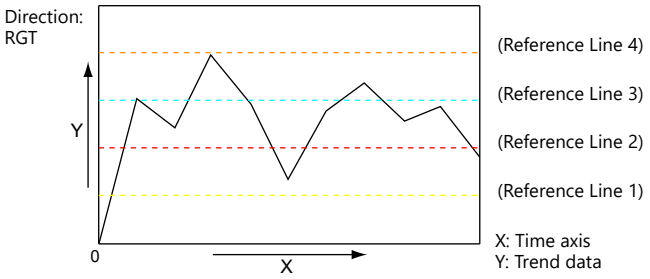
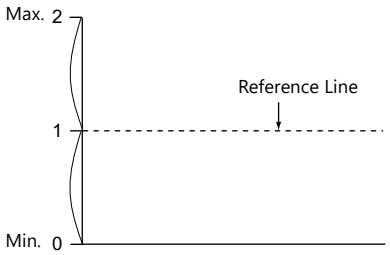
Contents



Graph

Item	Description
Shape	Set the graph shape. Line/Rectangular
Direction	Set the direction of graph lines. • RGT (right) • LFT (left) • UP (upward) • DW (downward) 

Reference line

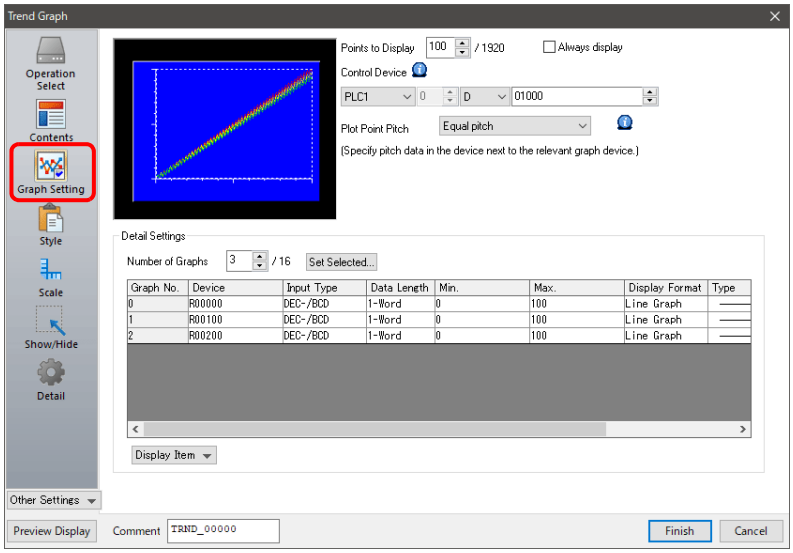
Item	Description
Reference Line	Display a maximum of four horizontal reference lines on a graph. Set the display position and color of each reference line. The line type is fixed to a dotted line.  When a device memory address (other than [Constant]) is set, reference lines are updated when the graph is displayed or when a "redraw" or a "redraw after clear" is commanded by the control device memory.
Min. Scale Value Max. Scale Value	Set the scale values for calculating the position where the reference line should be drawn in the graph area. Negative values can also be specified. To draw a reference line in the center of a trend graph: Reference Line 1 - Min. Scale Value: 0 - Max. Scale Value: 2 Specifying "1" for reference line 1 will display a line at the center. 
Data Length	Set a data length when specifying device memory (other than [Constant]) for reference lines or the minimum and maximum scale values. Set data length for the device memory. 1-Word/2-Word
Input Type	Set the data type of the scale values. DEC-/BCD *1/FLOAT *2

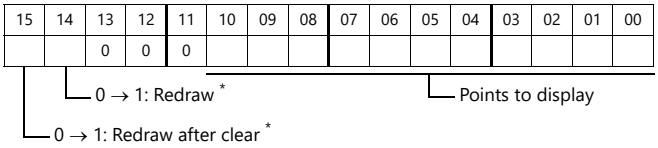
*1 When [DEC-/BCD] is selected, the setting at [System Setting] → [Hardware Setting] → [PLC Properties] → [Code] takes effect.

*2 If any specified value (non-numeric inclusive) is outside the range usable on the X1 series unit, the line cannot be displayed.

☞ For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

Graph Setting

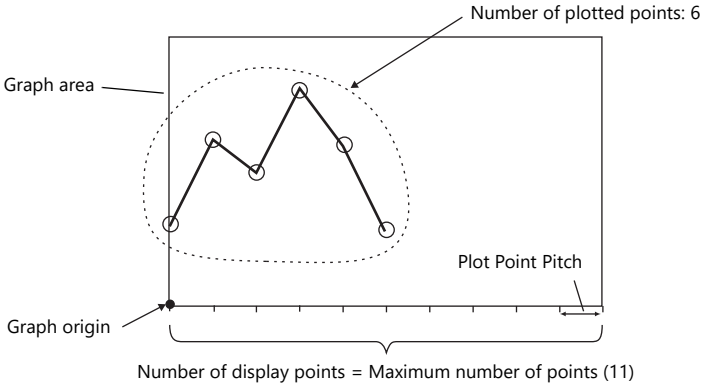


Item	Description
Points to Display [*1]	Set the number of plot points along the horizontal axis. - 1920 × 1080 dots: 3 to 1920 - 1280 × 800 dots: 3 to 1280
Always display	A graph is displayed at all times for the number of points specified by the control device memory. The update timing depends on the [Detail] → [Process Cycle] setting.
Control Device	 * When the [Always display] checkbox is selected, the redraw and redraw after clear bits are invalid.
	Number of plotted points [*1]: 0 to 1920 Set the number of points to display. The content of the device memory addresses set for numbers 0 to 15 is read for the specified number of points.
	Redraw [*2] The number of points to display are redrawn. 0 → 1 Drawing is performed over the previous graph without clearing the graph area. The previously displayed image remains.
	Redraw after clear [*2] The number of points to display are redrawn. 0 → 1 Drawing is performed after clearing the graph area. Only the latest graph is displayed.
Plot Point Pitch	Equal pitch Space all points equally. Specify the scale range Specify the interval between points using the scale range. Specify the number of dots Specify the interval between points with the number of dots. For details, refer to "7.3.3 Plot Point Pitch" page 7-40.

Item		Description
Detailed Settings	Number of Graphs	Set the number of graph lines. Max. 16
	Device	The contents of this device memory address is read and displayed on the graph. The required number of addresses varies depending on the setting for [Points to Display] and [Data Length]. For details, refer to "7.3.3 Plot Point Pitch" page 7-40.
	Use Range	Point pitch: when specified with the number of dots
	Input Format	Set data format of device memory values. DEC- / BCD *3 / Actual Number *4 The selection here also applies to minimum, maximum, and X axis scale values.
	Data Length	Select the data length for one plot point. 1-Word/2-Word
	Min. *5	Set the graph display area. (PLC device memory *6 / internal device memory *6 / constant)
	Max. *5	
	Min. Scale *5	Set when [Graph Setting] → [Plot Point Pitch] is set to [Specify the scale range]. For details, refer to "7.3.3 Plot Point Pitch" page 7-40.
	Max. Scale *5	
	Display Format	Set the graph type (line or marker) and color.
	Type	
	Color	
Item to Display		Change the items displayed in the [Detail Settings] area.

*1 Number of display points

Direction: RGT



If a value larger than the X size (dots) of the graph area is specified for [Points to Display], the graph will not be drawn correctly.

*2 "Redraw" and "redraw after clear"
When redrawing, select the "Redraw" or "Redraw after clear" bit.
If the interval between redrawing is too short, the graph may not be redrawn even at the leading edge.
Once displayed, data on the graph cannot be changed unless the redrawing command is given.

*3 When [DEC-/BCD] is selected, the setting for [System Setting] → [Hardware Setting] → [PLC Properties] → [Code] → [DEC/BCD] takes effect.

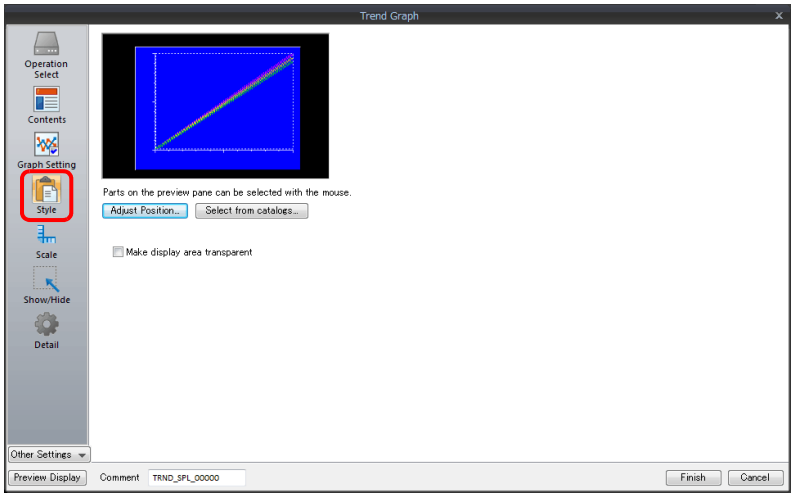
*4 If any value (non-numeric inclusive) specified is outside the range usable on MONITOUCH, the value cannot be displayed.

☞ For details on the allowable range, refer to "5.1.4 Real Numbers (Floating Point Numbers)".

*5 Max., Min., Max. Scale, Min. Scale
Do not specify the same value for both maximum and minimum values. Doing so will result in an error when transferring data to the unit. Make sure to set valid values.

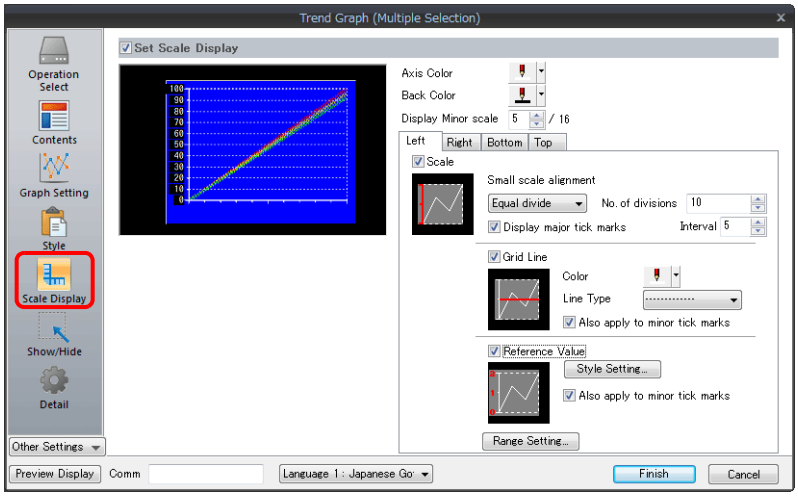
*6 When minimum and maximum values are set with a device memory address (other than [Constant]), these values are updated when the graph is displayed or when a "redraw" or a "redraw after clear" is commanded by the control device memory.

Style



Item	Description
Adjust Position	Adjust the placement position.
Select from catalogs	Change parts.
Make display area transparent	Make the display area transparent.

Scale Display



Item	Description
Axis Color	Select the color of the major and minor tick marks, and axis lines of the scale. This setting is common to all left, right, bottom, and top sides.
Back Color	
Display Minor scale	Set the length of the minor tick marks of the scale. Range: 1 to 16 This setting is common to all left, right, bottom, and top sides. The thickness of the markings is fixed.
[Scale] in [Left], [Right], [Bottom], and [Top] tab windows	Displays the scale, grid line, and reference value settings for each side. Default: Selected on [Left] and [Bottom] tab windows
Small scale alignment	Equal divide (unit based on [No. of divisions]) Minor tick marks are equally spaced according to the specified number of divisions along the axis line. Equal interval (unit based on [Interval]) Minor tick marks are equally spaced according to the specified interval from the zero point along the axis line within the following range.

Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of horizontal axis points or scale of [Range Setting]
UP/DW	Left/Right	
LFT/RGT	Left/Right	Scale of [Range Setting]
UP/DW	Top/Bottom	

Item		Description
Display major tick marks		Display major tick marks on the scale. (Unit: [Interval]) Length: Twice the minor tick marks Thickness: Fixed
Grid Line		Grid lines are drawn at the major and minor tick marks of the scale.
	Color, Line Type	Set the color and line type of grid lines.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display grid lines. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Reference Value		Select this checkbox to display reference values at major and minor tick marks on the scale.
	Style Setting	Set the number of digits or the color of reference values shown at tick marks.
	Also apply to minor tick marks	This can be set when the [Display major tick marks] checkbox is selected. Set whether to display reference values. Selected: Display at both major and minor tick marks Unselected: Only display at major tick marks
Range Setting		Use when [Small scale alignment] is set to [Equal divide] or when the [Reference Value] checkbox is selected. Match with the specified graph The range changes according to the following combinations.

Graph Direction	Side	Range
LFT/RGT	Top/Bottom	Number of X-axis data points *1
UP/DW	Left/Right	
LFT/RGT	Left/Right	Minimum and maximum values specified for the selected graph number *2
UP/DW	Top/Bottom	

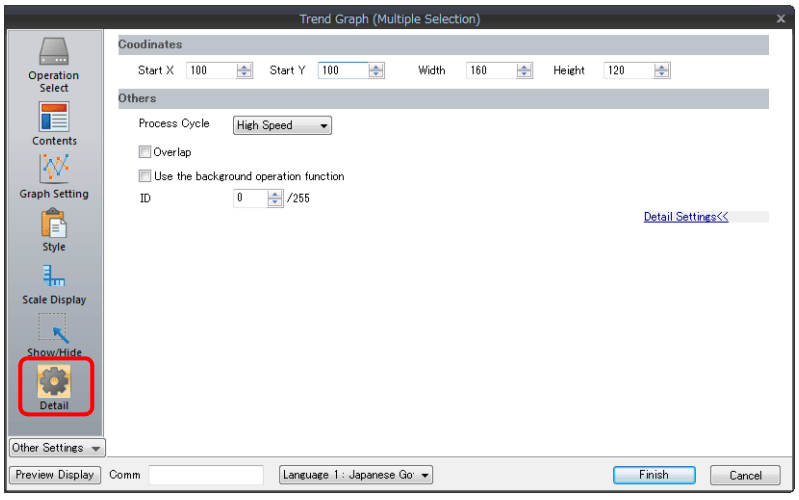
Set Value
Specify the minimum and maximum values using constants or devices. *2

*1 If [Plot Point Pitch] is set to [Specify the scale range], use the minimum and maximum scale values.

*2 If the minimum and maximum values are specified with device memory addresses (other than [Constant]) in the [Range Setting] window and these values are changed in RUN mode, the changes are updated at the following timings:

- When the screen is redrawn
- The bit for "redraw" or "redraw after clear" in the control device memory is set to ON.

Detail



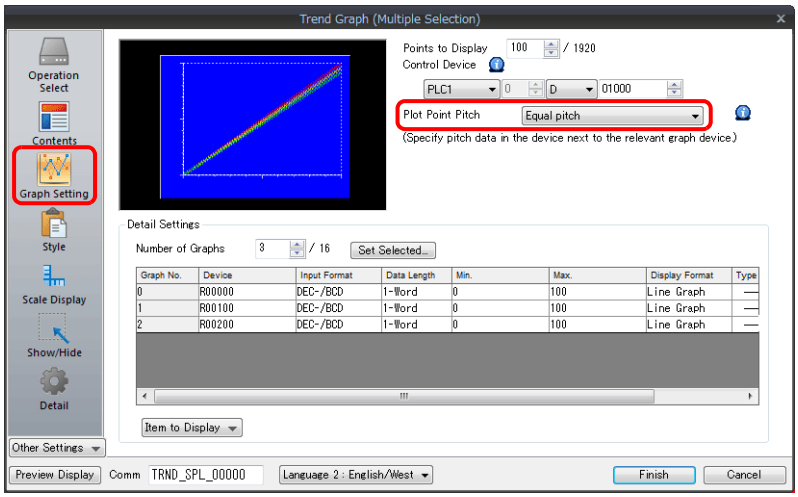
Item	Description
Coordinates	Set a display position and size.
Process Cycle	Set the cycle used to read the device memory. High Speed, Low Speed, Refresh
Overlap	Select this checkbox to display multiple graphs asynchronously or 17 or more lines in one graph area. For details, refer to "7.3.5 Asynchronous Display of Multiple Trend Graphs" page 7-46.
Use the background operation function *1	Update graphs in the background when other screens are displayed. For details, refer to "7.3.6 Background Update" page 7-49.
ID	Set an ID number.

*1 This setting is invalid if the [Always display] checkbox is selected.

7.3.3 Plot Point Pitch

Select whether to place plot points along the X-axis of graphs at equal pitches (intervals) or at variable pitches.

Location of setting: [Graph Setting] → [Plot Point Pitch]

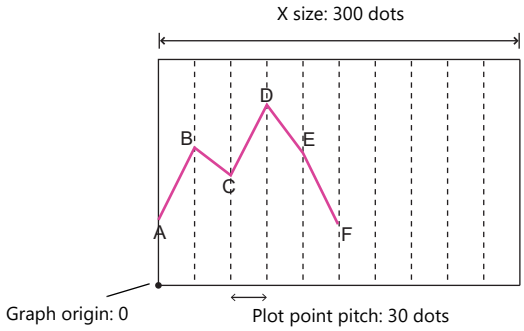


Type

Equal pitch

Plot points are automatically set at an equal pitch. MONITOUCH calculates a pitch between plot points as shown below. (MONITOUCH adjusts the data so that no remainder will result.)

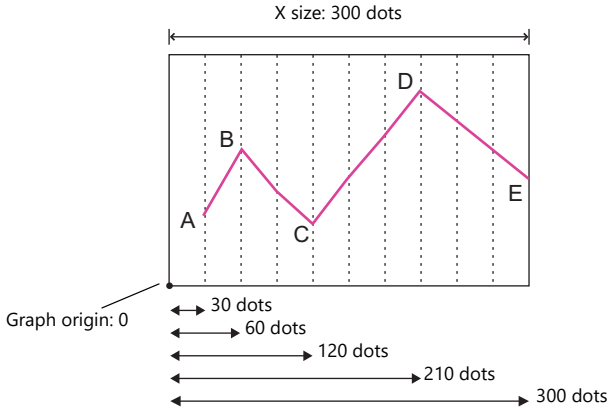
Formula: Point pitch (dots) = X size of graph (dots) ÷ ([Points to Display] - 1)



☞ For details on device memory allocation, refer to "Equal pitch" page 7-42.

Specify the number of dots

Pitch data (distance from the graph origin to each plot point) can be specified in units of dots.

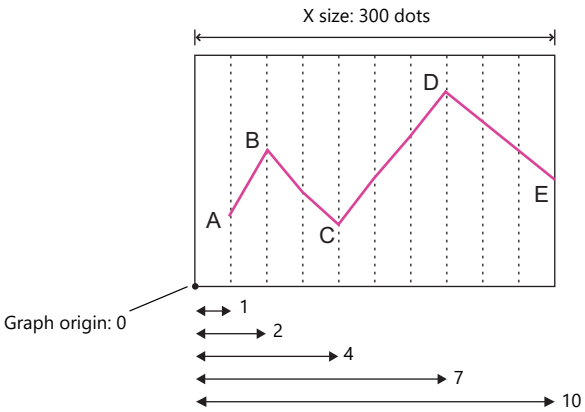


☞ For details on device memory allocation, refer to "Specify the scale range, specify the number of dots" page 7-43.

Specify the scale range

Pitch data (distance from the graph origin to each plot point) can be specified using a scale value. The scale value is specified as the range in the [Graph Setting] settings. ([Max. Scale], [Min. Scale])

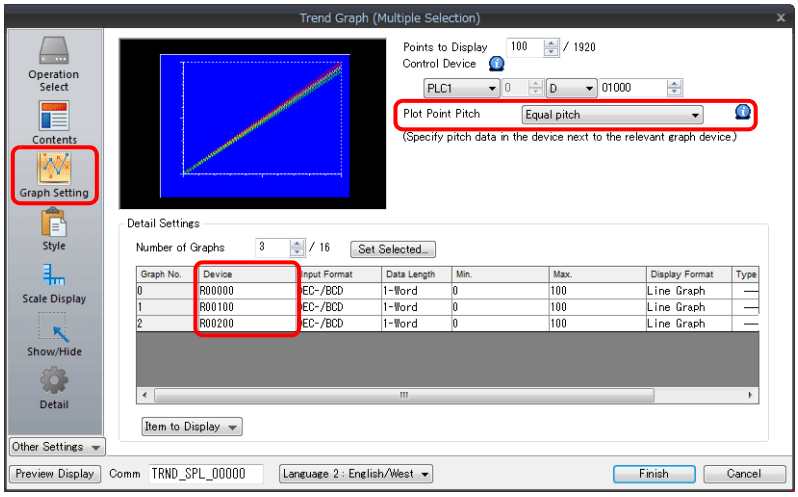
[Specify the scale range]
- [Min. Scale]: 0
- [Max. Scale]: 10



☞ For details on device memory allocation, refer to "Specify the scale range, specify the number of dots" page 7-43.

Device Memory Allocation

The allocation of device memory addresses differs depending on the [Points to Display] setting and the data length of each graph.



Equal pitch

Point data is stored consecutively from the set device memory address.

Device memory address setting: n

Data length: word

n + 0	Point 0 data
n + 1	Point 1 data
n + 2	Point 2 data
n + 3	Point 3 data
n + 4	Point 4 data
n + 5	Point 5 data
	:
n + m	Point “m” data

Data length: double word

n + 0 n + 1	Point 0 data
n + 2 n + 3	Point 1 data
n + 4 n + 5	Point 2 data
	:
n + m	Point “m” data

For example, allocation is performed as follows when 11 points are plotted on the X-axis and [Device] is D100.

- If the data length is 1 word, devices D100 to D110 are used.
- If the data length is 2 words, devices D100 to D121 are used.

Device memory address setting: D100

Data length: word

D100	Point 0 data
D101	Point 1 data
D102	Point 2 data
D103	Point 3 data
D104	Point 4 data
D105	Point 5 data
	:
D110	Point 10 data

Data length: double word

D100 D101	Point 0 data
D102 D103	Point 1 data
D104 D105	Point 2 data
	:
D120 D121	Point 10 data

Specify the scale range, specify the number of dots

Point data and pitch data (dot or scale value) from the set device memory address are stored one after the other. A device for pitch data is allocated following the device memory for each point.

Device memory address setting: n

Data length: word

n + 0	Point 0 data
n + 1	Point 0 pitch data
n + 2	Point 1 data
n + 3	Point 1 pitch data
n + 4	Point 2 data
n + 5	Point 2 pitch data
	⋮
n + m	Point “m” data
	Point “m” pitch data

Data length: double word

n + 0 n + 1	Point 0 data
n + 2 n + 3	Point 0 pitch data
n + 4 n + 5	Point 1 data
n + 6 n + 7	Point 1 pitch data
	⋮
n + m	Point “m” data
	Point “m” pitch data

For example, allocation is performed as follows when 11 points are plotted on the X-axis and [Device] is D100.

- If the data length is 1 word, device memory addresses D100 to D121 are used.
- If the data length is 2 words, device memory addresses D100 to D141 are used.

Device memory address setting: D100

Data length: word

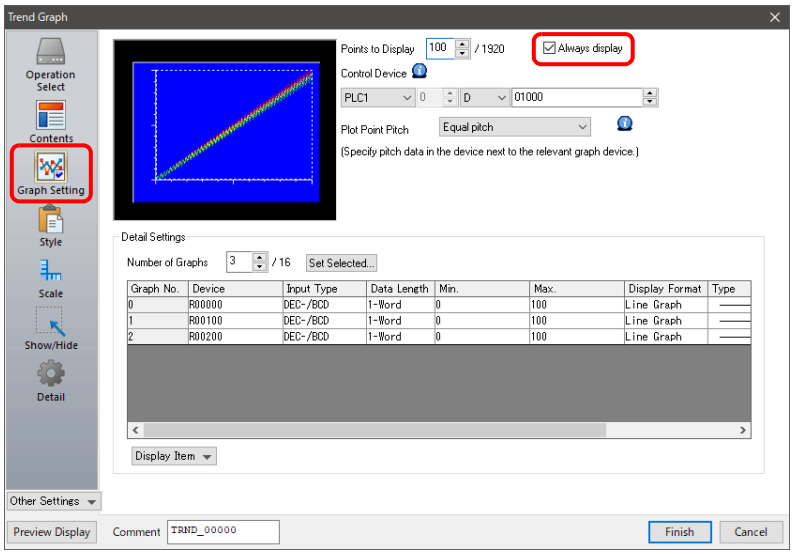
D100	Point 0 data
D101	Point 0 pitch data
D102	Point 1 data
D103	Point 1 pitch data
D104	Point 2 data
D105	Point 2 pitch data
	⋮
D120	Point “m” data
D121	Point “m” pitch data

Data length: double word

D100 D101	Point 0 data
D102 D103	Point 0 pitch data
D104 D105	Point 1 data
D106 D107	Point 1 pitch data
	⋮
D140	Point 10 data
D141	Point 10 pitch data

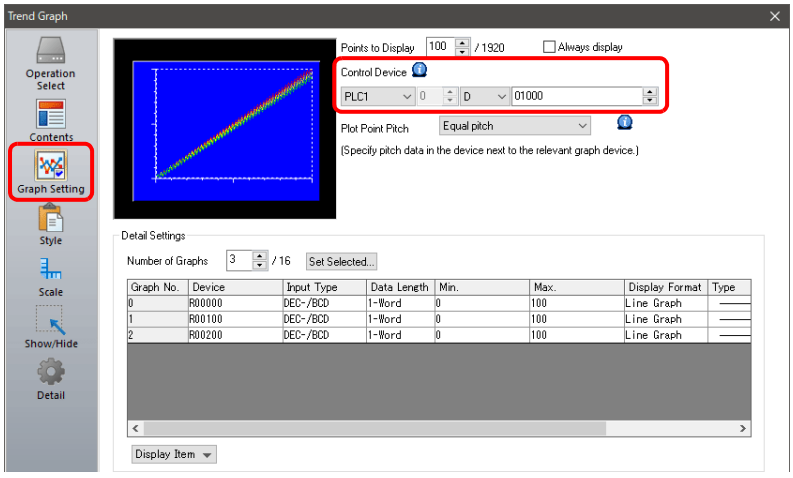
7.3.4 Display Method

The display method differs depending on whether the [Graph Setting] → [Always display] checkbox is selected or not.



When [Always display] Checkbox is Selected

1. Check the graph control device memory. (Example: D1000)
   Location of setting: [Trend Graph] settings window → [Graph Setting] → [Control Device]

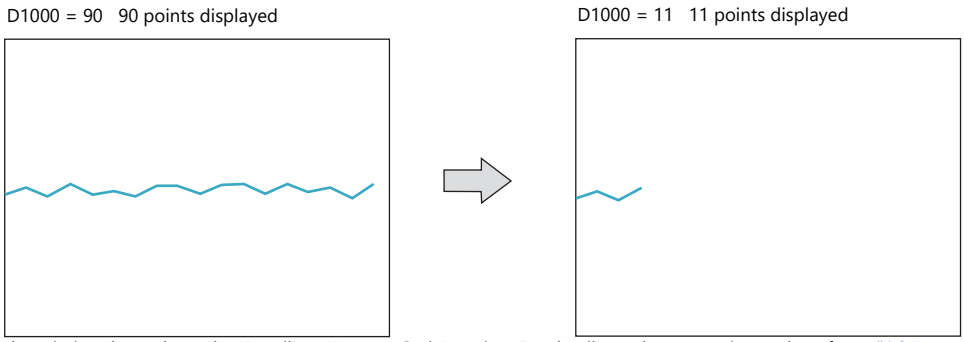


15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0											

System reserved

0 to 1024: Points to Display

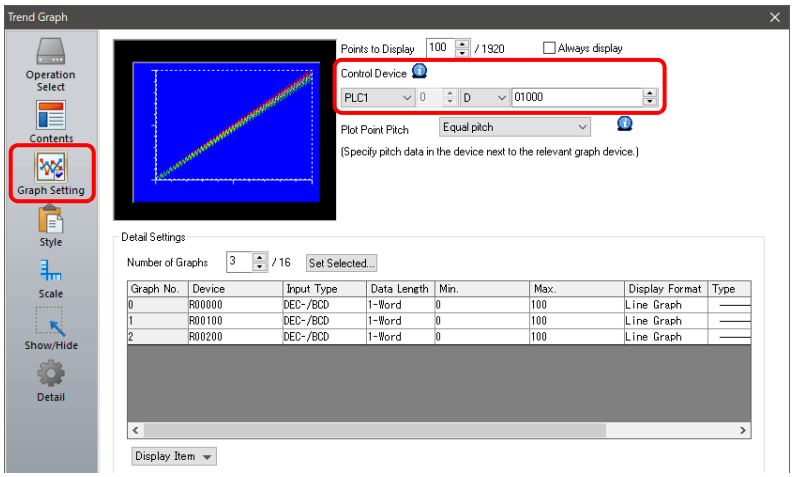
2. Set the control device memory to “90”. (Points to Display)
   Graphs are displayed with 90 points. Next, set the control device memory to “11” to display graphs with 11 points.



* The update timing depends on the [Detail] → [Process Cycle] setting. For details on the processing cycle, refer to “1.2 Process Cycle” page 1-34.

When [Always display] Checkbox is Not Selected

1. Check the graph control device (e.g. D1000).
   Location of setting: [Trend] settings → [Graph Setting] → [Control Device]



15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
		0	0	0											

0 → 1: Redraw after clear

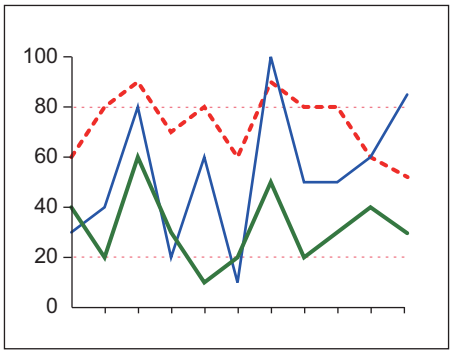
0 → 1: Redraw

0 to 1920: Points to Display

2. Set the control device to "11" (number of plotted points).

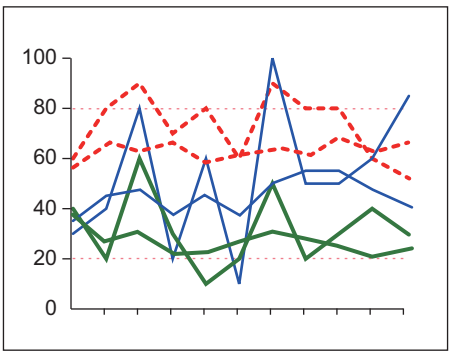
3. Change "redraw after clear" (bit 15) or "redraw" (bit 14) of the control device memory from 0 to 1.

   - Redraw after clear (bit 15)
     The previous graphs are cleared before displaying the latest graph.



The graphs are displayed with the 11 most recent points.

   - Redraw (bit 14)
     The previous graphs are not cleared and the latest graph is displayed.

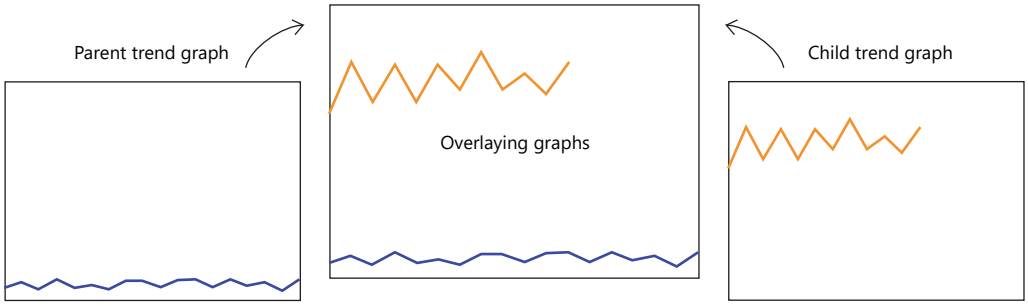


The latest graph with the 11 most recent points is displayed over the previous graph.

This completes the necessary settings.

7.3.5 Asynchronous Display of Multiple Trend Graphs

All the trend lines in the graph area are drawn at the same points and at the same timing because trend graphs have one word of control device memory. To draw multiple trend lines at different timings, two or more graphs must be overlaid and linked, thereby assigning priorities to respective control device memory.



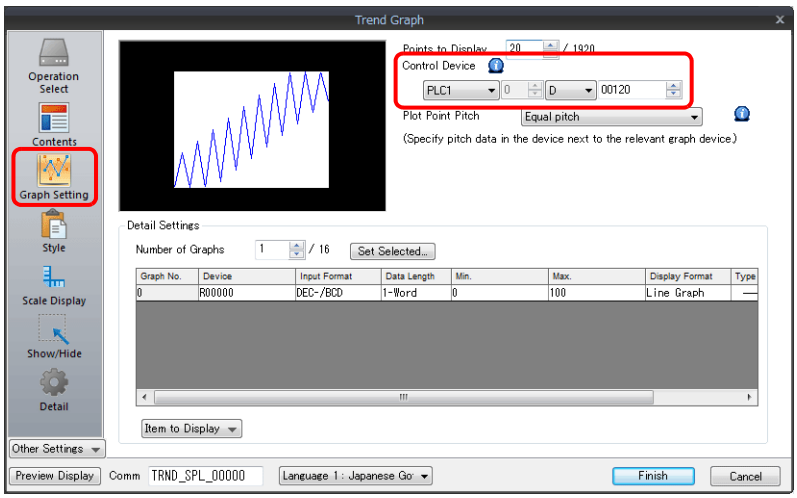
Setting Procedure

This section explains drawing multiple graphs with an example of displaying two trend graphs asynchronously.

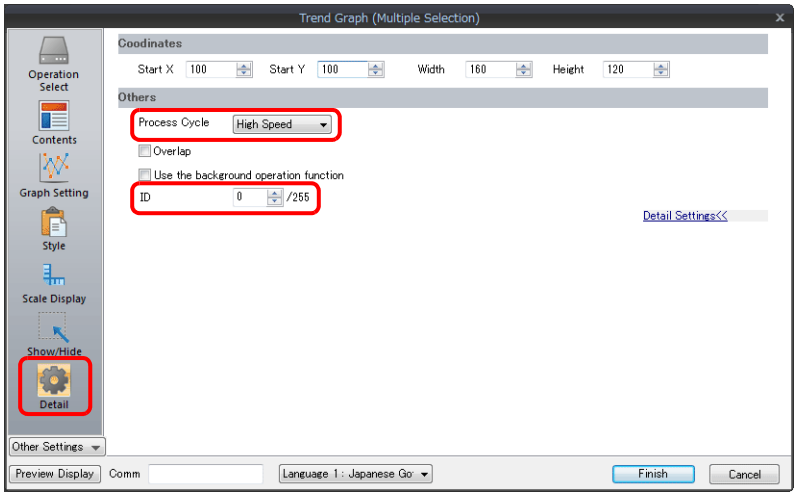
1. Place two trend graphs.

   ☞ Refer to "7.3.1 Location of Settings" page 7-34.

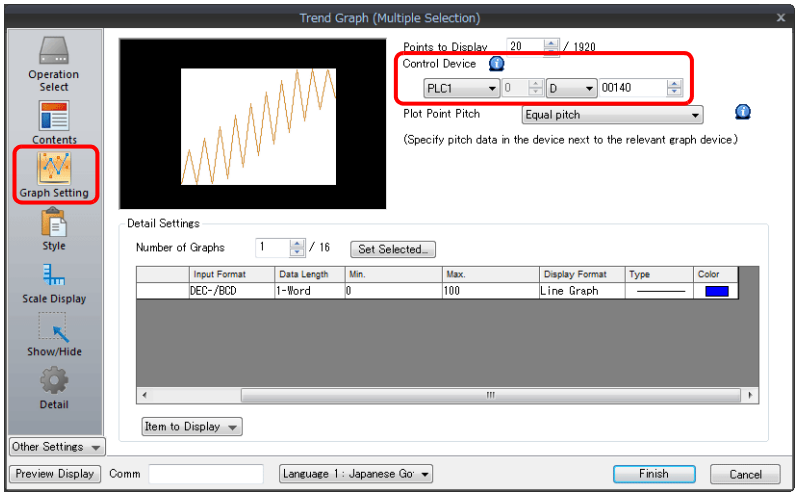
2. Set D120 to [Graph Setting] → [Control Device] in the [Trend] settings window.



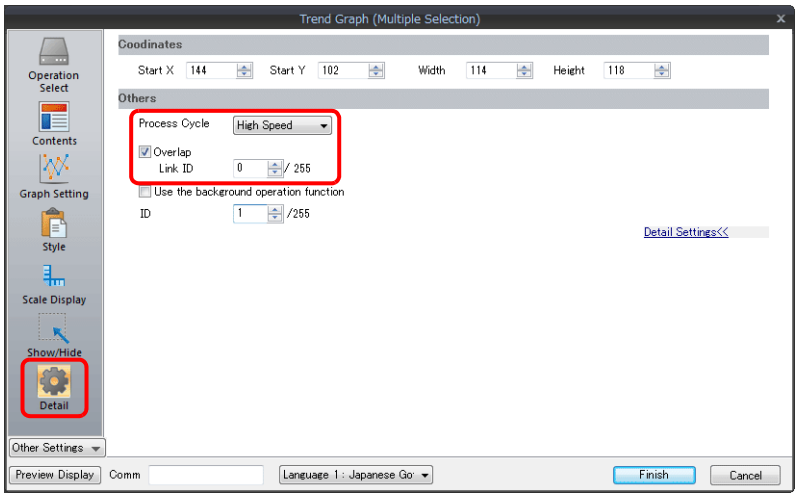
3. Set "High Speed" for [Detail] → [Process Cycle] and "0" for [ID] (parent trend graph).



4. In the [Trend] settings window of the other graph, set D140 to [Graph Setting] → [Control Device].



5. Set “High Speed” for [Detail] → [Process Cycle] and “0” for [Overlap] (child trend graph).



6. Place the parent trend graph under the child trend graph to overlap the two graphs.

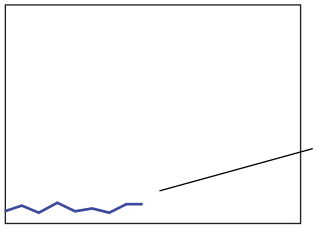
This completes the necessary settings.
The graphs are drawn using the D120 control device memory (parent trend graph).

☞ For details on display, refer to “7.3.4 Display Method” page 7-44.

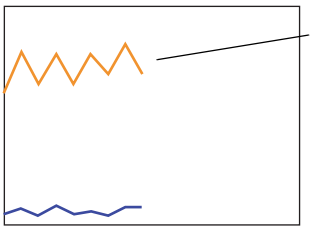
Display Method

This section explains how to draw two trend graphs based on the example in "Setting Procedure" page 7-46.

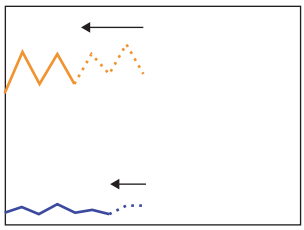
1. Set D120 to 9H (number of plotted points).



2. Set D140 to 9H (number of plotted points).

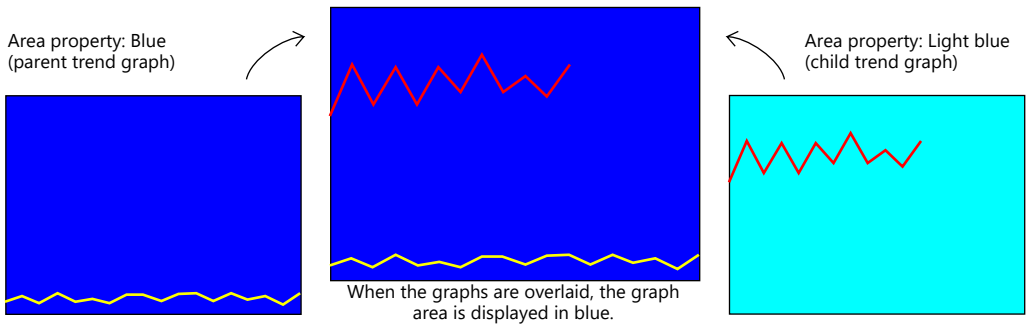


3. Set the D140 to 5H (number of plotted points) and set D120 to 8007H ("redraw after clear" and number of plotted points).



Notes on Setting

- When linking two or more trend graphs, regard one trend graph as a "parent" and the other trend graph as a "child." Select the [Detail] → [Overlap] checkbox for the child trend graph and set the ID of the parent trend graph. Both the "redraw" and "redraw after clear" commands issued at the child trend graph are ignored and only the commands from the control device memory of the parent trend graph are accepted.
- Set [Process Cycle] to "High Speed" for all the trend graphs that are linked.
- Only the area property settings of the parent trend graph are available. The area property settings of the child trend graph are not displayed.
  In addition, the reference lines set for the child trend graph area ignored.
- Place the child trend graph over the parent trend graph using the [Bring to Top] or [Send to Bottom] icon. If the parent trend graph is placed over the child trend graph, these two graphs will not be linked correctly.



- When the parent trend graph is set to be always displayed, both the parent and child trend graphs are displayed at all times.

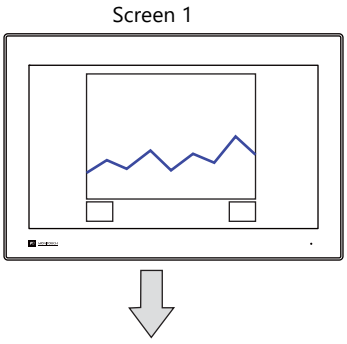
7.3.6 Background Update

Graphs can be updated even when displaying screens that do not contain trend graph parts.

Display example: [Number of Graphs]: 1
[Points to Display]: 9
[Control Device]: D100 (redraw command bit: 14th bit)

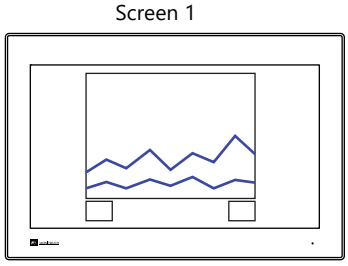
(1) Display graph on screen 1

D100 = 9H
(9 point display)



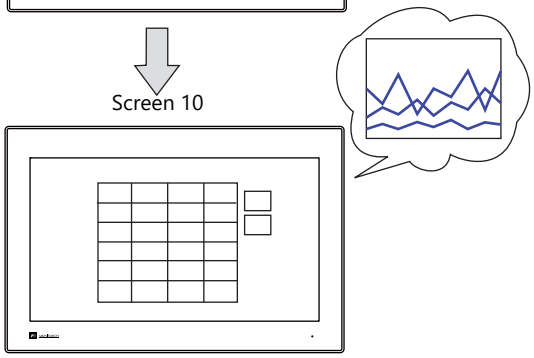
(2) Redraw graph on screen 1

D100 = 4009H
(Redraw 9 point)



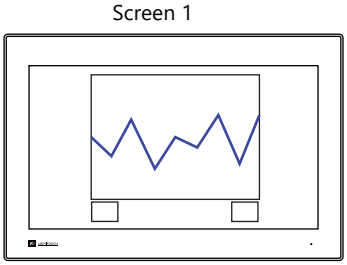
(3) Display screen 10
Graph redraw command

D100 = 4009H
(Redraw 9 point)



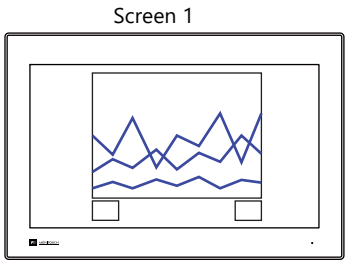
(4) Display screen 1

- [Use the background operation function] checkbox unselected



Only update the latest state
(latest single graph line only)

- [Use the background operation function] checkbox selected

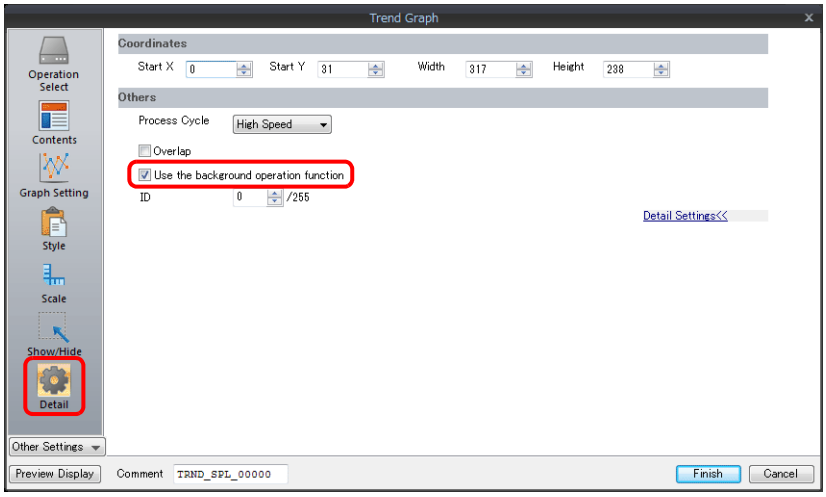


Display the graph updated by the command in step 2 (three graph lines)

* Previous graph lines remain until the redraw clear bit is turned ON.

Location of Settings

[Detail] → [Use the background operation function]



Notes on Setting

- The maximum number of trend parts using the background operation function that can be placed in one screen is 256.
- This function cannot be used with component parts.
- This setting is invalid if the [Always display] checkbox is selected.

8 Alarm

8.1 Overview

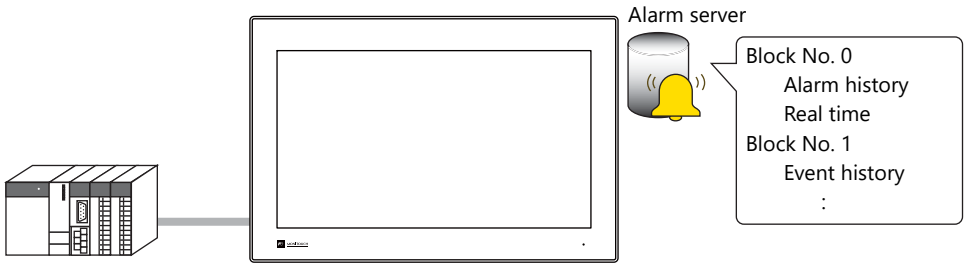
8.2 Alarm Server

8.3 Date and Time Display Setting

8.4 Alarm Parts

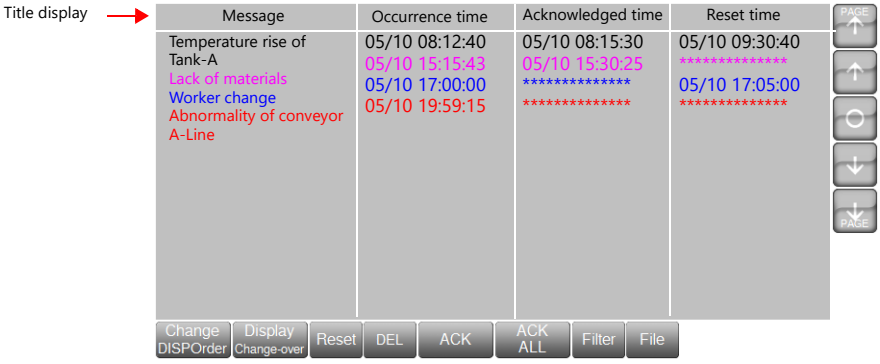
8.1 Overview

- Alarm server
  The states of device memory registered to an alarm server can be saved as alarm history. History data can be output to storage as a CSV file by turning the relevant bit ON for checking on a computer.

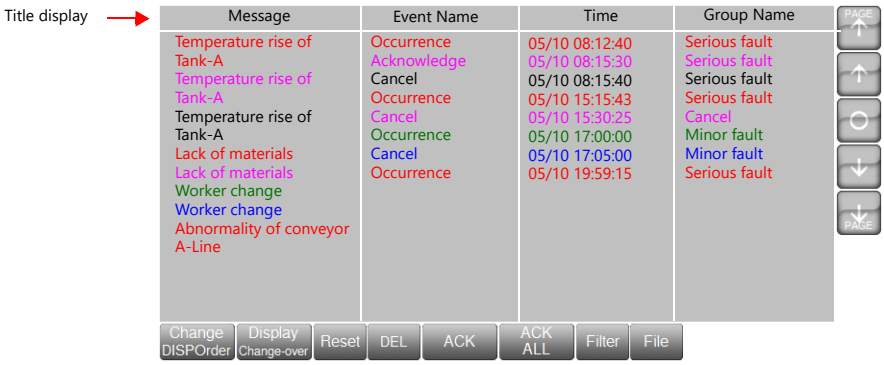


"Alarm Server" page 8-7

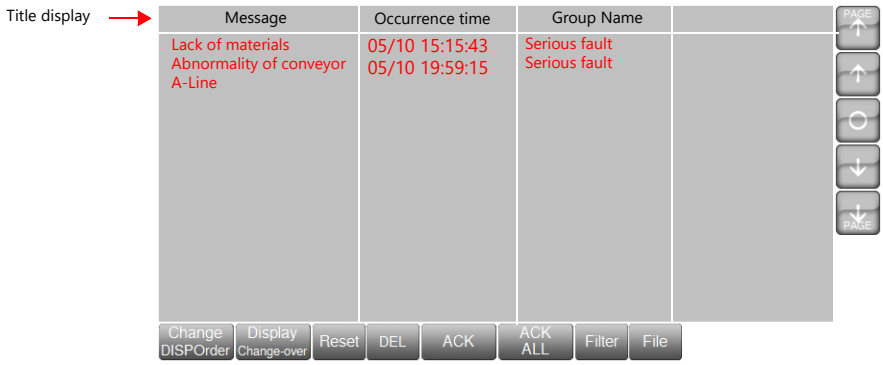
- Alarm parts
  Placing alarm parts on the screen allows history data saved on an alarm server to be displayed in conjunction with certain times and messages. There are three alarm types to alarm parts.
  - Alarm history
    Alarm occurrence, reset, and acknowledged times are displayed on one line. The state of each alarm can be checked at a glance.



  - Event history
    Alarm occurrence, reset, and acknowledged times are each displayed on one line.

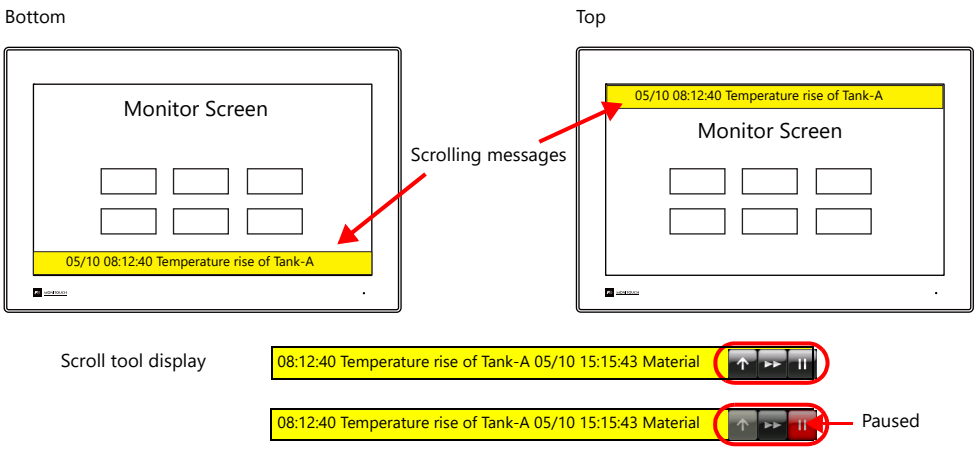


- Real time display
  This screen will only display alarms that are currently occurring. Alarms that require resetting can be checked at a glance.



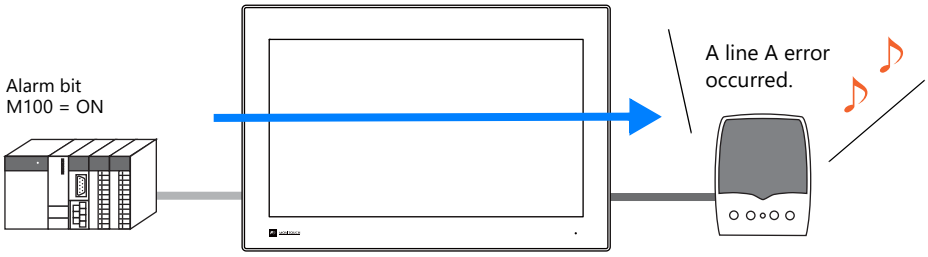
- Action when alarms occur
  Six actions can be set to occur according to the alarm that occurred.

  1) Scrolling messages
     When an alarm occurs, an alarm message is automatically displayed at the bottom (or top) of the screen. Displaying the scroll tool allows the display position to be changed or automatic scrolling to be paused. Scrolling messages are displayed continually until the error is reset even if the screen is changed.



☞ "Scrolling Messages" page 8-22

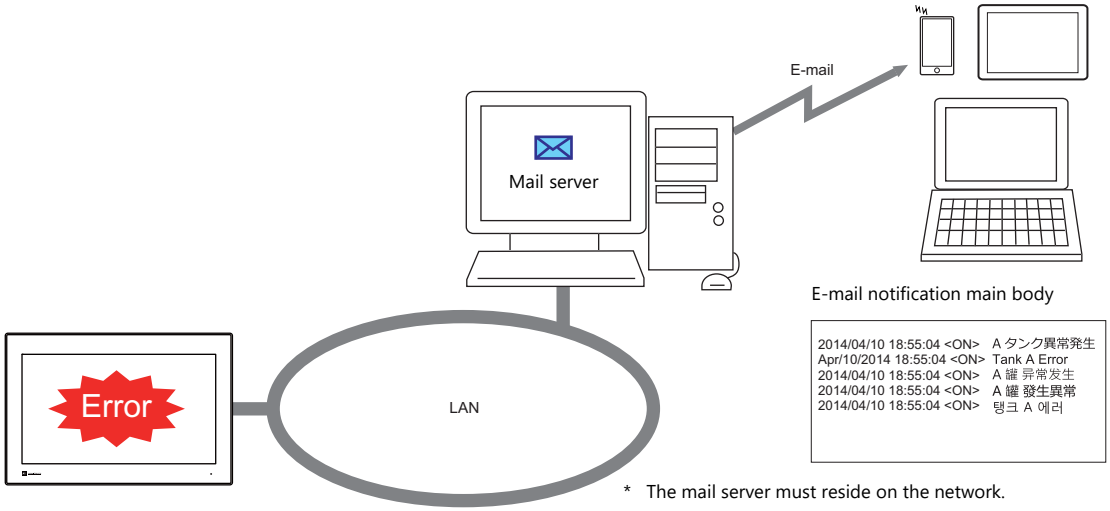
  2) Audio playback
     An audio file can be played when an alarm occurs.



☞ "Playing Sounds" page 8-24

3) E-Mail

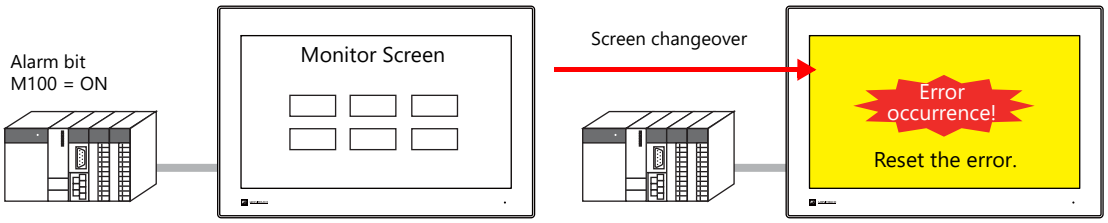
Send an e-mail when an alarm occurs or is reset. When using a multi-language screen, e-mails are sent in all languages.



☞ "E-mail Notification" page 8-25

4) Operation Setting

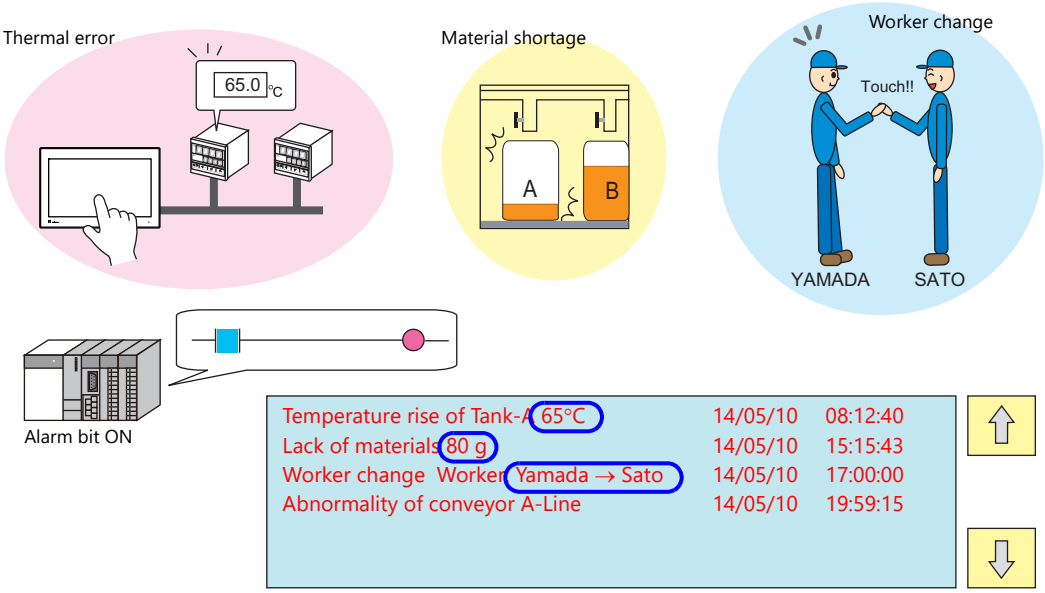
Operations including output to a specified device memory address, display changeover, and macro execution can be performed when an alarm occurs.



☞ "Operation Setting" page 8-26

5) Parameter display

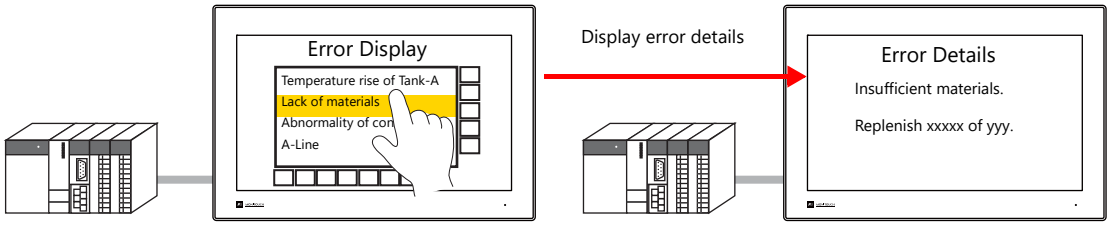
When an alarm occurs, the data (parameters) associated with the alarm can be saved/displayed together with an alarm message. Logging the history of such alarm-relevant parameters will make it easier to locate and investigate the causes of alarms.



☞ "Parameters" page 8-28

6) Touch action

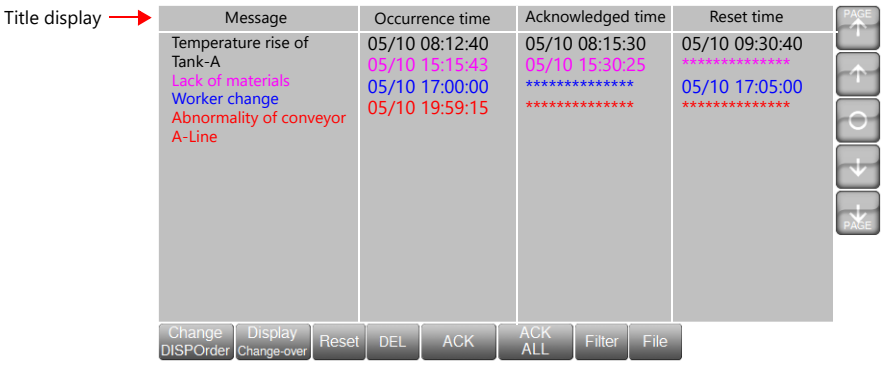
The screen can be changed by tapping the message on the alarm part.
More detailed alarm information can be displayed.



☞ "Touch Action" page 8-30

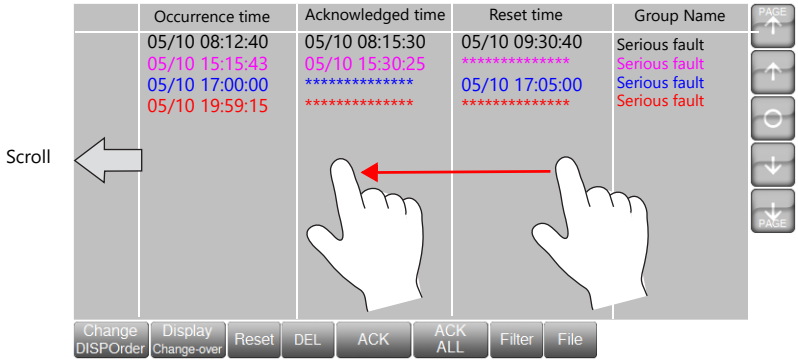
- Alarm part display/operation
  - Title display/operation

    A title can be added to each item in alarm parts.



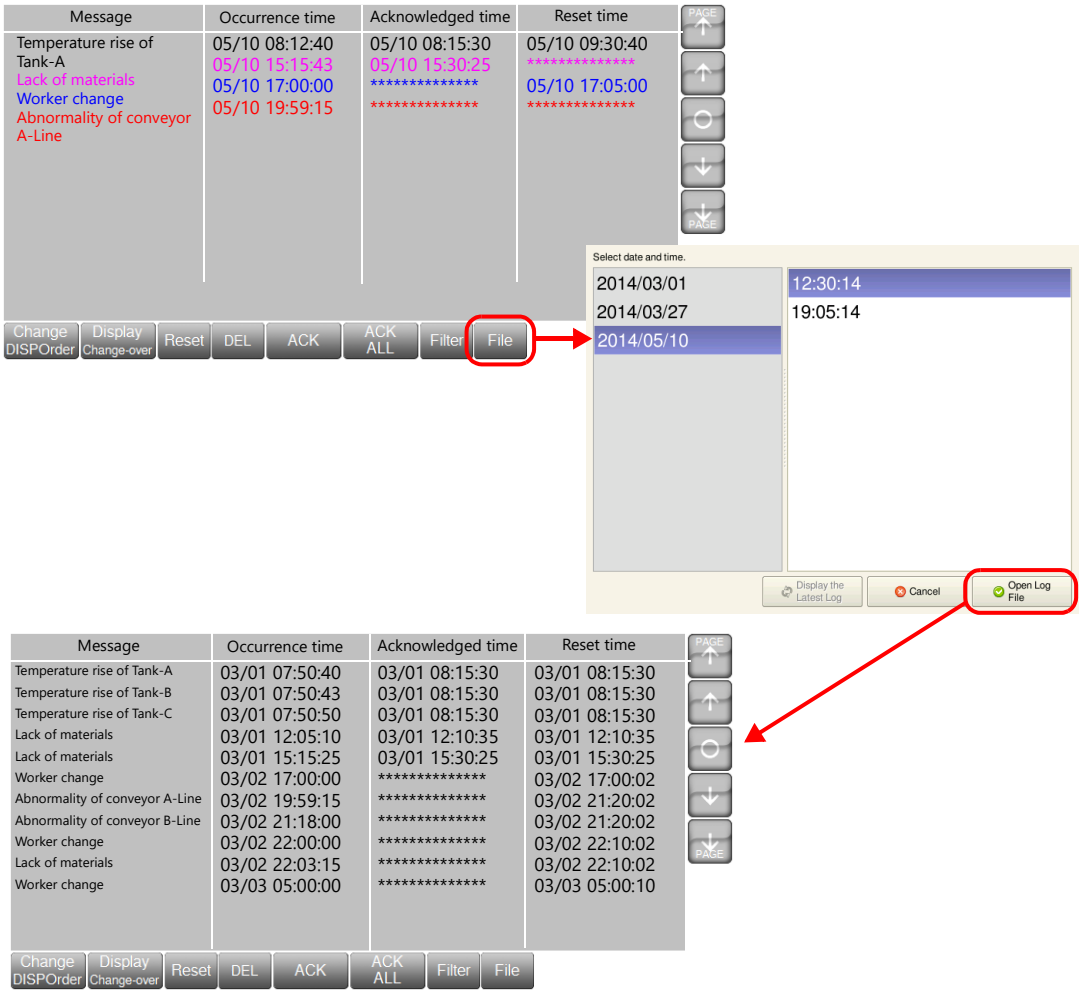
  - Scrolling function

    If the area width is insufficient to display all items, the screen can be scrolled by touch operation.



- Backup file display

  Use the [File] switch to redisplay backup files (BIN) output to storage.

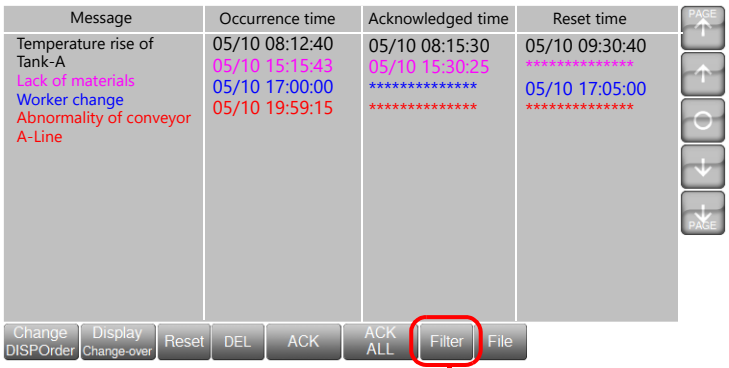


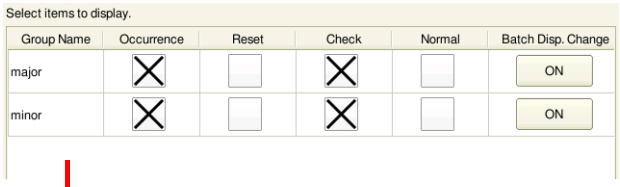
- Filter display

Use the [Filter] switch to select display in groups or display according to state (Occurrence, Reset, Check, Normal).

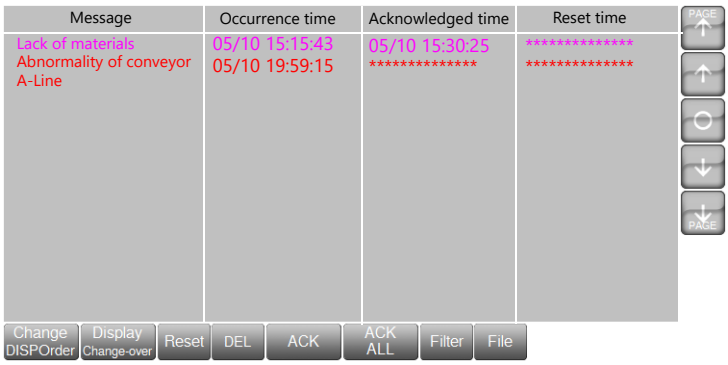
Example: Changing from display of all items to only occurring and acknowledged items.

Display all items





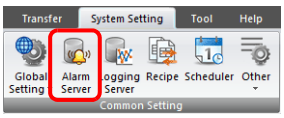
Displaying occurring and acknowledged items



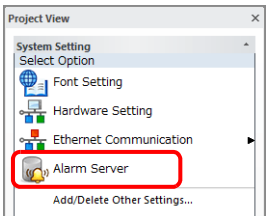
8.2 Alarm Server

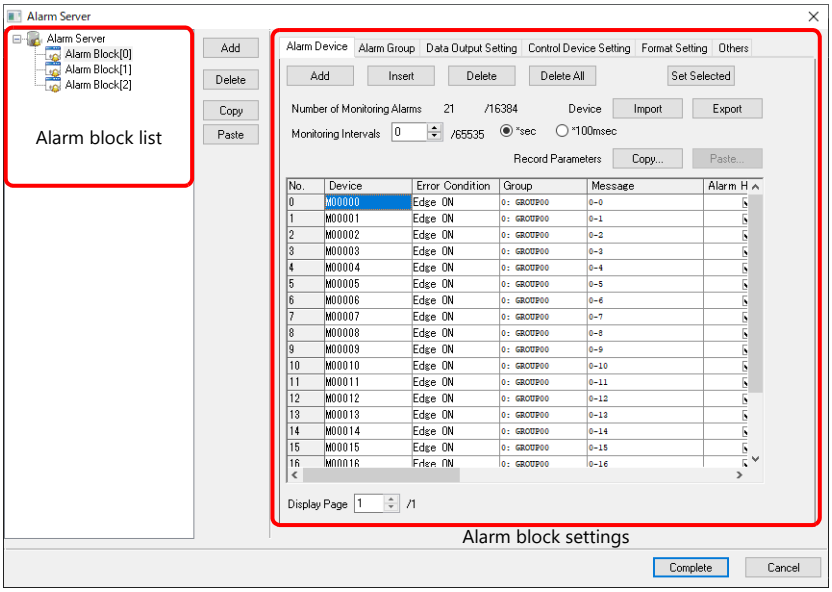
8.2.1 Alarm Server

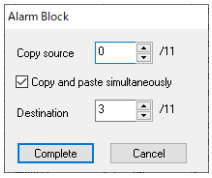
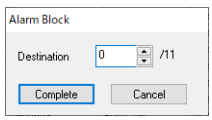
The area that stores the alarm history is referred to as an alarm server.
Set an alarm server via [System Setting] → [Alarm Server] or [View] → [Project] → [Project View] window.



or

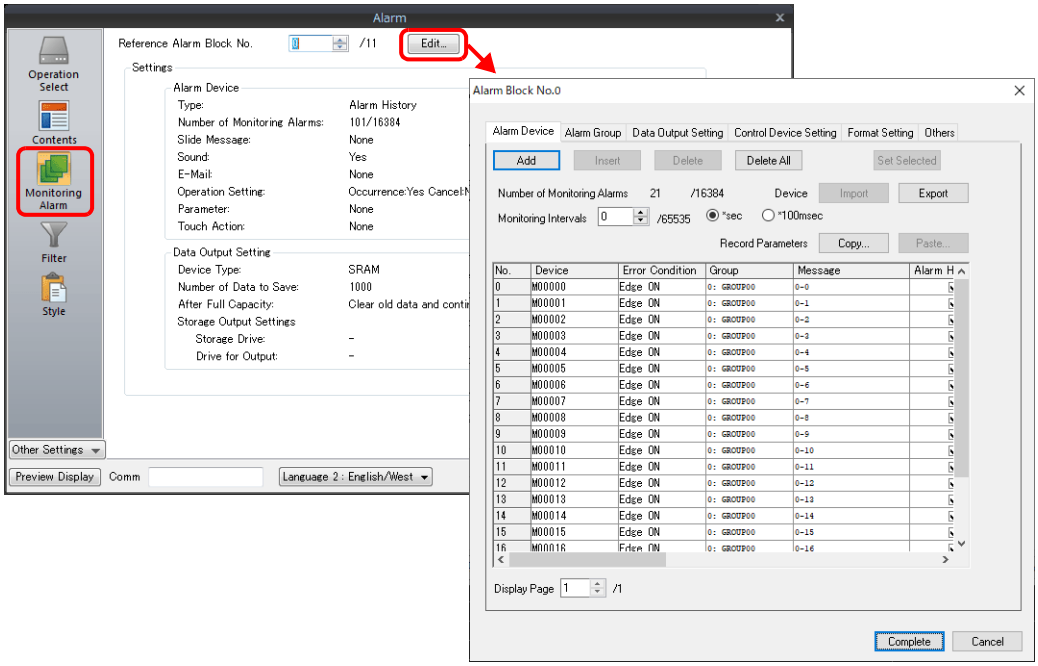




Item	Description
Alarm block list	A list of registered alarm blocks is displayed. Alarm block numbers 0 to 11 (total of 12) can be registered. Screen program converted from V8 to X1 is displayed as V8 compatible.
Add	Add an alarm block.
Delete	Delete an alarm block.
Copy	The following dialog box is displayed.  **Item / Description** Copy source: The specified block is copied. Copy and paste simultaneously: When selected, copying and pasting are done simultaneously. The paste destination is specified at [Destination]. * Be sure to deselect this checkbox when copying and pasting to a different file. Destination: This setting is valid when [Copy and paste simultaneously] is selected. Specify the block number of the destination for pasting the copied content.
Paste	The following dialog box is displayed. The content copied using the [Copy] button is pasted to the specified number. 

Item	Description
Alarm block settings *1	Perform detailed configuration of the alarm block selected in the alarm block list. Refer to"8.2.2 Alarm Block Settings" page 8-9

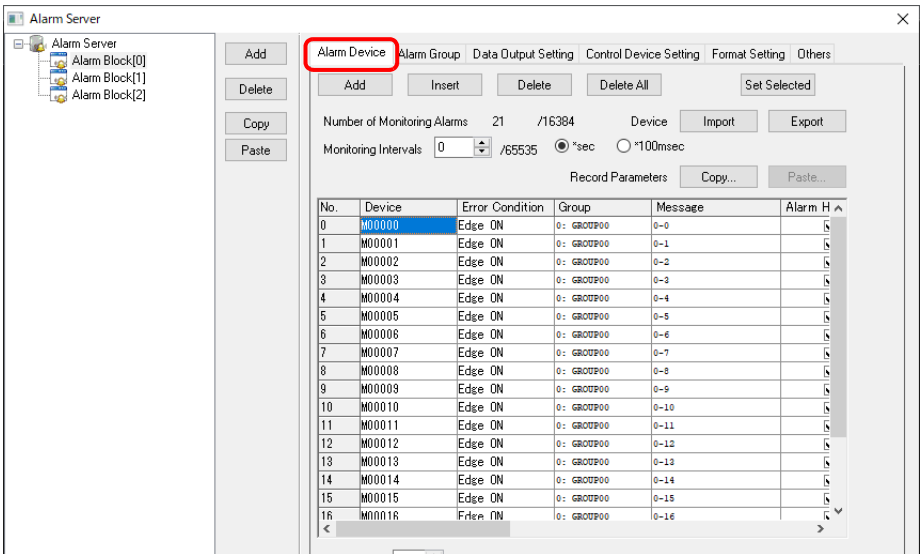
*1 Alarm blocks can also be configured from the [Monitoring Alarm] settings in the alarm part settings window.



8.2.2 Alarm Block Settings

Alarm Device

Register alarm device memory and configure error conditions.

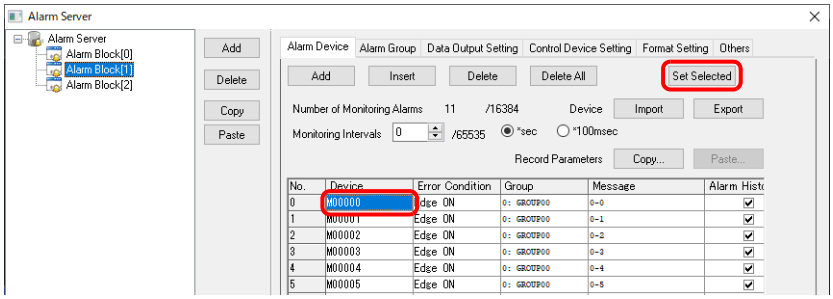


<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Number of Monitoring Alarms</td><td>Register a monitoring alarm using the [Add], [Insert], [Delete], [Delete All], and [Set Selected] buttons.
The number of registered alarms is displayed.
1 - 16384</td></tr>
<tr><td></td><td>Add</td><td>Add an alarm device memory to the bottom of the list.
A device memory address is automatically allocated by adding “1” to the device memory address in the last row on the list.</td></tr>
<tr><td></td><td>Insert</td><td>Insert an alarm device memory under the selected row.
A device memory address is automatically allocated by adding “1” to the device memory address in the selected row.</td></tr>
<tr><td></td><td>Delete</td><td>Delete the selected alarm device memory.</td></tr>
<tr><td></td><td>Delete All</td><td>Delete all registered alarm device memory.</td></tr>
<tr><td></td><td>Set Selected *1</td><td>Batch copy the settings of the selected cell to other cells.
<table>
<tr><th colspan="2">Item</th><th>Settings</th></tr>
<tr><td colspan="2">Device</td><td>Automatic device memory address increment</td></tr>
<tr><td colspan="2">Error Condition</td><td rowspan="2">Batch copy</td></tr>
<tr><td colspan="2">Group</td></tr>
<tr><td colspan="2">Message</td><td>Automatic message number increment</td></tr>
<tr><td>Alarm types</td><td>Alarm history
Event history
Real time</td><td rowspan="2">Batch copy</td></tr>
<tr><td>Actions</td><td>Scrolling messages
Sound
E-Mail
Operation Setting Parameters
Touch action</td></tr>
</table></td></tr>
<tr><td></td><td>Import*2</td><td>Import all alarm device memory settings from a CSV file.</td></tr>
<tr><td></td><td>Export*2</td><td>Export all alarm device memory settings to a CSV file.</td></tr>
<tr><td colspan="2">Monitoring Intervals</td><td>Set the monitoring frequency of the alarm device memory.
0: Every cycle
100 msec - 65535 sec</td></tr>
<tr><td rowspan="2">Record Parameters</td><td>Copy*3</td><td>Copy the parameters set for alarm device memory addresses.</td></tr>
<tr><td>Paste*3</td><td>The parameters copied using the [Copy] button are pasted to the specified alarm number.</td></tr>
<tr><td colspan="2">Device</td><td>Set the alarm device memory</td></tr>
</table>

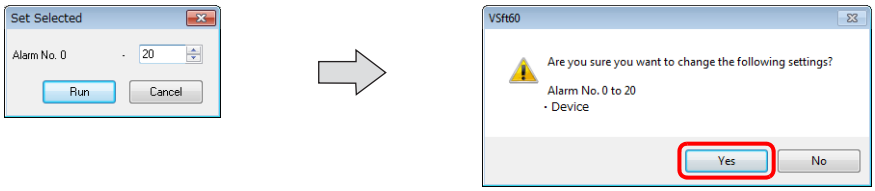
Item		Description
Error Condition		Set the error conditions of the device memory
	Edge ON	Bit OFF → ON: Error occurrence Bit ON → OFF: Error reset
	Edge OFF	Bit ON → OFF: Error occurrence Bit OFF → ON: Error reset
	Range Designation	Set the comparison condition expression for the value of the device memory address. Data length: Set the data length of the condition value. 1-Word/2-Word Constant Set the format of the comparison condition expression. DEC+–/DEC/BCD
Group	No.0 - 15	Set which alarm group the alarm device memory belongs to. For details on alarm groups, refer to page 8-13.
Message		Register an alarm message.
	GNo.0 - 127 No.0 - 255	Set the group number and line number to which an alarm message is to be registered. Display the [Message Edit] window by clicking the [Edit] button.
	Message Lines	Set the number of lines of the alarm message.
Alarm types		Set the history type. Multiple types can be selected. Match the [Display Mode] of alarm items when alarm messages are to be checked on MONITOUCH. * When none are selected, the alarm is disabled even if [Error Condition] is satisfied. In this case, no history is recorded. This is useful when registering a device memory for future use.
	Alarm History	Alarm occurrence, reset, and acknowledged times are all displayed on one line. The state of each alarm can be checked at a glance.
	Event History	Alarm occurrence, reset, and acknowledged times are each displayed on one line.
	Real Time	This screen will only display alarms that are currently occurring. Alarms that require resetting can be checked at a glance.
Actions		Set the action to perform when an alarm occurs.
	Flowing Message	An alarm message is automatically displayed at the bottom (or top) of the screen. It is displayed continually until the error is reset even if the screen is changed. Refer to page 8-22
	Sound	Play back an audio file. Refer to page 8-24.
	E-Mail	Send an e-mail. Refer to page 8-25.
	Operation Setting	Perform operations including writing to the specified device memory address (output setting), screen changeover / overlap control (function), and macro execution (macro). Refer to page 8-26.
	Parameter	When an alarm occurs, the data (parameters) associated with the alarm can be saved/displayed together with an alarm message. Refer to page 8-28.
	Touch Action	Change the screen by touching the alarm message. The [Enable the touch-action function] checkbox must be selected at [Detail] → [Auxiliary Function] in the alarm part settings window. Refer to page 8-30.
Display Language		Change the display language when using multi-language screens.
Display Page		Each page displays 512 monitoring alarms.

*1 Batch setting of devices

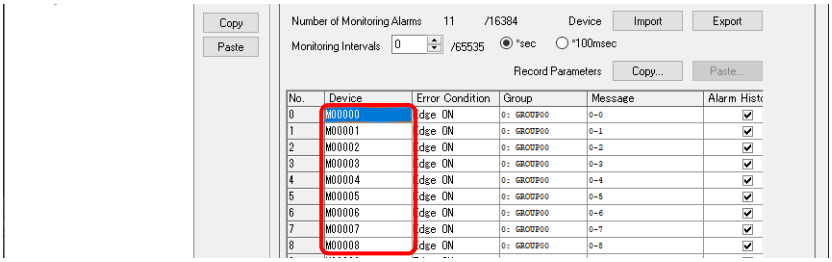
1) Select a cell to set a device memory address.
2) With the cell in the selected state (highlighted in blue), click [Set Selected]. The [Set Selected] window is displayed.



3) Select the alarm range for batch setting and click [Run]. A confirmation message is displayed.



4) Check that the setting range is correct and click [Yes]. The device memory addresses of the specified range are changed.

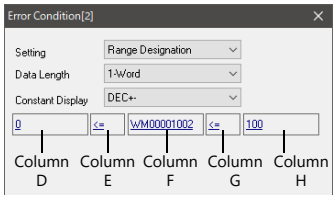


*2 Importing and exporting alarm device memory settings
Settings such as device memory addresses, error conditions, and message numbers can be exported to a CSV file and also imported from a CSV file.

Example of CSV file output

Header information: Do not change these items. If changed, settings cannot be imported.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	ALMSVR	2																			
2	Device	Error Conc	Constant I	Range De	Range De	Range De	Range De	Range De	Group	Message	Message L	Alarm His	Event Hist	Real Time	Flowing M	Sound	E-Mail	Recording	Operation	Parameter	Touch Action
3	PLC1[M000010000]	Edge ON							0	0	1	ON	OFF	ON	Enable	Enable	Enable	None	None	None	Enable
4	PLC1[M000010010]	Edge OFF							0	1	1	ON	OFF	ON	Enable	Enable	Enable	None	None	None	Enable
5	PLC1[WM00001002]	1word	DEC+-	0	<=	PLC1[WM	<=	100	0	2	1	OFF	ON	OFF	None	None	None	None	None	Enable	None
6	PLC1[WM00001003]	2word	DEC+-	0	<=	PLC1[WM	<=	100	0	3	1	ON	OFF	ON	Enable	Enable	Enable	None	Enable	Enable	Enable
7	PLC1[M000010040]	Edge ON							0	4	1	ON	ON	OFF	None	None	None	None	None	None	None
8	PLC1[M000010050]	Edge ON							0	5	1	ON	ON	OFF	None	None	None	None	None	None	None
9	PLC1[M000010060]	Edge ON							0	6	1	ON	OFF	ON	Enable	Enable	Enable	None	None	None	None
10	PLC1[M000010070]	Edge ON							0	7	1	ON	OFF	ON	Enable	Enable	Enable	None	None	None	None
11	PLC1[WM00001008]	1word	DEC+-	0	<=	PLC1[WM	<=	100	0	8	1	ON	OFF	OFF	None	None	None	None	Enable	Enable	Enable
12	PLC1[M000010090]	Edge ON							0	9	1	ON	OFF	OFF	None	None	None	None	Enable	None	Enable
13	PLC1[M000010100]	Edge ON							0	10	1	ON	OFF	OFF	None	None	None	None	None	None	None
14	PLC1[M000010110]	Edge OFF							0	11	1	ON	OFF	OFF	None	None	None	None	None	None	None
15	PLC1[M000010120]	Edge OFF							0	12	1	ON	OFF	OFF	None	None	None	None	None	None	None
16	PLC1[M000010130]	Edge ON							0	13	1	ON	OFF	OFF	None	None	None	None	None	None	None
17	PLC1[M000010140]	Edge ON							0	14	1	ON	OFF	OFF	None	None	None	None	None	None	None

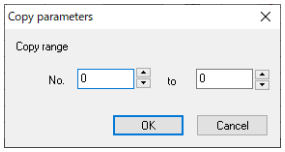
Item	Settings	Remarks
Device	Alarm device memory addresses Setting examples Internal device memory $u00100 PLC device memory (Fuji Electric SX (F mode) M10000 specified) 1:1 connection: PLCx[Mzz.000010000] (x = PLC No., zz = CPU No.) 1:n connection: PLCx[yyy:Mzz.000010000] (x = PLC No., yyy = Port No., zz = CPU No.) Temperature control device memory (device memory of a Fuji Electric inverter specified) 1:1 connection: PLCx[#401799-00] (x = PLC No.) 1:n connection: PLCx[yyy:#401799-00] (x = PLC No., yyy = Port No.)	The "zz." in the setting example of a Fuji Electric PLC device memory can be omitted if the CPU No. is "0".
Error Condition	Error conditions (Edge ON / Edge OFF / Range designation) Setting value: Edge ON / Edge OFF / 1word / 2word	
Constant Display Type	Display type Setting value: DEC+– / DEC / BCD	This is used when the error condition is "1word" or "2word" (range designation).
Range Designation (columns D to H)	Range settings Column D: Constant or device memory Column E: Condition expression Column F: Constant or device memory Column G: Condition expression Column H: Constant or device memory	This is used when the error condition is "1word" or "2word" (range designation). 
Group	Specifies the alarm group. Setting value: 0 to 15	
Message	Specifies the message number as an absolute address. Setting value: 0 to 32767	
Message Lines	Specifies the number of lines of a message to display. Setting value: 1 to 24	
Alarm History	Specifies whether or not to use the alarm history function. Setting value: ON / OFF	
Event History	Specifies whether or not to use the event history function. Setting value: ON / OFF	
Real Time	Specifies whether or not to use the real time alarm function. Setting value: ON / OFF	
Flowing Message	Specifies whether or not to use scrolling messages. Setting value: Enable / None	*1
Sound	Specifies whether or not to use audio output. Setting value: Enable / None	*1

Item	Settings	Remarks
E-Mail	Specifies whether or not to use E-mails. Setting value: Enable / None	*1
Recording	Specifies whether or not to use the video capture function. Setting value: Enable / None	*1
Operation Setting	Specifies whether or not to use operation settings. Setting value: Enable / None	*1
Parameter	Specifies whether or not to use parameters. Setting value: Enable / None	*1, *2
Touch Action	Specifies whether or not to use the touch action function. Setting value: Enable / None	*1

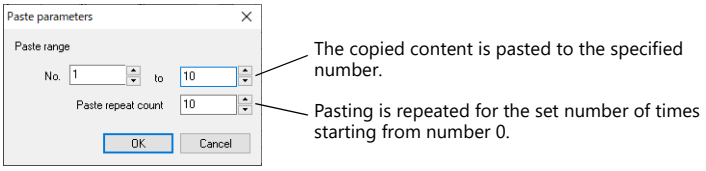
*1 Only specifies whether the function is used or not. Check and configure other detailed settings using V-SFT.
*2 Importing is possible only when the destination alarm is set to use parameters and "Enable" is specified.

*3 Copying and pasting parameters

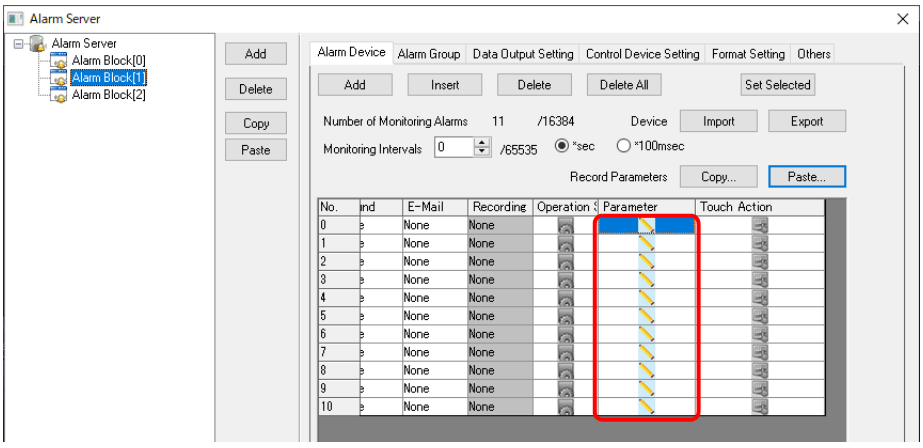
1) Click the [Copy] button. The [Copy parameters] menu is displayed.
Set the copy range and click [OK].



2) Click the [Paste] button. The [Paste parameters] menu is displayed.
Set the paste range and click [OK].

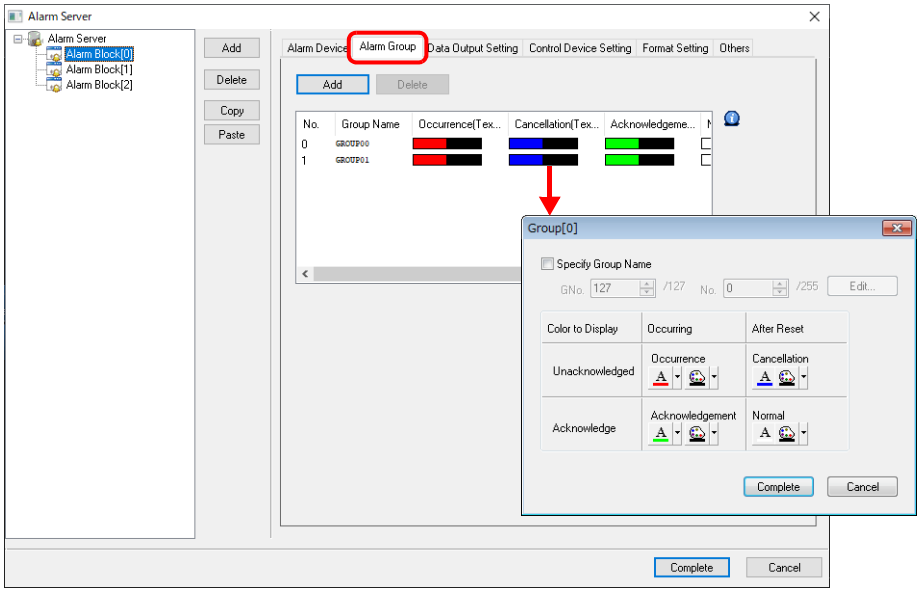


3) The parameters are copied.



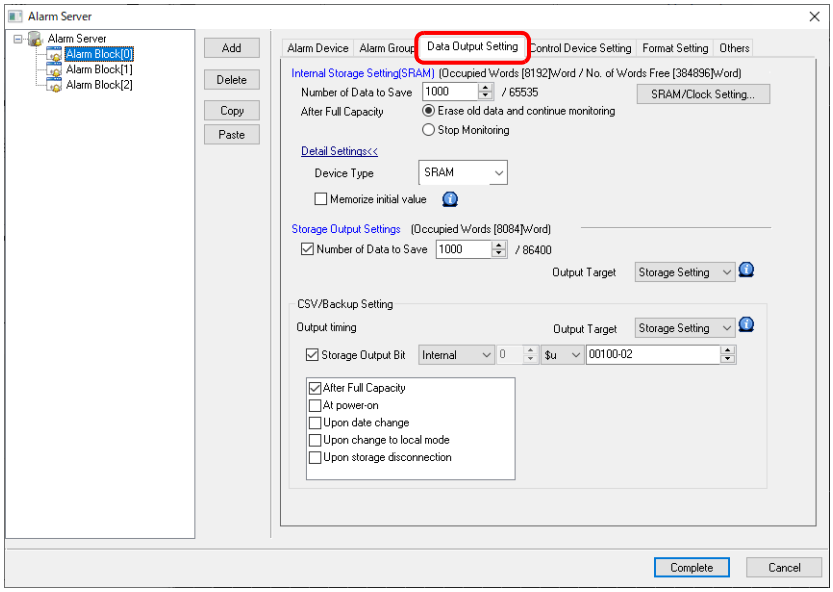
Alarm Group

Set the color of alarm messages. Because up to 16 groups can be created, the color can be changed according to the severity of alarms.



Item		Description
Alarm Group		Create groups with the [Add] button. 0 - 15
	Add	Add a group.
	Delete	Delete a group. There must be at least one group at all times. If all groups are deleted by the [Delete] or [Delete All] button, a new group is automatically created as No. 0.
Group settings		Set the name and color of each group.
	Specify Group Name	Unselected GROUPxx (xx: 00 to 15) is set automatically. Selected GNo. / No. Register the group name in the message editor. Display the [Message Edit] window by clicking the [Edit] button.
	Color to Display	Set the text color and background color of each alarm state. Occurrence: Alarm occurring, unacknowledged Cancellation: Alarm reset, unacknowledged Acknowledgment: Alarm occurring, acknowledged Normal: Alarm reset, acknowledged
Display Language		When specifying a group name on a multi-language screen, group titles can be displayed according to the display language.

Data Output Setting



Item			Description
Internal Storage Setting			Configure the settings for history stored in SRAM.
	Number of Data to Save		Set the number of alarms to save. 1 - 65535 Occurrence, cancellation, and acknowledgment each count as one alarm entry.
	After Full Capacity		Set the operation to perform when the value of [Number of Data to Save] is exceeded. Erase old data and continue monitoring Stop Monitoring
	SRAM/Clock Setting		Display the [SRAM/Clock Setting] window. The amount of free space and total used space in SRAM can be checked.
	Detail Settings	Device Type	Set the save destination. SRAM: History is retained even when power is turned OFF or when switched to Local mode. DRAM: All history is cleared when power is turned OFF or the screen is changed to local mode.
		Memorize initial value	In the state where an alarm is occurring, set the operation to perform when power to the unit is turned ON or when switched from Local mode to RUN mode. Selected The error occurrence is not logged again because the latest state of the bit is recorded. If the alarm is reset when power to the unit is turned OFF or while Local mode is displayed, the time that the X1 series unit switches to RUN mode is saved as the reset time. Unselected The error occurrence is logged again. The time that RUN mode starts is saved as the time of occurrence. The reset time of any alarms that were occurring is displayed as "-----".
		Specify the number of real-time alarms to display	Real time display Set the number of errors to display when multiple errors occur at the same time. Example: When the maximum display number is set to 50 If error number 51 occurs, only 50 error messages are displayed.
Storage Output Settings			Output data saved in the internal storage settings to storage. Output timing • When the internal storage settings become full • When the mode is switched from RUN to STOP • When the [Storage Disconnection] switch is pressed • At power-on (only when SRAM is selected) • When a reset is performed (reset switch/reset bit ON) • When the SAMPLE macro (V8 compatible) is executed
	Number of Data to Save		Set the amount of data to save to a storage folder. Occurrence, reset, and acknowledgement are each counted as a single data entry. If this setting is not configured, a BIN file is not created in the ALARM folder. SRAM history data is output to the backup folder.

