User's Manual

DXA120
DAQSTANDARD
Hardware Configurator

vigilantplant.®

YOKOGAWA
Yokogawa Electric Corporation

IM 04L41B01-64EN
3rd Edition

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PRS 108-02E

Thank you for purchasing the DAQSTANDARD (model name: DXA120).
This manual explains how to use DAQSTANDARD Hardware Configurator. Please read this manual carefully before operating the software to ensure its correct use. After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.

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How to Use This Manual

Structure of the Manual

This manual consists of the following seven chapters and index.

Chapter	Title	Content
1	Before using the DAQSTANDARD	Explains the PC system environment required for use of the DAQSTANDARD. Also explains how to install it.
2	Setup Data on DX1000/DX2000 Models with the /AS1 Advanced Security Option	Explains how setup data is sent and received on DX1000/DX2000 models with the /AS1 advanced security option.
3	Configuring the DX1000/DX2000	Explains how to configure the DX1000/DX2000 measurement conditions and other settings.
4	Configuring the MV1000/MV2000	Explains how to configure the MV1000/MV2000 measurement conditions and other settings.
5	Configuring the CX1000/CX2000	Explains how to configure the CX1000/CX2000 measurement conditions and other settings.
6	Configuring the DX100/DX200/ DX200C/MV100/MV200	Explains how to configure the DX100/DX200/ DX200C/MV100/MV200 measurement conditions and other settings.
7	Troubleshooting	Gives a list of error messages and corrective measures.
Index		Gives a list of important terms used in this manual.

Range of Explanation in this Manual

This manual does not explain the basic operations of your PC's operating system (OS). For such descriptions, refer to the Windows User’s Guide etc.

Conventions Used in This Manual

- **Unit**
  K ..... Indicates “1024”. (Example: 100 KB)
- **Menus, commands, dialog boxes and buttons**
  Enclosed in [ ].
- **Note**
  Provides useful information regarding operation of the software.

About Images

The images that appear in this manual may be different from those that appear on the software, but not to a degree that interferes with procedural explanations.

Products Covered in This Manual

Item	Described in This Manual
DX1000/DX1000N/DX2000	Up to release number 4 (firmware version 4.1x) Described as DX1000/DX2000 in this manual.
MV1000/MV2000	Up to release number 1 (firmware’s version 1.0x).
CX1000/CX2000	Up to style number S3.
DX100/DX200/DX200C	Up to style number S4.
MV100/MV200	Up to style number S4.
DAQSTANDARD	Up to firmware’s version R8.2x.

Revision History

Edition	Additions and Changes
1	Revised for release number 4 of the DX1000/DX1000N/DX2000. This manual was created through the division of the fifth edition of the conventional DAQSTANDARD user's manual (IM04L41B01-61E) into different manuals for each software application.
2	Changes to the operating environment (support for Windows 7). Improvements to descriptions.
3	Changes to the operating environment (Support for Windows XP SP2 is terminated). Improvements to descriptions.

Contents

1.1 Overview of DAQSTANDARD

DAQSTANDARD Software Package

DAQSTANDARD consists of the following three software applications.

- Viewer
- Hardware Configurator
- DX-P Hardware Configurator

- **Viewer**
  Data Viewer displays the values and waveforms of the measured data from the recorder and prints them.

- **Hardware Configurator**
  Hardware Configurator is a software application for creating setup data for the recorder. It can send setup files that you have created to the recorder and save them to storage media. It can be used with the following recorders: the DX1000, DX1000N, DX2000, DX100, DX200, CX1000, CX2000, MV1000, MV2000, MV100, and MV200.

- **DX-P Hardware Configurator**
  DX-P Hardware Configurator is a software application for creating setup data for the DX100P/DX200P recorder. It can send setup files that you have created to the recorder and save them to storage media.

About Hardware Configurator

Creating Setup Data

You can use one of the following three methods to create setup data:

- Specify a new device and options.
- Edit setup data that is stored on an external storage medium or the PC.
- Edit setup data received from the recorder.

Configuring the Recorder

You can use one of the following two methods to configure the recorder:

- Load the settings to the recorder from a CF card or other external storage medium.
- Send the setup data to the recorder.

Printing Setup Data

You can print setup data.

Recorder Information Acquisition

You can acquire the recorder’s device information through communication.

1.2 PC System Requirements

Hardware

Personal Computer

A computer which runs on Windows 2000, Windows XP, Windows Vista, or Windows 7.

CPU and Main Memory

- **When Using Windows 2000 or Windows XP**
  Pentium III, 600 MHz or faster Intel x64 or x86 processor; 128 MB or more of memory
- **When Using Windows Vista**
  Pentium 4, 3 GHz or faster Intel x64 or x86 processor; 2 GB or more of memory
- **When Using Windows 7**
  32-bit edition: Intel Pentium 4, 3 GHz or faster x64 or x86 processor; 2 GB or more of memory
  64-bit edition: Intel x64 processor that is equivalent to Intel Pentium 4, 3 GHz or faster; 2 GB or more of memory

Hard Disk

Free space of 100 MB or more (more space may be required, depending on the amount of data stored).

CD-ROM Drive

One CD-ROM drive.

Mouse

A mouse supported by Windows.

Monitor

A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024×768 or higher, and that can show 65,536 colors (16-bit, high color) or more.

Interface Port

When communicating through RS-232, use a COM port (COM1, COM2, COM3, or COM4) supported by Windows.
When communicating through RS-422/RS-485, connect a converter to an RS-232 port.
To communicate through an Ethernet connection, you need an Ethernet card supported by Windows. Also, the TCP/IP protocol must be installed.

Printer

A printer supported by Windows is required. An appropriate printer driver is also required.

Operating System (OS)

OS	Version
Windows 2000	SP4
Windows XP	Home Edition SP3
	Professional SP3 (excluding x64 Editions)
Windows Vista	Home Premium SP1, SP2 (excluding 64-bit editions)
	Business SP1, SP2 (excluding 64-bit editions)
Windows 7	Home Premium 32-bit and 64-bit editions
	Professional 32-bit and 64-bit editions

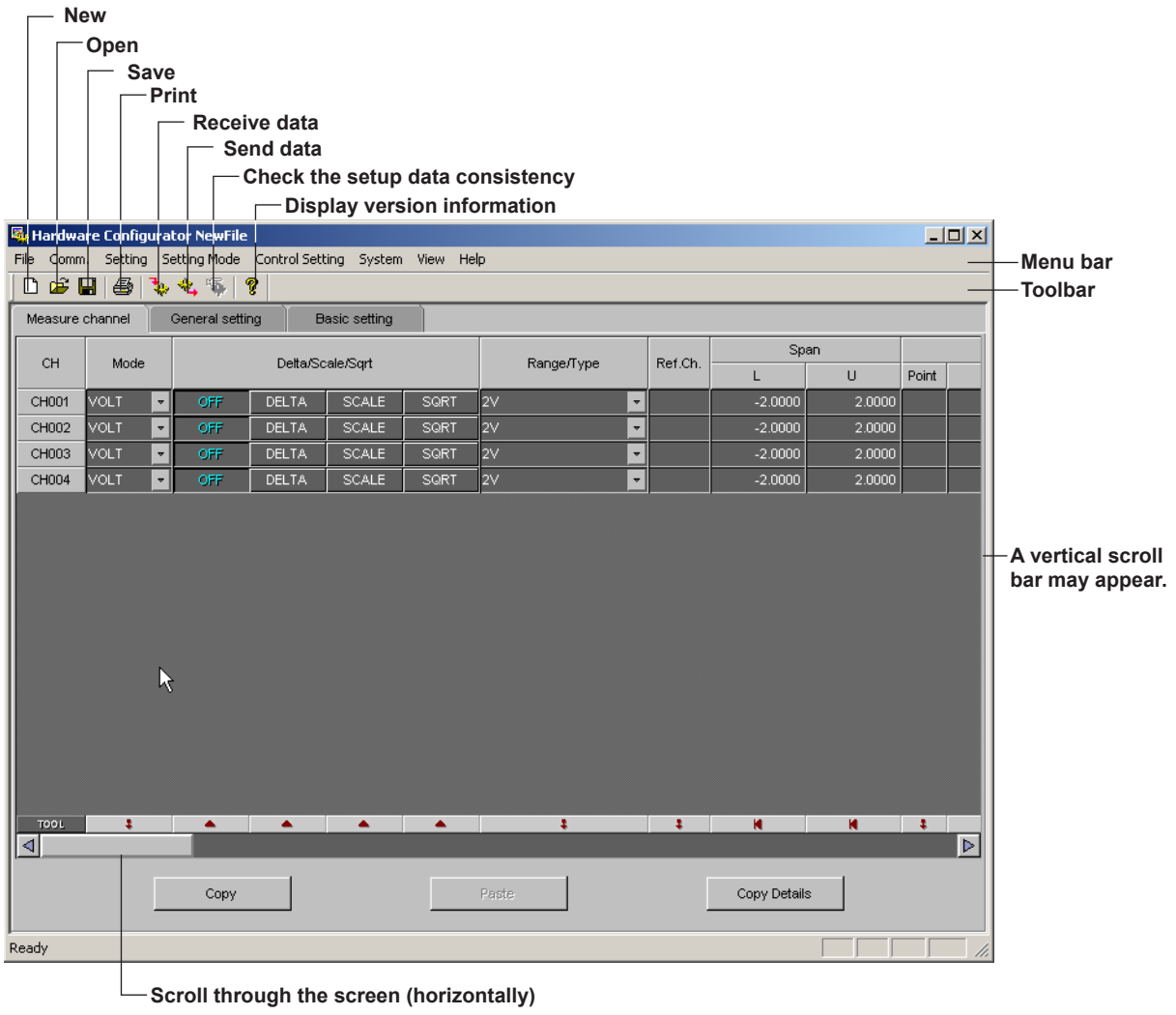
Note

- The time zone can be set in [Date/Time] which can be opened from [Control Panel].
- If daylight saving time is used, mark the check box of “Automatically adjust clock for daylight saving changes.”
- The time zone should not be set using the autoexec.bat file. If “TZ=GTM0” is set in the file, specify “rem” to disable it.
- Data created in 2038 or later cannot be handled.
- The font “Courier New” needs to be installed on your personal computer.

1.3 Starting/Exiting the Software

Starting

1. From the Start menu, select [Programs] - [DAQSTANDARD] - [Hardware Configurator].
Hardware Configurator starts, and the following window appears.



Exiting

To exit Hardware Configurator, select [File] - [Exit], or click the [X] button.

1.4 Menu and Tool Bars

Menu Bar

The menu bar is the same for all recorders. Only the menu items that can be selected are available.

Menu			Description
File	New		Creates new setup data.
	Open		Opens setup data that has been saved in the past.
	Save		Overwrites the current file.
	Save As		Saves to a specified file name.
	Restore Original		See the explanation later in this section.
	Print Format Settings		See section 1.5.
	Print		Prints data.
	Print Preview		Displays a print preview.
	Print Setup		Set up the printer.
	Exit		Exits the software.
Comm.	Receive Setting		Receives setup data from the recorder.
	Send Setting		Sends setup data to the recorder.
	Action	Hardware Info	Receives the device information from the recorder and displays it.
		Memory&Math Start	Starts memory sampling.
		Memory&Math Stop	Stops memory sampling.
	Partial Transfer	Address Settings	See section 3.7.
Setting	Meas Channels		This item appears for the DX1000/ DX2000 and MV1000/MV2000.
	Math Channels		
	Ext. Channels		
	General Setting	(Submenu)	
	Basic Setting	(Submenu)	
	Initialize		
	Load Changed Settings		See the explanation later in this section.
Setting Mode	SET (Regular) Setting	(Submenu)	This item appears for the DX100/ DX200, MV100/MV200, and CX1000/CX2000.
	SETUP (Basic) Setting	(Submenu)	
	Initialize		
Control Setting	SET (Regular) Setting	(Submenu)	This item appears for the CX1000/ CX2000.
	SETUP (Basic) Setting	(Submenu)	
	Program Pattern Setting	(Submenu)	
System	System Configuration		Set the setup data system configuration.
	Data Adjustment		Checks the setup data consistency.
View	Standard Toolbar		Shows or hides the toolbar.
	Status bar		Shows or hides the status bar.
	Data Adjustment Dialog		Shows or hides the data adjustment dialog.
Help	About		Shows the version. See section 1.6.
	User's Manual		Shows the user's manual.

About [File] - [Restore Original] (Only on the DX1000/DX2000 and MV1000/MV2000)

When you select [File] - [Restore Original], the data from the last time one of the following operations was performed is restored.

- [File] - [New]
- [File] - [Open]
- [File] - [Save]
- [File] - [Save As]
- [Comm.] - [Receive Setting]
- [Comm.] - [Send Setting]
- [Comm.] - [Partial Transfer]
- [System] - [System Configuration]

About [Setting] - [Load Changed Settings] (Only on the DX1000/DX2000 and MV1000/MV2000)

You can change the settings on the currently displayed setting screen to those of a specified setup file.

1. Select [Setting] - [Load Changed Settings].
   The [Open] dialog box appears.

2. Specify a file, and click [Open].
   The contents of the displayed setting screen are changed to those of the specified file.

Note

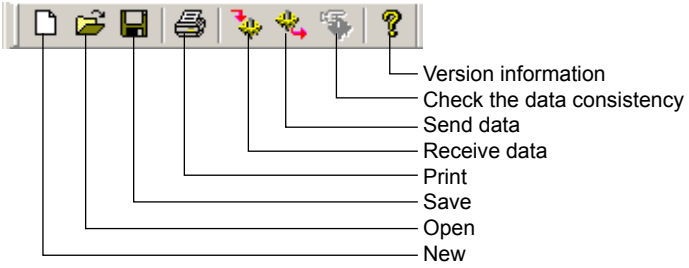
- Only the settings on the displayed setting screen are changed.
- Settings that do not match those of the setup data that you are currently editing are not loaded.
- Settings that are not included in the setup data that you are currently editing are not loaded.

Displaying the Manual

Select [Help] - [User's Manual]. A PDF of the manual appears.

Toolbar

The toolbar is the same for all recorders. Only the icons of tools that can be used are available.

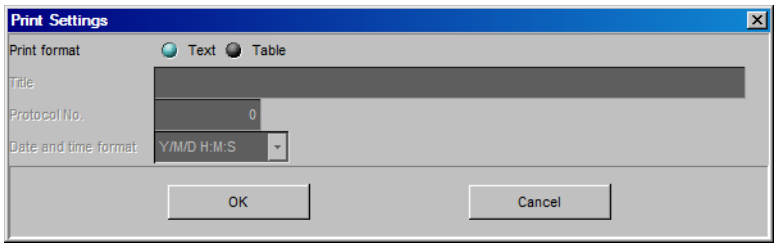


1.5 Printing Setup Data

Print Format Settings (Only on the DX1000/DX2000 and MV1000/MV2000)

You can set the print format of the setup data to text or table format.

1. Select [File] - [Print Format Settings] from the menu.
The [Print Settings] dialog box appears.



2. Configure the various settings.

Item	Setting	Description	Default
Print format	Text	Only text is printed.	Text
	Table	The data is printed in a preset format.	

The following settings only need to be configured when the print format is [Table].

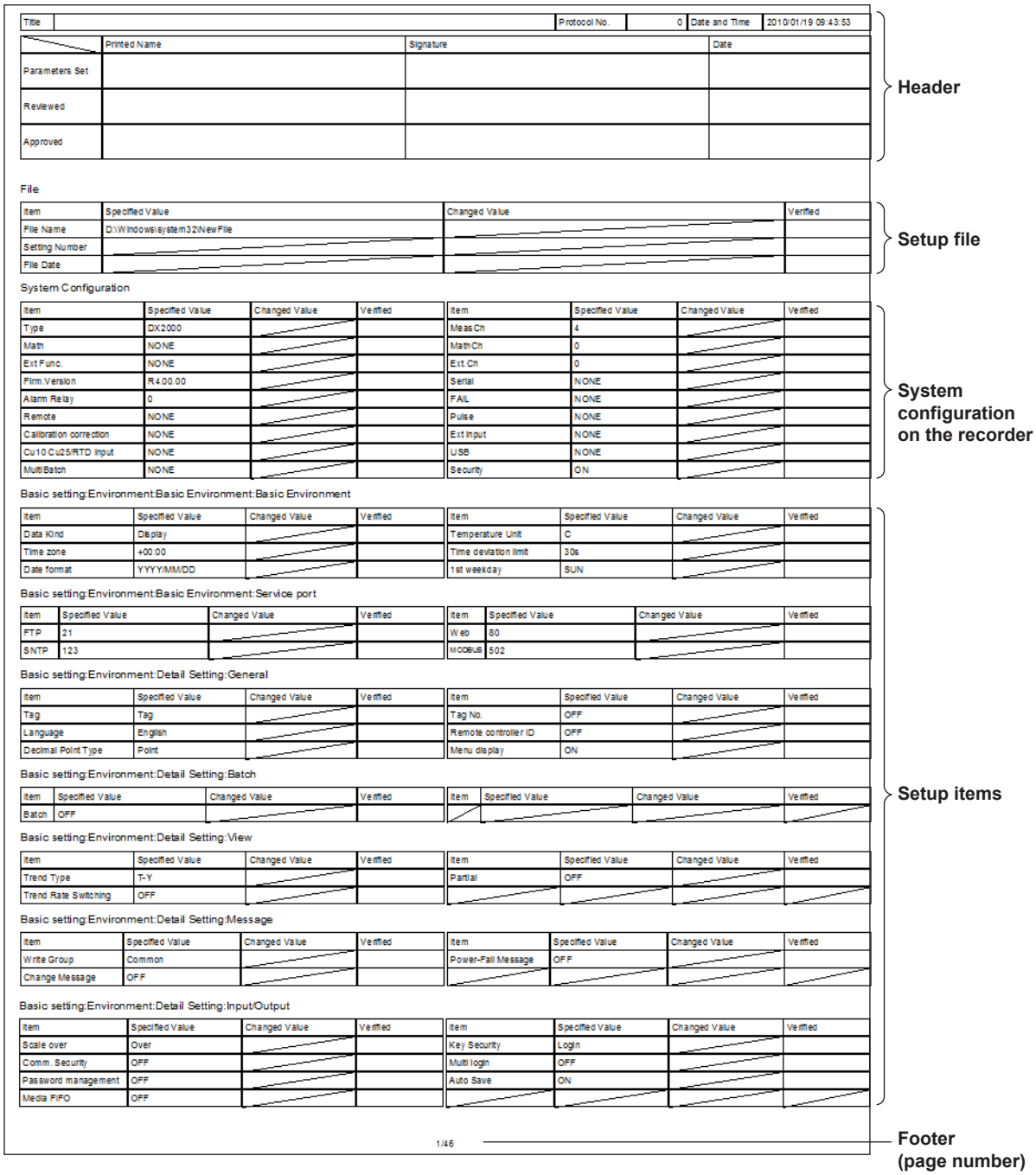
Item	Input Value/Option		Default
Title	Enter a character string of up to 128 characters in length.		Nothing is printed.
Protocol No.	Specify an integer from 0 to 2147483647.		0
Date and time format	Year/Month/Day Hour: Minute:Second	Example: 2010/04/25 12:34:56	✓
	Month/Day/Year Hour: Minute:Second	Example: 04/25/2010 12:34:56	
	Day/Month/Year Hour: Minute:Second	Example: 25/04/2010 12:34:56	
	Day.Month.Year Hour: Minute:Second	Example: 25.04.2010 12:34:56	
	Year-Month-DayTHour: Minute:Second	Example: 2010-04-25T12:34:56	

Note

The print setting information is held while Hardware Configurator is open.

Print Example (Table)

This is an example of what the first printed page looks like.



Title		Protocol No.	0	Date and Time	2010/01/19 09:43:53

	Printed Name	Signature	Date
Parameters Set			
Reviewed			
Approved			

File

Item	Specified Value	Changed Value	Verified
File Name	D:\Windows\system32\NewFile		
Setting Number			
File Date			

System Configuration

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Type	DX2000			Meas.Ch	4		
Math	NONE			Math.Ch	0		
Ext.Func.	NONE			Ext.Ch	0		
Firm.Version	R4.00.00			Serial	NONE		
Alarm Relay	0			FAIL	NONE		
Remote	NONE			Pulse	NONE		
Calibration correction	NONE			Ext.Input	NONE		
Cu10 Cu25/RTD Input	NONE			USB	NONE		
Multi Batch	NONE			Security	ON		

Basic setting:Environment:Basic Environment:Basic Environment

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Data Kind	Display			Temperature Unit	C		
Time zone	+00:00			Time deviation limit	30s		
Date format	YYYY/MM/DD			1st weekday	SUN		

Basic setting:Environment:Basic Environment:Service port

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
FTP	21			Web	80		
SNTP	123			MODBUS	502		

Basic setting:Environment:Detail Setting:General

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Tag	Tag			Tag No.	OFF		
Language	English			Remote controller ID	OFF		
Decimal Point Type	Point			Menu display	ON		

Basic setting:Environment:Detail Setting:Batch

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Batch	OFF						

Basic setting:Environment:Detail Setting:View

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Trend Type	T-Y			Partial	OFF		
Trend Rate Switching	OFF						

Basic setting:Environment:Detail Setting:Message

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Write Group	Common			Power-Fail Message	OFF		
Change Message	OFF						

Basic setting:Environment:Detail Setting:Input/Output

Item	Specified Value	Changed Value	Verified	Item	Specified Value	Changed Value	Verified
Scale over	Over			Key Security	Login		
Comm. Security	OFF			Multi login	OFF		
Password management	OFF			Auto Save	ON		
Media FIFO	OFF						

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Header

Setup file

System configuration on the recorder

Setup items

Footer (page number)

Header
The header contains the title, protocol number, date, and signature.

Setup File
- **Settings**

Item	Description
File Name	The name of the setup file that is being edited. The full path is printed. The name of a newly created file is “NewFile.”
Setting Number*	The ID number of the setup file that is being edited. If there is no ID number or if the file has been newly created, a diagonal line is drawn through this cell.
File Date*	The date when the setup file that is being edited was created. If there is not creation date information or if the file has been newly created, a diagonal line is drawn through this cell.

* These items only appear for files that were created on a DX with the /AS1 advanced security option (files with .pel, .dsd, and .dse extensions).

- **Changed Value**
  The last file name, setting number, and file date that were loaded when you selected [Load Changed Settings].

Specified Values and Changed Values
There are specified value and changed value columns for the system configuration and setup items. The setting values are the values at the time when one of the following operations was last performed (the same as the settings that are recovered when you select [File] - [Restore Original]).
- [File] - [New]
- [File] - [Open]
- [File] - [Save]
- [File] - [Save As]
- [Comm.] - [Receive Setting]
- [Comm.] - [Send Setting]
- [Comm.] - [Partial Transfer]
- [System] - [System Configuration]

The changed values are the last values that have been set for each item. If a value has not been changed, a diagonal line is drawn through its cell.

Note

Items that cannot be set are not printed. Also, an item whose “Specified Value” is not printed is not printed even if the settings are changed so that it can be set.
Example: When [Data Kind] is set to [Display], [Scan Interval] and [Data Length], which are event data settings, are not printed. Even if you change [Data Kind] to [Event] and set [Scan Interval] and [Data Length], these items are not printed.

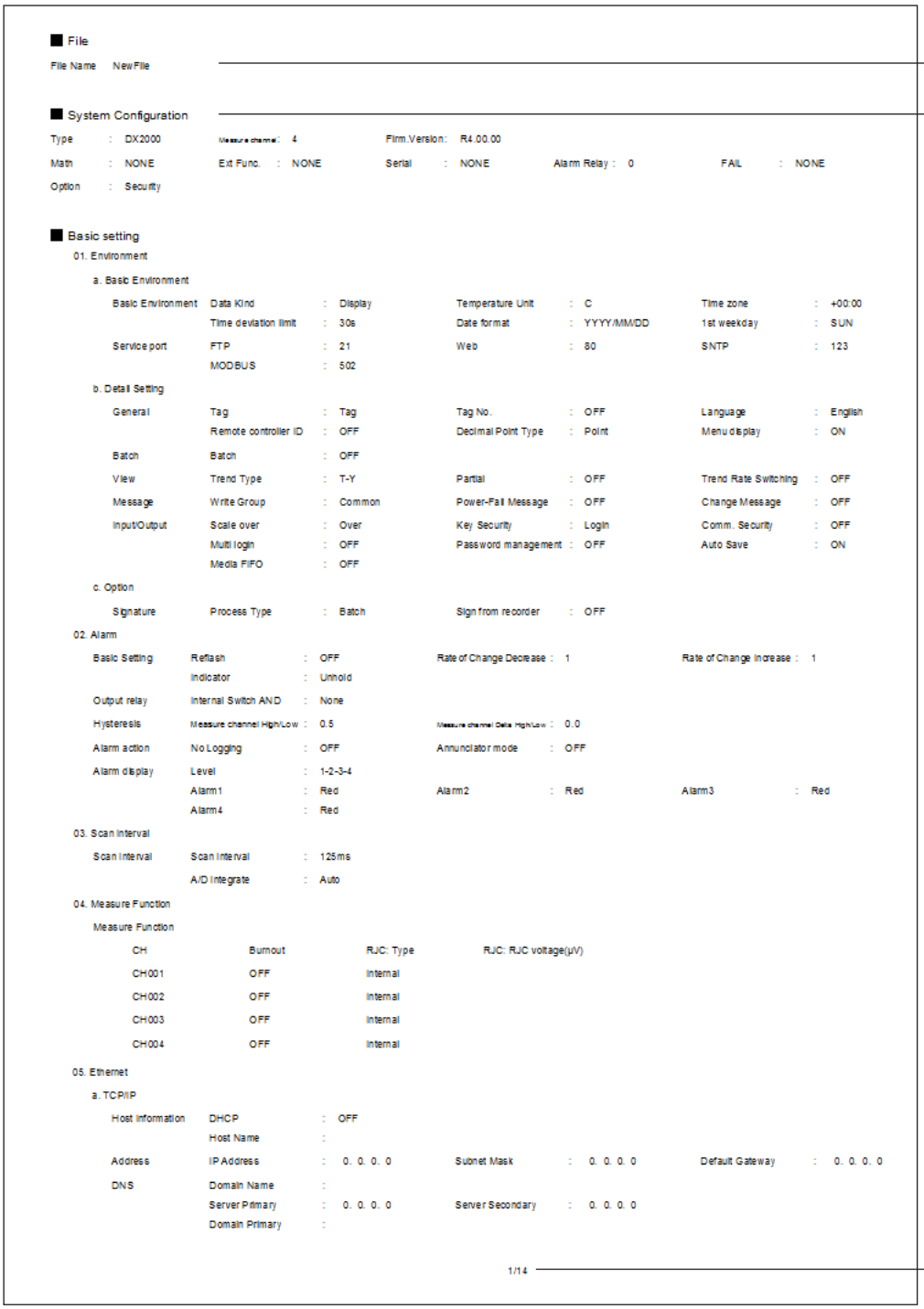
System Configuration
The system configuration of the setup file. The device name, firmware version number, and options are printed.

Setup Items
The settings for each setup item.

Footer
The page number.

Print Example (Text)

This is an example of what the first printed page looks like.



■ File

File Name NewFile

■ System Configuration

Type : DX2000 Measure channel : 4 Firm.Version : R4.00.00

Math : NONE Ext Func. : NONE Serial : NONE Alarm Relay : 0 FAIL : NONE

Option : Security

■ Basic setting

01. Environment

a. Basic Environment

Basic Environment	Data Kind	:	Display	Temperature Unit	: C	Time zone	: +00:00
	Time deviation limit	:	30s	Date format	: YYYY/MM/DD	1st weekday	: SUN
Service port	FTP	:	21	Web	: 80	SNTP	: 123
	MODBUS	:	502				

b. Detail Setting

General	Tag	:	Tag	Tag No.	: OFF	Language	: English
	Remote controller ID	:	OFF	Decimal Point Type	: Point	Menu display	: ON
Batch	Batch	:	OFF				
View	Trend Type	:	T-Y	Partial	: OFF	Trend Rate Switching	: OFF
Message	Write Group	:	Common	Power-Fail Message	: OFF	Change Message	: OFF
Input/Output	Scale over	:	Over	Key Security	: Login	Comm. Security	: OFF
	Multi login	:	OFF	Password management	: OFF	Auto Save	: ON
	Media FIFO	:	OFF				

c. Option

Signature	Process Type	:	Batch	Sign from recorder	: OFF		

02. Alarm

Basic Setting	Reflash	:	OFF	Rate of Change Decrease	: 1	Rate of Change Increase	: 1
	Indicator	:	Unhold				
Output relay	Internal Switch AND	:	None				
Hysteresis	Measure channel High/Low	:	0.5	Measure channel Delta High/Low	: 0.0		
Alarm action	No Logging	:	OFF	Annunciator mode	: OFF		
Alarm display	Level	:	1-2-3-4				
	Alarm1	:	Red	Alarm2	: Red	Alarm3	: Red
	Alarm4	:	Red				

03. Scan Interval

Scan Interval	Scan Interval	:	125ms
	A/D Integrate	:	Auto

04. Measure Function

Measure Function

CH	Burnout	RJC: Type	RJC: RJC voltage(μV)
CH001	OFF	Internal	
CH002	OFF	Internal	
CH003	OFF	Internal	
CH004	OFF	Internal	

05. Ethernet

a. TCP/IP

Host Information	DHCP	:	OFF				
	Host Name	:					
Address	IP Address	:	0. 0. 0. 0	Subnet Mask	: 0. 0. 0. 0	Default Gateway	: 0. 0. 0. 0
DNS	Domain Name	:					
	Server Primary	:	0. 0. 0. 0	Server Secondary	: 0. 0. 0. 0		
	Domain Primary	:					

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File name

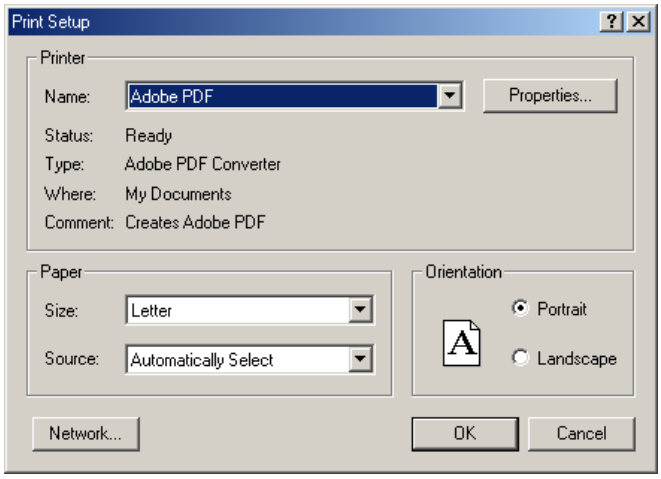
System configuration on the recorder

Setup items

Page number

Print Setup

1. Select [File] - [Print Setting].



2. Set the printer, paper and orientation.

Note

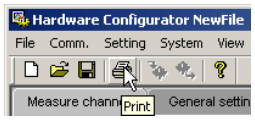
Set the printer according to the environment of the system that you are using.

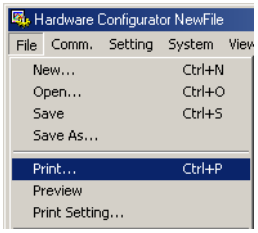
Print Preview

You can preview the print layout before actually printing the data.
Selecting [File] - [Print Preview] displays the print preview screen.

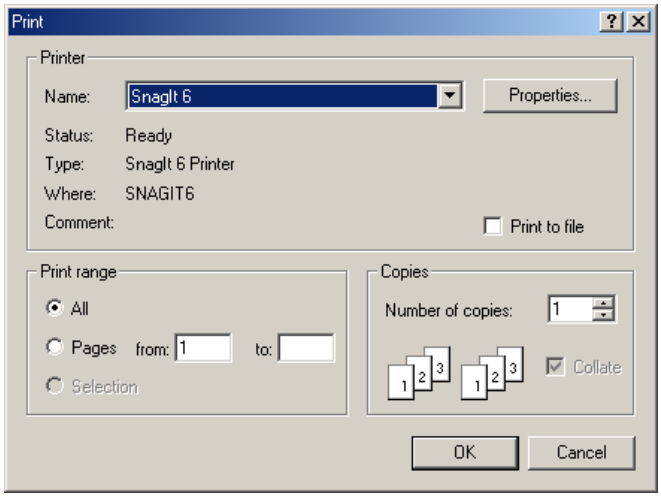
Printing

1. Click the [Print] button, or choose [File] - [Print] from the menu bar.





The [Print] dialog box appears.

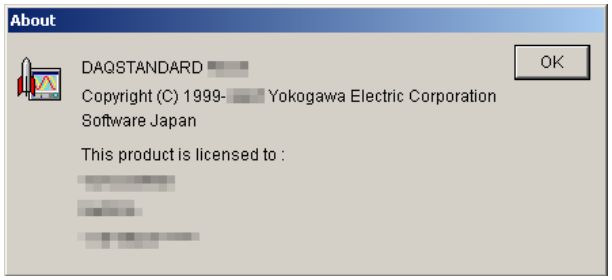


2. Click the [OK] button.
The setup data is printed. For an example of what the printed setup data looks like, see "Print Example (Text)" on the previous page.

1.6 Displaying the Version Information

Procedure

1. Select [Help] - [About] from the menu bar.
   The [About] dialog box appears.



2. Click [OK] to close the [About] dialog box.

2.1 Explanation of Operations

This chapter explains operations relating to the setup data (.PEL extension) of DX1000/DX2000s with the /AS1 advanced security option.

Displaying Setup Data

You can display existing setup data using one of the following methods:

- Open the viewer, and view the setup data within the measured data.
  For the operating procedure, see the DAQSTANDARD Viewer User's Manual (IM04L41A01-63EN).
- Display the setup data within the measured data.
  See section 2.2.
- Display the data of a saved setup file.
  See section 2.2.
- Use communication to receive and display the DX settings.
  See section 2.2.

Note

You cannot display or change [Login] items.

Creating Setup Data

See sections 3.2 and later in chapter 3.

Saving Setup Data and Applying It on the DX

You can use one of the following methods to apply setup data on the DX:

- Save the setup data to a file and load it using the DX.
  For the procedure for saving setup data, see section 3.8. For instructions on how to load setup data, see section 6.9 in the User's Manual (IM04L41B01-01E or IM04L42B01-01E).
- Use communication to send the setup data to the DX.
  See section 3.7.

Note

For [Login] items, the initial values are output when you create new setup data, and the original values are output when you use existing setup data.

Printing Setup Data

You can print setup data. For the operating procedure, see section 1.5.

Note

[Login] items are not printed.

Starting and Stopping Measurement on the DX1000/DX2000 and Checking the DX1000/DX2000 Hardware Information

From this software, you can start and stop measurement on the DX1000/DX2000 and display DX1000/ DX2000 hardware information. For the operating procedure, see section 3.10.

Connecting to the DX

The conditions for establishing a connection with the DX are listed in the table below.

Ethernet

You need to log in to the DX monitoring or setting function as an administrator or user who has been registered on the DX. The connection is automatically closed after you execute the operations.

Operation	Connected Function	User*
Receive setup data	Monitoring function	Administrators and users
Send setup data	Setting function	Administrators
Send address settings (see section 3.3)	Setting function	Administrators
Acquire hardware information	Monitoring function	Administrators and users
Start or stop recording	Setting function	Administrators

* User's who have permission to log in through communication.

For information about the monitoring function, setting function, administrators, users, and simultaneous login limitations, see section 1.3 in the Advanced Security Function (/AS1) User's Manual (IM 04L41B01-05EN).

Invalid User

When a user is prompted for a password, if he or she tries to log in with the wrong password consecutively for the number of times specified by the password retry frequency setting, that user is made invalid, and will be unable to perform operations. The invalid user status is released when an administrator sets the password of an invalid user to the default value.

Serial Communication

You can only use serial communication to output data from the DX.

Operation	Description
Receive setup data	You can perform this operation without logging in.
Send setup data	You cannot perform this operation.
Send address settings	You cannot perform this operation.
Acquire hardware information	You can perform this operation without logging in.
Start or stop recording	You cannot perform this operation.

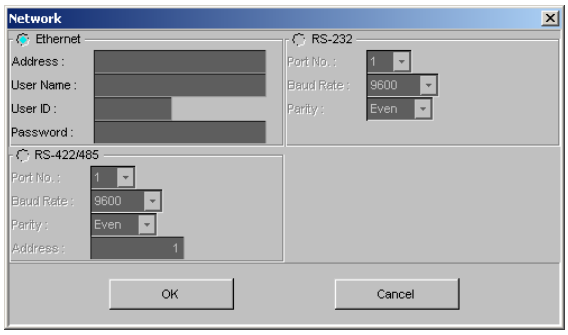
2.2 Displaying Setup Data

To Load Setup Data from the DX1000/DX2000

Use communication to receive and display the DX settings.

1. Click the [Receive Data] button, or select [Comm.] - [Receive Setting] from the menu bar.
   The [Network] dialog box appears.

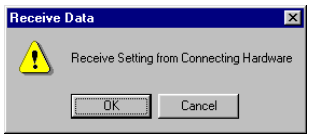
2. Enter all the parameters for [Ethernet], and click the [OK] button.
   For information about the connection conditions, see section 2.1.



   If the [Receive Data] dialog box appears, proceed to step 4.
   If the current password has expired and you are prompted to change it, proceed to step 3.

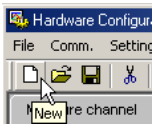
3. Enter the new password into the [New password] and [Re-type new password] boxes, and click the [OK] button.
   The [Receive Data] dialog box appears.

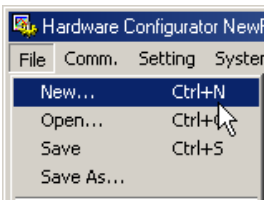
4. Click the [OK] button.
   The software receives the setup data from the DX and displays it.



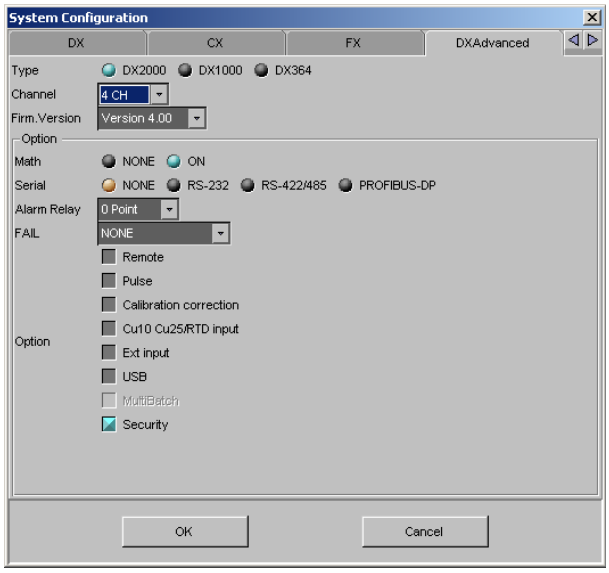
Creating Setup Data by Configuring a New System

1. Click the [New] button, or select [File] - [New] from the menu bar.





The [System Configuration] dialog box appears.
Click the [DXAdvanced] tab.

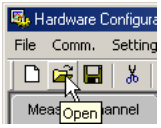


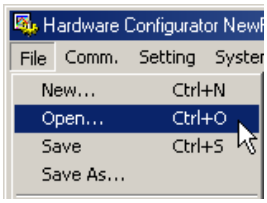
2. Configure all the settings on the [DXAdvanced] tab, and then click the [OK] button.
The DX1000/DX2000 setting screen in displayed.

Loading Existing Setup Data

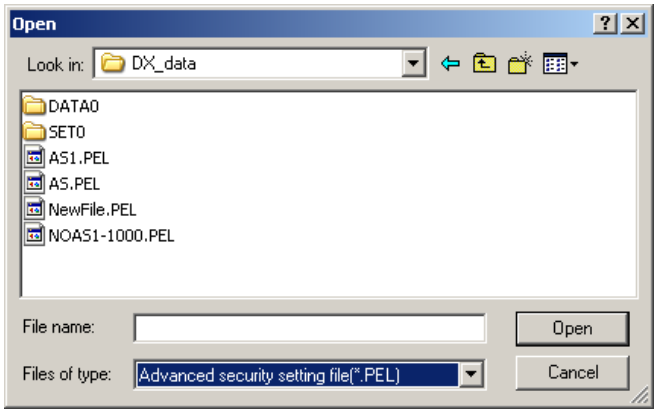
Load and display existing setup data.

1. Click the [Open] button, or select [File] - [Open] from the menu bar.





The [Open] dialog box appears.



2. Select a setup data file (.PEL extension) or measured data file (.DSD or .DSE extension), and click [Open].

The setup data is loaded and displayed.

Note

If you specify a measured data file, the setup file contained within it is loaded.

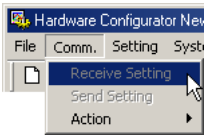
3.1 Starting the Harware Configurator

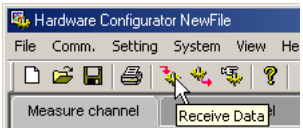
The Hardware Configurator can transmit and receive the setup data, change the setup data, and create new setup data. For information about the settings on DXs with the /AS1 advanced security option, see section 2.2. **The setting screen may differ from your actual screen.**

To Load Setup Data from the DX1000/DX2000

Before performing the following procedure, please make sure that the communication method and parameters are correct. (For details, see section 2.3, “Setting the Communication Method.”)

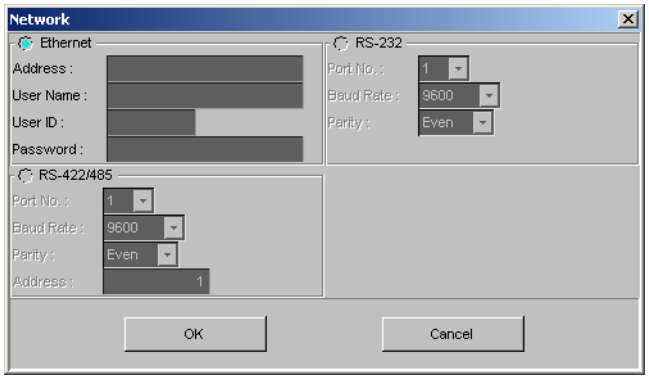
1. Click the [Receive Data] button, or select [Comm.] - [Receive Setting] from the menu bar.





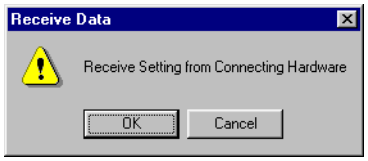
The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Receive Data] dialog box appears.

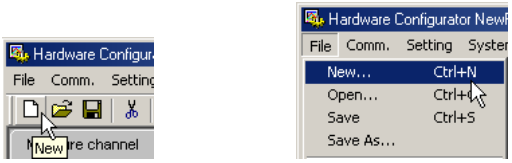
2. Click the [OK] button.



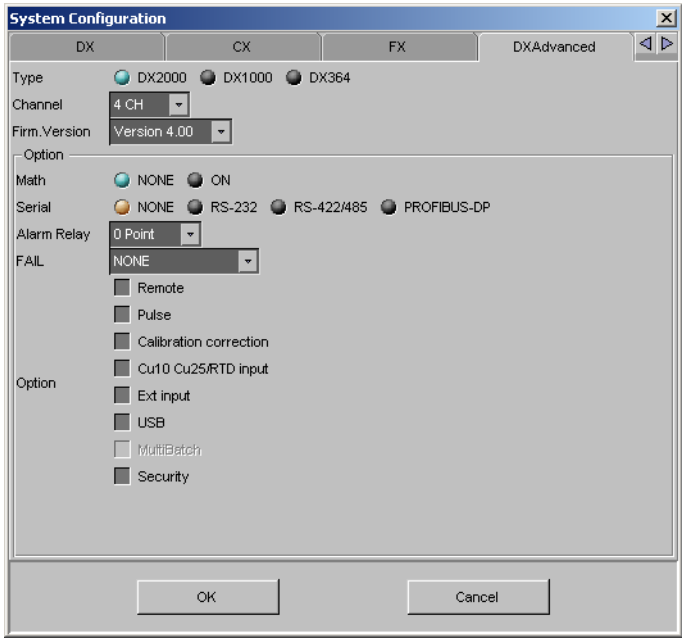
The software receives the setup data from the DX and displays it.

Creating Setup Data by Configuring a New System

1. Click the [New] button, or choose [File] - [New] from the menu bar.



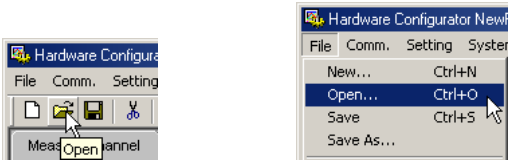
The [System Configuration] dialog box opens.
Click the [DXAdvanced] tab.



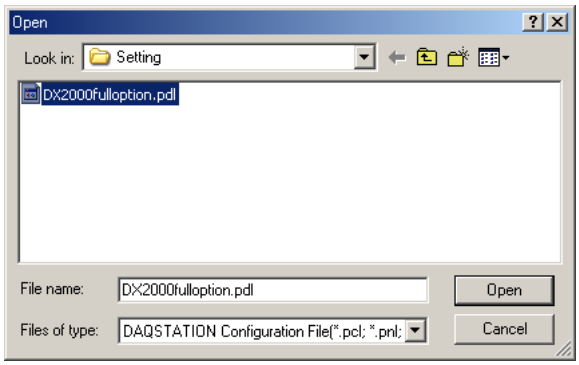
2. Enter all settings on the [DXAdvanced] tab, then click the [OK] button. The DX1000/DX2000 setting screen in displayed.

Loading Existing Setup Data

1. Click the [Open] button, or choose [File] - [Open] from the menu bar.



The [Open] dialog box is displayed.



2. Select a setup data file (with the .PDL extension).

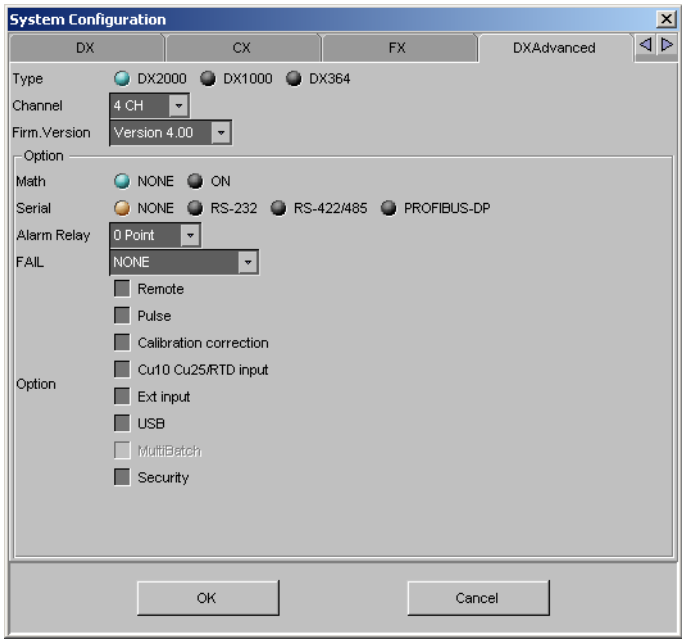
3.2 Setting and Checking the System Configuration and Initializing Settup Data

Changing/Checking the System Configuration

You can create new hardware configuration files, or open existing configuration files and then check the system configuration or change the configuration according to the specifications of the connected DX1000/DX2000.
Normally, a system is set up according to the specifications of the DX1000/DX2000 to be set up.

1. Choose [System] - [System Configuration] from the menu bar.

The [System Configuration] dialog box opens.
Click the [DXAdvanced] tab.

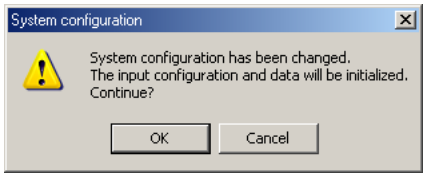


2. Change the various settings according to the DX1000/DX2000 that you will connect to (blue and brown items are selected, gray items are cleared).

The settings in the Option group differ depending on the model and options of the instrument.

For example, for the DX1000, or for the DX2000 with eight channels or fewer, the external function item cannot be selected. If [Pulse] is selected (blue), the [Math] and [Remote] items are disabled.

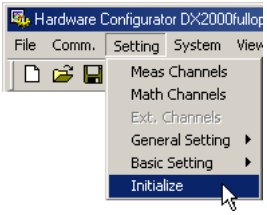
3. After changing the configuration and clicking the [OK] button, the message, "System configuration has been changed. The input configuration and data will be initialized. Continue?" appears.



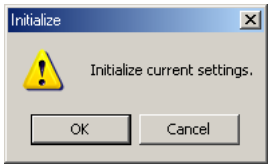
4. Click the [OK] button to initialize the data.

Initializing the Setup Data

1. Choose [Setting] - [Initialize] from the menu bar.



The [Initialize] dialog box opens.

