Cat. No. W428-E1-03

SYSMAC
WS02-LCMC1-EV2

CX-Process Monitor Plus

(Ver. 2.1)

OPERATION MANUAL

OMRON

WS02-LCMC1-EV2
CX-Process Monitor Plus (Ver. 2.1)

Operation Manual

Revised June 2009

Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ Caution Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation “Ch,” which appears in some displays and on some OMRON products, often means “word” and is abbreviated “Wd” in documentation in this sense.

The abbreviation “PLC” means Programmable Controller. “PC” is used, however, in some Programming Device displays to mean Programmable Controller.

Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1,2,3... 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

Before Installing the CX-Process Monitor Plus

Installing the CX-Process Monitor Plus signifies that you accept the software user’s license agreement displayed during the installation process. Do not install this software if you do not accept the user’s license agreement. Warranty and after-sales services are available only to users that register with the enclosed registration form. Please fill in the registration form and return it to OMRON.

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About this Manual:

This manual describes the installation and operation of the WS02-LCMC1-EV2 CX-Process Monitor Plus software package and includes the sections described below. The CX-Process Monitor Plus is used to control and monitor the operation of the CS1W-LC001 Loop Control Unit, the CS1W-LCB01 Loop Control Board, the CS1W-LCB05 Loop Control Board, the CS1D-CPU□□P Process-control CPU Units, and the CJ1G-CPU□□P Loop-control CPU Units.

Please read this manual carefully and be sure you understand the information provided before attempting to install and operate the CX-Process Monitor Plus. Please read the following manuals carefully and be sure you understand the information provided before setting up or using an application for a Loop Control Unit or Loop Control Board.

Product	Manual name	Cat. No.	Contents
WS02-LCMC1-EV2	CX-Process Monitor Plus Operation Manual	W428 (this manual)	Installation and operation procedures for the CX-Process Monitor Plus.
WS02-LCTC1-EV5 CX-Process Tool	CX-Process Tool Operation Manual	W372	Installation and operation procedures for the CX-Process Tool.
CS1W-LC001 Loop Control Unit	Loop Control Unit Operation Manual	W374	Installation and operation procedures for the Loop Control Unit (except for function blocks).
CS1W-LCB01/05 Loop Control Boards, CS1D-CPU□□P Process-control CPU Units, and CJ1G-CPU□□P Loop-control CPU Units	Loop Control Boards Operation Manual	W406	Installation and operation procedures for the Loop Control Boards (except for function blocks).
CS1W-LC001 Loop Control Unit	Loop Control Unit Function Block Reference Manual	W375	Detailed information on function blocks for Loop Control Units.
CS1W-LCB01/05 Loop Control Boards, CS1D-CPU□□P Process-control CPU Units, and CJ1G-CPU□□P Loop-control CPU Units	Loop Control Boards Function Block Reference Manual	W407	Detailed information on function blocks for Loop Control Boards.

Section 1 introduces the CX-Process Monitor Plus.

Section 2 describes installing the CX-Process Monitor Plus and connections to the PLC.

Section 3 described data exchange for the CX-Process Monitor Plus

Section 4 describes the monitor screens used with the CX-Process Monitor Plus.

Section 5 describes the procedures to create screens and monitor using the CX-Process Monitor Plus.

Section 6 describes errors that can occur while using the CX-Process Monitor Plus.

The ***Appendix*** provides a list of ITEM settings for function blocks.

⚠ **WARNING** Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.

PRECAUTIONS

This section provides general precautions for using the CX-Process Monitor Plus.

The information contained in this section is important for the safe and reliable application of the CX-Process Monitor Plus. You must read this section and understand the information contained before attempting to set up or operate the CX-Process Monitor Plus.

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1 Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent) and knowledge about instrumentation system.

- Personnel in charge of installing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of managing FA systems and facilities.

2 General Precautions

The user must operate the product according to the performance specifications described in the operation manuals.

Before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, petrochemical plants, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

This manual provides information for programming and operating the Unit. Be sure to read this manual before attempting to use the Unit and keep this manual close at hand for reference during operation.

⚠ **WARNING** It is extremely important that a PC and all PC Units be used for the specified purpose and under the specified conditions, especially in applications that can directly or indirectly affect human life. You must consult with your OMRON representative before applying a PC System to the above-mentioned applications.

3 Safety Precautions

⚠ **WARNING** Check the following items before starting Loop Control Unit operation:

Analog I/O Units used in combination with the Loop Control Unit must be mounted correctly, and the unit number set on the front panel of the Analog I/O Unit must be the same as the unit number set on the Field Terminal Function Block. If the unit numbers are not the same, I/O (read/write) will be performed on the data for another Special I/O Unit (i.e., the one whose unit number is set in the Field Terminal Function Block).

The initial settings of the System Common Block on the Loop Control Unit must be set correctly. In particular, make sure that the Data Memory for the Node Terminals in the CPU Unit controlling the Loop Control Unit is not used for other applications on the PC. If the same words in Data Memory are used for more than one application, the PC system may act unexpectedly and cause injury.

When writing data to the I/O memory in the CPU Unit with function blocks (e.g., using Send All Blocks, Expanded DO/AO Terminal to CPU Unit, or DO/AO Terminal to CPU Unit), be sure that the words written to in the I/O memory are not being used for any other purpose. If I/O memory words are allocated to more than one purpose, the PC system may act unexpectedly and cause injury.

⚠ **WARNING** Check the following items before starting to run the Loop Control Board:

- Do not allow the bank of the EM Area with the number specified for allocation to the HMI (human-machine interface) data to be used by the CPU Unit or other Units for any other purpose. The bank allocated for the HMI is specified in ITEM 050 (EM Area Bank Allocated for HMI Memory = 0 to 12) of the System Common block. If the same memory area is used for more than one purpose, the system may operate in an unexpected fashion, which may result in injury.
- Do not allow the area to which user link table data is written to be used by the CPU Unit or other Units for any other purpose. If the same memory area is used for more than one purpose, the system may operate in an unexpected fashion, which may result in injury.
- Analog Input/Output Units used in combination with the Loop Control Board must be mounted correctly, and the unit number set on the front panel of the Analog Input/Output Unit must match the unit number set on the Field Terminal block. If the unit numbers do not match, input/output (read/write) will be performed on the data of another Special I/O Unit (i.e., the one whose unit number is set on the Field Terminal block).
- The defaults of the System Common block on the Loop Control Board must be set correctly.

⚠ **WARNING** Always stop the operation of the Loop Control Board before converting any of the EM Area to file memory. If any part of the EM Area that is being used by the Loop Control Board for the HMI is converted to file memory during Board operation, the system may operate in an unexpected fashion, which may result in injury.

⚠ **WARNING** Do not perform processing in such a way that the Loop Control Unit/Board and CPU Unit write to identical I/O memory words allocated to a contact output or analog output of an external Unit. If the same words are written to, the externally connected loads may act unexpectedly and cause injury.

⚠ **WARNING** Fail-safe measures must be taken by the customer to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes.

⚠ **Caution** Before transferring function block data (initial setting data or operation data) to the Loop Control Unit/Board, confirm that the destination for the data is correct and also confirm the overall safety of the system (including the Loop Control Unit/Board). Not doing so may result in unexpected operation.

⚠ **Caution** After updating the tag settings or network configuration for CX-Process Monitor Plus, always confirm that the Monitor Plus screens will operate properly with the new settings or configuration before attempting actual operation. If the settings or configuration is not appropriate, unexpected operation may result.

4 Application Precautions

Observe the following precautions when using CX-Process Monitor Plus.

⚠ **Caution** Loop Control Unit/Board data is monitored and operated using CX-Process Monitor Plus based on the tag files for Monitor Plus created using CX-Process Tool. CX-Process Tool can be used on Microsoft Windows 95, 98, Me, 2000, or NT (Service Pack 4 or later). CX-Process Tool Ver. 3.2 or higher must be used to output tag files for the CX-Process Monitor Plus.

⚠ **Caution** Before using function block data in actual operation, confirm operation by monitoring run status (to check the load rate; select ***Execute/Operation/Monitor Run Status***) and validating actions (select ***Validate Action/Start***) with CX-Process Tool. In particular, be sure to confirm that the load rate will be less than 60%. (For details on the load rate, refer to the *Loop Control Unit/Board Operation Manual*.)

⚠ **Caution** The Loop Control Unit/Board can read and write I/O memory in the CPU Unit using the Field Terminal Function Blocks or CPU Terminal Blocks independent of the user program (Step Ladder Program) in the CPU Unit. Do not write to the same I/O memory words from both the Loop Control Unit/Board and the CPU Unit.

⚠ **Caution** To hold an analog output or contact output at a specific value (for example, the maximum value or minimum value) when the Loop Control Unit/Board stops running, create a Step Ladder Program in the CPU Unit so that the corresponding output bit allocated to Analog Output Unit or Contact Output Unit is set to the desired value using an NC condition of the Loop Control Unit/Board Running Flag (bit 00 in allocated CIO word “n”) as an input condition.

⚠ **Caution** If a fatal error occurs in the CPU Unit (including fatal errors created by execution of an FALS instruction), the Loop Control Unit/Board will also stop running. To hold analog outputs to the previous values before the stop occurred, and to set analog outputs to either the minimum value or maximum value, use the output hold function of the Analog Output Unit or Analog I/O Unit.

⚠ **Caution** Before turning ON the power to the PC, make sure that the facilities are safe. The analog output values and contact outputs from the Loop Control Unit/Board are updated when the power to the PC is turned ON regardless of the operating mode of the CPU Unit (including in the PROGRAM mode). (Internally, the analog output values and contact outputs are sent from the CPU Unit to Basic I/O Units and Analog Output Units.)

⚠ **Caution** Fail-safe measures must be taken by the customer to ensure safety in the event of incorrect, missing, or abnormal signals caused by broken signal lines, momentary power interruptions, or other causes.

⚠ **Caution** Confirm that no adverse effect will occur in the system before attempting any of the following:

- Changing the operating mode of the PC (including the setting of the Startup Mode)
- Force-setting/force-resetting any bit in memory
- Changing the present value or any set value in memory

⚠ **Caution** Be sure that all mounting screws, terminal screws, and cable connector screws are tightened to the torque specified in the user manuals. Incorrect tightening torque may result in malfunction.

⚠ **Caution** In the event of system or power failure, CX-Process function files (extension ".ist") may not be saved. It is recommended that function files are saved regularly.

⚠ **Caution** If the power supply is turned OFF while function block data is being backed up from RAM to flash memory, the backup will not be completed normally. If the power supply is turned back ON within 24 hours, however, the super capacitor will have held the RAM data. The backup operation will restart when power is turned ON and operation will start when the backup has been completed. If the power supply is turned OFF for more than 24 hours, however, RAM data will be lost and operation will be started with the data that was previously saved to flash memory. If this happens, the Cold Start Auto-execution Flag (A35807) will turn ON to show that the previous data has been used. Use this bit in programming to take whatever steps are necessary, such as downloading the most recent function block data.

SECTION 1
Introduction

This section introduces the CX-Process Monitor Plus.

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1-1 CX-Process Monitor Plus

1-1-1 Outline

The CX-Process Monitor Plus is an application that runs on Windows 2000, XP, or Vista. It is used to monitor the Function Block data within a Loop Control Unit/Board using Control screens (on-site instrument images), Trend screens, Graphic screens, and Annunciator screens, etc., via the Controller Link, serial communications, or Ethernet. The CX-Process Monitor Plus is used together with the CX-Process Tool to create function blocks for Loop Control Units/Boards.

You can also perform the following four functions.

Monitoring Function Blocks in a Loop Control Unit/Board

Monitor PV, SP, and MV, etc., within the Control Block, monitor analog signals, and monitor contact signals.

Perform Run/Stop instructions in the Loop Control Unit/Board.

Display the status of the CPU Unit, such as the current operating mode.

Controlling Function Blocks in a Loop Control Unit/Board

Change settings, switch between auto and manual, and perform manual operations, tune PID constants, etc., in the Control Block.

You can perform stop block operation commands for each Control Block (when using the Tuning screen).

Monitoring Function Block Alarm Status in a Loop Control Unit/Board

Display Control Block and Alarm Block alarms if they occur, and store the alarms in the alarm history.

Configuring CX-Process Monitor Plus Screens

You can configure the screen to suit your needs.

CX-Process Monitor Plus Functions

---	Screen	Monitoring operating status	Controlling operation	Monitoring alarm status
User-defined screens	Overview	---	---	OK
	Control	OK (Display PV bar)	OK (Change SP, switch between auto/manual, and perform manual operations)	OK
	Tuning	OK (Display PV, SP, and MV trends for 1 loop)	OK (Change SP, and change P, I, D, etc.)	OK (Change bar graph colors)
	Trend	OK (Display Control Block or analog signal trends)	---	OK
	Batch Trend	OK (Display Control Block or analog signal trends)	---	---
	Segment Program 2	OK (Display Segment Program 2 trends)	OK (Run/stop operation at the relevant Segment Program 2 Block)	OK (Errors related to the relevant Segment Program 2 Block)
	Graphic	OK (Display status for contact or analog signal graphics)	OK (Turn ON/OFF the contact, and set the analog value)	OK
	Annunciator	---	---	OK (Use colors or sound to notify of an alarm)
	Operation Guide	OK (Display message when Internal Switch is turned ON)	---	OK
	System Monitor	OK (Display the run/stop status for the Loop Control Unit/Board, display Execution errors, RAM checksum errors, and battery errors, and monitor the status of the CPU Unit control mode, etc.)	OK (Run/stop command for the Loop Control Unit/Board)	OK
System screens	Alarm Log	---	---	OK (Stored when an alarm occurs)
	Operation Log	---	OK (Stores run operation history, e.g., SP change, etc.)	OK
	System Monitor Log	OK (Displays run/stop command history and Execution error history when an error occurs)	---	OK

Note Only the following data can be monitored and set with the CX-Process Monitor Plus and tag names must be set to enable monitoring and setting. Use CX-Process Tool Ver. 3.2 or higher to set the tag names.

Data set/monitored by CX-Process Monitor Plus		Loop Control Unit	Loop Control Board
Function block data		Control Blocks: Basic PID (Block Model 011), Advanced PID (Block Model 012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (Block Model 031), Indication and Operation (Block Model 032), Ratio Setting (Block Model 033), Indicator (Block Model 034), 2-position ON/OFF (Block Model 001), and 3-position ON/OFF (Block Model 002) Operation Blocks: High/Low Alarm (Block Model 111), Segment Program 2 (Block Model 157), ON/OFF Valve Manipulator (Block Model 221), Motor Manipulator (Block Model 222), Reversible Motor Manipulator (Block Model 223), Motor Opening Manipulator (Block Model 224), Timer (Block Model 205) and Counter (Block Model 208)	
Contact signals		Contact signals through Contact Distributor (Block Model 201) + Internal Switch (Block Model 209)	
Analog signals	Sent to Monitor Plus	Analog signals through Input Selector (Block Model 162)	
	Set from Monitor Plus	Analog signals through Constant Generator (Block Model 166)	

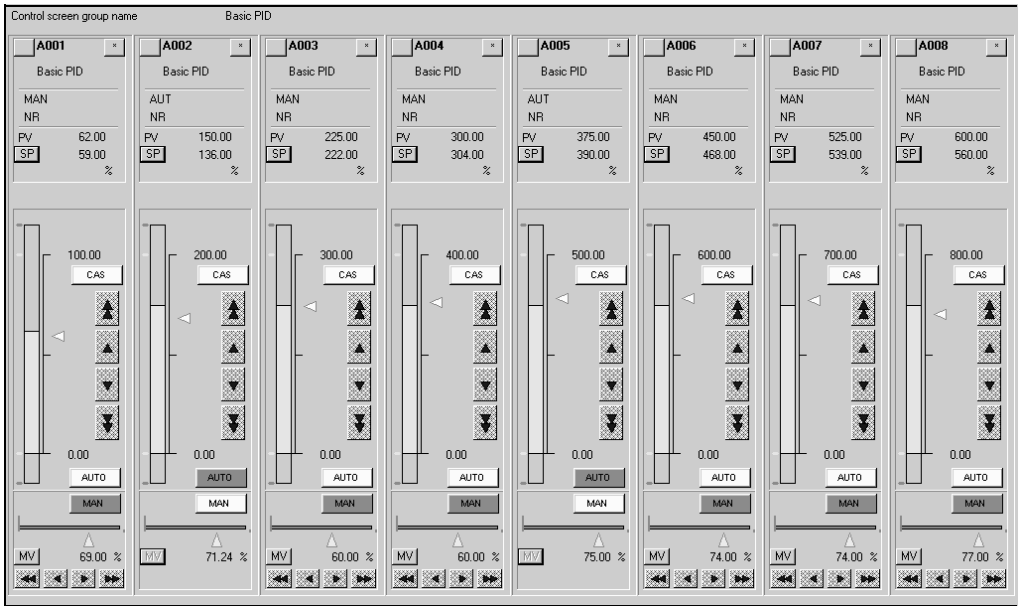
1-1-2 Screen Outlines

Overview Screen

Possesses the functions of all menu screens and alarm display screens.

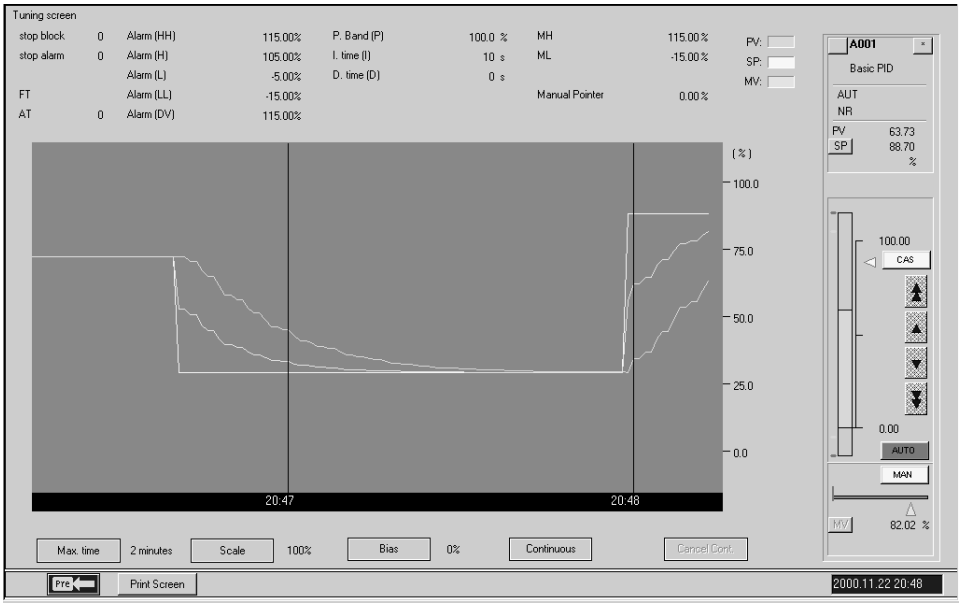
Control Screens

Monitor and set the Control Block and part of the Operation Block, monitor analog signals, and monitor and set contact signals.



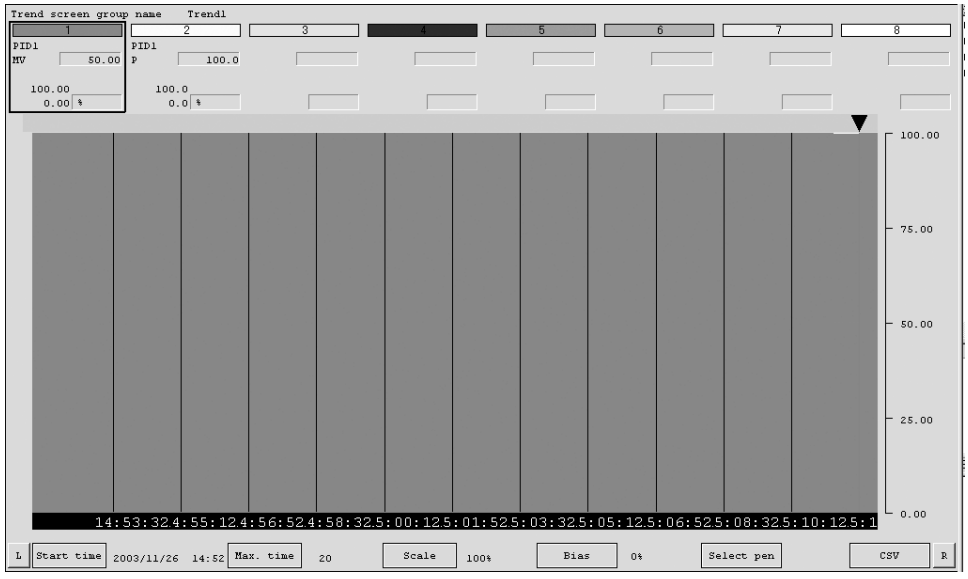
Tuning Screens

Use this screen to change Control Block P, I, D constants.



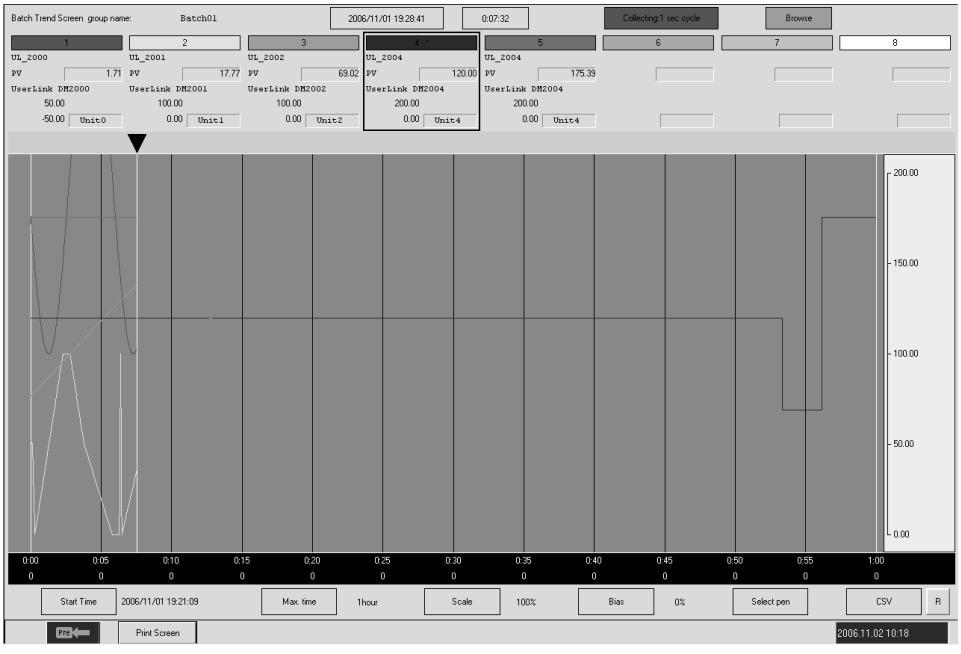
Trend Screens

Display as an image changes due to the passage to time of the Control Block PV, SP, MV, or other analog signals.



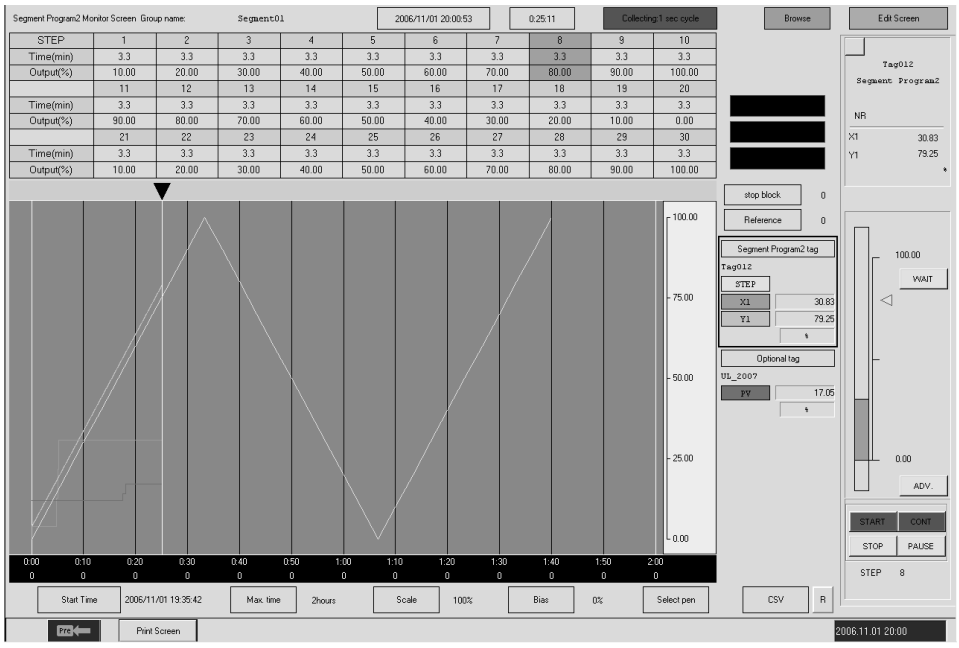
Batch Trend Screens

Display a recorder image of the changes over time of the Control Block PV, SP, MV, or other analog signals. Trend sampling is started and ended with tag data (digital or analog) as the trigger.



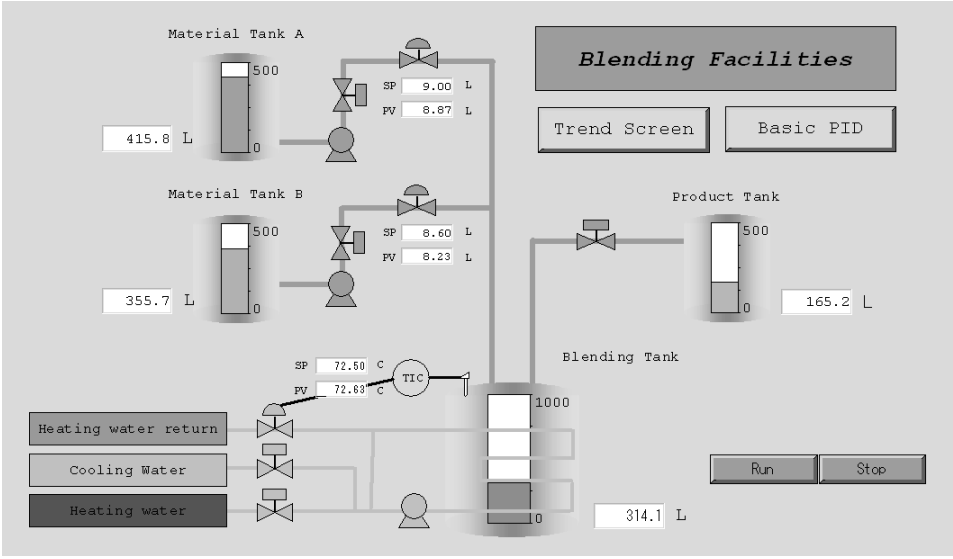
Segment Program 2 Screens

Display a recorder image of PV trends for Segment Program 2 (Block Model 157) set values. Segments can be set in table format while observing a time axis graph.



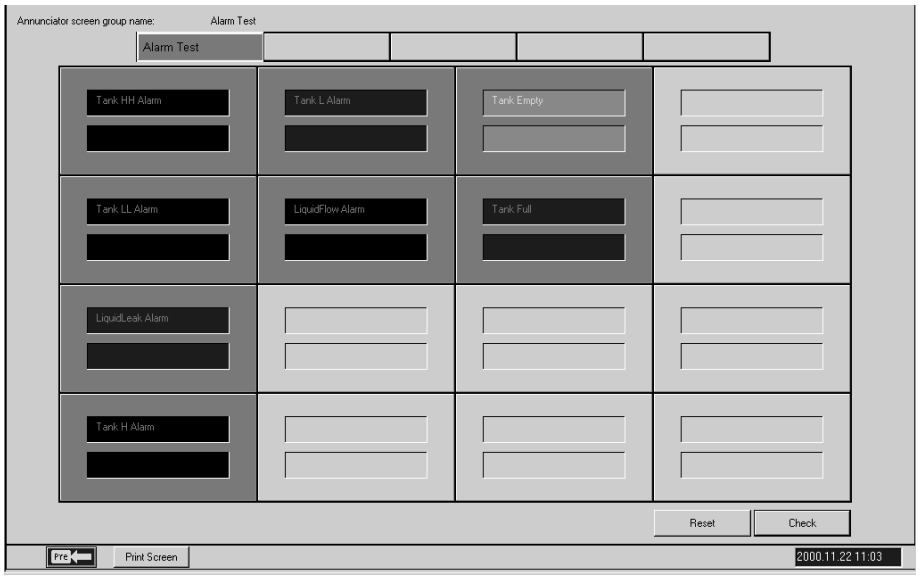
Graphic Screens

Use the screen to display the device status as a schematic.



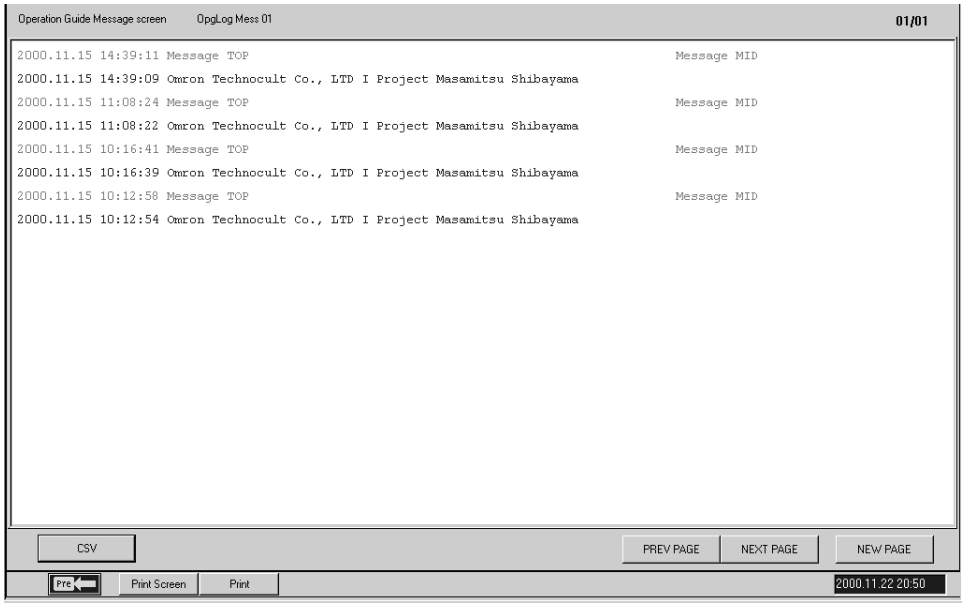
Annunciator Screens

Use this screen to display comprehensively the status (mainly the alarm status) of the contacts.



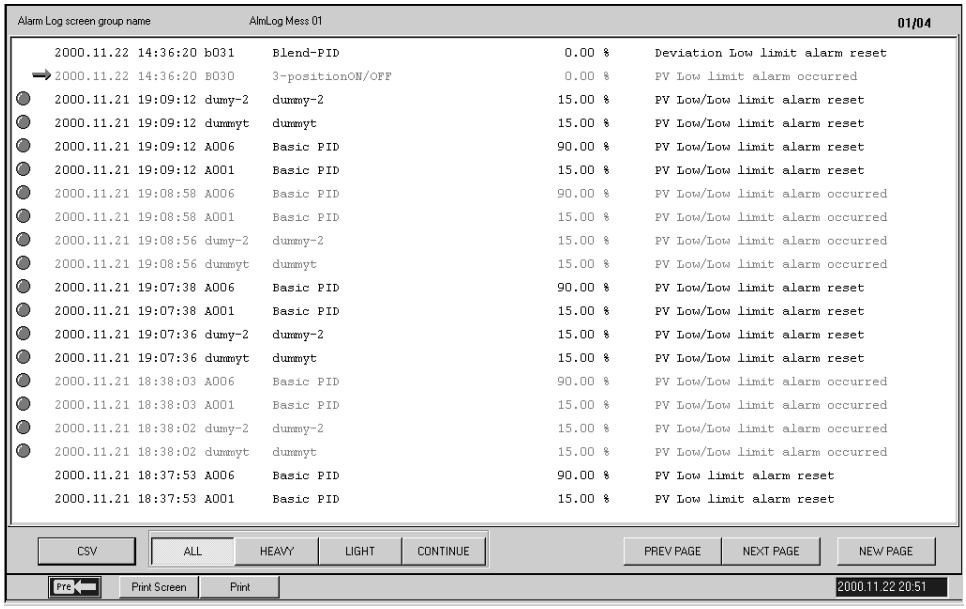
Operation Guide Screens

Use this screen to display registered messages when the contact signal is ON.



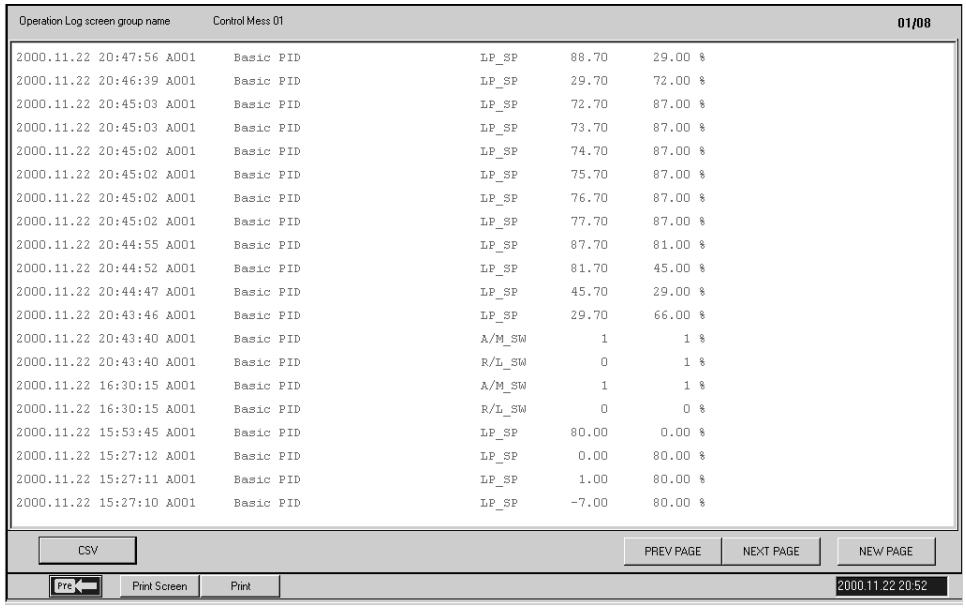
Alarm Log Screens

Use this screen to display the alarm history.



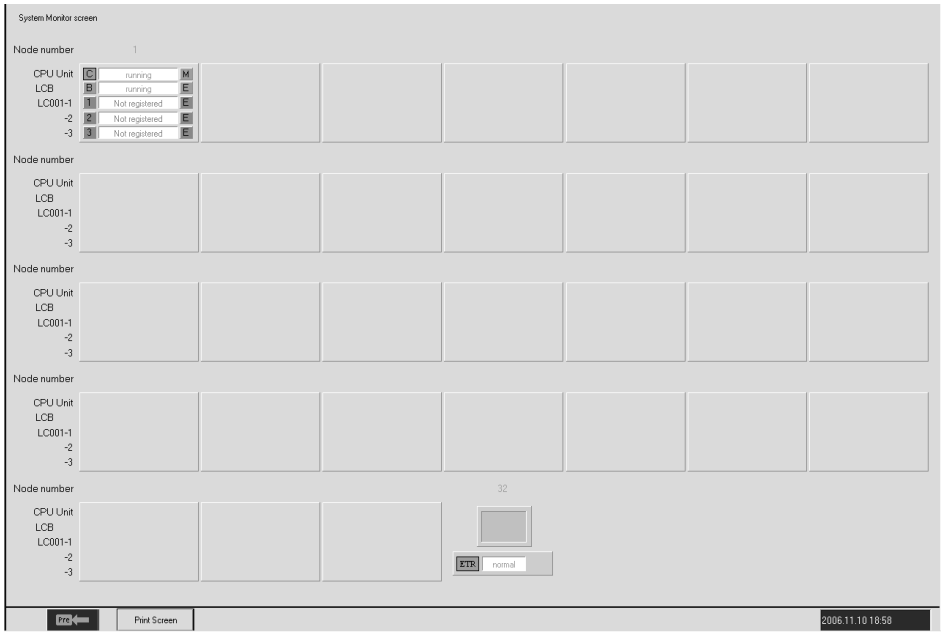
Operation Log Screens

Use this screen to display the operation history.



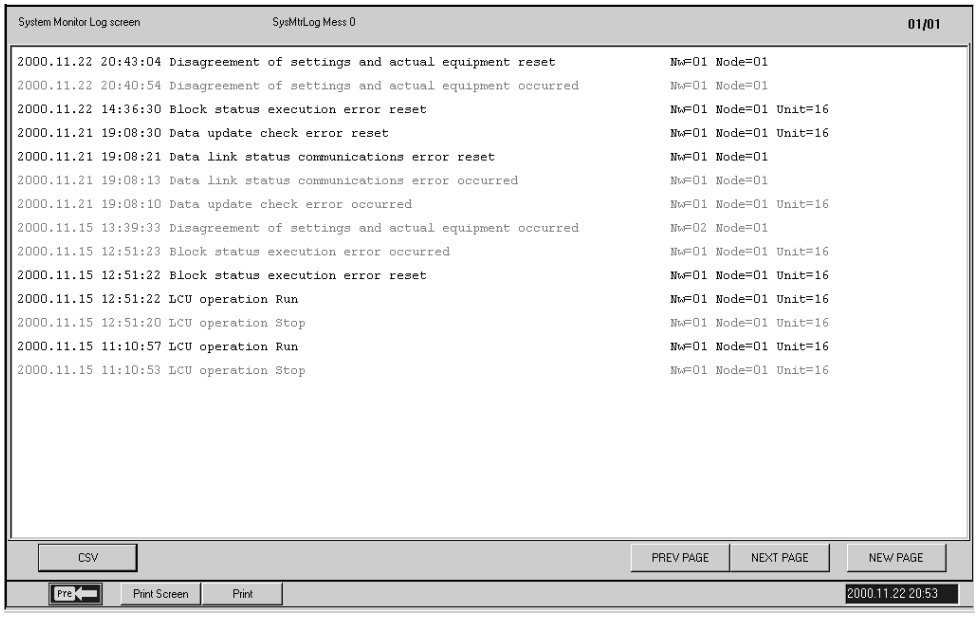
System Monitor Screens

Use this screen to display the system status, and run/stop the Loop Control Unit/Board.



System Monitor Log Screens

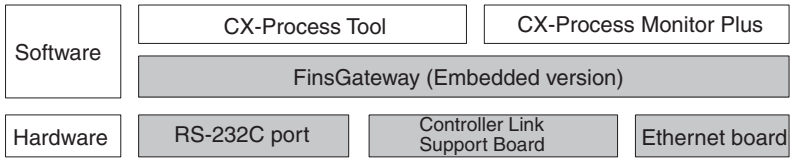
Use this screen to display the run/stop history and Execution error history, and to record the time at which they occurred.



1-1-3 CX-Process Monitor Plus System Requirements

FinsGateway

As shown below, the CX-Process Monitor Plus uses the communications driver FinsGateway (Embedded version) to communicate with the PLC (Programmable Controller) mounted to the Loop Control Unit/Board.



You can use any one of the FinsGateway (Embedded version) given below.

- Serial Unit driver
- Controller Link driver
- CLK (PCI) driver
- ETN_UNIT driver

Note

1. You cannot start CX-Process Monitor Plus if FinsGateway (Embedded version) is not installed.
2. CX-Process (Monitor Plus and Tool) cannot use FinsGateway Version 1 as a communications driver. Be sure to use Version 3 or later.
3. If CX-Programmer, CX-Protocol, CX-Motion, or other Support Software (i.e., CX-Server communications software), or applications that use special serial drivers, are connected online, they use the same COM port, so CX-Process (Monitor Plus and Tool) cannot connect online (i.e., initialize serial communications) using the Host link (SYSWAY). First disconnect offline other Support Software or applications that use special serial drivers, before reconnecting online (i.e., initializing serial communications) CX-Process. Conversely, while CX-Process is connected online (i.e., initializing serial communications), other Support Software that communicate using CX-Server cannot connect online.
4. You cannot install CX-Process and FinsGateway Version 1 on the same IBM PC/AT or compatible.
5. Both FinsGateway Version 3 and Version 2003 (Embedded version) are bundled with the CX-Process Monitor Plus software.
   When using FinsGateway for the communications driver, install one of these versions. The FinsGateway Runtime Version can also be used. If the runtime version is already installed, it is not necessary to install the embedded version.

Set Network Address, Node Address, and Unit Address.

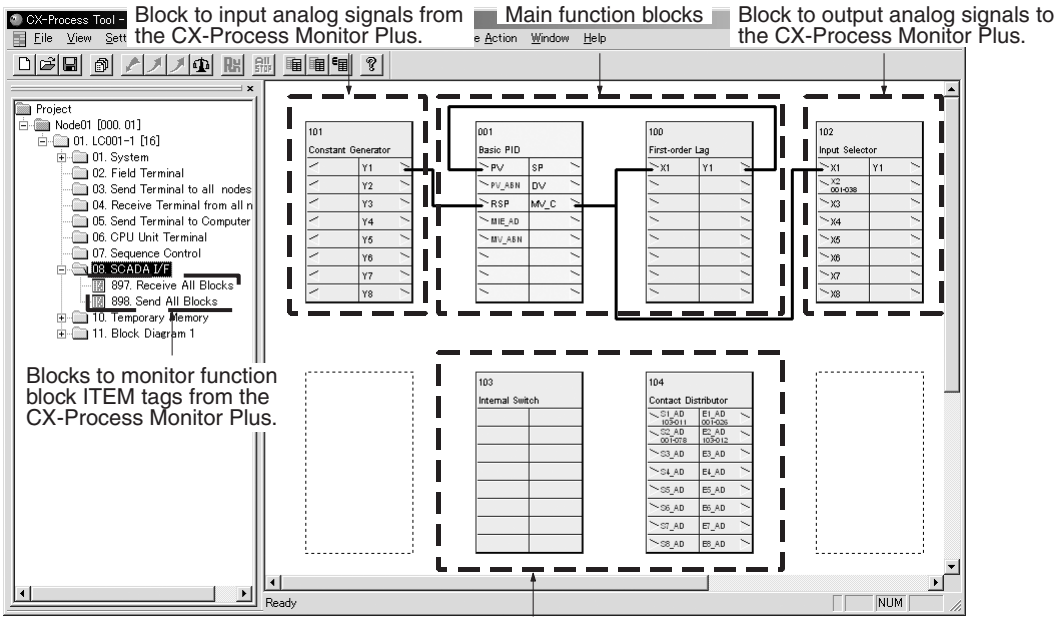
The network address, node address, and unit address for communications between the CX-Process Monitor Plus and PLC are set using the CX-Process Tool address settings (***Settings/Network Settings***).

Note The CX-Process Monitor and CX-Process Monitor Plus use FinsGateway as the communications driver for connections with the PLC. When using the CX-Process Monitor or CX-Process Monitor Plus, always set FinsGateway as the communications driver for the CX-Process Tool. If the CX-Server is set, the CX-Process Monitor or CX-Process Monitor Plus will not be able to go online with the PLC.

Register the Function Blocks to Exchange Data with the CX-Process Monitor Plus.

Register and connect the function blocks to exchange data with the CX-Process Monitor Plus. The following function blocks can be used depending on the items to be monitored.

Items to monitor	Registrations and connections	Loop Control Unit	Loop Control Board
Function block data	Only register the function blocks.	Send All Blocks block (Block Model 462) and Receive All Blocks block (Block Model 461)	HMI settings in the System Common block (Block Mode 000)
Contact signals	Register and connect the function blocks.	Contact Distributor (Block Model 201) or Internal Switch (Block Model 209)	
Analog signals	Register and connect the function blocks.	Input Selector block (Block Model 162) and Constant Generator block (Block Model 166)	



Set CSV Tags and Tags for CX-Process Monitor Plus.

The CX-Process Monitor Plus uses tags set from the CX-Process Tool (Ver. 3.2 or higher) to read and write data in Loop Control Units/Boards. To use the CX-Process Monitor Plus, therefore, CSV tags and tags for the CX-Process Monitor Plus must be set.

Loop Control Units

1,2,3...

1. Register the Send All Blocks block (Block Model 642) and Receive All Blocks block (Block Model 641).
2. Set tags as follows:
   - Function block data: Set CSV tags.
   - Individual contact signals: Set tags for Monitor Plus for the contacts in the Internal Switch block (Block Model 209).
   - Individual analog signals from LCU to computer: Set tags for Monitor Plus for the analog signals in the Input Selection block (Block Model 162).
   - Individual analog signals from computer to LCU: Set tags for Monitor Plus for the analog signals in the Constant Generator block (Block Model 166).

Loop Control Boards

1,2,3...

1. Make the settings for the HMI in the System Common block (Block Model 000).
2. Set tags as follows:
   - Function block data: Set CSV tags.
   - Individual contact signals: Set tags for Monitor Plus for the contacts in the Internal Switch block (Block Model 209).
   - Individual analog signals from LCU to computer: Set tags for Monitor Plus for the analog signals in the Input Selection block (Block Model 162).
   - Individual analog signals from computer to LCU: Set tags for Monitor Plus for the analog signals in the Constant Generator block (Block Model 166).

   Note For both the Loop Control Unit and Loop Control Board, the following function blocks must be created and connected separately to enable monitoring and setting individual contact signals and individual analog signals (i.e., other than function block data).
   - To monitor and set individual contact signals, contact signals must be input/output using the Contact Distributor block (Block Model 201) and Internal Switch block (Block Model 209).
   - To monitor individual analog signals, analog signals must be output from the Input Selection block (Block Model 162).
   - To set individual analog signals, analog signals must be input to the Constant Generator block (Block Model 166).

Compile the Tag File for the CX-Process Monitor Plus.

The tag file for Monitor Plus must be compiled (***Execute – Create Tag File – Monitor Plus Tag***).

Note The following dialog box will be displayed if a tag file for Monitor Plus is output while the CX-Process Monitor Plus is running.

Tag information will not be updated if a tag file for Monitor Plus is output during CX-Process Monitor Plus operation. To update the tag file, restart the CX-Process Monitor Plus.

Download Function Block Data to the Loop Control Unit/Board.

Download the function blocks.

Compile the Monitor Tag Files.

Start the CX-Process Monitor Plus. In the Main Window, click the **Run** Button or the **Setup** Button. The monitor tag files (mtagmst and mtagsubmst) will be automatically generated based on the tag file for Monitor Plus (monitor.csv).

1-1-4 Relationship to CX-Process Tool

Tag Names

As shown earlier in *CX-Process Monitor Plus Conditions of Use*, if monitoring or operating Function Blocks using CX-Process Monitor Plus, you must first perform the following steps using CX-Process Tool.

1,2,3...

1. Set the network address, node address, and unit address.
2. Register the blocks for which data is to be exchanged with the CX-Process Monitor Plus.
3. Set the CSV tags and tags for Monitor Plus.
4. Generate the tag file for Monitor Plus.
5. Download the function block data to the Loop Control Unit/Board.
6. Compile the monitor tag file.

CX-Process Monitor Plus handles all items allocated tag names as one string. CX-Process Monitor Plus does not differentiate which Function Block was used to specify the tag names.

ITEM Settings

Function block ITEMs are set as shown in the following table. The CX-Process Tool is normally used to set initial data S and the CX-Process Monitor Plus is normally used to set operation data O.

CX-Process Tool data classification	Type	ITEM	Example: PID Block	CX-Process Tool	CX-Process Monitor Plus
Initial settings	S	Initial setting parameter for each function block	Forward/Reverse direction, SP setting method, compensation method, etc.	Set	Cannot be set
Operation data	O	Operation parameters for each function block	Example: PID Block SP, alarm settings, PID constants, etc.	Set in special cases	Set

Note Initial settings O and operation data S classifications are displayed on ITEM Setting Screens of the CX-Process Tool. For details on the ITEMs set each function block, refer to the *Function Block Reference Manual*.

Example

ITEM type	ITEM	Contents	R: Read, W: Write, R/W: Read/write, ---: R/W disabled r, t/w: CX-Process Tool operation monitor/Operation monitor read and write (S): Initial setting, (O): Operation data	
			CX-Process Tool	CX-Process Monitor Plus
Parameter	004	Operation cycle (s)	R/W (S)	---
Parameter	008	High/Low alarm	R/W (O)	R/W
	012	Hysteresis set value	R/W (S)	---
Parameter	023	Local SP set value	R/W (O)	R/W
	024	SP set method (Initial setting) 0: Local, 1: Remote/Local	R/W (S)	R

Note Analog values are normally set with the CX-Process Monitor Plus. They can be set with the CX-Process Tool provided that they are in percentage increments between 0% and 100%. Scaling engineering units cannot be set with the CX-Process Tool.

1-1-5 Relation between Screens and Function Blocks

The relation between screens and function blocks is shown below.

Screen		Loop Control Unit: Register Send All Blocks and Receive All Blocks blocks Loop Control Boards: Make HMI settings in the System Common block	Input Selector block (Block Model 162)	Internal Switch block (Block Model 209)	Constant Generator block (Block Model 166)
User-defined screens	Overview Screen	---	---	---	---
	Control Screens	Basic PID, Advanced PID, Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting, Indication and Operation, Ratio Setting, Indicator, 2-Position ON/OFF, 3-Position ON/OFF, High/Low Alarm, Segment Program 2, ON/OFF Valve Manipulator, Motor Manipulator, Reversible Motor Manipulator, Motor Opening Manipulator, Timer, Counter	Analog signal or analog value parameters	Contact signal or contact parameters	Analog output
	Tuning Screens	Segment Program 2	---	---	---
	Trend Screens	Basic PID, Advanced PID, Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting, Indication and Operation, Ratio Setting, Indicator, 2-Position ON/OFF, 3-Position ON/OFF (PV, SP, MV only), Segment Program 2, ON/OFF Valve Manipulator, Motor Manipulator, Reversible Motor Manipulator, Motor Opening Manipulator	Analog signal or analog value parameters	Contact signal or contact parameters	Analog output
	Batch Trend Screen				
	Segment Program 2 Screen	Segment Program 2	Can be designated as expansion measurement tags	Can be designated as expansion measurement tags	Can be designated as expansion measurement tags
	Graphic Screens	Same tag ITEMs as for Control screens.	Analog signal or analog value parameters	Contact signal or contact parameters	Analog output
	Annunciator Screens	Same tag ITEMs as for Control screens.	---	Contact signal or contact parameters	---
	Operation Guide Screens	---	---	Contact signal or contact parameters	---
	System Monitor Screens	---	---	---	---
System screens	Alarm Log Screens	Contacts for which alarms were automatically allocated when registering tags	---	Contacts for which alarms were automatically allocated when registering tags	---
	Operation History Screens	---	---	---	---
	System Monitor Log Screens	---	---	---	---

1-1-6 CX-Process Monitor Plus Software Specifications

CX-Process Monitor Plus Specifications

Item		Descriptions	
Product name		CX-Process Monitor Plus	
Model		WS02-LCMC1-EV2	
Applicable PLC-series		CS/CJ-series	
Applicable Unit		Loop Control Unit Ver. 2.0 or later Loop Control Board Process-control CPU Unit Loop-control CPU Unit	
Applicable computer	Personal computer	IBM PC/AT or compatible	
	CPU	Min. required: Pentium MMX233 MHz or faster, Recommended: Celeron 400 MHz or faster	
	OS	Windows 2000 Professional (Service Pack 4 or higher), Windows XP Professional, Windows Vista Ultimate, or Windows Vista Business (Operation is not supported on Windows 95, 98, NT, or ME.)	
	Memory	Min. required: 128 Mbytes, Recommended: 256 Mbytes or more	
	Hard disk drive	Min. required: 650 Mbytes of free space, Recommended: 800 Mbytes or more of free space	
	Monitor	Min. required: XGA, Recommended: XGA or higher, min. 1024 × 768 dots, 256 colors	
	CD-ROM drive	At least one	
	Mouse	Recommended: Microsoft mouse or compatible pointing device	
	Printer	Any printer supported by Microsoft Windows	
	Sound board	1 board	
Required software		FinsGateway (One of the following must be installed according to the communications method with the PLC.) Serial Unit driver (Host Link) Controller Link driver (Controller Link) CLK (PCI) driver (Controller Link, PCI bus) ETN_UNIT driver (Ethernet)	
Connecting method	Connection with CPU Unit (or Serial Communications Board/Unit)	Using FinsGateway Serial Unit version	The computer is connected to the CPU Unit peripheral ports or integrated RS-232C port, or RS-232C port of the Serial Communications Unit. (Only a 1:1 connection is possible.) – Connector cable: When connecting to the CPU Unit peripheral ports: Model CS1W-CN□□□ (2 m, 6 m) When connecting to the CPU Unit's RS-232C port: Model XW2Z□□□-□ (2 m, 5 m) – Communications protocol with PLC: Host Link (not supported on Peripheral bus)
	Connection via Controller Link	Using FinsGateway CLK (PCI) Driver	Install the driver in a computer equipped with a Controller Link Support Board (PCI slot) to support communications between the computer and PLCs equipped with a Controller Link Unit.
		Using FinsGateway Controller Link driver	Install the driver in a computer equipped with a Controller Link Support Board (ISA slot) to support communications between the computer and PLCs equipped with a Controller Link Unit.
	Connection via Ethernet	Using FinsGateway ETN_UNIT driver	Install the FinsGateway ETN_UNIT driver on the computer on which an Ethernet board is mounted to enable to enable communications with the PLC on which the Ethernet Unit is mounted.
Loop Control Unit/Board data specification method		CSV tags and tags for Monitor Plus (CSV monitor tags) are set using the CX-Process Tool. These tags are used to specify Loop Control Unit/Board data.	
Offline operation functions		Prepare user configuration screens for use in the online operation screen.	

<table>
<tr><th colspan="3">Item</th><th colspan="3">Descriptions</th></tr>
<tr><td rowspan="8">Online operation functions</td><td rowspan="8">User Configuration screen</td><td>Overview screen</td><td colspan="3">Place buttons for progressing to the Control screen, Trend screen and other screens. 4 columns and 8 lines are displayed on each screen (max. 32 screens).</td></tr>
<tr><td>Control screen</td><td colspan="3">Control blocks such as the PID blocks and Indication blocks, and some Operation blocks are displayed for up to 8 loops in a single screen in the form of a field device. The maximum number of screens is 400.
This screen displays the Set Point, PV and MV numeric values, displays PV as a bar graph, and can be used for changing Set Point, MAN and other setting values. The color of bar graphs changes when an alarm occurs.
You can progress to the Tuning screen from the Control screen.
Fine tuning according to the degree specified by the user is possible for PID constants.</td></tr>
<tr><td>Tuning screen</td><td colspan="3">This screen is for setting P, I, D parameters in Control blocks such as the PID blocks, and for setting alarm setting values. PV, Set Point and MV can be tuned while their trends are monitored. The maximum number of screens is 3200.
Run stop/stop cancellation are possible on each function block.
Note Only the Control block that is designated as the source at the 1-Block Send Terminal to Computer block can be registered.</td></tr>
<tr><td rowspan="3">Trend screen</td><td colspan="3">The analog signals output from each function block tag ITEM are collected at fixed intervals and saved to a file. If necessary, up to 8 analog signals can be displayed on one screen in the form of a multi-dot recorder.</td></tr>
<tr><td rowspan="2">Data collected (logger function)</td><td>Real time trend
10, 20, 50, 100, or 300 hours of data is saved at 1, 2, 5, 10, or 30-second intervals for up to 480 tags.</td><td rowspan="2">Data can be saved in CSV format either using button commands, or automatically at a set interval (every 1, 2, 3, 4, 6, 8, 10, 12, 18, 20, 24, 48, 72, 96, 120, or 240 hours)</td></tr>
<tr><td>Historic trend
30, 150, 300, 900, or 1,800 days of data is saved at 1, 5, 10, 30, or 60-minute intervals for up to 960 tags.</td></tr>
<tr><td>Data display</td><td colspan="2">Horizontal (time) axis: 2, 4, 8, 12 and 24 hour time units can be scrolled
Vertical (8-point common) axis: Graduation can be enlarged by a factor or 1, 2, 5 and 10.
Data is displayed from the time when the specified display start time is reached.
Display color: red, yellow, green, blue, magenta, purple, cyan, white</td></tr>
</table>

Item			Descriptions		
Online operation functions	User Configuration screen	Batch Trend Screen	The analog signals output from each function block tag ITEM are collected at fixed intervals when tag data conditions are satisfied, and the data is automatically saved. Data can be displayed in combination with past data.		
			Data collection	Four hours or ten days of data is saved at 1-second or 1-minute intervals for up to 960 tags.	Data can be manually saved in CSV format by button operations or automatically saved at the completion of each batch. Past data can be automatically saved in binary format.
			Data display	Horizontal (time) axis: The following time units can be scrolled. 1, 2, 4, 6, 8, 12, 24, 36, 48, and 72 hours; 7 or 10 days Vertical (8-point common) axis: Gradation can be enlarged by a factor of 1, 2, 5, or 10. When a display start time is specified, data is displayed from that time.Display color: Red, yellow, green, blue, magenta, purple, cyan, white	
		Segment Program 2 Screen	Displays PV trends for Segment Program 2 (Block Model 157) set values. Segments can be set in table format while observing a time axis graph.		
			Data collection	3, 30, or 180 days of data is saved at 1-, 10-, or 60-second intervals.	Data can be manually saved in CSV format by button operations or automatically saved with each batch completion. Past data can be automatically saved in binary format.
			Data display	Horizontal (time) axis: 2, 4, 8, 12, 24, 72 hour time increments can be scrolled. Vertical axis: Gradation can be enlarged by a factor of 1, 2, 5, or 10. When a display start time is specified, data is displayed from that time. Display color: Yellow, light blue, green, purple	

Item			Descriptions
Online operation functions	User Configuration screen	Graphic screen	Graphic elements representing plant process control can be pasted to Graphic Screens from a library. These elements can be used to display changes in plant status. Up to 200 Graphic Screens can be created. • Library Figures and Image Elements Text displays, straight lines, rectangles, rectangle with round corners, ellipses, polygons, images • Library Functional Objects • Fixed Graphic Display Elements: Text, instruments, thermometers, transmitters, orifices • Changeable Graphic Display Elements: Analog displays: Bar graph displays, numeric displays, tanks Analog settings: Numerical settings Contact display: Pumps, valves, pipes Contact operation: Switches • Elements for Screen Display: Screen jump elements FP switch (faceplate popup) elements • Individual graphic screens can be saved as files or read. • Multiple graphic elements can be grouped and saved as files or read.
		Annunciator screen	This screen notifies the operator of alarms or errors that occur by changing the display color and emitting sound. At the same time, a 32-character message is displayed over two lines on screen elements. A total of 16 screen elements (4 columns × 4 lines) can be displayed on each screen. The maximum number of screens is 5.
		Operation Guide Screen	This screen displays pre-registered 128-character messages over two lines together with the date of occurrence when the specified internal switch is set to ON. Max. number of registerable messages: 1000, Number of display colors: 16 Up to 1000 messages are displayed in a single screen. Output possible in CSV format.
	System Fixed screen	Alarm Log screen	A record of alarms (time of error occurrence, tag name, PV or MV current value at occurrence, alarm type, etc.) that occur and that are input from the Control and Alarm blocks is saved and displayed as a list later. Up to 1000 alarm messages are displayed in a single screen. Output possible in CSV format.
		Operation Log screen	A record of operations using graphic screen data and switch objects and changes made to ITEM data in the Loop Control Unit/Board in the Control or Tuning Screen can be saved and later displayed as an operation log. The operation log includes the date and time of change, tag name, original ITEM data setting, new ITEM data setting, etc. Up to 1000 operation messages are displayed in a single screen. Output possible in CSV format.
		System Monitor screen	This screen displays the Loop Control Unit/Board system error information.
		System Monitor Log screen	This screen displays a log of the run/stop history and a history of execution errors that occur on the Loop Control Unit/Board together with the date of occurrence. Output possible in CSV format.

The Loop Control Unit/Board does not itself have HMI functionality. To monitor function block operation status, it is thus necessary to connect and use the CX-Process Monitor Plus.

1-1-7 CX-Process Monitor Plus Setting and Monitoring Capabilities

The data that can be set and monitored using the CX-Process Monitor Plus is listed in the following table.

Item		Loop Control Unit	Loop Control Board
Function block data		Control Blocks: Basic PID (Block Model 011), Advanced PID (Block Model 012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (Block Model 031), Indication and Operation (Block Model 032), Ratio Setting (Block Model 033), Indicator (Block Model 034), 2-position ON/OFF (Block Model 001), and 3-position ON/OFF (Block Model 002) Operation Blocks: High/Low Alarm (Block Model 111), Segment Program 2 (Block Model 157), ON/OFF Valve Manipulator (Block Model 221), Motor Manipulator (Block Model 222), Reversible Motor Manipulator (Block Model 223), Motor Opening Manipulator (Block Model 224), Timer (Block Model 205) and Counter (Block Model 208)	
Contact signals		Contact signals through Contact Distributor (Block Model 201) + Internal Switch (Block Model 209)	
Analog signals	Sent to Monitor Plus	Analog signals through Input Selector (Block Model 162)	
	Set from Monitor Plus	Analog signals through Constant Generator (Block Model 166)	

The following items must be set in advance using the CX-Process Tool.

Item		Loop Control Unit	Loop Control Board
1. Register the function blocks used for data exchange.	Function block data exchange	Receive All Blocks (Block Model 461) and Send All Blocks (Block Model 462)	HMI functions in the System Common block (Block Model 000)
	Contact signal data exchange	Contact Distributor block (Block Model 201) + Internal Switch block (Block Model 209)	
	Analog signal data exchange	Input Selector block (Block Model 162) and Constant Generator block (Block Model 166)	
2. Set the tag names.		Function Block Data: CSV tags are set in the CX-Process Tool by selecting the function blocks and then selected ***Settings – Tag Setting – CSV Tags.*** Contact Signals: tags for Monitor Plus are set for each contact in the Internal Switch blocks. The function blocks are then selected, the right mouse button clicked, and ***Tag Setting – Monitor Plus Tag*** is selected. Analog Signals: tags for Monitor Plus are set for each analog signal in the Variable ITEM Setting and Constant Generator blocks. The function blocks are then selected, the right mouse button clicked, and ***Tag Setting – Monitor Plus Tag*** is selected.	
3. Create the monitor tag file.		Start the CX-Monitor Plus and click the **Run** or **Setup** Button.	

Note Using CX-Process Monitor Plus, you can monitor and set only the data given above to which tag names have been allocated. Also, be sure to use CX-Process Tool to make tag name settings.

1-1-8 Files Created Using CX-Process Monitor Plus

The following data can be created using the CX-Process Monitor Plus

Data type	Contents
Graphic screen data (filename extension: grf)	Graphic screen data, created for each screen.
Object data (filename extension: itm)	Grouped object data (functional objects, figures, images), created when a group file is saved. (Does not include jump elements or FP switch elements.)

1-1-9 Version Upgrade

The CX-Process Monitor Plus has been upgraded from version 2.0 to version 2.1. The following table lists the contents of the version upgrade.

Item	Previous (version 2.0)	New (version 2.1)
Supported operating systems	Microsoft Windows NT 4.0 Workstation (Service Pack 6a or higher), 2000 Professional (Service Pack 4 or higher), or Windows XP Professional (Windows 95, 98, and ME are not supported.)	Microsoft Windows 2000 Professional (Service Pack 4 or higher), Windows XP Professional, Windows Vista Ultimate, or Windows Vista Business (Windows 95, 98, NT, and ME are not supported.)

Note The CX-Process Monitor Plus does not support Loop Control Units earlier than version 2.0.

1-2 Basic Operating Procedure

This section explains the procedure up to monitoring using CX-Process Monitor Plus.

1,2,3...

1. Install CX-Process Monitor Plus. (Refer to *Section 2 Setup*.)
   - Install CX-Process Monitor Plus.
2. Make Settings and Transfer Using CX-Process Tool. (Refer to the *CX-Process Tool Operation Manual* (W372).)
   a. Set the network address, node address, and unit address (**Settings – Network**).
   b. Register and connect the function blocks that exchange data with the CX-Process Monitor Plus.
   c. Set the CSV tags and the tags for Monitor Plus.
      - CSV tags: **Settings – Tag Setting – CSV Tag**
      - Tags for Monitor Plus: **Settings – Tag Setting – Monitor Plus Tag**
   d. Generate the tag file for Monitor Plus: ***Execute – Create Tag File – Monitor Plus Tag***
   e. Download the function block data to the Loop Control Unit/Board.
   f. Compile the monitor tags. Start the CX-Process Monitor Plus and click the **Setup** Button.
   g. Enter password.

   Note (a) If the above steps are not performed using CX-Process Tool, you cannot monitor using CX-Process Monitor Plus.
   (b) The network address, node address, and unit address settings made with CX-Process Tool are also used by the CX-Process Monitor Plus.
3. Configure the Screen Using CX-Process Monitor Plus. (Refer to *Section 4 Screen Configuration*.)

- Design the monitor system using CX-Process Monitor Plus.
- Create and register the Control screens, Trend screens, Graphic screens, and Annunciator screens on Overview screens.
- When registering, specify on the screen the Loop Control Unit/Board data by selecting the tags (CSV tags and tags for Monitor Plus) set using CX-Process Tool.
- Set the communications conditions with the PLC using the system monitor setting window (if using serial communications).

  Perform the following procedure.

  a. Select ***Omron*** – ***CX-Process Monitor Plus*** – ***CX-Process Monitor Plus*** from the Windows Start Menu.
  b. Click the **Setup** Button in the Main Window.
  c. Enter password.
  d. Click the ***System Monitor Builder*** Button in the Setup Dialog Box, and make settings using the System Monitor Setting Window.
  e. Click the ***Graphic Builder*** Button in the Setup Dialog Box, create the Graphic Screen Create Window (including tag name specifications), and save.
  f. Click the ***CRT Builder*** Button in the Setup Dialog Box, and register the screen using the Builder Window (including Tag name specifications).
  g. From the Builder Window ***Settings*** menu, select ***Save***, and then click the **OK** Button.

4. Check Screen Configuration Using CX-Process Monitor Plus. (Refer to *5-7 Checking Configurations.*)

- Check if you can monitor the Loop Control Unit/Board using the configured screen.
- Start FinsGateway Serial Unit communications according to the communications conditions set using the System monitor setting window by starting the monitor process (communications parameters must be set manually for FinsGateway, Controller Link, or Ethernet).

  Perform the following operation.

  a. Click the **Setup** Button in the Main Window.
  b. Enter password.
  c. In the Setup Dialog Box, click the **Run** Button (to start the monitoring process for the configured screen, and to start communications).
  d. Select the screens using the Overview Screen, and check that each function is operating normally.

5. Start the Monitor Operation to monitor the Loop Control Unit/Board. (Refer to *Section SECTION 4 Monitor Screen Functions and Operations* for details.)

   Perform the following operation.

   a. Click the **Run** Button in the Main Window.
   b. Click the screens using the Overview Screen.

SECTION 2
Setup

This section describes installing the CX-Process and connections to the PLC.

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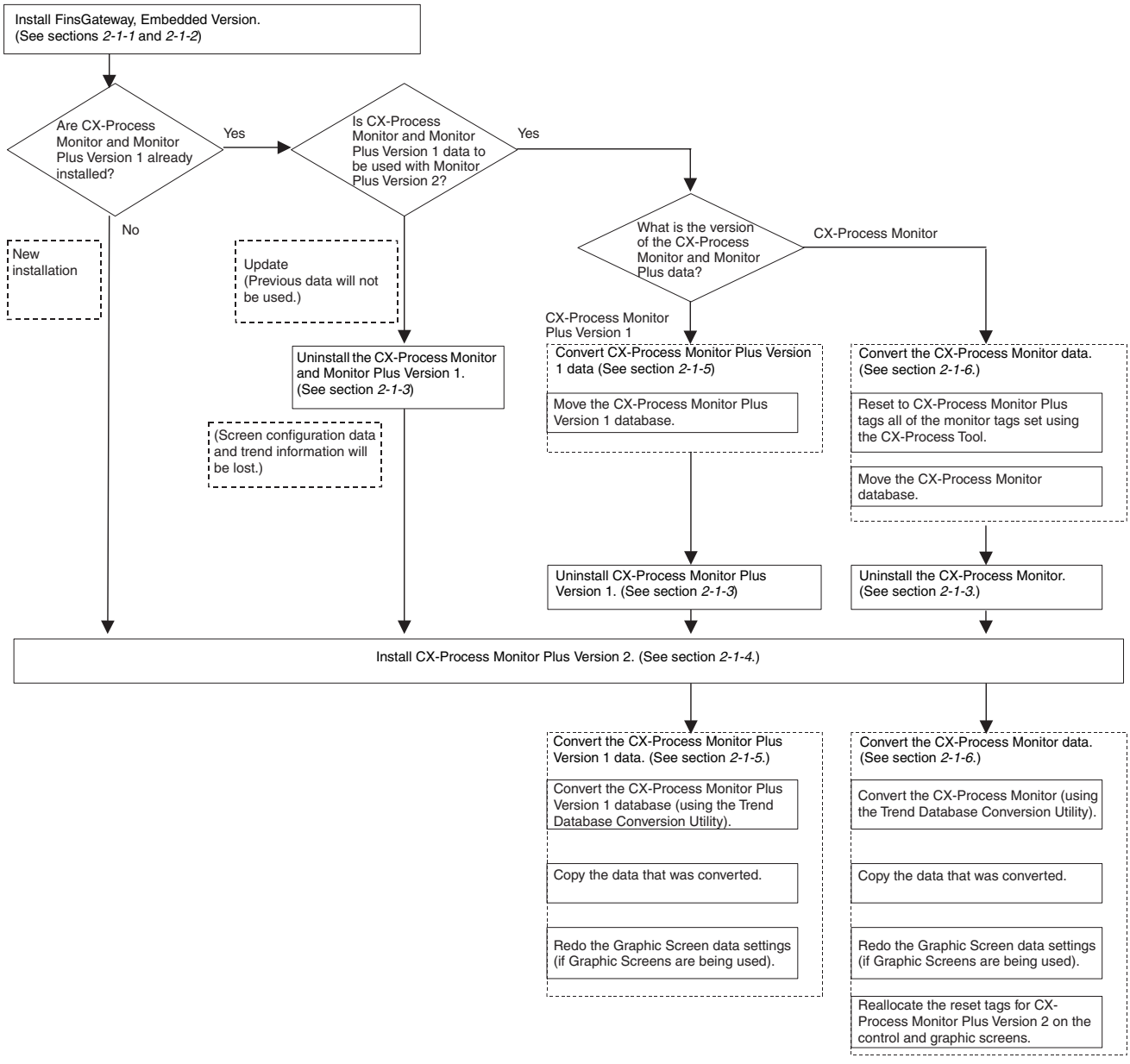
2-1 Installation

Install the CX-Process Monitor Plus using the following procedure.



Note

1. This software must be installed on an computer using Windows 2000, XP, or Vista as its OS. It will not operate on Windows 95, 98, NT, or Me.
2. Be sure to install FinsGateway Embedded before installing CX-Process Monitor Plus. You cannot install CX-Process Monitor Plus first.
3. You cannot start CX-Process Monitor Plus if FinsGateway Embedded is not installed.
4. If connecting CX-Process online using a PLC and Host Link, you cannot install and use CX-Process on the same computer as FinsGateway Version 1.

2-1-1 Before Installing FinsGateway

To use the CX-Process Monitor Plus software, the communications driver (FinsGateway) must be installed in the computer in which the CX-Process Monitor Plus software is installed.

FinsGateway Versions

Both FinsGateway Version 3 and Version 2003 (Embedded version) are bundled with the CX-Process Monitor Plus software. When using FinsGateway for the communications driver, install one of these versions.

The FinsGateWay Runtime version can also be used. If the Runtime version is already installed, it is not necessary to install the Embedded version.

Selecting the Communications Driver

The CX-Process Monitor Plus software supports the following communications drivers.

- FinsGateway Ver. 3.12
- FinsGateway Ver. 2003

Select the communications driver to install according to the user's application. The following tables show the main factors to use in selecting the driver.

OS

Driver	OS		
	Windows 2000 (See note 1.)	Windows XP (See note 2.)	Windows Vista (See note 3.)
FinsGateway Ver. 3.12	Supported	Supported	Not supported
FinsGateway Ver. 2003	Supported	Supported	Supported

Note

1. Supported for CX-Process Monitor Plus only with Windows 2000 Professional and Service Pack 4.
2. Supported for CX-Process Monitor Plus only with Windows XP Professional.
3. Supported for CX-Process Monitor Plus only with Windows Vista Ultimate/Business.

Communications

Driver	Communications method	
	Toolbus connection	Duplex Ethernet in computer
FinsGateway Ver. 3.12	Not supported	Not supported
FinsGateway Ver. 2003	Supported	Supported

Items to Check before Installing FinsGateway

If a FinsGateway version earlier than Version 2 is already installed:

Start the procedure from *Step 1: Backing Up the FinsGateway Settings*.

Installing FinsGateway for the First Time:

Start the procedure from *Step 4: Internet Explorer Installation.*

Steps to Perform before Installing FinsGateway

Step 1: Backing Up the FinsGateway Settings

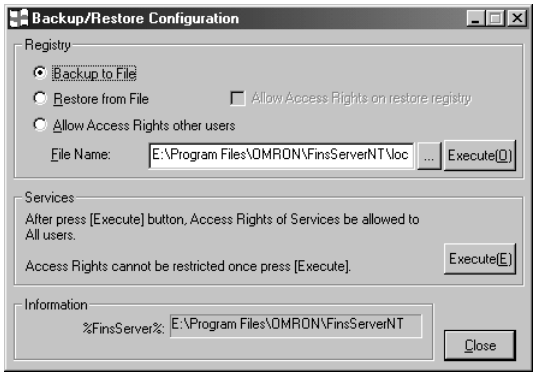
If necessary, back up the previous FinsGateway settings, as follows:

Note If FinsGateway is removed (uninstalled) without backing up the setting data, the previous setting data will all be lost.

1,2,3...

1. Execute the Backup/Restore FinsGateway Setting Data program on the CD.

   <CD-ROM drive>:\Fgwv3\FgwUtils\SettingSalvage.exe



2. Select the Backup to File option, and click OK Button.

Step 2: Removing the Previous FinsGateway

Remove the previous version of FinsGateway by referring to that manual for details.

Note

The FinsGateway removal process does not delete all of the FinsGateway files and registry data used by FinsGateway. As a result, the FinsGateway reinstallation process sometimes fails. If this happens, execute the following program from the distribution CD to remove all the files and registry data used by FinsGateway.

<CD-ROM drive>:\Fgwv3\FgwUtils\FgwRemover3.exe

Step 3: System Restart

After removing FinsGateway, restart the computer. If the following steps are performed without restarting the computer, the installation will not be completed properly.

Step 4: Internet Explorer Installation

If Internet Explorer is not already installed, or if the version is old, the FinsGateway installation will display a warning to update it. Update Internet Explorer.

Internet Explorer is not included with FinsGateway. Refer to the Microsoft website for details, and install the newest version.

Step 5: Updating the HTML Help Runtime Component

If the HTML Help runtime component is not already installed, or if the version is old, the FinsGateway installation will display a warning to update it. Update the HTML Help runtime component using the following procedure.

If a warning is not displayed, then there is no need to update. The FinsGateway Installer will display the appropriate instructions.

1,2,3...

1. Execute the following program from the FinsGateway CD:

   <CD-ROM drive>:\Fgwv3\Update\hhupd.exe
2. Update the HTML Help runtime component according to the instructions displayed on the screen.
3. The program will suggest a system restart when it finishes.
   Do not proceed to the next step without restarting the computer. If the installation is continued without restarting the computer, the FinsGateway will not operate properly.

2-1-2 Installing FinsGateway

Using FinsGateway Version 3

After installing FinsGateway Version 3, install FinsGateway Update 3.12.

Installation of FinsGateway Version 3

1,2,3... 1. Select one of the following directories from within the Fgwv3\FGW3ee folder in the CD-ROM. (Select the directory corresponding to the communications method being used in the PLC.)

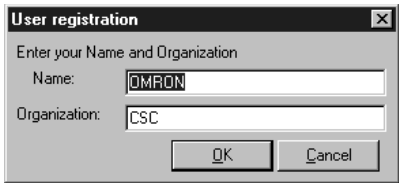
Folder name	Contents
Clk	Select this directory when connecting the PLC and personal computer (the CX-Process Tool and the CX-Process Monitor Plus) via Controller Link using a Controller Link Support Board (ISA bus) installed in the computer.
Clk (PCI)	Select this directory when connecting the PLC and personal computer (the CX-Process Tool and the CX-Process Monitor Plus) via Controller Link using a Controller Link Support Board (PCI bus) installed in the computer.
Etn	Select this directory to connect the personal computer (the CX-Process Tool and the CX-Process Monitor Plus) to the PLC via Ethernet.
Serial	Select this directory to connect the personal computer (the CX-Process Tool and the CX-Process Monitor Plus) to the PLC via the Host Link.

The following step applies to Host Link SYSWAY connections.

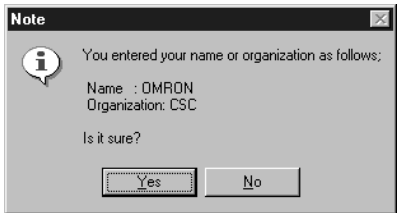
2. Use a program such as Windows Explorer to open the CD-ROM and double-click the following icon to start the **Setup.exe** file in the CD-ROM's **Serial/disk1** directory.

The following screen will be displayed.

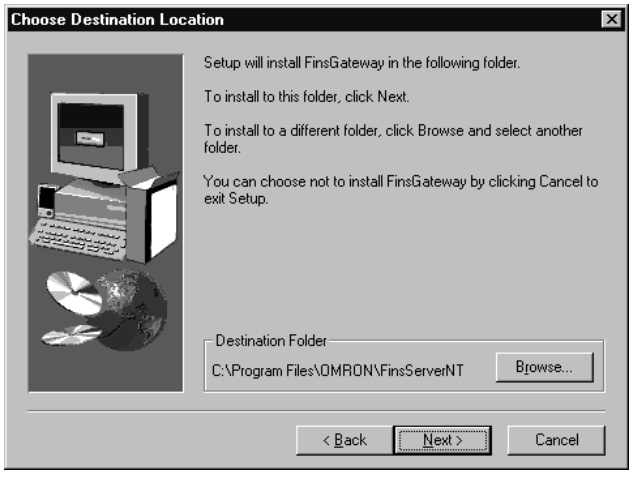
3. Click the **Next** Button. The User Registration Dialog Box will be displayed.



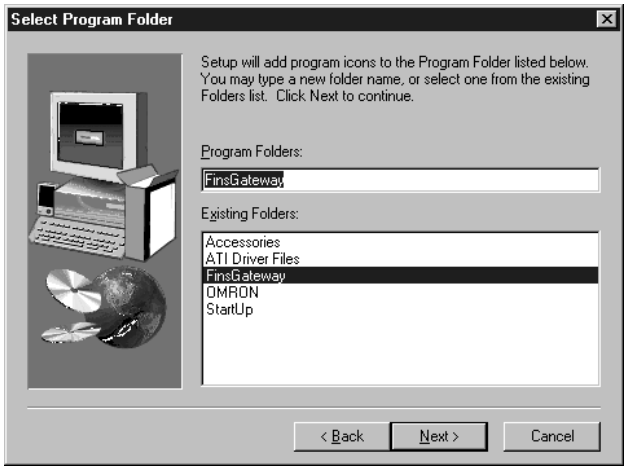
4. Enter your name and organization, and then click the **OK** Button. The Note Dialog Box will be displayed.



5. Click the **Yes** Button. The Choose Destination Location Dialog Box will be displayed.

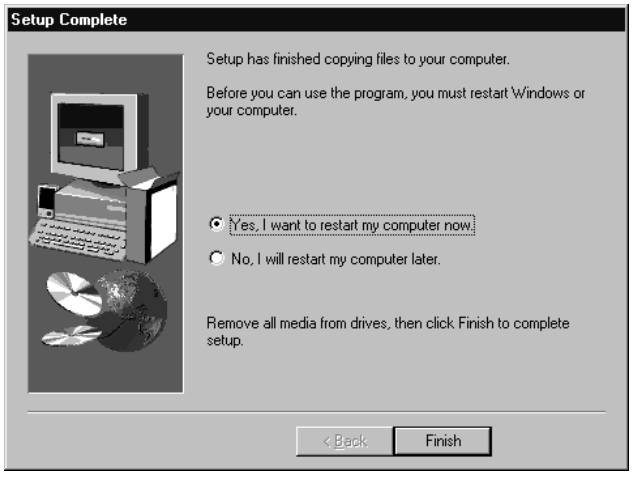


6. Click the **Next** Button. The Select Program Folder Dialog Box will be displayed.



7. Check the installation destination is correct, and then click the **Next** Button. Installation will start automatically.

   When installation is completed, the following dialog box will be displayed.



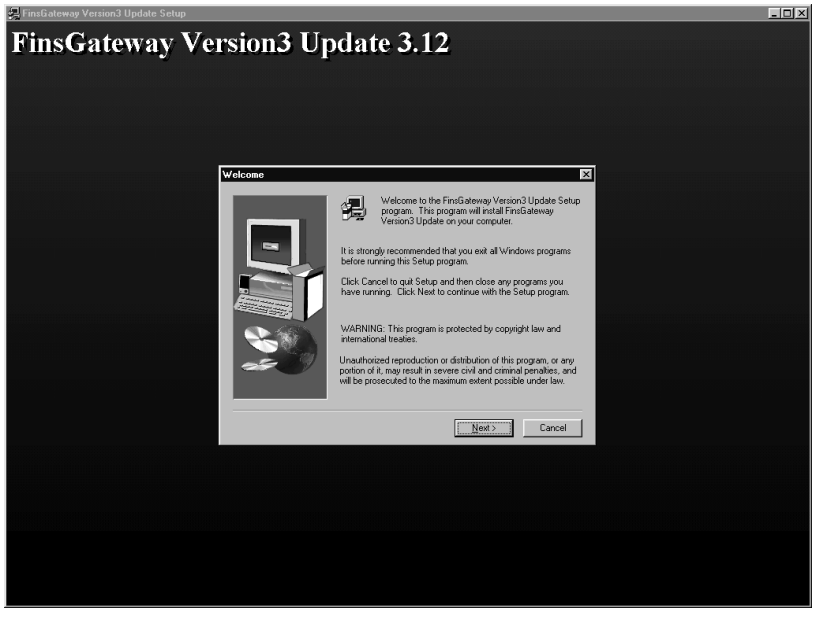
Click the **Finish** Button.

Installing FinsGateway Update 3.12

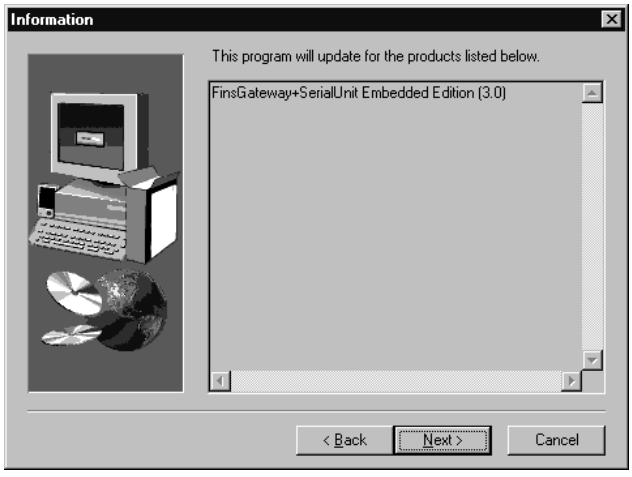
1,2,3...

1. Use a program such as Windows Explorer to open the CD-ROM and double-click the following icon in the CD-ROM's **Fgwv3\FgwUpdate** directory.

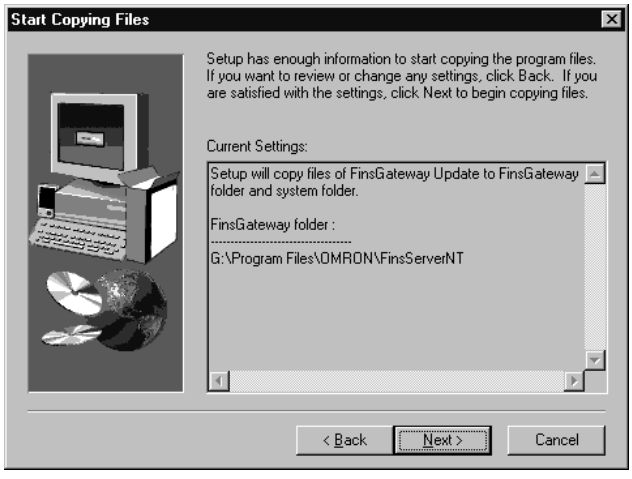
2. The following dialog box will be displayed.



3. Click the **Next** Button. The Select Program Folder Dialog Box will be displayed.

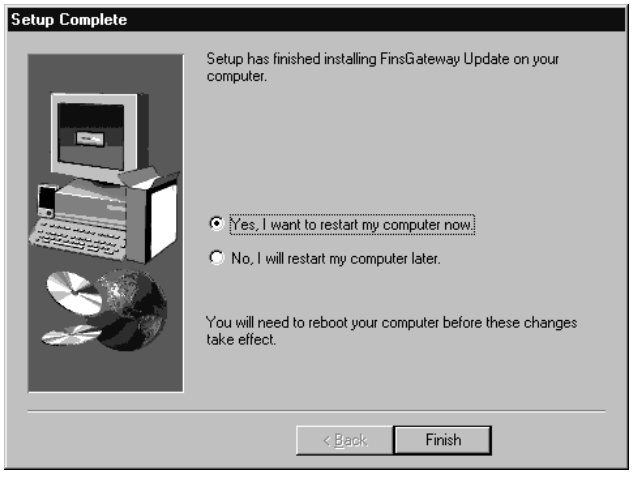


4. Check the installation destination is correct, and then click the **Next** Button. The Start Copying Files Dialog Box will be displayed.