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Output Target</td><td>Set the output destination for the ALARMxx.BIN/EVENTxx.BIN files.
<table>
<tr><th>Output Target</th><th>Details</th></tr>
<tr><td>Storage Setting</td><td>*2</td></tr>
<tr><td>C: sd Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\sd
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>D: usb Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\usb
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *3</td><td>External USB storage (Drive name):\X1_Storage</td></tr>
</table>
BIN file output destination: (output destination)\(access folder)\ALARM folder
Filename (xx: block No.):
Alarm history: ALARMxx.BIN (ALARMxx.BIN-journal *1)
Event history: EVENTxx.BIN (EVENTxx.BIN-journal *1)

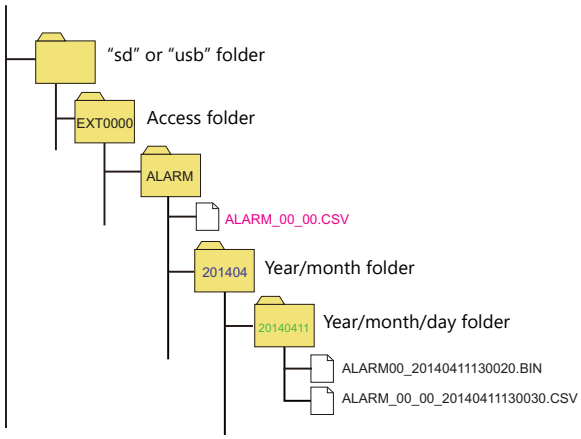
</td></tr>
<tr><td colspan="2">CSV/Backup Setting</td><td>Output a CSV file and backup file (BIN/CSV) to storage.*4</td></tr>
<tr><td></td><td>Output Target</td><td>Select the output destination.
<table>
<tr><th>Output Target</th><th>Details</th></tr>
<tr><td>Storage Setting</td><td>*2</td></tr>
<tr><td>C: sd Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\sd
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>D: usb Folder
(internal storage)</td><td>C:\MONITOUCH\X1\0\work\strage\usb
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *3</td><td>External USB storage (Drive name):\X1_Storage</td></tr>
</table>
<CSV file output>
(output destination)\(access folder)\ALARM

CSV filename: ALARM_00_00.CSV (default)
Set at [Format Setting] → [CSV Format Setting] → [File Name].

<Backup file output>
(output destination)\(access folder)\ALARM\(year month folder)\(year month day folder)

BIN filename (xx: block No.)
Alarm history: ALARMxx_yyyymmddhhmmss.BIN
Event history: EVENTxx_yyyymmddhhmmss.BIN

CSV filename: ALARM_00_00_yyyymmddhhmmss.CSV (default)
Set at [Format Setting] → [CSV Format Setting] → [File Name].

Example: For “sd” folder on C: drive or “usb” folder on D: drive
C:\MONITOUCH\X1\0\work\strage

</td></tr>
</table>

Item		Description
	Output timing	Set the output timing. Storage Output Bit: Output when the relevant bit turns ON. After Full Capacity At power-on Upon date change Upon change to local mode Upon storage disconnection *5

*1 Temporary file created during data update. This file is created temporarily only when the [System Setting] → [Unit Setting] → [General Setting] → [Output alarm data in binary format] checkbox is unselected.

*2 Match with the setting of [System Setting] → [Storage Setting] → [Storage folder].

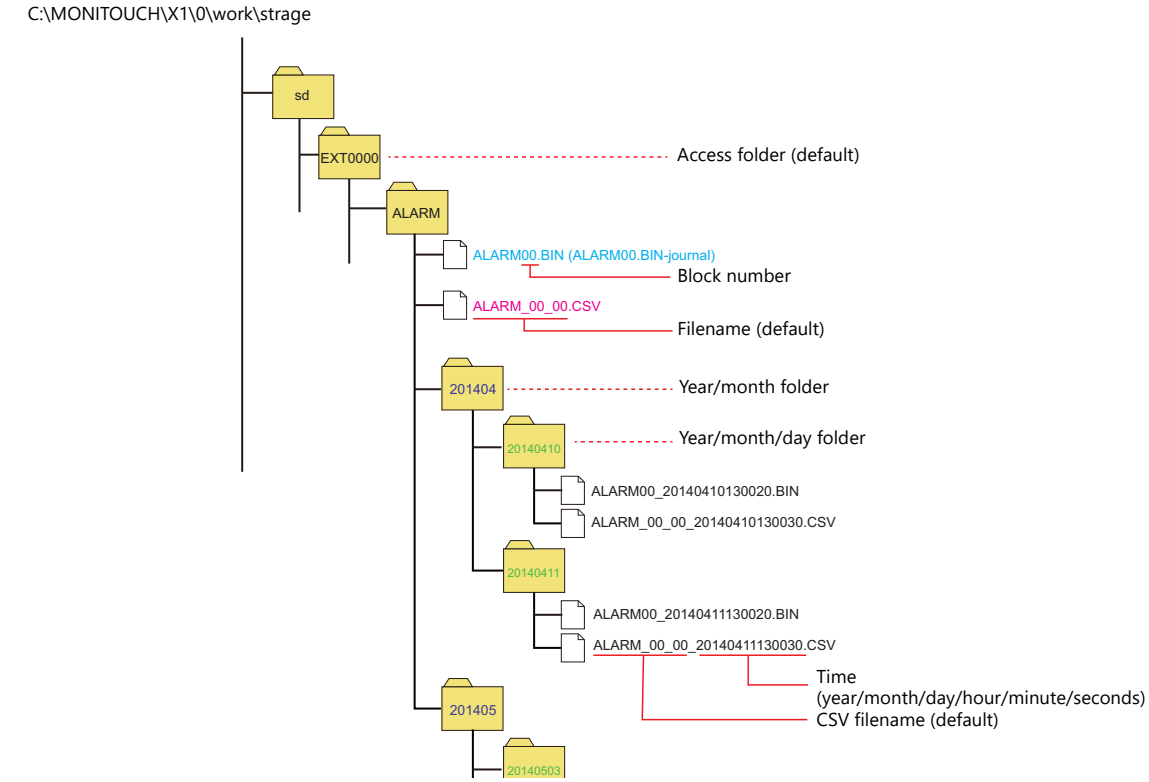
*3 Available when the [System Setting] → [Other] → [Storage Setting] → [External USB storage] checkbox is selected. In this case, selection of the "usb Folder" option is disabled.

*4 If you do not want to create a backup folder, select the [Do not output backup files] checkbox on the [Others] tab window.

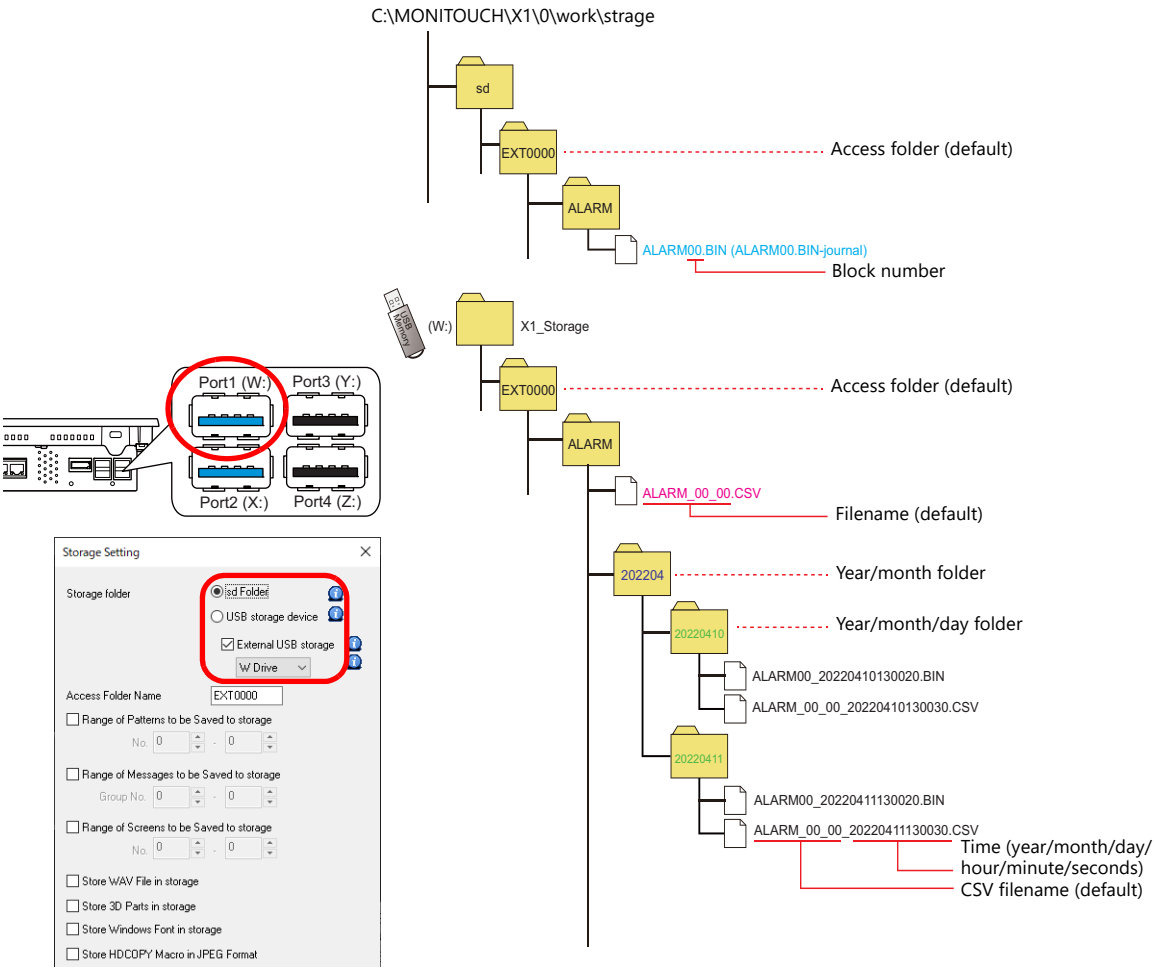
*5 Refers to the operation of a switch for which [Function] is set to [Storage Disconnection].

Example of storage output

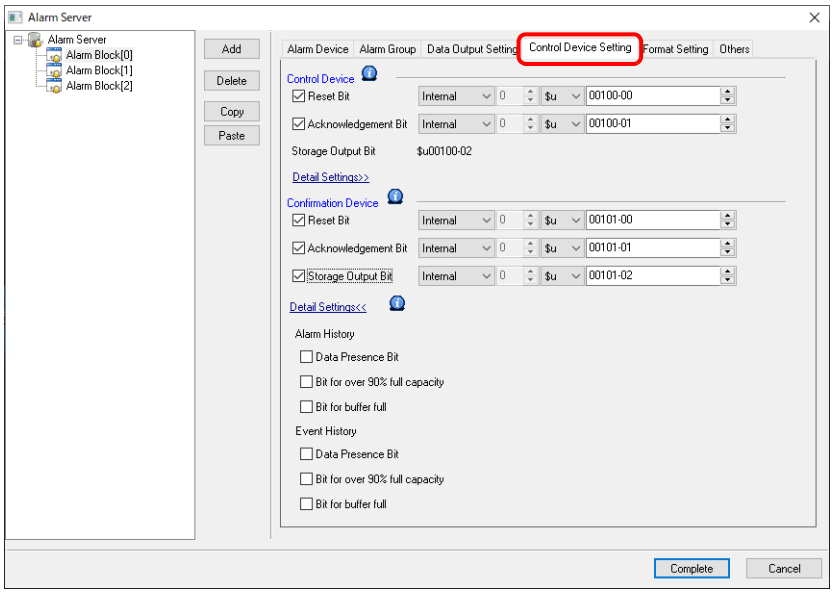
1. Alarm block number 0, alarm history, output destination (“sd” folder), CSV/backup file output destination (“sd” folder)



2. Alarm block number 0, alarm history, output destination (“sd” folder), CSV/backup file output destination (W: USB storage device)

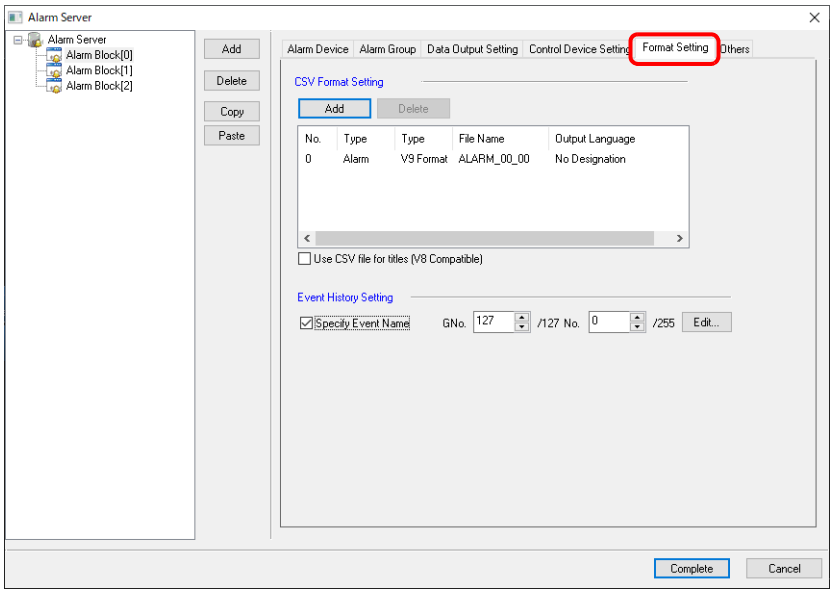


Control Device Setting



Item		Description
Control Device		Execute resets and storage output using a control device memory.
	Reset Bit	Bit OFF → ON: Clears the history data. While bit is ON, saving of history is halted.
	Acknowledgment Bit	Bit OFF → ON: Sets an unacknowledged alarm as acknowledged. When multiple X1 series units are connected to a single PLC, using this acknowledgment bit allows the acknowledged state to be updated to all X1 series units.
	Storage Output Bit	Bit OFF → ON: Outputs history data to CSV file. The bit device memory setting is configured on the [Data Output Setting] tab window.
	Monitoring Bit	Control the start and end of history saving. Bit OFF → ON: Starts monitoring. History is saved when the alarm bit turns ON. Bit ON → OFF: Stops monitoring. History is not saved even if the alarm bit turns ON. If this bit is not used, history is saved when the alarm bit turns ON/OFF.
	Normal Operation Bit	This bit controls the alarm history. While the alarm bit is OFF, this bit is ON. As soon as the alarm bit turns ON, this bit turns OFF. The first error bit that is turned ON while this bit is OFF is recognized as the "primary cause" error, and can be distinguished from the other errors.
Confirmation Device		Output the execution result of the control device memory and other information.
	Reset Bit	When the reset bit of the control device memory is ON and reset is completed, this bit turns ON.
	Acknowledgment Bit	When the acknowledgment bit of the control device memory changes to 1, this bit turns ON.
	Storage Output Bit	When the storage output bit of the control device memory changes to 1, this bit turns ON.
	Alarm History	This bit turns ON according to the amount of alarm history save data. Data Presence Bit: Turns ON when history data exists. Bit for over 90% full capacity: Turns ON when history data takes up 90% of the storage capacity. Bit for buffer full: Turns ON when the storage folder is full.
	Event History	This bit turns ON according to the amount of event history save data. Data Presence Bit: Turns ON when history data exists. Bit for over 90% full capacity: Turns ON when history data takes up 90% of the storage capacity. Bit for buffer full: Turns ON when the storage folder is full.

Format Setting

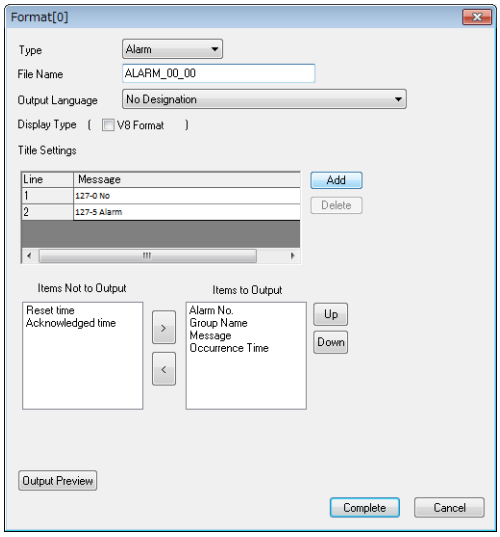


Item		Description
CSV Format Setting		These settings are for saving alarm and event history to CSV files. Multiple CSV formats can be registered using the [Add] button.
	Use CSV file for titles (V8 Compatible) *1	Add title lines using SMHxxxx.csv (xxxx: 0000 to 0011). Place any CSV files into the "ALARM" folder in a storage folder in advance. The CSV format is only valid for No. 0 (V8 format).
Event History Setting	Specify Event Name	Set the message to use for the status display area of the event history part. Display the [Message Edit] window by clicking the [Edit] button. GNo. No.

*1 While there are no restrictions on the number of rows and columns in the SMHxxxx.csv files, the maximum file size is 239 kbytes.
If there is a mistake in the settings or a SMHxxxx.csv file cannot be read, the alarm block number is added to the title line.

CSV format setting

- X1 format

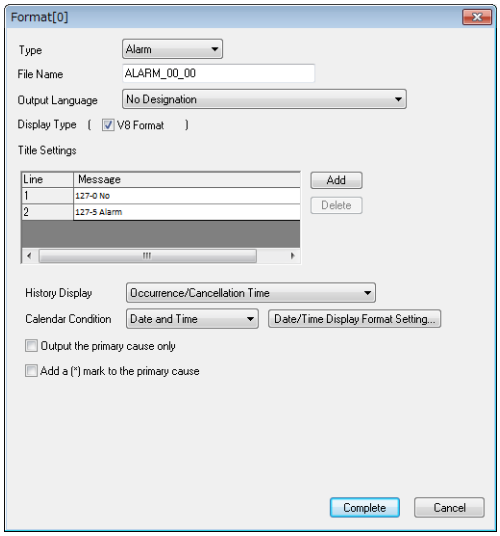


Item	Description
Type	Select the alarm type. Alarm/Event
File Name	Set the name of the CSV file. 1 to 64 one-byte alphanumeric characters Default ALARM_xx_aa.CSV (xx: block number, aa: format number)
Output Language	Set the language used in the CSV file. No Designation: Output the CSV file using the language displayed on the unit. Language 1 to 16

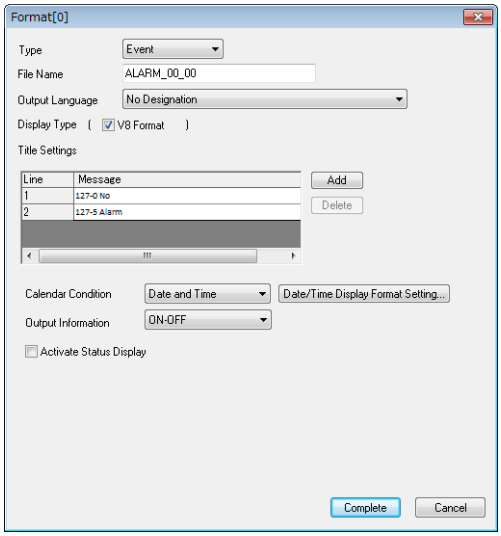
Item		Description
Display Type		Set the items and format for CSV file output. V8 Format: Select this checkbox to output the CSV file in the same format as the V8 series.
Title Setting		Add a title to each item. Click [Add] to register up to 10 lines. Double-click a cell under [Message] and register text in the [Message Edit] window. (GNo., No. designation)
Items Not to Output Items to Output > <		Use the [>] and [<] switches to select the items for CSV file output. Items Not to Output: Not output to CSV file Items to Output: Output to CSV file
	Items to Output Up Down	Set the display order in the CSV file using the [Up] and [Down] buttons. Items are displayed in left to right order in the CSV file.
	Calendar Condition	Set the output condition of the selected items. Date Only/Time Only/Date and Time Date/Time Display Format Setting Set the date and time display format. Refer to page 8-31.
Output Preview		Check a preview of the CSV file output.

- V8 format
  Select when saving CSV files in the same format as the V8 series.

Alarm



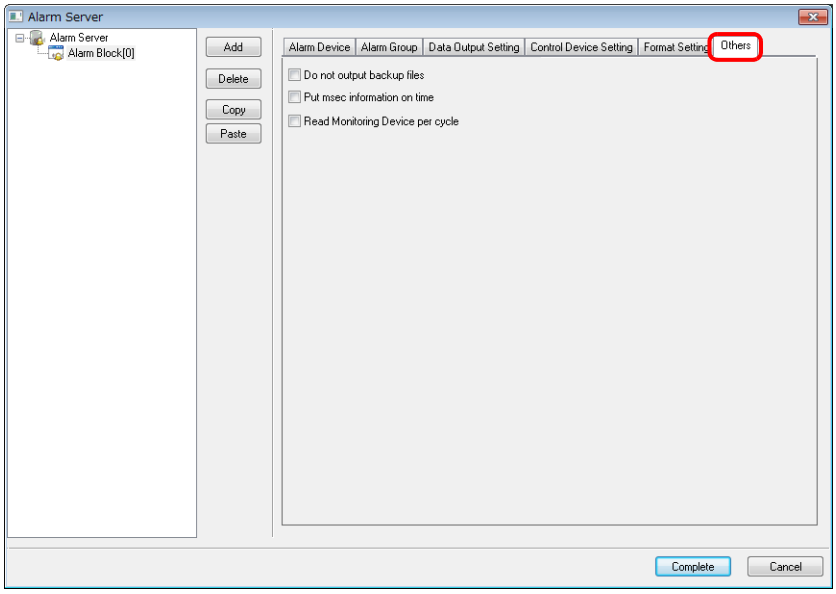
Event



Item	Description
Type	Select the alarm type. Alarm: V8 alarm display format Event: V8 bit sampling format
File Name	Set the name of the CSV file. 1 to 64 one-byte alphanumeric characters Default ALARM_xx_aa.CSV (xx: block number, aa: format number)
Output Language	Set the language used in the CSV file. No Designation: Output the CSV file using the language displayed on the unit. Language 1 to 16
Display Type (V8 Format)	Set the items and format for CSV file output. V8 Format: Select this checkbox to output the CSV file in the same format as the V8 series.
Title Setting	Add a title to each item. Click [Add] to register up to 10 lines. Double-click a cell under [Message] and register text in the [Message Edit] window. (GNo., No. designation)
History Display	Select the history data for CSV file output. [Time of Occurrence]/[Occurrence/Cancellation Time]/[Occurrence/Confirmation Time]/ [Occurrence/Cancellation/Confirmation Time]/[Time Lag Display]/ [Total Frequency of Occurrence Display]/[Total Time of Occurrence Display]/ [Time of Occurrence Display]
Calendar Condition	Set the output condition of items shown in [History Display]. Date Only/Time Only/Date and Time Date/Time Display Format Setting Set the date and time display format. Refer to page 8-31.
Display the primary cause only	Only output history data of primary causes to the CSV file.

Item	Description
Add a (*) mark to the primary cause	Add an asterisk (*) to the left of the primary cause error.
Output Information	Select the status for output to the CSV file. ON-OFF: Output occurrence/cancellation history. ON: Output occurrence history. OFF: Output cancellation history. ON-OFF-CHK: Output occurrence/cancellation/acknowledgment history.
Activate Status Display	Select the status of output information. Display ON/OFF/CHK: Output the bit status as ON/OFF/CHK. Specify Message No.: Output the bit status using a message.

Others



Item	Description
Do not output backup files	No backup folder or file is created. Unselected Create a backup folder. Selected Do not create a backup folder. The files ALARMxx.BIN/EVENTxx.BIN *1 and ALARM_xx_aa.CSV *2 are created in the ALARM folder.
Put msec information on time *3 *4	When using an alarm part with [Display Mode] set to [Event History], display the date and time down to milliseconds. Select the [Event History] checkbox in the [Alarm Server] settings window and place a numerical display part with [Function] set to [Alarm Time Display]. * The time displayed within an alarm part and the time output to a CSV file is in seconds.
Read Monitoring Device per cycle	Selected Read the alarm device memory according to the communication cycle. Unselected Read the alarm device memory according to [Monitoring Intervals].

*1 If the setting at [Alarm Server] → [Data Output Setting] → [Storage Output Settings] → [Number of Data to Save] is not configured, ALARMxx.BIN/EVENTxx.BIN files are not created. A CSV file is created from the data saved in the internal storage settings.

*2 The filename can be changed via [Format Setting] → [File Name].

*3 SRAM requires formatting because the SRAM usage changes. After changing this setting, any history data recorded prior to the change cannot be displayed.

*4 The display content differs depending on the number of displayable digits of the numerical display part.

Less than 8 digits	No display
8 to 11 digits	Hour, minutes, and seconds
12 to 13 digits	Hour, minutes, seconds, and milliseconds
14 to 17 digits	Month, day, hour, minutes, and seconds

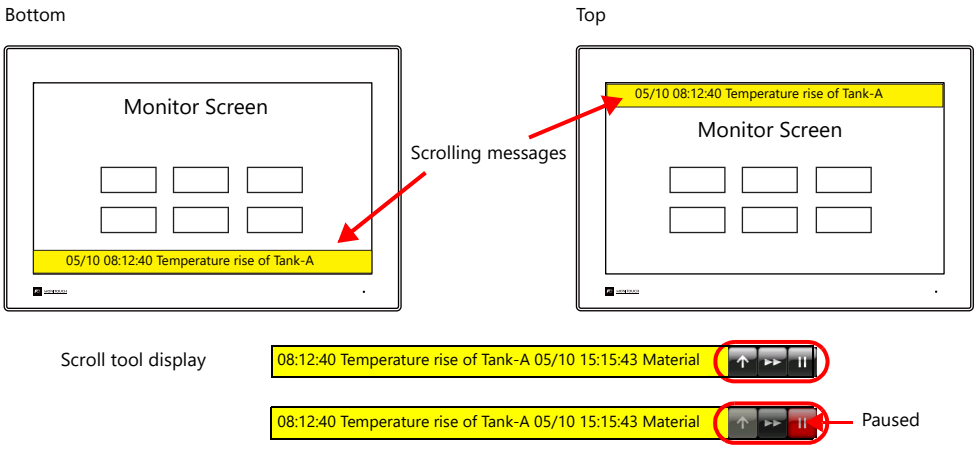
18 digits	Month, day, hour, minutes, seconds, and milliseconds
19 to 22 digits	Year, month, day, hour, minutes, and seconds
23 digits or more	Year, month, day, hour, minutes, seconds, and milliseconds

8.2.3 Action When Alarms Occur

In addition to saving history to an alarm server when an alarm occurs, other actions such as displaying a scrolling message or sending e-mails can be added. This section describes the required settings for each action.

Scrolling Messages

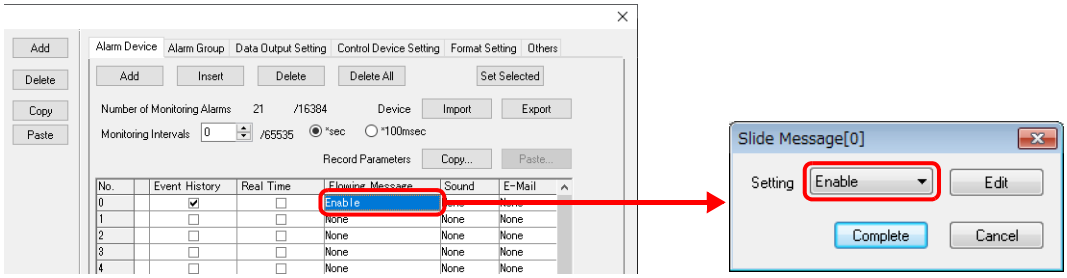
An alarm message is automatically displayed at the bottom (or top) of the screen. It is displayed continually until the error is reset even if the screen is changed over. Once all messages have been scrolled through, the first message is displayed.



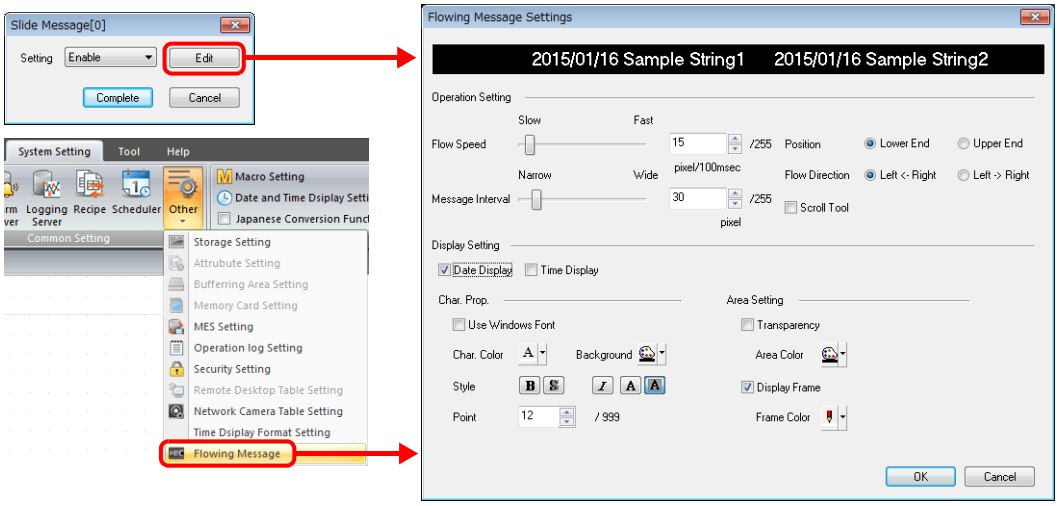
* If two or more lines are set for [Alarm Device] → [Message Lines], the multiple lines are merged into one line for display in the scrolling message.
However, note that only the first line is displayed when the MONITOUCH system version is 1.360 or earlier and when Windows fonts are used.

Settings

- Alarm block settings
  Select [Enable] for [Alarm Block] → [Alarm Device] → [Slide Message] → [Setting].



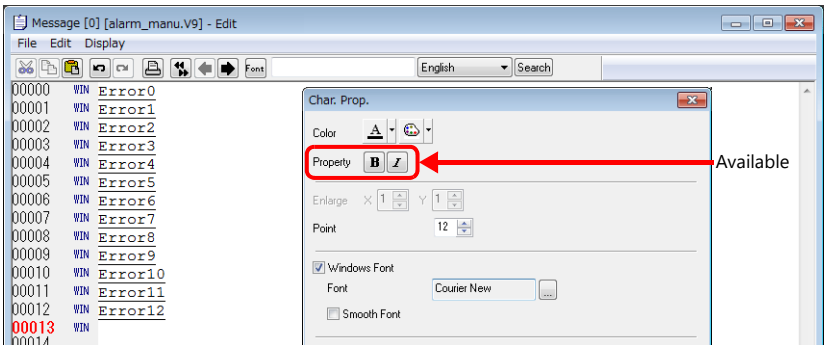
- Flowing (scrolling) message settings
  Click the [Edit] button or [System Setting] → [Other] → [Flowing Message].
  Configure the following settings.



Item		Description
Operation Setting	Flow Speed	Set the message speed. 1 - 255 pixel/100ms
	Message Interval	Set the interval between multiple scrolling messages.
	Position	Set the display position of messages. Lower End / Upper End * Scrolling messages can be moved between the top/bottom of the screen in RUN mode by using the "scroll tool".
	Flow Direction	Set the direction of message scrolling. Left ← Right / Left → Right
	Scroll Tool	Display the scroll tool when the message area is tapped. The scroll tool can be used to change the display position and speed. Moves the display position. Scrolling occurs at double speed while the switch is pressed. Stop scrolling. Tap a stopped message to manually scroll left or right.
Display Setting	Date Display	Display the date of alarm occurrence. *1
	Time Display	Display the time of alarm occurrence. *1
Char. Prop.	Use Windows Font	Displays with the [Windows Font] setting set in the [Char. Prop.] window accessible in the [Message Edit] window. *2
	Char. Color Background Style Point	Set the text color, background color, style, and point size of scrolling messages.
Area Setting	Transparency Area Color	Set the area color. The area can be made transparent.
	Display Frame Frame Color	Add a frame to the area. The frame color can also be set.

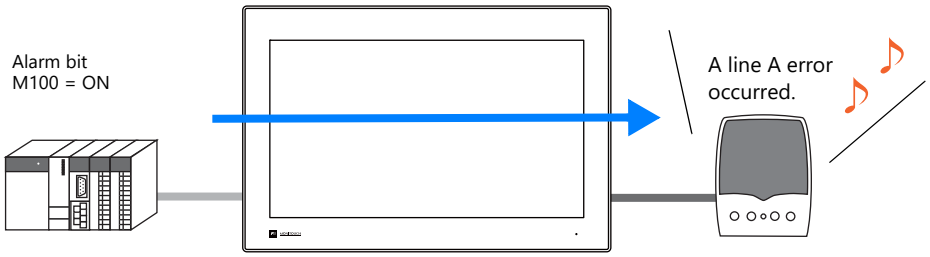
*1 The time of scrolling messages is referenced from the internal clock of the X1 series unit and not the history time on the alarm server. If power to the X1 series unit is turned off and on again or the screen is switched to Local mode while a scrolling message is displayed, the time is updated to when switched to RUN mode.

*2 Only [Windows Font] properties in the [Char. Prop.] window accessible from the [Message Edit] window are available. The other [Color]/[Point] settings are unavailable.



Playing Sounds

Play back an audio file. Audio can be played back continuously while an alarm is occurring.

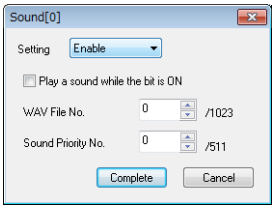


Supported models

Connection Port	Other
Audio output connector	Connection to both an amplifier and external speaker is required.

Settings

- Double-click [Alarm Block] → [Alarm Device] → [Sound].
  Configure the following settings.



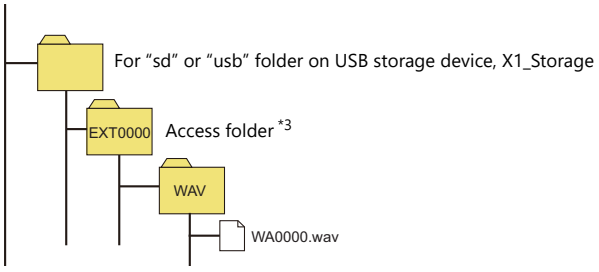
Item	Description
Setting	Enabled
Play a sound while the bit is ON	Continuously play back the audio file.
WAV File No.	Set the WAV file number from number 0000 to 1023. The names of audio files that can be played are formatted as "WAxxxx.wav" (xxxx: 0000 to 1023). For details on file formats, refer to "2 Sound" in the X1 Series Reference Manual 2.
Sound Priority No. *1	Set the priority of the WAV file.

*1 Audio priority
When multiple errors occur, the WAV file with the highest priority is played.
If multiple errors with the same priority occur, the audio file of the last error to occur is played.

Storage destination of audio files

Audio files need to be stored in the "WAV" folder located in storage.

Storage *1		File Directory *2
Internal storage	sd Folder	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\WAV
	usb Folder	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\WAV
External USB storage	USB storage device	(Drive name):\X1_Storage\(access folder)\WAV

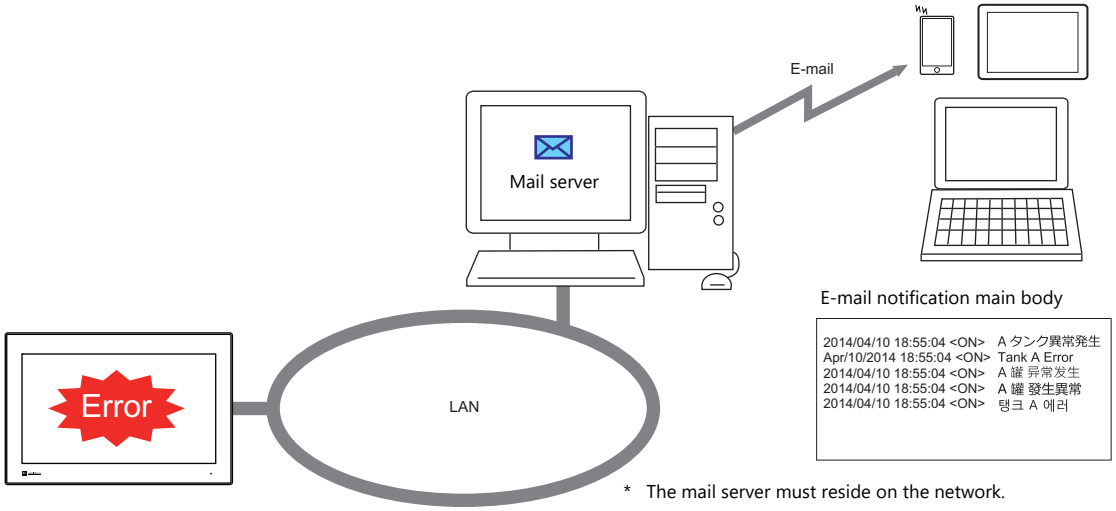


*1 Selected at [System Setting] → [Other] → [Storage Setting] → [Storage folder].
*2 Access by the sub app of the multi-display function is not supported.
*3 Specified at [System Setting] → [Other] → [Storage Setting] → [Access Folder Name].

☞ For details on the audio output function, refer to "2 Sound" in the X1 Series Reference Manual 2.

E-mail Notification

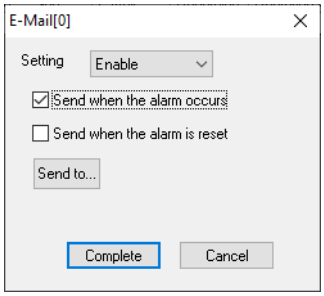
Send an e-mail when an error occurs. When using a multi-language screen program, e-mails are sent in all languages.

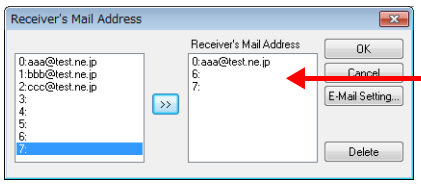


* The mail server must reside on the network.

Settings

- Double-click [Alarm Block] → [Alarm Device] → [E-Mail].
  Configure the following settings.



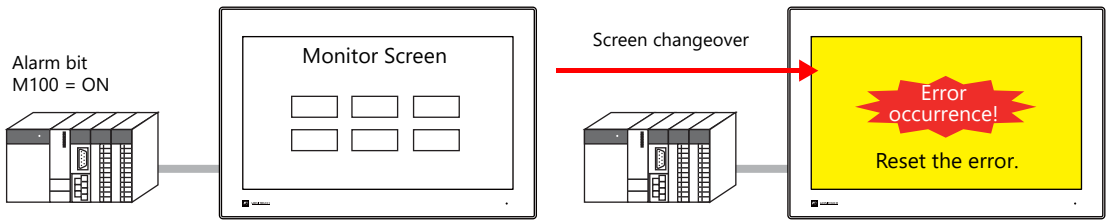
Item	Description
Setting	Enabled
Send when the alarm occurs	Send an e-mail notification when an error occurs.
Send when the alarm is reset	Send an e-mail notification when the system recovers from an error.
Send to	Select the recipient mail addresses.  Dummy settings * When creating screens and the recipients of e-mail notification is yet to be determined, dummy recipients from numbers 0 to 8 can be used instead. The actual recipient addresses can be registered later on the X1 series unit in the [E-Mail Setting] in Local mode.

- E-mail settings
  Configure the mail server settings. There are two ways to configure mail server settings: using the V-SFT editor or on the X1 series unit.

☞ Refer to "6.8 E-mail Notification" in the X1 Series Reference Manual 2.

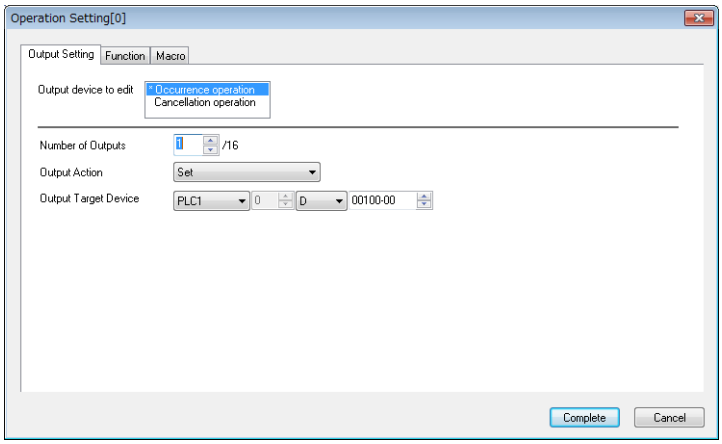
Operation Setting

Double-click [Alarm Block] → [Alarm Device] → [Operation Setting].
Perform operations including writing to the specified device memory address (output setting), screen changeover / overlap control (function), and macro execution (macro).



Output setting

Turn the output device ON or OFF or write data when an alarm occurs or is canceled.

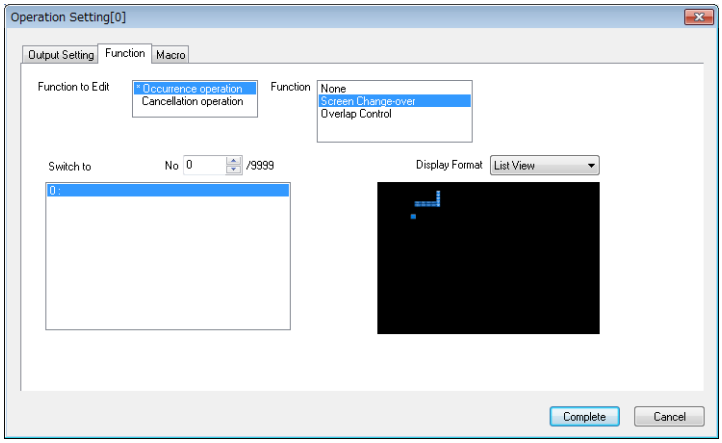


Item		Description
Output device to edit	Occurrence operation	Set the output operation to perform when an alarm occurs.
	Cancellation operation	Set the output operation to perform when an alarm is canceled.
Number of Outputs	0	No output operation
	1 - 16	Output operation performed Set the required items according to the output operation.

Output Action	Output Target Device	Inversion Time	Data Length Write Value
Set Reset Alternate	Output bit	-	-
Momentary (ON) Momentary (OFF)		100 ms - 3 s Bit returns to original value after inversion time elapses.	-
Writing in Words	Output device	-	1-Word/2-Word Value to write

Function

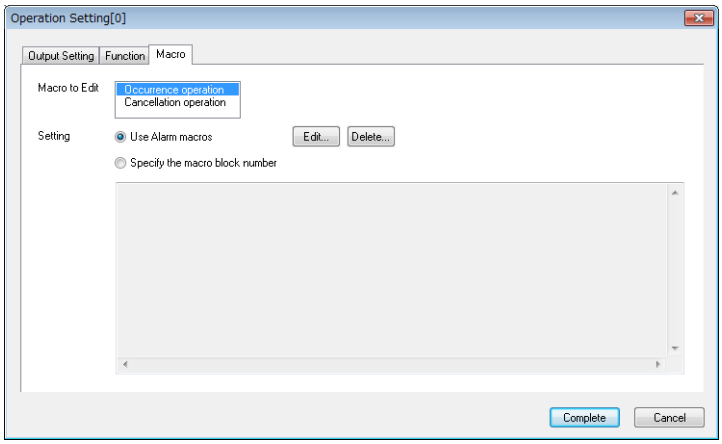
Perform screen changeover / overlap control when an alarm occurs or is canceled.



Item		Description
Function to Edit	Occurrence operation	Set the function used when an alarm occurs.
	Cancellation operation	Set the function used when an alarm is canceled.
Function	None	No function
	Screen Changeover	Perform screen changeover automatically. Set [Switch to] and [List View] or [Thumbnail].
	Overlap Control	Display a global overlap. Set [Global Overlap ID] and [Overlap Library No.].

Macro

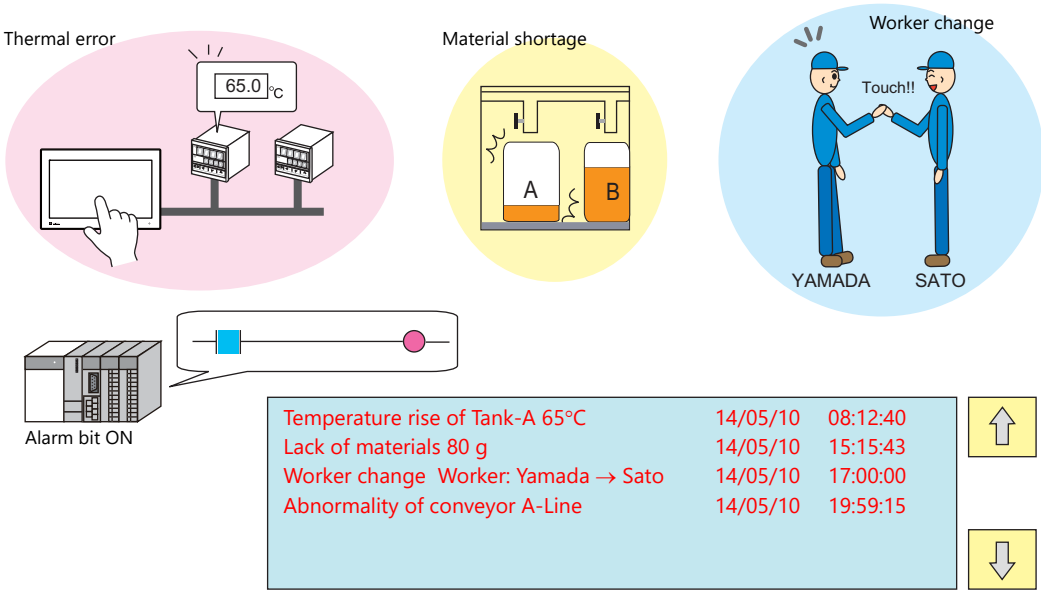
Execute a macro when an error occurs or is canceled.



Item		Description
Macro to Edit	Occurrence operation	Set the macro to execute when an alarm occurs.
	Cancellation operation	Set the macro to execute when an alarm is canceled.
Setting	Use Alarm macros	Register a macro via the [Edit] button.
	Specify the macro block number	Specify the macro block number.

Parameters

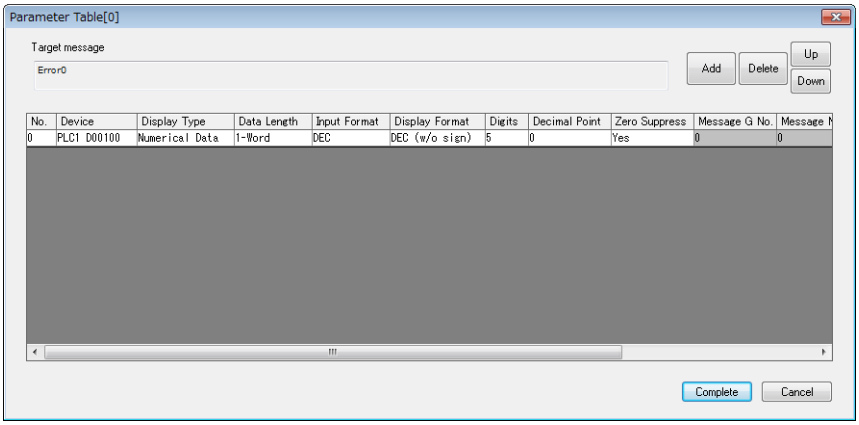
When an alarm occurs, the data (parameters) associated with the alarm can be saved/displayed together with an alarm message. Logging the history of such alarm-relevant parameters will make it easier to locate and investigate the causes of alarms.



Settings

- Double-click [Alarm Block] → [Alarm Device] → [Parameter].
  Configure the following settings.

  Parameter table

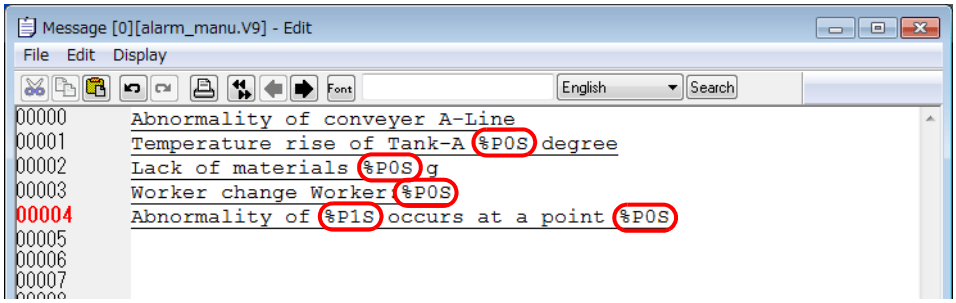


Item		Description
Parameter table number 0 to 31		Create parameters with the [Add] button. Up to 32 parameters can be registered per alarm device memory address.
	Add	Add a new parameter.
	Delete	Delete the selected parameter.
	Up/Down	Change the order of parameters.
Device		Set the parameter device memory address.

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Display Type</td><td>Set the display type of the parameter and other related items.</td></tr>
<tr><td></td><td>Numerical Data</td><td>Save/display the data value of the device memory. The following settings are required.
<table>
<tr><th>Item</th><th>Setting Value</th></tr>
<tr><td>Data Length</td><td>1-Word/2-Word</td></tr>
<tr><td>Input Format</td><td>DEC/BCD/FLOAT</td></tr>
<tr><td>Display Format</td><td>DEC (w/o sign)/DEC (with sign –)
DEC (with sign +–)/HEX/OCT/ BIN (binary)</td></tr>
<tr><td>Digits</td><td>1 - 32</td></tr>
<tr><td>Decimal Point</td><td>0 - 31</td></tr>
<tr><td>Zero Suppress</td><td>Yes/None</td></tr>
<tr><td>Char. Place</td><td>Flush Right/Flush Left</td></tr>
</table></td></tr>
<tr><td></td><td>Text</td><td>Save/display text set at the device memory address. The following settings are required.
<table>
<tr><th>Item</th><th>Setting Value</th></tr>
<tr><td>Data Length</td><td>1-Word/2-Word</td></tr>
<tr><td>Characters</td><td>1 - 127</td></tr>
<tr><td>Text Process</td><td>LSB → MSB / MSB → LSB</td></tr>
</table></td></tr>
<tr><td></td><td>Message No.</td><td>Specify a message number (absolute address) for the device memory address and save/display the corresponding message.
The following settings are required.
<table>
<tr><th>Item</th><th>Setting Value</th></tr>
<tr><td>Data Length</td><td>1-Word/2-Word</td></tr>
<tr><td>Input Format</td><td>DEC / BCD</td></tr>
</table></td></tr>
<tr><td></td><td>Bit</td><td>In the bit state when an error occurs, save/display the corresponding message.
Bit ON: Save the message of [Message G No.] and [Message No.].
Bit OFF: Save the message of [Message G No.] and [Message No. + 1].
The following settings are required.
<table>
<tr><th>Item</th><th>Setting Value</th></tr>
<tr><td>Message G No.</td><td>0 - 127</td></tr>
<tr><td>Message No.</td><td>0 - 255</td></tr>
</table></td></tr>
</table>

- Editing messages
  Register parameter numbers into alarm messages.

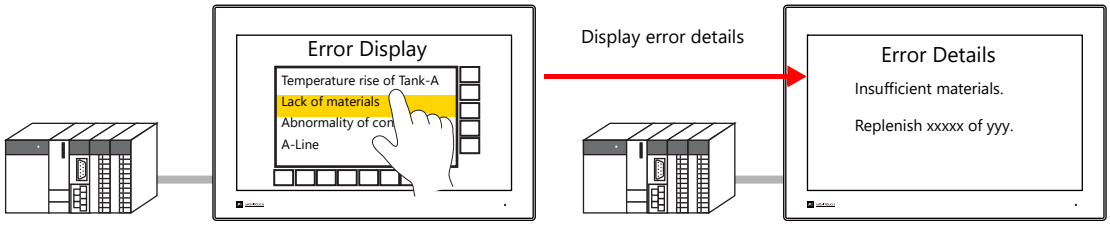
%PxxS
└ 0 - 31
Specify parameter numbers registered in the [Parameter Table] window.



Windows fonts are not supported. If Windows fonts are used, parameter symbols (%PxxS) are displayed instead of the relevant parameter.

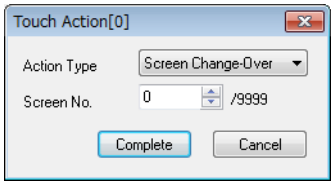
Touch Action

Tap the message on the alarm part to changeover the screen. This displays more detailed alarm information.



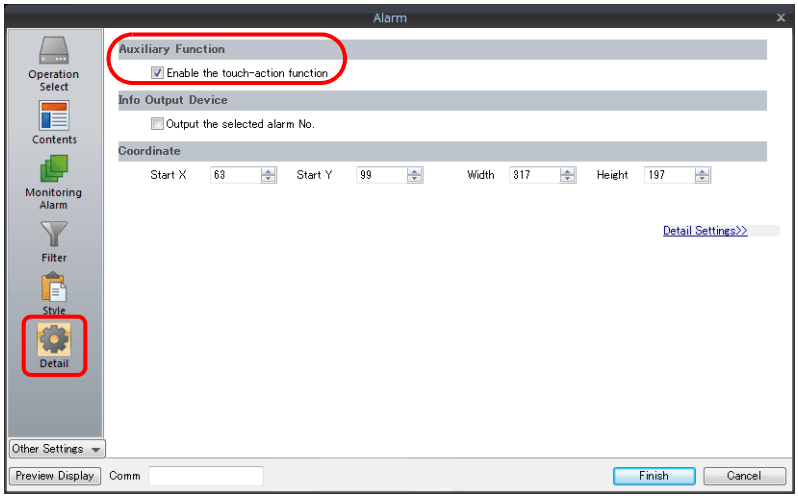
Settings

- Double-click [Alarm Block] → [Alarm Device] → [Touch Action].
  Configure the following settings.



Item	Description
Action Type	Screen changeover
Screen No.	Set a screen number from 0 to 9999.

- Alarm part settings window → [Detail]

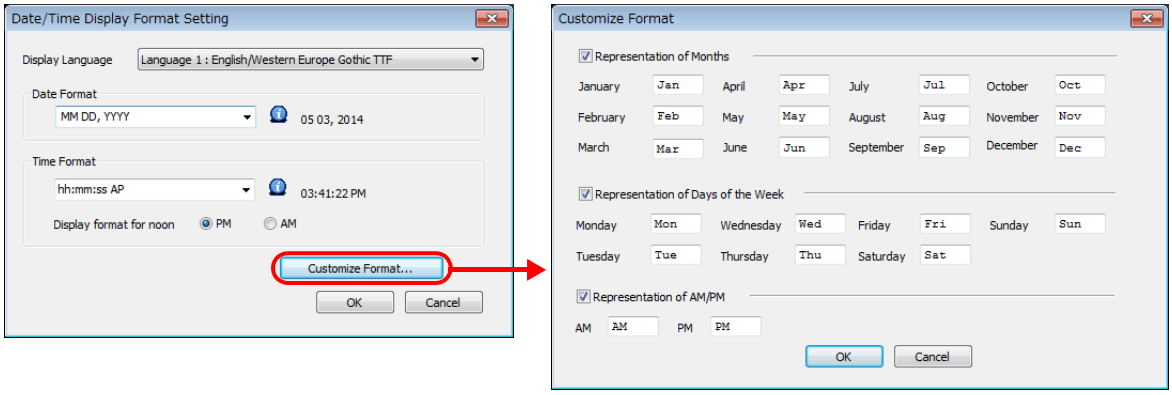


Item		Description
Auxiliary Function	Enable the touch-action function	Unselected: Tapping a message does not changeover the screen. Selected: Tapping a message changes over the screen.

8.3 Date and Time Display Setting

Set the date and time format used by alarm parts, alarm CSV output, scrolling messages, and e-mail.
When using multi-language screens, a format for each language can be set.

Configure settings at [System Setting] → [Setting] → [Date and Time Display Setting].



Item	Description
Display Language	Select a language. Language 1 to 16
Date Format	Set the date format. To use a format other than those provided, enter the format directly.
Time Format	Set the time format. To use a format other than those provided, enter the format directly.
Display format for noon	Set the noon display format. PM: PM12:00 AM: AM12:00
Customize Format	Customize the format of month (MMM), weekday (DDD), and AM/PM.
Representation of Months	Set when using characters instead of numbers for the month display. *1
Representation of Days of the Week	Set when displaying days of the week. *2
Representation of AM/PM	Set when changing the AM/PM display. *3

Year	YYYY	4 digits
	YY	2 digits (00 to 99)
Month	MM	01 - 12
	M	1 - 12
	MMM	Customized format *1
Day	DD	01 - 31
	D	1 - 31
Day of the week	DDD	Customized format *2

Hour	hh	00 - 12
	h	0 - 12
	HH	00 - 23
	H	0 - 23
Minute	mm	00 - 59
	m	0 - 59
Second	ss	00 - 59
	s	0 - 59
AM/PM	AP	AM/PM *3

*1 Default values for month format display (MMM)

Month	English Baltic	Japanese	Simplified Chinese Traditional Chinese	Korean	Central Europe	Cyrillic	Greek	Turkish
Jan	Jan					янв	Ίαν	Oca
Feb	Feb					февр	Φεβρ	Şub
Mar	Mar					март	Μάρτ	Mar
Apr	Apr					апр	Άπρ	Nis
May	May					май	Μάϊος	May
Jun	Jun					июнь	Ίούν	Haz

Month	English Baltic	Japanese	Simplified Chinese Traditional Chinese	Korean	Central Europe	Cyrillic	Greek	Turkish
Jul	Jul					июль	Ἰούλ	Tem
Aug	Aug					авг	Αύγ	Ağu
Sep	Sep					сент	Σεπτ	Eyl
Oct	Oct					окт	Όκτ	Eki
Nov	Nov					ноябрь	Νοέμ	Kas
Dec	Dec					дек	Δεκ	Ara

*2 Default values for days of the week display (DDD)

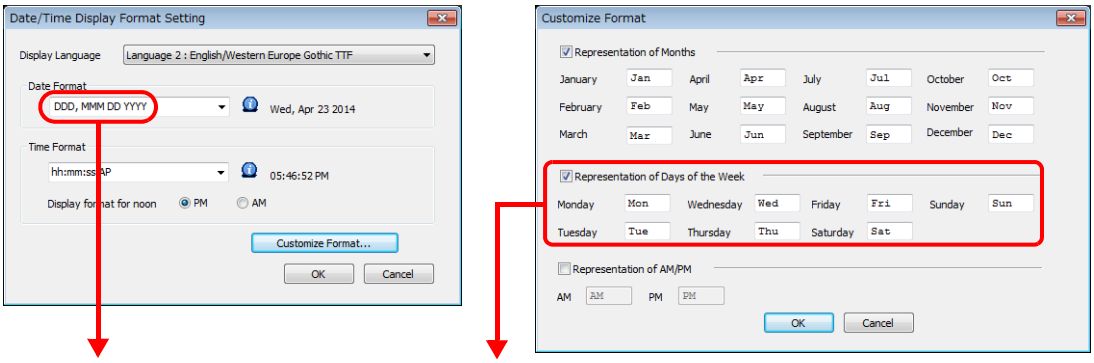
Day of the week	English Baltic	Japanese	Simplified Chinese Traditional Chinese	Korean	Central Europe	Cyrillic	Greek	Turkish
Mon	Mon	月	星期一	월요일	Mon	пн	Δευ	Ptesi
Tue	Tue	火	星期二	화요일	Tue	вт	Τρι	Salı
Wed	Wed	水	星期三	수요일	Wed	ср	Τετ	ar
Thu	Thu	木	星期四	목요일	Thu	чт	Πεμ	Per
Fri	Fri	金	星期五	금요일	Fri	пт	Παρ	Cuma
Saturday	Sat	土	星期六	토요일	Sat	сб	Σαβ	C.tesi
Sunday	Sun	日	星期日	일요일	Sun	вс	Κυρ	Paz

*3 Default values for AM/PM display

AM/PM	English Baltic	Japanese	Simplified Chinese Traditional Chinese	Korean	Central Europe	Cyrillic	Greek	Turkish
AM	AM	午前	上午	오전	AM	AM	am	AM
PM	PM	午後	下午	오후	PM	PM	pm	PM

Setting example

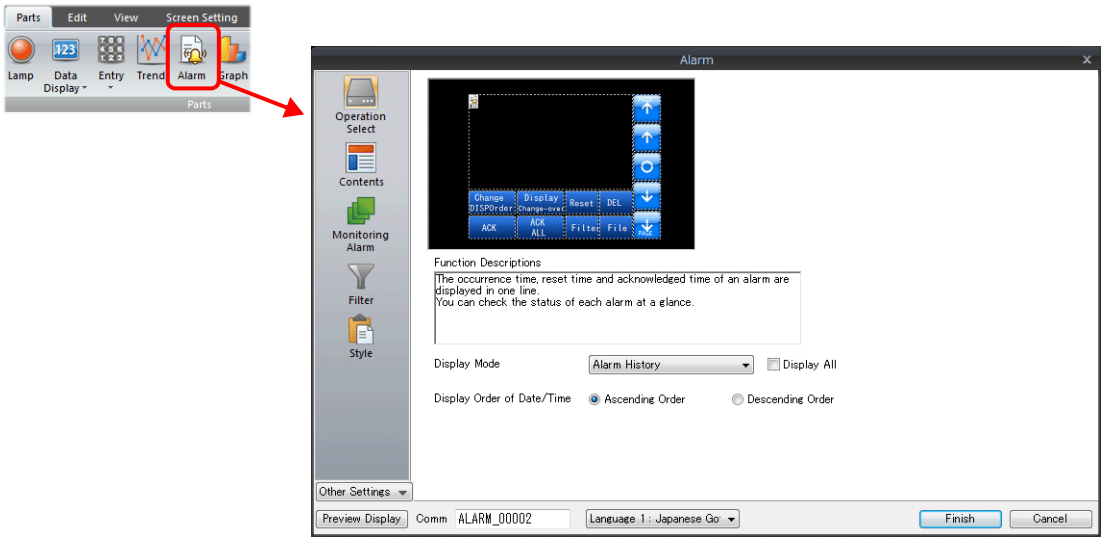
- Date Format



Date Format	Customize Format	Display on MONITOUCH
MMM DD YYYY	[Representation of Months] selected (default)	May 15 2014
DDD, MMM DD YYYY	[Representation of Months] selected (default) [Representation of Days of the Week] selected (default)	Thu, May 15 2014

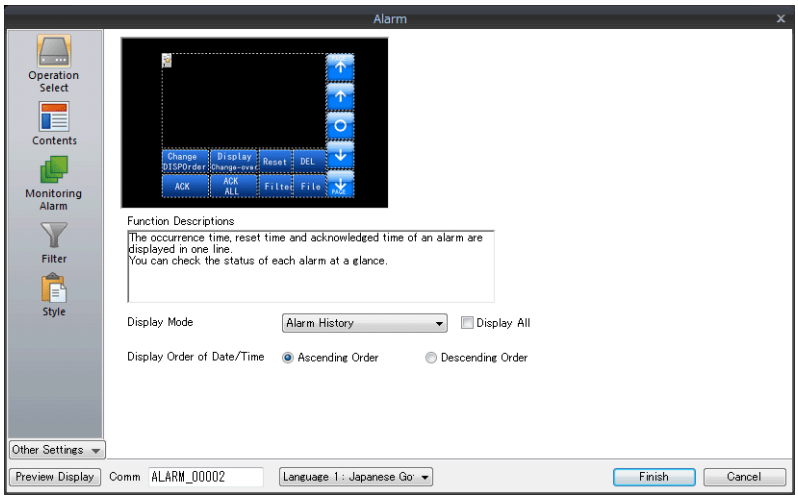
8.4 Alarm Parts

Place an alarm part for checking history saved to an alarm server on MONITOUCH.
An alarm part can be placed by clicking [Parts] → [Alarm].



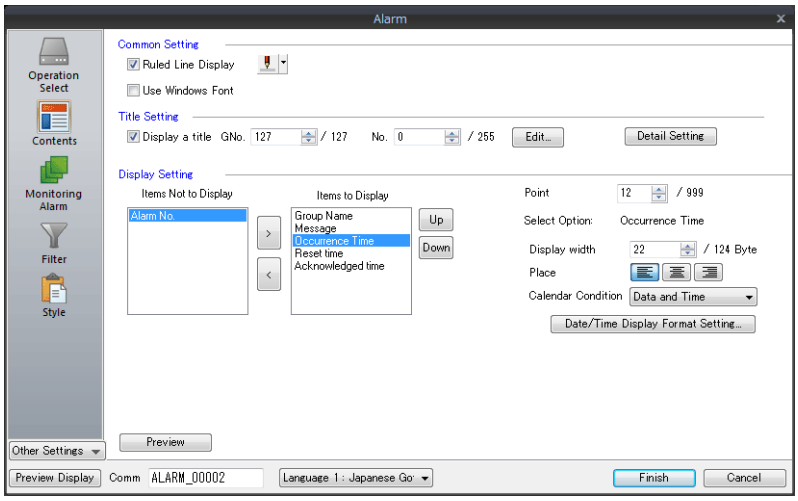
8.4.1 Detailed Settings

Operation Select



Item		Description
Display Mode		Display history data stored on an alarm server on MONITOUCH. The display on MONITOUCH differs depending on the display mode.
	Alarm History	Display alarm occurrence, cancellation, and acknowledgment times on one line. The state of each alarm can be checked at a glance.
	Event History	Alarm occurrence, reset, and acknowledged times are each displayed on one line.
	Real Time	Only display alarms that are currently occurring. Alarms that require canceling can be checked at a glance.
	Alarm Tracking (V8)	This is selected when using a screen program converted from the V8 series. The menu changes to a V8-compatible parts menu. These options are displayed when the [Display All] checkbox is selected.
	Alarm Logging (V8)	
	Time Order Alarming (V8)	
	Bit Order Alarming (V8)	
Display Order of Date/Time		Set the display order of error messages.
	Ascending Order	Display in the order of old errors → new errors.
	Descending Order	Display in the order of new errors → old errors.

Contents



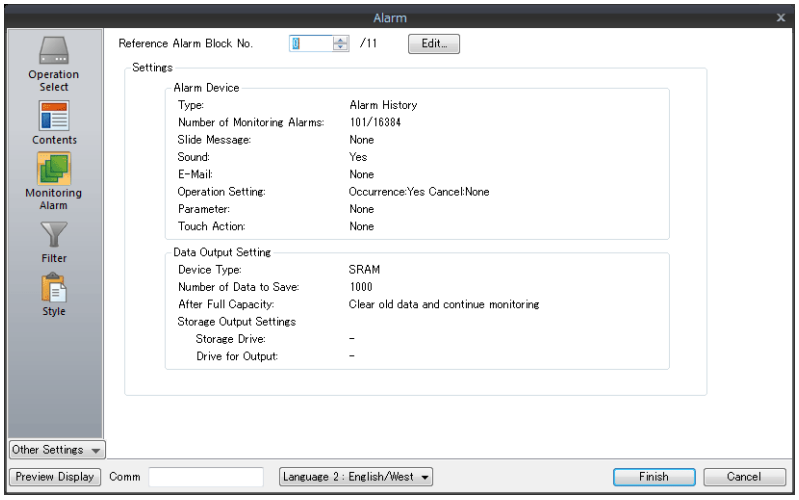
Item			Description
Common Setting	Ruled Line Display		Display ruled lines in the display area. The color of ruled lines can also be set.
	Use Windows Font		Display alarm messages using a Windows font. *1
Title Setting	Display a title		Display a title for each item in the display area.
	Edit		Titles can be edited by opening the [Message Edit] window. Use the same number of consecutive lines as the number of items to display.
	Detail Setting		Set the number of points, display position, and color of titles.
Display Setting	Items Not to Display Items to Display > <		Use the [>] and [<] switches to select the items for display on MONITOUCH. Items Not to Display: Not displayed on MONITOUCH. Items to Display: Displayed on MONITOUCH.
	Items to Display Up, Down		Set the display order of items on MONITOUCH using the [Up] and [Down] switches. Items are displayed from left to right on MONITOUCH.
	Point		Set the text size.
	Select Option	Display Width	Set the display width of the items selected for display. When a message is longer than the display area width, automatic scrolling is performed while the message is selected by the cursor so that the entire message can be displayed. *2
		Place	Set the display position of the items selected for display.
		Calendar Condition	Set the display state of the items selected for display. Date Only/Time Only/Date and Time Date/Time Display Format Setting Set the date and time display format. Refer to page 8-31.
Preview			Check a preview of the display on MONITOUCH.

*1 The location of the text size setting differs depending on the setting of [System Setting] → [Unit Setting] → [General Setting] → [Use the point size specified in the message edit window for alarm parts using Windows fonts].

- Unselected (default)
  Alarm messages are displayed using the size set at [Contents] → [Point] in the alarm settings window.
- Selected
  Alarm messages are displayed using the size set at [Edit] (or right-click menu) → [Char. Prop.] → [Point] in the message editor.

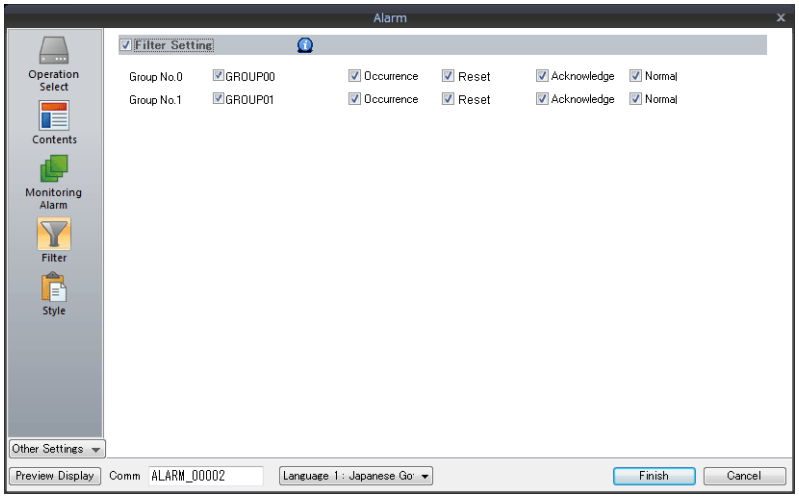
*2 The [System Setting] → [Unit Setting] → [General Setting] → [Activate auto-scroll display of the alarm] checkbox must be selected. (Default: selected)

Monitoring Alarm



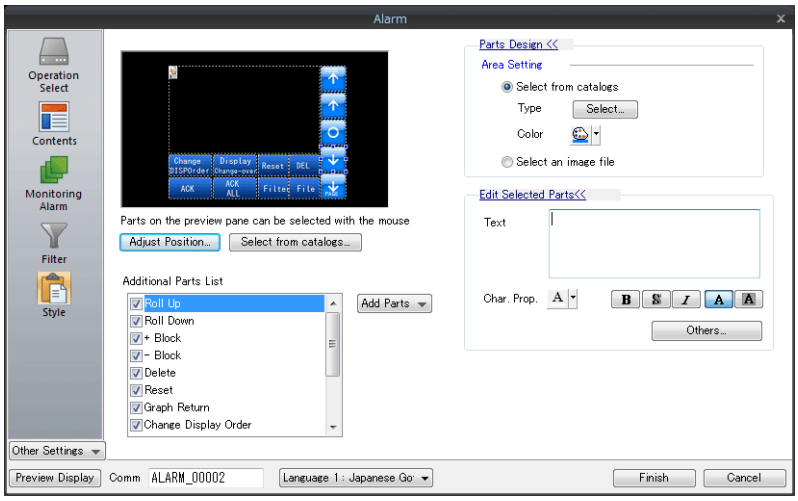
Item	Description
Reference Alarm Block No.	Set the alarm block number for displaying history data. The editing window for alarm blocks can be displayed using the [Edit] button.
Settings	The settings of the selected alarm block can be checked in this area.

Filter



Item		Description
Filter Setting		Set the display state immediately following screen switching. Filter settings are not required when displaying all history information. When [Real Time] is selected in the [Operation Select] window, configure the filter settings and select the [Occurrence] checkbox. * Filter settings can be changed on MONITOUCH in RUN mode.
	Group No. 0 to 15 Occurrence Reset Acknowledge Normal	Selected: Display on MONITOUCH. Unselected: Do not display on MONITOUCH.

Style



Item		Description
Additional Parts List		Displays a list of alarm-related parts. Selected: Displayed on MONITOUCH. Unselected: Not displayed on MONITOUCH. Parts can be added to the list by clicking [Add Parts].
	Roll Up	Move the cursor to the next item.
	Roll Down	Move the cursor to the previous item.
	+ Block	Scrolls the display up by one page.
	– Block	Scrolls the display down by one page.
	Delete	Delete the selected message. * The message is only erased from display on MONITOUCH and it remains in the history data.
	Reset	Clear the history data on the alarm server. Press this switch once to activate it and press it again within 2 seconds to clear the data. If the switch is not pressed again within two seconds, the switch s lamp turns off and resetting is nullified.
	Graph Return	This switch blinks when a message is selected using [+ Block] or [– Block] buttons. Press the switch when it is blinking to deselect the message and return to the latest alarm display.
	Change Display Order	Change the message display order between [Ascending Order] and [Descending Order].
	Display Change-over	Change the date and time display format between [Date Only] and [Time Only].
	Acknowledge	Acknowledge the selected unacknowledged messages.
	Acknowledge All	Acknowledge all unacknowledged messages.
	Filter Display	Change the information to display. Select the information to display from group, occurrence, cancellation, acknowledgment, and normal.
	File Select	Display the history of a backup file (CSV) saved to storage.
	Count Display *2	Display the number of event history entries or the count value of the selected message.
	Time Display *1 *2	Display the latest time of the event history or the time of the selected message.
	Status Display	Display the event history status. Occurrence/cancellation/acknowledgment/normal
	Mode (Switch)	Display relay (V8) or relay sampling (V8) mode messages on a switch.
	Mode (Lamp)	Display relay (V8) or relay sampling (V8) mode messages on a lamp.
Adjust Position		Display the window for adjusting the placement position of each part. Part size can also be changed.
Select from catalogs		Set the part design from the catalog.
Parts Design		Set the design and color of the part selected in the [Additional Parts List] or preview pane.
Edit Selected Parts		Set the part selected in the [Additional Parts List] or preview pane.

*1 Display differs depending on the number of specified digits.
Select the [Put msec information on time] checkbox at [Alarm Block] → [Others] to display and record down to milliseconds.

Less than 8 digits	No display
8 to 11 digits	Hour, minutes, and seconds
12 to 13 digits	Hour, minutes, seconds, and milliseconds
14 to 17 digits	Month, day, hour, minutes, and seconds

18 digits	Month, day, hour, minutes, seconds, and milliseconds
19 to 22 digits	Year, month, day, hour, minute, and second
23 digits or more	Year, month, day, hour, minutes, seconds, and milliseconds

*2 When converting data from an older model, this corresponds to the [Function] setting of "Logging Time Display" or "Logging Count Display".
Enable millisecond display by changing [Function] to "Alarm Time Display" or "Alarm Count Display".

Logging Time Display

Less than 8 digits	No display
8 to 11 digits	Hour, minutes, and seconds

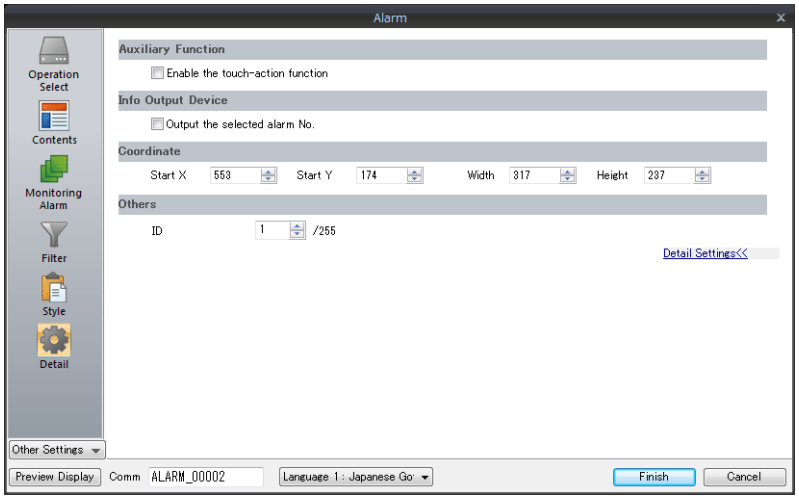
14 to 17 digits	Month, day, hour, minutes, and seconds
19 to 22 digits	Year, month, day, hour, minute, and second

Show/Hide

Set the show and hide settings of alarm parts.

☞ For details, refer to "14 Item Show/Hide Function"

Detail



Item		Description
Auxiliary Function	Enable the touch-action function	Changeover the screen by tapping the displayed alarm message. * Enable [Touch Action] on the alarm server.
Info. Output Device	Output the selected alarm No.	Store the alarm number selected (cursor display) on MONITOUCH into the specified device memory address. Use this setting to display detailed alarm information.
Coordinate	Start X / Start Y	Set the placement position and size of the display area.
	Width/Height	
Others	ID	Set the ID of the alarm part.

9 Graph Display

9.1 Bar Graph

9.2 Pie Graph

9.3 Closed Area Graphs

9.4 Panel Meter

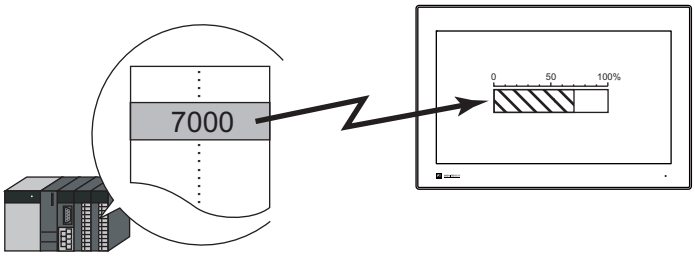
9.5 Statistic Bar Graph

9.6 Statistic Pie Graph

9.1 Bar Graph

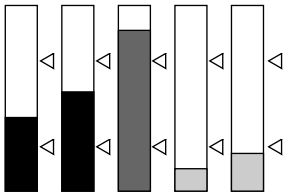
9.1.1 Overview

- Data in a device memory address can be expressed on a bar graph.



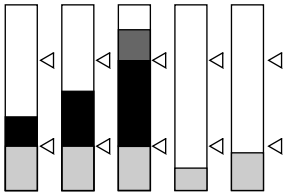
☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-2.

- When data in a device memory address exceeds or falls short of the range specified, the graph color can be changed. This helps the operator to recognize the situation easily and correctly.



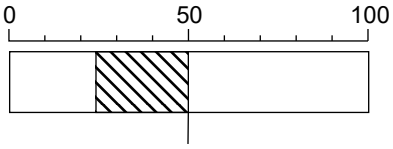
☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-2.

- As shown below, it is possible to display a bar graph in several colors.



☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-2.

- A reference point can be set and then data from the reference point to the specified data in a device memory address can be expressed on a graph (deviation display).

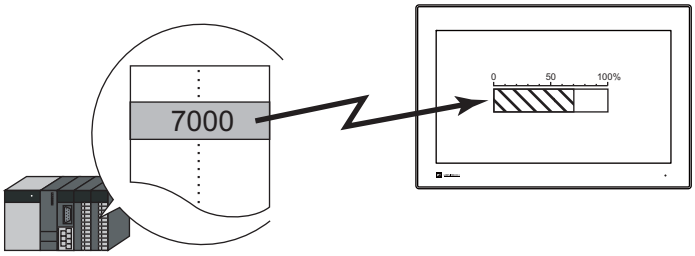


☞ For setting examples, refer to "Displaying Deviation from a Reference Value to the Current Value (Deviation Display)" page 9-4.

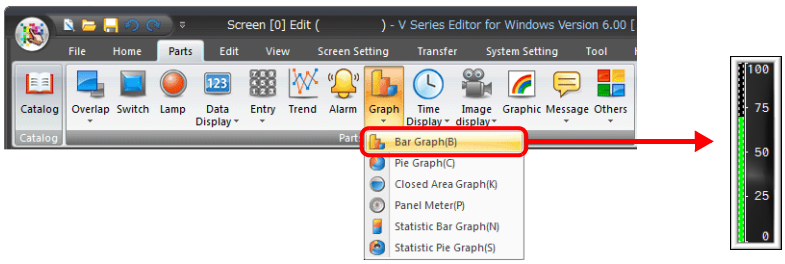
9.1.2 Setting Examples

Displaying Current Values (Standard Display)

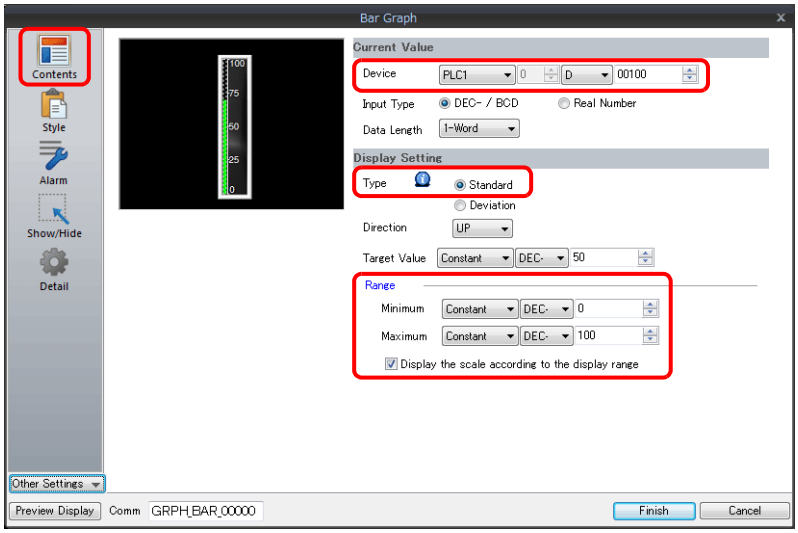
The current value of a device memory address within the range of the minimum and maximum values can be displayed (standard display).



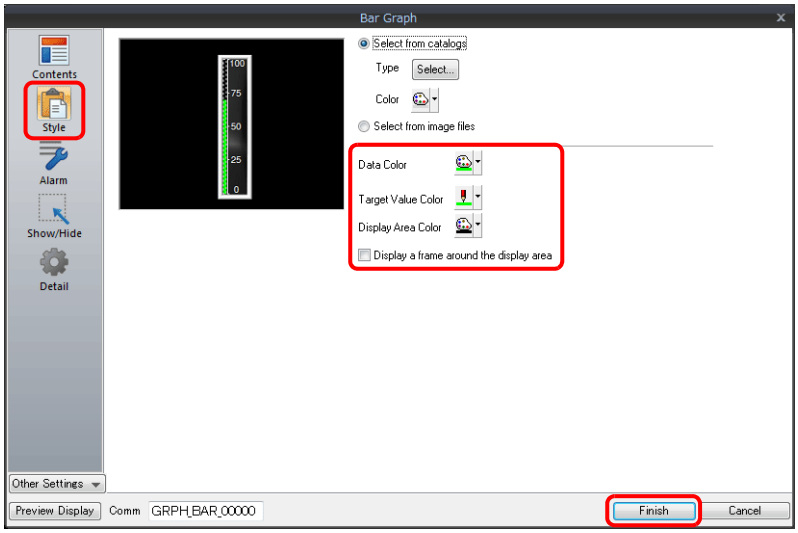
1. Click [Parts] → [Graph] → [Bar Graph] and place a bar graph on the screen.



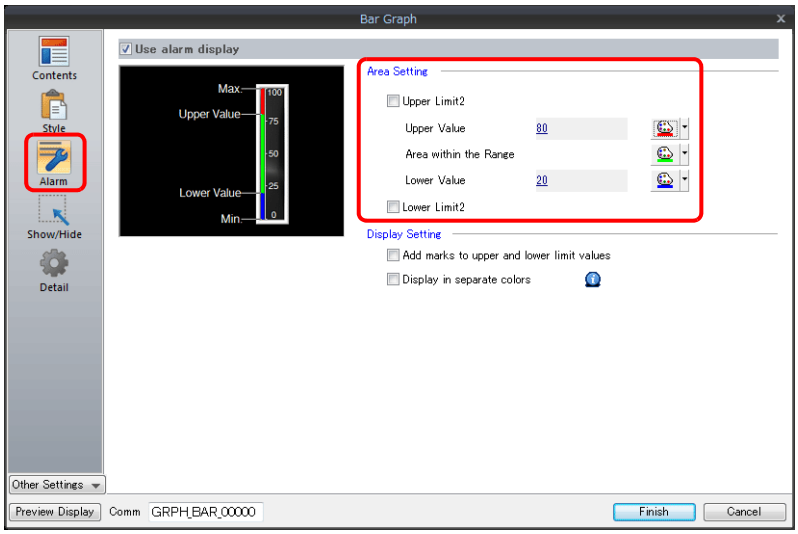
2. Double-click on the bar-graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the graph with [Current Value] → [Device].
   - Select [Standard] for [Type].
   - Specify the graph display area using [Range].



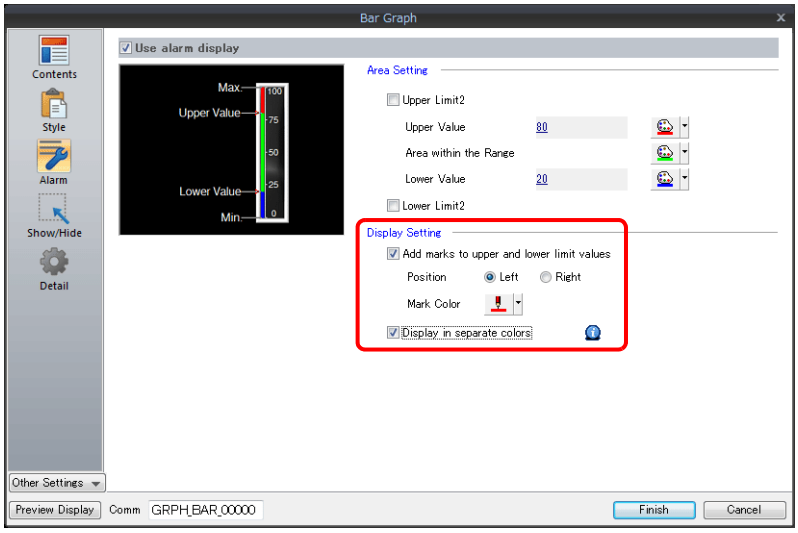
3. Configure the following settings for [Style] and then click [Finish].
   To change the graph color depending on the value, proceed to step 4.



4. Configure the [Alarm] settings to change the graph color depending on the value.
   In this case, color settings set for [Style] are disabled.



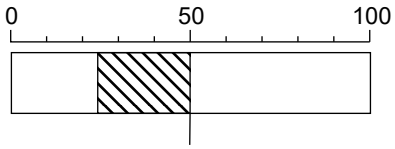
5. Set the following to display the graph using the different colors for different value ranges.



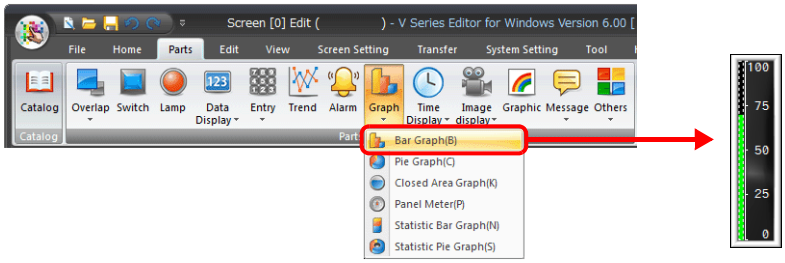
This completes the necessary settings.

Displaying Deviation from a Reference Value to the Current Value (Deviation Display)

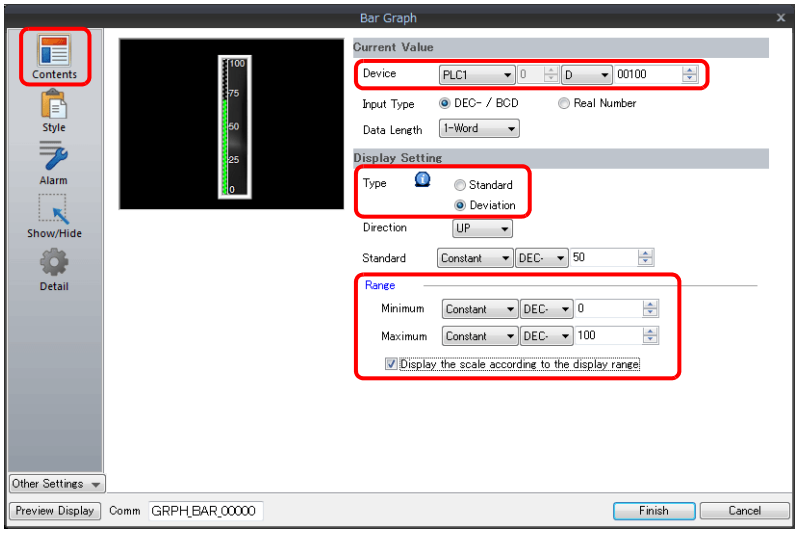
A reference point can be set and then data from the reference point to the specified device memory address can be expressed on a graph.



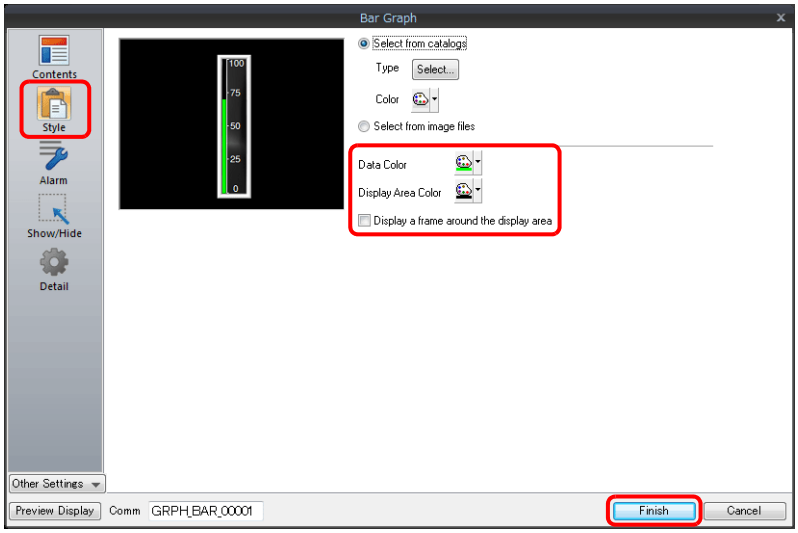
1. Click [Parts] → [Graph] → [Bar Graph] and place a bar graph on the screen.



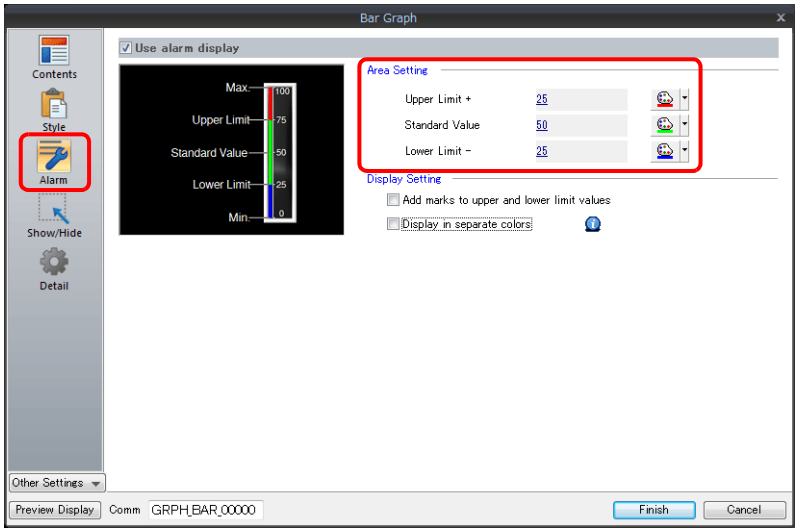
2. Double-click on the bar-graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the graph with [Current Value] → [Device].
   - Select [Deviation] for [Type].
   - Specify the value or device memory address to be used as the reference for [Standard].
   - Specify the graph display area.



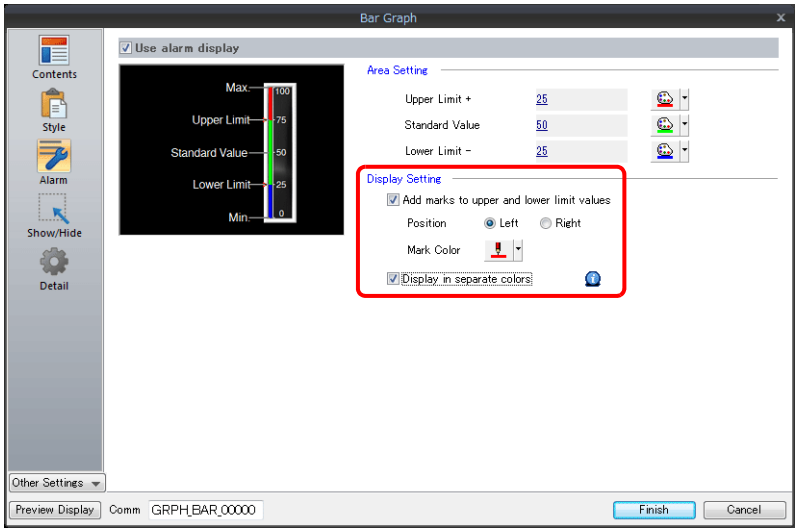
3. Configure the following settings for [Style] and then click [Finish].
   To change the graph color depending on the value, proceed to step 4.



4. Configure the [Alarm] settings to change the graph color depending on the value.
   In this case, color settings set for [Style] are disabled.