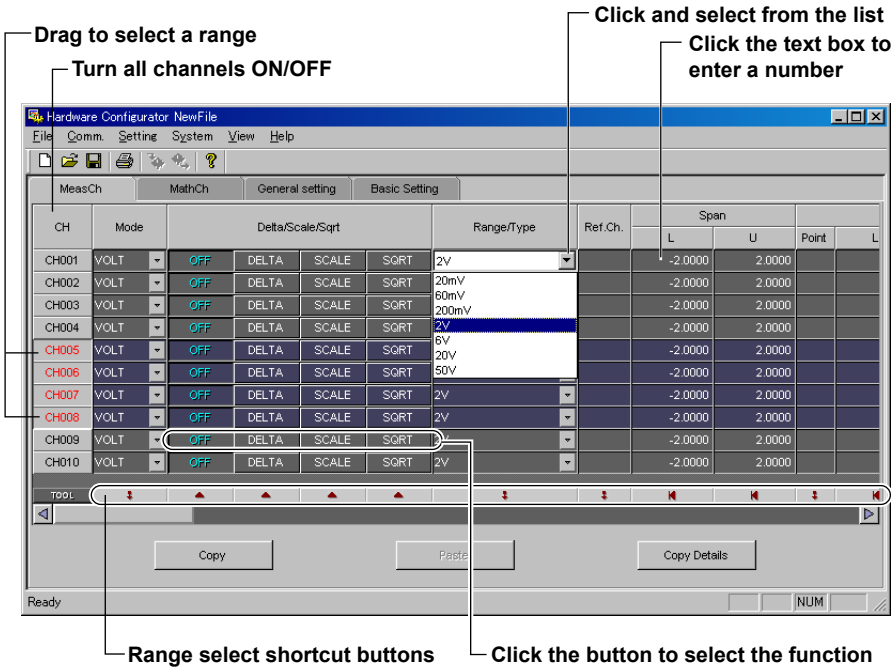


2. Click the [OK] button to initialize the current settings.
The changed settings are restored to the condition when they were newly created.

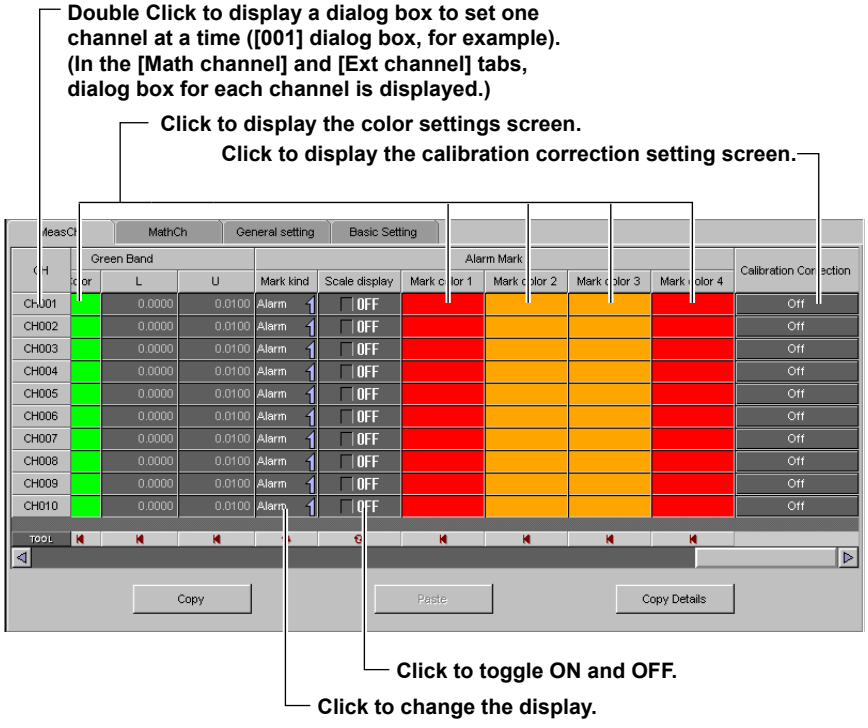
3.3 Setting the Measurement Channels, Ext. Channels

Setting Operation

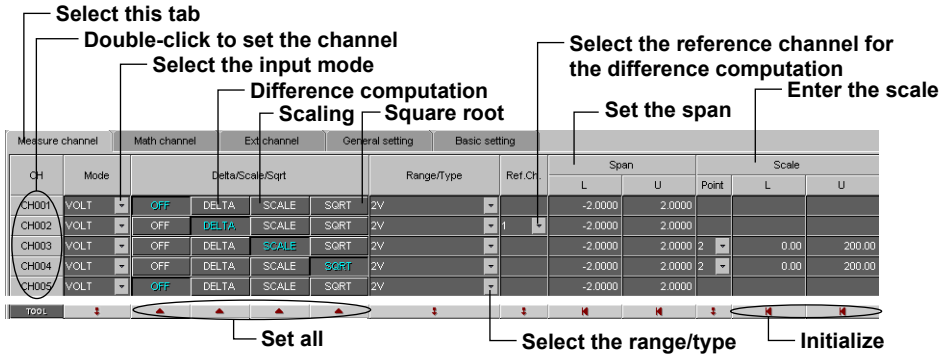
You can select a range of channels and set each item at once.

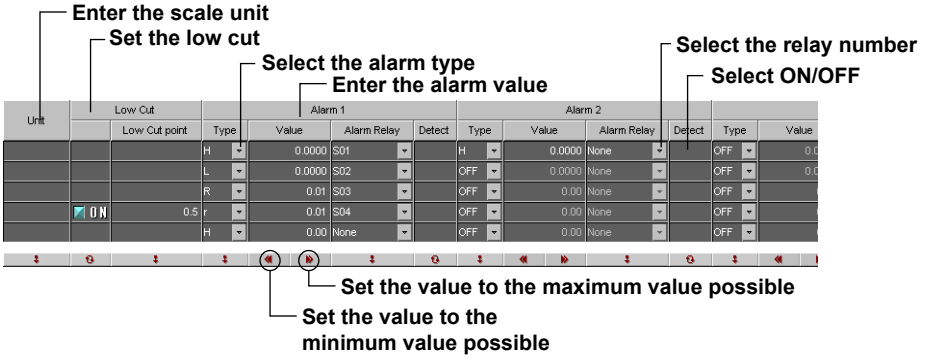


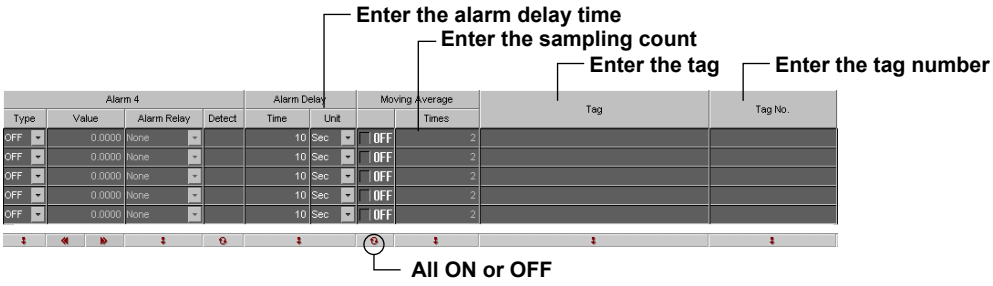
The range select shortcut buttons are effective on the channel range selected. If no channels are selected, the range select shortcut buttons are effective on all channels. For the function of each button, see next page.

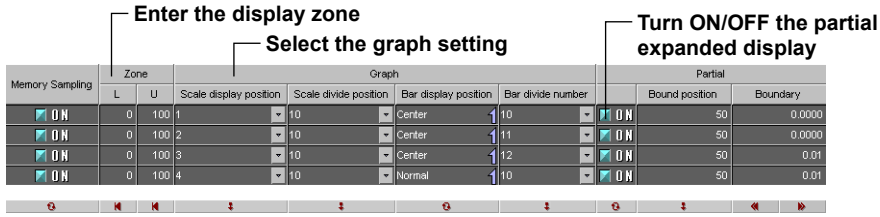


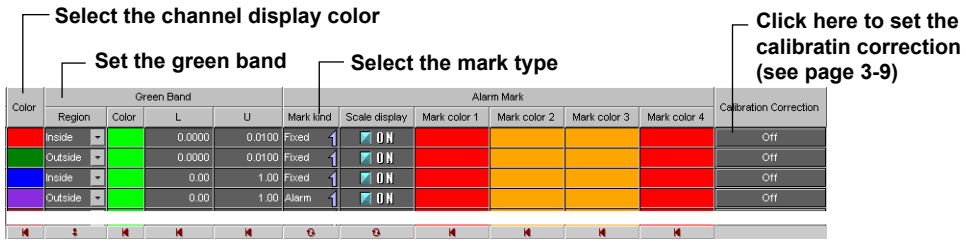
Enter external input channel settings in the same manner as those of the measurement channel items. Also note that this measurement channel setting screen is only one example; your actual screen may vary.











Input Type (Mode and Range/Type)

Correspondence between difference computation, scaling, and square root computation ([DELTA], [SCALE], and [SQRT]) is as follows.

Mode	OFF	DELTA	SCALE	SQRT
SKIP	Yes	No	No	No
VOLT (voltage)	Yes	Yes	Yes	Yes
TC (thermocouple)	Yes	Yes	Yes	No
RTD (resistance temperature detector)	Yes	Yes	Yes	No
DI (voltage level/contact input)	Yes	Yes	Yes	No
1-5 V	No	No	Yes	No

The values in the Range/Type list box vary depending on the above settings.
The following input types have been added in release number 3.

Mode	Input Type	Description
TC	Type XK	XK GOST, /N3 option
RTD	Pt100G	Pt100GOST, /N3 option
	Cu100G	Cu100GOST, /N3 option
	Cu50G	Cu50GOST, /N3 option
	Cu10G	Cu10GOST, /N3 option
	Pt46G	Pt46GOST, /N3 option

The following input types have been added in release number 4.

Mode	Input Type	Description
RTD	Pt200W	Pt200 (WEED), /N3 option

- **Span L, Span U**
  Input range. The selectable range is displayed on the screen.
  The selectable range for Type N has been expanded (from –270.0 to 1300.0°C) in release number 3.

Note

- You cannot set the same value to [Span L] and [Span U].
- When the [Mode] is [1-5V] or [Sqrt], [Span L] must be less than [Span U].

Linear Scaling (SCALE)

Converts the unit to obtain the measured value.

- **Scale L, Scale U**
  Input range after converting the unit. The selectable range is from –30000 to 30000.
- **Point**
  Set the number of digits to the right the decimal to four digits or less (0 to 4).

Note

- The DX converts the measured value to a value obtained by removing the decimal point from the value span specified by [Scale L] and [Scale U]. For example, if the scale setting is “–5 to 5,” the value is converted to a value within the span of “10”; if the scale setting is “–5.0 to 5.0,” the value is converted to a value within a span of “100.” In this case, the resolution of the value converted to a span of “10” is lower than the value converted to a span of “100.” To prevent the display from becoming rough, it is recommended that the scale be set so that this value is greater than 100.
- You cannot set the same value to [Scale L and [Scale U].
- When the [Mode] is [1-5V] or [Sqrt], [Scale L] must be less than [Scale U].

Difference Computation (DELTA)

Displays the difference between the input and the reference channel.
If difference computation is performed between channels that have different range and type settings, the decimal position of the computed result is set to that of the channel computing the difference. If the number of digits to the right of the decimal of the reference channel is greater than that of the channel computing the difference, the reference value below the least significant digit of the channel computing difference is rounded beforehand.

Ref. CH

The reference channel for difference computation.

Square Root

Computes and displays the square root of the input. This setting can be used only when the input mode is set to VOLT (voltage). As necessary, set the span, scale, and unit.

Unit

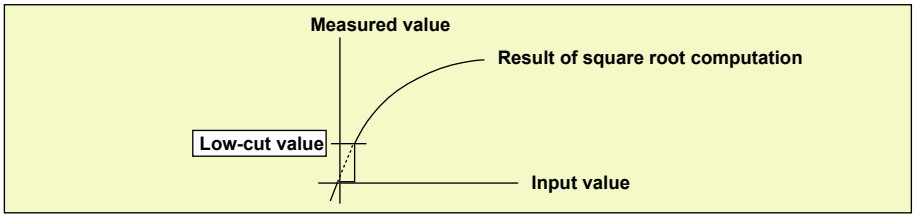
Enter the unit using up to six characters.

Low-cut (Can be set when the mode is 1-5V, and when the mode is VOLT with square root (SQRT) selected.)

Select [ON] to use the low-cut function.

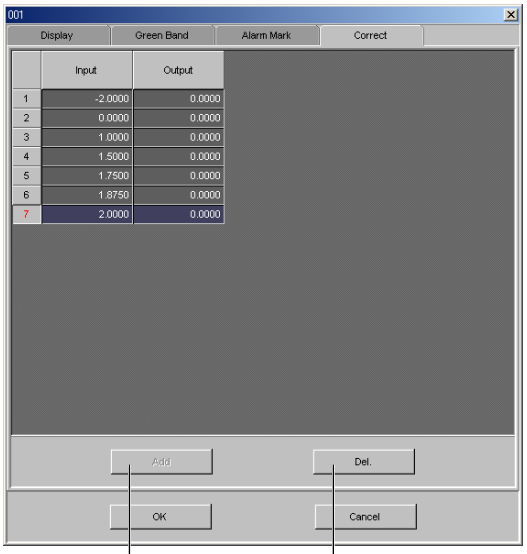
Low-cut value (Can be set when the mode is VOLT with square root (SQRT) selected.)

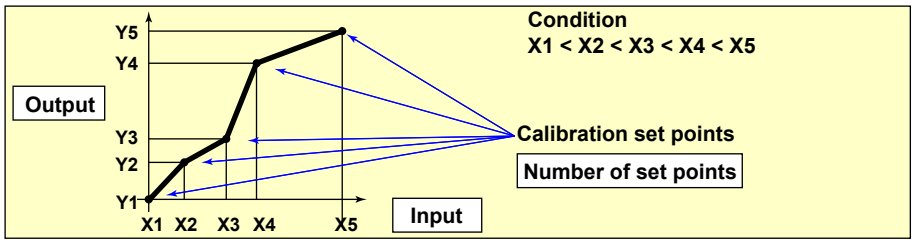
Set the low-cut value in the range of 0.0% to 5.0% of the input span.



Calibration Correction

Set the input and output values for the calibration correction. The number of set points (including the start and end points) can be specified in the range 2 to 16.





Selectable Range of Input and Output Values

- **Channels on which linear scaling is specified**
  –30000 to 30000 (the decimal place is the same setting as the scale value)
- **Other channels**
  Value in the measurable range of the selected range
  Example: –2.0000 to 2.0000 for 2 V range

Alarm

Four alarms (Alarm 1 to 4) can be specified on each channel.

Type

Select H, L, h, l, R, r, T or t. The selectable alarms vary depending on the input mode and computation type. For details, see chapter 3 in the User's Manual IM04L41B01-01E or IM04L42B01-01E.

Alarm value

Alarm is generated using the specified value as the boundary. The selectable range of alarm values vary depending on the input mode and range.

Alarm delay

- **Time**
  Set the alarm delay time to an integer value from 1 to 3600 s. On DXs with the /AS1 advanced security option, you can set the delay time to a value from 1 to 3600 seconds or 1 to 24 hours.
  If the measured value remains above or below the set alarm value for the set period of time (the delay time), an alarm is activated.
- **Unit (Only on DXs with the /AS1 advanced security option)**
  Set the unit of the alarm delay time. You can select seconds or hours.

Note

DX1000/DX2000 specifications

- The alarm delay time takes on a value that is an integer multiple of the scan interval. For example, if the alarm delay time is set to 5 s when the scan interval is 2 s, the actual delay time is 6 s.
- The delay alarm has the following special operations.
- If the computation is stopped in a condition in which the computed value is exceeding the alarm setting when a delay alarm is set on a computation channel, the alarm is turned On after the specified period (delay period) elapses.
- The alarm detection operation is reset if a power failure occurs. The operation restarts after the power recovers.
- If the alarm setting of the delay high limit alarm is changed when an alarm is already activated and the input is greater than or equal to the new setting, the alarm continues. For all other cases, the alarm detection operation starts at the new setting. This is also true for the delay lower limit alarm.

Alarm Relay

To output relays, select the output relay number. Otherwise, select [None].

Detect

This can be selected when [No Logging] is turned [ON] under [Alarm] - [Alarm action] in the [Basic Setting] tab.
Select whether to show or hide the alarm indication when an alarm occurs. If set to [OFF], a signal is output to the alarm output relay or internal switch when an alarm occurs, but it is not indicated on the screen. The alarm is also not recorded in the alarm summary.

Moving Average

To use the moving average, select the sampling count [Times] (2 to 400).

Tag and Tag No.

You can use the tag instead of the channel number to be displayed on the screen.
This can be selected when [Tag] is [Tag] under [Detail Setting] in the [Basic Setting] tab.

Release number 2 or earlier
You can enter tags using up to 16 characters.

Release number 3 or later
You can enter tags using up to 32 characters.
You can enter tag numbers using up to 16 characters. You can specify whether or not to use tag numbers by setting [Tag No.] under [Environment] - [Detail Setting] in the [Basic setting] tab.

Memory Sampling

Turn [ON] (sample) or [OFF] (do not sample).

Zone (Zone L and U)

You can select the range of the screen in which the waveform of each channel is to be displayed.
Specify positions (%) on the display scale for the upper and lower limits.
The conditions for setting the zones are as follows:

- Range: 0% to 100%
  The lower limit L must be less than the upper limit
- The difference between the lower and upper limits is at least 5%.

Graph

For details, see section 5.7 in the User's Manual IM04L41B01-01E or IM04L42B01-01E.

Scale display position
Select the scale display position on the trend display from 1 to 10 for the DX2000 or from 1 to 6 for the DX1000. Select [OFF] if you do not wish to display the scale.

Scale divide position
Select the number of main scale marks on the trend display from 4 to 12 and C10.
C10: The scale is equally divided into 10 sections by main scale marks, and scale values are indicated at 0, 30, 50, 70, and 100% positions on the trend display.

Bar display position
Select [Normal], [Center], [Lower][1], or [Upper][1].

1 [Lower] and [Upper] can only be selected with DX main unit firmware version 2.0x or later.

Bar divide number
Select number of divisions of the scale on the bar graph display.

Partial (Partial Expanded Display)

Bound position (%)

Set the boundary for the partial expanded display. The range is from 1 to 99%.

Boundary

Set the value that is to be the boundary between the reduced section and the expanded section in the range of “minimum span value + 1 digit to maximum span value – 1 digit.” For channels that are set to scaling, the selectable range is “minimum scale value + 1 digit to maximum scale value – 1 digit.”

Example: Input range: –6 V to 6V. Bound position: 30. Boundary: 0
The –6 V to 0 V range is displayed in the 0% to 30% range, and the 0 V to 6 V range is displayed in the 30% to 100% range.

The conditions used to set the boundary vary depending on the measurement and computation channels as follows:

- Measurement channel
  When SCALE and SQRT are not used: Span L < boundary < span U
  When SCALE and SQRT are used: Scale L < boundary < scale U
- Computation channel
  Span L < boundary < span U

Note

For the DX1000/DX2000, this is when [Partial] is turned [ON] under [Detail Setting] in the [Basic Setting] tab.

Color (Display Color)

You can select the display color of each channel from 24 colors.

Green Band

Displays a specified section of the measurement range using a color band on the scale. This setting is common with the bar graph display.

Region (Band area)

Settings	Description
Inside	Displays the area inside using the color band.
Outside	Displays the area outside using the color band.
OFF	Disables the function.

Color

Set the display color.

L and U

Specify the display position. Set a value within the span or scale range.

L: Lower limit of the area.

U: Upper limit of the area.

Alarm Mark

Displays marks indicating the values of the high and low limit alarms, delay high and low limit alarms, and difference high and low limit alarms. This setting is common with the bar graph display.

Mark kind

Settings	Description
Alarm	Indicates green under normal conditions and red when an alarm is activated.
Fixed	Displays a fixed color.

Scale display
To display alarm point marks, select [ON].

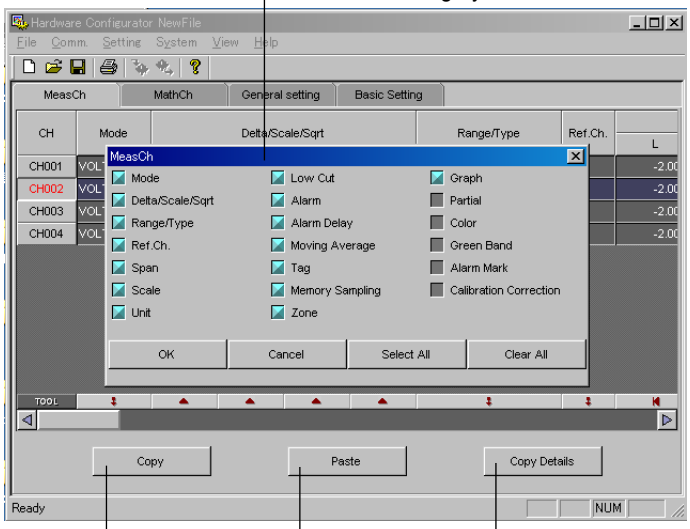
Mark color
If the [Mark kind] is set to [Fixed], specify the color of the alarm point marks. Click a setup box to open its display color selection dialog box. If you select [AUTO], alarm point marks are displayed using the specified alarm display colors (by accessing [Basic setting] > [Alarm] > [Alarm display]; release number 3 or later).

Copying and Pasting Setup Data
You can copy and paste settings using the [Copy], [Paste], and [Copy Details] buttons.

Selecting the Items That You Want to Copy
1. Click the [Copy Detail] button.
   The item selection dialog box opens.
2. Select the items that you want to copy.
   Items with a blue box will be copied.

Click the [X] button to close the item selection dialog box.

The item selection dialog box that opens when you click the [Copy Detail] button
Setting items appear. An item with a blue box is selected.
An item with a gray box is not selected.



Click this button to open the item selection dialog box and select the items that you want to copy

Paste to the copy destination

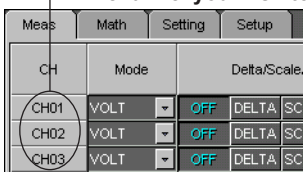
Copy the copy source settings

Copying and Pasting Settings
1. Select the copy source numbers (the [CH] row in this figure) and click the [Copy] button.
   * To specify multiple copy sources, drag over the numbers to select them.
2. Select the copy destination numbers (the [CH] row in this figure) and click the [Paste] button.
   * To specify multiple copy destinations, drag over the numbers to select them.

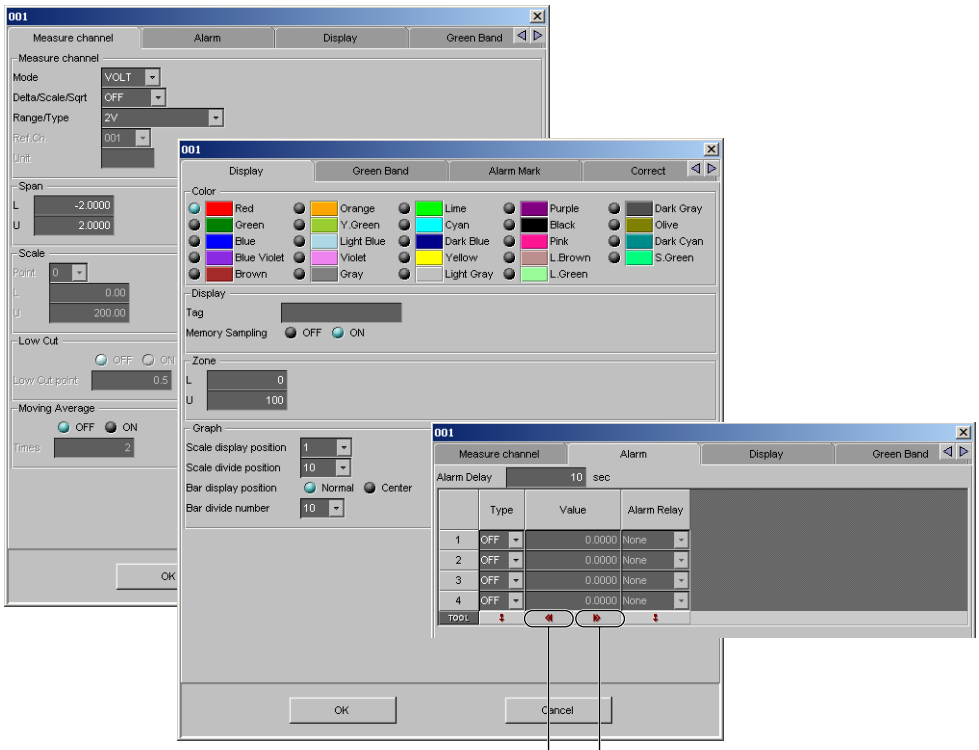
   The settings are copied and pasted.

Setting One Channel at a Time

1. Double-click the channel you wish to set.

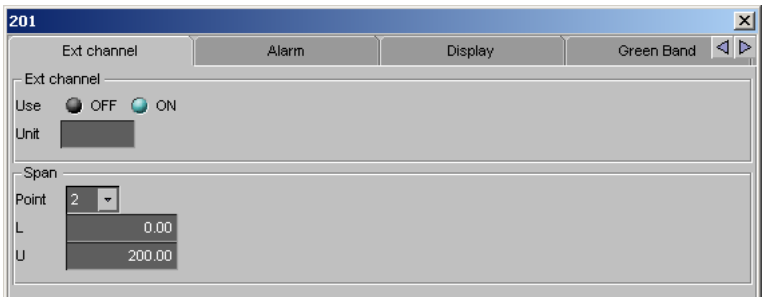


2. The channel setting dialog box opens.



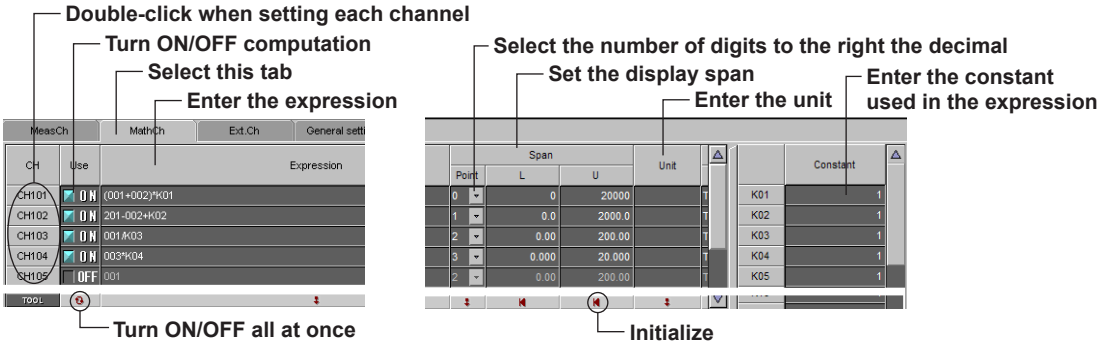
Set the maximum possible value
Set the minimum possible value

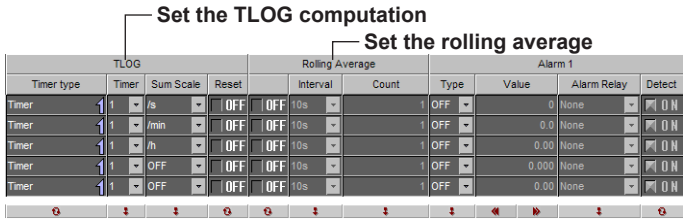
For Ext channels

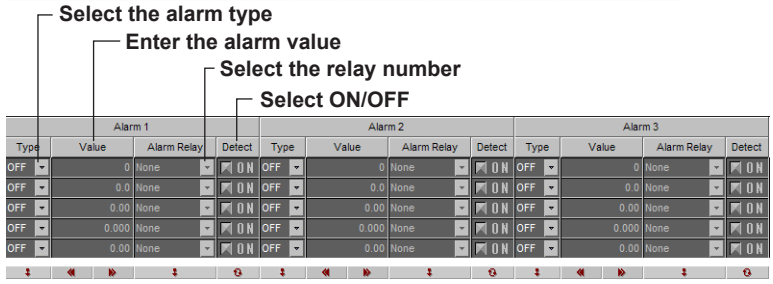


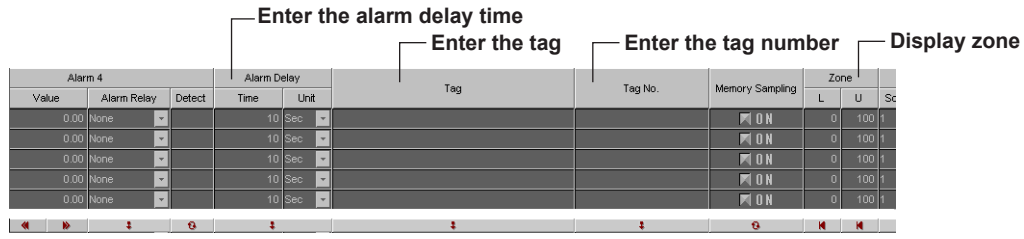
The items in the measurement channel tab and Ext. channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

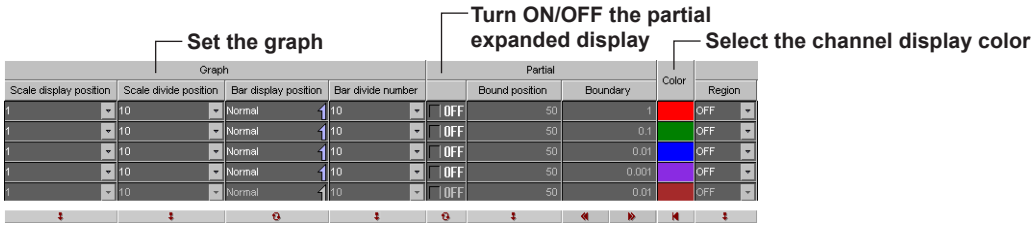
3.4 Setting the Computation Channels

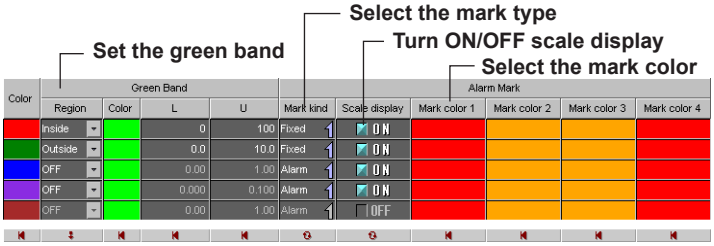










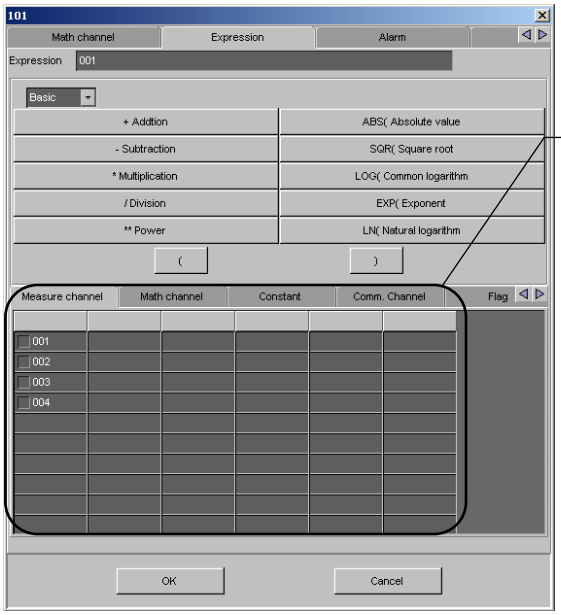


Turning Computation ON/OFF

Set whether or not to perform computation for each computation channel.

Entering Expressions

Enter an expression using up to 120 characters. You can display the variables or constants list and add one of the variables or constants in the list to your expression simply by clicking it. For details related to the expression, see the DX1000/DX2000 User's Manual.



Click the tab to display a list of that item [Memory] tab has been added in release number 3.

Span (Display Span) and Point

Sets the upper and lower limits of the display.
The range is from –9999999 to 99999999. Set the number of digits to the right the decimal to four digits or less (0 to 4).

Unit

Enter the unit using up to six characters.

TLOG (TLOG Computation)

Timer type

Select Timer or MatchTimeTimer.

Timer

Select the number of the timer or match time timer (release number 3 or later) that you want to use.

Sum Scale

Set the sum scale to [/s], [/min], [/h] to match the unit of the measured value.
Example: If the unit of the measured value is "m^3/min," select [/min].
OFF: Sums as-is the measured data per scan interval.

Reset

To reset the TLOG computed value at each interval, select [ON].

Alarm and Tag

The settings are the same as the measurement channels. For details, see section 3.3, "Setting the Measurement Channel, Ext. Channel."

Rolling Average

ON/OFF

To take the rolling average of the measured results, select [ON].

Interval

Select the sampling interval when taking the rolling average from the following: The sampling interval takes on a value that is an integer multiple of the scan interval. For example, if the sampling interval is set to 5 s when the scan interval is 2 s, the actual sampling interval is 6 s.

Count (Number of samples)

Set the number of samples for the rolling average using an integer between 1 and 1500. The rolling average time is equal to the sampling interval × the number of samples.

Note

DX1000/DX2000 Specifications

- If the number of data points to be averaged has not reached the specified number of samples immediately after computation is started, the average of the available data is calculated.
- Computation error data is excluded from the rolling average computation.
- If the computed data exceeds the upper or lower limit, the data is clipped at the upper or lower limit, and the rolling average is computed. The upper and lower limit is "±100000000" excluding the decimal point. The decimal place is the same as that of the span lower limit.

Memory Smpling, Zone, Graph, Partial, Color, Green Band, and Alarm Mark

The settings are the same as the measurement channels. For details, see section 3.3, "Setting the Measurement Channel, Ext. Channel."

Constant

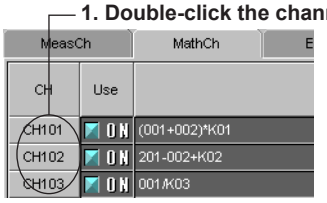
You can set constants to be used in the expression. Up to 60 constants can be specified.

Copying and Pasting Setup Data

See section 3.3, "Setting the Measurement Channel, Ext. Channel."

Setting One Computation Channel at a Time

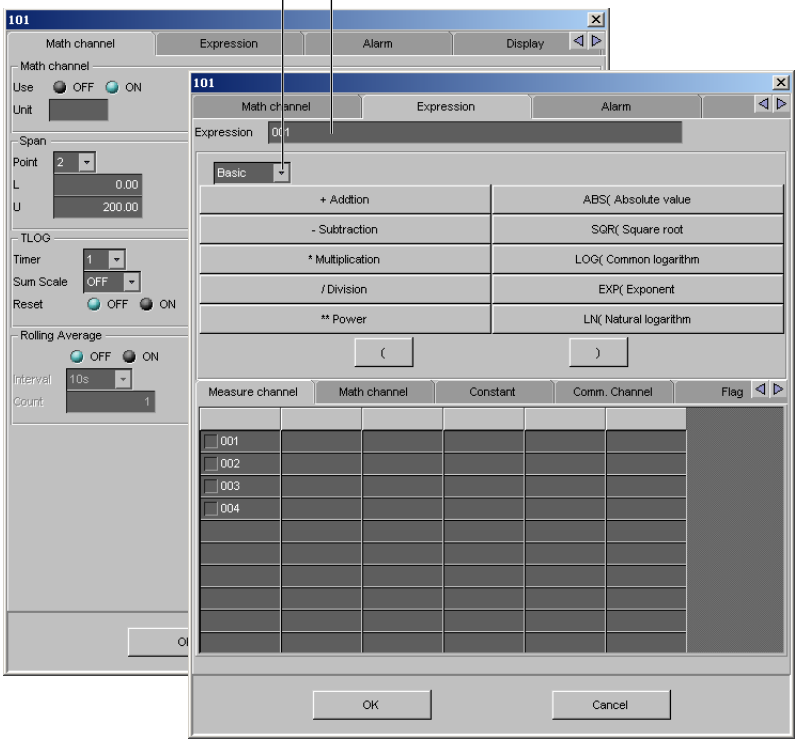
1. Double-click the channel you wish to set.



2. The channel setting dialog box opens.

Clicking here and selecting the list of operators switches the display

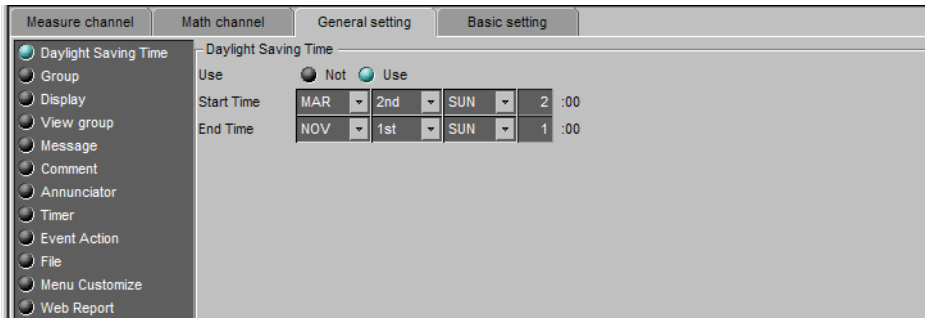
Select channels and constants on the Measure channel, Math channel, Constant, and other tabbed pages and select desired operators to create an expression.



The items in the math channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

3.5 Entering General Settings

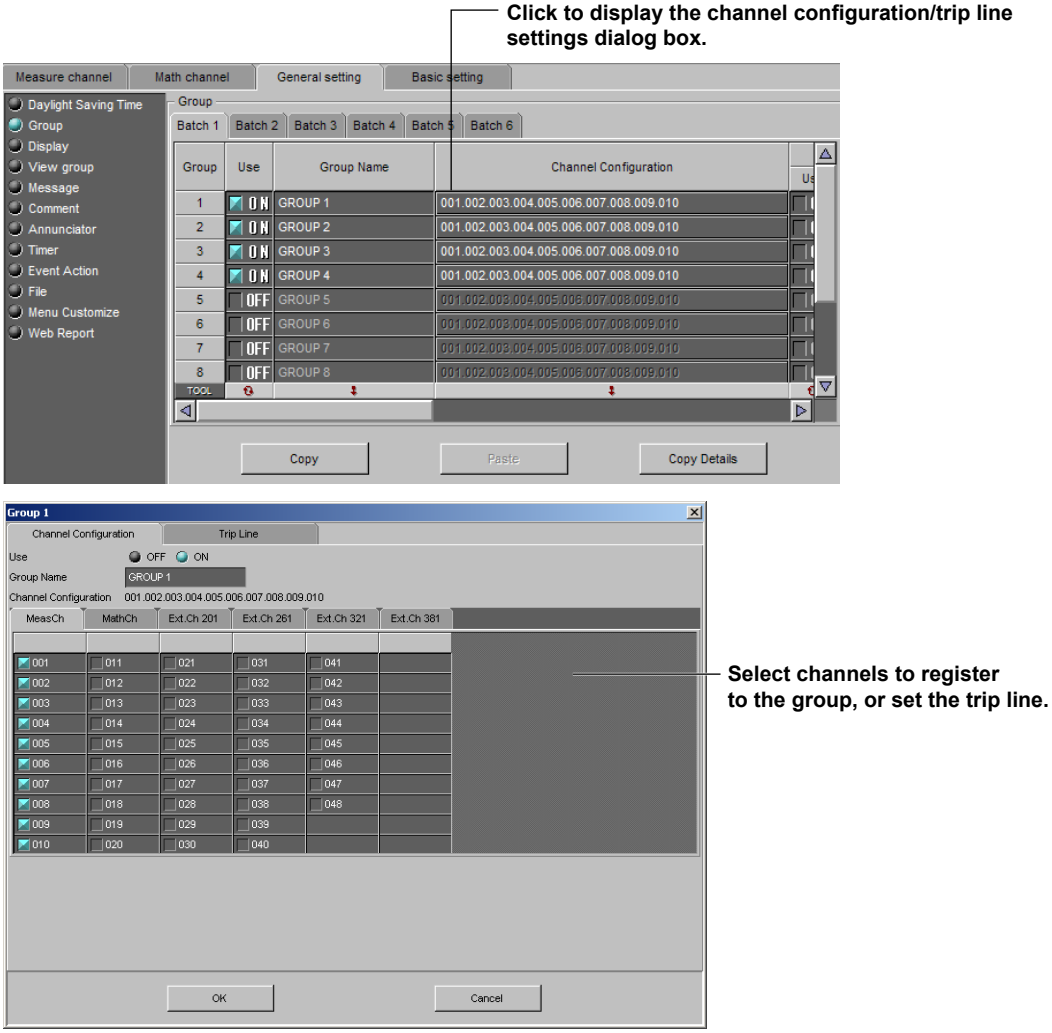
Daylight Saving Time



Start Time and End Time

Set the date and time at which to switch to daylight saving time and the date and time at which to switch to standard time.

Group



[Batch 1], [Batch 2], and Other Similar Tabs (Release number 3 or later)

When the multi batch function (/BT2 option) is enabled, select the appropriate batch tab.

Channel Configuration

- **Use**

  Select [ON] for the display groups that you want to display. The number of groups is as follows:

Model	Multi Batch Function (/BT2 option)	
	Disabled or not installed	Enabled
DX1000	10	6/batch
DX2000	36	12/batch

- **Group name**

  Set the group name. (up to 16 characters)

- **Channel Configuration**

  Set up to 10 channels (DX2000) or 6 channels (DX1000) from measurement channels, computation channels (/M1 and /PM1 options), and external input channels (/MC1 option, DX2000).

Note

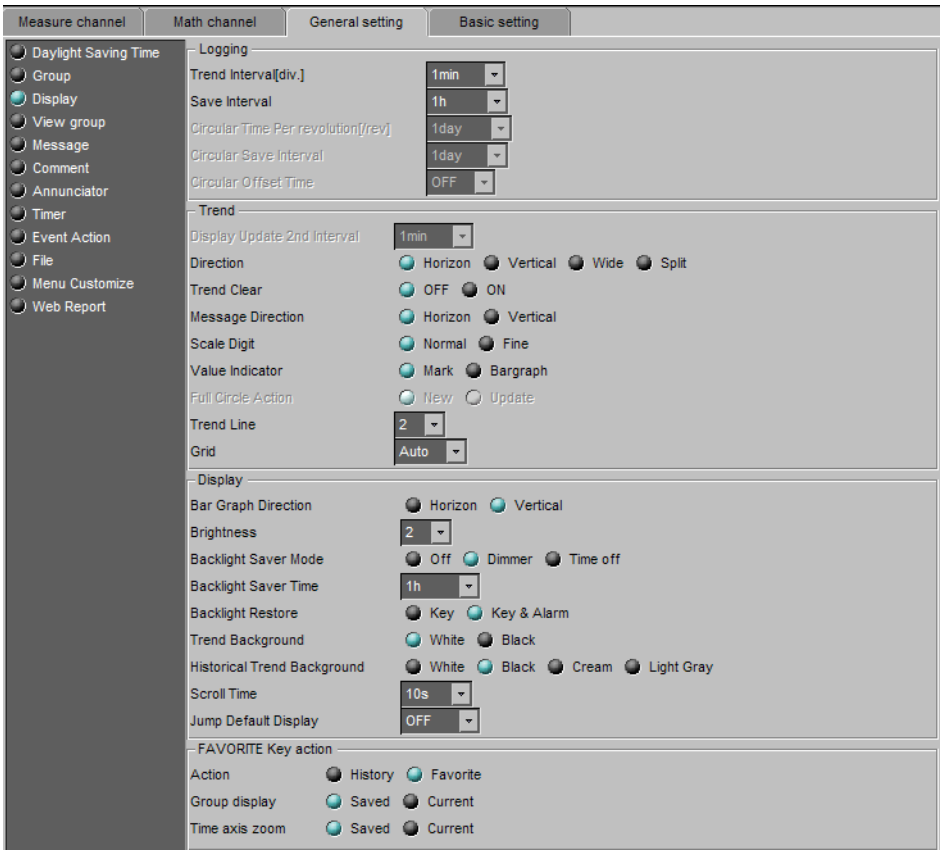
- The trend, digital, and bar graph displays are shown in the specified order.
- A channel can be assigned to multiple groups.
- The same channel cannot be assigned multiple times in a group.

Trip line

Set lines at specified positions in the waveform display range on the Trend display.

- **Use**
  Turn [ON] the trip lines you want to display.
- **Position**
  Set the position in the range of 0 to 100% of the display width.
- **Color**
  The default colors are red, green, blue, and yellow. If you want to change the color, select from the 24 available colors.
- **Trend Line**
  Set the line width of the trip line in dots (1 to 3).

Display



Logging

- **Trend interval [/div]**

  Select the time corresponding to 1 division of the time axis on the trend display from below: You cannot specify a trend interval that is faster than the scan interval. See the table under “Save Interval” below.

  15s*, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min, 1h, 2h, 4h, and 10h

  * Can be set on the DX1002, DX1002N, DX1004, DX1004N, DX2004 and DX2008.

- **Save Interval (when recording display data)**

  Select the size of a record data file. The recorded data is divided by the file size specified here. The available settings vary depending on the number of memory sampling channels and the Trend interval setting.

Trend interval	**5 s*1**	**10 s*1**	**15 s*2**	**30 s**	**1 min**
Selectable range of auto save interval	10 min to 12 hours	10 min to 1 day	10 min to 3 days	10 min to 7 days	10 min to 14 days
Trend interval	**2 min**	**5 min**	**10 min**	**15 min**	**20 min**
Selectable range of auto save interval	10 min to 14 days	10 min to 31 days	10 min to 31 days	10 min to 31 days	1 hour to 31 days
Trend interval	**30 min**	**1 h**	**2 h**	**4 h**	**10 h**
Selectable range of auto save interval	1 hour to 31 days	1 hour to 31 days	2 hours to 31 days	4 hours to 31 days	8 hours to 31 days

*1 Selectable on the DX1002, DX1002N, DX1004, DX1004N, DX2004, and DX2008 (release number 3 or later).

*2 Selectable in fast sampling mode on the DX1006, DX1006N, DX1012, DX1012N, DX2010, DX2020, DX2030, DX2040, and DX2048 (release number 3 or later).

- **Circular Time Per revolution [/rev]**

  Select the time of revolution from [20min]* to [4week].

  * For release number 2 or earlier, this can only be specified on the DX2004 and DX2008. For release numbers 3 and later, in addition to the DX2004 and DX2008, this can also be specified in the fast sampling modes of the DX2010, DX2020, DX2030, DX2040, and DX2048.

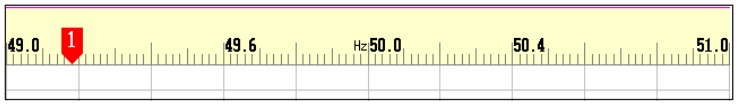
- **Circular Save Interval**
  Select the size of a record data file. The recorded data is divided by the file size specified here. The available settings vary in the range of [10min] to [31day] depending on the number of memory sampling channels and the [Time Per revolution] setting.
- **Circular Offset Time**
  The time at the reference position on the circle can be offset in unit of an hour up to 23 hours. The available settings vary depending on the [Time Per revolution] setting.

Trend

- **Display Update 2nd Interval**
  Enabled when [Trend Rate Switching] is turned [ON] under [Environment] - [Detail Setting] in the [Basic Setting] tab. Select a rate from the list.
  The selectable 2nd intervals are the same as those for Trend interval.
- **Direction**
  Set the display direction of the trends to [Horizontal], [Vertical], [Wide], or [Split].
- **Trend Clear**

Settings	Description
ON	Clears the displayed waveform when the memory sampling is started.
OFF	Does not clear the waveform when the memory sampling is started.

  This is fixed at [ON] if you are using the multi batch function (/BT2 option; release number 3 or later). You can set the multi batch function by setting [Batch operation qty] under [Environment] - [Detail Setting] in the [Basic setting] tab.
- **Message direction**
  Set the display direction of messages to [Horizontal] or [Vertical]. When the trend is set to Vertical, the message direction is fixed to [Horizontal].
- **Scale Digit**
  Select the [Normal] or [Fine].
  Fine If the scale value is two-digit display, it can be changed to three digits. For example, if the scale range is “49.0 to 51.0,” the scale values are displayed using 3 digits as shown below.



- **Value Indicator**
  The current value is displayed as a mark or a bar graph.
- **Full Circle Action**

Settings	Description
Allclear	Clears the entire waveform when one revolution of waveform is recorded and continues the recording of the next revolution.
Divclear	Clears one division of the old waveform when the remaining amount of waveform to be recorded falls to one division and continues the recording.

- **Trend Line**
  Set the line width of the trend in dots (1 to 3).
- **Grid**
  Select the number of grids to be displayed in the waveform display area of the trend display.

Settings	Description
4 to 12	Displays a grid that divides the display width into 4 to 12 sections.
Auto	Displays the same number of grids as the number of scale divisions of the first assigned channel of the group.

Display

- **Bar Graph Derection**
  Select Bar graph derection.
- **Brightness**
  Select a value from 1 to 6 (2 by default). Larger the value, brighter the display becomes.
- **Backlite Save Mode**

Settings	Description
OFF	Disables the backlight saver.
Dimmer	Dims the display if there is no operation for a given time.
Timeoff	Turns the backlight OFF if there is no operation for a given time.