5. Check the installation destination is correct, and click the **Next** Button. Installation will start automatically.

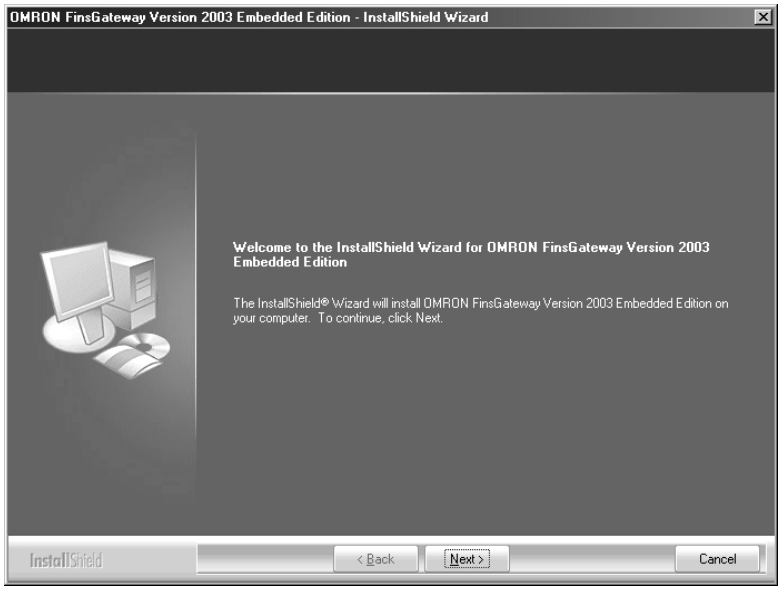
   When installation is completed, the following dialog box will be displayed. Click the **Finish** Button.



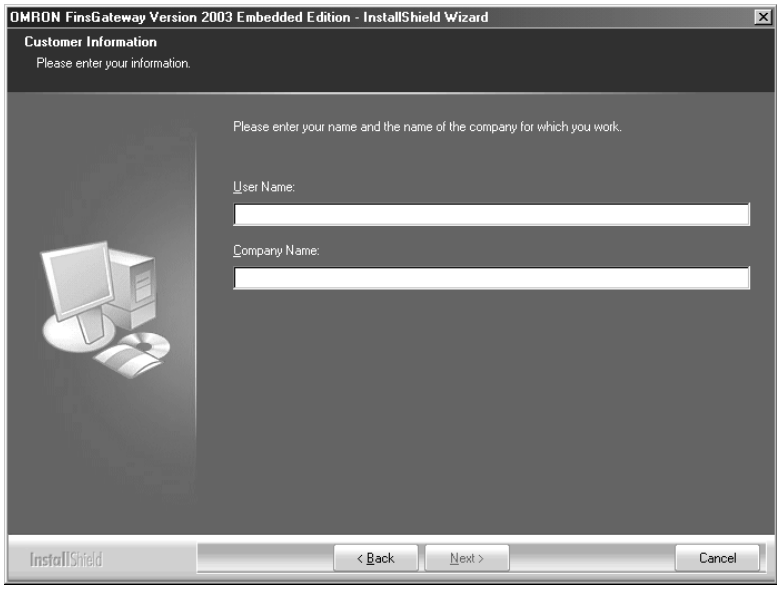
Using FinsGateway Version 2003

1,2,3...

1. Open the CD-ROM and double-click the setup.exe file in the CD-ROM's Fgw2003 folder (Fgw2003\Fgw2003\Disk Images\Embed\setup.exe) to start the setup program.
   The following window will be displayed.
   Click the **Next** Button.

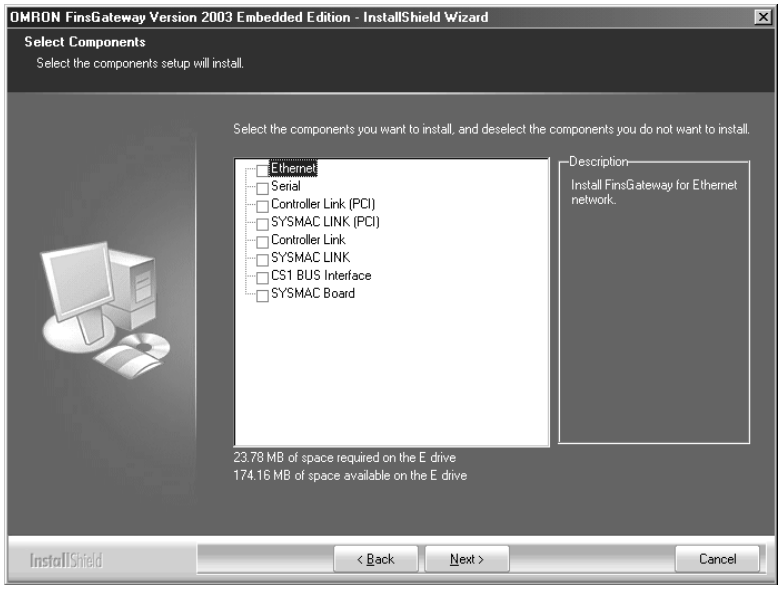


2. The following dialog box will be displayed.



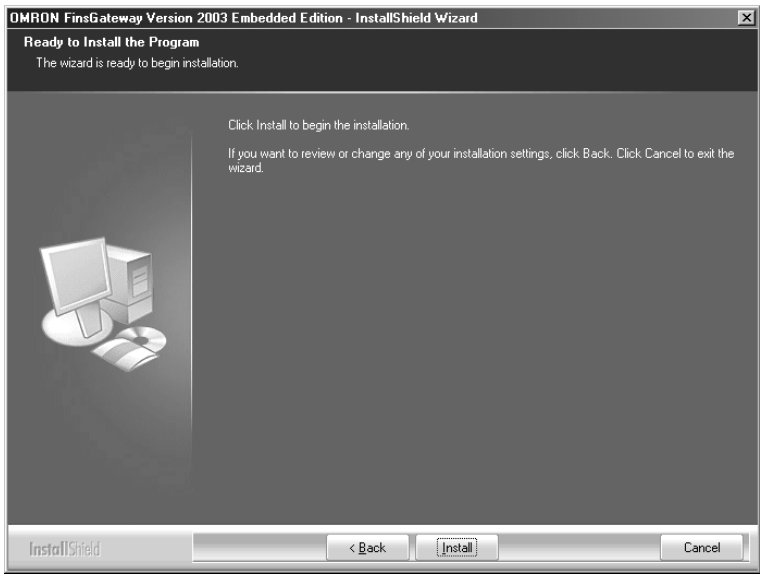
3. Enter the user name and the organization and click the **Next** Button.

4. Select the required communications drivers for the CX-Process Monitor Plus.
   As long as there is no problem, select all of them and then click the **Next** Button.

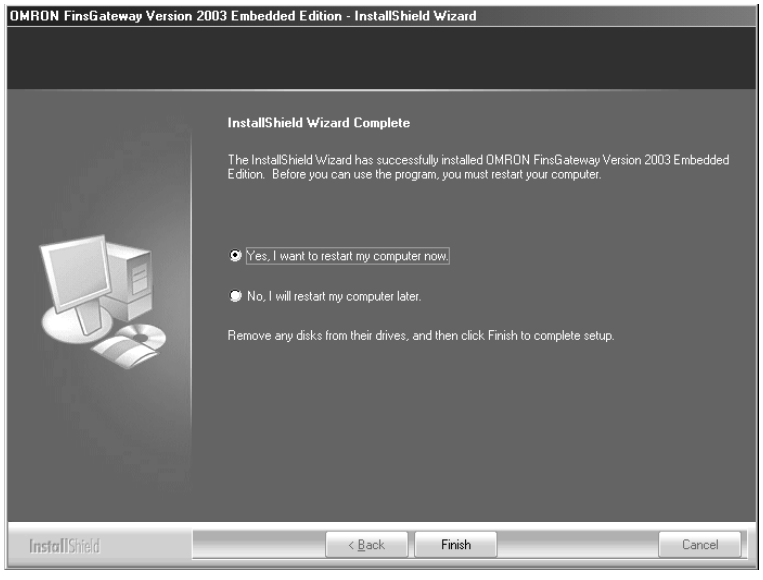


5. Specify the destination for the installation.
   If there is no need to change the default destination, just click the **Next** Button.

6. The following window will be displayed.
   Click the **Install** Button to start the installation.



7. When the installation has been completed, the following dialog box will be displayed.
   Click the **Finish** Button to restart the computer.



This completes the installation.

2-1-3 Uninstalling the CX-Process Monitor/Monitor Plus Version 1

If the CX-Process Monitor or CX-Process Monitor Plus Version 1 is already installed on the computer, uninstall it before installing CX-Process Monitor Plus Version 2. CX-Process Monitor Plus Version 2 cannot be installed on the same computer as the CX-Process Monitor or CX-Process Monitor Plus Version 1. Use the procedure given below.

Note The screen configuration data, trend information, and other data will be deleted when the CX-Process Monitor or Monitor Plus Version 1 is uninstalled. If this data needs to be saved, copy the data from the directory where

the CX-Process Monitor or CX-Process Monitor Plus Version 1 is installed to a suitable directory. Refer to *2-1-6 Converting Data from CX-Process Monitor*.

- Screen Configuration Data and Trend Data:
  If the database path has not been changed from its default, the data will be saved in one of the following folders.
  Copy the folder as is, and back it up.
  - CX-Process Monitor Plus: Program Files\Omron\CX-Process Monitor Plus\DB
  - CX-Process Monitor: Program Files\Omron\CX-Process Monitor\DB

  If the database path has been changed, the data will not be deleted even if the application is uninstalled. Save the data if it is needed.
- Graphic Screen Data:
  Graphic screen data created by the Graphic Builder is saved in a user-specified folder specified when files were created. The data in this folder will not be deleted even if the application is uninstalled. Remove the data manually if it is not required.

1,2,3...

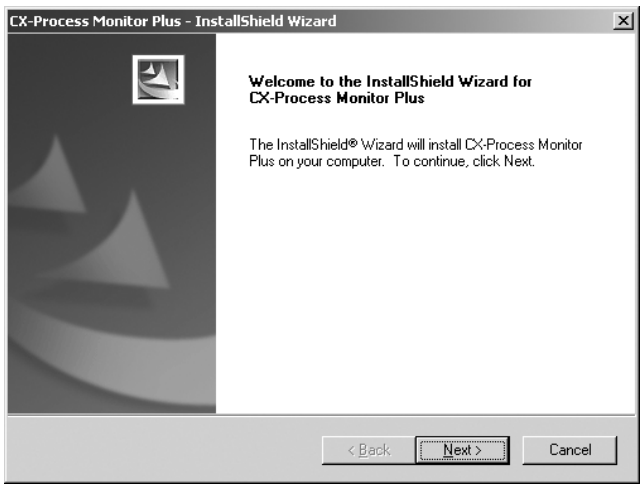
1. Start the tool to add and delete applications from the Windows Control Panel.
2. Select the CX-Process Monitor or CX-Process Monitor Plus.
3. Click the button to delete the application.
4. Click the **OK** Button. The application will be uninstalled.
5. When processing has been completed, click the **OK** Button.

2-1-4 Installing CX-Process Monitor Plus

1,2,3...

1. Insert the CX-Process Monitor Plus installation CD-ROM disk in the CD-ROM drive.
2. Using a program such as Windows Explorer, select **CX-Process Monitor Plus** on the CD-ROM, and then **Disk1**, and then double-click the **Setup.exe** icon shown below.

The Preparing Setup Dialog Box will be displayed, and then the Install Shield Wizard will be displayed. Click the **Next** Button.



Note If the CX-Process Monitor or Monitor Plus Version 1 is already installed on the computer, the new installation will be aborted and a message will be displayed prompting you to first uninstall the CX-Process Monitor or Monitor Plus Version 1 program.
Uninstall the CX-Process Monitor or Monitor Plus Version 1 and then again install the CX-Process Monitor Plus Version 2.
For details on uninstalling CX-Process Monitor and Monitor Plus, refer to *2-1-3 Uninstalling the CX-Process Monitor/Monitor Plus Version 1*.

3. The License Agreement Dialog Box will be displayed.

Carefully read the product license agreement. If you accept all of the terms of the agreement, select that option and then click the **Next** Button.

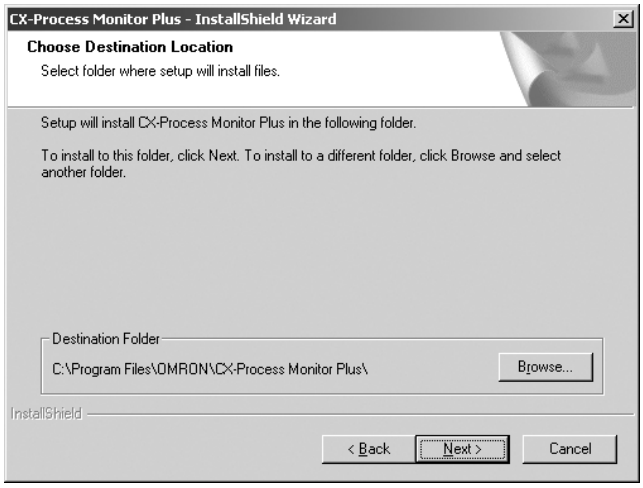
4. The User Information Dialog Box will be displayed.

The user name and organization name registered on the computer are entered by default.

Enter the license number and then click the **Next** Button.

The license number is written on the software license agreement and user register that is included with the product.

5. The Choose Destination Location Dialog Box will be displayed.



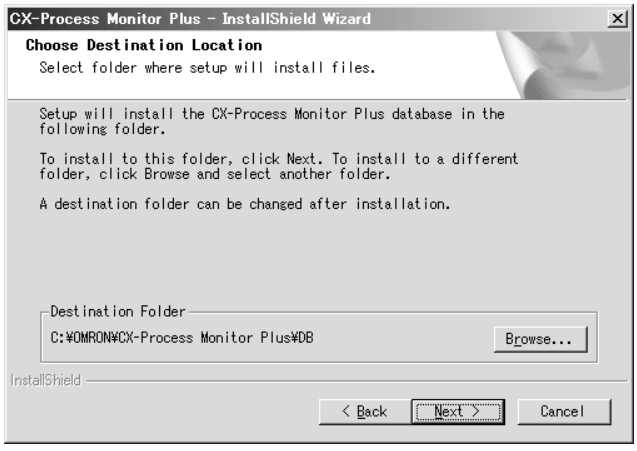
Check the installation destination and click the **Next** Button.

The default directory is C:\Program Files\OMRON\CX-Process Monitor Plus\

6. The Select Program Folder Dialog Box will be displayed.

Specify the location for adding a new shortcut to the program folder in the Start Menu, and then click the **Next** Button.

7. The Choose Destination Location Dialog Box will be displayed.

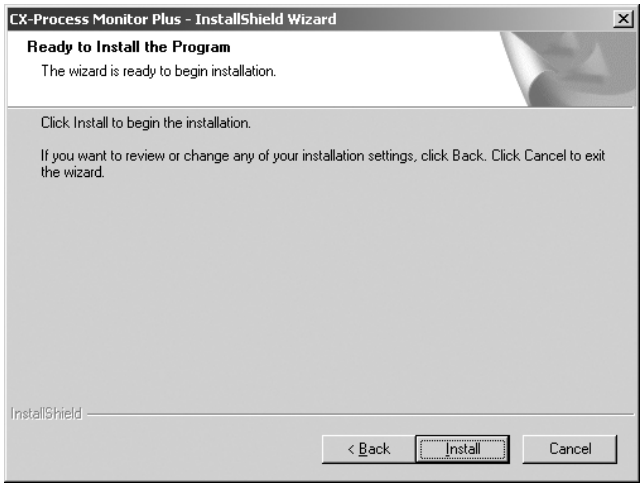


Check the destination folder and click the **Next** Button.

The default folder is C:\OMRON\CX-Process Monitor Plus\DB\.

With Windows 2000 or Windows XP, the Choose Destination Location Dialog Box will not be displayed. The DB folder will be installed in the following directory: C:\Program Files\OMRON\CX-Process Monitor Plus\DB\.

8. The Ready to Install the Program Dialog Box will be displayed.



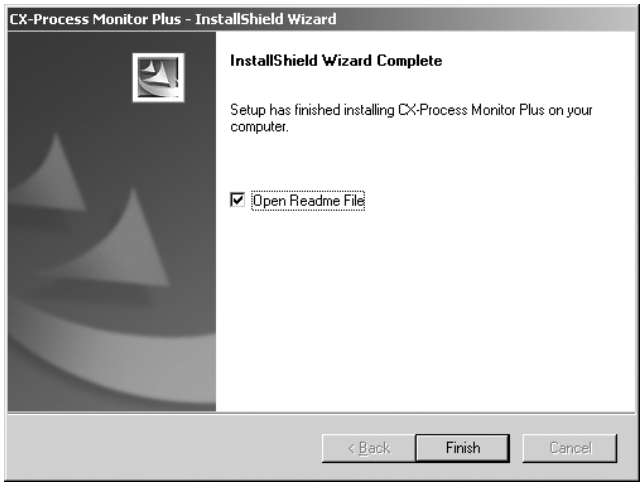
Click the **Install** Button.

The installation will be started by the installation program.

To check or make changes to the installation contents, click the **Return** Button.

To abort the installation, click the **Cancel** Button.

9. When the installation has been completed, the following dialog box will be displayed. Click the **Finish** Button.



Note Windows may have to be restarted after the installation. If required, restart Windows in response to the Install Shield Wizard message.

10. After the computer has been restarted, a ReadMe file will be displayed.

Note Be sure to read the ReadMe file before using CX-Process Monitor Plus.

This completes the CX-Process Monitor Plus installation.

2-1-5 Converting CX-Process Monitor Plus Data

The following procedure must be used to convert data from the CX-Process Monitor Plus software currently installed in the computer so that it can be used with the new CX-Process Monitor Plus version.

Check the CX-Process Monitor Plus version.

Check the version of the CX-Process Monitor Plus program currently installed on the computer.

Move the CX-Process Monitor Plus database.

Move the folder where data is saved for the CX-Process Monitor Plus program currently installed on the computer to a safe location. (See note.)

Note This is the folder set for the database path in the File System Setup. The default setting for CX-Process Monitor Plus version 2.1 or lower is C:\Program Files\Omron\CX-Process Monitor Plus\DB.

Convert the CX-Process Monitor Plus database (using the Trend DB Conversion Utility).

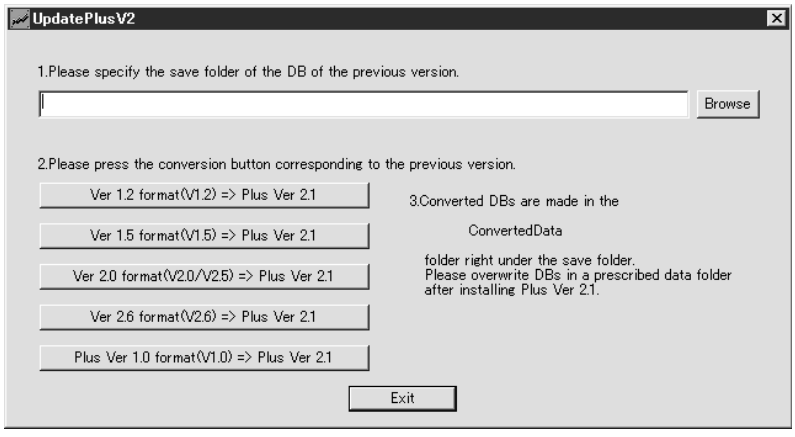
Use the Trend DB Conversion Utility to convert the trend group definition file for use with the new version of CX-Process Monitor Plus.

1,2,3...

1. Start the Trend DB Conversion Utility. The Trend DB Conversion Utility is stored at the following location:

   CD-ROM drive:\MonitorPlusUpDate\UpDatePlusV2.exe

   The following dialog box will be displayed:



2. Click the **Browse** Button and specify the folder where the CX-Process Monitor Plus database was moved earlier in this procedure.
3. Click the conversion button corresponding to the CX-Process Monitor Plus version confirmed earlier in this procedure.
   - Monitor Plus version 1.0: Plus version 1.0 format (Version 1.0) → Plus version 2.1
   - Monitor Plus Version 2.0: The Monitor Plus version 2.0 database can be used for Monitor Plus version 2.1. No change is required.

Note Some data cannot be converted by the Trend DB Conversion Utility. Refer to *2-1-7 CX-Process Monitor Plus Conversion Specifications* for details on conversion specifications when converting to CX-Process Monitor Plus.

Install the CX-Process Monitor Plus.

Copy the converted data.

When the CX-Process Monitor Plus database is converted, the utility creates a folder named ConvertedData in the folder where the CX-Process Monitor Plus database was moved earlier in this procedure. Copy all of the files in this folder, including the GRF folder and all files in the GRF folder, and paste them in the newly installed CX-Process Monitor Plus database folder, overwriting any files already there. (See note.)

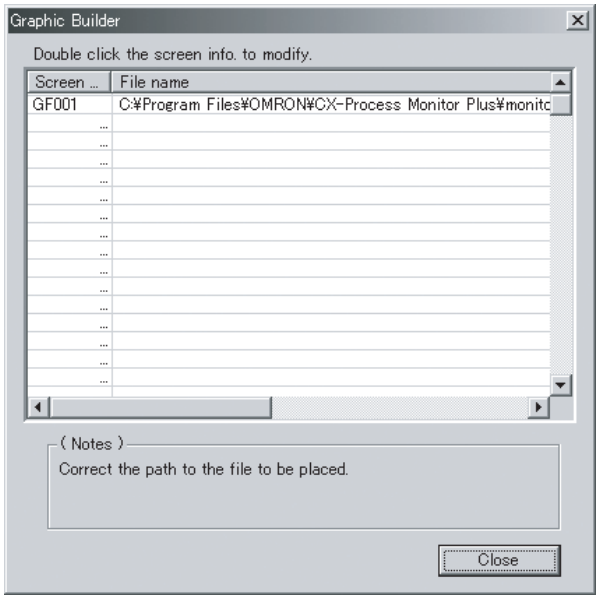
Note This is the folder set for the database path in the File System Setup.
Monitor Plus version 2.1 default setting:
Windows 2000 or XP: C:\Program Files\Omron\CX-Process Monitor Plus\DB
Windows Vista: C:\Omron\CX-Process Monitor Plus\DB

Reset the Graphic Screen data (if Graphic Screens are being used).

If Graphic Screens are being used, the Graphic Screen data must be reset in the CX-Process Monitor Plus.

1,2,3...

1. Start the CX-Process Monitor Plus.
2. Start the Graphic Builder and select the command from the File Menu to change the file information.
3. A list of registration information for previous graphic screens will be displayed. Specify each graphic file for each screen in the GRF folder in the Monitor Plus' DB folder.



2-1-6 Converting Data from CX-Process Monitor

The following procedure can be used to convert data from the CX-Process Monitor for use with the CX-Process Monitor Plus.

Check the Version of the CX-Process Monitor.

Check the version of the CX-Process Monitor currently installed on the computer.

Reset CX-Process Monitor Tags Set with CX-Process Tool as Tags for Monitor Plus.

Monitor tags used on the CX-Process Monitor cannot be used on the CX-Process Monitor Plus. The following procedure must thus be used to reset all of the CX-Process Monitor tags set with CX-Process Tool as tags for Monitor Plus. If the same tag names as used for the CX-Process Monitor tags are used for the CX-Process Monitor Plus, the work required in the last step of this data conversion procedure can be minimized.

1,2,3...

1. Display a monitor tag list on the CX-Process Tool (***Execute – Output Tag File – Monitor Tags***) and confirm the monitor tags that are being used.
2. Register the function blocks for data exchange with the CX-Process Monitor Plus that correspond to the function blocks for data exchange with the CX-Process Monitor.
3. For all of the tags set in the function blocks for data exchange with the CX-Process Monitor, set corresponding tags in the function blocks for data exchange with the CX-Process Monitor Plus.
4. Output the tag file for Monitor Plus (***Execute – Output Tag File – Monitor Plus Tag***).

Move the CX-Process Monitor Database

Move the CX-Process Monitor Database from the folder (see note) where CX-Process Monitor data is saved to another folder on the computer.

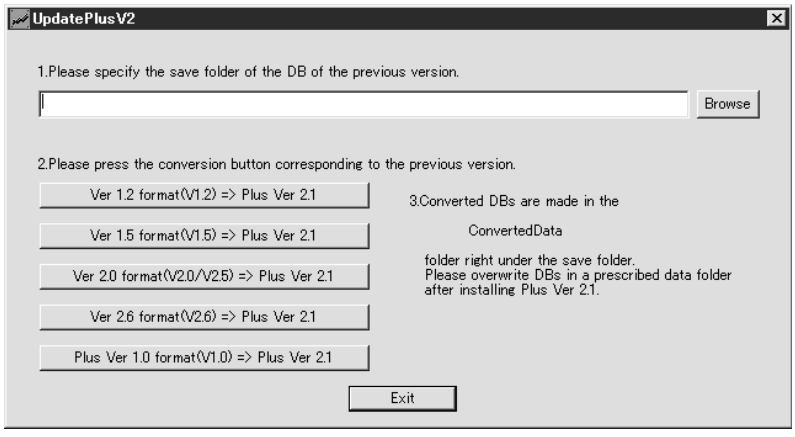
Note This folder is set in the DB Path setting in the File System Setup. The default setting is C:\Program Files\Omron\CX-Process Monitor\DB

Convert the CX-Process Monitor Database

Use the Trend DB Conversion Utility to convert the trend group definitions file for use with the CX-Process Monitor Plus.

1,2,3...

1. Start the Trend DB Conversion Utility. The Trend DB Conversion Utility is stored at the following location:
   CD-ROM drive: \MonitorPlusUpDate\UpDatePlusV2.exe
   The following window will be displayed.



2. Click the **Browse** Button and specify the folder where the CX-Process Monitor database was moved earlier in this procedure.
3. Click the conversion button corresponding to the CX-Process Monitor version confirmed earlier in this procedure.
   - Monitor Version 1.2:
     Ver 1.2 format (V1.2) → Plus Ver 2.1
   - Monitor Version 1.5:
     Ver 1.5 format (V1.5) → Plus Ver 2.1
   - Monitor Version 2.0 or 2.5:
     Vers 2.0 format (V2.0/V2.5) → Plus Ver 2.1
   - Monitor Version 2.6:
     Ver 2.6 format (V2.6) → Plus Ver 2.1

Note Some data cannot be converted by the Trend DB Conversion Utility. Refer to *2-1-7 CX-Process Monitor Plus Conversion Specifications* for details on conversion specifications when converting to CX-Process Monitor Plus.

Uninstall the CX-Process Monitor.

Install the CX-Process Monitor Plus.

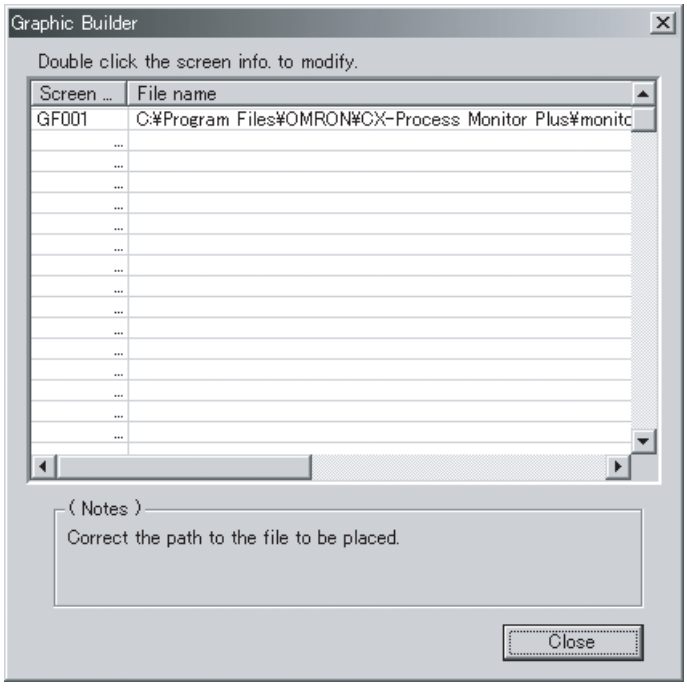
Copy the Converted Data. When the CX-Process Monitor database was converted, a folder called *ConvertedData* will have been created in the folder where the CX-Process Monitor database was moved earlier in this procedure. Copy all of the files in this folder, including the GRF folder and all files in the GRF folder, and paste them in the newly installed CX-Process Monitor Plus database folder, overwriting any files already there. (See note.)

Note This is the folder set for the database path in the File System Setup.
Monitor Plus version 2.1 default setting:
Windows 2000 or XP: C:\Program Files\Omron\CX-Process Monitor Plus\DB
Windows Vista: C:\Omron\CX-Process Monitor Plus\DB

Redo the Graphic Screen Data Settings. If Graphic Screens are being used, the Graphic Screen data must be reset in the CX-Process Monitor Plus.

1,2,3...

1. Start the CX-Process Monitor Plus.
2. Start the Graphic Builder and update the file information using the command on the File Menu.
3. A list of registration information for previous graphic screens will be displayed. Specify each graphic file for each screen in the GRF folder in the Monitor Plus' DB folder.



Re-allocate the Tags for Monitor Plus That Have Been Reset on the Control Screens and Graphic Screens

1,2,3...

1. If different tag names were used when the tags were reset for the CX-Process Monitor Plus, use the CRT Builder to set the tag names in Control Screens and Trend Screens to the new tag names.
2. Reset all of the tag names allocated to objects (e.g., meters and tanks) on Graphic Screens to the ones used when the tags were reset for the CX-Process Monitor Plus.

2-1-7 CX-Process Monitor Plus Conversion Specifications

The following table shows the conversion specifications when using the Trend DB Conversion Utility to convert CX-Process data to the latest CX-Process Monitor Plus data format. When necessary, set the converted data into the latest version of CX-Process Monitor Plus again.

Setting or screen		Data convertible?		Remarks
		CX-Process Monitor Plus Version 1 data	CX-Process Monitor data	
Tag information		Yes	No	When CX-Process Monitor data is converted, the tags for CX-Process Monitor Plus must be created again.
System Information setting		Yes	Yes	Settings added during version upgrades will be set to their default values.
System Monitor Log Screen		Yes	Yes	---
Overview Screen		Yes	Yes	---
Control Screen		Yes	Yes	---
Tuning Screen		---	---	---
Trend Screen	Tag settings	Yes	Yes	---
	Historical trend data	No	No	Past log data is discarded.
	Real time trend data	No	No	Past log data is discarded.
Graphic Screen	Graphic screen data	Yes	Yes	The path to the graphic screen data must be set again. For details, For details, refer to the instructions on resetting graphic screen data in *2-1-5* or *2-1-6*.
	Graphic objects	Yes	Yes	The earlier version's data is converted as-is, but new functions added during version upgrades cannot be used. When you want to use new functions, the data must be created again in the new version of Monitor Plus.
Annunciator Screen		Yes	Yes	---
Operation Guide Screen		Partially convertible	Partially convertible	• The Operation Guide Message settings are converted. • Past log data is discarded.
Alarm Log Screen		Partially convertible	Partially convertible	• The alarm messages and alarm tag settings are converted. • Past log data is discarded.
Operation Log Screen		No	No	Past log data is discarded.
System Monitor Log Screen		No	No	Past log data is discarded.

2-2 Connecting the PLC

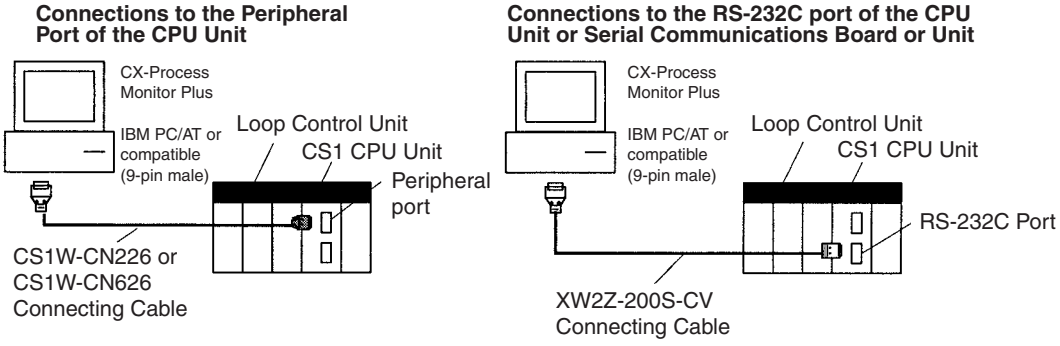
The following three methods can be used to connect to the PLC. Regardless of the connection method, the FinsGateway communications driver (embedded version) is used.

Communications network	FinsGateway communications driver	Contents
Host Link Network (See note.)	Serial Unit Driver	Connecting to the peripheral or RS-232C port of the PLC over Host Link.
Controller Link Network	CLK (PCI slot) Driver (Not supported by FinsGateway Version 2)	Connecting through the Controller Link Support Board to a PLC with a Controller Link Unit mounted.
Ethernet Network	ETN_UNIT Driver	Connecting through the Ethernet Board to a PLC with an Ethernet Unit mounted.

Note Host Link communications use FINS commands wrapped in header and terminator data (i.e., SYSWAY-CV for FinsGateway). Host Link communications (SYSMAC WAY) is set for the CPU Unit.

2-2-1 Connecting via Host Link

The personal computer uses the FinsGateway's Serial Unit Driver to connect to the peripheral or RS-232C port of the PLC via Host Link communications.



Note

1. The Serial Communications Mode must be set to Host Link.
   Host Link communications use FINS commands wrapped in header and terminator data (i.e., SYSWAY-CV for FinsGateway). The peripheral bus cannot be used.
2. The FinsGateway Serial Unit Driver must be installed to enable connecting the PLC via Host Link communications.
3. The following Connecting Cables are used to connect the CX-Process Tool (personal computer) to the PLC (CPU Unit or Serial Communications Board/Unit).

Connecting Cables

Unit	Port on Unit	Computer	Port on computer	Serial Communications Mode	Model	Length	Remarks
CPU Unit	Built-in peripheral port	IBM PC/AT or compatible	Male 9-pin D-SUB	Host Link	CS1W-CN226	2.0 m	---
					CS1W-CN626	6.0 m	
	Built-in RS-232C port Female 9-pin D-SUB				XW2Z-200S-CV	2 m	Anti-static connector
					XW2Z-500S-CV	5 m	
Serial Communications Board or Unit	RS-232C port Female 9-pin D-SUB				XW2Z-200S-CV	2 m	anti-static connector
					XW2Z-500S-CV	5 m	

Note Touch a grounded metal to discharge all static electricity from your body before connecting any of the above cable connectors to the RS-232C port of the PLC.
The XW2Z-□□□S-CV Cable uses the anti-static XM2S-0911-E Connector Hood. For safety sake, however, discharge all static electricity from your body before touching the connector.

The following components are used to connect RS-232C cable to the peripheral port.

Unit	Port on Unit	Computer	Port on computer	Serial Communications Mode	Model	Length	Remarks
CPU Unit	Built-in peripheral port	IBM PC/AT or compatible	Male 9-pin D-SUB	SYSMAC WAY (Host Link)	CS1W-CN118 + XW2Z-200S-CV/500S-CV	0.1 m + (2 or 5 m)	The XW-2Z□□□S-CV is an anti-static connector.
					CS1W-CN118 + XW2Z-200S-V/500S-V		---

The following components are available for connecting the CQM1-CIF01 or CQM1-CIF02 Cable to the peripheral port.

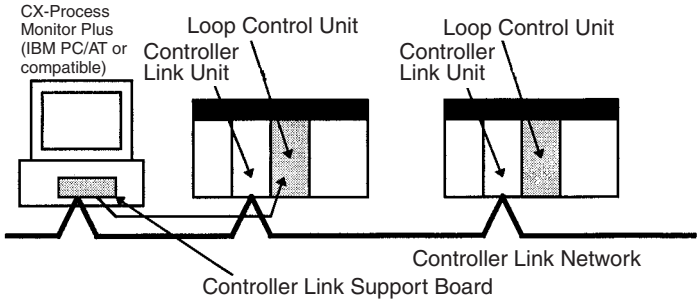
Unit	Port on Unit	Computer	Port on computer	Serial Communications Mode	Model	Length	Remarks
CPU Unit	Built-in peripheral port	IBM PC/AT or compatible	Male 9-pin D-SUB	SYSMAC WAY (Host Link)	CS1W-CN114 + CQM1-CIF02	0.05 m + 3.3 m	---

The following components are available for connecting the IBM PC/AT or compatible over RS-232C

Unit	Port on Unit	Computer	Port on computer	Serial Communications Mode	Model	Length	Remarks
CPU Unit	Built-in RS-232C port Female 9-pin D-SUB	IBM PC/AT or compatible	Male 9-pin D-SUB	SYSMAC WAY (Host Link)	XW2Z-200S-V	2 m	---
					XW2Z-500S-V	5 m	
Serial Communications Board or Unit	RS-232C Port Female 9-pin D-SUB				XW2Z-200S-V	2 m	
					XW2Z-500S-V	5 m	

2-2-2 Connecting through a Controller Link Support Board

The personal computer uses the FinsGateway Controller Link Driver to connect to the PLC over a Controller Link Network.



Note The FinsGateway CLK (PCI) Driver or Controller Link Driver with FinsGateway version 2 or higher must be installed to enable connecting the PLC via a Controller Link Network.

Controller Link Unit Models

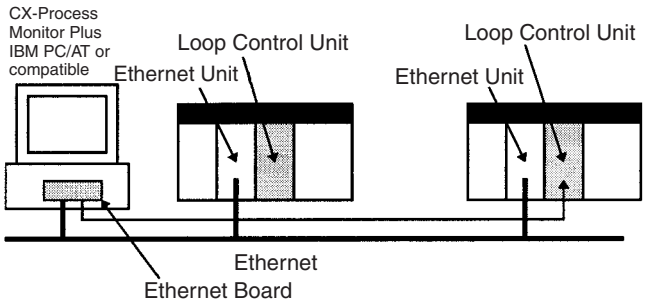
Controller Link Unit	PLC	Unit	Type	Transmission path
CS1W-CLK21-V1	CS1	CPU Bus Unit	Wired	Twisted-pair cable
CS1W-CLK12-V1			Optical Ring	Optical fiber cable
CS1W-CLK52-V1			Optical	GI Optical fiber cable
CJ1W-CLK21-V1	CJ	CPU Bus Unit	Wired	Twisted-pair cable

Controller Link Support Boards

Controller Link Support Board	Transmission medium	Computer	FinsGateway Driver
3G8F7-CLK12-V1	Optical fiber cable (ring configuration)	IBM PC/AT or compatible (PCI slot)	CLK (PCI slot) Driver (FinsGateway Version 2 cannot be used.)
3G8F7-CLK52-V1			
3G8F7-CLK21-V1	Wire		
3G8F5-CLK11-V1	Optical fiber cable	IBM PC/AT or compatible	Controller Link Driver
3G8F5-CLK21-V1	Wire		

2-2-3 Connections via Ethernet

The personal computer uses the FinsGateway ETN_UNIT Driver to connects to the PLC via Ethernet.



Note The FinsGateway ETN_UNIT Driver must be installed to enable connecting the PLC via Ethernet.

Ethernet Unit Model

Model	PLC	Unit	Transmission path
CS1W-ETN01	CS Series	CPU Bus Unit	Ethernet 10Base-5
CS1W-ETN11			Ethernet 10Base-T
CS1W-ETN21			Ethernet 10Base-T
CJ1W-ETN11	CJ	CPU Bus Unit	Ethernet 10Base-T
CJ1W-ETN21			Ethernet 10Base-T

SECTION 3
Exchanging Data with Monitor Plus

This section explains how to exchange analog and digital (contact) data between Monitor Plus and the function blocks in Loop Control Units and Boards.

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- 3-1-1 Overview 48
- 3-1-2 Exchanging Data with Function Blocks 48
- 3-1-3 Exchanging Analog Signal Data 51
- 3-1-4 Exchanging Contact Signal Data 54
- 3-1-5 Exchanging Data with the User Link Table 56

3-2 Example Function Blocks for Data Exchange 58

3-3 Loop Control Unit Precautions 68
- 3-3-1 System Information Area Settings 68
- 3-3-2 Applicable Versions 68

3-1 Data Exchange Method

3-1-1 Overview

The function blocks listed in the following table must be registered/connected in the Loop Control Unit/Board in order for the Monitor Plus Software to access data in the Loop Control Unit/Board. Data is exchanged using the function blocks and the tags set in those function block.

There are 4 possible cases, as shown in the following table.

Case	Data exchanged	Loop Control Unit	Loop Control Board
1	Function block (See note.)	1. Register Send All Blocks (Block Model 462) and Receive All Blocks (Block Model 461). 2. Set CSV tags in the function blocks.	1. Set the HMI function settings in the System Common Block (Block Model 000). 2. Set CSV tags in the function block.
2	Analog signals	When monitoring analog signals: 1. Register the Input Selector (Block Model 162). 2. Set the tags for Monitor Plus in the Input Selector (Block Model 162). 3. Connect the function block's analog signals in the Input Selector (Block Model 162). When setting analog signals: 1. Register the Constant Generator (Block Model 166). 2. Set the tags for Monitor Plus in the Constant Generator (Block Model 166). 3. Connect the function block's analog signals in the Constant Generator (Block Model 166).	
3	Contact signals	1. Register the Contact Distributor (Block Model 201) and Internal Switch (Block Model 209). 2. Set the target and source designations in the Contact Distributor (Block Model 201). 3. Set the tags for Monitor Plus. When setting contact signals: Specify the Internal Switch's (Block Model 209) ITEM tags as settings When monitoring contact signals: Specify the Internal Switch's (Block Model 209) ITEM tags as displays.	
4	User link table	None	Set the user link table.

Note Each function block's ITEM list indicates which ITEMs will be read or written. (An ITEM will not be read or written if "——" is indicated for the R/W Mode in the *According to HMI* or *According to Monitor Plus* columns.)

3-1-2 Exchanging Data with Function Blocks

This section explains how to use Monitor Plus to read and write data in function blocks within the Loop Control Unit or Board.

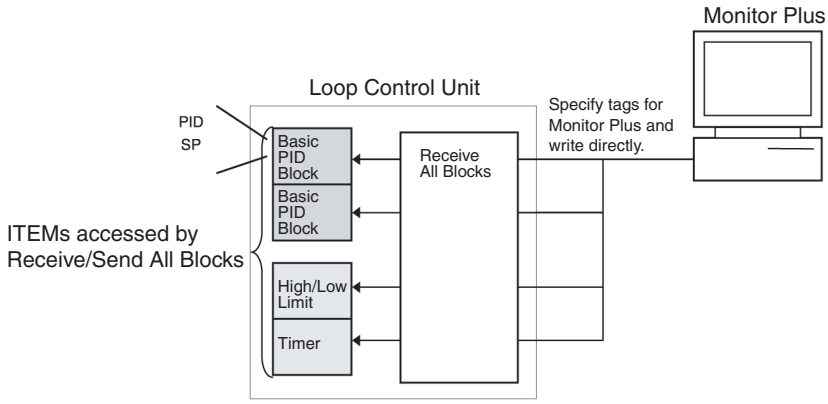
Loop Control Unit

Monitor Plus can be used to set function block data with Receive All Blocks (Block Model 461) and monitor function block data with Send All Blocks (Block Model 462).

Setting Function Block Data from Monitor Plus

Monitor Plus writes data directly to the specified function block's tag. The Receive All Blocks (Block Model 461) function block must be registered in advance.

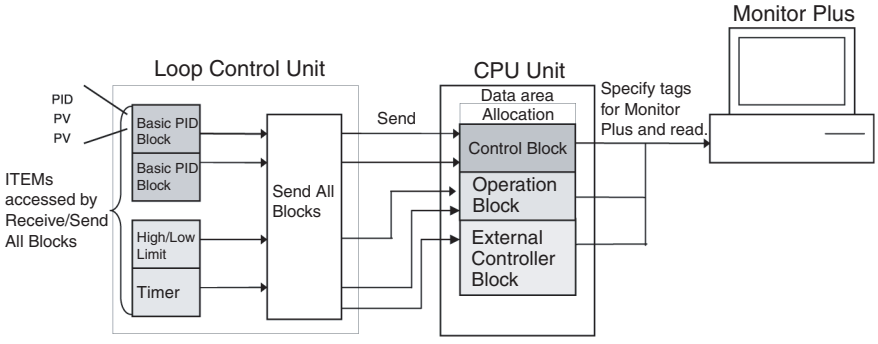
Setting Example:



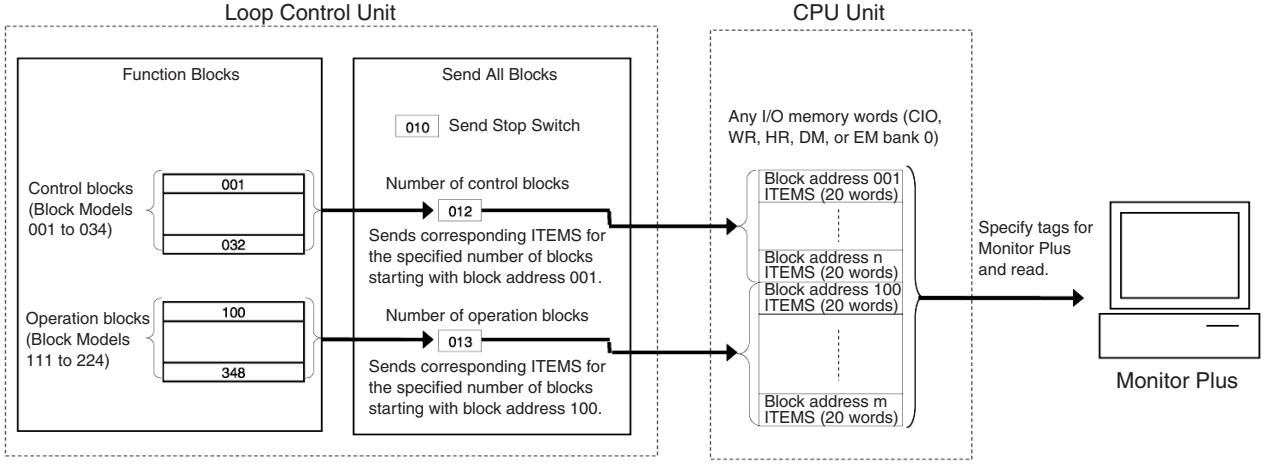
Monitoring Function Block Data from Monitor Plus

Monitor Plus monitors the Loop Control Unit's function block data through the Send All Blocks (Block Model 462) function block.

Monitoring Example:

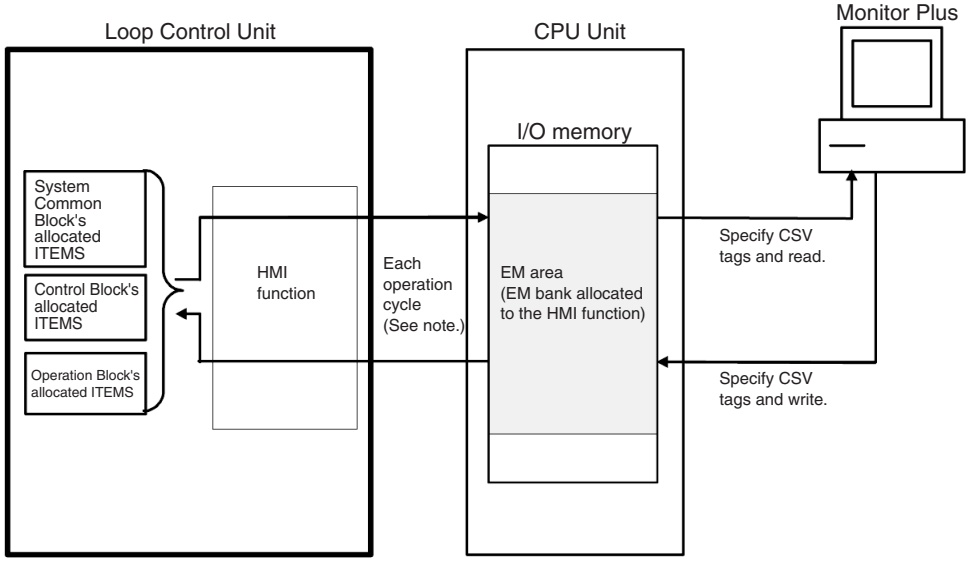


Monitor Plus actually monitors data as shown in the following diagram.



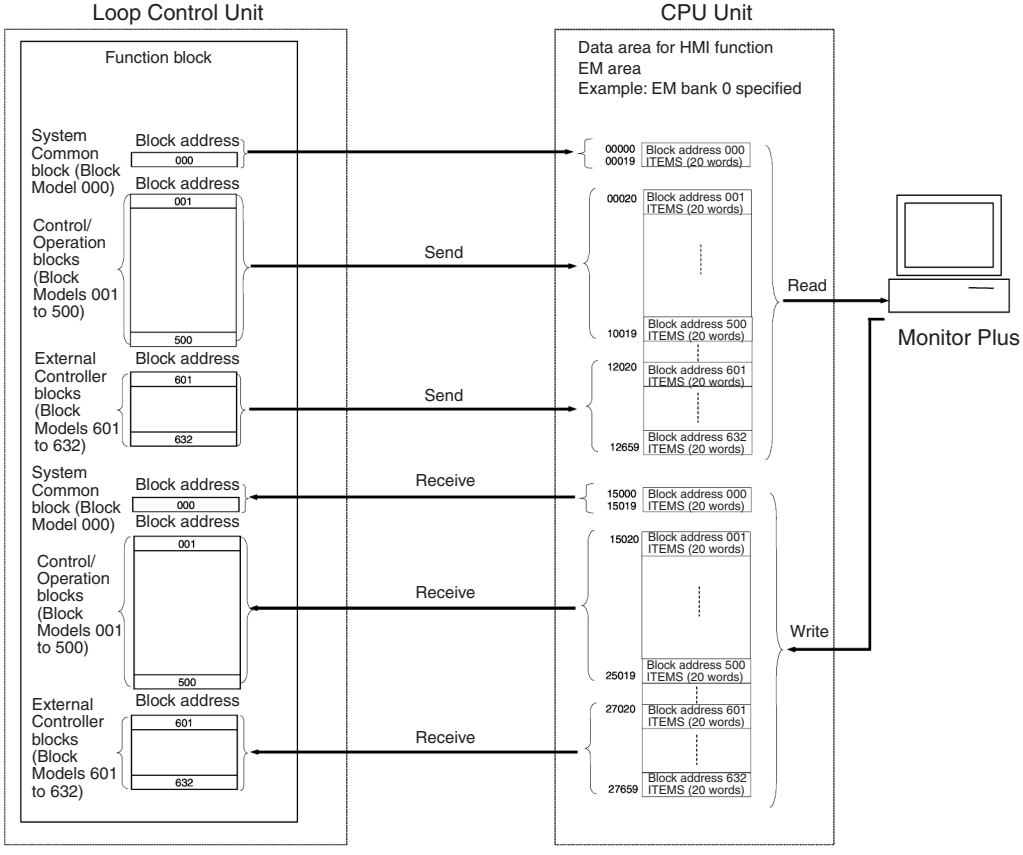
Loop Control Board

Monitor Plus uses the HMI function to set and monitor function block data.



HMI Function

The HMI function constantly exchanges ITEM data (20 words/block) of Control Blocks, Operation Blocks, External Controller Blocks, and the System Common Block with the specified words in an EM bank in the CPU Unit in the order of function block addresses.



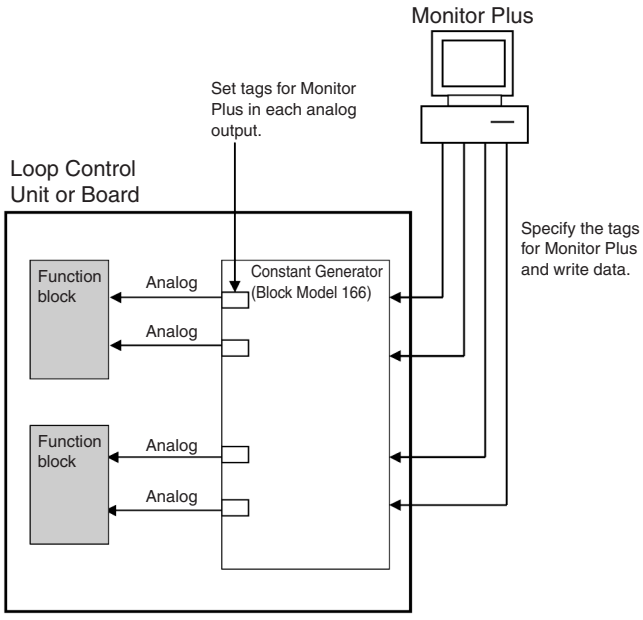
3-1-3 Exchanging Analog Signal Data

The Loop Control Unit or Board's analog signal data can be read and written as follows:

- Setting (Writing) Analog Signal Data
  The Constant Generator (Block Model 166) must be registered and data must be written to each function block's analog item. Set the tags for Monitor Plus in the Constant Generator (Block Model 166) function block's analog ITEMs.
- Monitoring (Reading) Analog Signal Data
  The Input Selector (Block Model 162) must be registered and data must be read from each function block's analog item. Set the tags for Monitor Plus in the Input Selector (Block Model 162) function block's analog ITEMs.

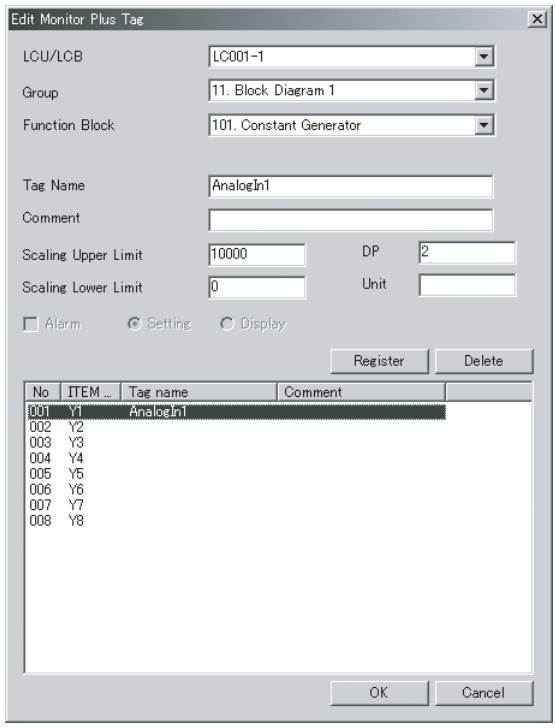
Setting Analog Signals from Monitor Plus

Write data through the tags for Monitor Plus set in the Constant Generator block (Block Model 166) from Monitor Plus. By writing to the Constant Generator block from Monitor Plus, it is possible to set analog values in the function blocks.



1,2,3... 1. Output (connect) the Constant Generator (Block Model 166) to the contact input ITEMs in which you want to set analog values.

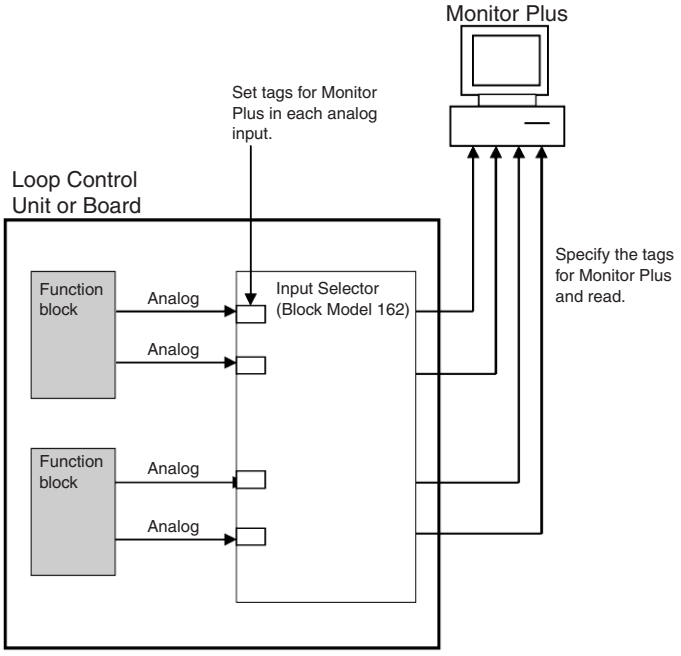
2. Set the tags for Monitor Plus in the Constant Generator (Block Model 166). Set a tag name for each ITEM (Y1 to Y8).



3. Use Monitor Plus to specify the Constant Generator's tags for Monitor Plus and write the data to each ITEM (Y1 to Y8).
4. Use the Contact Distributor (Block Model 201) to write each internal switch's bit data to the specified function block's bits.
5. In the end, the analog values are set in the function block's contact input ITEM.

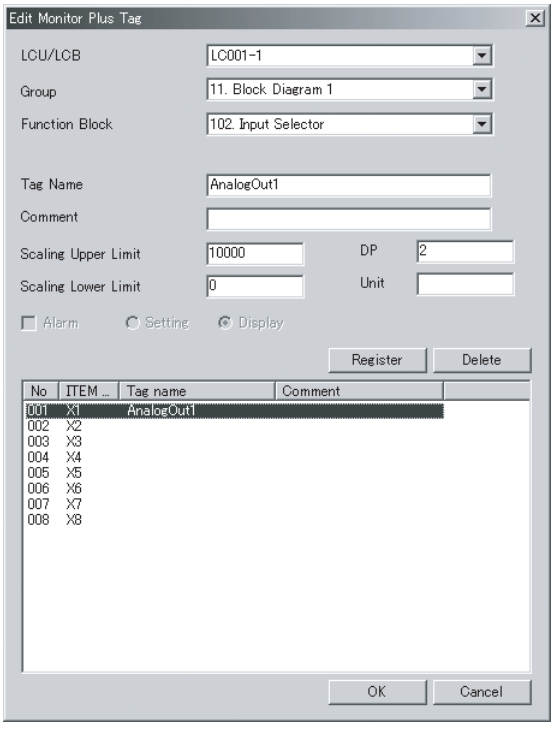
Monitoring Analog Signals from Monitor Plus

Write data through the tags for Monitor Plus set in the Input Selector block (Block Model 162) from Monitor Plus. By reading the analog values that are input to the Input Selector, it is possible to monitor the analog values in the function blocks.



1,2,3...

1. Input (connect) the analog inputs to the Input Selector (Block Model 162) from the function block's contact input ITEMs containing analog values that you want to monitor.
2. Set the tags for Monitor Plus in the Input Selector (Block Model 162). Set a tag name for each ITEM (X1 to X8).

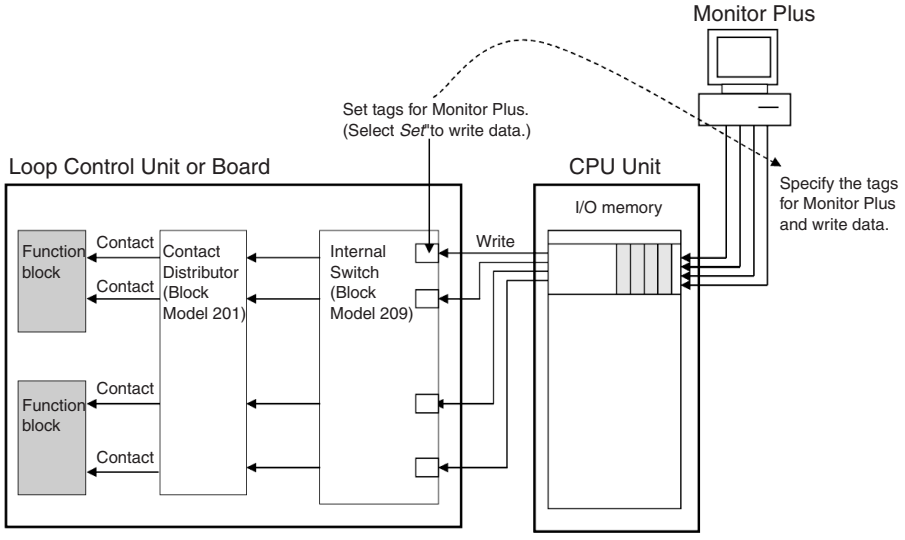


3. Use Monitor Plus to specify the Input Selector's tags for Monitor Plus and read the data from each ITEM (X1 to X8).
4. Use the Contact Distributor (Block Model 201) to write each internal switch's bit data to the specified function block's bits.
5. In the end, the analog values are monitored.

3-1-4 Exchanging Contact Signal Data

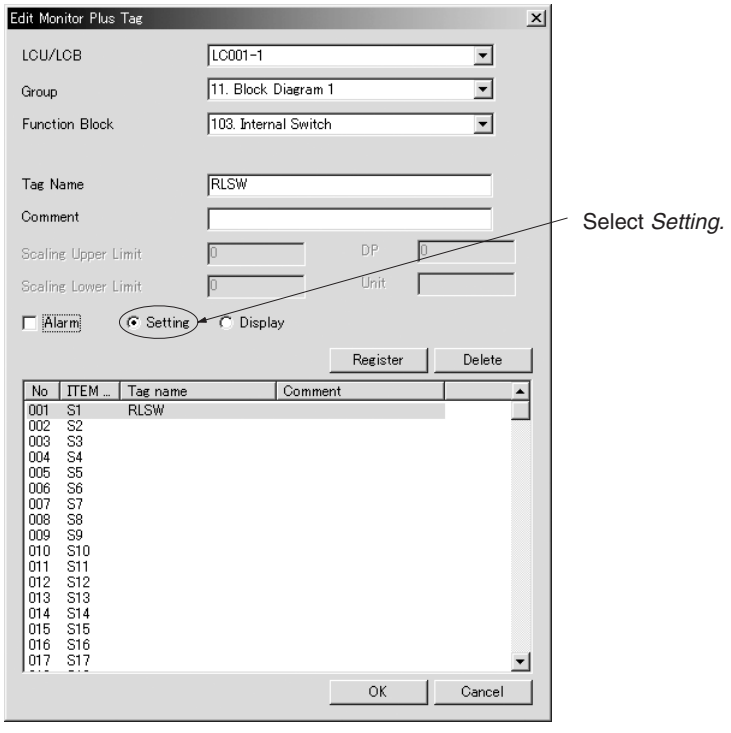
In order to read/write the Loop Control Unit or Board's contact signal data, the Contact Distributor (Block Model 201) and Internal Switch (Block Model 209) blocks must be registered as a set and the Contact Distributor (Block Model 201) must be connected to each function block's contact ITEMs. Set the tags for Monitor Plus in the Internal Switch (Block Model 209) block's bits.

Setting Bits from Monitor Plus



1,2,3...

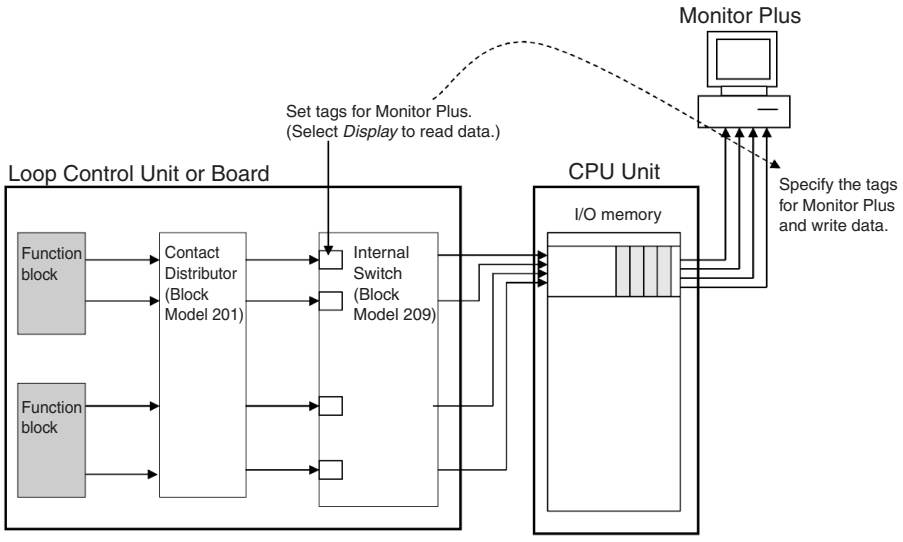
1. Connect the Contact Distributor (Block Model 201) as the destination for the function block's contact input ITEM that you want to set. At the same time, input (connect) the Internal Switch (Block Model 209) from the Contact Distributor (Block Model 201).
2. Set the tags for Monitor Plus in the Internal Switch (Block Model 209). Set a tag name for each ITEM (S1 to S8).



When setting data, select the *Set* Option.

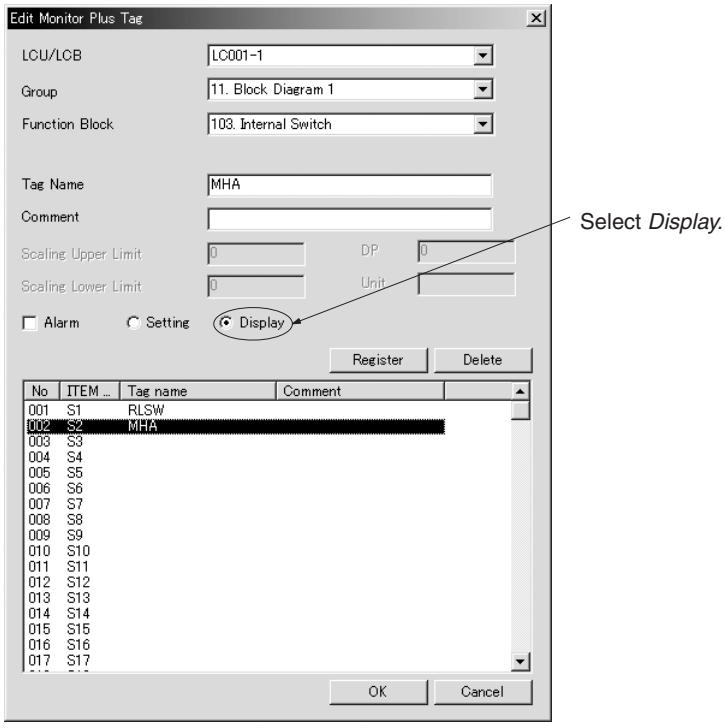
3. Use Monitor Plus to specify the Internal Switch's tags for Monitor Plus and write the data to the Internal Switch's bits through the CPU Unit's data area.
4. Use the Contact Distributor (Block Model 201) to write each internal switch's bit data to the specified function block's bits.
5. In the end, the bits will be set to the function block's contact input ITEMs.

Monitoring Bits from Monitor Plus



1,2,3...

1. Connect the Contact Distributor (Block Model 201) as the source for the function block's contact input ITEM that you want to monitor. At the same time, output (connect) from the Contact Distributor (Block Model 201) to the Internal Switch (Block Model 209).
2. Set the tags for Monitor Plus in the Internal Switch (Block Model 209). Set a tag name for each ITEM (S1 to S8).

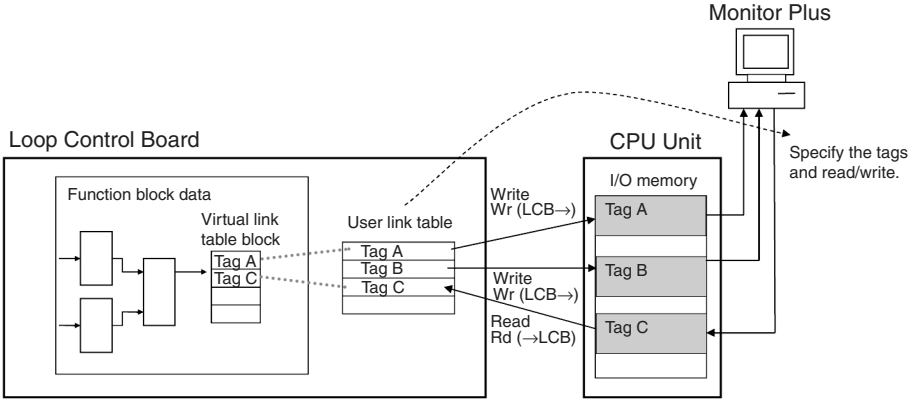


When monitoring data, select the *Display* option.

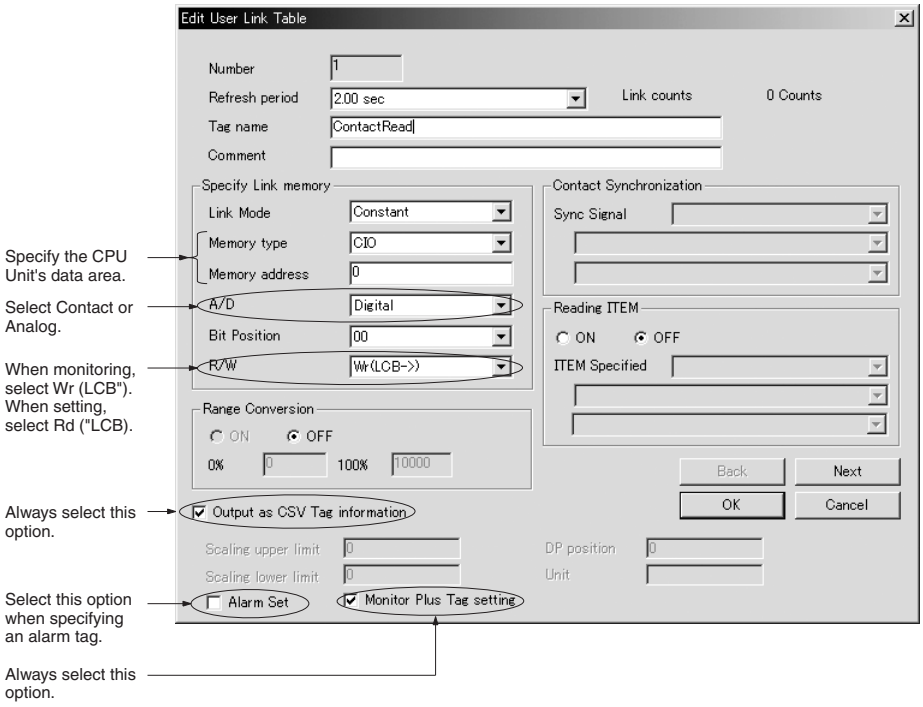
3. Use the Contact Distributor (Block Model 201) to read data to each internal switch's bit.
4. Use Monitor Plus to specify the Internal Switch's tags for Monitor Plus and read Internal Switch's bit data through the CPU Unit's data area.
5. The bit data will monitored.

3-1-5 Exchanging Data with the User Link Table

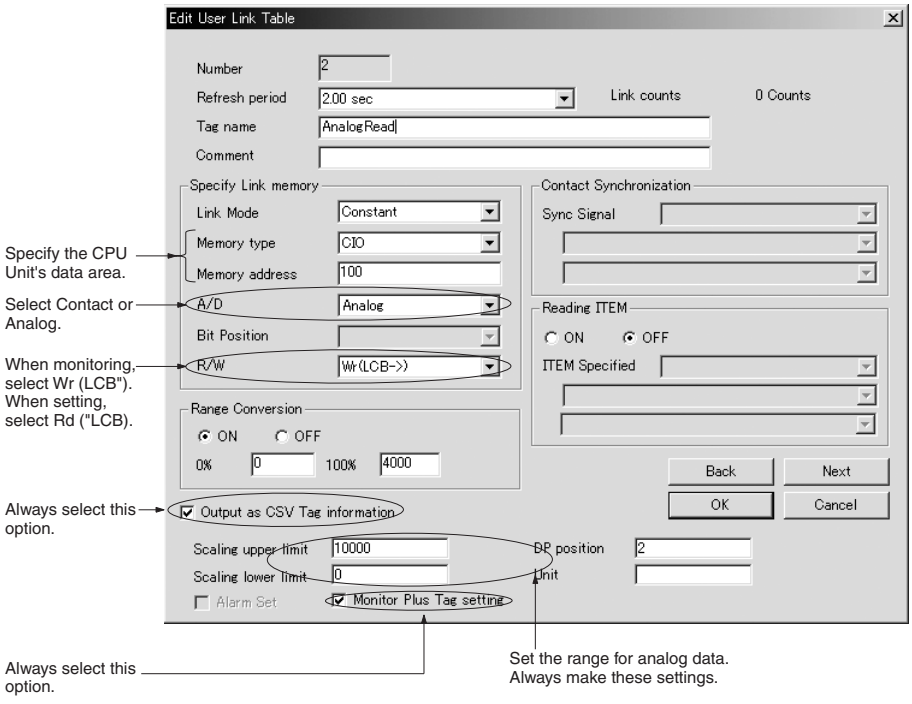
The user link table can be used to read/write data in the CPU Unit's memory. The CPU Unit's memory data areas can be read/written from Monitor Plus by setting tags in this user link table.



Setting/Monitoring Digital Data through the User Link Table



Setting/Monitoring Analog Data through the User Link Table

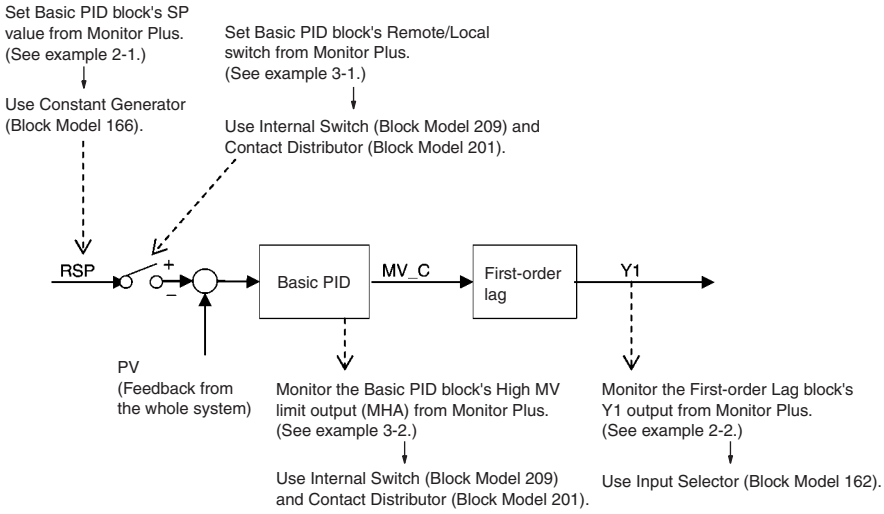


Note 1. The link memory values can be read directly in Monitor Plus when the R/W setting is set to Wr (LCB→) and reading from the ITEM is disabled. When reading the link memory values directly this way, set the Link Mode to an external sync and set the external sync contact to the System Common Block's 020: U0 (always output 0) ITEM.

2. If the above tag values are changed using CX-Process Monitor Plus when the R/W setting is set to "Rd (→LCB)" and writing to the ITEM is enabled, the link memory values in the user link table will be changed and as a result the function block ITEM will be changed.
   When making the setting, make sure that ladder program and function block operations will not be adversely affected.

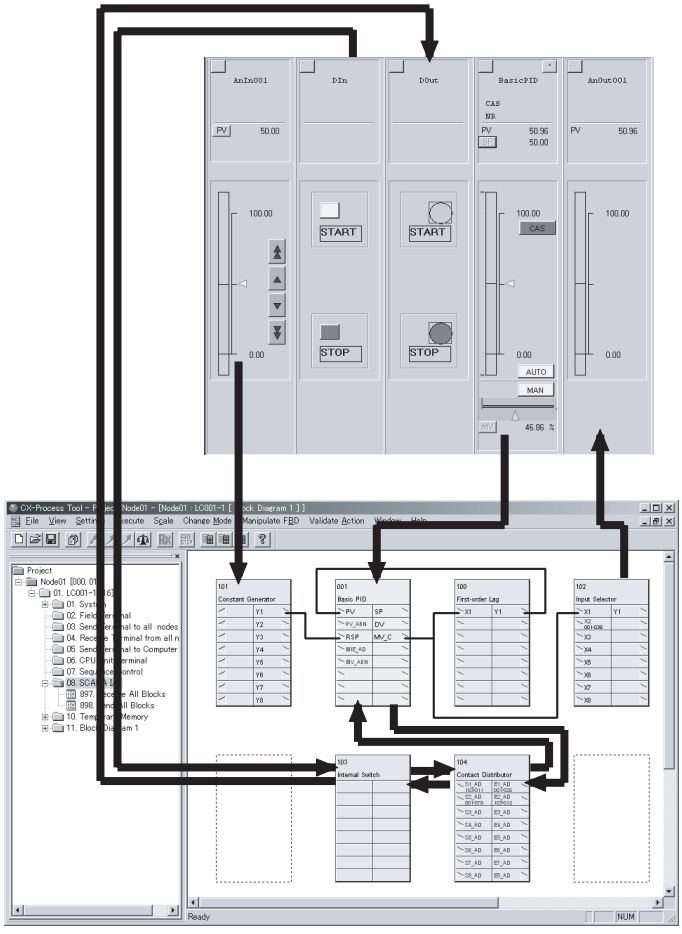
3-2 Example Function Blocks for Data Exchange

This section shows example function blocks that exchange data with Monitor Plus. To explain the operation of the function blocks, the examples show how to monitor the following kind of program from Monitor Plus.



A “main function block” and “monitor function block” are required to create a block diagram for this example.

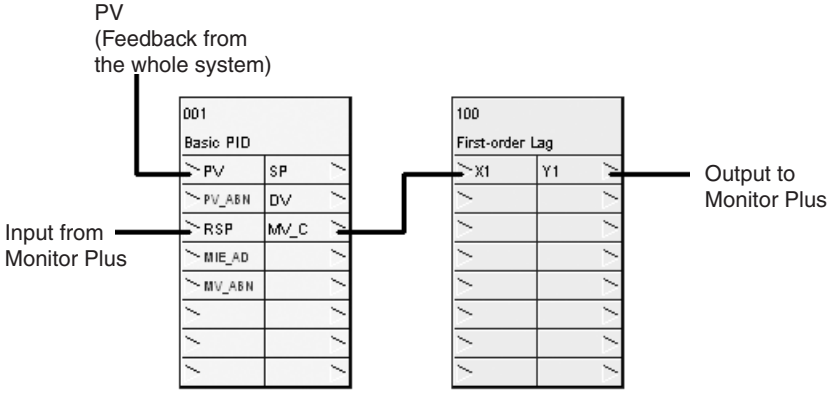
The following project provides the operations required in this example.



Step 1: Creating the Main Function Block

First create the main function block, which is the heart of the control system. This example requires a Basic PID block (Block Model 011) and a First-order Lag block (Block Model 141).

The following diagram shows the main function block.



Note Set ITEM 024 (Set point setting mode) of the Basic PID block to 1 (Remote/Local). The Remote/Local setting mode must be enabled in order for the Remote/Local setting to be made with a contact input.

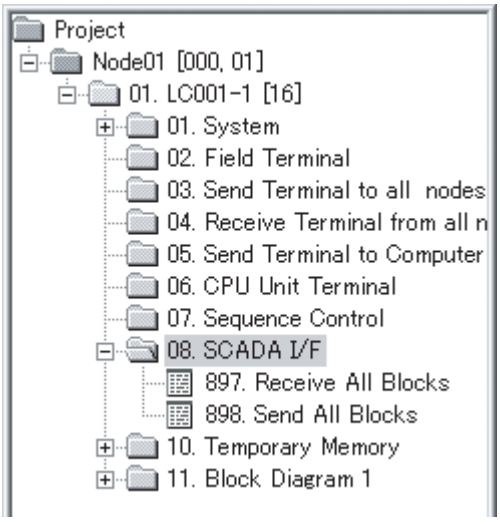
Step 2: Registering Function Blocks for Data Exchange

1. Exchanging Function Block Data

Make the following settings to monitor the MV_C output from the Basic PID block, which is the heart of the control system. Send All Blocks (Block Model 461) and Receive All Blocks (Block Model 462) must be registered in order to monitor the MV_C output from the Basic PID block.

1-1 Registering "Send All Blocks" and "Receive All Blocks"

Register Send All Blocks (Block Model 461) and Receive All Blocks (Block Model 462) in the project, as shown in the following diagram.



1-2 Settings for Send All Blocks and Receive All Blocks

The following ITEMs must be set in the Send All Blocks (Block Model 461) and Receive All Blocks (Block Model 462) function blocks. These settings specify the CPU Unit's allocated data area as well as the number of function blocks that will be sent and received.

- CPU Unit data area
- Leading address of the specified data area
- Number of Control blocks
- Number of Operation blocks
- Number of External Controller blocks

ITEM	Type	ITEM tag	Data	Data Name
		< Initial setting dat...		
001	S	COMMENT	ALL Block Rx Box	Comment
002	S	MODEL	461	Model:Receive All Blocks
004	S	CNT_TM	1.0 sec	Operation cycle
006	S	INT_M	1	Memory initialization at startup
008	S	MS	3	CPU Unit I/O memory area type
009	S	M_AD	00000	Beginning address
012	S	CNT_NO	32	Number of Control Blocks
013	S	CAL_NO	5	Number of Operation Blocks
014	S	SCT_NO	0	Number of Ext. Control Blocks
030	S	CYCL	0	Periodic initialization
031	S	CYCL_TM	4	Initialization interval
		< Operation data >		
007	O	S2	0	Forced memory initialization SW
010	O	S3	0	Reception stop switch
020	O	S1	0	Forced read switch

The following settings are made in this example.

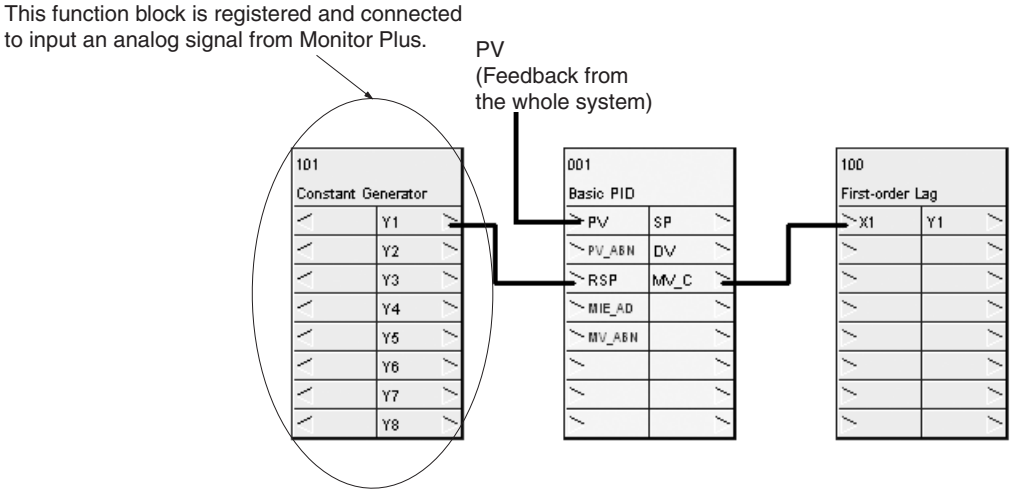
ITEM	Send All Blocks (Block Model 462)	Receive All Blocks (Block Model 461)
Data area	3:D (DM area)	
Leading address	00000	10000
Number of Control blocks	32 (default setting)	
Number of Operation blocks	5 (Five are used in this example.)	
Number of External Controller blocks	0	

2. Exchanging Analog Signal Data

2-1 Setting Analog Data from Monitor Plus

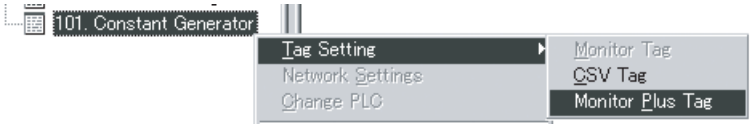
Example: Setting the Basic PID block's RSP value from Monitor Plus

This step registers a function block that inputs an analog signal from Monitor Plus to the Basic PID block. In this case, an analog input is being sent from Monitor Plus, so the Constant Generator (Block Model 166) is registered and connected.

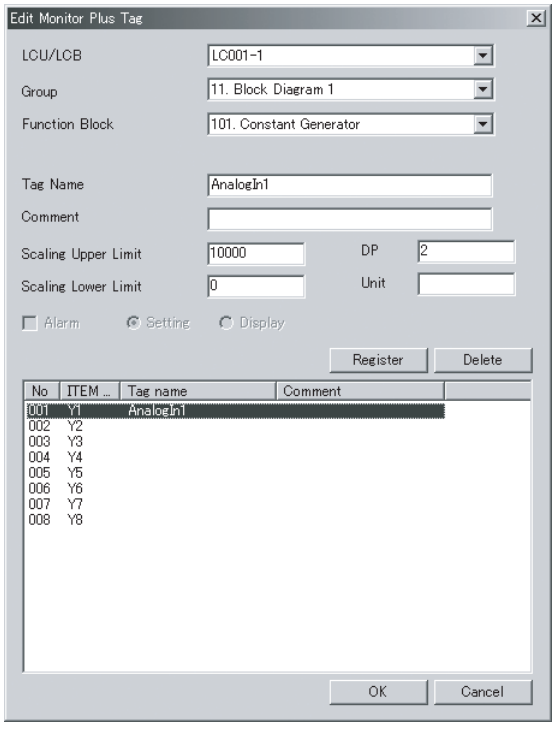


Setting the Tag for Monitor Plus

This step sets the tags for Monitor Plus needed to set an analog signal in the Constant Generator (Block Model 166) from Monitor Plus. This tag is specified from Monitor Plus to set the analog value.



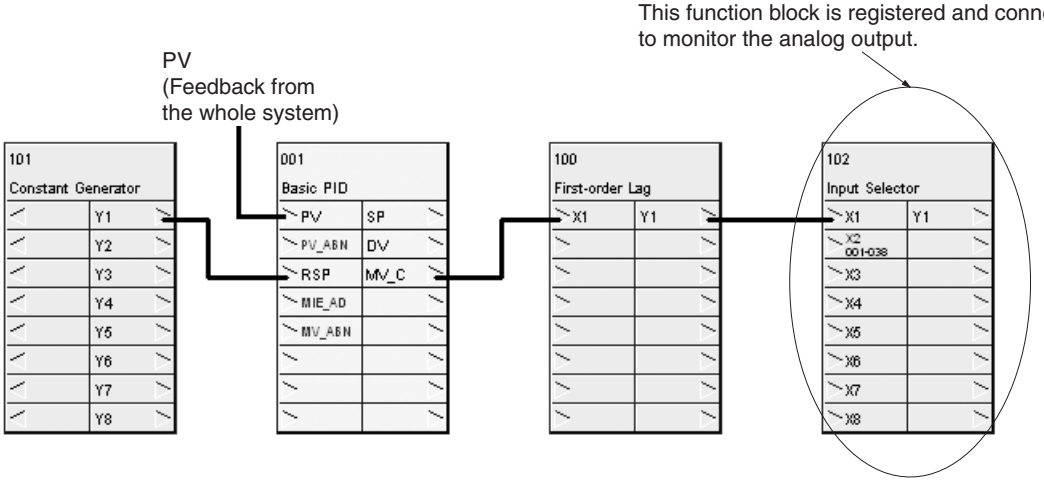
Tag name “AnalogIn1” is set for ITEM Y1.