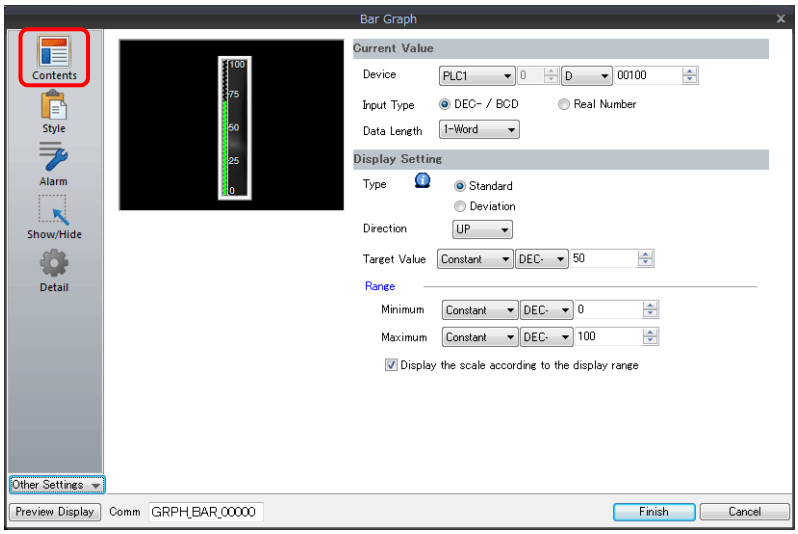
5. Set the following to display the graph using the different colors for different value ranges.

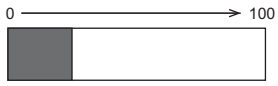
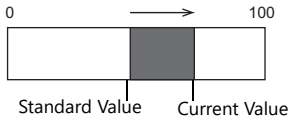


This completes the necessary settings.

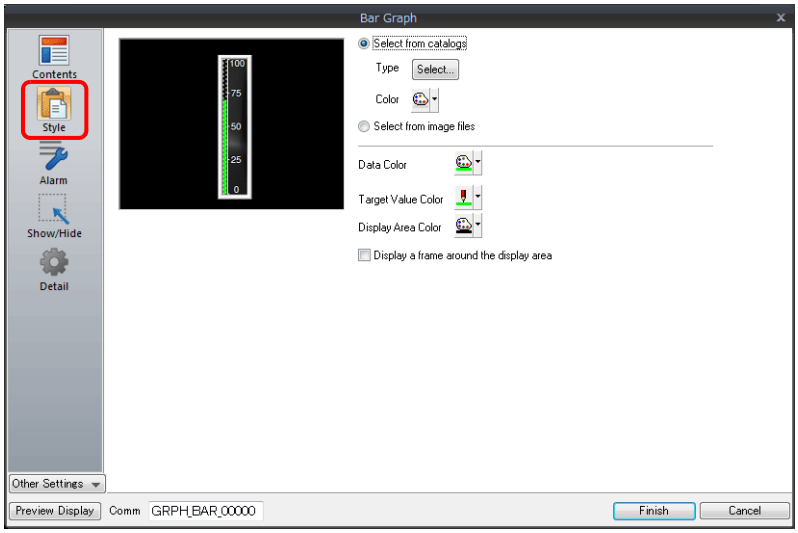
9.1.3 Detailed Settings

Displayed Information



Item		Description
Current Value	Device	Specify the device memory address to monitor as a graph.
	Input Type (DEC- / BCD, Real Number)	Select the data format of device memory values. The selection here also applies to the values of [Target Value], [Standard Value], [Range], and [Alarm]. * When [DEC-/BCD] is selected, the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting] takes effect.
	Data Length (1-Word, 2-Word)	Select data length of the device memory.
Display Setting	Type (Standard, Deviation)	Standard Display the device memory value between the minimum and maximum values on a graph.  Deviation Set a reference value and display deviation from the reference value to the current value. 
	Direction (UP, DW, LFT, RGT)	Set the direction to draw graph lines. Vertical bar graph: UP / DW Horizontal bar graph: LFT / RGT
	Target Value, Standard	Target Value Set this when [Standard] is selected for [Type]. Display a line at the position of the target value on the graph. * If a value less than the minimum value of the range is set, a line is not displayed. Standard Set this when [Deviation] is selected for [Type]. Specify the reference value of the graph. * If [Alarm] is configured, the [Standard] or [Target Value] setting is disabled.
	Range (Minimum/Maximum)	Specify the minimum and maximum values for the display range of the graph. If the display range is variable, select a device memory. If the display range is fixed, specify a constant.
	Display the scale according to the display range	This is only available for parts that correspond to a numerical display. An optimal scale is displayed according to the minimum and maximum of the value in the range. * This setting is only available when the minimum and maximum values are specified with constants.

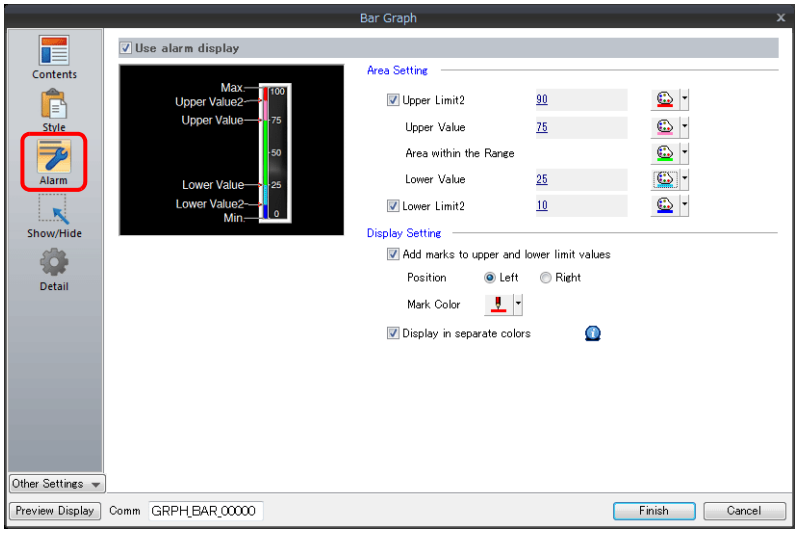
Style



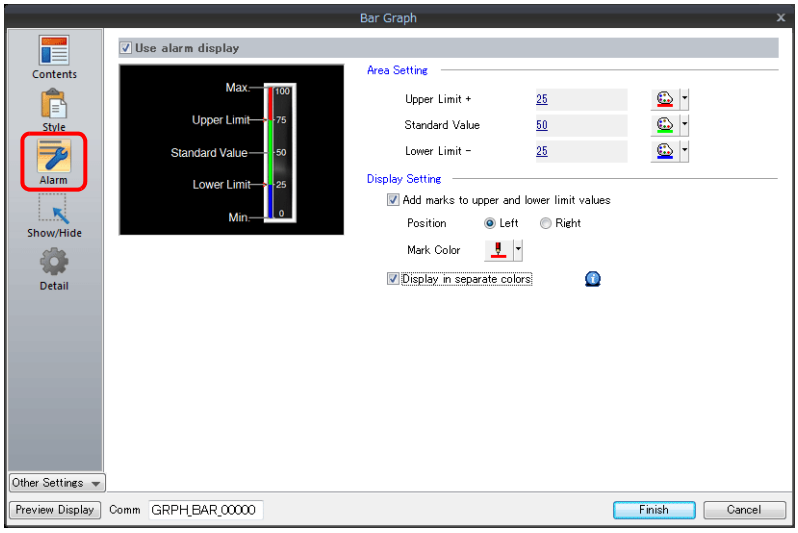
Item	Description
Select from catalogs	Type Set the part design. Color Set the part color.
Select from image files	Load an image file.
Data Color	When [Standard] is selected for [Type]: Set the graph color from the minimum value to the device memory value. When [Deviation] is selected for [Type]: Set the graph color from the reference value to the device memory value. * If [Alarm] is configured, this is disabled.
Target Value Color	When [Standard] is selected for [Type]: Set the color of the target value line displayed on the graph. * If [Alarm] is configured, this is disabled.
Display Area Color	Set the color inside the graph area.
Display a frame around the display area	Display a frame around the graph area. When this checkbox is selected, the frame color can be set.

Alarm

- Type: Standard



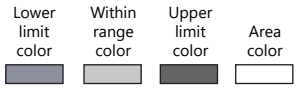
- Type: Deviation



Item		Description
Use alarm display		Change the colors of the graph according to the device memory value.
Area Setting	When [Standard] is selected for [Type]: Upper Limit2/Upper Value/Area within the Range/Lower Value/Lower Limit2	Set the ranges for alarm display and each corresponding color.
	When [Deviation] is selected for [Type]: Upper Limit+/Standard Value/Lower Limit−	Set the ranges for alarm display and each corresponding color.
Display Setting	Add marks to upper and lower limit values	Display △ marks at the alarm range positions of the graph.
	Position	Specify the position of the △ marks. Vertical bar graph: Left/Right Horizontal bar graph: Top/Bottom
	Mark Color	Specify the color of the △ marks.
	Display in separate colors	Display each alarm color separately on a single graph.

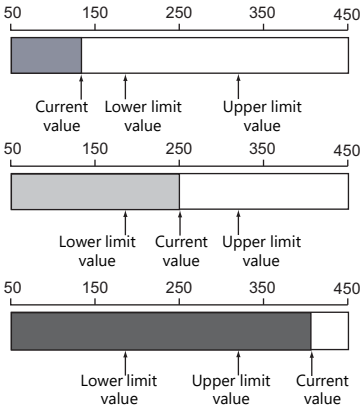
Examples of graphs with alarm settings

When [Standard] is selected for [Type]

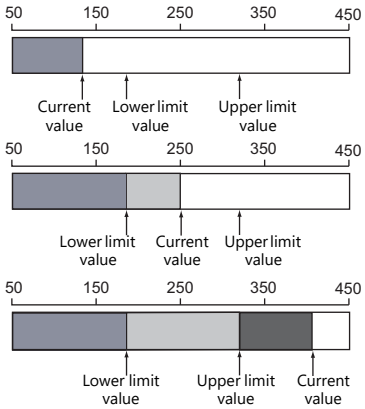


[Direction] set to RGT

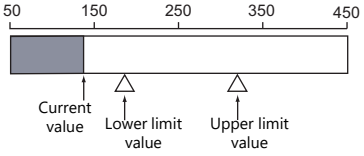
- Single color use



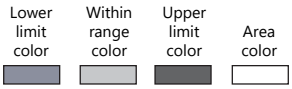
- Separate color use



- With marks

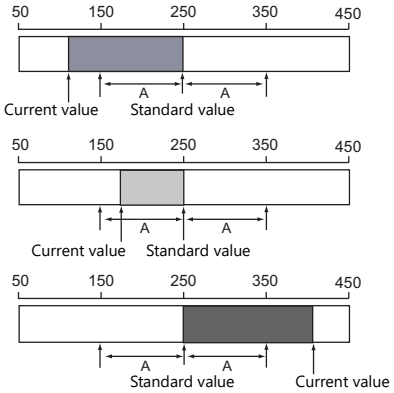


When [Deviation] is selected for [Type]

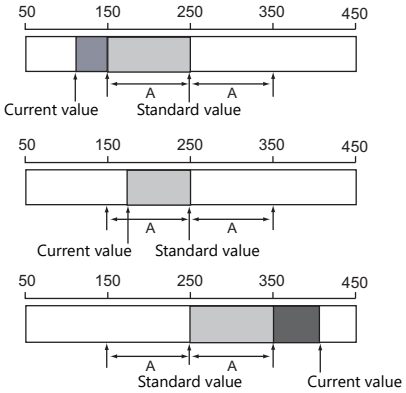


[Direction] set to RGT A: Range value

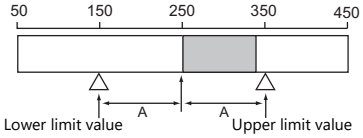
- Single color use



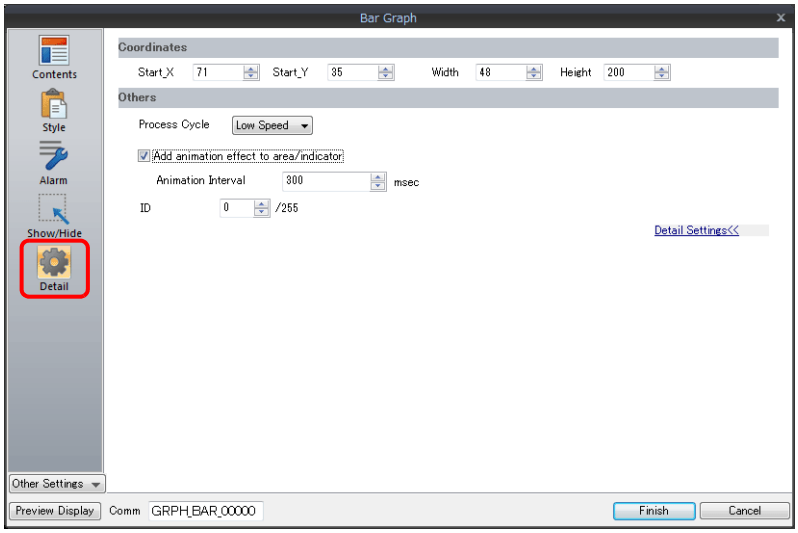
- Separate color use

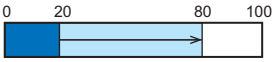


- With marks



Detail

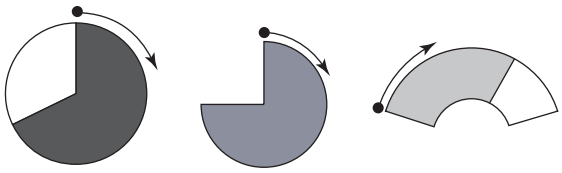


Item		Description	
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)	
	Width/Height	Specify the width and height of the part.	
Others	Process Cycle	Specify the process cycle of the part.	
	Add animation effect to area/indicator	Draw changes in the graph display over the time specified for [Animation Interval].	Example: Animation interval: 200 msec Current value changes from 20 to 80  Increase on graph occurs over 200 msec
	Animation Interval	Set the drawing speed of changes in the graph display.	
	ID	Set the ID.	

9.2 Pie Graph

9.2.1 Overview

- Data in the specified device memory address can be expressed clockwise on a pie graph.

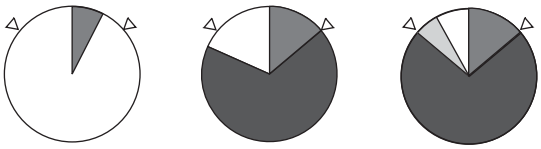


☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-12.

- When data in a device memory exceeds or falls short of the range specified, the graph color can be changed. This helps the operator to recognize the situation easily and correctly.

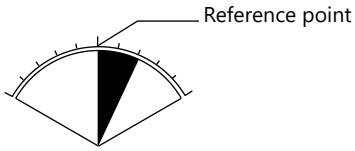
☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-12.

- As shown below, it is possible to display a bar graph in several colors.



☞ For setting examples, refer to "Displaying Current Values (Standard Display)" page 9-12.

- A reference point can be set and then data from the reference point to the specified data in a device memory can be expressed on a graph (deviation display).

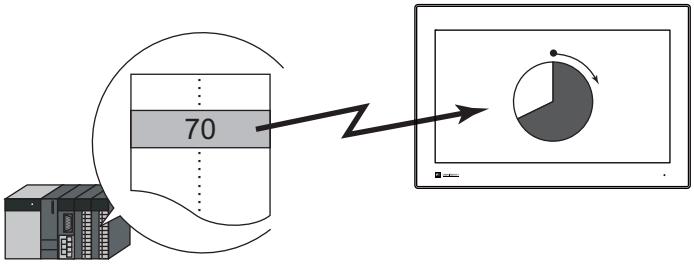


☞ For setting examples, refer to "Displaying Deviation from a Reference Value to the Current Value (Deviation Display)" page 9-14.

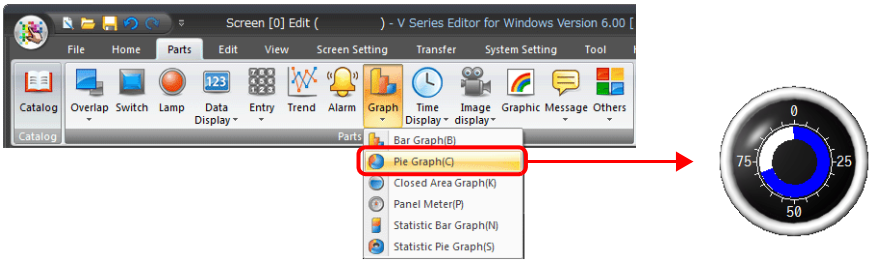
9.2.2 Setting Examples

Displaying Current Values (Standard Display)

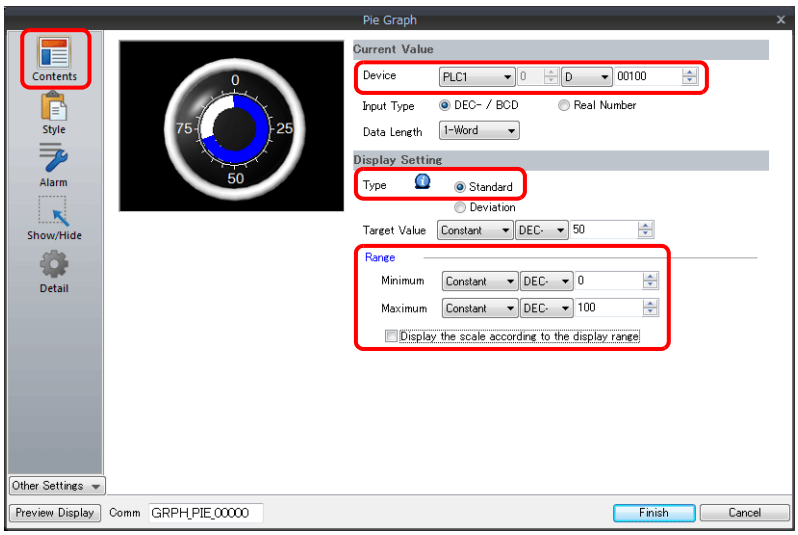
The current value of a device memory within the range of the minimum and maximum values can be displayed (standard display).



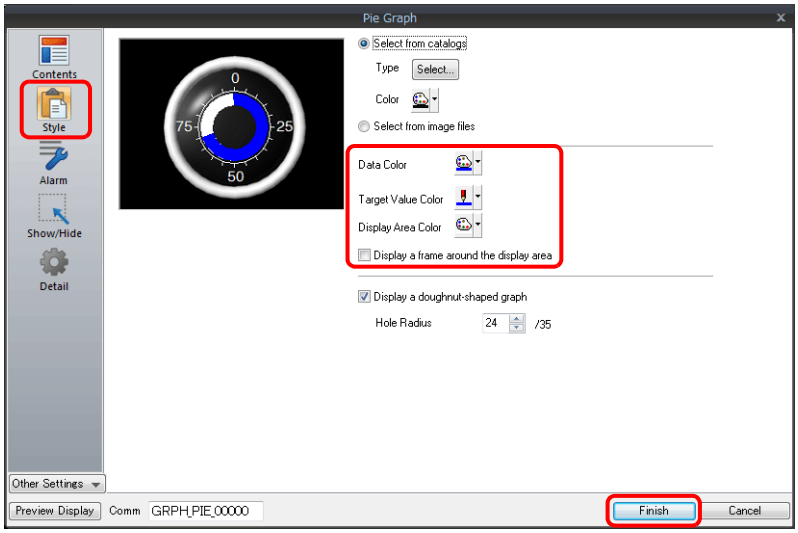
1. Click [Parts] → [Graph] → [Pie Graph] and place a pie graph on the screen.



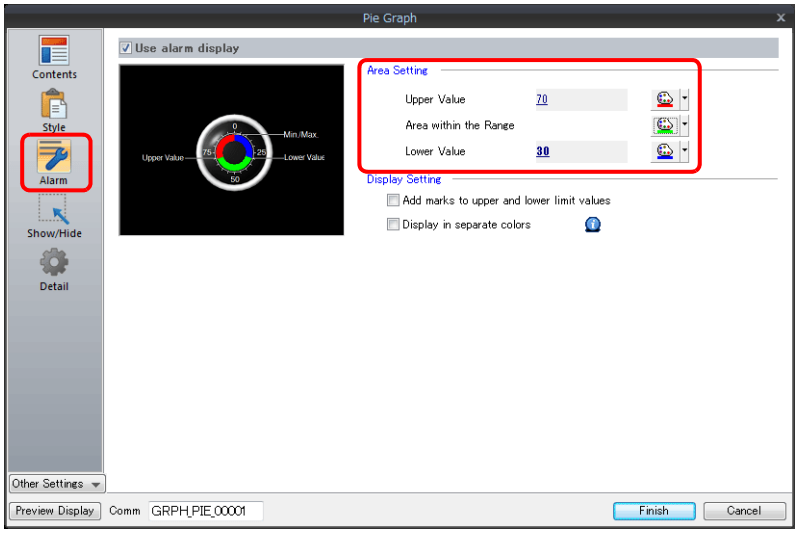
2. Double-click on the pie graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the graph with [Current Value] → [Device].
   - Select [Standard] for [Type].
   - Specify the graph display area using [Range].



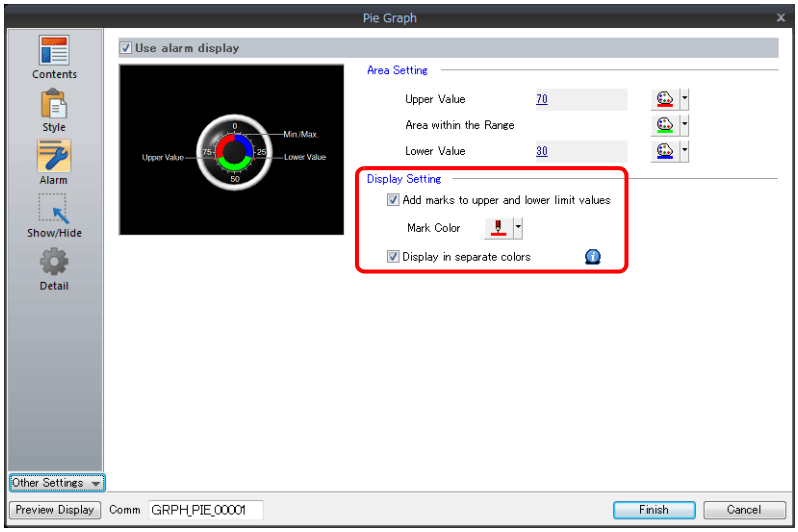
3. Configure the following settings for [Style] and then click [Finish].
   To change the graph color depending on the value, proceed to step 4.



4. Configure the [Alarm] settings to change the graph color depending on the value.
   In this case, color settings set for [Style] are disabled.



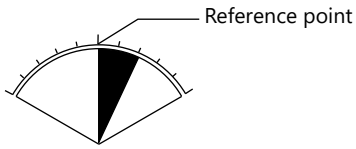
5. Set the following to display the graph using the different colors for different value ranges.



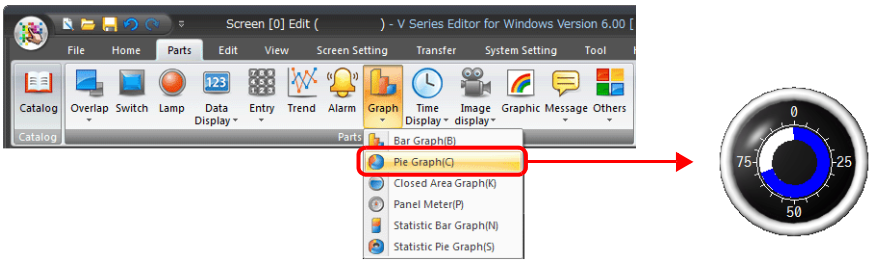
This completes the necessary settings.

Displaying Deviation from a Reference Value to the Current Value (Deviation Display)

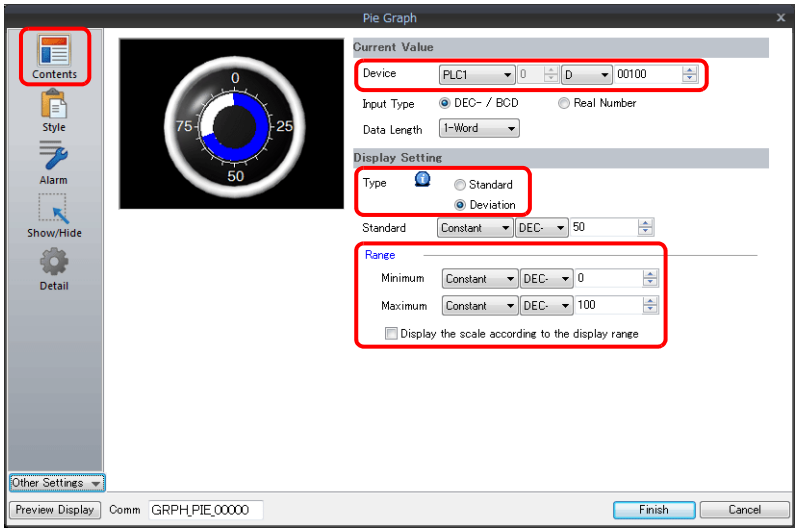
A reference point can be set and then data from the reference point to the specified device memory address can be expressed on a graph.



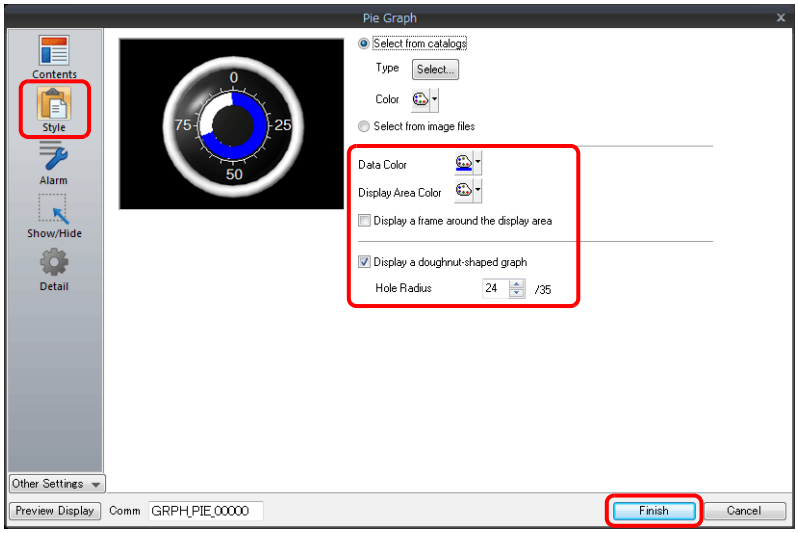
1. Click [Parts] → [Graph] → [Pie Graph] and place a pie graph on the screen.



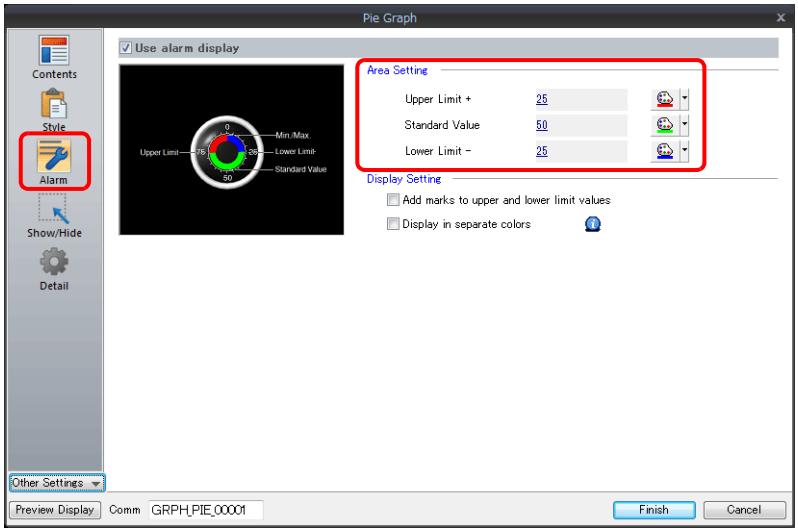
2. Double-click on the pie graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the graph with [Current Value] → [Device].
   - Select [Deviation] for [Type].
   - Specify the value or device memory address to be used as the reference for [Standard].
   - Specify the graph display area.



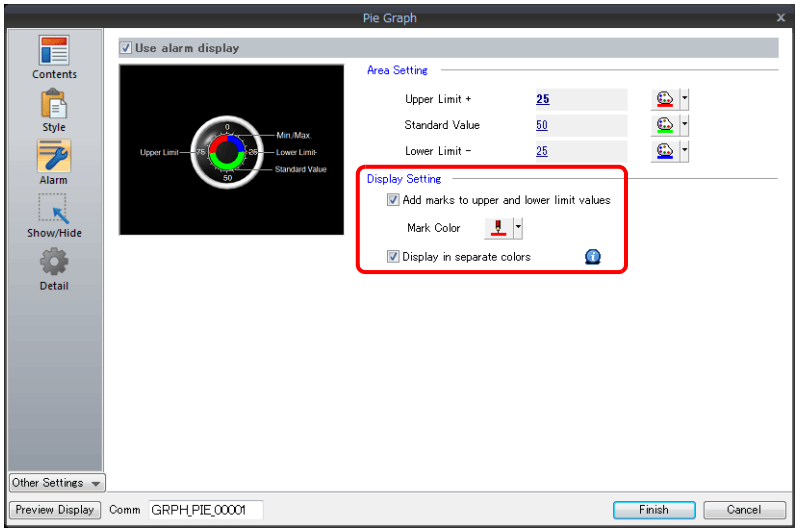
3. Configure the following settings for [Style] and then click [Finish].
   To change the graph color depending on the value, proceed to step 4.



4. Configure the [Alarm] settings to change the graph color depending on the value.
   In this case, color settings set for [Style] are disabled.



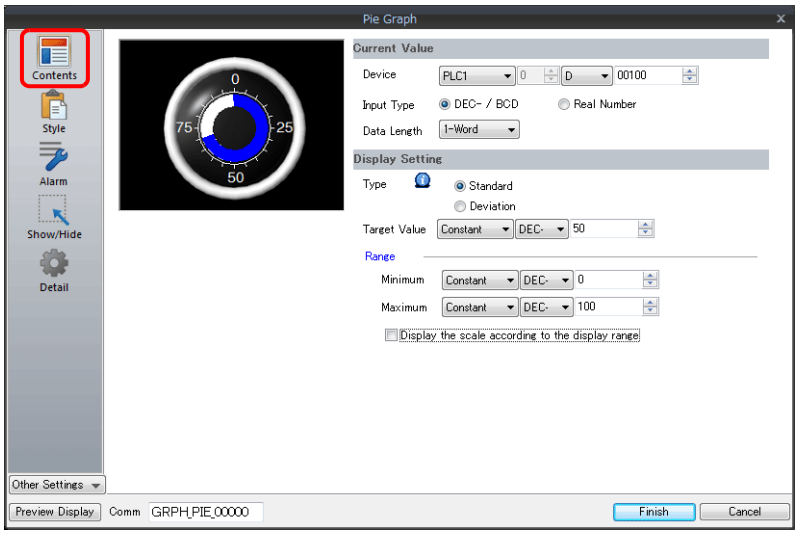
5. Set the following to display the graph using different colors for different value ranges.

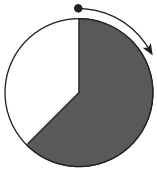
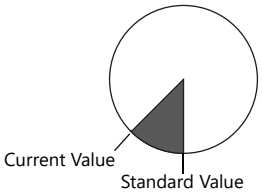


This completes the necessary settings.

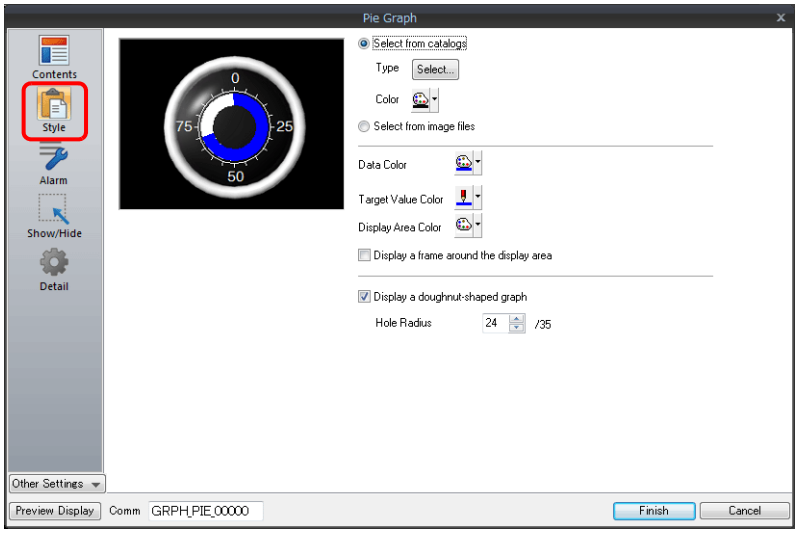
9.2.3 Detailed Settings

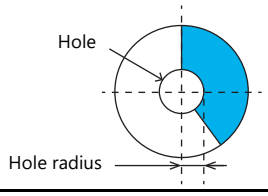
Displayed Information



Item		Description
Current Value	Device	Specify the device memory address to monitor as a graph.
	Input Type (DEC- / BCD, Real Number)	Select the data format of device memory values. The selection here also applies to the values of [Target Value], [Standard Value], [Range], and [Alarm]. * When [DEC-/BCD] is selected, the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting] takes effect.
	Data Length (1-Word, 2-Word)	Select data length of the device memory.
Display Setting	Type (Standard, Deviation)	Standard Display the device memory value between the minimum and maximum values on a graph.  Deviation Set a reference value and display deviation from the reference value to the current value. 
	Target Value, Standard	Target Value Set this when [Standard] is selected for [Type]. Display a line at the position of the target value on the graph. * If a value less than the minimum value of the range is set, a line is not displayed. Standard Set this when [Deviation] is selected for [Type]. Specify the reference value of the graph. * If [Alarm] is configured, the [Standard] or [Target Value] setting is disabled.
	Range (Minimum/Maximum)	Specify the minimum and maximum values for the display range of the graph. If the display range is variable, select a device memory. If the display range is fixed, specify a constant.
	Display the scale according to the display range	This is only available for parts that correspond to a numerical display. An optimal scale is displayed according to the minimum and maximum of the value in the range. * This setting is only available when the minimum and maximum values are specified with constants.

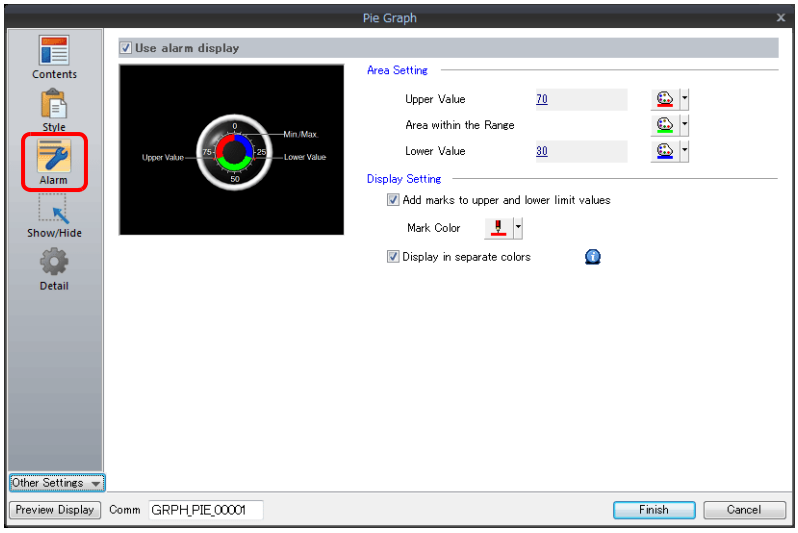
Style



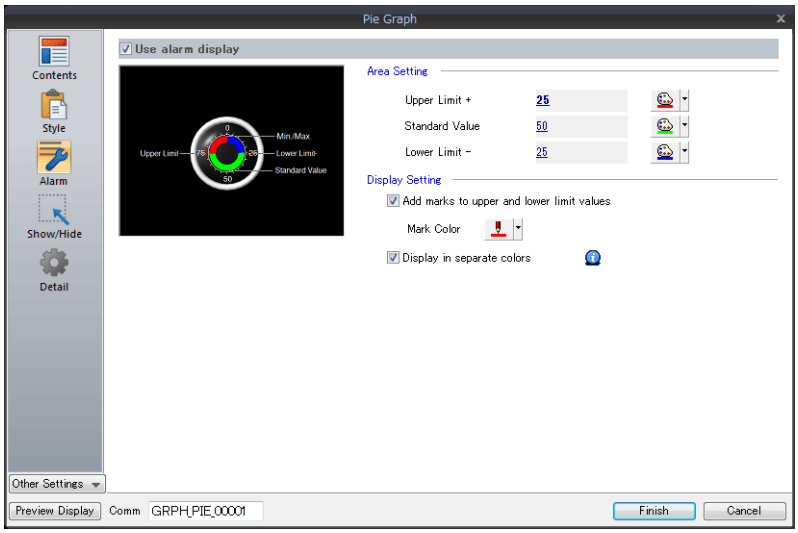
Item	Description	
Select from catalogs	Type Set the part design. Color Set the part color.	
Select from image files	Load an image file.	
Data Color	When [Standard] is selected for [Type]: Set the graph color from the minimum value to the device memory value. When [Deviation] is selected for [Type]: Set the graph color from the reference value to the device memory value. * If [Alarm] is configured, this is disabled.	
Target Value Color	When [Standard] is selected for [Type]: Set the color of the target value line displayed on the graph. * If [Alarm] is configured, this is disabled.	
Display Area Color	Set the color inside the graph area.	
Display a frame around the display area	Display a frame around the graph area. When this checkbox is selected, the frame color can be set.	
Display a doughnut-shaped graph	Display a doughnut-shaped pie graph. Select this checkbox to set the hole radius.	

Alarm

- Type: Standard



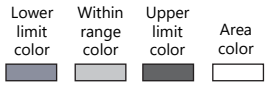
- Type: Deviation



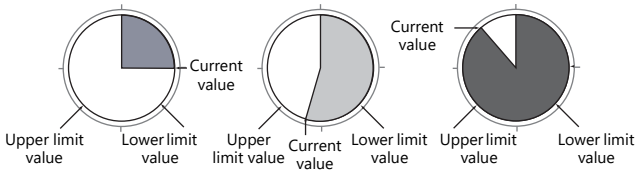
Item		Description
Use alarm display		Change the colors of the graph according to the device memory value. The color settings are implemented in the area settings.
Area Setting	When [Standard] is selected for [Type]: Upper Value/Area within the Range/Lower Value	Set the range for alarm display and each corresponding color.
	When [Deviation] is selected for [Type]: Upper Limit+/Standard Value/Lower Limit–	Set the reference value as well as the range for alarm display and each corresponding color.
Display Setting	Add marks to upper and lower limit values	Display △ marks at the alarm range positions of the graph.
	Mark Color	Specify the color of the △ marks.
	Display in separate colors	Display each alarm color separately on a single graph.

Examples of graphs with alarm settings

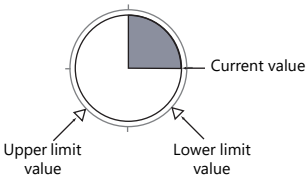
When [Standard] is selected for [Type]



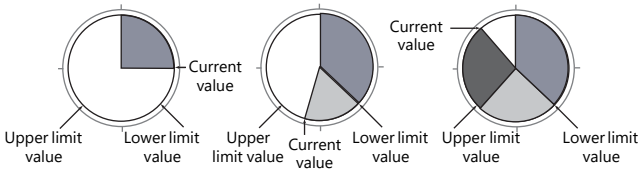
- Single color use



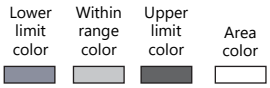
- With marks



- Separate color use

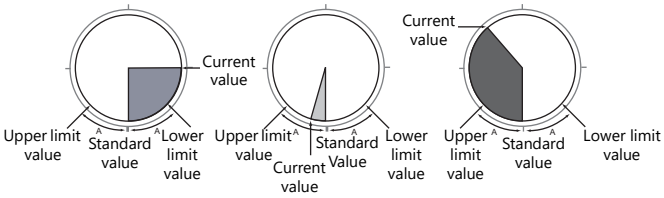


When [Deviation] is selected for [Type]

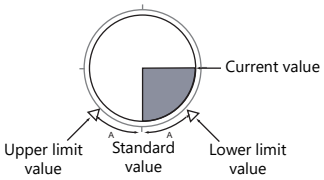


A: Range value

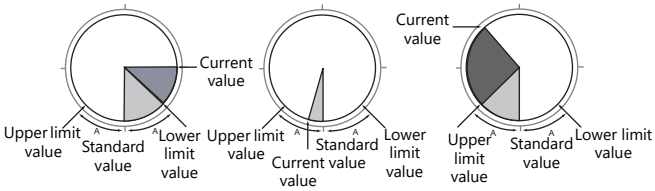
- Single color use



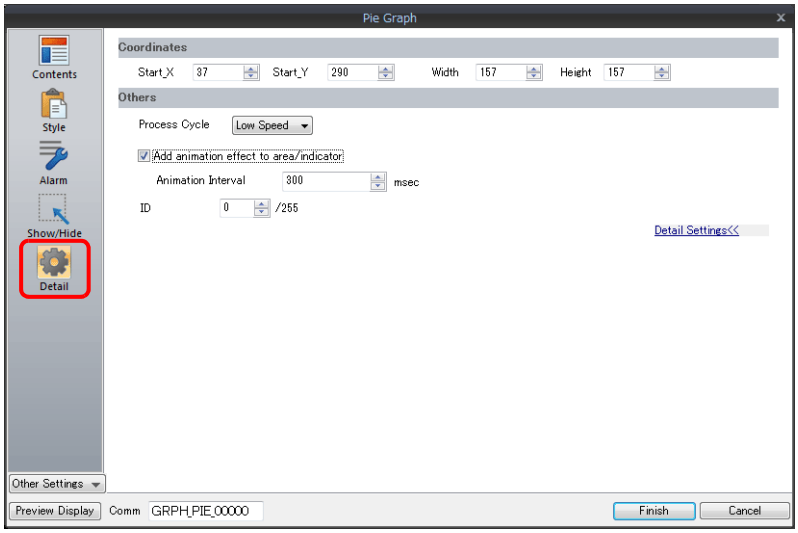
- With marks

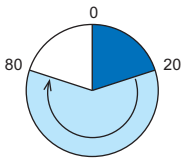


- Separate color use



Detail

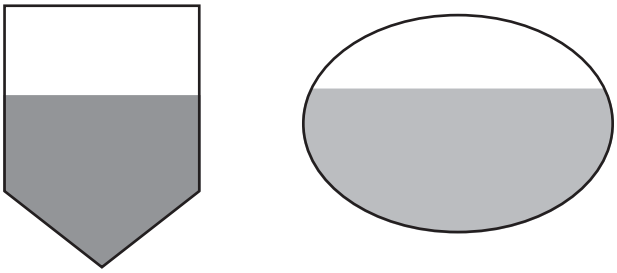


Item		Description	
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)	
	Width/Height	Specify the width and height of the part.	
Others	Process Cycle	Specify the process cycle of the part.	
	Add animation effect to area/indicator	Draw changes in the graph display over the time specified for [Animation Interval].	Example: Animation interval: 200 msec Current value changes from 20 to 80  Increase on graph occurs over 200 msec
	Animation Interval	Set the drawing speed of changes in the graph display.	
	ID	Set the ID.	

9.3 Closed Area Graphs

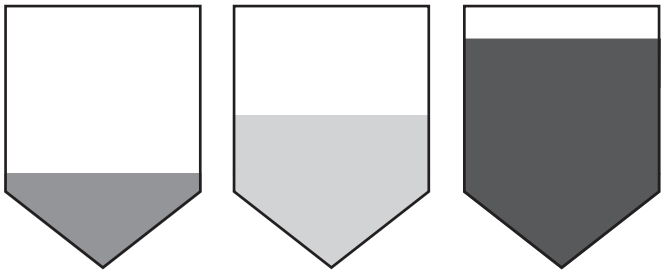
9.3.1 Overview

- Changes to data in a closed area, such as a tank, can be expressed on a closed area graph.



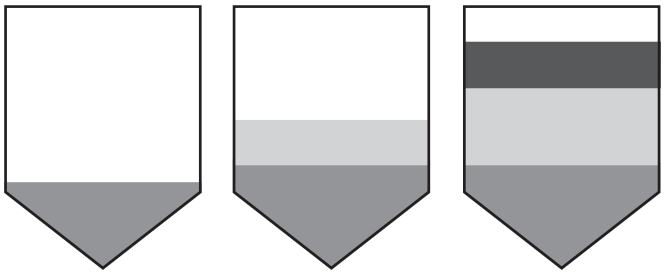
☞ For setting examples, refer to "Displaying Current Values" page 9-22.

- When data in a device memory exceeds or falls short of the range specified, the graph color can be changed.



☞ For setting examples, refer to "Displaying Current Values" page 9-22.

- As shown below, it is possible to display a bar graph in several colors.

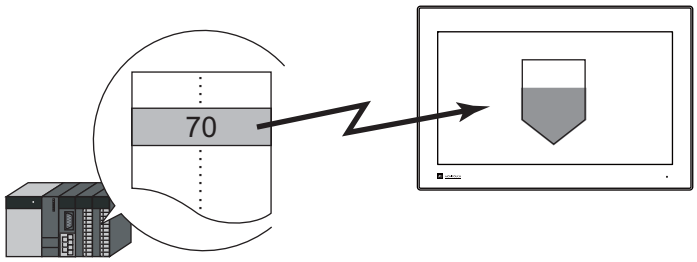


☞ For setting examples, refer to "Displaying Current Values" page 9-22.

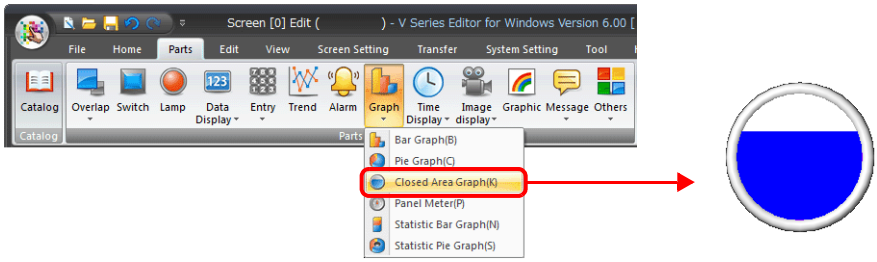
9.3.2 Setting Examples

Displaying Current Values

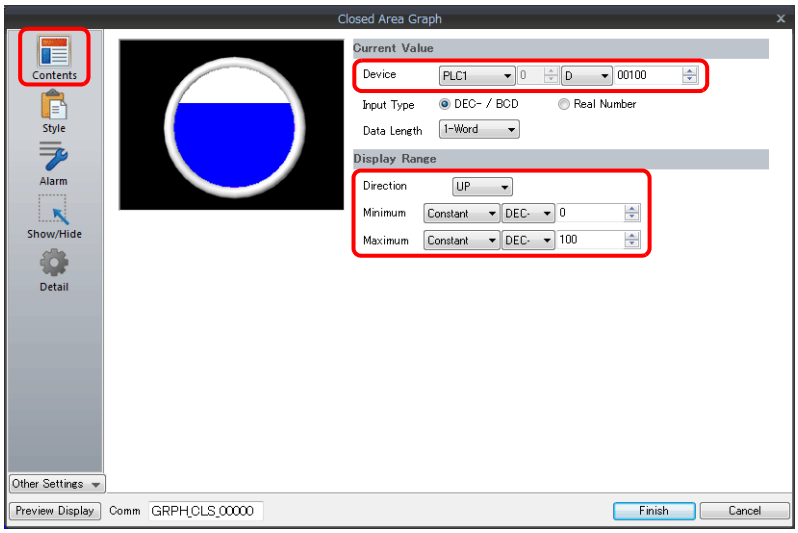
The current value of a device memory within the range of the minimum and maximum values can be displayed.



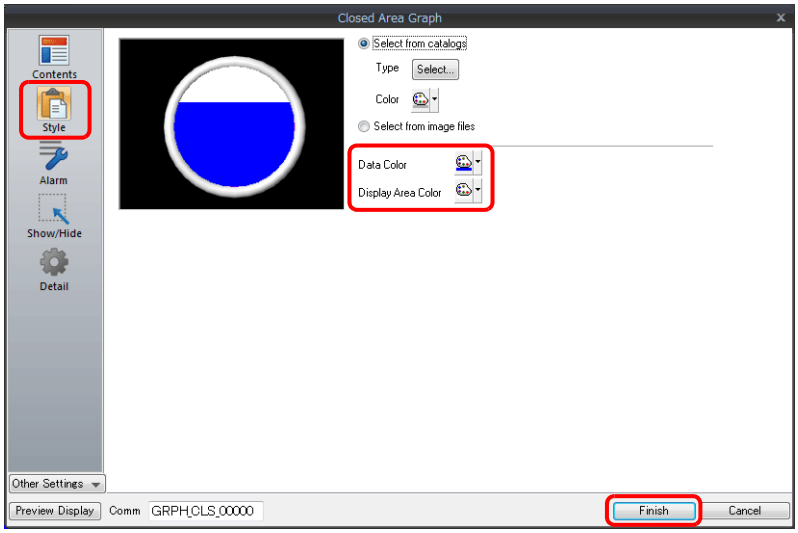
1. Click [Parts] → [Graph] → [Closed Area Graph] and place a closed area graph on the screen.



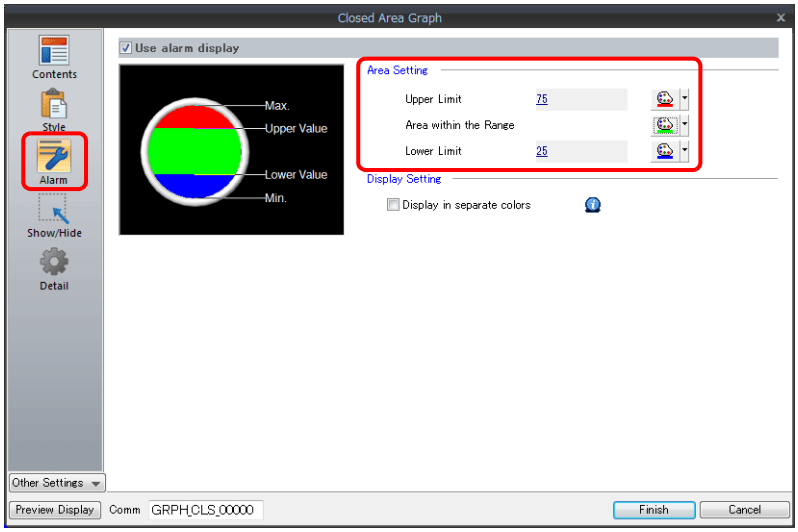
2. Double-click on the closed area graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the graph with [Current Value] → [Device].
   - Specify the graph display area using [Display Range].



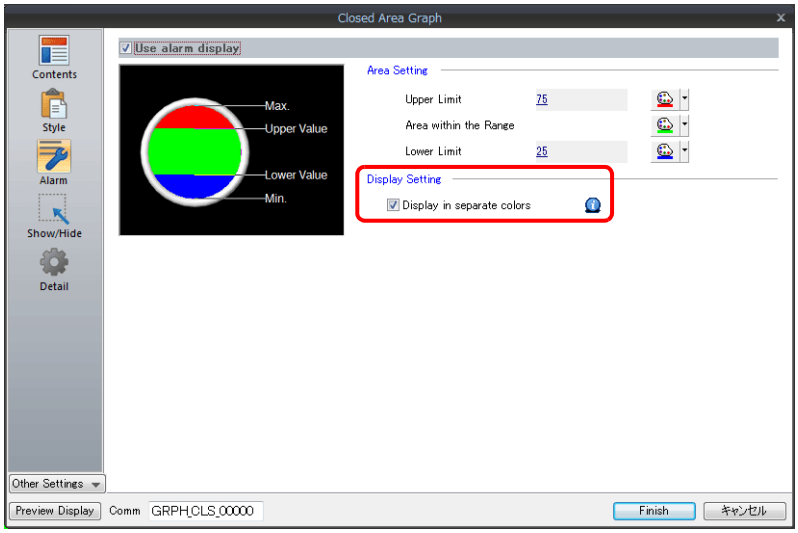
3. Configure the following settings for [Style] and then click [Finish].
   To change the graph color depending on the value, proceed to step 4.



4. Configure the [Alarm] settings to change the graph color depending on the value.
   In this case, color settings set for [Style] are disabled.



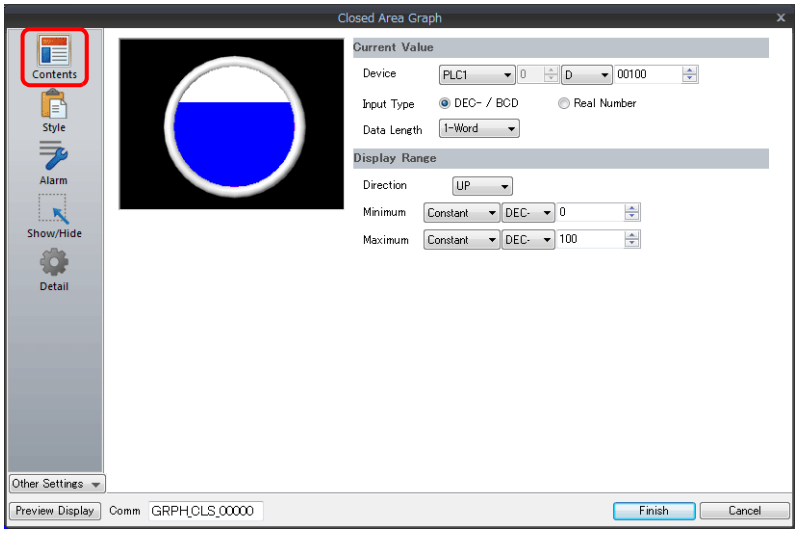
5. Set the following to display the graph using the different colors for different value ranges.



This completes the necessary settings.

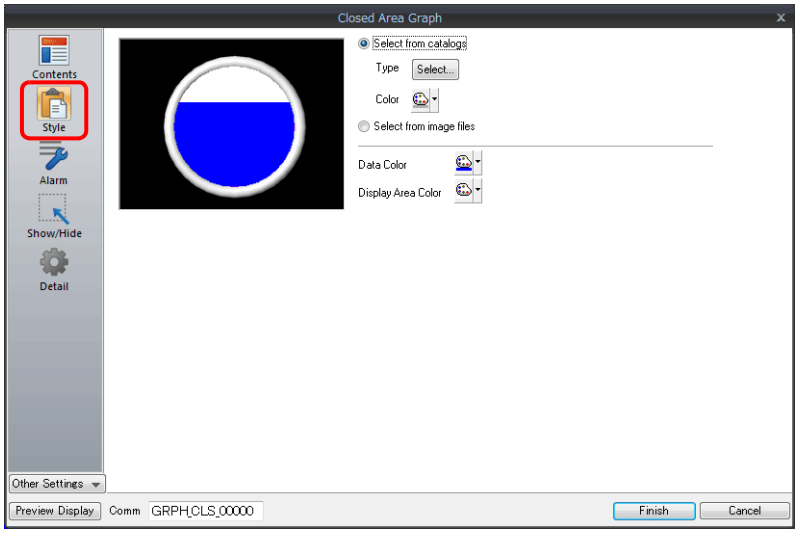
9.3.3 Detailed Settings

Displayed Information



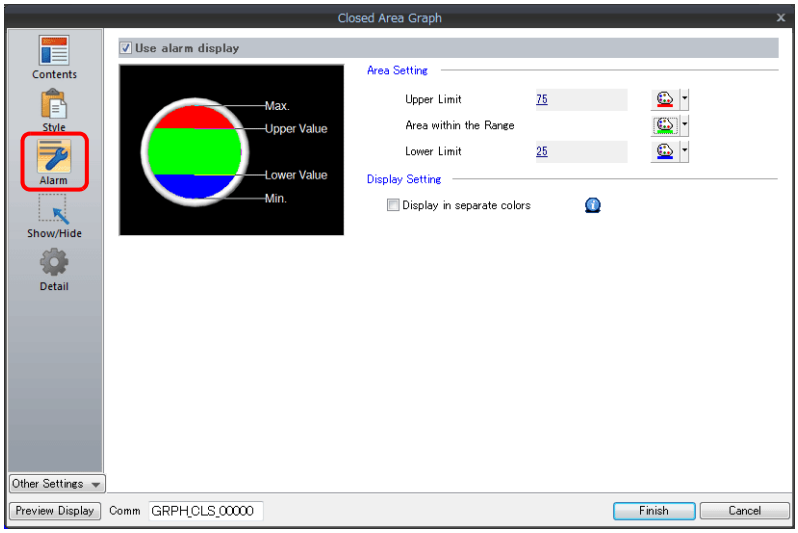
Item		Description
Current Value	Device	Specify the device memory address to monitor as a graph.
	Input Type (DEC- / BCD, Real Number)	Select the data format of device memory values. The selection here also applies to the values of [Display Range] and [Alarm]. * When [DEC-/BCD] is selected, the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting] takes effect.
	Data Length (1-Word, 2-Word)	Select data length of the device memory.
Display Range	Direction (UP, DW, LFT, RGT)	Set the direction to draw graph lines.
	Minimum/Maximum	Specify the minimum and maximum values for the range of the graph. If the display range is variable, select a device memory. If the display range is fixed, specify a constant.

Style



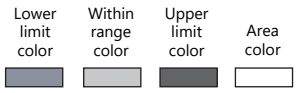
Item	Description
Select from catalogs	Type Set the part design. Color Set the part color.
Select from image files	Load a PNG file.
Data Color	Set the graph color from the minimum value to the device memory value. * If [Alarm] is configured, this is disabled.
Display Area Color	Set the color inside the graph area.

Alarm



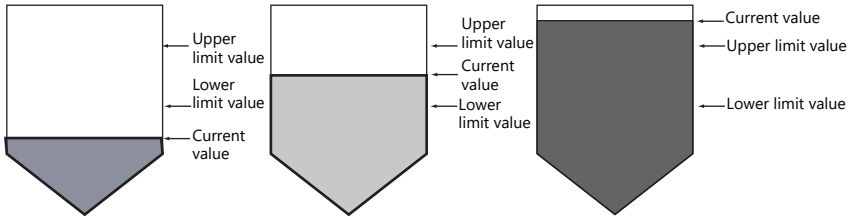
Item		Description
Use alarm display		Change the colors of the graph according to the device memory value. The color settings are implemented in the area settings.
Area Setting	Upper Limit/Area within the Range/Lower Limit	Set the range for alarm display and each corresponding color.
Display Setting	Display in separate colors	Display each alarm color separately on a single graph.

Examples of graphs with alarm settings

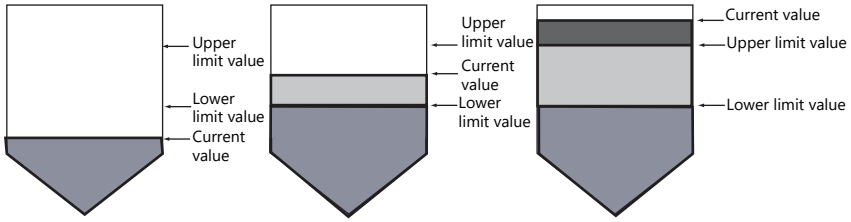


[Direction] set to UP

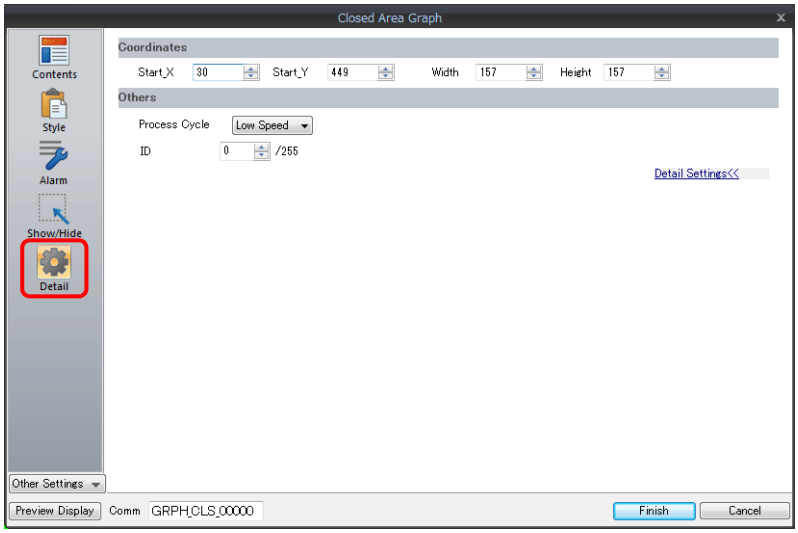
- Single color use



- Separate color use



Detail



Item		Description
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)
	Width/Height	Specify the width and height of the part.
Others	Process Cycle	Specify the process cycle of the part.
	ID	Set the ID.

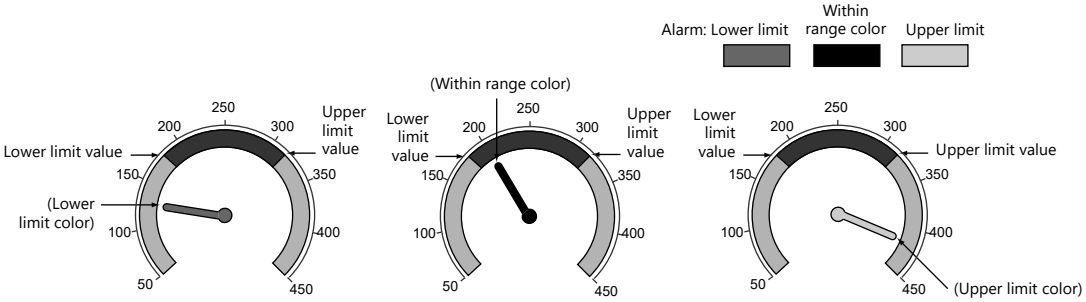
9.4 Panel Meter

9.4.1 Overview

- Data in a device memory can be expressed in the form of an analog meter.
  The indicator can be selected to move in either the clockwise or counterclockwise direction.

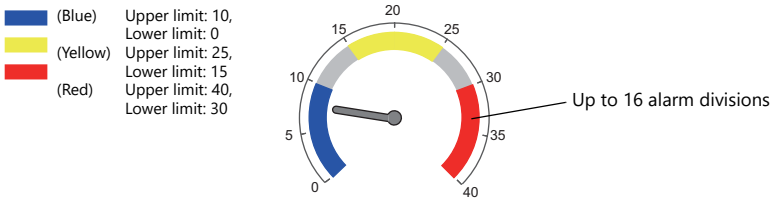
☞ For setting examples, refer to "Displaying Current Values" page 9-28.

- Alarm display
  - Location used for alarms: indicator
    When data in the device memory exceeds or falls short of the range specified, the indicator color changes to show the status.



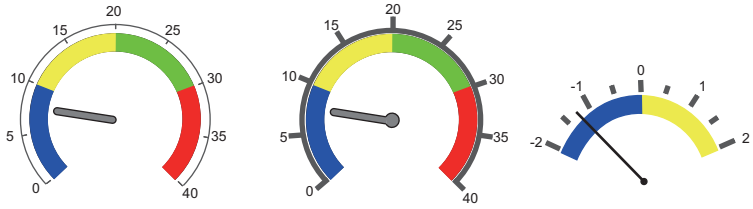
☞ For setting examples, refer to "Displaying Current Values" page 9-28.

  - Location used for alarms: Area
    When divisions are made in the alarm range, these divisions can be colored separately. Division into a maximum of 16 sections is allowed.
    Note that the color of the indicator does not change according to the alarm condition.
    Example: No. of divisions: 3



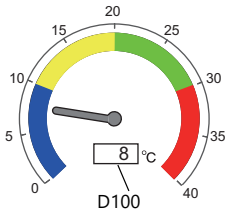
☞ For setting examples, refer to "Displaying Current Values" page 9-28.

- Extended indicator/scale settings
  The design of the scale or indicator can be changed using a PNG file prepared by the user.



☞ For setting examples, refer to "Using Image Files for the Indicator and Scale" page 9-43.

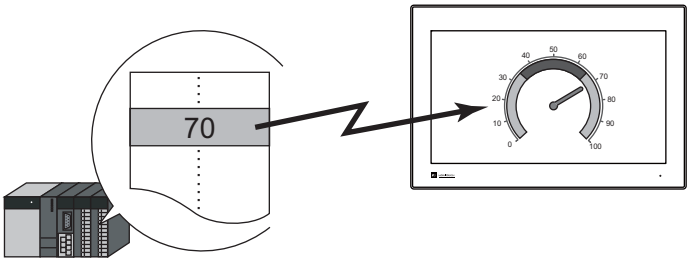
- Numerical data display
  The current data can be displayed on the panel meter in numerical format.
  Example: When "8" is set in the device memory address D100



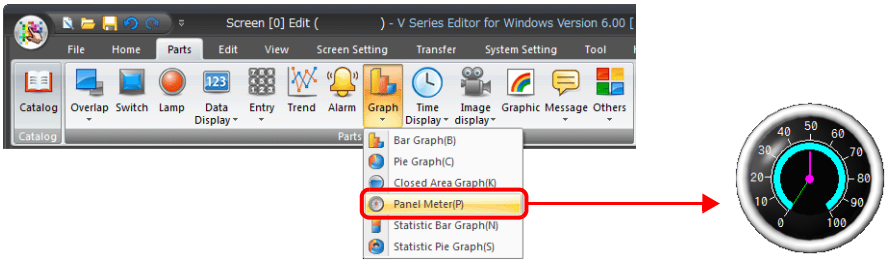
9.4.2 Setting Examples

Displaying Current Values

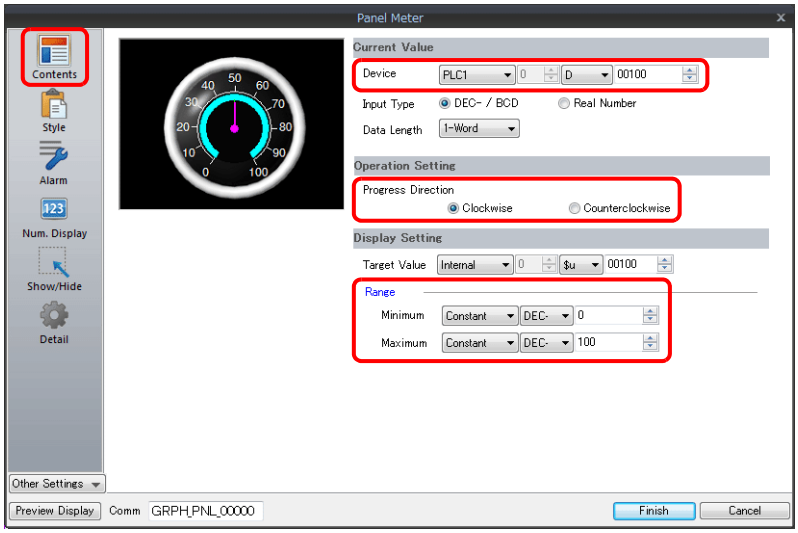
The current value of a device memory within the range of the minimum and maximum values can be displayed.



1. Click [Parts] → [Graph] → [Panel Meter] and place a panel meter on the screen.

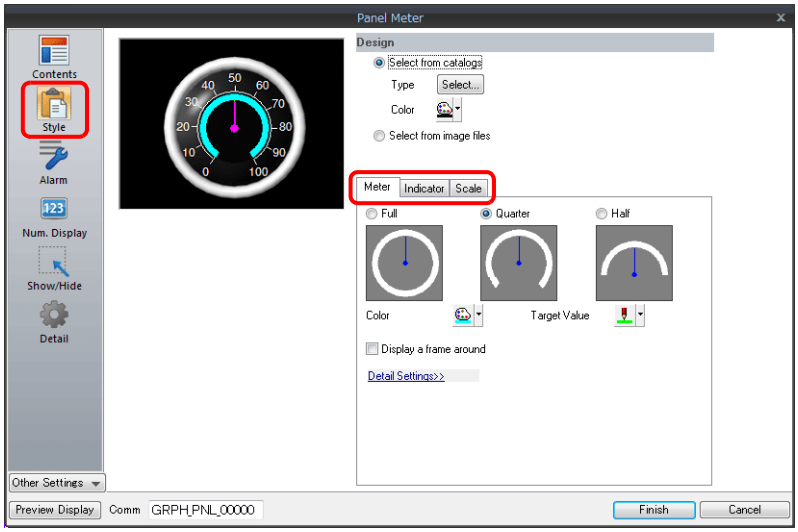


2. Double-click on the panel meter to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the device memory address to display on the panel meter with [Current Value] → [Device].
   - Select the direction of indicator movement with [Operation Setting] → [Progress Direction].
   - Specify the graph display area using [Display Setting] → [Range].



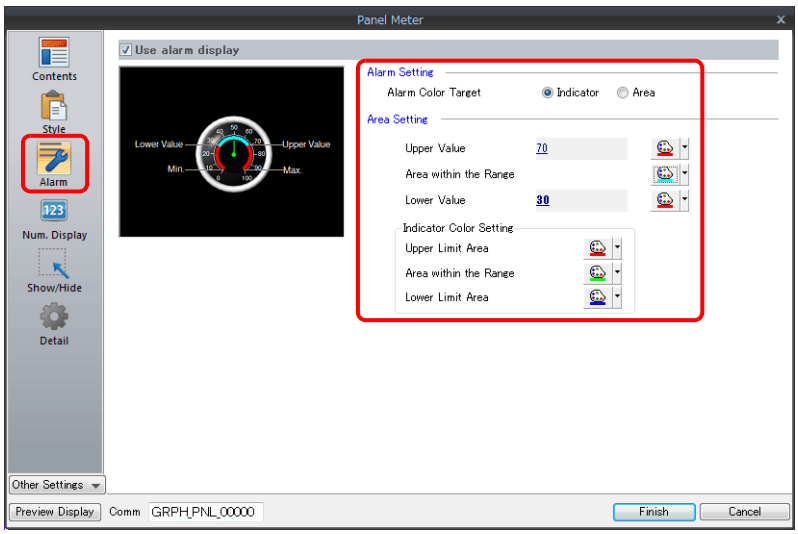
3. Configure the following settings for [Style] and then click [Finish].
   - Set the meter shape and color on the [Design] → [Meter] tab.
   - Set the indicator shape and color on the [Design] → [Indicator] tab.
   - Set the scale shape and color on the [Design] → [Scale] tab.

   To change the panel meter color depending on the value, proceed to step 4.

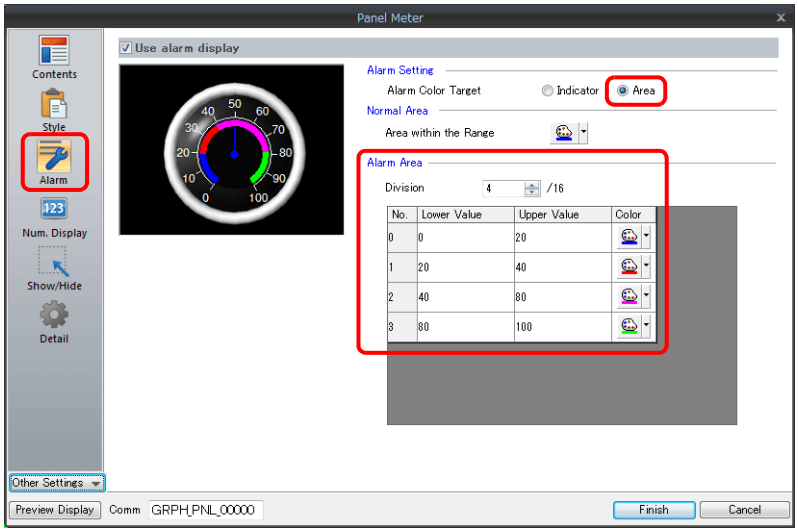


4. Configure the [Alarm] settings to change the indicator and meter color depending on the value.
   - When [Indicator] is selected for [Alarm Setting] → [Alarm Color Target]

     Set the three colors of the indicator, two colors of the meter area, and range. In this case, color settings set on the [Meter] and [Indicator] tabs in the [Style] settings are disabled.



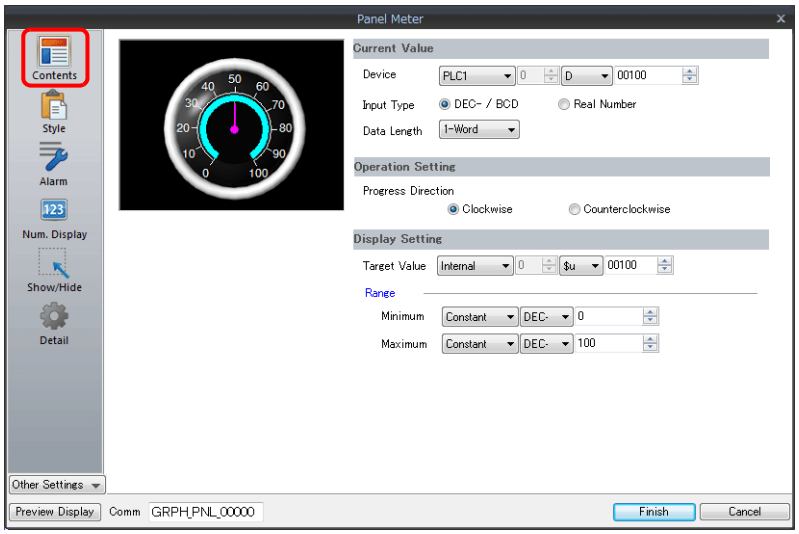
- When [Area] is selected for [Alarm Setting] → [Alarm Color Target]
  Set the color of the meter area and the range. (Up to 16 divisions)
  In this case, color settings set on the [Meter] tab in the [Style] settings are disabled.



This completes the necessary settings.

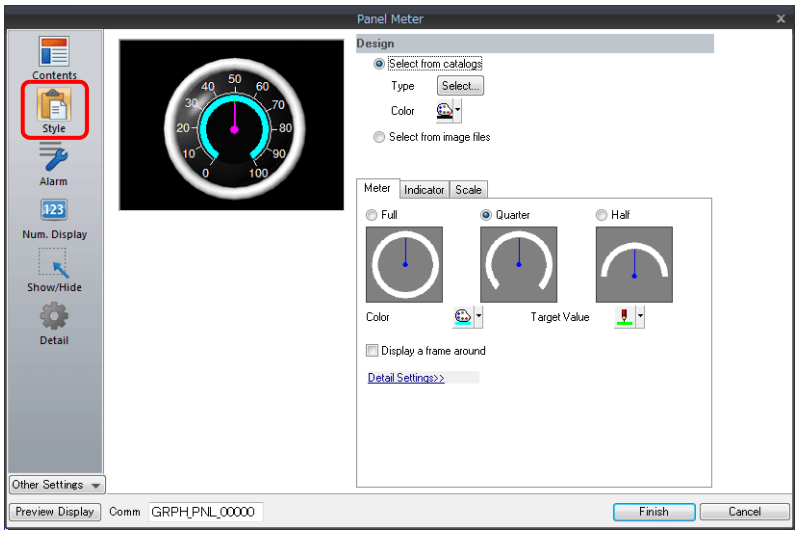
9.4.3 Detailed Settings

Contents



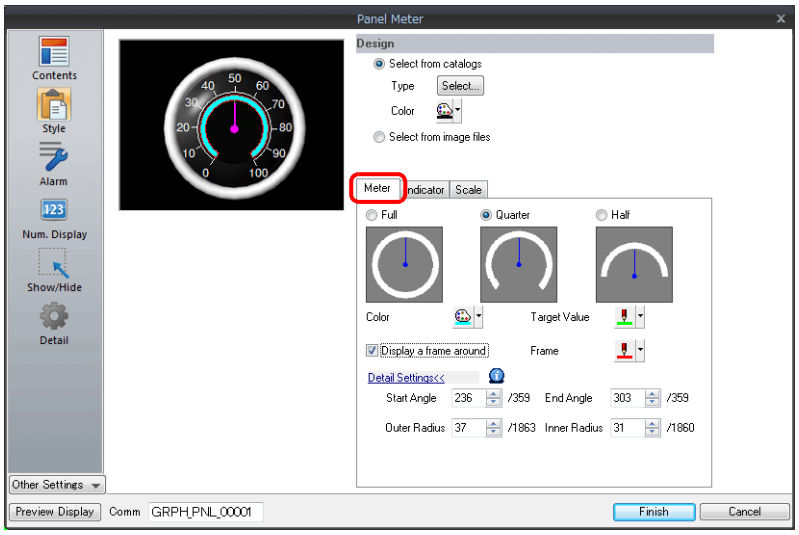
Item		Description
Current Value	Device	Specify the device memory address to monitor.
	Input Type (DEC- / BCD, Real Number)	Select the data format of device memory values. The selection here also applies to the values of [Range] and [Alarm]. * When [DEC-/BCD] is selected, the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting] takes effect.
	Data Length (1-Word, 2-Word)	Select data length of the device memory.
Operation Setting	Progress Direction (Clockwise, Counterclockwise)	Select the direction of indicator movement.
Display Setting	Target Value	Display a line at the position of the target value on the panel meter. * If the minimum value of the range is set, a line is not displayed. * If [Alarm] is configured, the [Standard Value] or [Target Value] setting is disabled.
	Range (Maximum, Minimum)	Specify the minimum and maximum values for the display range of the panel meter. If the display range is variable, select a device memory. If the display range is fixed, specify a constant.

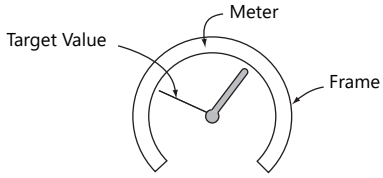
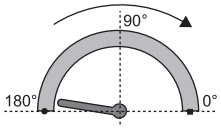
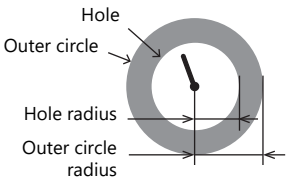
Style



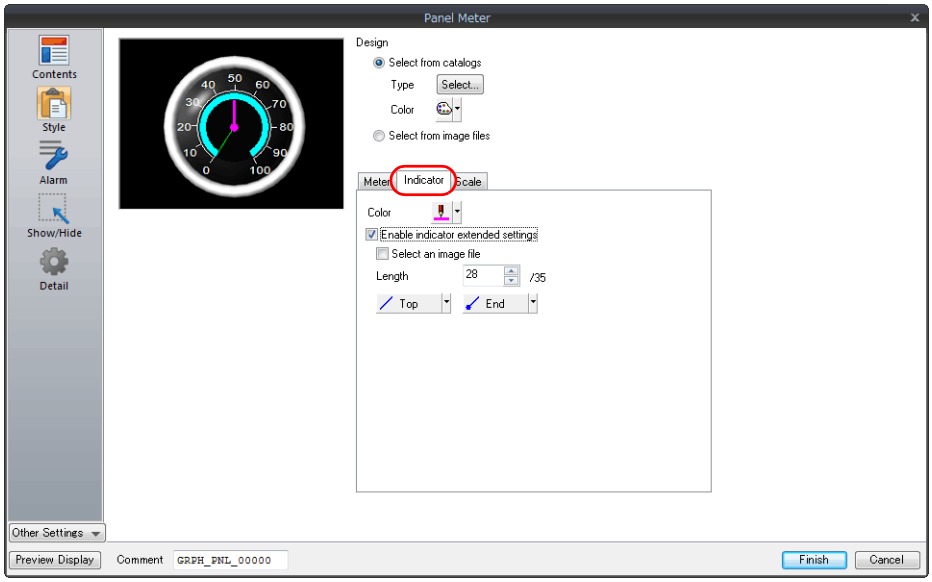
Item		Description
Design	Select from catalogs	Type Set the part design. Color Set the part color.
	Select from image files	Load an image file.
	Meter	Set the color and size of the meter. For details, refer to "Meter" page 9-33.
	Indicator	Set the color and size of the indicator. For details, refer to "Indicator" page 9-34.
	Scaling	Set the color, size, and number of divisions for the scale. For details, refer to "Scaling" page 9-35.

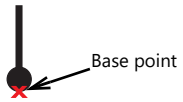
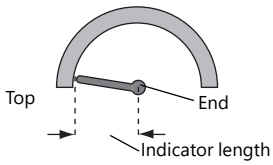
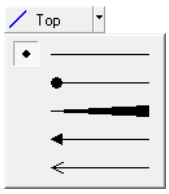
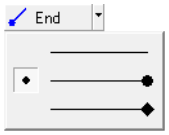
Meter



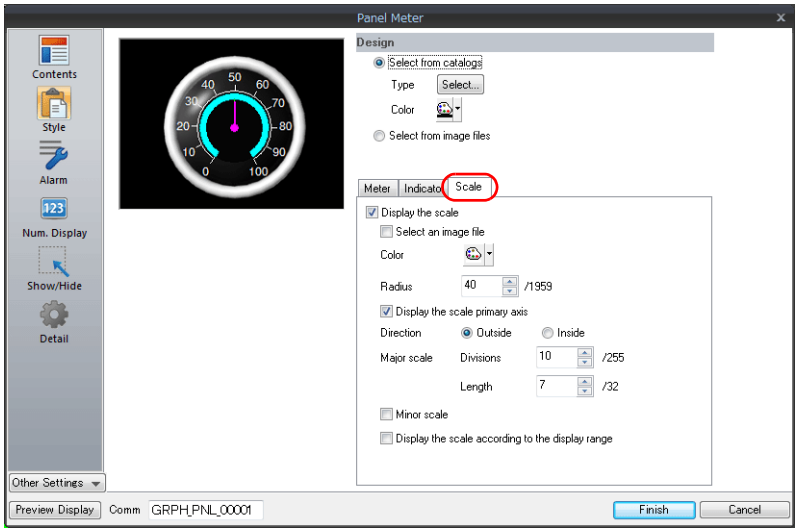
Item		Description	
Full, Quarter, Half		Select the shape of the meter.	
Color		Set the color of the meter.	
Target Value		Set the color of the line displayed for the target value. * If [Alarm] is configured, this is disabled.	
Display a frame around		Select this checkbox to display a frame around the meter. When this checkbox is selected, the frame color can be set.	
	Frame	Set the frame color for the meter.	
Customize the size		Set the meter to an arbitrary size.	
	Start Angle	Set the start position of the meter.	Example: [Start Angle]: 180, [End Angle]: 0  * The panel meter area is the area circularly enclosed from the start angle to the end angle in the clockwise direction.
	End Angle	Set the end position of the meter.	
	Outer Radius	The meter comprises the area between the outside and inside circles. The meter width can be adjusted with the outside circle and inside circle radii.	 * The inner circle must be set. The minimum radius of the inner circle is 10 pixels. The minimum difference between the radii of the outer and inner circles is 3 pixels.
	Inner Radius		

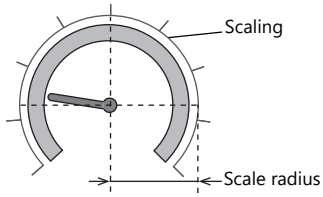
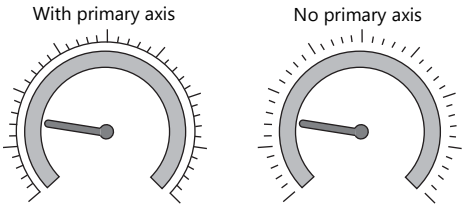
Indicator

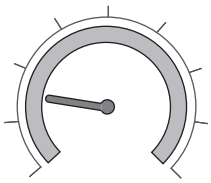
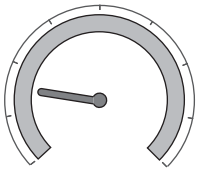
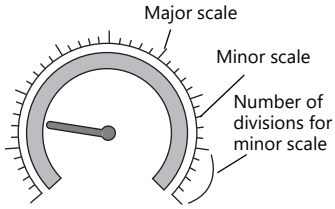


Item			Description	
Color			Set the indicator color. * If [Alarm Color Target] is set to [Indicator] in the [Alarm] settings, this is disabled.	
Enable indicator extended settings			Select this checkbox to specify the indicator's design.	
Select an image file			Select this checkbox to use an image file as the indicator.	
	Select		Select an image file to display as the indicator.	
	Size Setting	Width	Change the width of the image file.	
		Height	Change the height of the image file.	
		Fix aspect ratio	Enlarge/reduce the image file with the width and height bound to a fixed aspect ratio.	
	Position Setting	Base Point X	Adjust the horizontal position of the indicator image.	 * The indicator rotates around the point specified for [Panel Meter Center Point].
		Base Point Y	Adjust the vertical position of the indicator image.	
		Panel Meter Center Point	Displays the coordinates of the panel meter center point.	
		Default	Restore the base position of the indicator image (center bottom edge of the image file) to the center coordinates of the panel meter.	
Length			Set the length of the indicator in pixels. (Maximum: Radius of the panel meter; Minimum : 1)	
Top			Select the shape of the indicator tip. 	
End			Select the shape of the indicator base. 	

Scaling

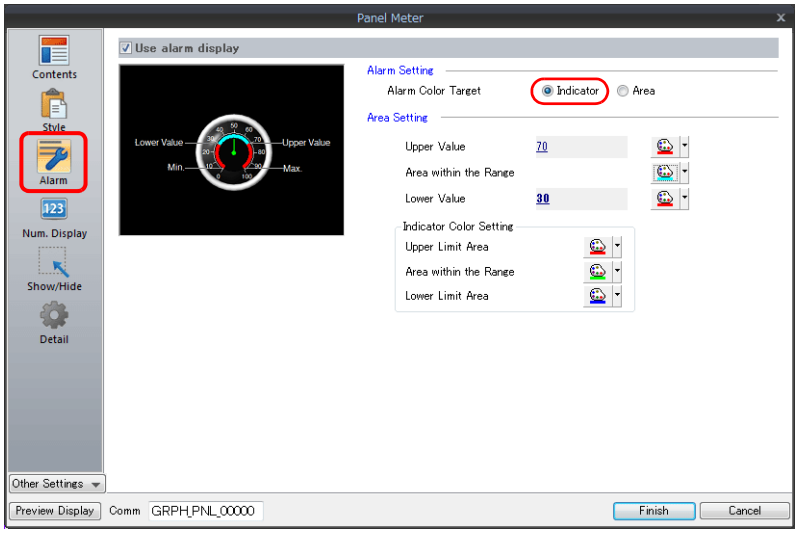


Item			Description	
Display the scale			Select this checkbox to display a scale on the panel meter.	
Select from image files			Select this checkbox to use an image file as the scale.	
	Select		Select an image file to display as the scale.	
	Size Setting	Width	Change the width of the image file.	
		Height	Change the height of the image file.	
		Fix aspect ratio	Enlarge/reduce the image file with the width and height bound to a fixed aspect ratio.	
	Position Setting	Base Point X	Adjust the horizontal position of the scale image.	
		Base Point Y	Adjust the vertical position of the scale image.	
		Panel Meter Center Point	Displays the coordinates of the panel meter center point.	
		Default	Restore the base position of the scale image (center of the image file) to the center coordinates of the panel meter.	
Color			Set the scale color.	
Radius			Set the scale size.	
Display the scale primary axis			Select this checkbox to display the primary axis on the scale.	

Item		Description	
Direction	Outside	Display tick marks on the outside of the primary axis.	
	Inside	Display tick marks on the inside of the primary axis.	
Major scale	Divisions (1 - 255)	Set the number of divisions on the major scale across the entire scale.	Example: Major scale divisions: 8 Minor scale divisions: 5 
	Length (1 - 16)	Set the length of the major scale. * If using the minor scale, the length increases and decreases by 2.	
Minor scale		Select this checkbox to divide the major scale by the minor scale. * The length of the minor scale is half of the major scale.	
	Divisions (1 - 16)	Set the number of divisions across the major scale.	
Display the scale according to the display range		This is only available for parts that correspond to a numerical display. An optimal scale is displayed according to the minimum and maximum of the value in the range. This setting is only available when the minimum and maximum values are specified with constants. Display numerical values on the scale according to the display range of the panel meter.	

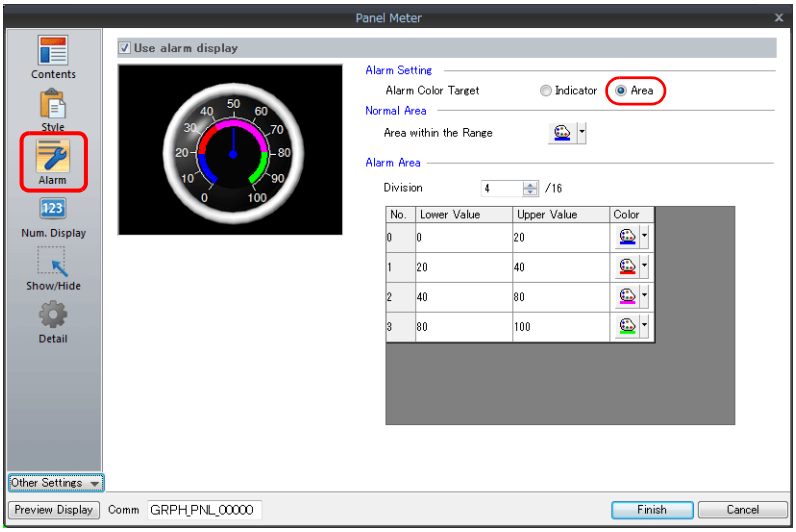
Alarm

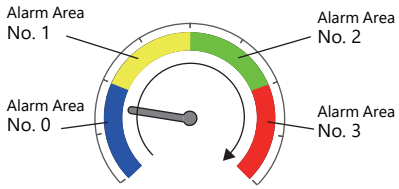
Alarm color target: indicator



Item			Description
Use alarm display			Select this checkbox to use the alarm function.
Alarm Setting	Alarm Color Target	Indicator	The indicator color is displayed using three alarm colors according to the upper and lower limit values. The meter is displayed using the two colors for within the range of the upper and lower limits, and outside of the range.
		Area	The meter color can be divided into a maximum of 16 colors according to the [Alarm Area] settings. The indicator color is fixed. For details on settings, refer to "Alarm color target: area" page 9-38.
Area Setting	Upper Value		Set the color of the meter for the upper limit value and outside the range of the upper and lower limits of the alarm display.
	Area within the Range		Set the within range color.
	Lower Value		Set the color of the meter for the lower limit value and outside the range of the upper and lower limits of the alarm display.
	Indicator Color Setting	Upper Limit Area	Set the indicator color when the current value exceeds the upper limit value.
		Area within the Range	Set the indicator color when the current value is within the range of the upper and lower limits.
		Lower Limit Area	Set the indicator color when the current value is less than the lower limit value.

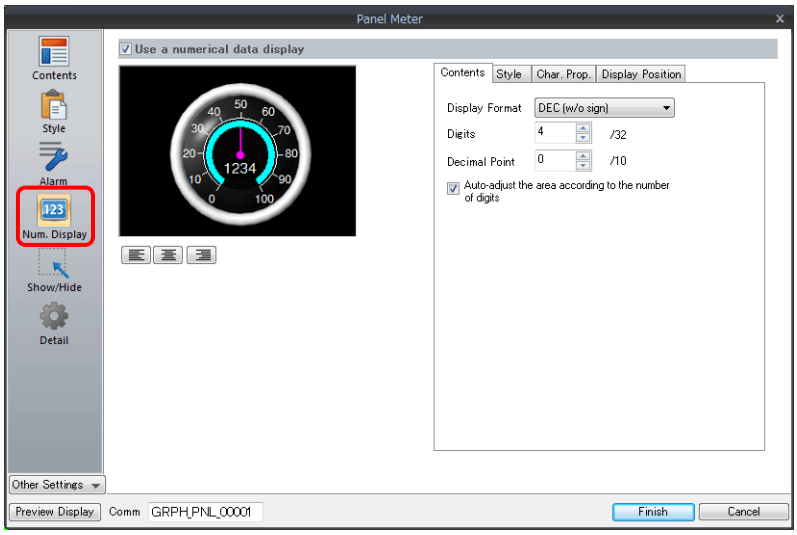
Alarm color target: area



Item			Description	
Use alarm display			Select this checkbox to use the alarm function.	
Alarm Setting	Alarm Color Target	Indicator	The indicator color is displayed using three alarm colors according to the upper and lower limit values. The meter is displayed using the two colors for within the range of the upper and lower limits, and outside of the range. For details on settings, refer to "Alarm color target: indicator" page 9-37.	
		Area	The meter color can be divided into a maximum of 16 colors according to the [Alarm Area] settings. The indicator color is fixed.	
Normal Area	Area within the Range		Specify the color of the area not included in the alarm range in the display range of the panel meter.	Example: Divisions: 4, clockwise  * Drawing is performed in order from "Data 0 property" to "Data 15 property". When a range overlaps with another when drawn, the color of the data property with the higher number is displayed in the foreground.
Alarm Area	Division		Set the number of alarm areas.	
	No. 0 - 15	Lower Value	Set the lower limit value of the alarm area.	
		Upper Value	Set the upper limit value of the alarm area.	
		Color	Set the display color of the alarm area.	

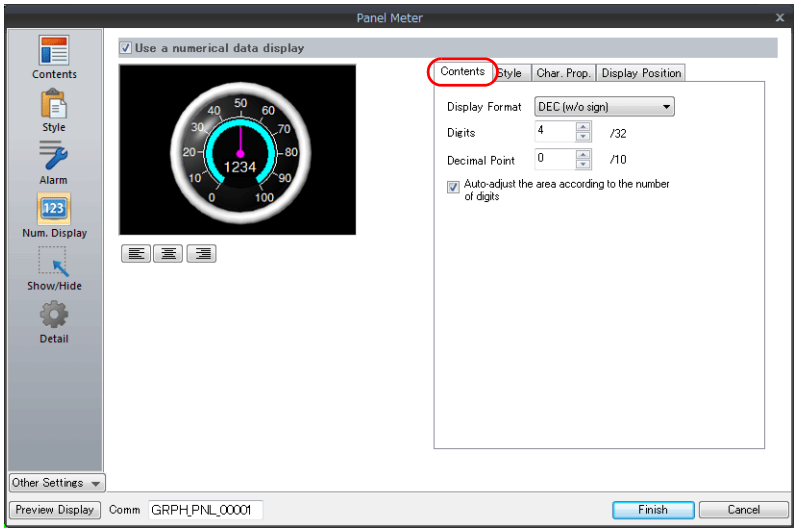
Num. Display

A panel meter can be set with a numerical data display to show the current value.