- **Backlight Saver Time**
  Select a value from 1 min to 1 h. If the specified time elapses without any key operation or alarm occurrence, the LCD backlight switches to the specified mode.
- **Backlight Restore**

Settings	Description
Key	The backlight returns to the original brightness when a key is pressed.
Key&Alarm	The backlight returns to the original brightness when a key is pressed or when an alarm occurs.

- **Trend Background**
  Set the background color of the operation screen to White (default setting) or Black.
- **Historical Trend Background**
  Select the background color of the historical trend display from the following:
  Settings: White, Black (default setting), Cream, and Lightgray
- **Scroll Time**
  Set the switching interval from the available settings between 5 s and 1 min. The groups switch in ascending order.
- **Jump Default Display**
  Returns to a preset display if there is no key operation for a specific time.

Settings	Description
1min to 1h	Time until switching the display.
OFF	Disables the function.

FAVORITE Key action (Release number 3 or later)

- **Action**

Settings	Description
History	The historical trend of the currently displayed data appears when you press the favorite key.
Favorite	The displays that have been registered to the favorite key appear when you press the favorite key. Select Favorite when you want to register displays to the favorite key and use the key to switch between the displays.

- **Group display**
  This setting is valid when [Action] is set to [Favorite].

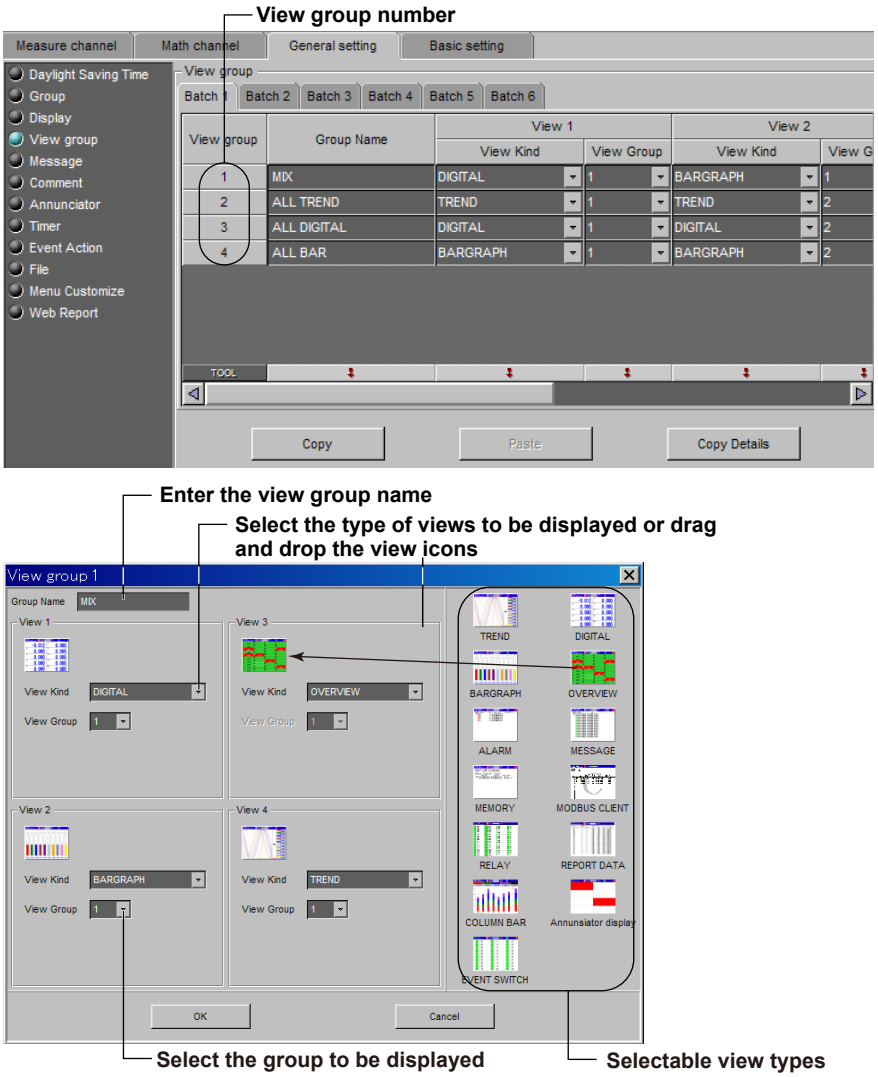
Settings	Description
Current	Of the displays that have been registered to the favorite key, those that display groups (the trend, digital, bar graph, and historical trend displays) are displayed using the currently displayed group.
Saved	Registered displays are displayed using the display groups that were selected when they were registered.

- **Time axis zoom**
  This setting is valid when [Action] is set to [Favorite].

Settings	Description
Current	Historical trend displays that have been registered to the favorite key are displayed using the current time axis zoom.
Saved	Historical trends are displayed using the time axis zooms that they were registered with.

View Group

Set the screens that will be displayed in the 4 panel display. This function is for the DX2000 only.
With revision R7.21 or later, you can open a settings dialog box for any view group by double-clicking its number.



[Batch 1], [Batch 2], and Other Similar Tabs (Release number 3 or later)

When the multi batch function (/BT2 option) is enabled, select the appropriate batch tab.

Group Name

Up to 16 characters can be entered for the group name.

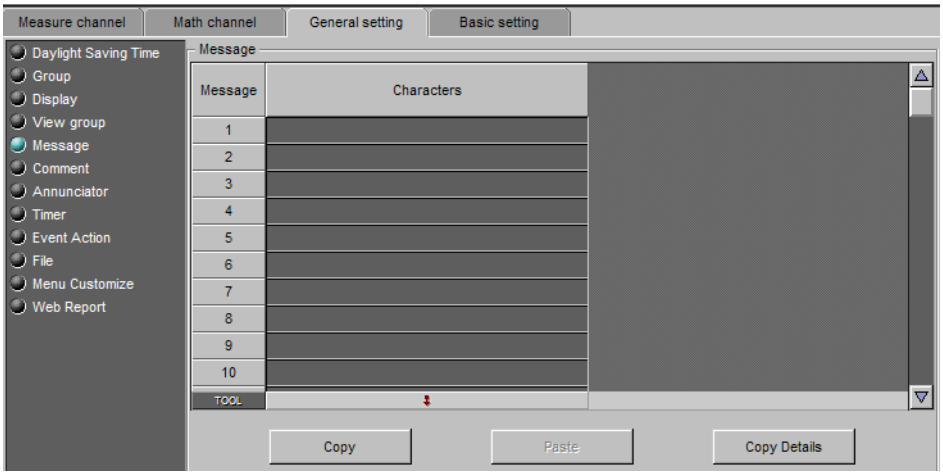
View Kind

The view group is made up of four screens. Select the type of screen to display in each screen.
You can also select the COLUMN BAR, Annunciator display, and EVENT SWITCH screens (release number 3 or later).

View Group

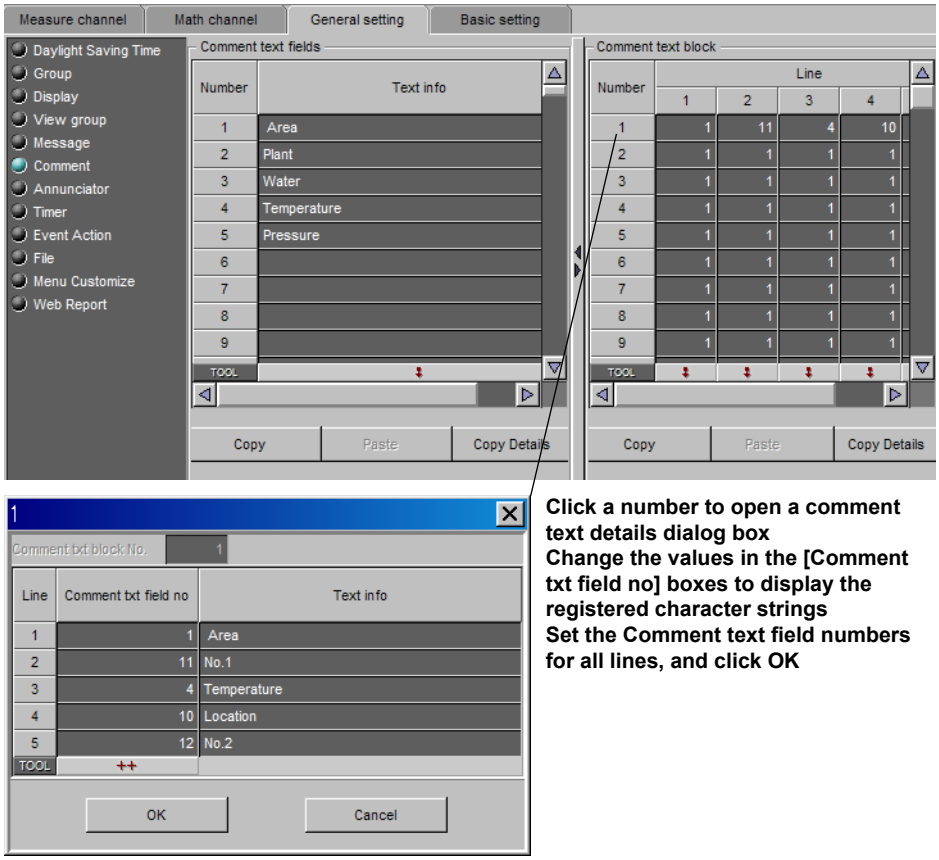
Up to four view groups can be registered. Specify the group to display. If you select COLUMN BAR, specify the COLUMN BAR group.

Message



Enter a message to be written to the group of up to 32 alphanumeric characters.

Comment (Release number 3 or later)



Click a number to open a comment text details dialog box
Change the values in the [Comment txt field no] boxes to display the registered character strings
Set the Comment text field numbers for all lines, and click OK

Comment text fields

- **Number and Text info**

  You can register text strings to Text info boxes.

  Text string: You can enter up to 32 characters.

Model	Number of comment text fields
DX1000	100
DX2000	200

Comment text block

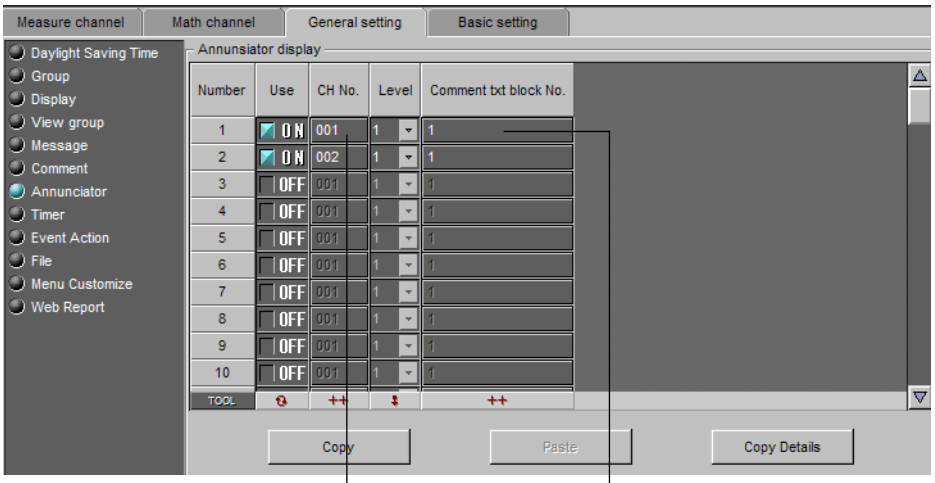
- **Number and Line**

  You can register text strings to Comment text blocks. Register comments to comment text blocks by combining up to 5 comment text fields. Set the comment text fields that you want to register in the Line boxes.

Model	Number of comment text blocks
DX1000	50
DX2000	100

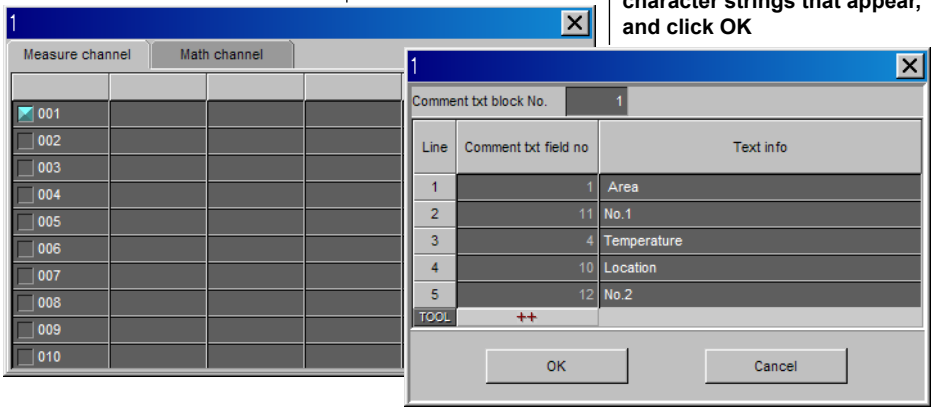
Annunciator (Release number 3 or later)

These settings are activated when the annunciator mode is set to [ON] (by accessing [Basic Setting] - [Alarm] - [Alarm action] - [Annunciator mode]).



Click here to open the channel selection dialog box
Click the desired channel numbers to select them

Click here to open a dialog box for specifying a comment text block
Enter values in the [Comment txt block no] boxes, check the character strings that appear, and click OK



Number

The position of the annunciator window.

Model	Displayed Windows
DX1000	24 or less
DX2000	80 or less

Use

Set the annunciator position that you want to use to [ON].
Starting with 1, consecutively set all annunciator positions that you want to use to [ON].
After a position has been set to [OFF], all of the positions after it will also be turned off even if they are set to [ON].

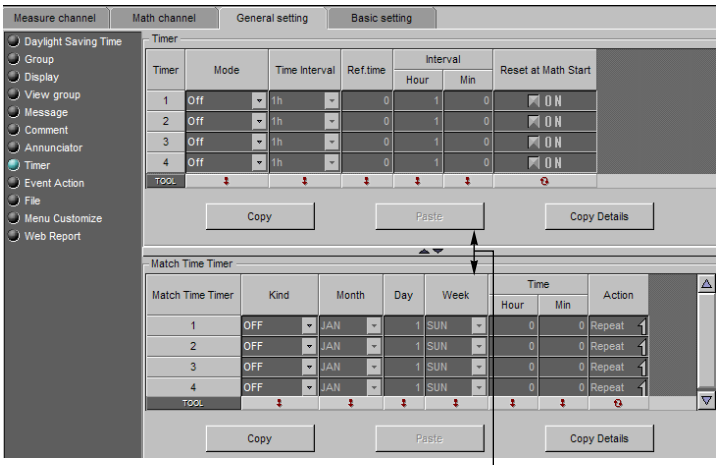
CH No. and Level

You can assign alarms to annunciator windows by specifying channel numbers and alarm levels.
You can set [Level] to [1], [2], [3], [4], or [All]. If you select [All], all of the alarms in the specified channel are assigned to the specified window.

Comment txt block No.

You can select a text string (label) to display in the annunciator window by selecting a comment text block number.

Timer



Timer used by event action. Used also in the TLOG computation of the computation function. The table below shows the number of timers supported by the DX1000 and DX2000.

Model	Number of Timers
Models without the multi batch function (/BT2 option)	4
Models with the multi batch function (/BT2 option; release number 3 or later)	12

When Using an Absolute Timer

- **Mode**
  Select [Absolute].
- **Time interval**
  Select the interval from the available settings between 1min to 24h.
- **Ref.time**
  Set the time in the range of hour 0 to hour 23.

When Using a Relative Timer

- **Mode**
  Select [Relative].
- **Time interval**
  Set in the range from 00:01 (1 min.) to 24:00 (24 hours).
  Hour: Set in the range from 0 to 24.
  Min: Set in the range from 0 to 59.
- **Reset at Math Start**
  ON Resets the timer when computation is started. The resetting of the timer is not considered to be a timeout. Even if the timer is used as an event, the action is not executed.

Match Time Timer

Set the time match condition used in event action. You can set the time condition that is used by the event action function. The table below shows the number of match time timers supported by the DX1000 and DX2000.

Model	Number of Match Time Timers
Models without the multi batch function (/BT2 option)	4
Models with the multi batch function (/BT2 option; release number 3 or later)	12

- **Kind**

  Day Set the time match condition of a day.
  Week Set the time match condition of a week.
  Month Set the time match condition of a month.
  Year Set the yearly time match conditions (release number 3 or later).

  Set the items with check marks in the following table depending on the Kind setting.

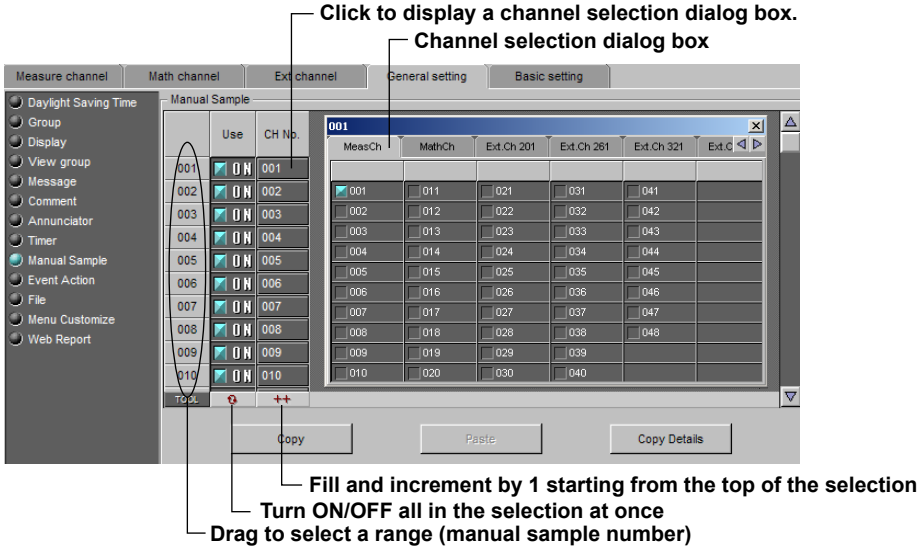
Setup Item	Kind			
	Daily	Weekly	Monthly	Year
Month				✓
Day			✓	✓
Week		✓		
Hour:Minute	✓	✓	✓	✓

- **Month**
  Set the month (release number 3 or later).
- **Day**
  Set the day.
- **Week**
  Set the day of the week.
- **Hour:Minute**
  Set the time in the range of 00:00 to 23:59.
- **Timer action**

Settings	Description
Single	Executes the action once when the condition is met.
Repeat	Executes the action at every specified time.

Manual Sample

On a DX2000 with the external input channel (/MC1) option, specify the channel that will be manually sampled. On all other models, all channels will be manually sampled so this setting is not necessary.



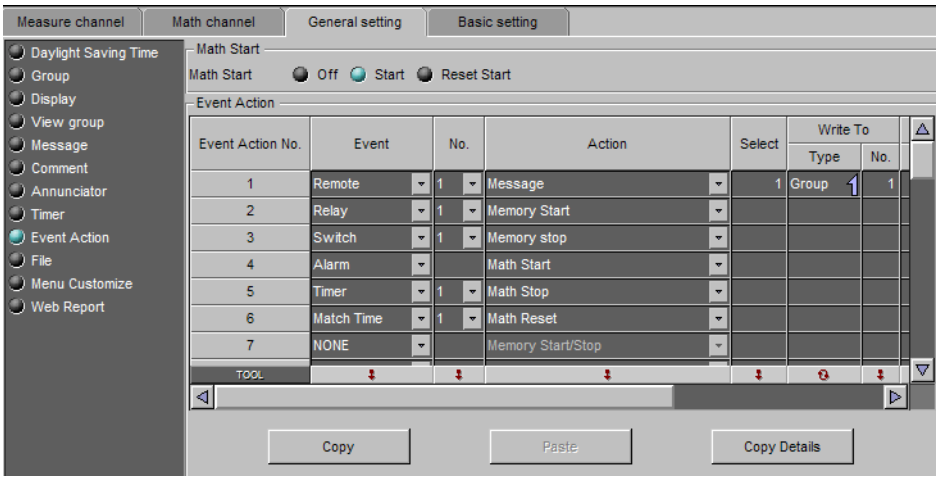
Manual sample number

001 to 120. The instantaneous values are output in this order.

Manual Sample

- **Use**
  Select On when assigning a channel to the manual sample number.
- **CH No.**
  Enter a channel number of a measurement channel, computation channel (/M1 and /PM1 options), or external input channel (/MC1 option).

Event Action



Math Start

Settings	Description
Off	Does not start the computation even when the START key is pressed.
Start	Starts the computation when the START key is pressed.
Reset Start	Resets the computed result up to then and starts the computation when the START key is pressed.

Event Action No.

You can set up to 40.

Event

The condition to execute the action.

Settings	Description
NONE	Not use.
Remote	Select the remote control input terminal number.
Relay	Select the alarm output relay number.
Relay off*2	Select the alarm output relay number.
Switch	Select the internal switch number.
Switch off*2	Select the internal switch number.
Timer	Select the timer number.
Match Time	Select the match timer number.
Alarm	-
Alarm off*2	-
User Key	-
Level*1	Select the event level switch number.
Level switch off*2	Select the event level switch number.
Edge*1	Select the event edge switch number.

*1 Available in release numbers 3 and later.

*2 Available in release numbers 4 and later.

Action

The action to be executed when an event occurs.

Settings	Description
Memory Start/Stop	-
Memory Start	-
Memory Stop	-
Trigger*2	Can be specified when the DX is configured to record event data.
AlarmACK	Cannot be specified when the event is set to [Relay], [Switch], or [Alarm].
Math Start/Stop	Can be specified on /M1 and /PM1 options.
MathStart	Can be specified on /M1 and /PM1 options.
MathStop	Can be specified on /M1 and /PM1 options.
Math Reset	Can be specified on /M1 and /PM1 options.
Save Display Data	Can be specified when the DX is configured to record display data.
Save Event Data	Can be specified when the DX is configured to record event data.
Message	Set the message number and the destination. Set the message destination to all groups (All) or a group number.
Snapshot	-
Display Update Interval Change	Can be specified when the function for switching between the trend update interval and the secondary update interval is enabled.
Manual Sample	-
Timer Reset	Cannot be specified when the event is set to [Timer].
Display Group Change	Specify the number of the group to be displayed.
Flag	Can be specified on /M1 and /PM1 options.
Time ADJUST	Can be specified only when the event is set to [Remote].
Panel Load*2	Can be specified only when the event is set to [Remote].
Alarm Display Reset*1	You can specify this when the annunciator sequence is set to use the “ISA-M” annunciator and the event is set to [Remote], [User Key], or [Edge].
Comment Display*1	Specify the comment text block number to display.
Favorite Display*1	Choose which registered display to switch to. Set [Action] to [Key] or [Select].

Settings	Description
Key	Performs the same operation as pressing the favorite key.
Select	Displays the specified favorite screen. Set the registration numbers of the screens you want to specify in the [No.] boxes.

*1 Available in release numbers 3 and later.

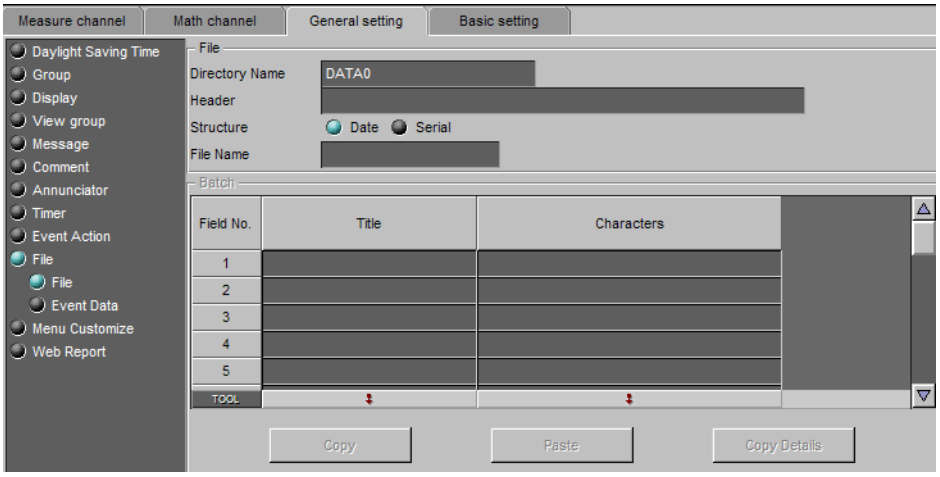
*2 Cannot be selected on DXs with the /AS1 advanced security option.

When the multi batch function (/BT2 option; release number 3 or later) is enabled, specify the target batch group when you set the action to any of the settings below.

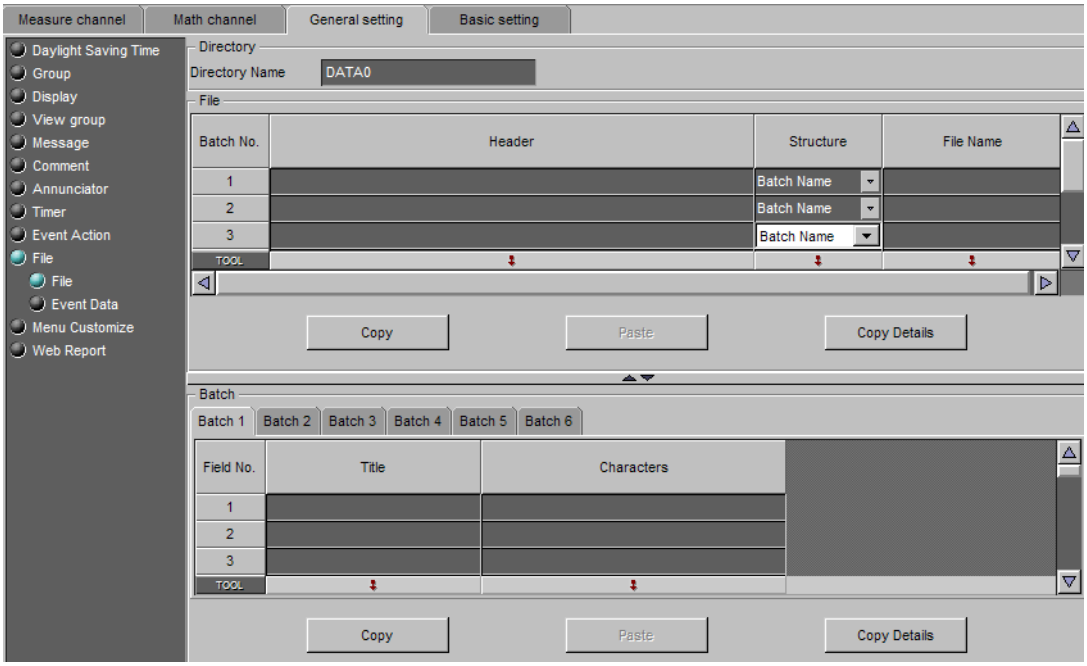
Settings that require the designation of a specific batch group	Memory Start/Stop
	Memory Start
	Memory Stop
	Math Reset
	Save Display Data
	Save Event Data
	Message
	Display Group Change

File

When the multi batch function (/BT2 option; release 3 or later) is disabled



When the multi batch function (/BT2 option; release 3 or later) is enabled



Directory name

Set the name of the directory on the storage medium for saving the data on the external storage medium. (Up to 20 characters)

Symbols that can be used: #, %, (,), +, -, ., @, °, and _.

Strings that cannot be used: AUX, CON, PRN, NUL, CLOCK, COM1 to COM9, and LPT1 to LPT9.

When the multi batch function (/BT2 option; release 3 or later) is enabled, set the [Header], [Structure], [File Name], [Title], and [Characters] items for each batch group.

Header

Set the header comment to be written to the data file (Up to 50 characters).

Structure

Sets the structure of the file name when saving data.

Settings	Description
Date	Serial number + user-assigned character string + date
Serial	Serial number + user-assigned character string
Batch	Serial number + batch name (when using the batch function)

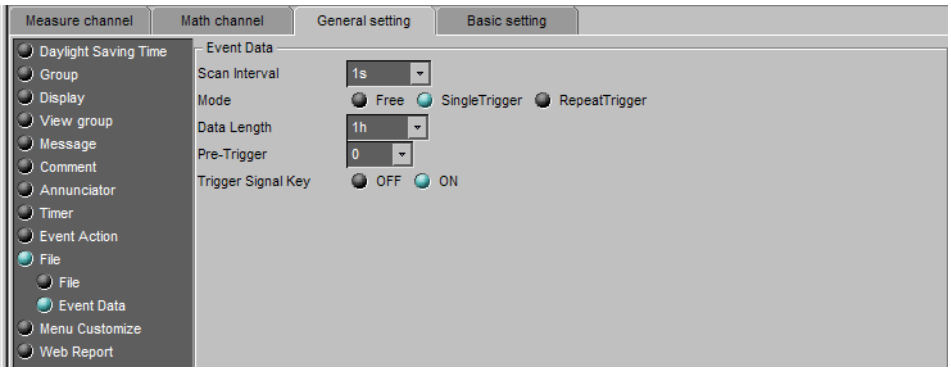
File name

Set the user-assigned section of the file name. (Up to 16 characters)
Symbols that can be used: #, %, (,), +, -, ., @, °, and _.

Field Title, Field Characters

Set text strings. When the multi batch function (/BT2 option; release number 3 or later) is enabled, select the appropriate batch tab.
Title: Up to 20 characters. Characters: Up to 30 characters.
The number of fields that you can use is 24 for release number 3 or later and 8 for release number 2 or earlier.

Event Data



Event related settings are enabled when [Data Kind] is set to [E+D] or [Event] in [Basic Environment] under [Environment] in the [Basic Setting] tab.

Sample rate

Select the data recording interval from the available settings. See the description for “Data length” below. You cannot specify a sampling rate that is faster than the scan interval.

Mode

Settings	Description
Free	Records data continuously.
Single	Records data when the trigger condition is met.
Repeat	Records data each time the trigger condition is met.

You can only select [Free] if you are using the multi batch function (/BT2 option; release number 3 or later). You can set the multi batch function by setting [Batch operation qty] under [Environment] - [Detail Setting] in the [Basic setting] tab. You can only select [Free] on DXs with the /AS1 advanced security option (release numbers 4 and later).

Data length

Select the size of a record data file. The recorded data is divided by the file size specified here. The available data lengths vary depending on the number of memory sampling channels and the Sample rate setting.

Sample rate*1	**25 ms*2**	**125 ms**	**250 ms**	**500 ms**	**1 s**
Selectable range of data length	10 min to 4 hours	10 min to 1 day	10 min to 2 days	10 min to 3 days	10 min to 7 days
Sample rate*1	**2 s**	**5 s**	**10 s**	**30 s**	**1 min**
Selectable range of data length	10 min to 14 days	10 min to 31 days	10 min to 31 days	1 hour to 31 days	1 hour to 31 days
Sample rate*1	**2 min**	**5 min**	**10 min**	**15 min*3**	**20 min*3**
Selectable range of data length	1 hour to 31 days	1 hour to 31 days	1 hour to 31 days	1 hour to 31 days	1 hour to 31 days
Sample rate*1	**30 min*3**				
Selectable range of data length	1 hour to 31 days				

*1 You cannot choose an interval that is faster than the scan interval.
*2 Selectable on the DX1002, DX1002N, DX1004, DX1004N, DX2004, and DX2008.
*3 Release number 3 or later.

Pre-Trigger

Specify the range when recording data before the trigger condition is met. Select the range as a percentage of the data length from 0, 5, 25, 50, 75, 95, and 100%. If you do not want to record the data existing before the trigger condition is met, select 0%.

Trigger Signal Key

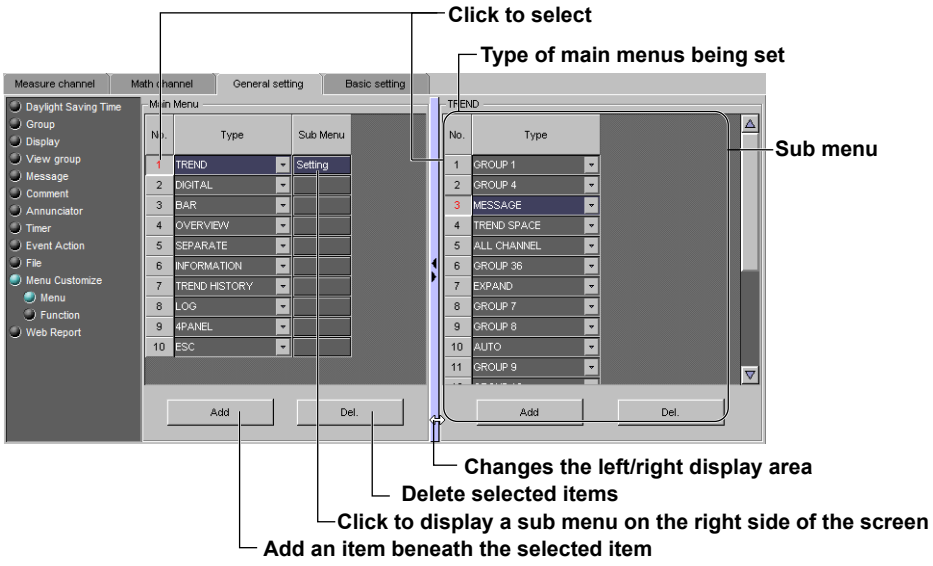
Select [ON] if you want to activate the trigger using key operation.

Custom Menu

You can show or hide items on the menu that appears when you press the FUNC key and on the display selection menu, which appears when you press the DISP/ENTER key.

Main Menu

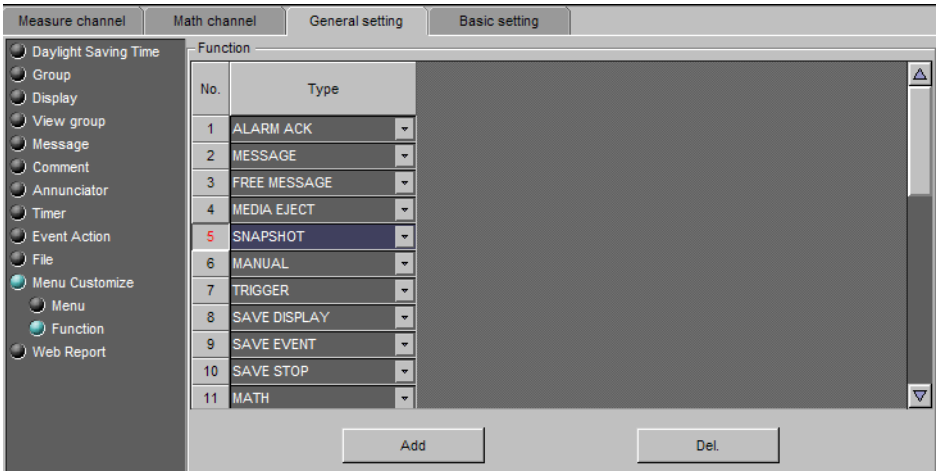
The display selection menu appears when the DISP/ENTER key is pressed.



For information about the menu, see section 5.17 in the DX1000 User's Manual or section 5.18 in the DX2000 User's Manual.

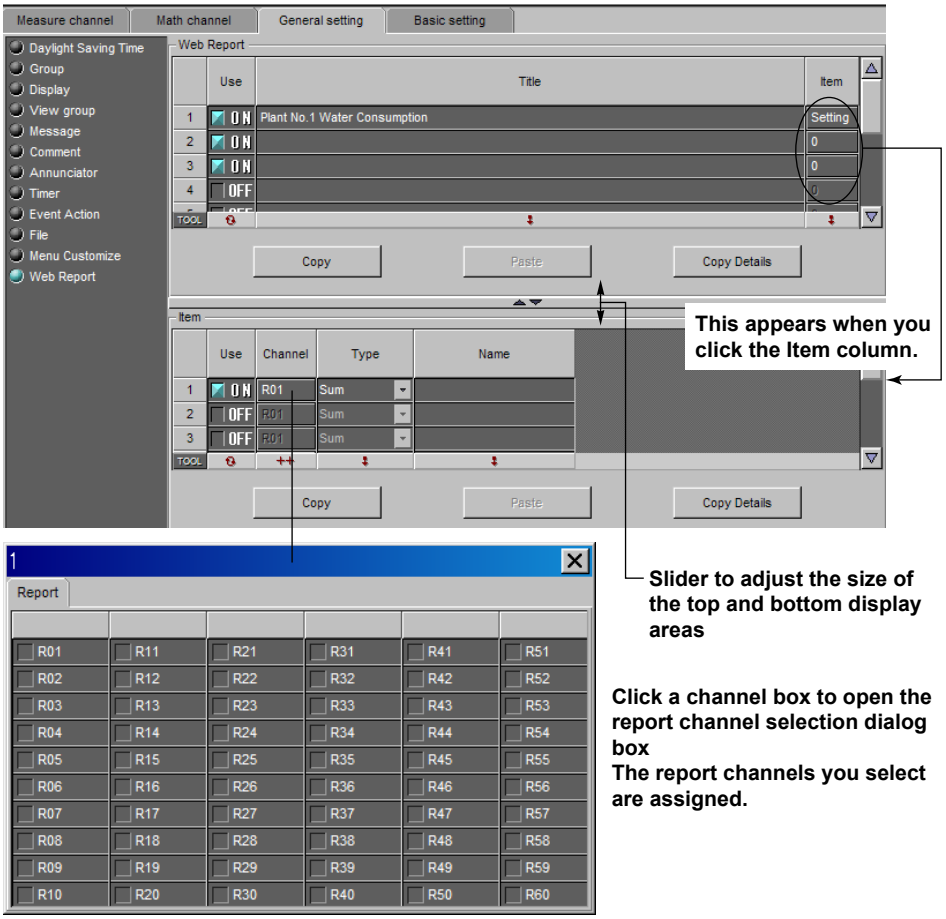
Function

The FUNC key menu appears when the FUNC key is pressed.



For information about the menu, see section 4.1 in the DX1000/DX2000 User's Manual.

Web Report (Release number 3 or later)



These settings affect how report data in the internal memory is displayed on the operator and monitor pages. You can create 10 report layouts. You can register up to 10 items to display in each layout.

You can display reports on the operator or monitor page by specifying the report layout and report data.

Web Report

- **Use and Title**
  Set [Use] to [ON], and enter a report layout name of 64 characters or less in the [Title] box.
- **Item**
  The number of registered items appears in this column. Click an [Item] box to display the [Item] setting area under the slider. [Setting] appears in the Web Report [Item] box whose Item setting area is displayed.

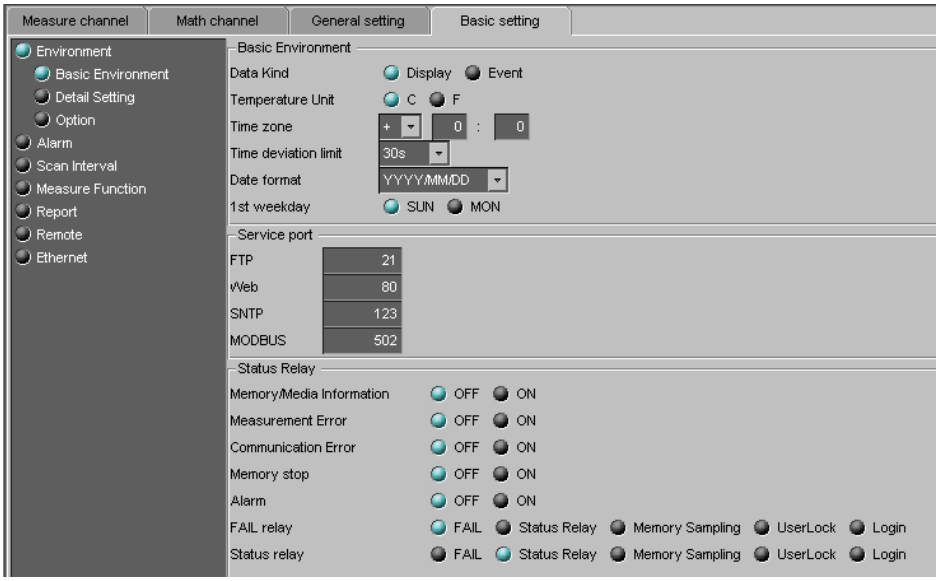
Item

- **Use**
  Set [Use] to [ON].
- **Channel, Type, and Name**
  Set the report channel number (for example R01) in the [Channel] box.
  Set the type of computation (Max., Min., Ave., Sum, or Instant) in the Type box.
  Enter the item name in the [Name] box using up to 16 characters.

3.6 Entering Basic Settings

Environment

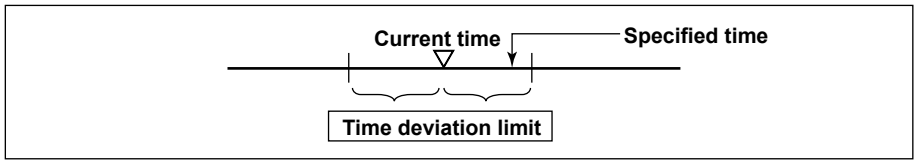
Basic Environment



- **Data Kind**

Settings	Description
Display	Records display data.
E+D	Records display data and event data. You cannot select [E+D] when [Trend Rate Switching] under [Environment] - [Detail Setting] under the [Basic setting] tab is set to [ON]. You cannot select [E+D] if you are using the multi batch function (/BT2 option; release number 3 or later). You can set the multi batch function by setting [Batch operation qty] under [Environment] - [Detail Setting] in the [Basic setting] tab. You cannot select [E+D] on DXs with the /AS1 advanced security option.
Event	Records event data.

- **Temperature Unit**
  Select C or F.
- **Time zone**
  Set the time zone of the region in which the DX will be used in terms of the time difference from GMT. A negative value indicates that the local time is behind the GMT.
- **Time deviation limit**



When the time deviation between the time on the DX and the specified time is within ±(the value specified here), the time on the DX is gradually corrected. Otherwise, the clock is corrected immediately. Note that time is not corrected on DXs with the Advanced security function (/AS1 option) when the specified time is over the time deviation limit. (Firmware version numbers 4.11 and later)
Select from 10 s to 5 min. Select [OFF] to disables the function.

Example: If [Time deviation limit] is set to 10s and the time on the DX is 10 hours 21 minutes 15 seconds, the time on the DX is gradually corrected if the specified time is between 10 hours 21 minutes 5 seconds and 10 hours 21 minutes 25 seconds.

- **Date format**

Settings	Display Example
Y/M/D	2005/11/30
M/D/Y	11/30/2005
D/M/Y	30/11/2005
D.M.Y	30.11.2005

Applied Range

The format is applied to the date displayed on the screen. It does not change the date format on the setup screen of the date/time, the date in the output data via communications, the date saved along with the data, and the date used in the data file names.

- **1st weekday (Release number 3 or later)**

This setting specifies how to display the calendar that you use to search past measured data. You can set the first day of the week to Sunday or Monday.

- **Service port**

The following table indicates the number of simultaneous uses (number of users that can use the function simultaneously), the maximum number of connections, and the port number for each function.

Function	Maximum Number of Connections	Number of Simultaneous Uses		Port No.
		Administrator	User	
FTP server	2	2	2*1	21/tcp*3
Web server (HTTP)	1	–	–	80/tcp*3
SNTP server	–	–	–	123/udp*3
Modbus server	2	–	–	502/tcp*3
Instrument information server	–	–	–	34264/udp*2

*1 There are user limitations. For details, see the DX1000/DX1000N/DX2000 Communication interface User's Manual (IM04L41B01-01E).

*2 The port number is fixed.

*3 The default port number. You can set the value in the range of 1 to 65535. Use the default port number unless there is a special reason not to do so.

- **Status Relay**

In the [System Configuration] screen, if [FAIL] is set to [FAIL/Alarm relay] (/F2 option) or [FAIL/Status relay] (/F1 option), the [Status Relay] setting items are displayed.

Fail Relay, Status Relay (Release numbers 4 and later)

For this function, there are relays labeled "FAIL" and "Status" on the rear panel. You can assign operations to these two relays. On a relay that has been set to "Status relay," you must also set the DX status that will be relayed.

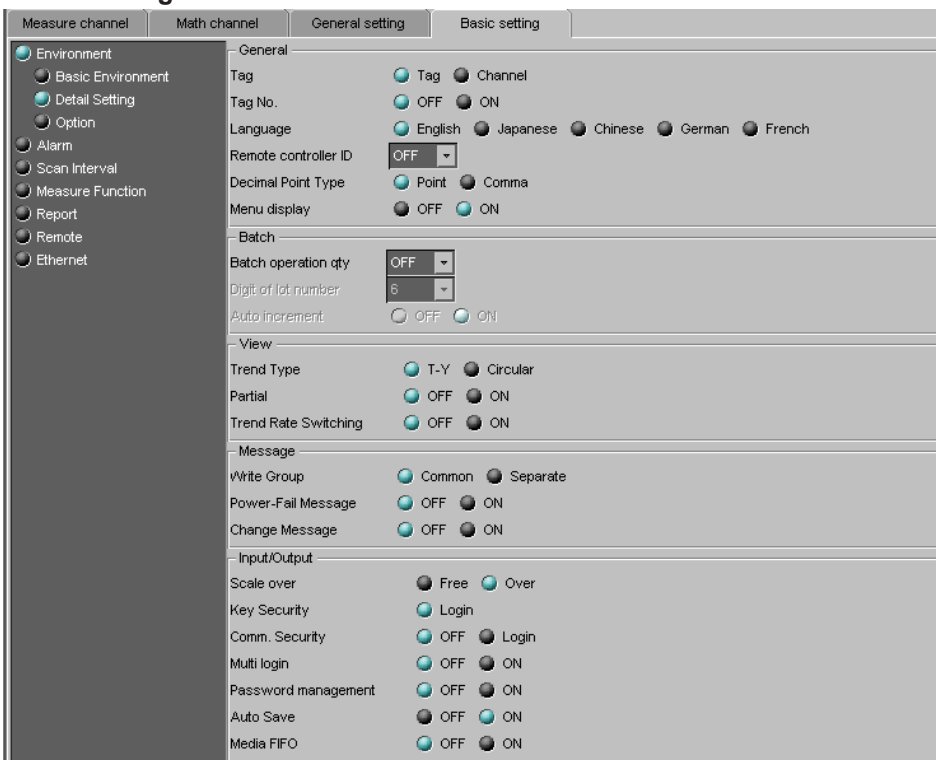
On DXs without the /AS1 advanced security (/AS1 option)
The relays can be set to [Fail] or [Status relay].

On DXs with the /AS1 advanced security (/AS1 option):
The relays can be set to [Fail], [Status relay], [Mem. sample], [Invalid user], or [Login].

Memory/Media Information, Measurement Error, Communication Error, Memory Stop, Alarm

The relay contact output is turned on when an item that is set to [ON] occurs. [Alarm] is available in release numbers 3 and later.

Detail Setting



- **Tag**

Settings	Description
Tag	Displays tags or tag numbers. Channel numbers are displayed for channels that do not have tags or tag numbers assigned to them.
Channel	Displays channel numbers.

- **Tag No. (Release number 3 or later)**
  Select [ON] to use tag numbers.
- **Language**
  Select the display language
- **Remote controller ID**
  Select the remote controller ID from 0 to 31. When not using the remote control terminal, select [OFF].
- **Decimal Point Type (Release number 3 or later)**
  You can set the decimal point type for the display and files saved in text format. You can select [Point] or [Comma].
- **Menu display (Release number 3 or later)**
  To display [Basic setting mode] (menu item for switching to basic setting mode) in the setting mode menu, select [ON].

- **Batch**

  Batch (when the multi batch function is not installed)

  Select [ON] to use the batch function.

  Batch operation qty (when the /BT2 multi batch function is installed; release number 3 or later)

  Specify the number of batches to use.

Settings	Description	
OFF	Disables the multi batch function and the batch function.	
1	Enables the single batch function.	
2 or higher	Enables the multi batch function. The table below shows the number of batches supported by the DX1000 and DX2000.	
	Model	**Number of Batches Supported**
	DX1000	2 to 6
	DX2000 (release number 3)	2 to 6 (standard memory model)
		2 to 12 (large memory model)
	DX2000 (release number 4)	2 to 12

- **Digit of lot number**

  Select the number of digits of the lot number from 4, 6, or 8. Select [OFF] to disable the lot number.

- **Auto increment**

  ON Automatically sets the lot number of the next measurement to “the lot number of the current measurement + 1.”

- **Trend Type**

  Function for the DX2000 only.

Settings	Description
T-Y	A trend display with a linear time axis
Circular	A trend display with a circular time axis

- **Partial**

  Turn Partial [ON] (partially expand) or [OFF] (do not partially expand).

- **Trend Rate Switching**

  ON Enables the function that switches the trend interval while the memory sampling is in progress. The “Second interval [/div]” item is displayed in the setting mode.

  - When [Trend Rate Switching] is set to [ON], you cannot set [Data Kind] under [Environment] - [Basic Environment] in the [Basic setting] tab to [E+D].
  - This setting is fixed at [OFF] if you set [Batch operation qty] to [2] or higher on models with the multi batch function (/BT2 option; release number 3 or later).

- **Write Group**

Settings	Description
Common	Write the message to all groups.
Separate	Write the message to the displayed group.

- **Power-Fail Message**

  ON A message is written when the DX recovers from a power failure while memory sampling is in progress.