2-2 Creating a Function Block to Monitor Data from Monitor Plus

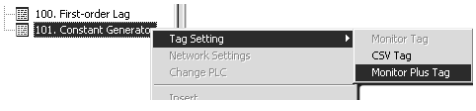
Monitoring the Filtered PID Output from Monitor Plus

This step registers a function block that monitors the analog output from the First-order Lag block (the filtered PID Block output). In this case, an analog input is being monitored from Monitor Plus, so the Input Selector (Block Model 162) is registered and connected.

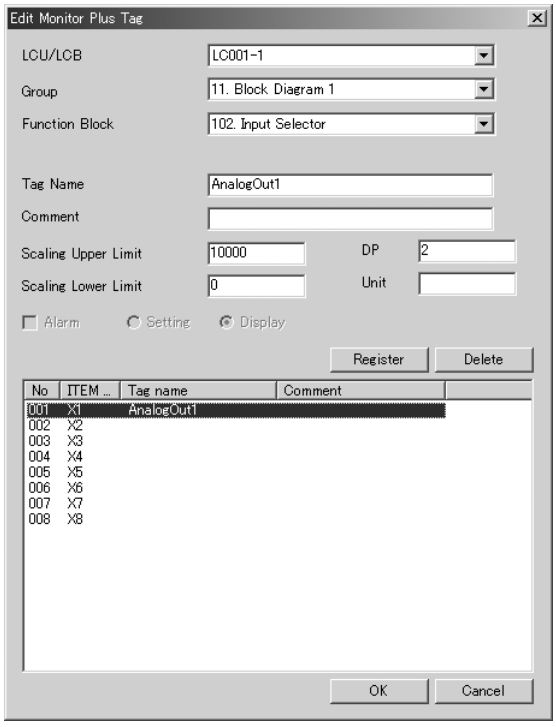


Setting the Tags for Monitor Plus

This step sets the tag for Monitor Plus needed to monitor the analog signal in the Input Selector (Block Model 162). This tag is specified from Monitor Plus to monitor the analog value.



In this case, the tag name “AnalogOut1” is set for ITEM X1.

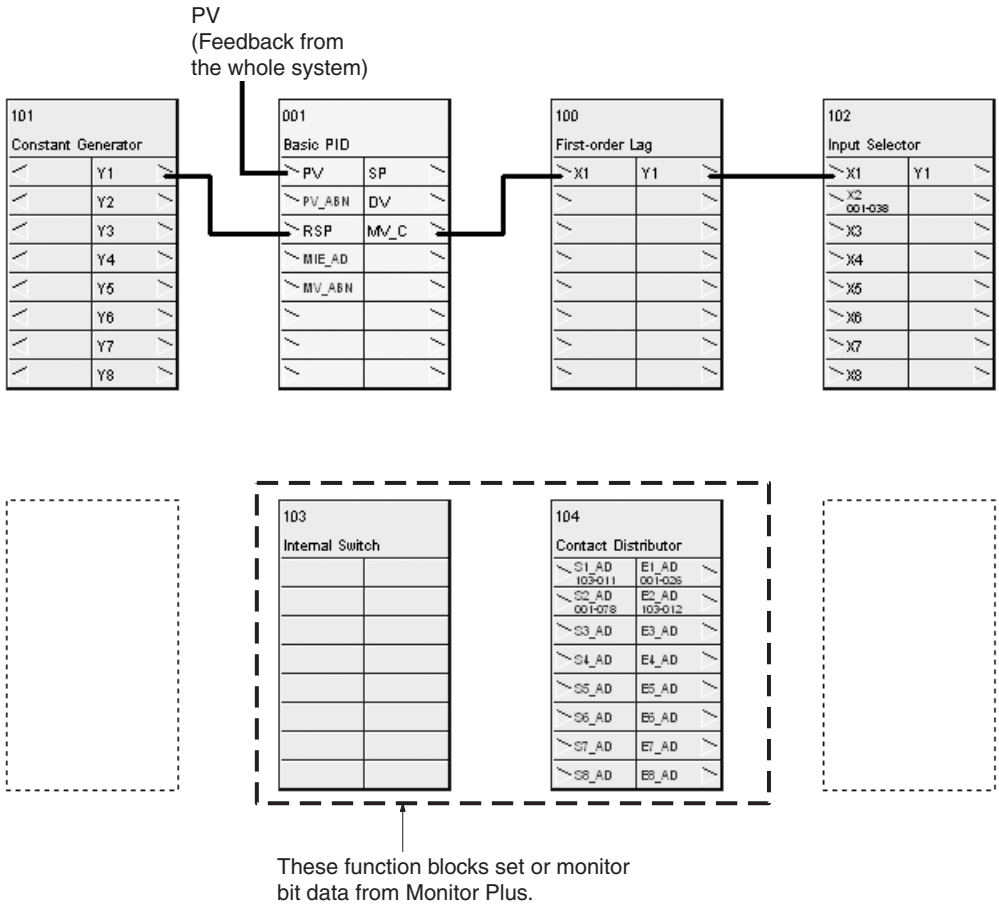


Creating Function Blocks to Set/Monitor Bit Data

This step registers and connects a function block that sets or monitors another function block’s bit data from Monitor Plus. The Contact Distributor (Block Model 201) and Internal Switch (Block Model 209) blocks must be used because bit data is being set or monitored.

Bit data is set or monitored through the CPU Unit’s I/O memory and the Loop Control Unit or Board’s internal memory. The direction of connections must be correct to transfer the data properly.

Note It is not necessary to go through the Contact Distributor when using bits in a sequence table or step ladder.



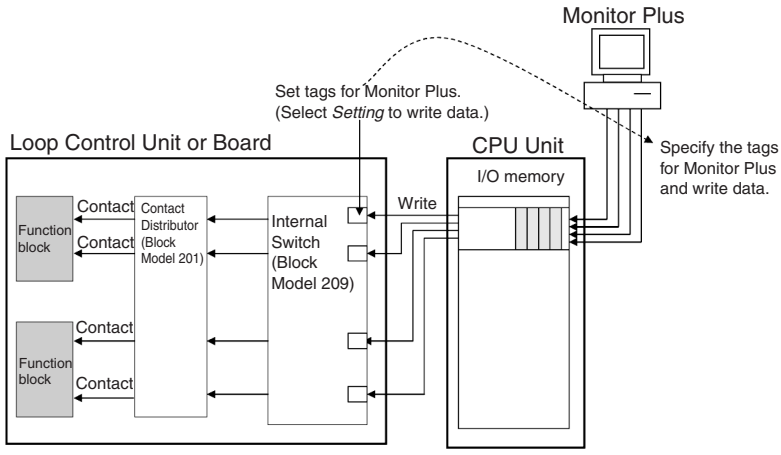
3-1 Setting a Bit (Contact)

Example: Setting the Basic PID block's R/L Switch from Monitor Plus

The following steps are required to set a bit's status.

1,2,3...

1. Write the data to the CPU Unit's data area from Monitor Plus, read this data with the Internal Switch (Block Model 209), and write it to the Loop Control Unit or Board's internal memory.
2. Use the Contact Distributor (Block Model 201) to input the data (written to internal memory in step 1) to the function block's bit. In this case, the bit data is input to the Basic PID block's Remote/Local Switch ITEM.
3. Set the tag for Monitor Plus (used to set the bit from Monitor Plus) in the Internal Switch's bit. In this case, S1's tag name is set to RLSW.

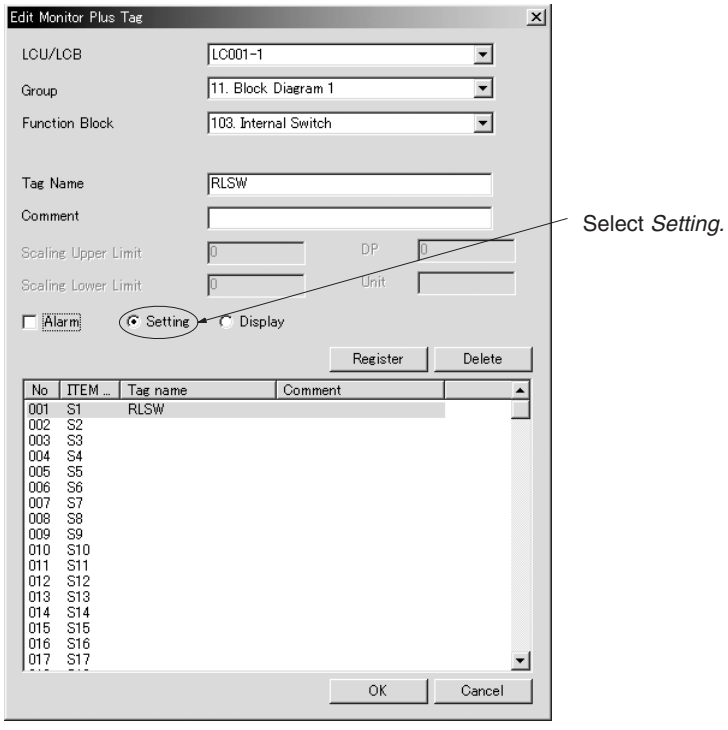


Actual Setting Procedure

The following settings are used to set a bit's status from Monitor Plus.

1,2,3...

1. Set the tag for Monitor Plus in the Internal Switch (Block Model 209) block's S1 ITEM. Set the tag type to *Set*.



2. Set the Contact Distributor block's S1_AD ITEM (S1 source designation) to the Internal Switch block's S1 ITEM. In this case, S1_AD is set to 103011.
3. Set the Contact Distributor block's E1_AD ITEM (E1 destination) to the Basic PID block's R/L_SW ITEM (Remote/Local switch). In this case, E1_AD is set to 001026.

Node01 : LC001-1 11.104 Contact Distributor

ITEM	Type	ITEM tag	Data	Data Name
		< Initial setting dat...		
001	S	COMMENT	Contact Distributor	Comment
002	S	MODEL	201	Model:Contact Distributor
004	S	CNT_TM	System common operation ...	Operation cycle
006	S	TYPE	0	Output type
007	S	S1_AD	103.011	S1 source designation
008	S	E1_AD	001.026	E1 destination designation
009	S	S2_AD	001.078	S2 source designation
010	S	E2_AD	103.012	E2 destination designation
011	S	S3_AD	000.000	S3 source designation
012	S	E3_AD	000.000	E3 destination designation
013	S	S4_AD	000.000	S4 source designation
014	S	E4_AD	000.000	E4 destination designation
015	S	S5_AD	000.000	S5 source designation
016	S	E5_AD	000.000	E5 destination designation
017	S	S6_AD	000.000	S6 source designation
018	S	E6_AD	000.000	E6 destination designation
019	S	S7_AD	000.000	S7 source designation
020	S	E7_AD	000.000	E7 destination designation
021	S	S8_AD	000.000	S8 source designation
022	S	E8_AD	000.000	E8 destination designation
		< Operation data >		

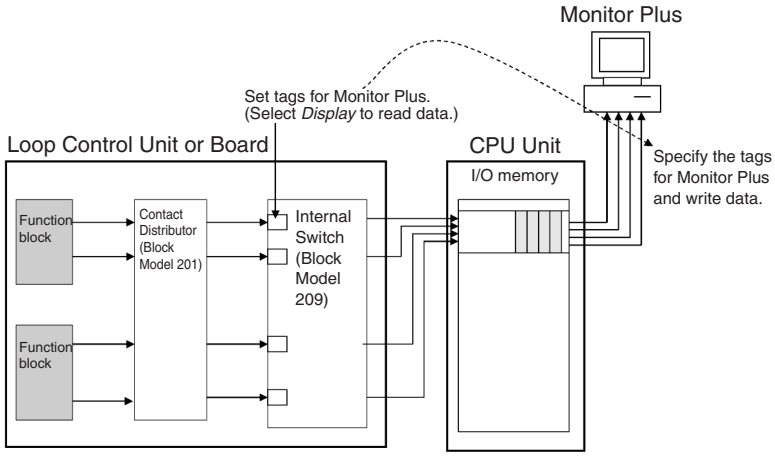
3-2 Monitoring a Contact (Bit)

Example: Monitoring the Basic PID block's High MV Limit Output (MHA) from Monitor Plus

The following steps are required to monitor a bit's status.

1,2,3...

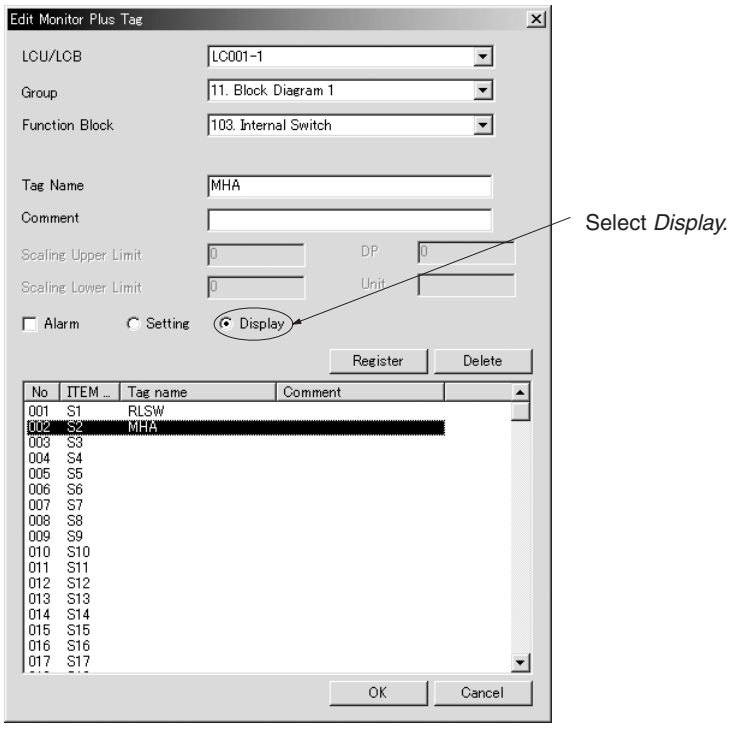
1. Use the Contact Distributor (Block Model 201) to temporarily store the function block's bit status in the Loop Control Unit or Board's memory.
2. Use the Internal Switch (Block Model 209) to read the temporarily stored data from memory and write it to the CPU Unit's data area.
3. Set the tag for Monitor Plus (used to monitor the bit from Monitor Plus) in the Internal Switch's bit. In this case, S2's tag name is set to MHA.



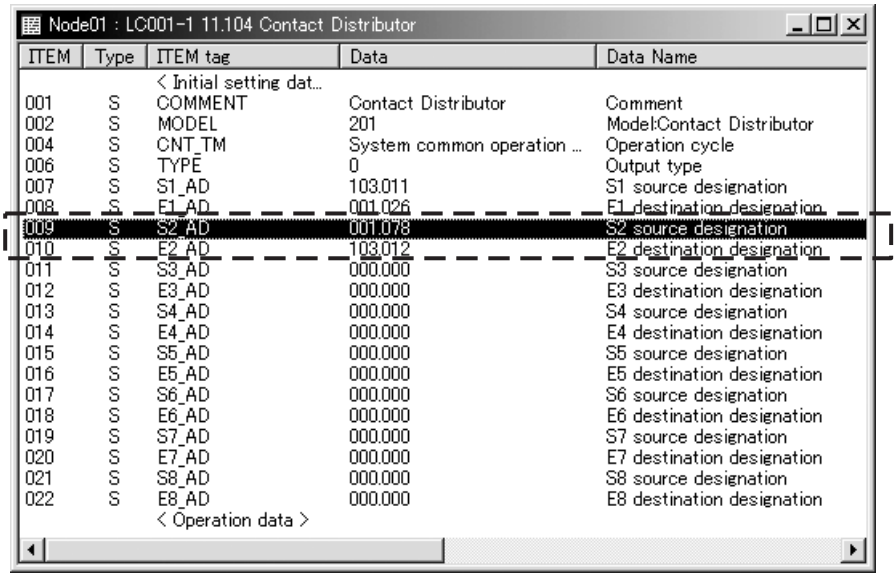
Actual Setting Procedure

The following settings are used to monitor a bit's status from Monitor Plus.

1,2,3... 1. Set the tag for Monitor Plus in the Internal Switch (Block Model 209) block's S2 ITEM. Set the tag type to *Display.* Set the tag name to MHA.



2. Set the Contact Distributor block's S2_AD ITEM (S2 source designation) to the Basic PID block's MHA ITEM (High MV Limit Output). In this case, S2_AD is set to 001078.
3. Set the Contact Distributor block's E2_AD ITEM (E2 destination) to the Internal Switch (Block Model 209) block's S2 ITEM. In this case, E2_AD is set to 103012.



3-3 Loop Control Unit Precautions

3-3-1 System Information Area Settings

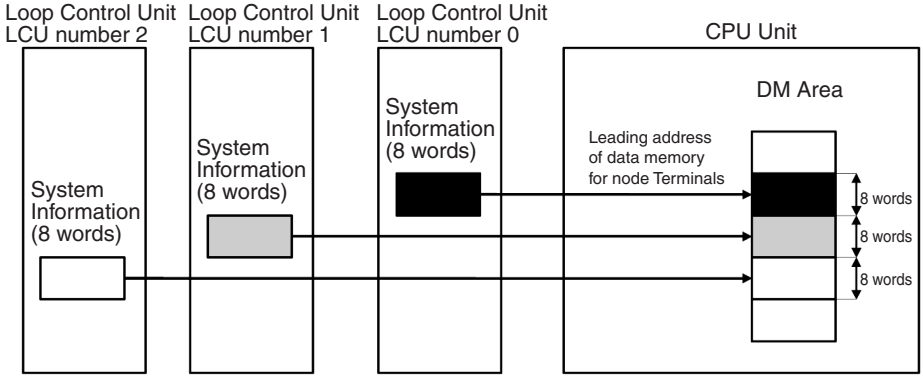
When monitoring a Loop Control Unit with Monitor Plus, the "system information area" is used to display and set the system information. To use the system information area, the following data must be set in the System Common block (Block Model 000) in the Loop Control Unit.

Default Settings to the System Common block (Block Model 000)

ITEM	Function	Setting range	Default
043	Leading address (S) of the data memory for node Terminals	0 to 32767	16020
042	LCU number A unique LCU number identifies each Loop Control Unit when there are multiple Loop Control Units (3 Units max.) mounted in the CPU Rack.	0 to 2	0

System Information

System information is information such as the Loop Control Unit's unit address and operating information. When the Loop Control Unit starts, this information is written to the 24 words (8 words per Loop Control Unit) starting with the leading address the data memory for node Terminals.



Note

1. The default leading address of the data memory for node Terminals is D16020 and the default LCU number is 0. Accordingly, the default location for the system information is the eight words from D16020 to D16027 when the Loop Control Unit is started. If the Loop Control Unit is being used with its default settings, do not use words D16020 to D16027 for any other applications.
2. When two or three Loop Control Units are mounted in the same CPU Rack, set a unique LCU number (ITEM042) in each Loop Control Unit to distinguish the Units. In addition, set the same leading address of the data memory for node Terminals (ITEM043) in each Loop Control Units.

3-3-2 Applicable Versions

The Send All Blocks (Block Model 461) and Receive All Blocks (Block Model 462) are not supported by Loop Control Units prior to version 2.0. CX-Process Monitor Plus thus cannot be used with Loop Control Units prior to version 2.0.

SECTION 4
Monitor Screen Functions and Operations

This section describes the monitor screens used with the CX-Process Monitor Plus.

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4-1 Outline

This section explains the functions and operations for each screen primarily for those people who will operate CX-Process Monitor Plus. The explanations assume that CX-Process Tool settings and screen configuration for the CX-Process Monitor Plus have already been completed.

Refer to *SECTION 5 Configuration Screens* for how to configure CX-Process Monitor Plus screens. Also, refer to the *CX-Process Tool Operation Manual* (W372) for CX-Process Tool settings.

CX-Process Monitor Plus screen configuration is already completed, monitor the Loop Control Unit/Board mainly by performing the following operations.

1,2,3...

1. Start CX-Process Monitor Plus (refer to *4-4 Starting and Stopping the CX-Process Monitor Plus*).
2. In the CX-Process Monitor Plus Main Window, click the **Run** Button to display the Overview Screen (refer to *4-5 Overview Screen*).
3. From the Overview Screen, move to each of the following screens.
   - Control Screen (see *4-7 Control Screens*)
   - Tuning Screen (see *4-8 Tuning Screens*)
   - Trend Screen (see *4-9 Trend Screens*)
   - Batch Trend Screen (see *4-10 Batch Trend Screens*)
   - Segment Program 2 Screen (see *4-11 Segment Program 2 Screens*)
   - Graphic Screen (see *4-12 Graphic Screens*)
   - Annunciator Screen (see *4-13 Annunciator Screens*)
   - Operation Guide Screen (see *4-14 Operation Guide Screens*)
   - Alarm Log Screen (see *4-15 Alarm Log Screens*)
   - Operation Log Screen (see *4-16 Operation Log Screens*)
   - System Monitor Screen (see *4-17 System Monitor Screens*)
   - System Monitor Log Screen (see *4-18 System Monitor Log Screens*)

4-2 Using the CX-Process Monitor Plus

Preparations on the CX-Process Tool

1,2,3...

1. Set the network address, node address, and unit address.
2. Register the function blocks for data exchange with the CX-Process Monitor Plus.
3. Set CSV tags and tags for the CX-Process Monitor Plus.
4. Generate the tag file for Monitor Plus.
5. Download the function block data to the Loop Control Unit/Board.

Operations on the CX-Process Monitor Plus

6. Start the CX-Process Monitor Plus.
7. In the Main Window, click the **Run** Button to compile the monitor tag file. (See note.)
8. In the Overview Screen, select **Control Screen**, **Trend Screen**, etc. as required.

Note Steps 7. will not be required and a specified screen will be displayed if autostarting is enabled. Autostarting can be enabled by clicking the **System Info.** Button when configuring the screen and then setting the Auto-start–Auto-start setting to *Enable*.

4-3 CX-Process Tool Procedures

The following six steps must be performed on the CX-Process Tool to pass tag data to the CX-Process Monitor Plus.

1,2,3...

1. Set the network address, node address, and unit address.
2. Register and connect the function blocks that exchange data with the CX-Process Monitor Plus.
3. Set the CSV tags and the tags for Monitor Plus.
4. Generate the tag file for Monitor Plus.
5. Download the function block data to the Loop Control Unit/Board.
6. Compile the monitor tag files.

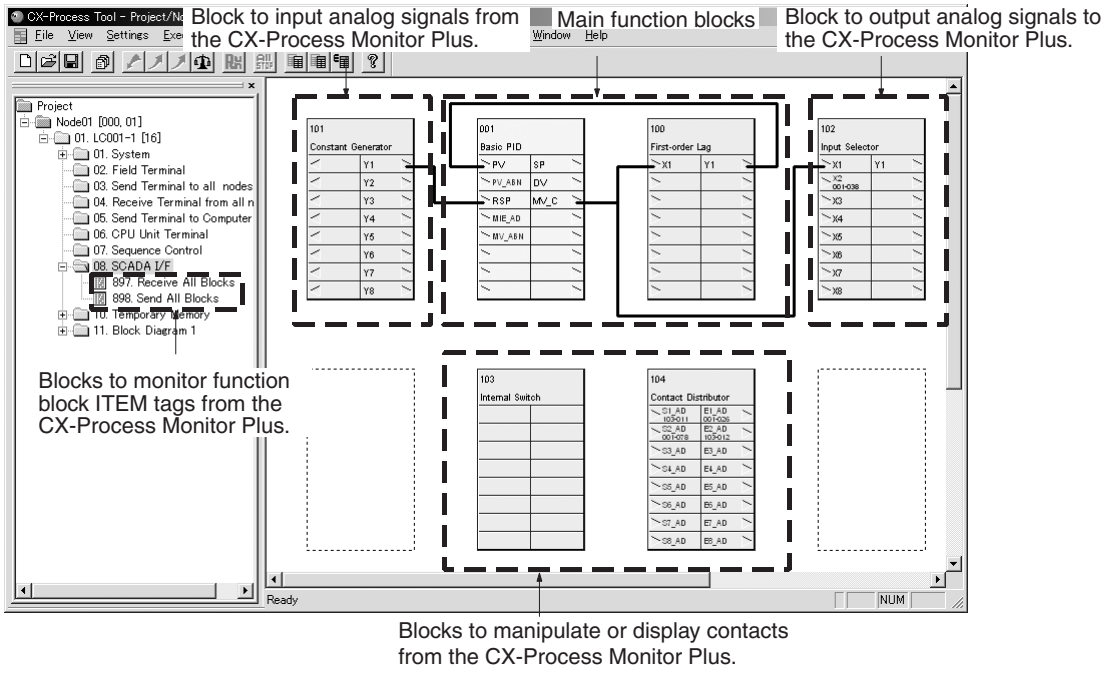
Set Network Address, Node Address, and Unit Address.

The CX-Process Monitor Plus uses the network address, node address, and unit address set using the CX-Process Tool (***Settings/Network Settings*** or ***Settings/Change PLC***) for communications with the PLC. The communications settings for the CX-Process Monitor Plus and thus made from the CX-Process Tool.

Note The CX-Process Monitor and CX-Process Monitor Plus use FinsGateway as the communications driver for connections with the PLC. When using the CX-Process Monitor or CX-Process Monitor Plus, always set FinsGateway as the communications driver for the CX-Process Tool. If the CX-Server is set, the CX-Process Monitor or CX-Process Monitor Plus will not be able to go online with the PLC.

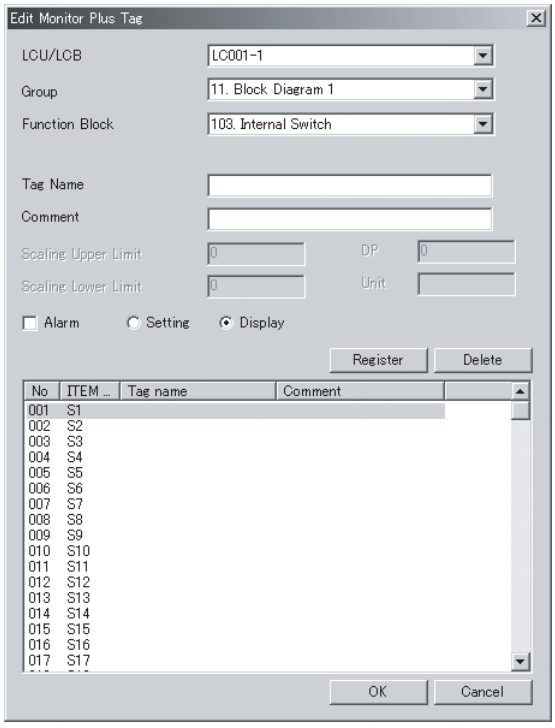
Register and Connect Function Blocks To Exchange Data with CX-Process Monitor Plus.

Item	Loop Control Unit	Loop Control Board
Function block data to exchange	Send All Blocks block (Block Model 462) and Receive All Blocks block (Block Model 461)	HMI settings in the System Common block (Block Mode 000)
Contact signals to exchange	Contact Distributor (Block Model 201) or Internal Switch (Block Model 209)	
Analog signals to exchange	Input Selector block (Block Model 162) and Constant Generator block (Block Model 166)	



Set CSV Tags and Tags for Monitor Plus.

Always set the CSV tags and tags for the CX-Process Monitor Plus. The CX-Process Monitor Plus recognizes CSV tags and tags for the CX-Process Monitor Plus using tag names.
Example for Internal Switch Block (Block Model 209)



Item	No. of character	Prohibited characters
Tag names	16 max.	None
Tag comments	16 max.	None

Note Set the range upper limit (RH) and range lower limit (RL) for scaling on the CX-Process Monitor Plus to the range given in the following table.

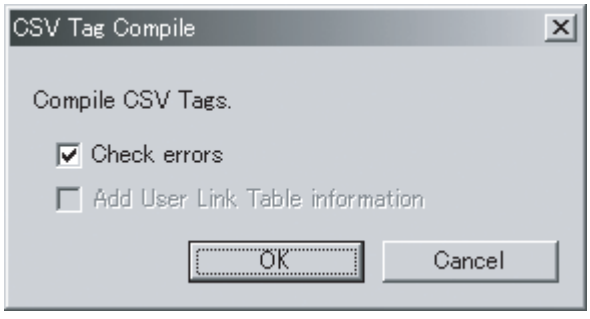
Number of digits	5 max. including sign and decimal point
Numeric range	–5000 to 99999 Example with one digit below the decimal point: –550.0 to 9999.9

Generate Tag File for Monitor Plus.

Generate the tag file for Monitor Plus using the following procedure.

1,2,3...

1. Select ***Execute – Output Tag File – Monitor Plus Tag.*** The following window will be displayed. To execute an error check, select the option to perform an error check.



2. Click the **OK** Button. Compilation of CSV tags and tags for Monitor Plus will begin. The following message will be displayed if compilation ends normally.

Note If the tag file for Monitor Plus is output while the CX-Process Monitor Plus is running, the following dialog box will be displayed.

Tag information will not be updated if a tag file for Monitor Plus is output during CX-Process Monitor Plus operation. To update the tag file, restart the CX-Process Monitor Plus.

Download Function Block Data to Loop Control Unit/ Board.

Download the function blocks.

Compile Monitor Tag Files.

The monitor tag file is automatically generated when the CX-Process Monitor Plus is started.

For details on starting the CX-Process Monitor Plus, refer to *5-2-1 Starting and Stopping the CX-Process Monitor Plus*.

Monitor tag files that are generated will be created under the following directory and file name.

For details on setting database path, refer to *5-5-2 Overview of Screen Registration* on page 176.

File names: mtagmst and mtagsubmst

⚠ **WARNING** After changing the CX-Process Monitor Plus tag settings or network configuration, set the CX-Process Monitor Plus screen configuration correctly according to the new settings.
Incorrect settings may result in unexpected operation.

4-4 Starting and Stopping the CX-Process Monitor Plus

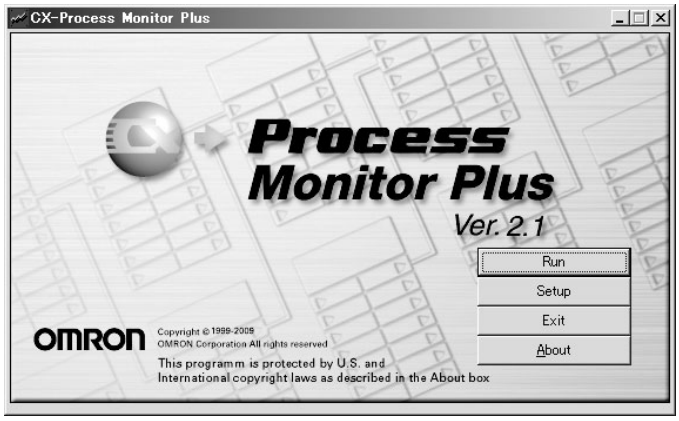
4-4-1 Starting the CX-Process Monitor Plus

This section explains how to start and stop the CX-Process Monitor Plus.

1,2,3...

1. Select **Start** – **Programs** – **Omron** – **CX-Process Monitor Plus** – **CX-Process Monitor Plus**.

   The CX-Process Monitor Plus's Main Window will be displayed.



   Note When you have finished using CX-Process Monitor Plus, click the **Exit** Button in the Main Window. The Main Window and CX-Process Monitor Plus will both close.

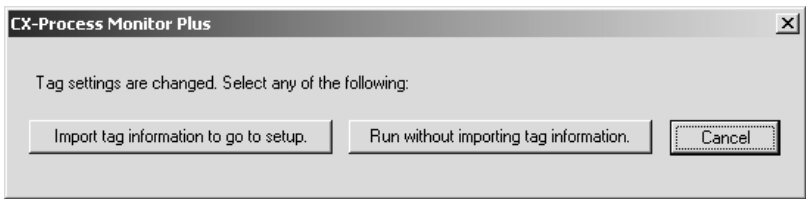
2. Click the **Run** Button.

   The monitoring process will be started, and the Overview Screen will be displayed. (Refer to *4-5 Overview Screen*.)

   When the configuration has been completed, monitoring can be started from the Overview Screen. Refer to *SECTION 5 Configuration Screens* for configuration.

Note

1. If auto-starting has been specified (i.e., if the *Auto-start enabl*e option is selected in the Auto-start settings), the screen that has been set will be displayed directly. (Refer *5-7 Checking Configurations*.)
2. When new tag or network information settings are made, the following dialog box will be displayed.



Import Tag Information to Go to Setup Button:

Regenerates the monitor tag file from the CX-Process Monitor Plus tag file. When this button is clicked, a dialog box will be displayed to input the password. For details on passwords, refer to *5-2-2 Setting Passwords*.

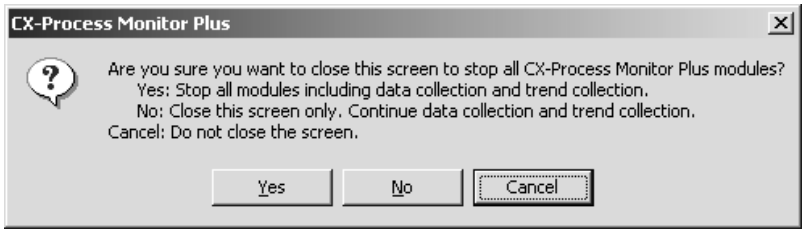
Run without Importing Tag Information Button:

Starts monitoring according to the tag information from the previous monitoring.

4-4-2 Stopping the CX-Process Monitor Plus

To stop the CX-Process Monitor Plus, click the **Close** Button at the top right of the Overview Screen. If a monitoring process, such as data or trend collection, is in progress, a dialog box will be displayed to confirm that the process is to be stopped.

Select ***Yes*** to end the monitor process. Select ***No*** to continue running the monitor process.

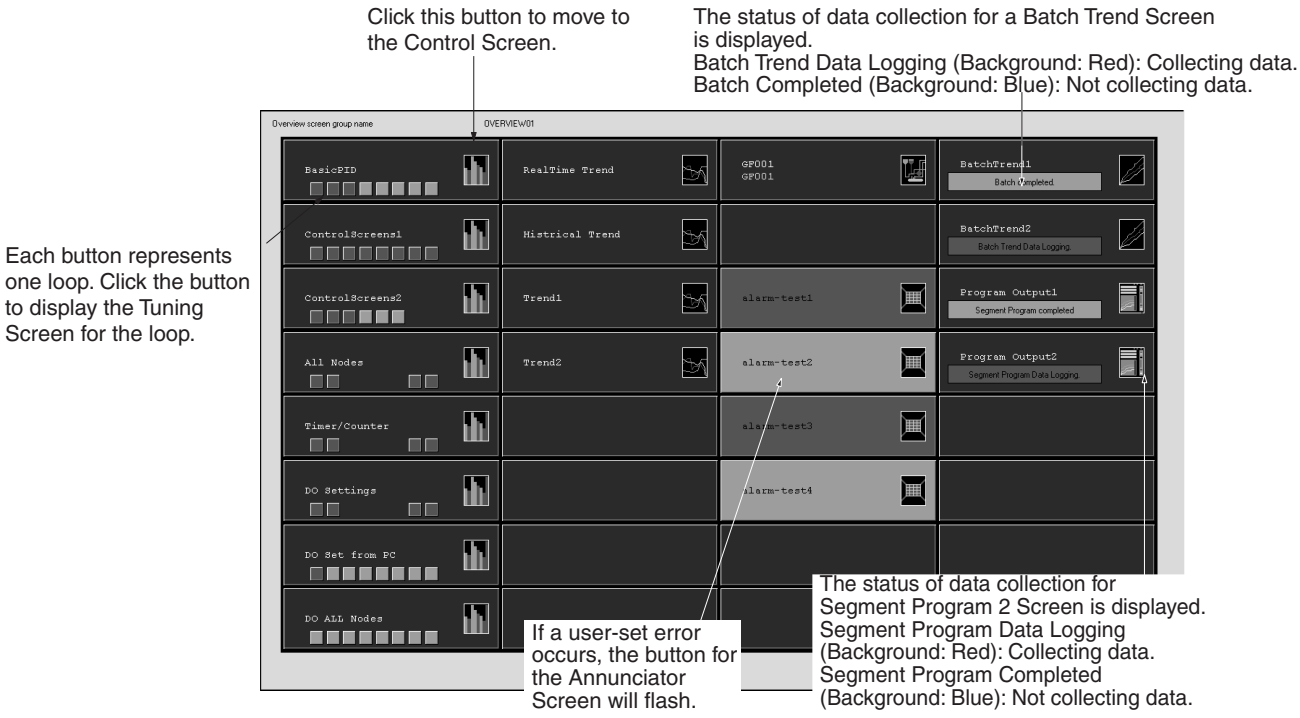


Note **Stopping a Monitoring Process That Was Continued:**
Use the following procedure to stop a process that was continued by clicking the **No** Button in the above dialog box.

1. Start the CX-Process Monitor Plus.
2. Click the **Exit** Button in the CX-Process Monitor Plus Main Window. The dialog box will again be displayed to confirm that the process is to be stopped. Click the **Yes** Button.
   The CX-Process Monitor Plus will be closed and the monitoring process will be stopped.

4-5 Overview Screen

The Overview Screen displays all the menu screens and displays alarms.



The button icons for the registered Control Screen, Trend Screen, Batch Trend Screen, Graphic Screen, Segment Program 2 Screen, and Annunciator Screen will be displayed.

Icon	Screen type	Icon	Screen type
	Control Screen		Segment Program 2 Screen
	Trend Screen		Graphic Screen
	Batch Trend Screen		Annunciator Screen

Each screen displays eight rows and four columns to a maximum of 32 screens. The alarm status for each loop is shown on the Control Screen button.

Select the icon to move to the registered screen.

If a user-set alarm occurs, the icon for the Annunciator Screen flashes.

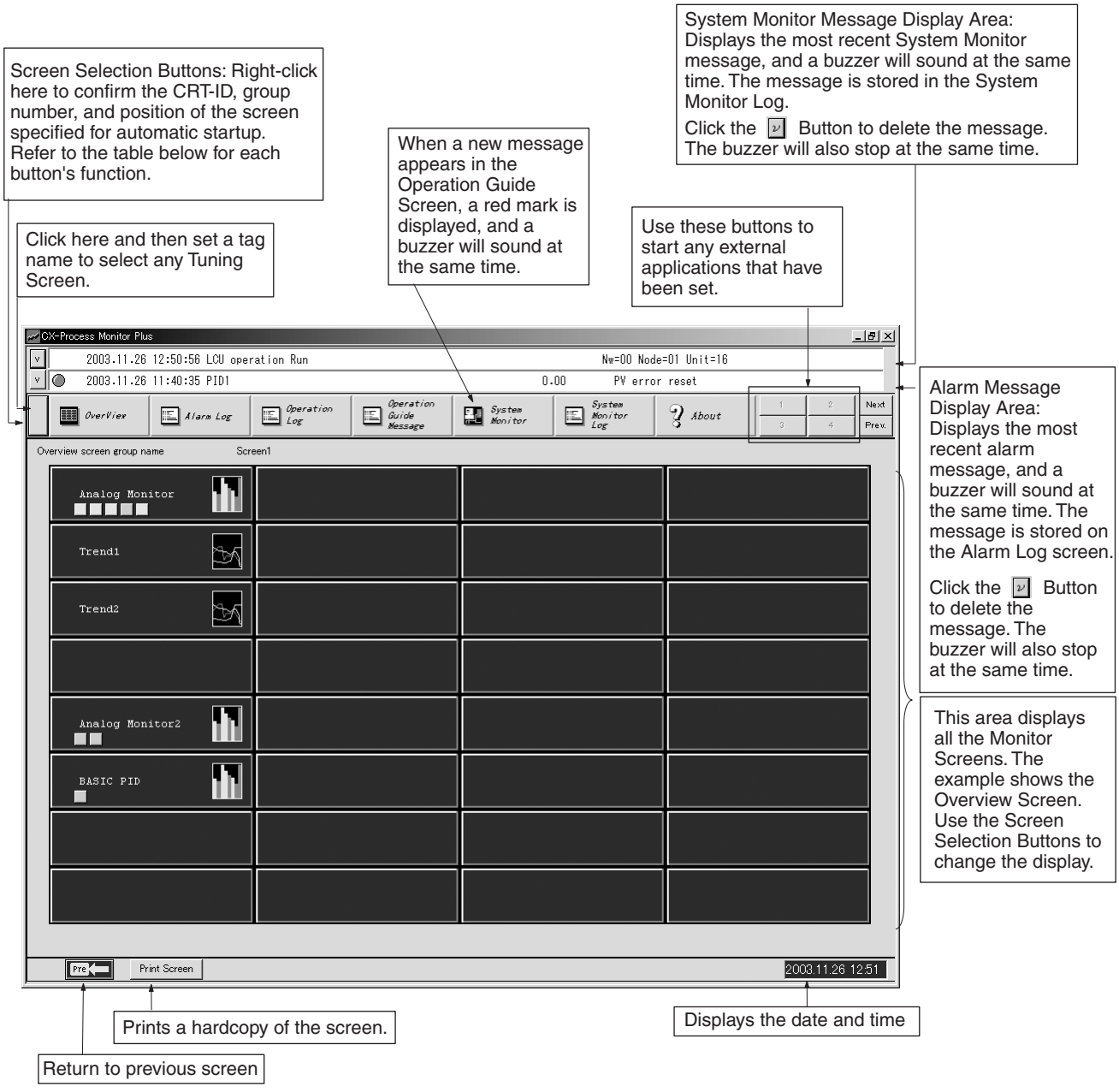
When returning to the Overview Screen from any screen, first select **Overview** from among the screen selection buttons, and then select the Overview Screen name.

More than one Overview Screen can be displayed by clicking the **System Info.** Button when configuring the screen and then setting the Multi-screen–Multi-screen setting to *Enable*. Refer to *5-6 System Information Settings* for details.

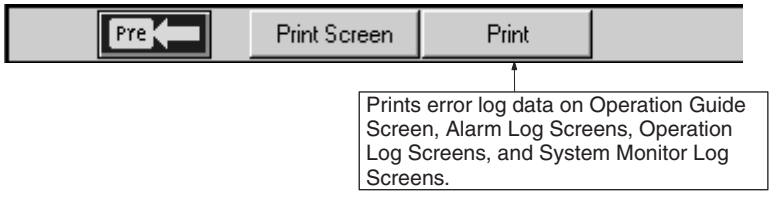
Note Auto-starting can be enabled or disabled by clicking the right mouse button at the top of an Overview Screen. Click the **Yes** Button on the dialog box that appears and then set **Auto-start** to as required.

4-6 Screen Configurations

This section explains the configuration of the CX-Process Monitor Plus Screen as a whole. The following example shows the Overview Screen.



Note The bottom line will appear as follows for some screens.



Screen Selection Buttons

Button name	Function
Overview	Displays the Overview Screen. If multiple Overview Screens are registered, a pull-down menu will be displayed from which you can select the Overview Screen you want.
Alarm	Displays the Alarm Log Screen.
Operation Log	Displays the Operation Log Screen.
Operation Guide	Displays the Operation Guide Screen.
System Monitor	Displays the System Monitor Screen to show system status.
System Monitor Log	Displays the System Monitor Log Screen, which registers system messages.
About	Displays information on the CX-Process Monitor Plus version.
External application start buttons	Start external applications set in the System Info.

4-7 Control Screens

4-7-1 Outline

Use Control Screens to monitor and set the Control Block and part of the Operation Block, to monitor analog signals, and to monitor and set contact signals. For the Control Block in particular, use the Control screen to perform such operations as monitoring Set Point (SP), Process Variable (PV), Manipulated Variable (MV) run status, and Set Point (SP) changes, etc.

Click the **Control Screen** Button in the Overview screen to display the following information on the Control Screen.

- You can display up to a maximum of eight loops per screen of PID, Indicators, and other Control Blocks as on-site Instrument images. The maximum is 400 screens x eight loops.
- You can perform SP changes, auto/manual switching, and manual operations, etc. (Items indicated by a Button can be changed. Items without a Button are displayed only.)
- You can also move to the Tuning Screen.

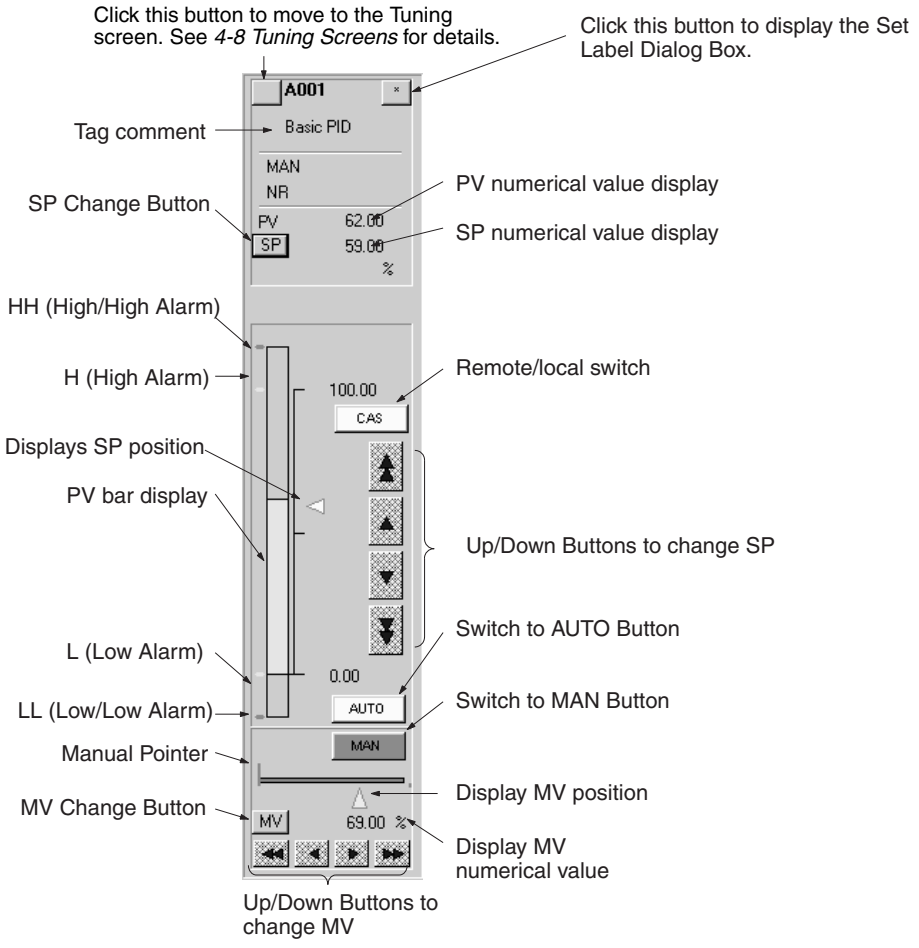
Block name (mode)	Send source function block, or ITEM
Target function block	Control Blocks: Basic PID (011), Advanced PID (012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), 2-position ON/OFF (001), 3-position ON/OFF (002) Operation Blocks: High/Low Alarm (111), Segment Program 2 (157), ON/OFF Valve Manipulator (221), Motor Manipulator (222), Reversible Motor Manipulator (223), Motor Opening Manipulator (224), Timer (205), Counter (208)
	The following for all function blocks: Analog input signals (Input Selector (Block Model 162)) Analog output signals (Constant Generator (Block Model 166))
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	SP, PV, MV, A/M status, R/L status (See note 1), bar color change analog signal when an alarm occurs, contact signal
Setting	SP, MV (only in manual mode), A/M switching (See note 3), R/L switching (See notes 1 and 2.) Contact signal (See note 4.)

Note

1. When the SP setting (local only, or remote/local both possible) for ITEM024 for Basic PID, Advanced PID, Indication and Setting, Ratio Setting, 2-position ON/OFF, and 3-position ON/OFF is 1 (remote/local both possible), CAS is displayed. If the setting is 0 (local only), nothing is displayed.
2. When the SP setting (local only, or remote/local both possible) for ITEM024 for Basic PID, Advanced PID, Indication and Setting, Ratio Setting, 2-position ON/OFF, and 3-position ON/OFF is 1 (remote/local both possible), CAS is displayed, and settings can be made.
3. When set to remote, only auto is possible; manual is disabled (this limit only applies to CX-Process Monitor Plus).
4. Analog signals are not possible.

4-7-2 Basic Displays and Operations

Basic PID (011)



PV Bar Display

Displays the PV range from upper to lower limit as a bar.

Green: Status normal
Red: PV Alarm (either HH, H, L, LL)
Yellow: Deviation Alarm
Blue: Alarm OFF
Light blue: Function block calculations stopped

Changing SP

Change SP using the SP Change Up/Down Buttons.

First press the **SP** Button, select the value column, and then enter the change using the ten-key dialog (using the mouse), or the keyboard. (The ten-key pad is displayed when the input box is selected. To enable inputting from the ten-key, click the **System Info.** Button in the Setup Dialog Box, and then change the setting to enable the ten-key.

Changing MV

Change the MP using the MP Change Up/Down Buttons.

First press the **MP** Button, and then enter the change using the ten-key dialog box (using the mouse), or the keyboard.

Remote/Local (R/L) Switching

When the SP setting (local only, or remote/local both possible) for ITEM024 for Basic PID, Advanced PID, Indication and Setting, Ratio Setting, 2-position ON/OFF, and 3-position ON/OFF is 1 (remote/local both possible), CAS is displayed.

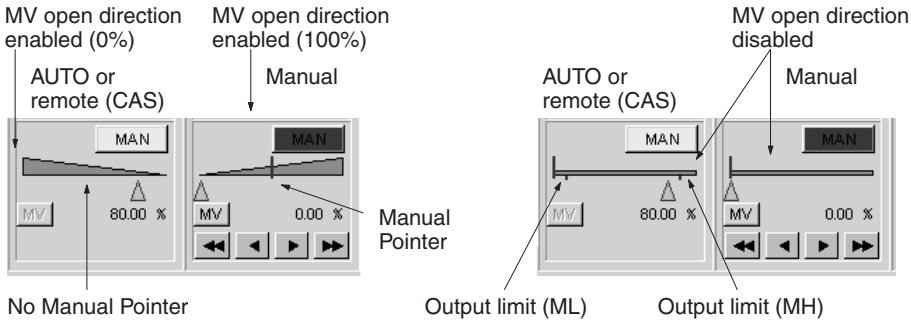
When the **CAS** Button is red, the setting is on remote SP. When the **CAS** Button is blue, the setting is on local SP. Click the **CAS** Button to switch the setting.

Note When the CX-Process Monitor Plus is set to Remote SP, A/M automatically switches to AUTO. You cannot set Manual.

A/M Switching

When AUTO is lit red, the setting is AUTO. You can change the SP value. When MAN is lit blue, the setting is manual. You can change MV and SP values. Select AUTO or MAN to switch.

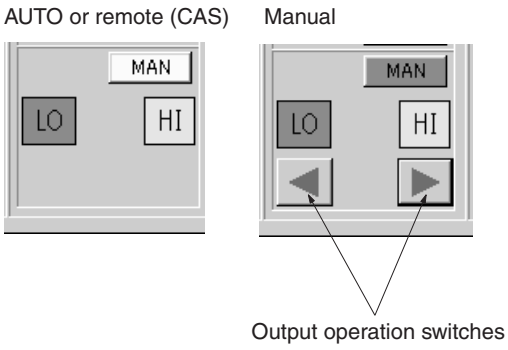
MV Adjustment Area Details:
Basic PID (011), Advanced PID (012), Batch Flowrate Capture (014), Indication and Operation (032), Ratio Setting (033)



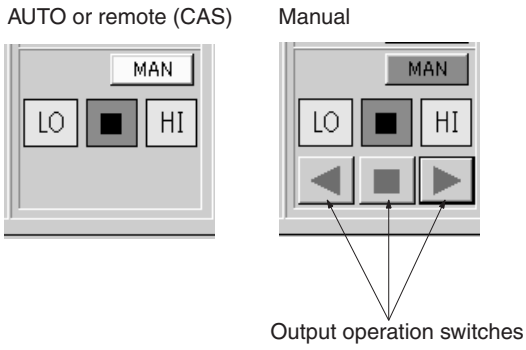
Make Manual Pointer and MV open direction settings when registering the Control Screen. Refer to *5-5-2 Overview of Screen Registration* for details.

Make output limit (ML, MH) settings using the Tuning screen. Refer to *4-8 Tuning Screens* for details.

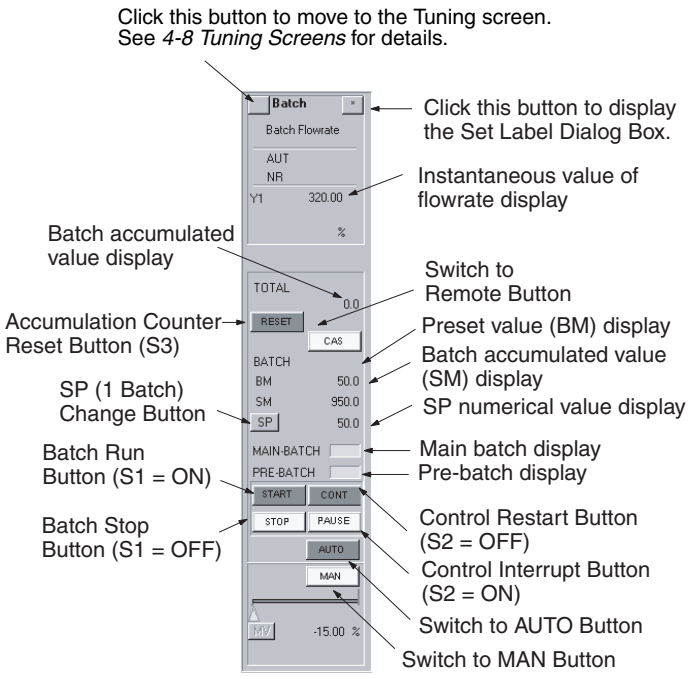
2-position ON/OFF (001)



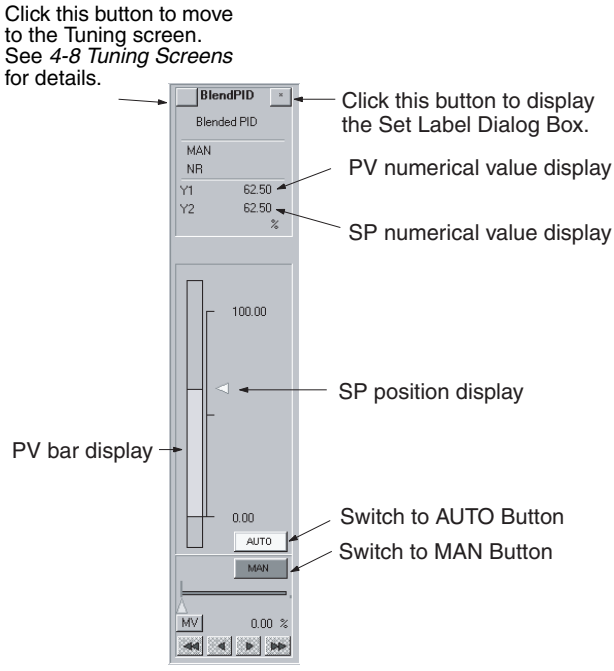
3-position ON/OFF (002)



Batch Flowrate Capture (014)

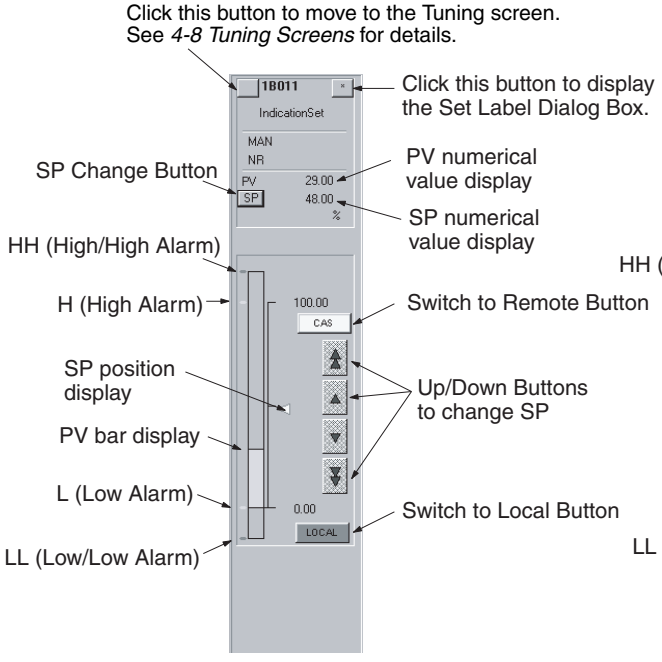


Blended PID (013)



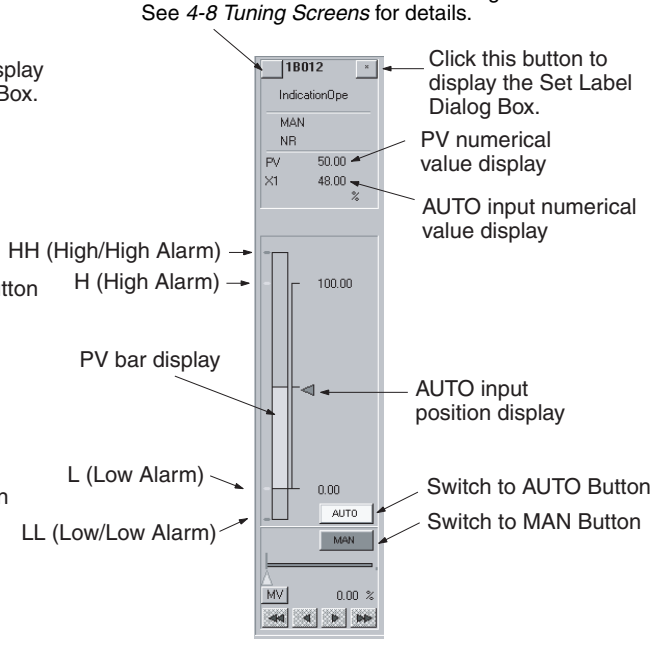
PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: Deviation Alarm (DHH, DH, DL, or DLL)
Yellow: MV Limit High/Low
Blue: Alarm OFF
Light blue: Function block calculations stopped

Indication and Setting (031)



PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: PV Alarm (either HH, H, L, LL)
Blue: Alarm OFF
Light blue: Function block calculations stopped

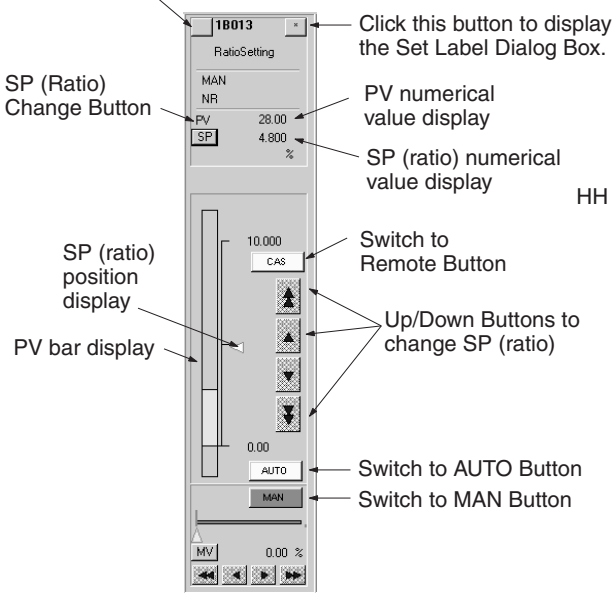
Indication and Operation (032)



PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: PV Alarm (either HH, H, L, LL)
Blue: Alarm OFF
Light blue: Function block calculations stopped

Ratio Setting (033)

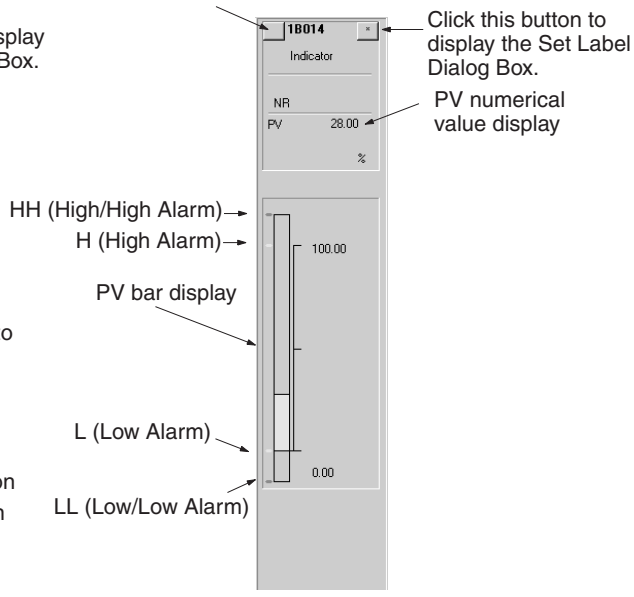
Click this button to move to the Tuning screen.
See *4-8 Tuning Screens* for details.



PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: PV Alarm (either HH, H, L, LL)
Blue: Alarm OFF
Light blue: Function block calculations stopped

Indicator (034)

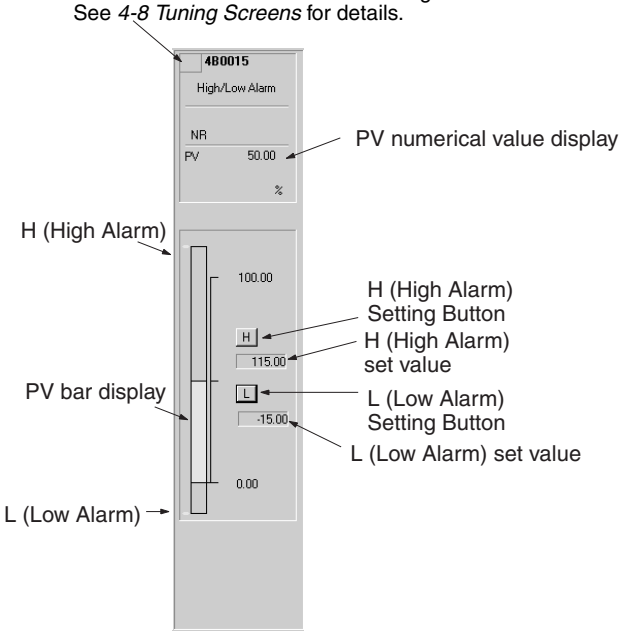
Click this button to move to the Tuning screen.
See *4-8 Tuning Screens* for details.



PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: PV Alarm (either HH, H, L, LL)
Blue: Alarm OFF
Light blue: Function block calculations stopped

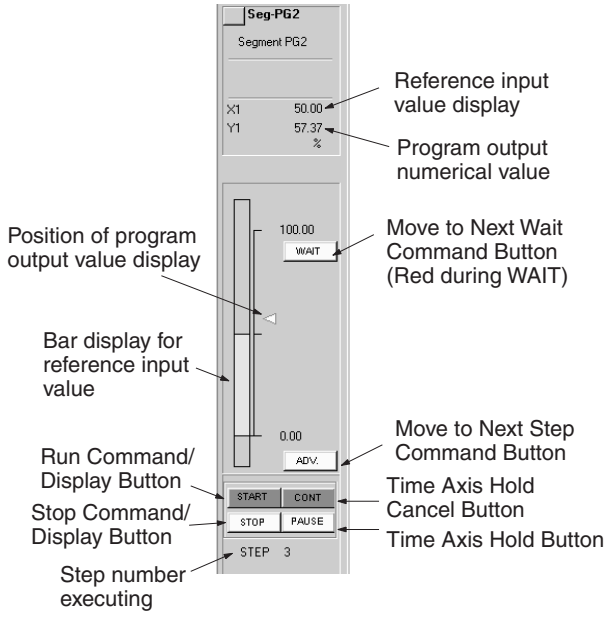
High/Low Alarm (111)

Click this button to move to the Tuning screen.
See *4-8 Tuning Screens* for details.

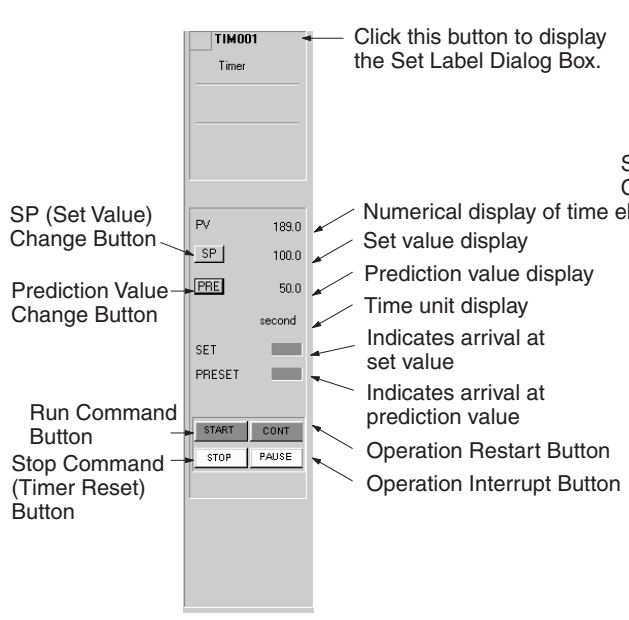


PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: Alarm
Light blue: Function block calculations stopped

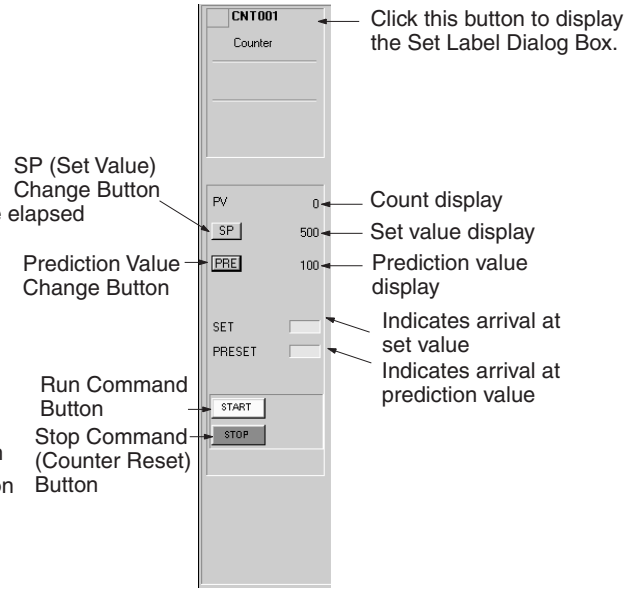
Segment Program 2 (157)



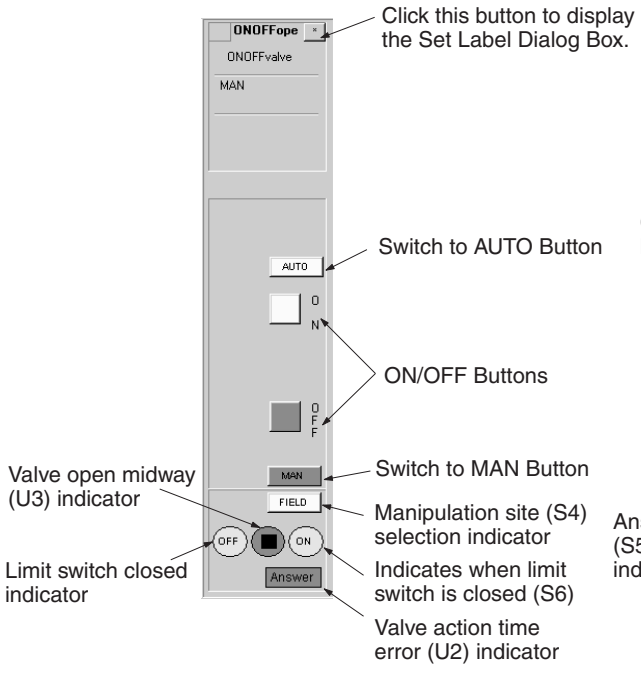
Timer (205)



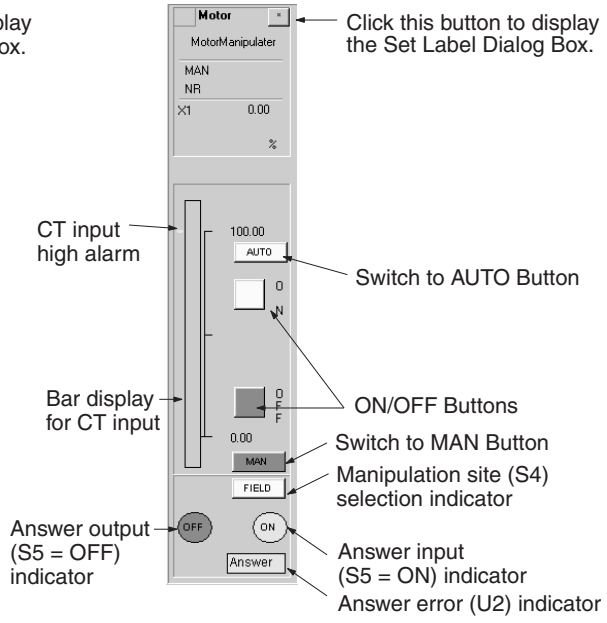
Counter (208)



ON/OFF Valve Manipulator (221)



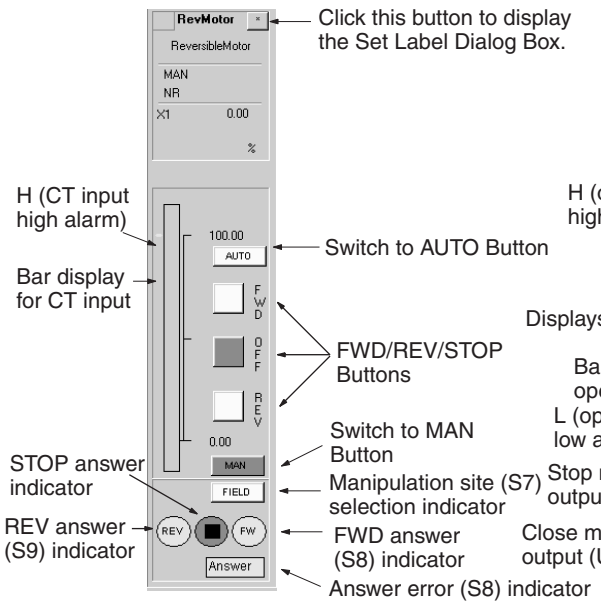
Motor Manipulation (222)



PV Bar Display

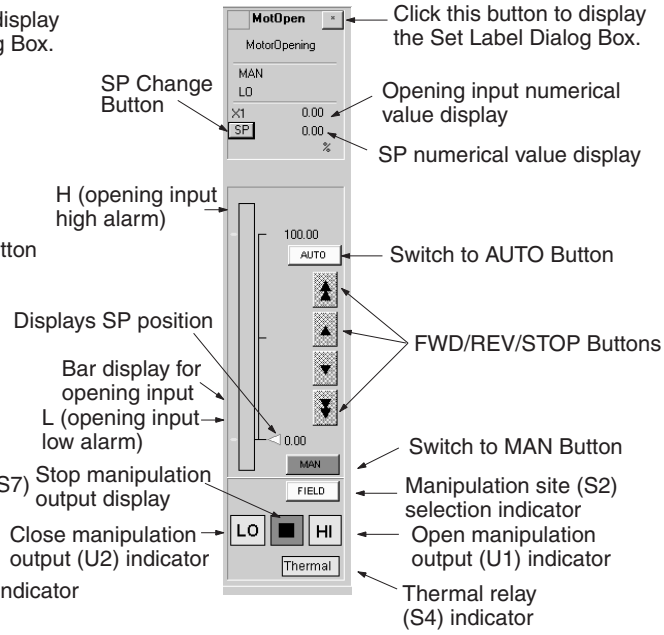
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: Alarm (H)

Reversible Motor Manipulator (223)



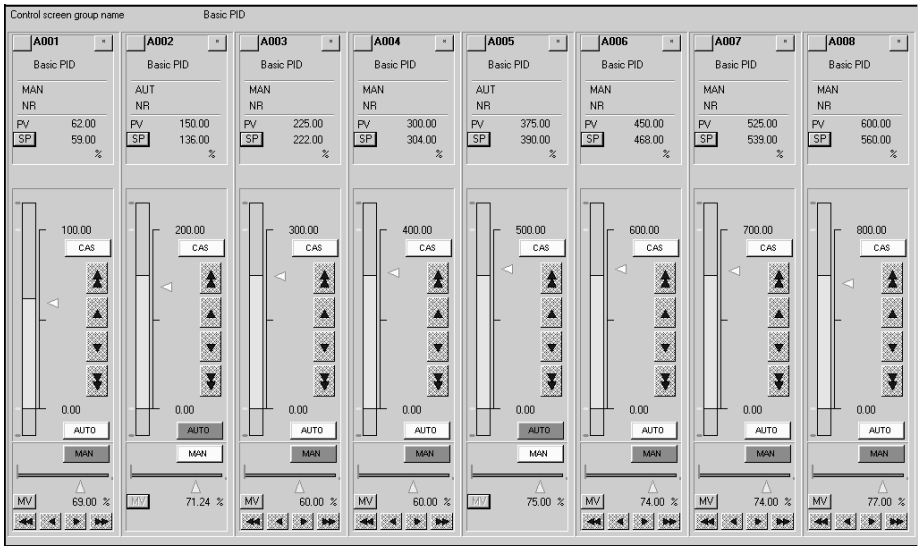
PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: Alarm (H)

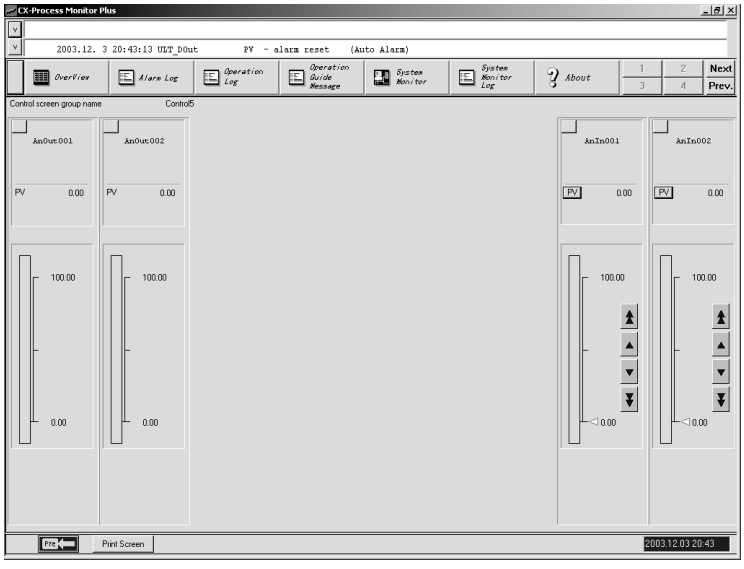
Motor Opening Manipulator (224)

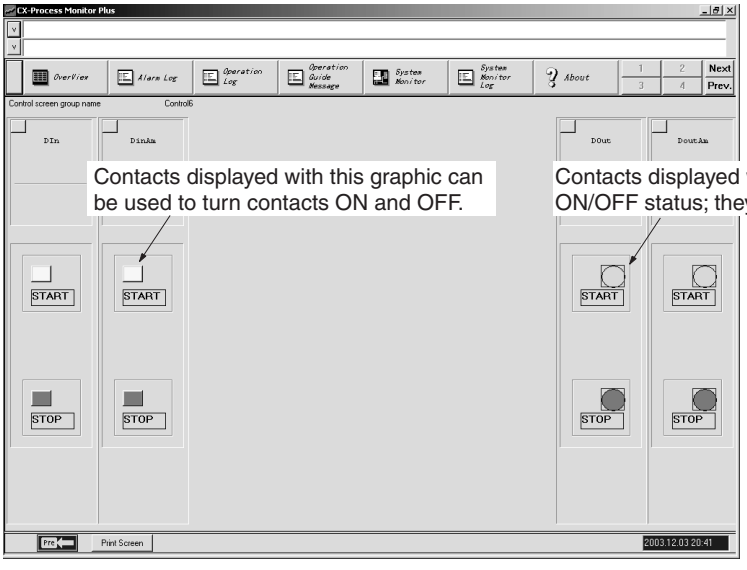


PV Bar Display
Displays the PV range from upper to lower limit as a bar.
Green: Status normal
Red: Alarm (H)

4-7-3 Display Examples







Contacts displayed with this graphic can be used to turn contacts ON and OFF.

Contacts displayed with this graphic only show ON/OFF status; they cannot be used for operation.

4-8 Tuning Screens

Use Tuning Screens, for example, to change Control Block P, I, and D constants, in control blocks.

- You can set the parameters for PID Block P, I, D, and alarm set values.
- You can make adjustments while monitoring PV, SP, and MV trends.
- A maximum of 3,200 screens can be displayed.
- If an alarm occurs, the bar graph color changes.

Use one of the following methods to display the Tuning Screen.

- Select a button to move to the Tuning Screen using the Control Screen. Refer to *4-7 Control Screens* for details.
- Click the button displayed by the Control Screen icon in the Overview Screen. Refer to *4-5 Overview Screen* for details.

A pop-up menu of tag names or a dialog box to specify the tag name will be displayed if the button on the upper left of an Overview Screen is displayed. (Refer to *4-6 Screen Configurations*.) (Either a pop-up menu or a dialog box can be selected by clicking the **System Info.** Button when configuring the screen and then setting the Auto-start–Tuning screen list setting.

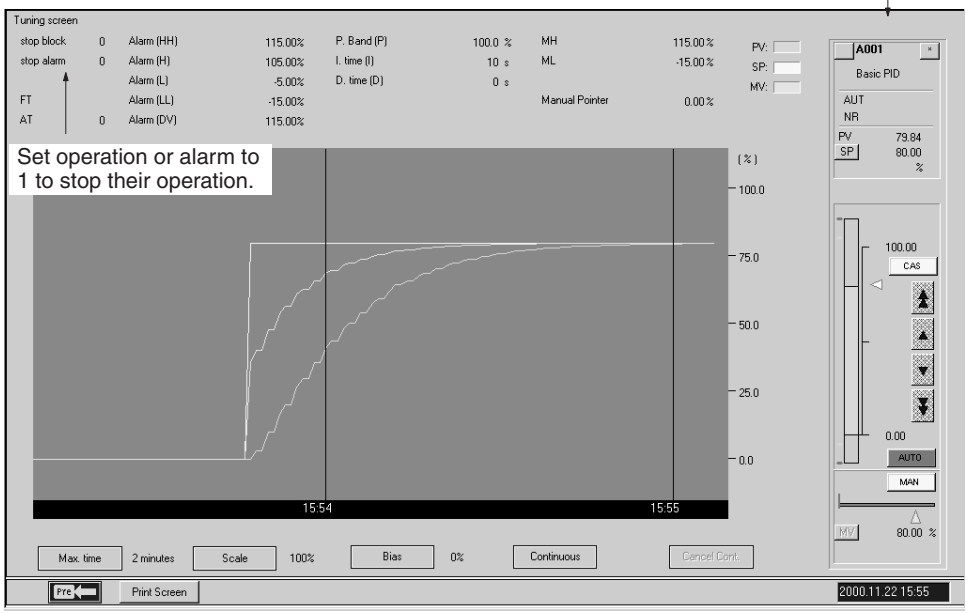
Block name (model)	Signal source Function Block or ITEM
Target function block	Control Block: Basic PID (011), Advanced PID (012), Batch flowrate capture (014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), blended PID (013), 2-position ON/OFF (001), 3-position ON/OFF (002), Segment Program 2 (157)
Display Example: Basic or Advanced PID	SP, PV, and MV trends Setting values for P, I, D, and MV limit High/Low, High/High Alarm, High Alarm, Low Alarm, Low/Low Alarm, and Deviation Alarm. Alarm OFF switch, Stop block operation command, SP, PV, MV, and A/M status, R/L status (See note 1.), bar color change if alarm occurs.
Settings Example: Basic or Advanced PID	Setting values for P, I, D, and MV limit High/Low, High/High Alarm, High Alarm, Low Alarm, Low/Low Alarm, and Deviation Alarm. SP, MV (manual mode only), A/M switching (See note 1.), R/L switching (See note 1.).

Note

1. Same as for Control Screen
2. If using the Tuning Screen, use the 1-Block Send Terminal to Computer function block (403). tag names specified using the 4-Block Send Terminal to Computer function block(404) cannot be displayed on the Tuning Screen.

Click the text to display the dialog boxes for changing the settings. You can make changes uses the ten-key dialog box (using the mouse), or the keyboard. (The ten-key pad is displayed when you select the Enter box. Refer to *5-6-3 Ten-key Settings* for ten-key/keyboard switching settings.)

Refer to *4-7 Control Screens* for how to operate.



Select these buttons to display the dialog boxes for changing the settings.

Click the **Time Range** Button to set the maximum amplitude for the time axis displayed on the screen.

The scale can be set to either percentages or engineering units. The setting can be made by clicking the **System Info.** Button when configuring the screen and then setting the Auto-start–Divisions in Tuning screen setting.

To zoom in on the scale displayed, click the **Scale** Button and change the setting.

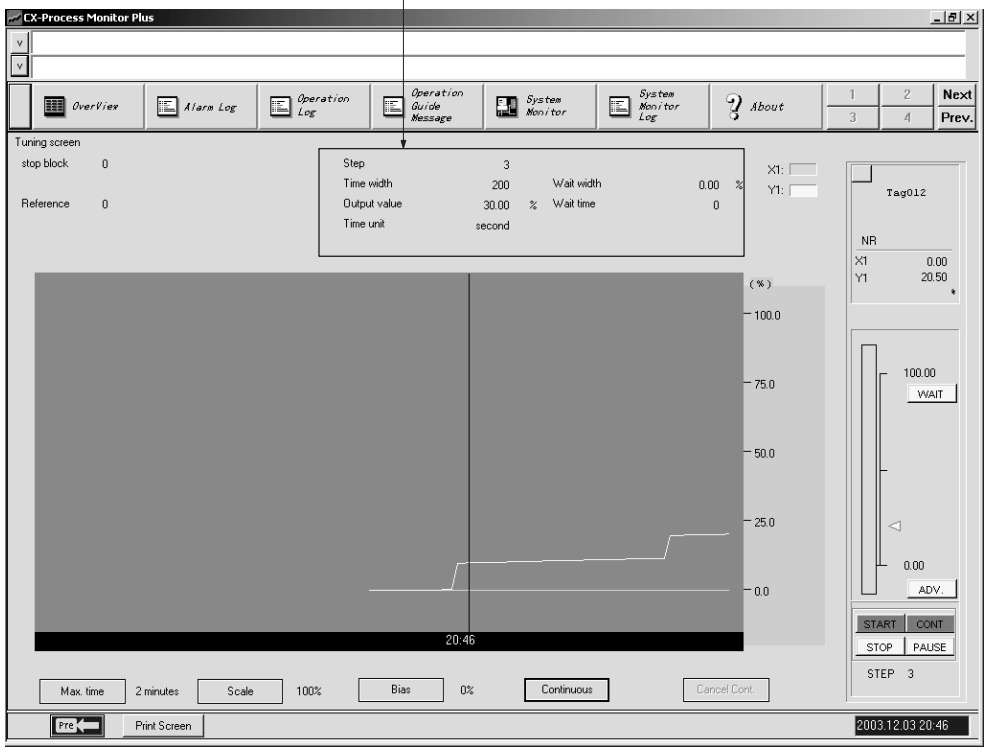
To add bias to the display, click the **Bias** Button and change the setting.

Collection of Trend data for the Tuning Screen starts once you have moved to the Tuning Screen, and is displayed only while the Tuning Screen is displayed. To continue to collect trend data even if you then move from the Tuning Screen to another screen, and to display the data continuously if you return to the Tuning Screen, click the **Continuous** Button. In this way, the data from three screens is collected against the background of the Tuning Screen.

To cancel the Continuous function explained above, click the **Cancel** button.

Note The display for Segment Program 2 (157) is shown below.

Step settings can be changed by clicking on the word.



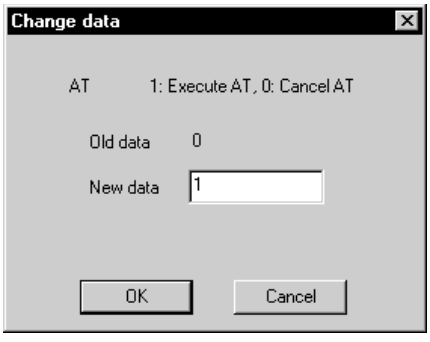
Auto-tuning (AT)

It is possible to automatically calculate and store the PID constants used for Basic PID (011) or Advanced PID (012). This function is called auto-tuning (AT). For details of the AT function, refer to the section on Basic PID (011) in the Loop Control Unit Function Block Reference Manual. AT can be set in the same way as the other settings, as shown below.

1,2,3...

1. If the value for AT displayed in the upper-left region of the Tuning Screen is 0, then AT will not be executed.
2. Click **AT**.

   The Change Data Dialog Box shown below will be displayed.



3. To execute AT, input 1 in the New Data Field.
4. Click the **OK** Button. AT will be executed (see note). The value for AT displayed in the upper-left region of the Tuning Screen will change to 1.
5. When the PID constants have been calculated and stored and AT has been completed, the value for AT displayed in the upper-left region of the Tuning Screen will return to 0.

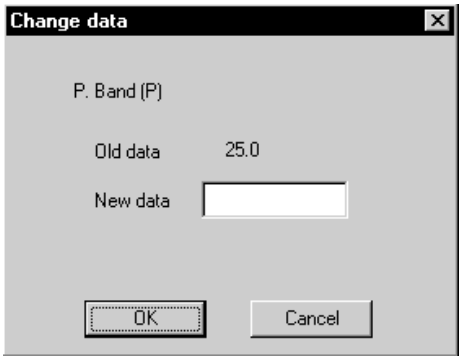
Note Execution of AT can be cancelled from the above dialog box by inputting 0 in the New Data Field and clicking the **OK** Button. (The value for AT displayed in the upper-left region of the Tuning Screen will return to 0.)

Changing P, I, D

The following example shows how to change P (the proportional band).

1,2,3...

1. Click **Proportional Band (P)** displayed in the upper center of the screen.
   The Change Data Dialog Box will be displayed.



2. Select the Change To Field.
   The ten-key dialog box will be displayed as shown.
   Note Refer to *5-6 Labels, Alarm Sounds, and Ten-key Settings* for settings to disable the ten-key pad (i.e., to input directly from the keyboard).

3. After using the mouse (or the keyboard) to enter a numerical value, click the **OK** Button.
   The display will return to the Change Data Dialog Box shown in Step 1.
4. Click the **OK** Button.