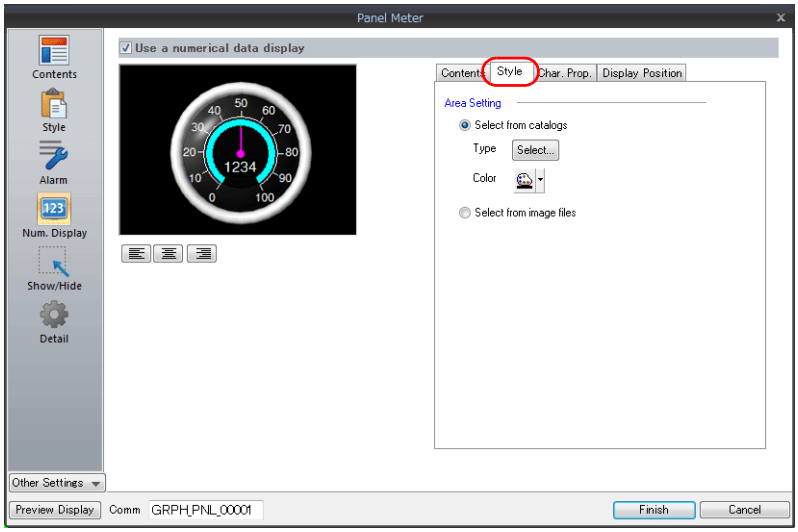
Item		Description
Use a numerical data display		Select this checkbox to display a numerical data display within the panel meter.
	Contents	Specify the display format, number of digits, and number of decimal places for the numerical data display. For details, refer to "Contents" page 9-39.
	Style	Specify the design of the numerical data display. For details, refer to "Style" page 9-40.
	Char. Prop.	Set a text color and size for the numeric data display. For details, refer to "Char. prop." page 9-41.
	Display Position	Specify the display position of the numerical data display. For details, refer to "Position" page 9-41.

Contents



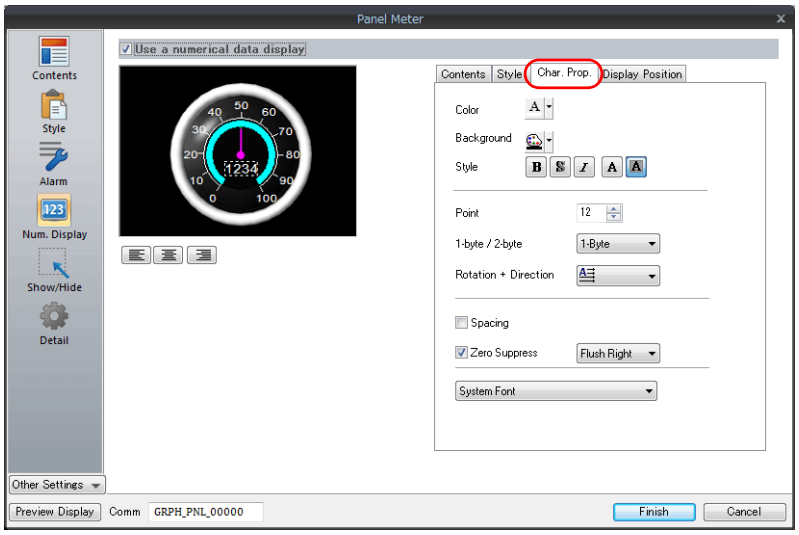
Item	Description
Display	Set the numerical value format.
Digit	Set the number of digits for the numerical data display.
Decimal Point	Set the number of decimal places. When no decimal point is required, set "0".
Auto-adjust the area according to the number of digits	Select this checkbox to automatically adjust the item size based on the [Digit] and [Decimal Point] settings.

Style



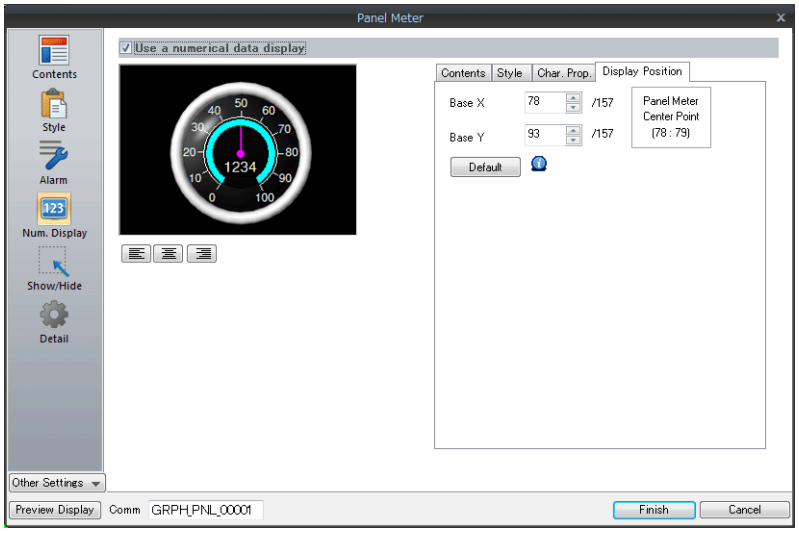
Item			Description
Area Setting	Select from catalogs		Select the design of the numerical data display part to use from the parts catalog. Type Select the design of the numerical data display part. Color Set the color of the numerical data display part.
	Select from image files		Select the design of the numerical data display part from an image file.
		Select	Select the image file to use.
		Width	Change the width of the image file.
		Height	Change the height of the image file.
		Fix aspect ratio	Enlarge/reduce the image file with the width and height bound to a fixed aspect ratio.

Char. prop.



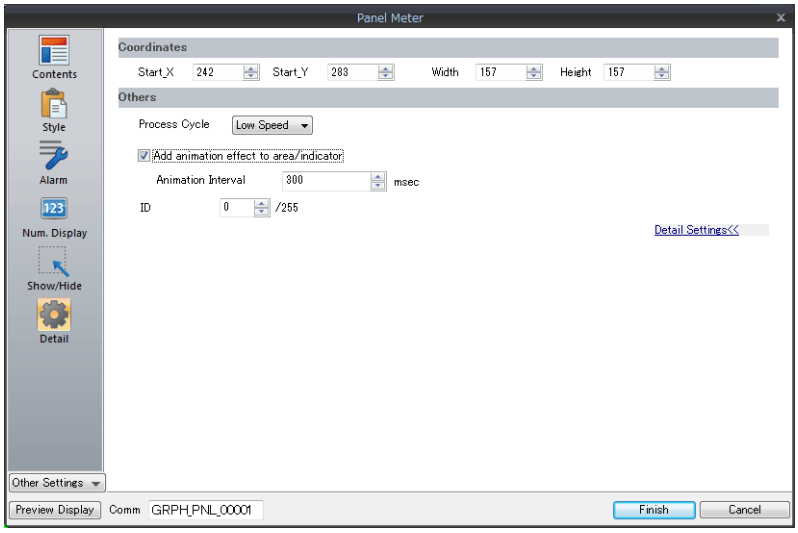
Item	Description
Color	Set the text color.
Background	Set the background color of the numerical data display area.
Style	Set the text style.
Character Size	Set the text size. * This changes to point specification when using a Windows font or 7-segment font.
Rotation +	Set the orientation of text. * This cannot be set when using a Windows font.
Spacing	To set a text spacing, select this checkbox and specify a spacing. * This cannot be set when using a Windows font.
Zero Suppress	To set zero suppression, select this checkbox and select flush left or flush right.
System Font Windows Font 7-segment Font	Select the font of the numerical data display.
Display light-out segments	This setting is available when [7-segment Font] is selected. Select this checkbox to display unlit segments.

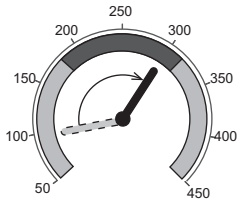
Position



Item	Description	
Base X	Adjust the horizontal position of the numerical data display.	
Base Y	Adjust the vertical position of the numerical data display.	
Panel Meter Center Point	Displays the coordinates of the panel meter center point.	
Default	Restore the base position of the numerical data display (center of the item) to the center coordinates of the panel meter.	

Detail



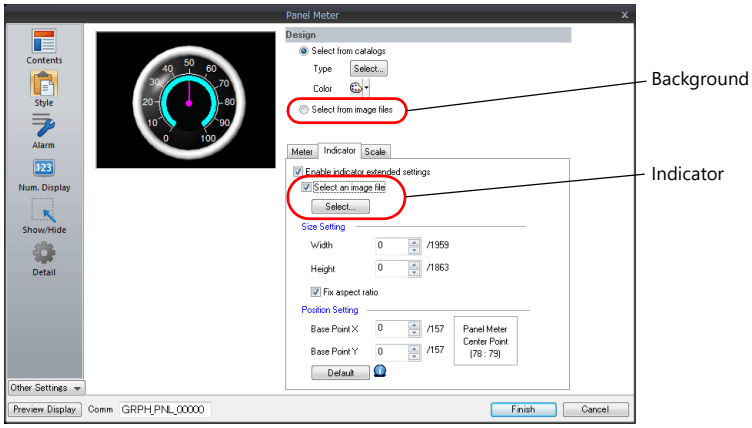
Item			Description	
Coordinates	Start X/Start Y		Specify the placement coordinates. (Coordinates at top left of part)	
	Width/Height		Specify the width and height of the part.	
Others	Process Cycle		Specify the process cycle of the part.	
	Add animation effect to area/indicator		Draw changes in the graph display over the time specified for [Animation Interval].	Example: Animation interval: 200 msec Current value changes from 100 to 300.  Indicator movement occurs over 200 msec.
		Animation Interval	Set the drawing speed of changes in the graph display.	
	ID		Set the ID.	

Using Image Files for the Indicator and Scale

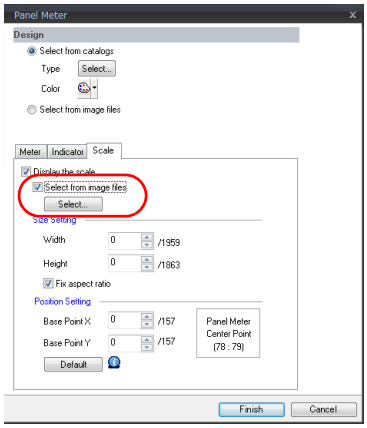
An image file created by the user can be used for the part design (background, indicator, and scale).

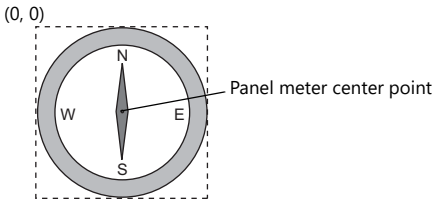
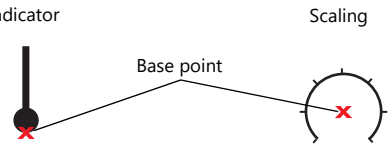
[Style]

Background / Indicator



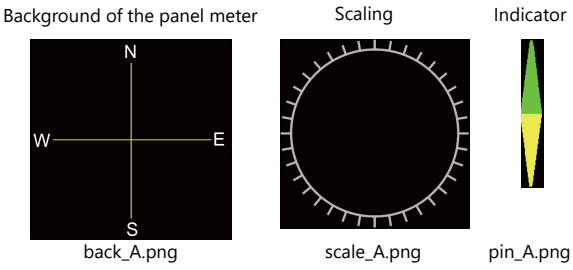
Scaling

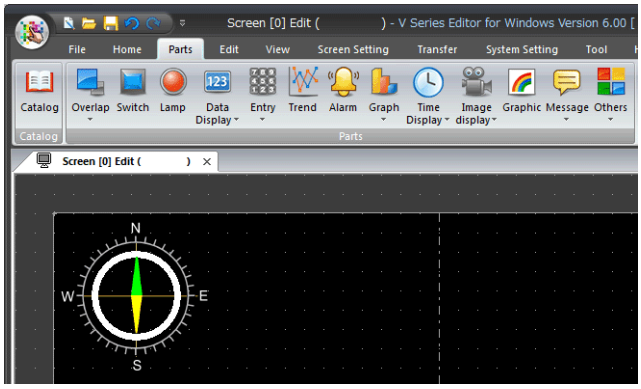


Item	Description
Select from images files (background/indicator/scale)	Select a PNG file from the desired folder. The selected PNG file is stored at ".\MONITOUCH\User\Parts".
Width, Height	Change the width and height of the imported PNG file.
Fix aspect ratio	Select this checkbox to use a fixed width-to-height ratio when changing the size of the PNG file.
Panel Meter Center Point	Displays the coordinate values of the panel meter (circle) center point. 
Base Point X/Base Point Y	Specify the X and Y coordinate values of the base point in pixels to adjust the position of the indicator or scale. The indicator rotates around the [Panel Meter Center Point]. 
Default	Restore the X and Y coordinate values of the base point to those specified for [Panel Meter Center Point].

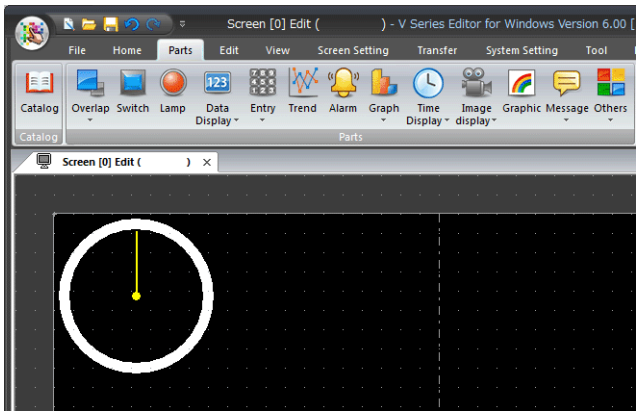
Setting procedure

This section explains the procedure for importing a PNG file into the panel meter.

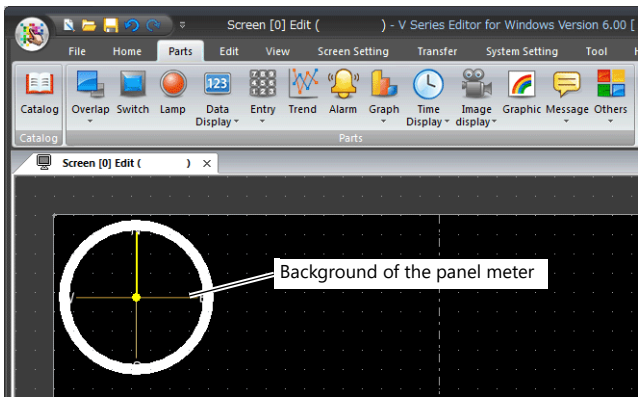




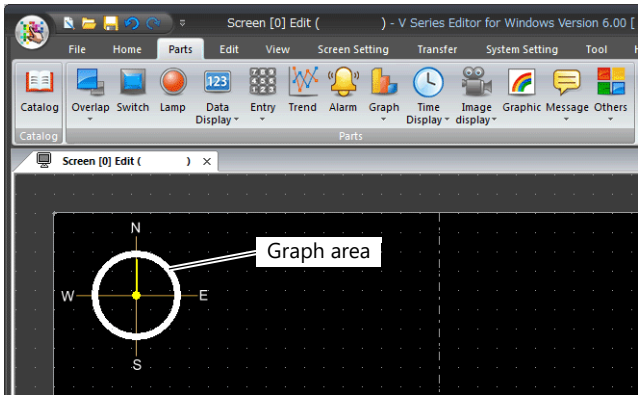
1. Place a panel meter on the screen.



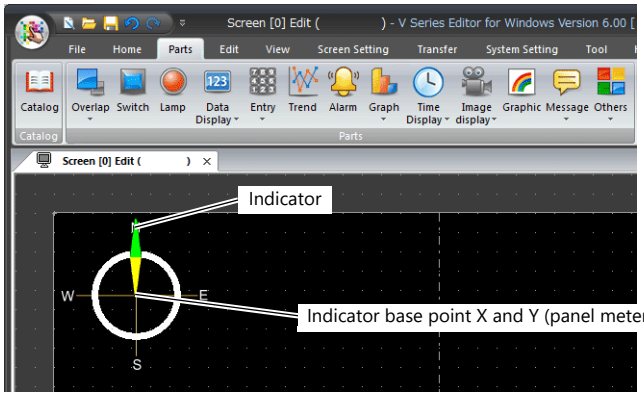
2. Import a background image for the panel meter.
   Select the [Style] → [Design] → [Select from image files] radio button in the settings window and click the [Select] button to select an image file (e.g. back_A.png).



3. Select the [Style] → [Meter] → [Detail Settings] in the settings window to enlarge or reduce the size using the [Outer Radius] and [Inner Radius] values.

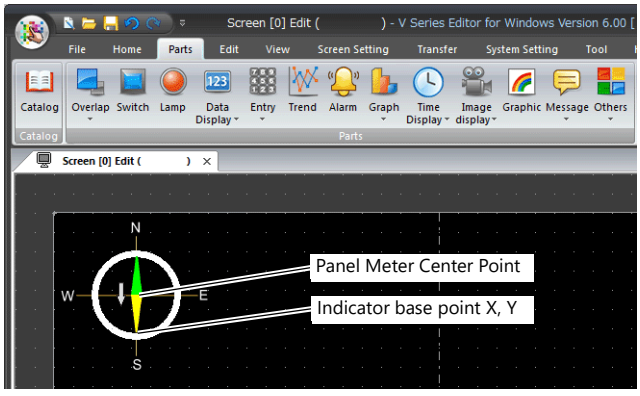


4. Import a PNG image for the indicator.
   Select the [Style] → [Indicator] → [Select an image file] checkbox in the settings window and click the [Select] button to select an image file (e.g. pin_A.png).



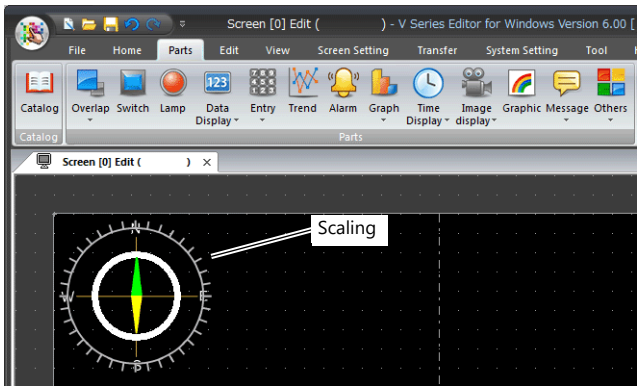
*** The PNG image of the indicator is imported while it is pointing upward with reference to the panel meter center point. The indicator cannot be rotated on the editor.**

5. Move the indicator part downward by specifying values for [Base Point X] and [Base Point Y] on the [Style] → [Indicator] tab.
   The indicator can be enlarged or reduced by specifying values for [Width] and [Height].

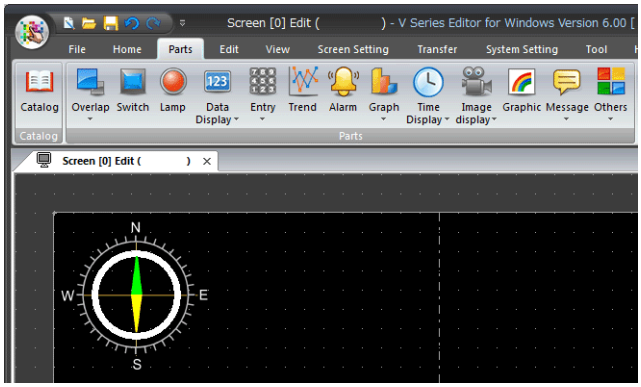


*** The indicator rotates around the panel meter center point.**

6. Import a PNG image of the scale.
   Select the [Style] → [Scale] → [Display the scale] → [Select an image file] checkbox in the settings window and click the [Select] button to select an image file (e.g. scale_A.png).



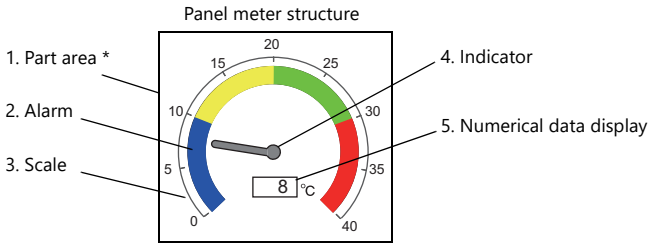
7. Specify values for [Width] and [Height] on the [Style] → [Scale] tab to reduce the size of the scale.
   The position of the scale can be moved by specifying values for [Base Point X] and [Base Point Y].



This completes the necessary settings.

Restrictions

- The order of drawing is shown below. Drawing is performed in ascending order.



  * When a draw item edited in the [Modify Part] window is placed on a 3D panel meter part, the item is placed over the panel meter.

- The numerical data display is displayed even when a value falls outside the range specified for [Scale] (specified at [Contents] → [Range]).
  However, if the number of digits exceeds the specified value, "---" is displayed.

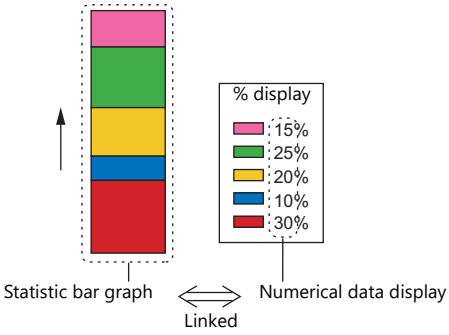
9.5 Statistic Bar Graph

9.5.1 Overview

- Percentages of data contained in consecutive device memory addresses can be expressed on a graph.
  One statistic bar graph can be divided into a maximum of eight sections.

  ☞ For setting examples, refer to "Displaying a Bar Graph of the Ratio of D100 to D104 Values" page 9-48.

- It is also possible to indicate percentages as numerical values for the statistic bar graph.
  In this case, the statistic bar graph must be linked to a numerical data display.

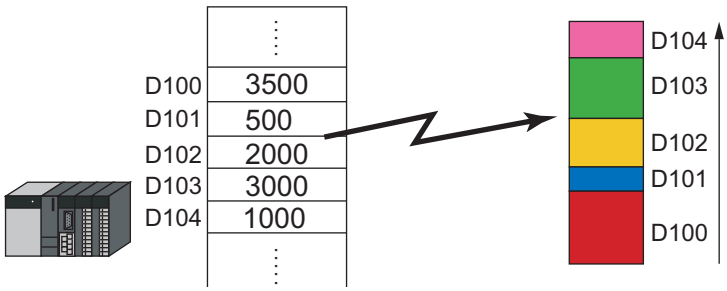


☞ For setting examples, refer to "Displaying a Numerical Data Display of the Ratio of D100 to D104 Values" page 9-49.

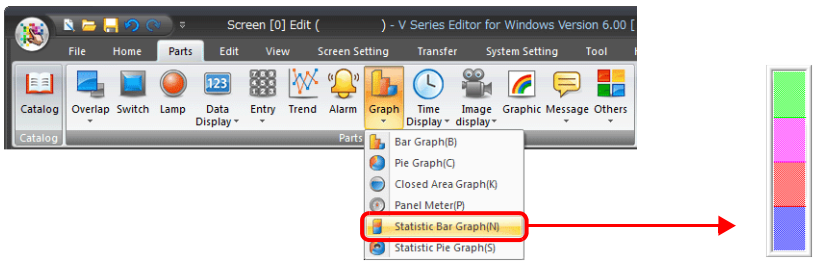
9.5.2 Setting Examples

Displaying a Bar Graph of the Ratio of D100 to D104 Values

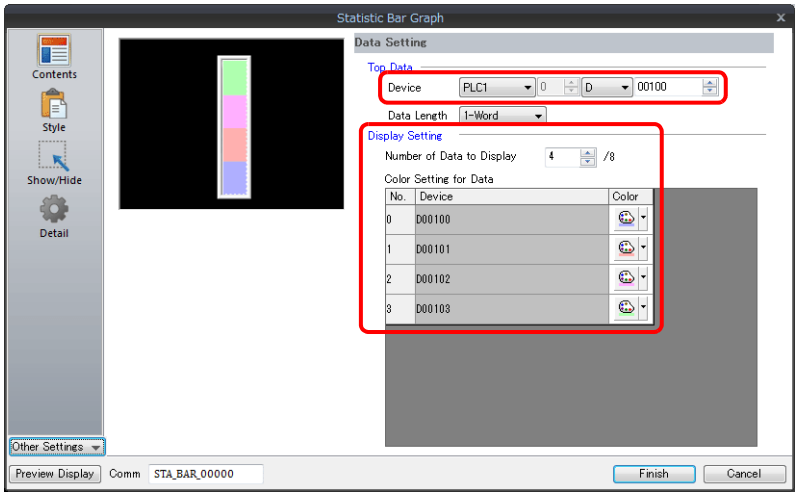
The following example shows how to display the ratio between the values of five device memory addresses on a bar graph.



1. Click [Parts] → [Graph] → [Statistic Bar Graph] and place a statistic bar graph on the screen.



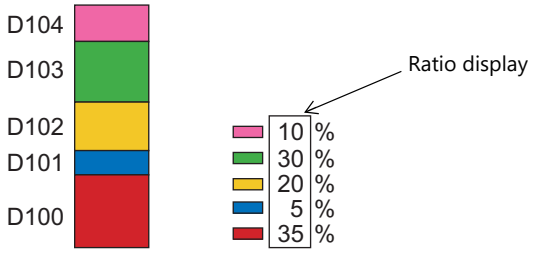
2. Double-click on the statistic bar-graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the top device memory address to display on the graph with [Top Data] → [Device].
   - Set the number of device memory addresses to display on the graph with [Display Setting] → [Number of Data to Display].
   - Set the color of each device memory on the graph display with [Display Setting] → [Color Setting for Data].



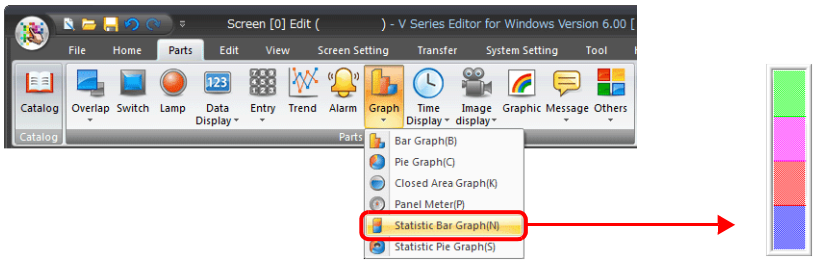
This completes the necessary settings.

Displaying a Numerical Data Display of the Ratio of D100 to D104 Values

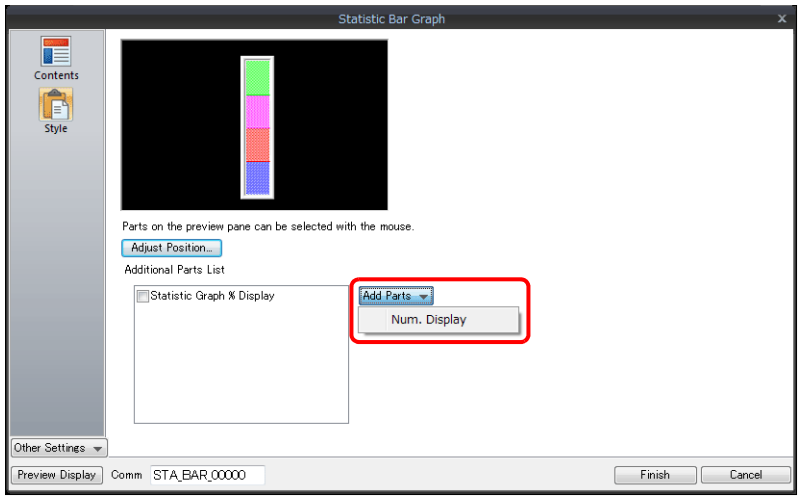
The following example shows how to display the ratio between the device memory addresses displayed on the statistic bar graph on a numerical data display.



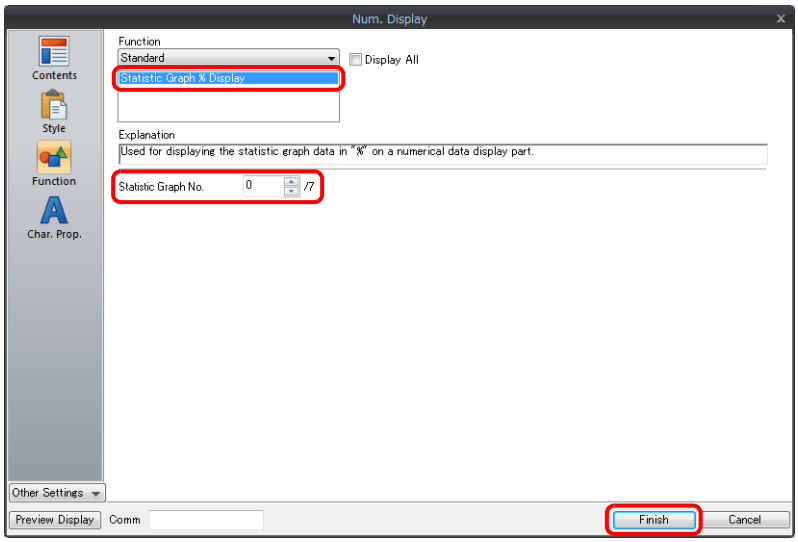
1. Click [Parts] → [Graph] → [Statistic Bar Graph] and place a statistic bar graph on the screen.



2. Double-click on the statistic bar-graph to display the settings window.
   Select [Num. Display] under [Add Parts] in the [Style] settings.



3. The settings window for the numerical data display is displayed. Select [Statistic Graph % Display] for [Function] and specify a value for [Statistic Graph No.]. Click [Finish] to close the settings window of the numerical data display.

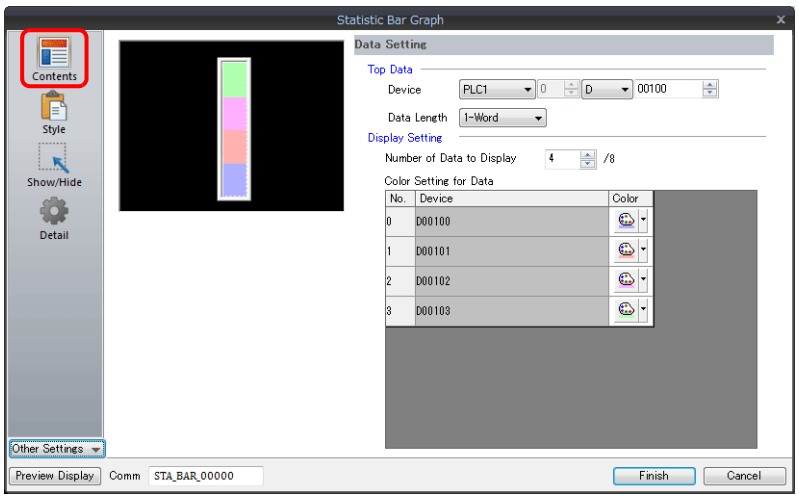


4. Repeat steps 2. and 3. to place multiple numerical data displays.

This completes the necessary settings.

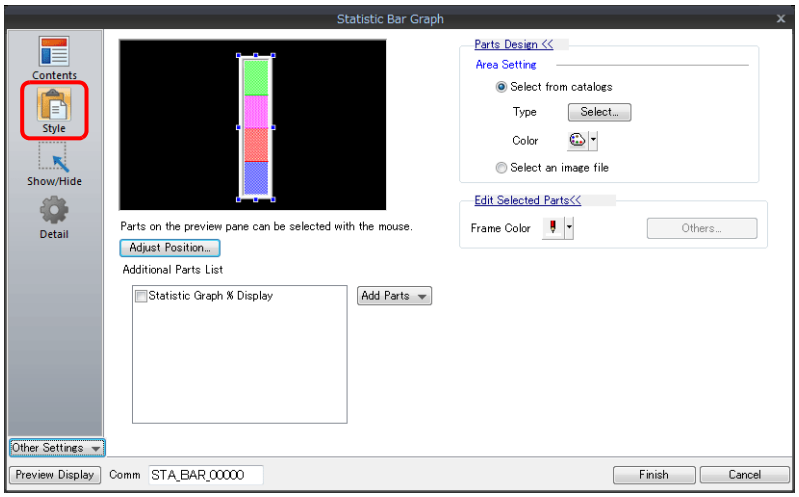
9.5.3 Detailed Settings

Contents



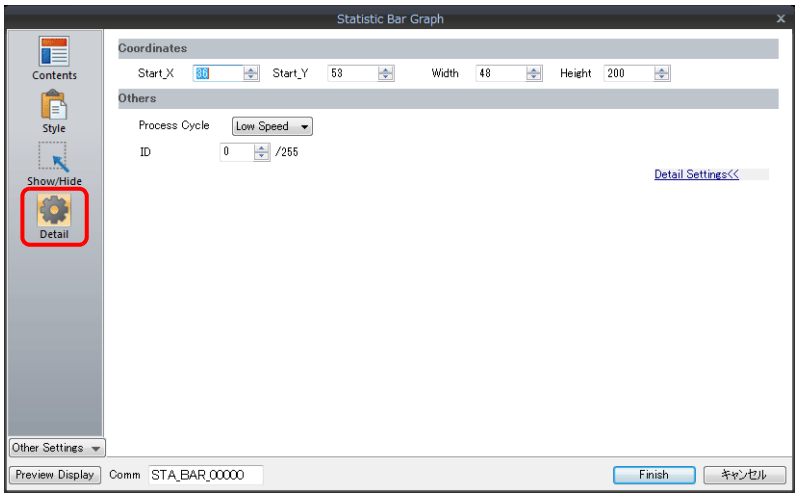
Item			Description
Data Setting	Top Data	Device	Set the top device memory address to display on the statistic graph. The required device memory are automatically allocated to the statistic graph. * The data format relies on the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting].
		Data Length (1-Word, 2-Word)	Select data length of the device memory.
	Display Setting	Number of Data to Display	Set the number of device memory to display on the statistic graph.
		Color Setting for Data	Set the color for each data memory displayed on the statistic graph.

Style



Item		Description
Select from catalogs		Type Set the part design. Color Set the part color.
Select an image file		Load an image file.
Frame Color		Set the color of the frame around the graph area.
Additional Parts List	Statistic Graph % Display	Add [Statistic Graph % Display].
Add Parts	Num. Display	Add a numerical data display part.

Detail



Item		Description
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)
	Width/Height	Specify the width and height of the part.
Others	Process Cycle	Specify the process cycle of the part.
	ID	Set the ID.

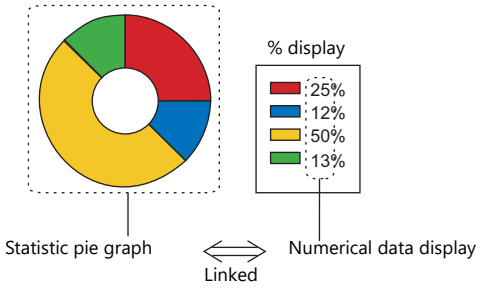
9.6 Statistic Pie Graph

9.6.1 Overview

- Percentages of data contained in consecutive device memory addresses can be expressed on a graph.
  One statistic pie graph can be divided into a maximum of eight sections.

  ☞ For setting examples, refer to "Displaying a Pie Graph of the Ratio of D100 to D103 Values" page 9-54.

- It is also possible to indicate percentages as numerical values for the statistic pie graph.
  In this case, the statistic pie graph must be linked to a numerical data display.

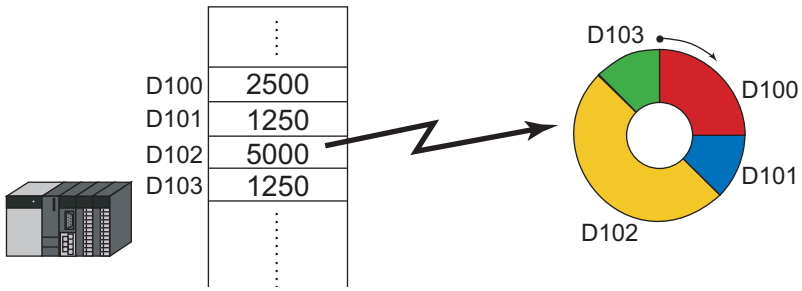


☞ For setting examples, refer to "Displaying a Numerical Data Display of the Ratio of D100 to D103 Values" page 9-55.

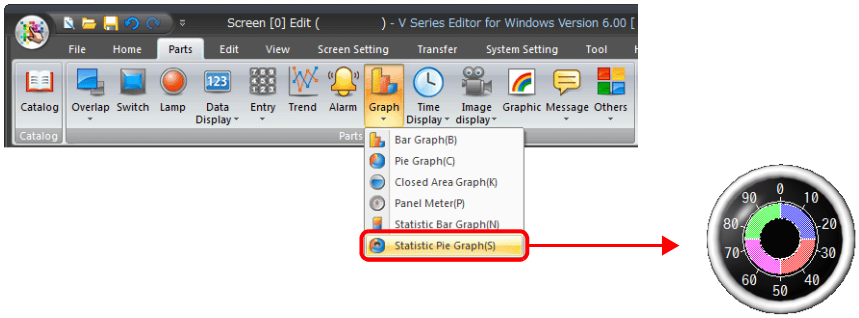
9.6.2 Setting Examples

Displaying a Pie Graph of the Ratio of D100 to D103 Values

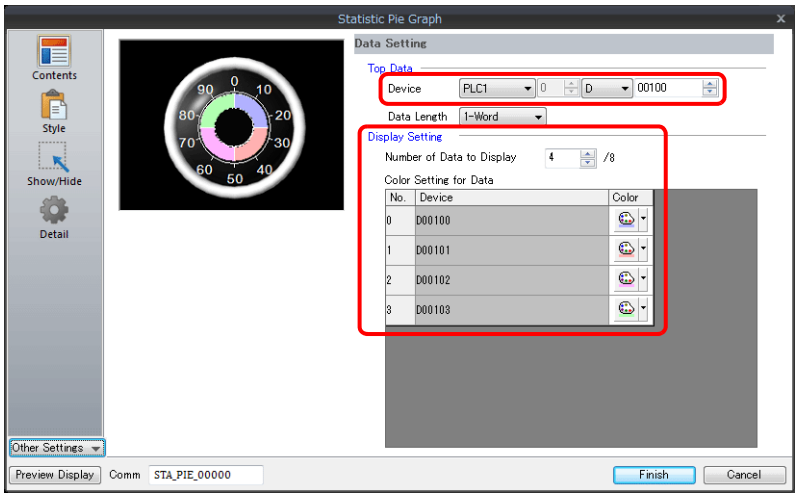
The following example shows how to display the ratio between the values of four device memory addresses on a pie graph.



1. Click [Parts] → [Graph] → [Statistic Pie Graph] and place a statistic pie graph on the screen.



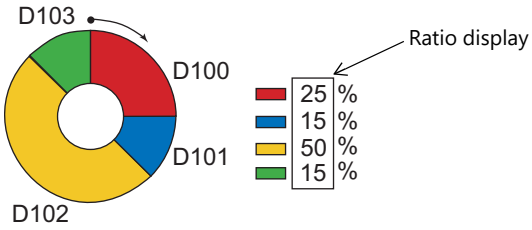
2. Double-click on the statistic pie graph to display the settings window.
   Configure the [Contents] settings as shown below.
   - Set the top device memory address to display on the graph with [Top Data] → [Device].
   - Set the number of device memory addresses to display on the graph with [Display Setting] → [Number of Data to Display].
   - Set the color of each device memory address on the graph display with [Display Setting] → [Color Setting for Data].



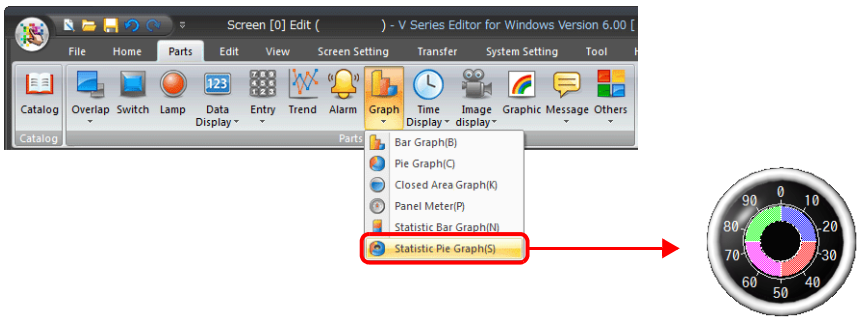
This completes the necessary settings.

Displaying a Numerical Data Display of the Ratio of D100 to D103 Values

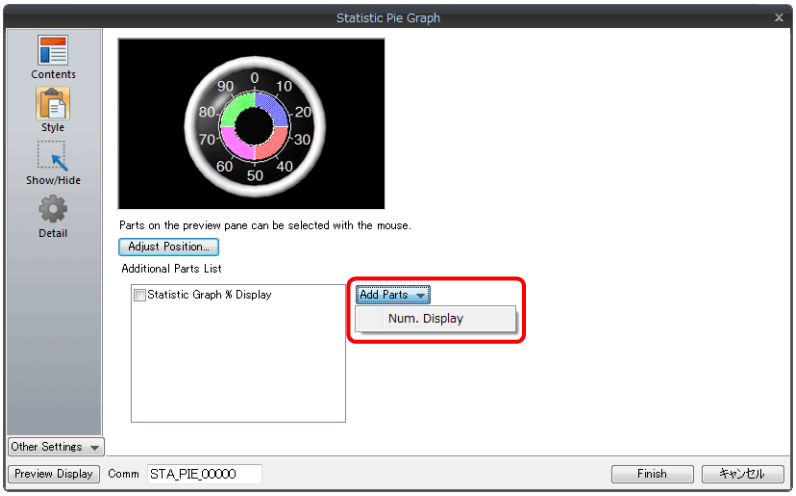
The following example shows how to display the ratio between the device memory addresses displayed on the statistic pie graph on a numerical data display.



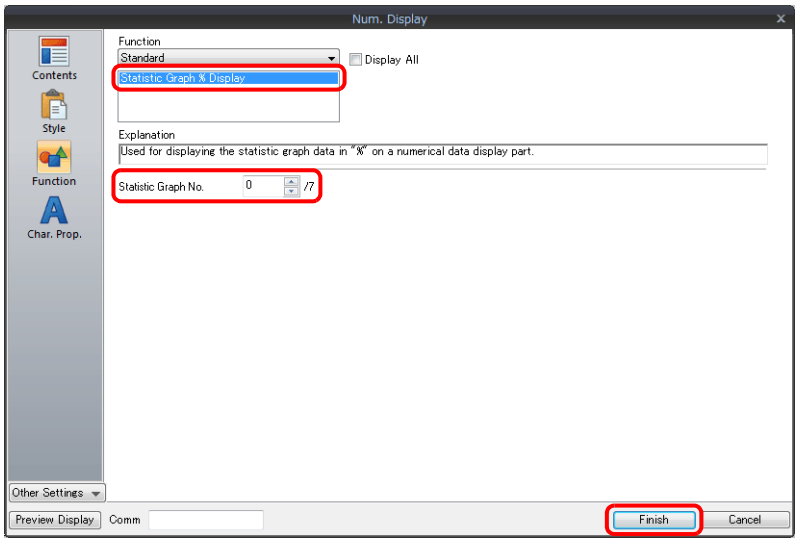
1. Click [Parts] → [Graph] → [Statistic Pie Graph] and place a statistic pie graph on the screen.



2. Double-click on the statistic pie graph to display the settings window.
   Select [Num. Display] under [Add Parts] in the [Style] settings.



3. The settings window for the numerical data display is displayed. Select [Statistic Graph % Display] for [Function] and specify a value for [Statistic Graph No.]. Click [Finish] to close the settings window of the numerical data display.

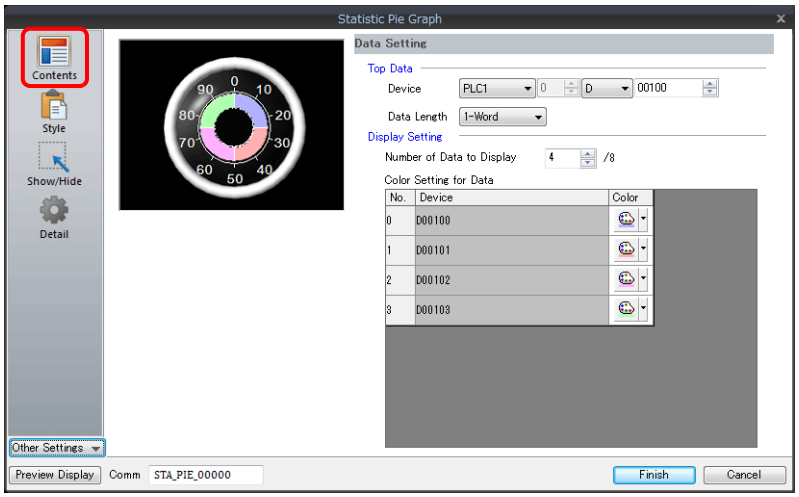


4. Repeat steps 2. and 3. to place multiple numerical data displays.

This completes the necessary settings.

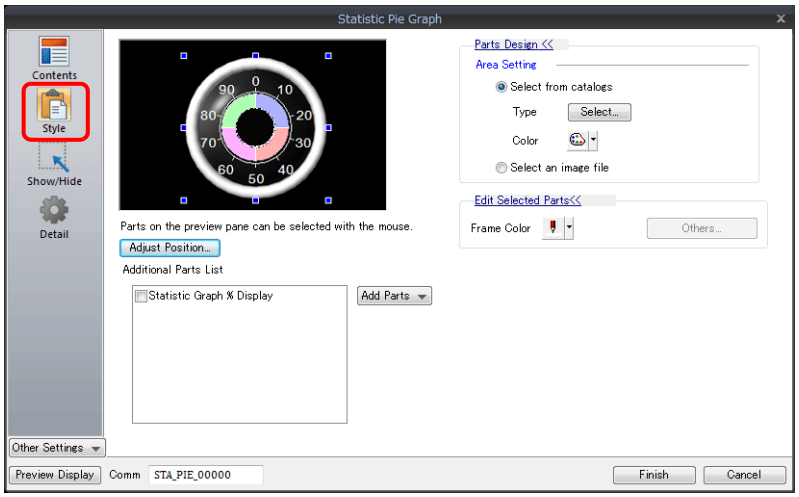
9.6.3 Detailed Settings

Contents



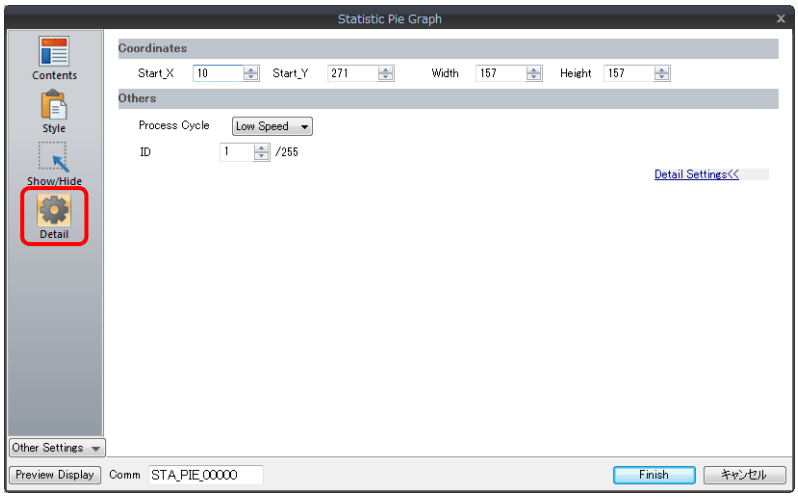
Item			Description
Data Setting	Top Data	Device	Set the top device memory address to display on the statistic graph. The required device memory are automatically allocated to the statistic graph. * The data format relies on the setting at [Code: DEC/BCD] under [Communication Setting] in the [PLC Properties] window accessible via [System Setting] → [Hardware Setting].
		Data Length (1-Word, 2-Word)	Select data length of the device memory.
	Display Setting	Number of Data to Display	Set the number of devices to display on the statistic graph.
		Color Setting for Data	Set the color for each data displayed on the statistic graph.

Style



Item		Description
Select from catalogs		Type Set the part design. Color Set the part color.
Select an image file		Load an image file.
Frame Color		Set the color of the frame around the graph area.
Additional Parts List	Statistic Graph % Display	Add [Statistic Graph % Display].
Add Parts	Num. Display	Add a numerical data display part.

Detail



Item		Description
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)
	Width/Height	Specify the width and height of the part.
Others	Process Cycle	Specify the process cycle of the part.
	ID	Set the ID.

10 Calendar

10.1 Overview

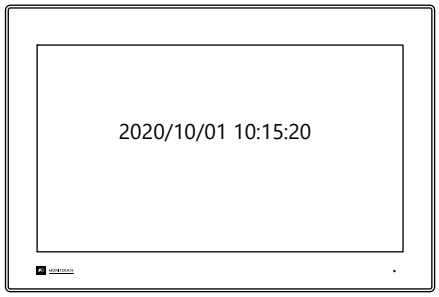
10.2 Time Display

10.3 Calendar

10.4 Calendar Data Correction

10.1 Overview

The calendar part is used to show the year, month, day, hour, minute, second, and day of the week on the screen.



- Depending on the calendar data to be used, the setting and correction methods vary. Refer to the following table.

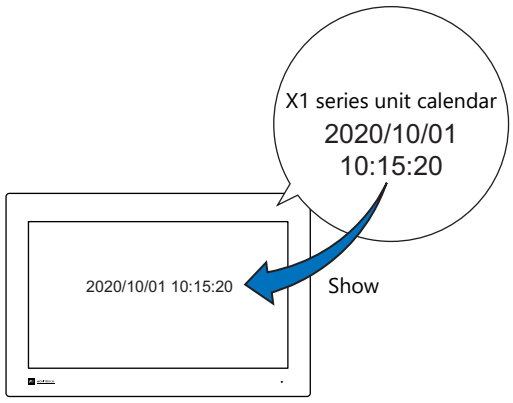
	X1 Series Calendar	User Format *1
Part	• Time display • Calendar	• Time display
Required Settings	–	Time display format setting
At Power ON	The X1 series calendar is displayed.	Data in the device memory set for the time display part is read and displayed.
RUN Mode	X1 series CPU clock	
Auto Correction	–	–
Correction	System Configurator	–
Backup at Power OFF	○	–

*1 [User Format]: Select to display a calendar in a user-defined format.

10.2 Time Display

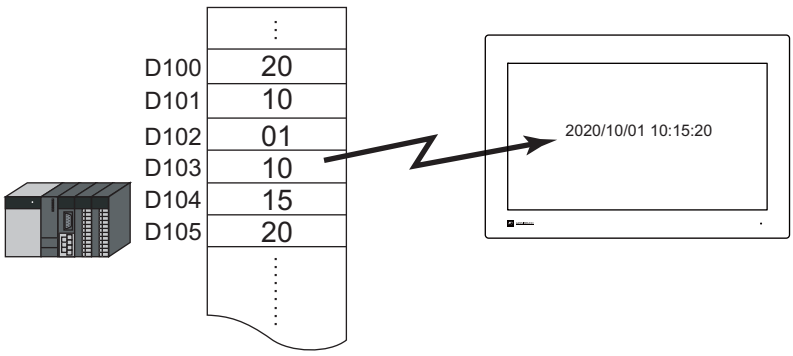
10.2.1 Overview

- Displays the X1 series unit clock.



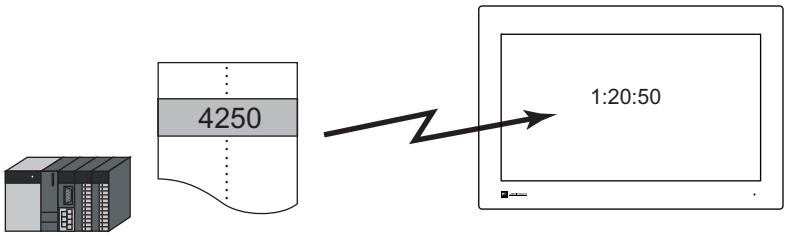
☞ For setting examples, refer to "Displaying the X1 Series Unit Calendar" page 10-3.

- Displays the values of consecutive device memory addresses as the time.



☞ For setting examples, refer to "Display Using the Time Display Format Setting" page 10-4.

- Displays the seconds data stored in device memory in timer format.

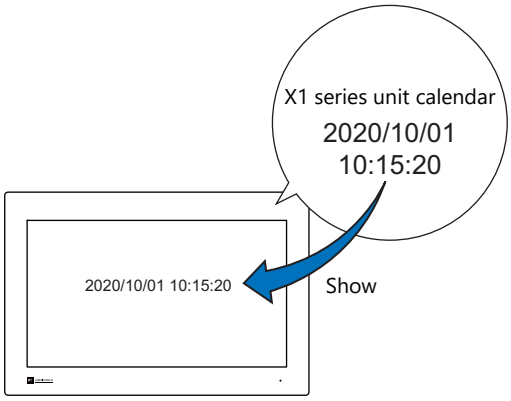


☞ For setting examples, refer to "Displaying Seconds Data Stored in Device Memory in Timer Format" page 10-6.

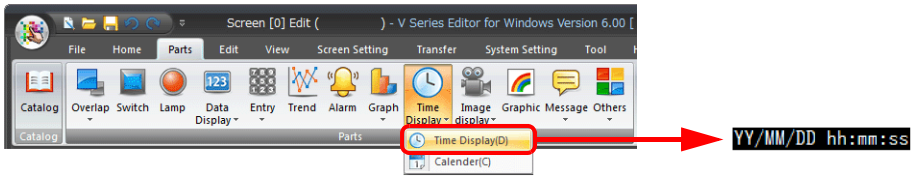
10.2.2 Setting Examples

Displaying the X1 Series Unit Calendar

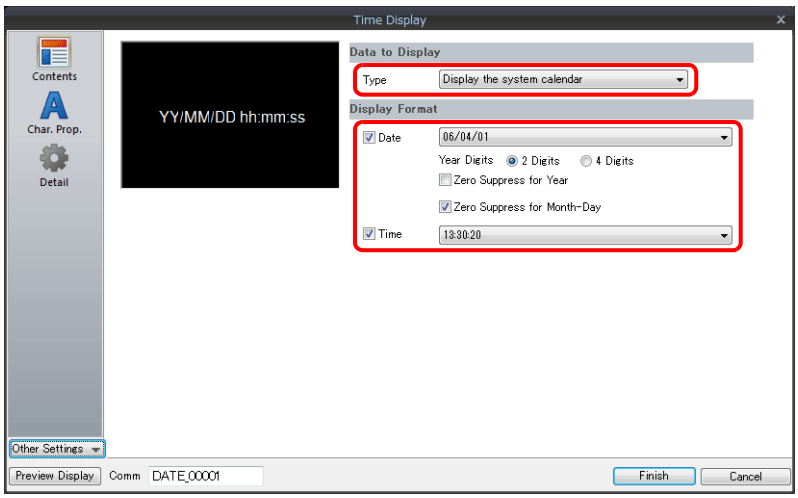
The following example shows how to display the built-in X1 series calendar.



1. Click [Parts] → [Time Display] → [Time Display] and place a time display part.

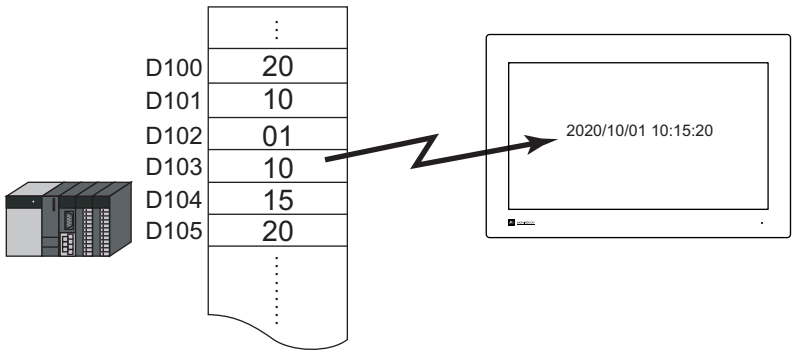


2. Double-click on the time display part to display the settings window.
   Configure the [Contents] settings as shown below.
   - Select [Type] → [Display the system calendar].
   - Specify the format of the date and time under [Display Format].

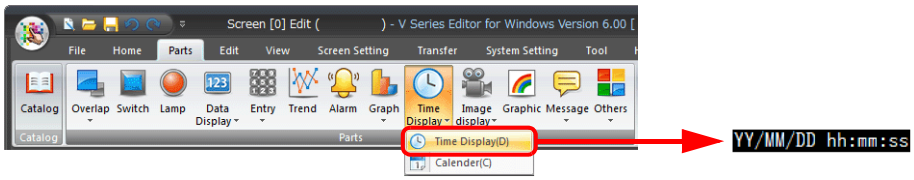


This completes the necessary settings.

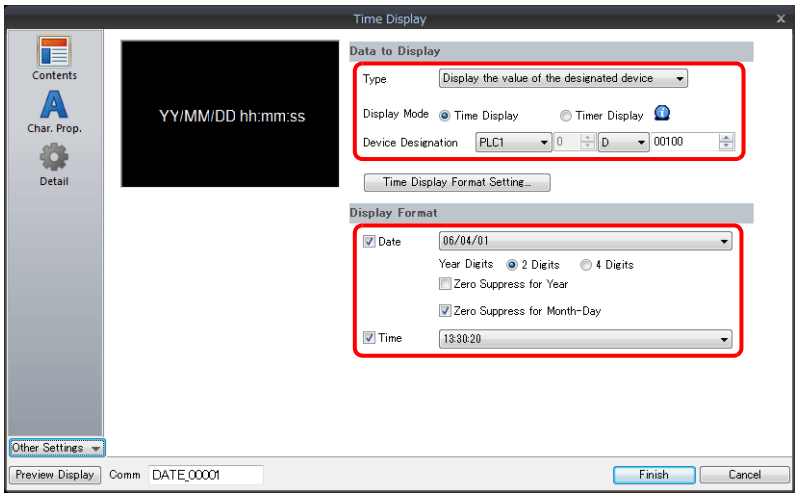
Display Using the Time Display Format Setting



1. Click [Parts] → [Time Display] → [Time Display] and place a time display part.

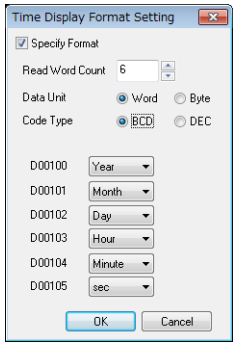


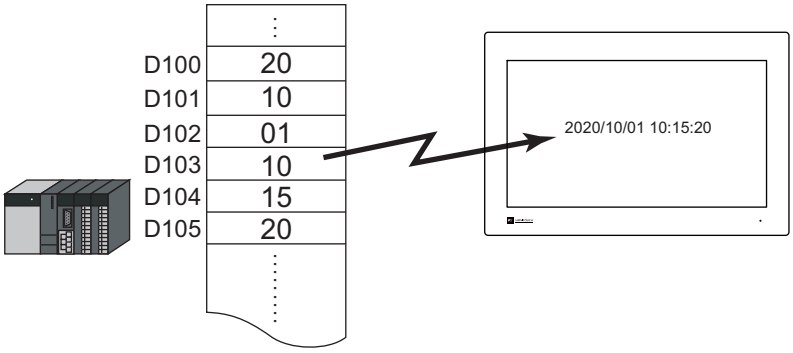
2. Double-click on the time display part to display the settings window.
   Configure the [Contents] settings as shown below.
   - Select [Type] → [Display the value of the designated device].
   - Select [Display Mode] → [Time Display].
   - Specify the top device memory address to use for time display with [Device Designation].
   - Specify the display format of the date and time under [Display Format].



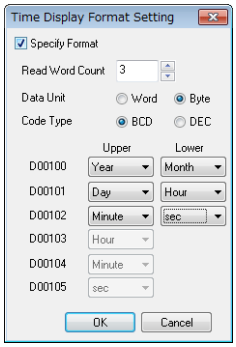
3. Specify the format of the data to read with [Time Display Format Setting].

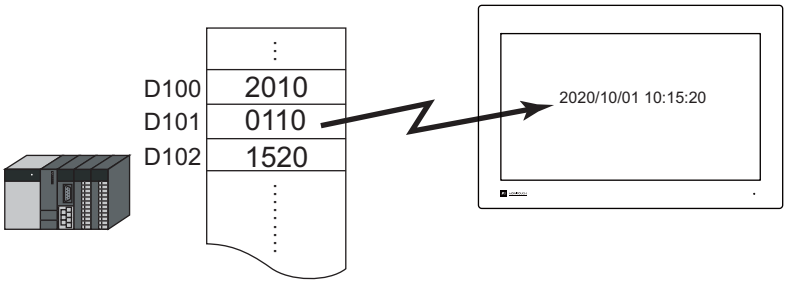
Example 1: Read Word Count: 6
Data Unit: Word
Code Type: BCD
0000: Year
0001: Month
0002: Day
0003: Hour
0004: Minute
0005: Sec





Example 2: Read Word Count: 3
Data Unit: Byte
Code Type: BCD
0000: Year Month
0001: Day Hour
0002: Minute Sec

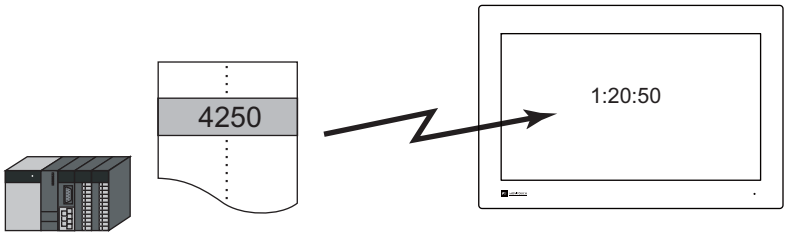




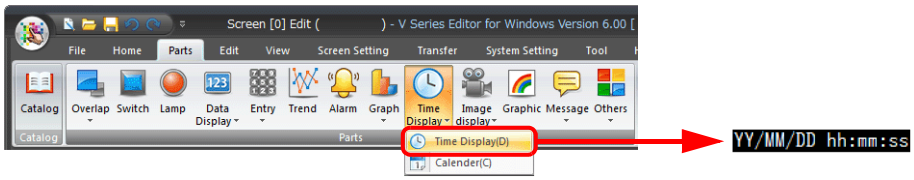
This completes the necessary settings.

Displaying Seconds Data Stored in Device Memory in Timer Format

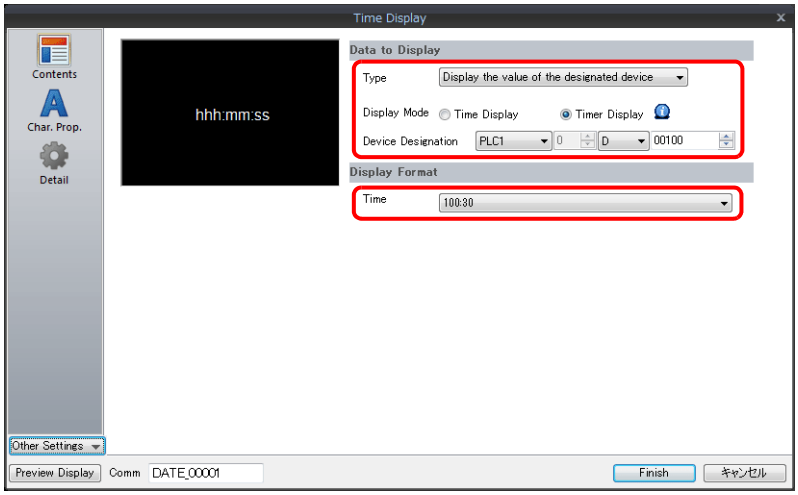
The following example shows how to display the seconds data stored in device memory in timer format on a X1 series unit.



1. Click [Parts] → [Time Display] → [Time Display] and place a time display part.



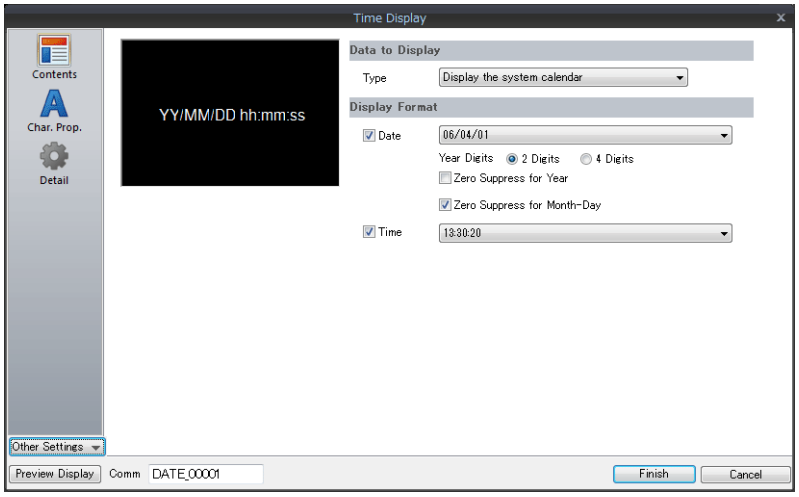
2. Double-click on the time display part to display the settings window.
   Configure the [Contents] settings as shown below.
   - Select [Type] → [Display the value of the designated device].
   - Select [Display Mode] → [Timer Display].
   - Specify the device memory address for storing the seconds data with [Device Designation].
   - Specify the display format of the time under [Display Format].



This completes the necessary settings.

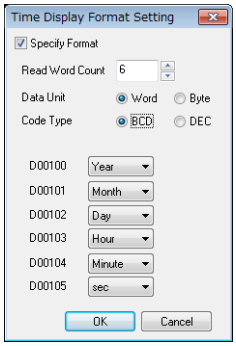
10.2.3 Detailed Settings

Contents



Item			Description
Data to Display	Type	Display the system calendar	Use the X1 series unit calendar. The display format can be set freely and the character size enlarged or reduced easily.
		Display the value of the designated device	Use a user-formatted calendar. Display the values of consecutive device memory addresses as the calendar.
	Display Mode	Time Display	This setting is available when “Display the value of the designated device” is selected for [Type]. Display the values of consecutive device memory addresses as the calendar.
		Timer Display	This setting is available when “Display the value of the designated device” is selected for [Type]. Display the seconds data stored in device memory in timer format.
	Device Designation		This setting is available when “Display the value of the designated device” is selected for [Type]. Specify the top address of the device memory for reading.
	Time display format setting		This setting is available when “Display the value of the designated device” is selected for [Type]. Set the calendar data format. For details, refer to “Time display format setting” page 10-8.
Display Format	Date		Select this checkbox to display the date. Set the date display format.
		Year Digits	Set the number of digits used to express the year.
		Zero Suppress for Year	Specify whether to use zero suppression for the year.
		Zero Suppress for Month-Day	Specify whether to use zero suppression for the month and day.
	Time		Select this checkbox to display the time. Set the time display format.

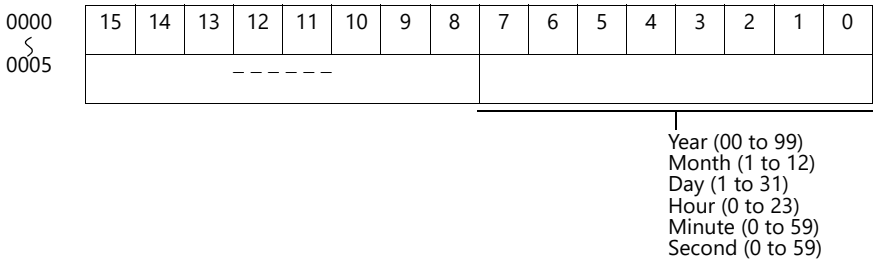
Time display format setting



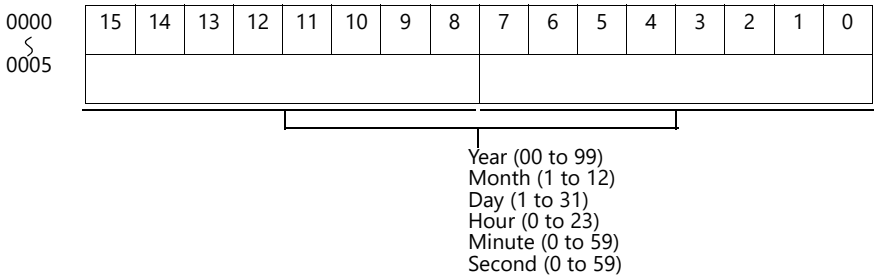
Item	Description
Specify Format	Select this checkbox if [Data Display] → [Type] → [Display the value of the designated device] is selected and [Display Mode] is set to [Time Display].
Read Word Count (1 - 6)	Data for the number of words to be read starting at [Device Designation] are read as the calendar data.
Data Unit *1 (Word, Byte)	Select [Word] or [Byte] for data unit when reading data from the PLC.
Code Type (BCD/DEC)	Select the code to be used at the time of reading data from the PLC.
0000 - 0005	Specify the contents of data for each device memory address.

*1 Device memory allocation for each data unit

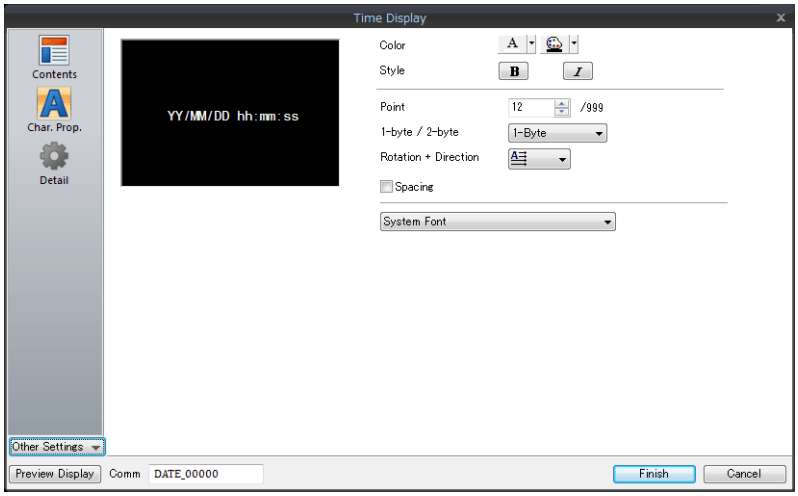
- Word



- Byte

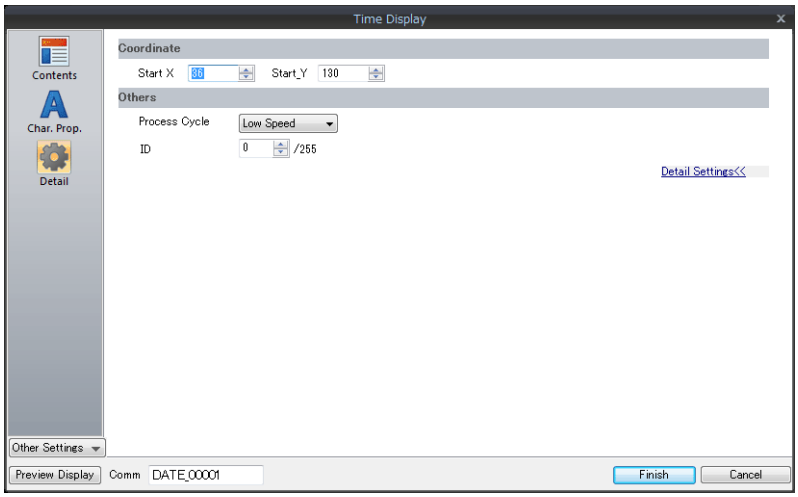


Character Properties



Item	Description
Color	Set the text color and area background color.
Style	Set the text style.
Character Size	Set the text size. This changes to point specification when using a Windows font or 7-segment font.
1-byte / 2-byte	Select one-byte or two-byte display.
Rotation + Direction	Set the orientation of text. This cannot be set when using a Windows font.
Spacing	To set a text spacing, select this checkbox and specify a spacing. This cannot be set when using a Windows font.
System Font Windows Font 7-segment Font	Select the font of the numerical data display.
Display light-out segments	This setting is available when [7-segment Font] is selected. Select this checkbox to display unlit segments.

Detail

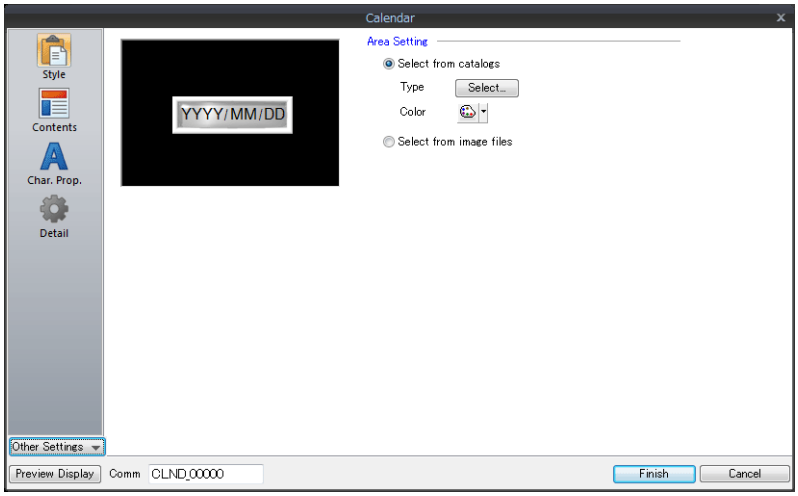


Item		Description
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at bottom left of part)
Others	Process Cycle	Set the process cycle.
	ID	Set the ID.

10.3 Calendar

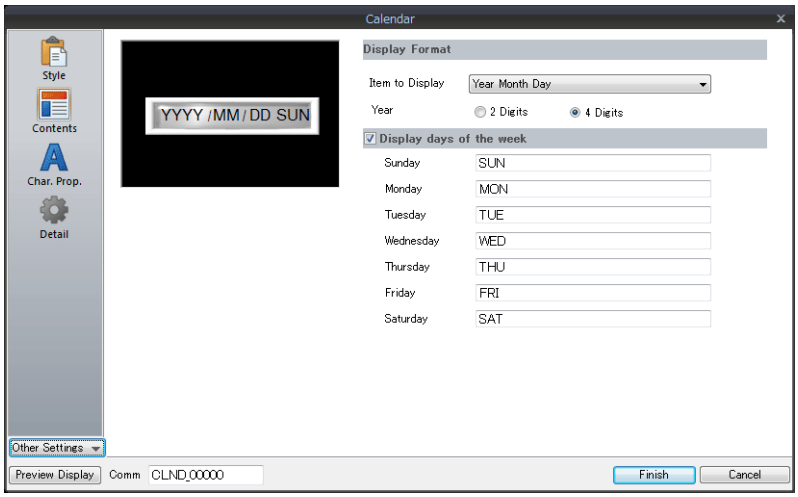
10.3.1 Detailed Settings

Style



Item		Description
Area Setting	Select from catalogs	Type Set the part design. Color Set the part color.
	Select from image files	Load an image file.

Contents

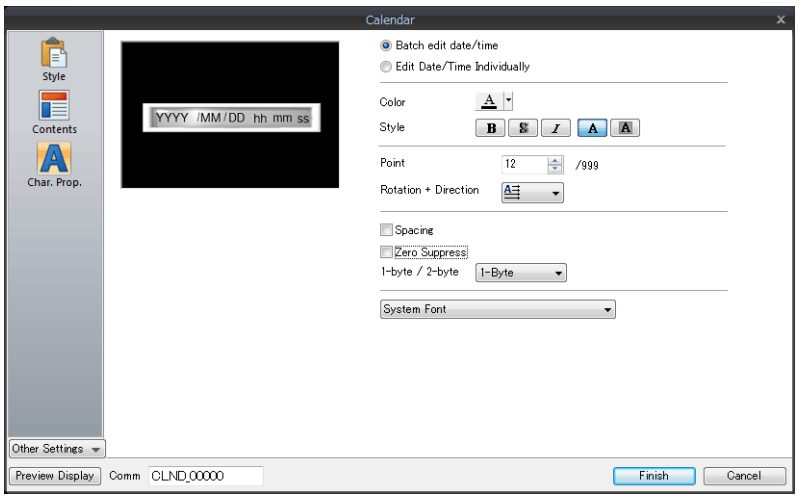


Item		Description
Display Format	Item to Display	Set the items to display on the calendar. The year in Western calendar format and the hour (0 to 24) are displayed. Year Month Day Hour Minute Second Year Month Day Hour Minute Second User format Select the checkbox of the items to display from year, month, day, hour, minute, and second.
	Year	Select either two digits or four digits to indicate the year. Display example: Two digits indicate the year 2020 as “20”, and four digits as “2020”.
Display days of the week		Register the display names of each day of the week. A maximum 13 one-byte characters (6 two-byte characters) can be used.

Character Properties

When [Batch edit date/time] is selected

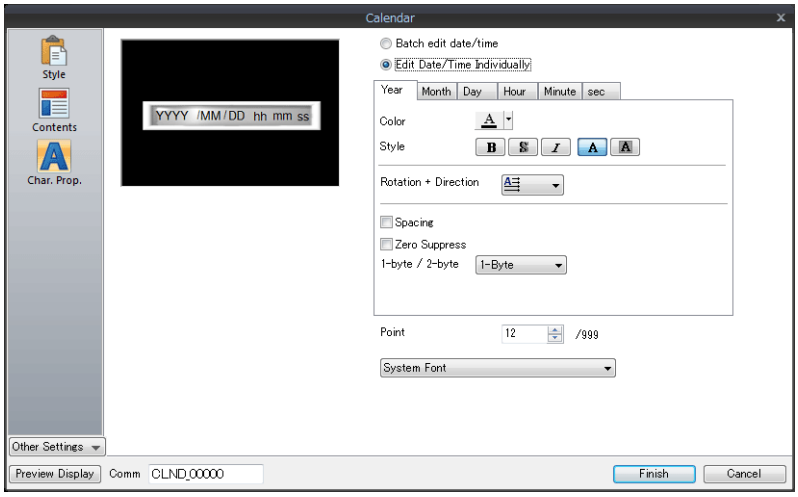
The character properties of the year, month, day, hour, minute, and second can be set at once.



Item	Description
Color	Set the text color and area background color.
Style	Set the text style.
Character Size	Set the text size. This changes to point specification when using a Windows font or 7-segment font.
Rotation + Direction	Set the orientation of text. This cannot be set when using a Windows font.
Spacing	To set a text spacing, select this checkbox and specify a spacing. This cannot be set when using a Windows font.
Zero Suppress	Select this checkbox to use zero suppression.
1-byte / 2-byte	Select one-byte or two-byte display.
System Font Windows Font 7-segment Font	Select the font of the numerical data display.
Display light-out segments	This setting is available when [7-segment Font] is selected. Select this checkbox to display unlit segments.

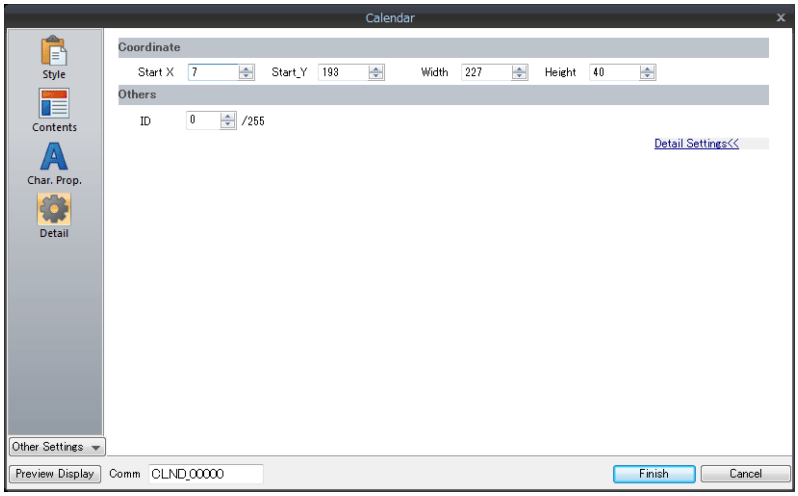
When [Edit Date/Time Individually] is selected

The character properties of the year, month, day, hour, minute, and second can be set individually.



Item		Description
Year/Month/ Day/Hour/ Minute/sec	Color	Set the text color and area background color.
	Style	Set the text style.
	Rotation + Direction	Set the orientation of text. This cannot be set when using a Windows font.
	Spacing	To set a text spacing, select this checkbox and specify a spacing. This cannot be set when using a Windows font.
	Zero Suppress	Select this checkbox to use zero suppression.
	1-byte / 2-byte	Select one-byte or two-byte display.
Character Size		Set the text size. This changes to point specification when using a Windows font or 7-segment font.
System Font Windows Font 7-segment Font		Select the font of the numerical data display.
Display light-out segments		This setting is available when [7-segment Font] is selected. Select this checkbox to display unlit segments.

Detail



Item		Description
Coordinates	Start X/Start Y	Specify the placement coordinates. (Coordinates at top left of part)
	Width/Height	Specify the width and height of the part.
Others	ID	Set the ID.

Notes

- Calendar parts consist of “hour, minute, and second” parts and “year, month, and day” parts as well as two-level displays. Additionally, there are parts for punctuation marks like “:” and “-”.
- Calendar data is displayed in the following format on the computer.

YY or YYYY	MM	DD	hh	mm	ss	SUN
Year	Month	Day	Hour	Minute	Second	Weekday (Displayed as registered)

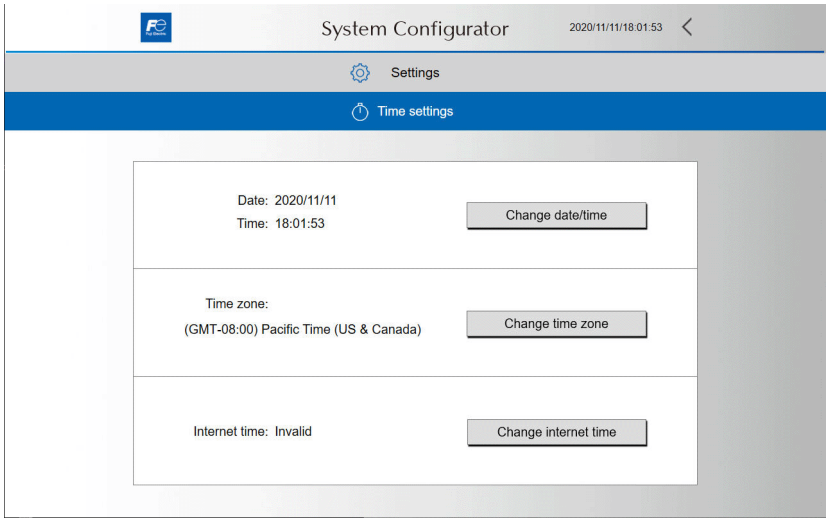
10.4 Calendar Data Correction

When the calendar has drifted, the calendar data can be corrected using System Configurator.

Calendar data cannot be corrected if the [Write filter setting] is set to [Valid].
Set the [Write filter setting] to [Invalid] and then change the [Time settings].
For details, refer to the X1 Series Hardware Specifications.

10.4.1 System Configurator

1. Start System Configurator and tap [Settings] → [Time settings].
2. Modify the calendar settings on the [Time settings] screen.



For details on starting System Configurator and the setting method, refer to the X1 Series Hardware Specifications.

10.4.2 Changing the PLC Calendar Time Data

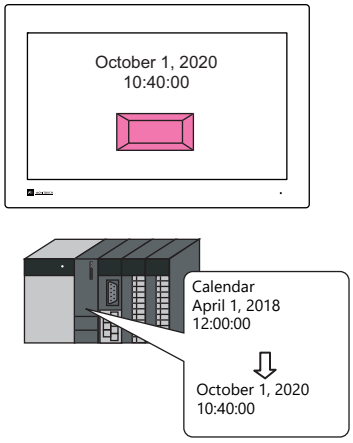
The calendar time data of a connected PLC can be changed using the “SYS(SET_CLND)” macro command.
This section describes how to update the PLC calendar data according to the X1 series unit calendar data.

<Operation Example>

Execute the “SYS(SET_CLND)” macro command.

Switch: [ON Macro]
SYS (SET_CLND) $s00160

* The X1 series unit calendar data is stored at $s00160 to 166.



* To change the calendar data for PLC2 and after, use the “PLC_CLND” macro command.
For details, refer to the V9 Series Macro Reference Manual.

☞ For details on macro commands, refer to the V9 Series Macro Reference Manual.

11 Graphics and Animation

11.1 Graphics

11.2 Animation

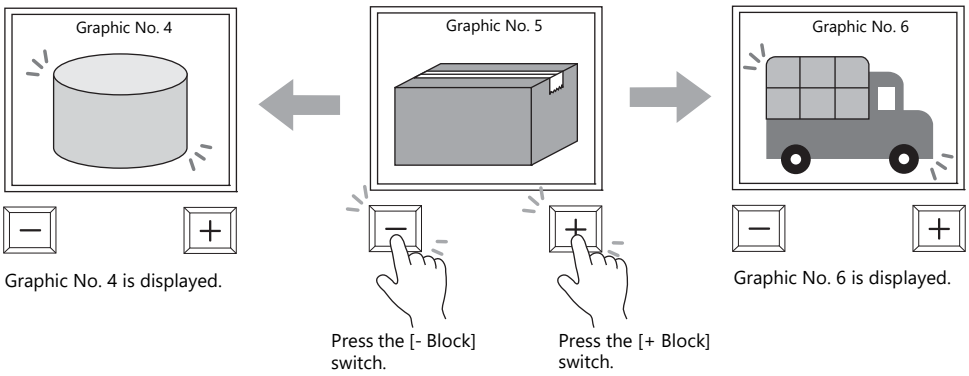
11.1 Graphics

11.1.1 Overview

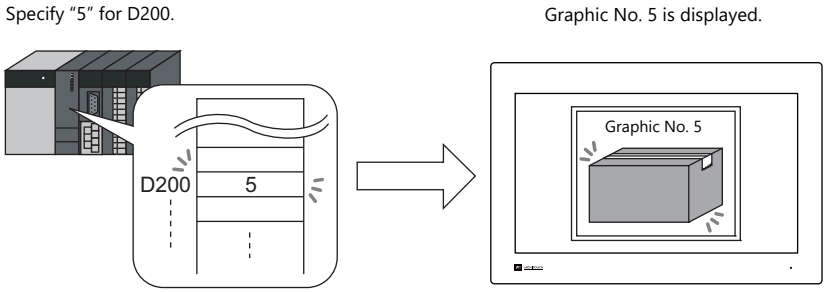
A variety of pre-registered graphics can be displayed on the screen or changed based on bit activation and the graphic number.

The graphic display method differs depending on the [Operation Select] setting.

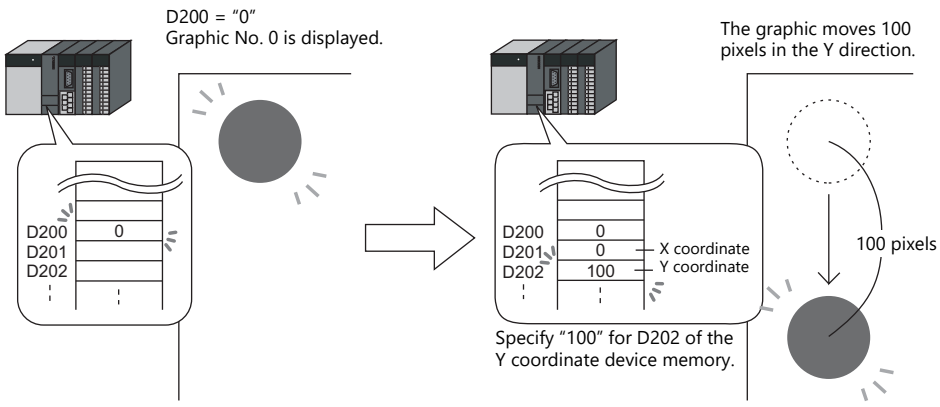
- Switch
  Switches can be used to display or change between graphics and text registered in the graphic library.
  In this case, the displayed graphics cannot be moved or transformed.



- Device (No. Designation)
  A graphic number can be specified for display using the [Device (No. Designation)] setting.

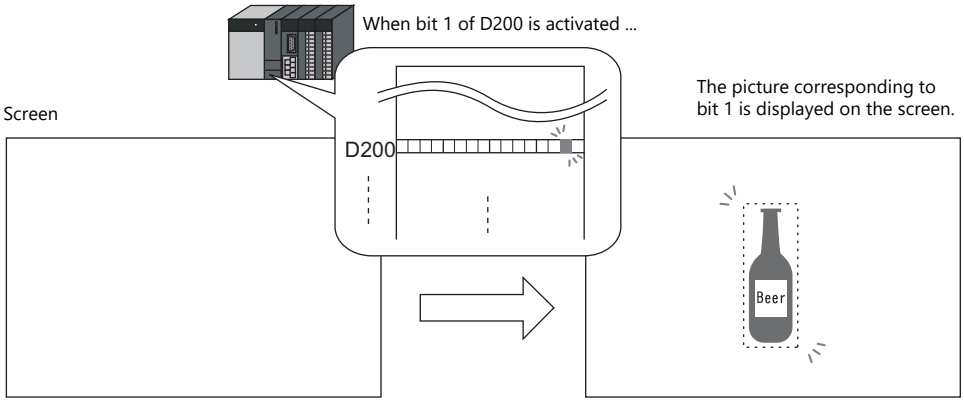


The displayed graphics can be moved or transformed.
To animate or transform graphics or text, set up parameters for these items in the graphic library.
When parameters are set, the required device memory addresses are allocated for animation and transformation.
For details on the procedure for setting parameters, refer to "11.1.4 Graphic Library (Parameter Settings)" page 11-14.

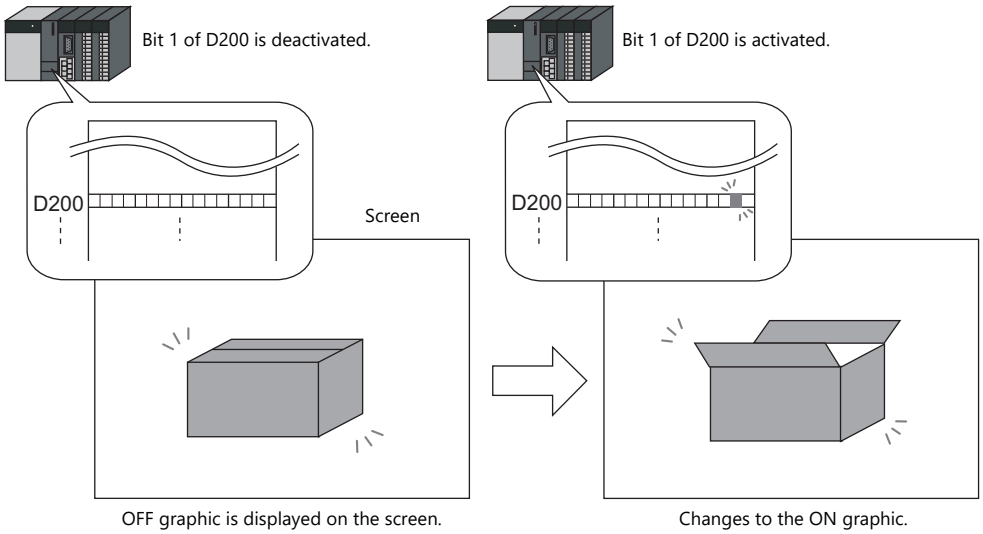


- Device (Bit Designation)
  The graphics or text registered in the graphic library can be shown or hidden according to bit activation.
  There are two display types.

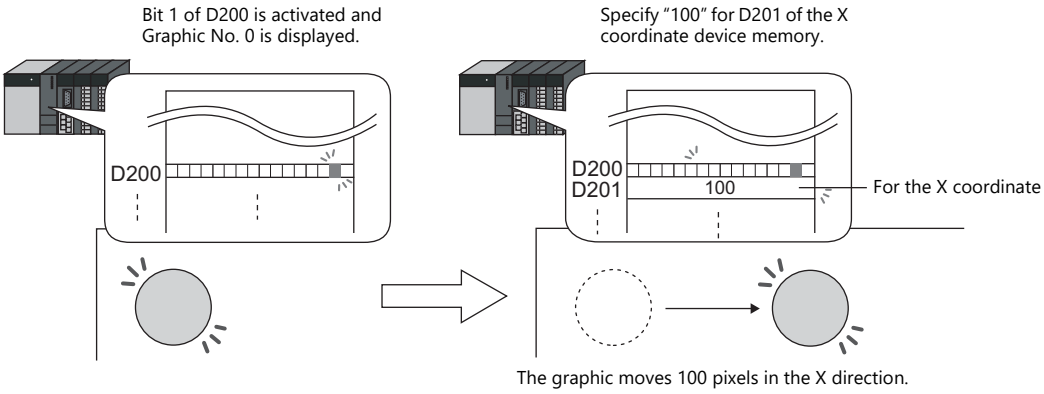
  - Type: 1-Graphic
    When the bit is set to ON, the corresponding graphic is shown, and when the bit is set to OFF, the graphic is hidden.



  - Type: 2-Graphic
    Two graphics are assigned to one bit. When the bit is set to OFF, the OFF graphic is displayed, and when the bit is set to ON, the ON graphic is displayed.



- It is possible to move or transform the graphics or text set for [1-Graphic] and [2-Graphic].
  To animate or transform graphics or text, set up parameters for these items in the graphic library.
  When parameters are set, the required device memory addresses are allocated for animation and transformation.
  For details on the procedure for setting parameters, refer to "11.1.4 Graphic Library (Parameter Settings)" page 11-14.

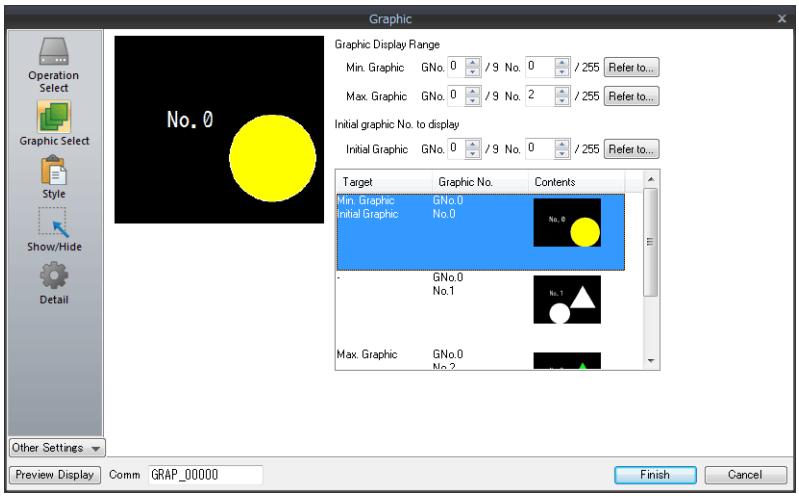


* The graphic mode display is possible without placing a display area part. For details, refer to page 11-7.