- **Change Message**

  ON Writes the time the interval is switched and the new trend interval as a message when the trend interval is switched. On DXs with the /AS1 advanced security option, a message is written even when the setting mode setup items are changed during memory sampling.

- **Scale over**

Settings	Description
Free	The value is set to –over range if the value is less than –30000 and +over range if the value is greater than 30000 excluding the decimal point. The value is displayed as –Over and +Over, respectively.
Over	The value is set to –over range if the value is less than –5% of the scale and +over range if the value is greater than 105%. The value is displayed as –Over and +Over, respectively.

Example: If the scale is 0.0 to 200.0, the value is set to –over range if the value is less than –10.0 of the scale and +over range if the value is greater than 210.0.

Note

For computations such as TLOG, CLOG, and report, the handling of the scale over-range value can be set in advance.

- **Key Security**

Settings	Description
Login	Enables only registered users to operate the DX using keys. The [User registration] is displayed in the [Basic Setting] tab. The Key Security setting is fixed at [Login] on DXs with the /AS1 advanced security option.
Keylock	Enables the key lock function. Set the key lock function in the [Basic Setting] tab. This option cannot be selected on DXs with the /AS1 advanced security option.
OFF	Disables the security functions. This option cannot be selected on DXs with the /AS1 advanced security option.

- **Comm. Security**

Settings	Description
Login	Enables only registered users to operate the DX via communications. The [User registration] is displayed in the basic setting mode menu.
OFF	Disables the security functions.

- **Multi Login (Only on DXs with the /AS1 advanced security option)**

Setting	Description
On	The multi-login function is used. At the same time, one user can log in through key operations, one through an Ethernet connection (connection to the setting function), and one through serial communication.
Off	The multi-login function is not used. Users cannot log in simultaneously through key operations, Ethernet (connection to the setting function), or serial communication (LL command).

- **Password Management (Only on DXs with the /AS1 advanced security option)**

To perform password management using a KDC server on the Ethernet, select [On]. You will have to set the [Ethernet communication] - [Password management] item.

- **Auto Save**

Settings	Description
ON	Automatically saves the measured data to the CF card.
OFF	Does not automatically save the data. Save the measured data manually to the CF card or USB flash memory (/USB1 option).

- **Media FIFO**

You can select this with DX main unit firmware version 2.0x or later.
This is valid only when [Auto Save] is [ON].

Settings	Description
ON	If there is no more free space on the CF card, the oldest file is deleted, and the newest file is saved.
OFF	If there is no more free space on the CF card, the measured data is not saved to the CF card.

Option

- **Value on Error**
  Specify whether to set the display for a computation error to [+Over] or [–Over].
- **Overflow Sum, Ave**
  Specify how to handle overflow data when it is detected in the SUM or AVE computation of TLOG or CLOG. This setting is also applied to report generation.

Settings	Description
Error	Sets the computed result to computation error.
Skip	Discards the overflow data and continues the computation.
Limit	Uses a limit value in place of the overflow data and continues the computation.

- **Overflow Min, Max, P-P**
  Specify how to handle overflow data when it is detected in the MAX, MIN, or P-P computation of TLOG or CLOG. This setting is also applied to report generation.

Settings	Description
Over	Uses the overflow data as-is.
Skip	Discards the overflow data and continues the computation.

- **Report (1 to 4)**
  Select the type of data to output as reports.

Settings	Description
OFF	Does not output reports. You cannot set Report 1 to [OFF].
Ave	Outputs the average value.
Max	Outputs the maximum value.
Min	Outputs the minimum value.
Sum	Outputs the sum value.
Instant	Outputs the instantaneous value.

- **File kind**
  Specify the method used to create report files.

Settings	Description
Split	Saves each type of report to a separate file.
Combined	Saves the report data of two types in a single file.
Separate2	Saves a collection of reports, such as the hourly reports for a day or the daily reports for a month, to a file (release numbers 4 and later).

- **Template Function (Release numbers 4 and later)**
  You can create report templates in XML spreadsheet format and use them to automatically create custom report files. To use templates, select [ON]. This setting is fixed at [OFF] when [File kind] is set to [Separate2].

- **Set Calibration (Release numbers 4 and later)**
  To use calibration management, select [ON].

  Notification
  You can specify how many days before the calibration due date you want to display the calibration notification screen. You can set the number of days to a value between 1 and 10.

  Renotification
  You can specify the period at which to display the calibration notification screen. The calibration notification screen will continue to appear until calibration is completed.

- **Signature (Only on DXs with the /AS1 advanced security option)**
  Process Type
  Set the process type to choose what kind of collection of measured data can be signed.

Setting	Description
Continuous	You can sign each individual measured data file.
Batch	You can sign a collection of all the measured data files from the start to stop of a recording. However, you can only sign a file from the DX when the file covers the measured data of an entire recording, from start to stop.

Sign from Recorder
Set the signature privilege range for DX key operations.

Setting	Description
Off	You cannot sign files from the DX.
Signature1	You can sign files from the DX using the Signature1 privileges.
Signature1+2	You can sign files from the DX using the Signature1 and Signature2 privileges.
Signature1+2+3	You can sign files from the DX using the Signature1, Signature2, and Signature3 privileges.

Memory Stop at Signature
You can configure this setting so that a screen for making a signature (historical trend display) appears when recording stops (memory stop).

Setting	Description
On	The historical trend display appears automatically at memory stop.
Off	The display does not change at memory stop.

Note

You cannot set [Memory stop at signature] when:

- [Sign from recorder] is set to [Off].

Even when [Memory stop at signature] is set to [On], the historical trend display will not appear when:

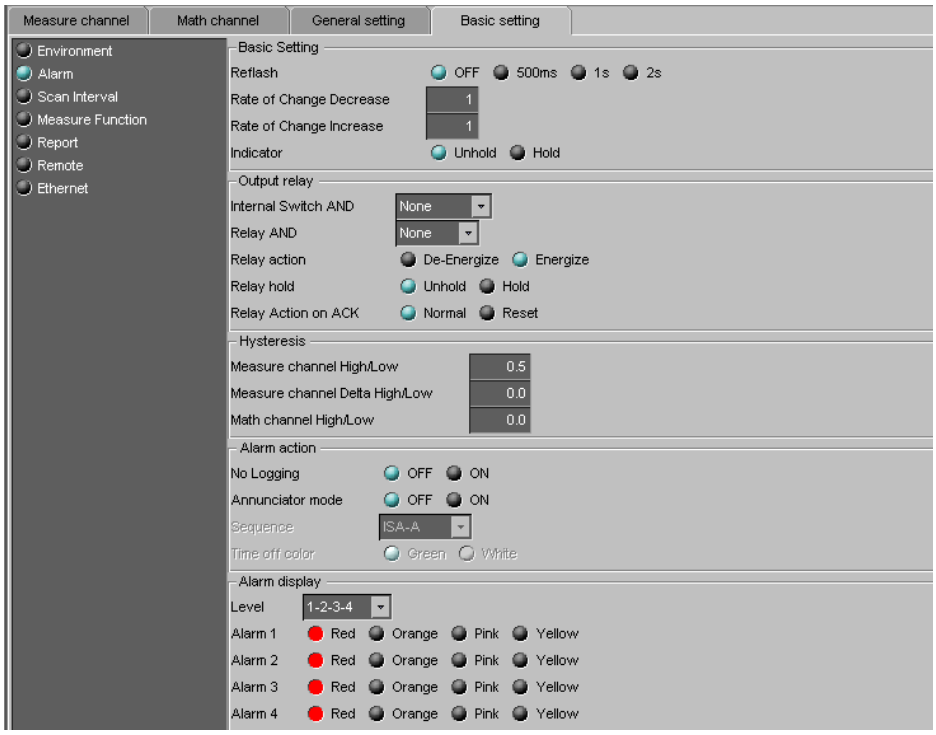
- The process type is [Batch] and the measured data is divided into multiple files.
- A user without signature privileges performs memory stop.
- The multi batch function (/BT2 option) is being used and batch overview mode is enabled.

FTP Transfer at Signing

You can transfer measured data files (display or event data files) to an FTP server after you sign them. You need to configure the FTP client settings so that display and event data are transferred.

Setting	Description
On	Measured display and event data files are only transferred to an FTP server after they are signed. Also, the [Transfer wait time] settings are invalid; transfer is executed immediately.
Off	Measured data files are not transferred to an FTP server after they are signed.

Alarm



Reflash

To set the reflash operation on the alarm output relay, select [ON]. The reflash function is set on the first three output relays.

Settings	Description
Off	Reflash is not used.
On*1	Reflash is used. The relays are deactivated for approximately 500 ms.
500ms*2	Reflash is used. The relays are deactivated for approximately 500 ms.
1s*2	Reflash is used. The relays are deactivated for approximately 1 s.
2s*2	Reflash is used. The relays are deactivated for approximately 2 s.

*1 Release numbers 3 and earlier

*2 Release numbers 4 and later.

Rate of Change Decrease

Set the interval for the rate-of-change calculation of the low limit on rate-of-change alarm in terms of the number of sampled data points (1 to 32). The actual interval is obtained by multiplying the value specified here by the scan interval.

Rate of Change Increase

Set the interval for the rate-of-change calculation of the high limit on rate-of-change alarm in the same manner as the interval for the low limit on rate-of-change alarm.

Hold

You can choose to make the alarm displays behave in the following ways. When you use the alarm annunciator function (release number 3 or later), the setting follows the annunciator sequence.

Settings	Description
Unhold	Clears the alarm indication when the alarm condition is released (returns to normal condition).
Hold	Holds the alarm indication until an alarm acknowledge operation is performed.

Internal Switch AND

Select the internal switches that are to operate using AND logic. Set the range of internal switches (from the first internal switch) to take the AND logic. All subsequent switches will be set to OR logic.

Relay AND

Select the relays that are to operate using AND logic. Set the range of relays (from the first alarm relay) to take the AND logic. All subsequent relays will be set to OR logic. Available settings are [None], [I01] (I01 only), [I01-I02] (I01 and I02), [I01-I03] (I01 to I03), etc. Only alarm output relays that are installed are valid.

Note

When reflash is turned ON, the operation of the first three output relays is fixed to OR logic. Specifying AND produces no effect.

Relay action

Select whether the alarm output relay is energized or de-energized when an alarm occurs. The setting applies to all alarm output relays.

Relay hold

You can choose to make the alarm output relays behave in the following ways. This setting applies to all relays. When you use the alarm annunciator function (release number 3 or later), the setting follows the annunciator sequence.

Settings	Description
Unhold	Turns the output relay OFF when the alarm condition is released (returns to normal condition).
Hold	Holds the output relay at ON until an alarm acknowledge operation is performed.

Relay Action on ACK

You can use this setting on DX firmware version 2.0x or later. When you use the alarm annunciator function (release number 3 or later), the setting follows the annunciator sequence.

Settings	Description
Normal	The relay output is deactivated when the alarm ACK operation is executed. If the condition for activating the alarm output relay is met in the next scan interval, the relay output is activated. This operation is valid only when the alarm output relay is set to [Hold].
Reset	The relay output is deactivated when the alarm ACK operation is executed. If a new condition for activating the alarm output relay, the relay is activated.

Note

When reflash is turned ON, the operation of the first three output relays is set to nonhold. Specifying Hold produces no effect.

Measure channel High/Low

Sets the hysteresis width of the alarm occurrence/release of the high/low limit alarm specified on measurement channels.

Selectable range: 0.0% to 5.0% of the span or scaling width

Measure channel Delta High/Low

Sets the hysteresis width of the alarm occurrence/release of the difference high/low limit alarm specified on measurement channels.

Selectable range: 0.0% to 5.0% of the span

Math channel High/Low, Ext channel High/Low

Sets the hysteresis width of the alarm occurrence/release of the high/low limit alarm specified on computation and external input channels.

Selectable range: 0.0% to 5.0% of the measurement span

Alarm action

- **No Logging**
  Select [ON] to hide alarm indication. The [Detect] setting is enabled in the Measure channel, Math channel, Ext channel tab(s).

  This function disables the alarm indicator and the logging of alarm events to the alarm summary. It also disables the display of alarms by the alarm annunciator (release number 3 or later).

- **Annunciator mode and Sequence (Release number 3 or later)**
  To use the annunciator function, select [ON] and set the sequence.

Settings	Description
ISA-A-4	A no lock-in sequence.
ISA-A	A lock-in sequence.
ISA-M	A double lock-in sequence.

- **Time off color (Release number 3 or later)**
  The annunciator window display color when no alarms are activated. You can select [White] or [Green].

Alarm display (Release number 3 or later)

- **Level**
  When multiple alarms occur, the DX gives higher priority to the display of alarms with higher levels.

Settings	Description
1>2>3>4	The order of alarm level preference, from highest to lowest preference, is 1, 2, 3, 4.
1>4>2>3	The order of alarm level preference, from highest to lowest preference, is 1, 4, 2, 3.
1>4>3>2	The order of alarm level preference, from highest to lowest preference, is 1, 4, 3, 2.

- **Alarm 1, Alarm 2, Alarm 3, and Alarm 4**
  You can set the alarm color for each alarm level. It is easy to understand what processes are taking place when alarms occur if you associate an alarm's color with its level. This setting applies to all channels.

Scan Interval

Scan interval

Select the scan interval. You cannot select fast sampling mode (125 ms) on the following models:

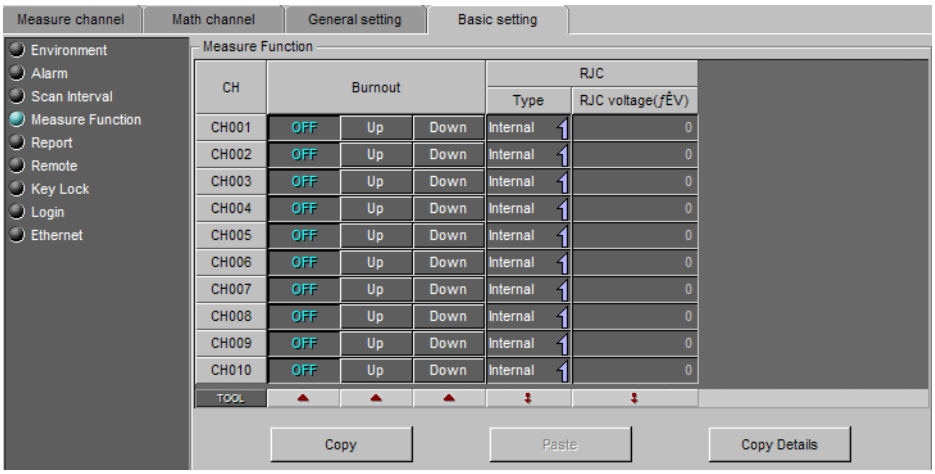
- Models equipped with external input channels (/MC1 option)
- Models with the multi batch function (/BT2 option; release number 3 or later)

A/D integrate

Select the A/D integration time as necessary. Only the selectable settings are displayed.

Settings	Description
Auto	The DX automatically detects the power supply frequency and sets the integration time to 16.7 ms and 20 ms for 60 Hz and 50 Hz, respectively. Fixed to 20 ms on /P1 models that use the 24 VDC power supply.
50Hz	Sets the integration time to 20 ms.
60Hz	Sets the integration time to 16.7 ms.
100ms	Sets the integration time to 100 ms (when the scan interval is 2 s or 5 s).
600Hz	The A/D integration time for fast sampling mode. You cannot change this value. You cannot use fast sampling mode on models with the external input channel (/MC1) option. You cannot use fast sampling mode when the multi batch function (/BT2 option) is being used.

Measure Function



Burnout

Settings	Description
OFF	Sensor disconnections are not detected.
UP	When the sensor burns out, the measured result is set to +over range. The measured value displays “Burnout.” For 1-5V input, the DX assumes that the sensor has burned out when the measured value exceeds the scale upper limit by 10% of the scale width. (Example: When the measured value is greater than 110 when the scale is from 0 to 100)
DOWN	When the sensor burns out, the measured result is set to –over range. The measured value displays “Burnout.” For 1-5V input, the DX assumes that the sensor has burned out when the measured value falls below the scale lower limit by 5% of the scale width. (Example: When the measured value is less than –5 when the scale is from 0 to 100)

RJC Mode

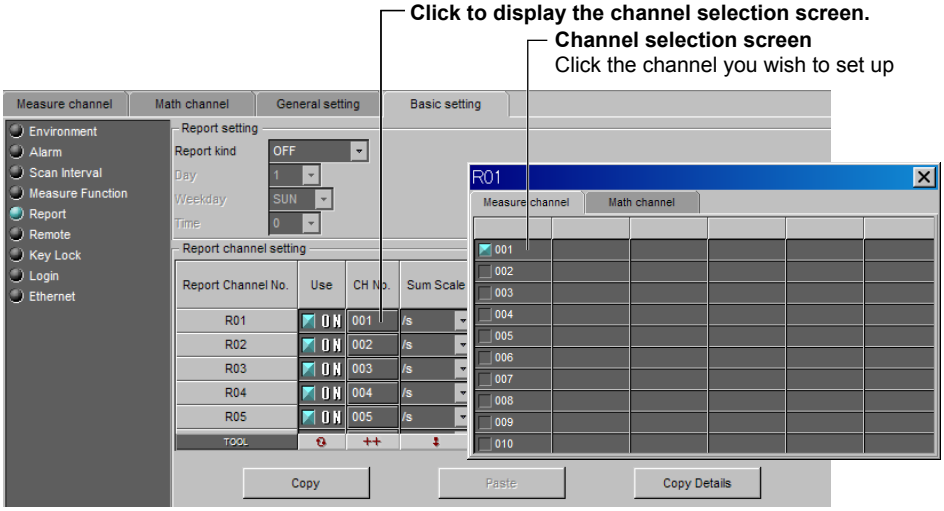
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

Settings	Description
Internal	Uses the reference junction compensation function of the DX.
External	Uses an external reference junction compensation function. When set to [External], [Volt] is displayed.

RJC voltage (µV)

The compensation voltage to be added to the input. Set the value in the range of –20000 µV to 20000 µV.

Report



Report kind

Select the type of report to be created.

Settings	Description
OFF	Do not create a report.
Hour	Creates hourly reports.
Day	Creates daily reports.
Hour+Day	Creates hourly and daily reports.
Day+Week	Creates daily and weekly reports.
Day+Month	Creates daily and monthly reports.

Day, Week day, and Time (hour)

Set the date or day of the week and the time when the report is to be created. The specified date/time is when the report file is divided. Set the values in the range indicated below. Items with a dash are invalid.

Report Type	Day	Week day	Time
Hour	-	-	0 to 23
Day	1 to 28*	-	0 to 23
Hour+Day	-	-	0 to 23
Day+Week	-	SUN to SAT	0 to 23
Day+Month	1 to 28*	-	0 to 23

* You cannot specify 29, 30, or 31.

Report Channel No.

The report is output in order by this number.

Use

Select [ON] for the report channels to be used.

CH No.

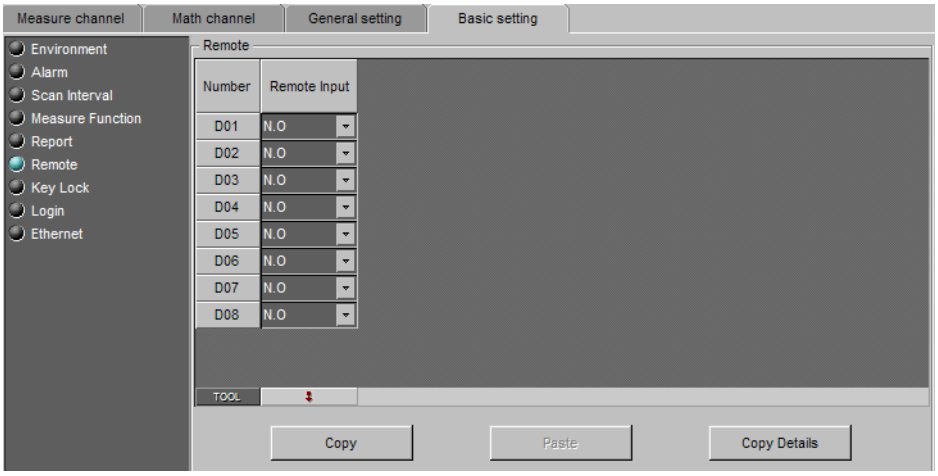
Set the channel to assign to the report channel. All channels can be assigned, but reports are not created for channels set to [Skip] or [OFF] even if they are assigned.
In the stacked bar graph display, report data is displayed in the following groups. However, only channels that have the same unit as the first group in the channel are displayed.

No.	1	2	3	4	5	6
Report Groups (DX1000)	R01 to R06	R07 to R12	R13 to R18	R19 to R24	—	—
Report Groups (DX2000)	R01 to R10	R11 to R20	R21 to R30	R31 to R40	R41 to R50	R51 to R60

Sum Scale

Set the sum scale to [/s] to [/day] to match the unit of the measured value.
Example: If the unit of the measured value is “m^3/min,” select [/min].
OFF Sums as-is the measured data per scan interval.

Remote (Release number 3 or later)



Number

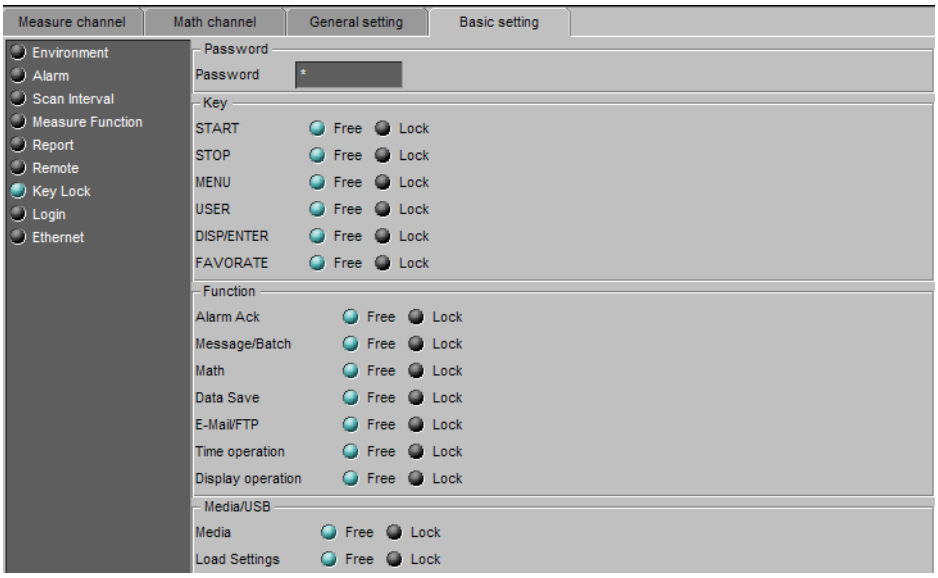
Remote control terminal numbers. The number of settings that appears corresponds to the number of remote control terminals.

Remote Input

Specify an operation for each remote control terminal.

Settings	Description
N.O	The remote signal rises when the contact input switches from open to closed, and it falls when the contact input switches from closed to open.
N.C	The remote signal rises when the contact input switches from closed to open, and it falls when the contact input switches from open to closed.

Key Lock



Enabled when [Key Security] is set to [Keylock] under [Environment] - [Detail Setting] in the [Basic Setting] tab. This function is not available on DXs with the /AS1 advanced security option.

Password

The password used to release the key lock. An entered password is displayed as "********." (Up to 8 characters)

Key, Function, Media

Select whether or not to disable each item. [Load Settings] is available in release numbers 3 and later.

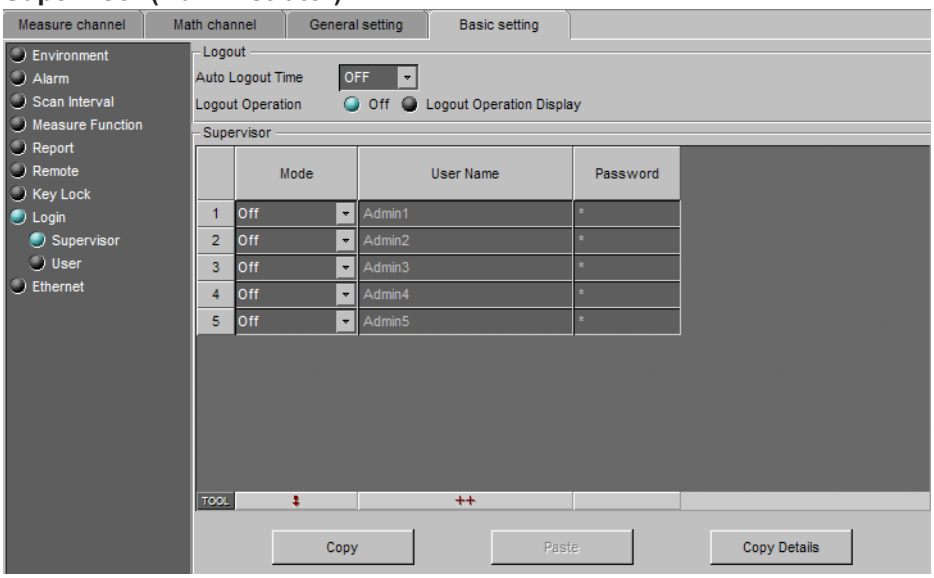
Settings	Description
Free	Key lock not applied.
Lock	Disables the operation.

Login

You cannot configure these settings on DXs with the /AS1 advanced security option.

You can set the [Login] when [Login] is selected as [Key Security] or [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab.

Supervisor (Administrator)



- **Auto Logout Time**

Settings	Description
OFF	Does not log out until the logout operation is executed.
1min to 10min	Automatically logs out when there is no key operation for a specified time.

- **Logout Operation**

Settings	Description
OFF	Only login operation is available.
Logout Operation Display	Allows the user to switch the operation screen in addition to the login operation.

- **Mode**

  The choices differ depending on the selected contents of [Key Security] and [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab.

Settings	Description
OFF	Not register.
Key	Log into the DX1000/DX2000 using keys.
Comm	Log into the DX1000/DX2000 via communications.
Web	Log into the operator page and monitor page of the DX1000/DX2000 using a Web browser.
Key+Comm	Log into the DX1000/DX2000 using keys and via communications.

- **User Name**

  Set the user name. (Up to 20 characters)
  - You cannot register user names that are already registered.
  - You cannot register “quit” or a user name containing all spaces.

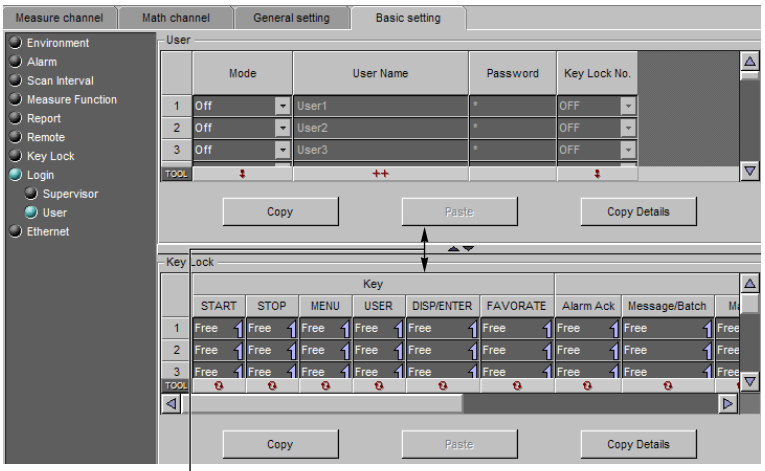
- **Password**

  Set the password. (Release numbers 3 and earlier: up to 8 characters. Release numbers 4 and later: up to 20 characters.)

  An entered password is displayed as “********.”
  - You cannot register the word “quit,” a character string that contains spaces, or a password containing all spaces.

User

Up to 30 names can be registered.



- **Mode**

  The available settings vary depending on the [Security] setting.

Settings	Description
OFF	Not register.
Key	Log into the DX using keys.
Comm	Log into the DX via communications.
Web	Log into the monitor page of the DX using a Web browser.
Key+Comm	Log into the DX using keys and via communications.

- **User Name, Password**

  Same as the supervisor settings.

- **Key Lock No.**

Settings	Description
OFF	No limitations on the operation.
1 to 10	Registration number of the operation limitation.

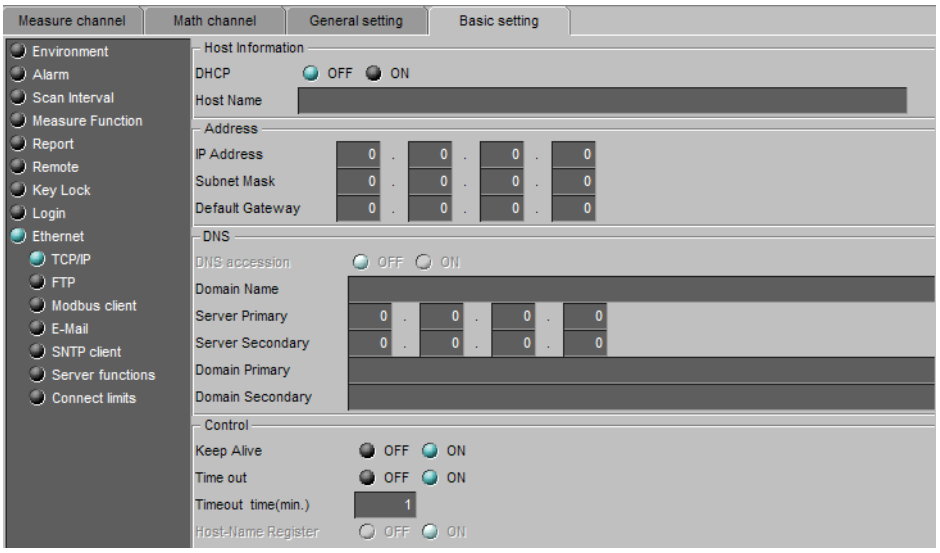
- **Key lock**

  Select whether or not to disable each item. [Load Settings] is available in release numbers 3 and later.

Settings	Description
Free	Key lock not applied.
Lock	Disables the operation.

Ethernet

TCP/IP



Set the IP address to a fixed IP address or obtain it automatically (DHCP).
Consult with your network administrator for the network parameters such as the IP address, subnet mask, default gateway, and DNS.

When using a fixed IP address

- **DHCP**
  Set [DHCP] to [OFF].
- **IP Address**
  Set the IP address to assign to the DX1000/DX2000.
- **Subnet Mask**
  Set the subnet mask according to the system or network to which the DX1000/DX2000 belongs.
- **Default Gateway**
  Set the IP address of the gateway.
- **Host Name**
  Set the DX's host name using up to 64 alphanumeric characters. You do not have to set this parameter.
- **Domain Name**
  Set the network domain name that the DX1000/DX2000 belongs to using up to 64 characters. You do not have to set this parameter.
- **Server Primary, Server Secondary**
  Register up to two IP addresses for the primary and secondary DNS servers.
- **Domain Primary, Domain Secondary**
  Set up to two domain suffixes: primary and secondary.

When obtaining the IP address from DHCP

- **DHCP**
  Set [DHCP] to [ON].
- **DNS accession**
  To automatically obtain the DNS server address, select [ON]. Otherwise, select [OFF]. If you select [OFF], you must set the IP address of the DNS server.
- **Host-Name Register**
  To automatically register the host name, select [ON].
- **Host Name**
  Set the DX1000/DX2000's host name using up to 64 alphanumeric characters.
- **Domain Name**
  Set the network domain name that the DX belongs to using up to 64 characters.
- **Server Primary, Server Secondary (not necessary when DNS accession is enabled)**
  Register up to two IP addresses for the primary and secondary DNS servers.
- **Domain Primary, Domain Secondary**
  Set up to two domain suffixes: primary and secondary.

Keep Alive

To disconnect when there is no response to the test packets that are periodically sent, select [ON]. Otherwise, select [OFF].

Time out

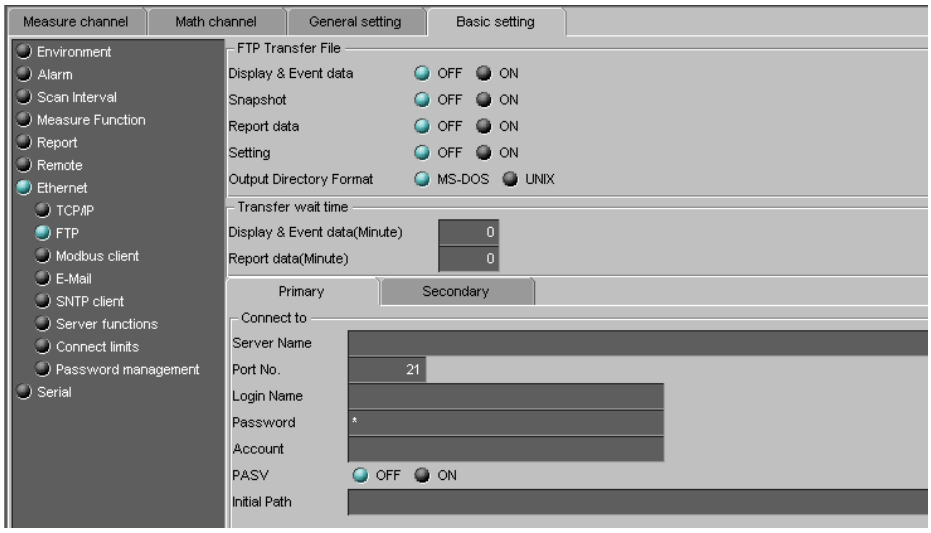
To use the application timeout function, select [ON]. Otherwise, select [OFF]. If you select [ON], a [Timeout time] is displayed.

- **Timeout time (min.)**
  Set the timeout value between 1 and 120 (minutes).

Checking the communication status

The Ethernet communication status can be confirmed with the LED lamp that is provided on the Ethernet connector on the DX1000/DX2000 rear panel or the [Ethernet link] that is shown at the upper right of the basic setting screen.

FTP



FTP Transfer File

Data files that are set to [ON] are automatically transferred to the FTP destination.

File Type	Description
Display data file	Data files are automatically transferred at each file save interval.
Event data file	Files are automatically transferred when the data length of data is recorded.
Report file	Data files are automatically transferred every time a report is created.
Snapshot data file	The files are automatically transferred when a snapshot is executed. They are transferred regardless of the media storage setting.
Setting	This item is only available on DXs with the /AS1 advanced security option. The setup file and change settings log file that are saved when the settings have changed are automatically transferred.

* Indicates snapshot using the FUNC key, communication command (EV2 command), USER key, or remote control function.

- **Output Directory Format (Release number 3 or later)**
  Set the directory output format to [MS-DOS] or [UNIX].

Transfer wait time (Release number 3 or later)

There may be cases when data cannot be transferred from the DX to the FTP server due to too many simultaneous connections to the FTP server. An example is when multiple files are created and need to be transferred at the same time from multiple DXs. By shifting the transfer time, you can avoid having too many simultaneous connections to the FTP server.

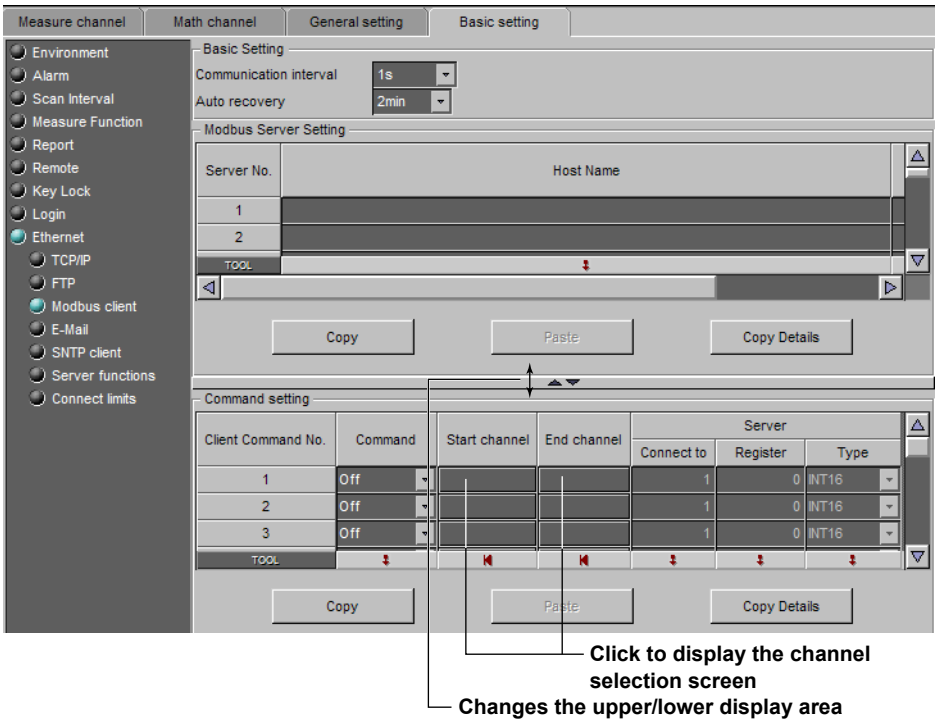
File Type	Setting
Display data files Event data files	0 to 120 minutes
Report files	0 to 120 minutes

Setting the FTP connection destination

Consult your network administrator when setting parameters such as the primary/secondary FTP servers, port number, login name, password, account, and availability of the PASV mode.

- **Primary, Secondary**
  You can specify two destination FTP servers, [Primary] and [Secondary]. If the primary FTP server is down, the file is transferred to the secondary FTP server.
- **Server Name**
  Enter the name of the file transfer destination FTP server using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Port No.**
  Enter the port number of the file transfer destination FTP server in the range of 1 to 65535. The default value is 21.
- **Login Name**
  Enter the login name for accessing the FTP server using up to 32 alphanumeric characters.
- **Password**
  Enter the password for accessing the FTP server using up to 32 alphanumeric characters. An entered password is displayed as "********."
- **Account**
  Enter the account (ID) for accessing the FTP server using up to 32 alphanumeric characters.
- **PASV**
  Select [ON] when using the DX behind a firewall that requires the passive mode. The default setting is [OFF].
- **Initial Path**
  Enter the directory of the file transfer destination using up to 64 alphanumeric characters. The delimiter for directories varies depending on the implementation of the destination FTP server.
  Example: When transferring files to the "data" directory in the "home" directory of an FTP server on a UNIX file system.
  /home/data
  If the file transfer to both primary and secondary destinations fails, the DX aborts the file transfer. When the connection recovers, the DX transfers the data that could not to be transferred in addition to the new data file. However, since the data that is transferred resides in the internal memory of the DX, if the data is overwritten, the data that could not be transferred is lost.

MODBUS Client



Basic Setting

- **Communication interval**
  Set the read cycle to 125ms, 250ms, 500ms, 1s, 2s, 5s, or 10s.
- **Auto recovery**
  Set the interval for retrying the connection when the connection is interrupted for some reason. Select OFF, 10s, 20s, 30s, 1min, 2min, 5min, 10min, 20min,30min, or 1h.

Modbus Server setting

- **Server No.**
  Select from 1 to 16 for the server registration numbers to be configured.
- **Port No.**
  Enter the port number in the range of 0 to 65535 for the selected server. The default value is 502.
- **Host Name**
  Set the destination Modbus server name using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Unit**
  Select [Auto] if the unit number of the destination server is not required; Otherwise, select [Fixed]. If you select [Fixed], the [Unit No.] item is displayed.
- **Unit No.**
  Enter a fixed unit number in the range of 0 to 255.

Command setting

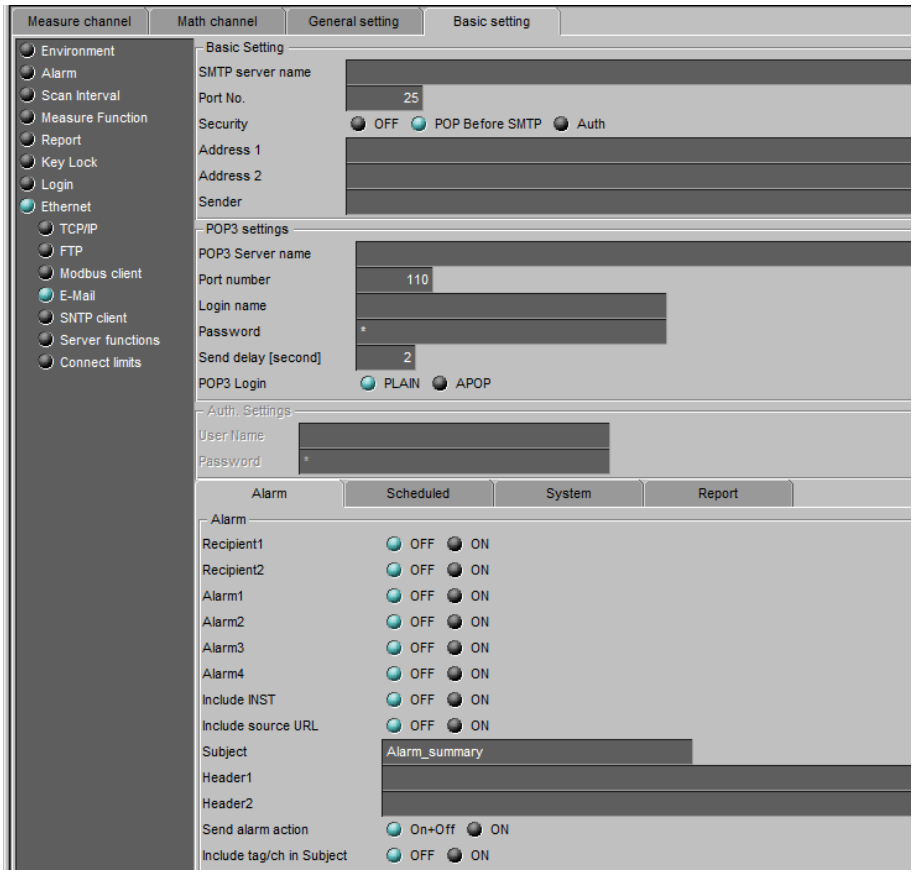
- **Client command No.**
  Select from 1 to 16 for the transmitted command numbers to be configured.
- **Command**
  Set the command type.

Settings	Description
Read	Read to the external input channel (16-bit signed integer type) from the server.
R-Math	Read to the communication input data (32-bit floating point type) from the server.
Write	Write the measurement channel (16-bit signed integer type) to the server.
W-Math	Write the measurement channel (32-bit signed integer type) to the server.
Exchange-M	Read to the communication input data (32-bit floating point type) from the server/write the custom display value to the server (release numbers 4 and later).

[Read] can be selected on DX2000s with the external input channel (/MC1 option) installed.
[R-Math], [W-Mat], and [Exchange-M] can be selected on models with the computation function (/M1 option) installed.

- **Start channel/End channel (client channels)**
  Enter the first and last channel numbers of input/output. The range of channels that you can enter varies depending on the command type as follows:
  Read: 201 to 440, R-Math: C01 to C60, Write: 1 to 48, W-Math: 101 to 160
  Exchange-M (release numbers 4 and later): C01 to C60
- **Connected to (server number)**
  Select the server number from 1 to 16.
- **Register**
  Set the register number of the server.
  For an input register, select in the range of 30001 to 39999 and 300001 to 365536.
  For a hold register, select in the range of 40001 to 49999 and 400001 to 465536.
  The register numbers you can specify vary depending on the command type. See section 6/3 of the DX1000/DX1000N/DX2000 Communication Interface User's Manual (IM04L41B01-17E).
- **Type**
  Select INT16, UINT16, INT32_B, INT32_L, UINT32_B, UINT32_L, FLOAT_B, or FLOAT_L.
  The register numbers you can specify vary depending on the command type. See section 6.3 of the DX1000/DX1000N/DX2000 Communication Interface User's Manual (IM04L41B01-17E).
  In release number 3, FLOAT has been added as a data type for measurement channel data and computation channel data.

E-mail



Set the SMTP server and mail address.

Basic Setting

- **SMTP server name**
  Enter the host name or IP address of the SMTP server.
- **Port No.**
  Unless specified otherwise, set the number to the default value. The default value is 25.
- **Security (Release number 3 or later)**
  Select [POP before SMTP] if you need to enable POP before SMTP. To enable authenticated e-mail transmission (Authentication SMTP), select [Auth] (release numbers 4 and later).
- **Address 1, Address 2**
  Enter the e-mail address. Multiple e-mail addresses can be entered in the box of one recipient. When entering multiple addresses, delimit each address with a space. Up to 150 characters can be entered.
- **Sender**
  Enter the sender e-mail address. You can enter up to 64 characters.

POP3 settings (Release number 3 or later)

- **POP3 Server name and Port number**
  Enter the POP3 server host name or IP address.
- **Port number**
  Use the default setting unless you need to change it. The default value is 110.
- **Login name**
  Enter the POP3 server login name.
- **Password**
  Enter the POP3 server login password using up to 32 characters. An entered password is displayed as “********.”

- **Send delay [second]**
  Set the delay between POP3 server authentication and transmission to a value from 0 to 10 seconds.
- **POP3 Login**
  To encrypt the password when logging into the POP3 server, select APOP. To send it in plain text, select PLAIN.

Auth. Settings (Release number 4 or later)

To enable support for authenticated e-mail transmission (Authentication SMTP), set a user name and password to use for authentication.

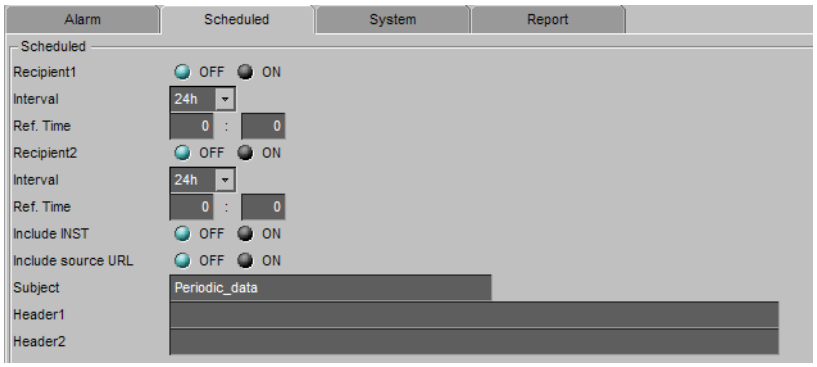
- **User name**
  Enter the user name. You can enter up to 32 characters.
- **Password**
  Enter the password. You can enter up to 32 characters. The password is displayed as "**********."

Alarm

Specify the settings for sending e-mail when alarms occur.

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Active alarms**
  Sends an e-mail when an alarm occurs. You can select [ON] (send e-mail) or [OFF] (not send e-mail) for alarms 1 to 4.
- **Include INST**
  Select [ON] to attach instantaneous value data to e-mail. The data that is attached to an e-mail is the instantaneous value that is measured at the time the e-mail is transmitted.
- **Include source URL**
  Select [ON] to attach the source URL. Attach the URL when the Web server is enabled.
- **Subject**
  Enter the subject of the e-mail using up to 32 alphanumeric characters. The default setting is Alarm_summary.
- **Header1, Header2**
  Enter header 1 and header 2 using up to 64 characters.
- **Send alarm action (Release number 3 or later)**
  To send an e-mail when an alarm occurs and when it is cleared, select [ON+OFF]. To only send an e-mail when an alarm occurs, select [ON].
- **Include tag/ch in Subject (Release number 3 or later)**
  Select [ON] to include a tag number in the subject. If the tag number is not set, the corresponding channel number is included.

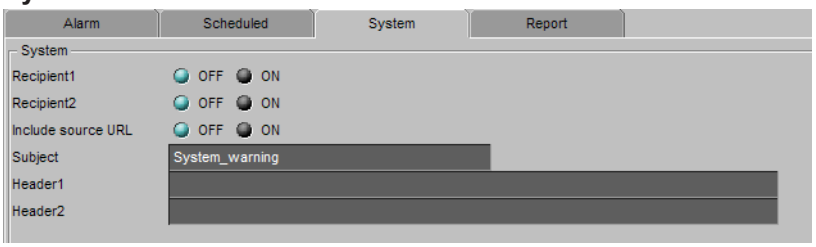
Scheduled



Specify the settings for sending e-mail at scheduled times.

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Interval**
  Select the interval for sending e-mail to Recipient1 and Recipient2 from 1, 2, 3, 4, 6, 8, 12, and 24 hours.
- **Ref. time**
  Enter the time used as a reference for sending the e-mail at the specified interval to Recipient1 and Recipient2.
- **Include INST, Include source URL, Subject, and Header**
  See the explanation of alarm mail. The default subject is Periodic_data.

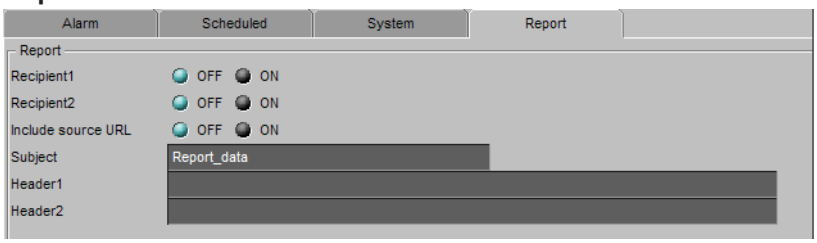
System



Specify the settings for sending e-mail when the DX recovers from a power failure, at memory end, when an error occurs, and when there is an invalid user (only on DXs with the /AS1 advanced security option).