You can change the settings for I (integral time) and D (differential time) in the same way.

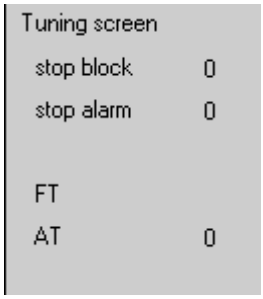
Changing Other Settings

You can use the procedure explained above to change the settings for MV High/Low Limit, High/High Alarm, High Alarm, Low/Low Alarm, Low Alarm, and Deviation Alarm in the same way.

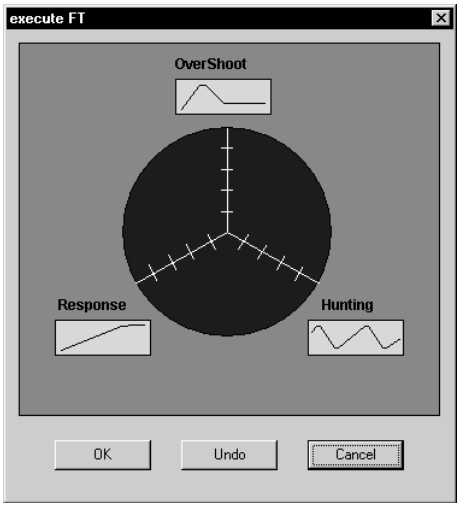
Executing Fine Tuning

Fine tuning (FT) can be executed for either Basic PID (011) or Advanced PID (012). Fine tuning lets the user use fuzzy inferences to set PID constants as required for more accurate control.

1,2,3... 1. Click ***Execute FT*** at the upper left portion of the Tuning Screen, as shown below.



The following FT Execution Dialog Box will be displayed.



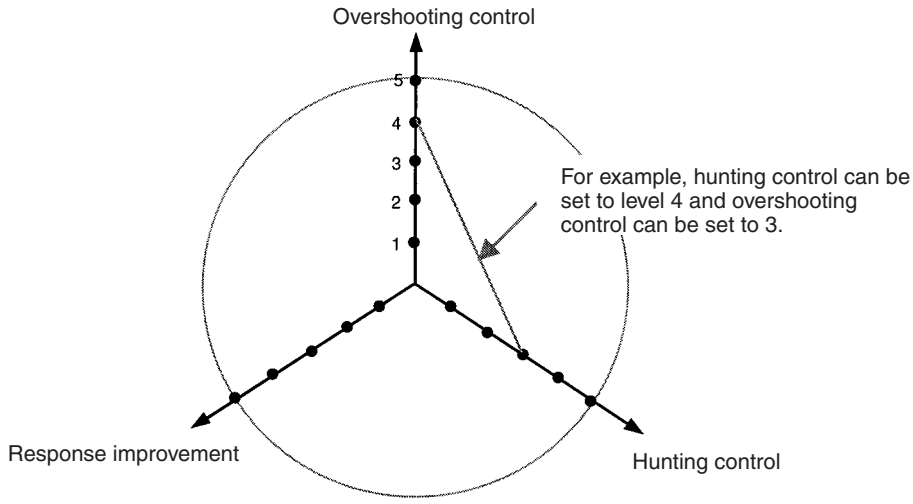
2. Set the degree of ***Response*** improvement, ***Overshoot***ing control, and ***Hunting*** control to any of the five levels and then click the **OK** Button. Either one or two of these can be set for one executed, but all three cannot be set at the same time.

   Fine tuning will be executed according to the settings, the resulting PID constants will be stored automatically, and the new values will be displayed at the top of the Tuning Screen.
3. Repeat the above process as many times as required to achieve suitable settings.
4. Click the **Undo** Button to return to the previous PID constant settings. If the Undo Button is pressed a second time, the FT settings will be returned to.

Execute fine tuning when the control performance produced by autotuning is not acceptable, when autotuning produces inconsistency in the PV, or when you cannot allow control to be interrupted.

Fine tuning uses three user settings for hunting control, overshooting, and response improvement along with fuzzy inferences from previous control conditions to improve control by automatically setting PID parameters.

Either one or two of the user settings for hunting control, overshooting, and response improvement can be set to any of five levels. For example, to better control hunting and overshooting, the *Overshoot* and *Hunting* parameters can be set to the desired levels.



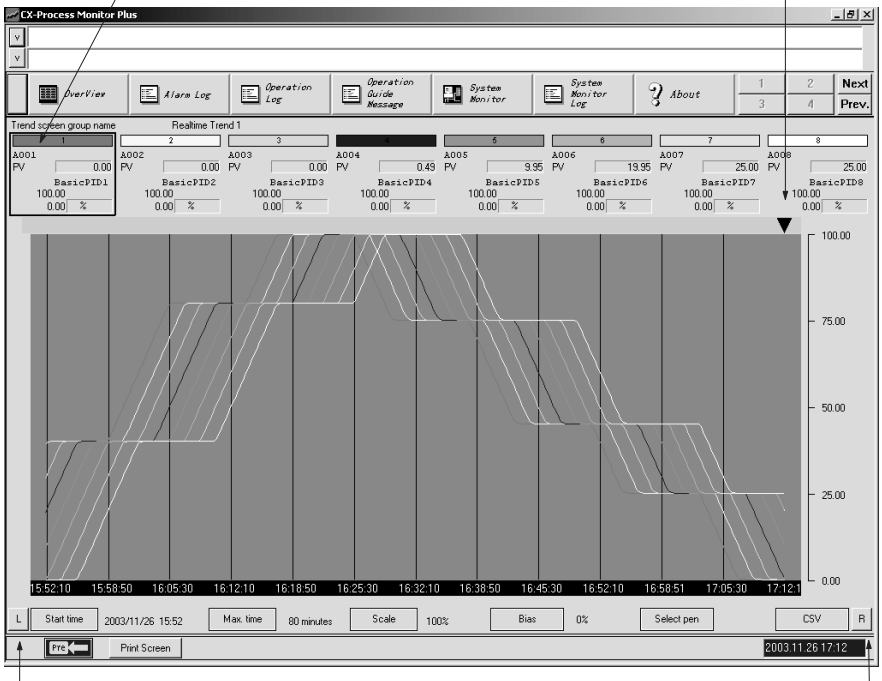
4-9 Trend Screens

Trend Screens display changes in Control Block PV, SP, MV, and analog signals across the passage of time as recording meter images. To display the Trend Screen, click the **Trend Screen** Button in the Overview Window.

4-9-1 Real Time Trend Screen Display

The scale of the graph is adjusted to the set value of the data that is selected. Click the icon of the desired number to change the data.

Data values at the point in time displayed by this mark (the current value for the default) are displayed in the upper part of the screen. You can drag this mark to move it about the screen. All data is displayed as real numbers.



Time Scroll

Shifts one screen further to the past.

Time Scroll

Shifts one screen further to the future.

Function block PV, SP, MV, and analog signals output from the Send Terminal to Computer function block are collected in fixed cycles, the trend displayed, and simultaneously stored in a file.

Trends are displayed as multi-dot recorder screen images to a maximum of eight dots per screen.

The following two Trend Screens are supported.

Item	Type	Realtime Trend	Historical Trend
Data collection (logger function)	**Collection cycle**	1, 2, 5, 10, or 30 s	1, 5, 10, 30, or 60 min
	Tags	480 max.	960 max.
	Maximum save time	Collection cycle 1 s: 10 h 2 s: 20 h 5 s: 50 h 10 s: 100 h 30 s: 300 h	Collection cycle 1 min: 30 days 5 min: 150 days 10 min: 300 days 30 min: 900 days 60 min: 1,800 days
Data display	**Horizontal axis**	Collection cycle 1 s: 2 min to 240 min 2 s: 4 min to 240 min 5 s: 10 min to 240 min 10 s: 20 min to 240 min 30 s: 20 min to 240 min	Collection cycle 1 min: 2 h to 10 days 5 min: 10 h to 50 days 10 min: 20 h to 100 days 30 min: 60 h to 300 days 60 min: 5 days to 600 days
	Vertical axis	One axis for all 8 points. Scale can be magnified by 1×, 2×, 5×, or 10×.	
	Display start time	Specify the display start time to display data from that point in time.	
	Display colors	Red, yellow, green, blue, magenta, purple, cyan, and white	

The data collection cycle is set on the System Info Screen. For details on the data collection cycle, refer to *5-6-9 CSV File Auto-save Settings*.

Note Depending on the number of combined function blocks and the model of Loop Controller that is connected, it may not be possible to collect the data within the collection cycle that is set.
If the data is displayed on a graph under these conditions, the data will be updated with the same values as for the previous collection. To remedy this situation, take measures such as lengthening the collection cycle interval.

You can register a maximum of 60 Realtime Trend Screens, or 120 Historical Trend Screens.

Set either Realtime Trend or Historical Trend when configuring the screen.

Regardless of the trend, trend data collection itself starts at the same time as the monitor process is started (using the **Run** Button in the Main Window).

- Click the **Start Time** Button in the lower left of the screen to set the time from which data will be displayed.
- Click the Maximum Display Time Button to set the maximum width of the time axis displayed on the screen.
- To zoom in on the scale displayed, click the **Scale** Button and change the setting.
- To add bias to the display, click the **Bias** Button and change the setting.
- Use the **Select Pen** Button to select the pen you want to display.

Realtime trends is recorded for the maximum save time (10 to 300 hours), after which the oldest data is discarded.

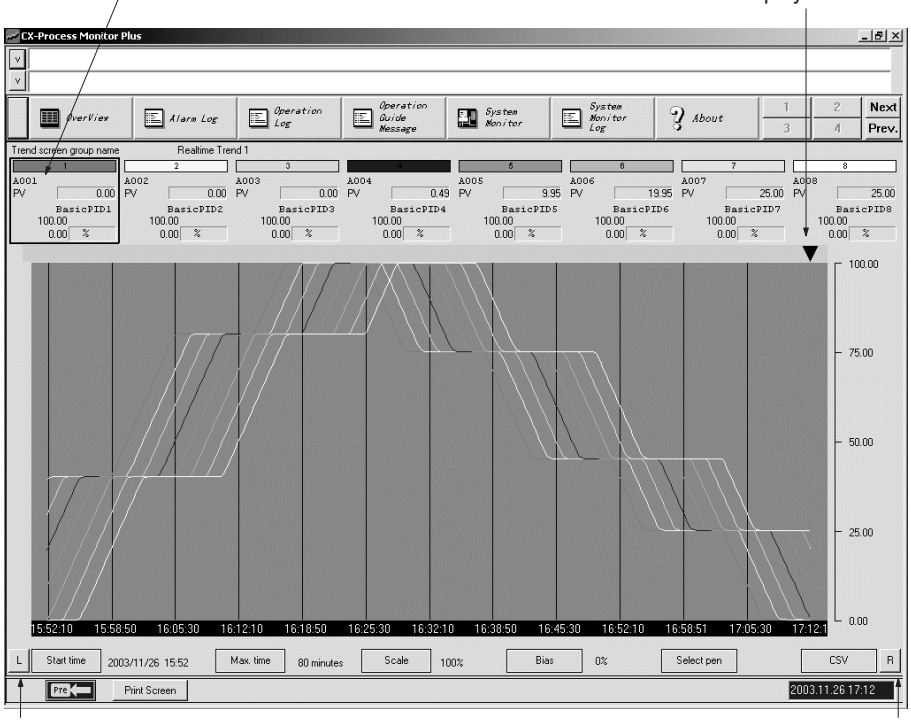
Element	Send source function block, or ITEM
Target function block	Control Block: PV, SP, MV, Y1, Y2, and HL only for Basic PID (011), Advanced PID (012), Batch flow-rate capture (014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), blended PID (013), 2-position ON/OFF (001), and 3-position ON/OFF (002).
	The following for all function blocks: Analog input signals (Input Selector (Block Model 162)) Analog output signals (Constant Generator (Block Model 166))
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	SP, PV, and MV, analog value, and contact (See note.)
Setting	None

Note MV is displayed as an SP and PV range, not as a percentage.

4-9-2 Historical Trend Screen Display

The scale of the graph is adjusted to the set value of the data that is selected. Click the icon of the desired number to change the data.

Data values at the point in time displayed by this mark (the current value for the default) are displayed in the upper part of the screen. You can drag this mark to move it about the screen. All data is displayed as real numbers.



Time Scroll
Shifts one screen further to the past.

Time Scroll
Shifts one screen further to the future.

CSV File Output

Realtime Trend data and Historical Trend data (data grouped by date, time, or tag name) can be output in CSV (Comma Separated Value) file format using the following procedure.

Automatic Saving (Scheduled Saving)

The following settings can be used when configuring screens (i.e., when registering trend screens).

- Automatic save enable

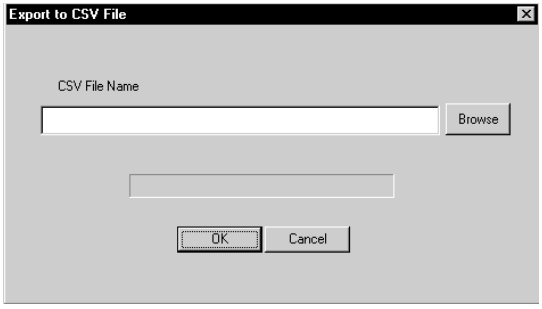
- Save period (1, 2, 3, 4, 6, 8, 10, 12, 18, 20, 24, 48, 72, 96, 120, or 240 h)
- Save file name and folder

Once automatic saving has been enabled and the monitor process has been started (by clicking the **Run** Button in the Main Window or the **Run** Button in the Setup Dialog Box), the automatic save function will be started. An CSV file will be saved periodically on the hour at the specified save period. Refer to *Registering Trend Screens* under *5-5 Screen Configuration* for details on automatic save settings.

Manual Saving

Use the following procedure.

1,2,3... 1. Press the **CSV** Button to display the Export to CSV File Dialog Box.



2. Specify a name for the CSV file, and click the **OK** Button. A CSV file will be created. (By clicking the **Browse** Button, the CSV file can be created in a desired folder. The default filename for Realtime Trend data is Trrl.csv and the default filename for Historical Trend data is Trhl.csv.) The contents of CSV files created are as follows:

Realtime Trend

Real-time Trend(carriage return)
<Screen_name>(carriage return)
<Date_exported>(comma)<Time_exported>(carriage return)
(comma)(comma)<Tag_name_1>(comma)<Tag_name_2>(comma)...(comma)<Tag_name_8>(carriage return)
(comma)(comma)<ITEM_tag_1>(comma)<ITEM_tag_2>(comma)...(comma)<ITEM_tag_8>(carriage return)
<Date_of_trend_data>(comma)<Time_of_trend_data>(comma)<Data_1>(comma)<Data_2>(comma)...(comma)<Data_8>(carriage return)

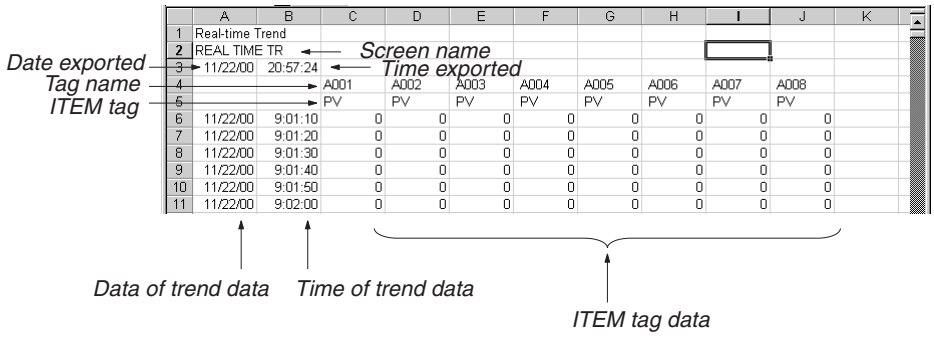
Note Data for tag names that have not been registered will be 0.

Historical Trend

Historical Trend(carriage return)
<Screen_name>(carriage return)
<Date_exported>(comma)<Time_exported>(carriage return)
(comma)(comma)<Tag_name_1>(comma)<Tag_name_2>(comma)...(comma)<Tag_name_8>(carriage return)
(comma)(comma)<ITEM_tag_1>(comma)<ITEM_tag_2>(comma)...(comma)<ITEM_tag_8>(carriage return)<Date_of_trend_data>(comma)<Time_of_trend_data>(comma)
<Data_1>(comma)<Data_2>(comma)...(comma)<Data_8>(carriage return)

Note Data for tag names that have not been registered will be 0.

Example: The following screen shows how Realtime Trend data exported to spreadsheet software (e.g., Microsoft Excel) will be displayed.

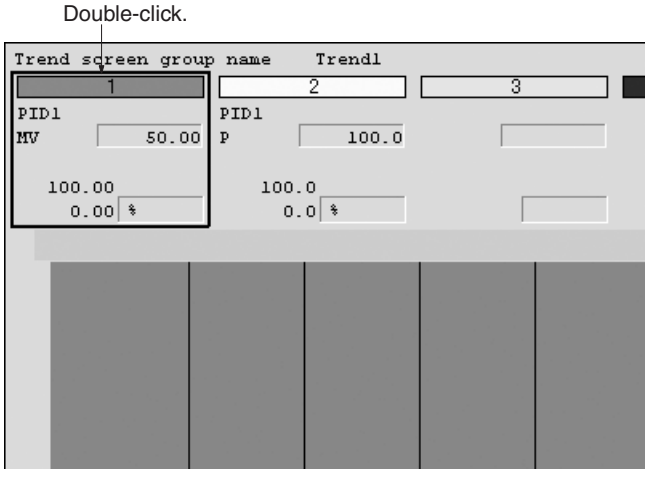


Changing Pen Settings

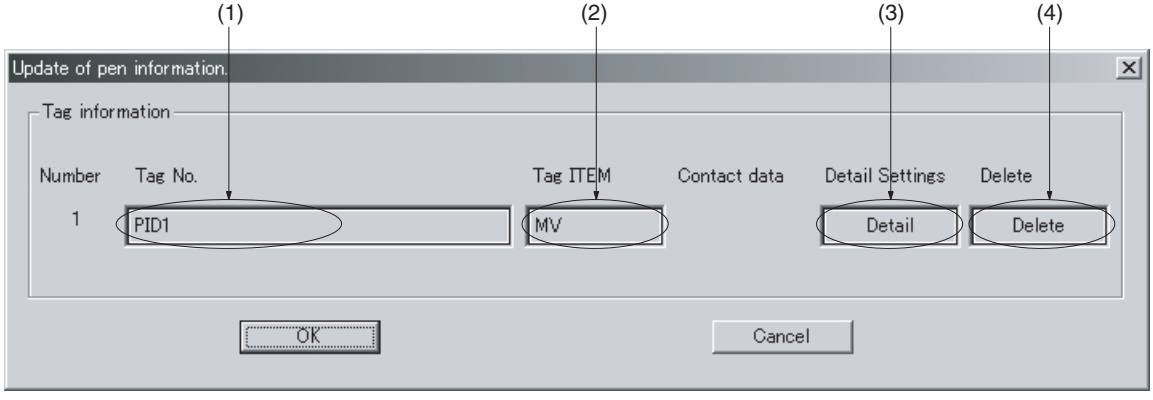
Pens can be changed, deleted, or added to Trend Screens without shutting down the CX-Process Monitor Plus.

Changing/Deleting Pens from the Dialog Box

1,2,3... 1. Double-click the pen selection area.



2. The following dialog box will be displayed. Click where indicated by numbers 1 to 4 in the following diagram to set the items.



(1) Tag Name Selection for CSV Tag
Displays a list of tags registered in CX-Process Monitor Plus.

(2) ITEM Tag Selection
Set the type of ITEM to use to narrow the ITEM list displayed for the tag names above.

(3) Detailed Settings
When the tag name is set above, the upper/lower limits of the specified tag will be displayed by default. The setting can be changed.

(4) Delete
Deletes the selected pen.

Note (a) When the Delete Button is pressed in step 4, above, all tag information will be deleted from the Trend Screen, including the graphic display for the pen.

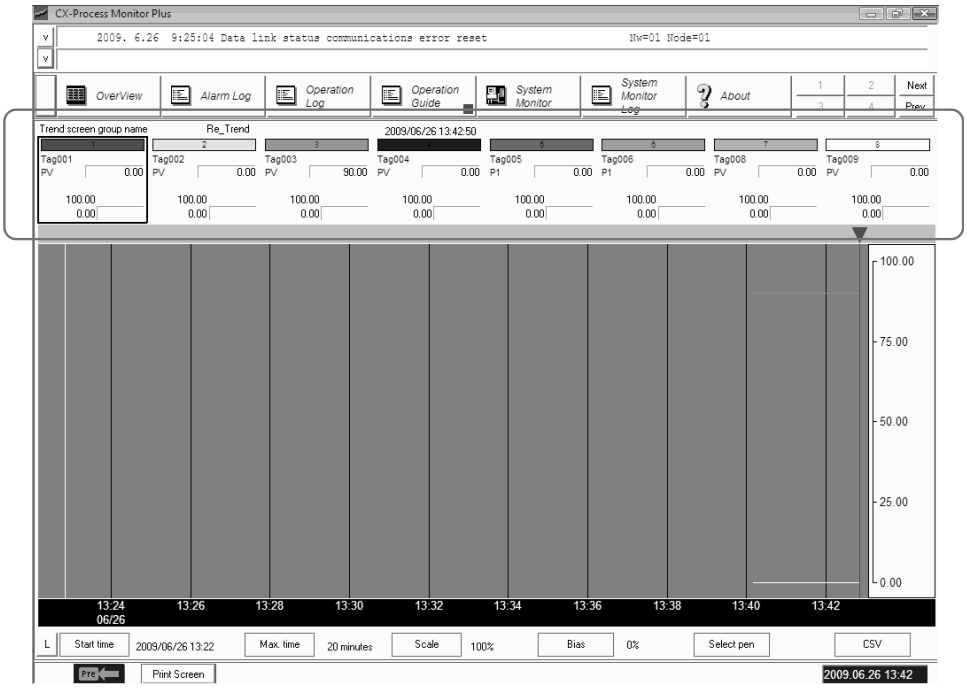
(b) After the four items above are set and the **OK** Button is clicked, some time will be required before the results are displayed on the Trend Screen. This time will be the collection cycle (approximately 10 s for realtime trends and 60 s for historical trends) plus the screen refresh cycle (a few seconds). If another screen is switched to, the changes will be reflected in the screen as soon as it is returned to.

(c) If the scaling settings have been changed using the CX-Process Tool, change the tag upper and lower limit settings to match the changed values using the **Detail** Button in the Update of Pen Information Dialog Box.

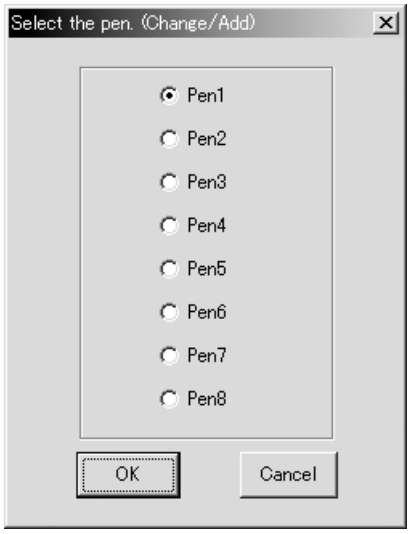
Adding Pens from the Dialog Box

Use the following procedure to assign a tag to a pen for which one is not yet assigned.

1,2,3... 1. Double-click in the area circled in the screen shown below.



The following dialog box will appear to change the pen.



2. Select a pen to which a tag is not yet assigned and click the **OK** Button.
3. Assign the pen using the same dialog box as used to change and delete pens in the previous procedure.

4-10 Batch Trend Screens

Batch Trend Screens collect changes over time in the control block PV, SP, MV, and other analog signals, and display them as recording meter images.

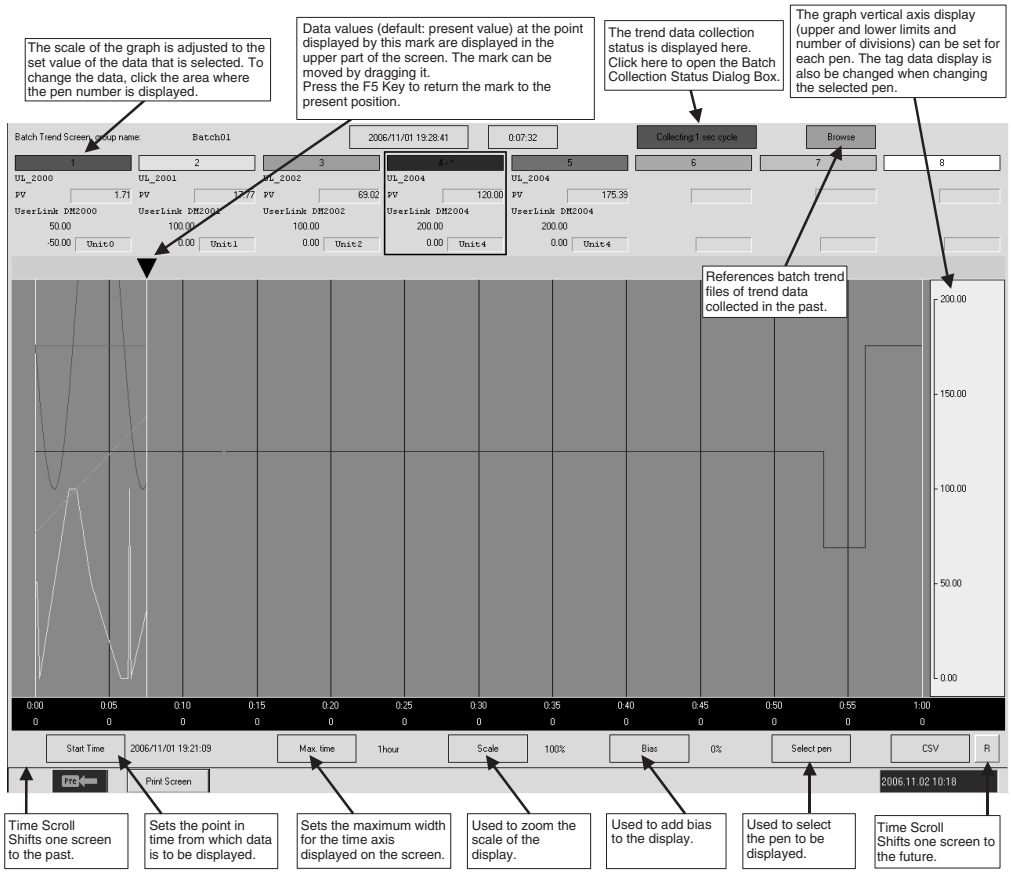
Trend data collection can be started and stopped using tag data status as the trigger.

Collected trend data is automatically saved in a batch trend file.

Past batch data in the batch trend file can be superimposed for display on the Batch Trend Screen during data collection, and can be output to a CSV file.

The Batch Trend Screen is displayed by clicking the Batch Trend Screen icon in the Overview Screen.

4-10-1 Batch Trend Screen Display



Note The CX-Process Monitor Plus provides the following two types of screens for data collection in trend graph format.
Use them according to the requirements of the application.
- Trend Screens
- Batch Trend Screens

For details on the differences between Trend Screens and Batch Trend Screens, refer to *Appendix B Differences between Trend Screens and Batch Trend Screens*.

- A recording meter screen image with a maximum of eight points is displayed on one screen.
- A maximum of 120 Batch Trend Screens and 960 tags can be registered.

- The trend data collection cycle and maximum save time in a Batch Trend Screen are shown in the following table.

Item	Details
Collection cycle (See note.)	1 s, 1 min
Maximum save time	4 hours (when collection cycle is 1 s) 10 days (when collection cycle is 1 min)

Note

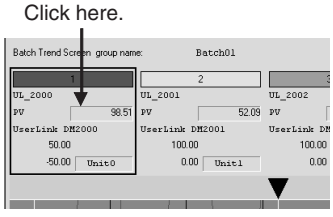
1. The collection cycle is set using the CRT Builder Dialog Box (Batch Trend Screen) from the Builder Window. For details on collection cycle settings, refer to *5-5-2 Overview of Screen Registration*.
2. Depending on the number of combined function blocks and the model of Loop Controller that is connected, it may not be possible to collect the data within the collection cycle that is set.
   If the data is displayed on a graph under these conditions, the data will be updated with the same values as for the previous collection. To remedy this situation, take measures such as lengthening the collection cycle interval.

Changing the Vertical Axis Display

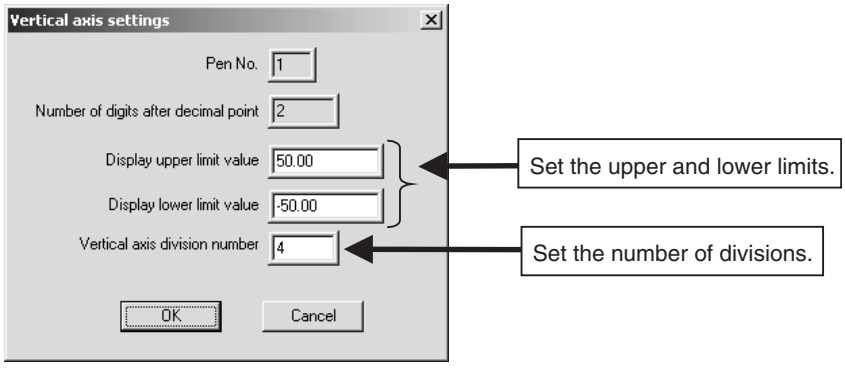
The display for the batch trend graph vertical axis can be changed for each pen.

1,2,3...

1. Click the Batch Trend Screen data display area.



2. With the pen selected, click the vertical axis of the graph.
3. The Vertical Axis Setting Dialog Box will be displayed. Set the vertical axis display.



Note If the scaling settings have been changed using the CX-Process Tool, change the tag upper and lower limits in the Vertical Axis Setting Dialog Box to match the new scaling values.

4-10-2 Collecting and Saving Trend Data

Triggers for Starting and Ending Trend Data Collection

There are two ways of starting and ending trend data collection, as described below.

Trigger Tags

Trigger tags can be used to start and end trend data collection according to the status of the specified tags.

Set the tags as follows, depending on the type of tag data (contact ITEM or analog ITEM):

Contact ITEM: Data collection starts and ends according to the ON and OFF status.

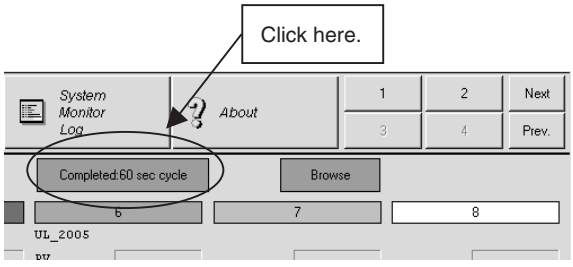
Analog ITEM: Data collection starts when the tag value is equal to or greater than the batch start value that has been set, and it ends when the tag value is less than the batch stop value.

Batch Trend Screen Operations

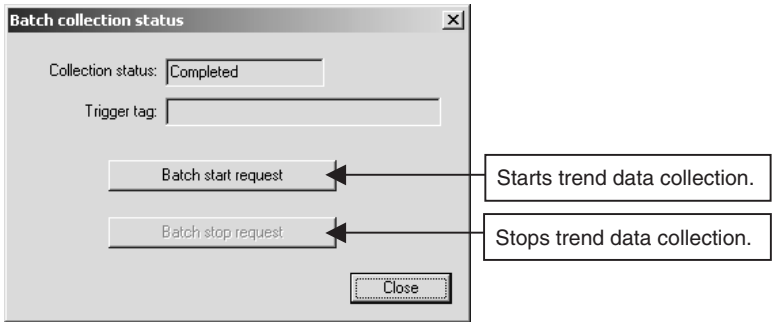
Trend data collection can be started and stopped at any time from the Batch Trend Screen.

Use the following procedure to start trend data collection.

1,2,3... 1. Click the collection status display area in the Batch Trend Screen.



2. The Batch Collection Status Dialog Box will be displayed.
Click the **Batch start request** Button. (If a trigger tag is set, a batch stop request can be executed. Even if it is ended, however, data collection will immediately start when the data collection conditions are satisfied.
Use this operation in cases such as switching to another batch when the collection conditions are already satisfied.)



Batch Trend Files

When trend data collection (batch) is started, batch trend files (binary format) are automatically created for each Batch Trend Screen.

File Names

Batch trend files are saved under the following file name for each date.

File name: Starting date - Starting time - Batch Trend Screen name.BTR

Example:

20061201 – 161510 – Batch1.BTR

- 20061201: Starting date (YYYYMMDD)
- 161510: Starting time (HHMMSS)
- Batch1: Batch Trend Screen name

Batch Trend Screen Maximum Save Time

When the maximum save time (4 hours or 10 days) elapses for a Batch Trend Screen, the batch trend file is no longer updated.

If the collection trigger condition is satisfied, a new batch trend file is created and trend data collecting is restarted.

Batch Trend File Save Time

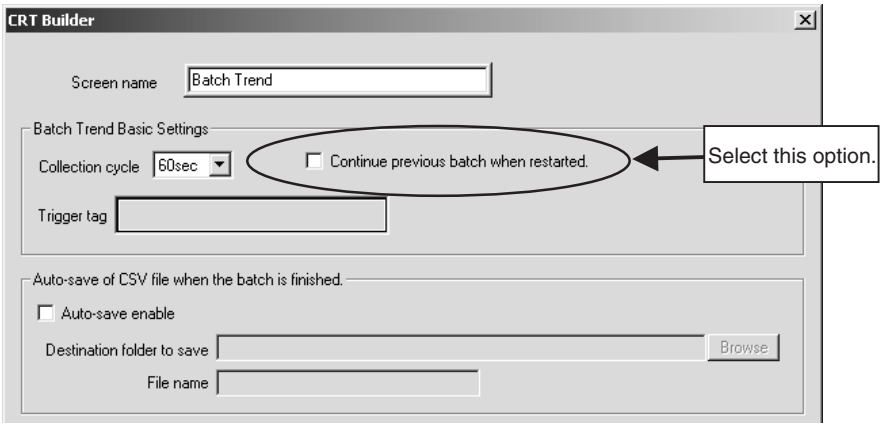
A batch trend file is added each time trend data collection is started. A setting can be made on the System Info Screen so that batch trend files created outside of the regular cycle are automatically deleted. For details on System Info Screen settings, refer to *5-6-9 CSV File Auto-save Settings*.

CX-Process Monitor Plus Starting and Stopping Operations

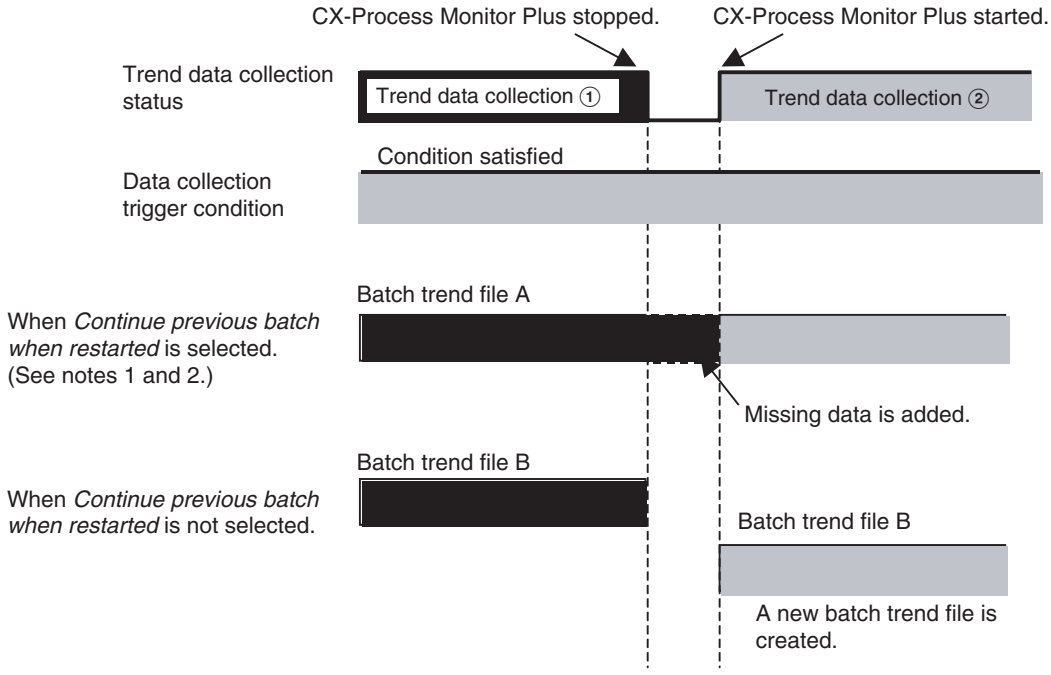
When the CX-Process Monitor Plus is ended (by ending all CX-Process Monitor Plus modules or by turning OFF the computer), data trace collection is stopped even if the data collection trigger condition is satisfied.

When the CX-Process Monitor Plus is restarted, the data collection starts again but the data is collected in a new batch file.

An option can be selected in the CRT Builder Dialog Box (Batch Trend Screen) from the Builder Window to enable trend data to continue to be collected in the same batch trend file as when the CX-Process Monitor Plus was stopped.

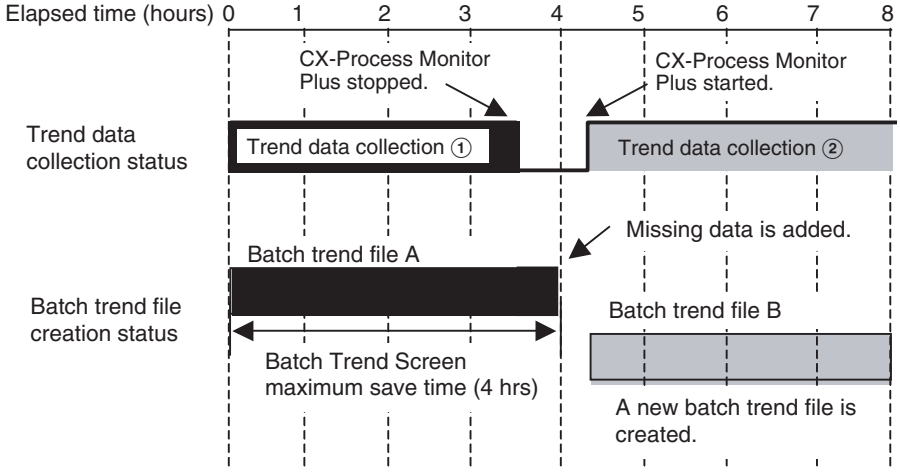


Difference in Batch Trend File Creation Method by Selecting *Continue Previous batch when restarted* Option



Note 1. Even if this option is selected, saving will not be continued if the restart time exceeds the Batch Trend Screen maximum save time.

Example: 1-s Collection Cycle



2. If the trend data collection trigger condition becomes satisfied while the CX-Process Monitor Plus is stopped, the CX-Process Monitor Plus will not recognize it.
   If the trend data trigger condition is satisfied when the CX-Process Monitor Plus is restarted and if the *Continue previous batch when restarted* option is selected, the data will be saved in the same batch trend file as when the previous CX-Process Monitor Plus was stopped.
3. For details on Builder Window CRT Dialog Box (Batch Trend Screen) settings, refer to *5-5-2 Overview of Screen Registration*.

Referencing Past Trend Data

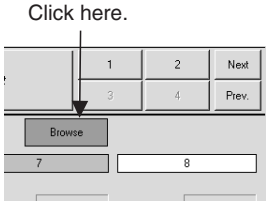
Trend data collected in the past is saved as batch trend files. These files can be displayed on Batch Trend Screens.

Procedure for Referencing Past Trend Data

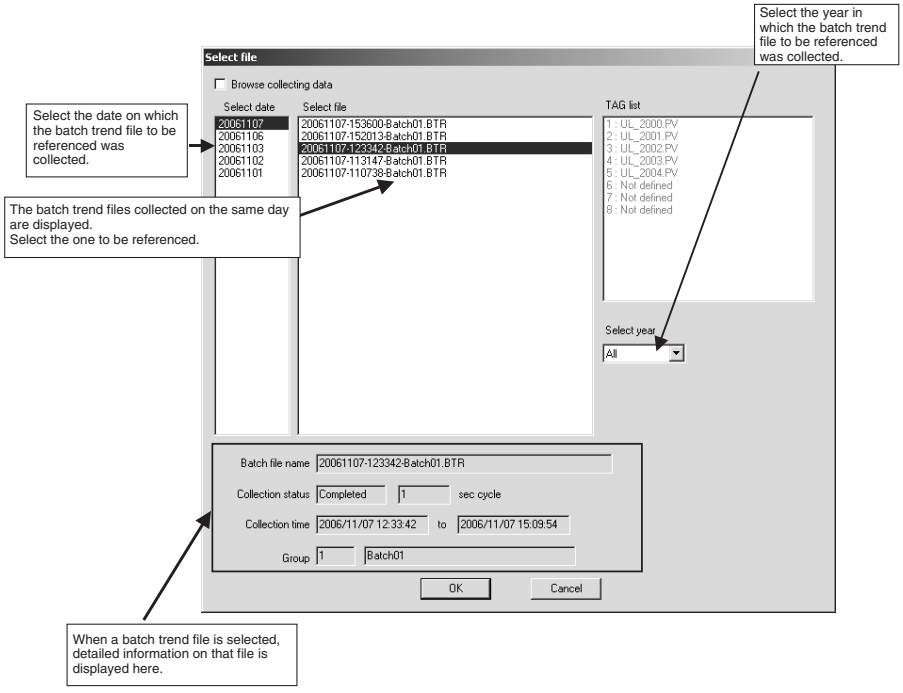
Trend data collected in the past can be checked on a Batch Trend Screen.

1,2,3...

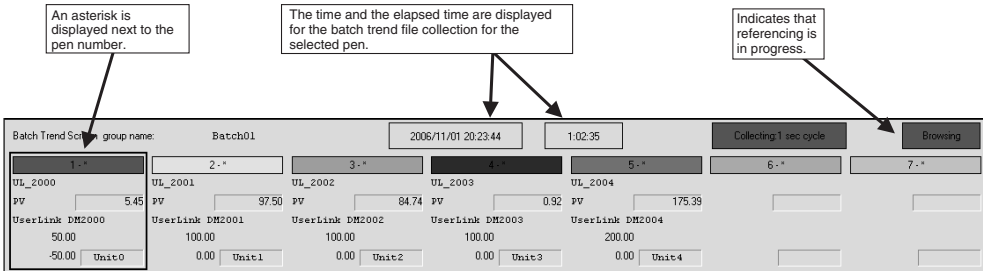
1. Click the **Browse** Button at the top of the Batch Trend Screen to display the Select File Dialog Box.



2. In the Select file Dialog Box, select the batch trend file that is to be referenced.



3. The status of the selected batch trend file will be displayed on the Batch Trend Screen.
   The display on the Batch Trend Screen while the batch trend file is being referenced will be as shown below.



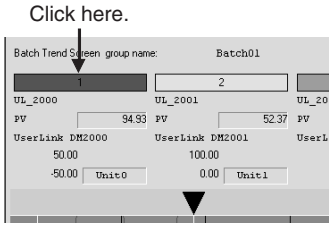
4. To end the batch trend file reference status, click the **Browse** Button to display the Browse File Dialog Box and select the *Browse collecting data* option.
   The batch trend file reference status will be ended when moving to another screen.

Overlaying Past and Currently Collected Trend Data

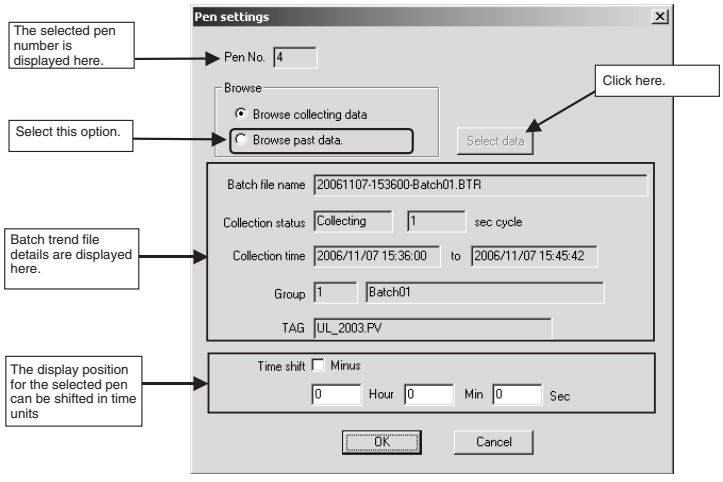
Past and present trend data collection can be compared in pen units.

1,2,3...

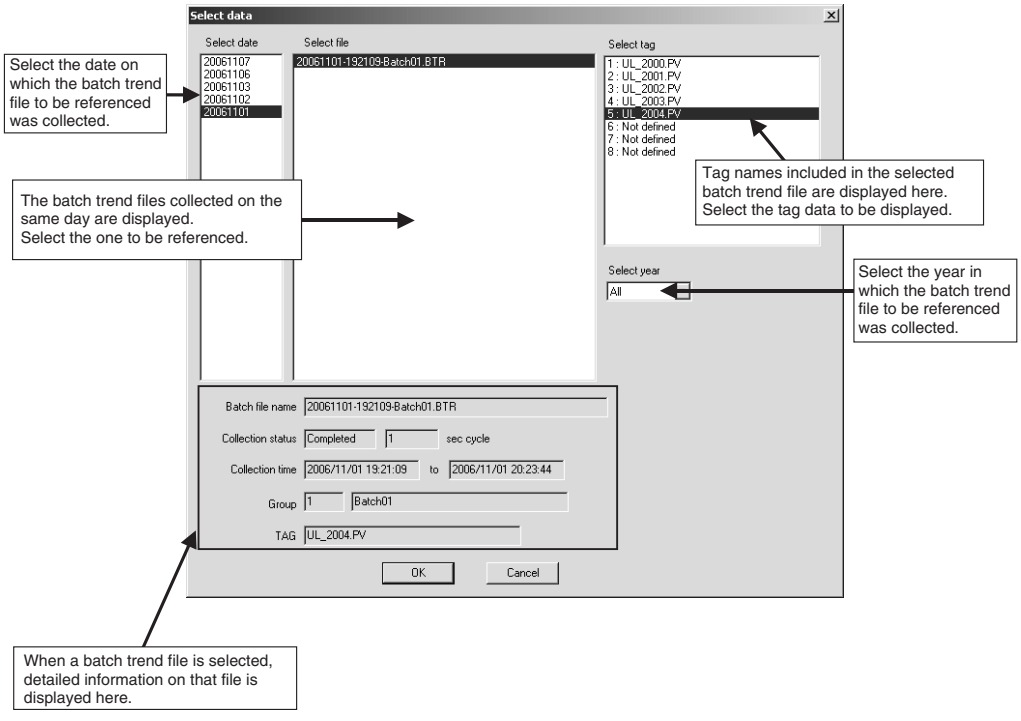
1. Click the pen number for the past trend data to be displayed.



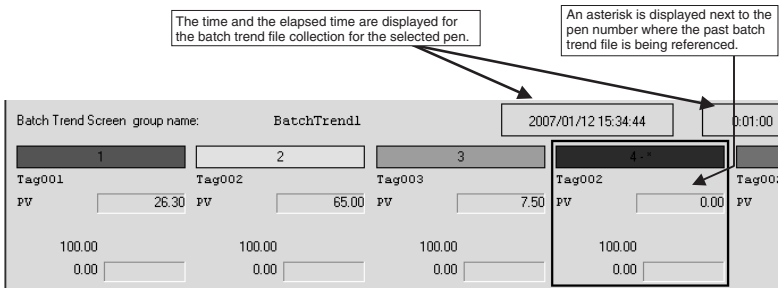
2. The Pen Settings Dialog Box will be displayed. Select *Browse past data* and click the **Select Data** Button.



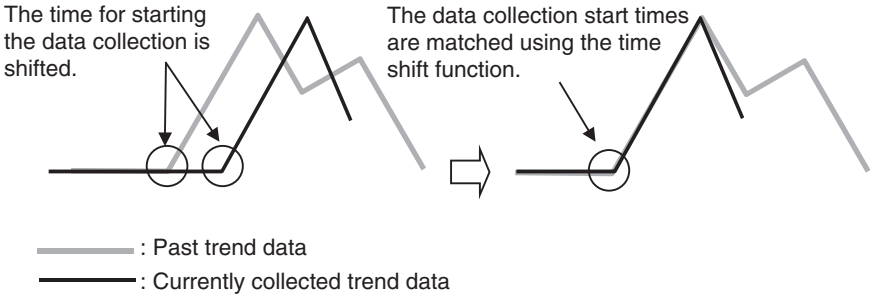
3. The Select data Dialog Box will be displayed. Select the tag data to be displayed.



4. The status of the past batch trend files for the selected pen will be displayed. While a batch trend file is being referenced, the Batch Trend Screen will appear as shown below.



Note Use the time shift setting in the Pen Settings Dialog Box to shift the graph for past and currently collected trend data as shown below.



5. To end the batch trend file reference status, click the **Browse** Button to display the Pen Settings Dialog Box and select the *Browse collecting data* option.
   The batch trend file reference status will be ended when moving to another screen.

CSV File Output

Data collected using the Batch Trend Screen (data grouped by date, time, or tag number) can be output in CSV (Comma Separated Values) file format either automatically or manually.

Automatic Saving

The following settings are used when configuring screens (i.e., when registering trend screens).

- Automatic save enable
- Save filter name and save destination folder

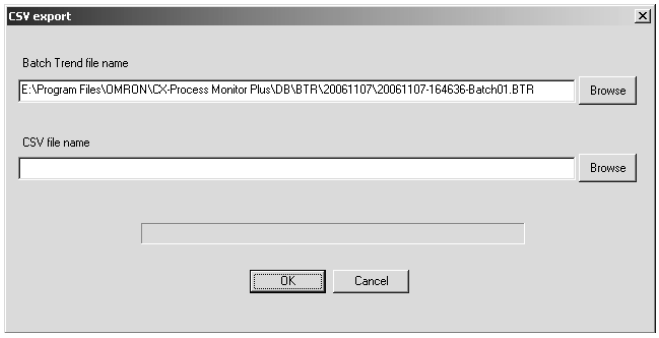
The CSV file is automatically saved according to these settings when trend data collection stops (when the trigger tag condition is not satisfied, or when a batch stop is requested manually).

Manual Saving (Saving by Using Buttons)

Use the following procedure.

1,2,3...

1. Press the **CSV** Button in the Batch Trend Screen to display the CSV export Dialog Box.



2. Select the batch trend file to export.
3. Specify a name for the CSV file and click the **OK** Button. The CSV file will be created.
   (The file can be created in a specified folder by clicking the **Browse** Button. The default file name is the name of the batch trend file with a CSV file name extension.)

CSV File Specifications

Batch trend (comma) Version (carriage return)

Screen name text string (carriage return)

Output time (comma) Output date data (comma) Output time data (carriage return)

Start time (comma) Batch start date data (comma) Batch start time data (carriage return)

Finish time (comma) Batch finish date data (comma) Batch finish time data (carriage return)

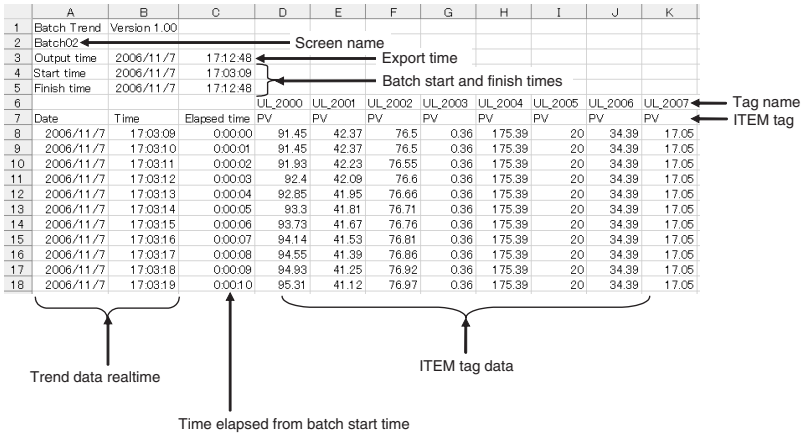
(comma) (comma) (comma) Tag name 1 (comma) Tag name 2 (comma) ···(comma) Tag name 8 (carriage return)

Date (comma) Time (comma) Elapsed time (comma) ITEM tag 1 (comma) ITEM tag 2 (comma) ···(comma) ITEM tag 8 (carriage return)

Data date (comma) Data time (comma) Data 1 (comma) Data 2 (comma) ···(comma) Data 8 (carriage return)

Note Data will not be displayed for unregistered tag numbers.

Example: When an Output CSV File Is Read Using Spreadsheet Software



	A	B	C	D	E	F	G	H	I	J	K
1	Batch Trend	Version 1.00									
2	Batch02										
3	Output time	2006/11/7	17:12:48								
4	Start time	2006/11/7	17:03:09								
5	Finish time	2006/11/7	17:12:48								
6				UL_2000	UL_2001	UL_2002	UL_2003	UL_2004	UL_2005	UL_2006	UL_2007
7	Date	Time	Elapsed time	PV	PV	PV	PV	PV	PV	PV	PV
8	2006/11/7	17:03:09	0:00:00	91.45	42.37	76.5	0.36	175.39	20	34.39	17.05
9	2006/11/7	17:03:10	0:00:01	91.45	42.37	76.5	0.36	175.39	20	34.39	17.05
10	2006/11/7	17:03:11	0:00:02	91.93	42.23	76.55	0.36	175.39	20	34.39	17.05
11	2006/11/7	17:03:12	0:00:03	92.4	42.09	76.6	0.36	175.39	20	34.39	17.05
12	2006/11/7	17:03:13	0:00:04	92.85	41.95	76.66	0.36	175.39	20	34.39	17.05
13	2006/11/7	17:03:14	0:00:05	93.3	41.81	76.71	0.36	175.39	20	34.39	17.05
14	2006/11/7	17:03:15	0:00:06	93.73	41.67	76.76	0.36	175.39	20	34.39	17.05
15	2006/11/7	17:03:16	0:00:07	94.14	41.53	76.81	0.36	175.39	20	34.39	17.05
16	2006/11/7	17:03:17	0:00:08	94.55	41.39	76.86	0.36	175.39	20	34.39	17.05
17	2006/11/7	17:03:18	0:00:09	94.93	41.25	76.92	0.36	175.39	20	34.39	17.05
18	2006/11/7	17:03:19	0:00:10	95.31	41.12	76.97	0.36	175.39	20	34.39	17.05

4-11 Segment Program 2 Screens

Operations such as monitoring operating conditions and setting step data for a Segment Program 2 (Block Model 157) function block can be executed using Segment Program 2 Screens. The monitored segment data can be automatically saved in a Segment Program 2 trend file.

Segment Program 2 trend files can be used to display previously collected segment data on Segment Program 2 Screens and to output the previous data to CSV files. The Segment Program 2 Screens are displayed by clicking the Segment Program 2 icon on the Overview Screen.

4-11-1 Overview

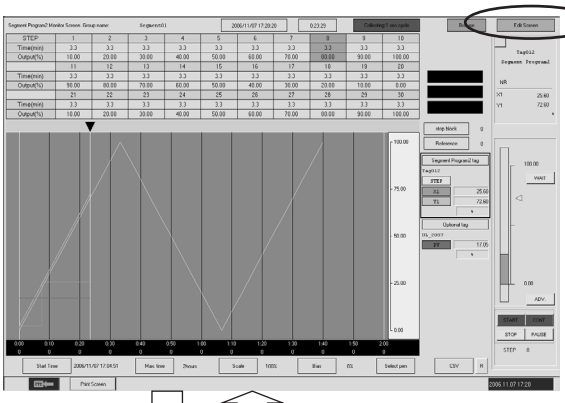
The Segment Program 2 Screens consists of the Segment Program 2 Monitor Screen and the Segment Program 2 Edit Screen, as shown below.

Overview Screen

Segment Program 2 Monitor Screen

Segment Program 2 step data set values, program output present values, and reference input present values are displayed on a trend graph.

- Controls Segment Program 2 graphs and monitors operating status.
- References previously collected Segment Program 2 segment data.

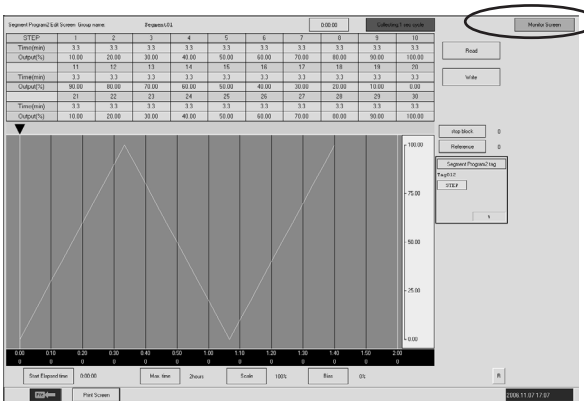


Click to go to the Segment Program 2 Edit Screen.

Segment Program 2 Edit Screen

Edit Segment Program 2 steps.

- Read, set, and write the relevant Segment Program 2 steps.

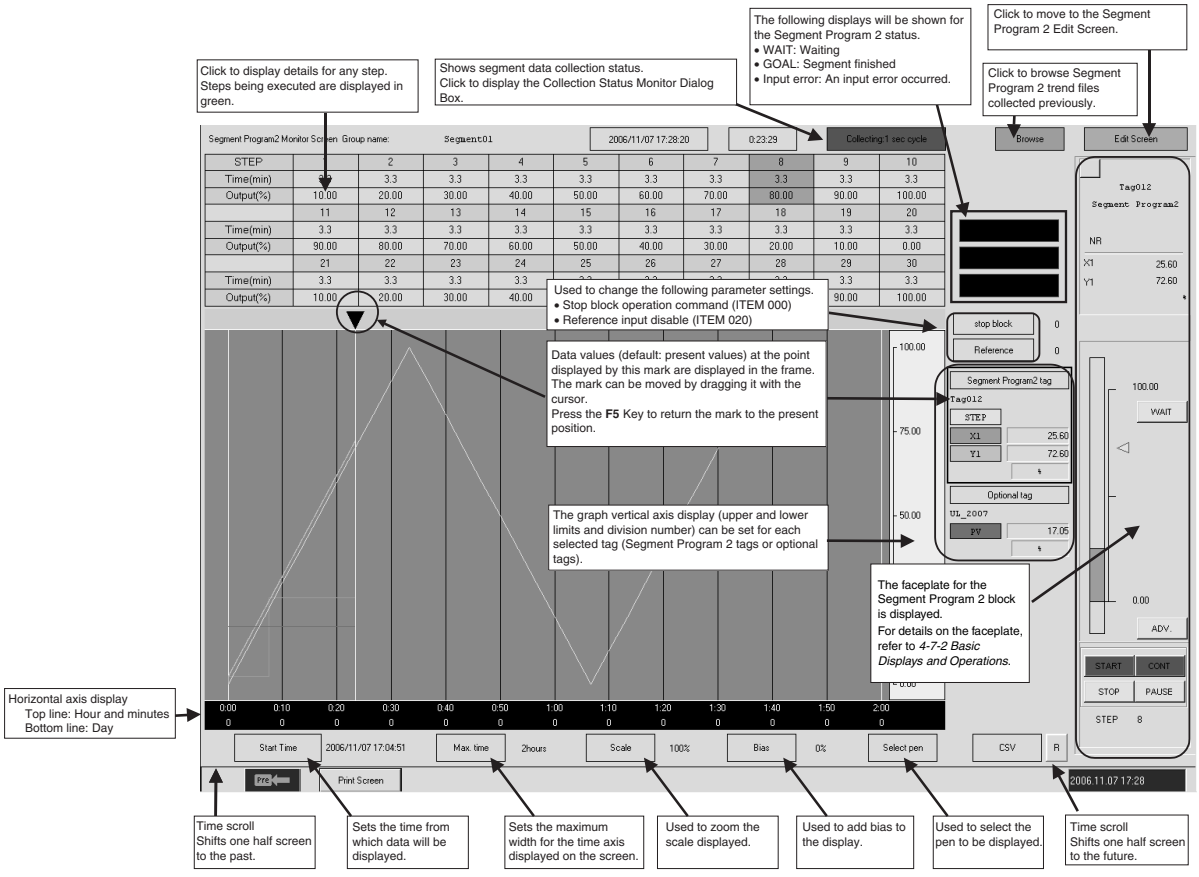


Click to go to the Segment Program 2 Monitor Screen.

- A maximum of 16 pairs of Segment Program 2 Edit Screens can be registered.
- The above screen names will be used in the descriptions from here onwards.

4-11-2 Segment Program 2 Monitor Screen Examples and Operations

Segment Program 2 present values are displayed in a trend graph.



Data That Can Be Monitored on the Segment Program 2 Monitor Screen

The following data can be displayed simultaneously on the Segment Program 2 Monitor Screen.

Data	Color of line on graph	Details
Step data	Yellow	Step data in the Loop Controller is displayed on the screen in advance, overlapping other tag values.
Program output Y1 (ITEM 008)	Light blue	---
Reference input X1 (ITEM 007)	Green	---
Optional tag	Purple	Specify any tag

Note Step Data Display
When the Segment Program 2 Monitor Screen is displayed first, the step data is not displayed. (Step data is displayed by starting segment data collection.) To check in advance the step data executed on the Segment Program 2 Monitor Screen, move to the Segment Program 2 Edit Screen.
With the move to the Segment Program 2 Edit Screen, new Segment Program 2 step data is received from the Loop Controller and the display is updated on the Segment Program 2 Monitor Screen.

Segment Program 2 Collection Cycles and Maximum Save Times

The following table shows the Segment Program 2 Monitor Screen data collection cycles and maximum save times.

Item	Details
Collection cycle (See note.)	1 s, 10 s, 1 min
Maximum save time	3 days (Collection cycle: 1 s) 30 days (Collection cycle: 10 s) 180 days (Collection cycle: 1 min)

Note

1. The collection cycle is set using the CRT Builder Dialog Box (Segment Program 2 Screen) from the Builder Window. For details on collection cycle settings, refer to *5-5-2 Overview of Screen Registration*.
2. Depending on the number of combined function blocks and the model of Loop Controller that is connected, it may not be possible to collect the data within the collection cycle that is set. If the data is displayed on a graph under these conditions, the data will be updated with the same values as for the previous collection. To remedy this situation, take measures such as lengthening the collection cycle interval.

Segment Data Collection Starting and Stopping

When the monitored Segment Program 2 Block S1 (ITEM 013) turns ON, data collection starts. When it turns OFF, data collection stops.

When segment data collection is started, Segment Program 2 trend files are automatically created in binary format for each Segment Program 2 Screen.

Note Start the CX-Process Monitor Plus before starting to run Segment Program 2. If it is started after the CX-Process Monitor Plus, the step data may not match the monitored program output display.

Segment Program 2 Status Display

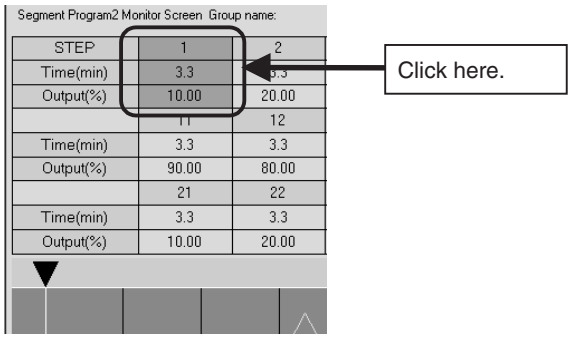
Segment Program 2 status is displayed at the upper right of the Segment Program 2 Monitor Screen.

There are three types of status display, as shown below.

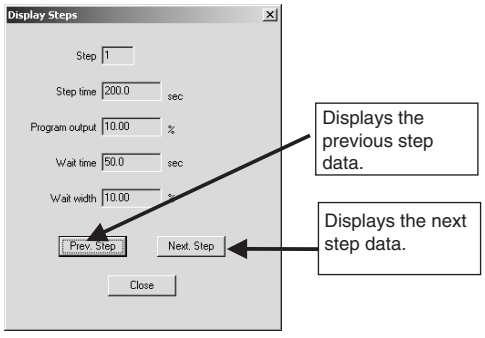
- Displayed when U10 Waiting (ITEM 019) in the Segment Program 2 block turns ON.
- Displayed when U2 Arrival at Final Segment (ITEM 016) in the Segment Program 2 block turns ON.
- Displayed when U1 X1 Input Error (ITEM 015) in the Segment Program 2 block turns ON.

Checking Step Data

1,2,3... 1. Click the step data section in the table.



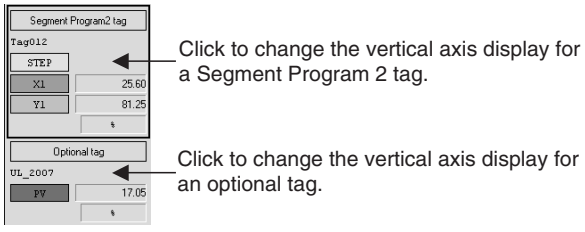
2. The Display Steps Dialog Box will be displayed.
   Set values cannot be changed from this dialog box. To change set values, use the Segment Program 2 Edit Screen.



Changing the Vertical Axis Display

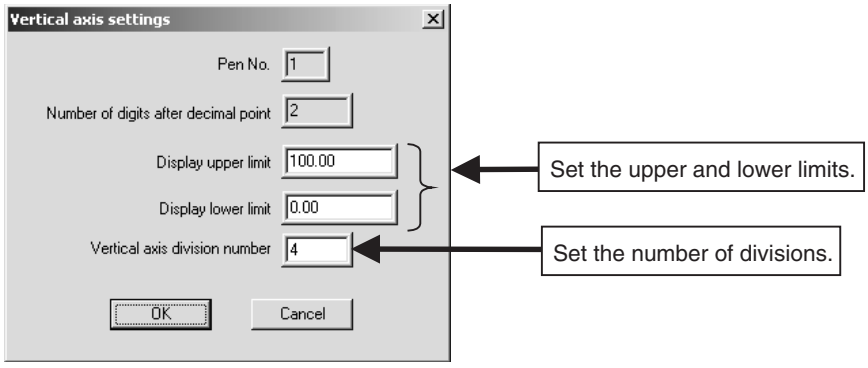
The Segment Program 2 Monitor Screen vertical axis display can be changed for each Segment Program 2 tag or optional tag.

1,2,3... 1. Click the data display area of the Segment Program 2 Monitor Screen.



2. With the data display area selected, double-click the vertical axis of the graph.

3. The Vertical axis settings Dialog Box will be displayed. Set the vertical axis display.



Note When changing the scaling settings in the CRT Builder's Segment Program 2 settings screen, change the upper and lower limit settings in the Vertical axis settings Dialog Box to match the new scaling values.

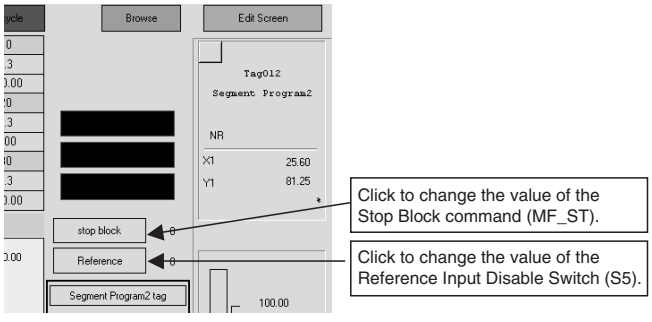
Changing Parameters

Change the following parameters for the Segment Program 2 Function Block.

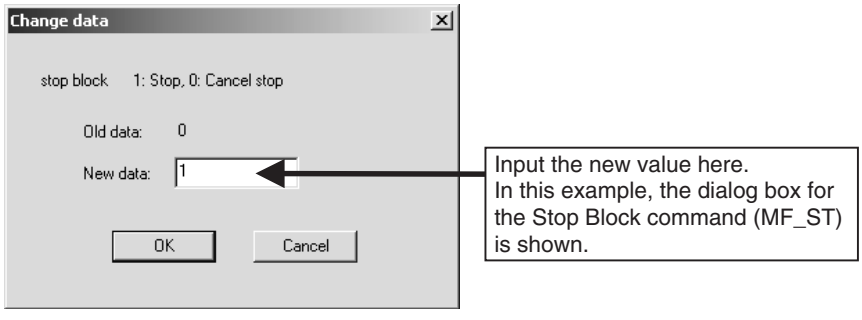
- Stop block operation command (ITEM 000)
- Reference input disable (ITEM 020)

1,2,3...

1. Click the **Stop Block** and **Reference** Buttons in the Segment Program 2 Monitor Screen.



2. The Change data Dialog Box will be displayed. Input the new value.



3. Click the **OK** Button. The new value will be reflected in the parameters for the Segment Program 2 Function Block.

Segment Program 2 Trend Files

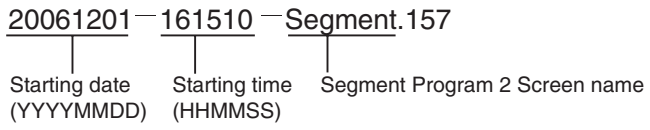
When Segment Program 2 data collection starts (i.e., when S1, ITEM 013, turns ON), Segment Program 2 trend files are automatically created in binary format for each Segment Program 2 Monitor Screen.

File Names

Segment Program 2 trend files are saved under the following file name for each date.

File name: Starting date - Starting time - Segment Program 2 Screen name.157

Example:



Segment Program 2 Monitor Screen Maximum Save Time

When the maximum save time (3, 30, or 180 days) has elapsed for a Segment Program 2 Monitor Screen, the Segment Program 2 trend file is no longer updated.

If S1 (ITEM 013) for the Segment Program 2 Block is ON, a new Segment Program 2 trend file is created and segment data collection is restarted.

Segment Program 2 Trend File Save Cycles

A Segment Program 2 trend file is added each time segment data collection is started.

A setting can be made on the System Info Screen so that Segment Program 2 trend files created outside of the regular cycle are automatically deleted.

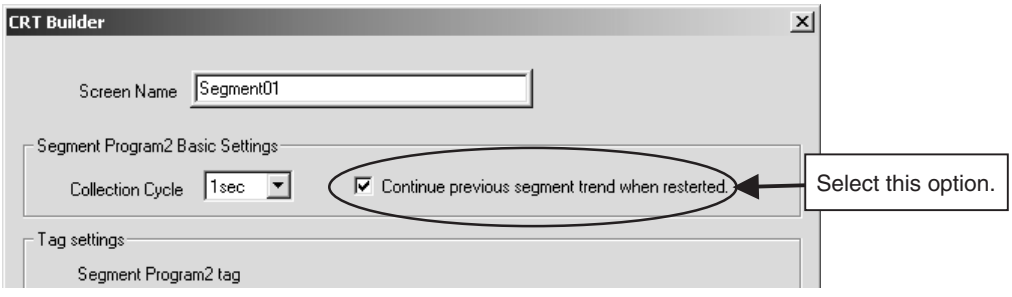
For details on the System Info Screen, refer to *5-6-9 CSV File Auto-save Settings*.

Starting and Stopping CX-Process Monitor Plus Operation

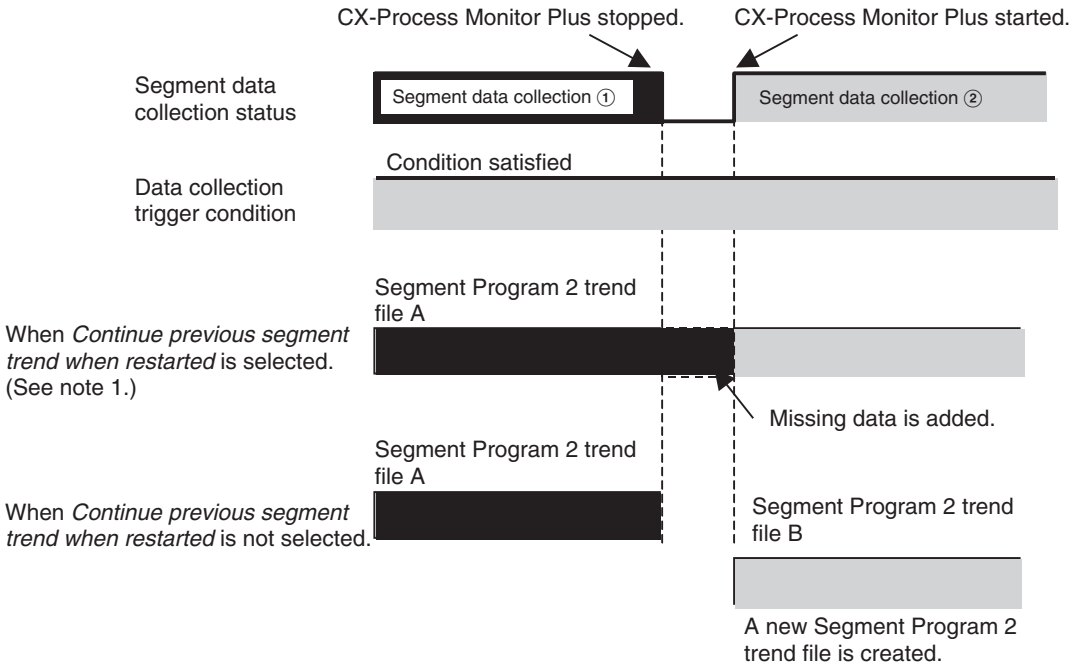
When the CX-Process Monitor Plus is stopped (either by stopping all CX-Process Monitor Plus modules or by turning OFF the computer), the segment data collection is stopped even if S1 (ITEM 013) of the Segment Program 2 Block is ON.

When the CX-Process Monitor Plus is restarted, the data collection starts again, but the data is collected in a new Segment Program 2 trend file.

An option in the CRT Builder Dialog Box option (Segment Program 2 Screen) from the Builder Window can be selected to enable segment data to continue to be collected in the Segment Program 2 trend file from when the CX-Process Monitor Plus was stopped.

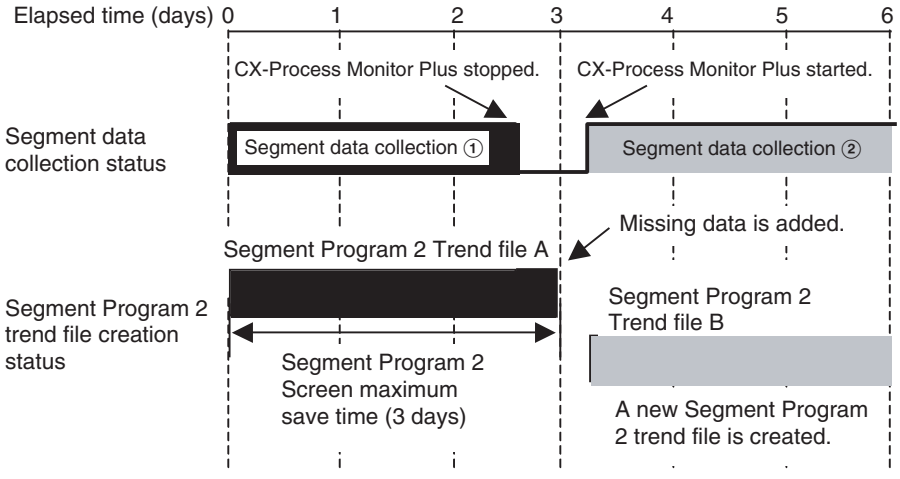


Difference in Segment Program 2 File Creation Method by Selecting *Continue previous segment trend when restarted* Option



Note 1. Even if this option is selected, saving will not be continued if the restart time exceeds the Segment Program 2 Screen maximum save time.

Example: 1-s Collection Cycle



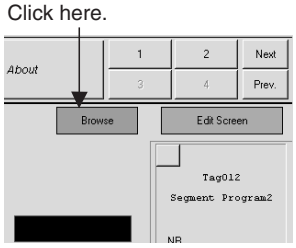
2. If S1 in the Segment Program 2 Block changes from ON to OFF while the CX-Process Monitor Plus is stopped, the CX-Process Monitor Plus will not recognize it.
   If S1 of the Segment Program 2 Block is ON when the CX-Process Monitor Plus is restarted, and if the *Continue previous segment trend when restarted* option is selected, the data will be saved in the same Segment Program 2 trend file as when the previous CX-Process Monitor Plus was stopped.
3. For details on Builder Window CRT Dialog Box (Segment Program 2 Screen) settings, refer to *5-5-2 Overview of Screen Registration*.

Referencing Past Segment Data

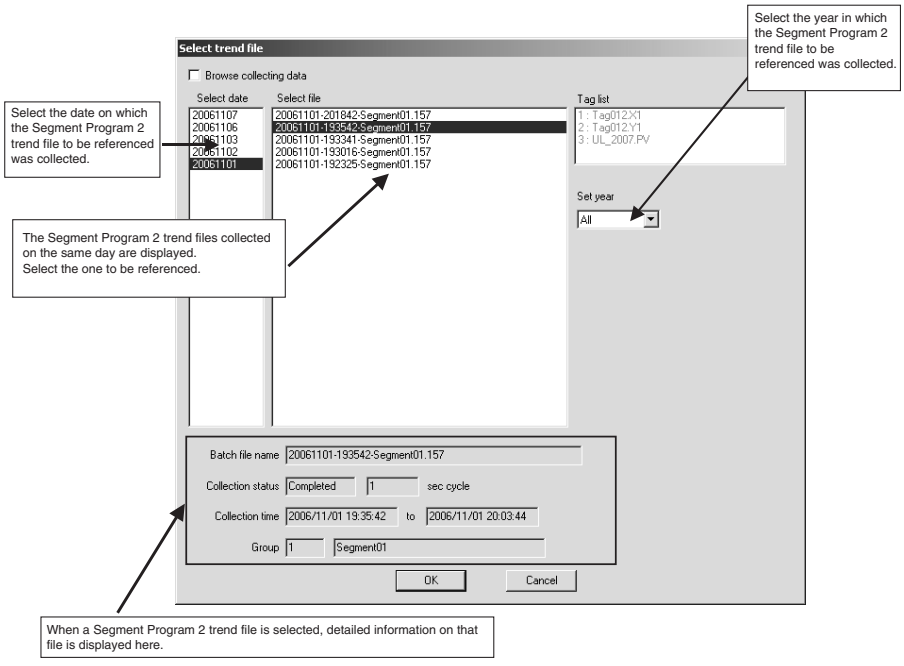
Segment data collected in the past is saved as Segment Program 2 trend files.

These files can be displayed on Segment Program 2 Monitor Screens.

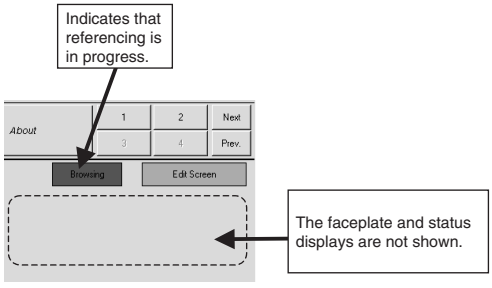
1,2,3... 1. Click the **Browse** Button at the top of the Segment Program 2 Monitor Screen to display the Select trend file Dialog Box.



2. In the Select trend file Dialog Box, select the Segment Program 2 trend file that is to be referenced.



3. The status of the selected Segment Program 2 trend file will be displayed on the Segment Program 2 Monitor Screen.
   The display on the Segment Program 2 Monitor Screen while the Segment Program 2 trend file is being referenced will be as shown below.



4. To end the Segment Program 2 trend file reference status, click the **Browse** Button to display the Select trend file Dialog Box and select the *Browse collecting data* option.
   The Segment Program 2 trend file reference status will be ended when moving to another screen.

Note Changing the Segment Program 2 Screen Name
If the name of a Segment Program 2 Screen is changed using the Builder Window CRT Builder Dialog Box (Segment Program 2 Screen), Segment Program 2 trend files created by data collection prior to the change can no longer be referenced.

CSV File Output

Data collected using the Segment Program 2 Monitor Screen (data grouped by date, time, or tag number) can be output in CSV (Comma Separated Values) file format either automatically or manually.

Automatic Saving

The following settings are used when configuring screens (i.e., when registering Segment Program 2 Screens).

- Automatic save enable
- Save filter name and save destination folder

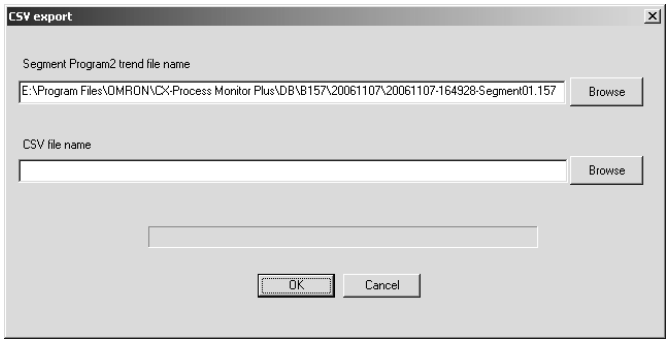
The CSV file is automatically saved according to these settings when segment data collection stops (when S1 turns OFF).

Manual Saving (Saving by Using Buttons)

Use the following procedure.

1,2,3...

1. Press the **CSV** Button in the Segment Program 2 Monitor Screen to display the CSV export Dialog Box.



2. Select the Segment Program 2 trend file to export.
3. Specify a name for the CSV file and click the **OK** Button. The CSV file will be created.
   (The file can be created in a specified folder by clicking the **Browse** Button. The default file name is "*Segment_Program_2_trend_file_name*.CSV.")

CSV File Specifications

Segment Program 2 trend (comma) Version (carriage return)

Screen name text string (carriage return)

Output time (comma) Output date data (comma) Output time data (carriage return) (carriage return)

Step (comma) Step time (comma) Time unit (comma) Program output value (comma) Output value unit (comma) Wait time (comma) Time unit (comma) Wait width (comma) Wait width unit (carriage return)

0 (comma) Step 0 output value data (carriage return)

1 (comma) Step 1 step time data (comma) Step 1 time unit data (comma) Step 1 program output value data (comma) Step 1 output value unit data (comma) Step 1 wait time data (comma) Step 1 wait time unit data (comma) Step 1 wait width data (comma) Step 1 wait width unit data (carriage return)

:

(Continued to step 30.)

:

(carriage return)

Start time (comma) Data collection start date data (comma) Data collection start time data (carriage return)

Finish time (comma) Data collection finish date data (comma) Data finish time data (carriage return)

(comma) (comma) (comma) Segment Program 2 tag name (comma) Segment Program 2 tag name (comma) Optional tag name (carriage return)

Date (comma) Time (comma) Elapsed time (comma) X1 (comma) Y1 (comma) Optional tag ITEM name (carriage return)

Data date (comma) Data time (comma) Data for time elapsed since batch start (comma) Data 1 (comma) Data 2 (comma) Data 3 (carriage return)

Note Data will not be displayed for unregistered tag numbers.
Also, if the data in a single CSV file exceeds 65,000 lines, another CSV file will be created. The CSV files will be saved with "_01.CSV," "_02.CSV," etc., added at the end of the filename.

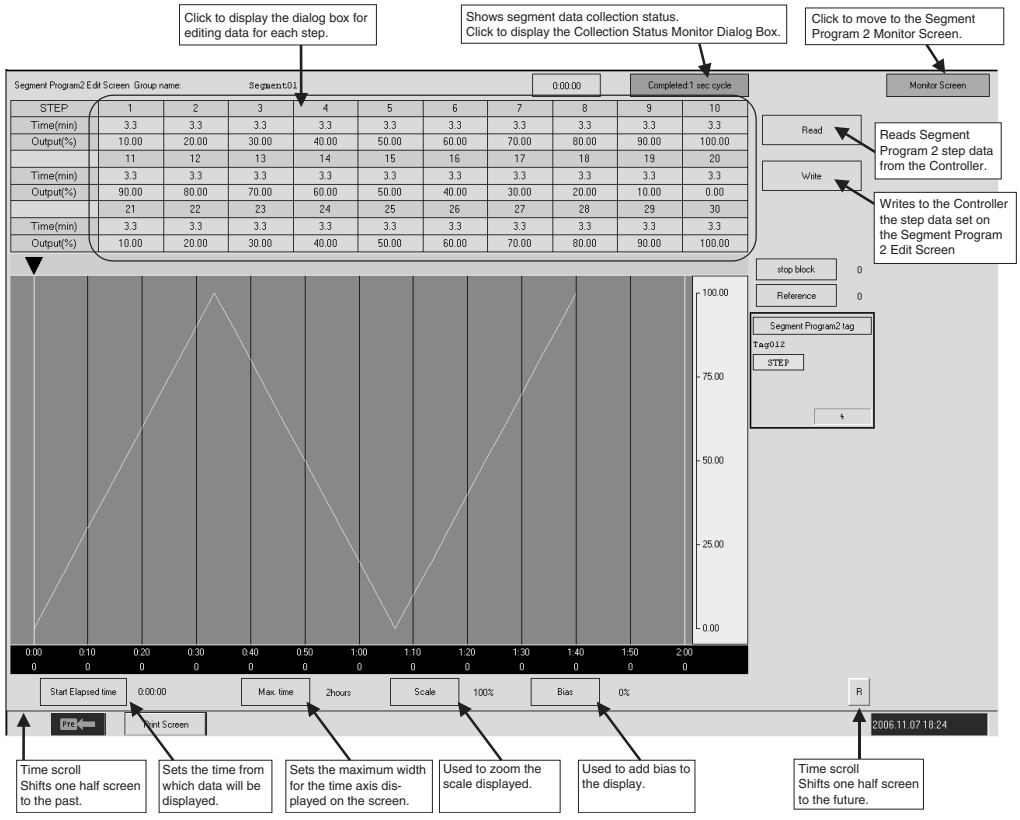
Example: When an Output CSV File Is Read Using Spreadsheet Software

	A	B	C	D	E	F	G	H	I
1	Segment Program2 Trend	Version 1.00							
2	Segment01								
3	Output time	2006/11/7	18:00:05						
4									
5	Step	Step time	time unit	program output value	output value unit	wait time	time unit	wait width	wait width unit
6	0			0	%				
7	1	200	sec	10	%	1.5	sec	0	%
8	2	200	sec	20	%	0	sec	0	%
9	3	200	sec	30	%	0	sec	0	%
10									
11									
12	28	200	sec	80	%	0	sec	0	%
13	29	200	sec	90	%	0	sec	0	%
14	30	200	sec	100	%	0	sec	0	%
15									
16	Start Time	2006/11/7	17:04:51						
17	Finish time	2006/11/7	17:59:46						
18				Tag012	Tag012	UL_2007			
19	Date	Time	Elapsed time	X1	Y1	PV			
20	2006/11/7	17:04:51	0:00:00	2.28	0	17.05			
21	2006/11/7	17:04:52	0:00:01	2.28	0	17.05			
22	2006/11/7	17:04:53	0:00:02	2.28	2.28	17.05			
23	2006/11/7	17:04:54	0:00:03	2.28	2.33	17.05			
24	2006/11/7	17:04:55	0:00:04	2.28	2.38	17.05			
25	2006/11/7	17:04:56	0:00:05	2.28	2.43	17.05			
26	2006/11/7	17:04:57	0:00:06	2.28	2.53	17.05			
27	2006/11/7	17:04:58	0:00:07	2.28	2.53	17.05			
28	2006/11/7	17:04:59	0:00:08	2.28	2.58	17.05			
29	2006/11/7	17:05:00	0:00:09	2.28	2.63	17.05			
30	2006/11/7	17:05:01	0:00:10	2.28	2.68	17.05			
31	2006/11/7	17:05:02	0:00:11	2.28	2.73	17.05			
32	2006/11/7	17:05:03	0:00:12	2.28	2.78	17.05			

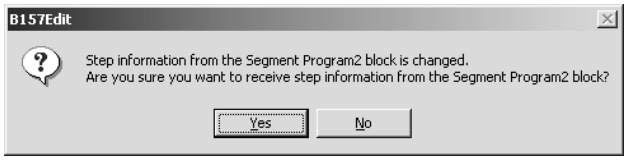
Screen name
Export time
Segment Program 2 step information
Data collection start and finish times
Tag name
ITEM tag
Trend data realtime
ITEM tag data
(X1, Y1, and optional tag data for Segment Program 2)
Time elapsed from batch start time

4-11-3 Segment Program 2 Edit Screen Display Examples and Operations

Segment data for the relevant Segment Program 2 Block can be set while observing actual segment status in realtime, and the settings can be transferred to the Loop Controller.