11.1.2 Detailed Settings

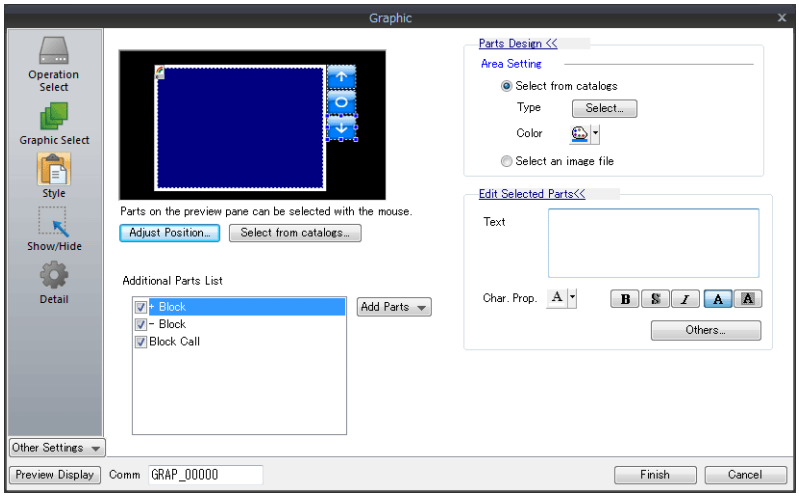
Operation Select: Switch

Graphic Select



Item	Description
Min. Graphic	Set the graphic with the lowest number among those to be displayed on the screen.
Max. Graphic	Set the graphic with the highest number among those to be displayed on the screen.
Initial Graphic	Set the initial graphic to show when the screen is displayed. Select an initial graphic number between the minimum and maximum graphic numbers.

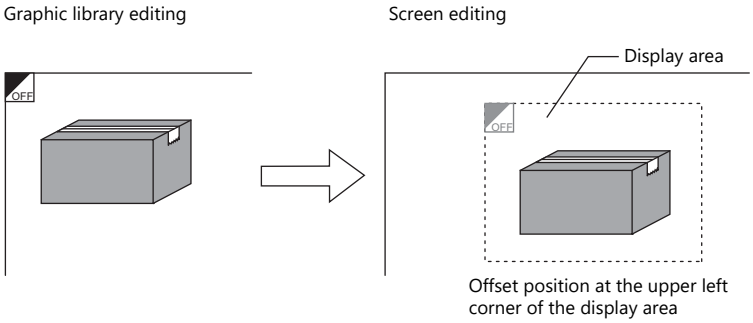
Style



Item		Description
Additional Parts List		Select an operation switch. Parts can be added to the list using the [Add Parts] button.
	+ Block	Switches to the next graphic.
	– Block	Switches to the previous graphic.
	Block Call	Switches to the specified graphic number. The graphic number is specified via [Edit Selected Parts] → [Others].
Parts Design		Set the design and color of parts.
Edit Selected Parts		Configure the part selected in the [Additional Parts List] or preview pane. Part size can also be changed.
Adjust Position		Displays the window for adjusting the placement position of each part.
Select from catalogs		Set the part design from the catalog.

Display area

The size of the display area must be changed to accommodate the graphic for display.
The position of the "OFF" mark (offset mark) of the graphic library corresponds to the upper left corner of the display area part on the screen. Take this position into consideration when determining the size of the display area part.

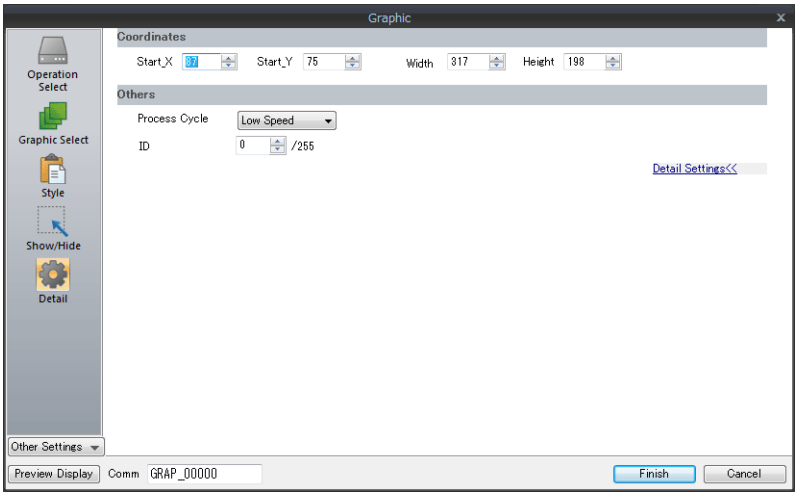


Show/Hide

Set the show and hide settings of graphic items.

☞ For details, refer to "14 Item Show/Hide Function".

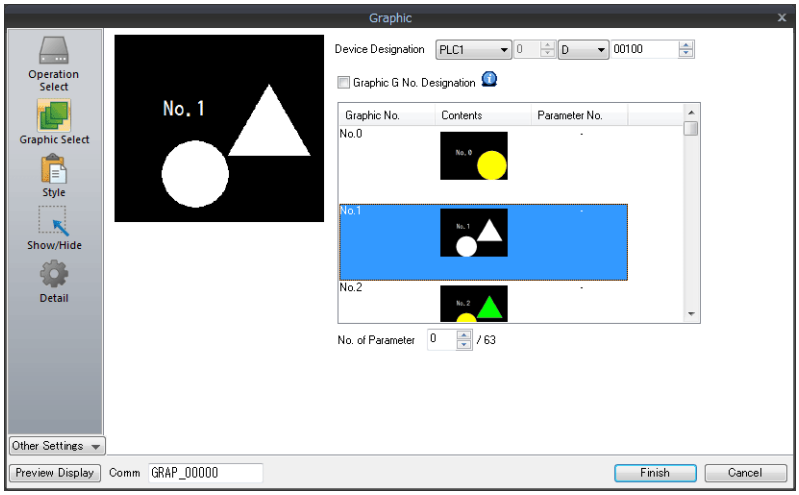
Detail



Item		Description
Coordinates	Start X/Start Y	Specify the coordinates of the display area.
	Width/Height	Set the size of the display area.
Others	Process Cycle	Set the cycle for the X1 series to read PLC data.
	ID	Set an ID number.

Operation Select: Device (No. Designation)

Graphic Select



Item	Description
Device Designation	Specify the device memory addresses used for specifying a graphic number. Consecutive device memory addresses are used when a parameter is specified. *1

Device Memory	Description	Remarks
n	Graphic No.	
n+1	Parameter 1	Only with parameter specification.
n+2	Parameter 2	
:	:	
n+63	Parameter 63	

Item	Description
Graphic G No. Designation	Selected Specify 0 to 9 for the graphic group number. The graphics that can be displayed on the screen are limited to those (0 to 255) of the specified group number. Unselected All graphics corresponding to graphic group numbers 0 to 9 can be displayed. Specify the graphic numbers using absolute addresses (0 to 2559).

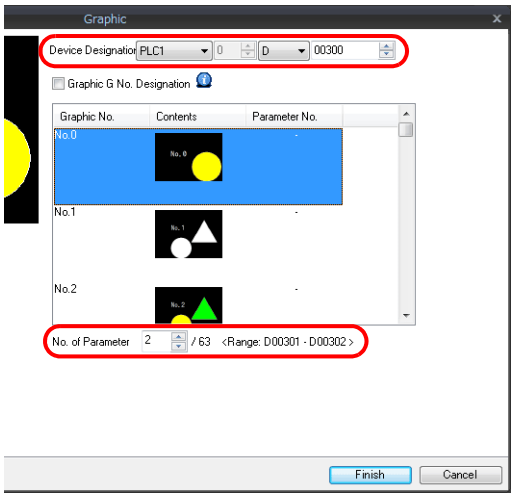
With Group No. Specification		Without Group No. Specification (Absolute Address)	
Group No.	Graphic No.	Group No.	Graphic No.
0	0000 - 0255	(None)	0000 - 0255
1	0000 - 0255		0256 - 0511
2	0000 - 0255		0512 - 0767
3	0000 - 0255		0768 - 1023
4	0000 - 0255		1024 - 1279
5	0000 - 0255		1280 - 1535
6	0000 - 0255		1536 - 1791
7	0000 - 0255		1792 - 2047
8	0000 - 0255		2048 - 2303
9	0000 - 0255		2304 - 2559

Item	Description
No. of Parameter *1	This is required when moving or changing graphics. Set the maximum parameter value of items registered in the graphic library. The valid parameter number determines the number of words secured for the specified device memory address. For details on parameter settings, refer to "11.1.4 Graphic Library (Parameter Settings)" page 11-14.

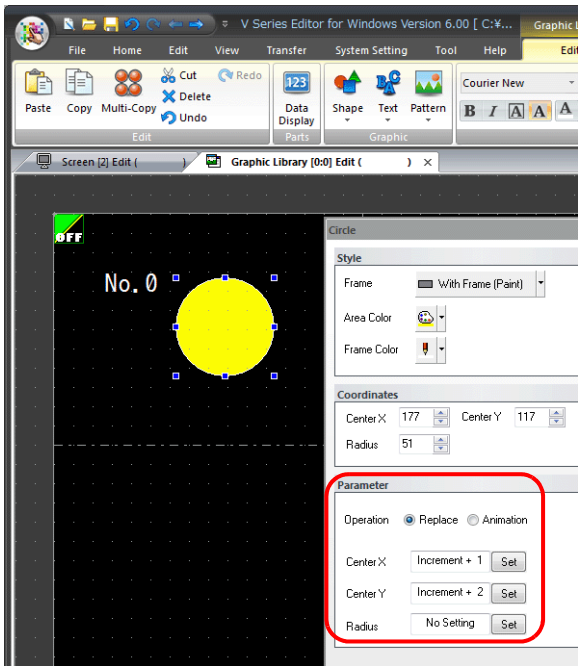
*1 Example of using parameters

The table below shows device memory assignment and contents when the following settings are configured.

Graphics

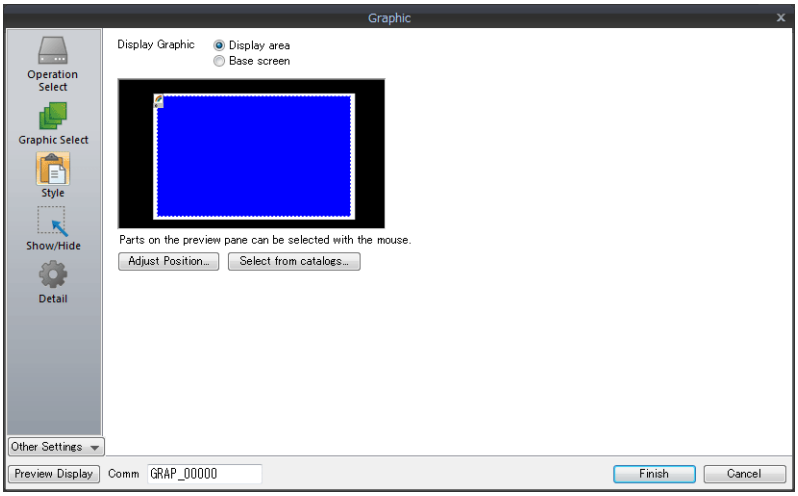


Graphics library



Device Memory	Description		Remarks
D300	Device	Device memory for graphic number specification	
D301	Parameter 1	Device memory for Center X coordinate specification	[Valid parameter No.] is set to “2” so two words are secured for use.
D302	Parameter 2	Device memory for Center Y coordinate specification	

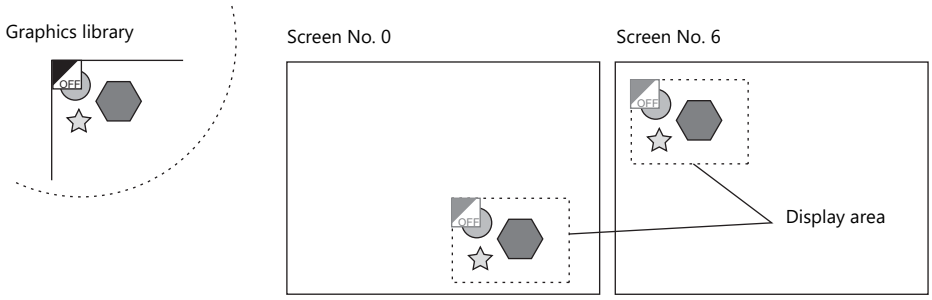
Style



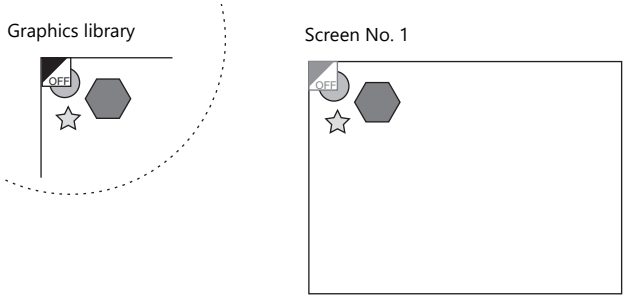
Item	Description
Display Graphic	Select the area for displaying graphics. Display area/Base screen
Adjust Position	Displays the window for adjusting the placement position of each part. Part size can also be changed.
Select from catalogs	Set the part design from the catalog.

Display area

- When [Display Graphic] is set to [Display area]
  The offset position of the graphic library corresponds to the upper left corner of the display area part. Take this position into consideration when determining the size of the display area part. Refer to page 11-4.



- When [Display Graphic] is set to [Base screen]
  The offset position of the graphic library corresponds to the upper left corner of the screen.



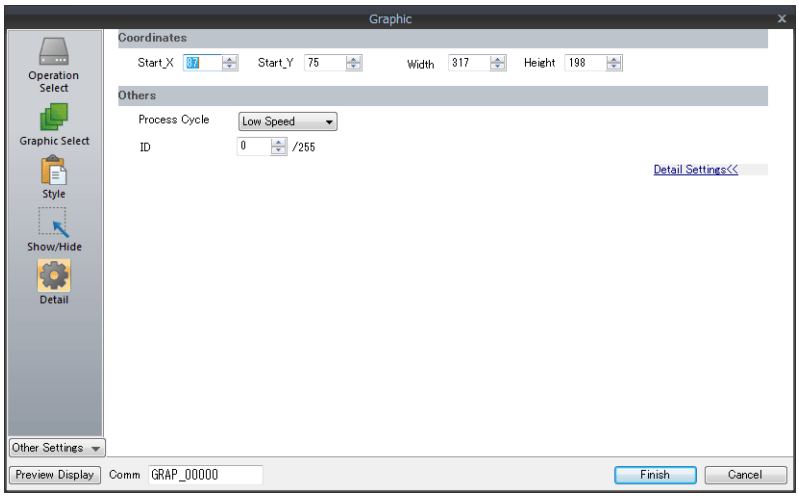
- If [Base area] for [Display Graphic] is selected and there is no display area, the previous picture may remain on the screen when the picture is changed.

Show/Hide

Set the show and hide settings of graphic items.

☞ For details, refer to "14 Item Show/Hide Function".

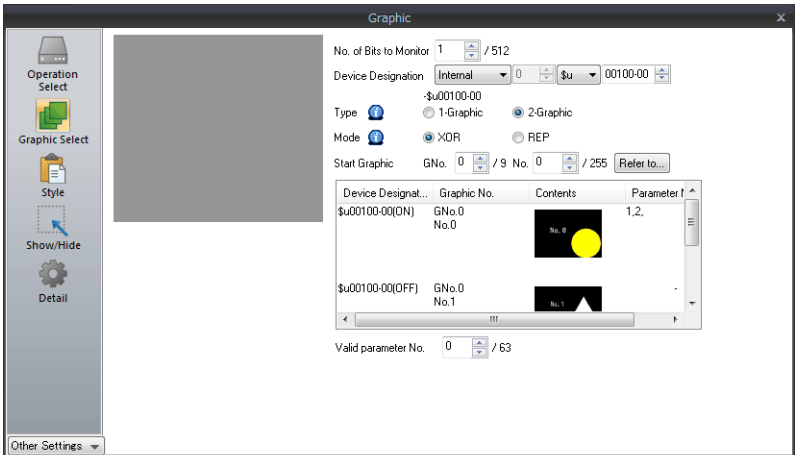
Detail



Item		Description
Coordinates	Start X/Start Y	Specify the coordinates of the display area.
	Width/Height	Set the size of the display area.
Others	Process Cycle	Set the cycle for the X1 series to read PLC data.
	ID	Set an ID number.

Operation Select: Device (Bit Designation)

Graphic Select



Item		Description
No. of Bits to Monitor *1		Set the total number of bits used for displaying graphics. 1 - 512
Device Designation *1		Set the device memory used for displaying graphics. Consecutive bits are used for the number of monitored bits.
Type *1		Select the graphic display method.
	1-Graphic	A graphic is displayed when the bit is set to ON. OFF: Graphic hidden ON: Graphic shown
	2-Graphic	A graphic is displayed when the bit is set to either ON or OFF. OFF: OFF graphic shown ON: ON graphic shown
Mode *3		Specify the display state when changing between graphics. This setting is available when [Type] is set to [2-Graphic]. When [Type] is set to [1-Graphic], the mode is fixed to [XOR].
	XOR	Bit OFF: OFF graphic is displayed. Bit OFF → ON: OFF graphic is cleared and ON graphic is displayed. Bit ON → OFF: ON graphic is cleared and OFF graphic is displayed.
	REP	Bit OFF: OFF graphic is displayed. Bit OFF → ON: ON graphic is displayed over the OFF graphic. Bit ON → OFF: OFF graphic is displayed over the ON graphic. The graphics are not XORed with the base screen and are instead displayed in their original colors.
Start Graphic *1		Set the starting graphic group number and graphic number of the graphic to display.
Valid parameter No. *2		This is required when moving or transforming the graphics. Specify the total number of parameters set for each graphic. The number of words for the device memory and allocation is determined from this total and the parameter numbers. (For details on the parameter setting, refer to the V9 Series Operation Manual.)

*1 Display example:
[Device Designation]: D200, [Start Graphic]: GNo. 0, No. 0, [No. of Bits to Monitor]: 12

- Type: 1-Graphic

	MSB															LSB
D200 bit No.	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Graphic No. 0 graphic No. (Bit ON)					11	10	9	8	7	6	5	4	3	2	1	0

Because [No. of Bits to Monitor] is 12, 12 graphics can be assigned to these bits (bit 0 to bit 11).

- Type: 2-Graphic

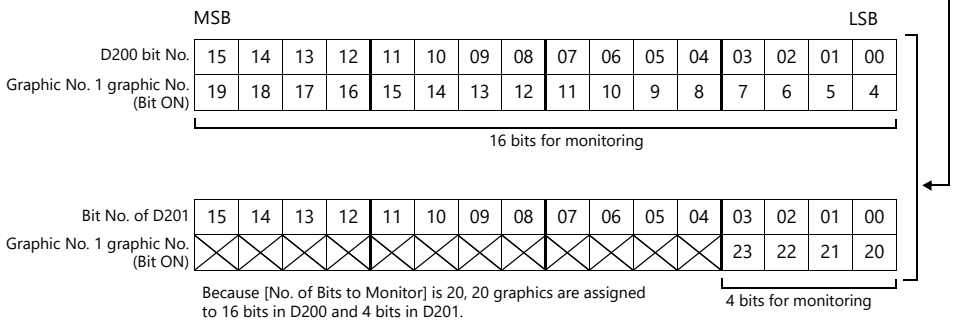
	MSB															LSB
D200 bit No.	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Graphic No. 0 graphic No. (Bit ON)					22	20	18	16	14	12	10	8	6	4	2	0
(Bit OFF)					23	21	19	17	15	13	11	9	7	5	3	1

Because [No. of Bits to Monitor] is 12, 24 graphics can be assigned to these bits (bit 0 to bit 11).

*2 Display example:
[Device Designation]: D200, [Type]: 1-Graphic, [Start Graphic]: GNo. 1, No. 4, [No. of Bits to Monitor]: 20, [Valid parameter No.]: 4

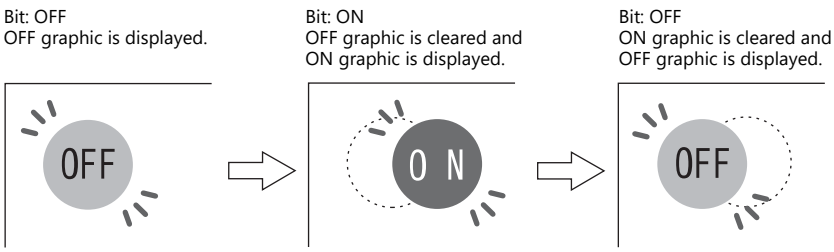
D200	For graphic relay operation (16 relays)
D201	For graphic relay operation (4 relays)
D202	For parameter No. 1
D203	For parameter No. 2
D204	For parameter No. 3
D205	For parameter No. 4

Total of 20
= [No. of Bits to Monitor]

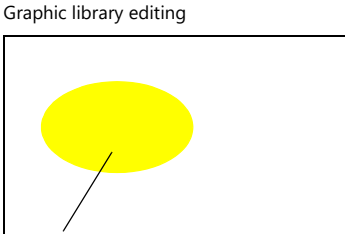


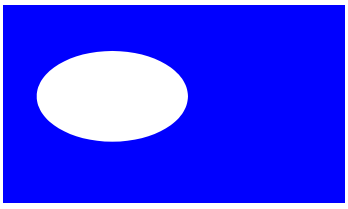
*3 Display example:

- Mode: XOR

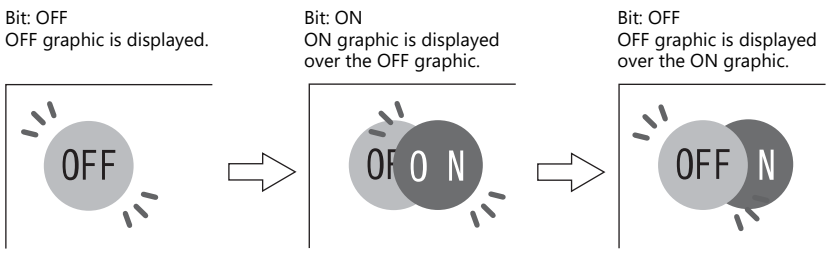


In XOR mode, the graphic color is XORed with the colors of the base screen (display area). Therefore, the graphic is displayed in the color XORed with the base color (= XORed color), rather than the color specified during editing. For details on XORed color, refer to page 11-12.

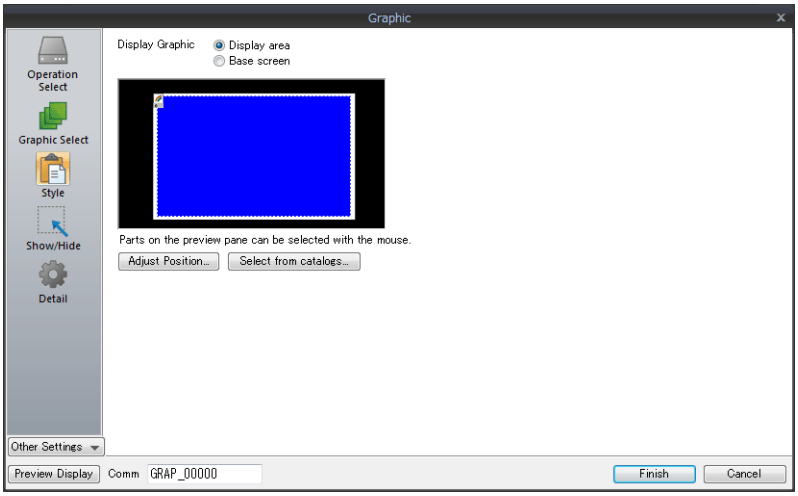




- Mode: REP



Style

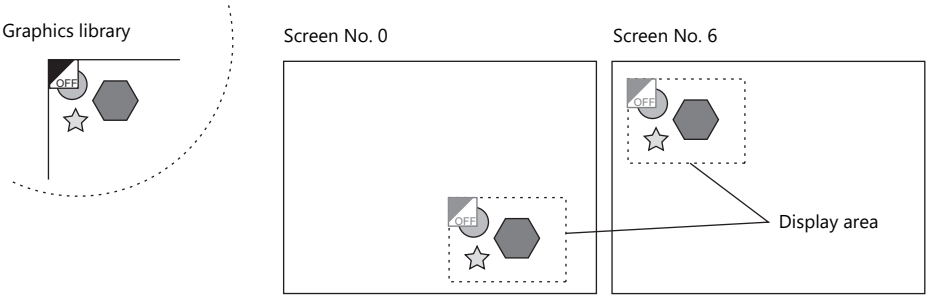


Item	Description
Display Graphic	Select the area for displaying graphics. Display area/Base screen
Adjust Position	Displays the window for adjusting the placement position of each part. Part size can also be changed.
Select from catalogs	Set the part design from the catalog.

Display area

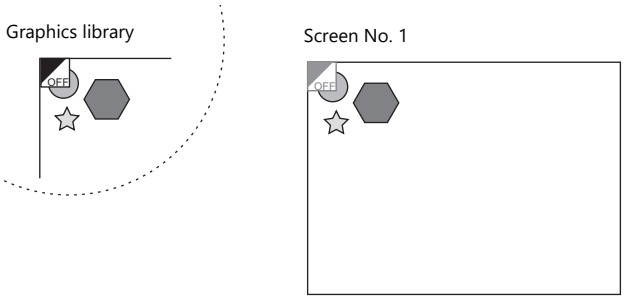
- Offset
  - When [Display Graphic] is set to [Display area]

    The offset position of the graphic library corresponds to the upper left corner of the display area part. Take this position into consideration when determining the size of the display area part.



  - When [Display Graphic] is set to [Base screen]

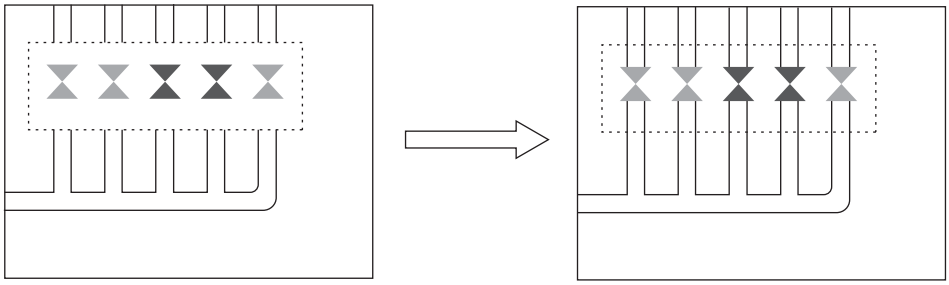
    The offset position of the graphic library corresponds to the upper left corner of the screen.



- Transparency
  Select the [Transparent] checkbox for the display area part to add transparency to the display area part properties. Select this checkbox to avoid a situation where graphics under the display area part are hidden. For details on part changes, refer to the V9 Series Operation Manual.

  - Example with transparent setting

    - Not transparent
    - Transparent

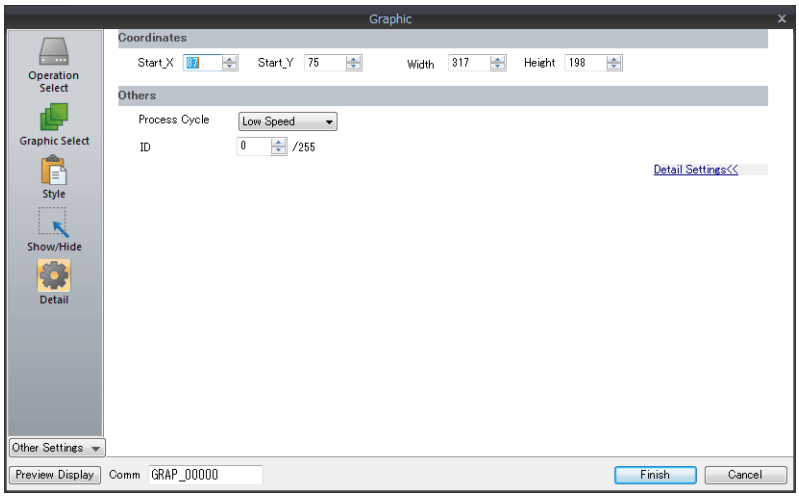


Show/Hide

Set the show and hide settings of graphic items.

☞ For details, refer to "14 Item Show/Hide Function".

Detail



Item		Description
Coordinates	Start X/Start Y	Specify the coordinates of the display area.
	Width, Height	Set the size of the display area.
Others	Process Cycle	Set the cycle for the X1 series to read PLC data.
	ID	Set an ID number.

11.1.3 Graphic Display Color

Display Modes

When graphics are displayed on the screen, there are two types of display modes.

- XOR: Graphic colors are XORed with the colors of the base screen.
- REP: Original graphic colors are shown.

Whether XOR or REP is used for the display state is determined by the mode and parameter settings. Refer to the following table.

Graphic Switching Method / Type / Graphic Registration			Parameter	
			Action: Replace	Action: Animation
Switch			REP	XOR
Device (No. Designation)			REP	XOR
Device (Bit Designation)	1-Graphic		XOR	XOR
	2-Graphic	Mode: XOR	XOR	XOR
		Mode: REP	REP	XOR

* When the graphic to be displayed is a "Paint" graphic, it cannot be displayed in XORed colors.

* When a pattern with a [Transparent Color Setting] is used, the graphic can be displayed with the original colors even if [Mode] is set to [XOR]. For details, refer to page 11-13.

XORed Colors

When [XOR] is selected, graphic colors are XORed with the colors of the base screen (display area). The resulting color is called "XORed color." The basic eight XORed colors are shown below.

Base screen picture colors (basic eight colors) / Overlaid picture colors (basic eight colors)	Black	Blue	Red	Magenta	Green	Cyan	Yellow	White
Black	Black	Blue	Red	Magenta	Green	Cyan	Yellow	White
Blue	Blue	Black	Magenta	Red	Cyan	Green	White	Yellow
Red	Red	Magenta	Black	Blue	Yellow	White	Green	Cyan
Magenta	Magenta	Red	Blue	Black	White	Yellow	Cyan	Green
Green	Green	Cyan	Yellow	White	Black	Blue	Red	Magenta
Cyan	Cyan	Green	White	Yellow	Blue	Black	Magenta	Red
Yellow	Yellow	White	Green	Cyan	Red	Magenta	Black	Blue
White	White	Yellow	Cyan	Green	Magenta	Red	Blue	Black

XOR operations

Each of the basic eight colors has an identification code as given below:

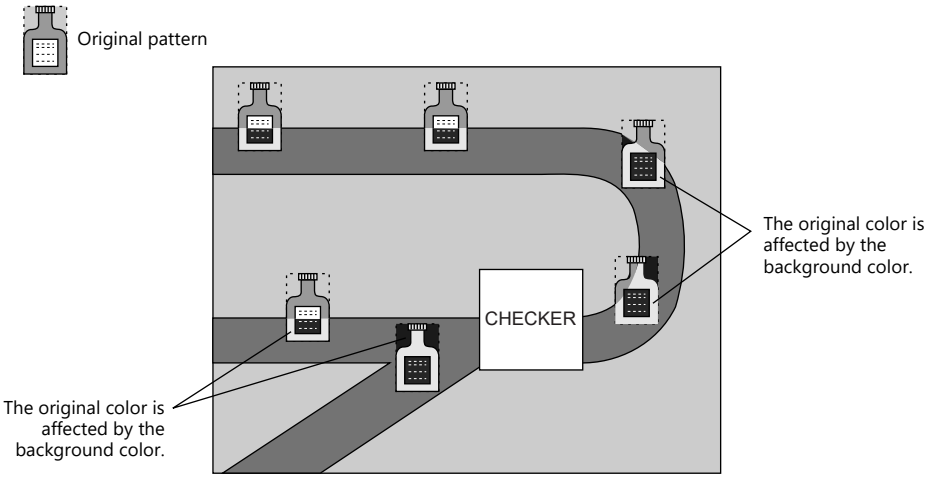
64k-color		32k-color	
Color	Code HEX	Color	Code HEX
Black	0000	Black	0000
Blue	001F	Blue	001F
Red	F800	Red	7C00
Magenta	F81F	Magenta	7C1F
Green	07E0	Green	03E0
Cyan	07FF	Cyan	03FF
Yellow	FFE0	Yellow	7FE0
White	FFFF	White	7FFF

When a color is XORed with another color, it means that the two color codes are XORed to obtain another code.

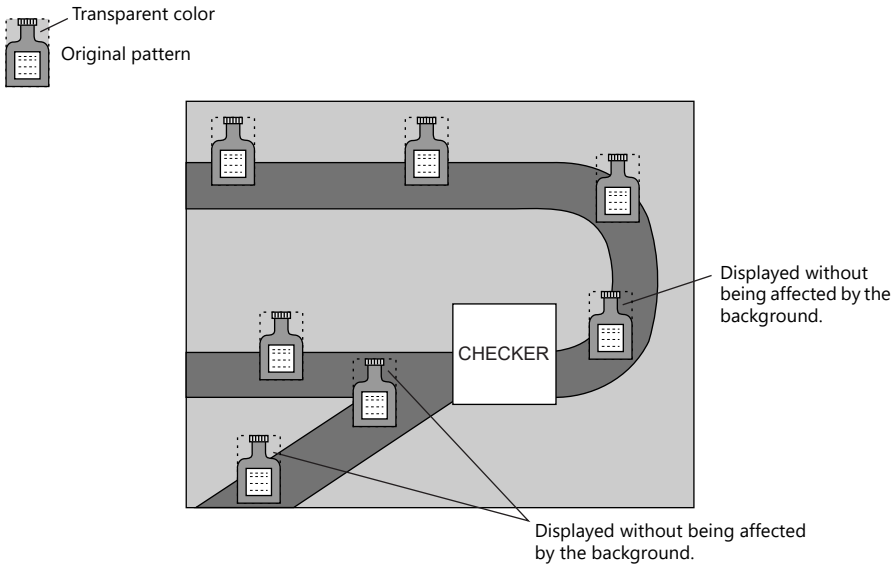
	64k-color XORed color of blue and white	32k-color XORed color of blue and white
Blue	0000 0000 0001 1111 (001F)	0000 0000 0001 1111 (001F)
White	1111 1111 1111 1111 (FFFF)	0111 1111 1111 1111 (7FFF)
	XOR ↓	XOR ↓
Yellow	1111 1111 1110 0000 (FFE0)	0111 1111 1110 0000 (7FE0)

XOR Display Transparency (Pattern Transparency)

Because animation on a graphic display is always XORed, it is impossible to display the same colors on the screen as initially set for the background color (other than black).
Additionally, because the XORed color is affected by the base color, when animation is performed on multiple background colors, the color changes whenever the background does.



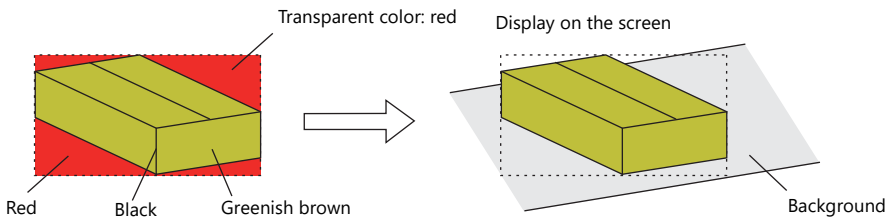
When a transparent pattern is used for animation, colors can be displayed just as they were originally created.



* Always select the [With Transparent] checkbox for the pattern when using this function.

Pattern editing

- Set the color not to show on the screen for the [Transparent Color Setting] in the [Pattern Edit] window.
- Only one transparent color can be set per pattern.
- For a pattern like the one below, the perimeter color (red) is set as the transparent color. Consequently, when this pattern is displayed on the screen, the red area becomes transparent and the background color is displayed.



☞ For details on pattern editing, refer to the V9 Series Operation Manual.

11.1.4 Graphic Library (Parameter Settings)

Configure parameter settings to move, transform, and change graphics registered in the graphic library.

Parameter Targets and Settings

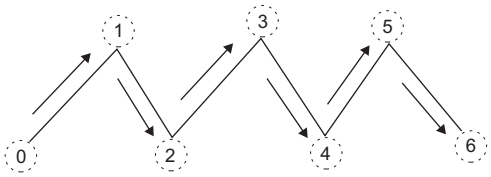
The following drawing items can be set using parameters.

Graphics	Item Specified by Parameter	Refer to
Straight line	Start point, end point	
Continuous line	Point 0 (to n) coordinates	page 11-14
Rectangle	Start point, end point	
Parallelogram	Start point, PX2, PY2, PX3, PY3	page 11-14
Polygon	Center coordinates, radius, start angle, number of corners	
Circle	Center coordinates, radius	
Arc, sector	Center coordinates, radius, start angle, end angle	
Ellipse, elliptical arc, elliptical sector	Center coordinates, X radius, Y radius	
Text	Start point (coordinates at the bottom left of the first character)	
Pattern	Start point (coordinates of the top left corner), (pattern) No.	page 11-15
Paint *1	Start point	page 11-15
Graphic call	Start point (library) No.	
Pixel	Start point	
Data display	Start point (coordinates of the bottom left of the first digit), No.	page 11-15

*1 Paint is not drawn correctly if operation of the graph is set to animation in the parameter settings.

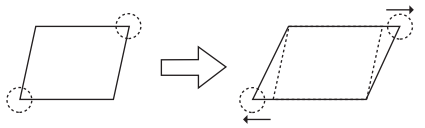
Continuous line (point 0 (to n) coordinates)

If a continuous line is drawn as shown below, there are seven points at which parameters can be set.

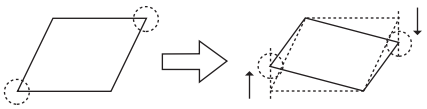


Parallelogram

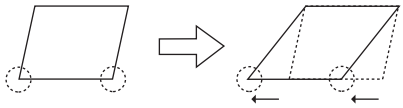
- PX2



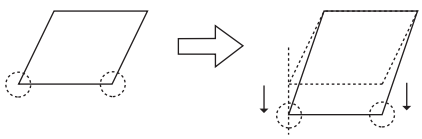
- PY2



- PX3

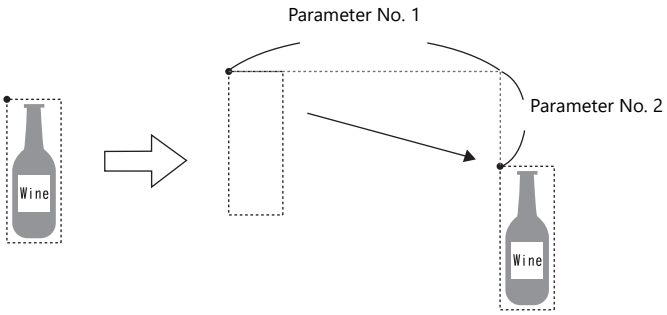


- PY3

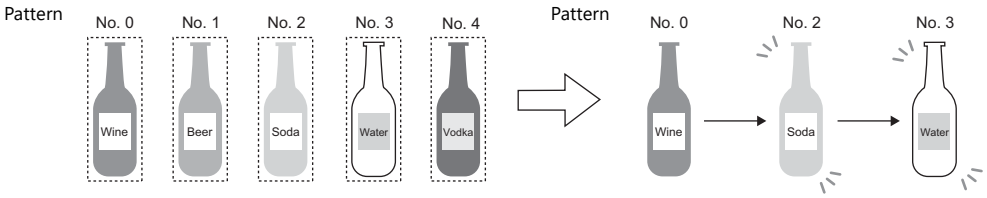


Pattern

- Start point
  The start point is the top left corner of the pattern, as shown below.

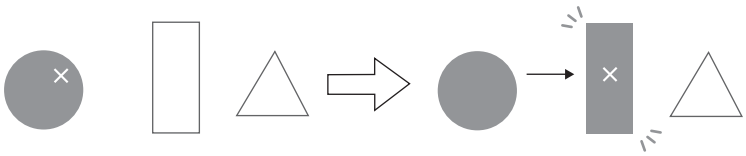


- Pattern No.
  Set the parameters for the numbers to change the picture by specifying a number.



Paint (start point)

The coordinates of the paint start point can be changed using a parameter device memory.
Note that drawing is performed using REP instead of XOR so the previous paint display (e.g. circle) will remain.

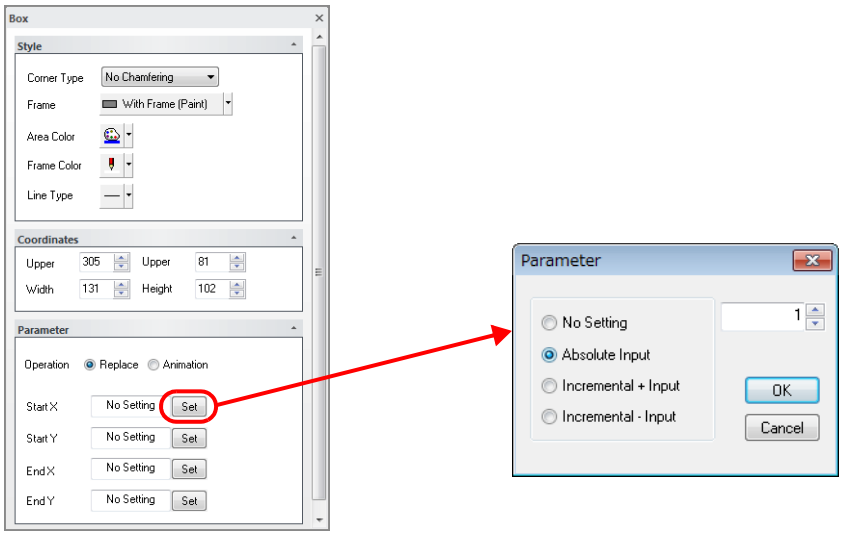


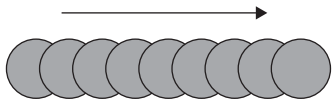
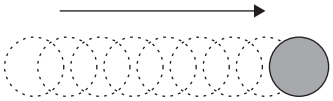
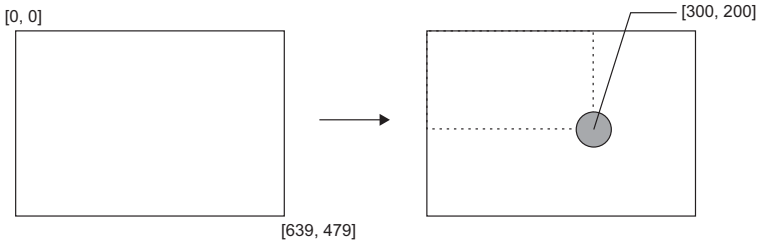
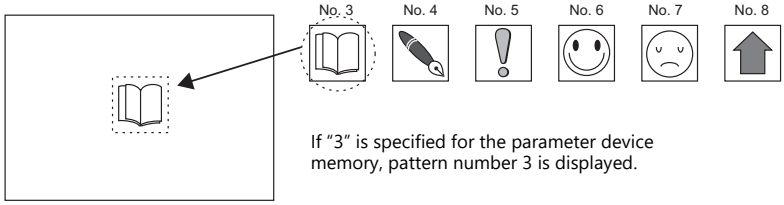
Data display

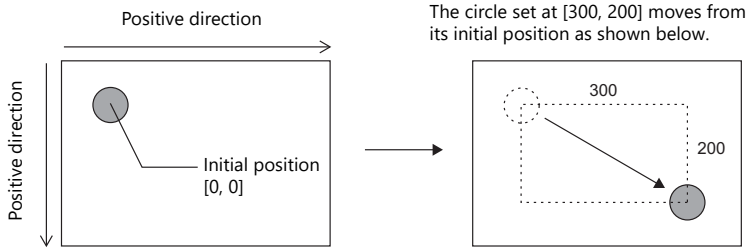
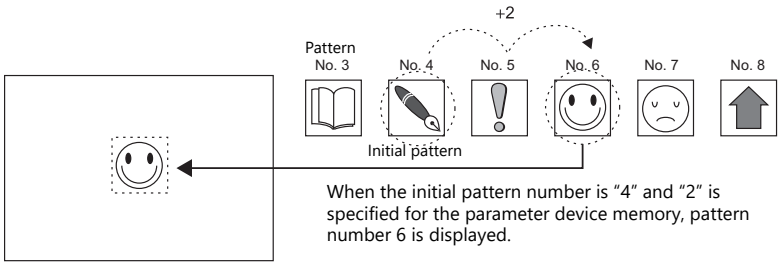
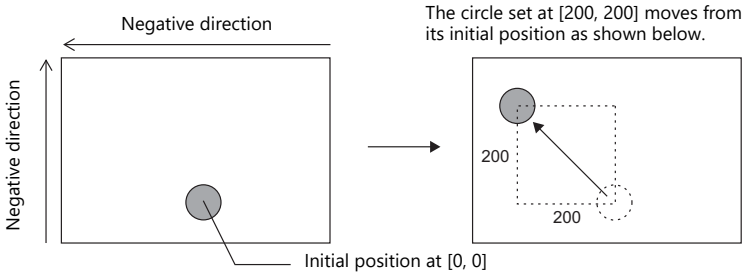
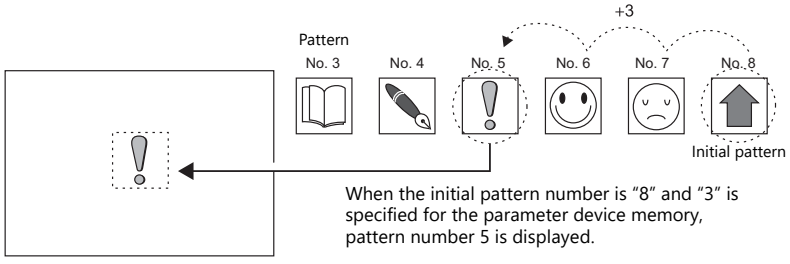
The position of the data display can be moved.

Parameter Settings

Set parameters in the graphic editing window of each graphic.



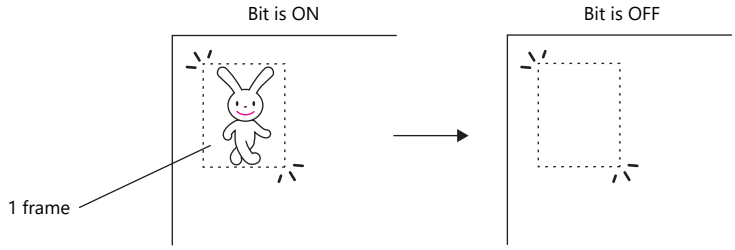
Item		Description
Operation		Select whether to overwrite the previous state or erase the previous state before drawing anew.
	Replace	Overwrite the previous state. The previous state will remain.  * This setting is available when there is no display area and the [System Setting] → [Unit Setting] → [General Setting] → [General Settings] tab → [Retain previous picture in graphic mode (V8 compatible)] checkbox is selected.
	Animation	Always draw the latest state. 
Set		Set the parameter of each setting item using the [Set] button.
	No Setting	Do not secure a device memory for the parameter.
	Absolute Input	Specify the parameter value using absolute coordinates. When specifying coordinates The following shows an example when target coordinate values are specified in a device memory where the coordinates of the top left corner of the screen are [0, 0] and the coordinates of the bottom right corner are [639, 479] (or [319,239]/[799, 599]/[1023, 767]). A circle specified at X = 300 and Y = 200 is displayed at the following location.  When specifying numbers (pattern, graphic call) The following shows an example when a registered pattern number or graphic library graphic number is specified directly.  If "3" is specified for the parameter device memory, pattern number 3 is displayed.

Item		Description
	Incremental + Input	Specify the input parameter value using relative coordinates in the positive direction. When specifying coordinates The following shows how the graphic moves in the positive direction when a positive value is specified to the device memory and in the negative direction when a negative value is specified to the device memory where the placement position of the graphic is [0, 0].  When specifying numbers (pattern, graphic call) The following shows how a number higher than the placed one is called when a positive value is specified to the device memory and a number lower than the placed one is called when a negative value is specified to the device memory where "0" is set for the number of the placed pattern or graphic. 
	Incremental – Input	Specify the input parameter value using relative coordinates in the negative direction. When specifying coordinates The following shows how the graphic moves in the negative direction when a positive value is specified to the device memory and in the positive direction when a negative value is specified to the device memory where the placement position of the graphic is [0, 0].  When specifying numbers (pattern, graphic call) The following shows how a number lower than the placed one is called when a positive value is specified to the device memory and a number higher than the placed one is called when a negative value is specified to the device memory where "0" is set for the number of the placed pattern or graphic. 

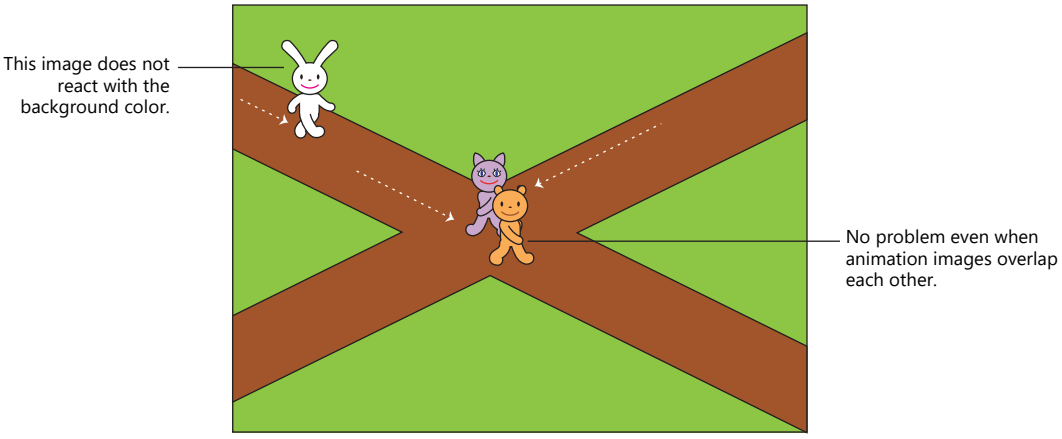
11.2 Animation

11.2.1 Overview

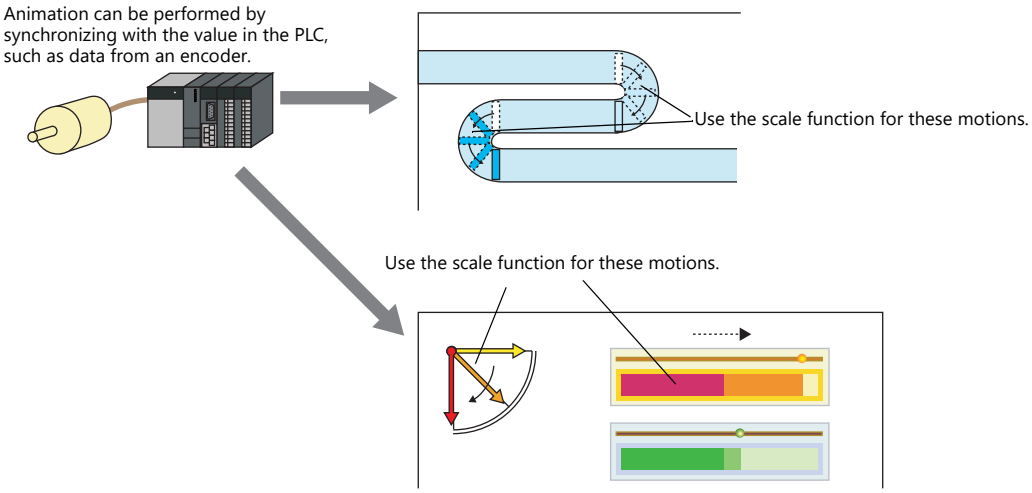
- When the configured bit is set to ON, the picture is displayed. When the bit is set to OFF, the picture is cleared. Movement can be easily set by switching pictures in a position or by moving a picture.



- Graphics can be created with pixels in the "Frame Edit" area. Bitmap data can be imported and used for animation easily.
- An animation image can be made opaque to the background color and display a picture exactly as registered (when transparent color is set). In this case, even if animation pictures overlap each other, the image will not be corrupted or change color.



- It is not necessary to create a complicated program on the PLC for animation. Because animation can be created easily using the settings on the X1 series, interesting screens such as screen savers or logo displays can be created with minimal effort.
- Using the scale function, screens can be created in synchronization with the PLC, which reflect the field conditions in real time.

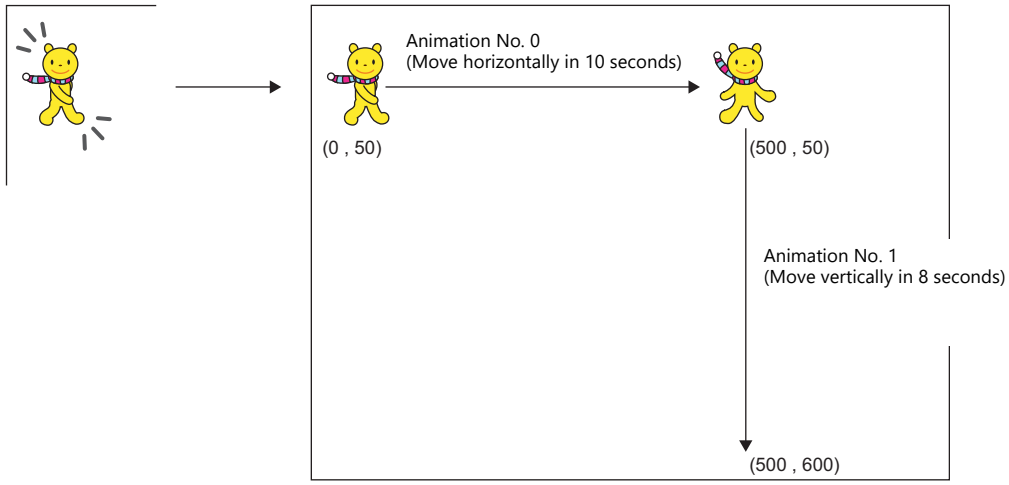


11.2.2 Setting Example

Using an Animation Table

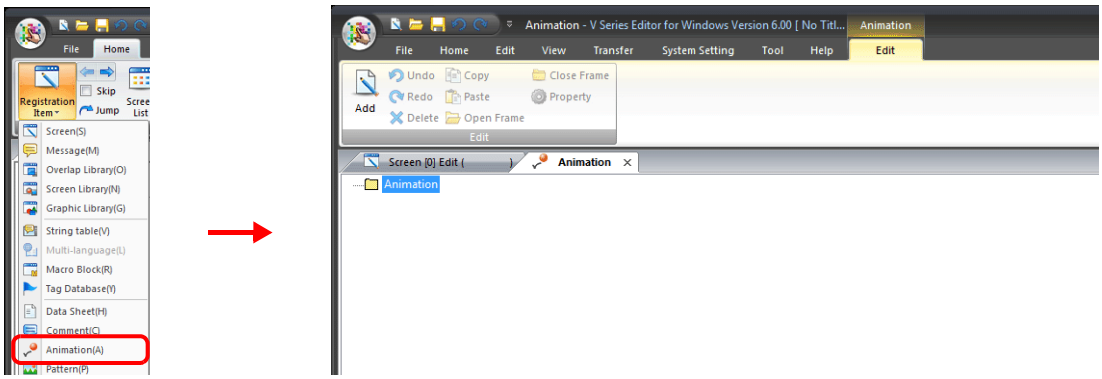
Create the following animation using an animation table.

Display when bit 0 of D100 is set to ON

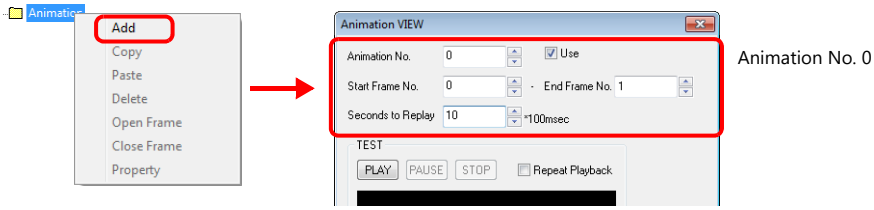


1. Registering animation

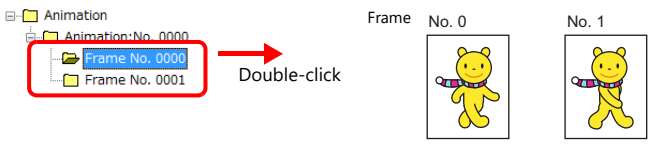
   1) Click [Home] → [Registration Item] → [Animation]. The [Animation] tab window is displayed.



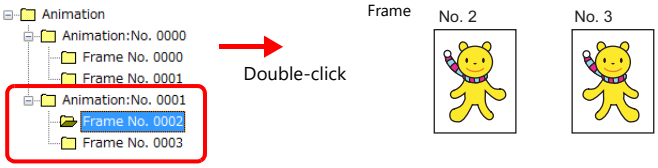
   2) Right-click on [Animation], select [Add], and set the [Animation VIEW] settings.



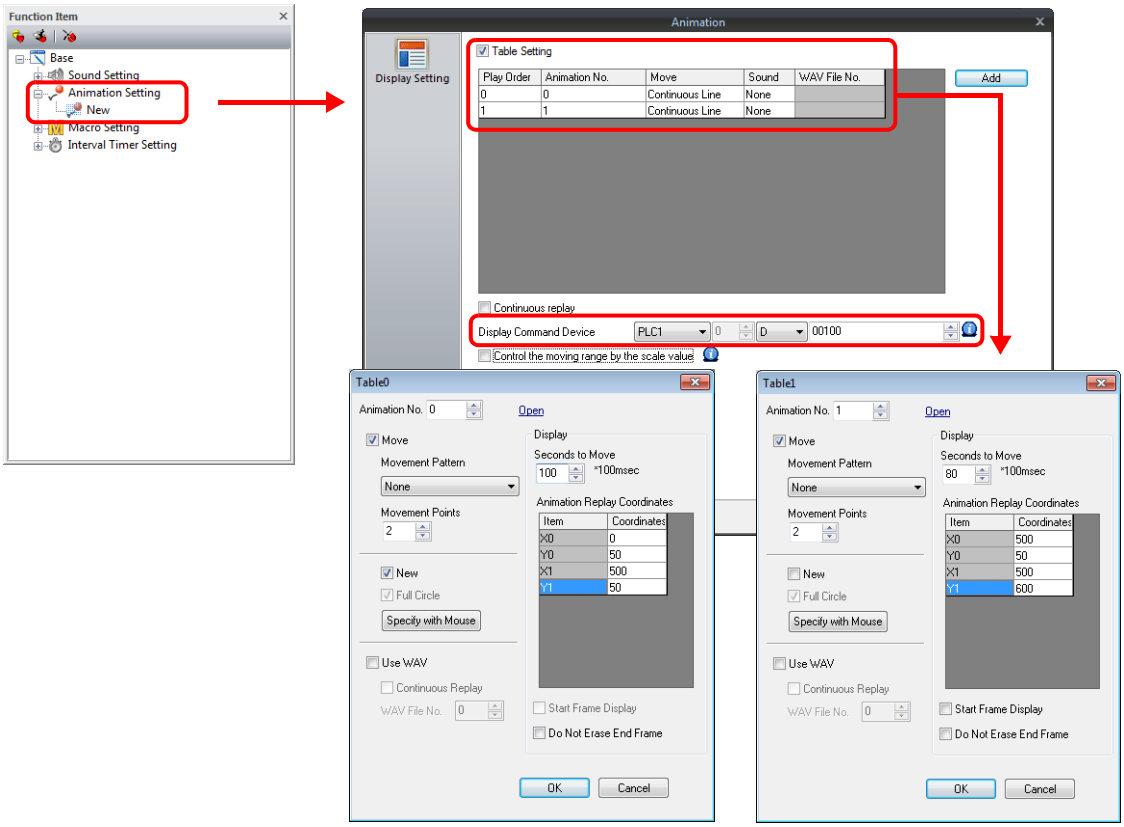
   3) Register frame numbers 0 and 1.



   4) In the same manner, create a new animation (animation number 1) and frame numbers 2 and 3.



2. Setting animation on the screen
   Click [View] → [Function Item] → [Animation Setting] → [New] and configure the animation settings.

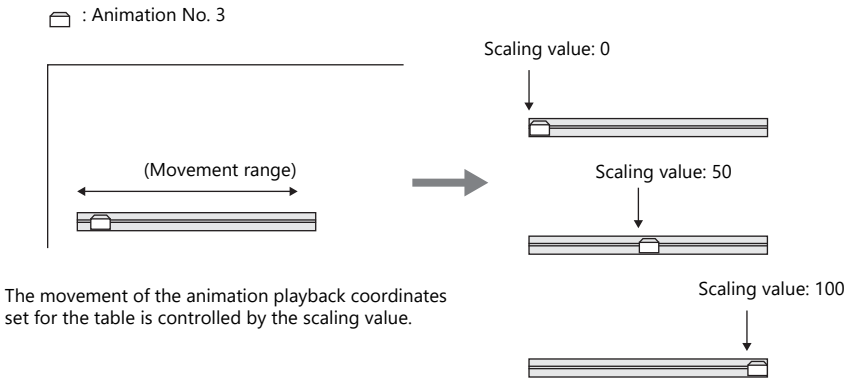


Item		Setting	
Table Setting		Selected	
	Table 0	Animation No. 0	
		Move: Continuous Line	Move
			Movement Pattern: None
			Movement Points: 2
			Seconds to Move: 100* 100 msec
			Animation Replay Coordinates X0:Y0 0,50 X1:Y1 500,50
		No sound	
	Table 1	Animation No. 1	
		Move: Continuous Line	Move
			Movement Pattern: None
			Movement Points: 2
			Seconds to Move: 80* 100 msec
			Animation Replay Coordinates X0:Y0 500,50 X1:Y1 500,600
		No sound	
Continuous replay		None	
Display Command Device		D100	
Control the moving range by the scale value		None	

3. Unit Operation
   Set bit 0 of D100 to ON. The animation is displayed.

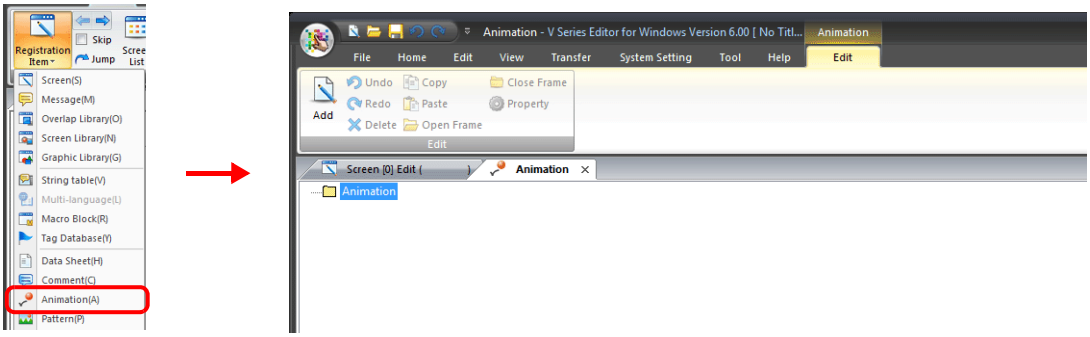
Using Scaling (With Movement)

Create the following animation using scaling. Animation movement is controlled by the change in the scaling value.

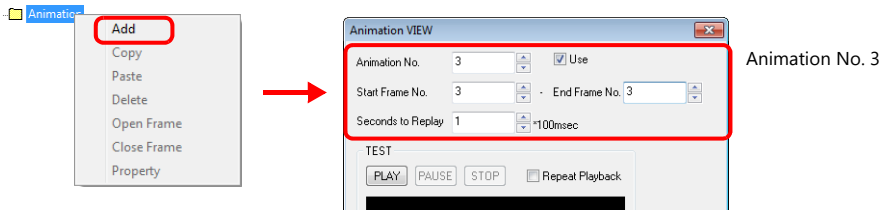


1. Registering animation

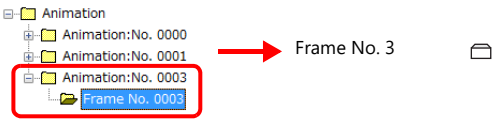
   1) Click [Home] → [Registration Item] → [Animation]. The [Animation] tab window is displayed.



   2) Right-click on [Animation], select [Add], and set the [Animation VIEW] settings.

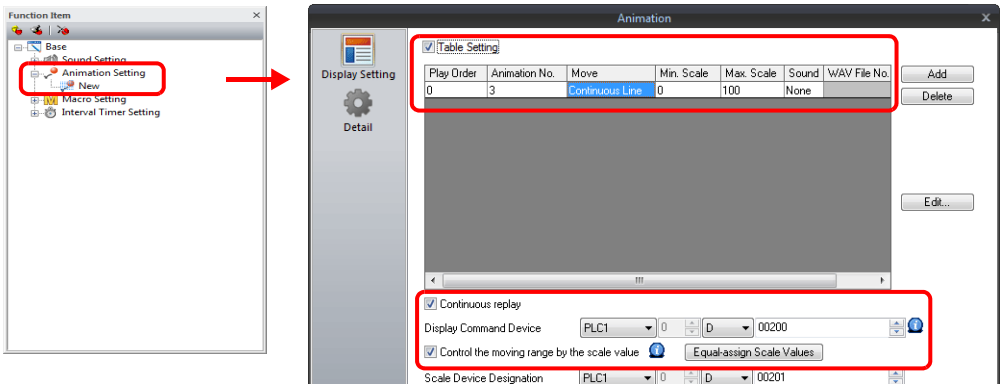


   3) Register frame number 3.



2. Setting animation on the screen

   Click [View] → [Function Item] → [Animation Setting] → [New] and configure the animation settings.



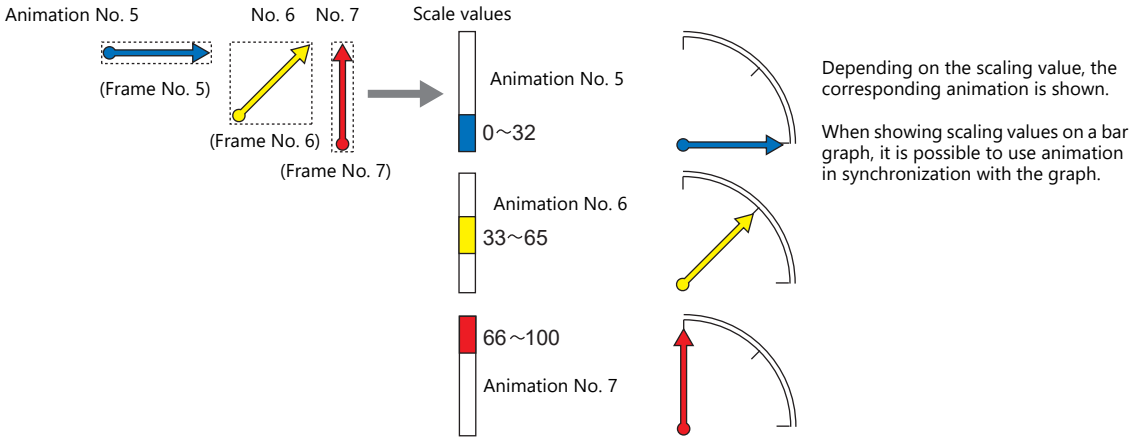
Item		Setting	
Table Setting		Selected	
	Table 0	Animation No. 3	
		Move: Continuous Line	Move
			Movement Pattern: None
			Movement Points: 2
			Animation Replay Coordinates X0:Y0 0,50 X1:Y1 500,50
		Scale values	0 to 100
		No sound	
Continuous replay		None	
Display Command Device		D200	
Control the moving range by the scale value		Selected	
	Scale Device Designation	D201	

3. Unit Operation

   1) Set bit 0 of D200 to ON. The animation is displayed.
   2) Set the scaling value of D201 to move the animation.

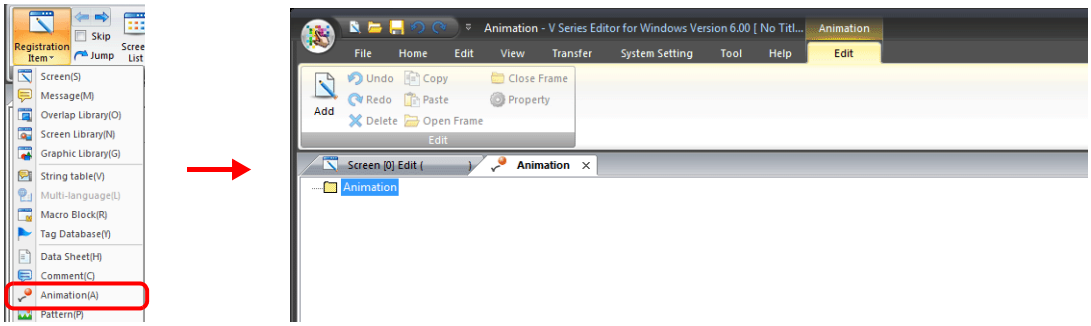
Using Scaling (Without Movement)

Create the following animation. The timing to switch the animation number can be specified using a scaling value.

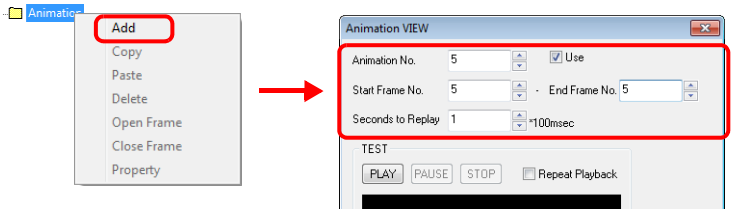


1. Registering animation

   1) Click [Home] → [Registration Item] → [Animation]. The [Animation] tab window is displayed.

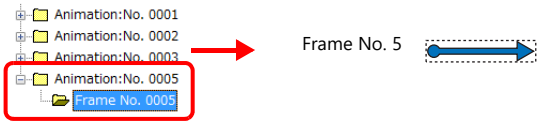


   2) Right-click on [Animation], select [Add], and set the [Animation VIEW] settings.

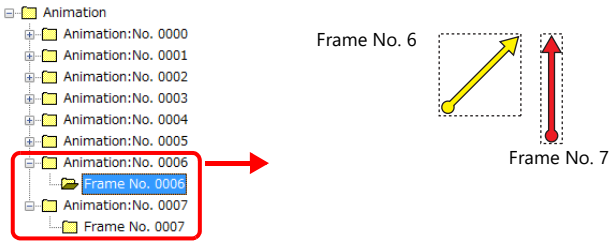


Animation No. 5

3) Register frame number 5.

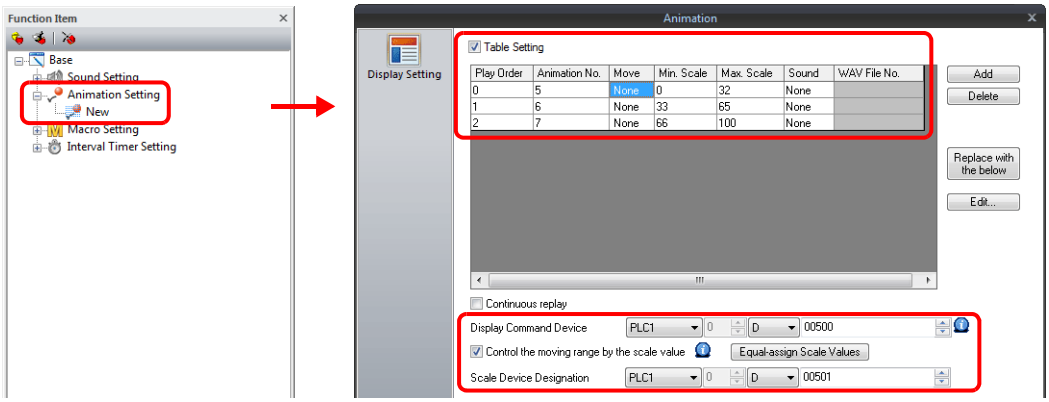


4) In the same manner, register animation number 6 (frame number 6) and animation number 7 (frame number 7).



2. Setting animation on the screen

1) Click [View] → [Function Item] → [Animation Setting] → [New] and configure the animation settings.



Item		Setting	
Table Setting		Selected	
	Table 0	Animation No. 5	
		No movement	Animation playback coordinates X, Y 100, 100
		Scale values	0 to 32
		No sound	
	Table 1	Animation No. 6	
		No movement	Animation playback coordinates X, Y 100, 100
		Scale values	33 to 65
		No sound	
	Table 2	Animation No. 7	
		No movement	Animation playback coordinates X, Y 100, 100
		Scale values	66 to 100
		No sound	
Continuous replay		None	
Display Command Device		D500	
Control the moving range by the scale value		Selected	
	Scale Device Designation	D501	

3. Unit Operation

1) Set bit 0 of D500 to ON. The animation is displayed.
2) Set the scaling value of D501 to change the animation number.

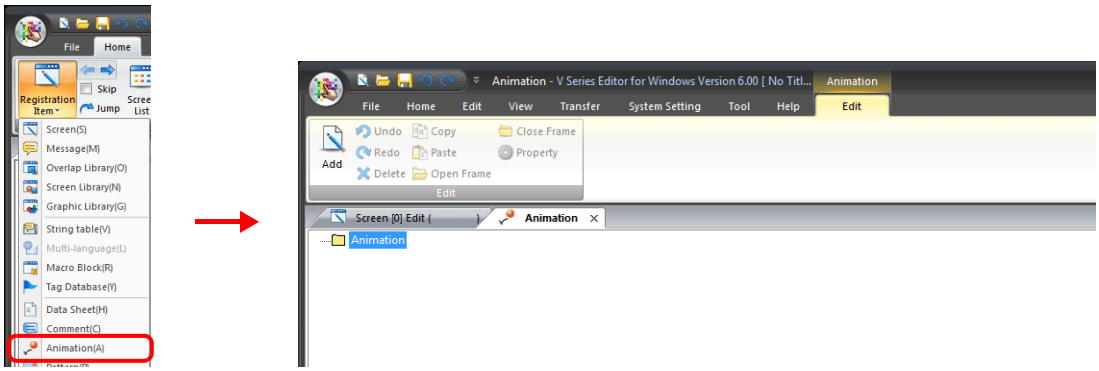
11.2.3 Detailed Settings

Registering Animation

Animations are defined and registered in the [Animation] tab window.

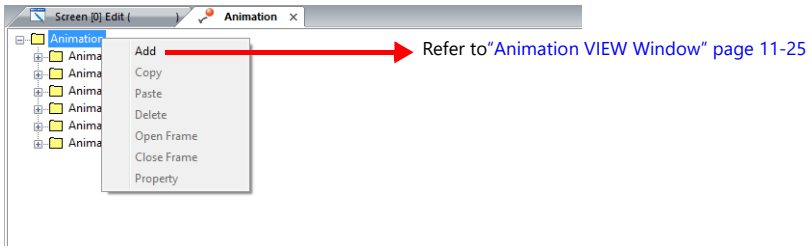
Opening the Registration Window

Click [Home] → [Registration Item] → [Animation] to display the [Animation] tab window.
Configure settings in the [Animation VIEW] window and perform frame editing in this window.



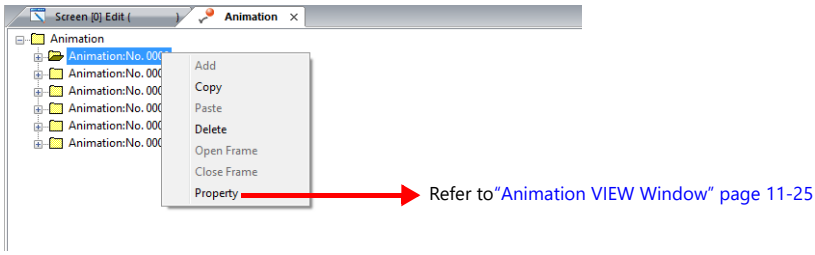
The menu items on the right-click menu differ depending on the folder that was right-clicked, [Animation], [Animation No. xxxx] or [Frame No. xxxx].

- [Animation] folder



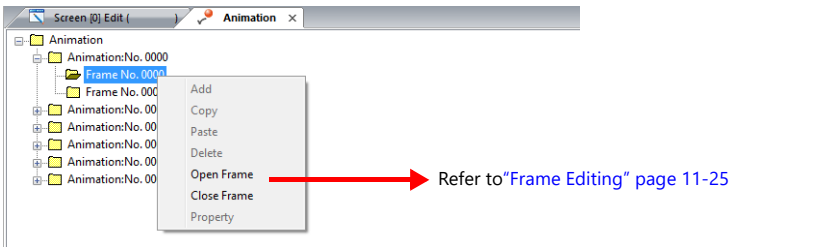
Refer to"Animation VIEW Window" page 11-25

- [Animation No. xxxx] folder



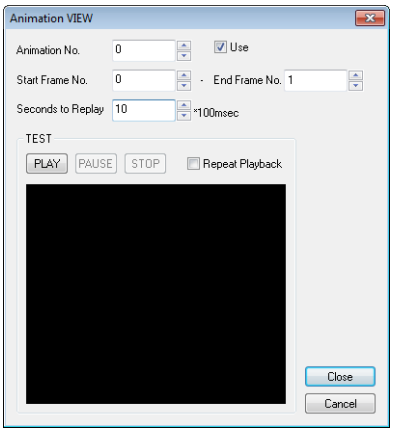
Refer to"Animation VIEW Window" page 11-25

- [Frame No. xxxx] folder



Refer to"Frame Editing" page 11-25

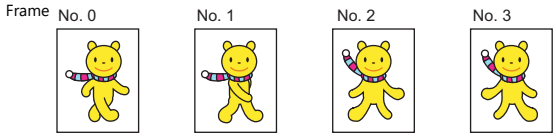
Animation VIEW Window



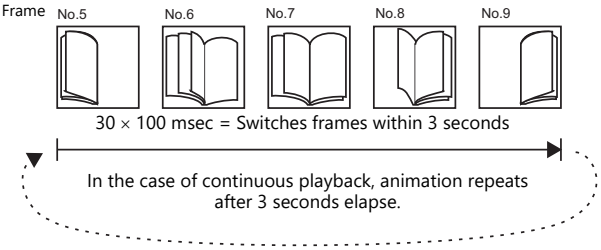
Item	Description
Use	When this checkbox is selected, an animation number is set. To clear the setting, deselect this checkbox.
Animation No.	Displays the animation number currently being edited. The animation number can be changed by clicking the up/down arrow buttons. Values can also be entered directly without using the up/down buttons. Setting range: 0 to 1023
Start Frame No. - End Frame No.	Set the range (number) of frames *1 to be used for animation. Setting range: 0 to 1022
Seconds to Replay (× 100 msec) *2	Set the cycle (speed) for changing the frames specified for [Start Frame No.] and [End Frame No.].
TEST	When the frames have been registered, the actual motion of the animation can be checked.

PLAY	The set frame is displayed within the time set for [Seconds to Replay].
PAUSE	Pause playback.
STOP	Stop playback.
Repeat Playback	Normally playback is only performed once when the [PLAY] button is clicked. Select this checkbox to enable continuous playback.

*1 A "frame" refers to a single image used in animation. Drawing is performed on a pixel unit basis.



*2 Display example
Start Frame No.: 5
End Frame No.: 9
Seconds to Replay: 30 × 100 msec
Animation is performed as shown below.



Frame Editing

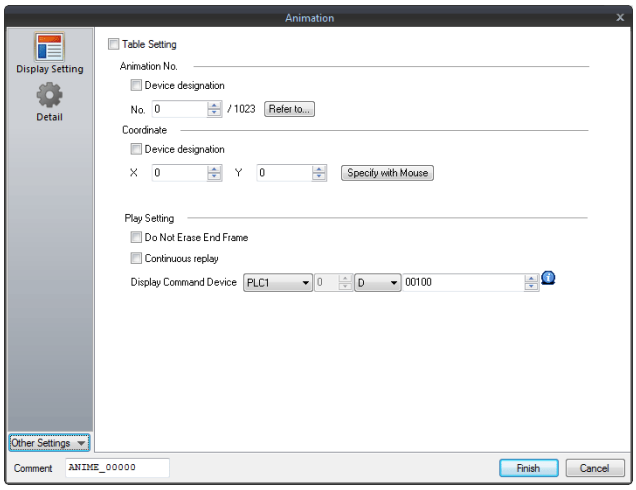
- For details on frame editing and registration, refer to the V9 Series Operation Manual.
- A maximum of 1023 frames can be registered (0 to 1022).

Animation Settings

Display Settings

[Table Setting]: Unselected

Specify one animation number for playback. Specifying a device memory address allows changing the animation number and display position.



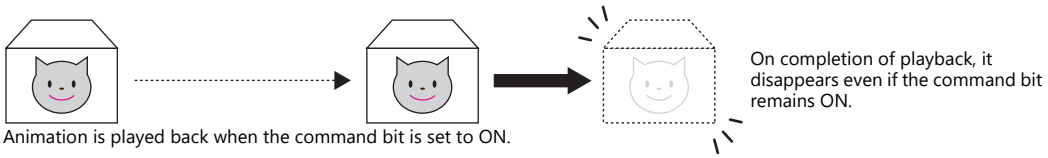
Item		Description
Animation No.		Set the animation number specification method. Unselected: Set one animation number. Selected: Set the animation number using a device memory.
Coordinate		Set the display position of the animation. Unselected: Set the X and Y coordinates. Selected: Set the X and Y coordinates using a device memory.
Play Setting	Do Not Erase End Frame *1	Set the operation to perform when animation playback ends. Unselected On completion of playback, the image disappears even if the command bit remains ON. Selected The end frame is shown even after completion of replay while the command bit remains ON. When the command bit is set to OFF, the end frame disappears.
	Continuous replay	Set the number of times to play back the animation. Unselected: The animation is played back only once. Selected: The animation is played back continuously.
	Display Command Device	This is the device memory to be used for displaying the animation on the screen. MSB … LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 System reserved (“0” setting) (3) Pause/resume movement (2) Pause/resume playback (1) Show/hide animation (1) Show/hide animation (bit 0) [1] (ON): Show the corresponding animation number. [0] (OFF): Hide the currently displayed animation. (2) Pause/resume playback (bit 1) [1] (ON): Pause the currently playing animation. [0] (OFF): Resume playback of the paused animation. Playing Paused Set bit 1 to ON. Frames are switched in accordance with the animation setting. The animation pauses with the frame displayed when bit 1 is set to ON.

Continued

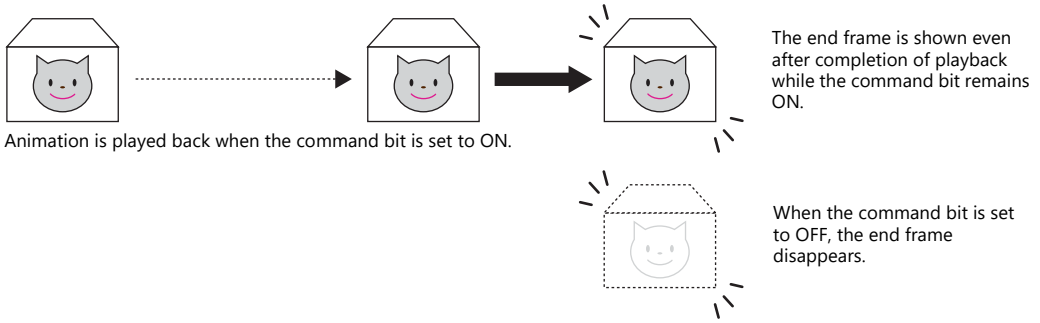
Item		Description
Play Setting	Display Command Device	(3) Pause/resume movement (bit 2) *2 [1] (ON): Pause the currently moving animation. [0] (OFF): Resume movement of the animation.

*1 Do Not Erase End Frame

- Checkbox unselected

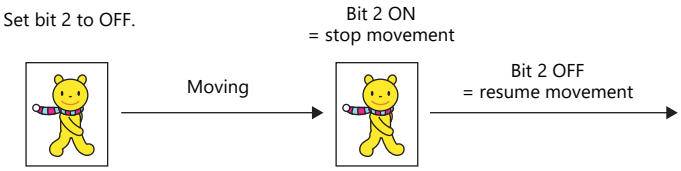


- Checkbox selected
  Animation can be shown or hidden according to the status of the command device memory, which facilitates display control from an external device.

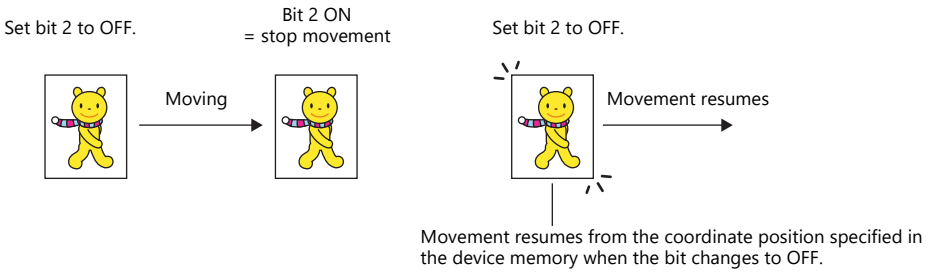


*2 Pause/resume movement (bit 2)

- When movement is selected on the animation table ([Table Setting]: selected), movement is resumed from the position where it was paused.

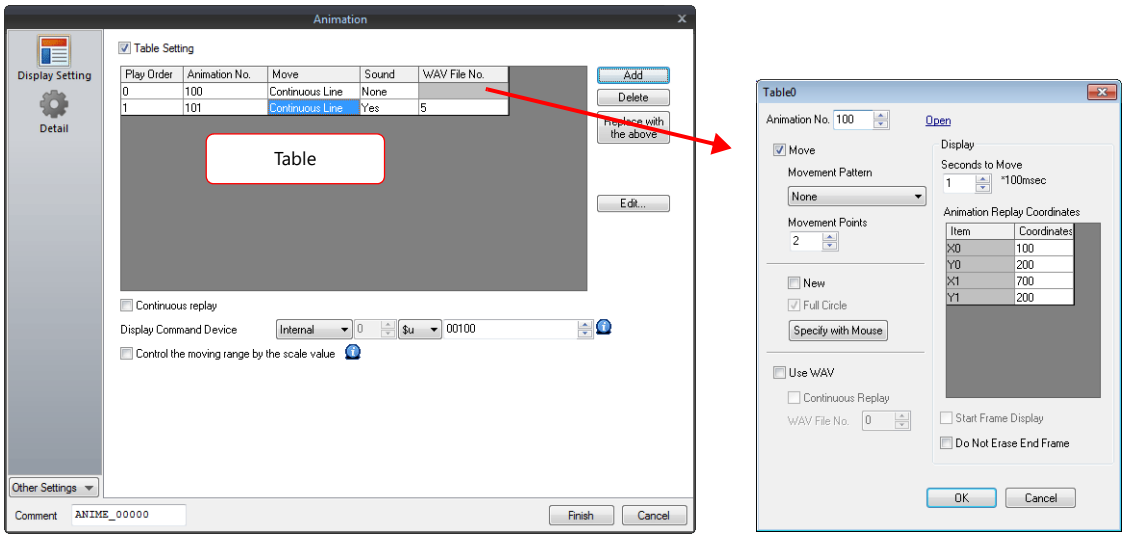


- When movement occurs using the coordinates specified by a device memory address, movement resumes according to the value specified for [Display Command Device].



[Table Setting]: selected

The multiple animations registered in the table are played back in order.



Item	Description
Table	Register animation numbers to play back using the [Add] button. Refer to "Table 0 to 15" page 11-29.
Continuous replay	Set the number of times to play back the animation. Unselected: The animation is played back only once. Selected: The animation is played back continuously.
Display Command Device	This is the device memory to be used for displaying the animation on the screen. MSB … LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 System reserved ("0" setting) (3) Pause/resume movement (2) Pause/resume playback (1) Show/hide animation (1) Show/hide animation (bit 0) [1] (ON): Show the corresponding animation number. [0] (OFF): Hide the currently displayed animation. (2) Pause/resume playback (bit 1) [1] (ON): Pause the currently playing animation. [0] (OFF): Resume playback of the paused animation. Playing Paused Set bit 1 to ON. Frames are switched in accordance with the animation setting. The animation pauses with the frame displayed when bit 1 is set to ON. (3) Pause/resume movement (bit 2) *1 [1] (ON): Pause the currently moving animation. [0] (OFF): Resume movement of the animation.
Control the moving range by the scaling value	Use a scaling value. The settings for scaling values are available when this checkbox is selected. Refer to "Scaling" page 11-32.

*1 For details, refer to "Display Settings" page 11-26.

Table 0 to 15

Register up to 16 animations to play back in sequence.

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Animation No.</td><td>Set the animation number to play back.</td></tr>
<tr><td colspan="2">Move</td><td>Set whether or not to move the animation.

Unselected: No movement
Selected: Move</td></tr>
<tr><td></td><td>No movement</td><td>Configure the following settings.

<table><tr><td>Animation Replay Coordinates</td><td>Set the display position of the animation.</td></tr><tr><td>Seconds to Move (× 100 msec)</td><td>Set the playback time for the set animation number.</td></tr></table></td></tr>
<tr><td></td><td>Move</td><td>Set the following items for straight line path.

<table><tr><td>Movement Pattern *1</td><td>None</td></tr><tr><td>Movement Points</td><td>Specify the number of movement points.
Range: 2 to 32</td></tr><tr><td>Animation Replay Coordinates</td><td>Specify the coordinates of the movement points.
These can be specified with direct input or by using the mouse.</td></tr><tr><td>New *2
Specify with Mouse</td><td>Specify the coordinates of the movement points using the mouse.
Not set: Selected
Already set: Unselected</td></tr><tr><td>Seconds to Move (× 100 msec)</td><td>Set the movement time for the set animation number.</td></tr></table>
Set the following items for circular and arc-like paths.

<table><tr><td rowspan="2">Movement Pattern *1</td><td>Circle (Clockwise)</td></tr><tr><td>Circle (Counterclockwise)</td></tr><tr><td>No. of Divisions *1</td><td>Specify the number of divisions of the circumference.
Range: 2 to 31</td></tr><tr><td>Animation Replay Coordinates</td><td>Specify the coordinates of the movement points.
These can be specified with direct input or by using the mouse.</td></tr><tr><td>New *2
Specify with Mouse</td><td>Specify the coordinates of the movement points using the mouse.
Not set: Selected
Already set: Unselected</td></tr><tr><td>Full Circle *2</td><td>Select this checkbox when a full circle is used for the path.</td></tr><tr><td>Seconds to Move (× 100 msec)</td><td>Set the movement time for the set animation number.</td></tr></table></td></tr>
<tr><td colspan="2">Use WAV</td><td>Set whether or not to play an audio file.

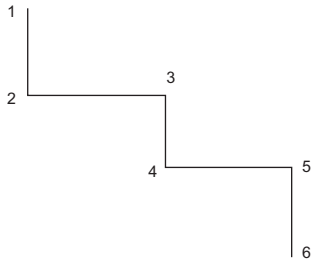
Unselected: No playback.
Selected: Play back an audio file. The following movement settings become available when this checkbox is selected.</td></tr>
<tr><td></td><td>Continuous Replay</td><td>Continuously play back an audio file.</td></tr>
<tr><td></td><td>WAV File No.</td><td>Set the audio file number.</td></tr>
<tr><td colspan="2">Start Frame Display *3</td><td>Baton pass animation can be performed. This setting is available for tables other than table number 0.</td></tr>
<tr><td colspan="2">Do Not Erase End Frame *4</td><td>Set the operation to perform when animation playback ends.

Unselected
On completion of playback, the image disappears even if the command bit remains ON.

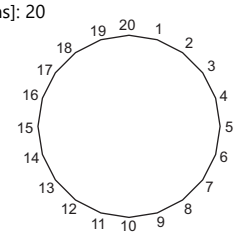
Selected
The end frame is shown even after completion of replay while the command bit remains ON.
When the command bit is set to OFF, the end frame disappears.</td></tr>
</table>

*1 Movement Pattern/Movement Points/No. of Divisions

Example: Straight line
[Movement Points]: 6

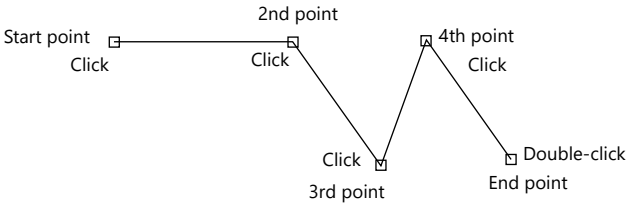


Example: Circle
[No. of Divisions]: 20

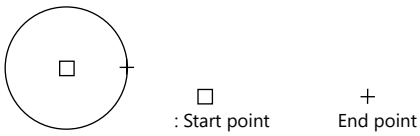


*2 [Specify with Mouse]/[New]

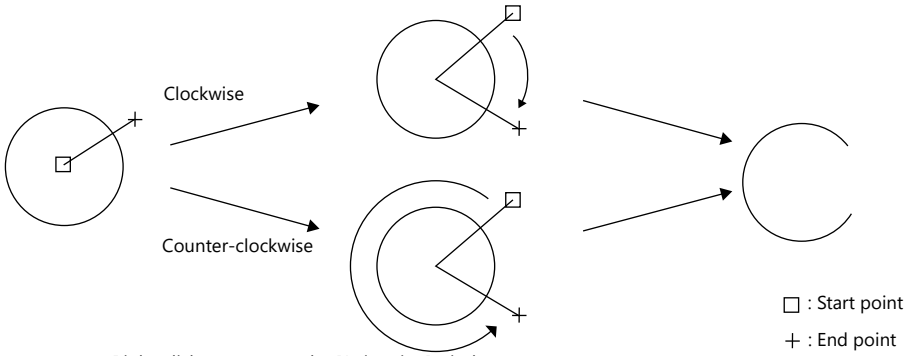
- When [Movement Pattern] is set to "None", click the desired points on the screen in the same way as drawing a continuous straight line. The coordinates are defined in order. Double-click to accept the points and display the window again. The number of clicks is automatically set for [Movement Points]. Specifying with mouse is automatically finished when 32 points are set.



- When [Movement Pattern] is set to "Circle (Clockwise/Counterclockwise)" with [Full Circle], specify the start and end points.

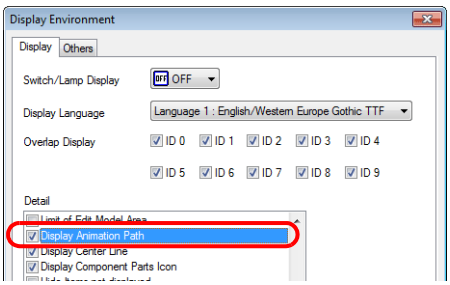


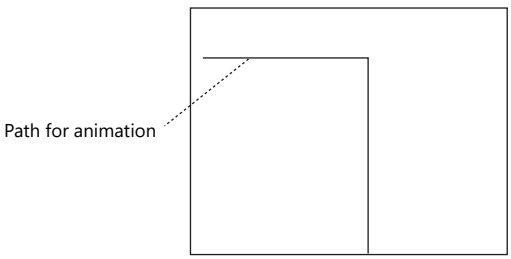
- When [Movement Pattern] is set to "Circle (Clockwise/Counterclockwise)" with [Arc], specify the start and end points.