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Include source URL, Subject, and Header**
  These items are the same as the e-mail that is sent when an alarm occurs. The default subject is System_warning.

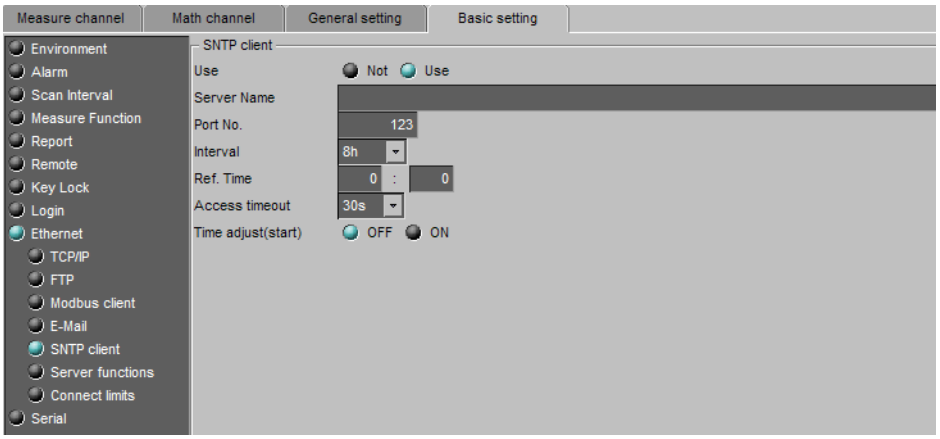
Report



Specify the settings for sending e-mail when reports are created.

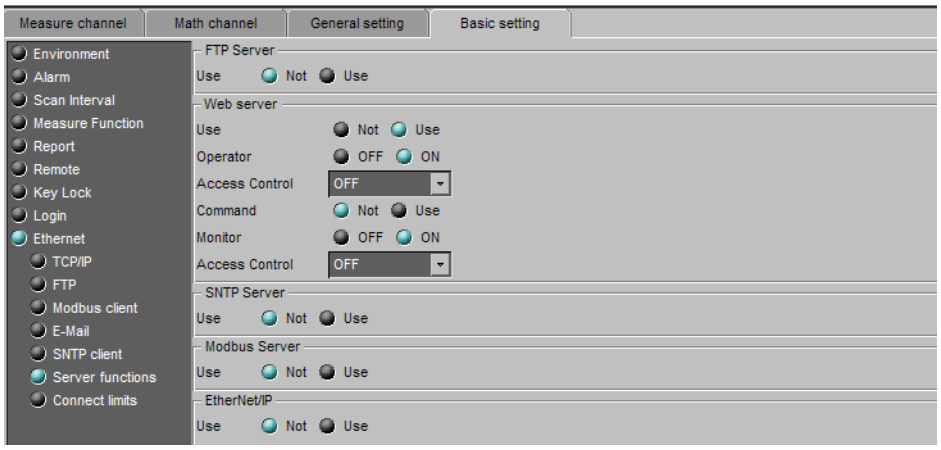
- **Recipient1 and Recipient2**
  Set the recipients. For Recipient1 and Recipient2, select On to send e-mail or OFF to not send e-mail.
- **Include source URL, Subject, and Header**
  These items are the same as the e-mail that is sent when an alarm occurs. The default subject is Report_data.

SNTP Client



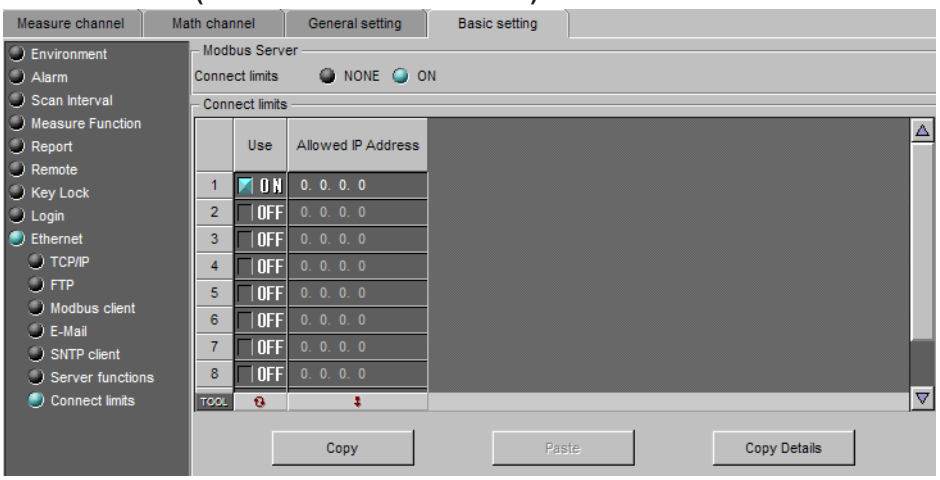
- **Use**
  Select [Use] to use the SNTP client function; Otherwise, select [Not]. If you select [Use], the SNTP client settings are displayed.
- **Server Name**
  Set the SNTP server name using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Port No.**
  Enter the port number of the file transfer destination SNTP server in the range of 1 to 65535. The default value is 123.
- **Access Interval**
  Set the time interval for synchronizing the time with the server to OFF, 1, 8, 12, or 24h. If you select OFF, you can synchronize the time manually by operating soft keys. The time is not synchronized if the difference in the time between the DX and the server is greater than or equal to 10 minutes.
- **Ref. Time**
  Set the reference time for making queries.
- **Access timeout**
  Set the time to wait for the response from the SNTP server when querying the time to 10, 30, 90s.
- **Time adjust (start)**
  Select [On] to synchronize the time using SNTP when memory start is executed; Otherwise, select [OFF].

Server Function



- **Use**
  Select [Use] or [Not] (don't use).
- **Web server Use**
  For the Web item under Server, select [Use] or [Not] (don't use). When [Use] is selected, the Web page item is added to the basic setting mode menu.
  - **Operator**
    To set the operator page, select [ON].
  - **Operator Access Control**
    To use access control, select [ON]. You must enter a user name and password to display the operator page. You must select [Login] as [Key Security] or [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab, and register users under the [User Registration]. On DXs with the /AS1 advanced security option, perform the [Login] settings on the DX.
  - **Command**
    To write messages, select [ON]; Otherwise, select [OFF]. This setting is fixed at [Not] on DXs with the /AS1 advanced security option.
  - **Monitor**
    To display the monitor page on a browser, select [ON]; otherwise, select [OFF].
  - **Monitor Access Control**
    Same as the Operator Access Control.
- **SNTP Server Use**
  select [Use] or [Not] (don't use).
- **Modbus Server Use**
  select [Use] or [Not] (don't use).
- **EtherNet/IP (Release number 3 or later)**
  Select whether or not to use the DX as an EtherNet/IP server. Select [Use] or [Not] (don't use).

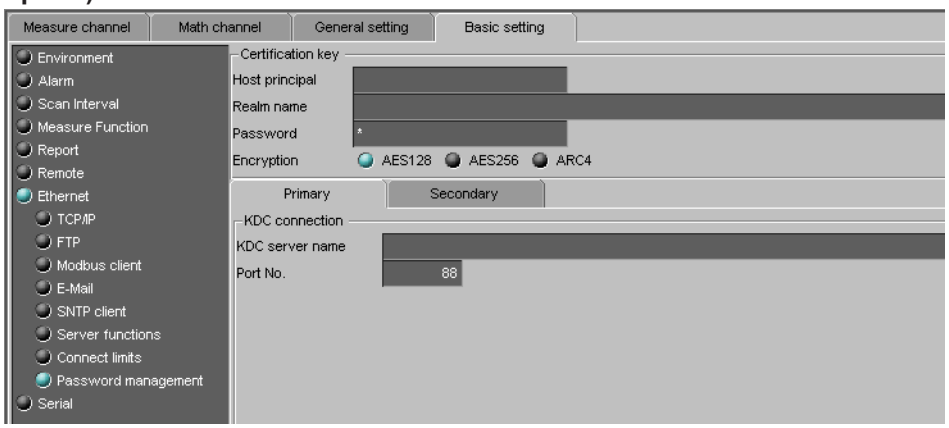
Connect limits (Release number 3 or later)



Modbus Server

- **Connect limits**
  Select [ON] to place connection limits.
- **Allowed IP Address**
  If you want to only allow certain IP addresses to connect to the DX Modbus server, set [Use] to [ON] and enter IP addresses (in the range of 0.0.0.0 to 255.255.255.255) in the [Allowed IP Address] boxes. You cannot enter host names.
  Only the IP addresses specified here can connect to the DX Modbus server.

Password Management (Only on DXs with the /AS1 advanced security option)



Certification Key

- **Host Principal**
  The DX account name registered on the KDC server. You can enter up to 20 alphanumeric characters.
- **Realm Name**
  The name of the domain that contains the KDC server and the DX. You can enter up to 64 alphanumeric characters.
- **Password**
  Set the password to use to access the KDC server using up to 20 characters. The password is displayed as "**********."
- **Encryption**
  Select an encryption method that the server supports from AES128, AES256, and ARC4. ARC4 (ARCFOUR) is an encryption algorithm that is compatible with RC4.

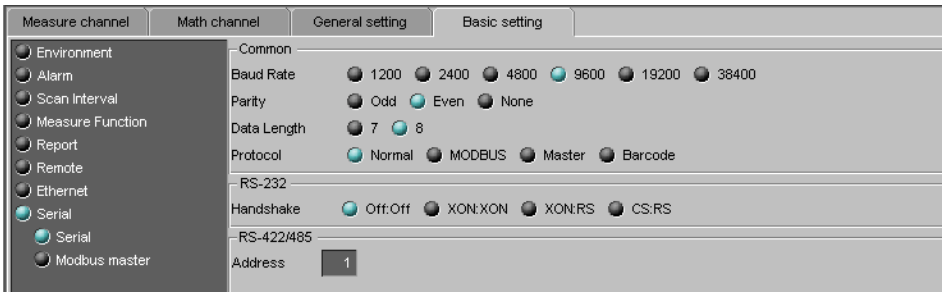
KDC Connection

You can specify a primary and a secondary KDC server.

- **KDC Server Name**
  The KDC server name. You can enter up to 64 alphanumeric characters.
- **Port No.**
  You can specify a value from 1 to 65535. If you do not specify a port number, the default port number, which is 88, is used.

Serial

Serial



For RS-232

- **Baud Rate**
  Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Parity**
  Set the parity check method to Odd, Even, or None.
- **Data length**
  Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Handshaking**
  Select Off:Off, XON:XON, XON:RS, or CS:RS.
- **Address**
  For Modbus protocol, enter a value in the range of 1 to 99. For a general purpose communication protocol, this value is not set.
- **Protocol**

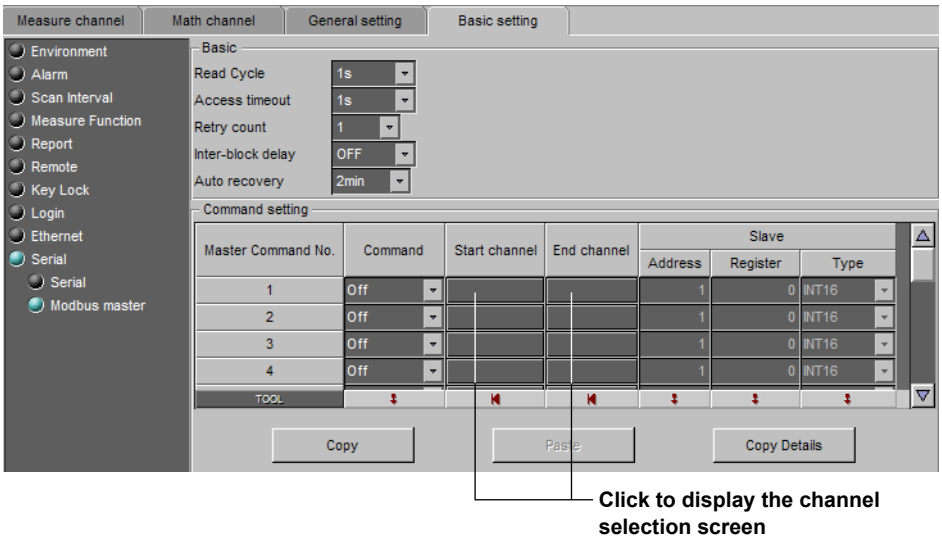
Settings	Description
Normal	General purpose communication protocol
Modbus	Modbus slave
Master	Modbus master*
Barcode	The barcode protocol. This only appears on DXs with the /AS1 advanced security option.

* If you select Modbus master, you need to configure the Modbus master settings. See the next page.

For RS-422/485

- **Baud rate**
  Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Data length**
  Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Parity**
  Set the parity check method to Odd, Even, or None.
- **Handshaking**
  Not specified.
- **Address**
  Select a number from 1 to 99.
- **Protocol**
  This is the same as with the RS-232.

Modbus master



Modbus master settings are enabled when you set [Protocol] to [Master] under [Serial] - [Serial] in the [Basic Setting] tab.

Basic setting

- **Read cycle**
  Set the read cycle to 125ms, 250ms, 500ms, 1s, 2s, 5s, or 10s.
- **Timeout**
  Set the command timeout value to 125ms, 250ms, 500ms, 1s, 2s, 5s, 10s, or 1min.
- **Retrials**
  Set the number of retrials when there is no response from the slave. Select OFF, 1, 2, 3, 4, 5, 10, or 20.
- **Inter-block delay**
  Set the inter-block delay to OFF, 5ms, 10ms, 15ms, 45ms, or 100ms.
- **Auto recovery**
  Set the auto recovery time from communication halt. Select OFF, 1min, 2min, 5min, 10min, 20min, 30min, or 1h.

Command setting

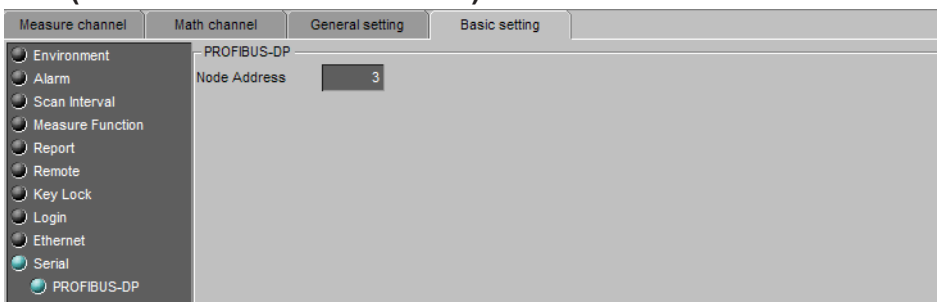
- **Master command No.**
  Select from 1 to 16 for the command numbers to be configured.
- **Command**
  Set the transmitted command type.

Settings	Description
Read	Read to the external input channel (16-bit signed integer type) from the slave.
R-Math	Read to the communication input channel (32-bit floating point type) from the slave.
Write	Write the measurement channel (16-bit signed integer type) to the slave.
W-Math	Write the measurement channel (32-bit signed integer type) to the slave.
Exchange-M	Read to the communication input data (32-bit floating point type) from the server/write the custom display value to the server (release numbers 4 and later).

[Read] can be selected on DX2000s with the external input channel (/MC1 option) installed. [R-Math], [W-Mat], and [Exchange-M] can be selected on models with the computation function (/M1 option) installed.

- **Start channel/End channel (master channel numbers)**
  Enter the first and last channel numbers of input/output. The range of channels that you can enter varies depending on the command type as follows:
  Read: 201 to 440, R-Math: C01 to C60, Write: 1 to 48, W-Math: 101 to 160
  Exchange-M (release numbers 4 and later): C01 to C60
- **Address**
  Enter the address of the slave device in the range of 1 to 247.
- **Register**
  Set the register number of the server.
  For an input register, select in the range of 30001 to 39999 and 300001 to 365536.
  For a hold register, select in the range of 40001 to 49999 and 400001 to 465536.
  The register numbers you can specify vary depending on the command type. See section 6.3 in the DX1000/DX1000N/DX2000 Communication Interface User's Manual.
- **Type**
  Select INT16, UINT16, INT32_B, INT32_L, UINT32_B, UINT32_L, FLOAT_B, or FLOAT_L.
  The type you can specify vary depending on the command type. See section 6.3 in the DX1000/DX1000N/DX2000 Communication Interface User's Manual (IM04L41B01-17E).
  In release number 3, FLOAT has been added as a data type for measurement channel data and computation channel data.

Serial - PROFIBUS-DP (Release number 3 or later)



Node Address

Set to a number from 0 to 125.

3.7 Sending the Setup Data to the DX1000/DX2000

You cannot send data while the DX1000/DX2000 is performing memory sampling or math computations.

Sent Setup Data

Address Setup Data

When settings that deal with communication (hereinafter referred to as “address settings”), such as IP addresses, are changed, the data for those settings is sent separately from other setup data. A DX that receives address setup data restarts automatically and begins operating with the data that has been sent.
The following items are address settings:

- The [TCP/IP] and [Server functions] settings under [Ethernet].
- The [Serial] and [PROFIBUS-DP] settings under [Serial].

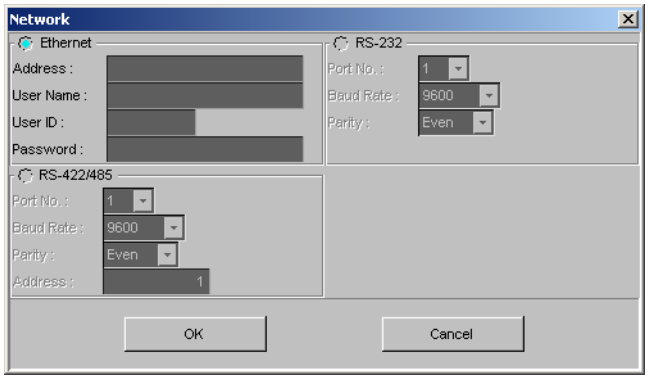
Setup Data Other Than the Address Setup Data

Other setup data is sent together.

Sending Address Setup Data

1. Select [Comm.] - [Partial Transfer] - [Address Settings] from the menu bar.
   The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



   The [Store] dialog box appears.
   If the password has expired on a DX with the /AS1 advanced security option, follow the directions in the dialog box that appears.

3. Click [OK].

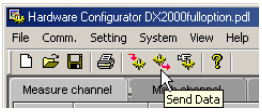
   Data transfer starts. A message appears to indicate when data transfer has stopped. Click [OK] to close the message. The data that you send is enabled after the DX restarts.

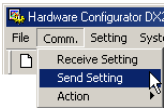
Note

After you change the address, the address that is sent is recorded as the retry destination. The next time you open the [Network] dialog box, the address appears as the initial value.

Sending Setup Data Other Than the Address Setup Data

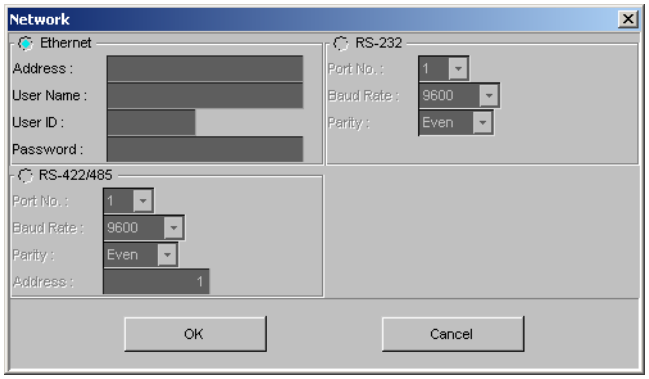
1. Click the [Send Data] button, or select [Comm.] - [Send Setting] from the menu bar.





The [Network] dialog box appears.
If the password has expired on a DX with the /AS1 advanced security option, follow the directions in the dialog box that appears.

2. Enter the parameters, and click the [OK] button.



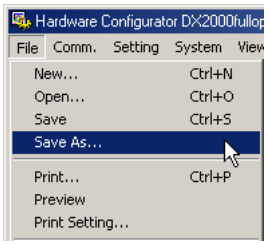
The [Store] dialog box appears.

3. Click [OK].

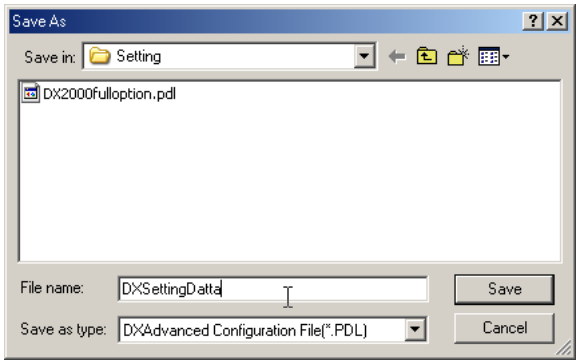
Data transfer starts. A message appears to indicate when data transfer has stopped. Click [OK] to close the message. The settings that you sent are applied.

3.8 Saving the Setup Data

1. Click the Save button or choose [File] - [Save], or [File] - [Save As].



If you choose [File] - [Save as], the [Save As] dialog box appears.



2. Enter a destination file name and location and click the [Save] button.

Save

On a DX1000/DX2000 without the /AS1 advanced security option:
The previous file (*.PDL) is overwritten.

On a DX1000/DX2000 with the /AS1 advanced security option:
The [Save As] dialog box appears.

Save As

Saves the setup data by specifying the save destination and file name.

3.9 Printing the Setup Data

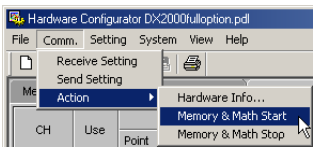
For the operating procedure, see section 1.5.

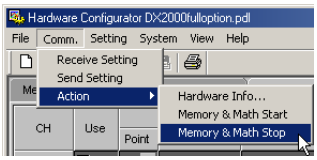
3.10 Starting and Stopping Measurement on the DX1000/DX2000 and Checking the DX1000/DX2000 Hardware Information

From this software, you can start and stop the DX1000/DX2000 and display DX1000/DX2000 hardware information.

Starting and Stopping Measurement

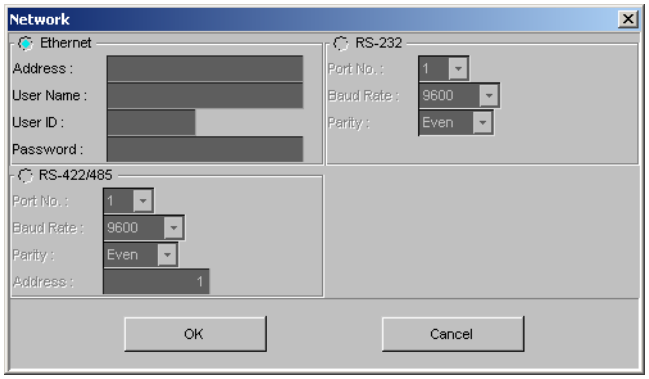
1. Select [Comm.] - [Action] - [Memory&Math Start]/[Memory&Math Stop] from the menu bar.





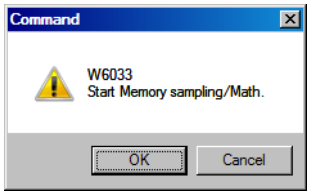
The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Command] dialog box appears. If the password has expired on a DX with the /AS1 advanced security option, follow the directions in the dialog box that appears.

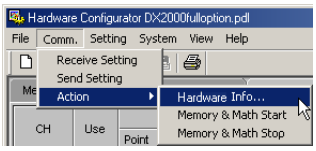
3. Click [OK].



Recording on the DX starts or stops.

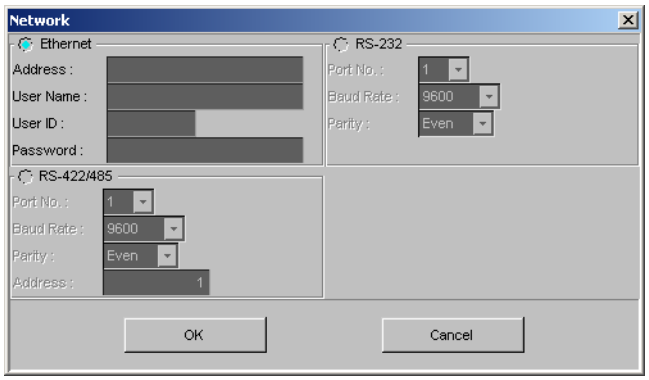
Displaying DX1000/DX2000 Hardware Information

1. Select [Comm.] - [Action] - [Hardware Info] from the menu bar.

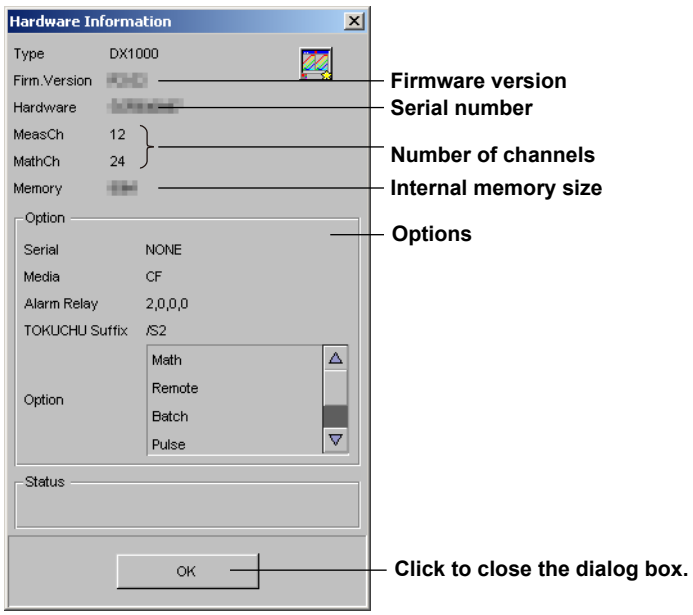


The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Hardware Information] dialog box appears. If the password has expired on a DX with the /AS1 advanced security option, follow the directions in the dialog box that appears.



3.11 Characters That Can Be Used

List of Input Types

Type	Allowed Characters		Item
	Alphanumeric characters	Symbol	
Arbitrary string	Yes	Yes	Tag, group name, comment text field, Web report title/item name, tag number
	Yes	No	Batch field title/characters, file header, mail header
Alphanumeric	Yes	Yes	Unit, user name, password, character string account
	Yes	Yes (including “[” and “]”)	Expression
Machine address	Yes	Disallowed	Host name, domain name, server name, and domain suffix
E-mail address	Yes	Disallowed	Transfer destination, transfer source
Subject	Yes	Disallowed	Mail title
File path name	Yes	Disallowed	File name, directory name,initial path

[Yes] and [Disallowed] indicate availability.
“Disallowed” in the symbol box indicates some disallowed characters are present even though input was possible.
The following characters cannot be used in a file path: * + . /
Expressions are defined by the grammar.

Allowed alphanumeric characters and symbols expressed with a single byte are as follows.

Table of Character Codes

HEX	Alphanumeric characters, Symbol							
	0x	1x	2x	3x	4x	5x	6x	7x
0			(SP)	0	@	P		p
1				1	A	Q	a	q
2				2	B	R	b	r
3			#	3	C	S	c	s
4				4	D	T	d	t
5			%	5	E	U	e	u
6				6	F	V	f	v
7				7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*		J	Z	j	z
B			+		K	[	k	
C					L		l	
D			-		M	]	m	
E			.		N	°	n	
F			/		O	_	o	

(SP) means “space.”
“ ° ” is the symbol for degrees (of temperature). Input, output and indicated using “ ^.”
“ [” and “]” are only allowed in expressions.

4.1 Starting the Harware Configurator

The Hardware Configurator can transmit and receive the setup data, change the setup data, and create new setup data. **The setting screen may differ from your actual screen.**

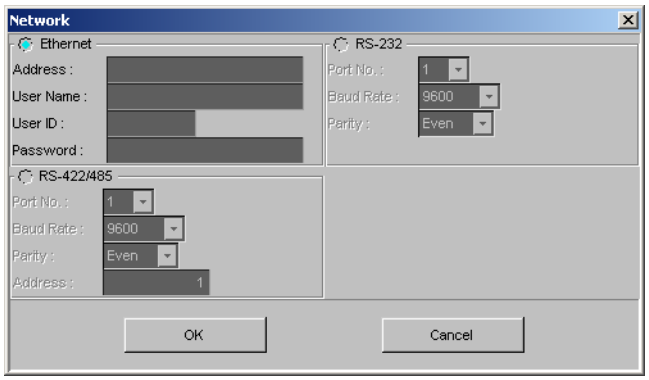
To Load Setup Data from the MV1000/MV2000

Before performing the following procedure, please make sure that the communication method and parameters are correct.

1. Click the [Receive Data] button, or select [Comm.] - [Receive Setting] from the menu bar.

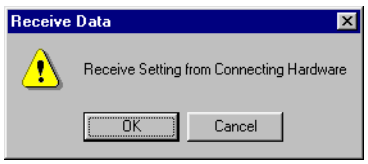
The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Receive Data] dialog box appears.

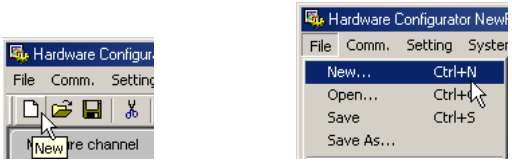
3. Click the [OK] button.



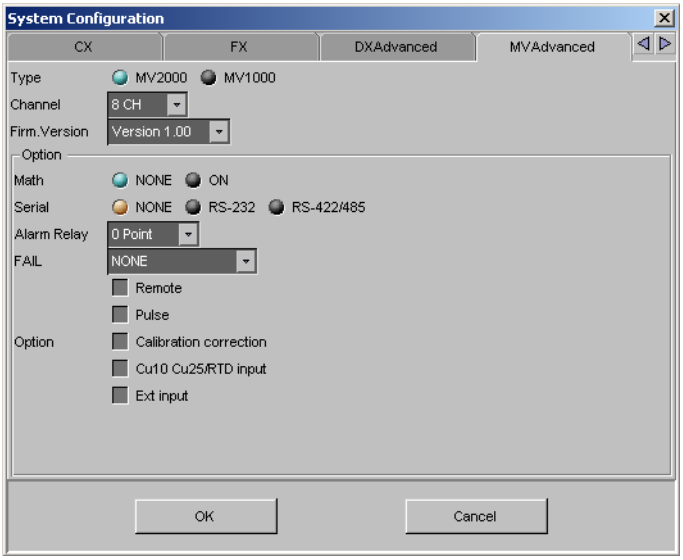
The software receives the setup data from the DX and displays it.

Creating Setup Data by Configuring a New System

1. Click the [New] button, or choose [File] - [New] from the menu bar.



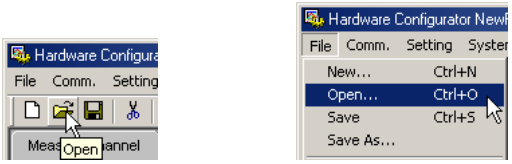
The [System Configuration] dialog box opens.
Click the [MVAdvanced] tab.



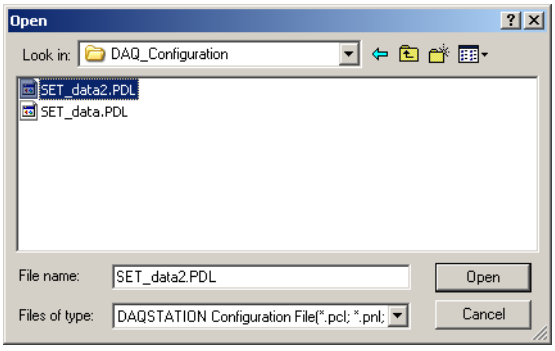
2. Enter all settings on the [MVAdvanced] tab, then click the [OK] button. The MV1000/MV2000 setting screen in displayed.

Loading Existing Setup Data

1. Click the [Open] button, or choose [File] - [Open] from the menu bar.



The [Open] dialog box is displayed.



2. Select a setup data file (with the .PDL extension).

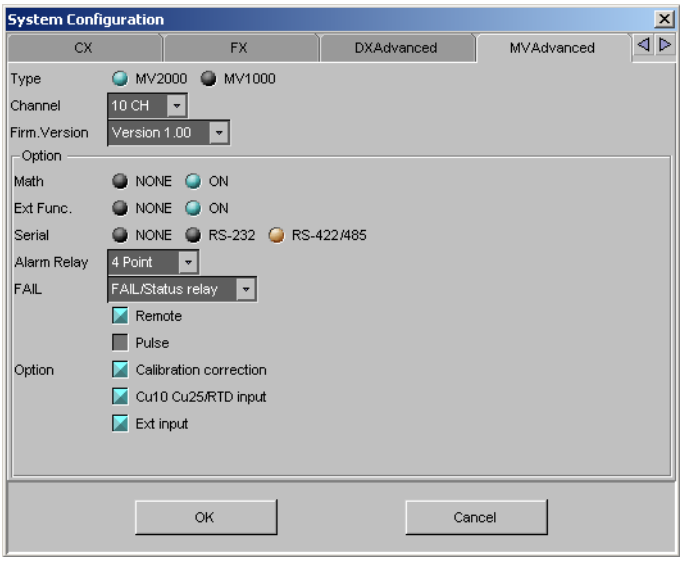
4.2 Setting and Checking the System Configuration and Initializing Settup Data

Changing/Checking the System Configuration

You can create new hardware configuration files, or open existing configuration files and then check the system configuration or change the configuration according to the specifications of the connected MV1000/MV2000.
Normally, a system is set up according to the specifications of the MV1000/MV2000 to be set up.

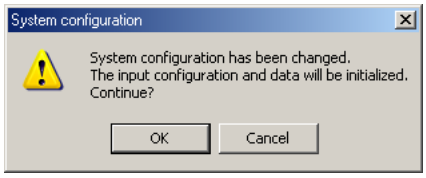
1. Choose [System] - [System Configuration] from the menu bar.

The [System Configuration] dialog box opens.
Click the [MVAdvanced] tab.



2. Change the various settings according to the MV1000/MV2000 that you will connect to (blue and brown items are selected, gray items are cleared).
The settings in the Option group differ depending on the model and options of the instrument.
For example, for the MV1000, or for the MV2000 with eight channels or fewer, the external function item cannot be selected. If [Pulse] is selected (blue), the [Math] and [Remote] items are disabled.

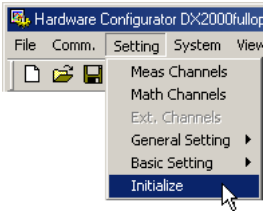
3. After changing the configuration and clicking the [OK] button, the message, “System configuration has been changed.
The input configuration and data will be initialized. Continue?” appears.



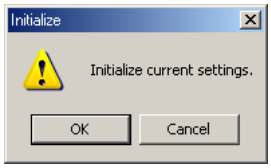
4. Click the [OK] button to initialize the data.

Initializing the Setup Data

1. Choose [Setting] - [Initialize] from the menu bar.



The [Initialize] dialog box opens.

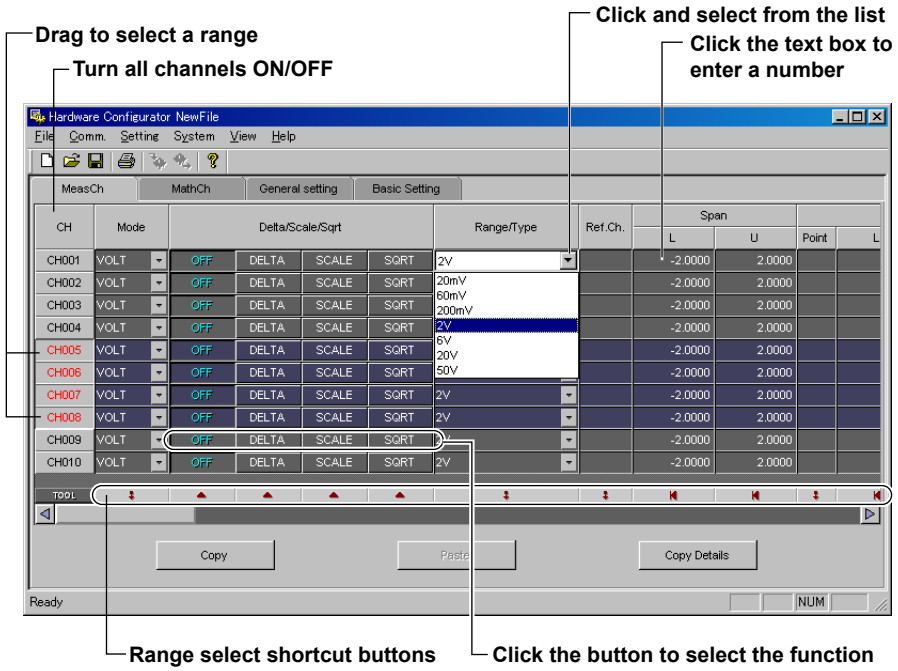


2. Click the [OK] button to initialize the current settings.
The changed settings are restored to the condition when they were newly created.

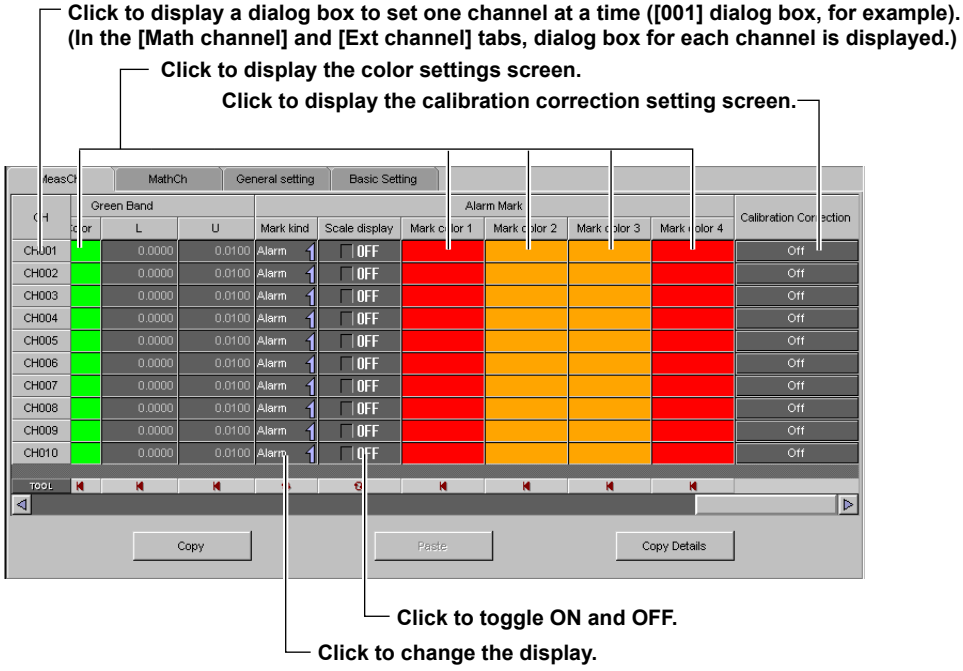
4.3 Setting the Measurement Channels, Ext. Channels

Setting Operation

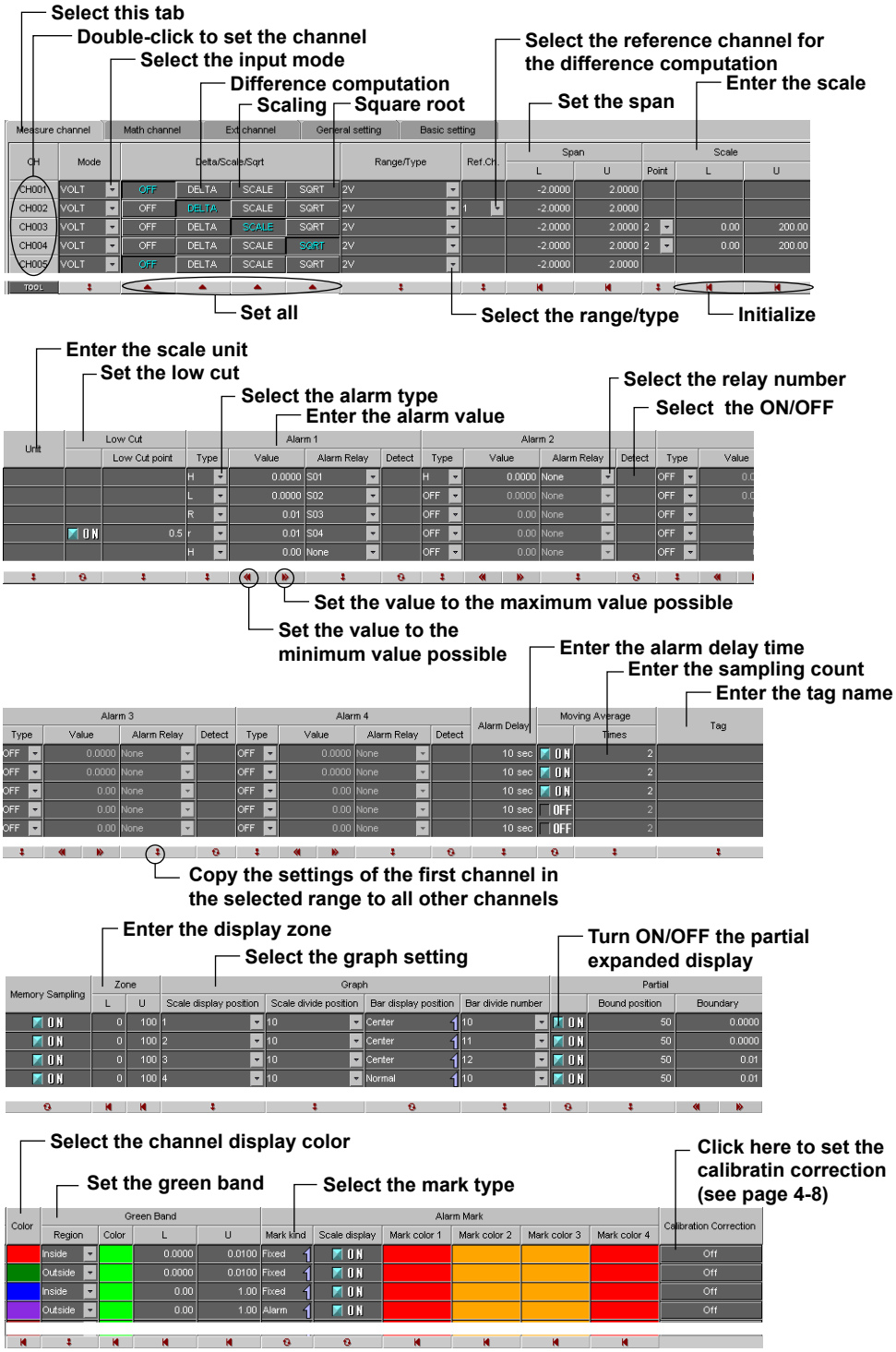
You can select a range of channels and set each item at once.



The range select shortcut buttons are effective on the channel range selected. If no channels are selected, the range select shortcut buttons are effective on all channels. For the function of each button, see next page.



Enter external input channel settings in the same manner as those of the measurement channel items. Also note that this measurement channel setting screen is only one example; your actual screen may vary.



Input Type (Mode and Range/Type)

Correspondence between difference computation, scaling, and square root computation ([DELTA], [SCALE], and [SQRT]) is as follows.

Mode	OFF	DELTA	SCALE	SQRT
SKIP	Yes	No	No	No
VOLT (voltage)	Yes	Yes	Yes	Yes
TC (thermocouple)	Yes	Yes	Yes	No
RTD (resistance temperature detector)	Yes	Yes	Yes	No
DI (voltage level/contact input)	Yes	Yes	Yes	No
1-5 V	No	No	Yes	No

The list for range/type changes depending on the above settings.

Span L, Span U

Input range. The selectable range is displayed on the screen.

Note

- You cannot set the same value to [Span L] and [Span U].
- When the [Mode] is [1-5V] or [Sqrt], [Span L] must be less than [Span U].

Linear Scaling (SCALE)

Converts the unit to obtain the measured value.

- **Scale L, Scale U**
  Input range after converting the unit. The selectable range is from –30000 to 30000.
- **Point**
  Set the number of digits to the right the decimal to four digits or less (0 to 4).

Note

- The MV converts the measured value to a value obtained by removing the decimal point from the value span specified by [Scale L] and [Scale U]. For example, if the scale setting is "–5 to 5," the value is converted to a value within the span of "10"; if the scale setting is "–5.0 to 5.0," the value is converted to a value within a span of "100." In this case, the resolution of the value converted to a span of "10" is lower than the value converted to a span of "100." To prevent the display from becoming rough, it is recommended that the scale be set so that this value is greater than 100.
- You cannot set the same value to [Scale L and [Scale U].
- When the [Mode] is [1-5V] or [Sqrt], [Scale L] must be less than [Scale U].

Difference Computation (DELTA)

Displays the difference between the input and the reference channel.
If difference computation is performed between channels that have different range and type settings, the decimal position of the computed result is set to that of the channel computing the difference. If the number of digits to the right of the decimal of the reference channel is greater than that of the channel computing the difference, the reference value below the least significant digit of the channel computing difference is rounded beforehand.

Ref. CH

The reference channel for difference computation.

Square Root

Computes and displays the square root of the input. This setting can be used only when the input mode is set to VOLT (voltage). As necessary, set the span, scale, and unit.

Unit

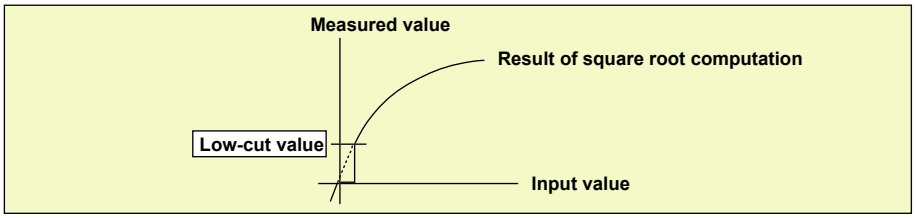
Enter the unit using up to six characters.

Low-cut (Can be set when the mode is 1-5V, and when the mode is VOLT with square root (SQRT) selected.)

Select [ON] to use the low-cut function.

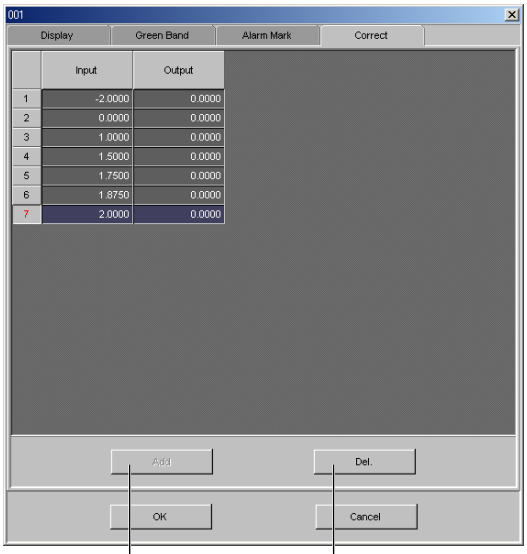
Low-cut value (Can be set when the mode is VOLT with square root (SQRT) selected.)

Set the low-cut value in the range of 0.0% to 5.0% of the input span.



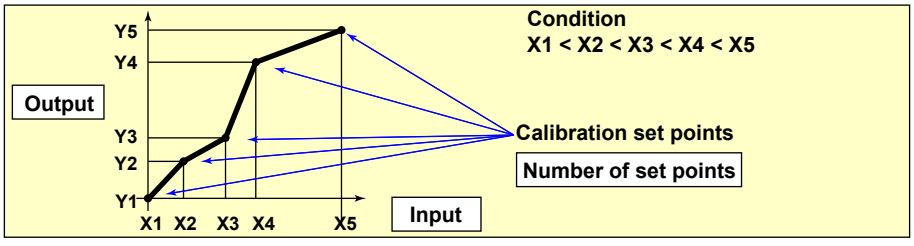
Calibration Correction

Set the input and output values for the calibration correction. The number of set points (including the start and end points) can be specified in the range 2 to 16.



Click to delete the selected row.

Click to add set points (rows) to the number of calibration set points.



Selectable Range of Input and Output Values

- **Channels on which linear scaling is specified**
  –30000 to 30000 (the decimal place is the same setting as the scale value)
- **Other channels**
  Value in the measurable range of the selected range
  Example: –2.0000 to 2.0000 for 2 V range

Alarm

Four alarms (Alarm 1 to 4) can be specified on each channel.

Type

Select H, L, h, l, R, r, T or t. The selectable alarms vary depending on the input mode and computation type. For details, see chapter 3 in the MV1000/MV2000 User's Manual (IM MV1000-01E).

Alarm value

Alarm is generated using the specified value as the boundary. The selectable range of alarm values vary depending on the input mode and range.

Alarm delay

Set the alarm delay time to an integer between 1 and 3600 seconds.
Alarm is generated when the measured value stays above or below the specified alarm value for the specified time (delay period).

Note

MV1000/MV2000 specifications

- The alarm delay time takes on a value that is an integer multiple of the scan interval. For example, if the alarm delay time is set to 5 s when the scan interval is 2 s, the actual delay time is 6 s.
- The delay alarm has the following special operations.
- If the computation is stopped in a condition in which the computed value is exceeding the alarm setting when a delay alarm is set on a computation channel, the alarm is turned On after the specified period (delay period) elapses.
- The alarm detection operation is reset if a power failure occurs. The operation restarts after the power recovers.
- If the alarm setting of the delay high limit alarm is changed when an alarm is already activated and the input is greater than or equal to the new setting, the alarm continues. For all other cases, the alarm detection operation starts at the new setting. This is also true for the delay lower limit alarm.