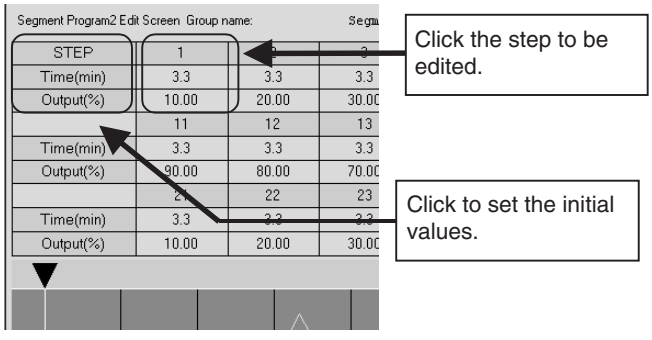


Note The following dialog box will be displayed if step data registered in the Loop Controller is updated when the Segment Program 2 Edit Screen is displayed. Click the **Yes** Button to update the step data.

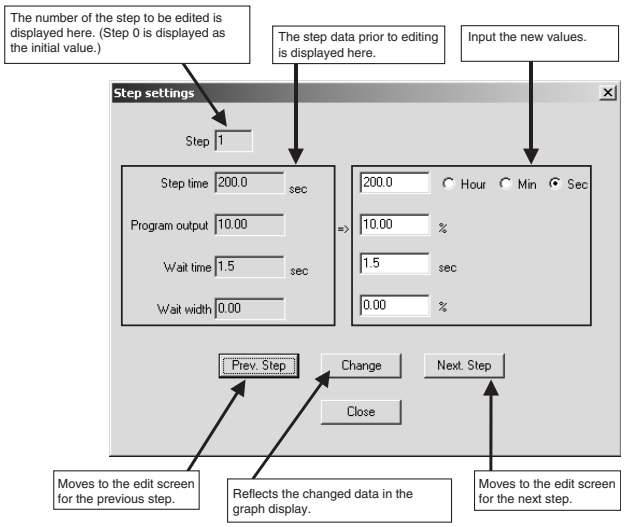


Editing Step Data

1,2,3... 1. Click the step area at the top of the Segment Program 2 Edit Screen.



2. The Step Settings Dialog Box will be displayed.
   Input the values to be set for each step and click the **Change** Button.
   The graph display will be updated at that point, but the new settings will not be sent to the Loop Controller.



3. After the changes have been completed, click the **Close** Button to close the Step Settings Dialog Box.

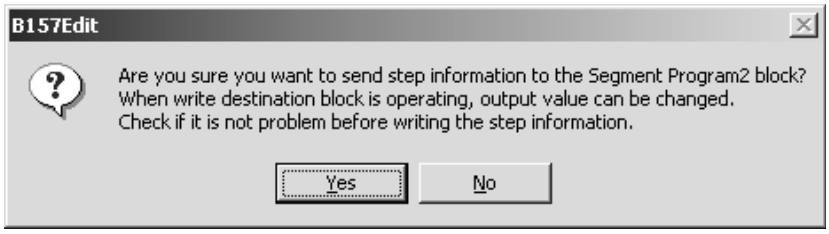
Transferring Edited Step Data to the Loop Controller

Use the following procedure to transfer the step data edited on the Segment Program 2 Edit Screen to the Loop Controller.

⚠ WARNING Transferring segment data while the Segment Program 2 function block or function blocks that are affected by Segment Program 2 outputs are running may affect the outputs from these function blocks.
Transferring data without first confirming the results may cause unexpected operation of the controlled equipment.

1,2,3...

1. Click the **Write** Button on the Segment Program 2 Edit Screen.
2. The following dialog box will be displayed.
   Confirm the effects of writing the step data, and then click the **Yes** Button to start the transfer.



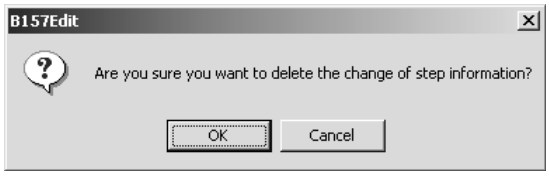
Reading Step Data from the Loop Controller

Use the following procedure to read the step data currently registered to the Loop Controller.

1,2,3...

1. Click the **Read** Button on the Segment Program 2 Edit Screen.

2. If step data has been edited on this screen, the following dialog box will be displayed. Click the **OK** Button to delete the step data edited on this screen and to use the step data read from the Loop Controller.

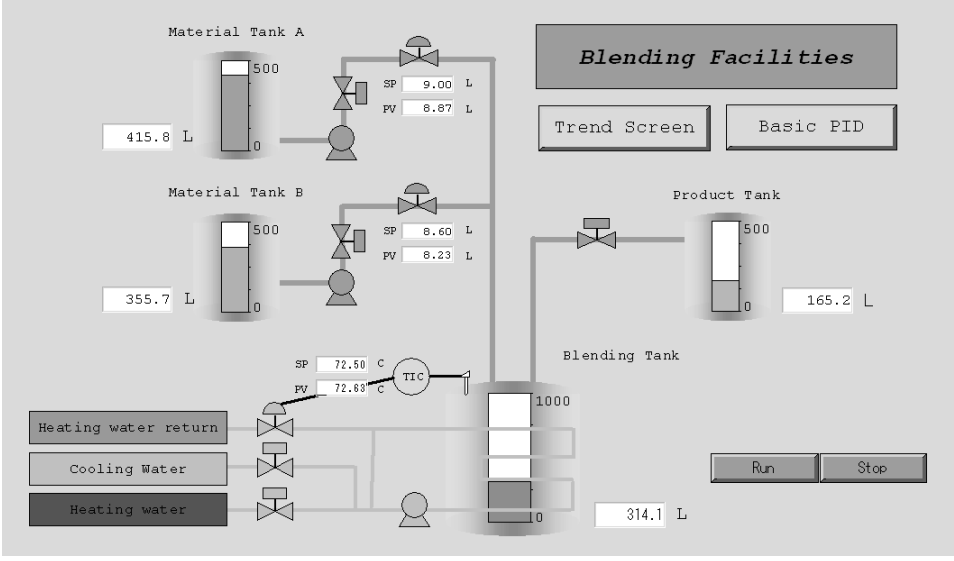


3. The step data will be read from the Loop Controller and will be reflected on the Segment Controller 2 Edit Screen.

4-12 Graphic Screens

Graphic Screens display the status of the system or device in graphic form. To display the Graphic Screen, click the **Graphic Screen** Icon in the Overview Screen.

Graphic Screen



Paste to the screen graphic elements representing plant instrumentation, which have been provided, and use them to display the device status, to a maximum of 200 screens.

Library figures and images: Text, lines, rectangles, round rectangles (rectangles with rounded corners), ellipses, polygons, and images

Library Functional Objects

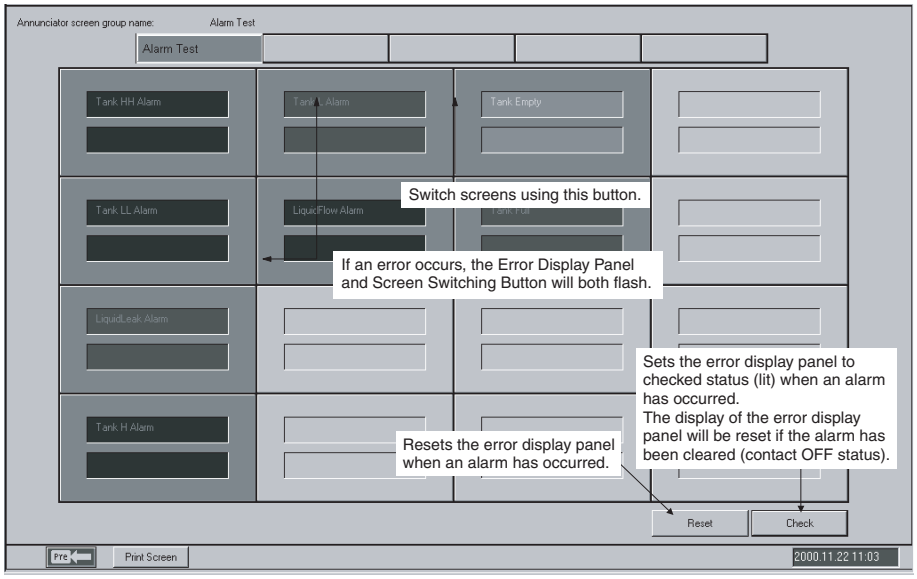
- Fixed graphic display elements:
  - Text boxes, instruments, thermometers, transmitters, and orifices
- Changeable graphic display elements:
  - Analog inputs: Bar graph displays, numerical value displays, and tanks
  - Analog settings: Numerical settings (See note.)
  - Contact inputs (display): Pumps, valves, and pipes
  - Contact settings (operation): Switches (See note.)
- Screen display objects:
  - Screen jump objects, FP switch (faceplate pop-up) objects

Note If making analog values or contact settings, use tags for Constant Generator (Block Model 166) and Internal Switch (Block Model 209).

Element	Function block or ITEM set as send source
Function block	Control Blocks: Basic PID (011), Advanced PID (012), Blended PID (Block Model 013), Batch Flow-rate Capture (Block Model 014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), 2-position ON/OFF (001), 3-position ON/OFF (002) Operation Blocks: High/Low Alarm (111), Segment Program 2 (157), ON/OFF Value Manipulator (221), Motor Manipulator (222), Reversible Motor Manipulator (223), Motor Opening Manipulator (224), Timer (205), Counter (208)
	The following for all function blocks: Analog input signals (Input Selector (Block Model 162)) Analog output signals (Constant Generator (Block Model 166))
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	Analog values: Bar graphs, numerical values, tank level Contacts: Indicators, pumps, valves, pipes
Setting	Analog values: Numerical values (using Constant Generator (Block Model 166)) Contacts: Switches (using Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))

4-13 Annunciator Screens

Annunciator Screens display comprehensively the contacts status (mainly the alarm status). To display the Annunciator Screen, click the **Annunciator Screen** icon on the Overview Screen.



There are no particular limits to contacts that can be specified. Basically, however, register contacts that display the alarm status of the Control Block's HH (High/High Alarm), H (High Alarm), L (Low Alarm), and LL (Low/Low Alarm), etc.

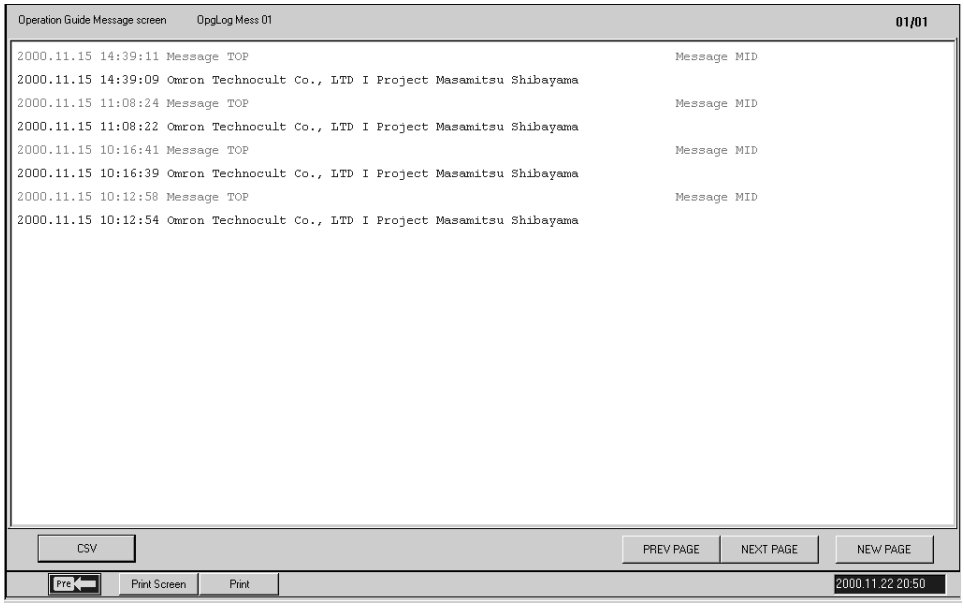
If an alarm/error occurs, the icon color will change and a beep will sound. At the same time, two rows of eight wide-size characters making a user-registered message can be displayed.

You can display a total of 16 separate elements per screen as 4 rows × 4 columns, to a maximum of five screens.

Element	Send source Function Block, or ITEM
Target function block	Control Blocks: PV, SP, and MV only for Basic PID (011), Advanced PID (012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), 2-position ON/OFF (001), and 3-position ON/OFF (002). Operation Blocks: High/Low Alarm (111), Segment Program 2(157), ON/OFF Valve Manipulator (221), Motor Manipulator (222), Reversible Motor Manipulator (223), Motor Opening Manipulator (224), Timer (205), Counter (208)
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	Color, sound, and messages displayed when contact is ON.
Setting	None

4-14 Operation Guide Screens

Operation Guide Screens display messages registered when the contact signal was turned ON. To display the Operation Guide Message Screen, click the **Operation Guide** Button.



When the specified contact (internal switch, etc.) is turned ON, the pre-prepared wide-size character message (54 wide characters) will be displayed together with the time the contact was turned ON. (When the contact is turned ON, a red mark will be displayed next to the Operation Guide icon on the Overview Screen.)

Possible No. of registrations: 1,000 messages max.

Message colors: 16 colors, displayed with sound.

You can display a message with a maximum of 1,000 elements on one screen.

Element	Send source Function Block, or ITEM
Target function block	Control Blocks: PV, SP, and MV only for Basic PID (011), Advanced PID (012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), 2-position ON/OFF (001), and 3-position ON/OFF (002). Operation Blocks: High/Low Alarm (111), Segment Program 2 (157), ON/OFF Value Manipulator (221), Motor Manipulator (222), Reversible Motor Manipulator (223), Motor Opening Manipulator (224), Timer (205), Counter (208)
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	Color, sound, and messages displayed when contact is ON.
Setting	None

CSV File Output

Operation Guide message data (date, time, contents of Operation Guide) can be output in CSV (Comma Separated Value) file format using the following procedure.

1,2,3...

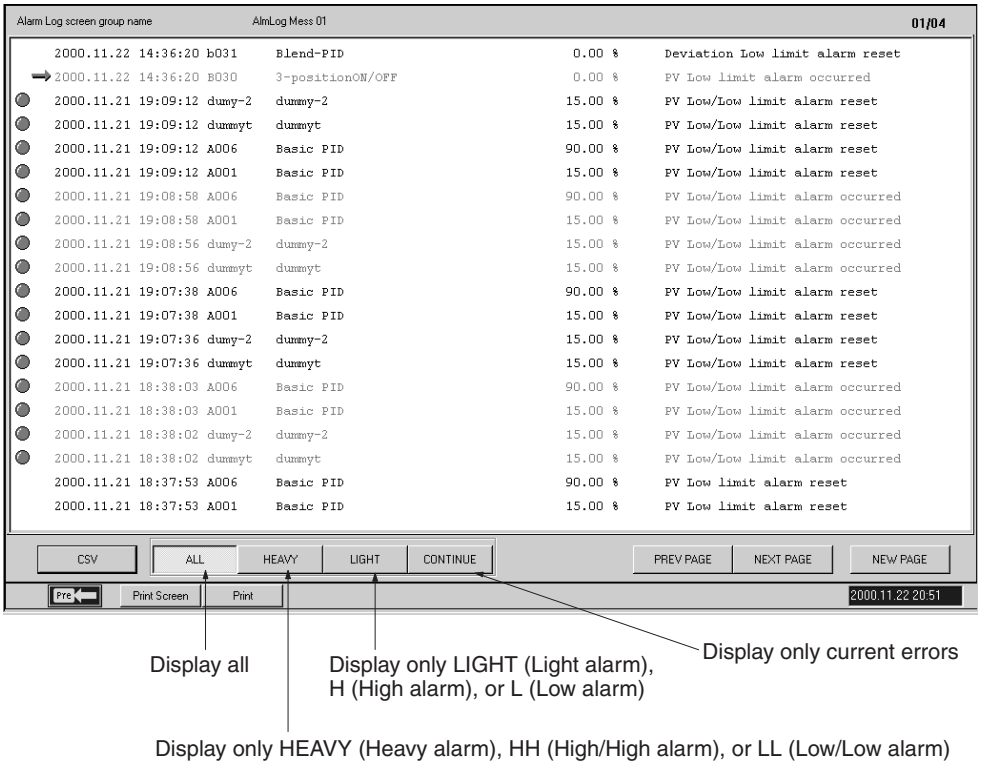
1. Press the **CSV** Button to display the Export to CSV File Dialog Box.
2. Specify a name for the CSV file, and click the **OK** Button. A CSV file will be created. (By clicking the **Browse** Button, the CSV file can be created in a desired folder. The default filename is Opglog.csv.) The contents of CSV files created are as follows:

   Operation Guide Message Log (carriage return)
   <Screen_name>(carriage return)
   <Date_exported>(comma)<Time_exported>(carriage return)
   <Date_of_Operation_Guide>(comma)<Time_of_Operation_Guide>(comma)<Registered_Message>(carriage return)

4-15 Alarm Log Screens

Alarm Log Screens display alarm logs. To display the Alarm Log Screen, click the **Alarm** Button.

The targets monitored for alarms are as follows: Control Block's HH (High/High Alarm), H (High Alarm), L (Low Alarm), LL (Low/Low Alarm), and DA (Deviation Alarm) contacts, and other contact signals (including parameters).



Save and display comprehensively alarm records (time error occurred, Tag name, current value when PV or MV occurred, alarm type, etc.) occurring from the Controller and Alarm Blocks.

You can display a maximum of 1,000 alarm messages on one screen.

Element	Function block or ITEM set as send source
Function block	Control Blocks: High/High alarm, High alarm, Low alarm, Low/Low alarm, and Deviation alarm for Basic PID (011), Advanced PID (012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (031), Indication and Operation (032), Ratio Setting (033), Indicator (034), 2-position ON/OFF (001), and 3-position ON/OFF (002), Segment Program 2 (157), ON/OFF Value Manipulator (221), Motor Manipulator (222), Reversible Motor Manipulator (223), Motor Opening Manipulator (224).
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	Alarm history (date and time of occurrence, and value when alarm occurred) Time of occurrence: Red; Time of recovery: Black
Setting	None

CSV File Output

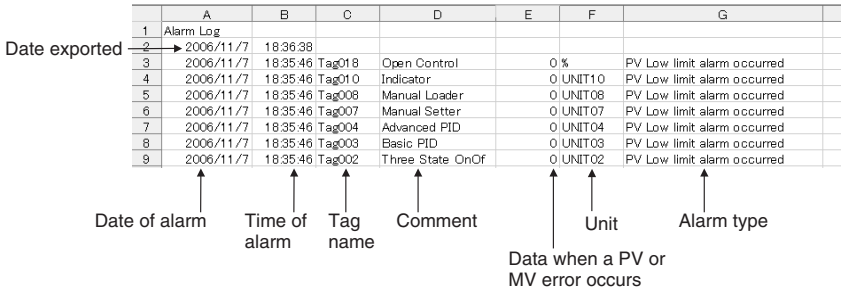
Alarm log data (date, time, tag names, current value when alarm occurred, type of alarm) can be output in CSV (Comma Separated Value) file format using the following procedure.

1,2,3... 1. Press the **CSV** Button to display the Export to CSV File Dialog Box.

2. Specify a name for the CSV file, and click the **OK** Button. A CSV file will be created. (By clicking the **Browse** Button, the CSV file can be created in a desired folder. The default filename is Almlog.csv.) The contents of CSV files created are as follows:

   Alarm Log (carriage return)
   <Date_exported>(comma)<Time_exported>(carriage return)
   <Alarm_date>(comma)<Alarm_time>(comma)<Tag_name>(comma)
   <Comment>(comma)<Data_when_a_PV_or_MV_error_occurs>(comma)
   <Unit>(comma)<Alarm_type>(carriage return)

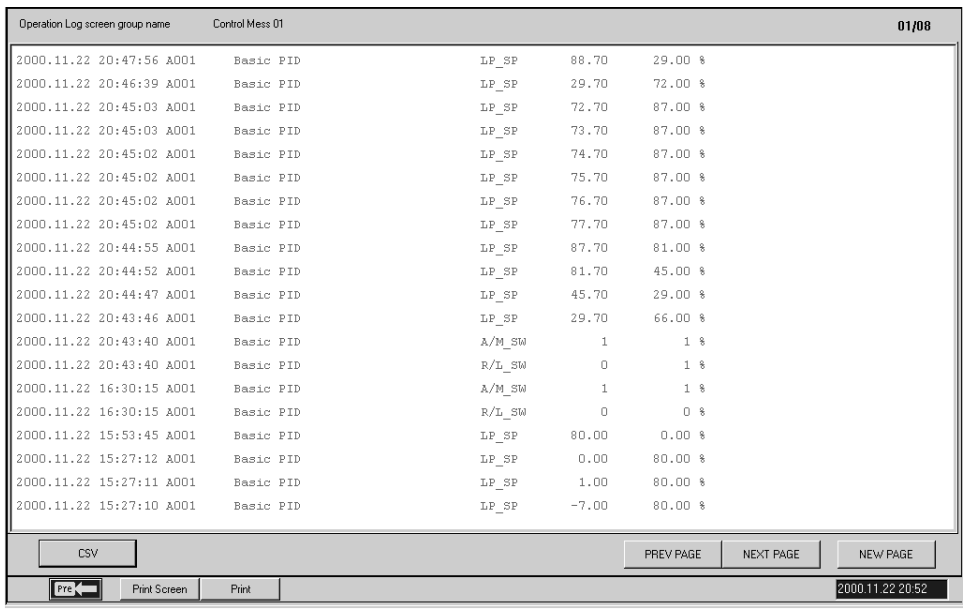
   Example: The following screen shows how alarm log data exported to spreadsheet software (e.g., Microsoft Excel) will be displayed.



	A	B	C	D	E	F	G
1	Alarm Log						
2	2006/11/7	18:36:38					
3	2006/11/7	18:35:46	Tag018	Open Control	0	%	PV Low limit alarm occurred
4	2006/11/7	18:35:46	Tag010	Indicator	0	UNIT10	PV Low limit alarm occurred
5	2006/11/7	18:35:46	Tag008	Manual Loader	0	UNIT08	PV Low limit alarm occurred
6	2006/11/7	18:35:46	Tag007	Manual Setter	0	UNIT07	PV Low limit alarm occurred
7	2006/11/7	18:35:46	Tag004	Advanced PID	0	UNIT04	PV Low limit alarm occurred
8	2006/11/7	18:35:46	Tag003	Basic PID	0	UNIT03	PV Low limit alarm occurred
9	2006/11/7	18:35:46	Tag002	Three State OnOf	0	UNIT02	PV Low limit alarm occurred

4-16 Operation Log Screens

Operation Log Screens display operation logs. To display the Operation Log Screen, click the **Operation Log** Button.



Save and display comprehensively records (time and date operation occurred, Tag name, ITEM data before change, ITEM data after change, etc.) of ITEM data changed within the Loop Control Unit, using the Control Screen or the Tuning Screen.

Operations using Graphic Screen data elements and switch elements are saved as operation logs and displayed together.

You can display a maximum of 1,000 operation messages on one screen.

CSV File Output

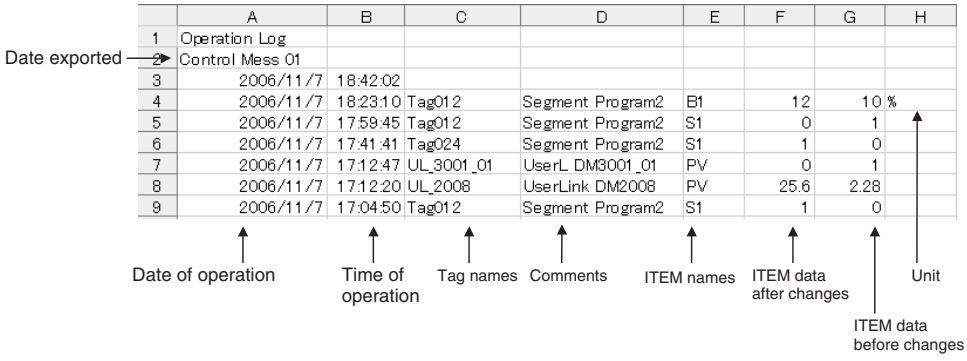
Operation log data (date, time, contents of operation) can be output in CSV (Comma Separated Value) file format using the following procedure.

1,2,3...

1. Press the **CSV** Button to display the Export to CSV File Dialog Box.
2. Specify a name for the CSV file, and click the **OK** Button. A CSV file will be created. (By clicking the **Browse** Button, the CSV file can be created in a desired folder. The default filename is Ctllog.csv.) The contents of CSV files created are as follows:

   Operation Log (carriage return)
   <Screen_name>(carriage return)
   <Date_exported>(comma)<Time_exported>(carriage return)
   <Operation_date>(comma)<Operation_time>(comma)
   <Tag_name>(comma)<Comment>(comma)<ITEM_name>(comma)
   <ITEM_data_after_changes>(comma)
   <ITEM_data_before_changes>(comma)<Unit>(carriage return)

   Example: The following screen shows how operation log data exported to spreadsheet software (e.g., Microsoft Excel) will be displayed.



	A	B	C	D	E	F	G	H
1	Operation Log							
2	Control Mess 01							
3	2006/11/7	18:42:02						
4	2006/11/7	18:23:10	Tag012	Segment Program2	B1	12	10	%
5	2006/11/7	17:59:45	Tag012	Segment Program2	S1	0	1	
6	2006/11/7	17:41:41	Tag024	Segment Program2	S1	1	0	
7	2006/11/7	17:12:47	UL_3001_01	UserL DM3001_01	PV	0	1	
8	2006/11/7	17:12:20	UL_2008	UserLink DM2008	PV	25.6	2.28	
9	2006/11/7	17:04:50	Tag012	Segment Program2	S1	1	0	

4-17 System Monitor Screens

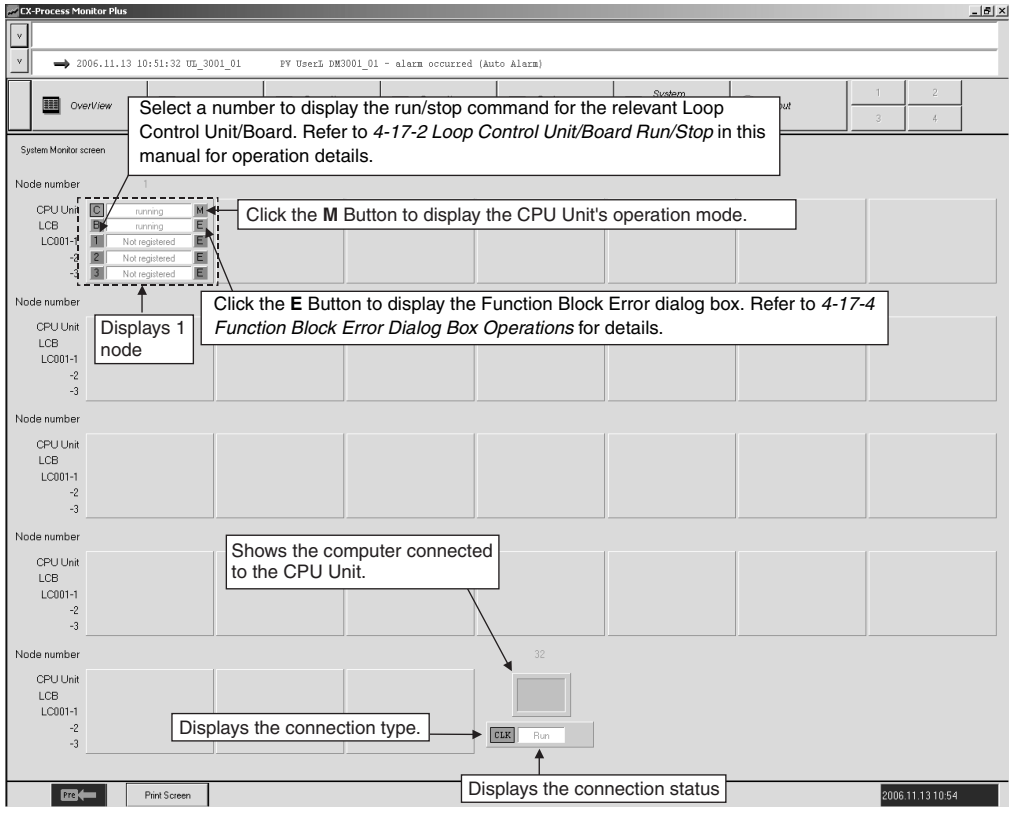
4-17-1 System Monitor Screen Outline

System Monitor Screen display the system status, and runs/stops the Loop Control Unit/Board. To display the System Monitor Screen, click the **System Monitor** Button.

You can display and operate the following items.

Display/operation	Item
Display	All system allocations
	All CPU Unit modes
	All Loop Control Unit/Board statuses (run/stop)
	Block errors (Execution errors, RAM checksum errors, battery errors)
	Type of connection to computer (CLK, Ethernet, serial), and connection status (OK, error)
Operation	Loop Control Unit/Board run/stop

Note The system status display on the System Monitor Screen depends on the settings made in the System Monitor Setting Window (using the **System Monitor Builder** Button in the Setup Dialog Box).



4-17-2 Loop Control Unit/Board Run/Stop

⚠ **WARNING** Before starting a Loop Control Unit, check the following points.

- Make sure that I/O Units used in combination are correctly mounted. Also, make sure that the Unit number on the front of analog I/O Units agree with the Unit number set using the field terminals. If the Unit numbers do not agree, I/O (i.e., read and write) will be performed incorrectly, with data for another Special I/O Unit (with the Unit number set using the field terminal).
- Make sure that the initial settings for System Common Block within the Loop Control Unit are correct. In particular, check that data memory (DM) for node terminals within the CPU Unit used by the Loop Control Unit is not allocated to other applications in the PLC as well. If the same DM has been allocated twice, there is a risk that the PLC system will malfunction, resulting in injury.
- When writing data to the I/O memory in the CPU Unit with function blocks (e.g., using Send All Blocks, Expanded DO/AO Terminal to CPU Unit, or DO/AO Terminal to CPU Unit), be sure that the words written to in the I/O memory are not being used for any other purpose. If I/O memory words are allocated to more than one purpose, the PLC system may act unexpectedly and cause injury.

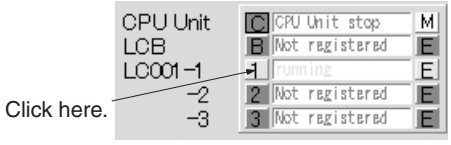
⚠ **WARNING** Check the following items before starting to run the Loop Control Board:

- Do not allow the bank of the EM Area with the number specified for allocation to the HMI (human-machine interface) data to overlap with any other area used by the CPU Unit or other Units. The block allocated for the HMI is specified in ITEM 050 (EM Area Bank Allocated for HMI Memory = 0 to 12) of the System Common block. If areas overlap, the system may operate in an unexpected fashion, which may result in injury.
- Do not allow the area to which user link table data is written to overlap with any other area used by the CPU Unit or other Units. If areas overlap, the system may operate in an unexpected fashion, which may result in injury.
- Analog Input/Output Units used in combination with the Loop Control Board must be mounted correctly, and the unit number set on the front panel of the Analog Input/Output Unit must match the unit number set on the Field Terminal block. If the unit numbers do not match, input/output (read/write) is performed on the data of another Special I/O Unit (whose unit number is set on the Field Terminal block).
- The defaults of the System Common block on the Loop Control Board must be set correctly.

⚠ **WARNING** Always stop the operation of the Loop Control Board before converting any of the EM Area to file memory. If any part of the EM Area that is being used by the Loop Control Board for the HMI is converted to file memory during Board operation, the system may operate in an unexpected fashion, which may result in injury.

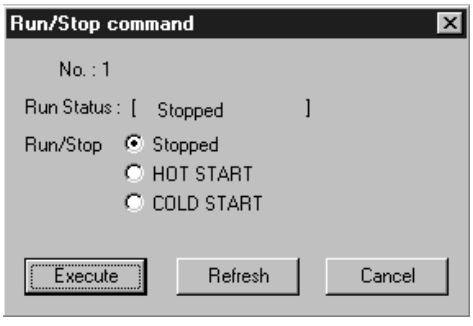
Note First sufficiently check system operation using the CX-Process Tool (check the load rate, etc.: Execution, Operation, Monitor Run Status), and sufficiently check operation (Monitor Run Status, Start) for the Function Block data that has been created, and then change to actual operation. In particular, first check that the load rate is 60% or less, and then change to actual operation.

1,2,3... 1. Click the number button for the Loop Control Unit you want to use, as shown.



The Run/Stop Command Dialog Box will be displayed as shown (for a Loop Control Unit).

- Loop Control Unit is stopped.



- Loop Control Unit is running.

2. Select **Stop**, **HOT START**, or **COLD START**, and then click the **Execute** Button.

   Click the **Refresh** Button to check and redisplay the run status of the Loop Control Unit.

4-17-3 Backing Up Data during Operation

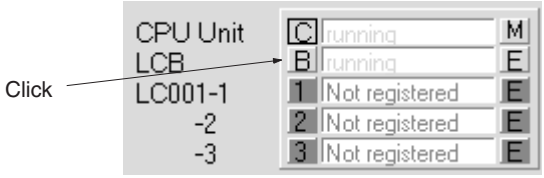
With the LCB01/05 (Version 1.50 and later), LCB05D, or LCB03, data can be backed up during operation from the Run Command Dialog Box.

Function block data in the RAM in the Loop Control Board is backed up to the flash memory in the Loop Control Board without interrupting operation.

An entry will be added to the system monitor log to indicate a backup operation was performed during operation.

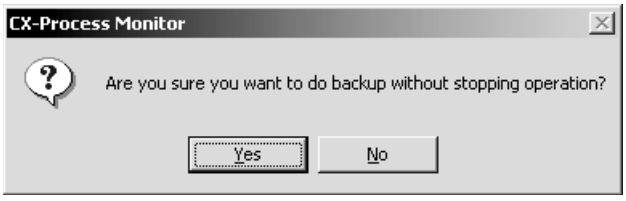
Procedure

1,2,3... 1. Click the button (here B) for the Loop Control Board for which data is to be backed up.



2. Display the Run/Stop Command Dialog Box.

3. Click the **Send** Button for the backup during operation command. A confirmation dialog box will be displayed to confirm the backup during operation. Click the **OK** Button.



4. A dialog box will appear when the command has been completed. Click the **OK** Button.

Precautions for Backing Up Data during Operation

The command to back up data during operation cannot be used if the Loop Control Board is not running. The following dialog box will be displayed if an attempt is made to do so.

The command to back up data during operation cannot be used for Loop Control Boards with a version lower than 1.50. The following dialog box will be displayed if an attempt is made to do so.

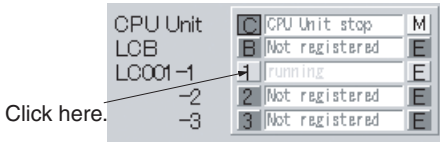
The command to back up data during operation cannot be used for Loop Control Units and the command button will thus not be displayed in the Run/Stop Command Dialog Box.

Note Observe the following precautions when backing up data during operation.

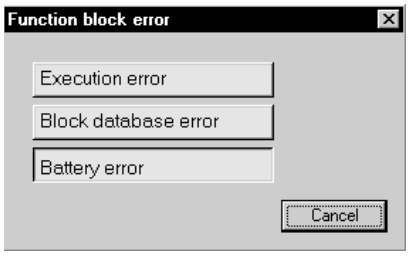
- The cycle time of the CPU Unit may be extended by approximately 10 ms.
- Up to approximately 10 minutes could be required to complete the backup.
- If the command to stop operation is selected while backing up data during operation, operation will stop but the data backup process will continue.
- If the command to back up data during operation is selected while backing up data during operation, the second command will be ignored. Wait for the backup to be completed before selecting the command again.

4-17-4 Function Block Error Dialog Box Operations

1,2,3... 1. Click the **E** Button.



The Function Block Error Dialog Box will be displayed.

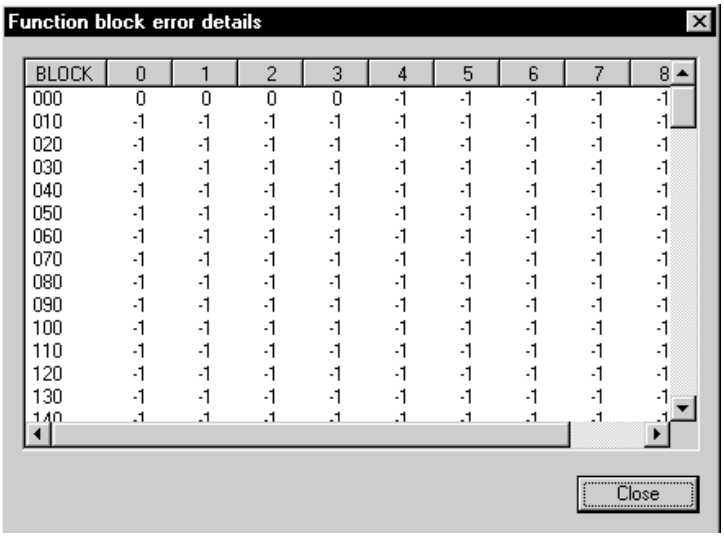


Note A Block database error indicates an error has occurred in the function block database.

The Function Block Error Dialog Box is displayed in green during normal operation, and red if there is an error.

2. Click the **Execution Error** or the **Block Database Error** button (Battery Error is displayed only and cannot be selected).

The Details of Function Block Error Dialog Box will be displayed.



BLOCK	0	1	2	3	4	5	6	7	8
000	0	0	0	0	-1	-1	-1	-1	-1
010	-1	-1	-1	-1	-1	-1	-1	-1	-1
020	-1	-1	-1	-1	-1	-1	-1	-1	-1
030	-1	-1	-1	-1	-1	-1	-1	-1	-1
040	-1	-1	-1	-1	-1	-1	-1	-1	-1
050	-1	-1	-1	-1	-1	-1	-1	-1	-1
060	-1	-1	-1	-1	-1	-1	-1	-1	-1
070	-1	-1	-1	-1	-1	-1	-1	-1	-1
080	-1	-1	-1	-1	-1	-1	-1	-1	-1
090	-1	-1	-1	-1	-1	-1	-1	-1	-1
100	-1	-1	-1	-1	-1	-1	-1	-1	-1
110	-1	-1	-1	-1	-1	-1	-1	-1	-1
120	-1	-1	-1	-1	-1	-1	-1	-1	-1
130	-1	-1	-1	-1	-1	-1	-1	-1	-1

Block Database Error 0 = Normal (no errors), –1 = Block number not in use, 90 = Relevant Function Block has a database error.

Execution Error 0 = Normal (no errors), –1 = Block number not in use, other numbers (1 to 89) = Error code.

The following table gives the function error codes.

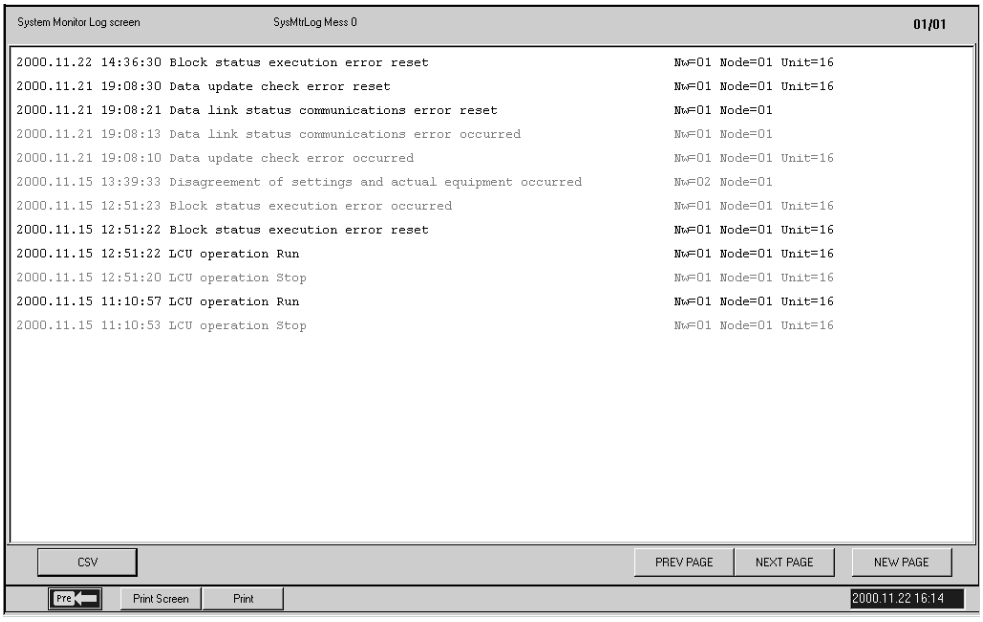
Code	Description	Explanation	Operation at Error	Remedy
0	Normal			
1	Connection terminal/ output terminal connection not defined	Either the function block is not registered to the block address of the source designation or the destination, or the ITEM number does not exist.	Running of the function block in question is stopped, and the functions in question do not operate normally.	Check the block address and ITEM number of the source designation or destination designation.
2	Default error	When run/stop command S1 turned ON in the ramp program or segment program, the reference input was outside the rise ramp range.	The program is not started.	Check the connection of the reference input and program settings.
3	Variable value error	A constant between A1 and A8 or an intermediate buffer between B1 and B4 that is used in the conditional statement for Arithmetic Operation (Block Model 126) is not defined.	Execution of the Arithmetic Operation block will be stopped.	Set definitions for all constants A1 to A8 and an intermediate buffers B1 to B4 that are used.
10	Operation process: Division by “0”	An attempt was made to execute division by a “0” denominator in the operation process.	In the case of Multiplication, DI/AI Terminal from CPU Unit, DI/AI Terminal from Expanded CPU Unit or Field Terminal blocks, the maximum value is output. In the case of the Segment Linearizer or Temperature and Pressure Correction blocks, the previous data is retained.	In the case of DI/AI Terminal from CPU Unit, DI/AI Terminal from Expanded CPU Unit or Field Terminal blocks, check the scaling value, and in the case of the Segment Linearizer block, check the setting value of the input coordinate side. In the case of temperature and pressure correction, check the gain bias value.
		An attempt was made to execute division by a ”0” denominator in Arithmetic Operation block (Block Model 126).	Execution of the Arithmetic Operation block will be stopped.	Check the contents of the conditional statement and calculation expressions for division by 0.
11	Operation process: Operation out of restricted value	The output value of the operation result exceeded the data length of two bytes. **Note** An error does not occur even if the output range (e.g., 320.00) is exceeded if the data length of two bytes is not exceeded.	Output becomes the maximum value or minimum value of the output range. (For example, when the output range is 320.00, the output becomes +320.00 or 320.00.)	If there is a problem, review the settings of related ITEMs.
		The arguments or results for a Arithmetic Operation block exceed the defined limits.	Execution of the Arithmetic Operation block will be stopped.	Check the contents of the conditional statement and calculation expressions and correct the mistake.
12	Argument beyond definition	An argument used in Arithmetic Operation (Block Model 126) is beyond the definition.	Execution of the Arithmetic Operation block will be stopped.	Check the range of the arguments and correct the conditional statement or calculation expressions.
15	AT error	A limit cycle cannot be generated for Basic PID (Block Model 011) or Advanced PID (Block Model 012) or suitable PID constants cannot be calculated.	Execution of the relevant block will be stopped.	Check the following AT parameters: ITEM 036 to ITEM 040. Also, set ITEM 051 to 2 s or less.

Code	Description	Explanation	Operation at Error	Remedy
19	Inappropriate operation	Two or more S1 to S3 select switches are set to 1 (ON) at the same time in the 3-output Selector block (Block Model 163) or 3-input Selector block (Block Model 164).	The output value that was active before the error occurred is held.	Re-program the Step Ladder Program block so that S1 to S3 select switches are set to 1 (ON) independent of each other.
20	Download terminal data exchange error	Data exchange with the CPU Unit is not being executed correctly on the CPU Unit Terminal, Expanded CPU Unit Terminal, Node Terminals and Field Terminal blocks.	The data of the function block in question is not updated.	If a malfunction has occurred on the CPU Unit, follow the remedy for that error. If the CPU Unit is normal, turn ON the power supply again.
21	I/O memory address out-of-range	An address out of the I/O memory address range has been specified on the CPU Unit Terminal, Expanded CPU Unit Terminal, Node Terminals and Field Terminal blocks.	Operation of the function block in question is stopped.	On the CPU Unit Terminal and Expanded CPU Unit Terminal blocks, check the leading address, and on field terminals check the setting of the CIO (channel I/O) Area number setting. In the case of Node Terminals, check the setting of the “leading address of the memory for the node terminals” specified by System Common block ITEM043.
29	Reception error for external device	A communications frame error was generated by the data received from an ES100X Controller for an ES100X Controller Terminal (Block Model 045). (An FCS check error or frame error occurred 3 times in a row.	Communications will be stopped with the specified ES100X and tried with another ES100X.	Check the communications path and the communications settings (7 data bits, even parity, and 2 stop bits).
30	Response timeout	A response was not returned after sending data to the Controller for a ES100X Controller Terminal (Block Model 045). (Response was not returned for 5 s 3 times.)	Communications will be stopped with the specified ES100X and tried with another ES100X.	Check the communications path, the communications settings (7 data bits, even parity, and 2 stop bits), and other required settings in the ES100X (parameter setting mode, unit number, etc.).
31	Controller unit number duplicated	The unit number set in ITEM 006 for a ES100X Controller Terminal (Block Model 045) is the same as another ES100X Controller Terminal. (A response timeout will occur if the unit number does not exist.)	Communications will be stopped with the ES100X Controllers	Change the unit number settings (ITEM 006)so that each is used only once.
70	Illegal combination of function blocks	The function block on the primary loop side is not basic PID or advanced PID when bumpless processing between primary/secondary loops was specified in basic PID or advanced PID.	Running of the function block in question is stopped.	Check the function block model number on the primary loop side.

Code	Description	Explanation	Operation at Error	Remedy
71	Inappropriate parameter	a) When restricted conditions are applied across two ITEMs: (example: when the unit pulse output is equal to or greater than the operation cycle when there is unit pulse output in run time accumulation) b) An attempt has been made to write out-of-range data at the ITEM Setting block.	a) The function block in question is not executed. b) Data cannot be written.	Check the settings of the ITEMs.
80	Step Ladder Program command error	There is an irrelevant command in the Step Ladder Program, or the method of use of commands is wrong, for example, there is an AND command even though there is no input command.	The command in question and onwards are not executed.	Check the program within the Step Ladder Program block.
81	Step Ladder Program source designation not defined	Either the function block is not registered to the block address currently specified by each command in the Step Ladder Program, or the ITEM number does not exist.	The command in question and onwards are not executed.	Check the block address and ITEM number.
89	Overuse of Step Ladder Program differentiated instruction	The number of differentiated instructions to be simultaneously executed has exceeded 256.	Differentiated instructions exceeding 256 instructions are not executed.	Reduce the number of differentiated instructions to be executed simultaneously.

4-18 System Monitor Log Screens

System Monitor Log Screens record and display run/stop logs and the execution error logs as soon as they occur. To display the System Monitor Log Screen, click the **System Monitor Log** Button.



Display is red for an occurrence, and black following recovery.

CSV File Output

System monitor log data (date, time, contents of runs/stops and execution errors) can be output in CSV (Comma Separated Value) file format using the following procedure.

1,2,3...

1. Press the **CSV** Button to display the Export to CSV File Dialog Box.
2. Specify a name for the CSV file, and click the **OK** Button. A CSV file will be created. (By clicking the **Browse** Button, the CSV file can be created in a desired folder. The default filename is Sysmlog.csv.) The contents of CSV files created are as follows:

   System Monitor Log (carriage return)
   <Export_date>(comma)<Export_time>(carriage_return)<Date>(comma)
   <Time>(comma)
   <Operation_start/stop_or_contents_of_execution_error>(carriage return)

SECTION 5
Configuration Screens

This section describes operating procedures to create screens and monitor using the CX-Process Monitor Plus.

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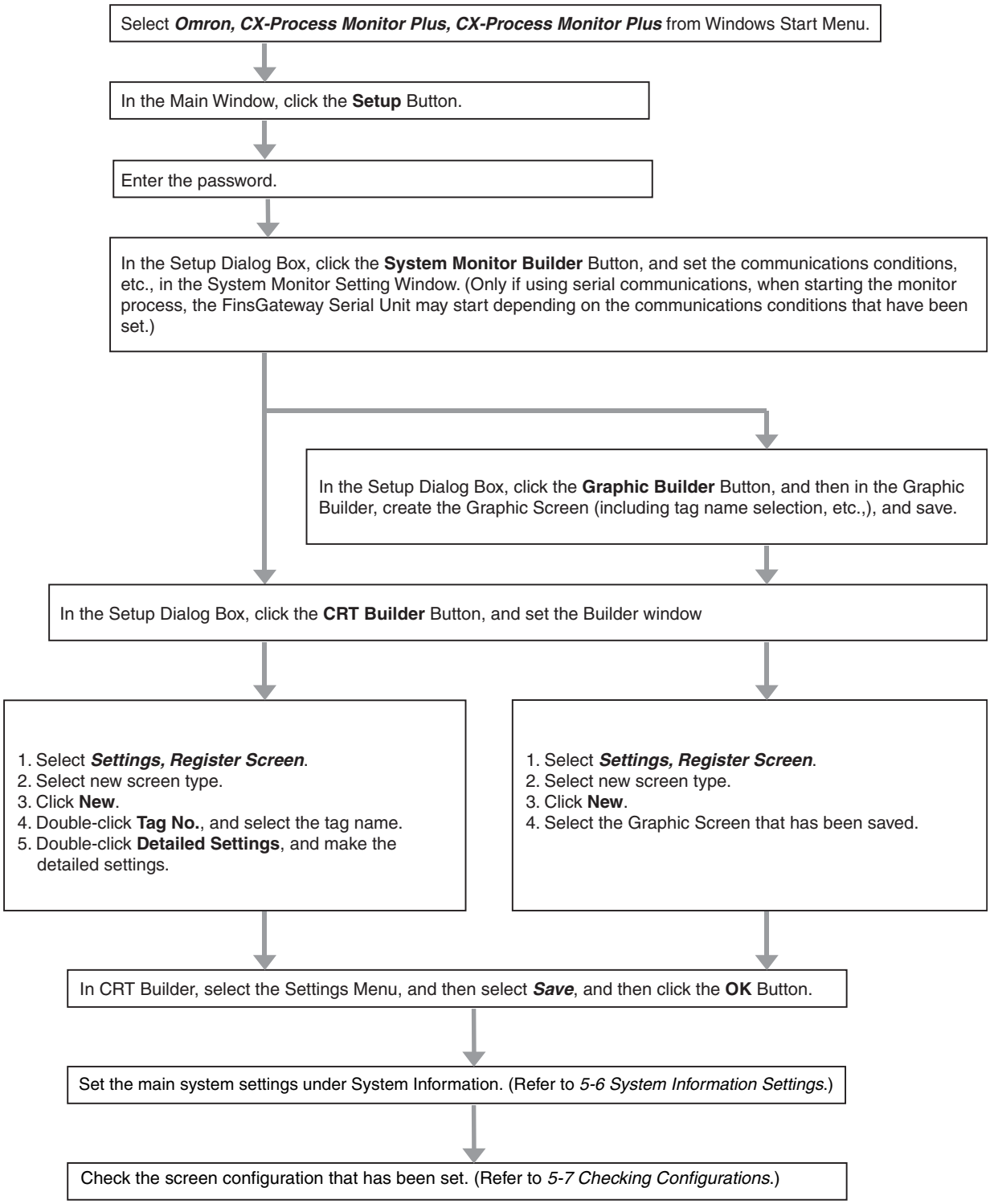
5-1 Basic Configuration Procedure



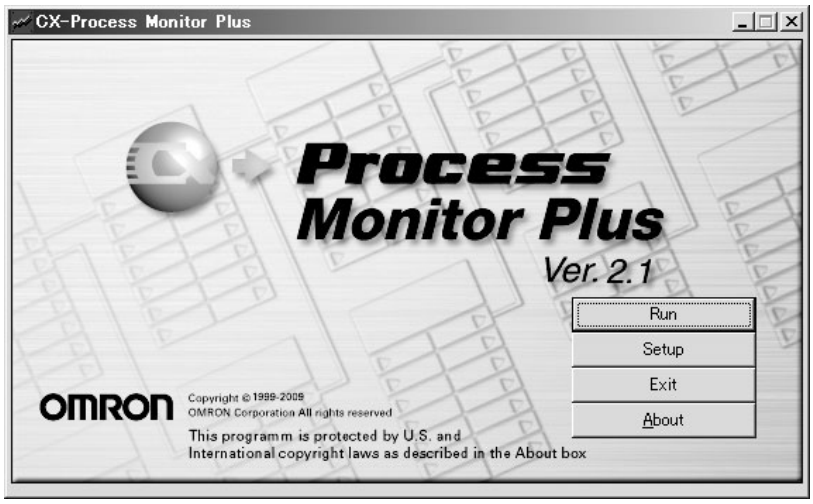
5-2 Basic Configuration Operations

5-2-1 Starting and Stopping the CX-Process Monitor Plus

Starting

1,2,3... 1. Select ***Programs***, ***Omron***, ***CX-Process Monitor Plus***, *and* ***CX-Process Monitor Plus*** from the Windows Start Menu.

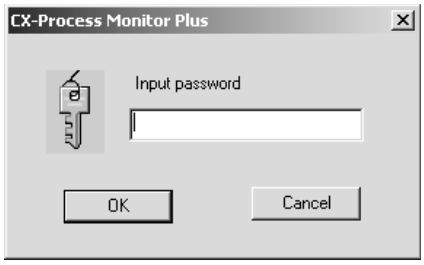
The CX-Process Monitor Plus Main Window will be displayed.



2. Click the **Setup** Button.
3. If the tag or network information has been changed, the following dialog box will be displayed. Click the **Yes** Button to create a monitor tag file from the CX-Process Monitor Plus tag file.

⚠ **WARNING** If the CX-Process Monitor Plus tag settings or network configuration have been changed, set the CX-Process Monitor Plus screen configuration correctly according to the new settings.
Failure to correctly update the settings may result in unexpected operation by the machinery.

4. A dialog box will be displayed to input the password.



Note If no password has been set for the initial startup, the dialog box for registering a password will be displayed when the **Setup** Button is clicked. It is not possible to configure screens or make settings unless a password has been registered and the correct password has been entered. Personnel who will be making settings must register a password.
For details on registering passwords, refer to *5-2-2 Setting Passwords*.

5. Enter the password and click the **OK** Button. The Setup Dialog Box will be displayed.

Stopping

In the Main Window, click the **Exit** Button.

The Main Window will close, and CX-Process Monitor Plus will stop running.

5-2-2 Setting Passwords

Set the password to configure the CX-Process Monitor Plus Screen and to protect the settings you have made.

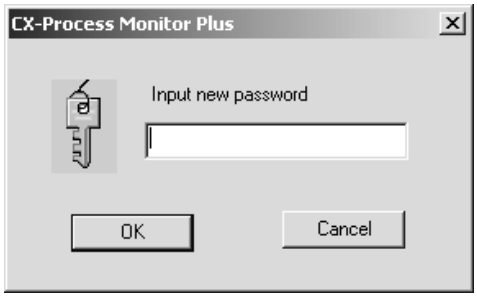
Note Unless a password has been set and the correct password has been entered, it will not be possible to make any settings.

1,2,3...

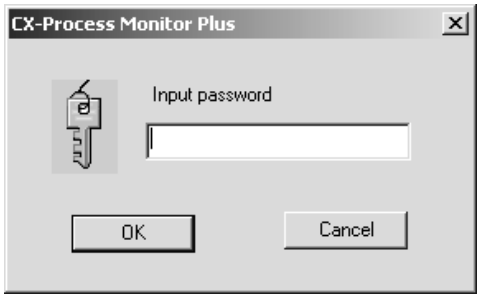
1. If no password has been set and if new tag information is imported, the following dialog box will be displayed when the **Setup** Button is clicked in the Main Window.

2. Click the **OK** Button.

   The following dialog box will be displayed.



3. Enter the password, and click the **OK** Button.
   The following dialog box will be displayed.

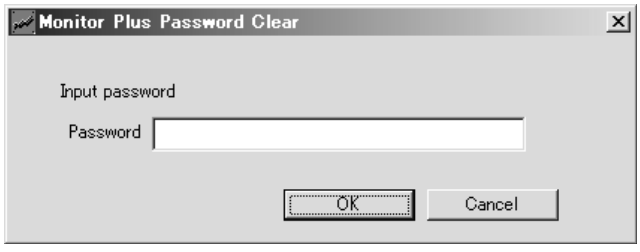


4. Enter the password once again, and click the **OK** Button.

Note Use the Password Clear utility to change or delete passwords that have been set. After deleting a password by using the Password Clear utility, use the procedure given above to set a new password. The procedure for using the Password Clear utility is given below.

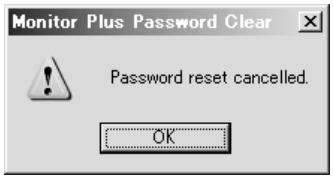
■ Changing the Password

1,2,3... 1. Start the Password Clear utility. The following dialog box will be displayed. The Password Clear utility is stored in the following location:
   CD-ROM drive: \MonitorPlusPasswordClear\ PasswordClear.exe



2. Enter the password that is set, and then click the **OK** Button. If the passwords match, the following dialog box will be displayed.

3. Click the **Execute** Button. The password will be initialized, and the following dialog box will be displayed.



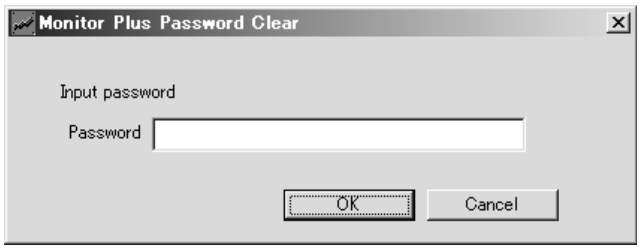
■ If a Password That Has Been Set Is Lost

The following procedure can be used to initialize the password and the Monitor Plus setting data folder where the database path is set.

Note Be careful when initializing the setting data folder. When the setting data folder is initialized, the screen configurations and other settings will also be initialized.

1,2,3... 1. Start the Password Clear utility. The following dialog box will be displayed. The Password Clear utility is stored in the following location:

CD-ROM drive: \MonitorPlusPasswordClear\ PasswordClear.exe



2. If the passwords do not match or if the **OK** Button is clicked with no password entered, the following dialog box will be displayed. Click the **Execute** Button.

3. The following dialog box will be displayed. Click the **OK** Button.

4. The password and the Monitor Plus setting data folder where the database path is set will be initialized, and the following dialog box will be displayed.

5-2-3 Setup Dialog Box

This section explains the functions of the Setup Dialog Box.

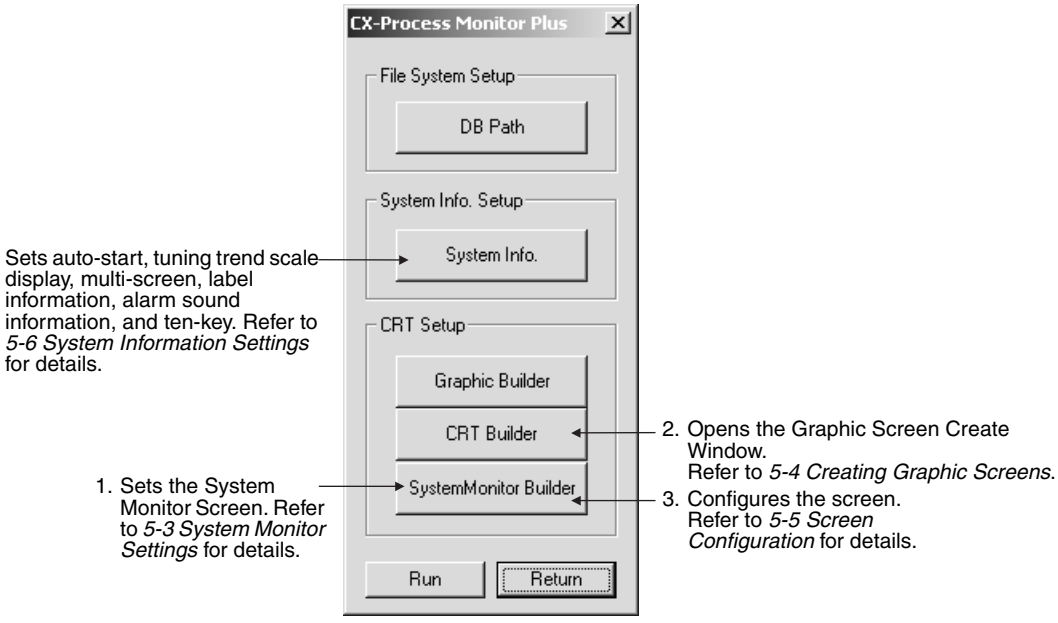
1,2,3... 1. In the Main Window, click the **Setup** Button.
A dialog box will be displayed to input the password. If no password has been set, the Setup Dialog Box will not be displayed. For details on setting a password, refer to *5-2-2 Setting Passwords*.

2. Enter the password, and click the **OK** Button.

The Setup Dialog Box will be displayed.

3. Click any button, and then select a function.

Setup Dialog Box



Refer to the following sections for details on the functions of each button.

5-3 System Monitor Settings

Using the System Monitor Setting Window, register the PLC and Loop Control Unit/Board to be monitored using the System Monitor Screen. Also register the local computer to perform the monitoring.

The setting items are as follows:

PLC setting	PLC node number (address)	Use the System Monitor Screen for this setting.
	Unit address of the Loop Control Unit/ Board (The unit address of the Loop Control Board is always 225.)	
Computer setting	Computer node number (default is 32)	
	Communications type (CLK, Serial, Ethernet) (Use the System Monitor Screen to set CLK or Ethernet communications.) For serial connections, you must also set the COM port and baud rate.	

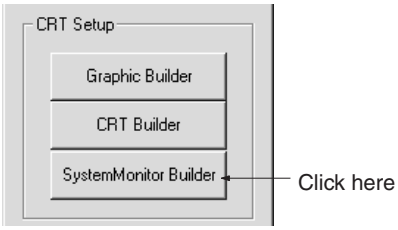
When the monitor process is started with serial (Host Link) communications by clicking the **Run** Button in the Main Window or the Setup Dialog Box, Fins-Gateway communications will start according to the settings of the following communications conditions.

- Communications type: Serial (Host Link)
- COM port used and baud rate

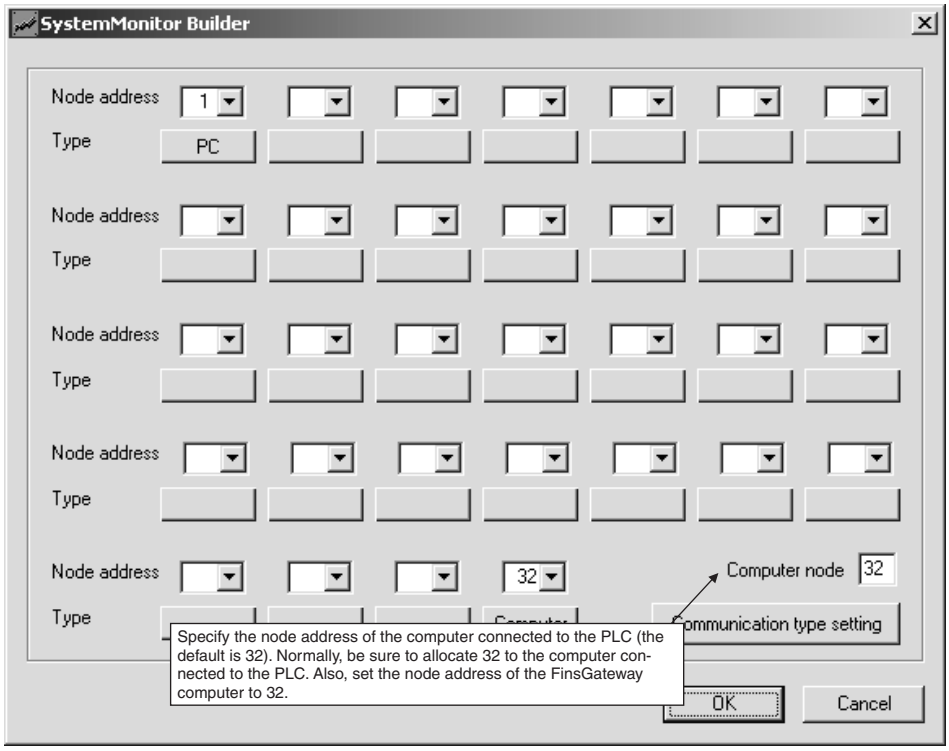
Note The PLC settings (node address, Unit address, etc.) set here can be used only from the System Monitor Screen. Actual communications processing depends on the network address, node address, and Unit address set using the CX-Process Tool. Controller Link and Ethernet settings within the computer settings made here can also be used only from the System Monitor Screen. Perform actual communications processing by manually starting FinsGateway.

Note Set the PLC settings (node address, Unit address, etc.) made here to agree with the network address, node address, and Unit address settings made using CX-Process Tool. If the settings do not agree, monitoring using the System Monitor Screen will not be performed correctly.

1,2,3... 1. In the Setup Dialog Box, click the **System Monitor Builder** Button.



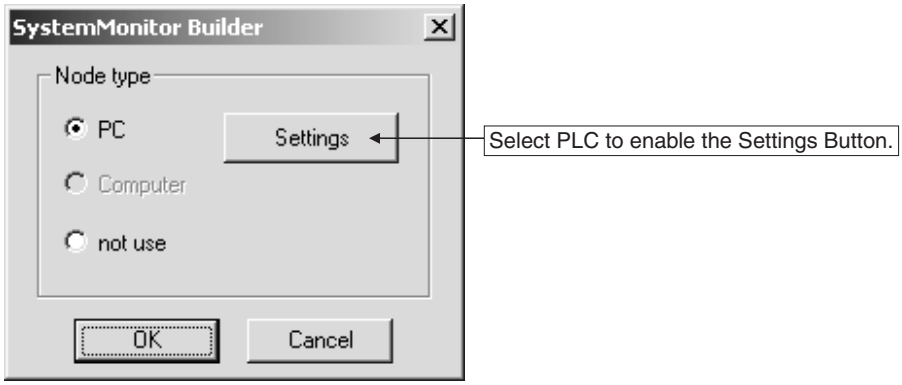
The System Monitor Setting Window will be displayed.



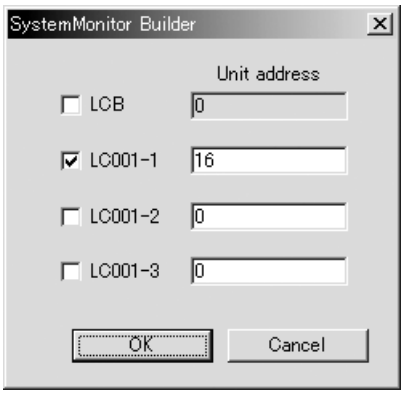
2. Select the node number allocated to the PLC or computer, as described below, and then click the button displayed under the node number.
   - PLC: Select the number from the list box.
   - Computer: Input the number in the list box. Normally register node 32.

   (The node number of the computer connected to the PLC is the same as the number input for the computer node in the bottom right of the System Monitor Settings Window.)

3. Select the device (PLC or computer), and then make the appropriate settings.



4. When *PC* has been selected as the node type, click the **Settings** Button. The following dialog box will be displayed. Make the setting as shown.



Note When using more than one Loop Control Unit in the same PLC, set the unit addresses and function numbers in ascending order.

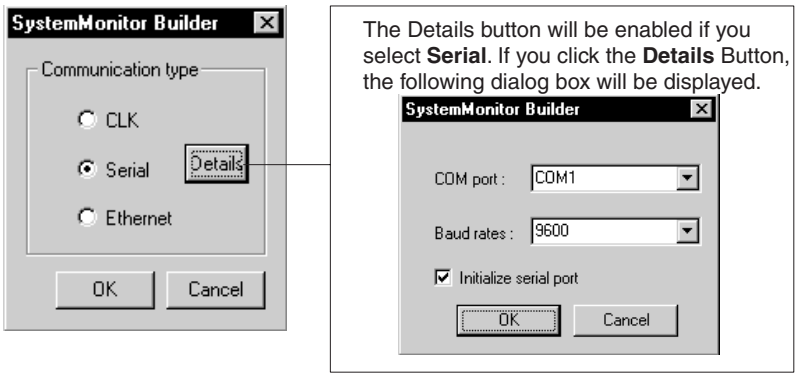
You can connect one Loop Control Board and up to three Loop Control Units to one PLC. Select the check box for the Loop Control Unit/Board mounted to the PLC, and enter the unit address.

The unit address of the Loop Control Board is always 225.

Click the **OK** Button to return to the Set Node Dialog Box.

Note The unit address for each node set here can be used only from the System Monitor Screen. Which Loop Control Unit/Board's data and which PLC CX-Process Monitor Plus will be accessed depends on the network address, node address, and unit address set using the CX-Process Tool. (This is linked to the tag information.) The unit address of the Loop Control Board is always 225.

5. Click the **Communication type setting** Button. The following dialog box will appear.



In Network Type, select **CLK**, **Serial**, or **Ethernet**.

If you select **Serial**, set the computer COM port, and the baud rate. If necessary, also set ***Initialize serial port***. Refer to the following Note.

Click the **OK** Button to return to the Set Node Dialog Box.

Note If the communications type is set to Serial (Host Link), then when the monitor process is started (by clicking the **Run** Button in the Main Window or in the Setup Dialog Box), FinsGateway Serial Unit driver will start according to the communications conditions set here.

If you select another communications type (Controller Link or Ethernet), the communications type set here can be used only from the System Monitor Screen. You must start the FinsGateway manually.

6. When you have finished making all the PLC and computer settings, click the **OK** Button in the System Monitor Settings Window. This completes the System Monitor settings.

5-4 Creating Graphic Screens

5-4-1 Outline

The Graphic Screen displays schematically the device status.

Create the Graphic Screen using the Graphic Builder.

- Paste to the screen graphic elements representing plant instrumentation, which have been provided, and use them to display the device status, to a maximum of 200 screens.
- Library figures and images:

  Text, lines, rectangles, round rectangles (rectangles with rounded corners), ellipses, polygons, and images
- Fixed graphic display elements:

  Text boxes, instruments, thermometers, transmitters, and orifices
- Changeable graphic display elements:

  Analog inputs: Bar graph displays, numerical value displays, and tanks

  Analog settings: Numerical settings (See note.)

  Contact inputs (display): Pumps, valves, and pipes

  Contact settings (operation): Switches (See note.)

  Note If making analog values or contact settings, use tags for Constant Generator (Block Model 166) and Internal Switch (Block Model 209).

- Screen display objects:

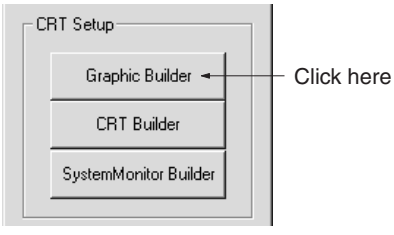
  Screen jump objects, FP switch (faceplate pop-up) objects

Element	Function block or ITEM set as send source
Function block	Control Blocks: Basic PID (Block Model 011), Advanced PID (Block Model 012), Blended PID (Block Model 013), Batch Flowrate Capture (Block Model 014), Indication and Setting (Block Model 031), Indication and Operation (Block Model 032), Ratio Setting (Block Model 033), Indicator (Block Model 034), 2-position ON/OFF (Block Model 001), and 3-position ON/OFF (Block Model 002) Operation Blocks: High/Low Alarm (Block Model 111), Segment Program 2 (Block Model 157), ON/OFF Valve Manipulator (Block Model 221), Motor Manipulator (Block Model 222), Reversible Motor Manipulator (Block Model 223), Motor Opening Manipulator (Block Model 224), Timer (Block Model 205), and Counter (Block Model 208)
	The following for all function blocks: Analog input signals (using Input Selector (Block Model 162)) Analog output signals (using Constant Generator (Block Model 166)) Or Analog value parameters(using Constant Generator (Block Model 166))
	Contact input signals or contact output signals for all function blocks, or contact value parameters (Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))
Display	Analog values: Bar graphs, numerical values, tank level Contacts: Indicators, pumps, valves, and pipes
Setting	Analog values: Numerical values (using Constant Generator (Block Model 166)) Contacts: Switches (using Contact Distributor (Block Model 201) + Internal Switch (Block Model 209))

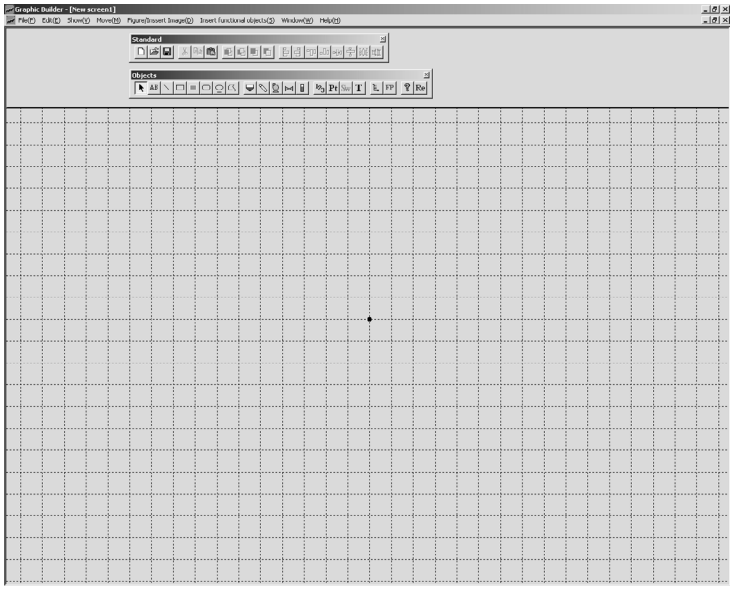
5-4-2 Procedure for Creating Graphic Screens

Starting the Graphic Builder

1,2,3... 1. In the Setup Dialog Box, click the **Graphic Builder** Button.



The Graphic Builder will be displayed.

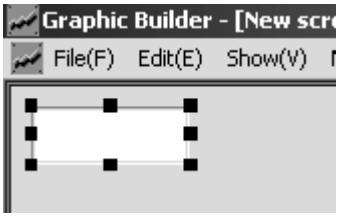


Creating Graphic Screens

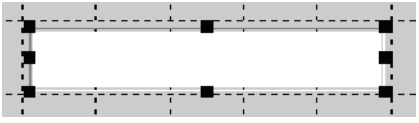
Graphic objects are placed on Graphic Screens. The object placed on a Graphic Screen in this example is a data box.

1,2,3...

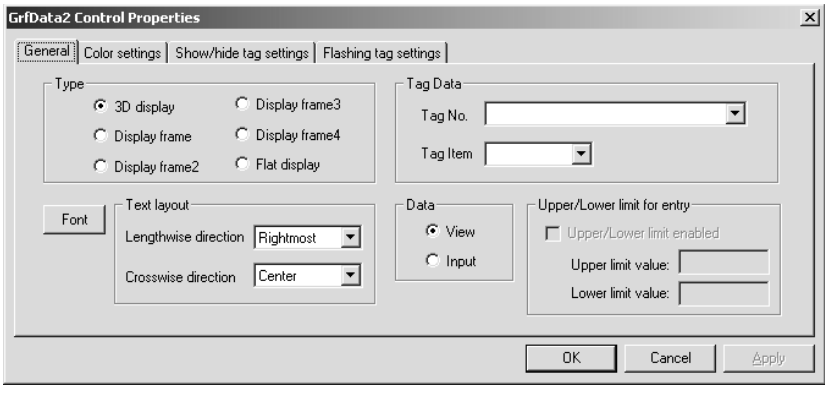
1. Select ***Insert Functional Object*** - ***Data*** (or click the icon on the Object Toolbar).
   The data box will be displayed on the top left of the screen as shown below.



2. Double-click the data box to select it, and drag it to the display position.
3. Drag any of the eight points on the data box frame to enlarge or reduce its size.



4. Right-click the data box and select ***Properties - GrfData2 Control Object*** from the pop-up menu.
5. The GrfData2 Control Properties Dialog Box will be displayed. Make the settings for the data box and click the **OK** Button.
   For details on setting graphic objects, refer to *5-4-6 Setting Graphic Objects*.



6. Place other graphic objects using the same procedure as above.

Saving Graphic Screens

Graphic Screens that have been created are saved one by one.

1,2,3...

1. Select ***Save*** or ***Save As*** from the File Menu, or click the icon.
2. The following dialog box will be displayed. Input the file name and click the **Save** Button.
   One Graphic Screen will be saved (with a GRF file name extension).

Exiting the Graphic Screen Creation Window

In the File menu, click **Exit**.

The Graphic Builder will close.

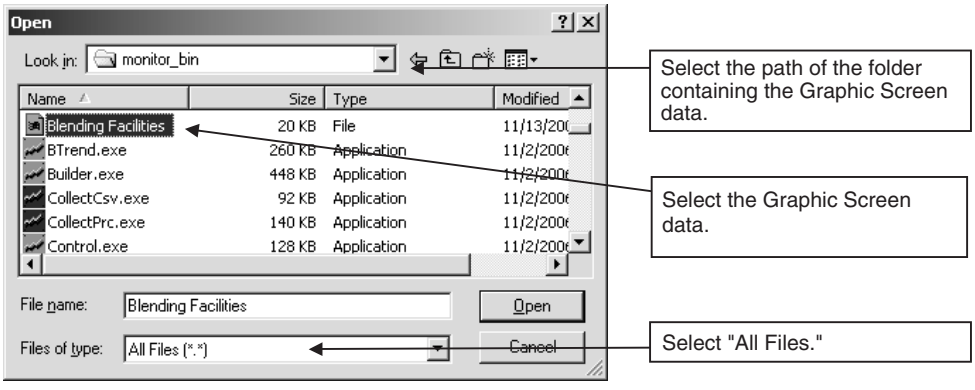
Note

1. When using the Graphic Screen, first create and save the graphics using Graphic Builder (using the **CRT Builder** Button in the Setup Dialog Box), and then register the saved graphics in the Overview Screen in the format you have selected. Consequently, before registering the graphics in the Overview screen, you must create and save the graphics using the Graphic Builder.
2. If you have not saved the edited data when you click **Exit**, a window recommending that you save the data will be displayed. Save all necessary data. After performing this operation, the Graphic Builder will close.
3. You must configure the screen to display the Graphics Screen you have created using CX-Process Monitor Plus. Refer to *5-5 Screen Configuration* for how to make the settings.

Graphic Screens Created Using CX-Process Monitor Plus Version 1 or Earlier

Graphic Screens created using CX-Process Monitor Plus version 1 or earlier can be used with version 2 by following this procedure:

1. In the Graphic Screen Creation Window, select ***File - Open***.
2. The Open Dialog Box will be displayed. Select the Graphic Screen that was created using CX-Process Monitor Plus version 1, and click the **Open** Button.



3. Using the procedure described in *Saving Graphic Screens* above, save the monitor Graphic Screen read to the Graphic Screen Creation Window.

Graphic objects created using CX-Process Monitor Plus version 1 cannot be used with the expanded functions of version 2.
To use all of the functions for graphic objects, create new graphic objects using CX-Process Monitor Plus version 2.

5-4-3 Graphic Builder Menus and Tool Bars

Menu Command This shows the commands available in the Graphics Builder.

Menu	Command		Shortcut key	Function
File	New		Ctrl + N	Create new Graphic Screen.
	Open		Ctrl + O	Close created Graphic Screen.
	Save		Ctrl + S	Overwrite project being edited.
	Save As		---	Save project being edited with a new name.
	Save Group File		---	Save grouped graphic object data.
	Load Group File		---	Read grouped graphic object data.
	Delete File Information		---	Specify name of a registered Graphic Screen, and delete that file information.
	Modify File Information		---	Specify name of a registered Graphic Screen, and change the file information for it.
	Recent Files (1…2…)		---	Display the most recent files.
	Exit		---	Close Graphic Builder.
Edit	Undo		Ctrl + Z	Undo the previous operation.
	Cut		Ctrl + X	Cut the specified range.
	Copy		Ctrl + C	Copy the specified range.
	Paste		Ctrl + V	Paste the contents of the clipboard.
	Delete		Del	Delete the specified range.
	Select All		Ctrl + A	Select all items.
	Paste Special...		---	This menu item is not used.
	Group Objects		Ctrl + G	Group two or more selected figures objects.
	Ungroup Objects		Ctrl + F	Clear grouping of objects.
	Properties		Alt + Enter	Display properties of selected figures or image objects.
	Create/Paste Objects		---	Display the Insert Objects dialog box. Select and create objects from the menu of objects supported by CX-Process Monitor Plus and objects that can be inserted into the Graphic Screen. Specify and paste file names.
	Links		---	This menu item is not used.
	Object		---	Open the selected figure, image or functional object properties.
View	Standard Toolbar		---	Select whether to display or hide the Standard Toolbar
	Object Toolbar		---	Select whether to display or hide the Object Toolbar.
	Paper Color	Basic Color	---	Set the background color.
		System Color	---	Restore the default background color.
	Display Frame		---	Select whether to display or hide object frame.
	Grid line		---	Set the grid lines. 10 points, 20 points, 40 points, 60 points, or none You can also change the line color.
	Refresh		---	Refresh the screen.

Menu	Command		Shortcut key	Function
Move	To Front		+	Move the selected object to the front.
	To Back		–	Move the selected object to the back.
	To Top		Ctrl + +	Move the selected object to the top.
	To Bottom		Ctrl + –	Move the selected object to the bottom.
	Arrange	Align Left	---	Align multiple selected objects on the left, right, top, or bottom of the selected object that is farthest to the left, right, top, or bottom.
		Align Right	---	
		Align Top	---	
		Align Bottom	---	
		Align Recent Left	---	Align multiple objects on the left, right, top, or bottom of the last object that was selected.
		Align Recent Right	---	
		Align Recent Top	---	
		Align Recent Bottom	---	
		Distribute Horizontally	---	Distribute multiple selected objects with even spacing horizontally.
		Distribute Vertically	---	Distribute multiple selected objects with even spacing vertically.
	Make Same Size	Width	---	Unify the width, height, or both, of multiple selected objects.
		Height	---	
		Both	---	
	Snap to Grid		---	Align a selected object to the nearest grid cross point
Insert Figure/ Image	Text		---	Insert a text display object.
	Line		---	Insert a line.
	Rectangle		---	Insert a rectangle.
	Round rect		---	Insert a rectangle with rounded corners.
	Ellipse		---	Insert an ellipse.
	Polygon		---	Insert a polygon.
	Image		---	Insert an image object.
Insert Functional Object	Tank		---	Insert a tank.
	Pipe		---	Insert a pipe.
	Pump		---	Insert a pump.
	Valve		---	Insert a valve.
	Meter bar		---	Insert a meter bar.
	Parts		---	Insert parts (instrument, thermometer, transmitter, or orifice).
	Switch		---	Insert a switch.
	Data		---	Insert a data box.
	Text Box		---	Insert a text box.
	Jump		---	Insert an object to call another screen.
	FP Switch		---	Insert a FP Switch object to display a faceplate.
Window	Cascade		---	Cascade Graphic Screen Edit Windows.
	Tile Vertically		---	Tile Graphic Screen Edit Windows vertically.
	Tile Horizontally		---	Tile Graphic Screen Edit Windows horizontally.
	Align Icons		---	Align minimized Edit Windows.
	Select Window (1…2…)		---	Select an edited Graphic Screen and display it in front.
Help	Version		---	Display the Graphics Builder version information.

Toolbars

To display or hide the toolbar, first select *View* and then either *Standard Toolbar* or *Object Toolbar*.

The Builder Window has two types of toolbars, as shown below.