Right-click to return to the [Animation] window.

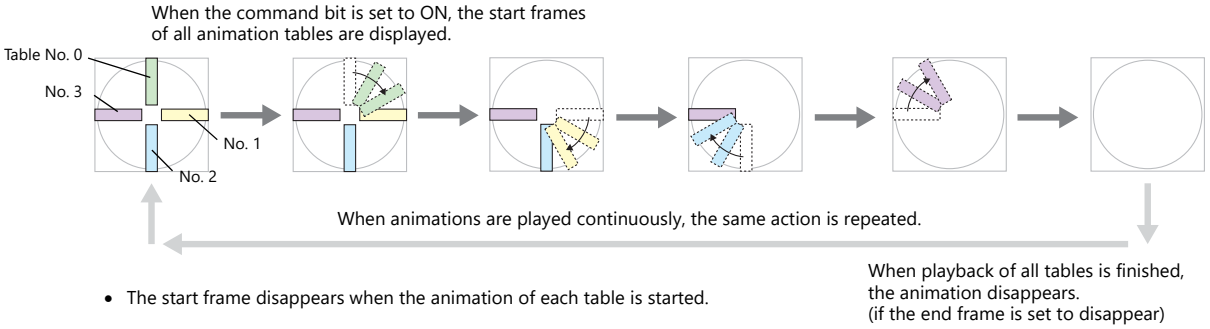
A configured path can be modified by clicking [Specify with Mouse] when the [New] checkbox is unselected.
To show the path on the editing screen, select the [Display Animation Paths] checkbox in the [Display Environment] window.
A straight line, continuous straight line, circle, or arc created by drawing is displayed in the editing window.





*3 Start Frame Display

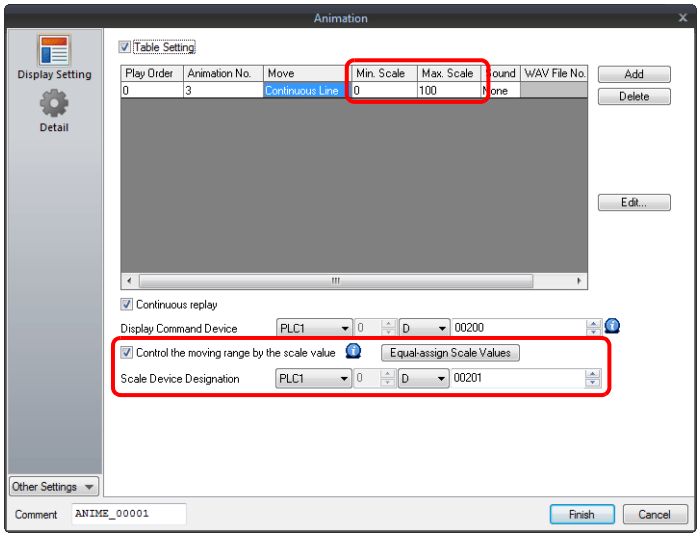
: Animation table No. 0
: Animation table No. 1, with start frame display
: Animation table No. 2, with start frame display
: Animation table No. 3, with start frame display



- The start frame disappears when the animation of each table is started.

*4 For details, refer to "Display Settings" page 11-26.

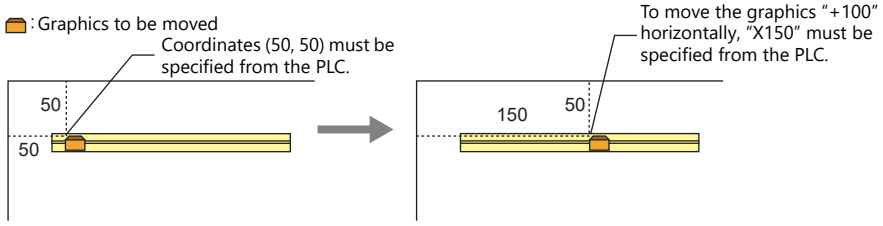
Scaling



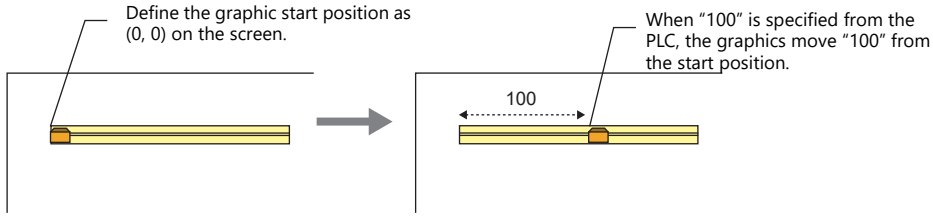
Item	Description
Control the moving range by the scaling value *1	Use a scaling value. The following setting items for scaling values become active.
Scale Device Designation	Set the device memory that specifies the scaling value.
Min. Scale	Set the minimum scaling value of the animation table.
Max. Scale	Set the maximum scaling value of the animation table.
Equal-assign Scale Values *2	Equally assign scaling values to the animation in the table.

*1 Difference between using and not using scaling values

- When scaling values are not used:

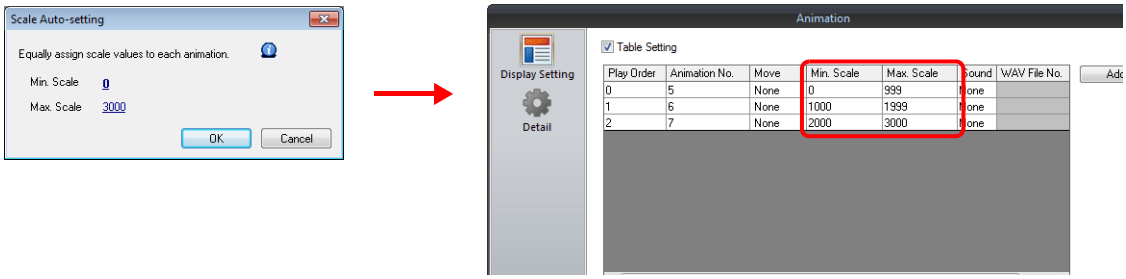


- When scaling values are used:

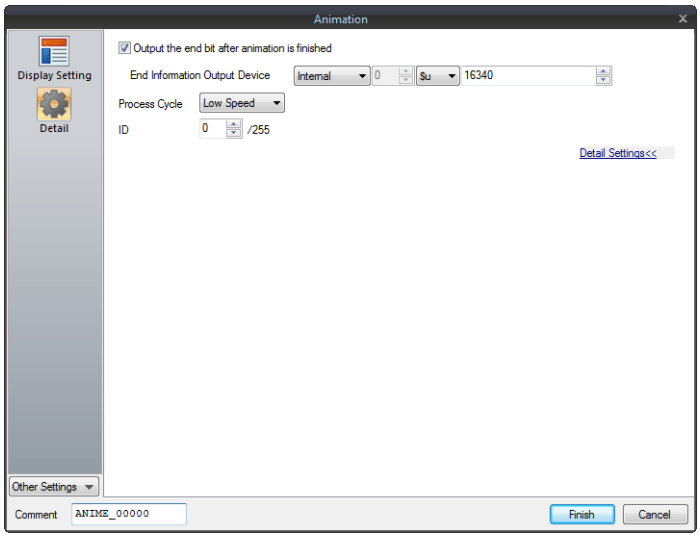


*2 Setting example

When assigning scaling values equally in the range from 0 to 3000 using animation tables No. 0 to No. 2 :



Detail



Item	Description
Output the end bit after animation is finished	This is the device memory to be used for checking the status of animation. • In the case of device memory designation, the end bit is output when the animation playback time (seconds) has elapsed. • In the case of using an animation table, the end bit is output when all of the animations in the animation table have been played back. • If the animation is finished halfway through playback, the end bit is not output. • The end bit is not output when using scaling. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 System reserved (“0” setting) End of animation
Process Cycle	Set a cycle for the X1 series to read the PLC data while it is communicating with the PLC. For details, refer to “1.2 Process Cycle”.
ID	Set the ID.

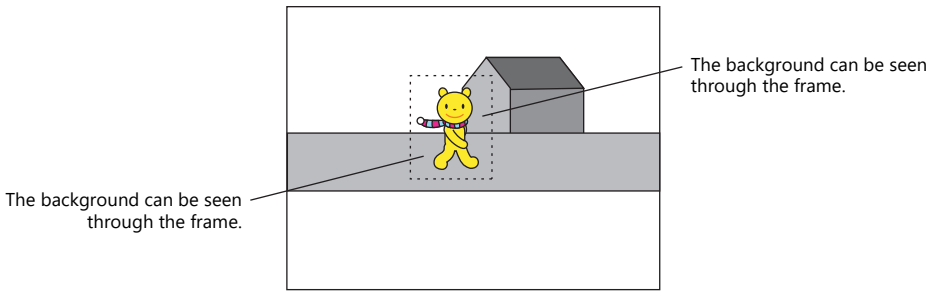
11.2.4 Notes

Animation Setting Position

An animation can be set only on a base screen. Note that you cannot register it on an overlap screen.

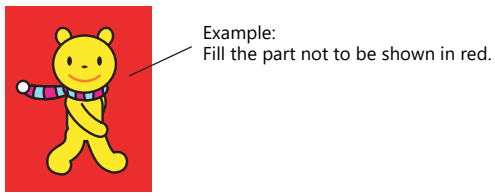
Transparency

A part of a picture (frame) in the registered animation can be hidden.

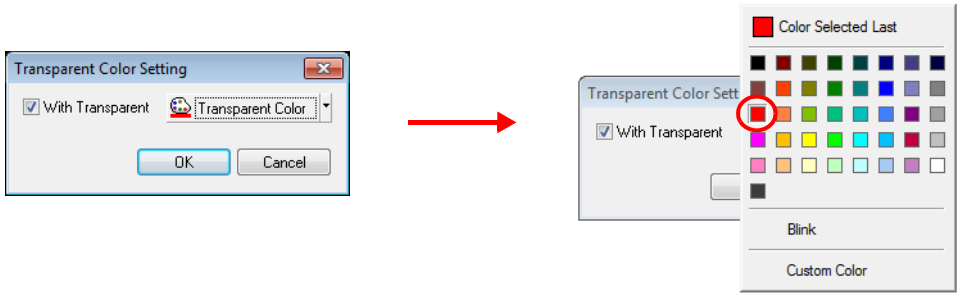


Transparent color setting for frame

1. Fill out the non-display area of each frame using a color different from the color of the display area in the [Frame Edit] tab window.



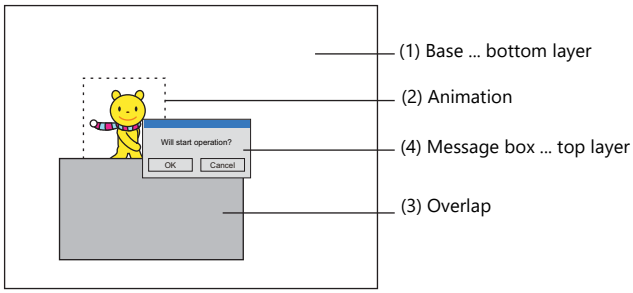
2. Click [Transparent Color Setting] on the [Edit] menu. Select the [With Transparent] checkbox and select the red color used in step 1.



This makes the color in the non-display area transparent. When displaying the frame on the screen, the background can be seen though the non-display area.

Structure of Layers

Animations are displayed behind overlaps on the X1 series unit.



Restrictions

- Frame size limit
  The maximum capacity per frame is 1 MB.
  In the case of capturing a bitmap or JPEG file larger than 1 MB, the file will be automatically divided into 1 MB segments so that the bitmap or JPEG can be captured. (Files with a resolution of up to 1920 × 1080 can be captured.)
- Maximum number of movements
  Up to 256 animation settings can be configured for each screen. However, the maximum number of animations that can be displayed simultaneously is 64.
  Even if the bit is set to ON, the 65th and subsequent animations will not be displayed.

12 Message

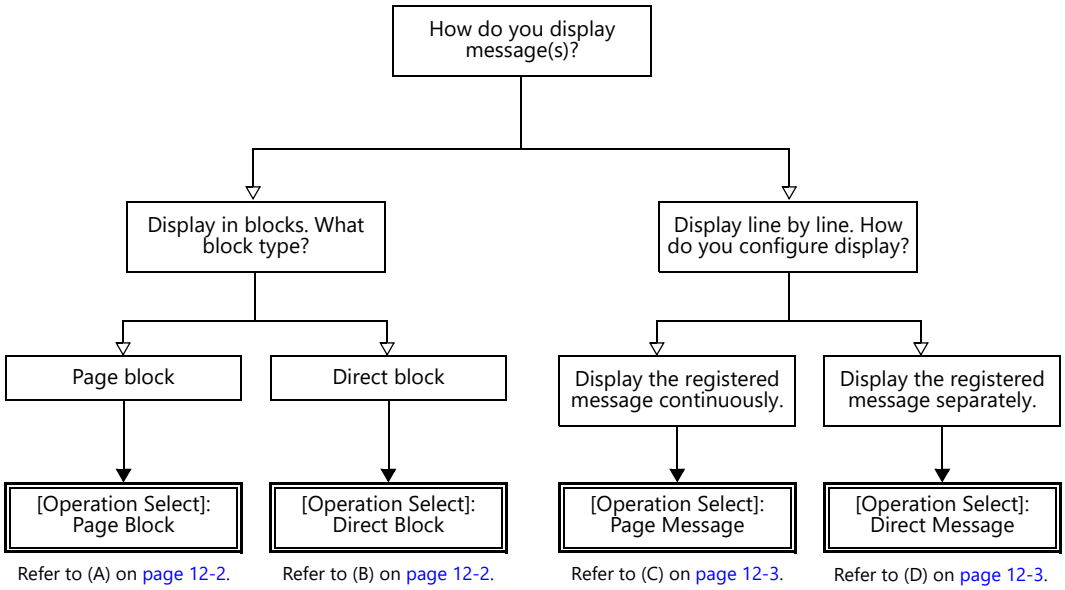
12.1 Message Mode

12.2 Displaying Comments

12.1 Message Mode

12.1.1 Overview

This function displays messages on the screen by specifying the line number of a message previously registered in the message registration area (message editing) or by grouping these messages into blocks and specifying the block number(s). The message mode has four kinds of display configurations as shown below.



Refer to (A) on page 12-2.
Refer to (B) on page 12-2.
Refer to (C) on page 12-3.
Refer to (D) on page 12-3.

Other message display methods are described in "5.3 Message Display" page 5-29 and "8 Alarm".

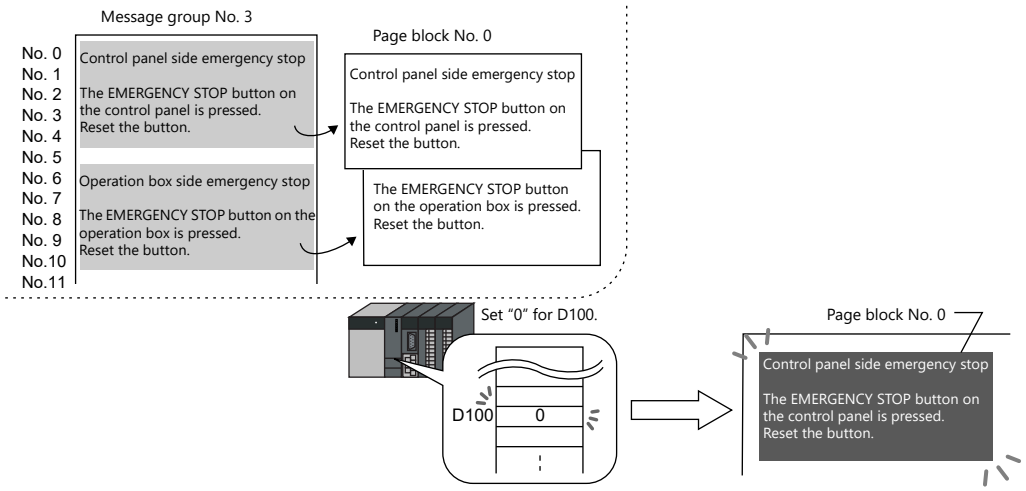
How to Specify Block Numbers

If [Operation Select] is set to [Page Block] or [Direct Block] in the message mode, specify the [Page Block] or [Direct Block] number to which the message to display is registered.

A [Operation Select]: Page block

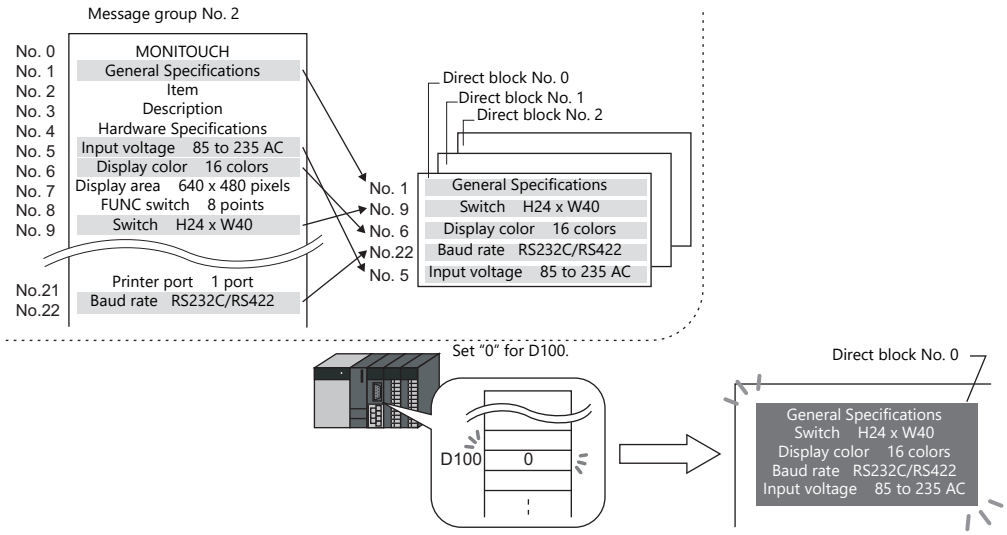
Register the message that was previously registered in the message editing area as [Page Block].
The corresponding "page block" is displayed on the screen.
To display a page block on the screen, there are two ways: changeover with a switch or changeover with respect to data in a device memory address.

☞ For setting examples, refer to "Displaying Messages (Page Blocks)" page 12-4.



B [Operation Select]: Direct block

Register the message that was previously registered in the message editing area as [Direct Block].
The corresponding "direct blocks" are displayed on the screen.
To display a direct block on the screen, there are two ways: changeover with a switch or changeover with respect to data in a device memory address.

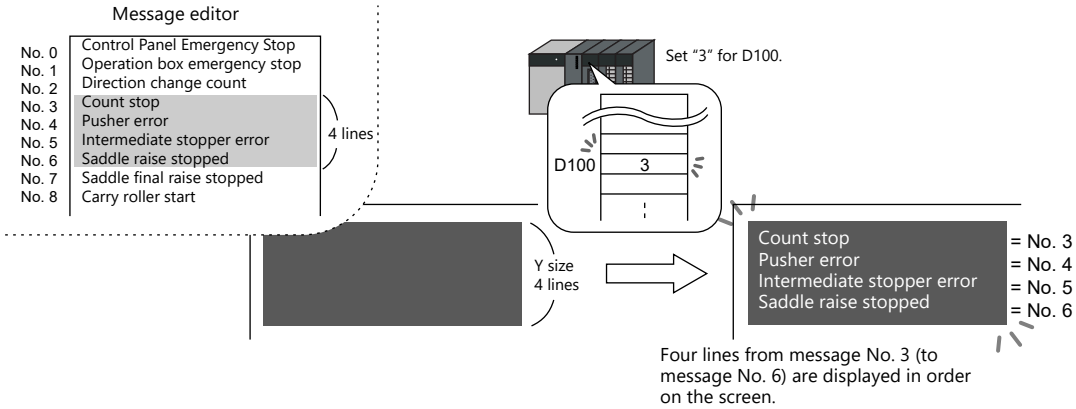


How to Specify Message Numbers

If [Operation Select] is set to [Page Message] or [Direct Message] in the message mode, always specify the number of the message to display.

C [Operation Select]: Page message

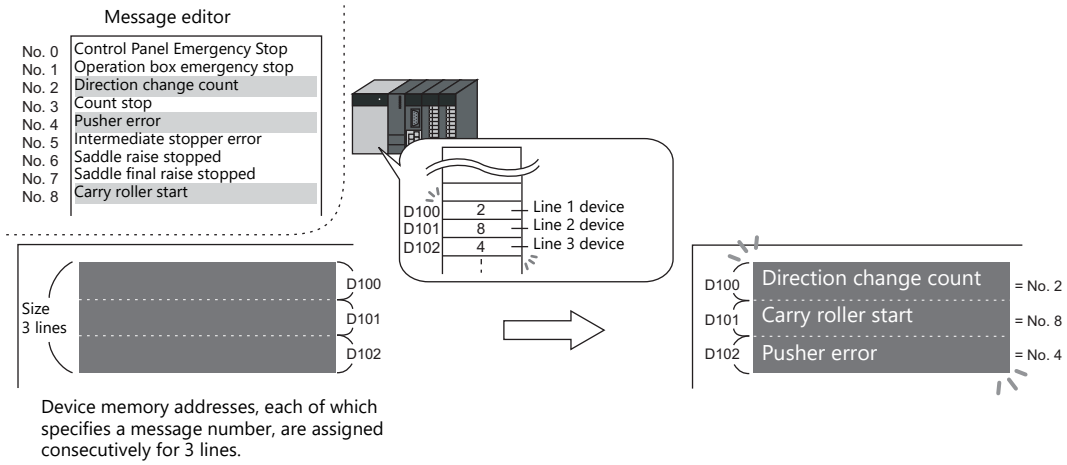
Specify the line number of the top message to display. Several lines of the message, of the number specified, are continuously displayed within the display area on the screen.



D [Operation Select]: Direct message

One device memory address is automatically assigned to each line in the message display area. Specify the message number to display based on the assigned device memory address.

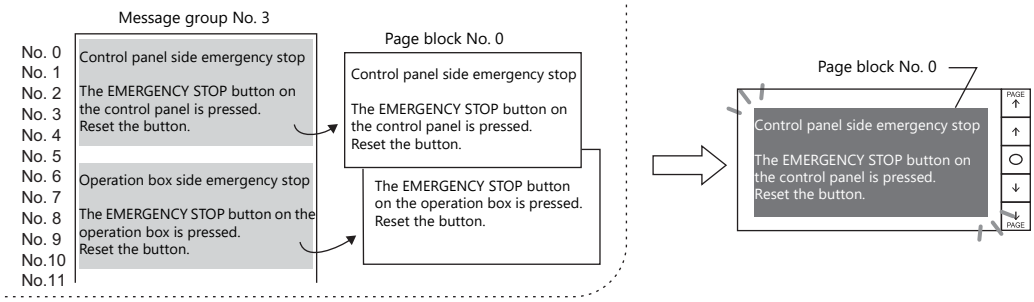
A message specified by the device memory address is displayed on the screen.



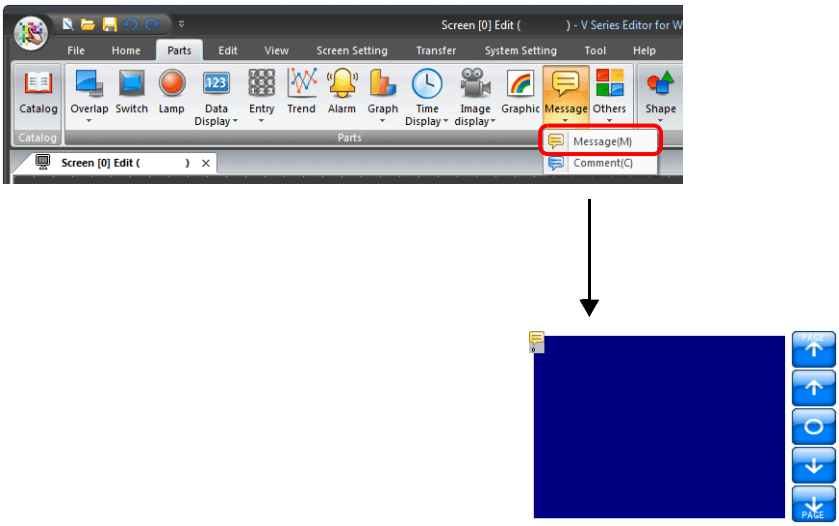
12.1.2 Setting Examples

Displaying Messages (Page Blocks)

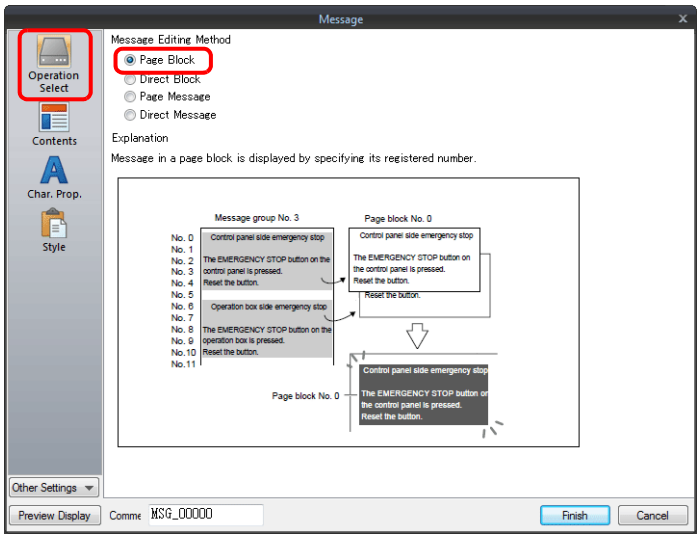
Register a message to a page block and display the message by changing the block number using a switch.



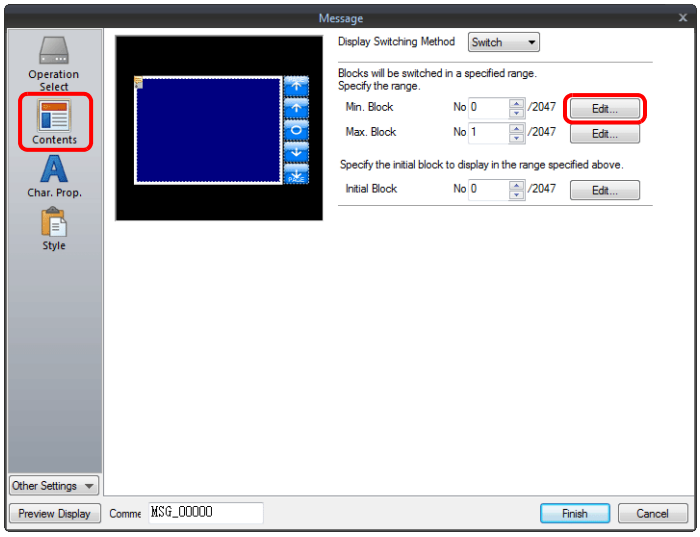
1. Click [Parts] → [Message] → [Message] and place a message mode part on the screen.



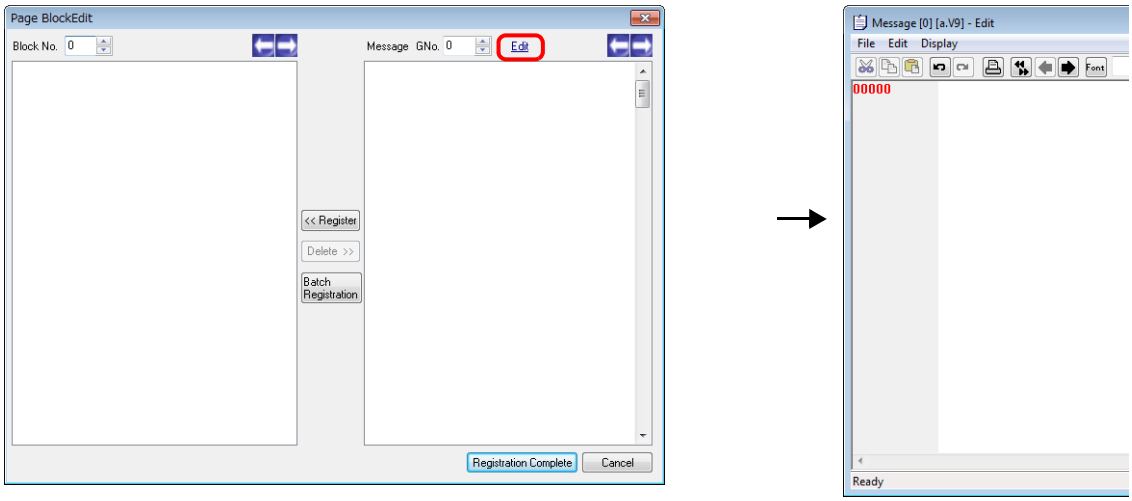
2. Double-click on the message mode part to display the settings window.
   Configure the [Operation Select] settings as shown below.



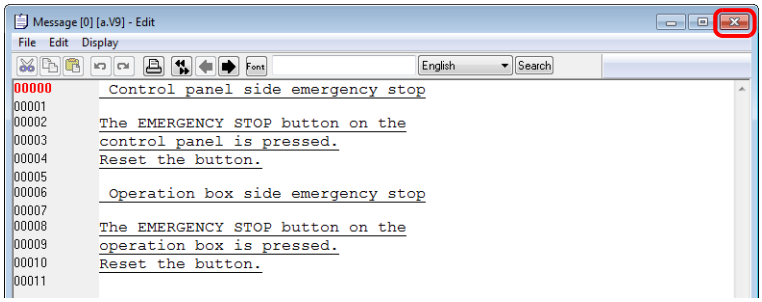
3. Click [Contents] and configure the settings as shown below.
   Click [Edit] to register a message for display.



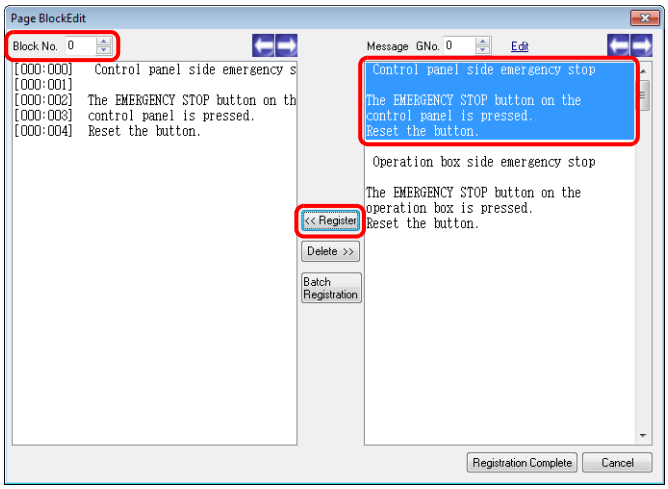
4. Click [Edit] in the [Page Block Edit] window to display the [Message Edit] window.



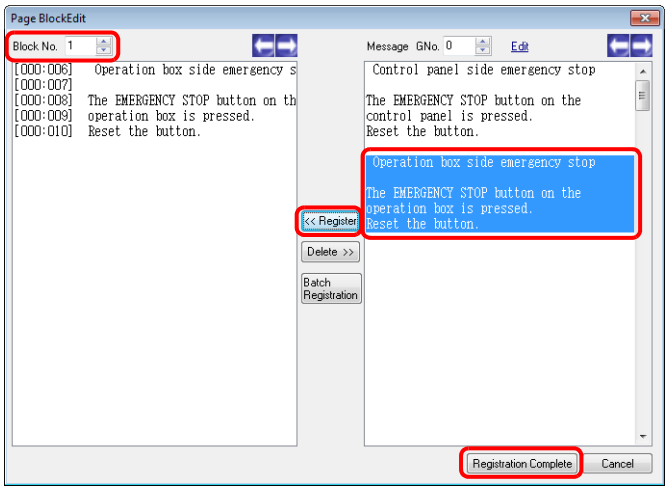
5. Register the following message and then close the [Message Edit] window.



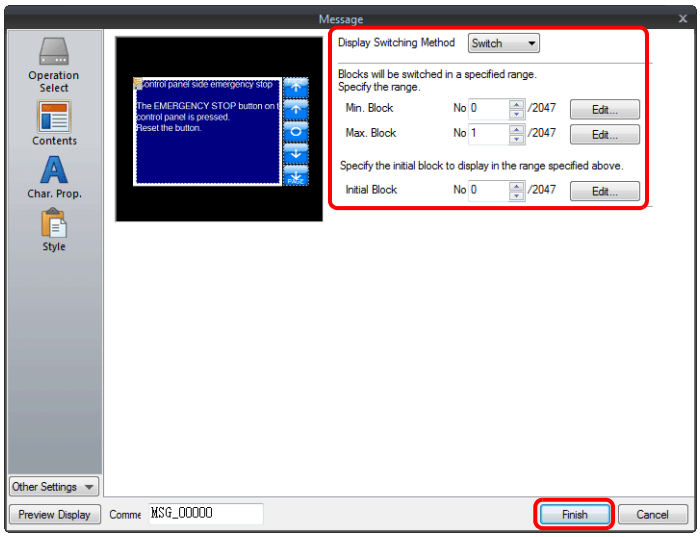
6. Register the message registered in the [Message Edit] window to page block number 0 as shown below.



7. In the same manner, register the message again to page block number 1 as shown below and click [Registration Complete].



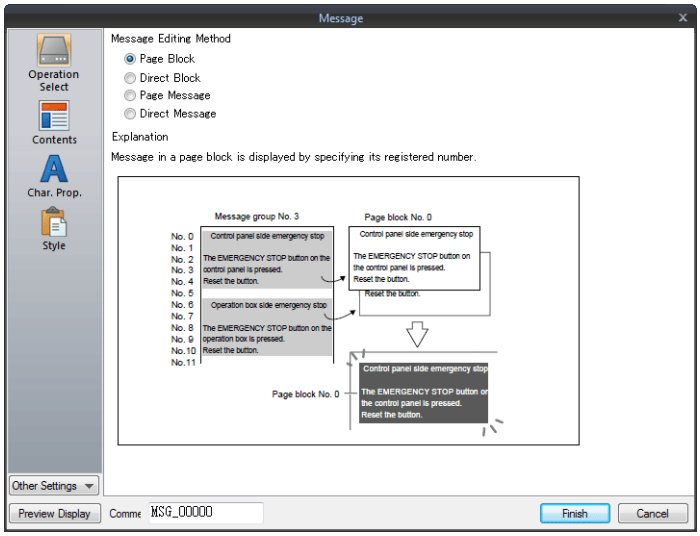
8. Configure the settings as shown below and click [Finish].



This completes the necessary settings.

12.1.3 Detailed Settings

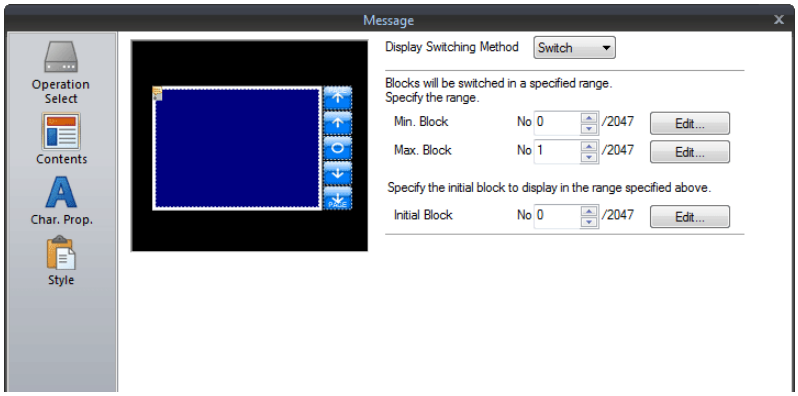
Operation Select



Item		Description
Message Editing Method		Select the display method for message mode.
	Page Block	Page blocks are displayed on the screen. There are two methods for changing the display: switches and device memory addresses
	Direct Block	Direct blocks are displayed on the screen. There are two methods for changing the display: switches and device memory addresses.
	Page Message	Specify the line number of the top message to display using [Message No. Designation Device] (described later). Several lines of the message, of the number specified, are continuously displayed within the area at the top of the screen.
	Direct Message	One device memory address is automatically assigned to each line in the message display area. Specify the message number to display for the assigned device memory address. A message specified by the device memory address is displayed on the screen.

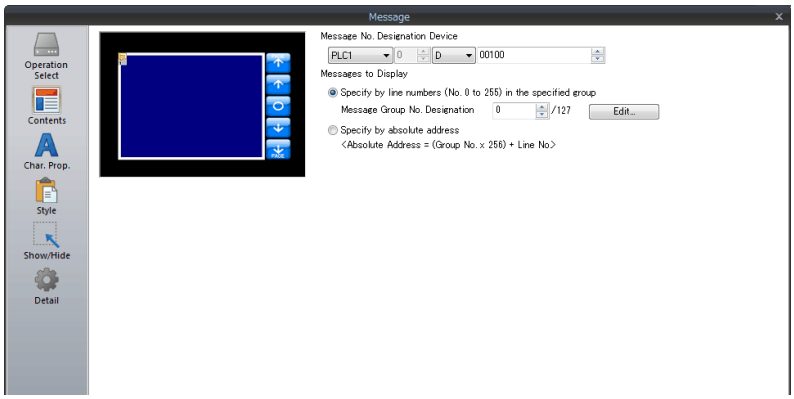
Displayed information

[Operation Select]: Page block/direct block



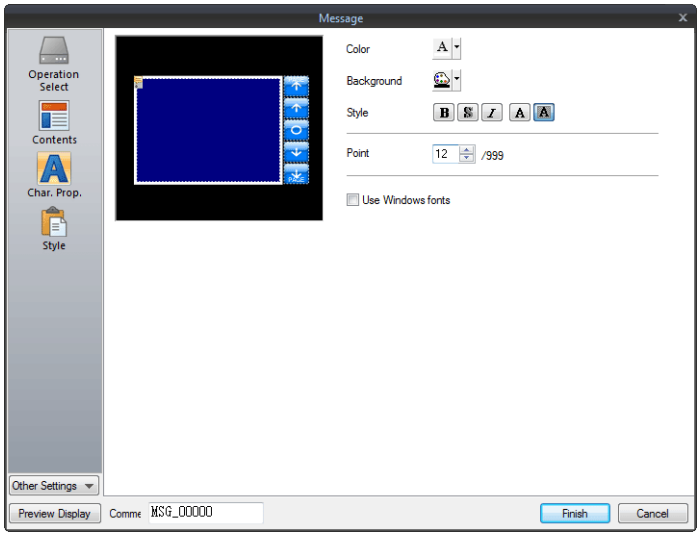
Item	Description
Display Switching Method	Select how to call up blocks. Switch: Change the block number to display using a switch placed on the screen. Device: Directly specify the block number using [Block No. Setting Device] (described later) to display the corresponding block.
Min. Block	Set the lowest block number for the page blocks or direct blocks to display. The page block or direct block can be edited by clicking [Edit].
Max. Block	Set the highest block number for the page blocks or direct blocks to display. The page block or direct block can be edited by clicking [Edit].
Initial Block	Set the initial block number to show when the screen is displayed. The page block or direct block can be edited by clicking [Edit].
Block No. Setting Device	Specify the block number to display on the screen. The page block or direct block can be edited by clicking [Block Edit].

[Operation Select]: Page message/direct message



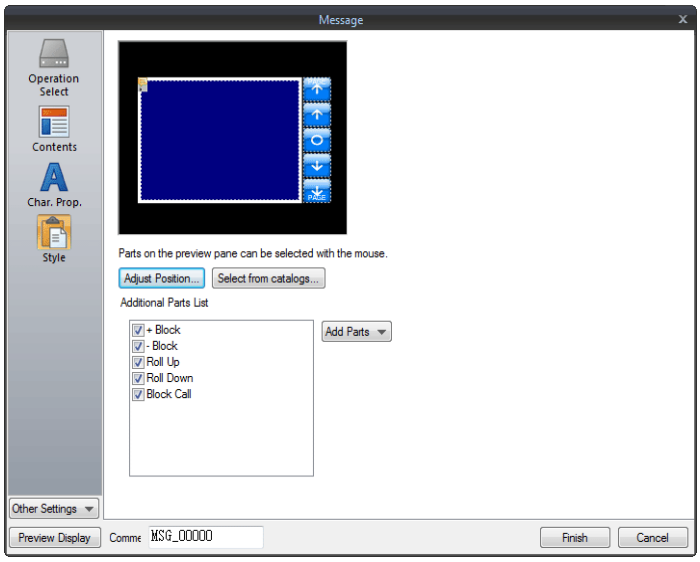
Item		Description
Message No. Designation Device		Specify the message number to display on the screen. One device memory address is automatically assigned to each line for direct messages. Device memory addresses are allocated sequentially from the first device memory address specified for [Message No. Designation Device]. The number of words to use is based on the display area's Y size divided by the character enlargement factor value.
Messages to Display	Specify by line numbers (No. 0 to 255) in the specified group	Set a group number. The message displayed on the screen is limited to a message within the specified group number. Specify a message number (0 to 255) in a single group for [Message No. Designation Device].
	Specify by absolute address	Specify the message number to be displayed as an absolute address. Messages from more than one group can be specified. Specify a message number (0 to 32767) among all groups for [Message No. Designation Device].

Char. Prop.



Item	Description
Color	Set the message color.
Background	Set the background color.
Style	Set the message style.
Character Size (1 - 8)	Set the character enlargement factor value of the message. When [Switch] or [Lamp] is selected for [Others] → [Action Area] (described later), the enlargement factor values for X and Y are fixed to "1". * When [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Point (6 - 999)	Set the text size. When [Switch] or [Lamp] is selected for [Others] → [Action Area] (described later), the point size is fixed to "12". * When a font type other than [Bitmap font] is selected at [System Setting] → [Multi-language Setting] → [Font Type]
Use Windows fonts	Select this checkbox to use a Windows font. Message character properties are configured in the [Message Edit] window.

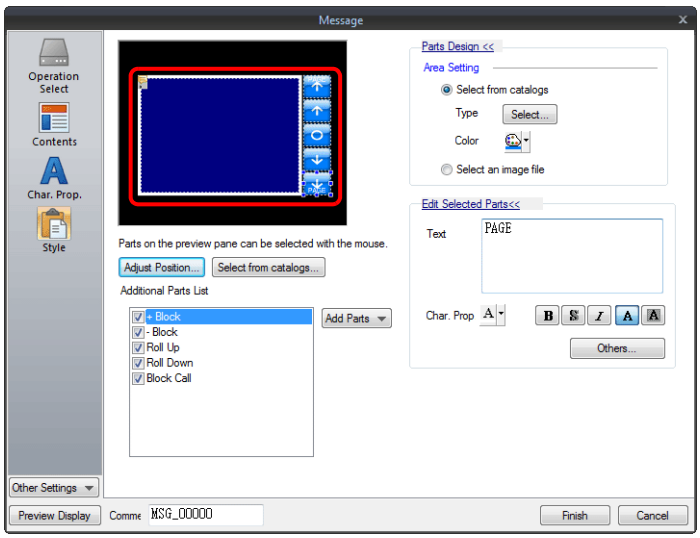
Style



Item		Description
Adjust Position		Adjust the position and size of parts.
Select from catalogs		Select the part design.
Additional Parts List		Add and delete switch parts used in message mode. Each switch is used for page blocks or direct blocks.
	+ Block	Changes to the next message block.
	– Block	Changes to the previous message block.
	Roll Up	Scrolls up through messages.
	Roll Down	Scrolls down through messages.
	Block Call	Changes to the specified block number.

Editing parts

Select a part in the preview pane to change the part's style settings.

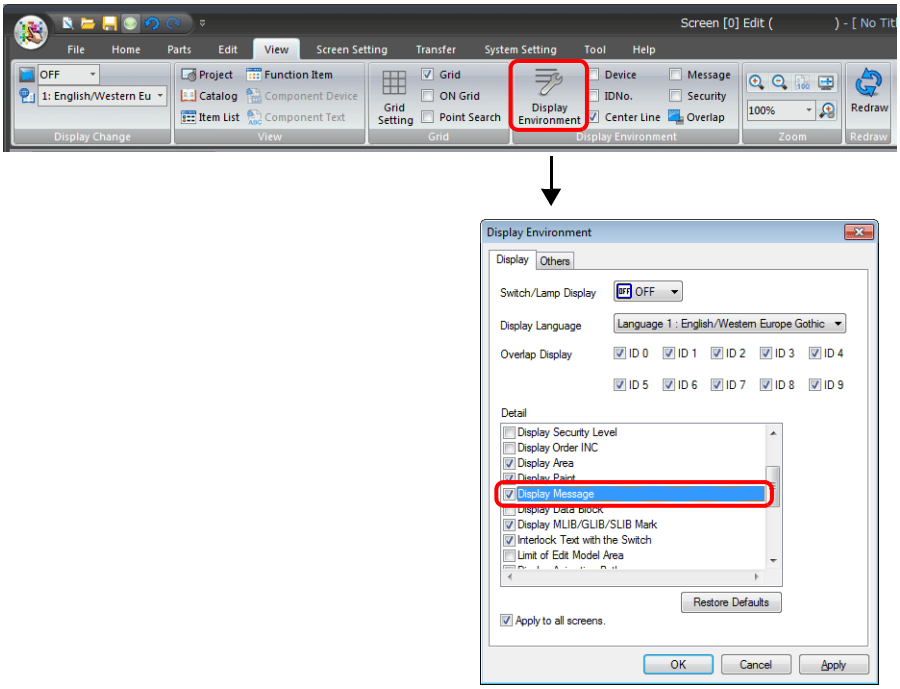


Item			Description
Parts Design	Area Setting	Select from catalogs	Select the part design. After selecting the part, select the part color.
		Select an image file	Select a PNG file.
Edit Selected Parts	Text		Enter the text to be displayed on the switch. (Up to 4 lines can be registered. Text properties can be set for each line.) Text can be justified within the switch part.
	Char. Prop.		Set the text properties and style.
	Others		Edit switch settings other than those related to text and style. For details on switch settings, refer to "3.1 Switch" page 3-1.

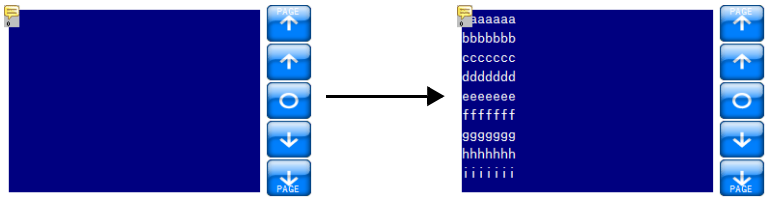
Checking the display area size

Whether messages are displayed as intended in display areas can be checked on the screen.

With messages registered, click [View] → [Display Environment] → [Display] tab and select the [Display Message] checkbox.

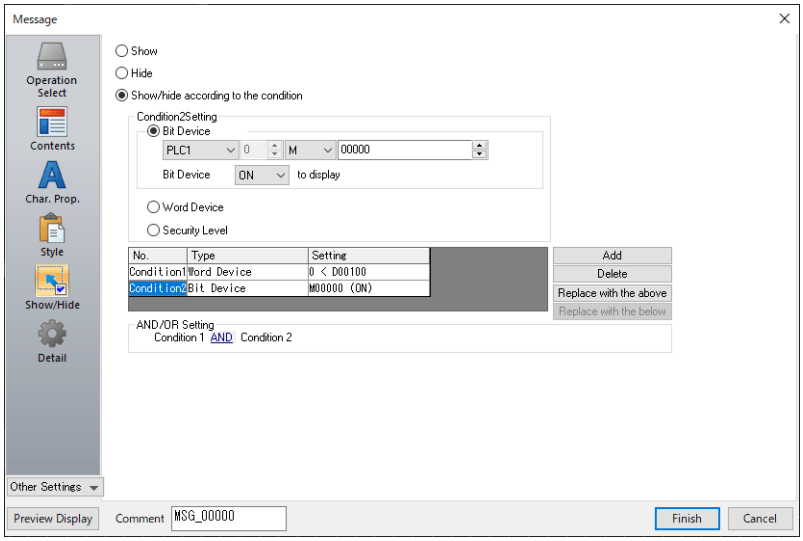


The registered messages are displayed on the screen.



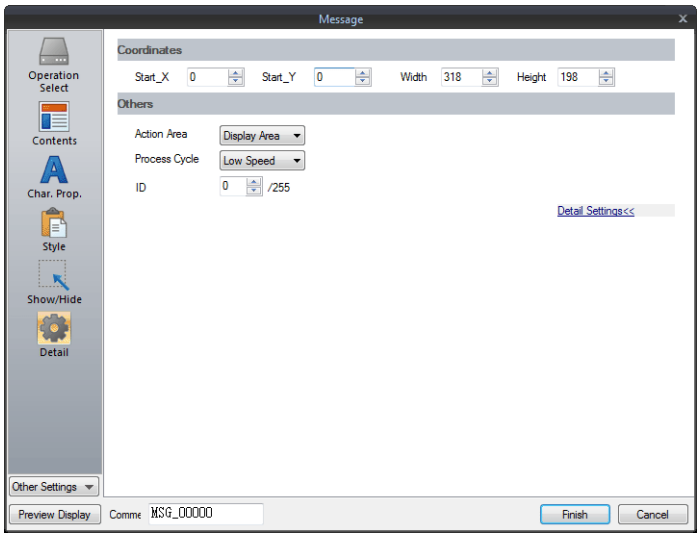
To adjust the size and other settings, perform adjustments via the [Adjust Position] button described in "Style" page 12-10.

Show/Hide



Item			Description
Show			Show the item on the screen.
Hide			Do not show the item on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. **Constant Display Type**: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] **Condition expression**: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail

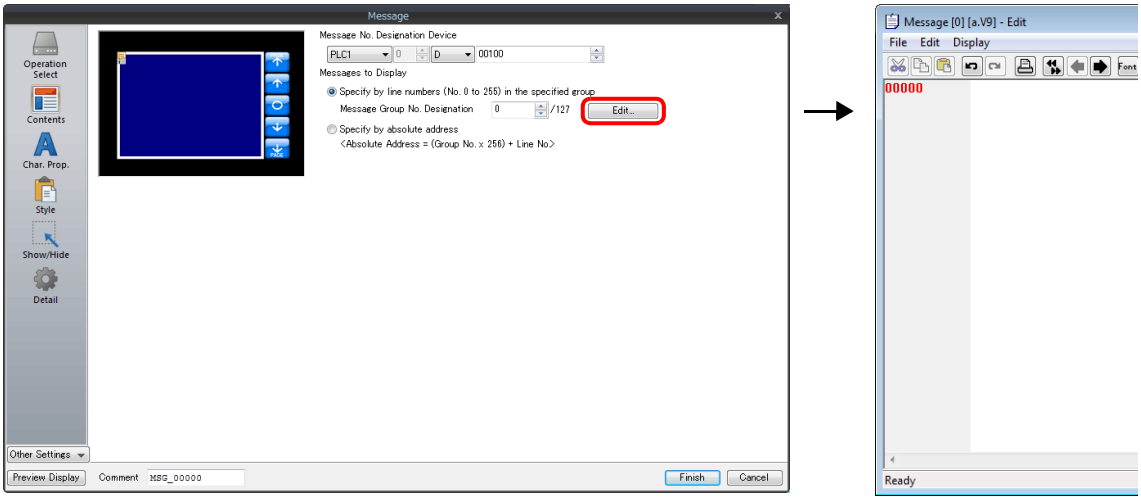


Item		Description
Coordinates	Start X/Start Y	Set the display position of the message mode part using X and Y coordinates.
	Width/Height	Set the size of the message mode part by specifying width and height.
Others	Action Area	Set the position to display the message on the screen. Display area: Display on provided display area parts. Switch: Display on provided switch parts. Switches are automatically set to "Mode" for [Function]. Each switch has [Display Order] (0 to 23) as an auxiliary setting where the message to display on each switch can be specified. When [Display Order] settings are all the same, messages are displayed in the same order that switches were placed. *** One switch part shows one message line.** Lamp: Display on provided lamp parts. Lamps are automatically set to "Mode" for [Function]. As with switch parts, each lamp has [Display Order] (0 to 23) as an auxiliary setting. *** One lamp part shows one message line.**
	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

12.1.4 Registering Messages

There are two ways of registering messages.

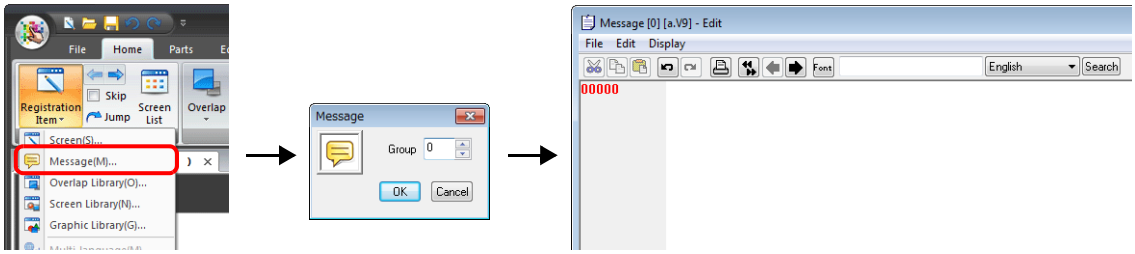
- [Message] settings window → [Contents] → [Edit]



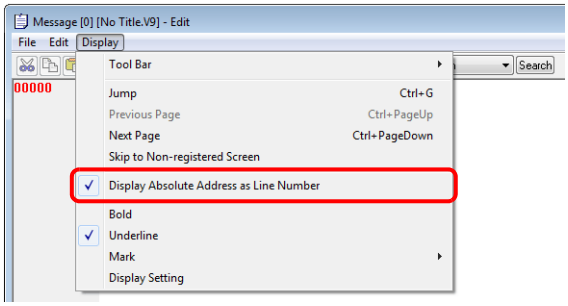
* When [Operation Select] is set to [Page Block] or [Direct Block], the [Message Edit] window cannot be displayed using this method.

* When a message group number is specified, the cursor appears at the start line of the group.

- [Home] → [Registration Item] → [Message] → (specify group number)



In the [Message Edit] window, line numbers denote absolute addresses as default.
When a message group number is specified, deselect [Display] menu → [Display Absolute Address as Line Number] before commencing editing.

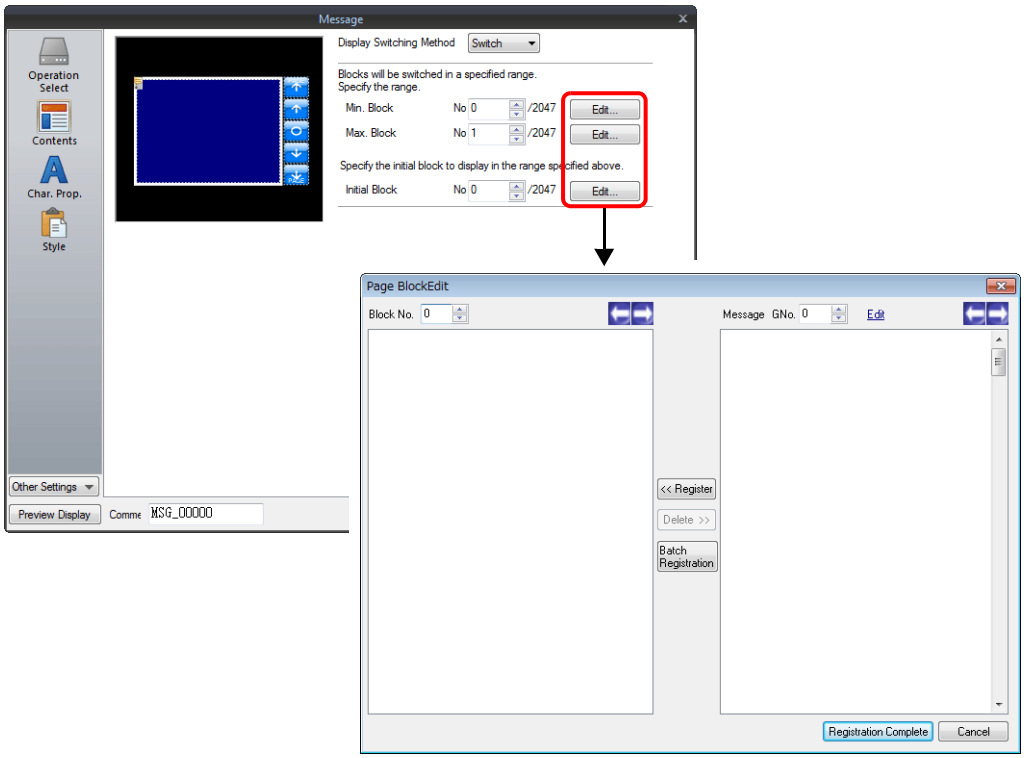


For details on the editing procedure in the [Message Edit] window, refer to the V9 Series Operation Manual.

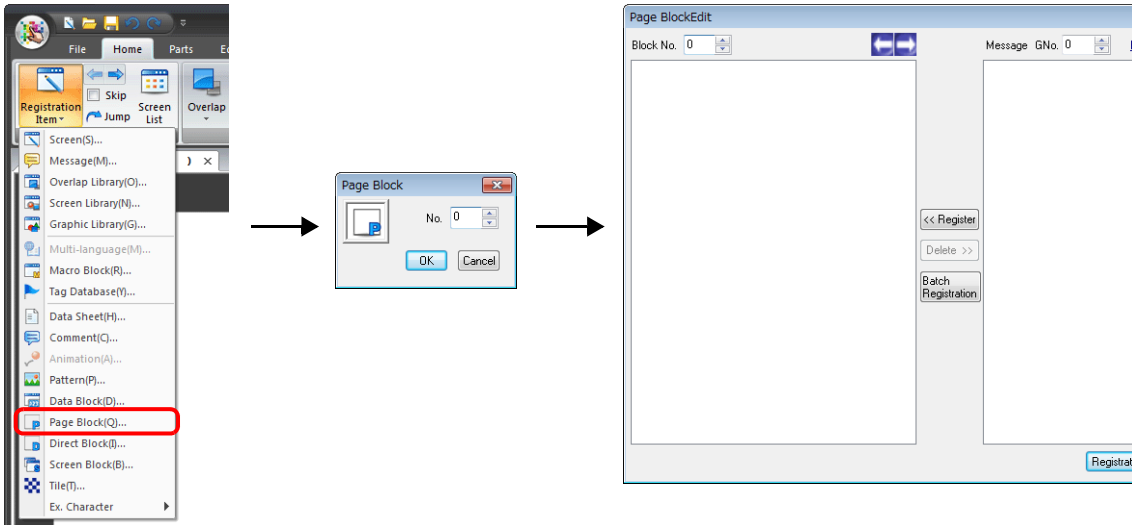
12.1.5 Registering Page Blocks

There are two ways of registering page blocks.

- [Message] settings window → [Contents] → [Edit]



- [Home] → [Registration Item] → [Page Block] → (specify block number)

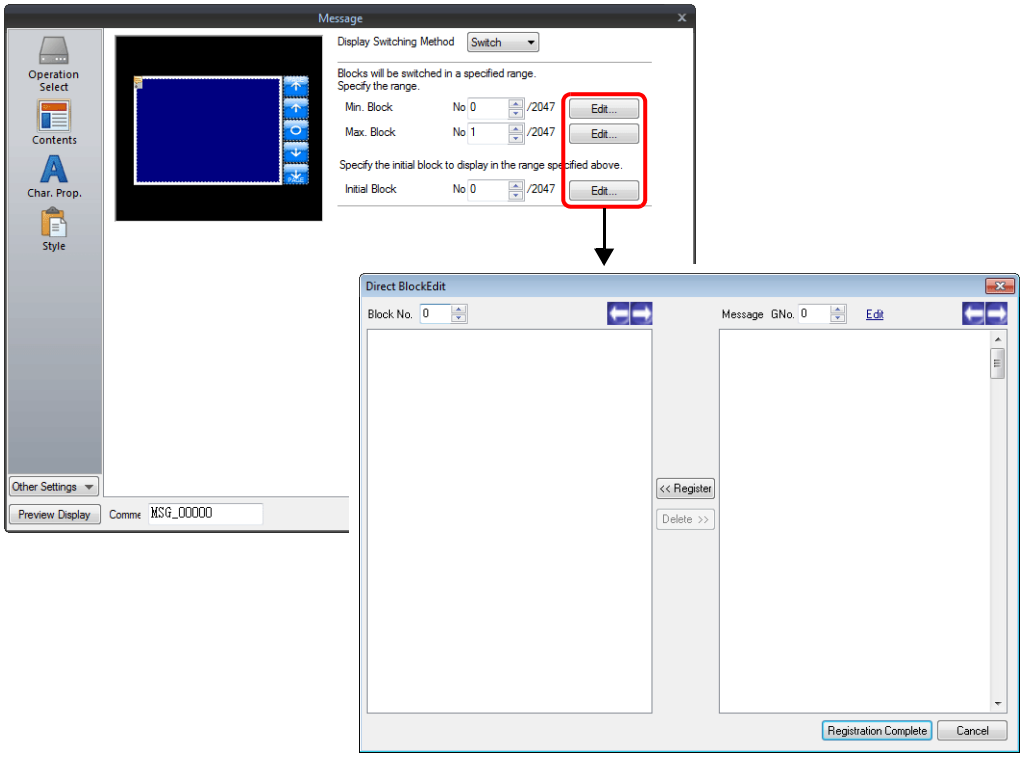


For details on the editing procedure in the [Page Block Edit] window, refer to the V9 Series Operation Manual.

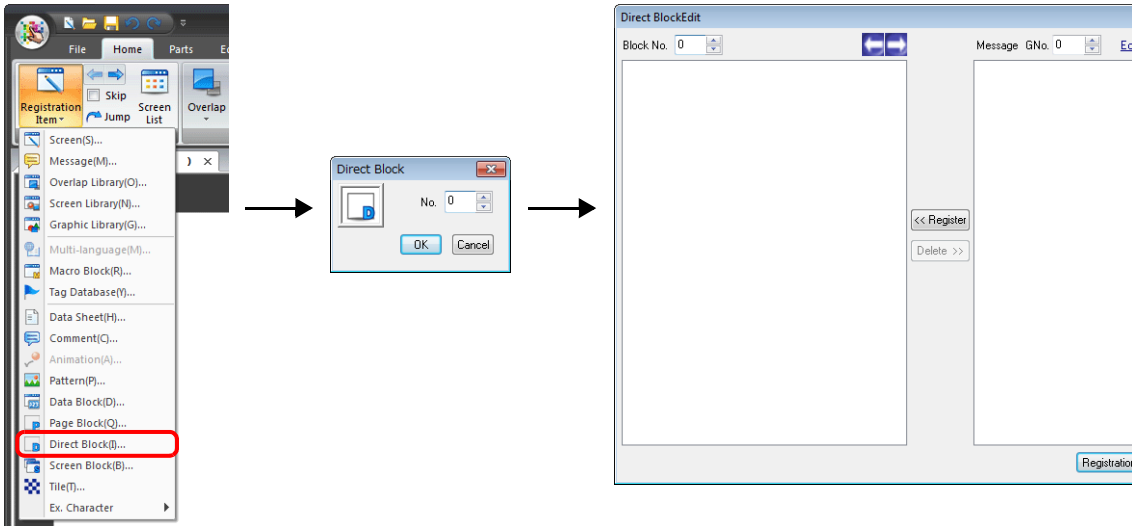
12.1.6 Registering Direct Blocks

There are two ways of registering direct blocks.

- [Message] settings window → [Contents] → [Edit]



- [Home] → [Registration Item] → [Direct Block] → (specify block number)



For details on the editing procedure in the [Direct Block Edit] window, refer to the V9 Series Operation Manual.

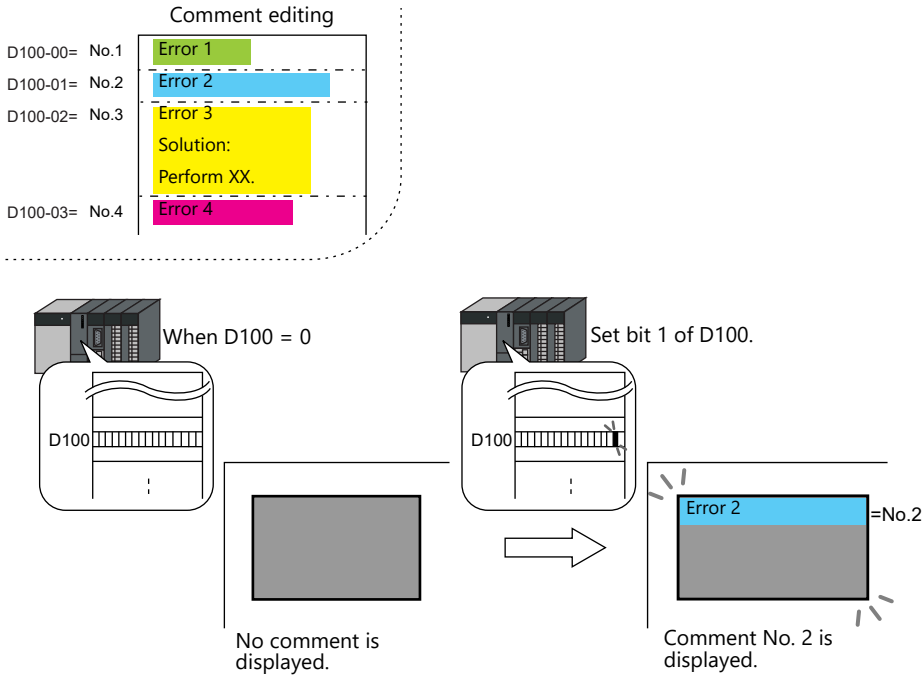
12.2 Displaying Comments

12.2.1 Overview

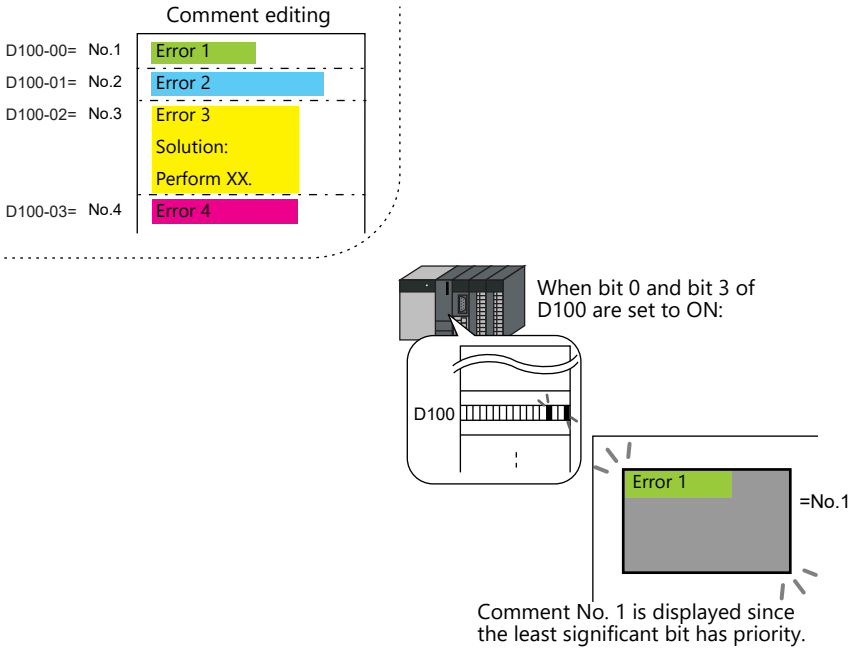
Register comments in advance and display them using bit designation or number designation.
A maximum of 32,767 comments can be registered. Character properties, such as color or size, can be set for each comment.
One comment can include multiple lines.

Bit Designation

Display the comment that corresponds to bit ON of the assigned device memory address.



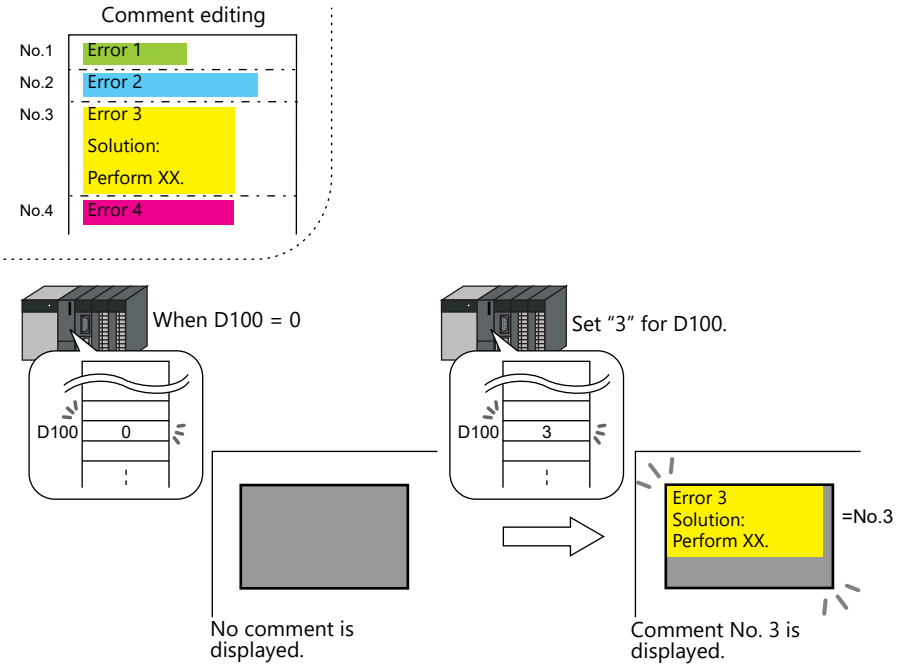
When multiple bits are set to ON, the least significant bit has priority.



Number Designation

Set the comment number to the assigned device memory address and display the comment.

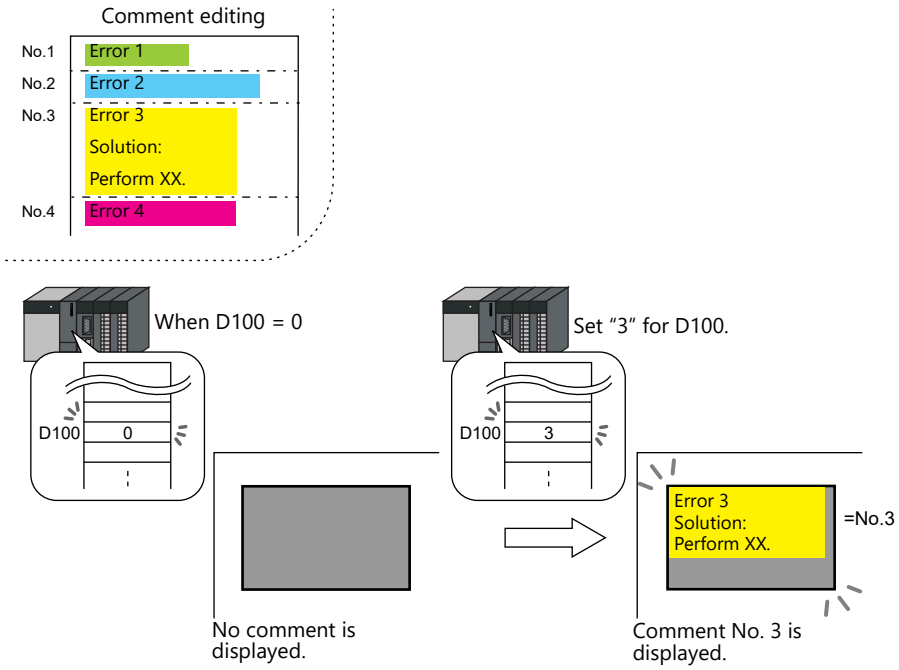
☞ For setting examples, refer to "Displaying Comments (Number Designation)" page 12-20.



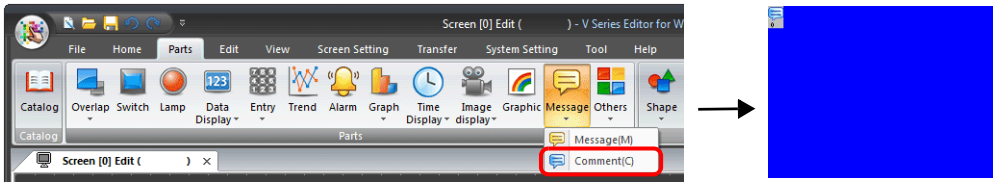
12.2.2 Setting Examples

Displaying Comments (Number Designation)

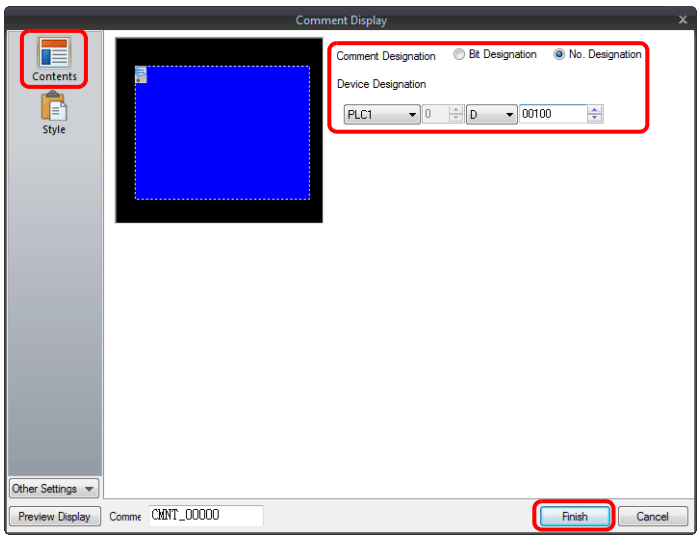
Register the comment to display in advance and specify the comment number to D100.



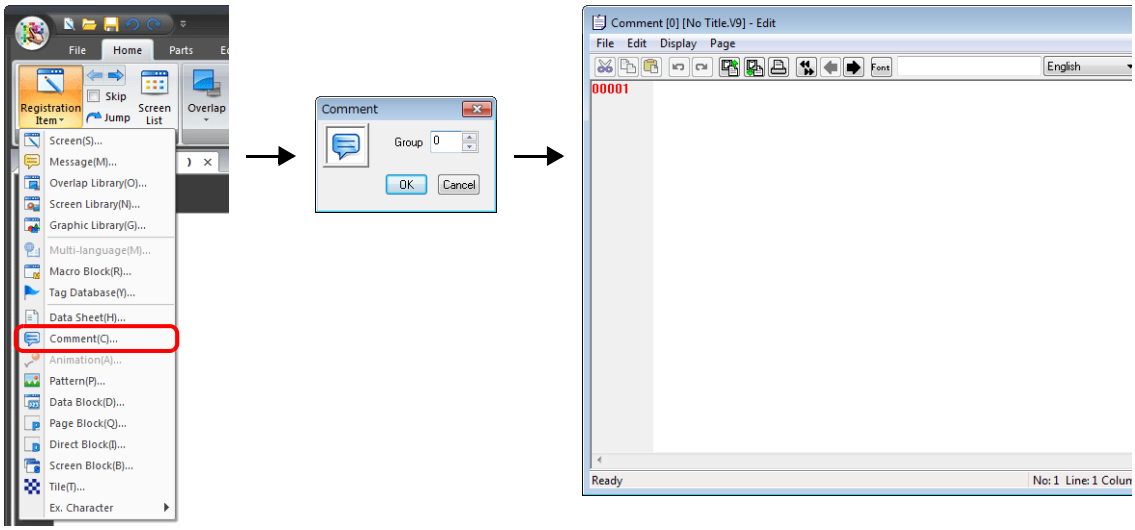
1. Click [Parts] → [Message] → [Comment] and place a comment display on the screen.



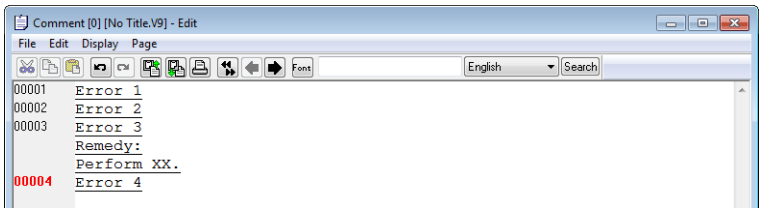
2. Double-click on the comment display to display the settings window.
   Configure the following settings for [Contents] and then click [Finish].



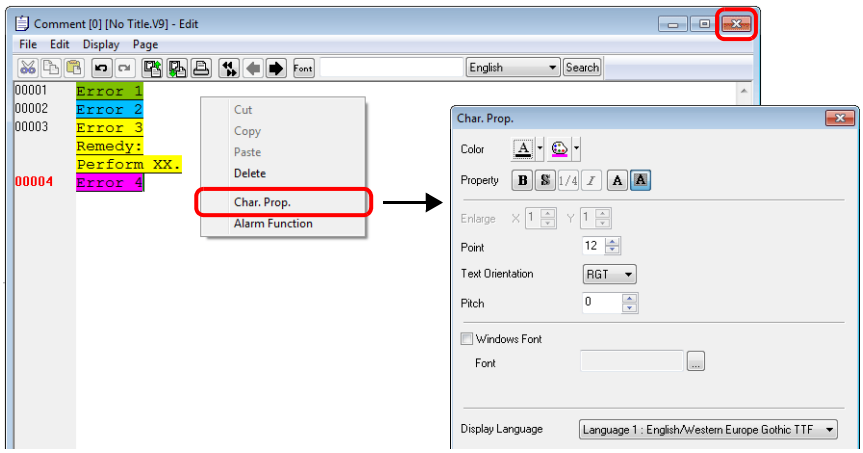
3. Click [Home] → [Registration Item] → [Comment] → [OK] with group number 0.



4. Register a comment as shown below.
   Press the [Alt] and [Enter] keys together to enter a new line.



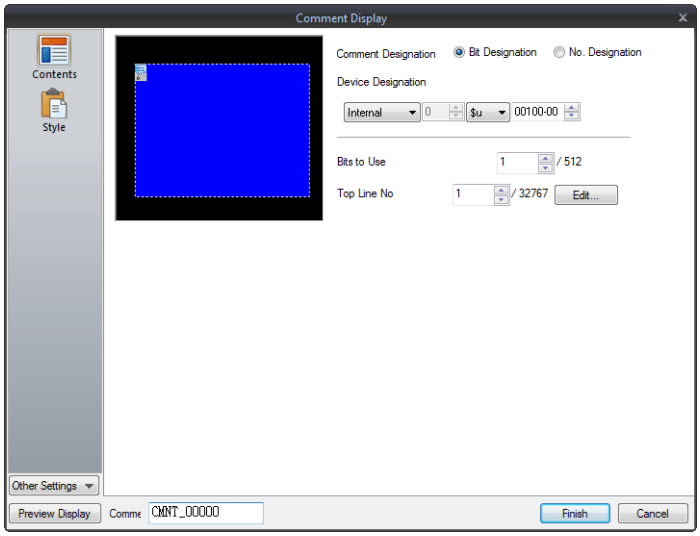
5. Select the comment line for setting character properties, right-click, and click [Char. Prop.].
   Set the following character properties and then close the [Comment Edit] window.



This completes the necessary settings.

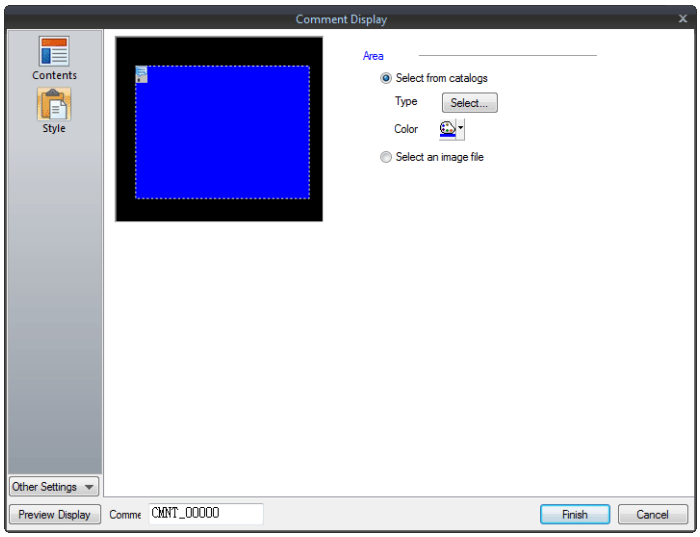
12.2.3 Detailed Settings

Operation Select



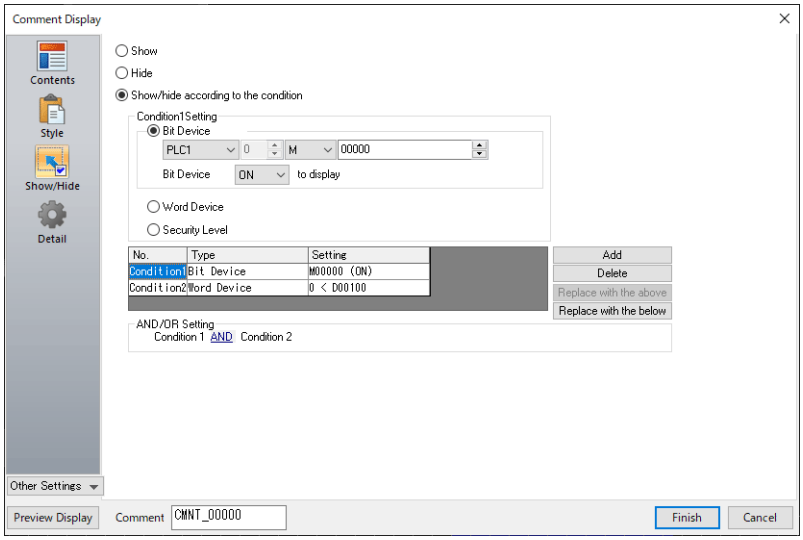
Item	Description
Comment Designation	Select the comment display method. Bit Designation Select this option to display the comment using bit activation. No. Designation Select this option to display the comment by specifying the comment number.
Device Designation	Specify the command device memory address to use for displaying comments on the screen. The setting should vary depending on which of [Bit Designation] or [No. Designation] was selected. Bit Designation: Set the device memory address (1 bit) to display the comment set for [Top Line No.]. When multiple bits are set to ON, the least significant bit has priority. No. Designation: Set the device memory address (1 word) for specifying the comment number. When "0" is specified, no comment is displayed. When "1 to 32767" is specified, the corresponding comment is displayed. However, if the BCD code is used on the PLC, the available range is limited to "0 to 9999".
Bits to Use (1 - 512)	Set the number of bits to use for comment display (total number of comments to be displayed). From the bit set for [Device Designation], as many bits as set for [Bits to Use] are consecutively allocated to the comment specified for [Top Line No.] and later.
Top Line No. (1 - 32767)	Specify the top comment number for display by activation of the bit set for [Device Designation]. Click [Edit] to display the [Comment Edit] window.

Style



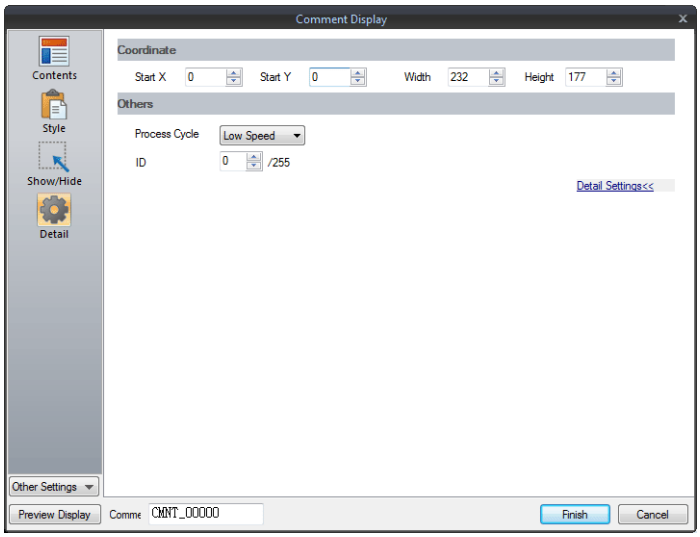
Item		Description
Area	Select from catalogs	Select the part design. After selecting the part, select the part color.
	Select an image file	Select a PNG file.

Show/Hide



Item			Description
Show			Show the item on the screen.
Hide			Do not show the item on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. Constant Display Type: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] Condition expression: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to “5 Security” in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Detail



Item		Description
Coordinates	Start X/Start Y	Set the display position of the comment display using X and Y coordinates.
	Width/Height	Set the size of the comment display by specifying width and height.
Others	Process Cycle	Set a cycle for the X1 series to read PLC data while the X1 series is communicating with the PLC. For details, refer to "1.2 Process Cycle".
	ID (0 - 255)	Set the ID. For details on IDs, refer to the V9 Series Operation Manual.

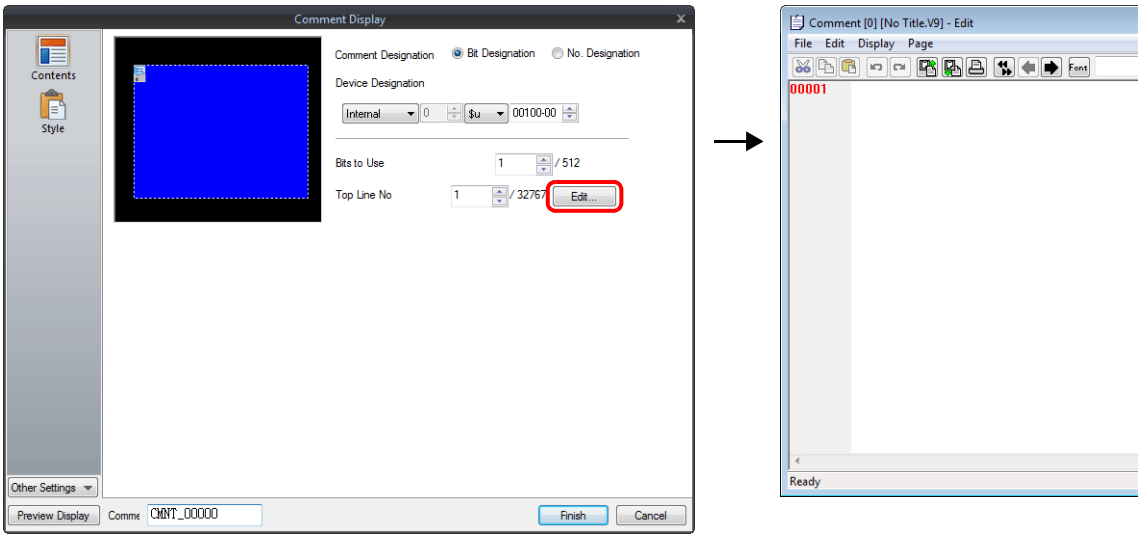
Checking the display area size

Whether comments are displayed as intended in display areas can be checked on the screen.
The procedure is the same as described for the message mode. Refer to page 12-12.

12.2.4 Registering Comments

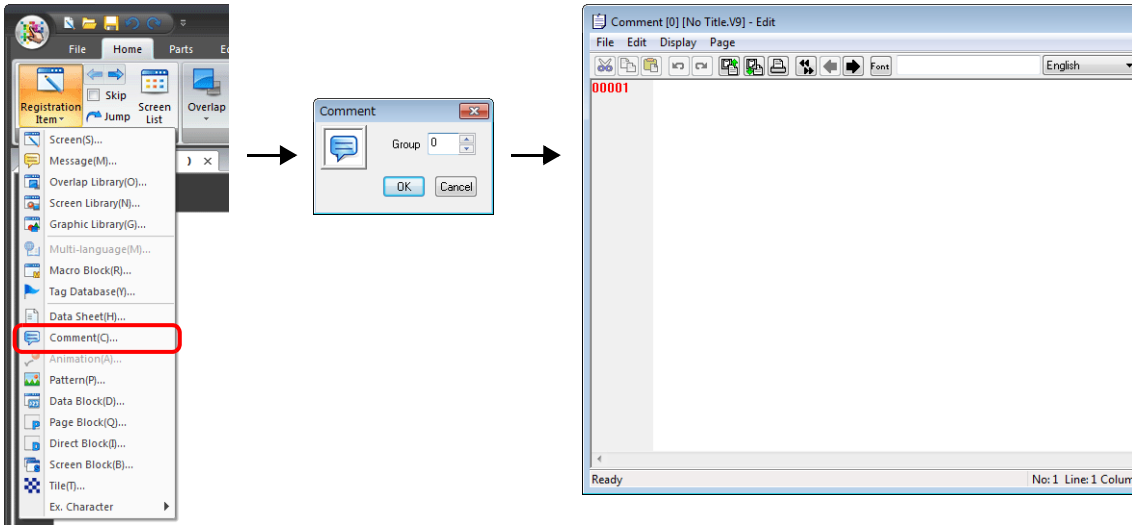
There are two ways of registering comments.

- [Comment] settings window → [Contents] → [Edit]



* When [No. Designation] is selected, the window for comment registration will not be displayed in this way.
* The cursor is displayed at the start line of the group that includes the line number specified for [Top Line No.].

- [Home] → [Registration Item] → [Comment] → (specify group number)



For details on the editing procedure in the [Comment Edit] window, refer to the V9 Series Operation Manual.

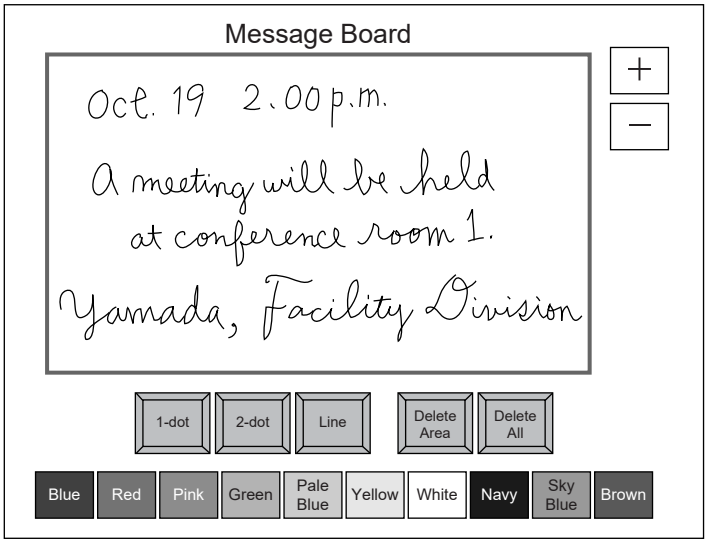
13 Others

13.1 Memo Pad

13.1 Memo Pad

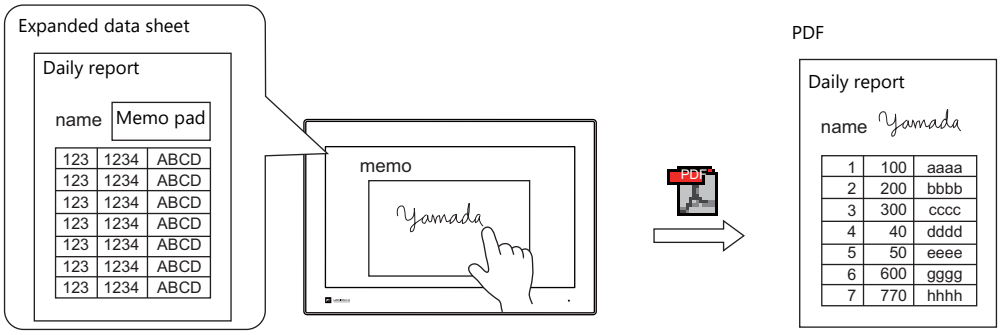
13.1.1 Overview

- Message board function
  The message board function is available for leaving daily messages in a workshop, etc.
  This is particularly useful for exchanging messages among operators working in shifts.
- Pen input
  Message entry is made simple by writing on the screen directly with a special pen.
- A maximum of eight memo pad areas
  Memo pad areas are common to every screen. Up to 8 memo pad areas can be registered.
- Saved in the SRAM area
  When a memo pad area is secured in the built-in or separate SRAM area, the data is retained even after the power is turned off.
- Also, it is possible to use a storage folder to save memo pad data without using the SRAM area.



Only one memo pad function can be used on one screen.

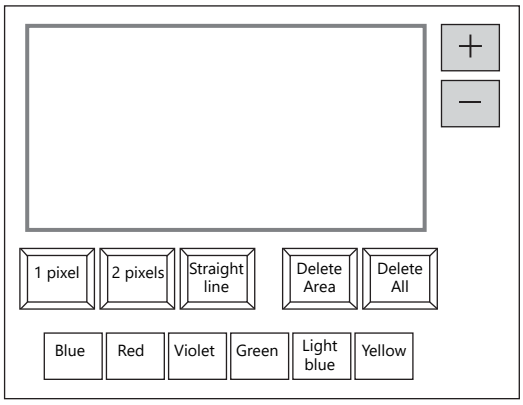
- The memo pad can be displayed on screen by specifying the page number of the memo pad.
- Linking with the data sheet function is possible. A signature input using the memo pad can be output to a data sheet to create a file with an electronic signature.



For details on data sheets, refer to "16.4 Printing Data Sheets".

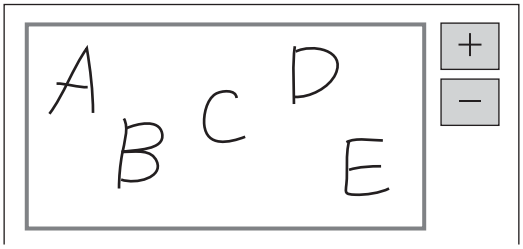
13.1.2 Usage Example

Suppose that the following screen is created.



1. When the screen is first opened, the following settings are set as default.
   Pen size: 1 pixel
   Pen color: White
   Pen state: Free
   To change the setting, press the corresponding switch and set the desired option.