Alarm Relay

To output relays, select the output relay number. Otherwise, select [None].

Detect

This can be selected when [Alarm No Logging] is turned [ON] under [Detail Setting] in the [Basic Setting] tab.
Select whether to show or hide the alarm indication when an alarm occurs. If set to [OFF], a signal is output to the alarm output relay or internal switch when an alarm occurs, but it is not indicated on the screen. The alarm is also not recorded in the alarm summary.

Moving Average

To use the moving average, select the sampling count [Times] (2 to 400).

Tag

Up to 16 characters can be entered for the tag.
You can use the tag name instead of the channel number to be displayed on the screen.
This can be selected when [Tag] is [Tag] under [Detail Setting] in the [Basic Setting] tab.

Memory Sampling

Turn [ON] (sample) or [OFF] (do not sample).

Display Zone (Zone L and U)

You can select the range of the screen in which the waveform of each channel is to be displayed.
Specify positions (%) on the display scale for the upper and lower limits.
The conditions for setting the zones are as follows:

- Range: 0% to 100%
  The lower limit L must be less than the upper limit
- The difference between the lower and upper limits is at least 5%.

Graph

For details, see section 5.7 in the MV1000/MV2000 User's Manual (IM MV1000-01E).

Scale display position

Select the scale display position on the trend display from 1 to 10 for the MV2000 or from 1 to 6 for the MV1000. Select [OFF] if you do not wish to display the scale.

Scale divide position

Select the number of main scale marks on the trend display from 4 to 12 and C10.

C10: The scale is equally divided into 10 sections by main scale marks, and scale values are indicated at 0, 30, 50, 70, and 100% positions on the trend display.

Bar display position

Select [Normal], [Center], [Lower], or [Upper].

Bar divide number

Select number of divisions of the scale on the bar graph display.

Partial (Partial Expanded Display)

Bound position (%)

Set the boundary for the partial expanded display. The range is from 1 to 99%.

Boundary

Set the value that is to be the boundary between the reduced section and the expanded section in the range of “minimum span value + 1 digit to maximum span value – 1 digit.” For channels that are set to scaling, the selectable range is “minimum scale value + 1 digit to maximum scale value – 1 digit.”

Example: Input range: –6 V to 6V. Bound position: 30. Boundary: 0
The –6 V to 0 V range is displayed in the 0% to 30% range, and the 0 V to 6 V range is displayed in the 30% to 100% range.

The conditions used to set the boundary vary depending on the measurement and computation channels as follows:

- Measurement channel
  When SCALE and SQRT are not used: Span L < boundary < span U
  When SCALE and SQRT are used: Scale L < boundary < scale U
- Computation channel
  Span L < boundary < span U

Note

For the MV1000/MV2000, this is when [Partial] is turned [ON] under [Detail Setting] in the [Basic Setting] tab.

Color (Display Color)

You can select the display color of each channel from 24 colors.

Green Band

Displays a specified section of the measurement range using a color band on the scale. This setting is common with the bar graph display.

Region (Band area)

Settings	Description
Inside	Displays the area inside using the color band.
Outside	Displays the area outside using the color band.
OFF	Disables the function.

Color

Set the display color.

L and U

Specify the display position. Set a value within the span or scale range.

L: Lower limit of the area.

U: Upper limit of the area.

Alarm Mark

Displays marks indicating the values of the high and low limit alarms, delay high and low limit alarms, and difference high and low limit alarms. This setting is common with the bar graph display.

Mark kind

Settings	Description
Alarm	Indicates green under normal conditions and red when an alarm is activated.
Fixed	Displays a fixed color.

Scale display

To display alarm point marks, select [ON].

Mark color

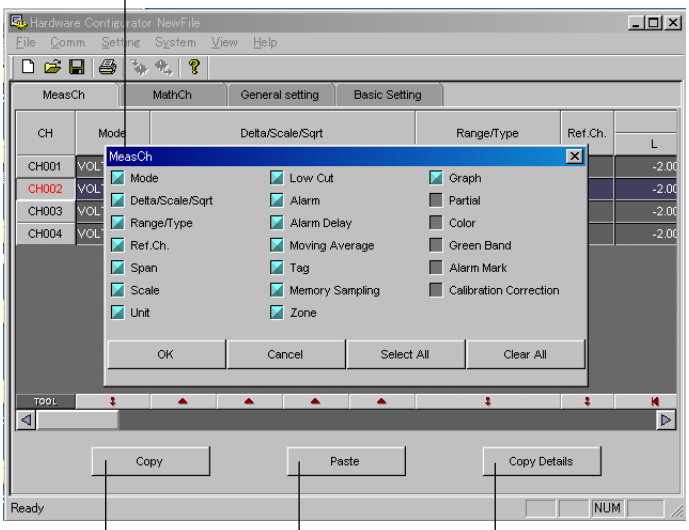
If the [Mark kind] is set to [Fixed], specify the color of the alarm point marks.

Copying and Pasting Setup Data

The items checked in [Copy Details] can be copied and pasted. Click the channel number to select the copy source or paste destination.

To select multiple channels to be copied, drag the channel number to specify the range to be copied. To select multiple paste destinations, select the range in a similar fashion.

Example of the selection screen of the setting item
This screen is displayed when clicking the [Copy Details] button
The setting item names of the channel setup screen appear.
Blue means selected, gray means cleared.



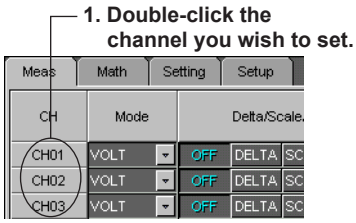
Click to display the screen for selecting setting items to copy, then select the desired items.

Paste the selected settings to the specified range.

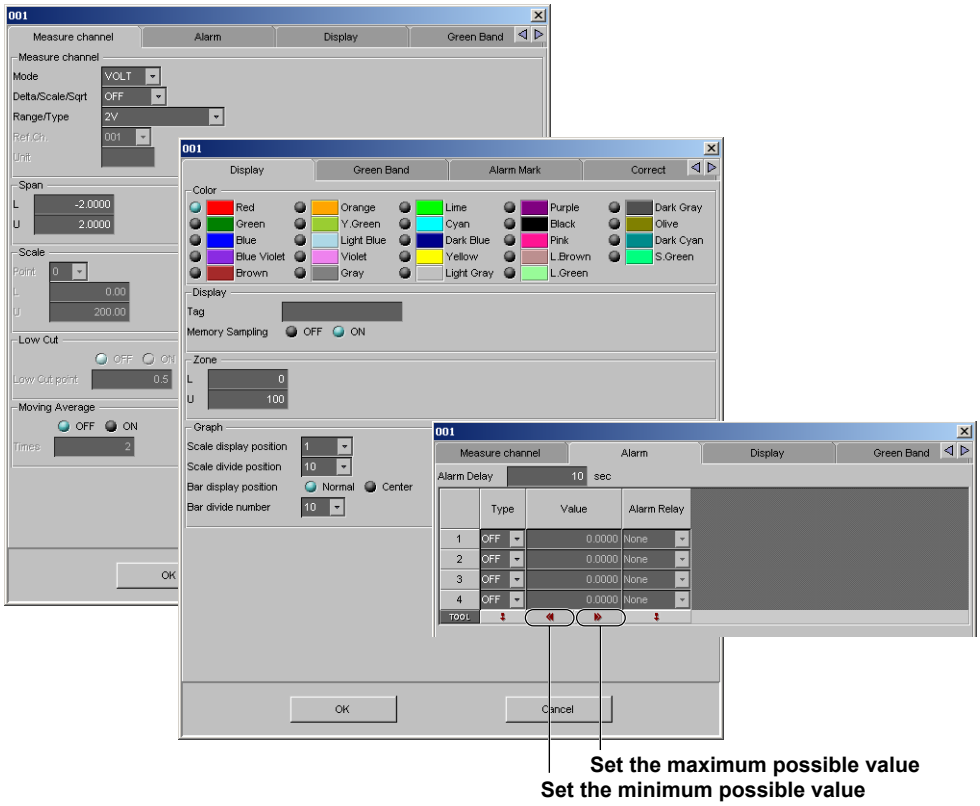
Copy the selected settings of the specified range.

1. Select the copy source channels. Click the [Copy] button.
2. Select the paste destination channels. Click the [Paste] button.

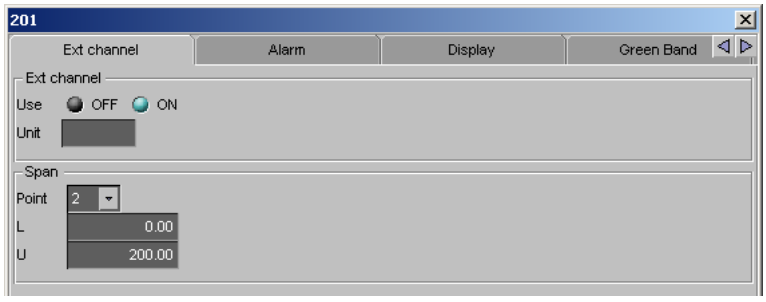
Setting One Channel at a Time



2. The channel setting dialog box opens.

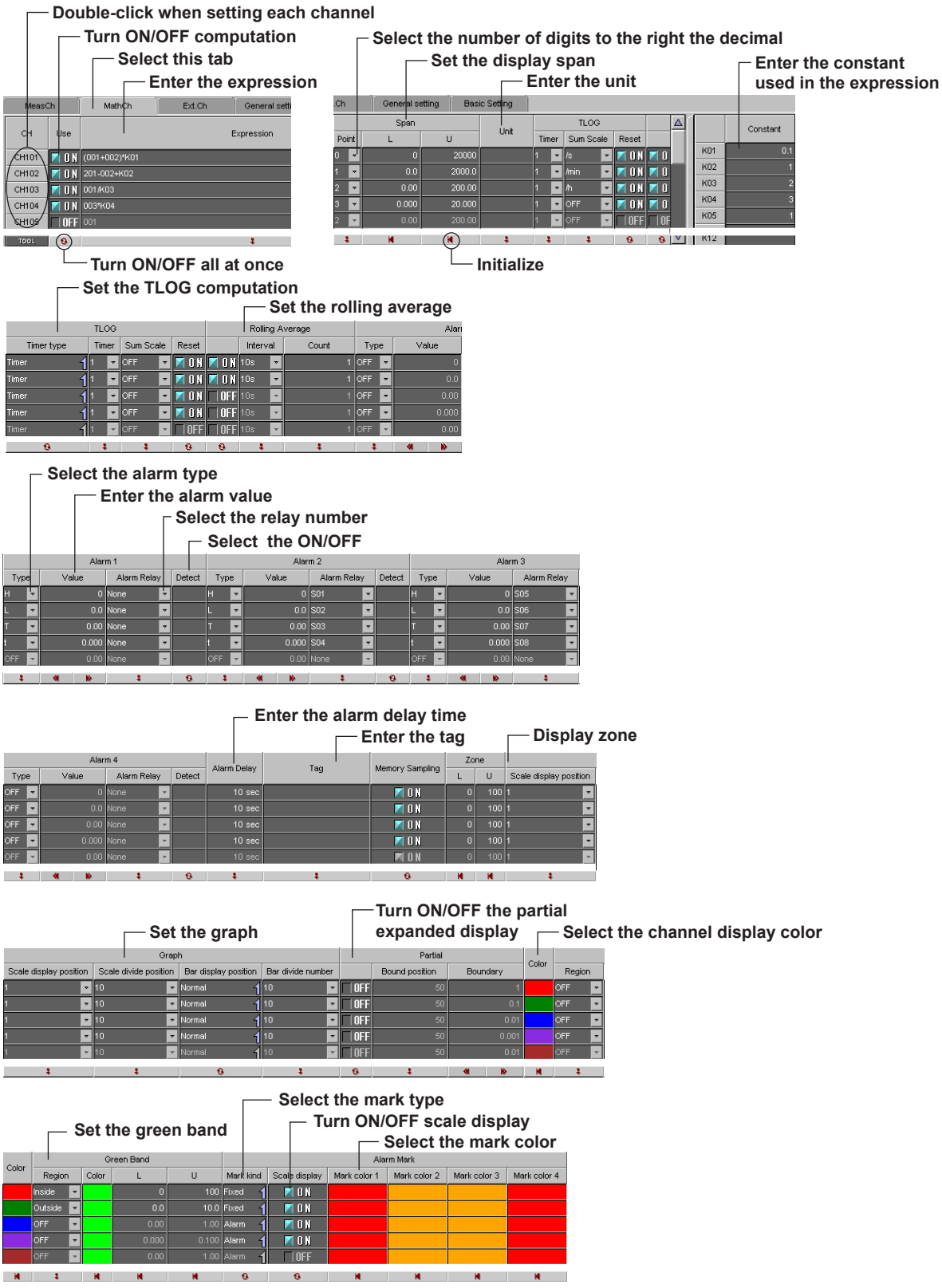


For Ext channels



The items in the measurement channel tab and Ext. channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

4.4 Setting the Computation Channels

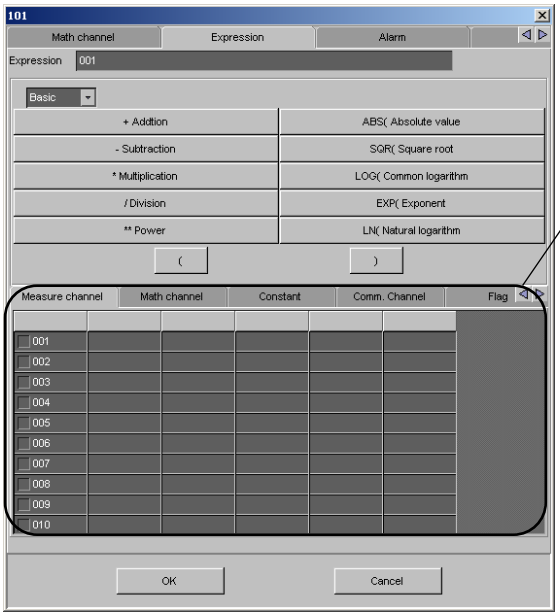


Use (Turning ON/OFF Computation)

Select whether or not to perform computation for each channel.

Entering Expressions

Enter an expression using up to 120 characters. You can display the variables or constants list and add one of the variables or constants in the list to your expression simply by clicking it. For details related to the expression, see the MV1000/MV2000 User's Manual.



Span (Display Span) and Point

Sets the upper and lower limits of the display.
The range is from –9999999 to 99999999. Set the number of digits to the right the decimal to four digits or less (0 to 4).

Unit

Enter the unit using up to six characters.

TLOG (TLOG Computation)

Timer Type

Select timer or match time timer.

Timer

Select the timer number or match time timer number to use.

Sum Scale

Set the sum scale to [/s], [/min], [/h] to match the unit of the measured value.
Example: If the unit of the measured value is "m^3/min," select [/min].
OFF: Sums as-is the measured data per scan interval.

Reset

To reset the TLOG computed value at each interval, select [ON].

Alarm and Tag

The settings are the same as the measurement channels. For details, see section 4.3, "Setting the Measurement Channel, Ext. Channel."

Rolling Average

ON/OFF

To take the rolling average of the measured results, select [ON].

Interval

Select the sampling interval when taking the rolling average from the following: The sampling interval takes on a value that is an integer multiple of the scan interval. For example, if the sampling interval is set to 5 s when the scan interval is 2 s, the actual sampling interval is 6 s.

Count (Number of samples)

Set the number of samples for the rolling average using an integer between 1 and 1500. The rolling average time is equal to the sampling interval × the number of samples.

Note

MV1000/MV2000 Specifications

- If the number of data points to be averaged has not reached the specified number of samples immediately after computation is started, the average of the available data is calculated.
- Computation error data is excluded from the rolling average computation.
- If the computed data exceeds the upper or lower limit, the data is clipped at the upper or lower limit, and the rolling average is computed. The upper and lower limit is “±100000000” excluding the decimal point. The decimal place is the same as that of the span lower limit.

Memory Smpling, Zone, Graph, Partial, Color, Green Band, and Alarm Mark

The settings are the same as the measurement channels. For details, see section 4.3, “Setting the Measurement Channel, Ext. Channel.”

Constant

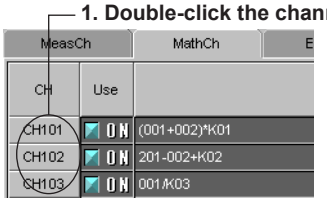
You can set constants to be used in the expression. Up to 60 constants can be specified.

Copying and Pasting Setup Data

See section 4.3, “Setting the Measurement Channel, Ext. Channel.”

Setting One Computation Channel at a Time

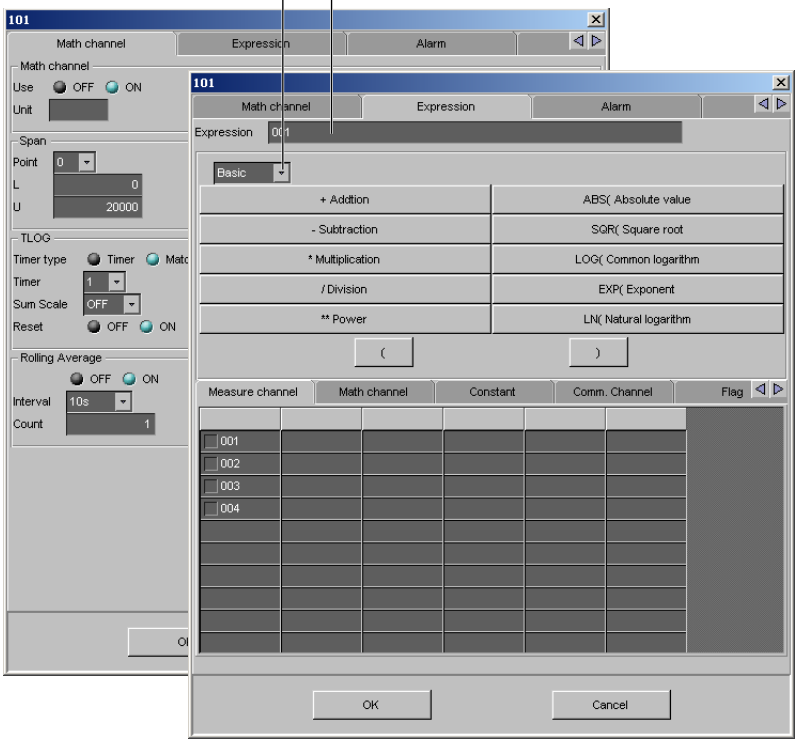
1. Double-click the channel you wish to set.



2. The channel setting dialog box opens.

Clicking here and selecting the list of operators switches the display

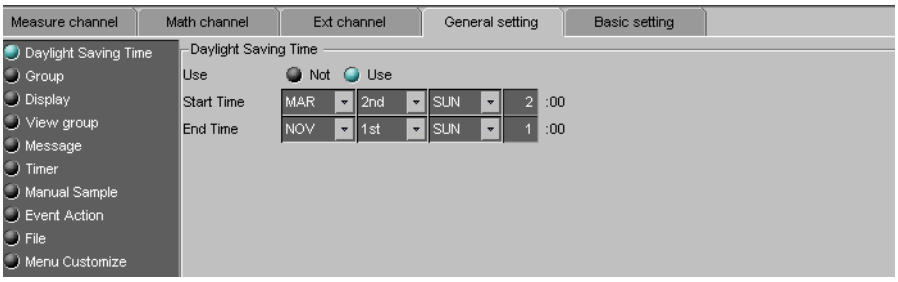
Select channels on the Measure channel, Math channel, and Ext channel tabbed pages and select desired operators to create an expression.



The items in the math channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

4.5 Entering General Settings

Summer Time



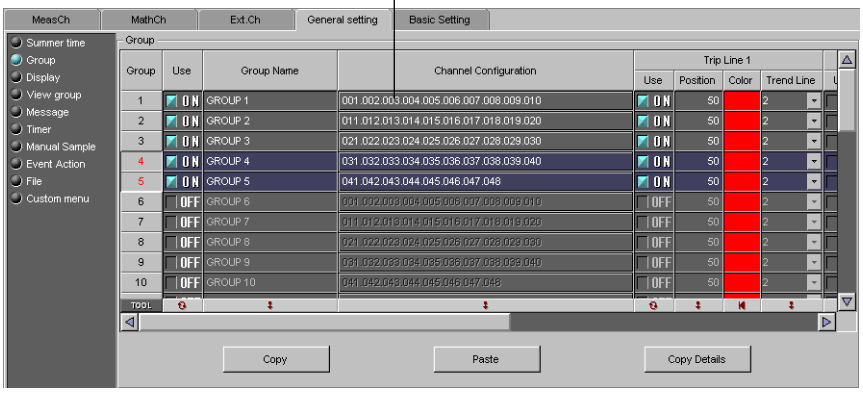
On/Off — To switch between summer time and standard time, select [On].

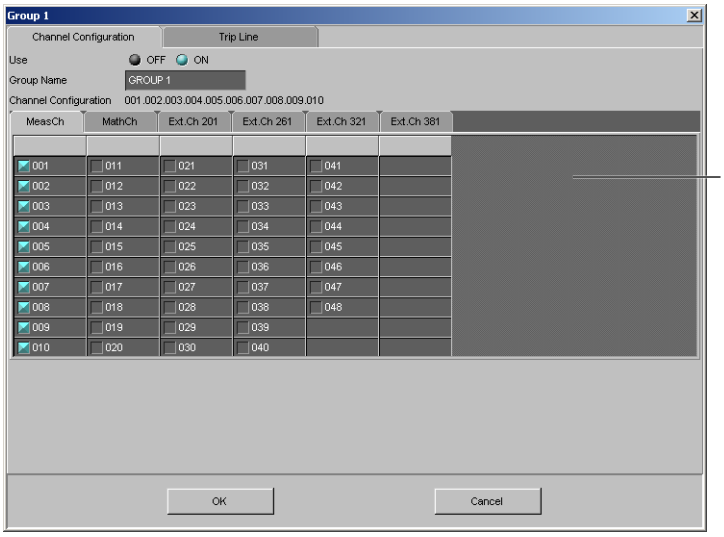
Start Time — Specify the date/time to switch from standard time to summer time. Set the month, the nth week, the day of the week, and the time.

End Time — Specify the date/time to switdh from summer time to standard time. Set the month, the nth week, the day of the week, and the time.

Group

Click to display the channel configuration/trip line settings dialog box.





Select channels to register to the group, or set the trip line.

Use
Turn On the groups you want to use.

Group name
Set the group name. (up to 16 characters)

Channel Configuration
Set up to 10 channels (MV2000) or 6 channels (MV1000) from measurement channels, computation channels (/M1 and /PM1 options), and external input channels (/MC1 option, MV2000).

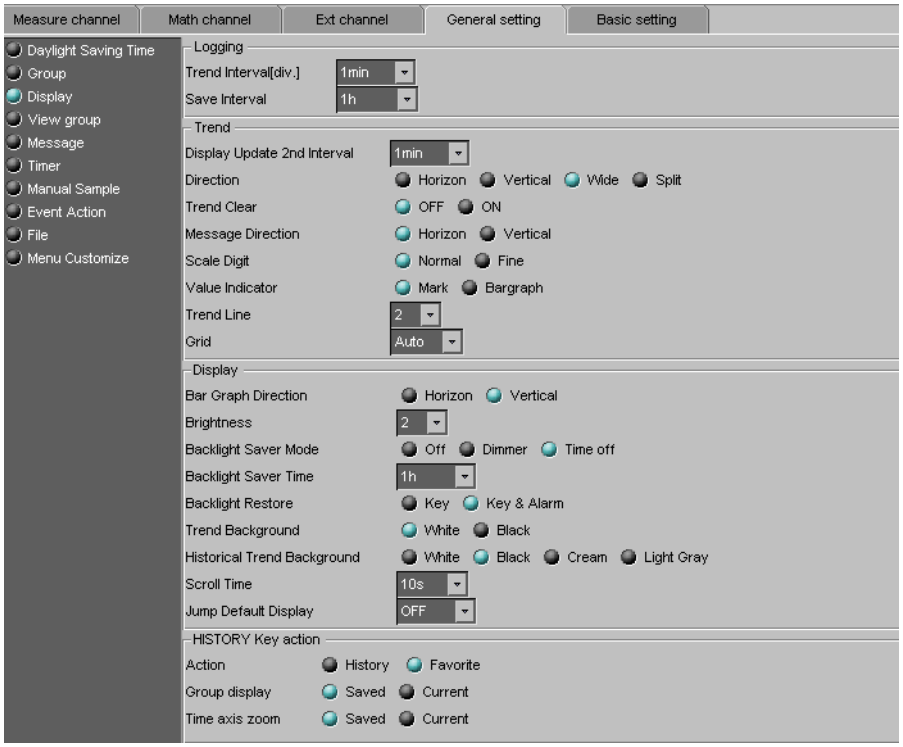
Note

- The trend, digital, and bar graph displays are shown in the specified order.
- A channel can be assigned to multiple groups.
- The same channel cannot be assigned multiple times in a group.

Trip line
Set lines at specified positions in the waveform display range on the Trend display.

- **Use**
  Turn [ON] the trip lines you want to display.
- **Position**
  Set the position in the range of 0 to 100% of the display width.
- **Color**
  The default colors are red, green, blue, and yellow. If you want to change the color, select from the 24 available colors.
- **Trend Line**
  Set the line width of the trip line in dots (1 to 3).

Display



Trend interval [/div]

Specify the trend/storage interval (sampling interval and recording interval) in terms of time per division on the time axis. You cannot choose a sampling interval that is faster than the scan interval. See the table under “Save Interval” below.

High-speed model: 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min, 1h, 2h, 4h, 10h

Medium-speed model**: 15s*, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min, 1h, 2h, 4h, 10h

* Only during fast sampling mode.

** You cannot use fast sampling mode on models with the external input channel (/MC1) option.

Save Interval (when recording display data)

Select the size of a record data file. The recorded data is divided by the file size specified here. The available settings vary depending on the number of memory sampling channels and the Trend interval setting.

Trend interval	**5 s**	**10 s**	**15 s**	**30 s**	**1 min**
Sampling interval	125 ms	250 ms	500 ms	1 s	2 s
Selectable range of auto save interval	10 min to 12 h	10 min to 1 day	10 min to 3 days	10 min to 7 days	10 min to 14 days
Trend interval	**2 min**	**5 min**	**10 min**	**15 min**	**20 min**
Sampling interval	4 s	10 s	20 s	30 s	40 s
Selectable range of auto save interval	10 min to 14 days	10 min to 31 days	10 min to 31 days	10 min to 31 days	1 h to 31 days
Trend interval	**30 min**	**1 h**	**2 h**	**4 h**	**10 h**
Sampling interval	1 min	2 min	4 min	8 min	20 min
Selectable range of auto save interval	1 h to 31 days	1 h to 31 days	2 h to 31 days	4 h to 31 days	8 h to 31 days

Display Update 2nd Interval

Enabled when [Trend Rate Switching] is turned [ON] under [Environment] - [Detail Setting] in the [Basic Setting] tab. Select a rate from the list.

The selectable 2nd intervals are the same as those for Trend interval.

Direction

Set the display direction of the trends to [Horizontal], [Vertical], [Wide], or [Split].

Trend Clear

ON Clears the displayed waveform when the memory sampling is started.

OFF Does not clear the waveform when the memory sampling is started.

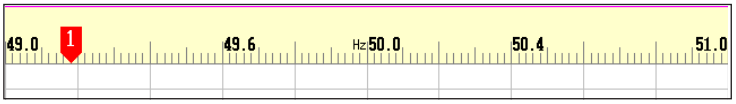
Message direction

Set the display direction of messages to [Horizontal] or [Vertical]. When the trend is set to Vertical, the message direction is fixed to [Horizontal].

Scale Digit

Select the [Normal] or [Fine].

Fine If the scale value is two-digit display, it can be changed to three digits. For example, if the scale range is “49.0 to 51.0,” the scale values are displayed using 3 digits as shown below.



Value Indicator

The current value is displayed as a mark or a bar graph.

Trend Line

Set the line width of the trend in dots (1 to 3).

Grid
Select the number of grids to be displayed in the waveform display area of the trend display.

Settings	Description
4 to 12	Displays a grid that divides the display width into 4 to 12 sections.
Auto	Displays the same number of grids as the number of scale divisions of the first assigned channel of the group.

Bar Graph Derection
Select Bar graph derection.

Brightness
Select a value from 1 to 6 (2 by default). Larger the value, brighter the display becomes.

Backlite Save Mode

Settings	Description
OFF	Disables the backlight saver.
Dimmer	Dims the display if there is no operation for a given time.
Timeoff	Turns the backlight OFF if there is no operation for a given time.

Backlight Saver Time
Select a value from 1 min to 1 h. If the specified time elapses without any key operation or alarm occurrence, the LCD backlight switches to the specified mode.

Backlight Restore

Settings	Description
Key	The backlight returns to the original brightness when a key is pressed.
Key&Alarm	The backlight returns to the original brightness when a key is pressed or when an alarm occurs.

Trend Background
Set the background color of the operation screen to White (default setting) or Black.

Historical Trend Background
Select the background color of the historical trend display from the following:

Settings: White, Black (default setting), Cream, and Lightgray

Scroll Time
Set the switching interval from the available settings between 5 s and 1 min. The groups switch in ascending order.

Jump Default Display
Returns to a preset display if there is no key operation for a specific time.

Settings	Description
1min to 1h	Time until switching the display.
OFF	Disables the function.

HISTORY Key Operation

- **Operation**

Settings	Description
History	Switches to the historical trend display when the key is pressed.
Favorite	Switches to the favorite display that you registered when the key is pressed.

- **Group Display**

Settings	Description
Current	Displays a favorite display in the current group.
Saved	Displays a favorite display in the group that was selected when you registered the favorite display.

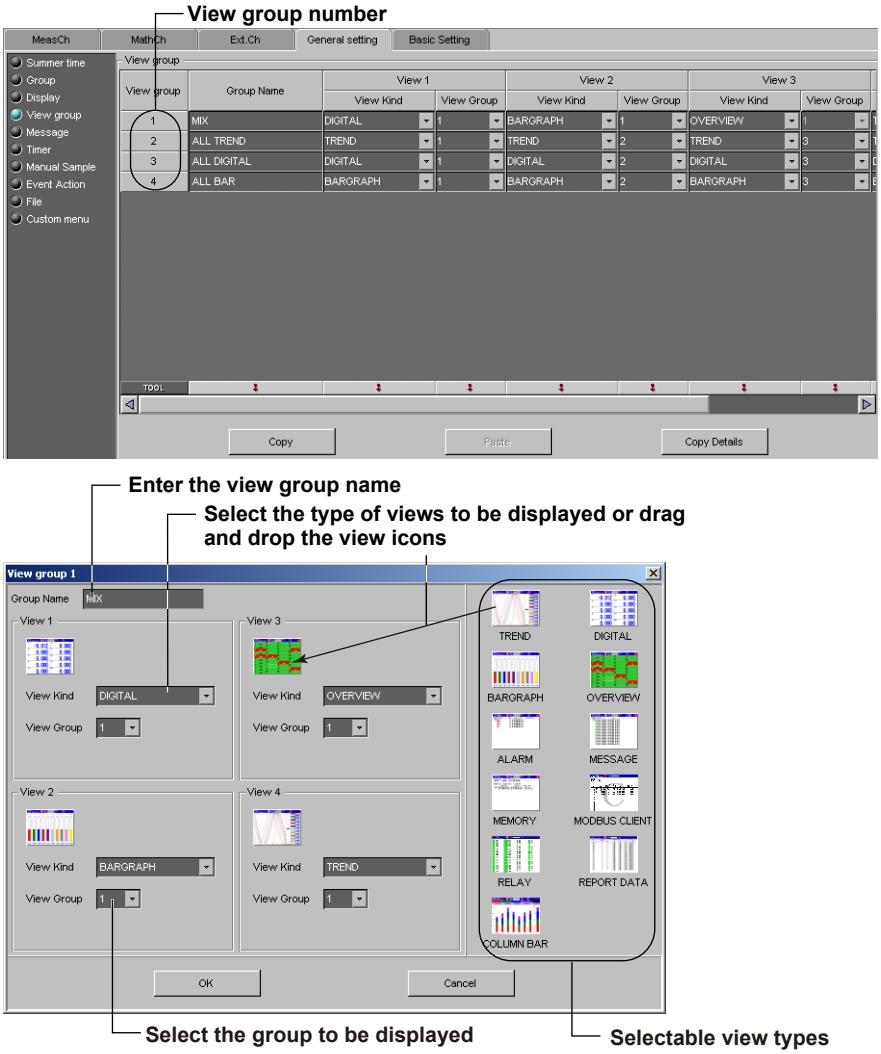
- **Time Axis Zoom**

Settings	Description
Current	Displays a favorite display at the current time axis zoom rate.
Saved	Displays a favorite display at the time axis zoom rate that was selected when you registered the favorite display.

View Group

Set the screens that will be displayed in the 4 panel display. This function is for the MV2000 only.

With revision R7.21 or later, you can open a settings dialog box for any view group by double-clicking its number.



Group Name

Up to 16 characters can be entered for the group name.

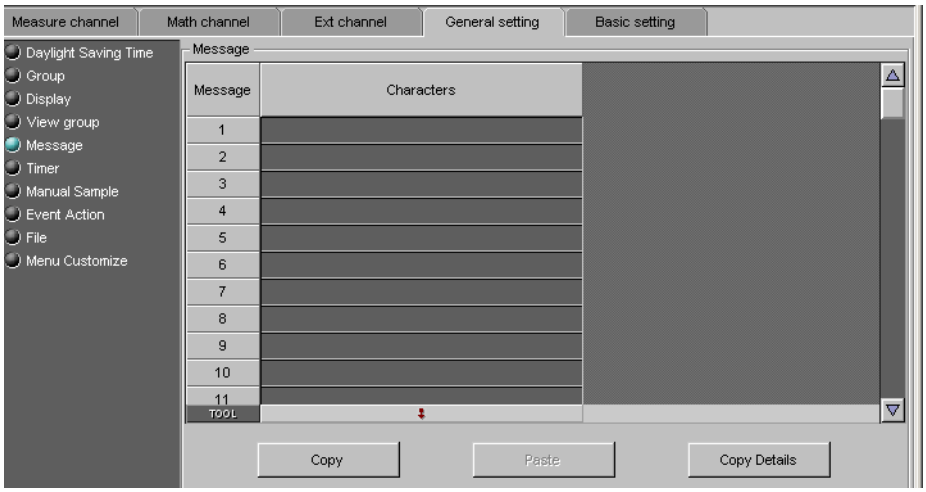
View Kind

The view group is made up of four screens. Select the type of screen to display in each screen.

View Group

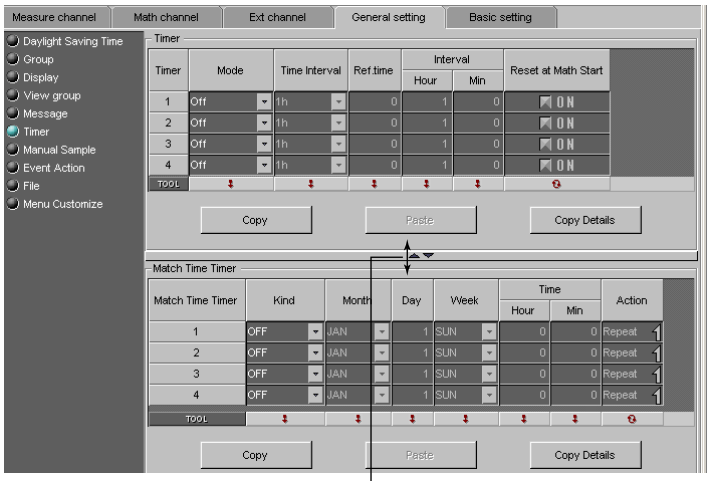
Up to four view groups can be registered.

Message



Enter a message to be written to the group of up to 32 alphanumeric characters.

Timer



Timer

Timer used by event action. Used also in the TLOG computation of the computation function.

Up to four timers (1 to 4) can be set.

- **When Using an Absolute Timer**
  - Mode
    Select [Absolute].
  - Time interval
    Select the interval from the available settings between 1min to 24h.
  - Ref.time
    Set the time in the range of hour 0 to hour 23.

- **When Using a Relative Timer**
  - Mode
    Select [Relative].
  - Time interval
    Set in the range from 00:01 (1 min.) to 24:00 (24 hours).
    Hour: Set in the range from 0 to 24.
    Min: Set in the range from 0 to 59.
  - Reset at Math Start
    ON Resets the timer when computation is started. The resetting of the timer is not considered to be a timeout. Even if the timer is used as an event, the action is not executed.

Match Time Timer

Set the time match condition used in event action. These timers are also used in TLOG computation of the computation function. You can set four match time timers (1 to 4).

- **Kind**

  Daily Set the time match condition of a day.
  Weekly Set the time match condition of a week.
  Monthly Set the time match condition of a month.
  Year Sets the time match condition for a year.

  Set the items with check marks in the following table depending on the Kind setting.

Setup Item	Kind			
	Daily	Weekly	Monthly	Year
Month				✓
Day			✓	✓
Week		✓		
Hour:Minute	✓	✓	✓	✓

- **Month, Day, Week, Hour:Minute**

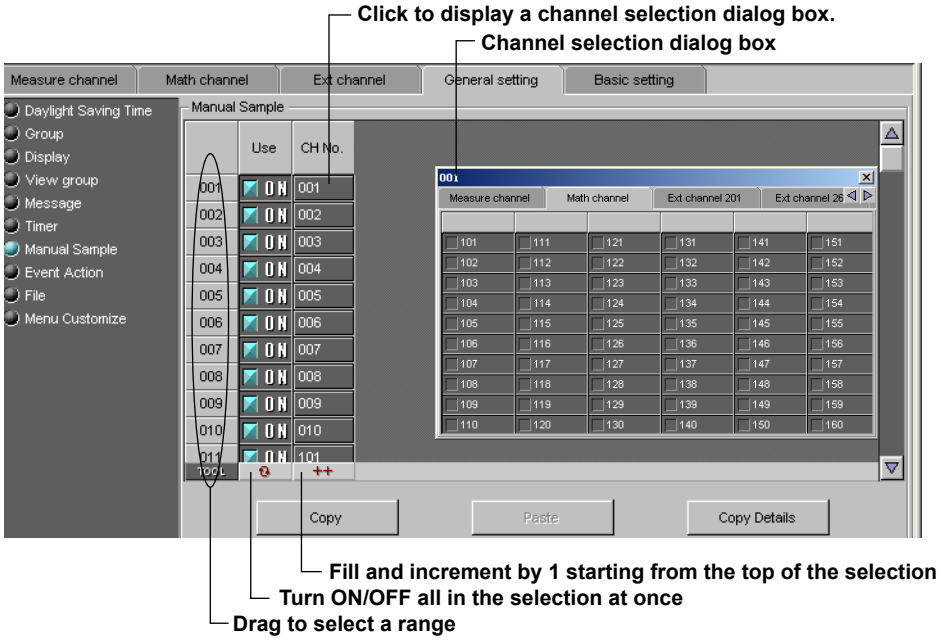
  Set the month, day, and weekday. Set the time in the range of 00:00 to 23:59 for Hour: Minute.

- **Timer action**

  Single Executes the action once when the condition is met.
  Repeat Executes the action at every specified time.

Manual Sample

On a MV2000 with the external input channel (/MC1) option, specify the channel that will be manually sampled. On all other models, all channels will be manually sampled so this setting is not necessary.



Manual sample number

Select a number from 001 to 120. The instantaneous values are output in this order.

Manual Sample

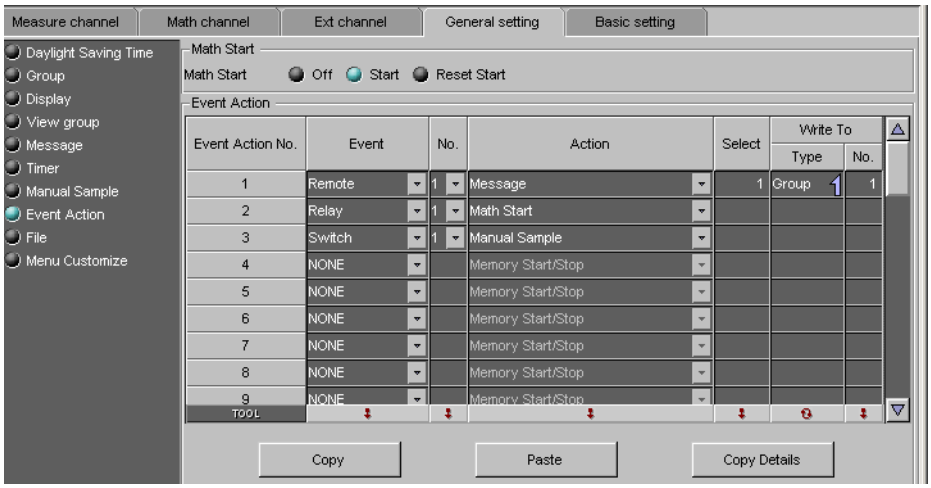
- **Use**

  Select On when assigning a channel to the manual sample number.

- **CH No.**

  Enter a channel number of a measurement channel, computation channel (/M1 and /PM1 options), or external input channel (/MC1 option).

Event Action



Math Start

Settings	Description
Off	Does not start the computation even when the START key is pressed.
Start	Starts the computation when the START key is pressed.
Reset Start	Resets the computed result up to then and starts the computation when the START key is pressed.

Event Action No.

You can set up to 40.

Event

The condition to execute the action.

Settings	Description
NONE	Not use.
Remote	Select the remote control input terminal number.
Relay	Select the alarm output relay number.
Switch	Select the internal switch number.
Timer	Select the timer number.
Match Time	Select the match timer number.
Alarm	-
User Key	-

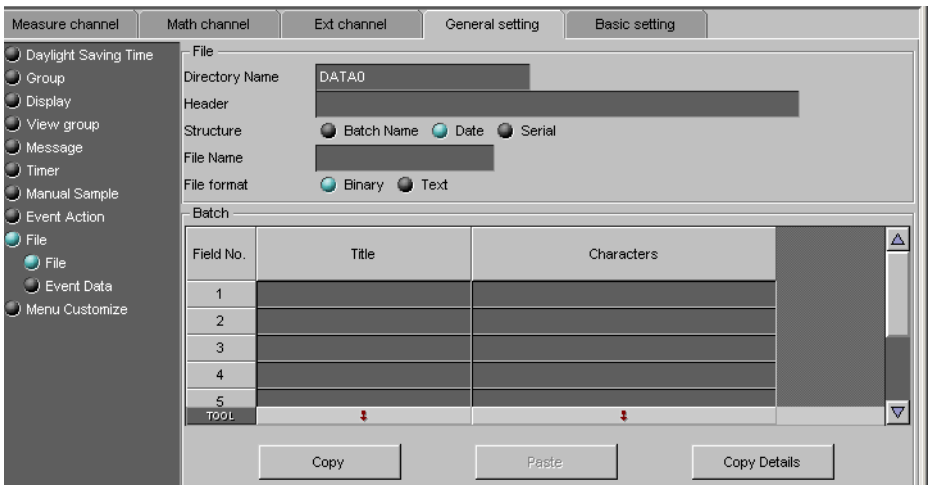
Action

The action to be executed when an event occurs.

Settings	Description
Memory Start/Stop	-
Memory Start	-
Memory Stop	-
Trigger	Can be specified when the MV is configured to record event data.
AlarmACK	Cannot be specified when the event is set to [Relay], [Switch], or [Alarm].
Math Start/Stop	Can be specified on /M1 and /PM1 options.
MathStart	Can be specified on /M1 and /PM1 options.
MathStop	Can be specified on /M1 and /PM1 options.
Math Reset	Can be specified on /M1 and /PM1 options.
Save Display Data	Can be specified when the MV is configured to record display data.
Save Event Data	Can be specified when the MV is configured to record event data.
Message	Set the message number and the destination. Set the message destination to all groups (All) or a group number.
Snapshot	-
Display Update Interval Change	Can be specified when the function for switching between the trend update interval and the secondary update interval is enabled.

Settings	Description
Manual Sample	-
Timer Reset	Cannot be specified when the event is set to [Timer].
Display Group Change	Specify the number of the group to be displayed.
Flag	Can be specified on /M1 and /PM1 options.
Time ADJUST	Can be specified only when the event is set to [Remote].
Panel Load	Can be specified only when the event is set to [Remote].

File



Directory name

Set the name of the directory on the storage medium for saving the data on the external storage medium. (Up to 20 characters)

Symbols that can be used: #, %, (,), +, -, ., @, °, and _.

Strings that cannot be used: AUX, CON, PRN, NUL, CLOCK, COM1 to COM9, and LPT1 to LPT9.

Header

Set the header comment to be written to the data file. (Up to 50 characters)

Structure

Sets the structure of the file name when saving data.

Settings	Description
Date	Serial number + user-assigned character string + date
Serial	Serial number + user-assigned character string
Batch	Serial number + batch name (when using the batch function)

File name

Set the user-assigned section of the file name. (Up to 16 characters)

Symbols that can be used: #, %, (,), +, -, ., @, °, and _.

File Format

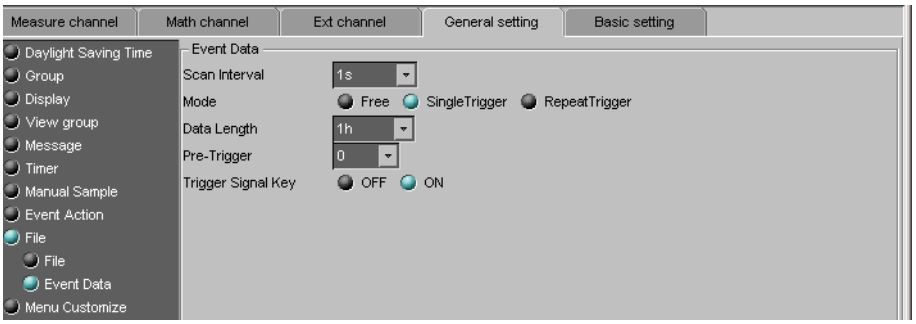
Settings	Description
Text	Display data files and event data files are in text format.
Binary	Display data files and event data files are in binary format.

Field Title, Field Characters

Set the string.

Title of field: Up to 20 characters, Characters: Up to 30 characters

Event Date



Event related settings are enabled when [Data Kind] is set to [E+D] or [Event] in [Basic Environment] under [Environment] in the [Basic Setting] tab.

Sample rate

Select the data recording interval from the available settings. You cannot specify a sampling rate that is faster than the scan interval.

Mode

Settings	Description
Free	Records data continuously.
Single	Records data when the trigger condition is met.
Repeat	Records data each time the trigger condition is met.

Data length

Select the size of a record data file. The recorded data is divided by the file size specified here. The available data lengths vary depending on the number of memory sampling channels and the Sample rate setting.

Sample rate	**25 ms***	**25 ms**	**250 ms**	**500 ms**	**1 s**
Selectable range of data length	10 min to 4 hours	10 min to 1 day	10 min to 2 days	10 min to 3 days	10 min to 7 days
Sample rate	**2 s**	**5 s**	**10 s**	**30 s**	**1 min**
Selectable range of data length	10 min to 14 days	10 min to 31 days	10 min to 31 days	1 hour to 31 days	1 hour to 31 days
Sample rate	**2 min**	**5 min**	**10 min**		
Selectable range of data length	1 hour to 31 days	1 hour to 31 days	1 hour to 31 days		

* Selectable on the MV1004, MV1008 and MV2008

Pre-Trigger

Specify the range when recording data before the trigger condition is met. Select the range as a percentage of the data length from 0, 5, 25, 50, 75, 95, and 100%. If you do not want to record the data existing before the trigger condition is met, select 0%.

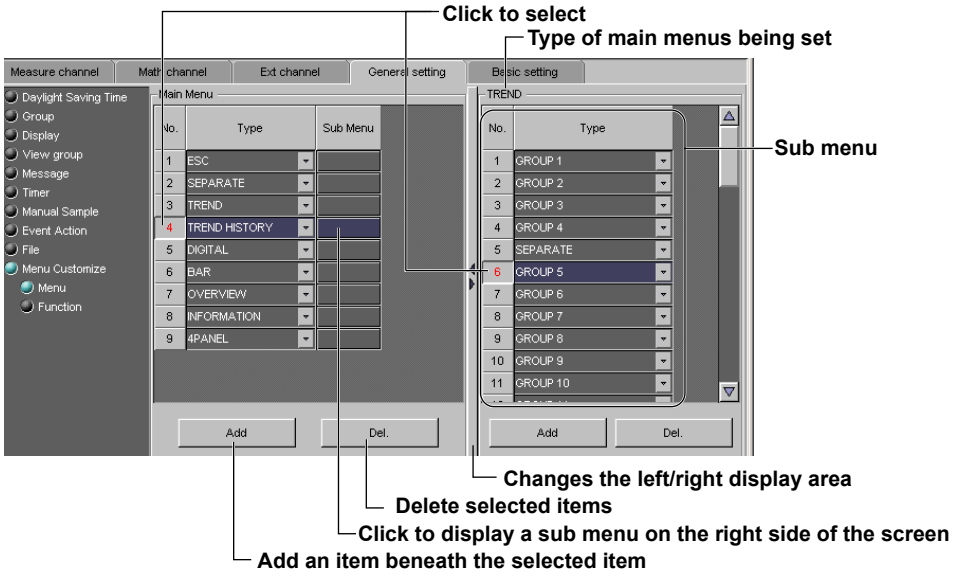
Trigger Signal Key

Select [ON] if you want to activate the trigger using key operation.