Standard Toolbar

Icon	Function
	New
	Open
	Save
	Cut
	Copy
	Paste
	To Top
	To Bottom
	To Front
	To Back

Icon	Function
	Align multiple objects on left
	Align multiple objects on right
	Align multiple objects at top
	Align multiple objects at bottom
	Evenly space multiple objects horizontally
	Evenly space multiple objects vertically
	Group objects
	Ungroup objects

Object Toolbar

Icon	Function
	Select a figure, image, or functional object
AB	Insert a text display
	Insert a line
	Insert a rectangle
	Insert an image
	Insert a rectangle with rounded corners
	Insert an ellipse
	Insert a polygon

Icon	Function
123	Insert a numerical data box
Pt	Insert parts (instrument, thermometer, transmitter, or orifice)
Sw	Insert a switch
T	Insert a text box
	Insert a Screen jump object
FP	Insert an FP switch to display a faceplate pop-up
	Display the Version Dialog Box
Re	Refresh the screen

Icon	Function
	Insert a tank
	Insert a pipe
	Insert a pump
	Insert an ellipse
	Insert a meter bar

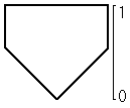
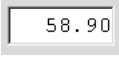
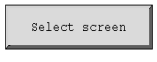
5-4-4 Basic Operations

The following table displays the basic Graphic Builder operations (operations other than those displayed on the menu and toolbars).

Objective	Operation
Select object	Double-click
Select multiple objects	Drag to surround the multiple objects
Cancel selection	Click an area outside of the selected object
Move object	Select the object, and then drag it
	Select the object and then press the Left, Right, Up, or Down Arrow Key on the keyboard.
Enlarge/reduce object	Select the object, and then drag one of the 8 points displaying the outline of the object
Set object properties (shape, color, font, etc.)	Right-click the object, select ***Properties*** or ***Grf*** Control Object***, and then click the tab for the item you want to set.

5-4-5 Graphic Objects

Functional Objects

Elements	Object name	Shape (typical)	Function	Specifications		
				Show/ hide tag allocation	Flashing tag allocation	Other
Changeable objects	Tank		Displays analog value.	Yes	Yes	Number of divisions (display required), font, upper limit, lower limit, type (tanks 1 to 3), tag data, color (foreground and background colors)
	Pipe		Displays contact.	Yes	Yes	Display frame (top line, bottom line, right line, left line), colors (ON /OFF colors), tag data
	Pump		Displays contact.	Yes	Yes	Direction (up, down, right, left), color (ON/OFF colors), tag data
	Valve		Displays contact.	Yes	Yes	Type (horizontal, vertical and up square/right square/left square/up semicircle/right semicircle/left semicircle), tag data, colors (ON/OFF colors)
	Meter bar		Displays analog value.	Yes	Yes	Number of divisions (display enable/disable), upper limit, lower limit, direction (vertical, horizontal), font, tag data, color (foreground and background colors)
	Numerical Data Box		Displays analog value (displays numerical value), and analog value setting (numerical value setting).	Yes	Yes	Type (3D display, display frame 0 to 4, flat display), font, tag data, display data, input data, color (character and background colors), text layout (horizontal or vertical), data display input setting (display, input), range check for data input
	Switch		Displays contact (indicator), and contact setting (switch).	Yes	Yes	Character specification (ON/ OFF), font, type (DI/DO), tag data, operation confirmation (Y/ N), color (ON/OFF colors, character color)
	Screen jump		Change display to specified screen	No	No	Display type (buttons, rectangles), text specification, screen selection type (every time, screen selection, or according to specification), color (button color, frame color, interior color, text color)
	Faceplate switch		Faceplate pop-up display	No	No	Display type (buttons/rectangles), text specification, tag specification, color (button color, frame color, interior color, text color)

Elements	Object name		Shape (typical)	Function	Specifications		
					Show/ hide tag allocation	Flashing tag allocation	Other
Fixed objects	Text box			---	Yes	Yes	Text, type (3D display, display frame 0 to 4, flat), font, color (character and background colors
	Parts	Transmitter			Yes	Yes	Direction (up, down, right, left), color (border line color and background colors)
		Orifice			Yes	Yes	
		Instrument			Yes	Yes	
		Temperature meter			Yes	Yes	

Figures and Images

Elements	Object name	Shape (typical)	Function	Specifications		
				Show/ hide tag allocation	Flashing tag allocation	Other
Figures	Text	123456	---	Yes	Yes	Text string, font, color settings (direct, tag settings), display position, border lines (line width, line style, color settings), background color (color settings)
	Line		---	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, color settings)
	Rectangle		---	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, color settings), background color (color settings)
	Rectangle with rounded corners (Round rect)		---	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, corner color settings), background color (enable/disable, color settings)
	Ellipse		---	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, color settings), background color (enable/disable, color settings)
	Polygon		---	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, color settings), background color (enable/disable, color settings)
Images	Image		Display image files in BMP or JPG format	Yes	Yes	Color settings (direct, tag settings), border lines (line width, line style, color settings), image specification (direct, tag settings)

5-4-6 Setting Graphic Objects

This section describes how to set properties (shapes, colors, and tags) for graphics objects.

Graphic object properties are set by displaying the dialog box described below.

Functional Objects

Double-click a functional object to select it, and then right-click and select ***Grf***** Control Object***.

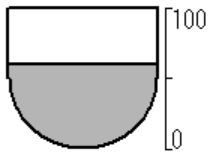
Figures and Images

Double-click a figure or image object to select it, and then right-click and select *Properties*.

Setting Functional Objects

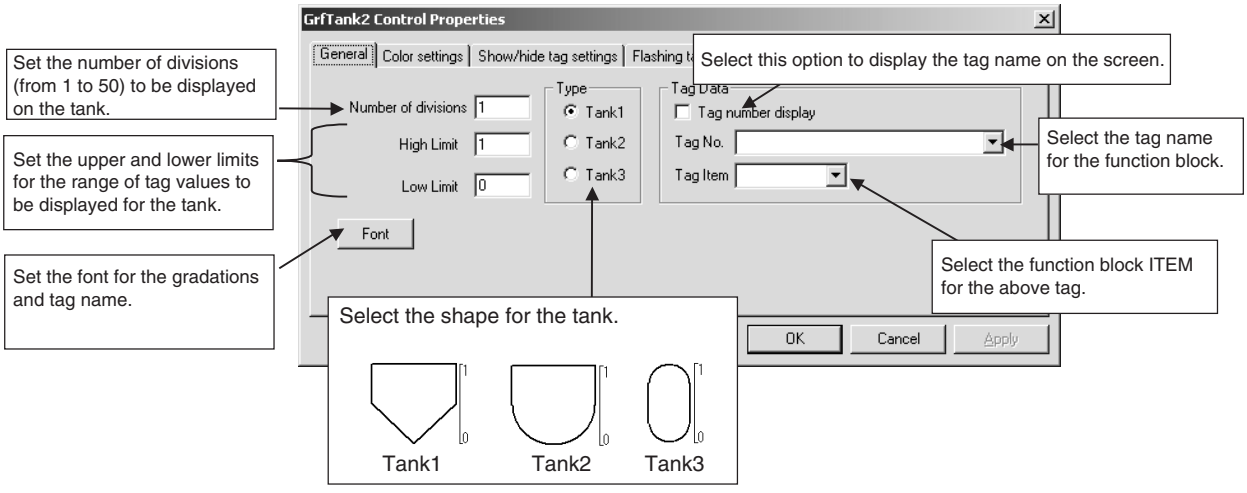
Tank ( )

The tank is filled at the ratio of the upper and lower limits according to the specified tag value.

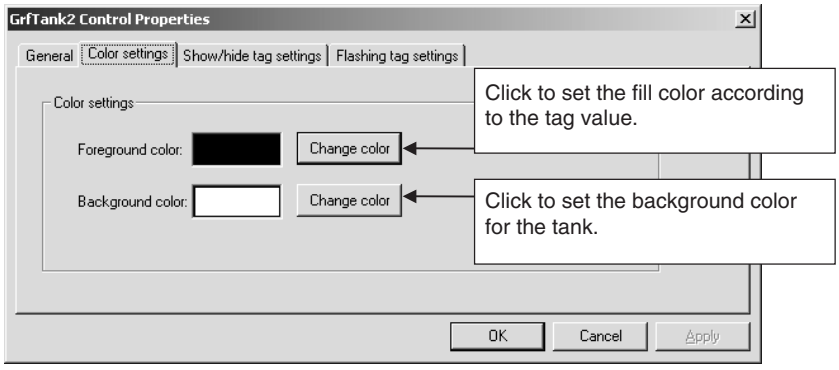


Setting Method

General Tag



Color Settings Tab



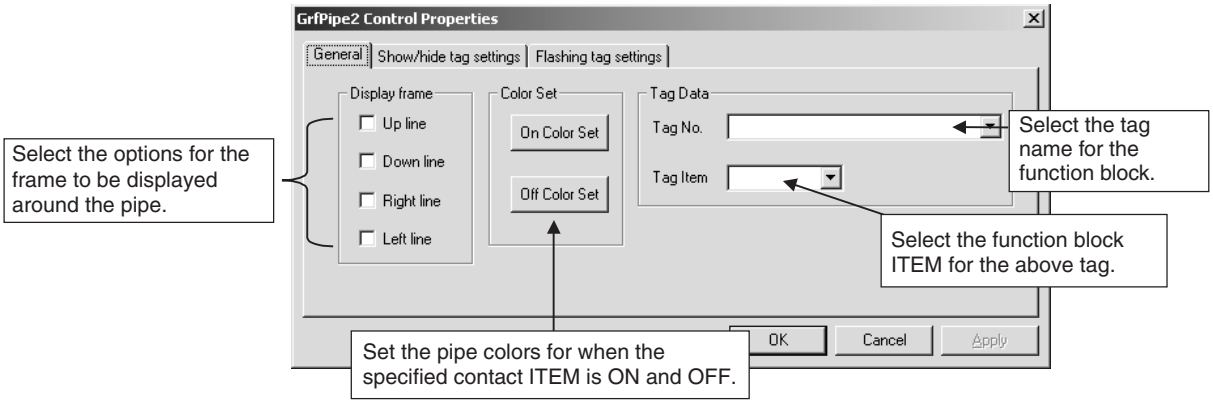
For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Pipe ( )

The color is changed according to the ON/OFF status of the specified tag.

Setting Method

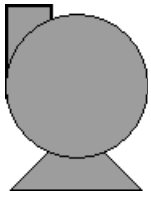
General Tab



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

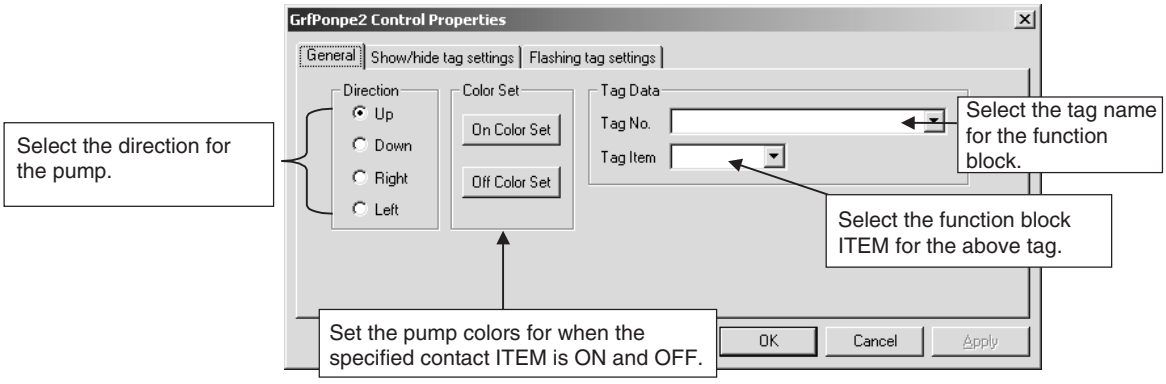
Pump ( )

The color is changed according to the ON/OFF status of the specified tag.



Setting Method

General Tab



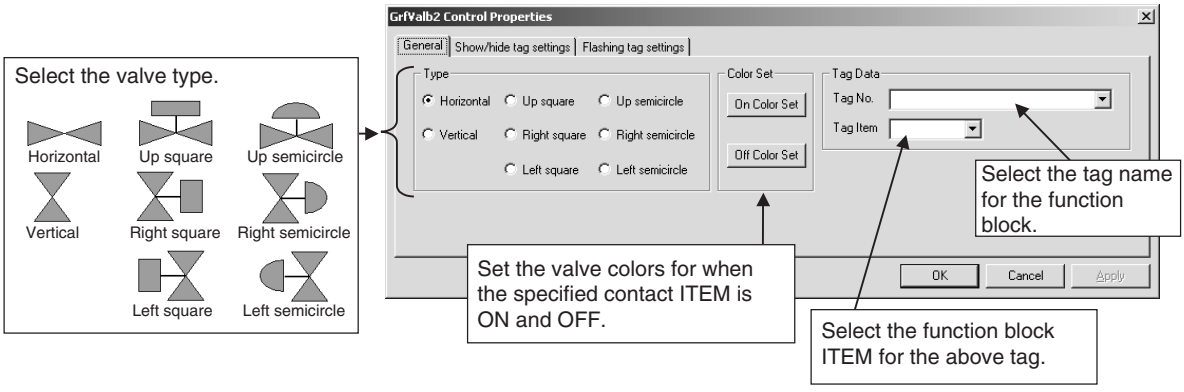
For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Valve ( )

The color is changed according to the ON/OFF status of the specified tag.

Setting Method

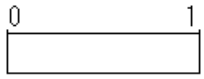
General Tab



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

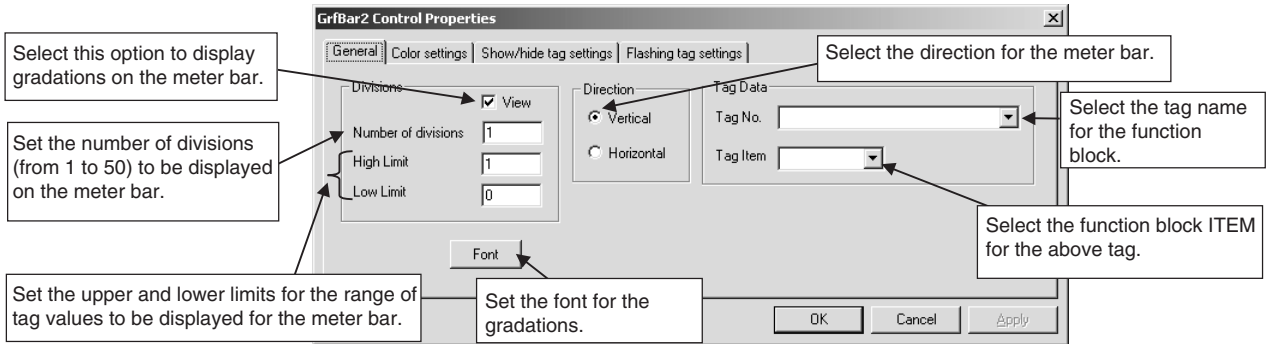
Meter Bar ( )

The meter bar is filled at the upper and lower limit ratio according to the value of the specified tag.

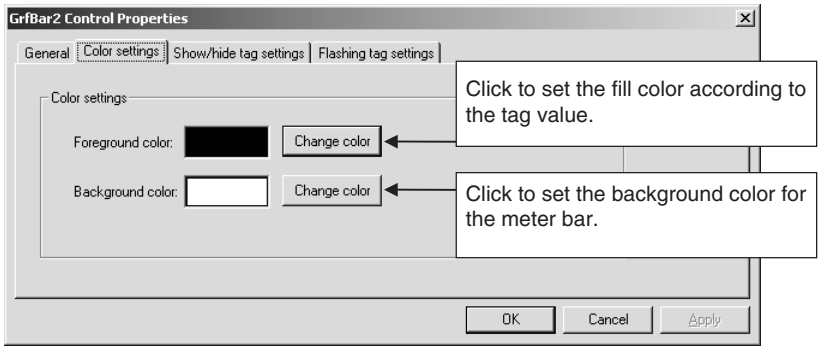


Setting Method

General Tab



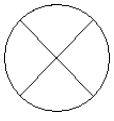
Color Settings Tab



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

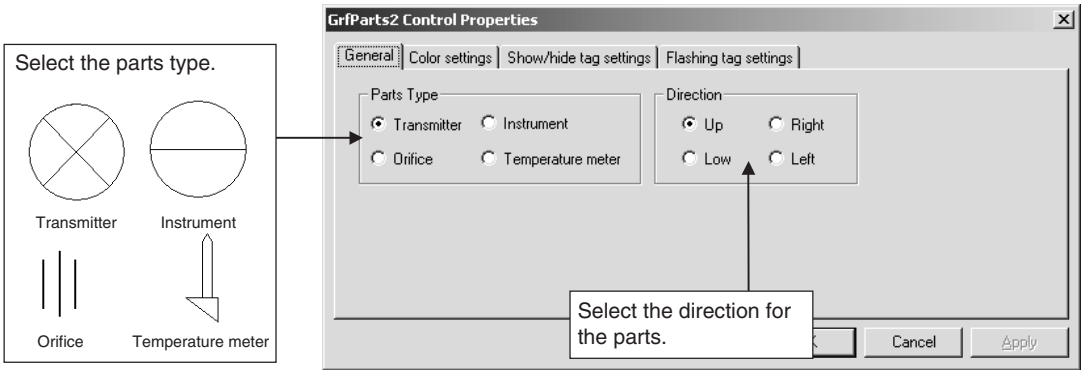
Parts ( )

These are image objects used for screens such as Control Screens.

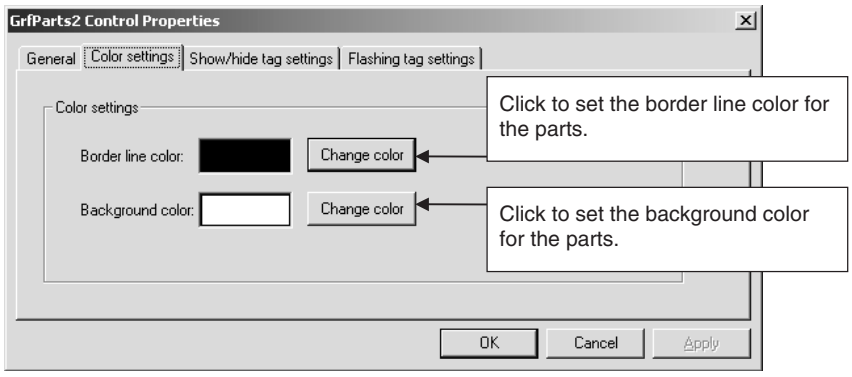


Setting Method

General Tab



Color Settings Tag



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Switch ( )

The switch operates as shown below, depending on the type of switch.

(Type: DO)

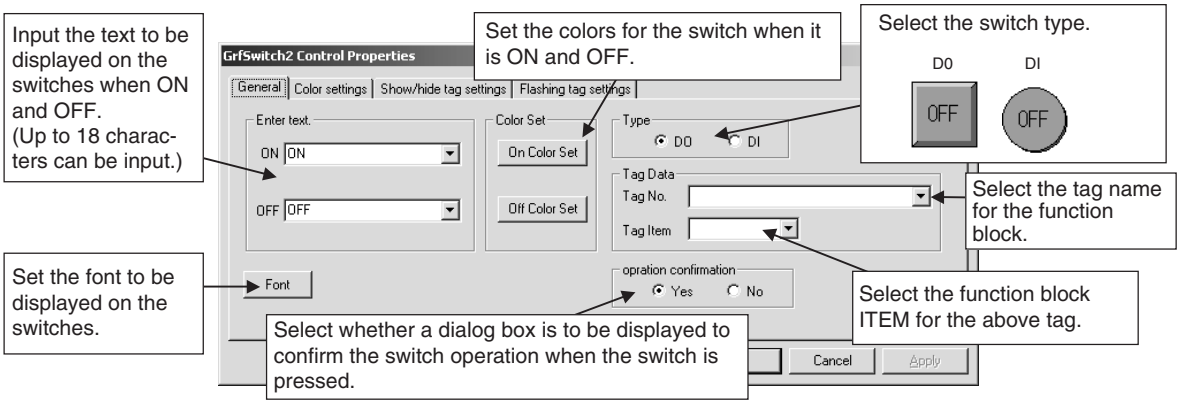
Clicking this switch turns the Loop Controller tag ON or OFF.

(Type: DI)

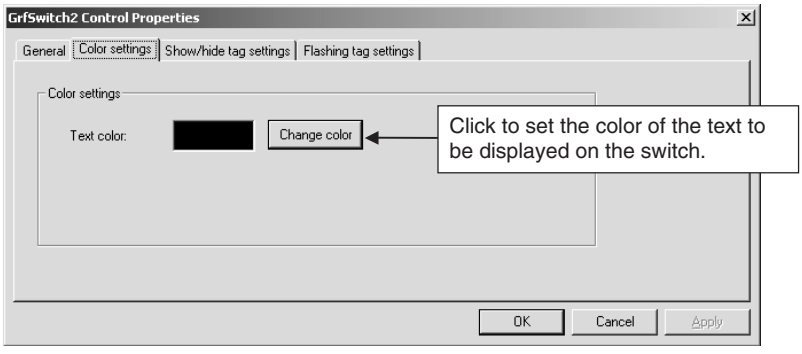
Displays the ON/OFF status of the Loop Controller tag.

Setting Method

General Tab



Color Settings Tab



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Data (123)

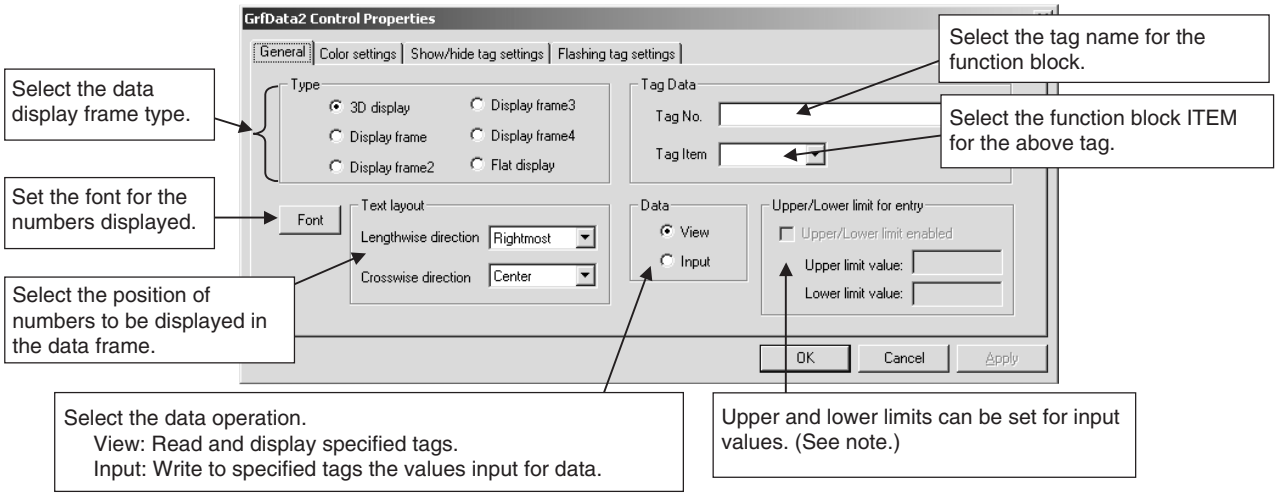
Executes the following operations for specified tag (analog ITEM) values.

- Data view: Reads and displays specified tag values.
- Data input: Writes to specified tags the values input for data.

300.0

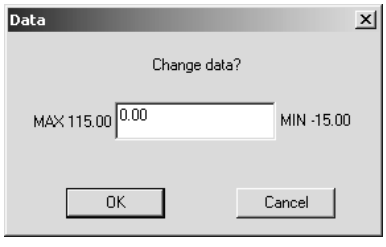
Setting Method

General Tab

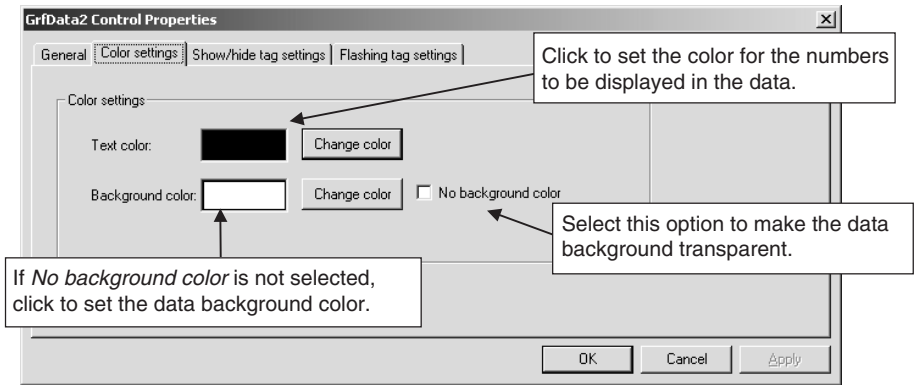


Note Upper and Lower Limits for Inputs

1. Upper and lower limits can be set once the following items have been set.
   Select *Input* for the *Data* operation.
   Select *Tag (Analog ITEM)* for *Tag Data*.
2. The upper and lower limits are automatically displayed according to the tag ITEM type selected for *Tag Data*.
   The upper and lower limits can be changed when inputting numbers directly.
3. Operation when Using Upper and Lower Limits
   When changing a number, the upper and lower limits are displayed as shown below. If a number exceeding the upper or lower limit is input, a message is displayed and the input is not allowed.



Color Settings Tab



For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Text Box (T)

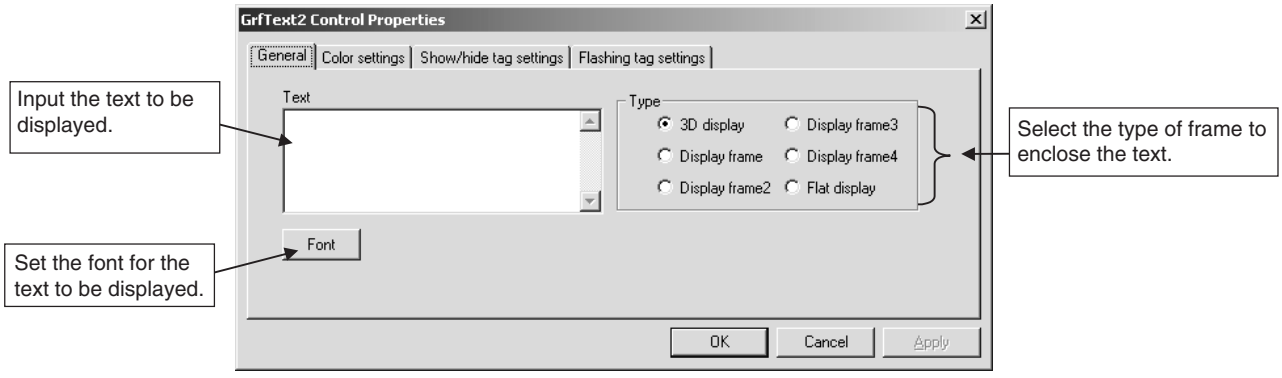
Used to display text input by the user.

Multiple lines can be displayed.

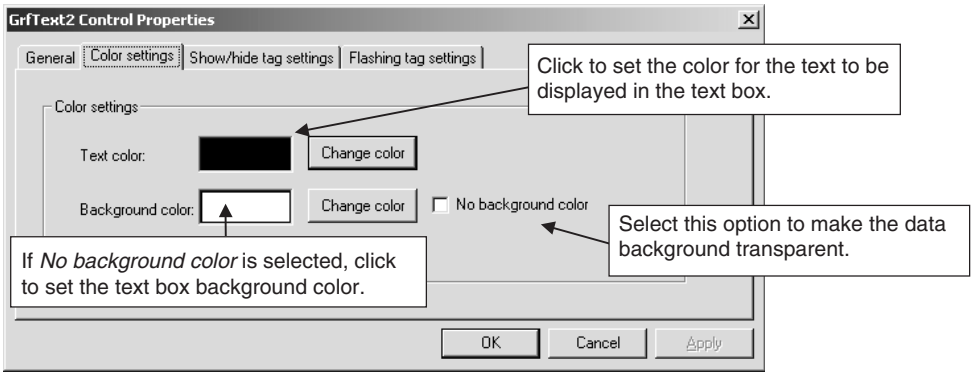
```
Brewing Tank
Group A
```

Setting Method

General Tab



Color Settings Tab



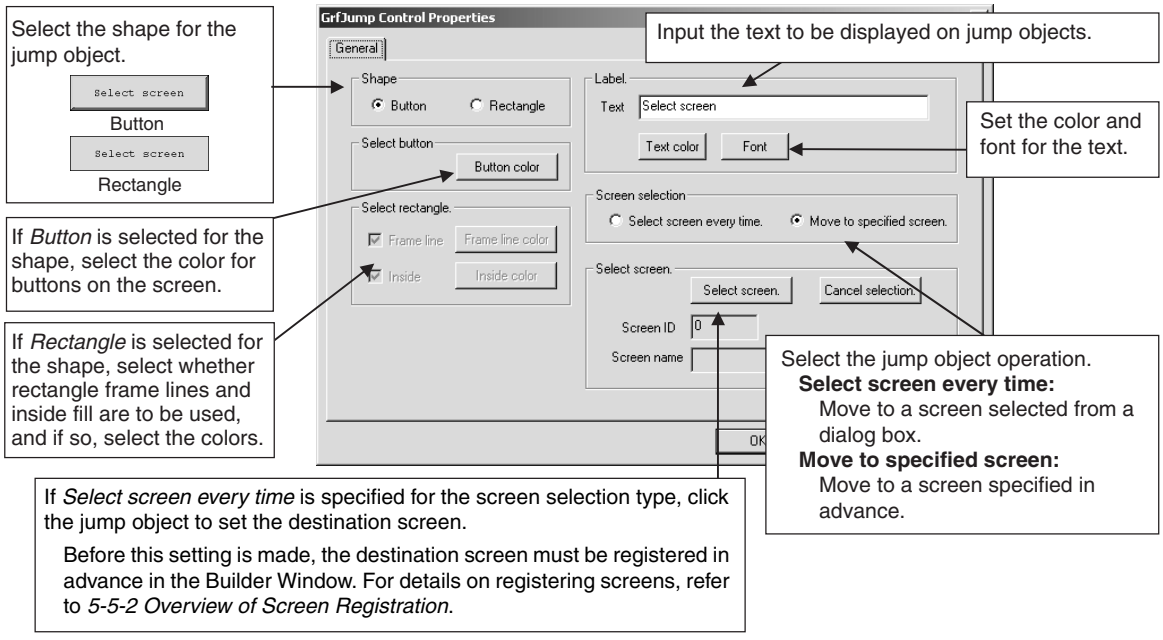
For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Screen Jump ( ) Used to change the display to a specified screen.

Select screen

Setting Method

General Tab

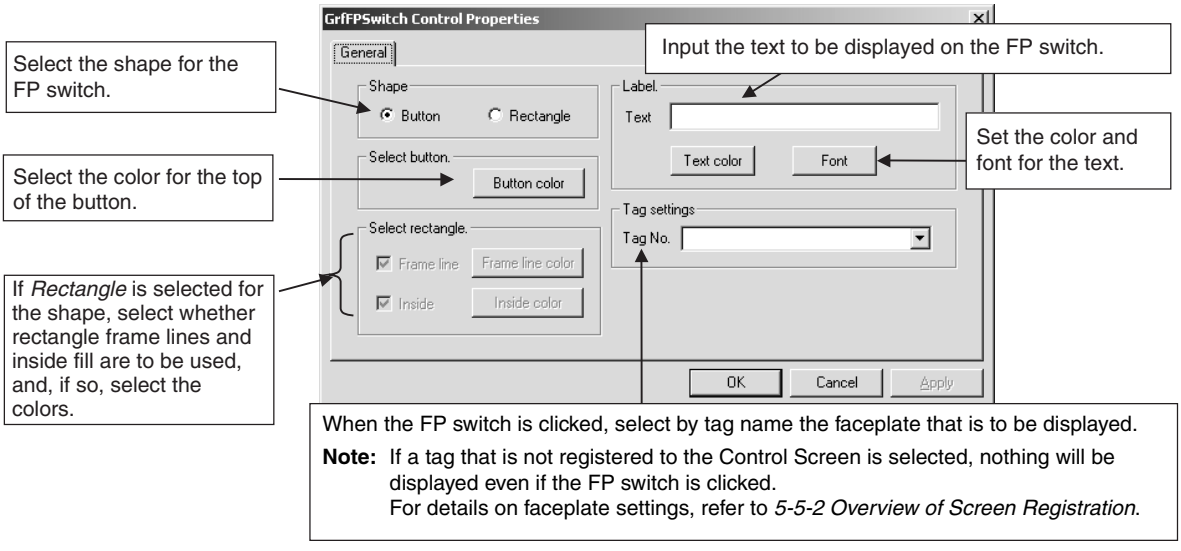


FP Switch ( ) Used to display specified faceplates as pop-ups on Graphic Screens.

Tag001

Setting Method

General Tab

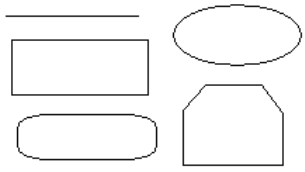


Note
1. A maximum of ten faceplates can be simultaneously displayed on Graphic Screens by using FP switches.
2. All faceplates displayed on a screen will be lost by moving to another screen while the faceplates are being displayed.

Setting Figures and Images

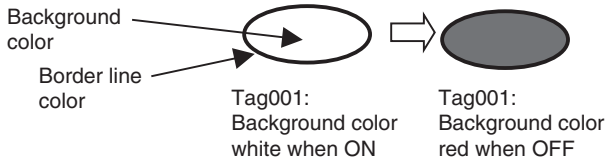
Setting Figures
( )

This section describes how to set lines, rectangles, rectangles with rounded corners, ellipses, and polygons.



Note The figure background color and border line color can be changed using tag values.

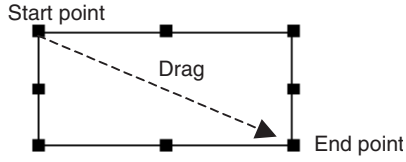
Example: Changing Figure Background Color from White to Red by Turning ON Tag001



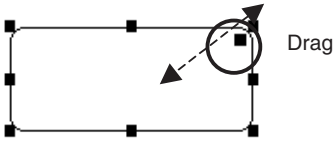
Drawing Method

Lines, Rectangles, Rectangles with Rounded Corners, and Ellipses

1,2,3...
1. In Object Tool Bar click the icon of the figure to be drawn, or select ***Insert Figure/Image*** and then ***Line, Rectangle, Round rect*** or ***Ellipse***.
2. Click the start point and drag to the end point.



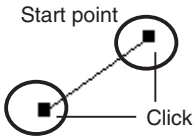
Note **Adjusting Rectangles with Rounded Corners**
The angle of a corner in a rectangle with rounded corners can be adjusted by clicking on the point displayed in the upper right-hand corner (■).



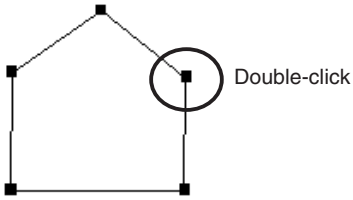
Polygon

1,2,3...

1. Either click the polygon icon in the Object Tool Bar or select ***Insert Figure/ Image - Polygon***.
2. Click the end point and then click the next corner.



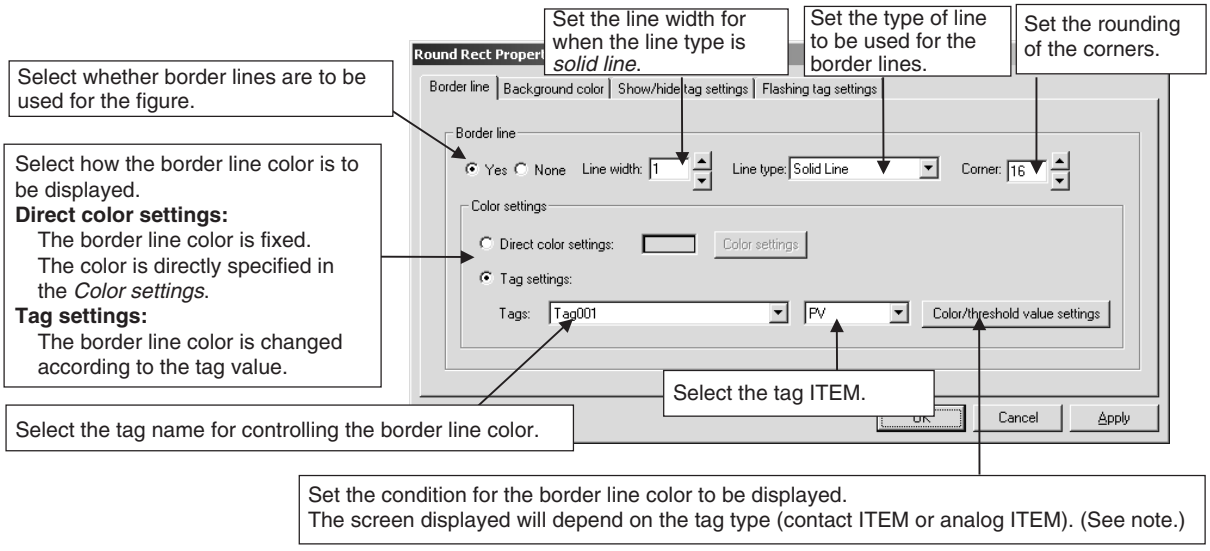
3. Double-click the end point.



Setting Method

The settings are described here using a figure (rectangle with rounded corners) as an example.

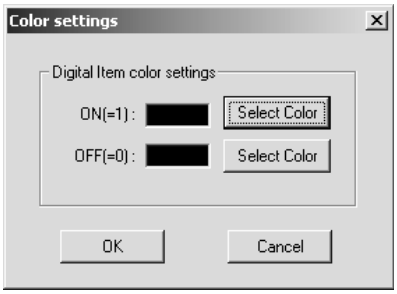
Border Line Tab



Note: Setting Threshold Values

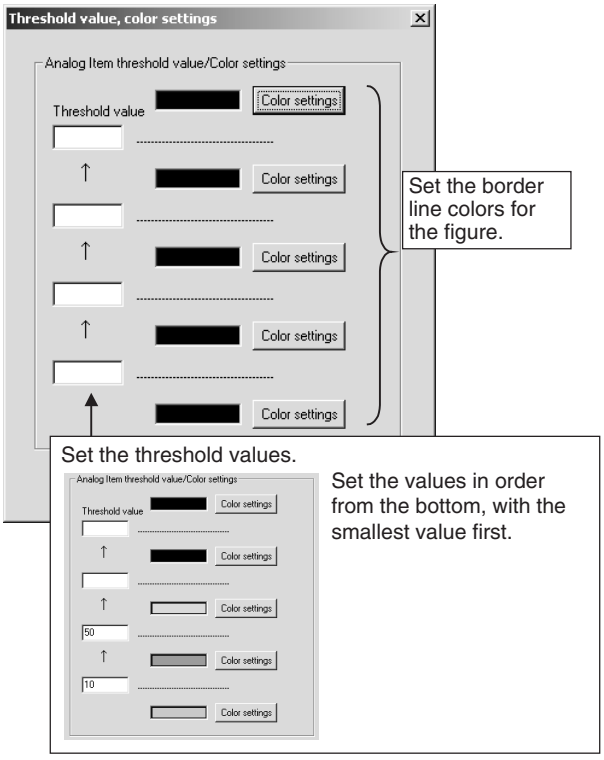
Contact ITEM (Digital Item):

Set the border line colors for when the tag value is ON and OFF.

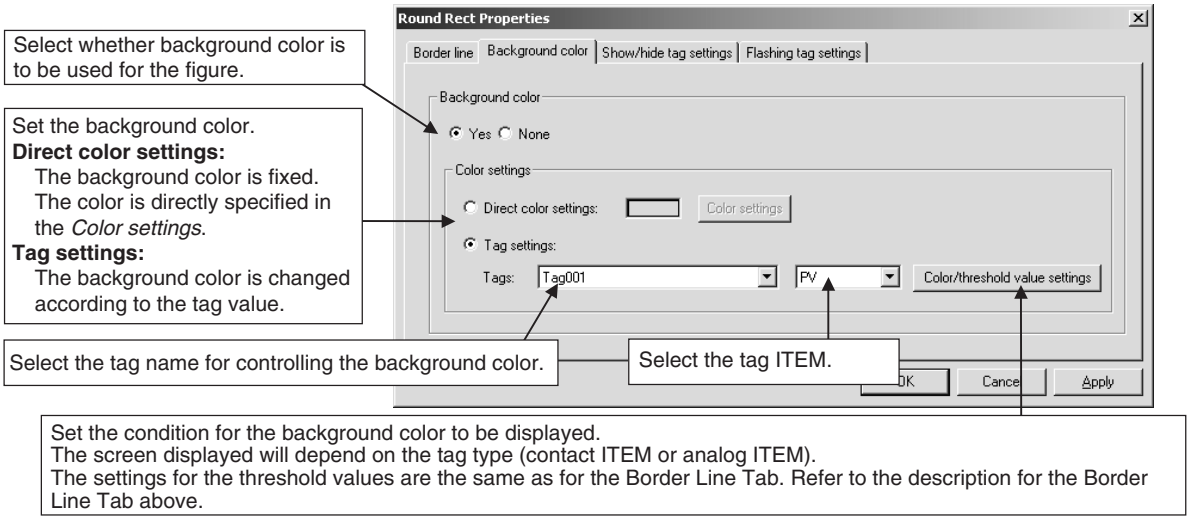


Analog ITEM:

Set the threshold values for changing border line colors.



Background Color Tab



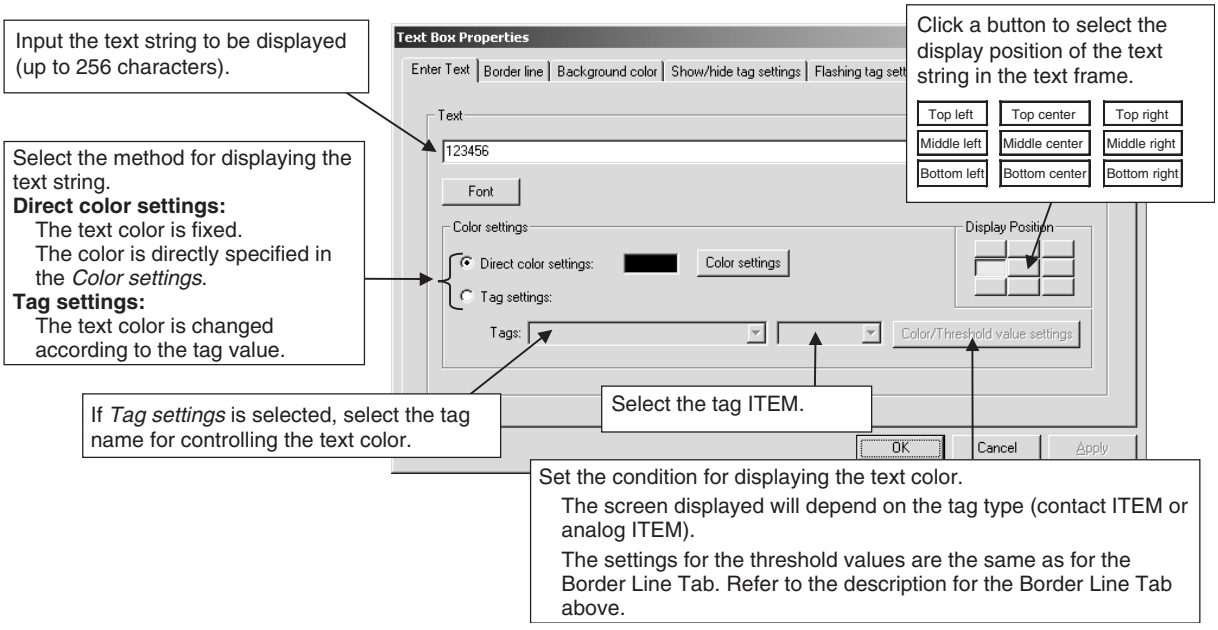
For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Text (AB)

Used to display text string that have been input.

Setting Method

Enter Text Tab



Border Line Tab

Refer to the description above of the setting method for the Borderline Tab.

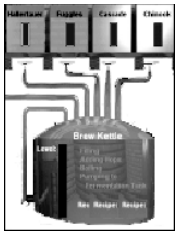
Background Color Tab

Refer to the description above of the setting method for the Background Color Tab.

For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

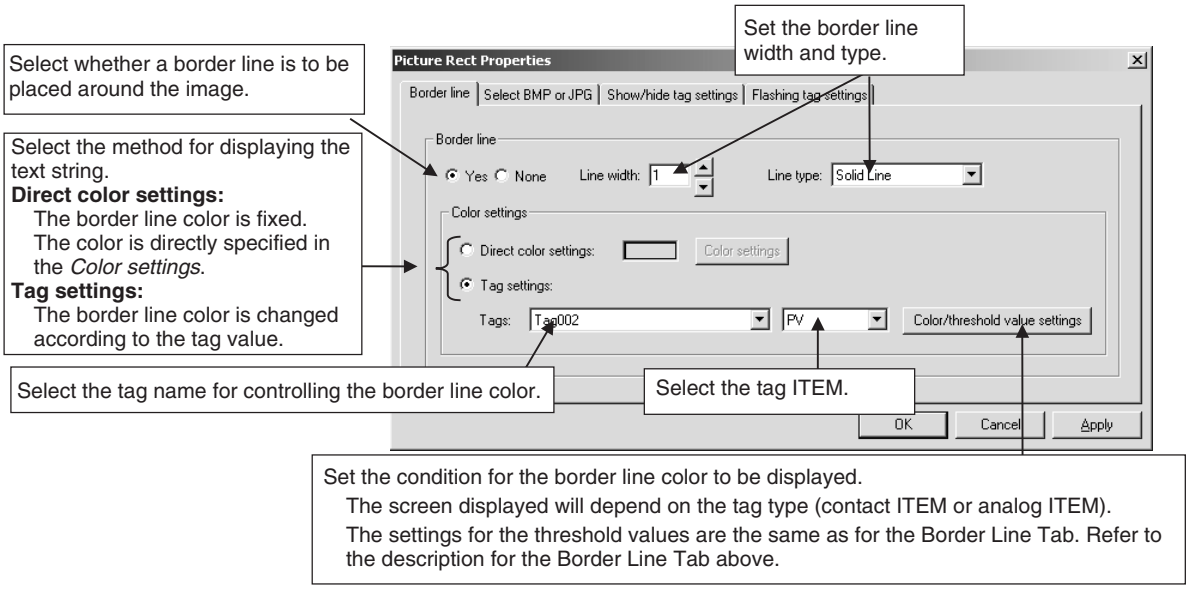
Images ( )

Image files in BMP (bit map) or JPG format can be displayed as graphic images.

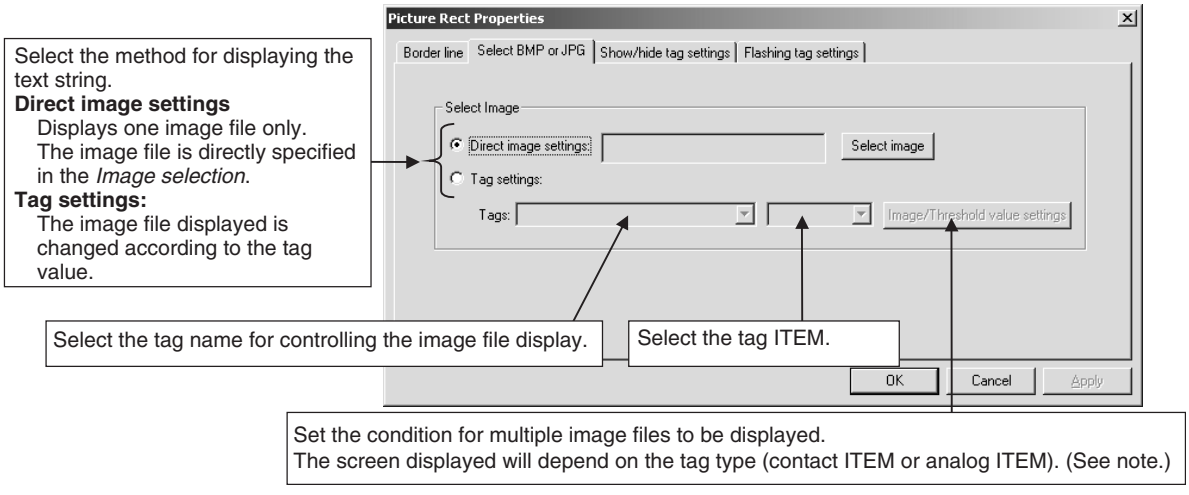


Setting Method

Border Line Tab



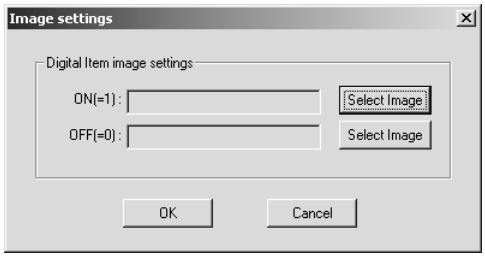
Select BMP or JPG Tab



Note: Setting Threshold Values

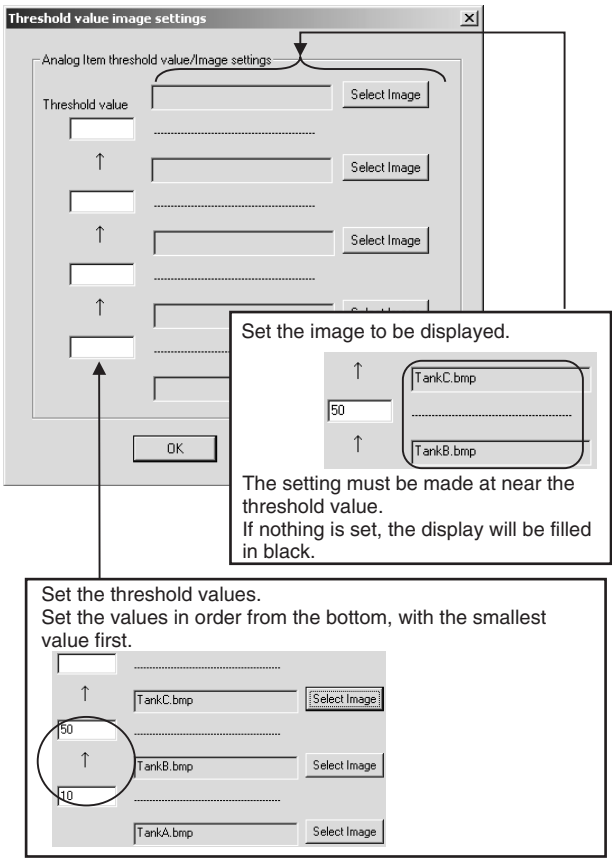
Contact ITEM:

Set the image files to be displayed when the tag value is ON and OFF.



Analog ITEM:

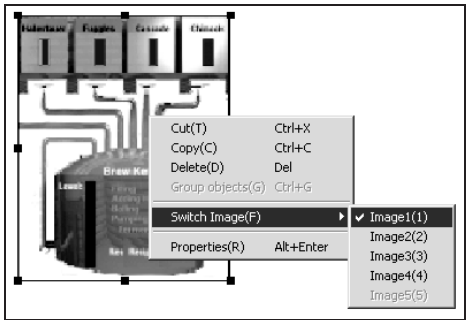
Set the threshold values for changing the image file displayed.



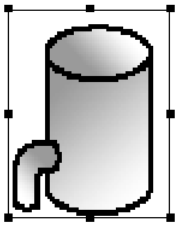
For details on the Show/Hide Tag Settings Tab and the Flashing Tag Settings Tab, refer to *Common Settings for Graphic Objects* in this section.

Note When specifying multiple image files to be displayed for an image object, the following procedure can be used to check the contents of the image files.

1. Double-click the image object to select it.
2. Right-click and select ***Switch Image*** and then ***Image1(1)*** to ***Image4(4)*** from the menu.



3. The image file selected from the menu will be displayed for the image object.



The following procedure can also be used to display an image on the Graphic Screen.

1. Copy the image using another drawing program and then select ***Edit - Paste*** (Ctrl+V) in the Graphic Screen Creation Window to paste the image.
2. Select ***Edit - Create/Paste Objects*** in the Graphic Screen Creation Window, and then specify and insert the image file.

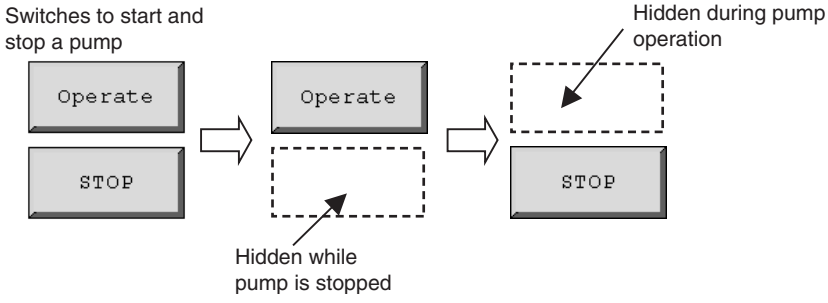
Common Settings for Graphic Objects

This section describes the settings made in common for graphic objects.

Showing or Hiding Tag Settings

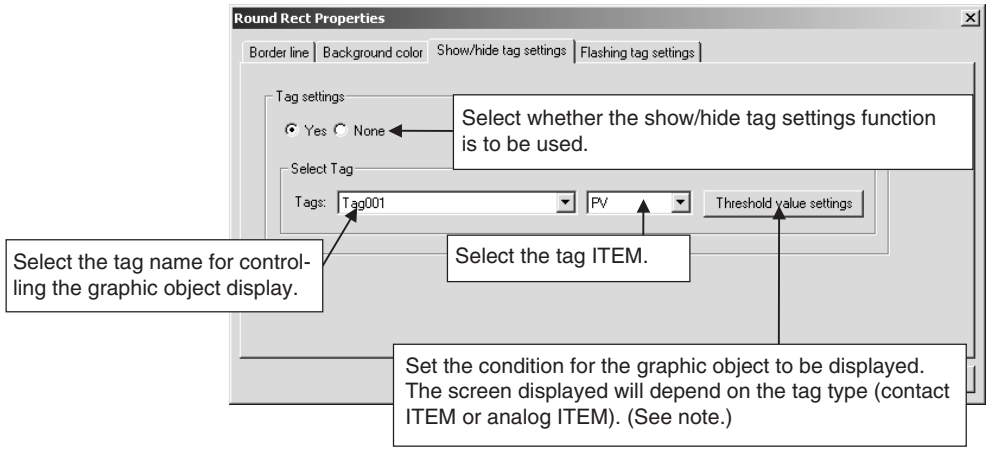
Graphic object displays are deleted according to tag values.

Example: Displaying Usable Switches Only



Example: Figure (Rectangle with Rounded Corners)

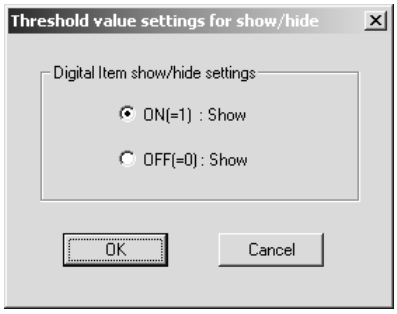
Show/Hide Tag Settings Tab



Note: Setting Threshold Values

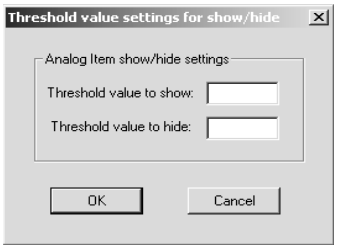
Contact ITEM (Digital Item):

Select whether the graphic object is to be displayed when the tag value is ON or OFF.



Analog ITEM:

Set the threshold values for displaying and hiding the graphic object.

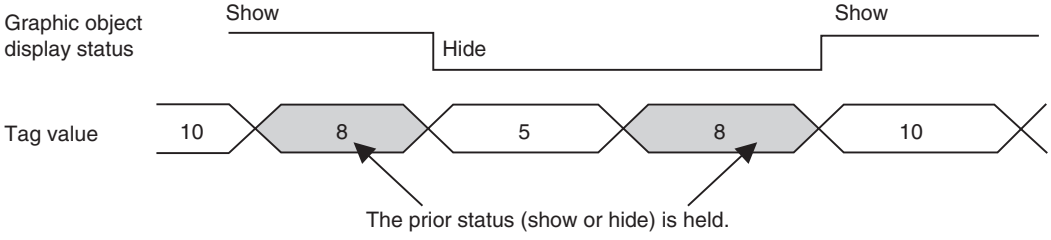


Note **Example 1: Show Threshold Value 6 and Hide Threshold Value 5**

Show when the tag value is 6 or higher, and hide when it is 5 or lower.

Example 2: Show Threshold Value 10 and Hide Threshold Value 5

Show when the tag value is 10 or higher, and hide when it is 5 or lower.
The prior status is held as shown below when the tag value is from 9 to 6.



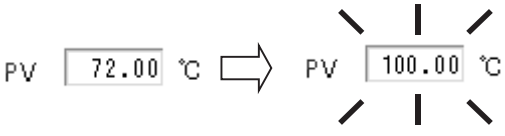
Example 3: Show Threshold Value 5 and Hide Threshold Value 5

Show when the threshold value is 5 or higher, and hide when it is less than 5.

Flashing Tag Settings

A graphic object is made to flash according to the tag value.

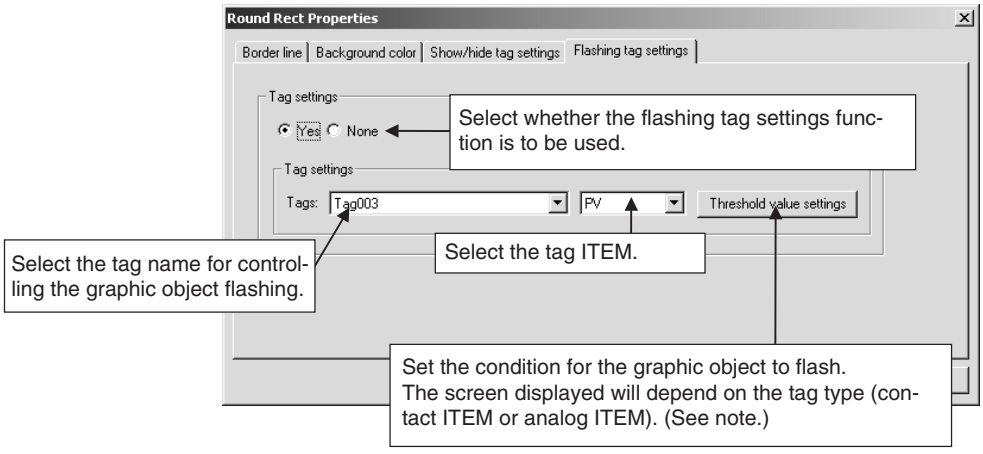
Example: A Numeric Object That Flashes When a Particular Temperature (100°C) Is Reached



The numeric object flashes when the temperature reaches 100°C.

Example: Figure (Rectangle with Rounded Corners)

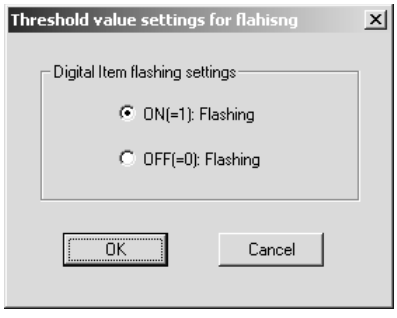
Flashing Tag Settings Tab



Note: Setting Threshold Values

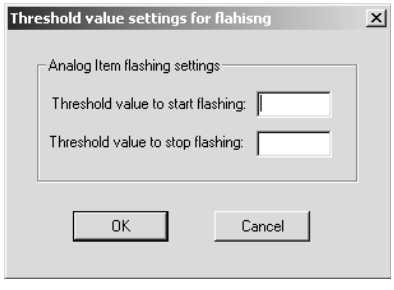
Contact ITEM (Digital Item):

Select whether the graphic object display is to flash when the tag value is ON or OFF.



Analog ITEM:

Set the threshold values for starting and stopping the graphic object flashing. The settings for the threshold values are the same as for showing and hiding tag settings.
Refer to the description for the *Showing or Hiding Tag Settings* above.



5-4-7 Grouping Graphic Objects

Multiple graphic objects can be grouped so that they will be treated as a single graphic object. (See note.)

Grouped graphic objects can be saved in individual files.

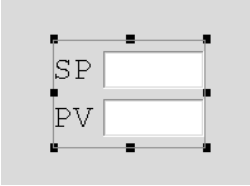
The grouped objects then can be imported and used in other Graphic Screens by reading the saved files.

Note Groups cannot include jump objects and FP switch objects.

Grouping Graphic Objects

1,2,3...

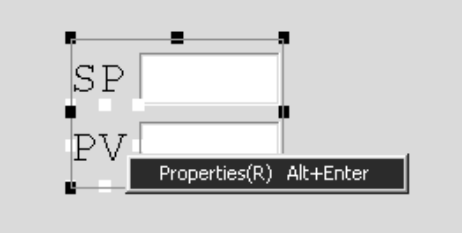
1. In the Graphic Builder Window, select the graphic objects that are to be grouped.
2. Right-click and select ***Group Objects*** from the pop-up menu. (Alternatively, select ***Group Objects*** from the Edit Menu.)
   The selected graphic objects will be grouped and the color of the lines in the frame will change to green.



Changing the Settings for Individual Graphic Objects in a Group

1,2,3...

1. Select the grouped graphic object.
2. Within the grouped graphic object, double-click the individual object for which the settings are to be changed.
3. Right-click and select ***Properties*** from the pop-up menu.
   The settings for individual graphic objects can then be changed as shown below.



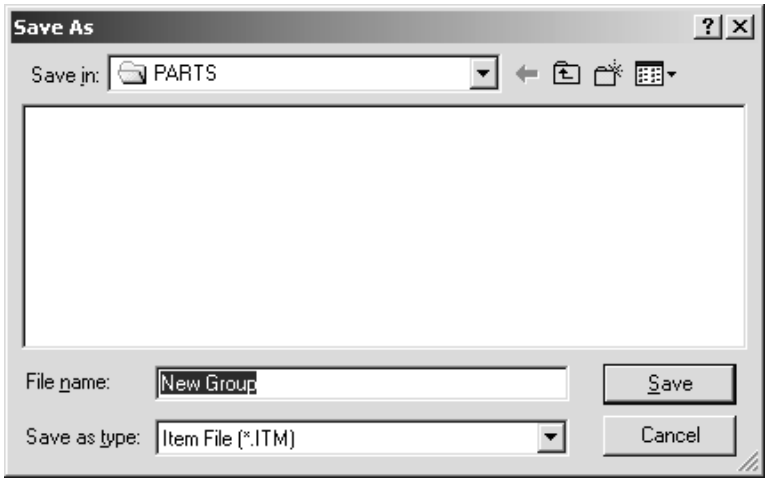
Note Individual graphic objects within a group cannot be moved to another display position, deleted, resized, or copied.
To perform any of these operations, first use the following procedure to ungroup the graphic objects.

1. Double-click the grouped graphic object to select it.
2. Right-click and select ***Ungroup Objects*** from the pop-up menu.

Saving Grouped Graphic Objects

1,2,3...

1. With the grouped object selected, select ***Save Group File*** from the File Menu.
2. The Save As Dialog Box will be displayed.
   Input the file name and click the **Save** Button.
   The grouped graphic object data will be saved (file name extension: ITM).

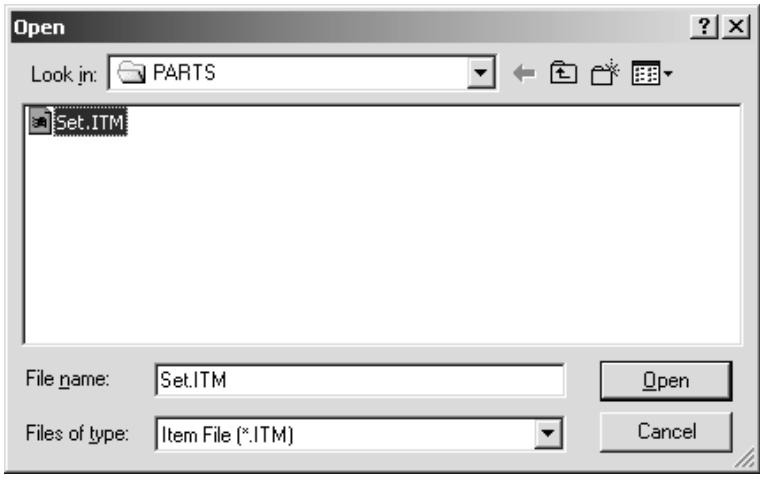


Note Settings related to tags set for individual graphic objects will not be saved. Set the tags as required when reading and using grouped graphic objects that have been saved.

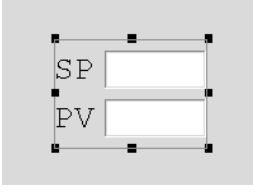
Loading Grouped Graphic Objects

1,2,3...

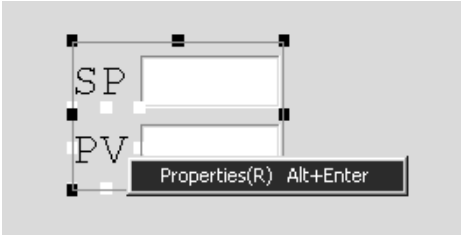
1. Select ***Load Group File*** from the File Menu.
2. The Open Dialog Box will be displayed. Select the group file that is to be read, and click the **Open** Button.



3. The grouped graphic object will be loaded to the Graphic Screen.



4. Tag settings are not saved for grouped graphic objects in the files. Right-click and select ***Properties*** to set the graphic object properties individually.



5-5 Screen Configuration

This section explains how to perform operations to configure the CX-Process Monitor Plus Screen.

Use the CRT Builder to configure the following screens.

Overview Screen

- Control Screen
- Trend Screen
- Batch Trend Screen
- Segment Program 2 Screen
- Graphic Screen (You must create this screen beforehand. Refer to *5-3 System Monitor Settings*.)
- Annunciator Screen

Alarm Log Screen

Operation Guide Screen

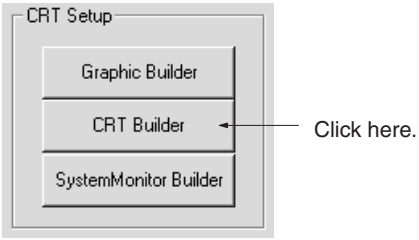
Note The Tuning Screen is created automatically when the Control Screen is registered.

When all screens have been configured, save their settings.

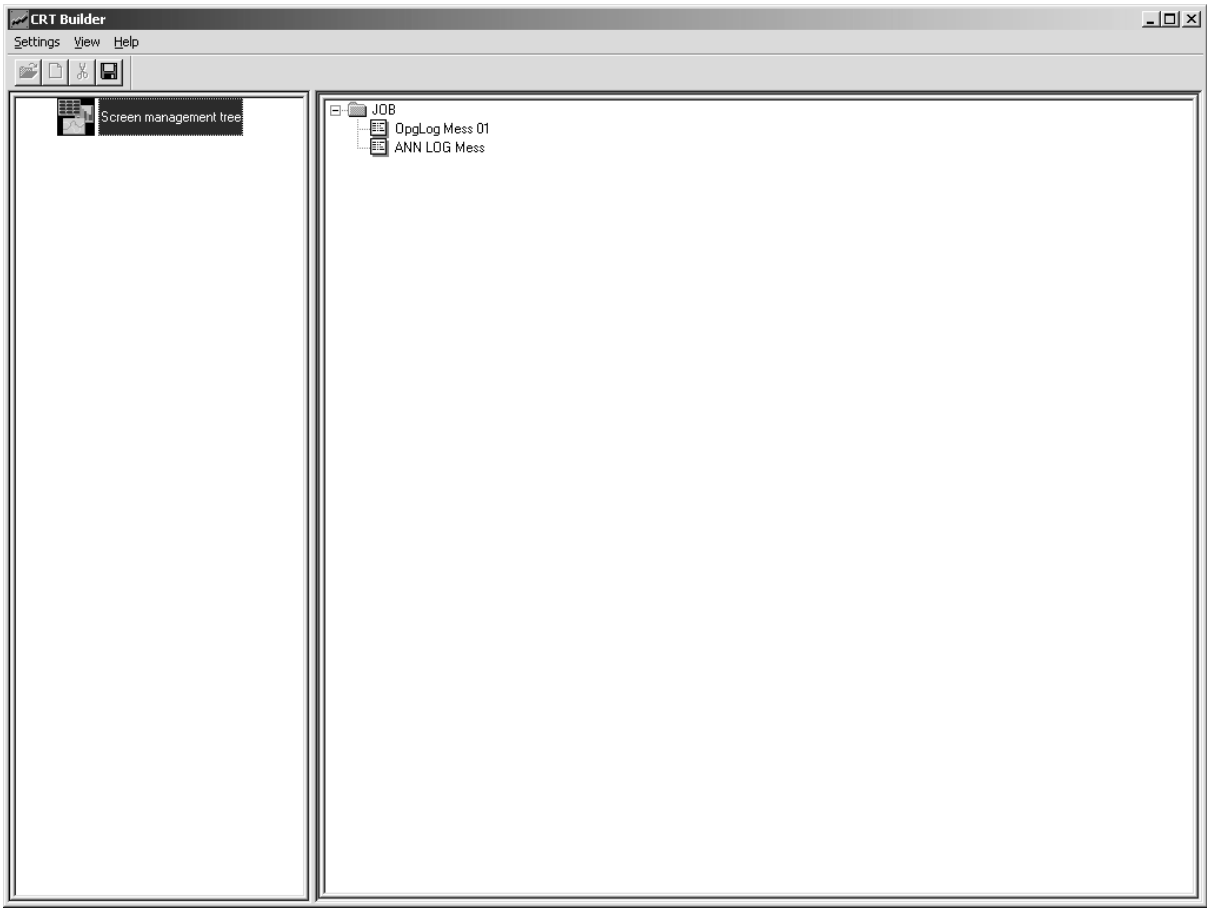
5-5-1 CRT Builder Functions

Starting the CRT Builder

In the Setup Dialog Box, click the **CRT Builder** Button.



The CRT Builder Window will be displayed.



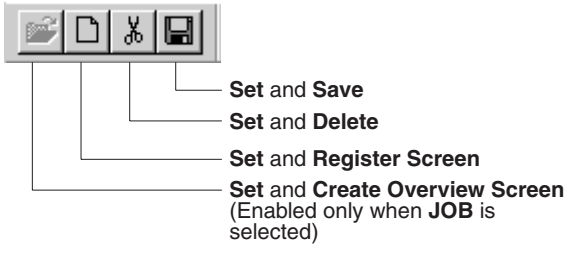
CRT Builder Menu

The CRT Builder menu contains the following functions.

Menu	Commands	Function
Settings	Create Overview Screen	Add a new Overview Screen based on the current Overview Screen.
	Register Screen	Set and register screen items. Enabled only when you have selected screen items using the Screen Management Tree.
	Delete	Deletes registered screen items.
	Save	Saves setting in CRT Builder.
	Exit	Ends the application.
View	Toolbars	Select whether to display or hide toolbars.
Help	About CRT Builder	Display the CRT Builder version information.

CRT Builder Toolbar

The CRT Builder toolbar contains the following functions.



5-5-2 Overview of Screen Registration

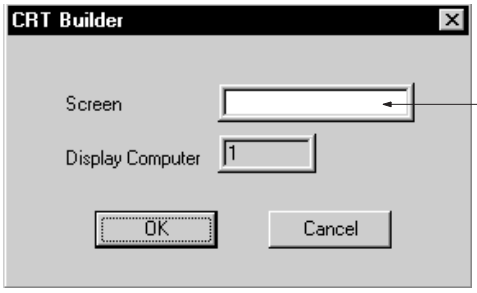
This section explains how to register the Overview Screen and set and register the sub-elements of the Overview Screen given below.

- Control Screen
- Trend Screen
- Batch Trend Screen
- Segment Program 2 Screen
- Graphic Screen (You must create the Graphic Screen beforehand. Refer to *5-4 Creating Graphic Screens*.)
- Annunciator Screen

Note The Tuning Screen is created automatically when the tag name is allocated.

Registering the Overview Screen

1,2,3... 1. Start CRT Builder, and then in the CRT Builder's Screen Management Tree, select ***JOB***, and then select ***Setting***, and then select ***Create Overview Screen***. The CRT Builder Dialog Box will be displayed.

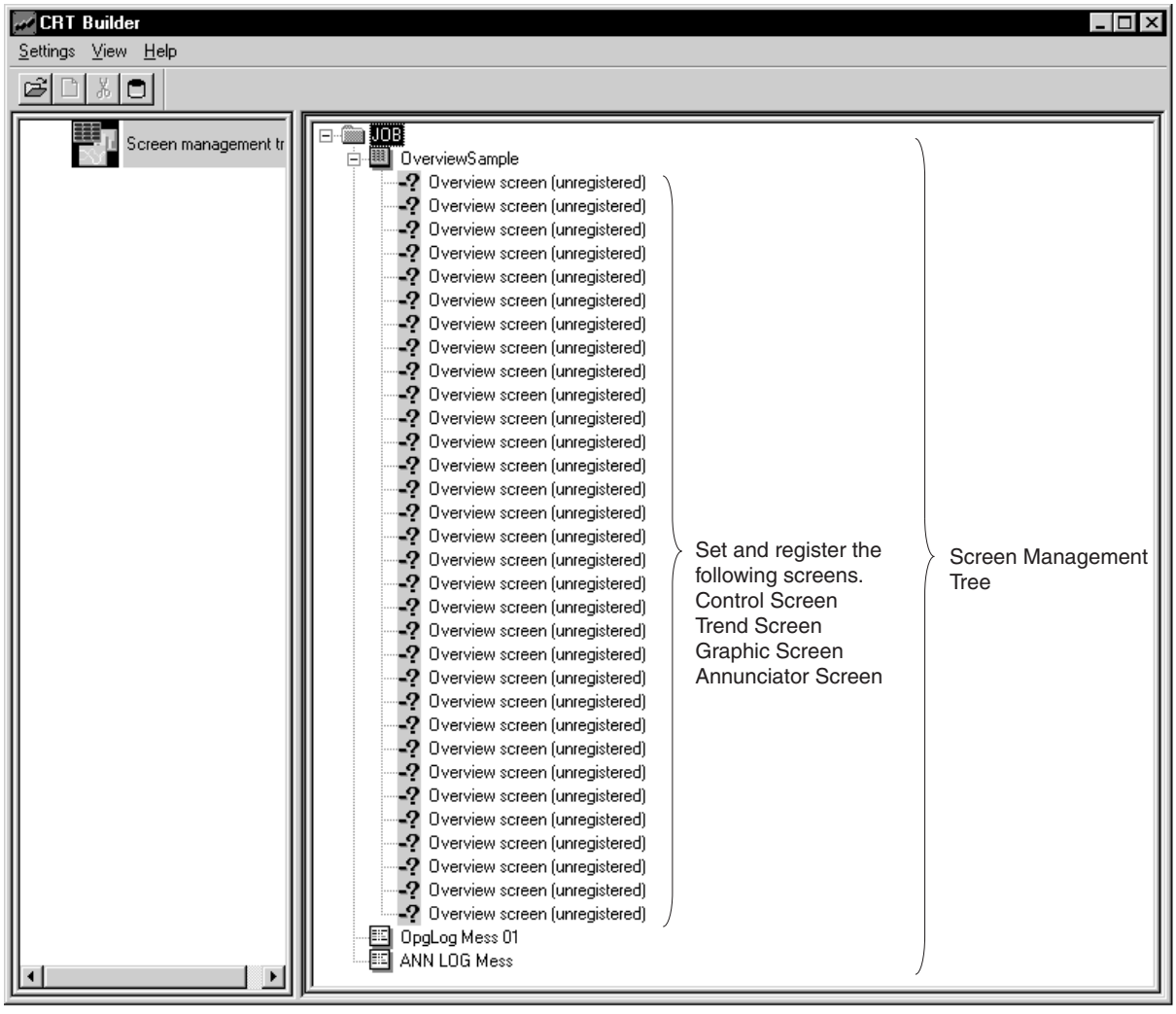


Enter the name of the Overview Screen using 8 full-width characters or 16 half-width characters. Make sure to enter a name for the Overview Screen.

Note Make sure to enter a name for the Overview Screen. If you do not enter a name, you will be unable to move to the Overview Screen.

2. Enter a screen name, and then click the **OK** Button.

   The Overview Screen will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.



3. Select the screen item, and then select ***Set***, and then select ***Register Screen*** (or double-click the screen item), to set and register the screens.

   Settings differ for each screen item. Refer to later in this manual for how to set each screen.

Setting the Screen Tag Names

To specify the Function Block data within the Loop Control Unit/Board, specify a tag name when registering each screen.

Note To specify the tag name, you must create a Monitor Tag file (select ***Execute***, and then select ***Compile Monitor Tags***) using CX-Process Tool (on Windows NT). If you do not create a tag file for Monitor Plus, you cannot specify tag names from CX-Process Monitor Plus.

There are two types of tag names:

1,2,3... 1. Tag names for function blocks. If specifying tag names for Function Blocks, specify the function block ITEMs using tag ITEM. (See note.)

Note Tag ITEM is a fixed name allocated beforehand to specific ITEMs (PV, SP, and MV, etc.) for a specific Function Block (Control Block, and part of the Operation Block). Refer to *Appendix A Reading/ Writing Function Block ITEMs* for details.

2. Tag names for analog ITEMs and contact ITEMs.

Refer to the following table for the relation between each screen and the tag name/tag ITEM given above.

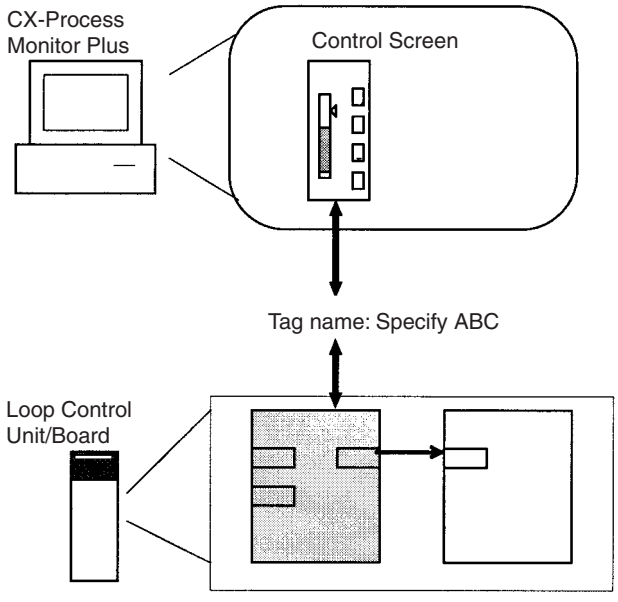
Screen	1		2
	tag names for function blocks	**Tag ITEMs for the function block**	**tag names for analog ITEMs and contact ITEMs**
Control Screen	Can be specified	---	Can be specified
Trend Screen	Can be specified	Can be specified	Can be specified
Batch Trend Screen	Can be specified	Can be specified	Can be specified
Segment Program 2 Screen	Can be specified	Can be specified	Can be specified (See note.)
Graphic Screen	Can be specified	Can be specified	Can be specified
Annunciator Screen	Can be specified	Can be specified	Can be specified
Operation Guide Screen	Can be specified	Can be specified	Can be specified
Alarm Log Screen	Can be specified	Can be specified	Can be specified

Note Only optional tags can be set.

Example 1

Specifying the Function Block for the Control Screen as Function Block with tag name “ABC.”

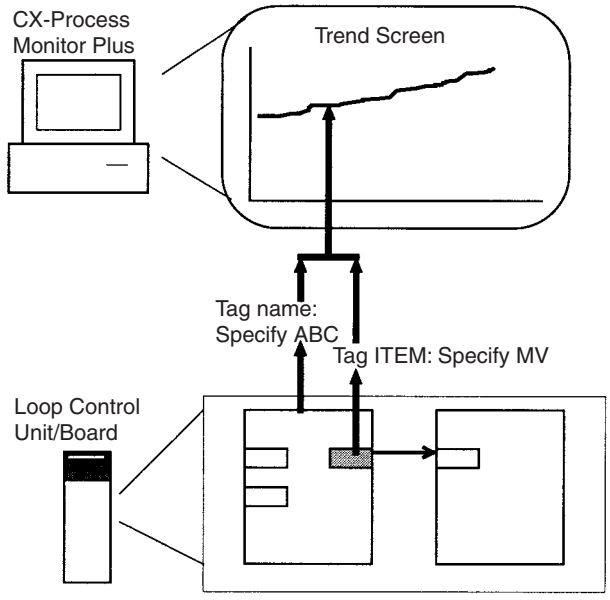
Tag name	ABC



Example 2

Specifying the analog ITEM for the Trend Screen trends as Function Block Tag ITEM “MV” for tag name “ABC.”

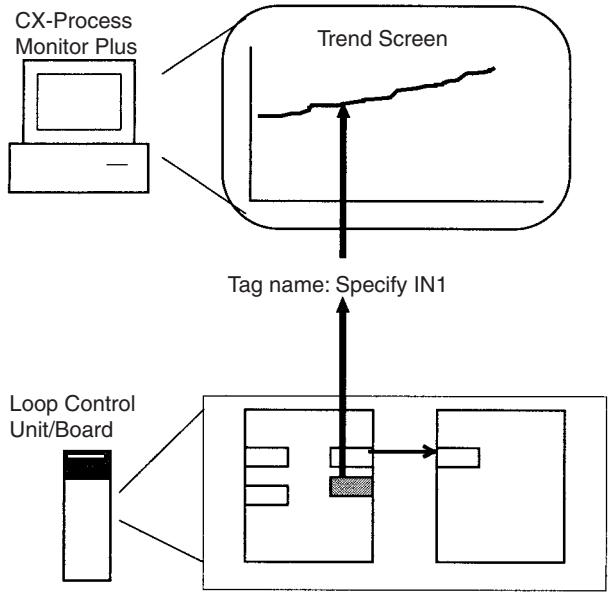
Tag name	ABC
Tag ITEM	MV



Example 3

Specifying the Trend Screen trend as analog ITEM for tag name "IN1."

Tag name	IN1



Changing Monitor Tag File Paths

When the **Run** Button in the Main Window is clicked, Monitor Tag files are saved under fixed file names in the directory where the Monitor Tag file application paths are set.

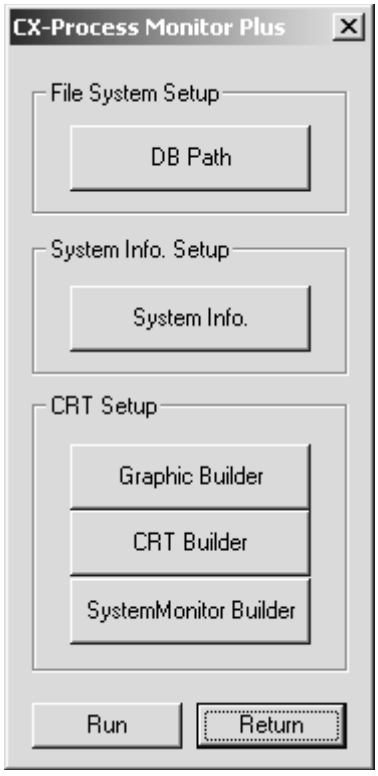
File names: mtagmst and mtagsubmst

It is possible to create several Monitor Tag files and to switch between them by changing the application path. By creating new Monitor Tag files in a directory different from the default one and changing the application path to this directory, you can change the Monitor Tag files that are used by Monitor Plus. The procedure is as follows:

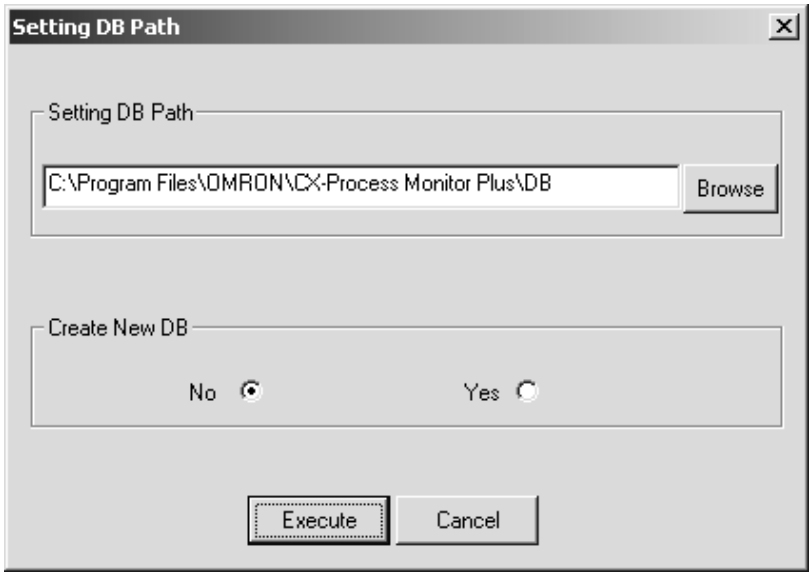
1,2,3...

1. In the Main Window, click the **Setup** Button. A box for entering the password will be displayed.

2. Enter the password and click the **OK** Button. The following Setup dialog Box will be displayed.



3. Click the **DB Path** Button. The following dialog box will be displayed.



4. The current path setting is displayed in the Setting DB Path field.
5. Click the **Browse** Button and specify the new path in the dialog box that is displayed.
6. Select ***Yes*** in the Create New DB field and click the **Execute** Button.
   When the **Run** Button is clicked in the Main Window, initialized Monitor Tag files will be created at the specified path, and the application path will change to the specified one (i.e., the Monitor Tag files used by CX-Process Monitor Plus will change to the newly created ones).

Note (a) Several files are created. Therefore, if a folder that is used only for Monitor Tag files is not specified, the Monitor Tag files will be created in the same folder as other files.

(b) Empty files are created when ***Yes*** is selected in the Create New DB field. Therefore, Monitor Plus must be restarted by selecting ***Execute - Output Tag File - Monitor Plus Tag*** from CX-Process Tool.

(c) Some time is required until the new DB is created.

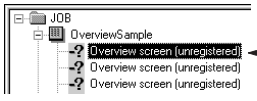
To return the Monitor Tag files that are use to the ones at the original path, select ***No*** in the Create New DB field and click the **Execute** Button. The application path will change to the original one (i.e., the files that CX-Process Monitor Plus uses will change to the ones corresponding to the original path.) If, however, there are no Monitor Tag files at the specified path, an error will occur when the monitor process is started (i.e., when the **Run** Button is clicked in the Main Window or in the Setup Dialog Box).

Note Specifying ***No*** in the Create New DB field is used to return the application path to the original one after it has been changed by specifying ***Yes*** in the Create New DB field.