2. Write a message within the memo pad area.

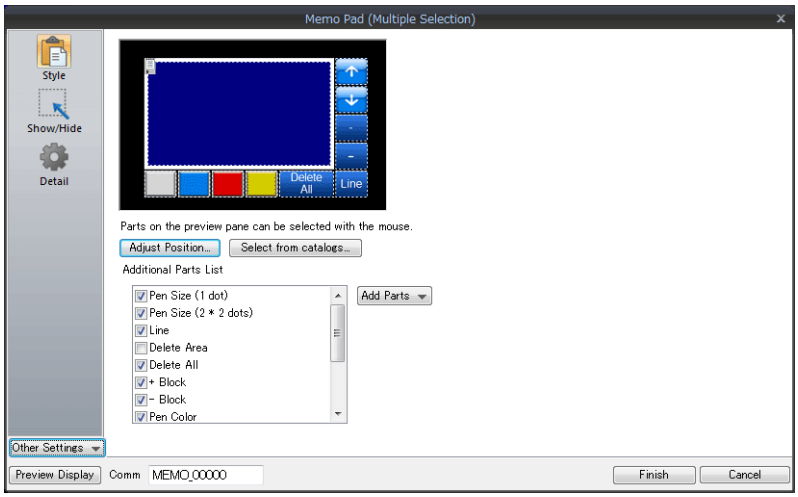


   Use the dedicated pen when writing messages.

3. When deleting the message, press the [Delete All] switch.
4. When deleting part of the message, press the [Delete Area] switch (ON display), and enclose the desired data.
   The enclosed data is deleted.
   On completion, press the [Delete Area] switch (OFF display).
5. When drawing a straight line, press the [Straight line] switch (ON display).
   Moving the pen on the memo pad area draws a straight line.
   To cancel the function that draws straight lines, press the [Straight line] switch again (OFF display).
6. Pressing the [+] switch brings up a new memo pad area (up to 8 areas).
   Pressing the [–] switch brings up the previous memo pad area.

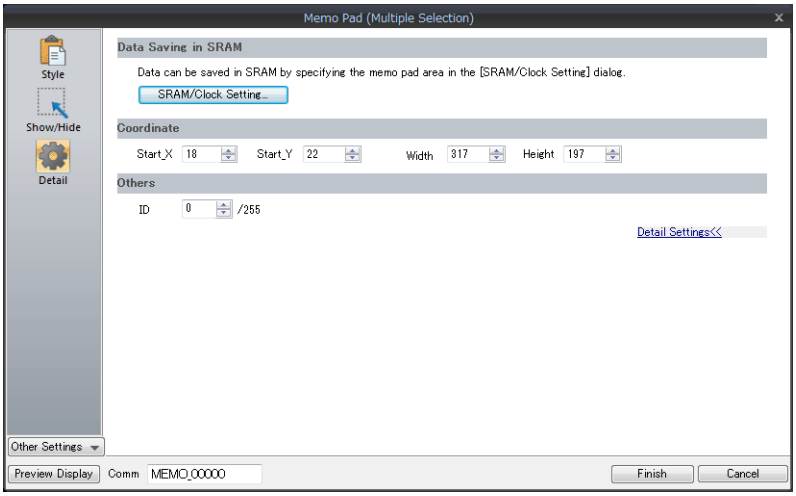
13.1.3 Detailed Settings

Style



Item		Description
Additional Parts List	Pen Size (1 dot)	Add a [Pen Size (1 dot)] switch. Selects the pen thickness.
	Pen Size (2 × 2 dots)	Add a [Pen Size (2 × 2 dots)] switch. Selects the pen thickness.
	Line	Add a [Line] switch. Select the pen state. This is an alternate switch. ON: Line OFF: Free
	Delete Area	Add a [Delete Area] switch. This switch deletes the selected memo pad area. This is an alternate switch. ON: Delete the rectangular area selected on the display area. OFF: Deletion is not possible.
	Delete All	Add a [Delete All] switch. This switch deletes data from the displayed memo pad area.
	+ Block	Add a [+ Block] switch. Brings up the next memo pad area (up to 8).
	– Block	Add a [– Block] switch. Brings up the previous memo pad area (up to 8).
	Pen Color	Add a [Pen Color] switch. This switch is used to select the pen color.
	Block Call	Add a [Block Call] switch. Brings up the memo pad area of the specified number.
Add Parts	Switch	Add a switch.

Detail



Item	Description
SRAM/Clock Setting	Configure the settings to save memo pad data to the SRAM area. For details, refer to "13.1.4 Memo Pad Data Storage" page 13-5.
Coordinate	Set the Start X/Start Y (top left coordinates).
ID	Set the ID.

13.1.4 Memo Pad Data Storage

Memo pad data can be saved to the built-in RAM, SRAM, or a storage folder.
Data saved to RAM is cleared when MONITOUCH is turned off or when the local mode screen is displayed.
To retain data even when the power is turned off, save data to SRAM or a storage folder.

Memo Pad Storage Area Size

Storage Target	Capacity (Words)
RAM	32,000
SRAM *	262,000
Storage folder	262,000

* This is the maximum capacity available provided that the entire SRAM area is used for the memo pad function.

☞ For details of the procedure for dividing the SRAM area, etc., refer to "1.1 System Settings".

Saving to RAM

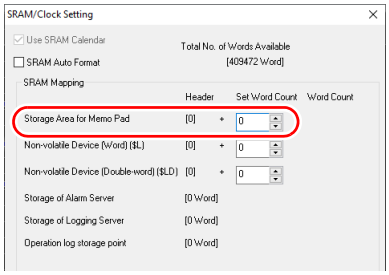
No settings are required.

Saving to SRAM

To save data to the SRAM area, settings must be configured in the [SRAM/Clock Setting] window.

[SRAM/Clock Setting] window

- Storage area for memo pad
  Set the storage area size for the memo pad function in the SRAM area.
  Refer to the list shown above to set an appropriate size.



☞ For details on other settings, refer to "1.1 System Settings".

Saving to a Storage Folder

No settings are required.
However, note that when the memo pad area is configured in the [SRAM/Clock Setting] window, data is stored in the SRAM area.

File storage destination

Files are stored in the storage selected at [System Setting] → [Other] → [Storage Setting].

Storage		File Directory
Internal storage	sd Folder	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\MEMO └ 0: Main app in multi-display 1: Sub app in multi-display
	usb Folder	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\MEMO └ 0: Main app in multi-display 1: Sub app in multi-display
External USB storage	USB storage device	(Drive name):\X1_Storage\(access folder)\MEMO

☞ For details on the [Storage Setting] window, refer to "9. Storage" in the X1 Series Reference Manual 2.

Filename

- MEMxxxx.png (xxxx: 0000 to 0007)

Timing for Saving Data

The memo pad data is saved to the memo pad area at the following timing.

- When switching pages using the [Function: + Block, – Block] switches
- When changing the screen
- When switching from RUN mode to Local mode (only for SRAM)

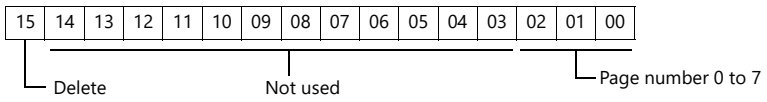
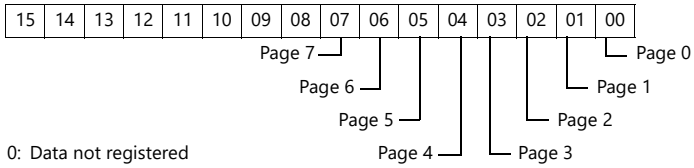
If data cannot be saved due to insufficient memory, the memo pad display area flashes and the unit beeps. Reduce the memo pad data.
The remaining space of the memo pad data storage area when saving to SRAM is stored in system device memory $s108 and 109.

*** Notes on SRAM usage**

- If the power is shut down before data is saved, the data is lost.
- If the power is shut down while data is being saved, all the data may be lost.
  The data save status is stored in the system device memory $s720.

System Device Memory

Memo pad data is stored in system device memory $s.

<table>
<tr><th>Address ($s)</th><th colspan="2">Description</th><th>Device Type</th></tr>
<tr><td>106</td><td colspan="2"> 
</td><td rowspan="3">→ X1
← X1</td></tr>
<tr><td>Page number</td><td>Stores the number of the currently displayed memo pad.
The number to display when a screen change occurs can be specified.</td></tr>
<tr><td>Delete</td><td>Select the operation to perform when a screen change occurs.
0: Displays the data saved for the specified number.
1: Displays the specified number after clearing the saved data (turns OFF automatically after clearing). *1</td></tr>
<tr><td>107</td><td colspan="2"> 

0: Data not registered
1: Data registered</td><td rowspan="2">← X1</td></tr>
<tr><td>108
109</td><td colspan="2">Remaining space of memo pad data storage area when saving to SRAM (unit: bytes)</td></tr>
<tr><td>719</td><td colspan="2">Pen color (128 colors) *2
Specify the color of the pen when the screen is displayed. If a color other than the 128 colors is specified, the color turns white.
When the color of the pen is changed using a switch, the selected color code is stored. If a color other than the 128 colors is selected, “–1” (FFFF Hex) is stored.

0: Black, 1: Blue, 2: Red, 3: Purple, 4: Green, 5: Light blue, 6: Yellow, 7: White (default) *2</td><td>→ X1
← X1</td></tr>
<tr><td>720</td><td colspan="2">Result of saving to SRAM area
0: Successfully saved
1: Error in data. The previous data is cleared.</td><td rowspan="2">← X1</td></tr>
<tr><td>727</td><td colspan="2">0: Save possible
1: Save impossible due to insufficient memory</td></tr>
</table>

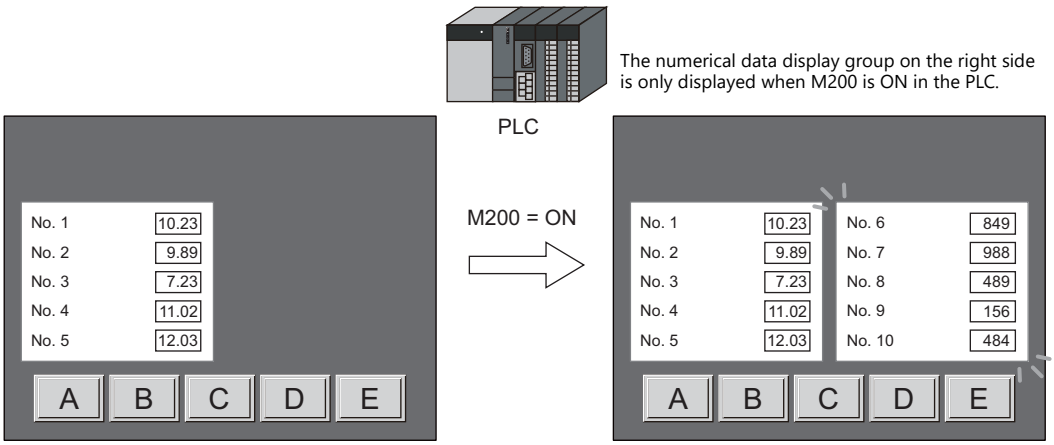
*1 Usage example
When “8002HEX” is stored in $s106 and a screen with a memo pad is displayed, page No. 2 is cleared before the screen is displayed.
Once the screen is displayed, the value stored in $s106 changes to “0002HEX”.

*2 Codes of the 128 colors

14 Item Show/Hide Function

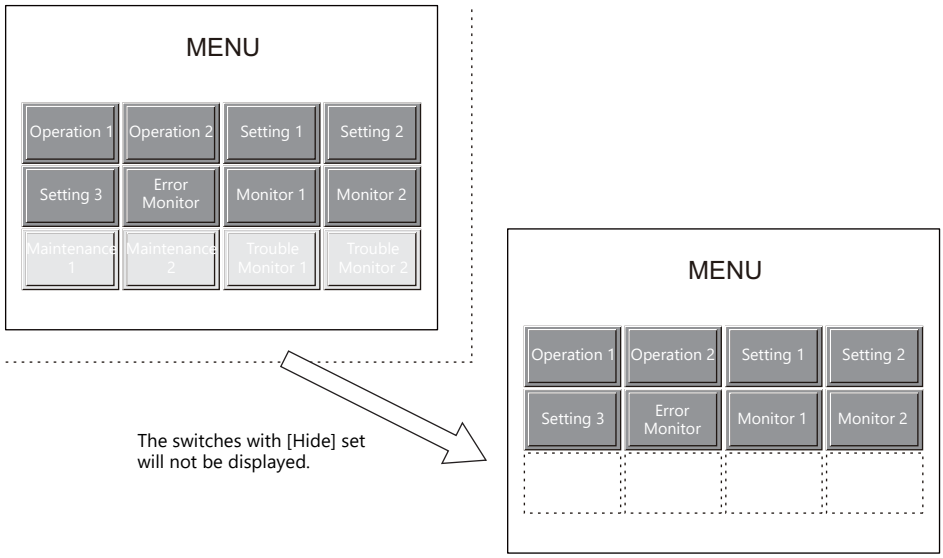
14.1 Overview

- The switch or numerical data display parts registered on the screen can be shown or hidden according to its operating status.
  The "show/hide" attribute can be set using methods including device memory bit activation in the PLC, bit/word designation, or commands.



Refer to "14.2 Setting Examples" page 14-2

- Registered items can be set with the show/hide attribute even if they will not be actually used. For example, if future additions of items are planned, the items to be added can be registered in advance and set with the hide attribute, which will make future programming easier.



- Items which were placed overlapping will be displayed in the same order that they were placed even if they are hidden and shown again.

Applicable Items

Switch	
Lamp	
Data display	Numerical display, character display, message display
Graph	Graph, statistic graph, closed area graph
Link parts	Keypad, character key, trend, alarm, JPEG display, graphic, message, comment, recipe, data block, memo pad
Grouped items	including graphic items

Registration positions

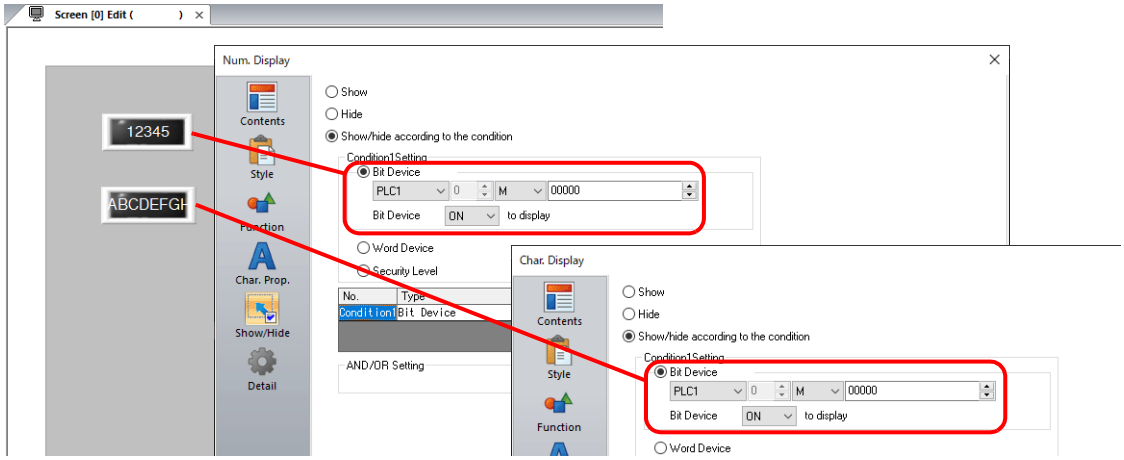
Screen, overlap library, screen library, data block

14.2 Setting Examples

14.2.1 Displaying Items when the Corresponding Bit Turns ON

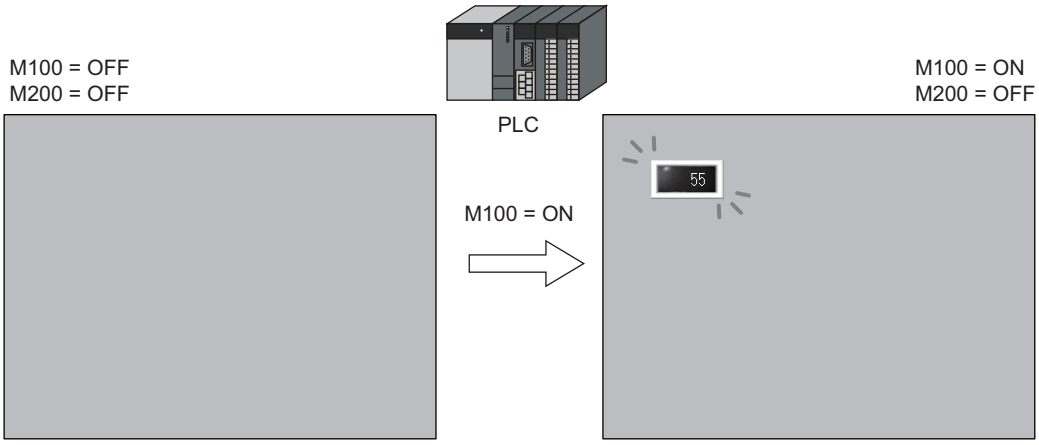
Screen Creation

1. Place a numerical data display and character display on the screen.
2. Configure the [Bit device] settings via [Show/Hide].

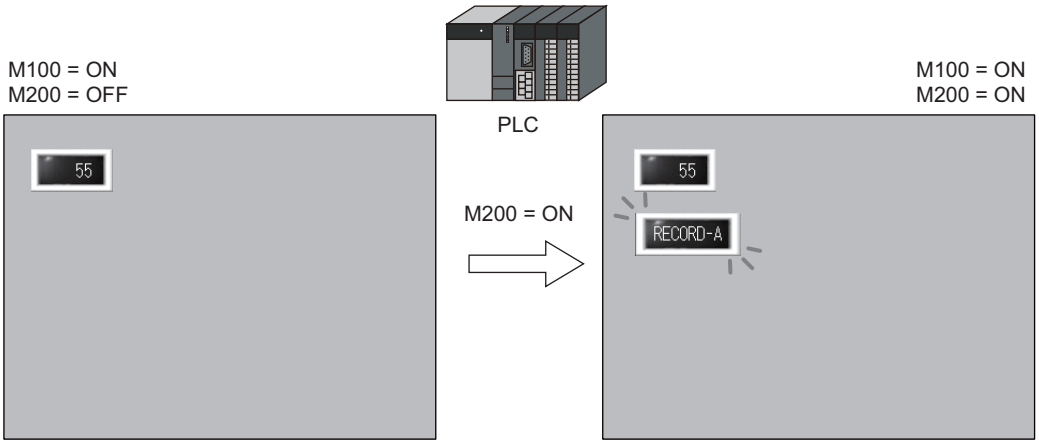


Unit Operation

1. When M100 is set to ON via the PLC, the numerical data display is shown.



2. When M200 is set to ON via the PLC, the character display is shown.

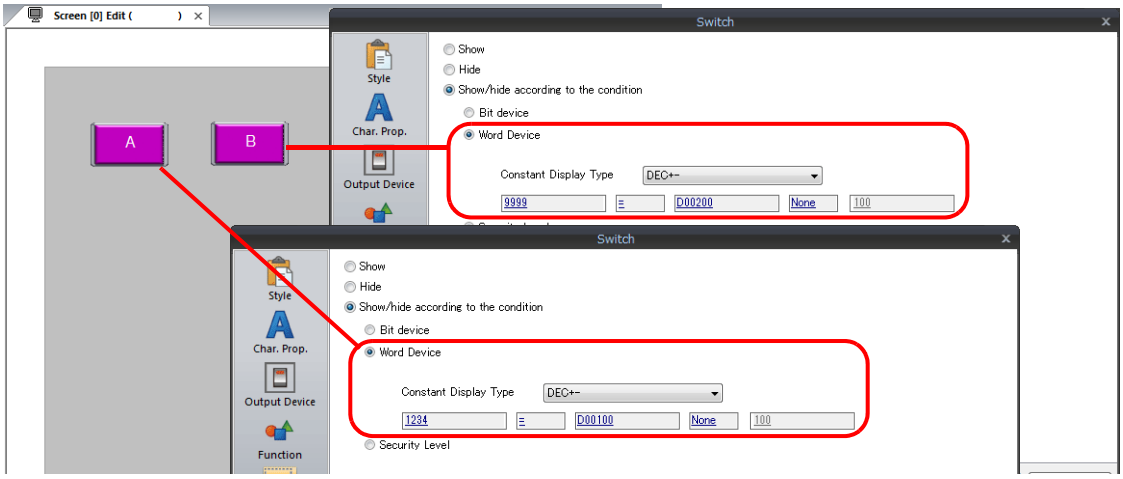


3. When M100 and M200 are set to OFF, the numerical data display and character display are hidden.

14.2.2 Displaying Items Using Device Memory Values

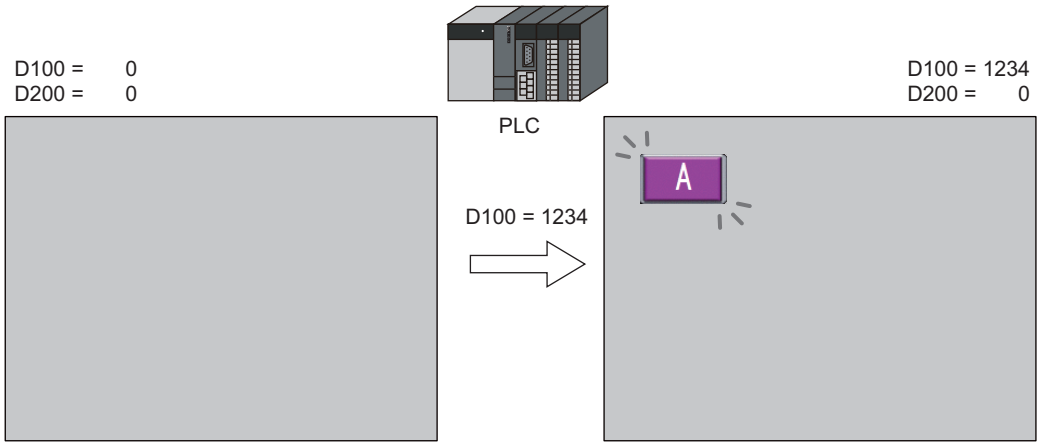
Screen Creation

1. Place a switch.
2. Configure the [Word Device] settings via [Show/Hide].

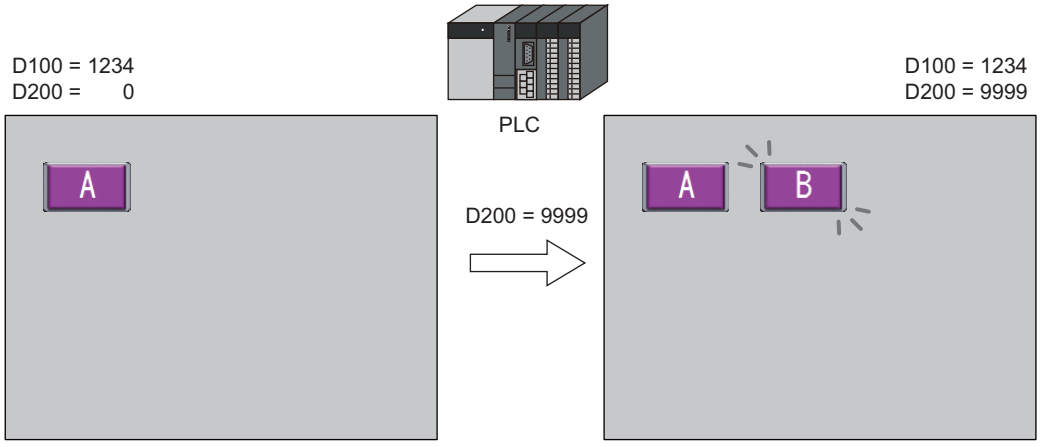


Unit Operation

1. When D100 is set to "1234" via the PLC, switch A on the left is shown.



2. When D100 is left as "1234" and D200 is set to "9999" via the PLC, switch B on the right is shown.

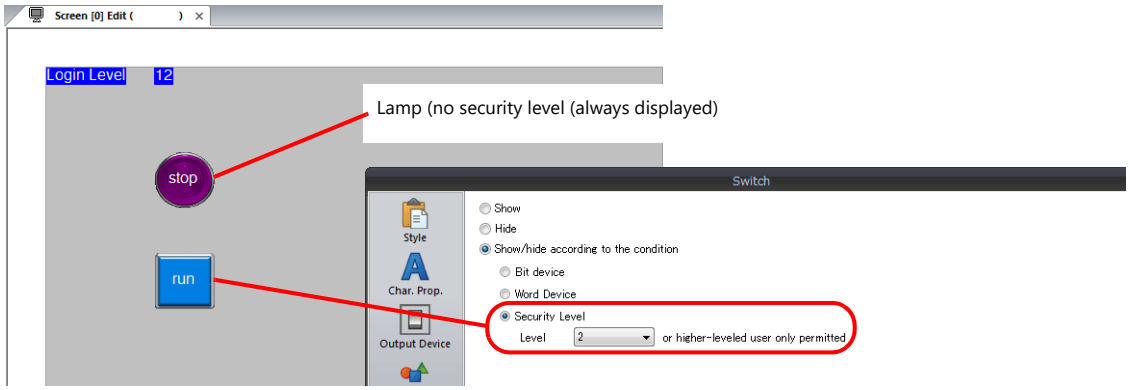


3. When D100 and D200 are both set to "0", the switches are hidden.

14.2.3 Displaying Items Using the Level of the Security Function

Screen Creation

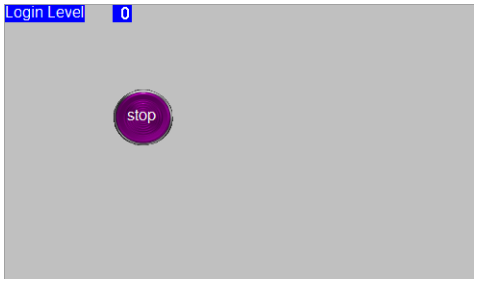
1. Place a switch that initiates operation.
2. Set the level of [Security Level] to "2" via [Show/Hide].



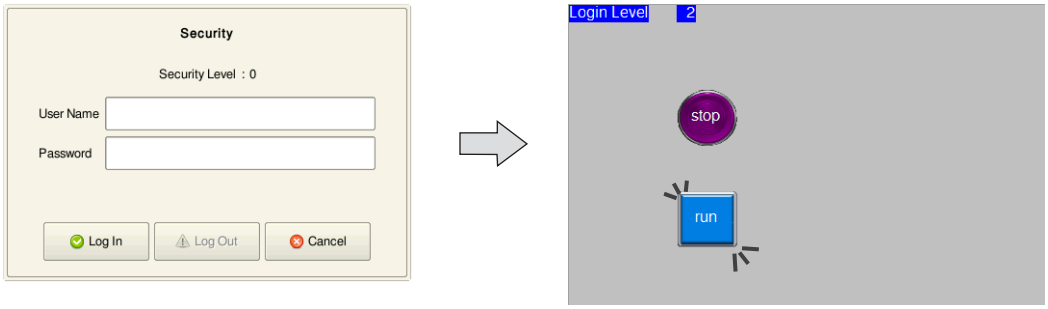
* Always turn on the security function. Items with security levels will not be displayed if the security function is not turned on.

Unit Operation

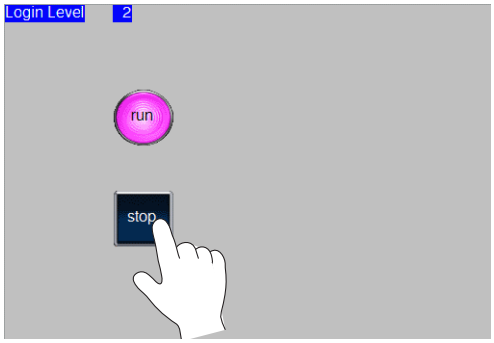
1. A lamp is displayed on the screen (security level 0).



2. Enter the ID and password for level 2 on the login screen of the security function.
   The login level changes to level 2 and the operation switch is displayed.



3. Users with a login level of 2 to 15 can operate the operation switch.

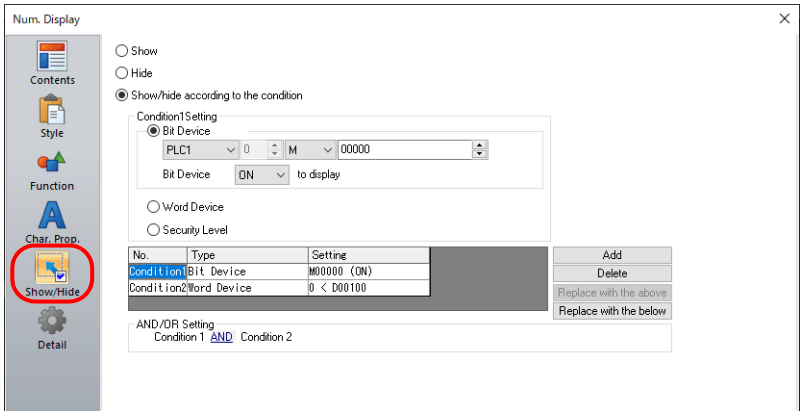


4. When a user logs off, the login level changes to 0 and the operation switch becomes hidden.

14.3 Detailed Settings

Show/Hide

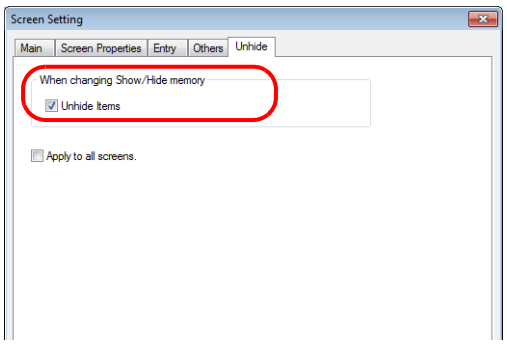
Configure the [Show/Hide] settings for each item.



Item			Description
Show			Show the part on the screen.
Hide			Do not show the part on the screen.
Show/hide according to the condition			The part is shown or hidden according to the specified conditions. Click [Add] and set up a maximum of five conditions.
	Condition Setting		Click a condition number to configure a condition that must be satisfied for showing or hiding the part.
		Bit Device	Show the part if the bit device memory condition is satisfied and hide the part if the condition is not satisfied.
		Word Device	Show the part if the conditional expression of the specified word device memory is satisfied and hide the part if the expression is not satisfied. **Constant Display Type**: Select the data type of the conditional expression. [DEC+–] / [DEC] / [BCD] / [HEX] **Condition expression**: Set an equal sign, value, and device memory address as the conditions for comparison.
		Security Level	This setting is available when using the security function. Show or hide the part according to the security level of the user that is currently logged in. For details, refer to "5 Security" in the X1 Series Reference Manual 2.
	AND/OR Setting		When setting two or more conditions, set whether to perform AND or OR operations on the conditions.

Screen Settings

Set the timing of item drawing via [Screen Setting] → [Screen Setting] → [Unhide].



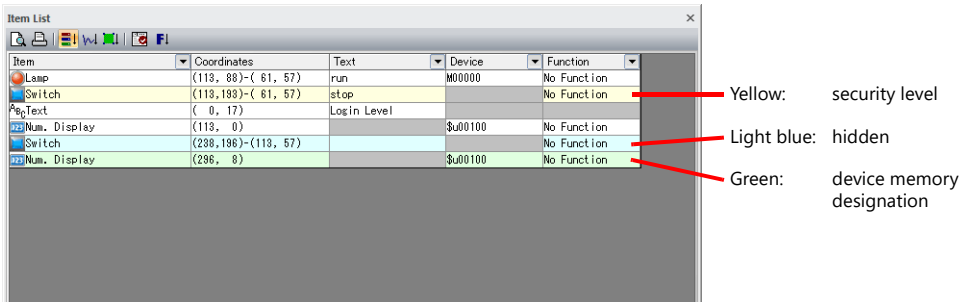
Item	Description
Unhide items	Selected Perform item redisplay when the state of [Show/Hide] for an item changes. Unselected Perform redisplay immediately after changing screens or only when executing the "SYS (RESET_SCRN)" macro.
Apply to all screens	Apply the above settings to all screens.

14.4 Checking Settings

Use the following method to check the [Show/Hide] settings of items.

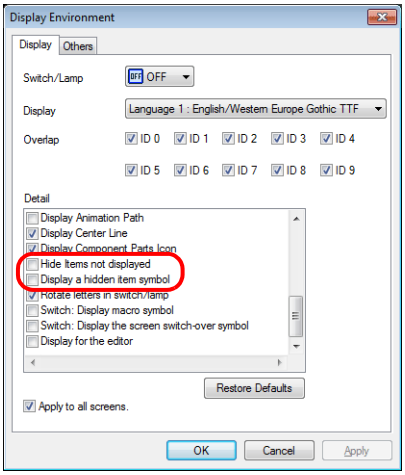
Item List

Display the [Item List] window from the [View] menu.
Items with [Show/Hide] settings are shown in green, yellow or light blue. Uncolored items correspond to items for which [Show] is selected.



Display Environment Settings

Select [View] → [Display Environment].



Item	Description
Hide Items not displayed	Items with [Show/Hide] settings are not displayed on the screen.
Display a hidden item symbol	Display a hidden item symbol for items with [Show/Hide] settings.

Symbol	Setting
None	Show
Light blue	Hide
Green	Show/hide according to the condition
Yellow	Security Level

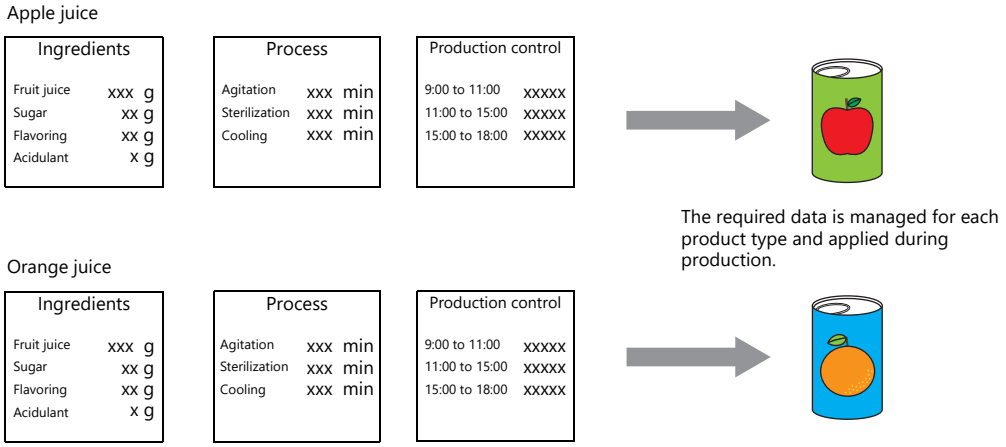
* The same settings can be made via the right-click menu on the screen.

15 Recipes

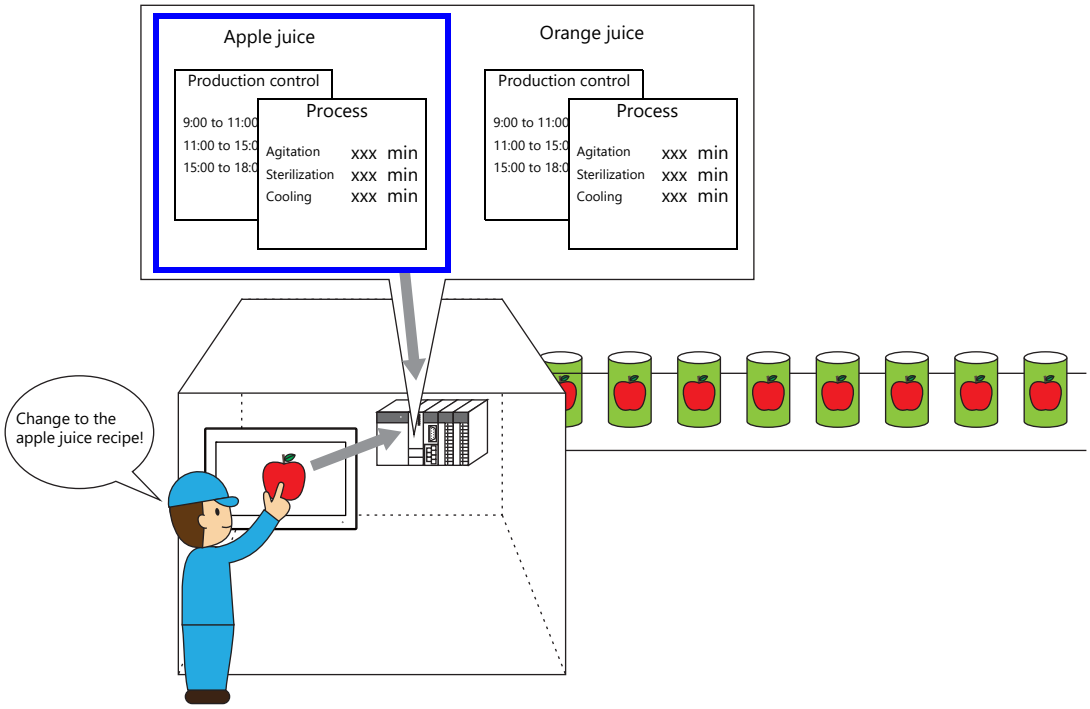
15.1 Overview

15.1.1 Recipes

In manufacturing, the conditions and data that are critical for making products are collectively referred to as a “recipe”.
For example, when beverages are produced on the factory floor of a beverage manufacturer, the conditions for producing apple juice and orange juice differ with respect to ingredients and production processes for each type of beverage.



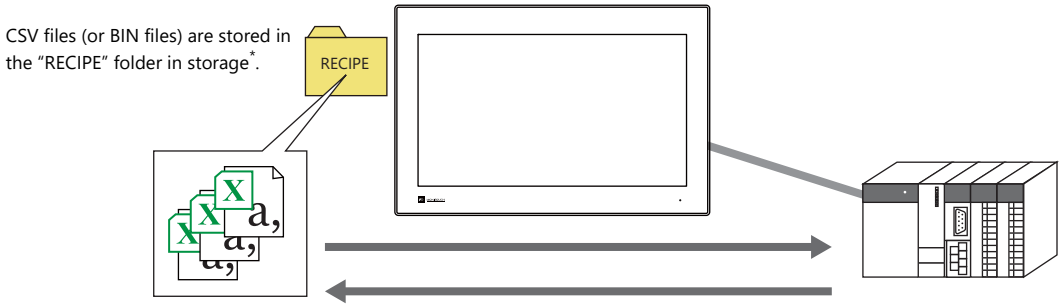
In order to produce and deliver products at a constant quality, the use of recipe information specific to each product is very important.
Recipes for products to be made on a particular day are managed on the factory floor, and smoothly changing between recipes according to the production conditions results in efficient production of higher quality products.



15.1.2 Recipe Function

Precise and easy management of recipes, as described in the previous section, on the factory floor is a requirement.
Recipes comprise different information depending on product type and may undergo modification on the factory floor.
Recipe data can be managed without stress by managers on the factory floor if data on a PLC can be substituted or changed according to circumstance.
The advantages of using the recipe function of the X1 series unit can be realized in various situations.

Structure

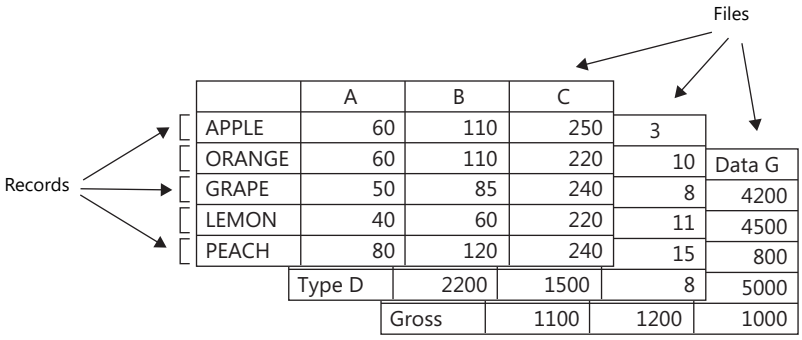


* The storage type is selected at [System Setting] → [Other] → [Storage Setting].

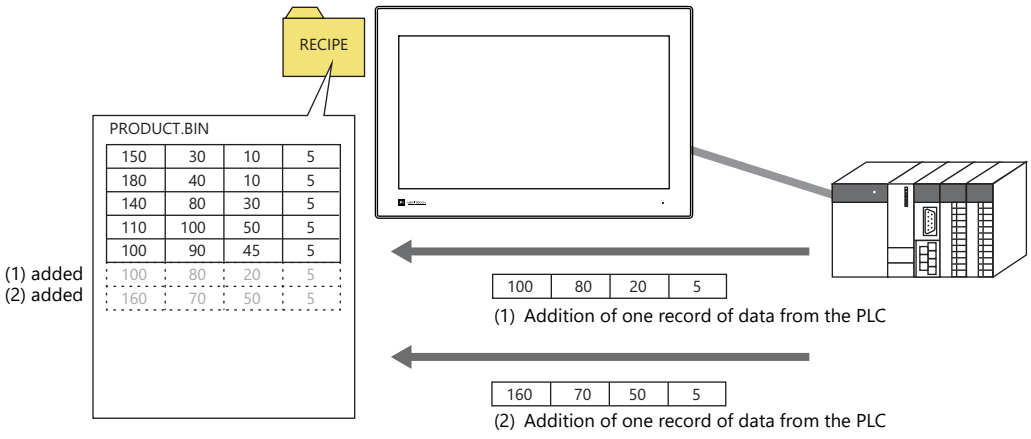
Storage		File Directory
Internal storage	sd Folder	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\RECIPE └ 0: Main app in multi-display 1: Sub app in multi-display
	usb Folder	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\RECIPE └ 0: Main app in multi-display 1: Sub app in multi-display
External USB storage	USB storage device	(Drive name):\X1_Storage\(access folder)\RECIPE

☞ For details on the [Storage Setting] window, refer to "9. Storage" in the X1 Series Reference Manual 2.

- Recipe data is stored in CSV or BIN file format and can be read or written by the X1 app.
  Files are stored in the X1 series unit internal "RECIPE" folder.
- Data can be read and written in units of files or records.



- Not only can data in the "RECIPE" folder be read or written, additions to data and new data can also be created.



- CSV and BIN files can be easily created and edited using the screen configuration software.
- Settings including the format of each file and bits for commanding transfer are specified in the recipe settings in the screen configuration software.

Operations

The recipe function performs the following operations.

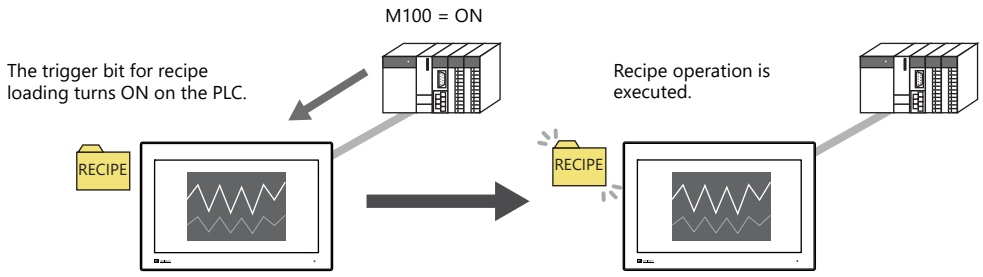
- Reading and writing of files (CSV/BIN)
  For details on these operations, refer to "15.3 Reading Recipes in Units of Files When the PLC Bit Turns ON" and "15.4 Reading Recipes in Units of Files with Switch Operations".

- Reading and writing of records
  For details on these operations, refer to "15.5 Reading Recipes in Units of Records" and "15.6 Writing Recipes in Units of Records".

There are two types of control modes in which operation execution commands can be issued. "Global control" allows commands to be executed regardless of the display state of MONITOUCH, and "local control" only accepts commands when a specific screen is displayed.
These modes are described below.

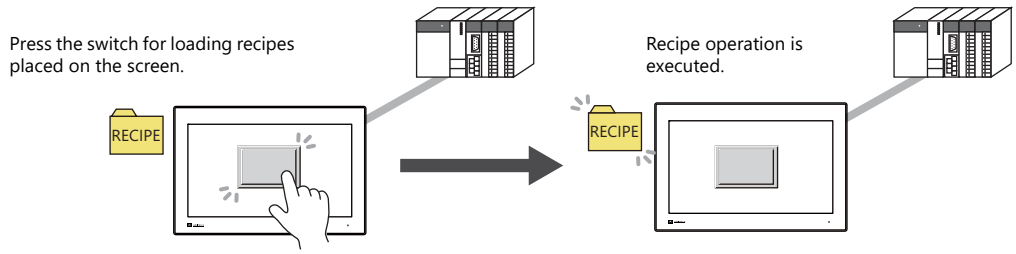
Global Control

Recipe operations can be performed when any screen is displayed using commands from a PLC because reading and writing of data is performed according to a control bit from the PLC, as specified in the recipe settings.



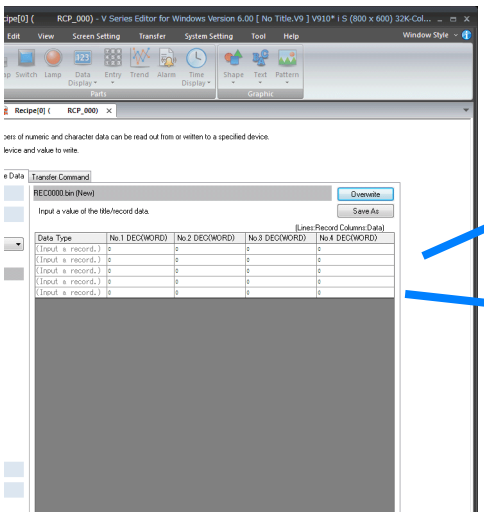
Local Control

Recipe operations are only possible using switches placed on a screen for executing the relevant recipe operations.



15.2 Creating Recipe Data (BIN/CSV Files)

15.2.1 Using the Screen Configuration Software



Create

PRODUCT.BIN

	Fruit juice	Sugar	Flavoring	Acidulant
APPLE	150	30	10	5
ORANGE	180	40	10	5
GRAPE	140	80	30	5
LEMON	110	100	50	5
PEACH	100	90	45	5

Create

WORK.BIN

	Agitation time	Sterilization time	Cooling time
APPLE	60	110	250
ORANGE	60	110	220
GRAPE	50	85	240
LEMON	40	60	220
PEACH	80	120	240

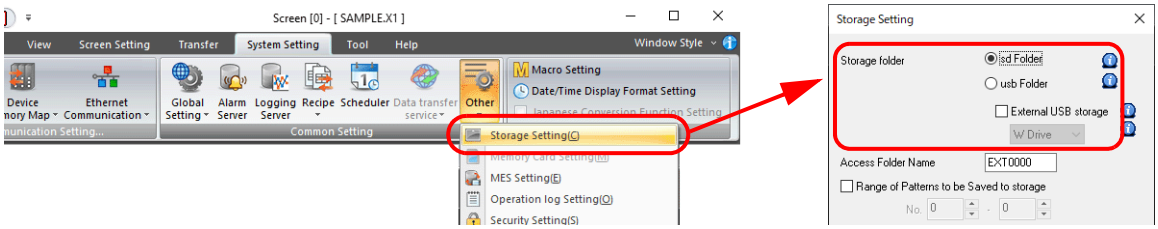
This section explains the procedure for creating BIN files such as the above two as an example.

Setting Procedure

Location of Storage and Access Folder Settings

Specify the storage to use with the recipe function. The available storage types are internal storage (“sd” folder and “usb” folder) and external USB storage, and the storage to use is specified in the screen program.
The access folders within the storage folder are also specified in the screen program.

Location of setting: [System Setting] → [Other] → [Storage Setting]

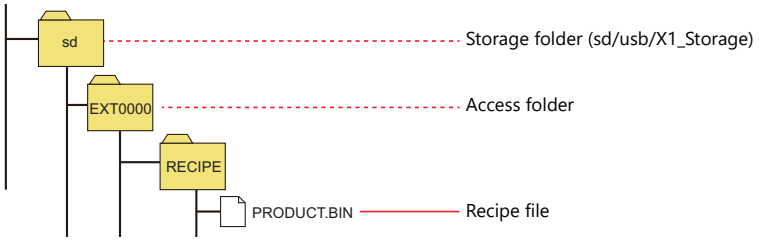


Recipe file storage destination

The storage destination of recipe files differs depending on the storage to be used.

Storage		File Directory
Internal storage	sd Folder	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\RECIPE └0: Main app in multi-display 1: Sub app in multi-display
	usb folder	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\RECIPE └0: Main app in multi-display 1: Sub app in multi-display
External USB storage	USB storage device	(Drive name):\X1_Storage\(access folder)\RECIPE

☞ For details on the [Storage Setting] window, refer to “9. Storage” in the X1 Series Reference Manual 2.



File Format/Format Settings

1. Because two BIN files of different formats are being created, recipe registration is separated into number 0 and number 1.
   The creation procedure for number 0, PRODUCT.BIN, is explained first.
   Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.

2. On the [Standard Operation] tab window, select [File-based transfer] for [Data to Transfer].
   Configure the other settings as shown below.

Storage Target Folder	(Blank = directly under the "RECIPE" folder)
File Type	BIN
Storage Target File	File Name Designation
Filename	PRODUCT (bin)

3. Next, select the [File Format] tab window.
   Configure the following settings.

Add record name	Selected
Add title to data	Selected
Number of Records	5
Number of Data	4
Record Name: Characters	8
Record Name: Text Process	LSB->MSB
Data Type	DEC
Data Length	1-Word
Decimal Point	0
Transfer Target	Data
Device Designation	Specify consecutively
Top device	D100

Creating BIN Files

This section describes the procedure for saving to a USB flash drive.

1. Connect the USB flash drive for saving BIN files to the PC.
2. Display the [Recipe Data] tab window in the recipe settings.
3. Select the drive to which the USB flash drive is connected (e.g. J: Removable disk) using [Storage Drive Select].
   The storage destination is displayed for [Storage Target Folder].
   - For "sd" folder or "usb" folder E.g. J:\EXT0000 (access folder)\RECIPE
   - For USB storage device E.g. J:\X1_Storage\EXT0000 (access folder)\RECIPE
4. Click [New].
   A creation area is displayed on the right with "PRODUCT.bin (New)" indicated as the title.
5. Enter title names. Double-click each title name to enter text.
6. Enter record names. Double-click each record to enter text.
7. Edit each entry of recipe data.
8. After editing the required number of entries, click [Save As] to save the file to the directory specified in step 3.
   The "EXT0000 (access folder)\RECIPE\PRODUCT.bin" file is created on the USB flash drive.

Creating Recipe No. 1

1. Create recipe number 1 in the same manner as recipe number 0.
   Click [System Setting] → [Recipe] again and select "1" for [No.]. The [Recipe [1]] tab window is displayed.
2. Create a file in the same manner as for recipe number 0.
   However, set "3" for [Number of Data] because "WORK.BIN" has three columns in this example.

This completes the necessary settings. Connect a USB flash drive containing the necessary BIN files to the X1 series unit.
If the BIN files are stored in internal storage ("sd" folder, "usb" folder), copy the EXT0000 (access folder) into the storage folder on the X1 series unit using the Explorer function of System Configurator.

☞ For details on System Configurator, refer to the X1 Series Hardware Specifications.

15.2.2 Creating Recipes Using Excel (CSV Files Only)

Setting Procedure

Location of Storage and Access Folder Settings

Specify the storage to use with the recipe function. The available storage types are internal storage ("sd" folder and "usb" folder) and external USB storage, and the storage to use is specified in the screen program.
The access folders within the storage folder are also specified in the screen program.
Location of setting: [System Setting] → [Other] → [Storage Setting]

☞ For details on the storage folder, access folder, and file storage destination, refer to page 15-4.

File Format/Format Settings

1. Configure the [Standard Operation] and [File Format] tab windows with the same settings as the BIN files in the previous section.

- [Standard Operation] tab window

Storage Target Folder	Any location
File Type	CSV
Storage Target File	File Name Designation
Filename	PRODUCT (csv)

- [File Format] tab window

Add record name	Selected
Add title to data	Selected
Number of Records	5
Number of Data	4
Record Name: Characters	8
Record Name: Text Process	LSB->MSB
Data Type	DEC
Data Length	1-Word
Decimal Point	0
Transfer Target	Data
Device Designation	Specify consecutively
Top device	D100

Creating CSV Files

This section describes the procedure for saving to a USB flash drive.

1. Connect the USB flash drive for saving CSV files to the PC.
2. Create the following folder on the USB flash drive.

Storage Setting		Folder for Creation
Internal storage	sd Folder	EXT0000 (access folder)\RECIPE folder
	usb Folder	
External USB storage	USB storage device	X1_Storage\EXT0000 (access folder)\RECIPE folder

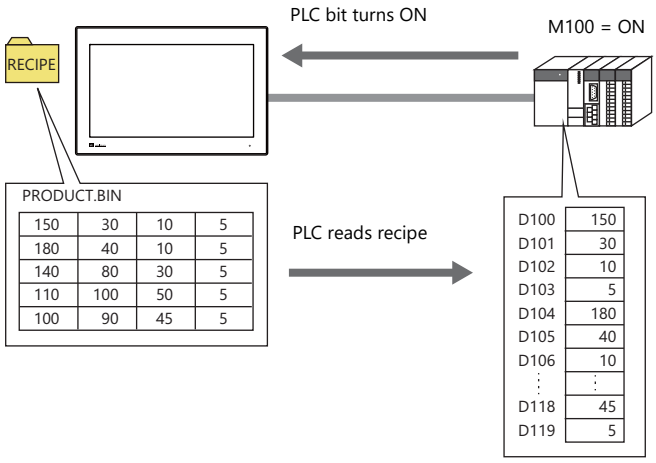
3. Start Excel.
   Edit the data in Excel according to the intended format.
4. Save the data by clicking [File] → [Save As].
5. Select "CSV (Comma delimited) (*.csv)" for [Save as type] and save the file in the "RECIPE" folder created in step 2.

This completes the necessary settings. Connect a USB flash drive containing the necessary BIN files to the X1 series unit.
If the BIN files are stored in internal storage ("sd" folder, "usb" folder), copy the EXT0000 (access folder) into the storage folder on the X1 series unit using the Explorer function of System Configurator.

☞ For details on System Configurator, refer to the X1 Series Hardware Specifications.

15.3 Reading Recipes in Units of Files When the PLC Bit Turns ON

15.3.1 Conceptual Operation



* PLC data can also be written to files. PLC data is written to a BIN file when the relevant bit turns ON.
If a BIN file does not exist, a new BIN file is created automatically.

15.3.2 Setting Procedure

1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [File-based transfer] for [Data to Transfer].
3. Select [File Name Designation] for [Storage Target File] and define the name of the file for reading (e.g. PRODUCT.bin).
   * Select the [Designate by device] checkbox under the filename to allow reading by a specified device memory address such as of a PLC. A fixed file is targeted in this example.
4. Display the [File Format] tab window.
5. Select [Specify consecutively] for [Device Designation] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
6. Display the [Transfer Command] tab window.
7. Select the [MONITOUCH → PLC] checkbox under [Add Transfer Condition].
   Define the PLC bit (e.g. M100) for [Device].
   Select [Transfer when bit [ON]] for [Trigger Select].

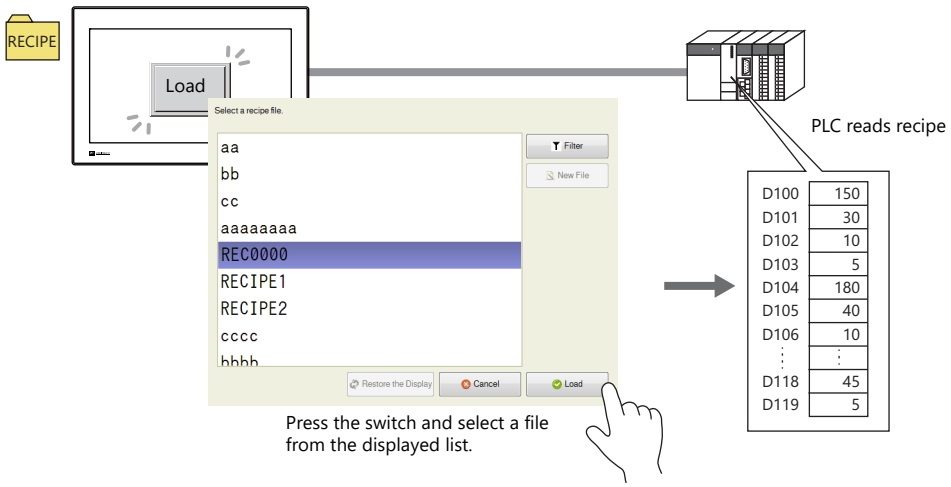
This completes the necessary settings. The screen program can be transferred to MONITOUCH.

15.3.3 Operating Procedure

1. With the recipe file stored in the "RECIPE" folder, set the PLC bit (e.g. M100) to ON.
2. The data of the file defined in step 3 of the previous section is read out sequentially to the reading destination starting from the top device memory address (e.g. D100).

15.4 Reading Recipes in Units of Files with Switch Operations

15.4.1 Conceptual Operation



* PLC data can also be written to files. Pressing the switch writes the PLC data to the selected file. If a file does not exist, a new file is created automatically.

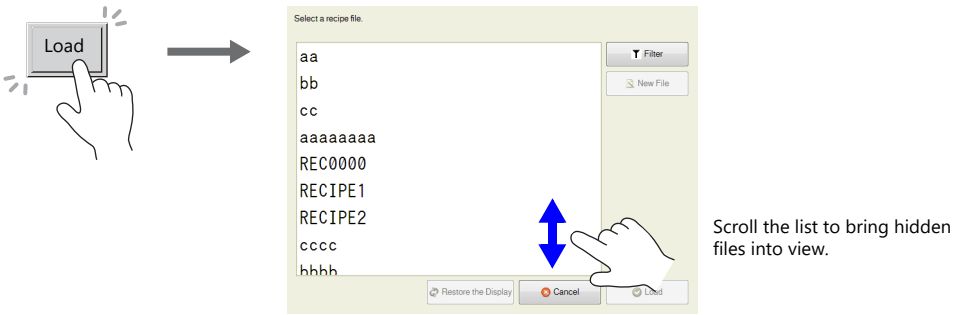
15.4.2 Setting Procedure

1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [File-based transfer] for [Data to Transfer].
3. Display the [File Format] tab window.
4. Select [Specify consecutively] for [Device Designation] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
5. Next, configure the switch settings.
   In the switch settings window, change "Standard" to "Recipe" under [Function] in the [Function] settings and then select "Recipe Data Load".
6. Select [0], which was specified in step 1, for [Recipe]. The switch settings differ depending on the selection made here.
7. Select the [Select at the time of execution] checkbox for [File Selection].
   (When there is only one file, specify a value for [Specify the number] or [Specify the name].)

This completes the necessary settings. The screen program can be transferred to MONITOUCH.

15.4.3 Operating Procedure

1. With the recipe file stored in the "RECIPE" folder, press the switch with [Function] set to [Recipe Data Load] on the screen.
   A list window for automatic file selection is displayed.



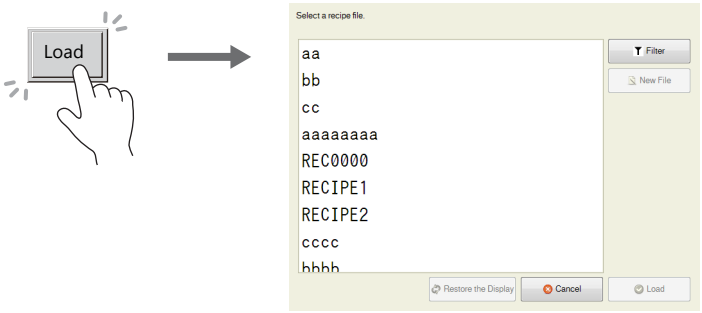
2. Select a file and press the [Load] button to sequentially read out to the reading destination starting from the top device memory address (e.g. D100). When there are files that cannot be viewed in the window at once, either scroll or perform filtering to bring them into view. For more information on filtering, refer to the next page.

Reading Out by Searching for Filenames (Filtering)

When there are many files, searching for filenames (filtering) can be used to find files.

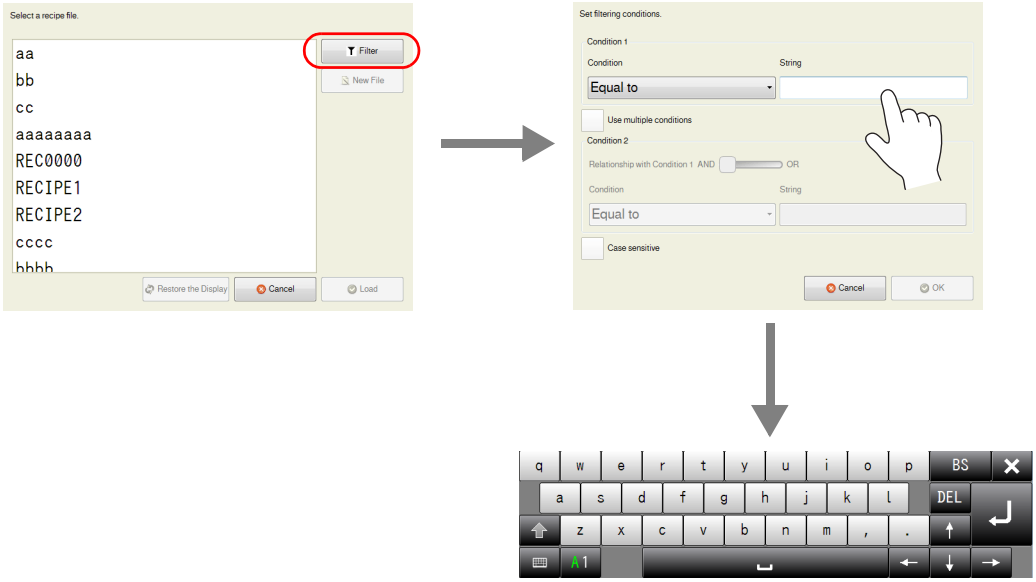
* Searching for record names (filtering) is also possible.

1. With the recipe file stored in the “RECIPE” folder, press the switch with [Function] set to [Recipe Data Load] on the screen.
   A list window for automatic file selection is displayed.



2. Press the [Filter] button to display the following filtering window.
   Enter the first few characters of the filename.

* Press the text field to automatically display the system keyboard. Use this keyboard to enter text.



3. Press [OK] to display a list of files with filenames that contain the entered text.
   When there are files that cannot be viewed in the window at once, the entire list can be checked by scrolling.

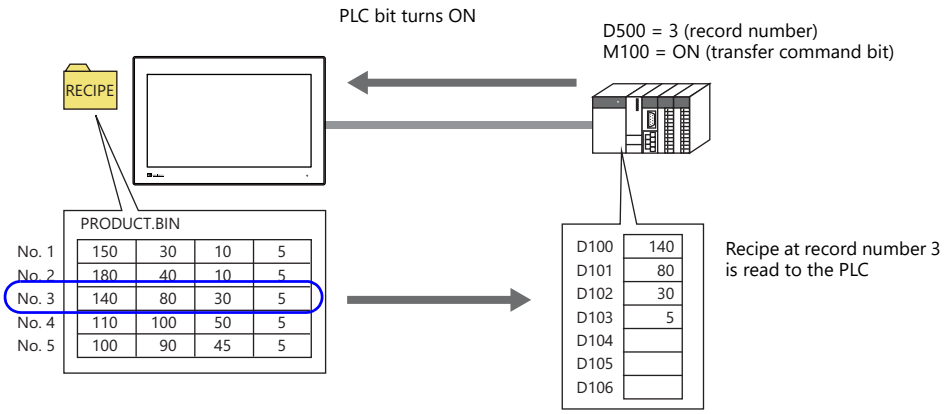
4. Find the target file, select it, and press [Load]. The target file is read out sequentially to the reading destination starting from the top device memory address (e.g. D100).

The recipe data of the file is read into the PLC.

15.5 Reading Recipes in Units of Records

15.5.1 Specifying Record Numbers for Reading

Conceptual Operation



Setting Procedure

1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [Record-based transfer] for [Data to Transfer].
3. Select [File Name Designation] for [Storage Target File] and define the name of the file for reading (e.g. PRODUCT.bin).
4. For the [Transfer Record] settings, select the [Designate by device] checkbox next to [Record Number Designation].
   Define the device memory address for record number designation (e.g. D500).
5. Display the [File Format] tab window.
6. Select [Data] for [Transfer Target] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
7. Display the [Transfer Command] tab window.
8. Select the [MONITOUCH → PLC] checkbox under [Add Transfer Condition].
   Define the PLC bit (e.g. M100) for [Device].
   Select [Transfer when bit [ON]] for [Trigger Select].

This completes the necessary settings. The screen program can be transferred to MONITOUCH.

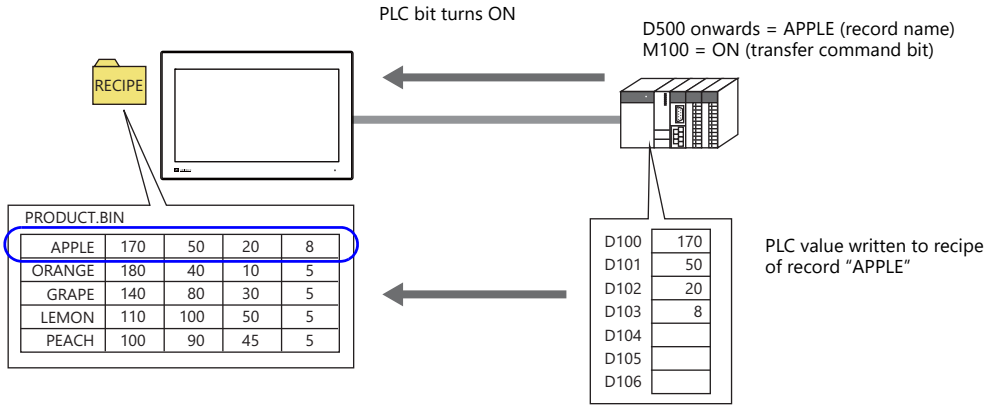
Operating Procedure

1. With the recipe file stored in the "RECIPE" folder, specify "3" to the device memory address (e.g. D500) on the PLC.
2. In addition, set the relevant bit (e.g. M100) to ON.
3. The data of record number 3 in the file defined in step 3 of the previous section is read out sequentially to the reading destination starting from the top device memory address (e.g. D100).

15.6 Writing Recipes in Units of Records

15.6.1 Specifying Record Names for Writing

Conceptual Operation



Setting Procedure

1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [Record-based transfer] for [Data to Transfer].
3. Select [File Name Designation] for [Storage Target File] and define the name of the file for reading (e.g. PRODUCT.bin).
4. For the [Transfer Record] settings, select the [Designate by device] checkbox next to [Record Name Designation].
   Define the device memory address for record name designation (e.g. D500).
5. Display the [File Format] tab window.
6. Select [Data] for [Transfer Target] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
7. Display the [Transfer Command] tab window.
8. Select the [PLC → MONITOUCH] checkbox under [Add Transfer Condition].
   Define the PLC bit (e.g. M100) for [Device].
   Select [Transfer when bit [ON]] for [Trigger Select].

This completes the necessary settings. The screen program can be transferred to MONITOUCH.

Operating Procedure

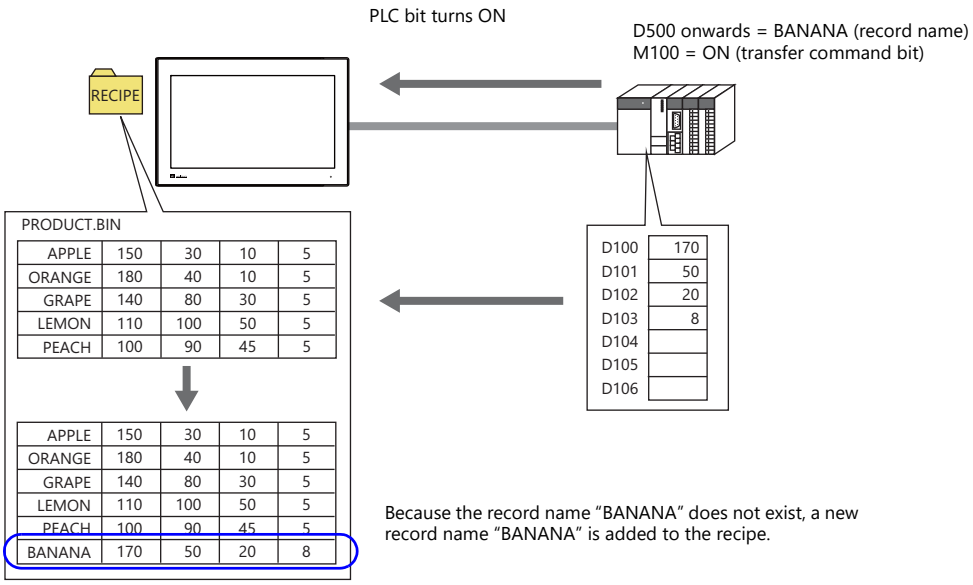
1. With the recipe file stored in the "RECIPE" folder, specify the record name (e.g. "APPLE") to the device memory address (e.g. D500) on the PLC using ASCII code characters.
2. In addition, set the relevant bit (e.g. M100) to ON.
3. The data stored in the transfer device memory (e.g. D100) is written sequentially starting from the top address to the "APPLE" record in the file defined in step 3 of the previous section.

15.6.2 Creating New Records

New records can be created by defining record numbers or records names that do not currently exist and executing writing.

* Files can also be created in the same manner.

Conceptual Operation



Setting Procedure

1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [Record-based transfer] for [Data to Transfer].
3. Select [File Name Designation] for [Storage Target File] and define the name of the file for reading (e.g. PRODUCT.bin).
4. For the [Transfer Record] settings, select the [Designate by device] checkbox next to [Record Name Designation].
   Define the device memory address for record name designation (e.g. D500).
5. Display the [File Format] tab window.
6. Select [Data] for [Transfer Target] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
7. Display the [Transfer Command] tab window.
8. Select the [PLC → MONITOUCH] checkbox under [Add Transfer Condition].
   Define the PLC bit (e.g. M100) for [Device].
   Select [Transfer when bit [ON]] for [Trigger Select].

This completes the necessary settings. The screen program can be transferred to MONITOUCH.

Operating Procedure

1. With the recipe file stored in the "RECIPE" folder, specify the record name (e.g. "BANANA") to the device memory address (e.g. D500) on the PLC using ASCII code characters.
2. In addition, set the relevant bit (e.g. M100) to ON.
3. Because the record name "BANANA" does not exist in the file defined in step 3 of the previous section, the data in the transfer device memory (e.g. D100) is written sequentially starting from the top address to a newly added record named "BANANA".

Difference in Operation Between Record Name Designation and Record Number Designation

When creating in units of records, operation differs between creating a new record name and creating a record number.

- Record name
  When a new record name is created that did not previously exist, records are added by inserting a line at the end of the relevant file.

APPLE	60	110	250
GRAPE	50	85	240
LEMON	40	60	220
PEACH	80	120	240

APPLE	60	110	250
GRAPE	50	85	240
LEMON	40	60	220
PEACH	80	120	240
ORANGE	60	110	220

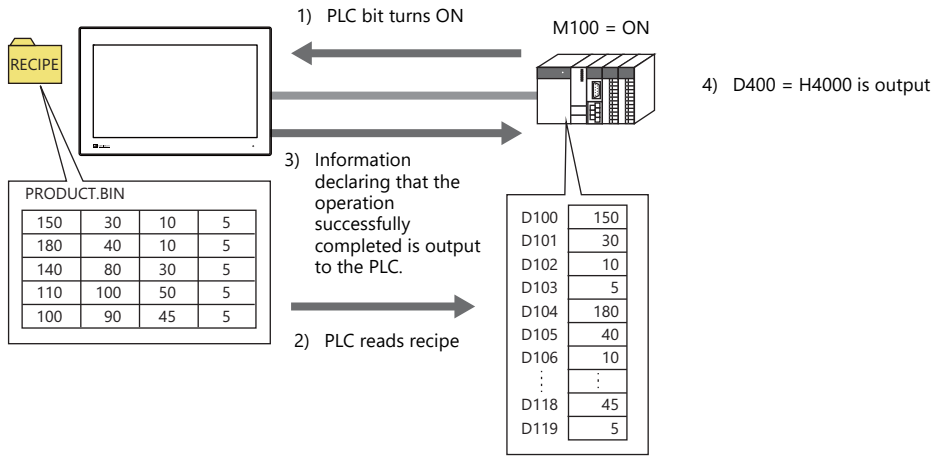
- Record number
  When a new record number is created that did not previously exist, a new record is created with the specified record number. If there is a gap between the end number and the new number, empty lines are registered.

No. 1	60	110	250
No. 2	50	85	240
No. 3	40	60	220

No. 1	60	110	250
No. 2	50	85	240
No. 3	40	60	220
No. 4	0	0	0
No. 5	0	0	0
No. 6	0	0	0
No. 7	0	0	0
No. 8	60	110	220

15.7 Checking that the Recipe Function is Operating Correctly

15.7.1 Conceptual Operation



15.7.2 Setting Procedure

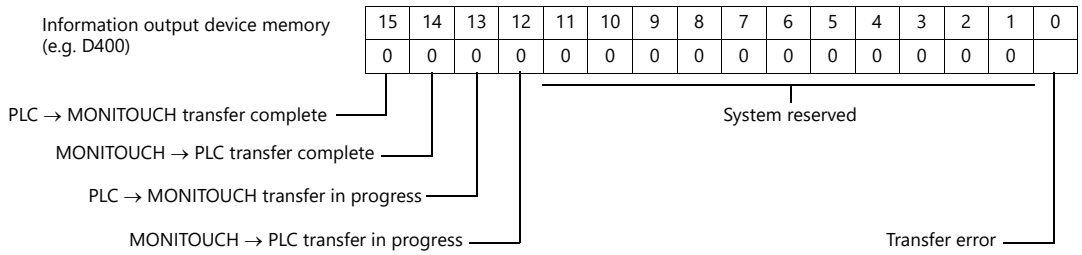
1. Click [System Setting] → [Recipe] and select "0" for [No.]. The [Recipe [0]] window is displayed.
2. On the [Standard Operation] tab window, select [File-based transfer] for [Data to Transfer].
3. Select [File Name Designation] for [Storage Target File] and define the name of the file for reading (e.g. PRODUCT.bin).
   * Select the [Designate by device] checkbox under the filename to allow reading by a specified device memory address such as of a PLC. A fixed file is targeted in this example.
4. Display the [File Format] tab window.
5. Select [Specify consecutively] for [Device Designation] under [Transfer Device Setting] and specify the top device memory address (e.g. D100).
6. Display the [Transfer Command] tab window.
7. Select the [MONITOUCH → PLC] checkbox under [Add Transfer Condition].
   Define the PLC bit (e.g. M100) for [Device].
   Select [Transfer when bit [ON]] for [Trigger Select].
8. Select the [Use Info Output Device] checkbox under [Device Setting] and specify a device memory address (e.g. D400).

This completes the necessary settings. The screen program can be transferred to MONITOUCH.

15.7.3 Checking Procedure

1. With the recipe file stored in the "RECIPE" folder, set the PLC bit (e.g. M100) to ON.
2. The data of the file defined in step 3 of the previous section is read out sequentially to the reading destination starting from the top device memory address (e.g. D100).
3. Check the D400 setting. If transfer was completed successfully, the 14th bit turns ON (D400 = H4000).

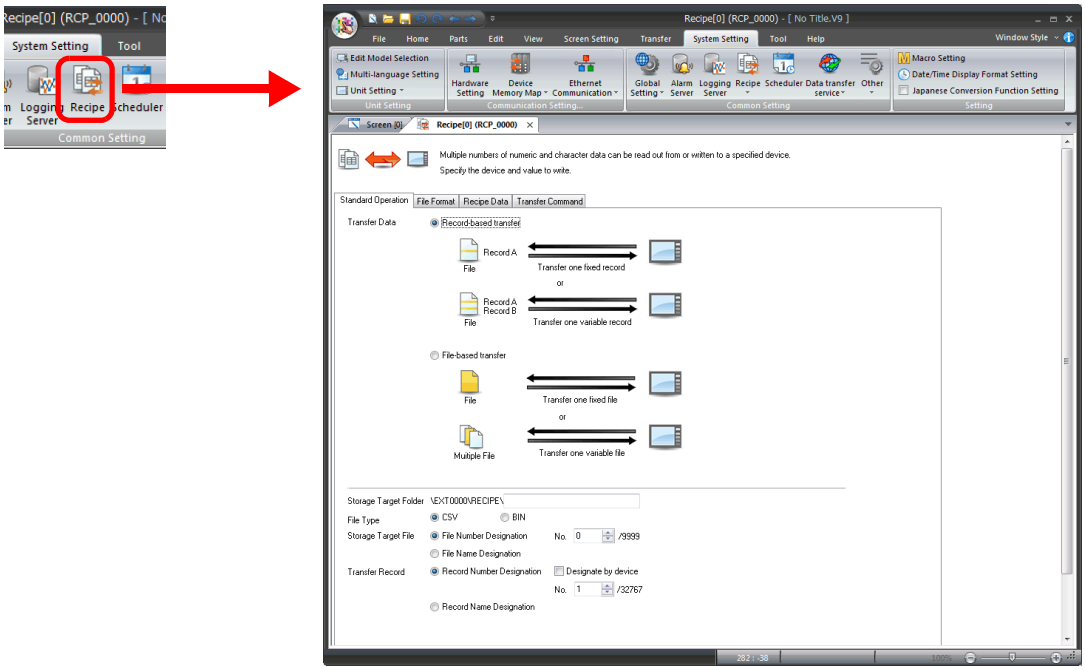
* The content of the information output device memory is shown below. For details, refer to page 15-19.



15.8 Detailed Settings

15.8.1 Location of Settings

Click [System Setting] → [Recipe].
A window for specifying the recipe number is displayed. Select a number and click [OK].
The [Recipe] settings window is displayed.



15.8.2 Recipe Settings (0 to 255)

The recipe settings area is used to newly register information when there are differences in the settings required for recipe management, such as the format of files that store recipe data and execution start bits etc. First, a number is set to the recipe setting.

[Standard Operation] Tab Window

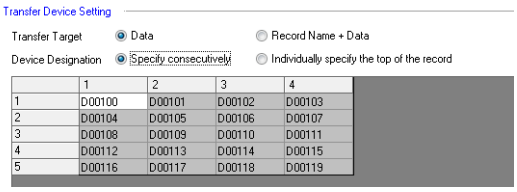
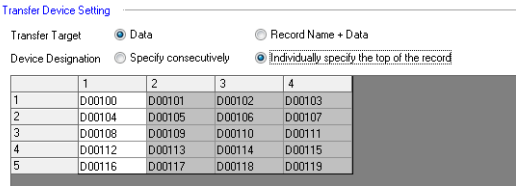
Item		Description
Data to Transfer	Record-based transfer	Select this option to read and write recipe data in units of records (rows or columns).
	File-based transfer	Select this option to read and write recipe data in units of files.
Storage Target Folder		Define the file storage destination folder. Define one folder per recipe setting.
File Type	CSV/BIN *1	Select the file format of the data to store.
	Add	This checkbox is enabled when [Transfer Data] is set to [File-based transfer] and [File Type] is set to [CSV]. When a "PLC → MONITOUCH" transfer is executed, data is added to the end of the CSV file. Max. 32767 lines
Storage Target File	File Number Designation *2 (0 to 9999)	Set the file number of the storage target. When the [☐ Designate by device] checkbox is selected, the storage target can be defined by specifying a number to a device memory address.
	File Name Designation	Set the filename of the storage target. When the [☐ Designate by device] checkbox is selected, the storage target can be defined by specifying a name to a device memory address.
Transfer Record	Record Number Designation (0 to 32767)	Set the record number of the storage target. When the [☐ Designate by device] checkbox is selected, the storage target can be defined by specifying a number to a device memory address.
	Record Name Designation	Set the record name of the storage target. When the [☐ Designate by device] checkbox is selected, the storage target can be defined by specifying a name to a device memory address.

*1 BIN files result in faster processing speed on MONITOUCH than CSV files.
However, checking and editing of BIN file content requires Hakko Electronics' "V-SFT" software.

*2 The applicable filenames when specifying by file number are "RECxxxx.CSV" and "RECxxxx.BIN". (xxxx: 0000 to 9999)

[File Format] Tab Window

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td>Line/Column Contents</td><td>Line: Record, Column: Data</td><td>Records
<table><tr><td>APPLE</td><td>60</td><td>110</td><td>250</td></tr><tr><td>ORANGE</td><td>60</td><td>110</td><td>220</td></tr><tr><td>GRAPE</td><td>50</td><td>85</td><td>240</td></tr><tr><td>LEMON</td><td>40</td><td>60</td><td>220</td></tr><tr><td>PEACH</td><td>80</td><td>120</td><td>240</td></tr></table>Data</td></tr>
<tr><td></td><td>Line: Data, Column: Record *1</td><td>Records
<table><tr><td>APPLE</td><td>ORANGE</td><td>GRAPE</td><td>LEMON</td><td>PEACH</td></tr><tr><td>60</td><td>60</td><td>50</td><td>40</td><td>80</td></tr><tr><td>110</td><td>110</td><td>85</td><td>60</td><td>120</td></tr><tr><td>250</td><td>220</td><td>240</td><td>220</td><td>240</td></tr></table>Data</td></tr>
<tr><td colspan="2">Add record name</td><td>Set how to handle the first column (or first line) in the CSV/BIN file.
• Unselected
The first column is handled as data.<table><tr><td>60</td><td>110</td><td>250</td></tr><tr><td>60</td><td>110</td><td>220</td></tr><tr><td>50</td><td>85</td><td>240</td></tr><tr><td>40</td><td>60</td><td>220</td></tr><tr><td>80</td><td>120</td><td>240</td></tr></table>• Selected
The first column is handled as a record name (2 to 255).<table><tr><td>APPLE</td><td>60</td><td>110</td><td>250</td></tr><tr><td>ORANGE</td><td>60</td><td>110</td><td>220</td></tr><tr><td>GRAPE</td><td>50</td><td>85</td><td>240</td></tr><tr><td>LEMON</td><td>40</td><td>60</td><td>220</td></tr><tr><td>PEACH</td><td>80</td><td>120</td><td>240</td></tr></table></td></tr>
<tr><td colspan="2">Add title to data</td><td>Set how to handle the first line (or first column) in the CSV file.
• Unselected
The first line is handled as data.<table><tr><td>APPLE</td><td>60</td><td>110</td><td>250</td></tr><tr><td>ORANGE</td><td>60</td><td>110</td><td>220</td></tr><tr><td>GRAPE</td><td>50</td><td>85</td><td>240</td></tr><tr><td>LEMON</td><td>40</td><td>60</td><td>220</td></tr><tr><td>PEACH</td><td>80</td><td>120</td><td>240</td></tr></table>• Selected
The first line is handled as the title.<table><tr><td></td><td>Agitation time</td><td>Sterilization time</td><td>Cooling time</td></tr><tr><td>APPLE</td><td>60</td><td>110</td><td>250</td></tr><tr><td>ORANGE</td><td>60</td><td>110</td><td>220</td></tr><tr><td>GRAPE</td><td>50</td><td>85</td><td>240</td></tr><tr><td>LEMON</td><td>40</td><td>60</td><td>220</td></tr><tr><td>PEACH</td><td>80</td><td>120</td><td>240</td></tr></table></td></tr>
<tr><td></td><td>Reading the title name</td><td>Read the CSV file created in advance that contains the title.
The read title is registered to [Title Name].</td></tr>
<tr><td></td><td>Interface Language</td><td>Select the display language of the title name.</td></tr>
<tr><td colspan="2">Delimiter (Comma, Tab, Period *2, Semicolon)</td><td>This setting is only available when [CSV] is selected for [File Type] on the [Standard Operation] tab window. Select the character for delimiting data.</td></tr>
<tr><td colspan="2">Number of Records (1 to 32767)</td><td>This setting is only available when [File-based transfer] is selected for [Data to Transfer] on the [Standard Operation] tab window. Set the number of records per file.</td></tr>
<tr><td colspan="2">Number of Data (1 to 4096)</td><td>Set the number of data entries on the first line (or first column) (per record) in the CSV/BIN file.</td></tr>
</table>

Item		Description
Format	Title Name (max. 255 bytes) *3	This setting is only available when the [Add title to data] checkbox is selected. Register a title. There are two methods to register a title, directly editing the cell or reading from a CSV file using [Reading the title name].
	Data Type (DEC/DEC-/HEX/OCT/BIN/CHAR/ BCD/FLOAT)	Set the data format.
	Data Length (1-Word/2-Word)	
	Decimal Point (0 to 32)	
	Characters (2 to 255)	
	Text Process (LSB → MSB)	
Transfer Target		This setting is only available when the [Add record name] checkbox is selected.
	Data	Only transfer data.
	Record Name + Data	Transfer record names and data.
Device Designation		This setting is only available when [File-based transfer] is selected for [Data to Transfer] on the [Standard Operation] tab window.
	Specify consecutively	Specify the top device memory address only. The number of bits required for the data is assigned consecutively. 
	Individually specify the top of the record	A top device memory address for each record in the file can be specified. 
	Specify individually	Specify all device memory addresses individually.
V8 Compatible Setting		The automatically converted settings when a V8 recipe screen is converted.

*1 This setting is only available when [CSV] is selected for [File Type] on the [Standard Operation] tab window.

*2 The decimal point is indicated using a comma for German, Italian, French and other relevant languages. For this reason, a period character may be used as the delimiter in CSV files. Note that when editing this data in Excel, the relevant option must be changed for the display format.

*3 The title name is read when creating a new recipe file. This cannot be used when reading an existing recipe file.

[Recipe Data] Tab Window

Item		Description
Create File		Select when creating a new CSV or BIN file.
	Overwrite	Save the created file to an existing file.
	Save As	Save the created file using a different filename. The save destination is not limited to the storage device drive and can be changed to any location on the PC.
	Page	Switch the screen for editing.
	Interface Language	Switch the language for editing.
File Editing		Select when loading an existing CSV or BIN file.
	Storage Drive Select	Select the drive of the SD card, USB flash drive, etc., to which CSV or BIN files are stored.
	Storage Target Folder	The folder specified on the [Standard Operation] tab window is displayed automatically.
	File List	The files in the specified folder are displayed.
	Edit	Select a CSV/BIN file displayed under [File List] and click the [Edit] button. The file is loaded into the editing window on the right.
	Copy	Select a CSV/BIN file displayed under [File List] and click the [Copy] button. This makes a copy of the file.
	Delete	Select a CSV/BIN file displayed under [File List] and click the [Delete] button. This deletes the file.
	Rename	Select the CSV/BIN file displayed under [File List] and click the [Rename] button. The file name can be changed.

Item	Description
Edit a file in another folder	Edit a file in a folder other than the storage target folder. Click to display a window for specifying the folder.
Newest File	Select when loading an existing CSV or BIN file that was used recently.

[Transfer Command] Tab Window

Item		Description
Add Transfer Condition		Specify the operation to perform and trigger bit to use when transferring the recipe.
	PLC → MONITOUCH/MONITOUCH → PLC	Select [PLC → MONITOUCH] to store the data on the PLC in the "RECIPE" folder. Select [MONITOUCH → PLC] to transfer the data in the "RECIPE" folder to the PLC.
	Device	Specify the trigger bit used for outputting transfer commands.
	Trigger Select *	The timing of the transfer command trigger can be selected. • Transfer when bit ON • Transfer when bit OFF
Device Setting	Use command device	Select this checkbox to prohibit recipe transfer operations. Turning this bit ON prevents execution of transfer even if a recipe is selected and a transfer command is issued.
	Use Info Output Device	Select this checkbox to check the state of recipe transfer operations on the specified device memory address. Information is divided across different bit numbers. Refer to the following table for details.
	Output Transfer File No.	This setting is only available when [File-based transfer] is selected for [Data to Transfer] and [File Number Designation] is selected for [Storage Target File] on the [Standard Operation] tab window. Select this checkbox to specify a device memory address. The transferred file number can be output.
	Output Transfer File Name	This setting is only available when [File-based transfer] is selected for [Data to Transfer] and [File Name Designation] is selected for [Storage Target File] on the [Standard Operation] tab window. Select this checkbox to specify a device memory address. The transferred file name can be output using the relevant number of characters.
	Output Transfer Record No.	This setting is only available when [Record-based transfer] is selected for [Data to Transfer] and [Record Number Designation] is selected for [Storage Target File] on the [Standard Operation] tab window. Select this checkbox to specify a device memory address. The transferred record number can be output.
	Output Transfer Record Name	This setting is only available when [Record-based transfer] is selected for [Data to Transfer] and [Record Name Designation] is selected for [Storage Target File] on the [Standard Operation] tab window. Select this checkbox to specify a device memory address. The transferred record name can be output using the relevant number of characters.

Device	Bit No.	State
n	0	Transfer error 0: No error 1: Transfer error
	12	MONITOUCH → PLC transfer in progress 1: Transferring (changes to 0 when transfer is complete)
	13	PLC → MONITOUCH transfer in progress 1: Transferring (changes to 0 when transfer is complete)
	14	MONITOUCH → PLC transfer complete 1: Transfer complete (must be cleared manually after checking)
	15	PLC → MONITOUCH transfer complete 1: Transfer complete (must be cleared manually after checking)
n+1	-	Error No. 12: Writing error 16: Reading error

* Operation when MONITOUCH is starting up
Transfer is executed when the trigger bit is ON or OFF during startup.

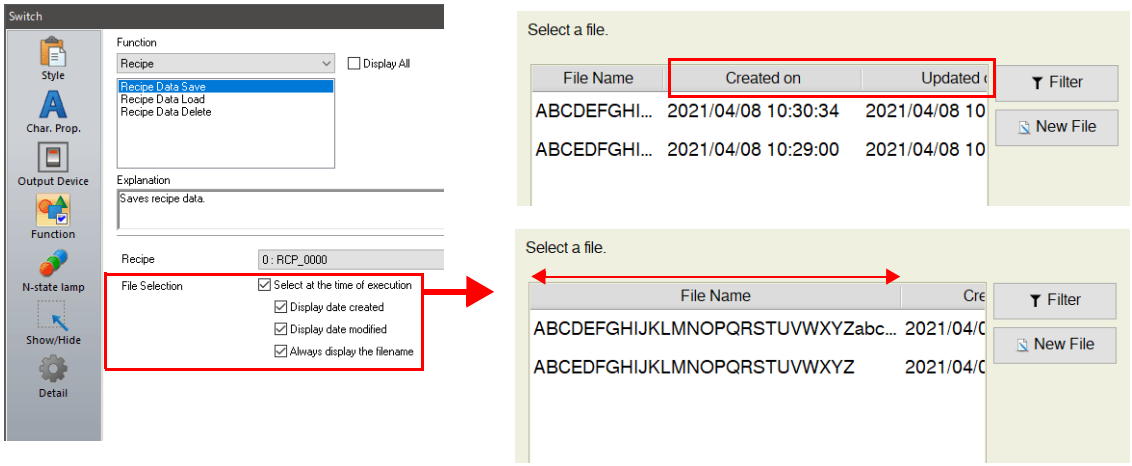
15.9 Switch Operated Functions

15.9.1 Switch Types

Operation	Switch Function	Attached Setting	Details of Operation
Filter	Recipe Data Save Recipe Data Load Recipe Data Delete	Select the [Select at the time of execution] checkbox for [File Selection]/[Record Selection].	Filter and display filenames or record names for when selecting a recipe.
New	Recipe Data Save	Select the [Select at the time of execution] checkbox for [File Selection]/[Record Selection].	Create new recipe data by naming a file or record and save it in the "RECIPE" folder.
Save	Recipe Data Save	Select the [Select at the time of execution] checkbox for [File Selection]/[Record Selection]. *2	Write data such as from a PLC to a recipe in the "RECIPE" folder (Filter and display filenames or record names in a list when selecting a recipe.)
	Recipe Data Save	Select [Specify the number] or [Specify the name] for [File Selection]/[Record Selection].	Write data such as from a PLC to a recipe (file/record specified with the switch) in the "RECIPE" folder.
Load	Recipe Data Load	Select the [Select at the time of execution] checkbox for [File Selection]/[Record Selection]. *2	Output recipe data from the "RECIPE" folder to a PLC, etc. (Filter and display filenames or record names in a list when selecting a recipe.)
	Recipe Data Load	Select [Specify the number] or [Specify the name] for [File Selection]/[Record Selection].	Output recipe data (file/record specified with the switch) from the "RECIPE" folder to a PLC, etc.
Delete	Recipe Data Delete (file-based)	Select the [Select at the time of execution] checkbox for [File Selection]. *2	Delete a recipe file from the "RECIPE" folder. (Filter and display filenames or record names in a list when selecting a recipe.)
		Select [Specify the number] or [Specify the name] for [File Selection].	Delete a specific recipe file from the "RECIPE" folder.
	Recipe Data Delete (record-based)	Select the [Select at the time of execution] checkbox for [Record Selection].	[Transfer Target: Data] Delete a specific record data in the "RECIPE" folder.*1 (Filter and display record names in a list when selecting a recipe.)
			[Transfer Target: Record Name + Data] Delete a record name and record data in the "RECIPE" folder.*1 (Filter and display record names in a list when selecting a recipe.)
		Select [Specify the number] or [Specify the name] for [Record Selection].	[Transfer Target: Data] Delete a specific record data in the "RECIPE" folder.*1
			[Transfer Target: Record Name + Data] Delete a specific record name and record data in the "RECIPE" folder.*1

*1 Entire lines are deleted when the [Shift subsequent record numbers of recipe data by one after a record is deleted.] checkbox is selected in the [System Setting] → [Unit Setting] → [General Settings] tab window.

*2 When [File-based transfer] is selected in the recipe settings and the [Select at the time of execution] checkbox is selected for [File Selection] in the switch function settings, [Created on] and [Updated on] can be displayed in the recipe window of the X1 series unit. When the [Always display the filename] checkbox is selected but the entire filename is not displayed in [File Name] column, the width of the column can be adjusted to display the entire filename.



Filter

Target/Conditions

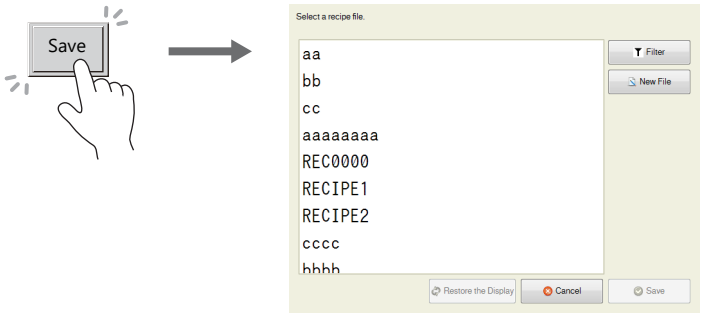
Filter target	Filenames and record names
Filter length	Max. 64 characters (both two-byte and one-byte)
Filter conditions *	Equal to/Not equal to/Begin with/Not begin with/End with/Not end with/Include/Not include
Location of execution	Executable by pressing switches with [Function] set to [Recipe Data Save], [Recipe Data Load], or [Recipe Data Delete].

* Not case-sensitive for file name targets.
Case-sensitive for record names.