Custom Menu

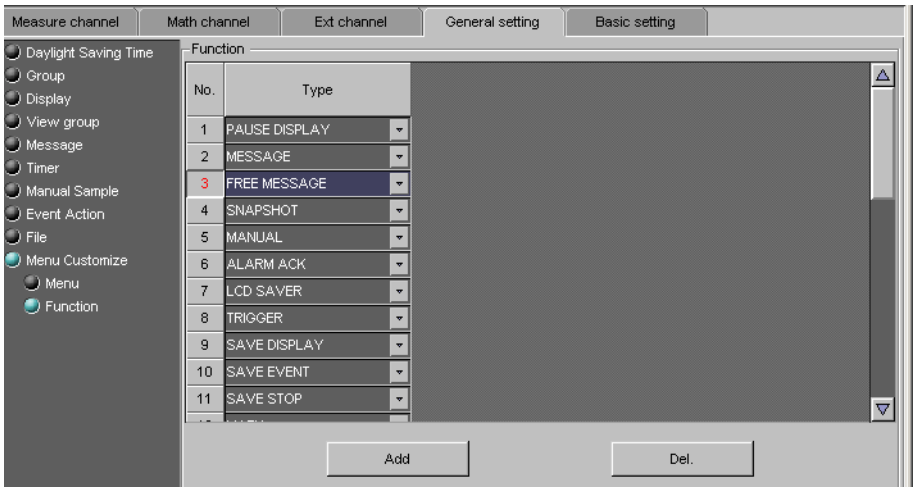
Menu

The display selection menu appears when the DISP/ENTER key is pressed.



Function

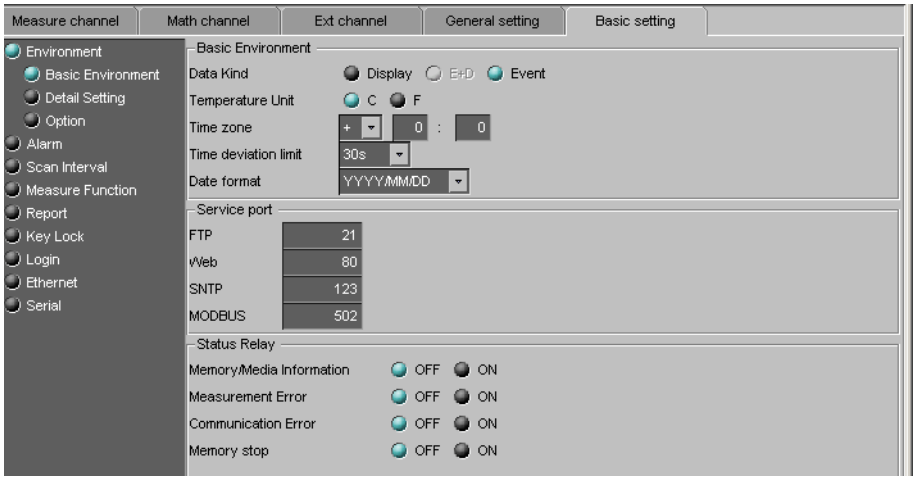
The FUNC key menu appears when the FUNC key is pressed.



4.6 Entering Basic Settings

Environment

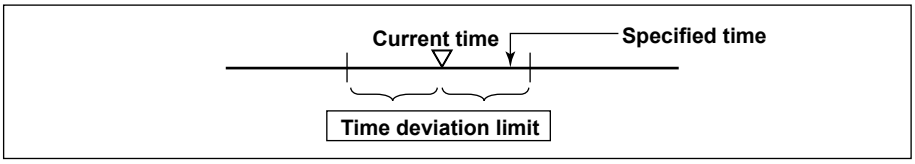
Basic Environment



- **Data Kind**

Settings	Description
Display	Records display data.
E+D	Records display data and event data. [E+D] cannot be selected when [Trend Rate Switching] is turned ON under [Environment] - [Basic Environment] in the [Basic Setting] tab.
Event	Records event data.

- **Temperature Unit**
  Select C or F.
- **Time zone**
  Set the time zone of the region in which the MV will be used in terms of the time difference from GMT. A negative value indicates that the local time is behind the GMT.
- **Time deviation limit**



  When the time deviation between the time on the MV and the specified time is within ±(the value specified here), the time on the MV is gradually corrected. Otherwise, the clock is corrected immediately.
  Select from 10 s to 5 min. Select [OFF] to disables the function.
  Example: If [Time deviation limit] is set to 10s and the time on the MV is 10 hours 21 minutes 15 seconds, the time on the MV is gradually corrected if the specified time is between 10 hours 21 minutes 5 seconds and 10 hours 21 minutes 25 seconds.
- **Date format**

Settings	Display Example
Y/M/D	2005/11/30
M/D/Y	11/30/2005
D/M/Y	30/11/2005
D.M.Y	30.11.2005

Applied Range

The format is applied to the date displayed on the screen. It does not change the date format on the setup screen of the date/time, the date in the output data via communications, the date saved along with the data, and the date used in the data file names.

- **Service port**

  The following table indicates the number of simultaneous uses (number of users that can use the function simultaneously), the maximum number of connections, and the port number for each function.

Function	Maximum Number of Connections	Number of Simultaneous Uses		Port No.
		Administrator	User	
FTP server	2	2	2*1	21/tcp*3
Web server (HTTP)	1	–	–	80/tcp*3
SNTP server	–	–	–	123/udp*3
Modbus server	2	–	–	502/tcp*3
Instrument information server	–	–	–	34264/udp*2

*1 There are user limitations. For details, see the MV1000/MV2000 Communication interface User's Manual (IM MV1000-17E).

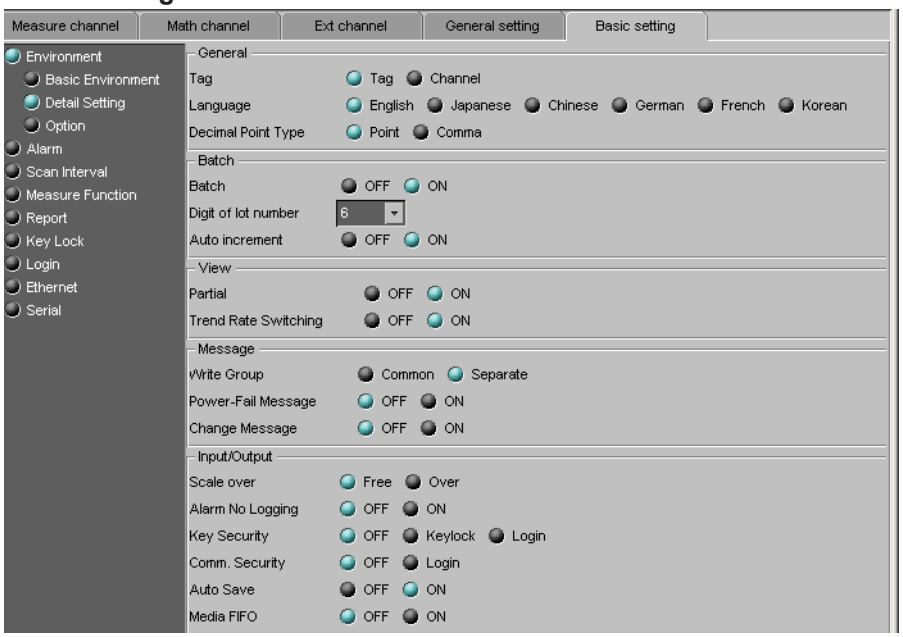
*2 The port number is fixed.

*3 The default port number. You can set the value in the range of 0 to 65535. Use the default port number unless there is a special reason not to do so.

- **Status Relay**

  If an abnormality occurs with items turned ON, relay contact output is performed. In the [System Configuration] screen, if [FAIL] is set to [FAIL/Alarm relay] or [FAIL/Status relay], the [Status Relay] setting items are displayed.

Detail Setting



- **Tag**

Settings	Description
Tag	Displays tags. Channel numbers are displayed for channels that do not have tags assigned.
Channel	Displays channel numbers.

- **Language**

  Select the display language

- **Decimal Point Type**

Settings	Description
Point	Sets the decimal point to a dot. Example: 1234.56
Comma	Sets the decimal point to a comma. Example: 1234,56

- **Batch**
  Select [ON] to use the batch function.
- **Digit of lot number**
  Select the number of digits of the lot number from 4, 6, or 8. Select [OFF] to disable the lot number.
- **Auto increment**
  ON Automatically sets the lot number of the next measurement to “the lot number of the current measurement + 1.”
- **Partial**
  Turn Partial [ON] (partially expand) or [OFF] (do not partially expand).
- **Trend Rate Switching**
  ON Enables the function that switches the trend interval while the memory sampling is in progress. The “Second interval [/div]” item is displayed in the setting mode.
  * When [Trend Rate Switching] is turned ON, [Data Kind] cannot be set to [E+D] under [Environment] - [Basic Environment] in the [Basic Setting] tab.
- **Write Group**

Settings	Description
Common	Write the message to all groups.
Separate	Write the message to the displayed group.

- **Power-Fail Message**
  ON A message is written when the MV recovers from a power failure while memory sampling is in progress.
- **Change Message**
  ON Writes the time the interval is switched and the new trend interval as a message when the trend interval is switched.
- **Scale over**

Settings	Description
Free	The value is set to –over range if the value is less than –30000 and +over range if the value is greater than 30000 excluding the decimal point. The value is displayed as –Over and +Over, respectively.
Over	The value is set to –over range if the value is less than –5% of the scale and +over range if the value is greater than 105%. The value is displayed as –Over and +Over, respectively.

Example: If the scale is 0.0 to 200.0, the value is set to –over range if the value is less than –10.0 of the scale and +over range if the value is greater than 210.0.

Note

For computations such as TLOG, CLOG, and report, the handling of the scale over-range value can be set in advance.

- **Alarm No Logging**
  Turn ON when using the Alarm No Logging function. The [Detect] setting is enabled in the Measure channel/Math channel/Ext channel tab(s).
- **Key Security**

Settings	Description
Login	Enables only registered users to operate the MV using keys. The [User registration] is displayed in the [Basic Setting] tab.
Keylock	Enables the key lock function. Set the key lock function in the [Basic Setting] tab.
OFF	Disables the security functions.

- **Comm. Security**

Settings	Description
Login	Enables only registered users to operate the MV via communications. The [User registration] is displayed in the basic setting mode menu.
OFF	Disables the security functions.

- **Auto Save**

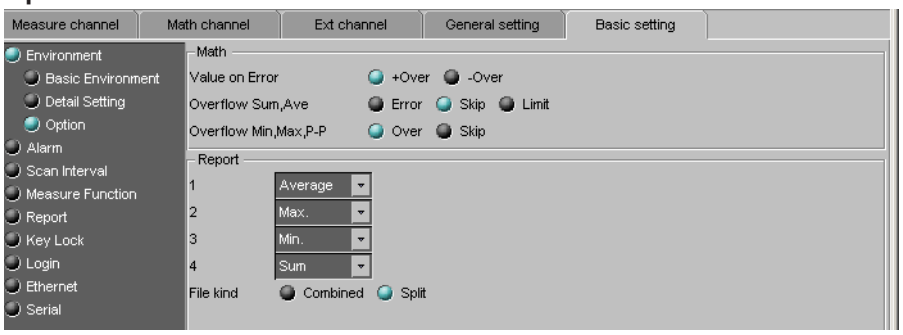
Settings	Description
ON	Automatically saves the measured data to the CF card.
OFF	Does not automatically save the data. Save the measured data manually to the CF card or USB flash memory (/USB1 option).

- **Media FIFO**

  You can select this with MV main unit firmware version 2.0x or later.
  This is valid only when [Auto Save] is [ON].

Settings	Description
ON	If there is no more free space on the CF card, the oldest file is deleted, and the newest file is saved.
OFF	If there is no more free space on the CF card, the measured data is not saved to the CF card.

Option



- **Value on Error**

  Specify whether to set the display for a computation error to [+Over] or [–Over].

- **Overflow Sum, Ave**

  Specify how to handle overflow data when it is detected in the SUM or AVE computation of TLOG or CLOG. This setting is also applied to report generation.

Settings	Description
Error	Sets the computed result to computation error.
Skip	Discards the overflow data and continues the computation.
Limit	Uses a limit value in place of the overflow data and continues the computation.

- **Overflow Min, Max, P-P**

  Specify how to handle overflow data when it is detected in the MAX, MIN, or P-P computation of TLOG or CLOG. This setting is also applied to report generation.

Settings	Description
Over	Uses the overflow data as-is.
Skip	Discards the overflow data and continues the computation.

- **Report (1 to 4)**

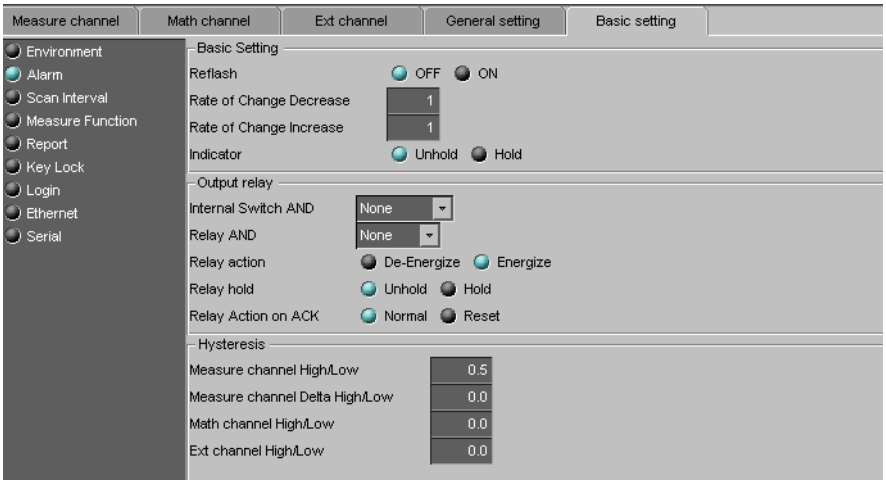
  Select the type of data to output as reports.

Settings	Description
OFF	Does not output reports. You cannot set the first term to [OFF].
Ave	Outputs the average value.
Max	Outputs the maximum value.
Min	Outputs the minimum value.
Sum	Outputs the sum value.
Instant	Outputs the instantaneous value.

- **File kind**
  Set this item when creating two types of reports such as daily report and monthly report.

Settings	Description
Split	Saves each type of report to a separate file.
Combined	Saves the report data of two types in a single file.

Alarm



Reflash
To set the reflash operation on the alarm output relay, select [ON]. The reflash function is set on the first three output relays.

Rate of Change Decrease
Set the interval for the rate-of-change calculation of the low limit on rate-of-change alarm in terms of the number of sampled data points (1 to 32). The actual interval is obtained by multiplying the value specified here by the scan interval.

Rate of Change Increase
Set the interval for the rate-of-change calculation of the high limit on rate-of-change alarm in the same manner as the interval for the low limit on rate-of-change alarm.

Hold
Select the alarm indication behavior from the following:

Settings	Description
Unhold	Clears the alarm indication when the alarm condition is released (returns to normal condition).
Hold	Holds the alarm indication until an alarm acknowledge operation is performed.

Internal Switch AND
Select the internal switches that are to operate using AND logic. Set the range of internal switches (from the first internal switch) to take the AND logic. All subsequent switches will be set to OR logic.

Relay AND
Select the relays that are to operate using AND logic. Set the range of relays (from the first alarm relay) to take the AND logic. All subsequent relays will be set to OR logic. Available settings are [None], [I01] (I01 only), [I01-I02] (I01 and I02), [I01-I03] (I01 to I03), etc. Only alarm output relays that are installed are valid.

Note

When reflash is turned ON, the operation of the first three output relays is fixed to OR logic. Specifying AND produces no effect.

Relay action
Select whether the alarm output relay is energized or de-energized when an alarm occurs. The setting applies to all alarm output relays.

Relay hold

Select the alarm output relay behavior from below: The setting applies to all relays.

Settings	Description
Unhold	Turns the output relay OFF when the alarm condition is released (returns to normal condition).
Hold	Holds the output relay at ON until an alarm acknowledge operation is performed.

Relay Action on ACK

Settings	Description
Normal	The relay output is deactivated when the alarm ACK operation is executed. If the condition for activating the alarm output relay is met in the next scan interval, the relay output is activated. This operation is valid only when the alarm output relay is set to [Hold].
Reset	The relay output is deactivated when the alarm ACK operation is executed. If a new condition for activating the alarm output relay, the relay is activated.

Note

When reflash is turned ON, the operation of the first three output relays is set to nonhold.
Specifying Hold produces no effect.

Measure channel High/Low

Sets the hysteresis width of the alarm occurrence/release of the high/low limit alarm specified on measurement channels.
Selectable range: 0.0% to 5.0% of the span or scaling width

Measure channel Delta High/Low

Sets the hysteresis width of the alarm occurrence/release of the difference high/low limit alarm specified on measurement channels.
Selectable range: 0.0% to 5.0% of the span

Math channel High/Low, Ext channel High/Low

Sets the hysteresis width of the alarm occurrence/release of the high/low limit alarm specified on computation and external input channels.
Selectable range: 0.0% to 5.0% of the measurement span

Scan Interval

Scan interval

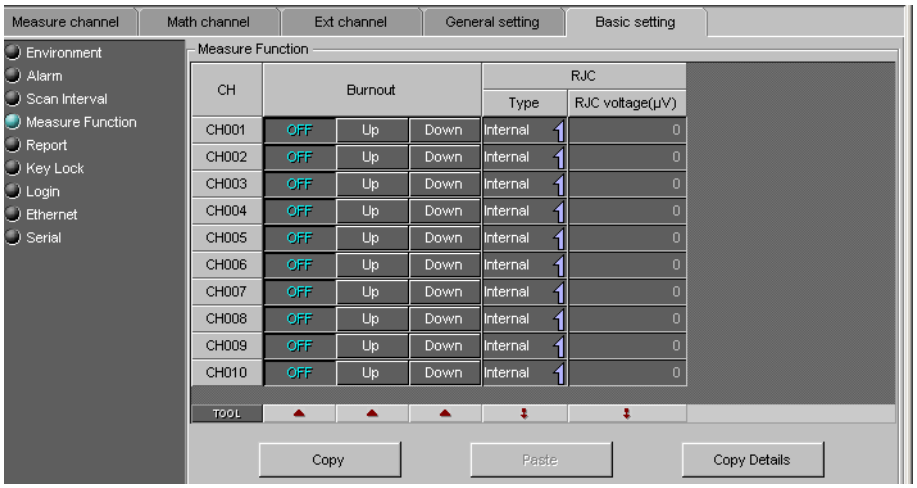
Select a scan interval.

A/D integrate

Select the A/D integration time as necessary. Only the selectable settings are displayed.

Settings	Description
Auto	The MV automatically detects the power supply frequency and sets the integration time to 16.7 ms and 20 ms for 60 Hz and 50 Hz, respectively. Fixed to 20 ms on /P1 models that use the 24 VDC power supply.
50Hz	Sets the integration time to 20 ms.
60Hz	Sets the integration time to 16.7 ms.
100ms	Sets the integration time to 100 ms (when the scan interval is 2 s or 5 s).
600Hz	The A/D integration time for fast sampling mode. You cannot change this value. You cannot use fast sampling mode on models with the external input channel (/MC1) option.

Measure Function



Burnout

Settings	Description
OFF	Sensor disconnections are not detected.
UP	When the sensor burns out, the measured result is set to +over range. The measured value displays “Burnout.” For 1-5V input, the MV assumes that the sensor has burned out when the measured value exceeds the scale upper limit by 10% of the scale width. (Example: When the measured value is greater than 110 when the scale is from 0 to 100)
DOWN	When the sensor burns out, the measured result is set to –over range. The measured value displays “Burnout.” For 1-5V input, the MV assumes that the sensor has burned out when the measured value falls below the scale lower limit by 5% of the scale width. (Example: When the measured value is less than –5 when the scale is from 0 to 100)

RJC Mode

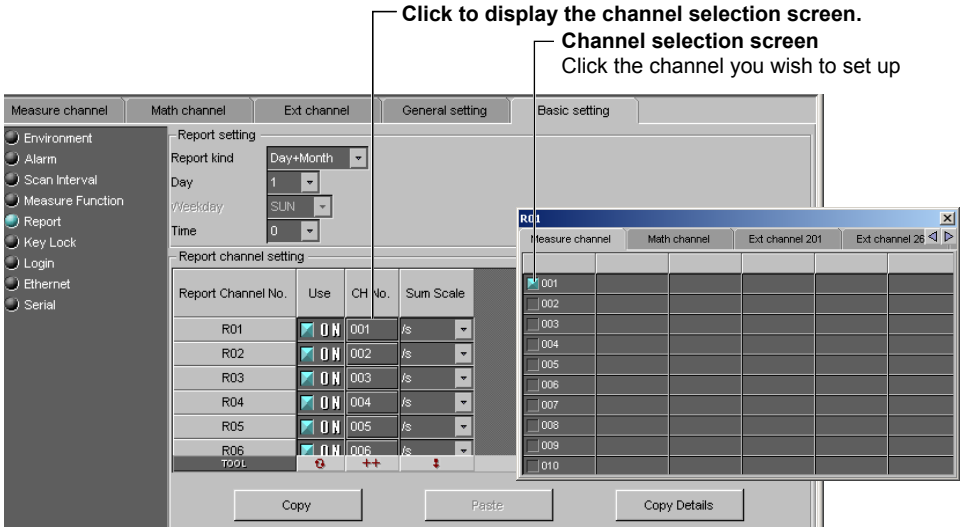
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

Settings	Description
Internal	Uses the reference junction compensation function of the MV.
External	Uses an external reference junction compensation function. When set to [External], [Volt] is displayed.

RJC voltage (µV)

The compensation voltage to be added to the input. Set the value in the range of –20000 µV to 20000 µV.

Report



Report kind

Select the type of report to be created.

Settings	Description
OFF	Do not create a report.
Hour	Creates hourly reports.
Day	Creates daily reports.
Hour+Day	Creates hourly and daily reports.
Day+Week	Creates daily and weekly reports.
Day+Month	Creates daily and monthly reports.

Day, Week day, and Time (hour)

Set the date or day of the week and the time when the report is to be created. The specified date/time is when the report file is divided. Set the values in the range indicated below. Items with a dash are invalid.

Report Type	Day	Week day	Time
Hour	-	-	0 to 23
Day	1 to 28*	-	0 to 23
Hour+Day	-	-	0 to 23
Day+Week	-	SUN to SAT	0 to 23
Day+Month	1 to 28*	-	0 to 23

* You cannot specify 29, 30, or 31.

Report Channel No.

The report is output in order by this number.

Use

Select [ON] for the report channels to be used.

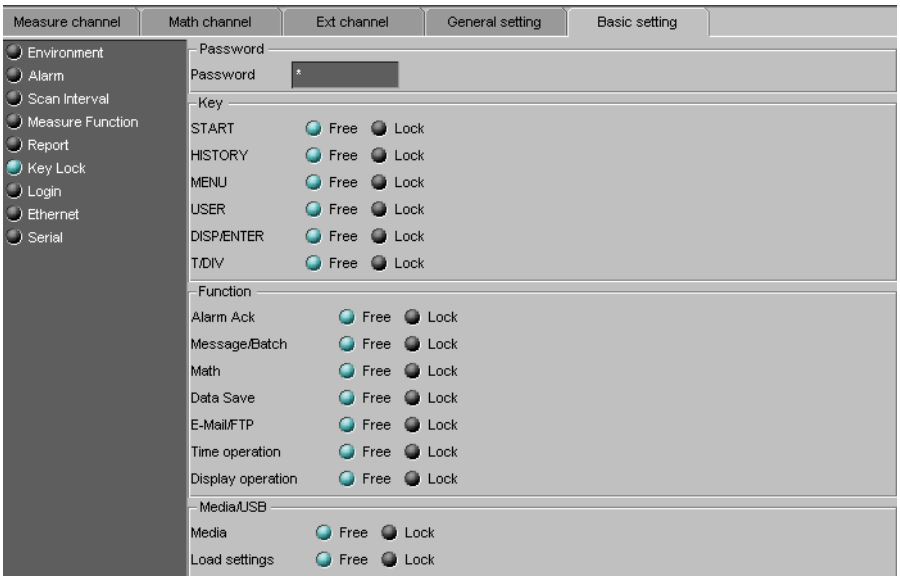
CH No.

Set the channel to assign to the report channel. All channels can be assigned, but reports are not created for channels set to [Skip] or [OFF] even if they are assigned.

Sum Scale

Set the sum scale to [/s] to [/day] to match the unit of the measured value.
Example: If the unit of the measured value is “m^3/min,” select [/min].
OFF Sums as-is the measured data per scan interval.

Key Lock



Enabled when [Key Security] is set to [Keylock] under [Environment] - [Detail Setting] in the [Basic Setting] tab.

Password

The password used to release the key lock. (Up to 8 characters)

Key, Function, Media

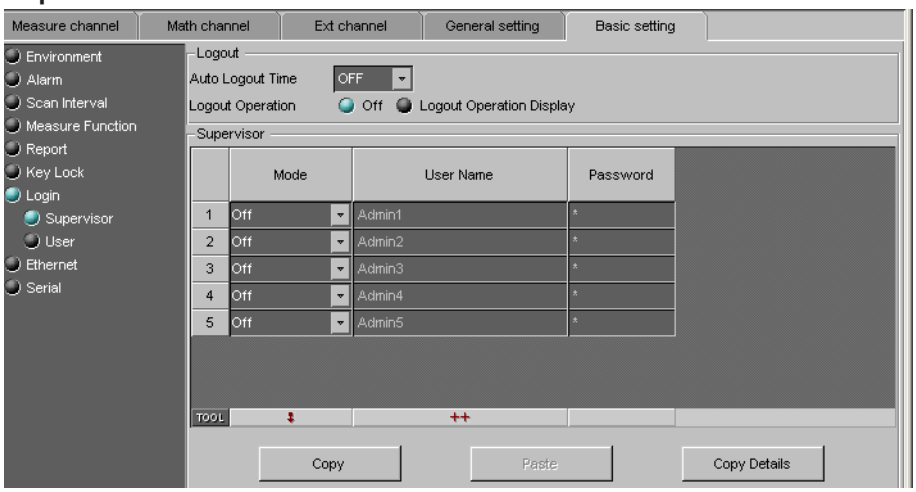
Select whether to lock each item.

Settings	Description
Free	Key lock not applied.
Lock	Disables the operation.

User Registration

You can set the [User Registration] when [Login] is selected as [Key Security] or [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab.

Supervisor



- **Auto Logout Time**

Settings	Description
OFF	Does not log out until the logout operation is executed.
1min to 10min	Automatically logs out when there is no key operation for a specified time.

- **Logout Operation**

Settings	Description
OFF	Only login operation is available.
Logout Operation Display	Allows the user to switch the operation screen in addition to the login operation.

- **Mode**

  The choices differ depending on the selected contents of [Key Security] and [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab.

Settings	Description
OFF	Not register.
Key	Log into the MV1000/MV2000 using keys.
Comm	Log into the MV1000/MV2000 via communications.
Web	Log into the operator page and monitor page of the MV1000/MV2000 using a Web browser.
Key+Comm	Log into the MV1000/MV2000 using keys and via communications.

- **User Name**

  Set the user name. (Up to 20 characters)
  - You cannot register user names that are already registered.
  - You cannot register “quit” or a user name containing all spaces.

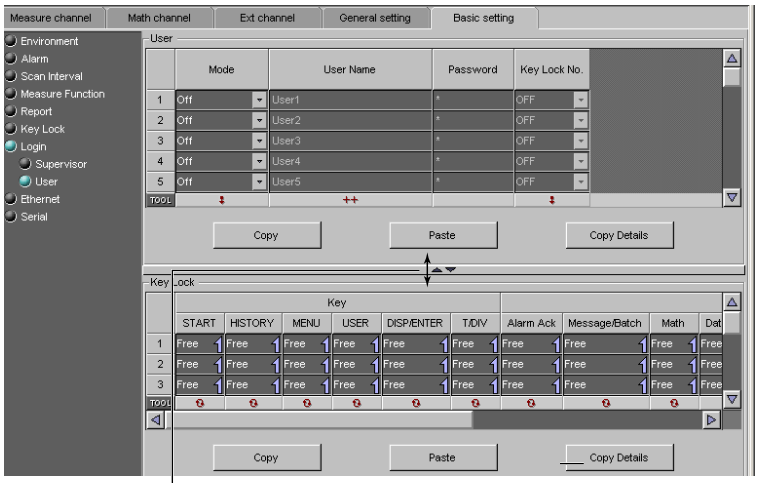
- **Password**

  Set the password. (Up to 8 characters)

  An entered password is displayed as “********.”
  - You cannot register “quit” or a password containing all spaces.

User

Up to 30 names can be registered.



- **Mode**

  The available settings vary depending on the [Security] setting.

Settings	Description
OFF	Not register.
Key	Log into the MV using keys.
Comm	Log into the MV via communications.
Web	Log into the monitor page of the MV using a Web browser.
Key+Comm	Log into the MV using keys and via communications.

- **User Name, Password**

  Same as the supervisor settings.

- **Key Lock No.**

Settings	Description
OFF	No limitations on the operation.
1 to 10	Registration number of the operation limitation.

- **Key lock**

  Select whether to lock each item.

Settings	Description
Free	Key lock not applied.
Lock	Disables the operation.

Ethernet

TCP/IP

Set the IP address to a fixed IP address or obtain it automatically (DHCP).
Consult with your network administrator for the network parameters such as the IP address, subnet mask, default gateway, and DNS.

When using a fixed IP address

- **DHCP**
  Set [DHCP] to [OFF].
- **IP Address**
  Set the IP address to assign to the MV1000/MV2000.
- **Subnet Mask**
  Set the subnet mask according to the system or network to which the MV1000/MV2000 belongs.
- **Default Gateway**
  Set the IP address of the gateway.
- **Host Name**
  Set the MV's host name using up to 64 alphanumeric characters. You do not have to set this parameter.
- **Domain Name**
  Set the network domain name that the MV1000/MV2000 belongs to using up to 64 characters. You do not have to set this parameter.
- **Server Primary, Server Secondary**
  Register up to two IP addresses for the primary and secondary DNS servers.
- **Domain Primary, Domain Secondary**
  Set up to two domain suffixes: primary and secondary.

When obtaining the IP address from DHCP

- **DHCP**
  Set [DHCP] to [ON].
- **DNS accession**
  To automatically obtain the DNS server address, select [ON]. Otherwise, select [OFF]. If you select [OFF], you must set the IP address of the DNS server.
- **Host-Name Register**
  To automatically register the host name, select [ON].
- **Host Name**
  Set the MV1000/MV2000's host name using up to 64 alphanumeric characters.
- **Domain Name**
  Set the network domain name that the MV belongs to using up to 64 characters.
- **Server Primary, Server Secondary (not necessary when DNS accession is enabled)**
  Register up to two IP addresses for the primary and secondary DNS servers.
- **Domain Primary, Domain Secondary**
  Set up to two domain suffixes: primary and secondary.

Keep Alive

To disconnect when there is no response to the test packets that are periodically sent, select [ON]. Otherwise, select [OFF].

Time out

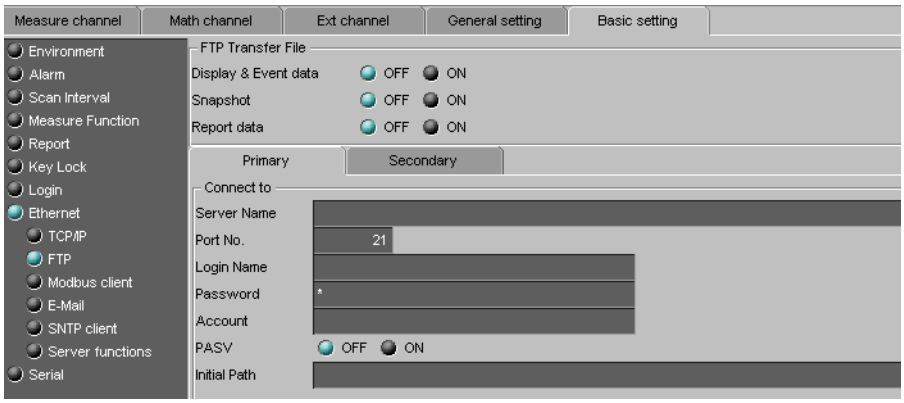
To use the application timeout function, select [ON]. Otherwise, select [OFF]. If you select [ON], a [Timeout time] is displayed.

- **Timeout time (min.)**
  Set the timeout value between 1 and 120 (minutes).

Checking the communication status

The Ethernet communication status can be confirmed with the LED lamp that is provided on the Ethernet connector on the MV1000/MV2000 rear panel or the [Ethernet link] that is shown at the upper right of the basic setting screen.

FTP



The data files are automatically transferred to the FTP destination.

File Type	Description
Display data file	Data files are automatically transferred at each file save interval.
Event data file	Files are automatically transferred when the data length of data is recorded.
Report file	Data files are automatically transferred every time a report is created.
Snapshot data file	The files are automatically transferred when a snapshot is executed. They are transferred regardless of the media storage setting.

* Indicates snapshot using the FUNC key, communication command (EV2 command), USER key, or remote control function.

Setting the FTP connection destination

Consult your network administrator when setting parameters such as the primary/secondary FTP servers, port number, login name, password, account, and availability of the PASV mode.

- **Primary, Secondary**
  You can specify two destination FTP servers, [Primary] and [Secondary]. If the primary FTP server is down, the file is transferred to the secondary FTP server.
- **Server Name**
  Enter the name of the file transfer destination FTP server using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Port No.**
  Enter the port number of the file transfer destination FTP server in the range of 1 to 65535. The default value is 21.
- **Login Name**
  Enter the login name for accessing the FTP server using up to 32 alphanumeric characters.
- **Password**
  Enter the password for accessing the FTP server using up to 32 alphanumeric characters.
- **Account**
  Enter the account (ID) for accessing the FTP server using up to 32 alphanumeric characters.
- **PASV**
  Select [ON] when using the MV behind a firewall that requires the passive mode. The default setting is [OFF].

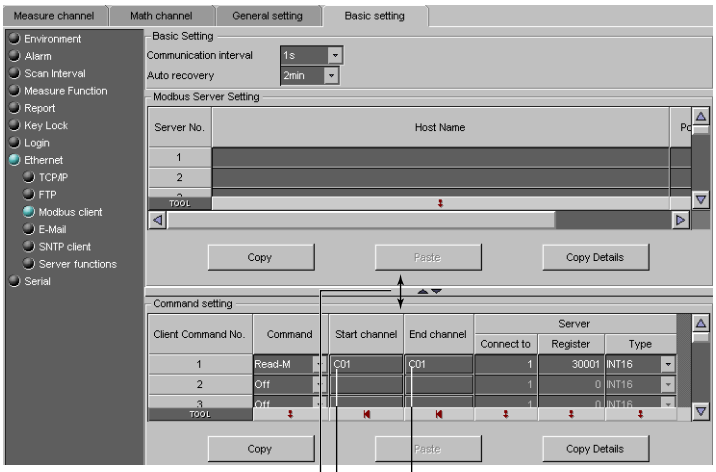
- **Initial Path**

  Enter the directory of the file transfer destination using up to 64 alphanumeric characters. The delimiter for directories varies depending on the implementation of the destination FTP server.

  Example: When transferring files to the “data” directory in the “home” directory of an FTP server on a UNIX file system.
  /home/data

  If the file transfer to both primary and secondary destinations fails, the MV aborts the file transfer. When the connection recovers, the MV transfers the data that could not to be transferred in addition to the new data file. However, since the data that is transferred resides in the internal memory of the MV, if the data is overwritten, the data that could not be transferred is lost.

MODBUS Client



Communication interval

Set the read cycle to 125ms, 250ms, 500ms, 1s, 2s, 5s, or 10s.

Auto recovery

Set the interval for retrying the connection when the connection is interrupted for some reason. Select OFF, 10s, 20s, 30s, 1min, 2min, 5min, 10min, 20min,30min, or 1h.

Modbus Server setting

- **Server No.**
  Select from 1 to 16 for the server registration numbers to be configured.
- **Port No.**
  Enter the port number in the range of 0 to 65535 for the selected server. The default value is 502.
- **Host Name**
  Set the destination Modbus server name using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Unit**
  Select [Auto] if the unit number of the destination server is not required; Otherwise, select [Fixed]. If you select [Fixed], the [Unit No.] item is displayed.
- **Unit No.**
  Enter a fixed unit number in the range of 0 to 255.

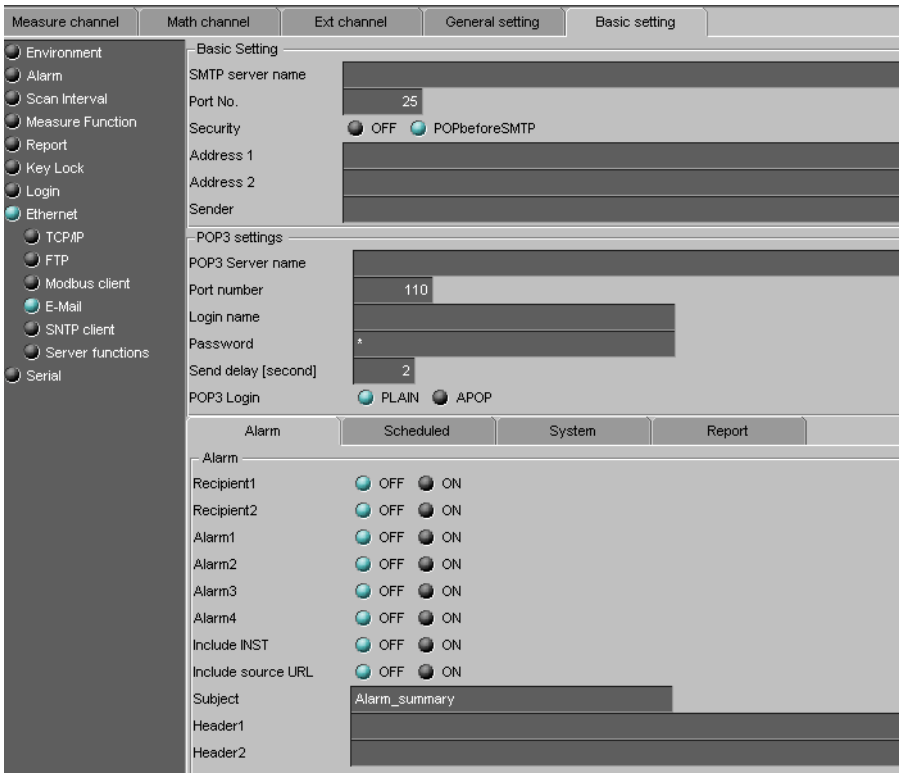
Command setting

- **Client command No.**
  Select from 1 to 16 for the transmitted command numbers to be configured.
- **Command**
  Set the command type.

Settings	Description
Read	Read to the external input channel (16-bit signed integer type) from the server.
R-Math	Read to the communication input data (32-bit floating point type) from the server.
Write	Write the measurement channel (16-bit signed integer type) to the server.
W-Math	Write the measurement channel (32-bit signed integer type) to the server.

  [Read] can be selected on MV2000s with the external input channel (/MC1 option) installed.
  [R-Math] and [W-Mat] can be selected on models with the computation function (/M1 option) installed.
- **Start channel/End channel (client channels)**
  Enter the first and last channel numbers of input/output. The range of channels that you can enter varies depending on the command type as follows:
  Read: 201 to 440, R-Math: C01 to C60, Write: 1 to 48, W-Math: 101 to 160
- **Connected to (server number)**
  Select the server number from 1 to 16.
- **Register**
  Set the register number of the server.
  For an input register, select in the range of 30001 to 39999 and 300001 to 365536.
  For a hold register, select in the range of 40001 to 49999 and 400001 to 465536.
  The register numbers you can specify vary depending on the command type. See section 6/3 of the MV1000/MV2000 Communication Interface User's Manual (IM MV1000-17E).
- **Type**
  Select INT16, UINT16, INT32_B, INT32_L, UINT32_B, UINT32_L, FLOAT_B, or FLOAT_L.
  The register numbers you can specify vary depending on the command type. See section 6.3 of the MV1000/MV2000 Communication Interface User's Manual (IM MV1000-17E).

E-mail



Basic Setting

Set the SMTP server and mail address.

- **SMTP server name**
  Enter the host name or IP address of the SMTP server.
- **Port No.**
  Unless specified otherwise, set the number to the default value. The default value is 25.
- **Security**

Settings	Description
OFF	Disables POP before SMTP.
POPbeforeSMTP	Enables POP before SMTP.

- **Address 1, Address 2**
  Enter the e-mail address. Multiple e-mail addresses can be entered in the box of one recipient. When entering multiple addresses, delimit each address with a space. Up to 150 characters can be entered.
- **Sender**
  Enter the sender e-mail address. You can enter up to 64 characters.

POP3 Settings

If you need to use POP before SMTP, specify the POP3 server.

- **POP3 Server name**
  Enter the host name or IP address of the POP3 server.
- **Port number**
  Unless specified otherwise, set the number to the default value. The default value is 110.
- **Login name**
  Enter the POP3 server login name.
- **Password**
  Enter the POP3 server login password. You can enter up to 32 characters.
- **Send delay [second]**
  Enter the wait time from POP3 server authentication until transmission. Set a value in the range of 0 to 10 (seconds).

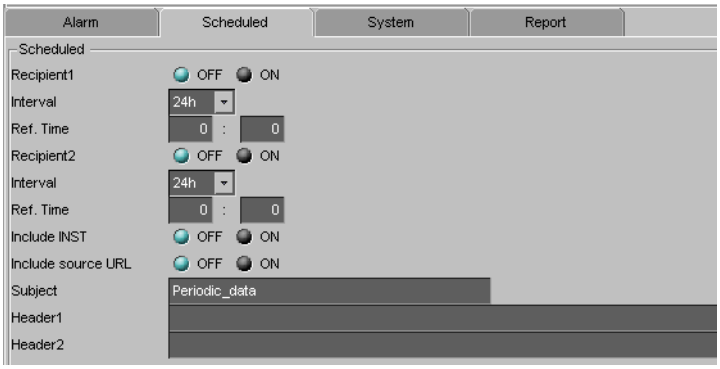
- **Login method**
  To send the POP3 server login password without encryption, set POP3 Login to [PLAIN]. To send the password with encryption, set POP3 Login to [APOP].

Alarm

Specify the settings for sending e-mail when alarms occur.

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Active alarms**
  Sends an e-mail when an alarm occurs. You can select [ON] (send e-mail) or [OFF] (not send e-mail) for alarms 1 to 4.
- **Include INST**
  Select [ON] to attach instantaneous value data when the alarm occurred.
- **Include source URL**
  Select [ON] to attach the source URL. Attach the URL when the Web server is enabled.
- **Subject**
  Enter the subject of the e-mail using up to 32 alphanumeric characters. The default setting is Alarm_summary.
- **Header1, Header2**
  Enter header 1 and header 2 using up to 64 characters.

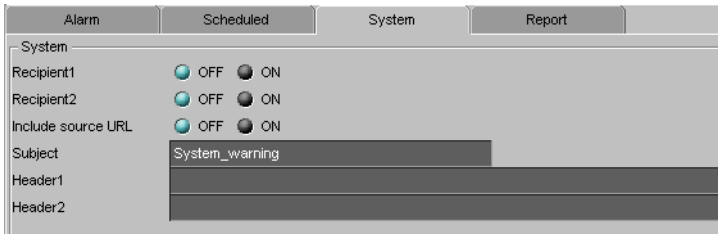
Scheduled



Specify the settings for sending e-mail at scheduled times.

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Interval**
  Select the interval for sending e-mail to Recipient1 and Recipient2 from 1, 2, 3, 4, 6, 8, 12, and 24 hours.
- **Ref. time**
  Enter the time used as a reference for sending the e-mail at the specified interval to Recipient1 and Recipient2.
- **Include INST, Include source URL, Subject, and Header**
  These items are the same as the e-mail that is sent when an alarm occurs. The default subject is Periodic_data.

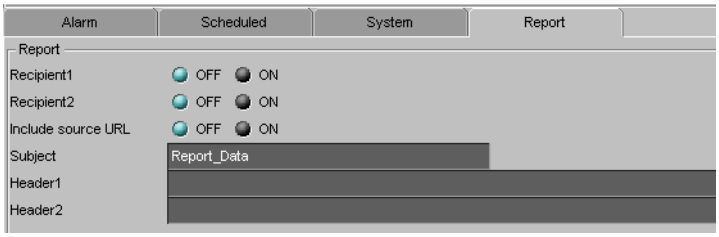
System



Specify the settings for sending e-mail when the MV recovers from a power failure, at memory end, and when an error occurs.

- **Recipient1 and Recipient2**
  Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Include source URL, Subject, and Header**
  These items are the same as the e-mail that is sent when an alarm occurs. The default subject is System_warning.

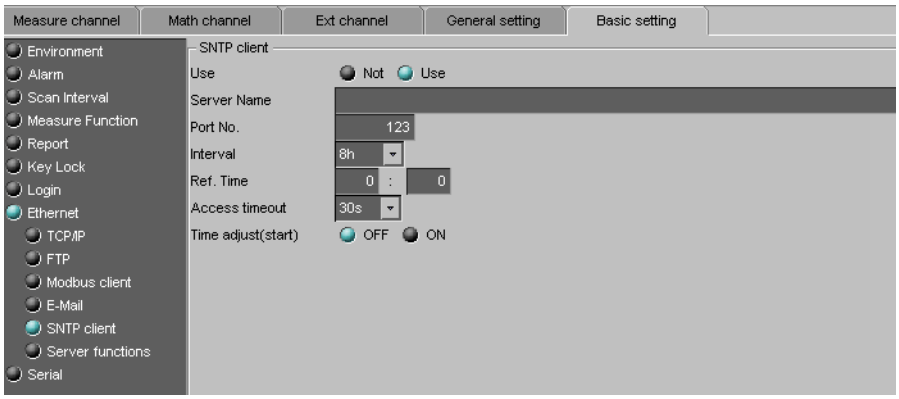
Report



Specify the settings for sending e-mail when reports are created.

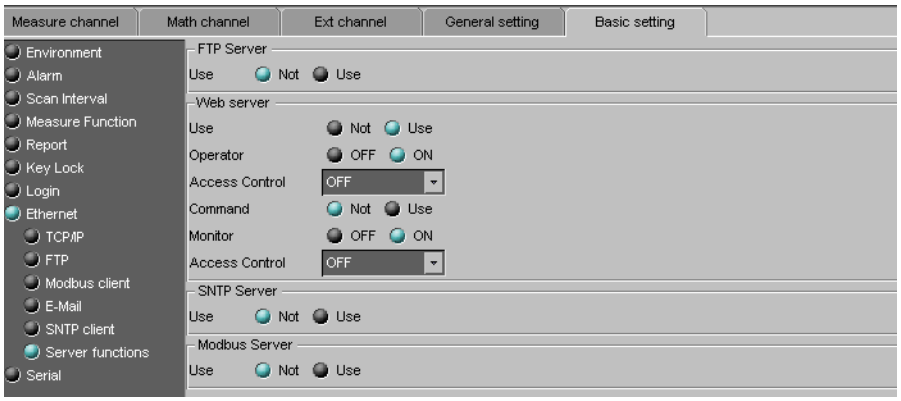
- **Recipient1 and Recipient2**
  Set the recipients. For Recipient1 and Recipient2, select On to send e-mail or OFF to not send e-mail.
- **Include source URL, Subject, and Header**
  These items are the same as the e-mail that is sent when an alarm occurs. The default subject is Report_data.

SNTP Client



- **Use**
  Select [Use] to use the SNTP client function; Otherwise, select [Not]. If you select [Use], the SNTP client settings are displayed.
- **Server Name**
  Set the SNTP server name using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the host name as a server name.
  - You can also set the IP address. In this case, the DNS is not required.
- **Port No.**
  Enter the port number of the file transfer destination SNTP server in the range of 1 to 65535. The default value is 123.
- **Access Interval**
  Set the time interval for synchronizing the time with the server to OFF, 1, 8, 12, or 24h. If you select OFF, you can synchronize the time manually by operating soft keys. The time is not synchronized if the difference in the time between the MV and the server is greater than or equal to 10 minutes.
- **Ref. Time**
  Set the reference time for making queries.
- **Access timeout**
  Set the time to wait for the response from the SNTP server when querying the time to 10, 30, 90s.
- **Time adjust (start)**
  Select [On] to synchronize the time using SNTP when memory start is executed; Otherwise, select [OFF].