Registering Control Screens

1,2,3...

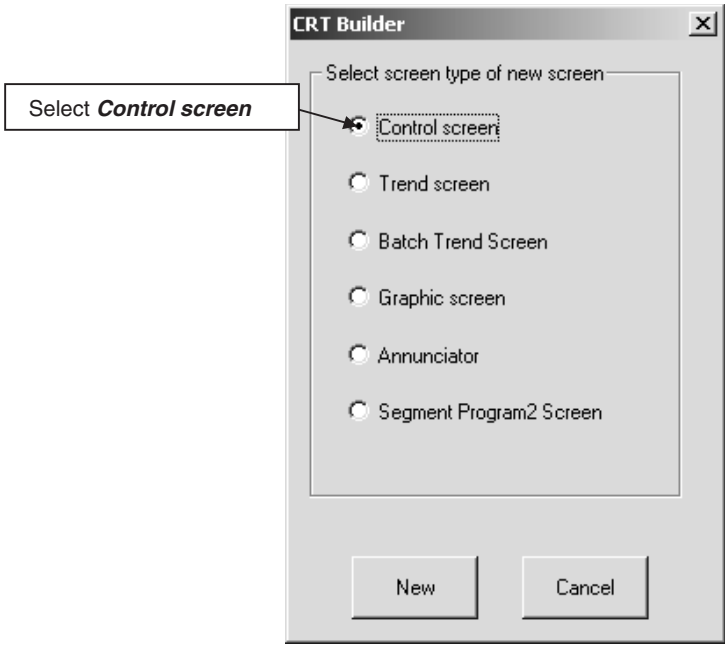
1. Select ***Screen*** in the Overview Screen sub-elements using Screen Management Tree in CRT Builder.



Click to select. Double-click to omit Step 2 of the operation.

2. From the ***Settings*** menu, select ***Register Screen***, or double-click **Screen**.

   The following dialog box will be displayed.

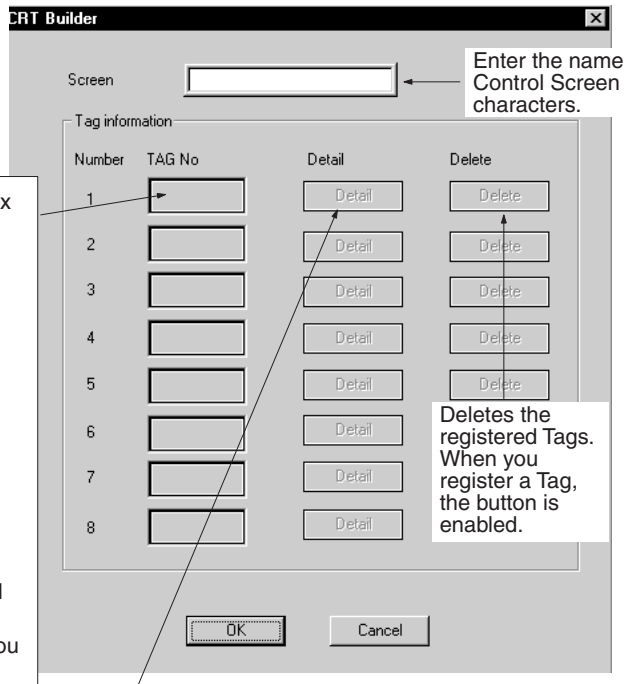


Select ***Control screen***

3. Select ***Control screen***, and then click the **New** Button.

   The following dialog box will be displayed.

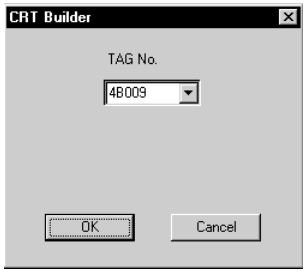
   You can register up to eight function blocks in the Control Screen. Specify the function blocks using tag names.



Enter the name of the Control Screen using16 characters.

Deletes the registered Tags. When you register a Tag, the button is enabled.

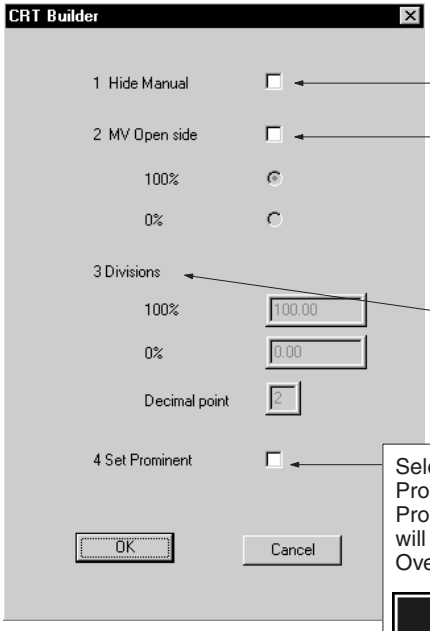
Select the box. The following dialog box will be displayed.



Select the tag name corresponding to the function block, analog ITEM, or contact ITEM you want to register, and then click the **OK** Button.

As shown in the screen on the right, you can allocate up to eight tag names.

When you select a tag name, the Details Button is enabled.
Select the box. The following dialog box will be displayed.



When you select this box, the Manual Pointer is not displayed. Refer to the next page for details of displays.

Select this box, and then select the direction MV will open. If you do not specify a direction, no direction will be displayed. Refer to the next page for details of displays.

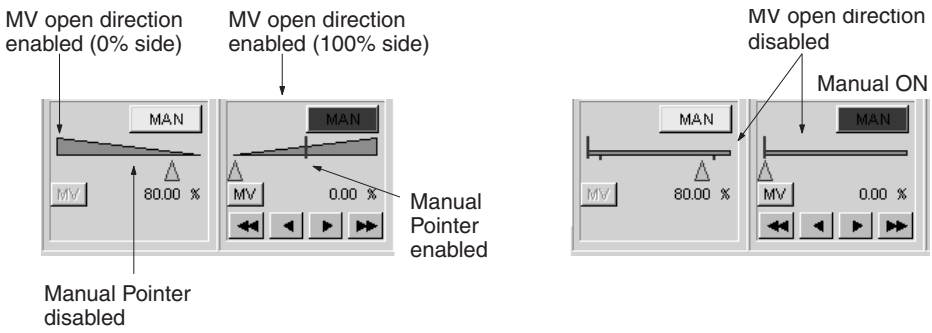
Displays the settings made using CX-Process Tool. You cannot change the settings.

Select this box to set the Prominent Tag. When setting the Prominent Tag, the following mark will be added to the icon on the Overview Screen, as shown.

Make the settings, and then click the **OK** Button.

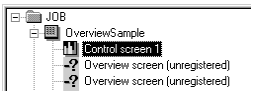
The Manual Pointer and MV direction settings will be reflected in the MV adjustment area in the lower part of the instrument diagram. Refer to the next page for details of displays.

MV Adjustment Area Display in the Lower Part of the Instrument Diagram



4. Enter the Screen Name, set the Tag No. and Detailed Settings, the click the **OK** Button.

   The Control Screen will be registered, and the Screen Name you have entered will be displayed on the Screen Management Tree.



Registering Trend Screens

You can register up to 60 Realtime Trend Screens, and up to 120 Historical Trend Screens.

1,2,3...

1. Select the Overview Screen's sub-element ***Screen*** in the CRT Builder's Screen Management Tree.

2. In the ***Settings*** Menu, select ***Register Screen***, or double-click **Screen**.

   The dialog box shown in Step 2 of the preceding section, Control Screen Registration, will be displayed.

3. Select the Trend Screen, and then click the **New** Button.

   The following dialog box will appear.

   You can register a maximum to eight analog ITEMs (PV, SP, MV, or other analog signals), or eight contact ITEMs in the Trend Screen. Specify analog ITEMs or contact ITEMs using either a) or b) below.

   a. Tag name and relevant Tag ITEM (either PV, SP, or MV) corresponding to the function block.

   b. The tag name corresponding to the analog ITEM or contact ITEM.

Please a check here to enable automatically saving a CSV file. When automatic saving has been enabled, the save period (time), save destination folder, save file name, and browse button will be enabled.

Select the Trend type.

Enter the name of the Overview Screen using 16 characters.

Deletes the registered tags. When you register a tag, the button is enabled.

Click the box. The following dialog box will be displayed.

Select a) the tag name for the Function Block (including the analog ITEMs you want to register), or b) the tag name for the for the analog ITEMs or contact ITEMs you want to register. In this example, the tag name for the Function Block for a) has been specified.

As shown in the screen on the right, you can allocate up to eight tag names.

4. Enter the Screen Name, set the ***Trend Type***, and then select ***Tag No.*** When you register the tag name, the dialog box will change as follows:

Select the box. The following dialog box will be displayed.

Select the Tag ITEM corresponding to the analog ITEM you want to register. In this example, Tag ITEM PV" for the Function Block for tag name 4B009 has been selected.

Select the box. The following dialog box will be displayed.

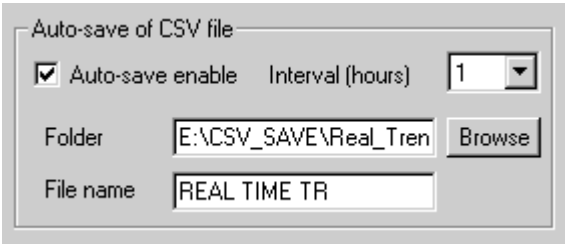
Normally, there is no need to make settings because they are set automatically.
Part of the data (PID constants, etc.), however, may not match the display on the chart. Set the settings for the High Limit and Low Limit for this data only.

5. Set ***Configure Tag No.***, ***Tag ITEM***, and ***Detailed Settings***, and then click the **OK** Button.

The Trend Screen will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.

Saving to an CSV File

Automatically saving to an CSV file is described below.



To automatically save a CSV file, check *Autosave enable* on the above screen and then make the following settings.

Interval (hours)

The time can be set to 1, 2, 3, 4, 6, 10, 12, 18, 20, 24, 48, 72, 86, 120, or 240 hours. The default for Real Time Trends is 12 hours, and the default for Historical Trends is 240 hours.

Folder

Specify the folder in which to save the file. The *Browse* Button can be use to simplify setting the folder.

Filename

Specify the name of the file to save. Do not specify the file name extension.

The actual name of the file that is saved will be as follows:

filename_data_time.csv

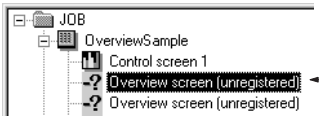
For example, if a file called RealTimeTrend is saved at 16:15:10 on December 1 2006, the file name RealTimeTrend_20061201_161510.csv will be created automatically.

Registering Batch Trend Screens

A maximum of 120 Batch Trend Screens can be registered.

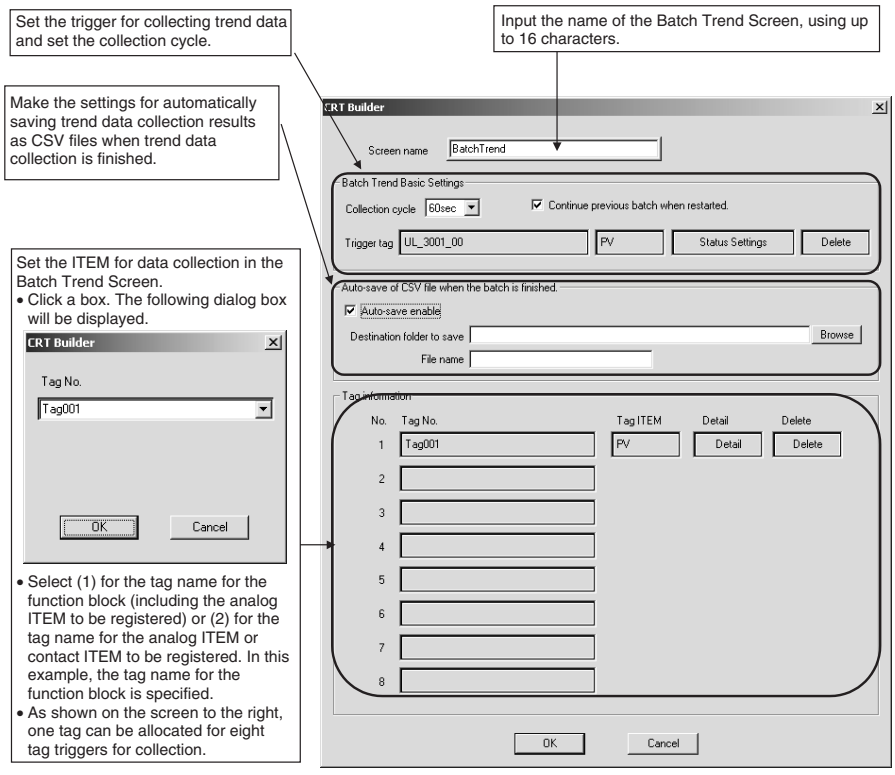
1,2,3...

1. Select *Screen* in the Overview Screen sub-elements using the Screen Management Tree in the Builder Window.



Click to select.
Double-click to omit step 2 of the procedure.

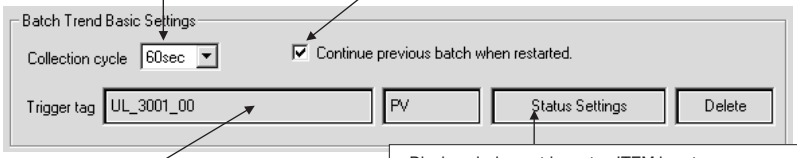
2. Select ***Register Screen*** from the Settings Menu, or double-click Screen. The dialog box displayed in step 2 of *Registering Control Screens*, above, will be displayed.
3. Select *Batch Trend Screen* and then click the **New** Button.
   The following dialog box will be displayed.
   A maximum of eight analog ITEMs (PV, SP, MV, or other analog signals) or eight contact ITEMs can be registered as data collection ITEMs in a Batch Trend Screen.
   Also, one analog ITEM (PV, SP, MV, or other analog signal) or contact ITEM can be registered to serve as the trigger for starting batch collection.
   Specify analog or contact ITEMs using either method (1) or (2) below.
   (1) Tag numbers (tag names) and tag ITEMs (PV, SP, or MV) for the function block
   (2) Tag numbers (tag names) for analog or contact ITEMs



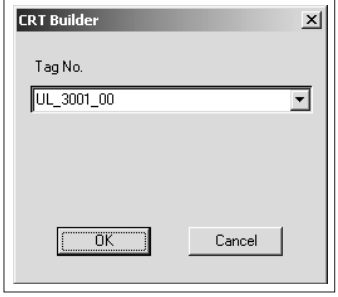
4. Input the screen name.
5. Set the batch trend basic settings as shown below.

Select the operation for when the trigger condition is satisfied for collecting data when the CX-Process Monitor Plus is restarted.
- **Selected:**
  Continue collecting data to the same batch trend file when the CX-Process Monitor Plus is restarted.
- **Not selected:**
  Begin collecting data to a new batch trend file when the CX-Process Monitor Plus is restarted.

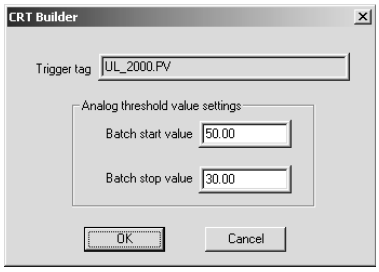
Select the batch trend collection cycle (1 or 60 s).



- Set the tag to serve as a trigger for start collecting trend data.
  Note: The trigger tag setting is not required. Trend data collection can also be started using a procedure from the Batch Trend Screen.
- Click the box to display the dialog box shown below.
- Select the tag ITEM for the analog ITEM that is to be registered. In this example, a tag ITEM (PV) with the tag name "UL_3001_00" is selected.



- Displayed when a trigger tag ITEM is set.
- Click the box to display one of the following dialog boxes according to the type of ITEM (analog or contact) that is selected.
- Analog ITEM:



Set the batch start and stop values.

If the batch start value is greater than the batch stop value:

Batch collection will start when the trigger ITEM value is equal to or greater than the batch start value.

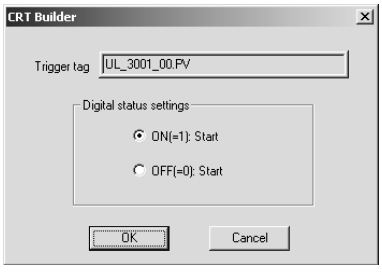
Batch collection will stop when the trigger ITEM value is less than the batch stop value.

If the batch start value is less than the batch stop value:

Batch collection will start when the trigger ITEM value is less than the batch start value.

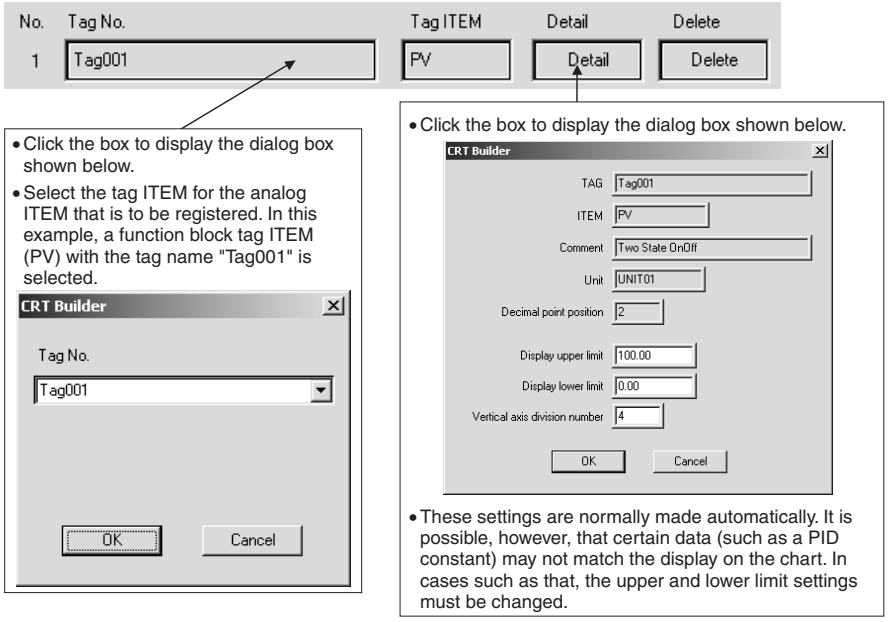
Batch collection will stop when the trigger ITEM value is equal to or greater than the batch stop value.

- Contact ITEM:



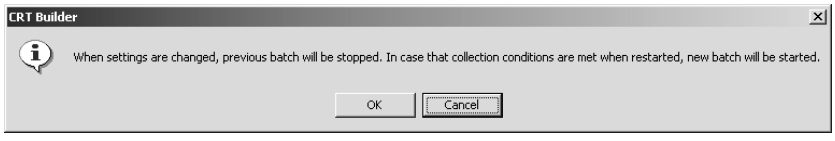
Set the condition (either when ON or when OFF) for starting the batch collection.

6. Select the tag number for the batch trend collection. Register the tag name and then set *Detail* as described below.



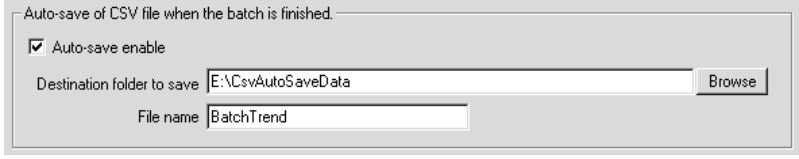
7. Select the option to enable auto-saving of CSV files (described below).
8. Click the **OK** Button.
   The Batch Trend Screen will be registered and the screen name that was input will be displayed on the Screen Management Tree.

Note If a setting is changed while the Continue previous batch when restarted option is selected, the following dialog box will be displayed.
To make the change, click the OK Button. To cancel the change, click the Cancel Button.



Setting Auto-saving of CSV Files

The CSV file auto-save function is described below.



Enabling Auto-saving

When *Auto-save enable* is selected, a CSV file is automatically created when the condition for the batch collection is stopped.

Destination Folder for Saved Files

Specify the destination folder for saved files at *Destination folder to save*.

The folder can be found by using the **Browse** Button. Within the destination folder, folders will be automatically created for the dates on which the batch collections are started, and the CSV files will be saved in those folders.

For example, if the destination is C:\BatchTrend, and the batch collection was started on December 1, 2006, the folders will be created under C:\BatchTrend\20061201\. (The underlined portion is the date on which the batch collection was started.)

File Name

Specify the name of the file to be saved. (Note: Do not specify the file name extension here.)

The actual name of the file that is saved will be as follows:

start_date-start_time-filename.csv
(The start date and the start time are the time information for when the trend data collection was started for the file that is being saved.)

For example, if the name of the file being saved is BatchTrend, and the batch collection was started at 16:15:10 on December 1, 2006, the file name 20061201-161510-BatchTrend.csv will be created automatically.

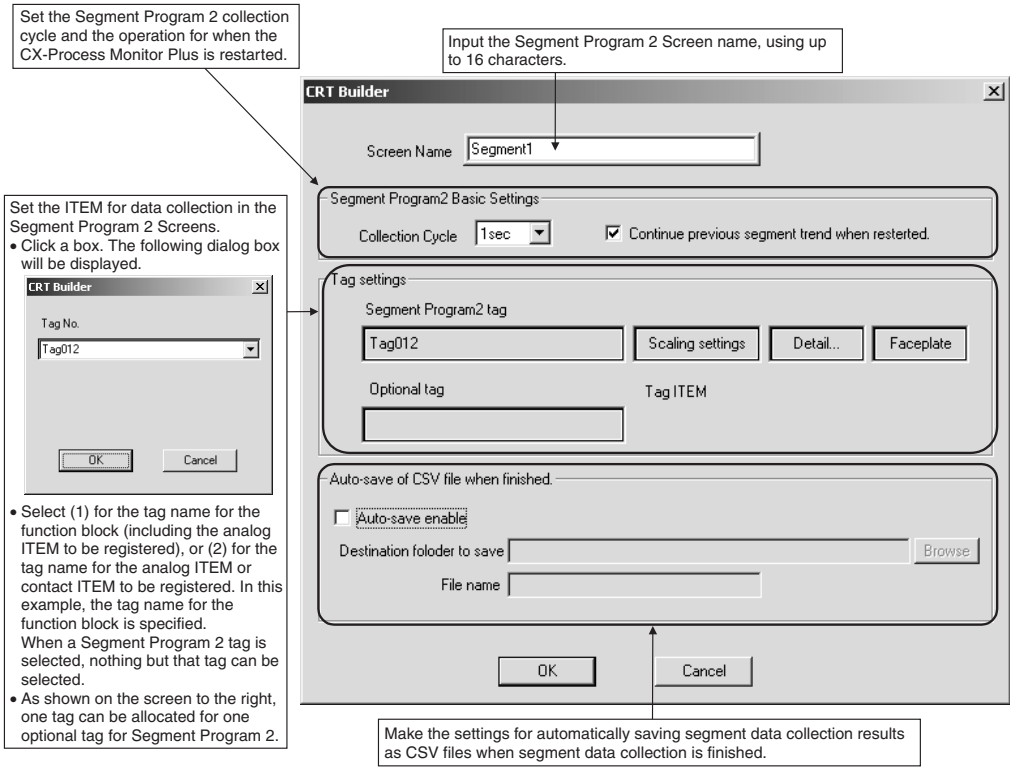
Registering Segment Program 2 Screens

There are two types of Segment Program 2 Screens: a Segment Program 2 Monitor Screen and a Segment Program 2 Edit Screen. Up to 16 pairs of Segment Program 2 Screens can be registered.

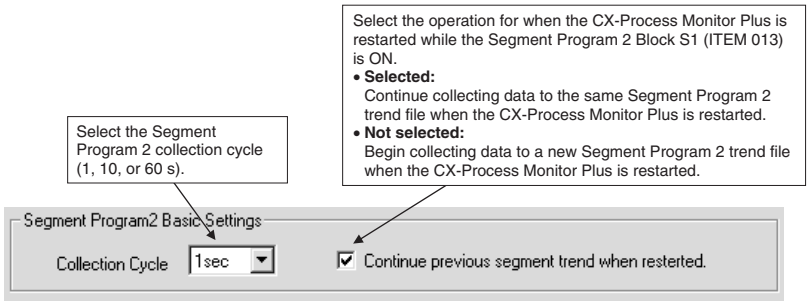
1,2,3...

1. Select Screen in the Overview Screen sub-elements using the Screen Management Tree in the Builder Window.

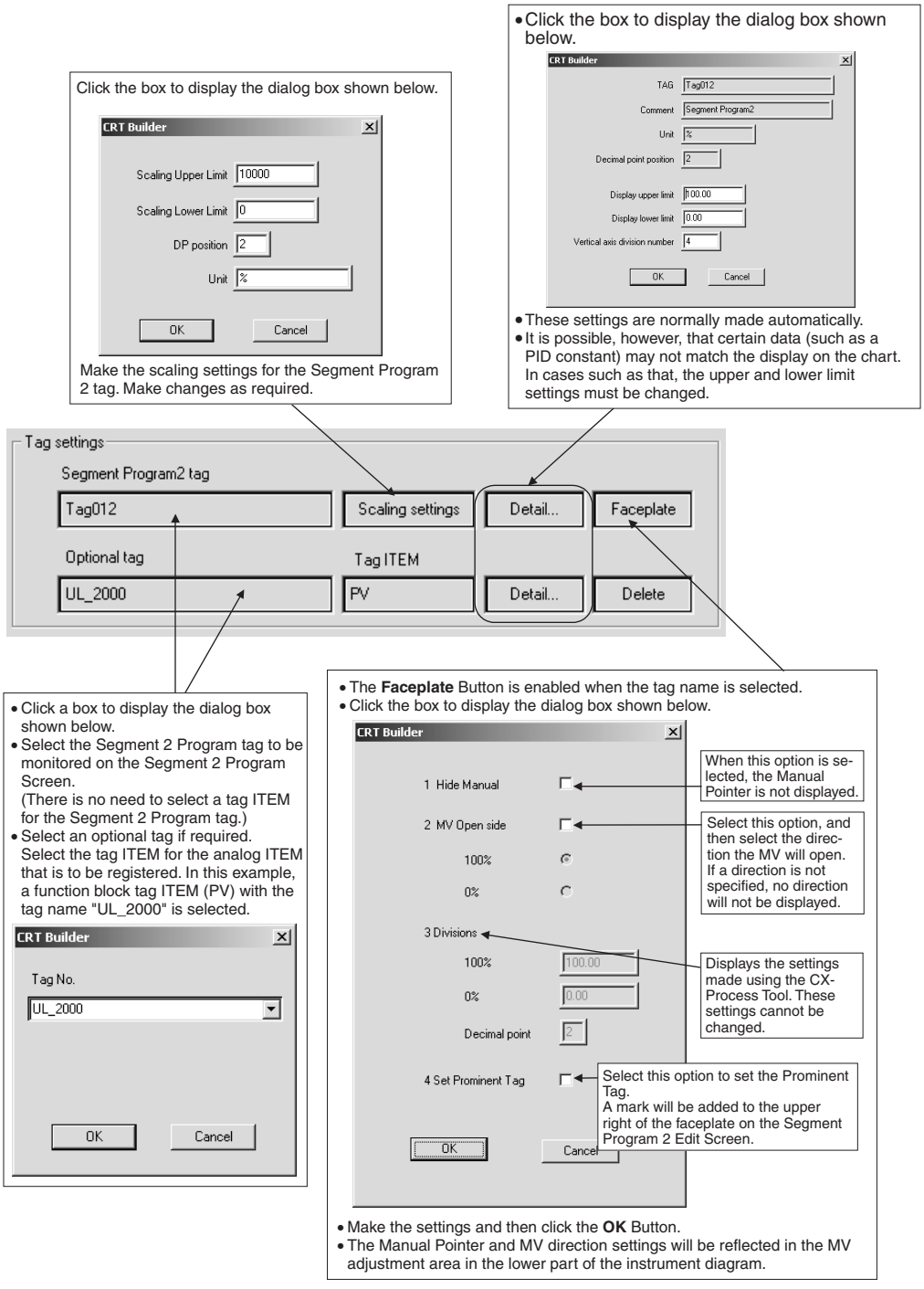
2. Select ***Register Screen*** from the Settings Menu, or double-click *Screen*. The dialog box displayed in step 2 of *Registering Control Screens* above will be displayed.
3. Select *Segment Program 2 Screen* and then click the **New** Button. The following dialog box will be displayed.
   Aside from the Segment Program 2 tags, one analog ITEM (PV, SP, MV, or other analog signal) and one contact ITEM can be registered as an optional tag.
   Specify analog or contact ITEMs using either method 1 or 2 below.
   (1) Tag numbers (tag names) and tag ITEMs (PV, SP, or MV) for the function block.
   (2) Tag numbers (tag names) for analog or contact ITEMs.



4. Set the screen name.
5. Set the Segment Program 2 Screen basic settings as shown below.

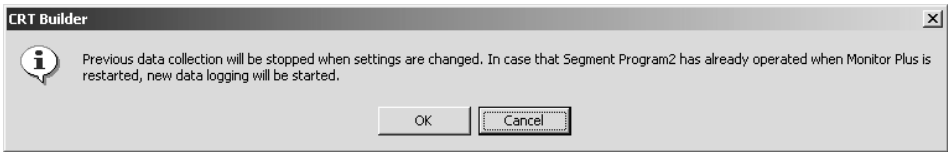


6. Select the Segment 2 Program to be monitored on the Segment 2 Program Monitor Screen, and if required select an optional tag. After selecting the tag, set *Detail* as described below.



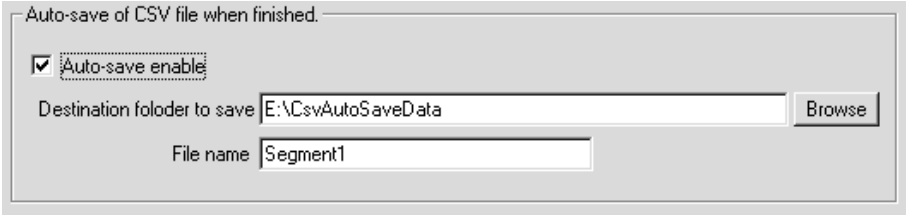
7. Select the option to enable auto-saving of CSV files (described below).
8. Click the **OK** Button.
   The Segment Program 2 Screen will be registered and the screen name that was input will be displayed on the Screen Management Tree.

Note If a setting is changed while the *Continue previous segment trend when restarted* Option is selected, the following dialog box will be displayed.
To make the change, click the **OK** Button. To cancel the change, click the **Cancel** Button.



Setting Auto-saving of CSV Files

The CSV file auto-save function is described below.



Enabling Auto-saving

When *Auto-save enable* is selected, a CSV file is automatically created when operation of the relevant Segment Program 2 Block is stopped, i.e., when S1 (ITEM 013) turns OFF.

Destination Folder for Saved Files

Specify the destination folder for saved files in the *Destination folder to save* Box.

The folder can be found by using the **Browse** Button. Within the destination folder, folders will be automatically created for the dates on which the batch collections are started, and the CSV files will be saved in those folders.

For example, if the destination is C:\Segment, and the data collection was started on December 1, 2006, the folders will be created under C:\Segment\20061201\. (The underlined portion is the date on which the data collection was started.)

File Name

Specify the name of the file to be saved. (Note: Do not specify the file name extension here.)

The actual name of the file that is saved will be as follows:

start_date-start_time- filename.csv
(The start date and the start time are the time information for when the segment data collection was started for the file that is being saved.)

For example, if the name of the file being saved is Segment, and the data collection was started at 16:15:10 on December 1, 2006, the file name 20061201-161510-Segment.csv will be created automatically.

Note If the data in a single CSV file exceeds 65,000 lines, another CSV file will be created. The CSV files will be saved in order with _01.CSV, _02.CSV, etc., added at the end of the file name.

Registering Graphic Screens

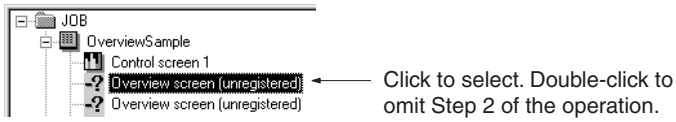
You can register up to 200 Graphic Screens.

Note Before registering the Graphic Screen, you must create and save the Graphic Screen using the **Graphic Builder** Button. Refer to *5-4 Creating Graphic Screens* for how to create a Graphic Screen.

The registration procedure is as follows:

1,2,3...

1. Select ***Screen*** in the Overview Screen sub-elements using Screen Management Tree in CRT Builder.



2. From the ***Settings*** menu, select ***Register Screen***, or double-click **Screen**.

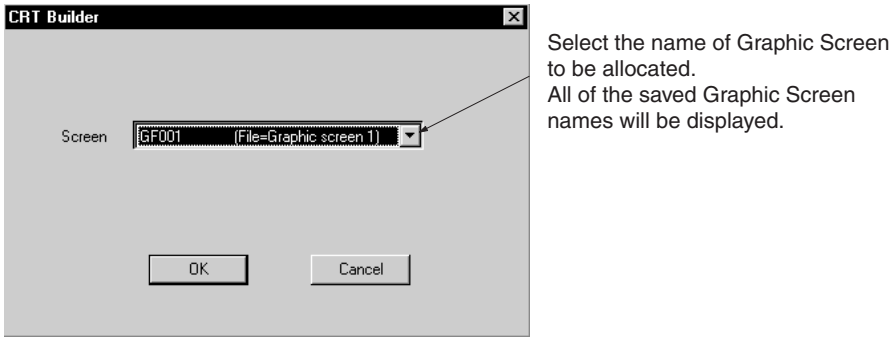
   The dialog box shown in Step 2 of the proceeding Control Screen Registration will be displayed.

3. Select ***Graphic Screen***, and then click the **New** Button.

   The following dialog box will be displayed.

   Select the Graphic Screen you created and saved using CRT Builder (i.e., the **Graphic Builder** Button).

   Note Before registering the Overview Screen, you must create and save the Graphic Screen using CRT Builder.



4. Select the screen name, and then click the **OK** Button.

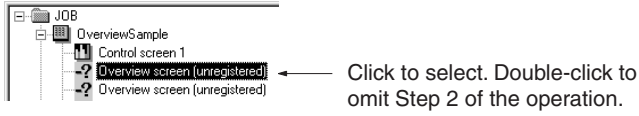
   The Overview Screen will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.

Registering Annunciator Screens

You can register up to five Annunciator Screens. The registration procedure is as follows:

1,2,3...

1. Select the Overview Screen's sub-element **Screen** in the CRT Builder's Screen Management Tree.



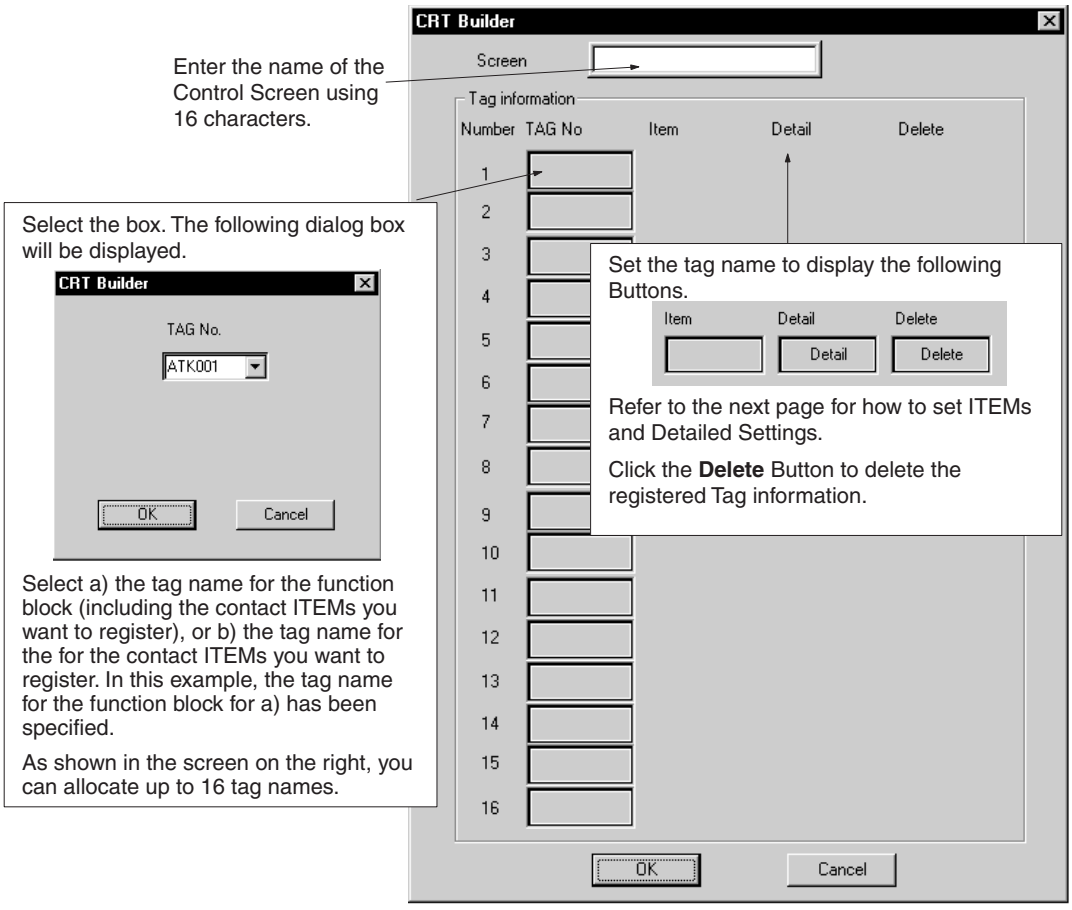
2. In the ***Settings*** Menu, select ***Register Screen***, or double-click **Screen**.

   The dialog box shown in Step 2 of the preceding section, Control Screen Registration, will be displayed.

3. Select the ***Annunciator***, and then click the **New** Button.

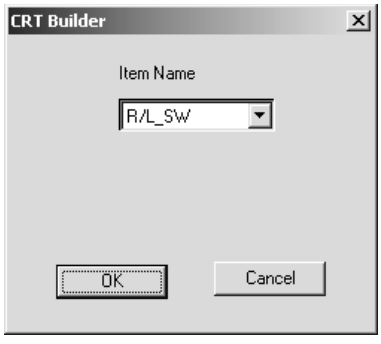
   The following dialog box will appear.

You can register up to 16 contact ITEMs in the Annunciator Screen. Specify the contact ITEM using the tag name.



Setting ITEMs

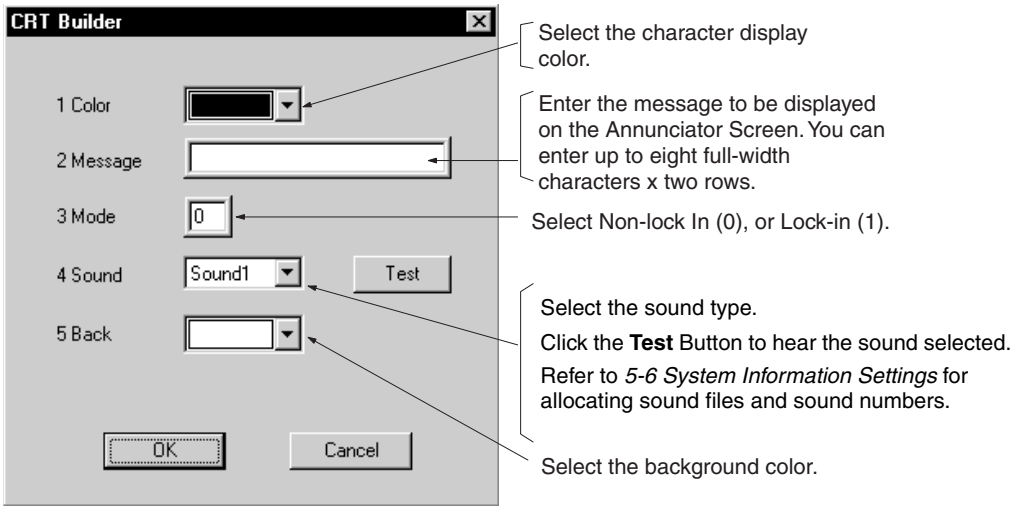
Select the tag name, and then click the **ITEM** Button. The following dialog box will be displayed.



Select the Tag ITEM corresponding to the contact ITEM you want to set. In this example, Tag ITEM “RL_SW” for the Function Block for tag name ATK001 has been selected. Next, click the **OK** Button.

Detailed Settings

Select the tag name, and then click the **Details** Button. The following dialog box will be displayed.



Complete the settings, and then click the **OK** Button.

4. Make the above settings, and then click the **OK** Button.

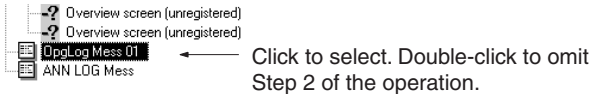
   The Annunciator Screen will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.

5-5-3 Registering Operation Guide Messages

This section explains how to register Operation Guide Messages.

If the conditions registered here occur, the corresponding message will be displayed on the Operation Guide Log Screen, and saved.

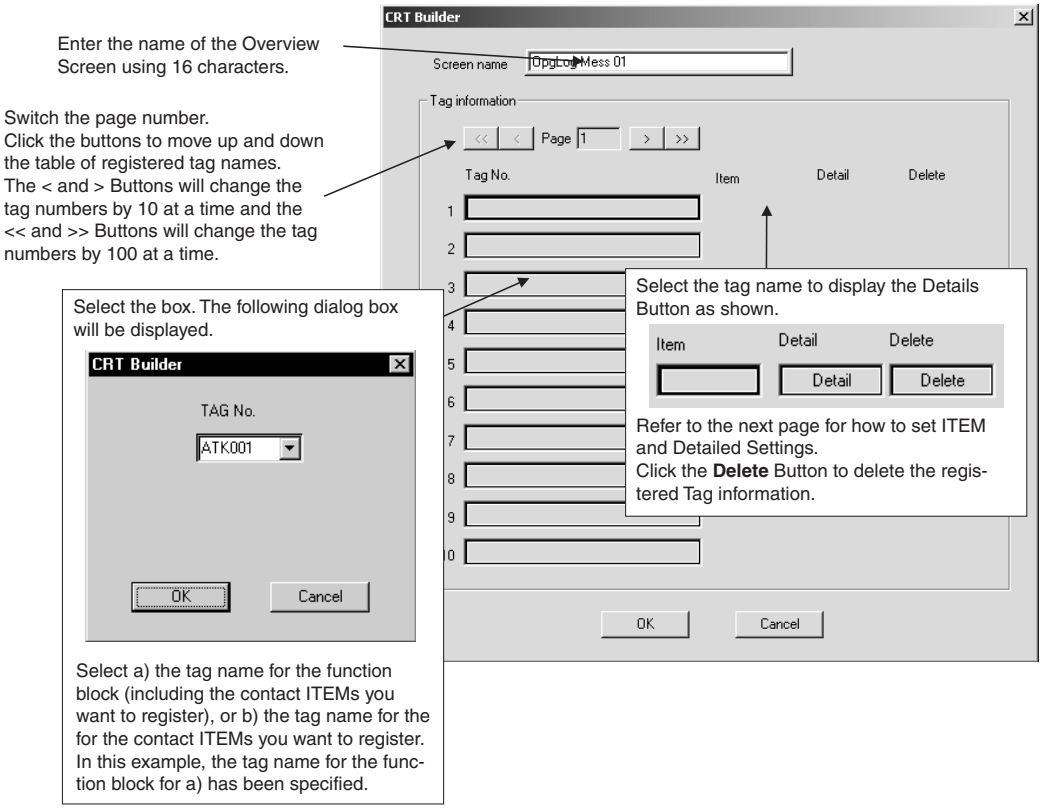
1,2,3... 1. Select ***OpgLog Mess01*** int the CRT Builder's Screen Management Tree.



2. In the ***Settings*** Menu, select ***Register Screen***, or double-click **OpgLog Mess01**.

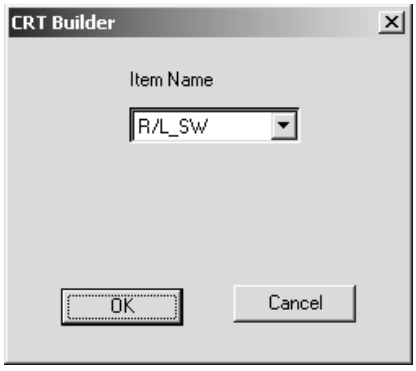
   The following dialog box will appear.

You can register up to 1,000 contact ITEMs in the Operation Guide Messages. Specify the contact ITEM using the tag name.



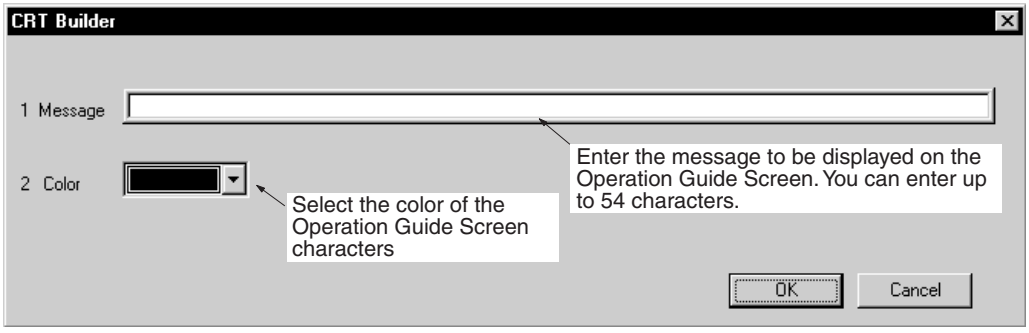
Setting Items

Select the tag name, and then click the **ITEM** Button. The following dialog box will be displayed.



Select the Tag ITEM corresponding to the contact ITEM you want to set. In this example, Tag ITEM “R/L_SW” for the Function Block for tag name ATK001 has been selected. Next, click the **OK** Button.

Detailed Settings



After completing the settings, click the **OK** Button.

3. After completing the above settings, click the **OK** Button.

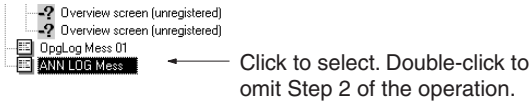
   The Operation Guide Message Screen will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.

5-5-4 Registering Alarm Messages

This section explains how to register alarm messages.

If the conditions registered here occur, the corresponding alarm message will be displayed in the second line of the Monitor Screen, and the alarm message will be saved on the Alarm Log Screen.

1,2,3... 1. In the CRT Builder's Screen Management Tree, select ***Register Alarm Message***.



2. From the Settings Menu, select ***Register Screen***, or double-click **ANN LOG Mess**.

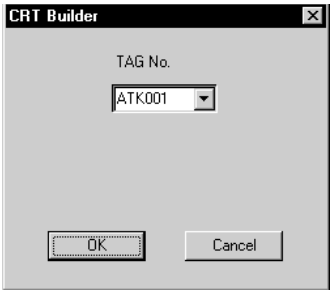
   The following dialog box will be displayed.

You can register up to 2,000 contact ITEMs in the alarm messages. Specify the setting ITEMs using the tag names.

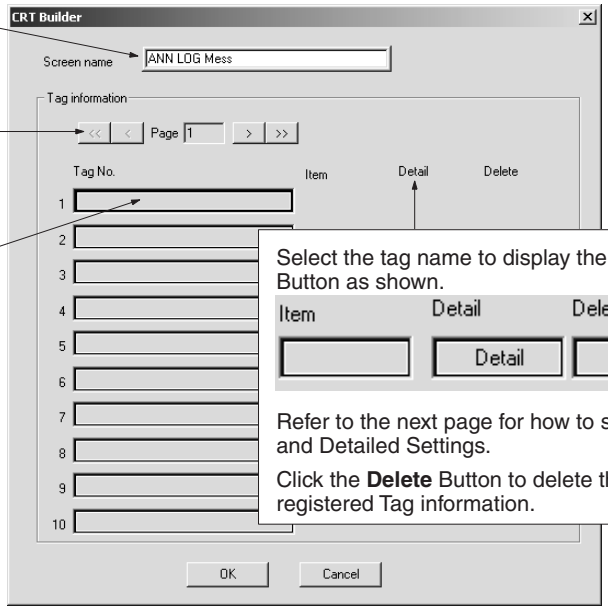
Enter the name of the Alarm Message Registration Screen using 16 characters.

Switch the page numbers. Click either button to move up and down the table of registered tag names below by 10 at a time.

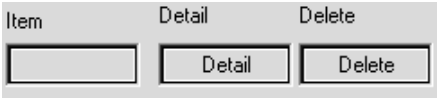
Select the box. The following dialog box will be displayed.



Select a) the tag name for the function block (including the contact ITEMs you want to register), or b) the tag name for the for the contact ITEMs you want to register. In this example, the tag name for the function block for a) has been specified.



Select the tag name to display the Details Button as shown.

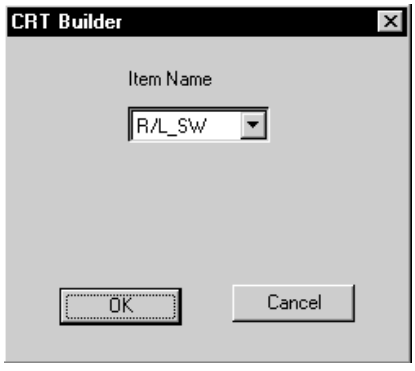


Refer to the next page for how to set ITEM and Detailed Settings.

Click the **Delete** Button to delete the registered Tag information.

Setting ITEMs

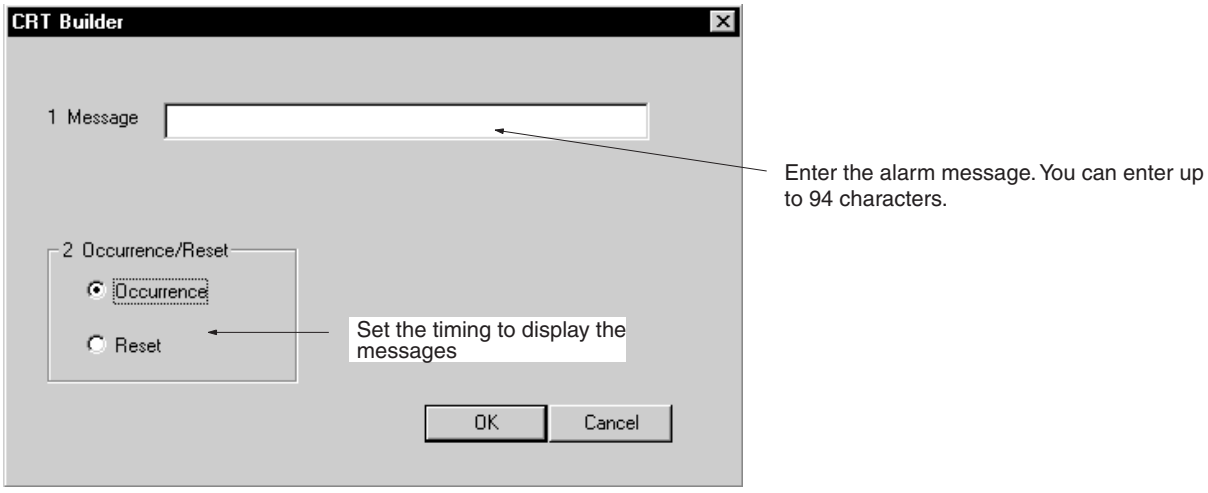
Select the tag name, and then click the **ITEM** Button. The following dialog box will be displayed.



Select the Tag ITEM corresponding to the contact ITEM you want to set. In this example, Tag ITEM “R/L_SW” for the Function Block for tag name ATK001 has been selected. Next, click the **OK** Button.

Detailed Settings

Select the tag name, and then click the **Details** Button. The following dialog box will be displayed.



After making the settings, click the **OK** Button.

Display is red for an occurrence, and black following recovery.

3. Complete the above settings, and then click the **OK** Button.

   The alarm message will be registered, and the name of the screen you entered will be displayed in the Screen Management Tree.

Automatic Allocation Function for Alarm Tags

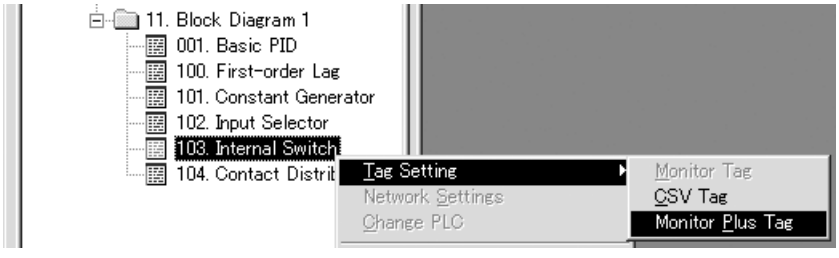
Tags specified with the CX-Process Tool can be set as alarm tags. Alarm tags can be displayed in the Alarm History Screens. The following tags can be set as alarm tags.

- Tags for Monitor Plus for Internal Switch blocks
- Data in the User Link Table when the analog/digital type is set to a contact

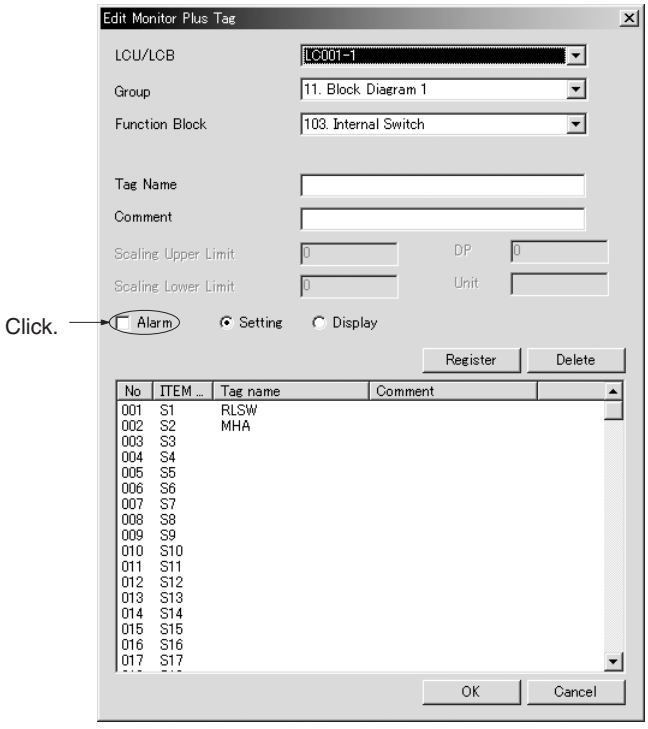
Use to the following procedure to set alarm tags.

Internal Switch Blocks

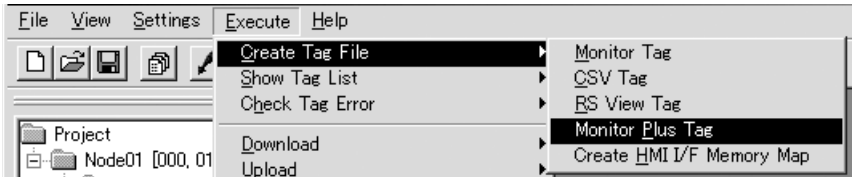
1,2,3... 1. Select *Internal Switch* as the function block and select Monitor Plus tags from the tag setting menu.



The following window will be displayed.



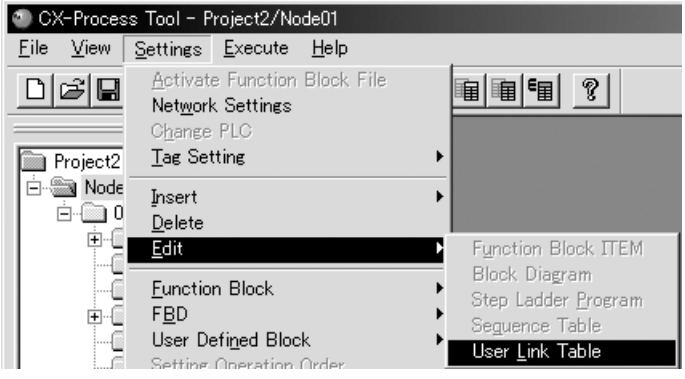
2. Select the *Alarm* Option, click the **Register** Button and then the **End** Button.
3. Compile the tags for Monitor Plus.



4. Start the CX-Process Monitor Plus.

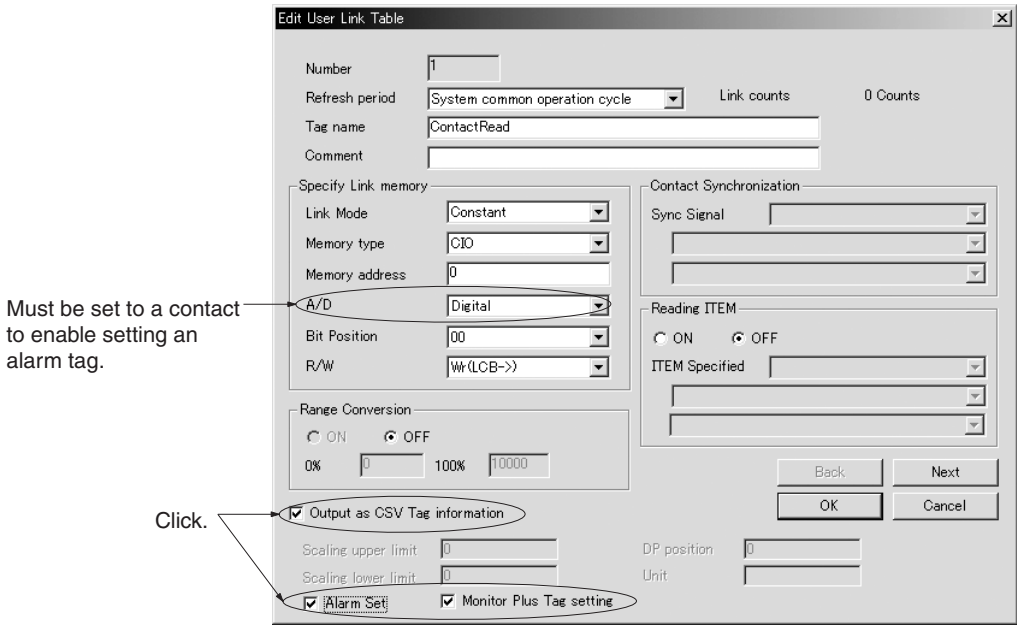
User Link Table

1,2,3... 1. Open the User Link Table for editing.

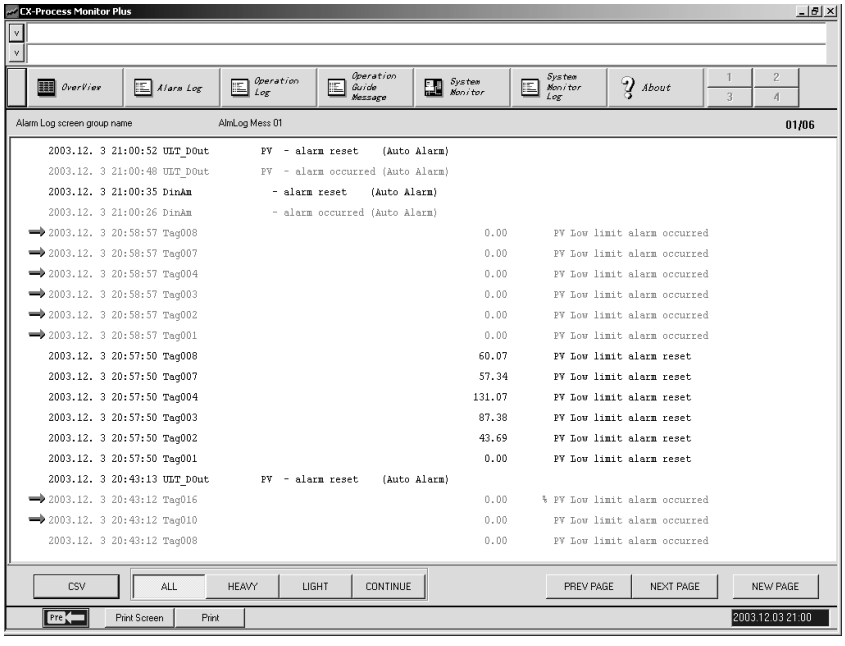


2. To create a new entry in the user link table, right-click and select ***Register***.

3. The following window will be displayed. Set the required items.



Note By using automatic allocations in the alarm monitor, alarm occurred *(Auto Alarm)* will be displayed when the specified flag is ON and alarm reset *(Auto Alarm)* will be displayed when the specified flag is OFF.



5-5-5 Saving Settings

Save the screen configurations that you have set.

Note If setting or changing screen configurations, make sure to save the settings or changes.

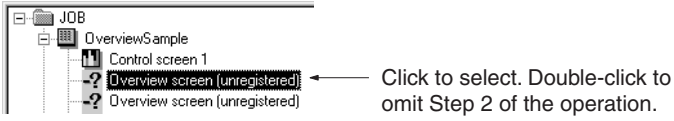
1,2,3... 1. From the Settings Menu in the CRT Builder, select ***Save***.

2. Click the **OK** Button.

5-5-6 Deleting Registered Screens

To delete registered screens, perform the following operation.

1,2,3... 1. In the CRT Builder's Screen Management Tree, click to select the screen you want to delete.



2. From the CRT Builder Settings Menu, select ***Delete***.

3. Click the **OK** Button.

5-5-7 Starting the Monitor Process

To start the monitor process, perform the following operation.

1,2,3... 1. In the Main Window or in the Setup Dialog Box, click the **Run** Button.
2. The monitor process will start and the Overview Screen will be displayed.

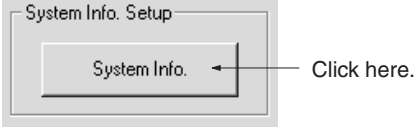
5-6 System Information Settings

This section explains label information, alarm sound information, and how to make the ten-key, color, and key-lock settings.

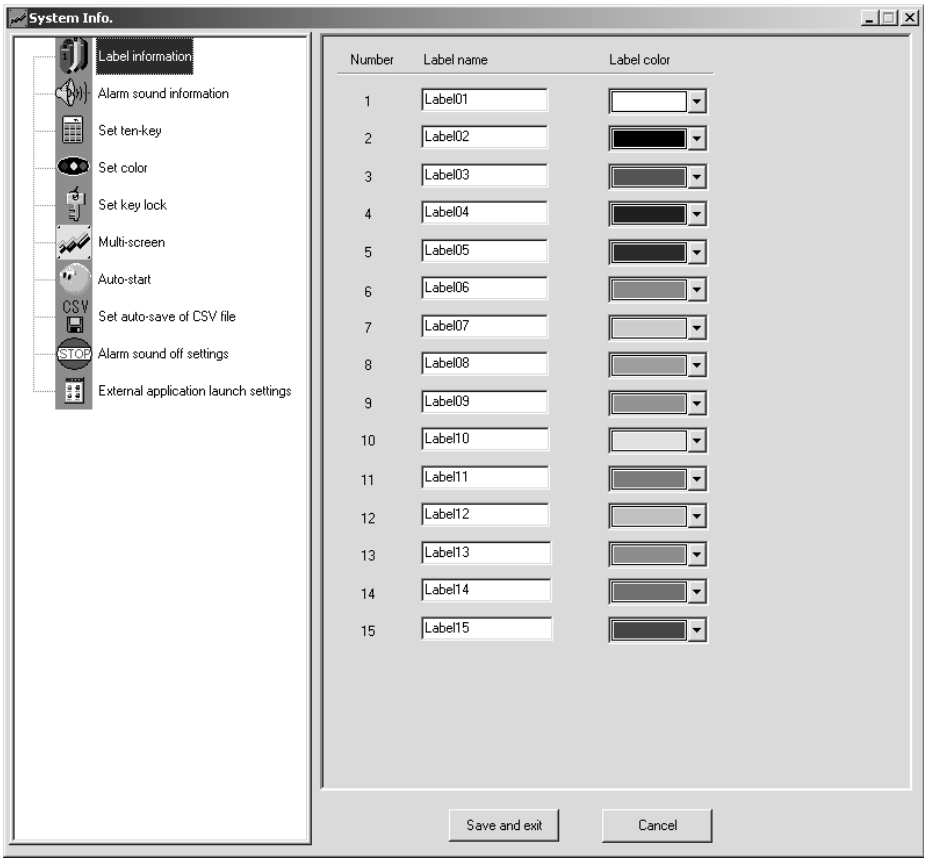
The contents of the settings are as follows:

Item	Contents
Label information	Label name
	Label color
Alarm sound information	Allocate an alarm sound file to each alarm number (1 to 10).
Ten-key settings	Set whether you want to use the Ten-key Dialog Box when entering numerical values. This setting will be enabled for all Monitor Screens. If you enable the ten-key, the Ten-key Dialog Box will be displayed when you select the numerical input box.
Color settings	Specify the color of the buttons used for the Function Block diagrams in the Control Screen and Tuning Screen.
Key-lock settings	It is possible to prohibit the values of ITEMs being changed from the Control Screen or the Tuning Screen.
Multi-screen settings	Specify if multiple screens can be displayed and automatic exiting of the background window for the monitoring process when automatically ending in operator mode. Specify the order in which the pages are to change.
Auto-start settings	Specify the scale display (engineering units or percentages) for the Tuning and Trend Screens, the Tuning Screen opening method, auto-starting, and the color of alarms on Annunciator Screens.
CSV file auto-save settings, trend settings	Set the method for collecting Trend Screen, Batch Trend Screen, and Segment Program 2 Screen data, and the method for saving the data.
Alarm buzzer stop setting	Set whether to sound the alarm buzzer when recovering from an alarm. Set whether to treat MHA and MLA as alarms. Register a tag to stop the alarm.
Starting external applications	Allocate applications to start buttons 1 to 4.

1,2,3... 1. In the Setup Dialog Box, click the **System Info.** Button.



The following window will be displayed.



2. In the leftmost window, select ***Label information***, ***Alarm sound information***, ***Set ten-key, Set color***, or ***Set key lock***.
3. Perform the following settings as shown.
4. When you have completed all the settings, click the **Save and Exit** Button.

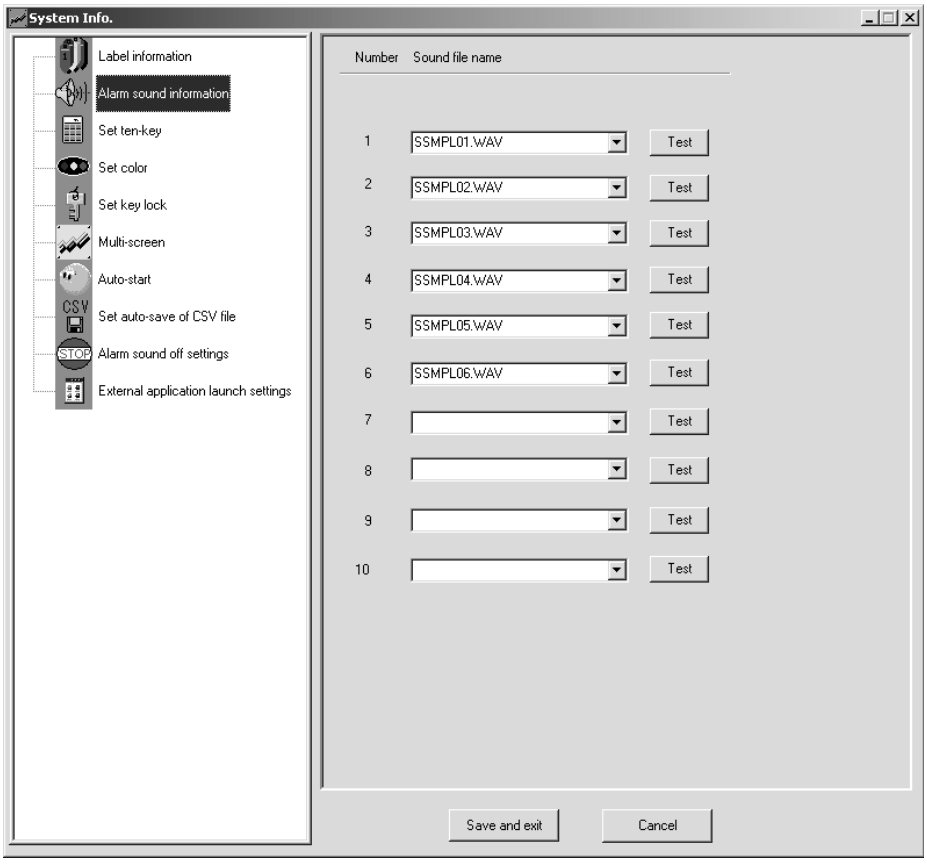
5-6-1 Label Information Settings

In the leftmost window, select ***Label Information***. The screen shown in Step 1 will be displayed.

Set ***Label name*** and ***Label color***.

5-6-2 Alarm Sound Information Settings

In the leftmost window, select ***Alarm sound information***. The following screen will be displayed.

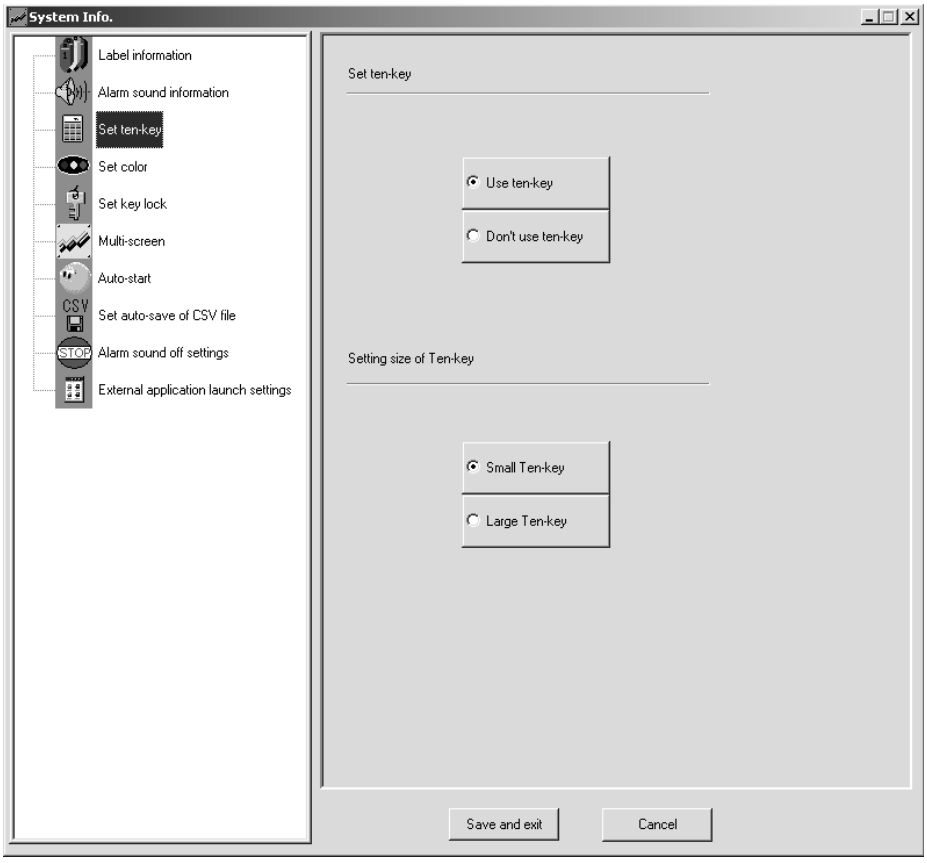


Allocate a sound file to each alarm sound number to register the sound you want to use.

Click the **Test** Button to try sounding the alarm.

5-6-3 Ten-key Settings

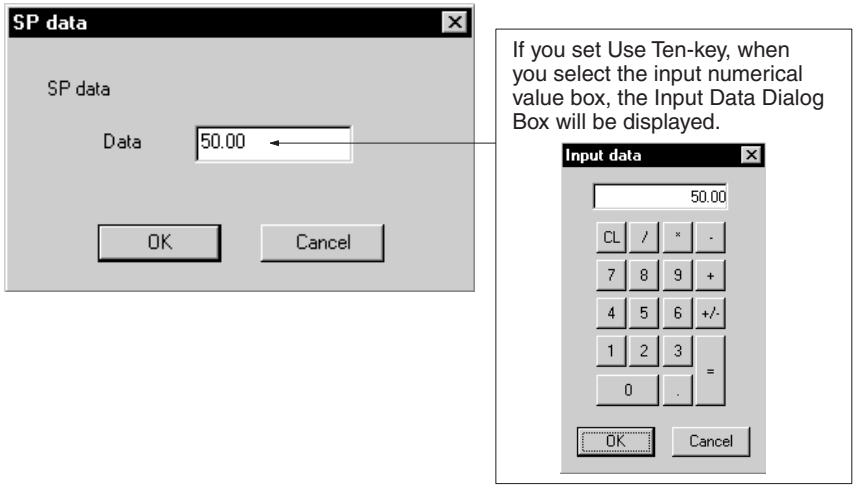
In the leftmost window, select **Set ten-key**. The following screen will be displayed.



Click the **Use ten-key** Button or the **Don't Use ten-key** Button. The setting will be enabled for all Monitor Screens.

If you set **Use ten-key**, when you select the input numerical value box, the Input Data Dialog Box will be displayed.

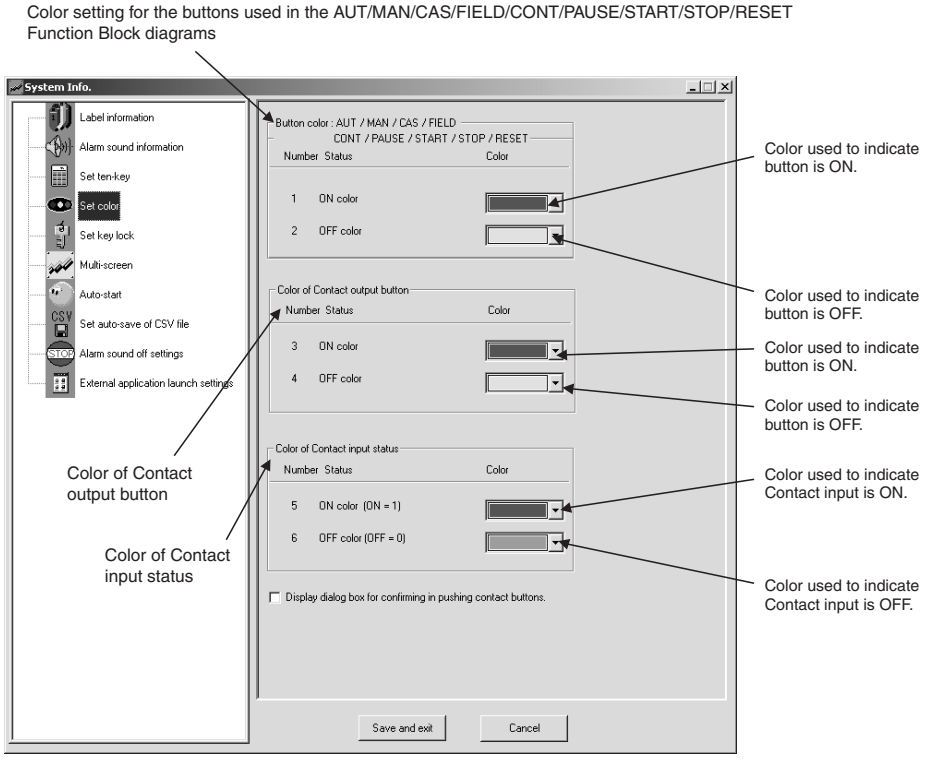
Example



Set the ten-key size to either large or small.

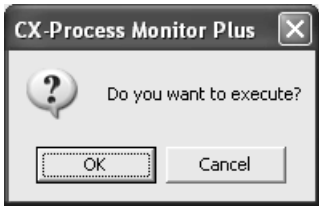
5-6-4 Color Settings

In the leftmost window, select **Set color**. The following screen will be displayed.



Use the above screen to specify the color used for the AUT/MAN/CAS/FIELD/CONT/PAUSE/START/STOP/RESET Function Block diagrams, the Contact output buttons, and the Contact input status.

If the **Display dialog box for confirming in pushing contact buttons** setting is clicked, a confirmation dialog box like the one shown below will be displayed to confirm operation when a contact output button, like AUTO/MAN is clicked.



5-6-5 Key-lock Settings

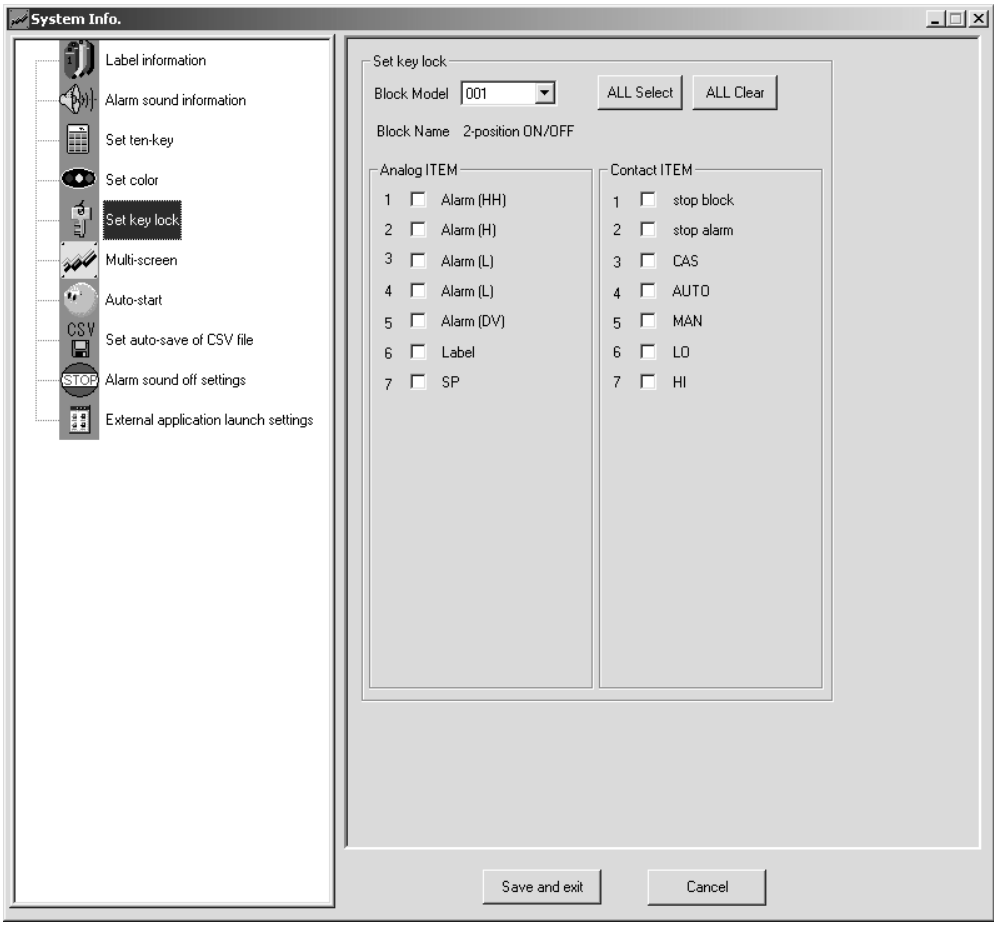
In the leftmost window, select **Set key lock**. The following screen will be displayed.

It is possible to prohibit changing specified ITEM values (e.g., changing SP values or PID constants) of specified Function Blocks (e.g., Basic PID Block) in screens, such as the Control Screen and the Tuning Screen, that can be using for setting operations from the CX-Process Monitor Plus. These settings are called “key locks.”

Note Key-lock specifications are made in terms of block models (setting in terms of the CX-Process Monitor Plus’s tag names is not possible).

Setting Procedure

1,2,3... 1. Select ***Block Model***. The Function Blocks will be displayed below it.



2. To set key locks for all the analog and contact ITEMs of the Function Blocks of the specified Block Model that can usually be changed using CX-Process Monitor Plus, click the **All Select** Button. Similarly, to clear the key locks for all of the ITEMs, click the **All Clear** Button.

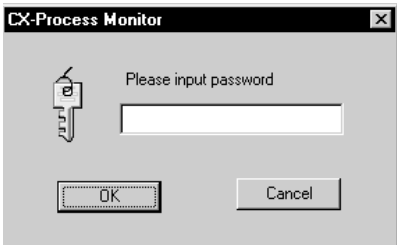
   To set key locks for specific ITEMs, click in the check box of the required ITEMs in either the analog ITEM or Contact ITEM fields.

3. Click the **Save and exit** Button to enable the key lock settings.

Operation with Key Locks Enabled

1,2,3... 1. If an attempt to change the value of an ITEM (e.g., SP) for which key lock has been set (e.g., by pressing the **SP** Button), the following dialog box will be displayed.

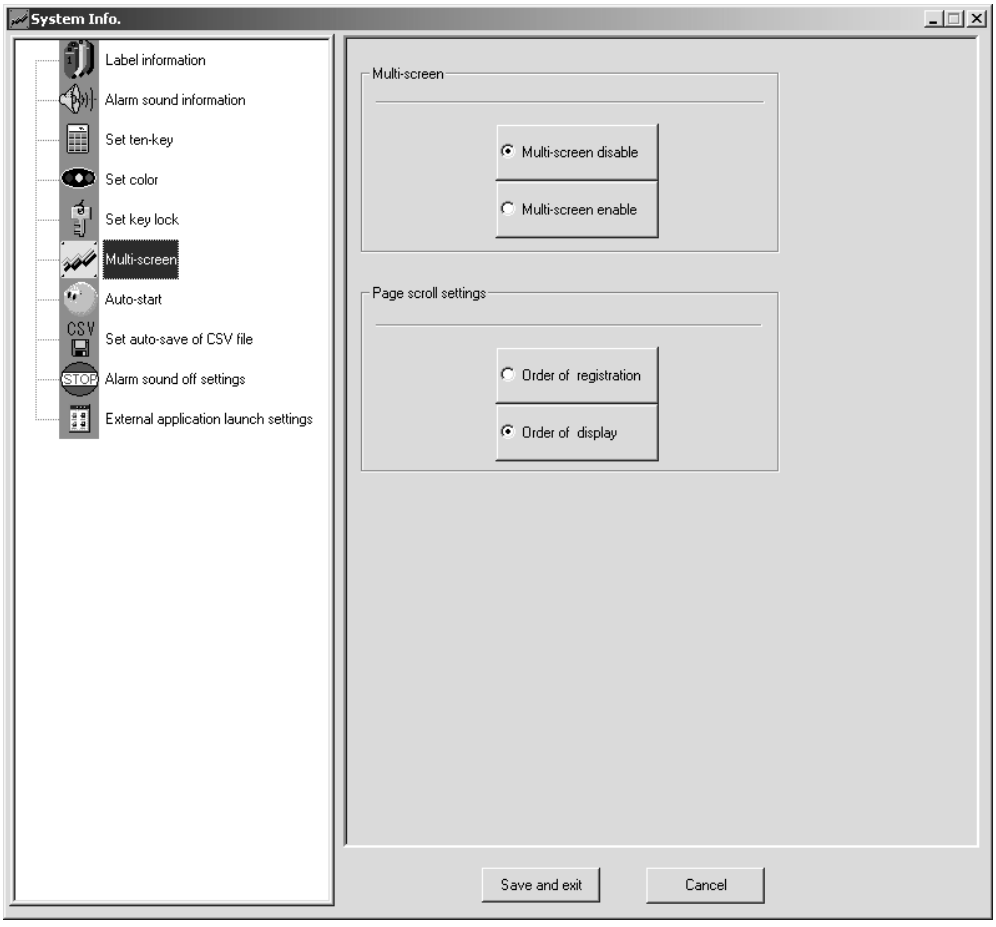
2. If ***Yes*** is clicked, the following dialog box, requesting entry of a password, will be displayed. (If ***No*** is clicked, the operation to change the ITEM will be cancelled.)



If the password set is entered (refer to *5-2-2 Setting Passwords*), the key lock for the ITEM will temporarily be cleared and it will be possible to change the value. The next time, however, that an attempt to change the value of the same ITEM is made, the key lock will be enabled and the above procedure will have to be repeated.

5-6-6 Multi-screen Settings

If ***Multi-screen*** is selected, the following screen will be displayed.



The following settings can be made.

Multi-screen

Set whether or not more than one Overview Screen can be displayed at the same time.

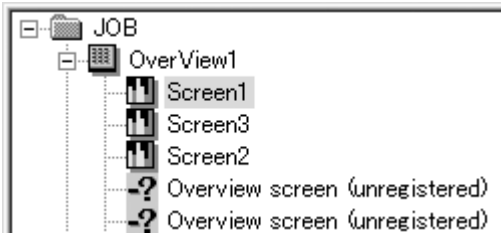
Setting the Order of Page Changes

The order in which pages are changed when the **Next** and **Previous** Buttons are clicked can be set to either the order they are registered in the database or the order they are displayed in the Builder Window. Both realtime trends and historical trends are treated in the same group.

Note The first page in each group will be displayed when the **Next** Button is pressed at the last page in the group. The last page in each group will be displayed when the **Previous** Button is pressed at the first page in the group.

Order of Database Registration

Pages will change in the order they are registered using the Builder Window. Both realtime trends and historical trends are treated in the same group.
Example:

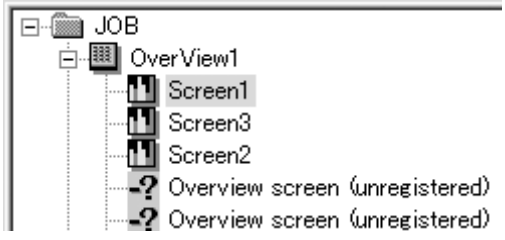


If the pages were registered in the order 1, 2, 3, then they will be displayed in that order.

Note When pages are changed using the **Previous** and **Next** Buttons while Graphic Screens are being displayed, even Graphic Screens that are not registered in the Builder Window are displayed.