Operating Procedure

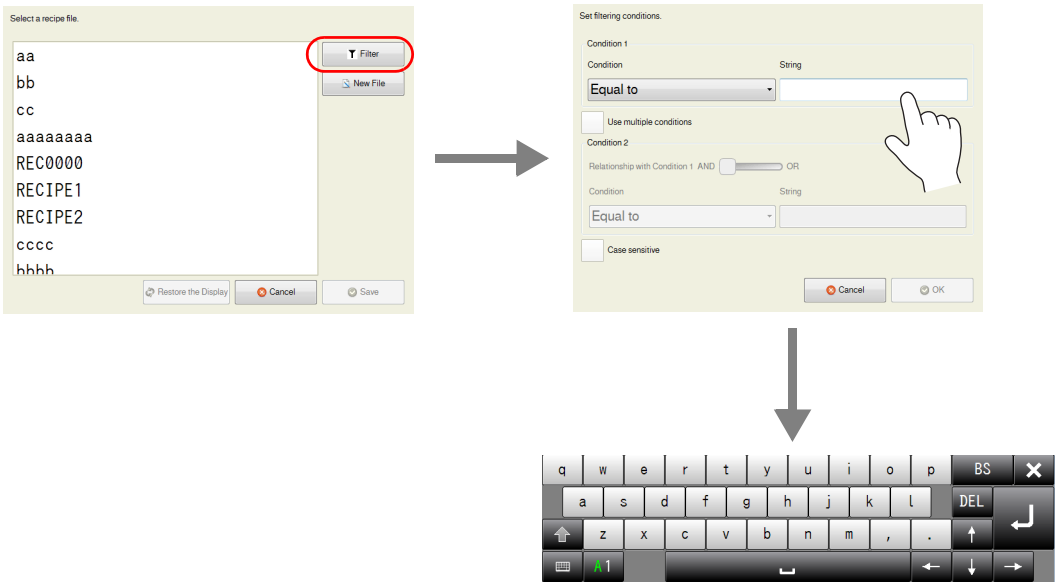
The operating procedure is explained using the example of pressing a [Recipe Save Data] switch.

1. Set the recipe number in the editor and transfer a [Recipe Data Save] switch with the [Select at the time of execution] checkbox selected for [File Selection]/[Record Selection] to the X1 series unit in advance.
2. Press the [Recipe Save Data] switch on the X1 series unit. The following list window is displayed.



3. Press the [Filter] button to display the following text filtering window.
   Enter the first few characters of the filename or record name.

* Press the text field to automatically display the system keyboard. Use this keyboard to enter text.



4. Selecting the [Include] filter condition and pressing the [OK] button displays a list of files or records with names that contain the entered text. (When the entire list cannot be viewed in the window at once, hidden items can be checked by scrolling.)

5. Find the target file or record, select it, and press [Save]. The following confirmation message is displayed. Press [Yes] to overwrite.

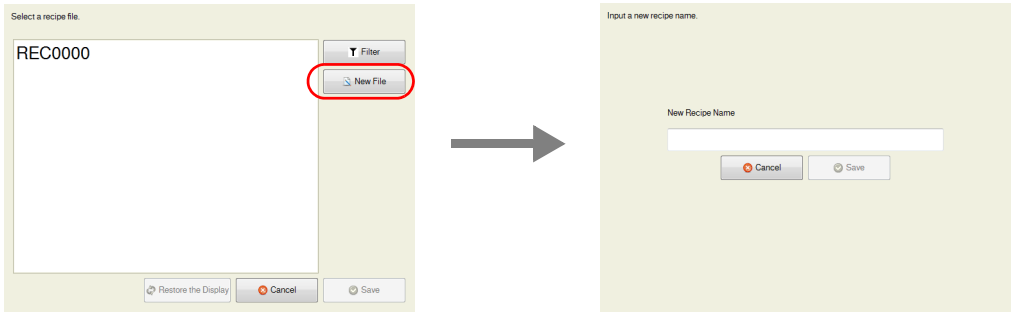
New

File-Based Targets

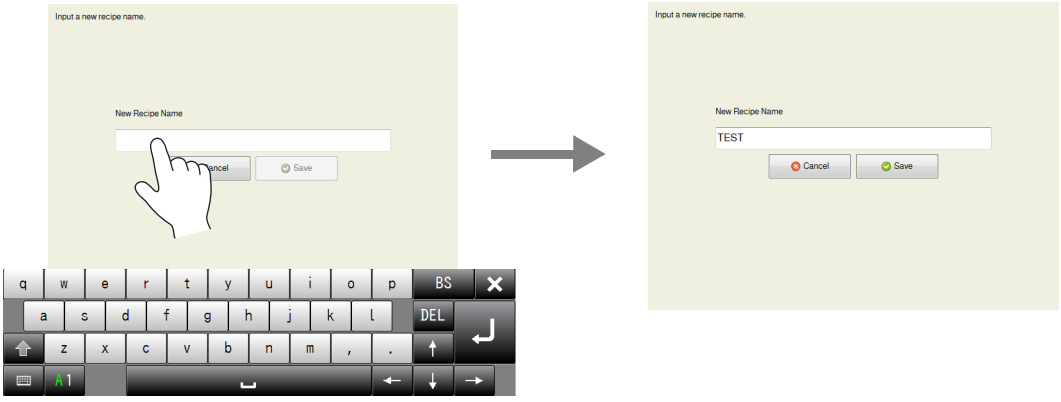
1. Set the recipe number in the editor and transfer a [Recipe Save Data] switch with the [Select at the time of execution] checkbox selected for [File Selection] to the X1 series unit in advance.
2. Press the [Recipe Save Data] switch on the X1 series unit. The window shown below is displayed.

A file list is displayed.

3. Click the [New File] button. The window for entering a new recipe name is displayed.

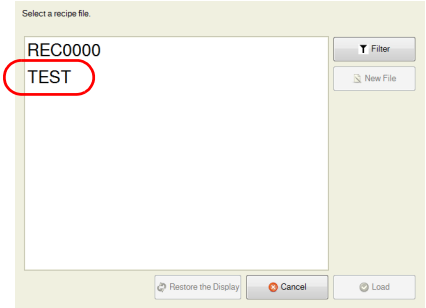


4. Press the text field to automatically display the system keyboard. Use this keyboard to enter the name of the new file to create.



Press the text field to display the system keyboard.

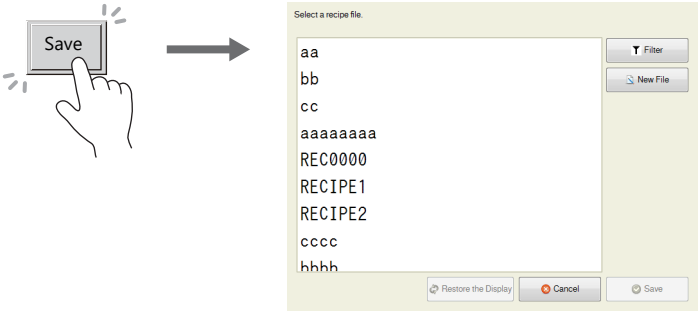
5. Press the [Save] button to create a new file.
   Press the [Recipe Load Data] switch to display a list that contains the newly created file.



Record-Based Targets

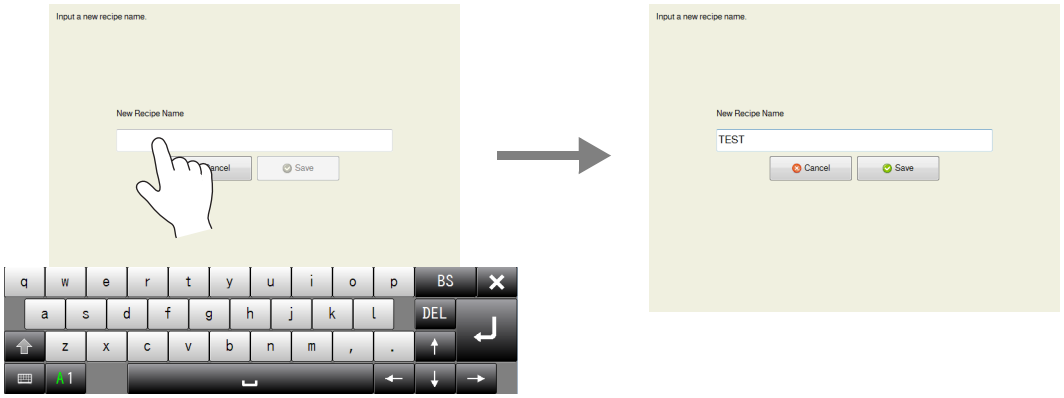
When the target is a record, select [Record Name Designation] for [Transfer Record] in the recipe settings in advance.

1. Set the recipe number in the editor and transfer a switch with the [Select at the time of execution] checkbox selected for [Record Selection] to the X1 series unit in advance.
2. Press the [Recipe Save Data] switch on the X1 series unit. The window shown below is displayed.



3. Click the [New File] button. The window for entering a new recipe name is displayed.

4. Press the text field to automatically display the system keyboard. Use this keyboard to enter the name of the new record to create.



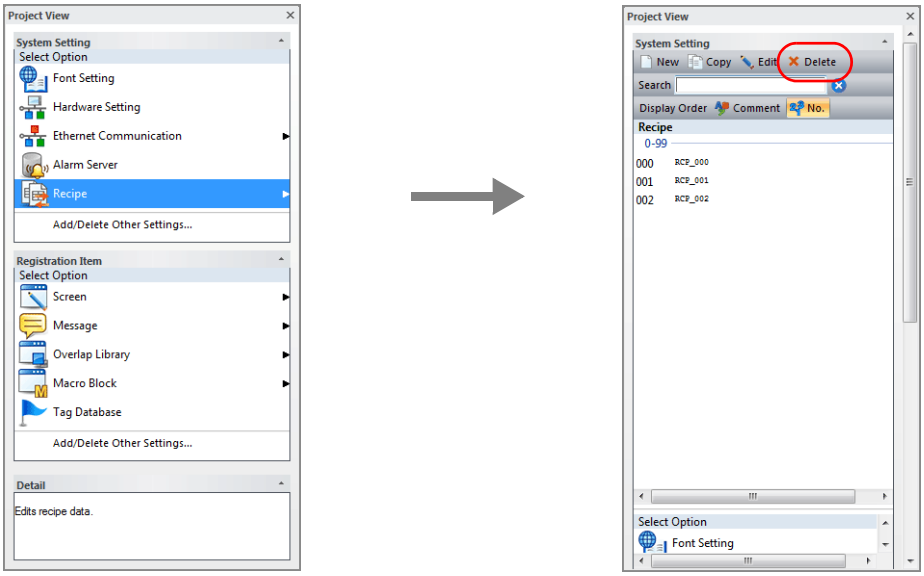
Press the text field to display the system keyboard.

5. Press the [Save] button to create a new record.

15.10 Specifications

Number of recipes	256 *1
Number of files	No limit (up to the capacity of the target storage device) *5
Number of records per file	32767
Number of data entries per record	4096 (number of words per record: 65535)
Number of folder name characters	Maximum of 255 characters (one-byte) for the full path name *2
Number of filename characters	Maximum of 64 characters (one-byte) or 32 characters (two-byte) *2 *5
Number of record name characters	Maximum of 255 characters (one-byte) *2
Number of transferable words	No limitation *3
Number of recipes executable at the same time	Maximum of 4 recipes *4
Number of files transferable at the same time	1
Number of records transferable at the same time	When [Record-based transfer] is set for [Data to Transfer]: 2 When [File-based transfer] is set for [Data to Transfer]: Number set for [Number of Records] on the [File Format] tab window (max. 32767 records).

*1 Check how many recipes are currently registered by clicking [Tool] → [List of Memory Use] or [View] → [Project]. Delete registered recipes by first displaying the [Project] view window via [View] → [Project], and then clicking [Recipe] via [Add/Delete Other Settings] under [System Setting]. Double-click on [Recipe] to display the current recipes in the list. Select the recipes for deletion and click the [Delete] button.



*2 Not case-sensitive for one-byte characters.

*3 Note that if 4096 words is exceeded, transfer processing is executed by internally dividing the number of records into units of 4096 words.

*4 Execution of a fifth recipe does not generate an error. The data of the fifth recipe is put on standby until the execution of any one of the four recipes is completed, and the recipe data on standby is executed.

*5 The maximum number of files available when specifying file numbers is 10,000. Applicable filenames are “RECxxxx.CSV” and “RECxxxx.BIN”. (xxxx: 0000 to 9999)

Notes

- Global operations and local operations cannot be executed at the same time on the same recipe number.
- When the screen is changed during recipe operation:
  Global: Not affected.
  Local: Screen is changed after transfer processing is complete.
- When record data is deleted, the record data is written as empty data.
- If the data format is a character string (including the record name), the recipe data cannot be read or written correctly if the language in the file (character code) and the language set on MONITOUCH do not match.

Recipe Parts

- Click [Parts] → [Others] → [Recipe] to place a recipe part on the screen.
  This part is a replacement for the recipe display used by the V8 series. Converting a V8 series screen program with recipe display parts on the screen to a X1 series screen program will automatically convert it to this item.
- Compatibility is maintained with recipe settings for this recipe part with the [V8 Compatible Setting] at [System Setting] → [Recipe] (No.) → [File Format].

16 Print

16.1 Overview

16.2 Connection Method

16.3 Hard Copy

16.4 Printing Data Sheets

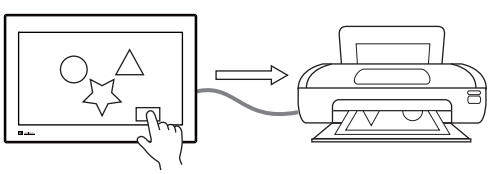
16.5 Connecting to a Sato MR-400 Barcode Printer

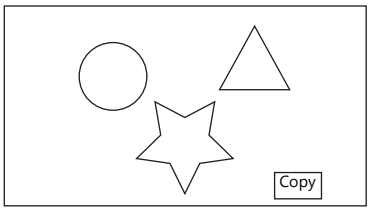
16.1 Overview

When the X1 series unit is in RUN mode, items such as the displayed screen and logging/alarm server information can be printed from a connected printer.

16.1.1 Printable Items

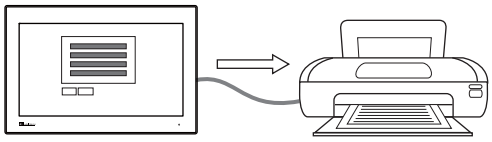
- Hard copy
  Print the displayed screen.





☞ For details, refer to "16.3 Hard Copy" page 16-5.

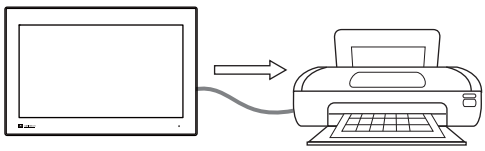
- Printing logs
  Print collected log data.



		No.1	No.2
1	08-20 13:25:40	300	80
2	08-20 14:05:13	250	40
3	08-24 16:59:54	360	290
4	08-24 17:01:05	340	75
5	08-24 17:01:05	310	120
6	08-24 17:01:05	310	115

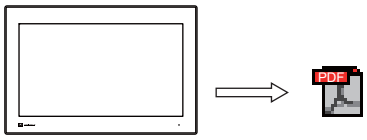
☞ For details, refer to "Log Printing" page 7-31.

- Data sheet print
  - Print data registered as a data sheet.



	1	2	3	4	5
A					
B					
C					
D					
E					
F					

  - Data registered as a data sheet is output to storage in PDF file format.



	1	2	3	4	5
A					
B					
C					
D					
E					
F					

☞ For details, refer to "16.4 Printing Data Sheets" page 16-7.

16.1.2 Compatible Printers

The X1 series is equipped with a Windows operating system. Therefore, printers that can be used with a Windows 10 operating system are supported.
Install the driver of the printer using System Configurator on the X1 series unit.

☞ For details on System Configurator, refer to the X1 Series Hardware Specifications.

However, the following printer model requires selection of the printer and configuration of communication settings on the V-SFT version 6 screen configuration software.

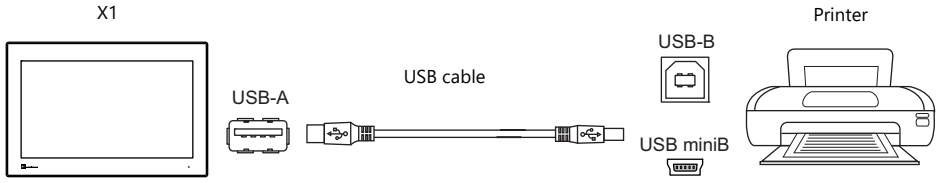
- Sato MR-400 series barcode printer

☞ For details, refer to "16.5 Connecting to a Sato MR-400 Barcode Printer" page 16-21.

16.2 Connection Method

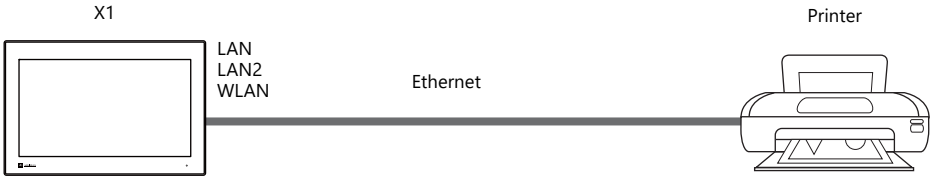
USB-A port connection

- Connect the USB-A port of the X1 series unit with the USB-B or USB miniB port of the printer with a commercially available USB cable.



LAN connection (LAN/LAN2/WLAN)

- Connect the LAN, LAN2, or WLAN port of the X1 series unit with the LAN port of the printer via Ethernet.



Serial connection (SERIAL)

- This is used only when connecting a Sato MR-400 series barcode printer.

☞ For details, refer to "16.5 Connecting to a Sato MR-400 Barcode Printer" page 16-21.

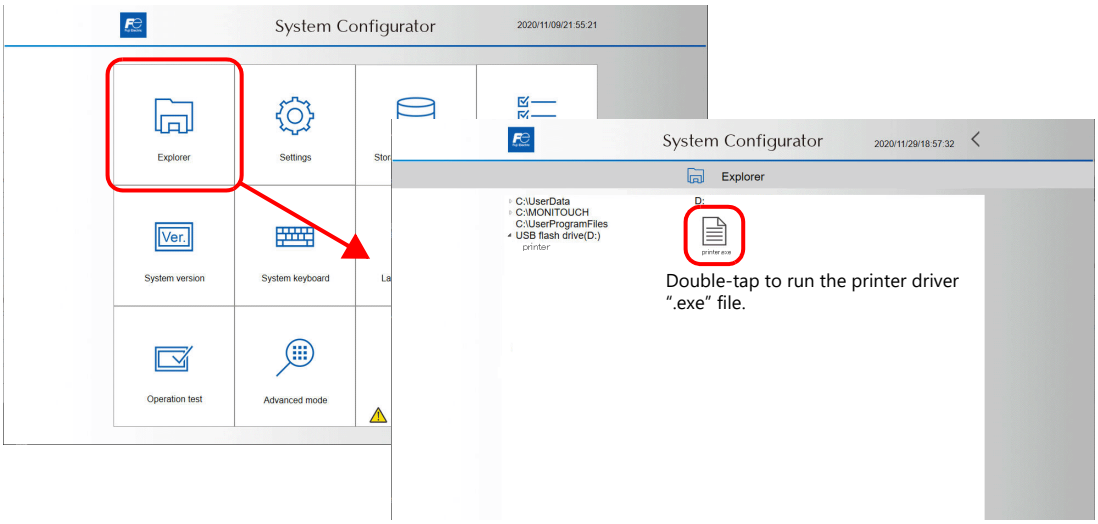
16.2.1 Printer Driver Installation and Settings

⚠ Installation of the printer driver and configuration of printer settings are done using System Configurator. Settings cannot be changed when [Write filter setting] is set to [Valid]. Set [Settings] → [Write filter setting] to [Invalid].

☞ For details on System Configurator and printer settings, refer to the X1 Series Hardware Specifications.

Installing the Driver

Install the printer driver using System Configurator.
Copy the executable file (".exe" file) of the printer driver or data from the CD supplied with the printer to a USB flash drive and install via Explorer.
For details on installation, refer to the instruction manual of the printer.

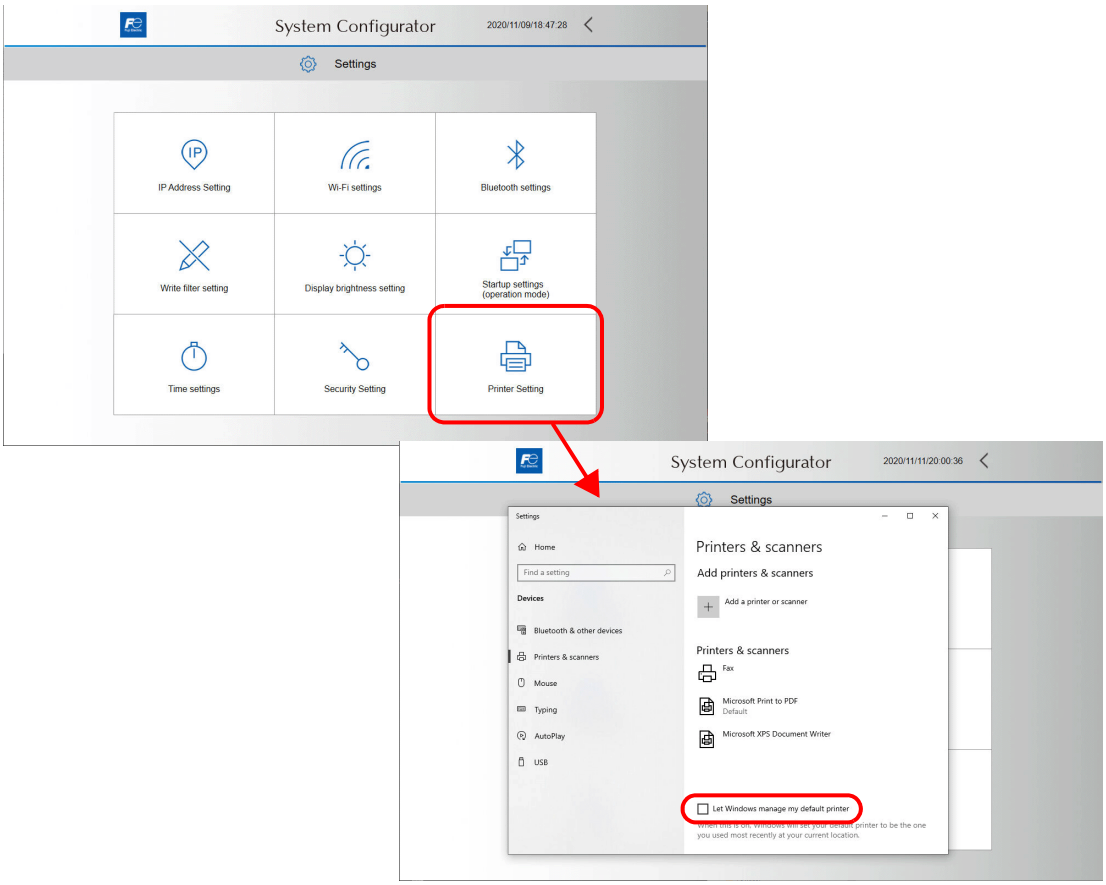


Setting as the Default Printer

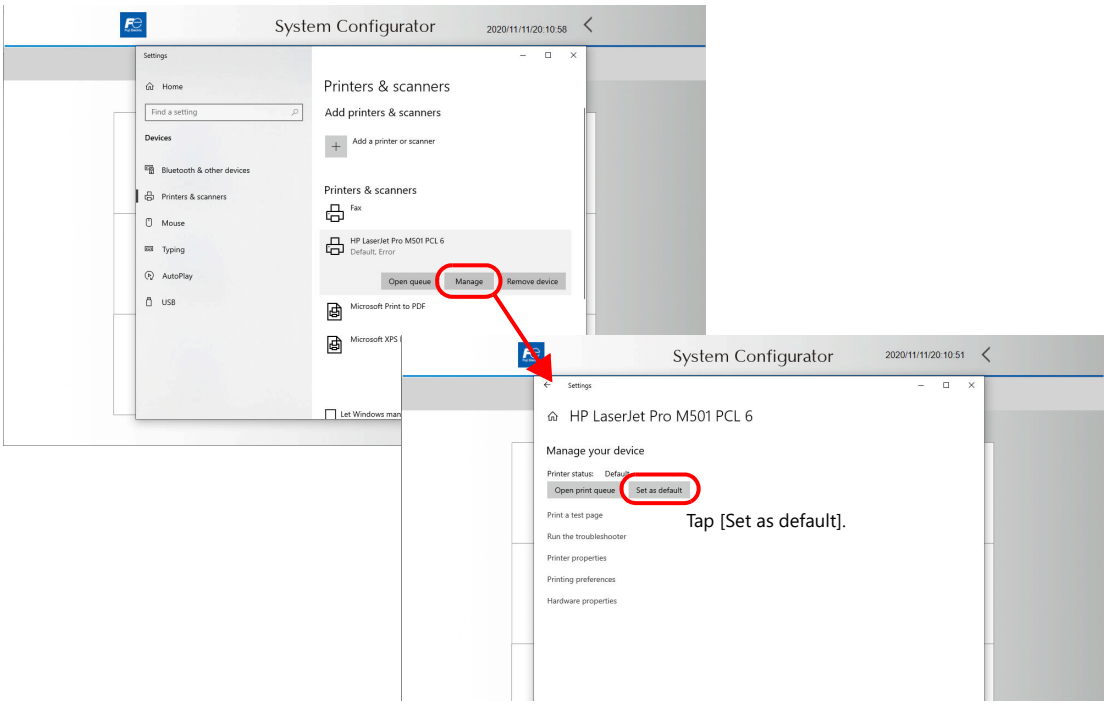
Set the default printer on the [Printers & scanners] menu via System Configurator → [Settings] → [Printer Setting].

Setting procedure

1. Display the [Printers & scanners] menu and deselect [Let Windows manage my default printer].

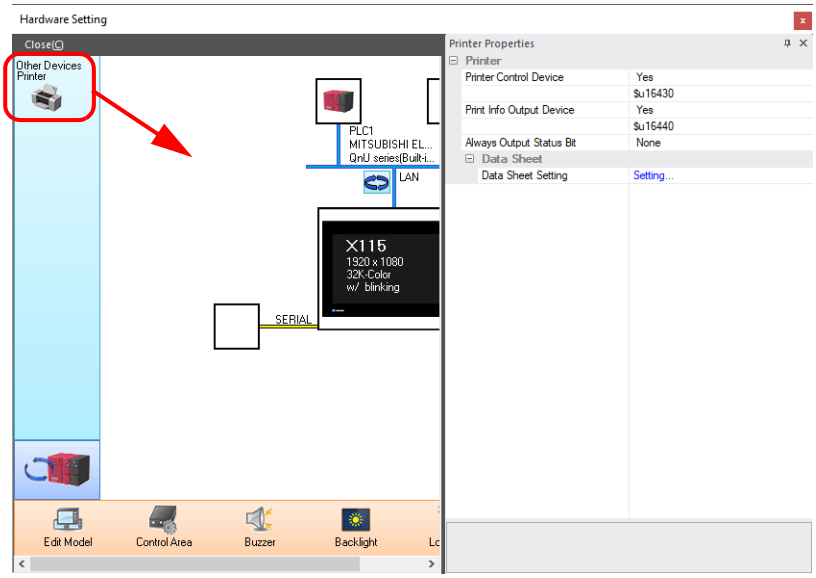


2. Select the printer to set as default from the printers & scanners list and tap [Manage]. Then at [Printer status], select [Set as default].



16.2.2 Hardware Settings (Printer Properties)

Configure the [System Setting] → [Hardware Setting] → [Printer Properties] settings.

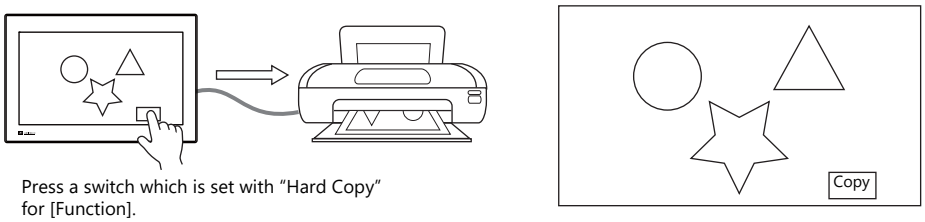


Item		Description
Printer Control Device (Yes/None)		When using a device memory for printer control, printing of screen hard copies and data sheets can be performed by setting the bit from "0" to "1". MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 →1: Screen hard copy 0 → 1: Data sheet output
Printer Info Output Device (Yes/None)		When using a device memory for outputting printer information, the printer state is output to the specified address. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring data for printing 0: Not busy state 1: Busy state
Always Output Status Bit (Yes/None)		When the X1 series receives a print command, "0 → 1" is output at the start of data transmission and "1 → 0" is output at the end of transmission. However, if the print data is minimal, the signal may not be output. Set to "Yes" when bit output is required regardless of the data size. The output area is shown below. • Bit 1 of the device memory for outputting printer information • Bit 0 of internal device memory $s16 $s16 MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring data for printing
Data Sheet	Data Sheet Setting	Configure settings for data sheet printing. For details, refer to page 16-7.

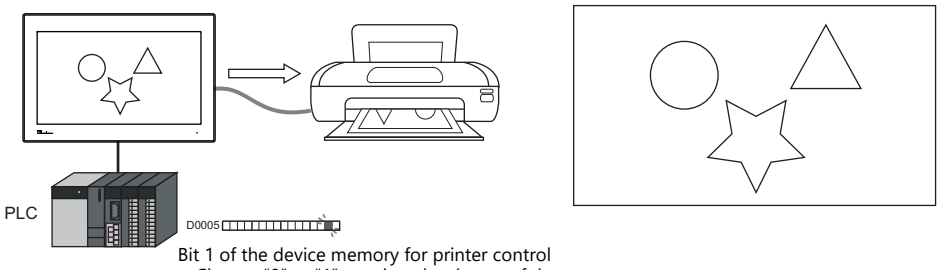
16.3 Hard Copy

16.3.1 Overview

The displayed screen can be printed using the switch function or a command from the PLC.



Press a switch which is set with "Hard Copy" for [Function].



Bit 1 of the device memory for printer control = Change "0" to "1" to print a hard copy of the screen

16.3.2 Printing

Two methods are available for printing the currently displayed screen.

Command from a Switch

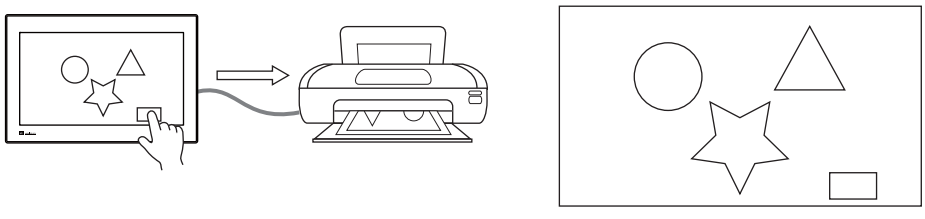
Output a hardcopy by tapping a switch placed on the screen. In this case, the switch image is also output.

Screen program setting

1) Place a switch set with "Hard Copy" for [Function] on the screen targeted for printing.
2) Transfer the screen data to the X1 series unit.

Printing procedure

1) Display the screen to be printed.
2) Press the hard copy switch.
3) Printing starts.

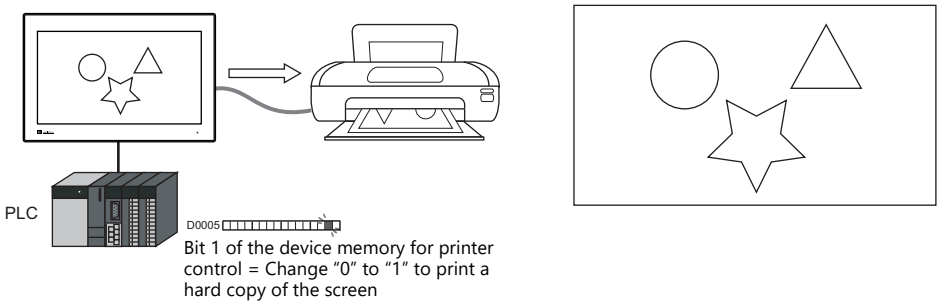


Command from a Device Memory for Printer Control

Bit 1 of the device memory for printer control is the screen hard copy bit.
When this bit changes from "0" to "1", a hard copy is printed.

Printing procedure

1) Display the screen to be printed.
2) Change bit 1 of the device memory for printer control from "0" to "1".
3) Printing starts.



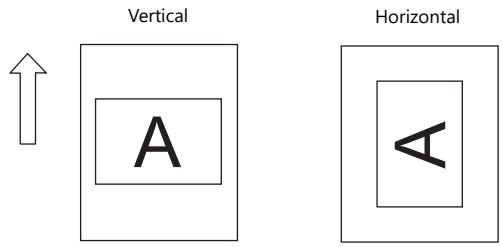
System Device Memory

A color or monochrome hard copy can be designated by specifying a value in $s1007 in RUN mode.

$s1007	Hard copy
0	Color (32-k colors)
1	Grayscale

Print Size

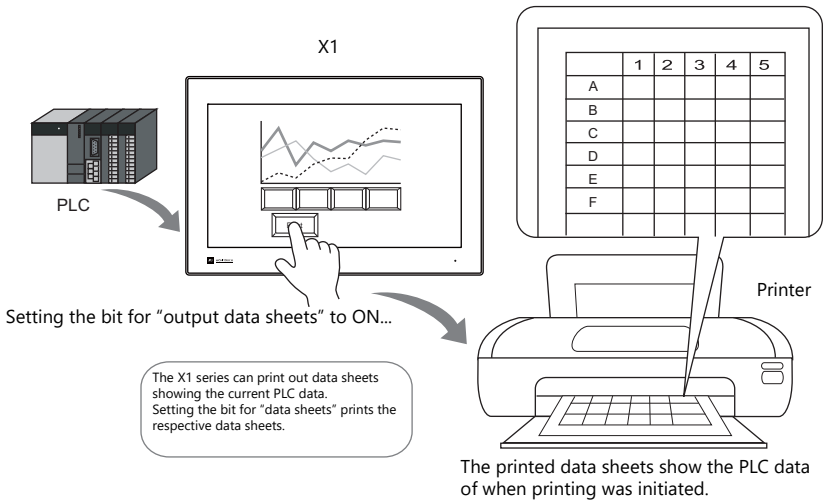
- The paper size is fixed to "A4". Set the printer settings to "A4" as well.
- The print start position and print size cannot be changed.
- The printing orientation is determined by the settings of the printer selected via System Configurator → [Printer Setting].



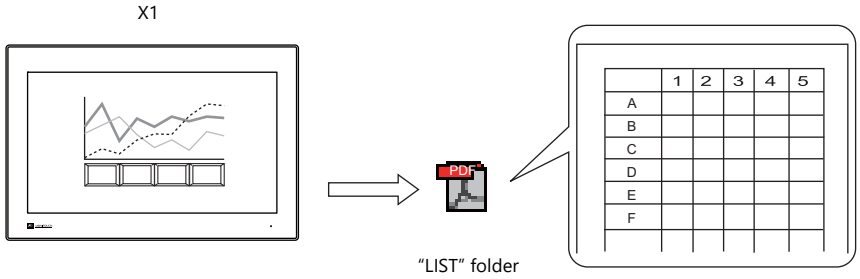
16.4 Printing Data Sheets

16.4.1 Overview

This section explains printing the data currently displayed on numerical data displays or character displays that are registered on a data sheet.
This print function also enables real-time printing of device memory data that is not shown on the X1 series.



Data sheets can also be output in PDF file format to the "LIST" folder in storage.



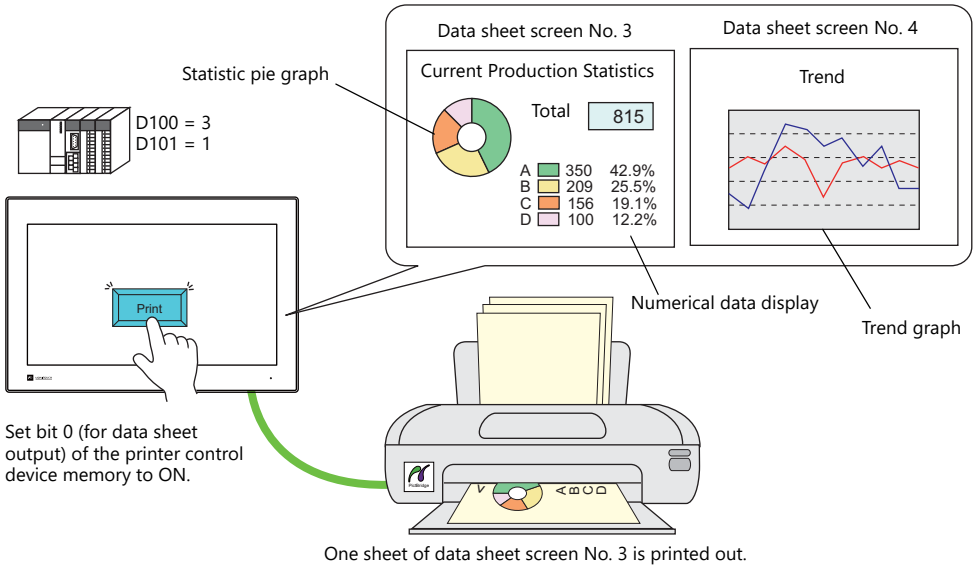
Files are stored in the storage selected at [System Setting] → [Other] → [Storage Setting].

Storage		File Directory
Internal storage	sd Folder	C:\MONITOUCH\X1**0**\work\strage\sd\(access folder)\LIST └ 0: Main app in multi-display 1: Sub app in multi-display
	usb Folder	C:\MONITOUCH\X1**0**\work\strage\usb\(access folder)\LIST └ 0: Main app in multi-display 1: Sub app in multi-display
External USB storage	USB storage device	(Drive name):\X1_Storage\(access folder)\LIST

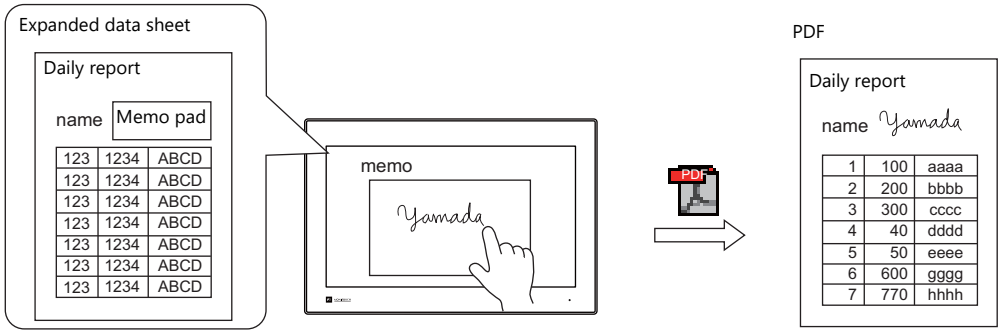
For the location of the output storage folder setting, refer to page 16-10.

Expanded functions

The expanded functions allow additional parts, such as lamps and graphs, to be used and changing of the sizes of those parts. Moreover, the expanded functions allow for part placement regardless of the grid, thereby diversifying layouts on data sheet screens. These data sheets can be printed in color.



Memo pad information created on the screen can be imported to the expanded data sheet and then output. By saving as a PDF, it is possible to create a file with an electronic signature.

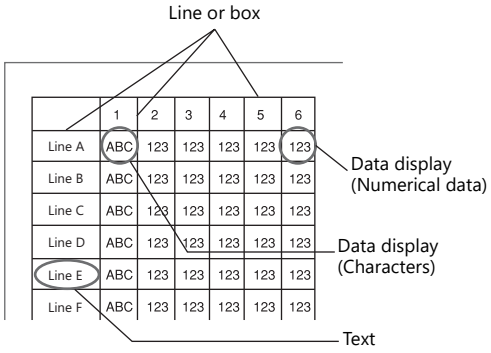


☞ For details on the memo pad function, refer to “13.1 Memo Pad”.

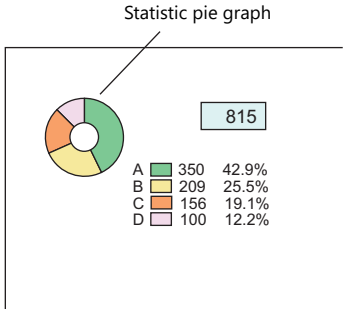
Data sheet screen

The print screen is formatted in "Data Sheet" in the X1 series screen program file.
Items usable on data sheets vary depending on whether the expanded functions are used.

- Without the expanded functions



- With the expanded functions



Item	Without Expanded Functions	With Expanded Functions
Graphics	Straight line Rectangle Text	Line/continuous line Box/circle Text/multi text Pixel Paint Scaling Pattern
Parts	Numerical data display Character display	Lamp Numerical data display Character display Message display Bar graph Pie graph Panel meter Statistic bar graph Statistic pie graph Time display/calendar Trend graph (real-time display) *1 Memo pad *2

*1 Notes on using trend graphs (real-time display)

- When the data sheet is printed with the number of points to display set to "0" in the control device memory, the graph is not displayed. Only the background is output.
- The [Overlap] and [Use the background operation function] checkboxes in the [Detail] settings cannot be selected.
- Trend data is read when printing is executed. Therefore, the printed trend graph may not be the same as that displayed on the screen.

☞ For details on the data sheet editing procedure, refer to the V9 Series Operation Manual.

*2 Notes on using the memo pad function

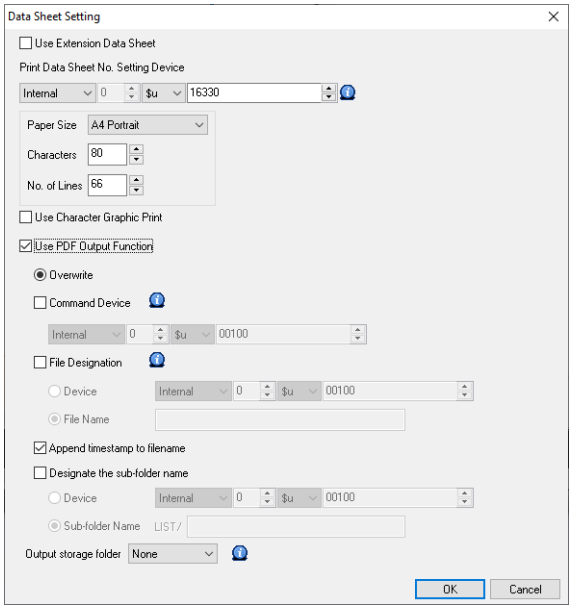
- The data of the memo pad page number stored at $s106 is imported.
- The dimensions of the memo pad data cannot be reduced. The data is imported in the dimensions that it was created on the screen.

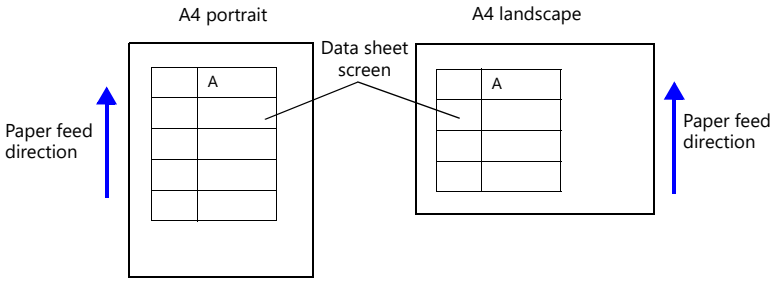
16.4.2 Detailed Settings

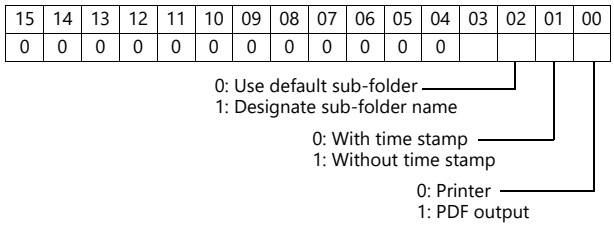
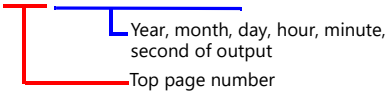
Data Sheet Setting

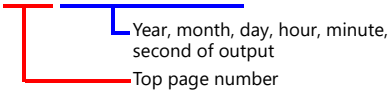
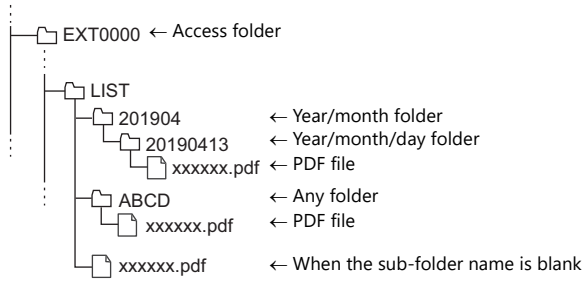
Configure these settings via [System Setting] → [Hardware Setting] → [Printer] → [Printer Properties] → [Data Sheet Setting] or [Home] → [Registration Item] → [Data Sheet] → [Data Sheet Edit] → [Data Sheet Setting].

Use extension data sheet: unselected



Item	Description
Print Data Sheet No. Setting Device	Use this device memory when printing data sheets using a device memory for printer control (refer to page 16-16). Two words are used. n: Print start data sheet number (→ X1) n+1: Number of pages to be printed (→ X1)
Paper Size (A4 Portrait, A4 Landscape)	Select a paper size. According to the size selected, the numbers of characters and lines are set. Data sheets are printed in portrait orientation regardless of the paper setting. 
Characters (16 to 152)	Specify the number of characters per line on a data sheet page.
No. of Lines (2 to 152)	Specify the number of lines per data sheet page.
Use Character Graphic Print	Select this checkbox to change the set number of lines. The numbers of characters and lines are automatically set as shown below. Paper Size / No. of Characters / No. of Lines (Character Graphics Not used / Character Graphics Used) A4 Portrait: 80 / 66 / 108 A4 Landscape: 114 / 40 / 64 * This setting is valid only for Japanese printers. All characters and lines on the data sheet screen are handled as text. Consequently, the printed data sheet looks slightly different from the one on the editor screen.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td colspan="2">Use PDF Output Function</td><td>Select this checkbox to output data sheets in PDF file format to the “LIST” folder in storage.
Configure the output destination within the “LIST” folder and the filename with the settings described below.</td></tr>
<tr><td></td><td>Overwrite (fixed)</td><td>When outputting a PDF file, a file with an identical name is overwritten.
If the specified filename does not exist, a new file will be created.</td></tr>
<tr><td></td><td>Command Device *1</td><td>Checking this option allows changes in output destination and method of the data sheet printing during RUN mode.
* When using the “STA_LIST” macro, select these conditions at $s1656. The settings are the same as the command device.
 
</td></tr>
<tr><td></td><td>File Designation (Maximum of 64 one-byte alphanumeric characters)</td><td>Specify a filename.
Selecting a device memory address allows the output filename to be changed when the unit is in RUN mode.
32 consecutive words are used from the specified address.
* Only internal device memory can be used.
Example: With time stamp
- When specifying a filename
Filename: (filename)XXXX_YYYYMMDDHHMMSS
 

- When not specifying a filename or when the device memory contains “null”
Filename: LISTXXXX_YYYYMMDDHHMMSS
 
</td></tr>
<tr><td></td><td>Append timestamp to filename *1</td><td>Select this checkbox to add a timestamp to a PDF filename.
Filename:
• With timestamp
- Any file name xxxx_YYYYMMDDHHMMSS.pdf
- LISTxxxx_YYYYMMDDHHMMSS.pdf
• Without timestamp
- Any file name xxxx.pdf
- LISTxxxx.pdf</td></tr>
<tr><td></td><td>Designate the sub-folder name *1</td><td>Select this checkbox to specify a location for the PDF file.
When the device is selected, the sub-folder name can be changed during RUN mode.
32 consecutive words are occupied, starting with the specified device.
* Only internal device memory can be used.
Storage destination:
• Sub-folder name not designated
(Output destination)\(access folder)\LIST\(year month folder)\(year month day folder)
• Sub-folder name designated
(Output destination)\(access folder)\LIST\(any folder)
(Output destination) * Selected at [Output storage folder]
 
</td></tr>
</table>

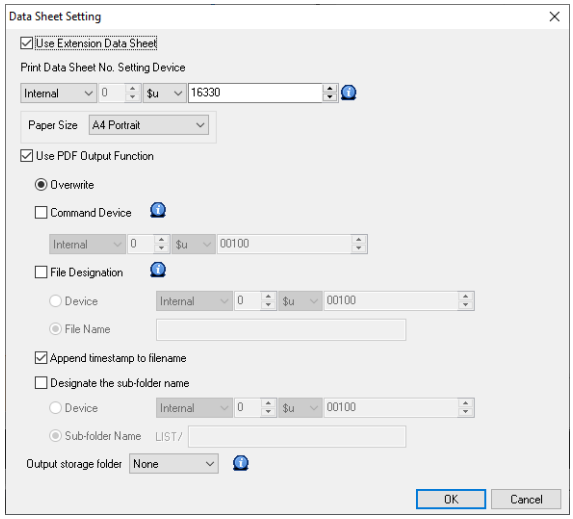
<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td></td><td>Output storage folder
None
sd Folder
usb Folder
or
W/X/Y/Z: USB storage device *</td><td>Select the storage folder for outputting a PDF file.
<table>
<tr><th>Item</th><th>Output Destination</th></tr>
<tr><td>None</td><td>The PDF file is output to the storage folder selected at [System Setting] → [Other] → [Storage Setting] → [Storage folder].*</td></tr>
<tr><td>sd Folder</td><td>Internal storage
C:\MONITOUCH\X1\0\work\strage\sd
└ 0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>usb Folder</td><td>Internal storage
C:\MONITOUCH\X1\0\work\strage\usb
└ 0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *</td><td>External USB storage (Drive name):\X1_Storage</td></tr>
</table>
* Available when the [System Setting] → [Other] → [Storage Setting] → [External USB storage] checkbox is selected. In this case, selection of the “usb Folder” option is disabled.
For details on the [Storage Setting] window, refer to the X1 Series Reference Manual 2.</td></tr>
</table>

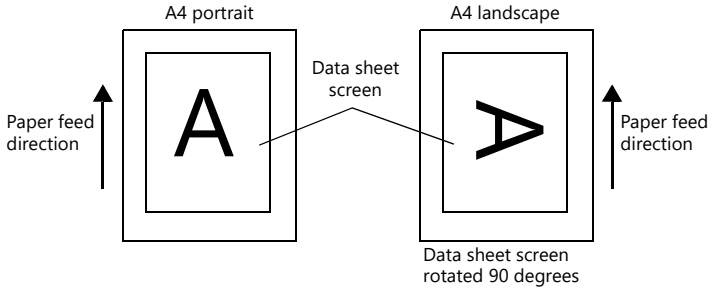
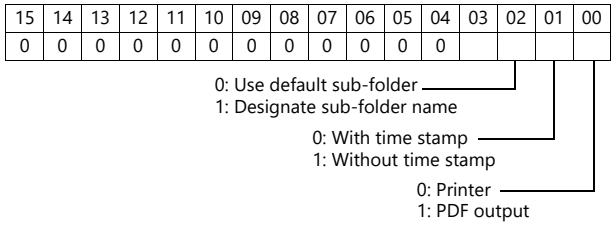
*1 If both [Command Device] and its equivalent settings by [Data Sheet Setting] are made, [Command Device] takes precedence. To specify a sub-folder name, you need to both check the [Designate sub-folder name] option of [Data Sheet Setting] and set a sub-folder name.

Print size

- The print size is A4 only. Use a printer that handles A4 paper.
  If the selected print size is different from the paper size specified in the printer settings in System Configurator, printing cannot be performed correctly. (Data outside the printing area is not printed.)
- The print start position and print size cannot be changed. Note that margins will vary slightly between different printer models.

Use extension data sheet: selected



Item	Description
Print Data Sheet No. Setting Device	Use this device memory when printing data sheets using commands from a device memory for printer control (refer to page 16-16). Two words are used. n: Print start data sheet number (→ X1) n+1: Number of pages to be printed (→ X1)
Paper Size (A4 Portrait, A4 Landscape)	Select the orientation of the data sheet screen. (Paper size: A4 fixed) Paper Size (Graphic area: height × width) / Orientation A4 Portrait (912 × 640 pixels) / Vertical A4 Landscape (640 × 912 pixels) / Horizontal Example: Print on A4 paper fed in portrait orientation 
Use PDF Output Function	Select this checkbox to output data sheets in PDF file format to the "LIST" folder in storage. Configure the output destination within the "LIST" folder and the filename with the settings described below.
Overwrite (fixed)	When outputting a PDF file, a file with an identical name is overwritten. If the specified filename does not exist, a new file will be created.
Command Device *1	Checking this option allows changes in output destination and method of the data sheet printing during RUN mode. * When using the "STA_LIST" macro, select these conditions at $s1656. The settings are the same as the command device. 

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	0	0	0	0	0				

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td></td><td>File Designation
(Maximum of 64 one-byte alphanumeric characters)</td><td>Specify a filename.
Selecting a device memory address allows the output filename to be changed when the unit is in RUN mode.
32 consecutive words are used from the specified address.
* This is only available for the internal device memory of the X1 series.
Example: With time stamp
- When specifying a filename
Filename: (filename)XXXX_YYYYMMDDHHMMSS
Year, month, day, hour, minute, second of output
Top page number
- When not specifying a filename or when the device memory contains “null”
Filename: LISTXXXX_YYYYMMDDHHMMSS
Year, month, day, hour, minute, second of output
Top page number</td></tr>
<tr><td></td><td>Append timestamp to filename *1</td><td>Select this checkbox to add a timestamp to a PDF filename.
Filename:
• With timestamp
- Any file name xxxx_YYYYMMDDHHMMSS.pdf
- LISTxxxx_YYYYMMDDHHMMSS.pdf
• Without timestamp
- Any file name xxxx.pdf
- LISTxxxx.pdf</td></tr>
<tr><td></td><td>Designate the sub-folder name*1</td><td>Select this checkbox to specify the storage destination for the PDF file.
When using a device memory address, the sub-folder name can be changed during RUN mode.
32 consecutive words are used from the specified address.
* Only internal device memory can be used.
Storage destination:
• Sub-folder name not designated
(Output destination)\(access folder)\LIST\(year month folder)\(year month day folder)
• Sub-folder name designated
(Output destination)\(access folder)\LIST\(any folder)
(Output destination) * Selected at [Output storage folder]
EXT0000 ← Access folder
LIST
201904 ← Year/month folder
20190413 ← Year/month/day folder
xxxxxx.pdf ← PDF file
ABCD ← Any folder
xxxxxx.pdf ← PDF file
xxxxxx.pdf ← When the sub-folder name is blank</td></tr>
<tr><td></td><td>Output storage folder
None
sd Folder
usb Folder
or
W/X/Y/Z: USB storage device *</td><td>Select the storage folder for outputting a PDF file.
<table>
<tr><th>Item</th><th>Output Destination</th></tr>
<tr><td>None</td><td>The PDF file is output to the storage folder selected at [System Setting] → [Other] → [Storage Setting] → [Storage folder].*</td></tr>
<tr><td>sd Folder</td><td>Internal storage
C:\MONITOUCH\X1\0\work\strage\sd
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>usb Folder</td><td>Internal storage
C:\MONITOUCH\X1\0\work\strage\usb
0: Main app in multi-display
1: Sub app in multi-display</td></tr>
<tr><td>W/X/Y/Z: USB storage device *</td><td>External USB storage (Drive name):\X1_Storage</td></tr>
</table>
* Available when the [System Setting] → [Other] → [Storage Setting] → [External USB storage] checkbox is selected. In this case, selection of the “usb Folder” option is disabled.
For details on the [Storage Setting] window, refer to the X1 Series Reference Manual 2.</td></tr>
</table>

*1 If both [Command Device] and its equivalent settings by [Data Sheet Setting] are made, [Command Device] takes precedence. To specify a sub-folder name, you need to both check the [Designate sub-folder name] option of [Data Sheet Setting] and set a sub-folder name.

Print size

- The print size is A4 only. Use a printer that handles A4 paper. If paper is fed in the landscape orientation or if the selected print size is different from the paper size specified in the printer settings in System Configurator, printing cannot be performed correctly. (Data outside the printing area is not printed.)
- The print start position and print size cannot be changed. Note that margins will vary slightly between different printer models.

- For parts placed on an expanded data sheet screen, the [Show/Hide] setting takes effect. When a part should always be printed, select [Show] for the [Show/Hide] setting.

16.4.3 Printing

There are two methods for printing configured data sheets from the X1 series unit.

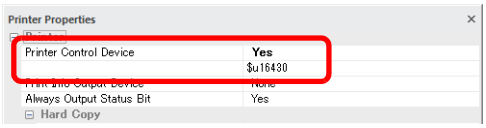
- Command from a printer control device
- Command with macro

Command from a Device Memory for Printer Control

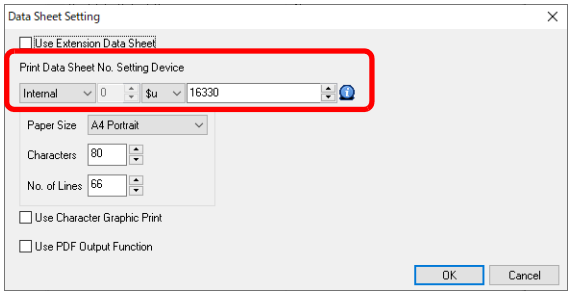
Bit 0 of the device memory for printer control is the data sheet output bit.
When this bit changes from "0" to "1", a data sheet is printed.

Screen program setting

- [System Setting]→[Hardware Setting]→[Printer Properties]→[Printer Control Device]



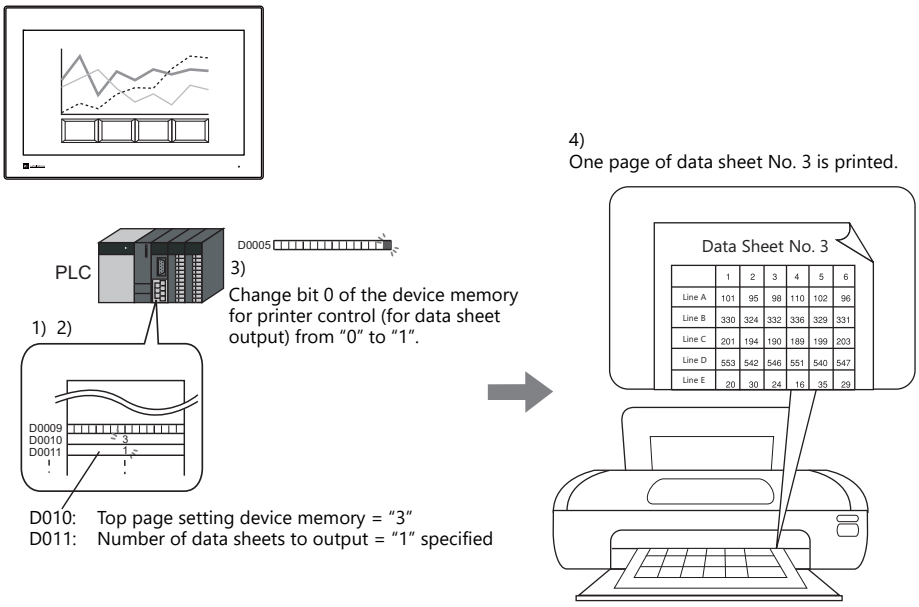
- [Home]→[Registration Item]→[Data Sheet]→[Data Sheet Setting]→[Print Data Sheet No. Setting Device]



Printing procedure

1) Set the data sheet number that is the top page to [Print Data Sheet No. Setting Device] "n".
2) Specify the number of output pages for [Print Data Sheet No. Setting Device] "n + 1".
   *** When [Print Data Sheet No. Setting Device] "n + 1" is "0", the printer will not print any data sheets.**
3) Change bit 0 of the device memory for printer control from "0" to "1".
4) Data sheet printing starts.

Usage Example
[Printer Control Device] = D0005
[Designation Device for Print Data Sheet No.] = D0010



Command with Macro

Use the "STA_LIST" macro command to print data sheets.

SYS(STA_LIST) F1

Device memory used

	Internal Device Memory	PLC1 to PLC8 Device Memory	Constant
F1	◎		

○: Setting enabled (indirect designation disabled) ◎: Setting enabled (indirect designation enabled)

Range

	Value	Remarks
F0	STA_LIST	
F1	Print start data sheet number	
F1 + 1	Number of pages to be printed: 1 to 1,024 *	
F1 + 2 to F1 + 33	Unused	$s1656-00=OFF (fixed)
F1 + 34 to F1 + 65	Unused	

*** No printing is executed when "0" is set as the number of pages to be printed. When the range specified for printing includes an unregistered number, the page corresponding to the number will not be printed.**

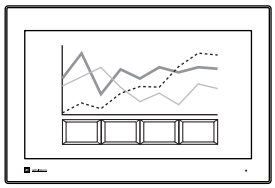
Printing procedure

1) Set $s1656=0.

☞ For details on $s1656, refer to System Devices page 16-20

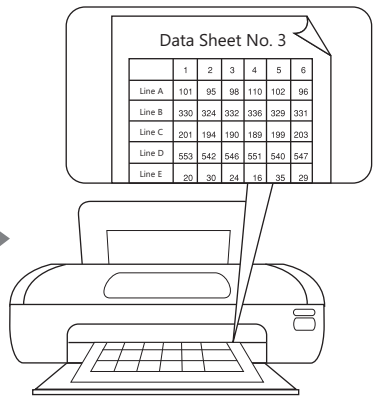
2) Set the data sheet number which is to be the top page to the device memory "F1 + 0".
3) Set the number of output pages to the device memory "F1+1".
4) Execute the "STA_LIST" macro command.
5) Data sheet printing starts.

Print example:
To print data sheet No. 3 with F1 = $u100:



1) $s1656 = 0 (W) Output target: printer
2) $u100 = 3 (W) Print start data sheet number
3) $u101 = 1 (W) Number of pages to be printed
4) SYS (STA_LIST) $u100 Macro execution

5) One page from data sheet No. 3 is printed.



16.4.4 PDF Output

There are two ways to output registered data sheet screen.

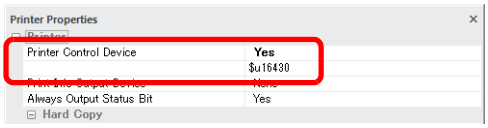
- Command from a printer control device
- Command with macro

Command from a printer control device

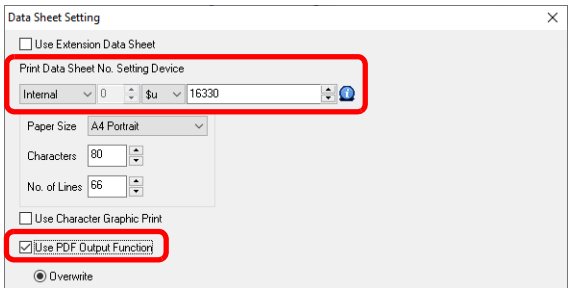
Bit 0 of [Printer Control Device] is the output bit. The document is output in PDF with the rising edge [0→1].

Setting Procedure

- [System Setting] → [Hardware Setting] → [Printer] → [Printer Properties] → [Printer Control Device]



- [Home] → [Registration Item] → [Data Sheet] → [Data Sheet Edit]
  - Print Data Sheet No. Setting Device
  - Use PDF Output Function

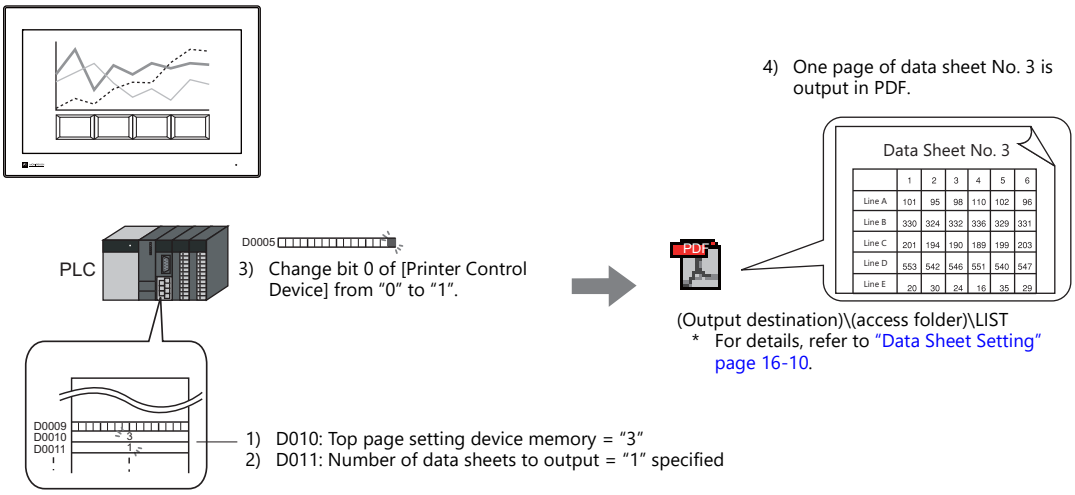


*** Set the other settings for PDF output according to your operation.**

PDF output procedure

1) Set the data sheet number that is the top page to [Print Data Sheet No. Setting Device] "n".
2) Specify the number of output pages for [Print Data Sheet No. Setting Device] "n+1".
   *** When [Print Data Sheet No. Setting Device] "n+1" is "0", data sheets will not be generated.**
3) Change bit 0 of [Printer Control Device] from "0" to "1".
4) Data sheets are output in PDF.

Usage Example:
[Printer Control Device] = D0005
[Designation Device for Print Data Sheet No.] = D0010



Command with Macro

Use the "STA_LIST" macro command to print data sheets.

SYS(STA_LIST) F1

Device memory used

	Internal Device Memory	PLC1 to PLC8 Device Memory	Constant
F1	◎		

○: Setting enabled (indirect designation disabled) ◎: Setting enabled (indirect designation enabled)

Range

	Value	Remarks
F0	STA_LIST	
F1	Print start data sheet number	
F1 + 1	Number of pages to be printed: 1 to 1,024 *	
F1 + 2 to F1 + 33	ASCII code: Output filename (maximum of 64 one-byte alphanumeric characters)	Only available when $s1656-00 = ON (PDF output)
F1 + 34 to F1 + 65	ASCII code: Output sub-folder name (maximum of 64 one-byte alphanumeric characters)	Only available when $s1656-00 = ON (PDF output) and $s1656-02 = ON (Designate sub-folder name)

*** No printing is executed when "0" is set as the number of pages to be printed. When the range specified for printing includes an unregistered number, the page corresponding to the number will not be printed.**

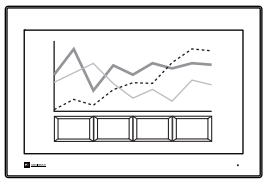
PDF output procedure

1) Set $s1656 = 1.

   ☞ For details on $s1656, refer to System Devices page 16-20

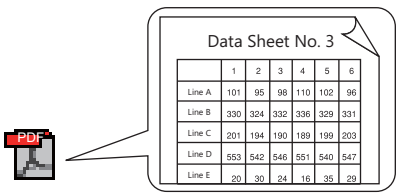
2) Set the data sheet number which is to be the top page to the device memory "F1 + 0".
3) Set the number of output pages to the device memory "F1+1".
4) To give the PDF file an arbitrary file name, set the file name to "F1+2" through "F1+33".
5) Execute the "STA_LIST" macro command.
6) Data sheet is output to a storage in PDF.

Operation example:
To output data sheet No. 3 in PDF with F1 = $u100:



1) $s1656 = 1 (W) Selected output target: PDF
2) $u100 = 3 (W) Print start data sheet number
3) $u101 = 1 (W) Number of pages to be printed
4) $u102 = TEST (STRING) Filename
5) SYS (STA_LIST) $u100 Macro execution

6) One page of data sheet No. 3 is output as a PDF file.



(Output destination)\(access folder)\LIST
* For details, refer to "Data Sheet Setting" page 16-10.

Quality of Text for PDF Output of Expanded Data Sheet

Text can be printed clearly by selecting the [System Setting] → [Unit Setting] → [General Setting] → [Make text rendering for printing extended data sheet PDF clear] checkbox.

Applicable parts

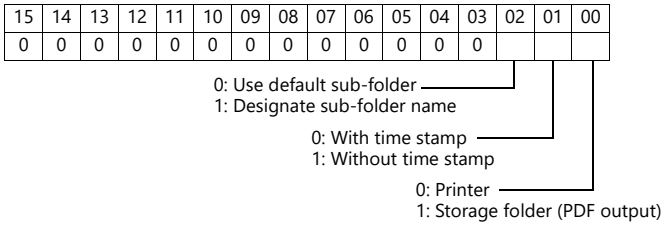
Numerical data display, character display, message display, trend graph, text, and multi-text

Notes

- This function is enabled only when TrueType font is selected on the [System Setting] → [Multi-language Setting] → [Font Setting] window
  Windows fonts are not supported.
- [Rotation + Direction], [Bold], [Italic], and [Spacing] settings are invalid.
- Characters are output to the foreground. Even if characters are placed behind other parts, they will be output on top of such parts in the PDF file.

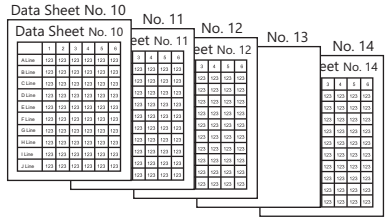
16.4.5 System Devices

System devices related to the data sheet printing are as follows.

Address	Description	Remarks
$s1655	Data sheet: PDF output error information 0: Normal termination 3: Error	← X1
$s1656	Macro command [STA_ LIST] is executed according to this setting.  	→ X1

16.4.6 Notes

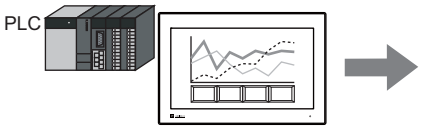
- When no data sheet screen has been registered, data sheets cannot be printed even if they are specified by number.
  Print example:
  [Printer Control Device] = D0005
  [Print Data Sheet No. Setting Device] = D0010



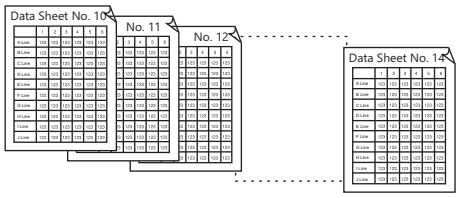
If data sheet pages are registered as shown on the left

D0010 (top page number of data sheet for printing) = 10
D0011 (number of pages of data sheet to output) = 5

Change bit 0 (data sheet output) of D0005 from “0” to “1”.



Data sheet No. 10 to 12 and 14 are printed.
The page that is not stored, No. 13, is ignored, and four pages are output.



- When PDF output is abnormally terminated by an external factor such as the power of the X1 series unit being turned off, the following may occur.
  - While writing a new file:
    A corrupted file may result in the storage folder.
  - While overwriting the file:
    The file cannot be recovered, and a corrupted file may result in the storage folder.
- When the storage capacity for PDF output is insufficient, the X1 follows the setting of [System Settings] → [Unit Setting] → [General Setting].
  - Delete folders from the oldest if Storage is lacking in space for backup

☞ For details on General Setting, refer to General Settings page 1-13

16.5 Connecting to a Sato MR-400 Barcode Printer

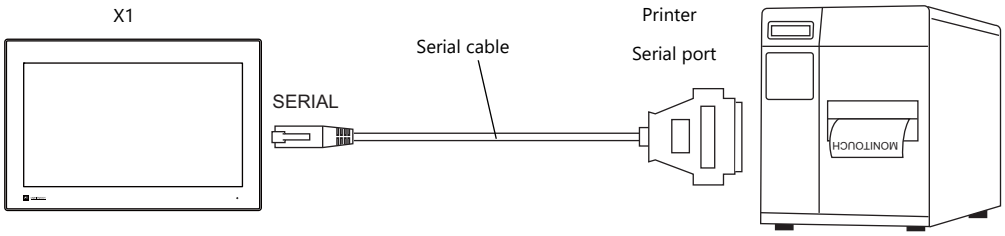
The X1 series can connect to Sato's barcode printer for printing barcodes.

Read the instruction manual and command reference book for Sato's MR-400 series barcode printer before using this function.

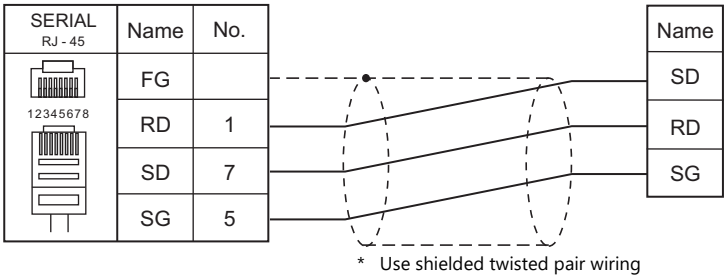
For information on connectable models, visit our website at http://www.monitouch.com.

16.5.1 Connection Method

Connect the SERIAL port of the X1 series unit with the serial port of the printer.



Wiring

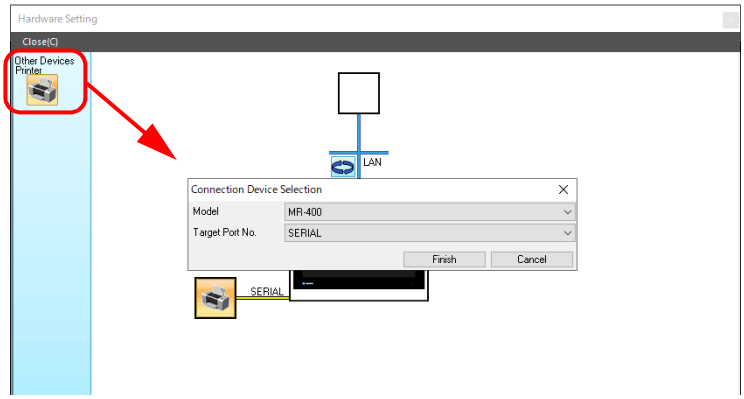


* The pin assignment of the SERIAL port of the X1 series differs from that of the MJ1/MJ2 port of the V series. The same cable used with a V series unit cannot be used for the X1 series.

Hardware Settings

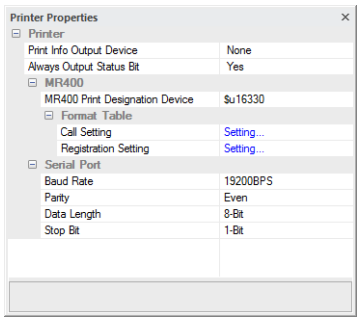
Configure the [System Setting] → [Hardware Setting] → [Printer] settings.

Printer model



Item	Description
Model	MR-400
Target Port No.	SERIAL

Printer properties



Item		Description
Print Info Output Device (Yes/None)		When using a device memory for outputting printer information, the printer state is output to the specified address. MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring print data 0: Not busy 1: Busy
Always Output Status Bit (Yes/None)		The X1 series outputs [0 → 1] when starting to transfer data upon receiving a print command, and outputs [1 → 0] upon finishing transfer. However, these signals may not be output if the print data is small. Set to "Yes" when bit output is required regardless of the data size. The output area is shown below. • Bit 1 of the device memory for outputting printer information • Bit 0 of internal device memory $s16 $s16 MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring print data
MR400	MR400 Print Designation Device	This setting can be configured when MR400 is selected for the printer model. Set the device memory used to issue printing commands to the MR400. For details, refer to "Print Command Device" page 16-32.
	Format Table	Register the printing format. For details, refer to "16.5.3 Format Tables" page 16-23.
Serial Port	Baud Rate	Specify the baud rate. 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K BPS
	Parity	Set the parity. None, Odd, Even
	Data Length	Set the number of bits for data. 7-Bit, 8-Bit
	Stop Bit	Set the number of stop bits. 1-Bit, 2-Bit

16.5.2 Notes on Memory Cards

Memory Cards

To use this function, a memory card is required for the MR-400.
For the memory card type and mounting procedure, refer to the instruction manual for the MR-400 series.

Card Slot Number Setting and Memory Card Formatting

To enable the use of memory cards, set the memory card slot number and format the memory card on the MR-400.

*** "Memory card formatting" means the same as media initialization for USB flash drives etc.**

1) Turn off the power to the MR-400 and insert a memory card into the card slot on the rear of the MR-400.
2) Hold down the LINE key on the front of MR-400, and turn the power ON.
   "USER MODE" is displayed on the front panel.
3) Press the LINE key and FEED key at the same time.
   "ADVANCED MODE" is displayed.
4) Press the LINE key and FEED key at the same time again.
   "CARD MODE" is displayed.
5) Press the FEED key until "CARD DRIVE NO / 1 2" is displayed.
   Set the memory card slot number.
   (Press the LINE key to select, and press the FEED key to accept.)
   This drive number is the memory card slot number.
6) Press the FEED key to accept the options. Select "YES" for "CARD FORMAT/YES NO" and format the memory card.
   If no error is given, formatting has completed successfully.
7) To quit "CARD MODE," turn the printer off.

- Formatting is required if the screen program is transferred after editing the MR-400 format table (registration setting) described in the following section.
  In addition to the above formatting procedure, it is possible to format the memory card by outputting the control command of MR-400 from the X1 series. For details, refer to Example 1: When the following commands are set in No. 22: (page 16-31).
- When printing two-byte characters, select "JIS" for "Kanji Code" on MR-400.

16.5.3 Format Tables

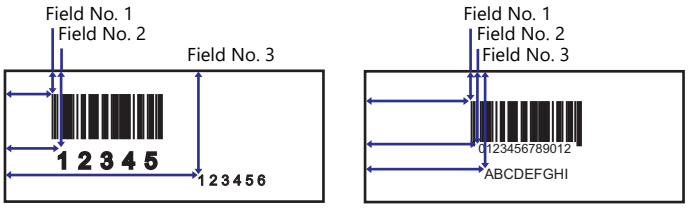
Format Table Types

There are two types of format tables.
When the MR-400 commands are registered in this table, desired formats or data can be printed.

MR-400 format table (registration setting)

Set the print format.

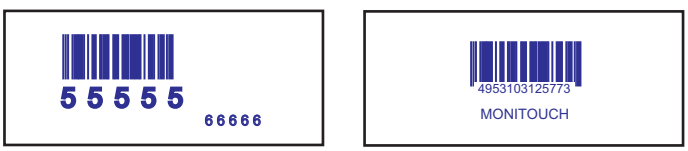
*** The "format" used in the format table includes settings for digits, position, typeface, barcode, etc. for the MR-400.**



Write these settings on the memory card using the MR_REG macro command.
Once they are written on the memory card, it is not necessary to repeat this step until the registration setting is changed.

MR-400 format table (call setting)

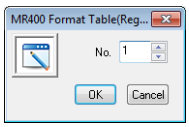
Use the format (registration setting), and change the print data. Set the storage target, type, etc. of the changed data.

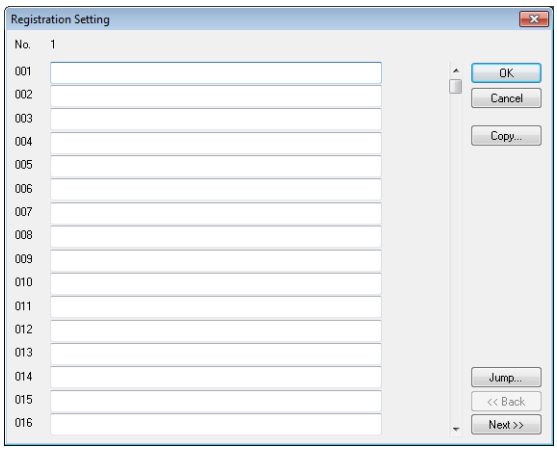


Print the data using the MR_OUT macro command.

Format Table (Registration Setting)

Configure the [System Setting] → [Hardware Setting] → [Printer] → [Format Table (Registration Setting)] settings.
Format table settings (registration settings) range from No. 1 to No. 128.

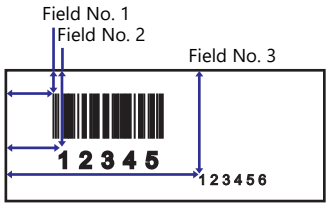




Item	Description
OK	The format table setting is ended.
Cancel	Format table editing is canceled.
Copy	The currently open format table is copied into the specified table.
Jump	The specified format table is opened.
Back	The previous format table number is opened.
Next	The following format table is opened.

Setting example

To print in the following format:



- Description of escape sequence

<A>
<Data send start>

<CC> 2
<Card slot> Slot number

<YS>, 1 0
<Format register>, Format register number

Match this number to the registration setting number.

</N>, 1, 1 0
<Field register>, field number, print digits

<V> 1 0 <H> 5 0
<Vertical print position> dots <Horizontal print position> dots

<B>2 0 2 0 8 0 1 2 3 4 5 6 7 8 9 0
<Barcode> Bar code type, bar width enlargement, bar top/bottom size (dots), data

Data registered for field No. 1

</N>, 2, 5

<V>1 0 0 <H> 5 0 <L> 0 2 0 2 <P> 2

<X22>, 1 2 3 4 5
<X22 characters>, data

Data registered for field No. 2

</N>, 3, 6

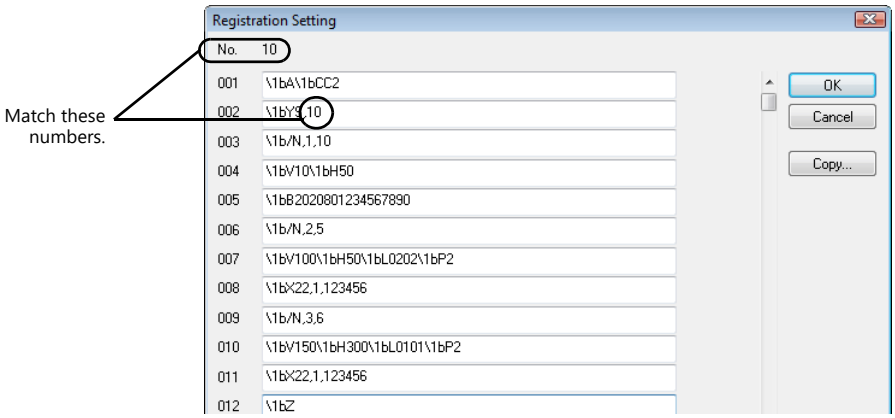
<V> 1 5 0 <H> 3 0 0 <L> 0 1 0 1 <P> 2

<X2 2>, 1 2 3 4 5 6

Data registered for field No. 3

<Z>
<Data send end>

- Description of the format table



Notes on inputting

<X22>, 12345 Escape sequence

1BX22, 12345 Escape sequence
(HEX display)

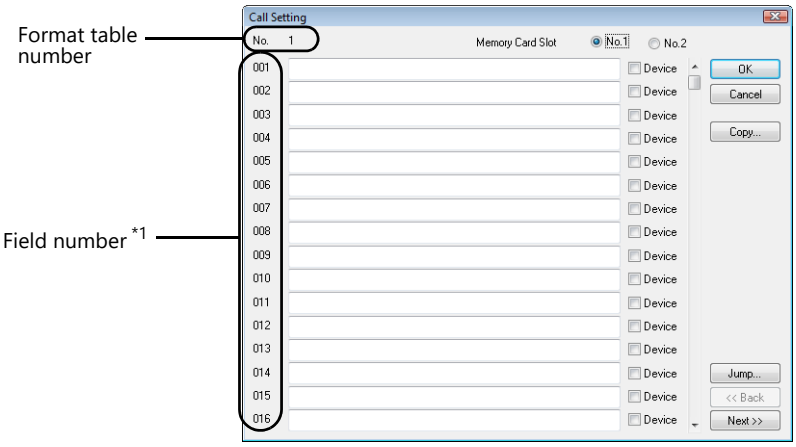
\1BX22, 12345 Format table

The escape character (ESC) at the top of the escape sequence is expressed as "<>" on MR-400 and as "1B(H)" in hexadecimal notation.
In the format table, "\" denotes hexadecimal data.
Consequently, "1B(H)" is shown as "\1B".

To use "\" as a character, enter "\\".

MR400 Format Table (Call Setting)

Configure format table settings (call setting) at [System Setting] → [Unit Setting] → [MR400 Format Table] → [Call Setting].
Numbers 1 to 128 can be set in the format table.

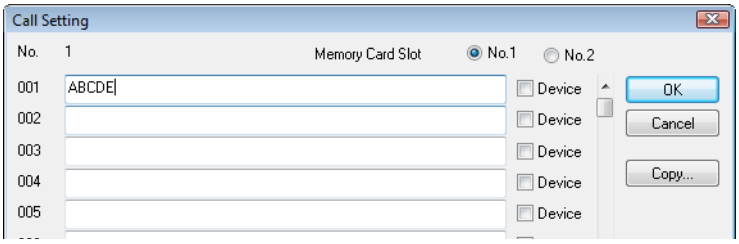


Item	Description
Memory Card Slot (No. 1 / No. 2)	Select the card slot drive number set on the MR-400.
Device	Select the checkbox when field data is stored in device memory.
OK	The format table setting is ended.
Cancel	Format table editing is canceled.
Copy	The currently open format table is copied into the specified table.
Jump	The specified format table is opened.
Back	The previous format table number is opened.
Next	The following format table is opened.

*1 Field numbers 1 to 99 are used.
Settings for numbers 100 to 512 are invalid.

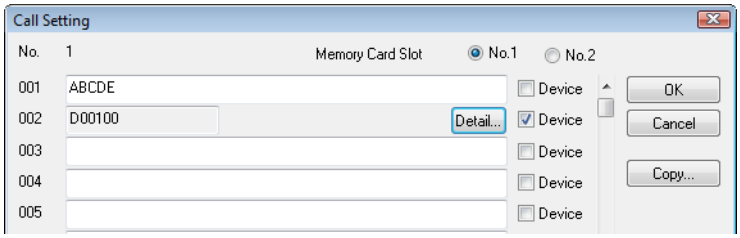
Setting example (1)

Printing "ABCDE" as a fixed string in field No. 1



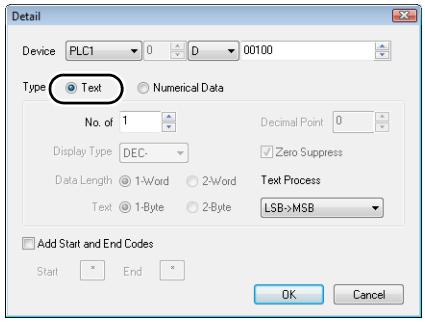
Setting example (2)

Printing data stored in a device memory in field No. 2



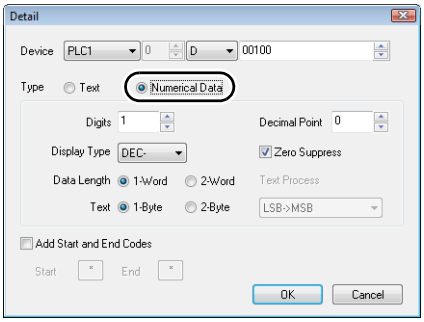
Select the [Device] checkbox of field No. 2.
Press the [Detail] button to display the [Detail] window.

- Select [Text] for [Type].



Item	Description
Device	Specify the top device memory address where data for printing is stored.
No. of Bytes	The specified number of bytes is output in order from the device memory address specified for [Device]. * To print "ABCDEF" in one-byte characters, specify as shown below in the Shift JIS code. D100 4241 [H] D101 4443 [H] D102 4645 [H]
Text Process	LSB → MSB/MSB → LSB Set the order of the first and second bytes within one word.
Add Start and End Codes	Configure this setting when using "CODE 39" type barcodes. (Refer to page 16-29.)

- Select [Numerical Data] for [Type].

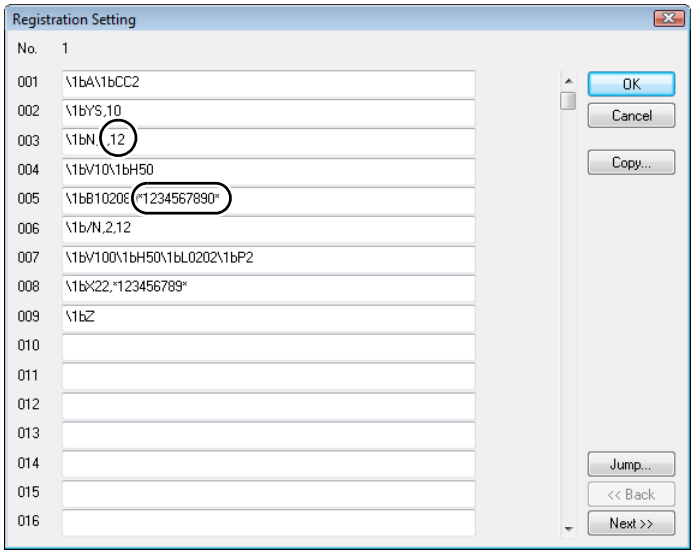


Item	Description
Device	Print data in the specified device memory address in numerical form. * When [Numerical Data] is selected, binary data is converted into characters (JIS code). Example: When "0100 (BIN)" is set for D100, the characters 0100 (= "100") are printed.
Digits	Specify the number of digits for the display type.
Decimal Point	Specify the number of decimal places.
Display Type	Select from DEC-, HEX, OCT, DEC or BIN. When [DEC-] is selected, data is shown in decimal notation with a ± sign.
Zero Suppress	Select whether or not to use the zero suppress function. When the [Zero Suppress] checkbox is selected, any suppressed zeros are filled with spaces.
Data Length	Set the data length for the device memory.
Text	Select one-byte or two-byte characters.
Add Start and End Codes	Configure this setting when using "CODE 39" type barcodes. (Refer to page 16-29.)

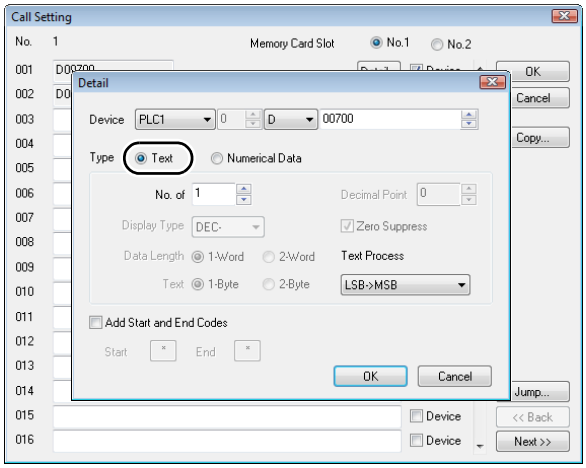
Barcode Type “CODE 39”

CODE 39 has “*” at the beginning and the end of each barcode.
When the format table is created, set “*” in the following two positions

- [MR-400 Format Table (Registration Setting)] settings
  Set the number of digits including “*” for format registration.
  For the following case for example, set “12” (10 characters + 2).

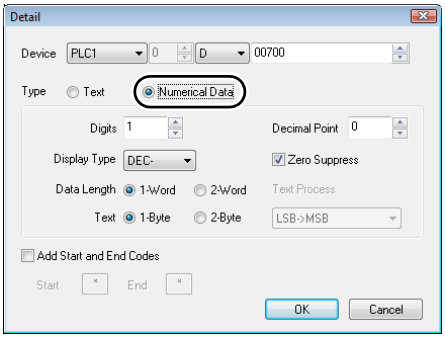


- [MR-400 Format Table (Call Setting)] settings
  - Select [Text] for [Type].



Item	Description
No. of Bytes	Specify the number of bytes including “*”.
Add Start and End Codes	Selected: “*” is not included in the data of [Device]. Unselected: “*” is included in the data of [Device].

- Select [Numerical Data] for [Type].



Item	Description
Add Start and End Codes	Selected: "*" is not included in the data of [Device]. Unselected: "*" is included in the data of [Device].

16.5.4 Printing

Macros

The "MR_REG" macro command is available to write the setting data from format tables (registration setting or call setting) to the MR-400. The "MR_OUT" macro command is available to print out the data.

MR_REG

Device memory used

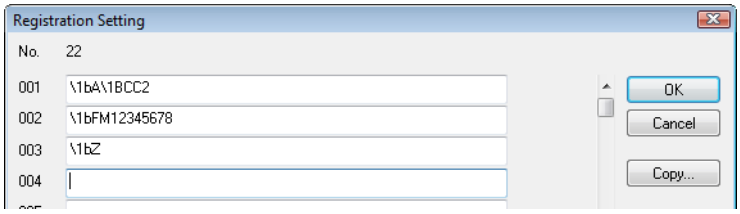
	Internal Device Memory	PLC1 to PLC8 Device Memory	Memory Card	Constant
F1	◎	◎	○	○

○: Setting enabled (indirect designation disabled) ◎: Setting enabled (indirect designation enabled)

Range

	Value
F0	Format table registration setting numbers 1 to 128

- Example 1: When the following commands are set in No. 22:



When the "MR_REG 22" macro command is executed, the memory card is formatted.

- Example 2: When the following commands are set in No. 1:

Execute the "MR_REG 1" macro command as the ON macro of a switch.
First: The format is registered on the memory card of the MR-400.
Second: The registered data is printed and the format can be checked.

MR_OUT

Device memory used

	Internal Device Memory	PLC1 to PLC8 Device Memory	Memory Card	Constant
F1	◎	◎	○	○

○: Setting enabled (indirect designation disabled) ◎: Setting enabled (indirect designation enabled)

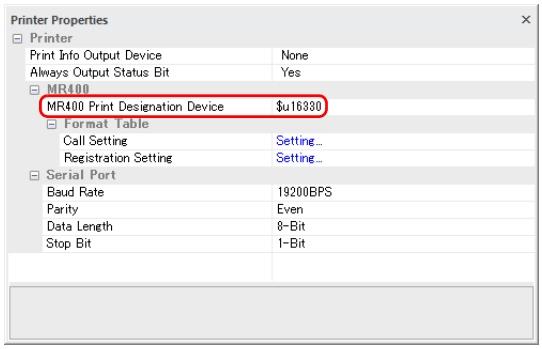
Range

	Value
F0	Format table call setting numbers 1 to 128

- Example 1: When the "MR_OUT 50" macro command is executed:
  Data of the MR-400 format table (call setting No. 50) is printed.

Print Command Device

Printing can be executed using an external command.



Item	Description
n	Control device memory MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: Standby 1: Printing * This is automatically reset when printing has been completed.
n+1	Format table No. designation device Set the number of the format table (call setting) to be printed.

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