Order of Display

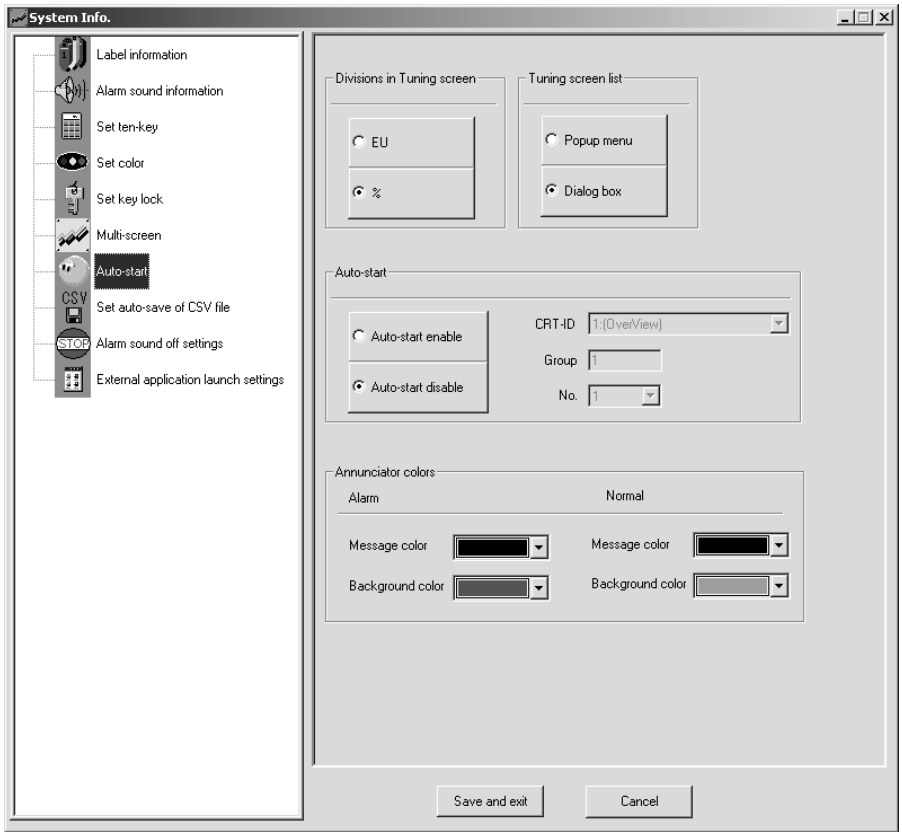
Pages will change in the order they are displayed in the Builder Window. Both realtime trends and historical trends are treated in the same group.
Example:



The pages will be displayed in the order 1, 3, 2 regardless of the order in which they were registered.

5-6-7 Auto-start Settings

If ***Auto-start*** is selected, the following screen will be displayed.



The following settings can be made.

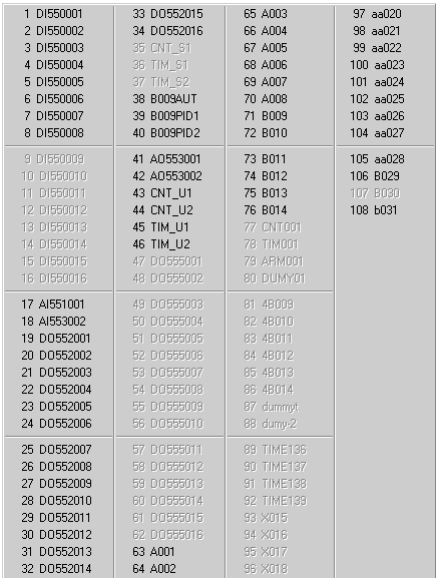
Divisions in Tuning Screen

Specify whether to use engineering units or percentages for the scale displayed in a Tuning Screen. The default is for percentages.

Tuning Screen List

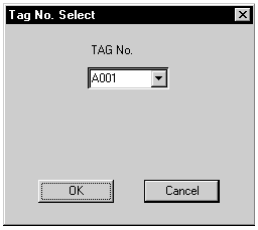
Specify whether to input the tag name directly or to select the tag name from a pull-down menu when switching to a Tuning Screen by clicking in the upper left corner of an Overview Screen.

Pull-down Menu



1 DI550001	33 DO552015	65 A003	97 aa020
2 DI550002	34 DO552016	66 A004	98 aa021
3 DI550003	35 CNT_S1	67 A005	99 aa022
4 DI550004	36 TIM_S1	68 A006	100 aa023
5 DI550005	37 TIM_S2	69 A007	101 aa024
6 DI550006	38 B009AUT	70 A008	102 aa025
7 DI550007	39 B009PID1	71 B009	103 aa026
8 DI550008	40 B009PID2	72 B010	104 aa027
9 DI550009	41 AO553001	73 B011	105 aa028
10 DI550010	42 AO553002	74 B012	106 B029
11 DI550011	43 CNT_U1	75 B013	107 B030
12 DI550012	44 CNT_U2	76 B014	108 b031
13 DI550013	45 TIM_U1	77 CNT001	
14 DI550014	46 TIM_U2	78 TIM001	
15 DI550015	47 DO555001	79 ARM001	
16 DI550016	48 DO555002	80 DUMY01	
17 AI551001	49 DO555003	81 4B009	
18 AI553002	50 DO555004	82 4B010	
19 DO552001	51 DO555005	83 4B011	
20 DO552002	52 DO555006	84 4B012	
21 DO552003	53 DO555007	85 4B013	
22 DO552004	54 DO555008	86 4B014	
23 DO552005	55 DO555009	87 dummy1	
24 DO552006	56 DO555010	88 dumy2	
25 DO552007	57 DO555011	89 TIME136	
26 DO552008	58 DO555012	90 TIME137	
27 DO552009	59 DO555013	91 TIME138	
28 DO552010	60 DO555014	92 TIME139	
29 DO552011	61 DO555015	93 X015	
30 DO552012	62 DO555016	94 X016	
31 DO552013	63 A001	95 X017	
32 DO552014	64 A002	96 X018	

Dialog Box



Note If the number of tags registered in the Control Screen exceeds 192, the Dialog Box will be displayed, even if the Pull-down menu is specified.

5-6-8 Auto-start

Specify whether to open a specified screen when the CX-Process Monitor Plus is started or to start normally. If the auto-start is enabled, the screen specified in the fields below will be displayed automatically when the CX-Process Monitor Plus is started from the menus. (This eliminates the need to click the **Run** Button on the Main Window.)

CRT-ID

Set the type of screen. 1: Overview, 2: Control, 3: Trend, 4: Graphic, 5: Annunciator, 10: Tuning, 17: Batch Trend, 18: Segment.

Group Number

The group number specifies the order of registration by the CRT Builder (0 to 400).

Position

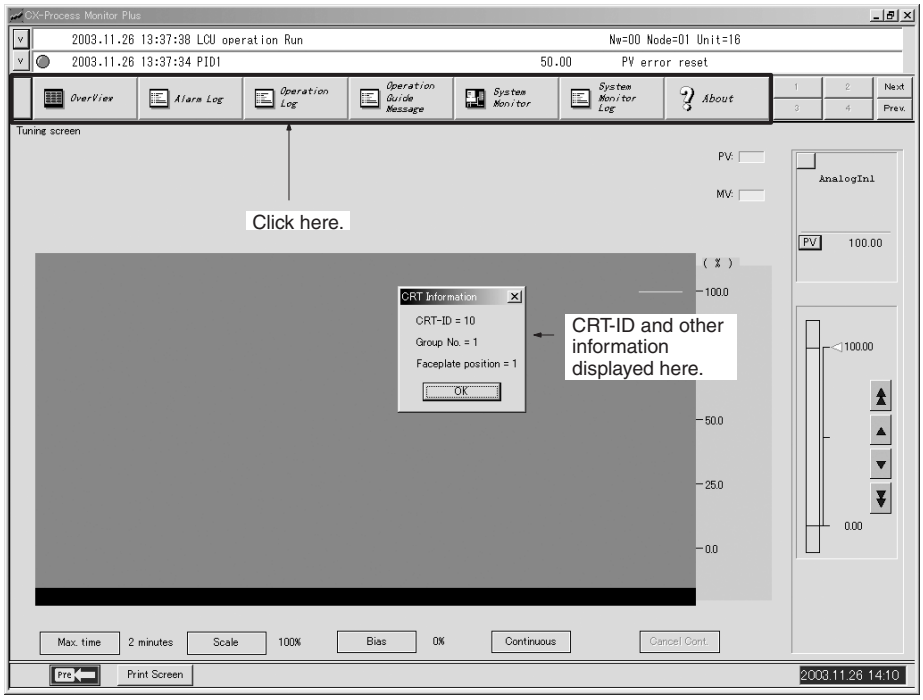
Specify the position on the function block diagram between 1 and 8. This setting is valid only for Tuning Screens.

Disabling Auto-start

The auto-start setting can be disabled by either of the following two methods.

- Double-click the MonitorCom.exe file from your Explorer to open the System Information settings and disable auto-starting under the *Auto-start* settings.
- Click the right mouse button at the top of an Overview Display and then click the Yes Button on the dialog box that will appear to open the System Information settings. Disable auto-starting under the *Auto-start* settings

Note The CRT-ID, group number, and position can be confirmed by clicking at the top of a screen as shown below.



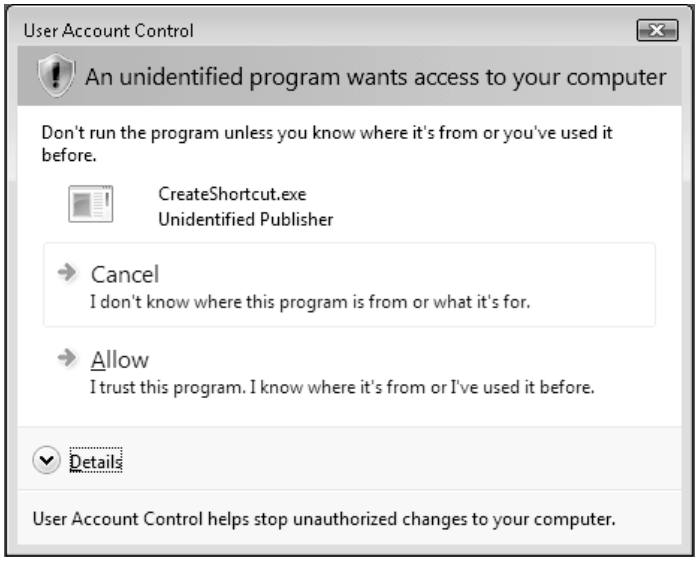
Disabling Auto-start

The auto-start setting can be disabled by using either of the following two methods.

1,2,3...

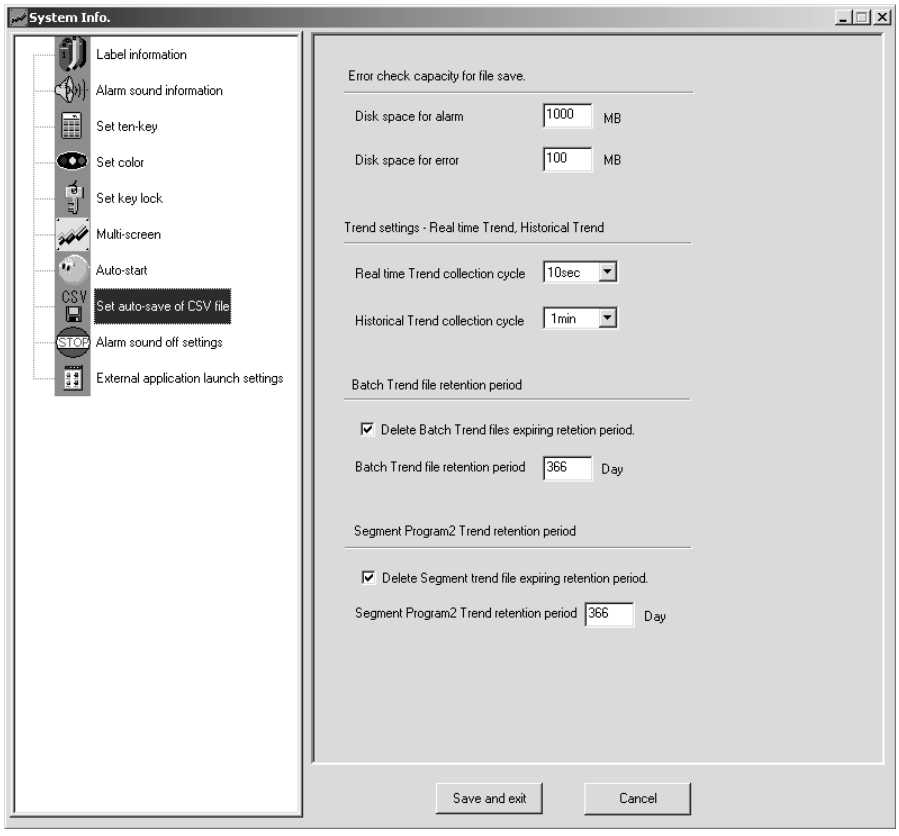
1. Double-click the MonitorCom.exe file from Explorer to independently open the System Information settings (which include label information, alarm sound information, ten-key, color, and key lock settings) and disable auto-starting under the Auto-start settings.
2. If the auto-start is enabled, right-click at the top of an Overview Screen and then click the **Yes** Button in the dialog box that will appear to open the System Information settings. Disable auto-starting under the Auto-start settings.

Note In Windows Vista, the following dialog box will be displayed when you change the automatic run settings. This is generated by the Windows Vista User Account Control and it does not indicate any problem. Select to allow access.



5-6-9 CSV File Auto-save Settings

If ***Set auto-save of CSV file*** is selected, the following screen will be displayed.



Error Check Capacity when Saving Files

Set the amount of disk space at which to generate an alarm or error when the drive in which the CSV file is being saved starts becoming full. Setting the values as megabytes. An alarm or error will be generated when the drive set to save the CSV file in for Trend Screens reaches the specified level or lower.

Set the disk space within the following ranges for an alarm or error to be generated.

Disk space for generating an alarm: 10 to 5,000 MB (Default: 1,000 MB)
Disk space for generating an error: 1 to 4,999 MB (Default: 100 MB)

The CX-Process Monitor Plus does not provide functions to delete or overwrite old files.

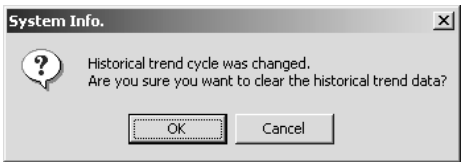
Note Although different drives can be set for the Trend Screens, the error and alarm settings are used for all of them.

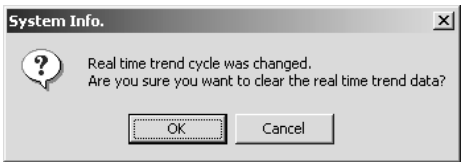
Trend Settings: Realtime Trend and Historical Trend Collection Cycles

The trend data collection cycles on the Trend Screen are set separately for realtime trends (1 to 30 s) and historical trends (1 to 60 min).

When a collection cycle setting is changed, one of the following dialog boxes will be displayed.

Click the OK Button to make the change, or click the Cancel Button to cancel the change.





Batch Trend File Retention Period

Select the option to have batch trend files created on the Batch Trend Screen deleted after a fixed period has elapsed.

Then set the number of days (from 10 to 36,600) for the batch trend file retention period.

By default this function is enabled and the retention period is set at 366 days.

Segment Program 2 File Retention Period

Select the option to have segment trend files created on the Segment Program 2 Screen deleted after a fixed period has elapsed.

Then set the number of days (from 10 to 36,600) for the segment trend file retention period.

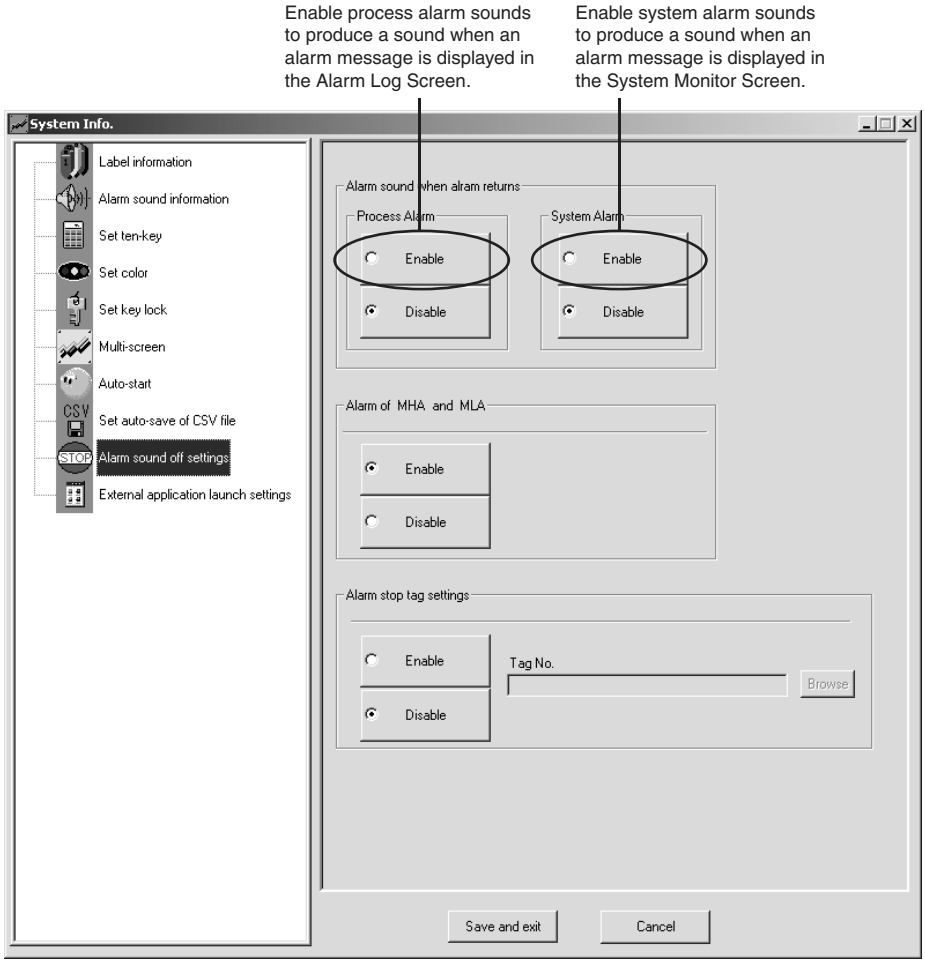
By default this function is enabled and the retention period is set at 366 days.

5-6-10 Setting for Stopping Alarm Sound

Alarm Reset Settings

These settings specify whether or not an alarm sound will be produced when alarms are reset. There are separate settings for process alarms and system alarms.

- Process Alarms
  An alarm message is displayed in the Alarm Log Screen.
- System Alarms
  An alarm message is displayed in the System Monitor Screen.

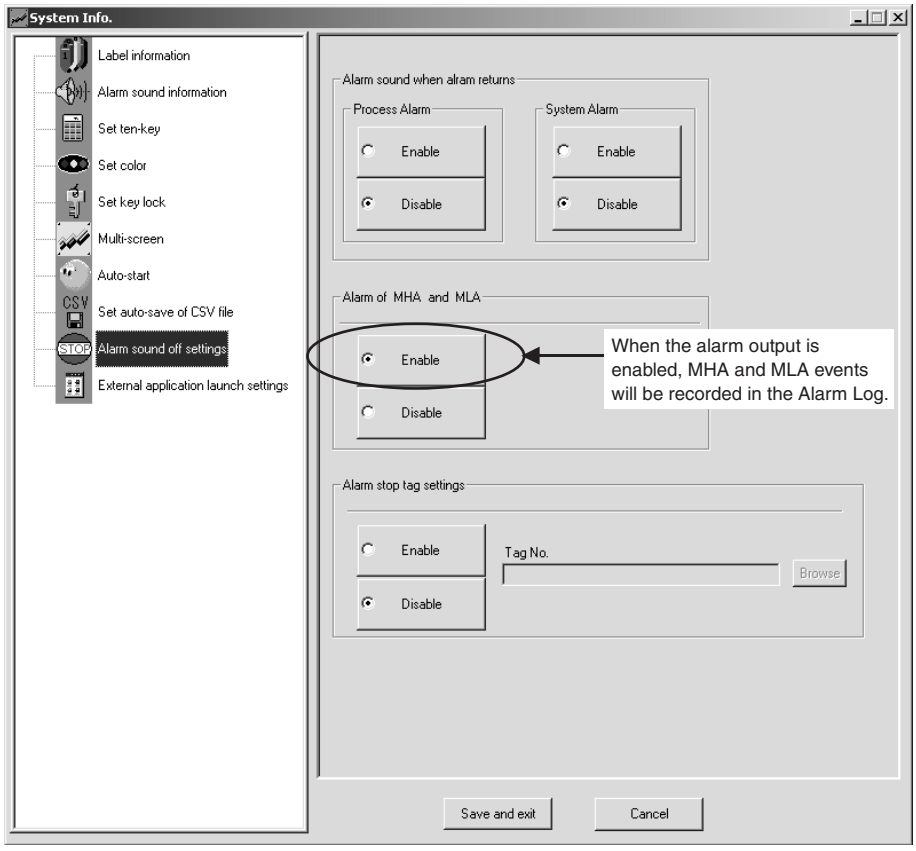


Both alarms are disabled by default.

Note When the alarm sound is disabled, no sound will be produced when the alarm is reset, but the alarm event will remain in the alarm log.

MHA and MLA Alarm Setting

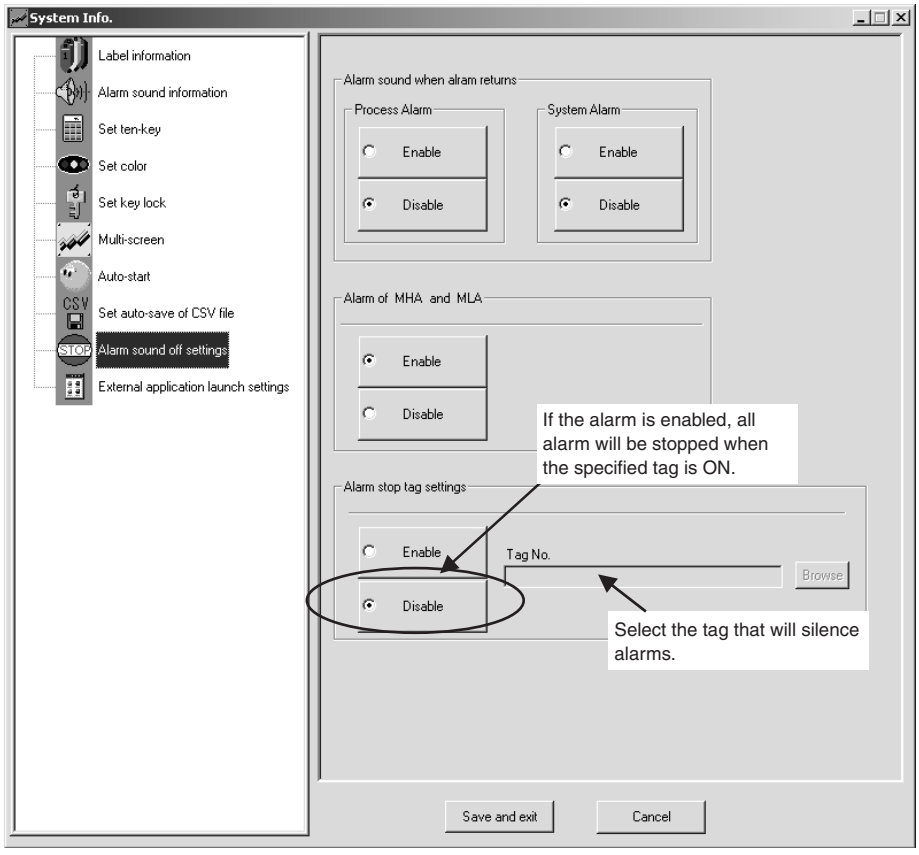
This setting specifies whether or not the MHA and MLA ITEM tags are treated as alarms. If MHA and MLA are treated as alarms, an alarm event will be recorded in the Alarm Log when MHA or MLA goes ON. If the alarm output is disabled, alarm events will not remain in the Alarm Log.



Alarm Stop Function

All alarm sounds can be silenced when the specified tag is ON.

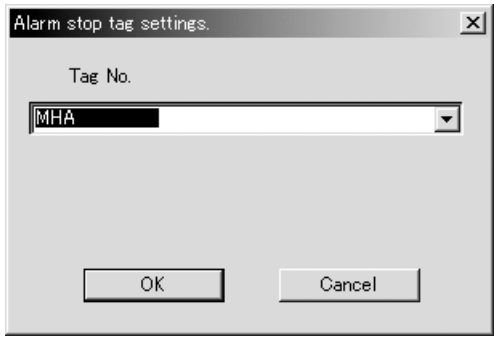
When this function is enabled and the specified tag is ON, all alarm sounds (such as process alarms, system alarms, and annunciator alarms) will be stopped.



Setting the Alarm Stop Tag

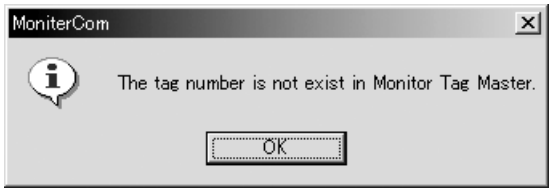
Click the **Browse** Button next to the Tag Name field to display the following dialog box. Select the tag name of the tag that will control alarm sounds and click the **OK** Button.

Contact tags in the user link table or internal switch tags can be specified as alarm stop tags.

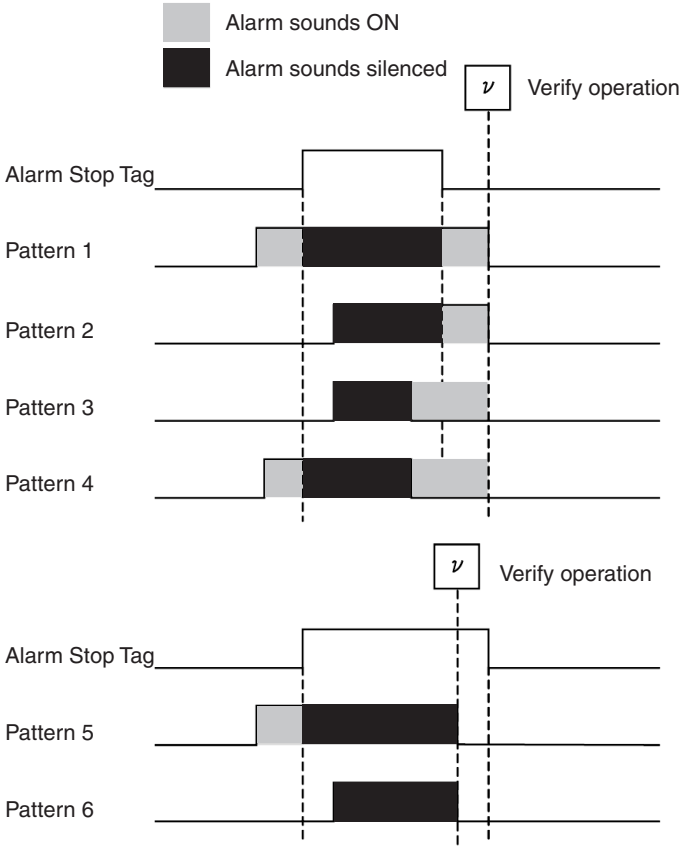


Note The following dialog box will be displayed if a tag name longer than 16 characters is input directly into this field. In this case, input an existing tag name that is up to 16 characters long.

The following dialog box will be displayed if a non–existent tag name is input. In this case, click the **Browse** Button and select a tag name.



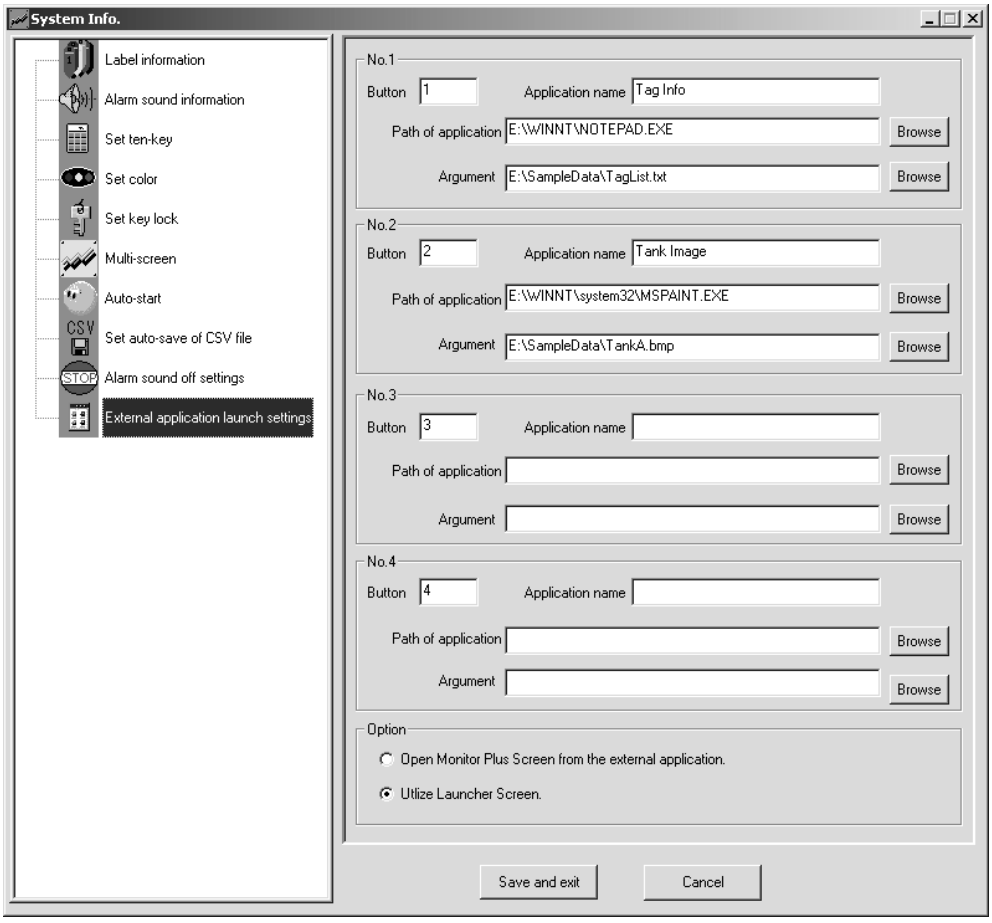
Time Chart of Alarm Stop Tag Operation



5-6-11 Settings Required to Start External Applications

A specified external application can be started while Monitor Plus is in use.

Set the application name, application path, and argument for the desired external application in this window. The argument is executed by being passed to the external application.



Settings

Buttons and Application Name

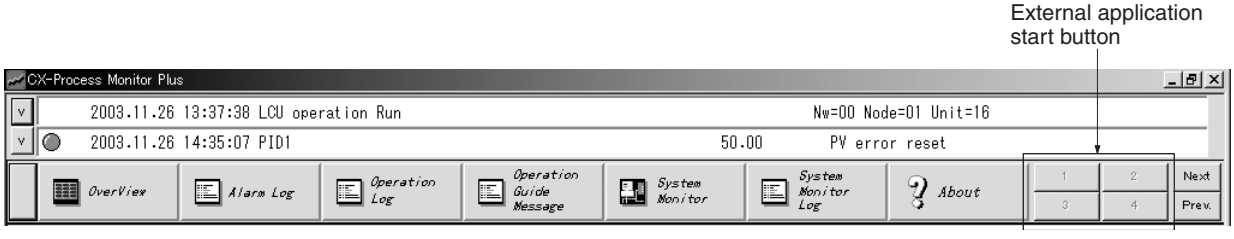
Set the external application names allocated to the external application start buttons on the screen as follows:

- Buttons:

  The characters set here are displayed on the external application start buttons.

- Application name:

  The application names set here are displayed as pop-ups on the screen.



Path of Application

Set the path to the application that you want to execute.

Argument

Set the argument to pass to the external application. If the argument contains a space, enclose the argument in double quotation marks.

For example, make the following settings to open the file C:\Project Folder\TagList.csv with Microsoft Excel:

Application name: Excel
Application path: C:\Program Files\Microsoft Office\Office10\EXCEL.EXE
Argument: C:\Project Folder\TagList.csv

Options

Select one of the following two display methods for when an external application is started from the CX-Process Monitor Plus.

Open Monitor Plus Screen from the External Application.

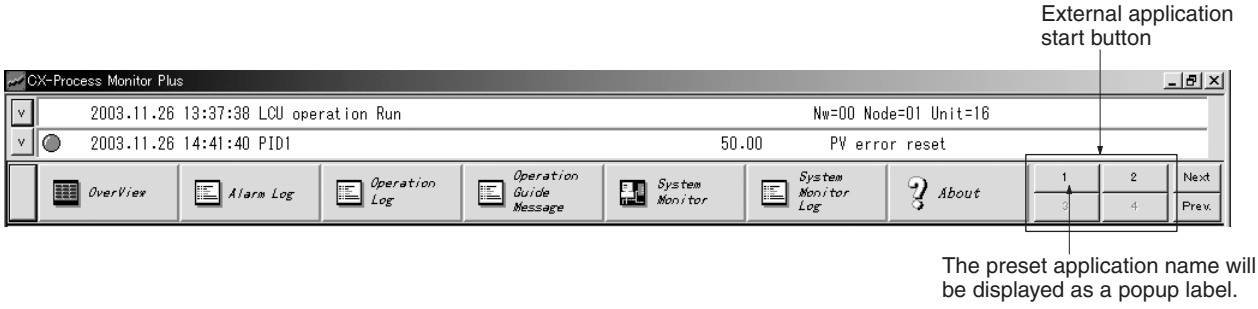
The CX-Process Monitor Plus display will be removed and the external application will be displayed over the entire screen.

Utilize Launcher Screen.

The external application will be displayed with a part of the CX-Process Monitor Plus Screen (the Launcher Window) remaining.

Starting an External Application

To start an external application, click the external application's start button.



Re-displaying CX-Process Monitor Plus from an External Application

When Open Monitor Plus Screen from the External Application Is Selected

From the external application, execute Hmene.exe with no argument.

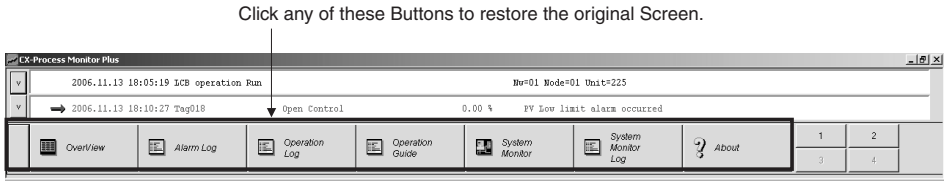
This file is installed in the system folder, so there is no need to specify the path.

> Even if the CX-Process Monitor Plus Screen is not displayed while the external application is running, processes such as alarm monitoring and trend collection continue.

When Utilize Launcher Screen Is Selected

When an external application has been started, only the top of the Monitor Plus Window will be displayed, as shown in the following diagram.

To return to the original Screen, click any one of the Buttons in the area shown below.



When the external application's Window is maximized, the Monitor Plus Window may be hidden in the background behind the external application. In this case, adjust the external application's window size if necessary.

Note When a user–created external application is started, it may have some effect on Monitor Plus. Consider the effects of the external application on Monitor Plus before starting the external application.

5-7 Checking Configurations

Start the monitor process with the **Setup** Button in the Main Window, and display the Overview Screen to check that the screen configurations have been set correctly.

Refer to the sections from *4-5* onwards for details on operations on Monitor Screens selected from the Overview Screen.

Select Start, **Program**, **Omron**, **CX-Process Monitor Plus**, and **CX-Process Monitor Plus**.

↓

In the Main Window, click the **Setup** Button.

↓

Enter the password.

↓

In the Setup Dialog Box, click the **Run** Button.

Start the Monitor Process for the screen you have configured, and start FinsGateway Serial Unit communications. (See note.)

Note Set the FinsGateway communications type (Host Link), the COM port used by the Host Link, and the baud rate using the configuration's System Monitor Setting Window. You must start the FinsGateway Controller Link and Ethernet manually.

↓

In the Overview Screen, select the Control Screen, Trend Screen, etc., and check their operation.

↓

(To enable auto-starting to an Overview Screen)
Click the **System info.** Button in the Setup Dialog and set the **Auto-start-Auto-start** setting to Enable.

5-7-1 Starting the Monitor Process and Displaying the Overview Window

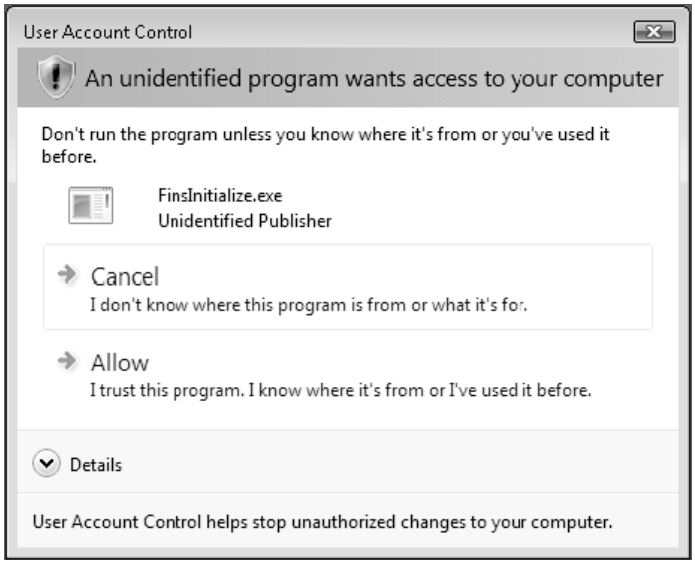
1,2,3...

1. In the Main Window, click the **Setup** Button.
   A dialog box will be displayed to input the password.
2. Input the password and click the **OK** Button.
   The Setup Dialog Box will be displayed.
3. Click the **Run** Button.
4. The Monitor Process will start and the Setup Dialog Box will be closed.
   Only if using Serial (i.e., Host Link) communications, FinsGateway Serial Unit communications with the PLC will start according to the following communications conditions set using the System Monitor Setting Window (using the System Monitor Builder Button in the Setup Dialog Box) at the same time as the Monitor Process starts. Unless ***Initialize Serial Port*** in the Serial Communications Detailed Settings Dialog Box is selected, however, communications will not start automatically. Refer to *5-3 System Monitor Settings* for details.
   - Communications type: Serial (Host Link)
   - COM port used and baud rate (if using Host Link)

Note (a) PLC network address, node address, and Unit address communications are based upon the settings made using the CX-Process Tool (select ***Settings***, ***Network Settings***). (Set the node address and Unit address using the System Monitor Settings Window to use the System Monitor Screen).

(b) If using Controller Link or Ethernet, you must start FinsGateway communications manually. (Set Controller Link and Ethernet communications type using the System Monitor Settings Window to use the System Monitor Screen).

(c) In Windows Vista, the following dialog box will be displayed when you execute FinsGateway automatic settings. This is generated by the Windows Vista User Account Control and it does not indicate any problem. Select to allow access.



5. The Overview Screen will be displayed as shown in *Section 4-5 Overview Screen*. Check to make sure that screens selected and set in the Overview Screen are operating correctly. For details on individual screens, refer to the sections from *4-7* onwards.

5-7-2 Setting the Auto-start Function

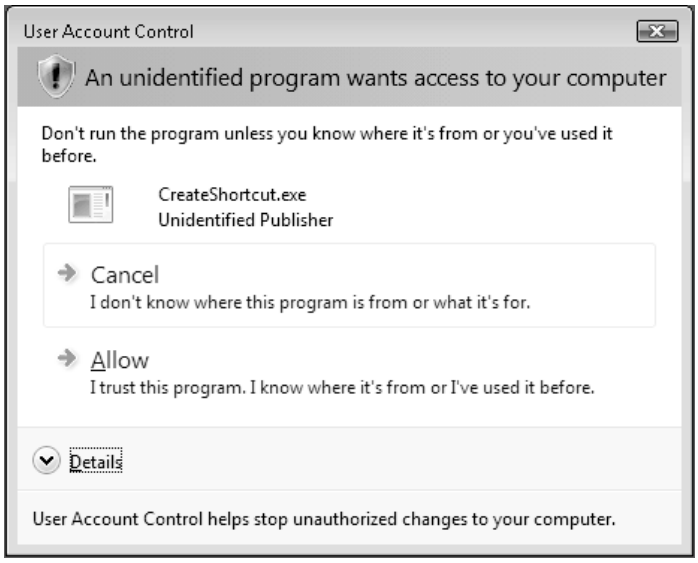
1,2,3...

1. Click the **System Info.** Button in the Setup Dialog Box.
2. Select ***Auto-start.***
3. Set ***Auto-start*** to *Enable*.

Note If the auto-start function is enabled, an Overview Screen will be displayed as soon as the CX-Process is started. The auto-start setting can be disabled by either of the following two methods.

- Double-click the MonitorCom.exe file from your Explorer to open the System Information settings and disable auto-starting under the *Auto-start* settings.
- Click the right mouse button at the top of an Overview Display and then click the Yes Button on the dialog box that will appear to open the System Information settings. Disable auto-starting under the *Auto-start* settings.

Note In Windows Vista, the following dialog box will be displayed when you change the automatic run settings. This is generated by the Windows Vista User Account Control and it does not indicate any problem. Select to allow access.



5-7-3 Ending the Monitor Process

1,2,3...

1. Click the **Close** Button in the upper right corner of the Overview Screen.
2. If a monitor process such as data collection or trend collection is in progress, a dialog box will be displayed to confirm that the monitor process is to be ended. Click the **Yes** Button.
3. The monitor process will be ended.

SECTION 6
Troubleshooting

This section describes errors that can occur while using the CX-Process Monitor Plus.

The following table shows the causes of errors that may occur during CX-Process Monitor Plus operations, and the action to take to clear the errors. Clear the cause of the error using the table below.

Phenomenon	Cause	Action
Cannot display Tag names.	No tag names have been registered in the tag settings for Monitor Plus using CX-Process Tool.	Register the tag name using CX-Process Tool, and then compile the tags for Monitor Plus.
The Loop Control Unit reads Information Not Refreshed in the System Monitor Screen.	The computer communications type setting in the System Monitor Builder Screen is incorrect.	Change the communications type setting.
	The Loop Control Unit's address in the System Monitor Screen's node settings and the actual Loop Control Unit's address do not agree.	Change the Loop Control Unit's address in the node settings to agree with the actual Loop Control Unit's address.
Error in Data Refresh Check is displayed in the System Monitor Messages.	The Monitor Tag settings between CX-Process Tool and CX-Process Monitor Plus agree, but the Function Block data when the Monitor Tag settings were made using CX-Process Tool have not been downloaded to the Loop Control Unit.	Download the Function Block from when the Tags were set using CX-Process Tool to the Loop Control Unit, and restart the Loop Control Unit.
	Power supply to the PLC Unit is turned OFF.	Turn ON the power supply to the PLC Unit.
	Communications cable is not connected.	Connect the communications cable.
Cannot move from the Overview Screen to the Control Screens or Tuning Screens.	The tag number registered using CX-Process Tool cannot be set correctly in the CX-Process Monitor Plus.	Reset the Tags using the Graphic Builder Screen and the CRT Builder Screen.
Error in Data Link Status Communications is displayed in the System Monitor Messages.	If the communications type setting is not CLK, the power supply to the PLC is turned OFF, or the communications cable is not connected.	Turn ON the power supply to the PLC Unit, or connect the communications cable.
The message dialog box Could Not Initialize FinsGateway is displayed.	FinsGateway Serial Unit initialization failed. (i.e., network address set using CX-Process Tool and FinsGateway Serial Unit network address do not agree.)	1. Make sure the network address set using CX-Process Tool, and FinsGateway Serial Unit network address agree. 2. Compile the Monitor Tags, and then reset the node PLC using the System Monitor Builder Screen. 3. (If the above two actions fail) Clear the Initialize Serial Port check box using the System Monitor Builder Screen.
Definitions Don't Agree With System is displayed in the System Monitor Messages.	The actual Loop Control Unit in the System Monitor Builder Screen has not been set using the System Monitor Builder.	Register the actual Loop Control Unit using all the System Monitor Builders.
	The network address when the Tag settings were made using CX-Process Tool, and the node address settings, do not agree with the actual Unit.	1. Make sure the network address and node address set using CX-Process tool, and the actual node address agree. 2. Compile the monitor Tags using CX-Process Tool, and then reset the node PLC using the System Monitor Builder Screen.
A timeout occurred in communications with the Ne□, Node□ PLC.	A timeout occurred in communications with the CPU Unit.	Check to make sure that the PLC power is turned ON. Check to make sure that the FinsGateway settings are correct.

Phenomenon	Cause	Action
An illegal response was received from the Net□, Node□ PLC.	An illegal response was received from the CPU Unit.	Check to make sure that the FinsGateway settings are correct. Check for an error at the CPU Unit and remove the cause of the error if necessary.
A timeout occurred in communications with an LCB registered at Net□, Node□. A timeout occurred in communications with an LCU registered at Net□, Node□, Unit□.	A timeout occurred in communications with the Loop Controller.	Check to make sure that the Loop Controller is correctly installed.
An illegal response was received from an LCB registered at Net□, Node□. An illegal response was received from an LCU registered at Net□, Node□, Unit□.	An illegal response was received from the Loop Controller.	Check to make sure that the Loop Controller is correctly installed. Check for an error at the Loop Controller.
The LCB model registered at the Net□, Node□ is incorrect. The LCU model registered at Net□, Node□, Unit□ is incorrect.	The Loop Controller model is incorrect.	The registered Loop Controller is not the one that is connected. Check the model.
The EM bank number for the LCB registered at Net□, Node□ is incorrect.	The EM bank number used by the LCB is incorrectly set.	The EM bank numbers that can be used by Loop Control Boards are 0 to C. Set a number within this range.
The HMI interface setting for the LCB registered at Net□, Node□ is incorrect.	The HMI interface settings for the LCB are not enabled.	The CX-Process Monitor Plus will not operate correctly if the HMI interface settings for the LCB are not enabled. Enable the HMI interface settings.
Block Execution Error is displayed in the System Monitor Messages.	An execution error has occurred in the Function Block data downloaded to the Loop Control Unit.	1. Click the **E** Button on the Loop Control Unit in the System Monitor Screen. 2. Click the **Execution Error** Button in the Function Block Error Dialog Box. 3. Check the Execution error's Function Block using the Details Of Function Block Error Dialog Box. 4. Correct the settings for the relevant Function Block using CX-Process Tool.
Unit Address Setting Disagrees With Actual Unit Number is displayed in the System Monitor Messages.	The actual Loop Control Unit's address and the node PLC's Unit address in the System Monitor Builder Screen do not agree.	Make sure the actual Loop Control Unit's address and the System Monitor Builder's node PLC Unit's address agree.
ERROR CODE: is displayed during Loop Control Unit Run/stop in the System Monitor Screen.	The FinsGateway setting or the network setting is incorrect.	Correct the FinsGateway setting and the network settings.
An address error message is displayed on the System Monitor Screen.	It's possible that the ladder program or another Unit is writing data to the area of memory used for system information. The system information is stored in the following areas. DM 16020 to DM 16044 for the Loop Control Unit 20 words from the first word used for the HMI for the Loop Control Board	Check the ladder program and Unit configuration to see if the system information area is being written to.

Phenomenon	Cause	Action
Monitoring cannot be performed normally.	After generating the tag file for Monitor Plus, newly updated tag information or network settings have not been set correctly.	Correctly set the tag information of network settings updated on a Builder Screen.
	After generating the tag file for Monitor Plus, the data set with the CX-Process Tool has not been downloaded to the Loop Control Unit/Board.	After changing the program with the CX-Process Tool and generating the tag file for Monitor Plus, download the data that was set to the Loop Control Unit/Board.
	It's possible that the ladder program or another Unit is writing data to the area of memory used for data exchange between the function blocks and the CX-Process Monitor Plus.	Check the ladder program and Unit configuration to see if any of the following areas of memory are being written to. Loop Control Units: Memory area specified for Send All Block Loop Control Board: Memory area being used by the HMI
Tag names that are newly set cannot be set.	The CX-Process Monitor Plus was not restarted after generating a tag file for Monitor Plus during CX-Process Monitor Plus operation.	Restart the CX-Process Monitor Plus.

Appendix A

Reading/Writing Function Block ITEMs

The following tables show which tag ITEMs can be monitored or set using CX-Process Monitor Plus for function blocks for which CSV tags are set.

Basic PID (Block Model 011)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	011	LL_SP	Low/low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
Contact output	016	LL	Low/low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	017	ALM_ OFF	Alarm stop switch 0: Alarm, 1: Stop	0 or 1	R (Color)	R	R/W	R	R	R	R/W	R	
Parameter	019	PV_ ABN	PV execution error display 0:Normal, 1:Error → MANUAL mod	0 or 1		R	R	R	R	R	R	R	R
	023	SP	Local Set Point setting	–15.00 to +115.00%		W	W				W		
	024	CAS_ SET	Set Point setting mode 0: Local only 1: Remote/Local	0 or 1		R	R	R	R	R	R		
	026	R/L_ SW	Remote/Local switch0: Local1: Remote Note: Valid only when ITEM024 is 1	0 or 1		R/W	R/W	R	R	R	R/W	R	
Analog output	029	SP	Current Set Point output	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	035	AT	AT command/AT Executing	0.1			R/W	R	R	R	R/W	R	R
	041	DVA_ SP	Deviation alarm setting (Hysteresis is set at ITEM012.)	0 to 115.00%		R	R/W	R	R	R	R/W		
Contact output	042	DVA	Deviation alarm output	0 or 1		R	R	R	R	R	R	R	R

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Parameter	054	P	Proportional band	0.1 to 999.9%			R/W	R	R	R	R/W		
	055	I	Integral time (0: No integral action)	0 to 9999 s			R/W	R	R	R	R/W		
	056	D	Differential time (0: No differential action)	0 to 9999 s			R/W	R	R	R	R/W		
	076	MH_ LMT	High MV limit	±320.00%		R	R/W	R	R	R	R/W		
	077	ML_ LMT	Low MV limit	±320.00%		R	R/W	R	R	R	R/W		
Contact output	078	MHA	MV upper limit output value 1: Upper limit or more 0: Less than upper limit	0 or 1	R		R	R	R	R	R	R	
	079	MLA	MV lower limit output value 1: Lower limit or less 0: Greater than lower limit	0 or 1	R		R	R	R	R	R	R	
Contact input	086	A/M_ SW	Auto/Manual switch 0: Manual, 1: Auto	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	089	MV	Host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ ABN	MV execution error display 0: Normal, 1: Error	0 or 1				R	R	R	R	R	R
	098	MV_ IDX	MV execution error display 0: Normal, 1: Error	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	099	OP_ MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Advanced PID (Block Model 012)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	017	ALM_OFF	Alarm stop switch 0: Alarm, 1: Stop	0 or 1		R (Color)	R/W	R	R	R	R/W	R	
Parameter	019	PV_ ABN	PV execution error display 0:Normal, 1:Error → MAN-UAL mode	0 or 1			R	R	R	R	R	R	R
	023	SP	Local Set Point setting	–15.00 to +115.00%		W	W				W		
	024	CAS_SET	Set Point setting mode (default)0: Local only1: Remote/Local Note: Setting to 0 invalidates ITEM026.	0 or 1		R	R	R	R	R	R		
	026	R/L_SW	Remote/Local switch 0: Local, 1: Remote Note: Valid only when ITEM024 is 1	0 or 1		R/W	R/W				R/W	R	
Analog output	029	SP	Current Set Point output	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	035	AT	AT command/AT Executing	0.1			R/W	R	R	R	R/W	R	R
	041	DVA_SP	Deviation alarm setting (Hystere-sis is set at ITEM012.)	0 to 115.00%			R/W	R	R	R	R/W		
Contact output	042	DVA	Deviation alarm output	0 or 1	R	R	R	R	R	R	R	R	R
Parameter	054	P	Proportional band	0.1 to 999.9%			R/W	R	R	R	R/W		
	055	I	Integral time (0: No integral action)	0 to 9999 s			R/W	R	R	R	R/W		
	056	D	Differential time (0: No differential action)	0 to 9999 s			R/W	R	R	R	R/W		
	076	MH_LMT	High MV limit	±320.00%		R	R/W	R	R	R	R/W		
	077	ML_ LMT	Low MV limit	±320.00%		R	R/W	R	R	R	R/W		
Contact output	078	MHA	High MV limit arrival output 1: Limit or more, 0: Less than limit	0 or 1	R		R	R	R	R	R	R	
Contact output	079	MLA	Low MV limit arrival output 1: Limit or less, 0: Not limit or less	0 or 1	R		R	R	R	R	R	R	
Contact input/ parameter	086	A/M_SW	Auto/Manual switch 0: Manual, 1: Auto	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	089	MV	Host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ABN	MV execution error display 0: Normal, 1: Error	0 or 1		R	R	R	R	R	R	R	R
	098	MV_ IDX	MV index position	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

2-position ON/OFF (Block Model 001)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	041	DVA_SP	Deviation alarm setting	0 to 115.00%		R	R/W	R	R	R	W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	042	DVA	Deviation alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch	0 or 1	R (Color)		R/W						
Parameter	019	PV_ ABN	PV execution error display	0 or 1			R	R	R	R	R	R	R
	023	SP	Local Set Point setting	–15.00 to +115.00%		W	W				W		
	024	CAS_SET	Set Point setting mode	0 or 1		R	R	R	R	R	R		
	026	R/L_SW	Remote/Local switch	0 or 1		R/W	R/W	R	R	R	R/W	R	
Analog output	029	SP	Current Set Point output	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	093	MV	Host display of MV	0 or 1		R/W	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

3-position ON/OFF (Block Model 002)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	041	DVA_SP	Deviation alarm setting	0 to 115.00%		R	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	042	DVA	Deviation alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R/W		
Parameter	019	PV_ABN	PV execution error display	0 or 1				R	R	R	R	R	R
	023	SP	Local Set Point setting	–15.00 to +115.00%		W	W				W		
	024	CAS_SET	Set Point setting mode	0 or 1		R	R	R	R	R	R		
	026	R/L_SW	Remote/Local switch	0 or 1		R/W	R/W	R	R	R	R/W	R	
Analog output	029	SP	Current Set Point output	–15.00 to +115.00%		R	R	R	R	R	R		
	093	MVH	Host display of MVH	0 or 1		R/W	R/W	R	R	R	R/W		
	095	MVL	Host display of MVL	0 or 1		R/W	R/W	R	R	R	R/W		
Parameter	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Blended PID (Block Model 013)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command (0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R	R	R	R	R		
Analog input	007	PV	PV input	0 to 9999		R	R	R	R	R	R		
Parameter	027	K1	Ratio	0 to 3.2000			R/W	R	R	R	R/W		
Accumulated value output	012	Q1	Accumulated value	0 to 9999			R	R	R	R	R		
	013	Q2	Accumulated value	0 to 9999			R	R	R	R	R		
Analog output	016	Y1	Instantaneous value output	0 to 320.00%		R	R	R	R	R	R		
	029	Y2	Current Set Point instantaneous value output	0 to 320.00%		R	R	R	R	R	R		
Parameter	031		Cumulative deviation High/high alarm output	±320.00%			R/W	R	R	R	R/W		
	032		Cumulative deviation High alarm setting	±320.00%			R/W	R	R	R	R/W		
	033		Cumulative deviation Low alarm setting	±320.00%			R/W	R	R	R	R/W		
	034		Cumulative deviation Low/low alarm setting	±320.00%			R/W	R	R	R	R/W		
Contact output	036	DHH	Cumulative deviation High/high alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	037	DH	Cumulative deviation High alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	038	DL	Cumulative deviation Low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
	039	DLL	Cumulative deviation Low/low alarm output	0 or 1	R (Color)	R (Color)	R (Color)	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R/W		
	014	S1	Counter reset	0 or 1			R/W	R	R	R	R/W		
Parameter	054	P	Proportional band	0.1 to 999.9%			R/W	R	R	R	R/W		
	055	I	Integral time	0 to 9999 s			R/W	R	R	R	R/W		
	056	D	Differential time	0 to 9999 s			R/W	R	R	R	R/W		
	076	MH_LMT	High MV limit	±320.00%			R/W	R	R	R	R/W		
	077	ML_ LMT	Low MV limit	±320.00%			R/W	R	R	R	R/W		
Contact input	086	A/M_SW	Auto/Manual switch	0 or 1		R/W	R/W	R	R	R	R/W		
Parameter	089	MV	Host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ABN	MV error display 0: Normal, 1: Error	0 or 1				R	R	R	R	R	R
	098	MV_ IDX	MV index position	−15.00 to +115.00%		R	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Batch Flowrate Capture (Block Model 014)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Accumulated value input	007	P1	PV input	0 to 9999				R	R	R	R		
Accumulated value output	012	Q1	Accumulated value (lower 4 digits)	0000 to 9999			R	R	R	R	R		
	013	Q2	Accumulated value (upper 4 digits)	0000 to 9999			R	R	R	R	R		
Contact input	014	S3	Accumulation counter reset switch (1: Reset)	0 or 1			R/W	R	R	R	R/W		
Analog output	016	Y1	Instantaneous value output	0 to 320.00%		R	R	R	R	R	R		
Parameter	023	SP	Local SP setting	0 to 9999		W	W				W		
Contact input/ parameter	026	R/L_SW	Remote/Local switching 0: Local, 1: Remote	0 or 1		R/W	R/W	R	R	R	R/W	R	
Accumulated value output	029	SP	Current Set Point output	0 to 9999		R	R	R	R	R	R		
	032	B0	Overrun setting (value subtracted from BM)	0 to 9999			R/W	R	R	R	R/W		
	033	BP	Pre-batch setting (value subtracted from BM)	0 to 9999			R/W	R	R	R	R/W		
	034	B1	Flowrate limitation	0 to 9999			R/W	R	R	R	R/W		
Analog output	035	SM	Batch accumulated value (lower 4 digits) Fixed value	0000 to 9999		R	R	R	R	R	R/W		
Contact input	036	S1	Run switch (0: Reset, 1: Run)	0 or 1		R/W	R/W	R	R	R	R/W	R	
	037	S2	Control interrupt switch (1: Interrupt)	0 or 1		R/W	R/W	R	R	R	R/W	R	
Contact output	038	U1	Main batch output	0 or 1		R	R	R	R	R	R/W	R	
	039	U2	Pre-batch output	0 or 1		R	R	R	R	R	R/W	R	
Contact input/ parameter	086	A/M_SW	SW 0: Manual, 1: Auto	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	089	MV	Host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ABN	MV error display 0: Normal, 1: Error	0 or 1		R	R	R	R	R	R	R	R
	098	MV_IDX	MV index position	–15 to 115.00%		R	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Indication and Setting (Block Model 031)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch 0: Alarm, 1: Stop	0 or 1	R (Color)		R/W	R	R	R	R/W	R	
Parameter	019	PV_ABN	PV error display 0: Normal, 1: Error	0 or 1			R	R	R	R	R	R	R
	023	SP	Local Set Point setting	–15.00 to +115.00%		W	W				W		
	024	CAS_SET	Set Point setting mode	0 or 1		R/W	R	R	R	R	R	R	
Contact input/ parameter	026	R/L_SW	Remote/Local switch	0 or 1			R/W	R	R	R	R/W	R	
Analog output	029	SP	Current Set Point output	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Indication and Operation (Block Model 032)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block opera-tion command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R/W		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch 0: Alarm, 1: Stop	0 or 1	R (Color)		R/W	R	R	R	R/W	R	
Parameter	019	PV_ABN	PV error display 0: Normal, 1: Error	0 or 1			R	R	R	R	R	R	R
Parameter	076	MH_LMT	High MV limit	±320.00%		R	R/W	R	R	R	R/W		
	077	ML_ LMT	Low MV limit	±320.00%		R	R/W	R	R	R	R/W		
	078	MHA	MV upper limit output value 1: Upper limit or more 0: Less than upper limit	0 or 1	R		R	R	R	R	R	R	
	079	MLA	MV lower limit out-put value 1: Lower limit or less 0: Greater than lower limit	0 or 1	R		R	R	R	R	R	R	
Analog input	084	X1	Auto input	±320.00%		R	R	R	R	R	R		
Contact input	086	A/M_SW	Auto/Manual switch 0: Manual, 1: Auto	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	089	MV	Inversion of host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ ABN	MV execution error display 0: Normal, 1: Error	0 or 1		R	R	R	R	R	R	R	R
	098	MV_ IDX	MV index position	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Ratio Setting (Block Model 033)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command (0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	Reference input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	019	PV_ ABN	PV error display 0: Normal, 1: Error	0 or 1			R	R	R	R	R	R	R
	023	SP	Local ratio setting	–15.00 to +115.00%		R/W	R/W	R	R	R	R		
Contact input	024	CAS_SET	Ratio setting mode 0: Local only 1: Remote/Local	0 or 1			R	R	R	R	R	R	
	026	R/L_SW	Remote/Local switch 0: Local, 1: Remote	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	054	K1	Ratio range (sets signal ratio range corresponding to Set Point=100%)	±10.000			R/W	R	R	R	R/W		
	055	A1	Input bias	±320.00%			R/W	R	R	R	R/W		
	056	B1	Output bias	±320.00%			R/W	R	R	R	R/W		
	076	MH_LMT	High MV limit	±320.00%		R	R/W	R	R	R	R/W		
	077	ML_ LMT	Low MV limit	±320.00%		R	R/W	R	R	R	R/W		
Contact input	086	A/M_SW	Auto/Manual switch 0: Manual, 1: Auto	0 or 1		R/W	R/W	R	R	R	R/W	R	
Parameter	089	MV	Host display of MV	±320.00%		R/W	R/W	R	R	R	R/W		
	091	MV_ ABN	MV error display 0: Normal, 1: Error	0 or 1		R	R	R	R	R	R	R	R
	098	MV_ IDX	MV index position	–15.00 to +115.00%		R	R/W	R	R	R	R/W		
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

Indicator (Block Model 034)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_ST	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R	R	
Analog input	007	PV	PV input	–15.00 to +115.00%		R	R	R	R	R	R		
Parameter	008	HH_SP	High/high alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	009	H_SP	High alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	010	L_SP	Low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
	011	LL_ SP	Low/low alarm setting	–15.00 to +115.00%		R (– only)	R/W	R	R	R	R/W		
Contact output	013	HH	High/high alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	014	H	High alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	015	L	Low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
	016	LL	Low/low alarm output	0 or 1	R (Color)	R	R	R	R	R	R	R	R
Contact input	017	ALM_OFF	Alarm stop switch 0: Alarm, 1: Stop	0 or 1	R (Color)	R (Color)	R/W	R	R	R	R/W	R	
Parameter	019	PV_ ABN	PV error display 0: Normal, 1: Error	0 or 1			R	R	R	R	R	R	R
	099	OP_MK	Label	0 to 15		R/W	R/W	R	R	R	R/W		

Note Only optional tags can be set.

High/Low Alarm (Block Model 111)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Analog input	008	PV	PV input	±320.00%		R		R	R	R	R		
Parameter	009	H_SP	High setting	±320.00%		R/W		R	R	R	R/W		
	010	L_SP	Low setting	±320.00%		R/W		R	R	R	R/W		
Contact output	012	H	High alarm output	0 or 1	R (Color)	R		R	R	R	R	R	R
	013	L	Low alarm output	0 or 1	R (Color)	R		R	R	R	R	R	R

Note Only optional tags can be set.

Segment Program 2 (Block Model 157)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Batch Trend Screen	Segment Program 2 Screen	Trend Screens	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Con-tact input	000	MT_ SW	Stop block operation command(0: Can-cel stop, 1: Stop)	0 or 1	R	R	R/W	R	R/W	R	R		
Analog input	007	X1	Reference input	±320.00%		R	R	R	R	R	R		
Analog output	008	Y1	Program output	±320.00%		R/W	R	R	R	R	R/W		
Analog output	009	Y2	Elapsed time unit	0 to 3200.0									
	011	Y3	Step output	0 to 30		R	R	R	R	R	R		
Con-tact input	013	S1	Run/stop command	0 or 1	R (Color)	R/W	R/W	R	R	R	R		
	014	S2	Hold switch	0 or 1	R (Color)	R/W	R/W	R	R/W	R	R/W		
Con-tact output	015	U1	X1 input error	0 or 1				R	R	R	R	R	R/W
	016	U2	Arrival at final seg-ment	0 or 1									
Con-tact input	017	S3	Move to next wait command	0 or 1		R/W	R/W	R	R/W	R	R		
	018	S4	Move to next step command	0 or 1		R/W	R/W	R	R/W	R	R		
	019	U10	Waiting	0 or 1		R	R	R	R	R	R		
Param-eter	022	B0	Default	±320.00%		R	R		R/W				
	023	A1	Step1 Time width	0 to 3200.0			R/W for each step		R/W				
	024	B1	Step1 Output value	±320.00%					R/W				
	025	J1	Step1 Time unit	0 to 2					R/W				
	026	A1	Step2 Time width	0 to 3200.0					R/W				
	027	B1	Step2 Output value	±320.00%					R/W				
	028	J1	Step2 Time unit	0 to 2					R/W				
	029	A1	Step3 Time width	0 to 3200.0					R/W				
	030	B1	Step3 Output value	±320.00%					R/W				
	031	J1	Step3 Time unit	0 to 2					R/W				
	032	A1	Step4 Time width	0 to 3200.0					R/W				
	033	B1	Step4 Output value	±320.00%					R/W				
	034	J1	Step4 Time unit	0 to 2					R/W				
	035	A1	Step5 Time width	0 to 3200.0					R/W				
	036	B1	Step5 Output value	±320.00%					R/W				
	037	J1	Step5 Time unit	0 to 2					R/W				
	038	A1	Step6 Time width	0 to 2					R/W				
	039	B1	Step6 Output value	±320.00%					R/W				
	040	J1	Step6 Time unit	0 to 2					R/W				
	041	A1	Step7 Time width	0 to 3200.0					R/W				
	042	B1	Step7 Output value	±320.00%					R/W				
	043	J1	Step7 Time unit	0 to 2					R/W				
	044	A1	Step8 Time width	0 to 3200.0					R/W				
	045	B1	Step8 Output value	±320.00%					R/W				
	046	J1	Step8 Time unit	0 to 2					R/W				
	047	A1	Step9 Time width	0 to 3200.0					R/W				
	048	B1	Step9 Output value	±320.00%					R/W				
	049	J1	Step9 Time unit	0 to 2					R/W				
	050	A1	Step10 Time width	0 to 3200.0					R/W				
	051	B1	Step10 Output value	±320.00%					R/W				
	052	J1	Step11 Time unit	0 to 2					R/W				
	053	A1	Step11 Time width	0 to 3200.0					R/W				
	054	B1	Step11 Output value	±320.00%					R/W				
	055	J1	Step11 Time unit	0 to 2					R/W				
	056	A1	Step12 Time width	0 to 3200.0					R/W				
	057	B1	Step12 Output value	±320.00%					R/W				

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Batch Trend Screen	Segment Program 2 Screen	Trend Screens	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Param-eter	058	J1	Step12 Time unit	0 to 2			R/W for each step		R/W				
	059	A1	Step13 Time width	0 to 3200.0					R/W				
	060	B1	Step13 Output value	±320.00%					R/W				
	061	J1	Step13 Time unit	0 to 2					R/W				
	062	A1	Step14 Time width	0 to 3200.0					R/W				
	063	B1	Step14 Output value	±320.00%					R/W				
	064	J1	Step14 Time unit	0 to 2					R/W				
	065	A1	Step15 Time width	0 to 3200.0					R/W				
	066	B1	Step15 Output value	±320.00%					R/W				
	067	J1	Step15 Time unit	0 to 2					R/W				
	068	A1	Step16 Time width	0 to 3200.0					R/W				
	069	B1	Step16 Output value	±320.00%					R/W				
	070	J1	Step16 Time unit	0 to 2					R/W				
	071	A1	Step17 Time width	0 to 3200.0					R/W				
	072	B1	Step17 Output value	±320.00%					R/W				
	073	J1	Step17 Time unit	0 to 2					R/W				
	074	A1	Step18 Time width	0 to 3200.0					R/W				
	075	B1	Step18 Output value	±320.00%					R/W				
	076	J1	Step18 Time unit	0 to 2					R/W				
	077	A1	Step19 Time width	0 to 3200.0					R/W				
	078	B1	Step19 Output value	±320.00%					R/W				
	079	J1	Step19 Time unit	0 to 2					R/W				
	080	A1	Step20 Time width	0 to 3200.0					R/W				
	081	B1	Step20 Output value	±320.00%					R/W				
	082	J1	Step20 Time unit	0 to 2					R/W				
	083	A1	Step21 Time width	0 to 3200.0					R/W				
	084	B1	Step21 Output value	±320.00%					R/W				
	085	J1	Step21 Time unit	0 to 2					R/W				
	086	A1	Step22 Time width	0 to 3200.0					R/W				
	087	B1	Step22 Output value	±320.00%					R/W				
	088	J1	Step22 Time unit	0 to 2					R/W				
	089	A1	Step23 Time width	0 to 3200.0					R/W				
	090	B1	Step23 Output value	±320.00%					R/W				
	091	J1	Step23 Time unit	0 to 2					R/W				
	092	A1	Step24 Time width	0 to 3200.0					R/W				
	093	B1	Step24 Output value	±320.00%					R/W				
	094	J1	Step24 Time unit	0 to 2					R/W				
	095	A1	Step25 Time width	0 to 3200.0					R/W				
	096	B1	Step25 Output value	±320.00%					R/W				
	097	J1	Step25 Time unit	0 to 2					R/W				
	098	A1	Step26 Time width	0 to 3200.0					R/W				
	099	B1	Step26 Output value	±320.00%					R/W				
	100	J1	Step26 Time unit	0 to 2					R/W				
	101	A1	Step27 Time width	0 to 3200.0					R/W				
	102	B1	Step27 Output value	±320.00%					R/W				
	103	J1	Step27 Time unit	0 to 2					R/W				
	104	A1	Step28 Time width	0 to 3200.0					R/W				
	105	B1	Step28 Output value	±320.00%					R/W				
	106	J1	Step28 Time unit	0 to 2					R/W				
	107	A1	Step29 Time width	0 to 3200.0					R/W				
	108	B1	Step29 Output value	±320.00%					R/W				
	109	J1	Step29 Time unit	0 to 2					R/W				
	110	A1	Step30 Time width	0 to 3200.0					R/W				
	111	B1	Step30 Output value	±320.00%					R/W				
	112	J1	Step30 Time unit	0 to 2					R/W				

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Batch Trend Screen	Segment Program 2 Screen	Trend Screens	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
● Wait setting													
Param-eter	121	WT_SP01	Step1 Wait width	0 to 320.00%			R/W for each step		R/W				
	122	WT_TM01	Step1 Wait time	0 to 3200.0					R/W				
	123	WT_SP01	Step2 Wait width	0 to 320.00%					R/W				
	124	WT_TM01	Step2 Wait time	0 to 3200.0					R/W				
	125	WT_SP01	Step3 Wait width	0 to 320.00%					R/W				
	126	WT_TM01	Step3 Wait time	0 to 3200.0					R/W				
	127	WT_SP01	Step4 Wait width	0 to 320.00%					R/W				
	128	WT_TM01	Step4 Wait time	0 to 3200.0					R/W				
	129	WT_SP01	Step5 Wait width	0 to 320.00%					R/W				
	130	WT_TM01	Step5 Wait time	0 to 3200.0					R/W				
	131	WT_SP01	Step6 Wait width	0 to 320.00%					R/W				
	132	WT_TM01	Step6 Wait time	0 to 3200.0					R/W				
	133	WT_SP01	Step7 Wait width	0 to 320.00%					R/W				
	134	WT_TM01	Step7 Wait time	0 to 3200.0					R/W				
	135	WT_SP01	Step8 Wait width	0 to 320.00%					R/W				
	136	WT_TM01	Step8 Wait time	0 to 3200.0					R/W				
	137	WT_SP01	Step9 Wait width	0 to 320.00%					R/W				
	138	WT_TM01	Step9 Wait time	0 to 320.0					R/W				
	139	WT_SP01	Step10 Wait width	0 to 320.00%					R/W				
	140	WT_TM01	Step10 Wait time	0 to 3200.0					R/W				
	141	WT_SP01	Step11 Wait width	0 to 320.00%					R/W				
	142	WT_TM01	Step11 Wait time	0 to 3200.0					R/W				
	143	WT_SP01	Step12 Wait width	0 to 320.00%					R/W				
	144	WT_TM01	Step12 Wait time	0 to 3200.0					R/W				
	145	WT_SP01	Step13 Wait width	0 to 320.00%					R/W				
	146	WT_TM01	Step13 Wait time	0 to 3200.0					R/W				
	147	WT_SP01	Step14 Wait width	0 to 320.00%					R/W				
	148	WT_TM01	Step14 Wait time	0 to 3200.0					R/W				
	149	WT_SP01	Step15 Wait width	0 to 320.00%					R/W				
	150	WT_TM01	Step15 Wait time	0 to 3200.0					R/W				
	151	WT_SP01	Step16 Wait width	0 to 320.00%					R/W				
	152	WT_TM01	Step16 Wait time	0 to 3200.0					R/W				
	153	WT_SP01	Step17 Wait width	0 to 320.00%					R/W				
	154	WT_TM01	Step17 Wait time	0 to 3200.0					R/W				
	155	WT_SP01	Step18 Wait width	0 to 320.00%					R/W				
	156	WT_TM01	Step18 Wait time	0 to 3200.0					R/W				
	157	WT_SP01	Step19 Wait width	0 to 320.00%					R/W				
	158	WT_TM01	Step19 Wait time	0 to 3200.0					R/W				
	159	WT_SP01	Step20 Wait width	0 to 320.00%					R/W				
	160	WT_TM01	Step20 Wait time	0 to 3200.0					R/W				
	161	WT_SP01	Step21 Wait width	0 to 320.00%					R/W				
	162	WT_TM01	Step21 Wait time	0 to 3200.0					R/W				
	163	WT_SP01	Step22 Wait width	0 to 320.00%					R/W				
	164	WT_TM01	Step22 Wait time	0 to 3200.0					R/W				
	165	WT_SP01	Step23 Wait width	0 to 320.00%					R/W				
	166	WT_TM01	Step23 Wait time	0 to 3200.0					R/W				
	167	WT_SP01	Step24 Wait width	0 to 320.00%					R/W				
	168	WT_TM01	Step24 Wait time	0 to 3200.0					R/W				
	169	WT_SP01	Step25 Wait width	0 to 320.00%					R/W				
	170	WT_TM01	Step25 Wait time	0 to 3200.0					R/W				
	171	WT_SP01	Step26 Wait width	0 to 320.00%					R/W				
	172	WT_TM01	Step26 Wait time	0 to 3200.0					R/W				
	173	WT_SP01	Step27 Wait width	0 to 320.00%					R/W				
	174	WT_TM01	Step27 Wait time	0 to 3200.0					R/W				

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Batch Trend Screen	Segment Program 2 Screen	Trend Screens	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Param-eter	175	WT_SP01	Step28 Wait width	0 to 320.00%			R/W for each step		R/W				
	176	WT_TM01	Step28 Wait time	0 to 3200.0					R/W				
	177	WT_SP01	Step29 Wait width	0 to 320.00%					R/W				
	178	WT_TM01	Step29 Wait time	0 to 3200.0					R/W				
	179	WT_SP01	Step30 Wait width	0 to 320.00%					R/W				
	180	WT_TM01	Step30 Wait time	0 to 3200.0					R/W				
● Step Executing flag													
Con-tact output	221	U11	Step1 Executing flag	0 or 1									
	222	U12	Step2 Executing flag	0 or 1									
	223	U13	Step3 Executing flag	0 or 1									
	224	U14	Step4 Executing flag	0 or 1									
	225	U15	Step5 Executing flag	0 or 1									
	226	U16	Step6 Executing flag	0 or 1									
	227	U17	Step7 Executing flag	0 or 1									
	228	U18	Step8 Executing flag	0 or 1									
	229	U19	Step9 Executing flag	0 or 1									
	230	U20	Step10 Executing flag	0 or 1									
	231	U21	Step11 Executing flag	0 or 1									
	232	U22	Step12 Executing flag	0 or 1									
	233	U23	Step13 Executing flag	0 or 1									
	234	U24	Step14 Executing flag	0 or 1									
	235	U25	Step15 Executing flag	0 or 1									
	236	U26	Step16 Executing flag	0 or 1									
	237	U27	Step17 Executing flag	0 or 1									
	238	U28	Step18 Executing flag	0 or 1									
	239	U29	Step19 Executing flag	0 or 1									
	240	U30	Step20 Executing flag	0 or 1									
	241	U31	Step21 Executing flag	0 or 1									
	242	U32	Step22 Executing flag	0 or 1									
	243	U33	Step23 Executing flag	0 or 1									
	244	U34	Step24 Executing flag	0 or 1									
	245	U35	Step25 Executing flag	0 or 1									
	246	U36	Step26 Executing flag	0 or 1									
	247	U37	Step27 Executing flag	0 or 1									
	248	U38	Step28 Executing flag	0 or 1									
	249	U39	Step29 Executing flag	0 or 1									
	250	U40	Step30 Executing flag	0 or 1									

ON/OFF Valve Manipulator (Block Model 221)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_SW	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1				R	R	R	R	R	
	012	S2	Auto input 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
	013	S3	Manual input 0:OFF; 1:ON	0 or 1		R/W		R	R	R	R	R	
	015	S5	Open limit switch input	0 or 1		R		R	R	R	R	R	
	016	S6	Close limit switch input	0 or 1		R		R	R	R	R	R	
	022	U2	Valve action time error (1:error)	0 or 1		R (Color)		R	R	R	R	R	R
	023	U3	Valve open midway (1: Open midway)	0 or 1		R		R	R	R	R	R	
	085	S4	Site manipulation switch input (0:Central; 1:Site)	0 or 1		R (Color)		R	R	R	R	R	
Parame-ter	086	A/M_SW	Auto/Manual switching 0: Manual, 1: Auto	0 or 1		R/W		R	R	R	R/W	R	
	099	OP_MK	Label	0 to 15		R/W		R	R	R	R/W		

Note Only optional tags can be set.

Motor Manipulator (Block Model 222)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_SW	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1				R	R	R	R	R	
	012	S2	Auto input 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
	013	S3	Manual input 0:OFF; 1:ON	0 or 1		R/W		R	R	R	R	R	
	015	S5	Answer input	0 or 1		R		R	R	R	R	R	
	022	U2	Answer error (1:error)	0 or 1		R (Color)		R	R	R	R	R	R
Analog input	032	X1	CT input	–320.00 to +320.00%		R		R	R	R	R		
Parame-ter	033	H_SP	CT input high alarm setting	–320.00 to +320.00%		R (–)		R	R	R	R/W		
Contact output	036	H	CT input high alarm output	0 or 1		R		R	R	R	R	R	R
Contact input	085	S4	Site manipulation switch input (0:Central; 1:Site)	0 or 1		R (Color)		R	R	R	R	R	
Parame-ter	086	A/M_SW	Auto/Manual switch-ing 0: Manual, 1: Auto	0 or 1		R/W		R	R	R	R/W	R	
	099	OP_MK	Label	0 to 15		R/W		R	R	R	R/W		

Note Only optional tags can be set.

Reversible Motor Manipulator (Block Model 223)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_SW	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1				R	R	R	R	R	
	012	S2	AUTO-FWD input 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
	013	S3	AUTO-REV input 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
	014	S4	MAN-FWD input 0:OFF; 1:ON	0 or 1		R/W		R	R	R	R/W	R	
	016	S6	MAN-REV input 0:OFF; 1:ON	0 or 1		R/W		R	R	R	R/W		
	018	S8	FWD answer input 0:OFF; 1:ON	0 or 1		R		R	R	R	R		
	019	S9	REV answer input 0:OFF; 1:ON	0 or 1		R		R	R	R	R		
	023	U3	Answer error (1:error)	0 or 1		R (Color)		R	R	R	R	R	R
Analog input	032	X1	CT input	–320.00 to +320.00%		R		R	R	R	R		
Param-eter	033	H_SP	CT input high alarm setting	–320.00 to +320.00%		R (–)		R	R	R	R/W		
Contact output	036	H	CT input high alarm output	0 or 1		R		R	R	R	R	R	R
Contact input	085	S4	Site manipulation switch input (0:Central; 1:Site)	0 or 1		R (Color)		R	R	R	R	R	
	086	A/M_SW	Auto/Manual switch-ing 0: Manual, 1: Auto	0 or 1		R/W		R	R	R	R/W	R	
Param-eter	099	OP_MK	Label	0 to 15		R/W		R	R	R	R/W		

Note Only optional tags can be set.

Motor Opening Manipulator (Block Model 224)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Contact input	000	MT_SW	Stop block operation command(0: Cancel stop, 1: Stop)	0 or 1				R	R	R	R	R	
Analog input	012	X2	Auto input	–320.00 to +320.00%		R		R	R	R	R	R	
Parame-ter	013		Manual input target opening setting	–320.00 to +320.00%		R/W		R	R	R	R	R	
Contact input	019	S3	Open monitor switch thermal relay opera-tion 0:OFF; 1:ON	0 or 1		R (Color)		R	R	R	R	R	R
	020	S4	Close monitor switch thermal relay opera-tion 0:OFF; 1:ON	0 or 1		R (Color)		R	R	R	R	R	R
Contact output	021	U1	Open manipulation output 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
	022	U2	Close manipulation output 0:OFF; 1:ON	0 or 1		R		R	R	R	R	R	
Analog input	032	X1	Opening input	–320.00 to +320.00%		R		R	R	R	R		
Parame-ter	033	H_SP	Opening input high limit alarm setting	–320.00 to +320.00%		R (–)		R	R	R			
	034	L_SP	Opening input low limit alarm setting	–320.00 to +320.00%		R (–)		R	R	R			
Contact output	036	H	Opening input high limit alarm output	0 or 1	R (Color)	R (Color)		R	R	R	R	R	R
	037	L	Opening input low limit alarm output	0 or 1	R (Color)	R (Color)		R	R	R	R	R	R
Contact input	085	S2	Site manipulation switch input (1: Site, 1: Central)	0 or 1		R (Color)		R	R	R	R	R	
	086	A/M_SW	Auto/Manual switching 0: Manual, 1: Auto	0 or 1		R/W		R	R	R	R/W	R	
Parame-ter	099	OP_MK	Label	0 to 15		R/W		R	R	R	R/W		

Note Only optional tags can be set.

Timer (Block Model 205)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Parame-ter	007	SP	Setting	0 to 3200.0		R/W		R	R	R	R/W		
	008	PRESET	Prediction (sub-tracted from setting)	0 to 3200.0		R/W		R	R	R	R/W		
Analog output	009	PV	Time elapsed	0 to 3200.0		R		R	R	R	R		
Contact input	011	S1	Run switch	0 or 1		R/W		R	R	R	R	R	
	012	S2	Interrupt switch	0 or 1		R/W		R	R	R	R	R	
Contact output	013	U1	Arrival at setting	0 or 1		R		R	R	R	R	R	
	014	U2	Arrival at prediction	0 or 1		R		R	R	R	R	R	

Note Only optional tags can be set.

Counter (Block Model 208)

ITEM type	ITEM	Tag ITEM	Data description	Data range	CX-Process Monitor screen (R:Read W:Write)								
					Over-view Screen	Control Screens	Tuning Screens	Trend Screens	Batch Trend Screen	Segment Program 2 Screen (See note.)	Graphic Screens	Annun-ciator Screens	Alarm Log Screens
Parameter	007	SP	Setting	0 to 9999		R/W		R	R	R	R/W		
	008	PRESET	Prediction (sub-tracted from setting)	0 to 9999		R/W		R	R	R	R/W		
80 Ana-log output	009	PV	Count	0 to 9999		R		R	R	R	R		
Contact input	010	S1	Run switch	0 or 1		R/W		R	R	R	R	R	
Contact output	012	U1	Arrival at setting	0 or 1		R		R	R	R	R	R	
	013	U2	Arrival at prediction	0 or 1		R		R	R	R	R	R	

Note Only optional tags can be set.

Appendix B

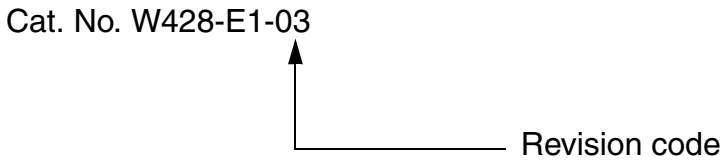
Differences between Trend Screens and Batch Trend Screens

The following table describes the functional differences between Trend Screens and Batch Trend Screens.

Item		Trend Screens		Batch Trend Screens
		Realtime trends	Historical trends	
Starting batch collection		Collection starts when monitor processing is started. (When the **Run** Button is clicked in the Setup Dialog Box or the Main Window.)		• Collection starts when the collection start condition is satisfied by the trigger tag (contact ITEM or analog ITEM). • Collection starts when the Batch Start Request Button is clicked in the Batch Trend Screen
Stopping batch collection		Collection stops when monitor processing is stopped. (When the CX-Process Monitor Plus is stopped, a message is displayed to confirm that data collection is to be stopped.)		• Collection stops when the collection start condition is not satisfied by the trigger tag (contact ITEM or analog ITEM). • Collection stops when the Batch Stop Request Button is clicked in the Batch Trend Screen.
Maximum number of registered screens		60	120	120
Maximum number of tags		480	960	960
Collection cycle		1, 2, 5, 10, or 30 s • One collection cycle setting is used for all screens.	1, 5, 10, 30, or 60 min • One collection cycle setting is used for all screens.	1 or 6 s • The setting is made for each screen.
Collection time (depends on collection cycle)		1-s cycle: 10 hours 2-s cycle: 20 hours 5-s cycle: 50 hours 10-s cycle: 100 hours 30-s cycle: 300 hours	1-min cycle: 30 days 5-min cycle: 150 days 10-min cycle: 300 days 30-min cycle: 900 days 60-min cycle: 1,800 days	4 hours (collection cycle: 1 s) 10 days (collection cycle: 1 min)
Saving collection data		• Data is saved up to the collection time. • From the collection time onwards, old data is deleted and the newest data is saved.		• After data collection is stopped, the data is saved as a batch trend file in binary format. (It is automatically deleted when outside of the save time set in the System Info Screen.) • After the collection time has expired, the next batch is immediately started if the trigger condition is satisfied.
Saving CSV files		• A file is saved for each set save period (1 to 240 hours). • A file can be saved by clicking a button on the Trend Screen.		• CSV files are saved when data collection is stopped). • A file can be saved by clicking a button on the Batch Trend Screen.
Other functions	Changing trend definitions online	Pens (tags) displayed on the Trend Screen can be changed, deleted, and added without stopping the CX-Process Monitor Plus.		---
	Referencing past trend data	---		• Trend data collected previously can be displayed on the Batch Trend Screen. • Past data can be overlapped with batch trend data currently being collected.

Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.



The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

Revision code	Date	Revised content
01	December 2003	Original production
02	January 2007	Revised for upgrade to version 2.0.
03	June 2009	Revised for upgrade to version 2.1.

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