Server Function



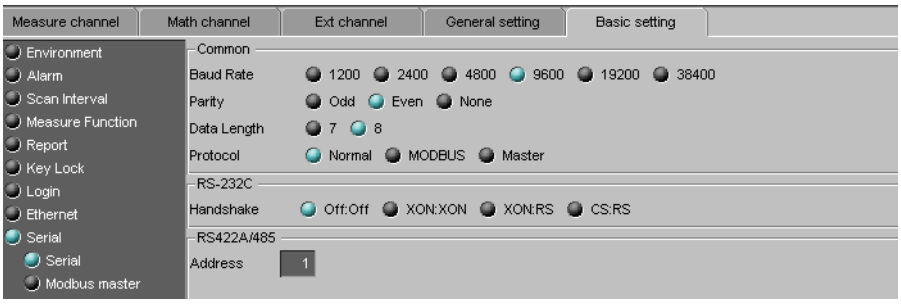
- **Use**
  Select [Use] or [Not] (don't use).

- **Web server Use**
  For the Web item under Server, select [Use] or [Not] (don't use). When [Use] is selected, the Web page item is added to the basic setting mode menu.
  - **Operator**
    To set the operator page, select [ON].
  - **Operator Access Control**
    To use access control, select [ON]. You must enter a user name and password to display the operator page. You must select [Login] as [Key Security] or [Comm. Security] under [Environment] - [Detail Setting] in the [Basic Setting] tab, and register users under the [User Registration].
  - **Command**
    To write messages, select [ON]; Otherwise, select [OFF].
  - **Monitor**
    To display the monitor page on a browser, select [ON]; otherwise, select [OFF].
  - **Monitor Access Control**
    Same as the Operator Access Control.

- **SNTP Server Use**
  select [Use] or [Not] (don't use).

- **Modbus Server Use**
  select [Use] or [Not] (don't use).

Serial



For RS-232

- **Baud Rate**
  Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Parity**
  Set the parity check method to Odd, Even, or None.
- **Data length**
  Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Handshaking**
  Select Off:Off, XON:XON, XON:RS, or CS:RS.
- **Address**
  For Modbus protocol, enter a value in the range of 1 to 99. For a general purpose communication protocol, this value is not set.
- **Protocol**
  Select [Normal] for a general purpose communication protocol, [MODBUS] for Modbus slave, and [Master] for Modbus master.
  If Modbus master is selected, Modbus master settings must be entered.

For RS-422/485

- **Baud rate**
  Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Data length**
  Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Parity**
  Set the parity check method to Odd, Even, or None.
- **Handshaking**
  Not specified.
- **Address**
  Select a number from 1 to 99.
- **Protocol**
  This is the same as with the RS-232.

Modbus master

Modbus master settings are enabled when you set [Protocol] to [Master] under [Serial] - [Serial] in the [Basic Setting] tab.

Basic setting

- **Read cycle**
  Set the read cycle to 125ms, 250ms, 500ms, 1s, 2s, 5s, or 10s.
- **Timeout**
  Set the command timeout value to 125ms, 250ms, 500ms, 1s, 2s, 5s, 10s, or 1min.
- **Retrials**
  Set the number of retrials when there is no response from the slave. Select OFF, 1, 2, 3, 4, 5, 10, or 20.
- **Inter-block delay**
  Set the inter-block delay to OFF, 5ms, 10ms, 15ms, 45ms, or 100ms.
- **Auto recovery**
  Set the auto recovery time from communication halt. Select OFF, 1min, 2min, 5min, 10min, 20min, 30min, or 1h.

Command setting

- **Master command No.**
  Select from 1 to 16 for the command numbers to be configured.
- **Command**
  Set the transmitted command type.

Settings	Description
Read	Read to the external input channel (16-bit signed integer type) from the slave.
R-Math	Read to the communication input channel (32-bit floating point type) from the slave.
Write	Write the measurement channel (16-bit signed integer type) to the slave.
W-Math	Write the measurement channel (32-bit signed integer type) to the slave.

[Read] can be selected on MV2000s with the external input channel (/MC1 option) installed. [R-Math] and [W-Mat] can be selected on models with the computation function (/M1 option) installed.

- **Start channel/End channel (master channel numbers)**
  Enter the first and last channel numbers of input/output. The range of channels that you can enter varies depending on the command type as follows:
  Read: 201 to 440, R-Math: C01 to C60, Write: 1 to 48, W-Math: 101 to 160

- **Address**
  Enter the address of the slave device in the range of 1 to 247.
- **Register**
  Set the register number of the server.
  For an input register, select in the range of 30001 to 39999 and 300001 to 365536.
  For a hold register, select in the range of 40001 to 49999 and 400001 to 465536.
  The register numbers you can specify vary depending on the command type. See section 6.3 in the MV1000/MV2000 Communication Interface User's Manual (IM MV1000-17E).
- **Type**
  Select INT16, UINT16, INT32_B, INT32_L, UINT32_B, UINT32_L, FLOAT_B, or FLOAT_L.
  The type you can specify vary depending on the command type. See section 6.3 in the MV1000/MV2000 Communication Interface User's Manual (IM MV1000-17E).

4.7 Sending the Setup Data to the MV1000/MV2000

You cannot send data while the MV1000/MV2000 is performing memory sampling or math computations.

Sent Setup Data

Address Setup Data

When settings that deal with communication (hereinafter referred to as “address settings”), such as IP addresses, are changed, the data for those settings is sent separately from other setup data. An MV that receives address setup data restarts automatically and begins operating with the data that has been sent.
The following items are address settings:

- The [TCP/IP] and [Server functions] settings under [Ethernet].
- The [Serial] and [PROFIBUS-DP] settings under [Serial].

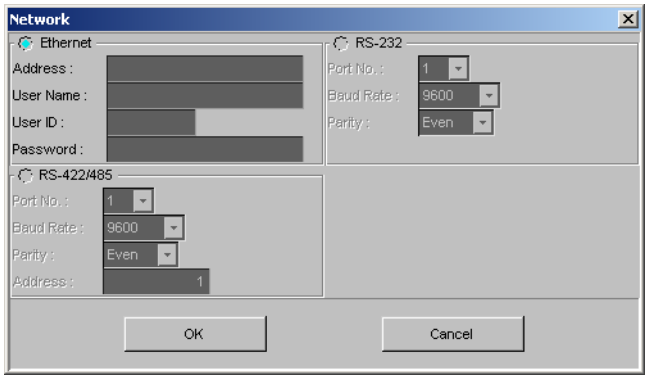
Other Setup Data

Other setup data is sent together.

Sending Address Setup Data

1. Select [Comm.] - [Partial Transfer] - [Address Settings] from the menu bar.
The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Store] dialog box appears.

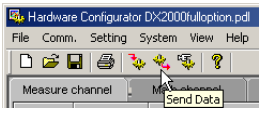
3. Click [OK].
The MV starts sending setup data.
The data that you send is enabled after the MV restarts.

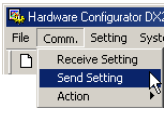
Note

After you change the address, the address that is sent is recorded as the retry destination. The next time you open the [Network] dialog box, the address appears as the initial value.

Sending Setup Data Other Than the Address Setup Data

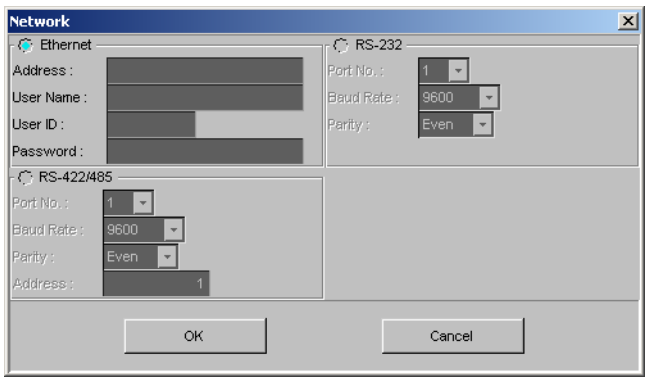
1. Click the [Send Data] button, or select [Comm.] - [Send Setting] from the menu bar.





The [Network] dialog box appears.

2. Enter the parameters, and click the [OK] button.



The [Store] dialog box appears.

3. Click [OK].

Data transfer starts. A message appears to indicate when data transfer has stopped. Click [OK] to close the message. The settings that you sent are applied.

4.8 Saving the Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .PDL.

4.9 Printing the Setup Data

For the operating procedure, see section 1.5.

4.10 Starting and Stopping Measurement on the MV1000/MV2000, Checking the MV1000/MV2000 Hardware Information

From this software you can start and stop the MV1000/MV2000, and display MV1000/MV2000 hardware information.

For the operating procedure, see section 3.10.

4.11 Characters That Can Be Used

List of Input Types

Type	Allowed Characters		Item
	Alphanumeric characters	Symbol	
Arbitrary string	Yes	Yes	Tag, group name
	Yes	No	Batch field title/characters, file header, mail header
Alphanumeric	Yes	Yes	Unit, user name, password, character string account
	Yes (including “[” and “]”)	Yes	Expression
Machine address	Yes	Disallowed	Host name, domain name, server name, and domain suffix
E-mail address	Yes	Disallowed	Transfer destination, transfer source
Subject	Yes	Disallowed	Mail title
File path name	Yes	Disallowed	File name, directory name,initial path

[Yes] and [Disallowed] indicate availability.
“Disallowed” in the symbol box indicates some disallowed characters are present even though input was possible.
The following characters cannot be used in a file path: * + . /
Expressions are defined by the grammar.

Allowed alphanumeric characters and symbols expressed with a single byte are as follows.

Table of Character Codes

HEX	Alphanumeric characters, Symbol							
	0x	1x	2x	3x	4x	5x	6x	7x
0			(SP)	0	@	P		p
1				1	A	Q	a	q
2				2	B	R	b	r
3			#	3	C	S	c	s
4				4	D	T	d	t
5			%	5	E	U	e	u
6				6	F	V	f	v
7				7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*		J	Z	j	z
B			+		K	[	k	
C					L		l	
D			-		M	]	m	
E			.		N	°	n	
F			/		O	_	o	

(SP) means “space.”
“ ° ” is the symbol for degrees (of temperature). Input, output and indicated using “ ^.”

5.1 Starting the Hardware Configurator, the Hardware Configurator Window, and System Configuration Settings

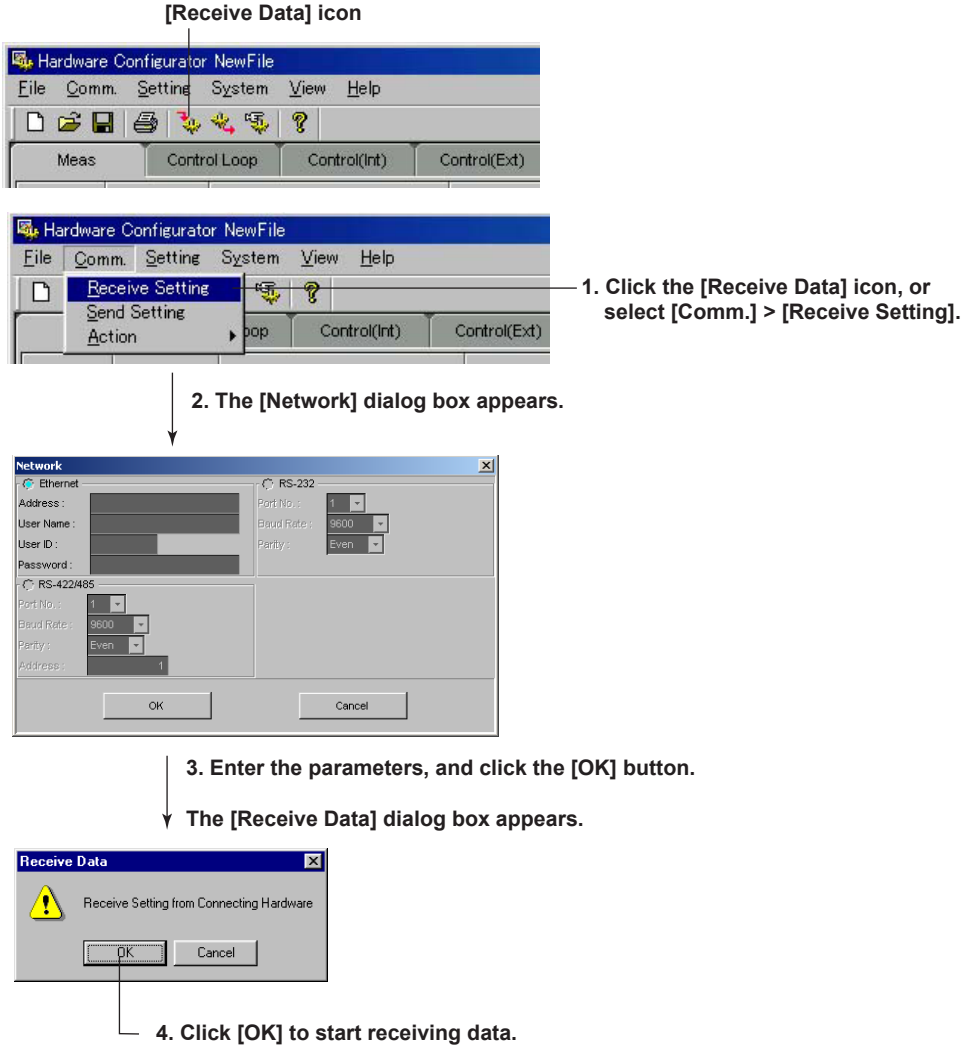
The Hardware Configurator can be used to transmit and receive the setup data, change the setup data, and create new setup data for a CX1000/CX2000 of style number S1-S3.
The setting screen may differ from your actual screen.

Starting the Hardware Configurator

See section 1.3.

Loading Setup Data from the CX

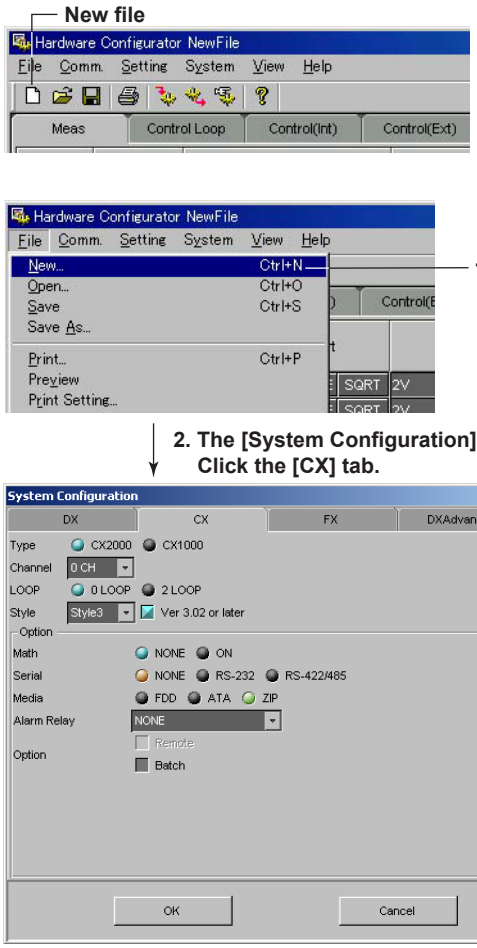
Before performing the following procedure, make sure that the communication method and parameters are correct. For details, see section 2.3, “Setting the Communication Method.”



Note

Do not load setup data when entering program control function settings on the CX, or when a medium is being accessed. A communications error can result.

Creating Setup Data by Configuring a New System

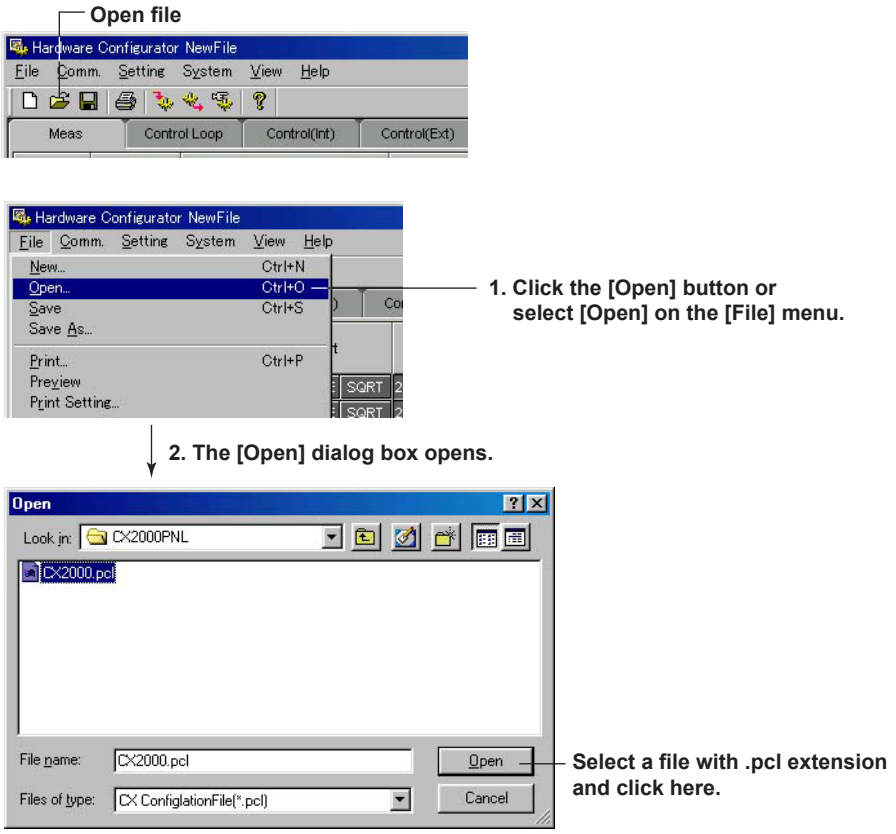


For details about the settings in the [System Configuration] dialog box, see section 5.2 “Setting and Checking the System Configuration and Initializing Setup Data”.

Note

In the procedure for the [System Configuration] dialog box, make sure that the CX tab is selected before entering settings. If the tab other than CX is selected, the settings you enter will apply only to those instruments.

Loading Existing Setup Data



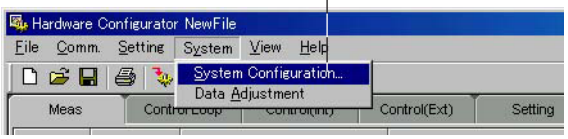
Specify the location of the setup data file and open the setup file.

5.2 Setting and Checking the System Configuration and Initializing Setup Data

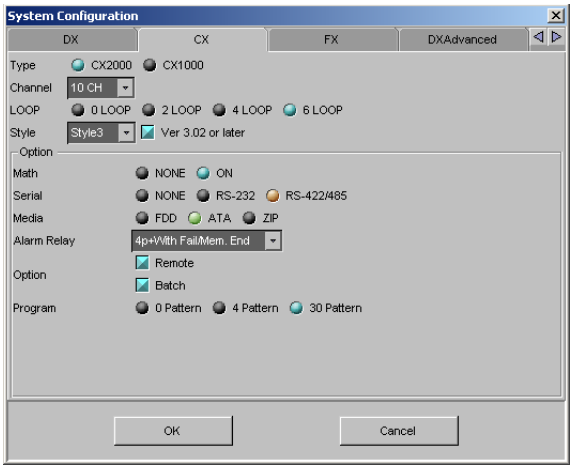
Entering and Checking System Settings

You can create new setup data files or open existing setup data files, and then enter or check system configuration according to the connected CX specifications.
Normally these settings should be entered per the specifications of the CX being setup.

1. Select [System Configuration] on the [System] menu.



2. The [System Configuration] dialog box opens. Click the [CX] tab.



You can enter the following settings in this dialog box.

Type
Select either CX2000 or CX1000.

Channel
Select the number of channels of the CX.
CX1000: 0 (when set to Style 2 or later), or 6 channels
CX2000: 0 (when set to Style 2 or later), 10, or 20 channels

LOOP
Select the number of loops.
CX1000: [0LOOP], [2LOOP]
CX2000: [0LOOP], [2LOOP], [4LOOP], [6LOOP]

Style
Select the CX style number.

Math Function
Select whether or not to enable the math functions (computation function).

Serial
Select the serial communications mode from [OFF], [RS-232], or [RS-422/485].

Media
Select the external storage media from [FDD], [ATA], or [ZIP].

Alarm Relay

Select the type of alarm relay from [NONE], [4p+With Fail/Mem. End], [6p], or [External Loop]. If you select 2LOOP for the CX1000, the Alarm Relay is automatically set to [NONE]. The items that can be selected vary depending on the model, number of channels, and number of loops.
If you select [2LOOP] for the CX1000, the [Alarm Relay] is automatically set to [NONE].

Options

If set to a style before Style 2, the following options can be selected.

- Green Series Comm
  Select whether options are installed for communications with an external controller. This option can only be selected when [Serial] is set to [RS-232] or [RS-422/485]. Also, this option is fixed to [Green Series Comm] if [0LOOP] is selected.
- Ladder Comm
  Select whether a ladder communication option is installed. This option can only be selected when [Serial] is set to [RS-232] or [RS-422/485].
  Also, this option is not available if [0LOOP] is selected.

Remote

Select whether a remote option is installed. Note that this option can only be selected when [Alarm Relay] is set to [4p+With fail/Mem. End] or [6p].

Batch

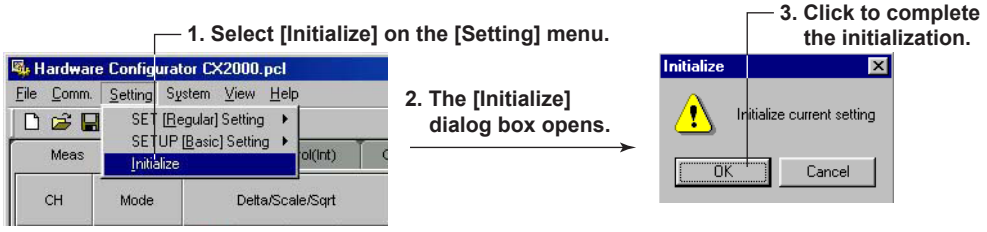
Select whether a batch option is installed. This option applies to style number S3 or later.

Program

Select [None], [Program Num:4], or [Program Num:30].

When you change the system configuration and click the [OK] button, the “System configuration has been changed. The input configuration and data will be initialized. Continue?” message appears. Click the [OK] button to initialize the data.

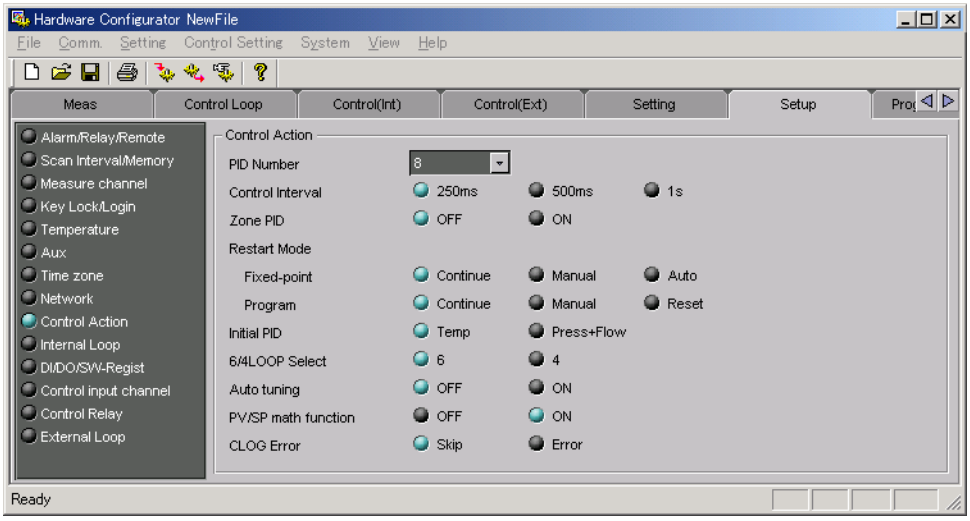
Initializing the Setup Data



5.3 Control Function Basic Settings

Make the basic settings of control function.
To enter settings, click the [Setup] tab then select the settings you wish to enter from the list that appears on the left of the screen. Or, you can select the items by choosing [Control Settings] - [Setup Mode].

Control Action



PID Number
Set between 1 and 8. If the number is changed, the program pattern for the program control option will be initialized.

Control Interval
Set to [250ms], [500ms], or [1s].
However, when [A/D Integrate] under [Scan Interval/Memory] is set to [100ms], you can only select [1s].

Zone PID
Turn ON or OFF.

Restart Mode
Set to [Continue], [Manual], or [Auto].
With the program control option, the choices are [Continue], [Manual], or [Reset].

Initial PID
Set to [Temp] or [Press+Flow].

6/4LOOP Select (only for CX2000)
Set to 6 or 4 loops.
This selection is only available when the [LOOP] setting in the [System Configuration] dialog box is set to [6LOOP].

Auto Tuning
Turn ON or OFF.

PV/SP Computation Function (CX Style Number S3 or Later)
Turn the PV/SP computation function ON or OFF. When ON, you can set the PV/SP equation.

CLOG Error (CX Style Number S3 or Later)

Set the method for dealing with abnormalities in the channel data for CLOG, an operator for the PV/SP computation function and analog retransmission.

Error: Process as a computation error

Skip: Skip any abnormal data and complete the computation

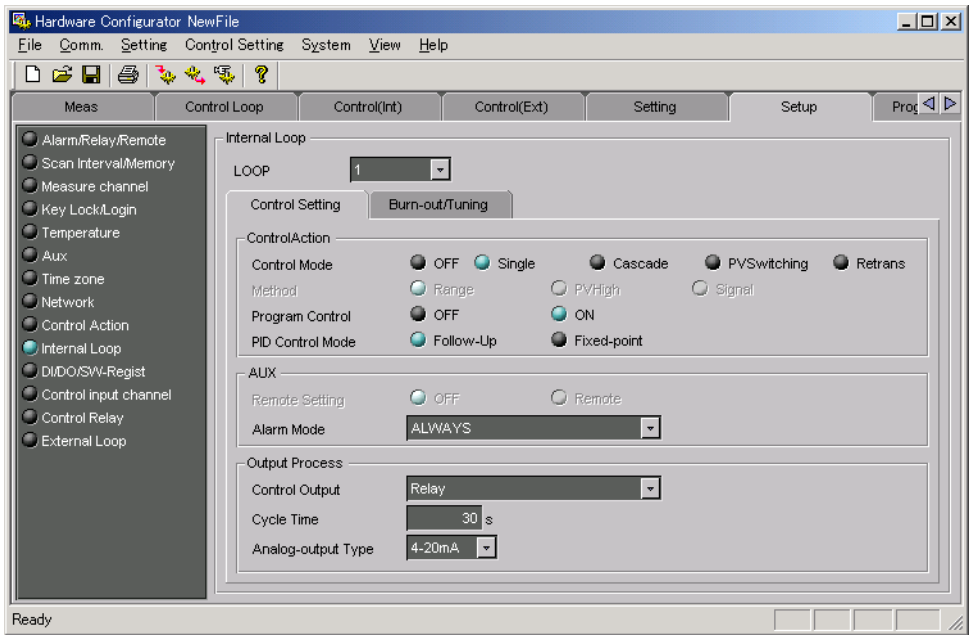
Event Output (CX Style Number S3 or Later)

Common: Set a common event output setting for all program patterns

Separate: Set the event output for each program pattern

Internal Loop

For each loop there are [Control Setting] and [Burn-out/Tuning] items.



LOOP

Select the loop number to which the settings apply (CX1000: 1 and 2. When 4 selected for CX2000 4/6LOOP: 1-4). Only the loop numbers for the loops specified in the system configuration settings appear in the list.

[Control Setting] Tab

Contains the control settings for internal loops.

- Control Action

  Control Mode

  Select the control mode from [Basic], [Cascade], [PVSwitching], or [Retrans] (Style 3 or later). For a loop with no control, select [OFF]. When selecting [Cascade], because of a common setting between two loops of a control output terminal block, when you set loop 1 to cascade, for example, loop 2 can also automatically be set to cascade. If you make a change such that the smallest loop number changes (other than selecting OFF), all program patterns are initialized.

  Method

  Select the switching conditions of two measurement inputs from [Range], [PVHigh], or [Signal]. You can only make this selection when [Control Mode] is set to [PVSwitching].

Program Control (with the Program Control Option)
Turn program control ON or OFF for each loop. On style 2 and earlier, there is a common setting for both loops of a single control output terminal block. If you make a change such that the smallest loop number changes (other than selecting OFF), all program patterns are initialized.

PID Control Mode
Select the PID control mode from [Follow-Up] or [Fixed-point]. This setting is disabled on loops for which [Control mode] is [OFF].

- AUX
  Remote Setting (Enabled When Program Control Is OFF)
  When performing measurements by remote, select [Remote]. It cannot be set in the following cases.
  - For secondary measurement loop numbers when [Control Mode] is set to [Cascade].
  - With even numbered loops (when PV/SP computation function is OFF) when the number of loops is 2, 4, or 6 (4Loop is selected under 6/4Loop) and [Control Mode] is set to PV Switching.
  - When the number of loops is 6 (6 Loop is selected under 6/4 Loop) and [Control Mode] is set to [PV Switching] (when the PV/SP computation function is OFF).

  Alarm Mode
  Select from the following conditions for disabling the control alarm.
  ALWAYS:
  Alarm is always enabled.
  STOP:
  Alarm disabled when operation is stopped.
  STOP/MAN:
  Alarm is disabled in manual operation mode or when operation is stopped.

- Output Process
  When [Control Mode] is set to [Cascade], the output process settings are not available for the primary loop.

  Control Output
  Select the type of control output from the following:
  - Relay (time-proportional PID relay contact output)
  - Voltage-pulse (time-proportional PID voltage pulse output)
  - Current-output (continuous PID control output)
  - On/Off-control (relay contact output, not available for analog retransmission loops)

  Cycle Time
  With a PID proportional to time, set the cycle time (control output cycle) between [1]s and [1000]s.

  Analog-output Type
  For the current output, select the output current range from the following:
  - [4-20mA], [0-20mA], [20-4mA], and [20-0mA].

[Burnout/Tuning] Tab (When PV/SP Computation Is OFF)

- Input Process

  Burnout

  Sets the burnout action for the PV inputs of each loop. You can select [OFF], [UP], or [DOWN]. [No.2] is valid only when the control mode is set to [PVSwitching]; [Remote] is valid only when the PV input is set to remote input. This setting is invalid for PV inputs other than thermocouples and standard signals.
  When PV/SP computation is ON, it is set according to “Control Input Channel” on page 5-12.

  RJC (Type, Volt (uV))

  This is the reference junction compensation setting for thermocouple inputs. The setting is entered on the PV inputs of each loop. [No.2] is valid only when the control mode is set to [PVSwitching]; [Remote] is valid only when the PV input is set to remote input. This setting is invalid on the CX main unit for PV input other than thermocouples.
  You can select [Internal] or [External] for Type.
  If you select [External], set a voltage in the range from -20000 uV to 20000 uV.
  When PV/SP computation is ON, it is set according to “Control Input Channels” on page 5-12.

- Tuning Setting

  Tuning item ON/OFF

  Select [On] for the parameters that you want to display in the tuning window, and [Off] for other parameters.

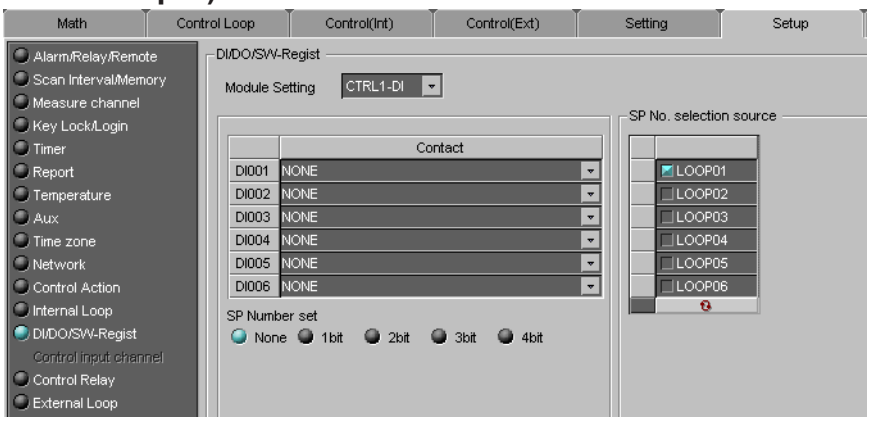
  ID

  Select the ID of the item from the following:
  SP (target set point), A1 (alarm 1 setting), A2 (alarm 2 setting), A3 (alarm 3 setting), A4 , P (proportional range), I (integration time), D (differentiation time), OH (upper output limit), OL (lower output limit), MR (manual reset), H (hysteresis), DR (control action direction), PO (preset output), BS1 (measured value 1 input bias), FL1 (measured value 1 input filter), BS2 (measured value 2 input bias), FL2 (measured value 2 input filter), RT (ratio setting), RBS (remote input bias), RFL (remote input filter), or W01–W36 (control computation constant).
  BS1, FL1, BS2, FL2, and RFL cannot be selected when PV/SP computation is ON.
  BS1, FL1, BS2, FL2, RT, RBS, RFL, and W01–W36 apply to style number S3 or later.

  Name

  Specify the name of the item using up to 6 alphanumeric characters.

DI/DO/SW-Regist (Contact Input)



Module Setting

Select the terminal blocks where you want to register contact inputs.

Style 3 or later

[CTRL1-DI] (2 loops or more), [CTRL2-DI] (4 loops or more), [CTRL3-DI] (6 loops or more), [CTRL1-DO] (2 loops or more), [CTRL2-DO] (4 loops or more), [CTRL3-DO] (6 loops or more), [EXT1-RI] (CX2000 with extension output terminal), [EXT1-RO] (CX2000 with extension output terminal), [INT-SW1], [INT-SW2], [INT-SW3]

Style 2 or earlier

[CTRL1-2], [CTRL3-4] (4 loops or more), [CTRL5-6] (6 loops or more), [ETXDIO] (CX2000 with extension output terminal)

Contact

For each contact input number, select the type of contact input from the following. Some items may not be available depending on the system settings and control mode. For details about the contact input settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

- ControlStopAll
- ControlStartAll
- ControlStart/Stop
- Remote/Local
- Auto/Man
- Cascade (1-2, 3-4)
- Auto1-2 or 3-4
- Man1-2 or 3-4
- SPNumber0 to 3 bit (enter by selecting one of the options under SP Number set).
- PVSwitching
- Program Start
- ProgramStop
- Hold
- Advance
- Memory Start/Stop
- Trigger
- Alarm ACK
- Time Adjust
- Math Start/Stop
- Math Reset
- Manual Sample
- Panel1 Load to Panel3 Load
- Message1 to 8
- Snapshot
- PatternNo.Set (0-4 bits) (Register per the number selected under pattern number setting. Available when program control is ON.)

SP Number Set
Select when registering to the contact input for switching the SP number.

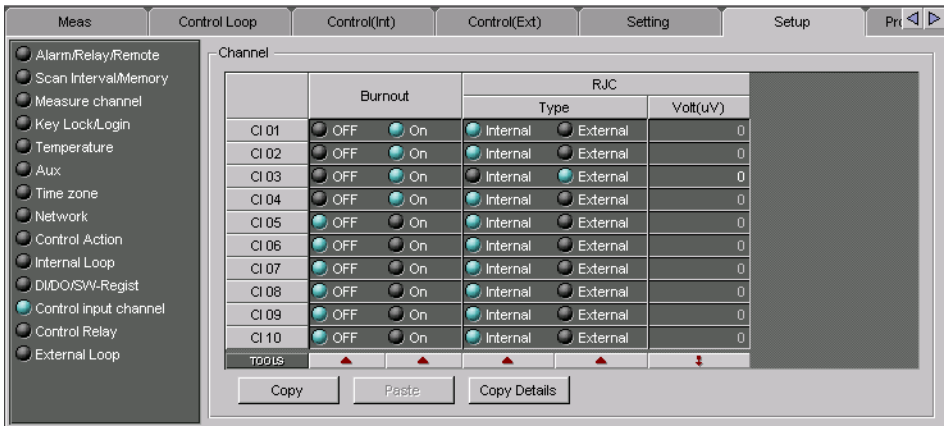
SP No. Selection Source
When specifying input contacts of SP No. settings, select the loop number of the SP Number set to be switched. Activate or deactivate each loop number (CX1000: LOOP1 and LOOP2, CX2000: LOOP1 to LOOP6 (up to 4 loops if 4LOOP was selected under 6/4 Loop selection)).

Pattern Number Selection (When Program Control for Internal Loop is ON)
(When [Program Control] for [Internal Loop] is ON)
With program control, you can select the range of pattern numbers when switching program patterns through contact input. The pattern numbers are entered in binary according to the number of relays required as shown in the following chart.

Pattern No.	No. of Relays	Assigned Relay(s)
1	1 (1 bit)	DI001
1–3	2 (2 bits)	DI001, DI002
1–7	3 (3 bits)	DI001–DI003
1–15	4 (4 bits)	DI001–DI004
1–30	5 (5 bits)	DI001–DI005

These are automatically registered under contact inputs according to the selected range of program pattern numbers. [1–15] and [1–30] are active only if the number of program patterns is 30 (/PG2).

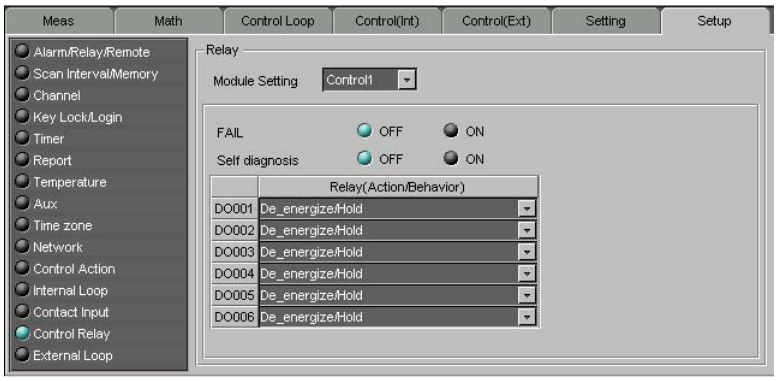
Control Input Channel (When PV/SP Computation Is ON, and with CX Style Number S3 or Later)
When PV/SP computation is ON (see Control Action), set burnout and RJC (when PV/SP computation is OFF, set in “Internal Loops”).



Burnout
Turn each control input channel ON or OFF.

RJC (Type, Volt (uV))
This is the reference junction compensation setting for thermocouple inputs. Set for each control input channel. This setting is invalid on the CX main unit for PV input other than thermocouples.
You can select [Internal] or [External] for Type.
If you select [External], set a voltage in the range from -20000 uV to 20000 uV.

Control Relay



Module Setting

Select the terminal blocks where you want to register contact outputs from [CTRL1-2], [CTRL3-4], [CTRL5-6], or [EXTDIO]. [CTRL3-4], [CTRL5-6], and [EXTDIO] are available only with the CX2000 and when the number of loops is 6 or more (with 6/4 loop select, selection is not possible when set to 4 loops). EXTDIO is available with the CX2000 and when External Loop is selected for alarm relay.

FAIL ([CTRL1-2] Only)

Activates the output of a relay contact signal (FAIL signal) if a fault occurs in the CX CPU. When it is [ON] (default: [OFF]), contact output number [DO001] of control output terminal block 1 in the [Relay] (Action/Behavior) setting is automatically assigned to [De_energize/Nonhold].

Self Diagnosis ([CTRL1-2] Only)

Activates the output of a relay contact signal in the event of input burnout, an A/D converter fault, or reference junction compensation failure. When it is [ON] (default: [OFF]), contact output number [DO002] of control output terminal block 1 in the [Relay] (Action/Behavior) setting is automatically assigned to [De_energize/Nonhold].

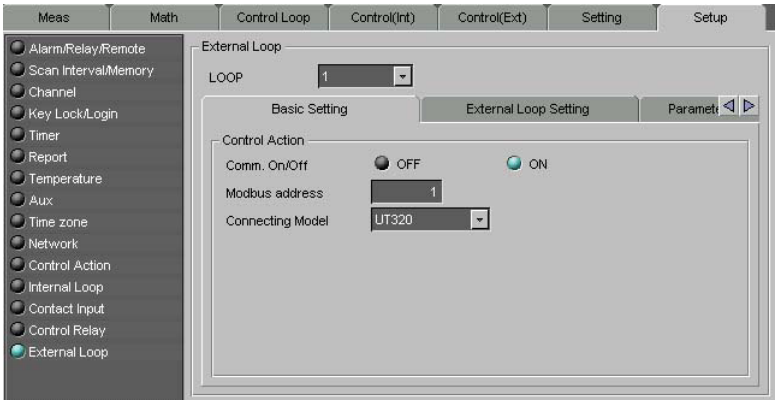
Relay (Action/Behavior)

Set the contact output relay operating mode to [De_energize/Hold], [De_energize/Nonhold], [Energize/Hold], or [Energize/Nonhold].

External Loop

For each loop there are Basic Setting, External Loop Setting, Parameter Address Setting, and Tuning Setting items. For details on external loops, see the CX1000/CX2000 Communication Interface User's Manual (IM04L31A01-17E).

[Basic Setting] Tab

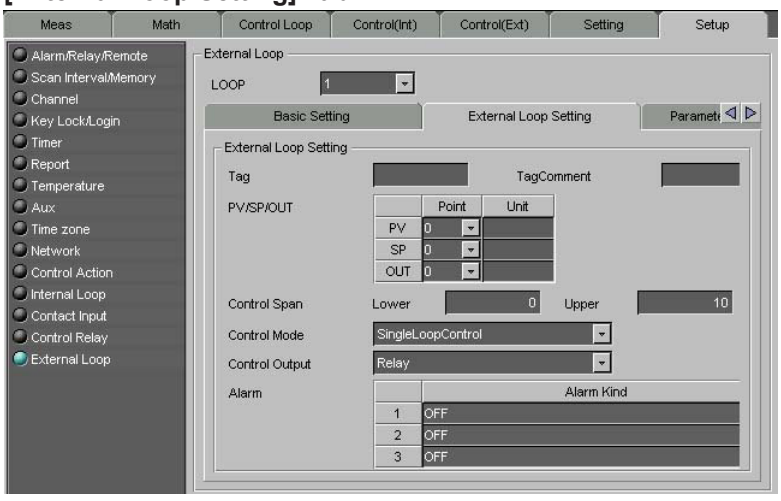


- Control Action
  Comm. On/Off
  Select to turn the external loop function (the Green Series Comm. function) ON or OFF.
  If you select OFF, all settings below will be disabled.

  Modbus address
  Enter the Modbus address of the controller used in external loop control from 1 to 247.

  Connecting Model
  Select the type of connected UT series controller. Select [Other] when connecting to a controller other than a UT series instrument.
  The following settings vary depending on the selected instrument.

[External Loop Setting] Tab



- Control Action
  Loop Select
  Select the loop from [Loop1] or [Loop2].
  This item appears when [Connecting Model] in [Basic Setting] is set to a model capable of two-loop control (UT520, UT550, UT750, or Other).

Tag
Specify a tag using a maximum of 8 alphanumeric characters.

Tag Comment
Specify a tag comment using a maximum of 8 alphanumeric characters.

PV/SP/OUT
Set the decimal place (0-4) and units (using up to 6 alphanumeric characters) of PV, SP, and OUT.

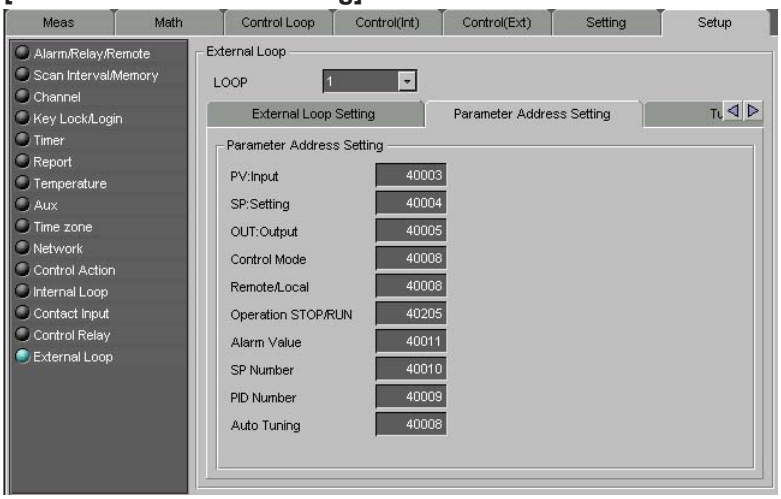
Control Span
Set the control span between the upper and lower limits.

Control Mode
Select the control mode from the choices below. The available modes differ depending on the connected instrument.
[SingleLoopControl], [CascadePrimaryLoop], [CascadeSecondaryLoop], [CascadeControl], [ControlBackUp], [PVSwitching], [PVAutoSelector], [PVHoldFunction], [2LoopControl], [GreenControl], [UniversalPVCascade], [UniversalPVSwitching], or [UniversalPVSelector].

Control Output
Select the type of control output from the choices below. This setting not available if the control mode is set to Cascade or UniversalPVCascade.
[Relay], [Voltage-pulse], [Current-output], and [On/Off-control]

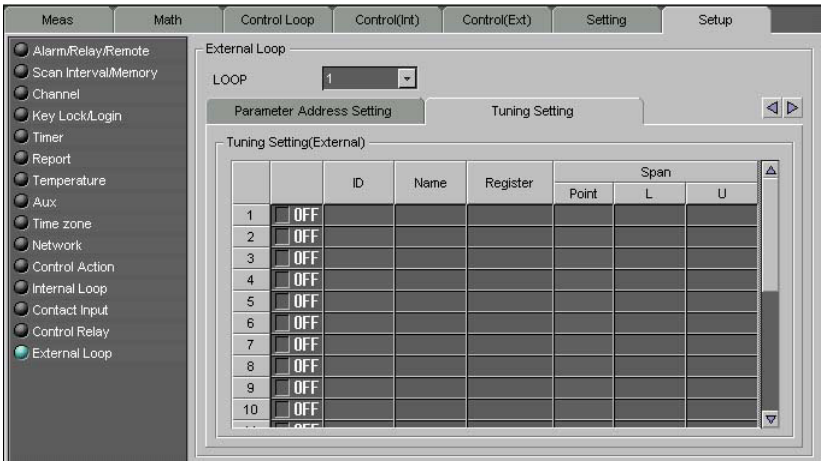
Alarm
Select the type of alarm from the choices below. The alarm types that can be selected differ depending on the connected model.
[OFF], [PV-High(Energ)], [PV-Low(Energ)], [Deviation-High(Energ)], [Deviation-Low(Energ)], [Deviation-High(Deenerg)], [Deviation-Low(Deenerg)], [Deviation-H&L(Energ)], [Dev-within-H&L(Energ)], [PV-High(Deenerg)], [PV-Low(Deenerg)], [PV-High(Energ/Standby)], [PV-Low(Energ/Standby)], [Dev-High(Energ/Standby)], [Dev-Low(Energ/Standby)], [Dev-High(Deenerg/Standby)], [Dev-Low(Deenerg/Standby)], [Dev-H&L(Energ/Standby)], [Dev-w-H&L(Energ/Standby)], [PV-High(Deenerg/Standby)], [PV-Low(Deenerg/Standby)], [Timer-upward(h:m)], [Timer-downward(h:m)], [Timer-upward(m:s)], [Timer-downward(m:s)], [Sensor-grounding], [Problem-diagnostic], [FAIL-output], [SP-High], [SP-Low], [Output-High], [Output-Low], [Header-burnout1], and [Header-burnout2].

[Parameter Address Setting] Tab



Select the parameter address settings from the following ranges.
30001 to 39999, 300001 to 365535, 40001 to 49999, 400001 to 465535.

[Tuning Setting] Tab



- Tuning Setting
  Tuning item ON/OFF
  Select [On] for the parameters that you want to display in the tuning window, and [Off] for other parameters.

  ID
  Select the ID of the item from the choices below.
  Internal Loop
  SP (target set point), A1 (alarm 1 setting), A2 (alarm 2 setting), A3 (alarm 3 setting), A4 (alarm 4 setting), P (proportional range), I (integration time), D (differentiation time), OH (upper output limit), OL (lower output limit), MR (manual reset), H (hysteresis), DR (control action direction), DB (dead band), PO (preset output), ETC (others), BS1 (measured value 1 input bias), FL1 (measured value 1 input filter), BS2 (measured value 2 input bias), FL2 (measured value 2 input filter), RT (ratio setting), RBS (remote input bias), RFL (remote input filter), or W01-W36 (control computation constant)

External Loops
Internal loop SP (target set point), A1 (alarm 1 setting), A2 (alarm 2 setting), A3 (alarm 3 setting), A4 (cannot select with UT320, UT321, UT350, or UT420), P (proportional range), I (integration time), D (differentiation time), OH (upper output limit), OL (lower output limit), MR (manual reset), H (hysteresis), DR (control action direction), DB (dead band), PO (preset output), or ETC (others)

Note

When [Connecting Model] in the [Basic Setting] tab of [External Loop] is set to [Other], you can only select [ETC].

Name
Specify the name of the item using up to 6 alphanumeric characters.

Register
Set the register address in the following ranges.
30001 to 339999, 300001 to 365535, 40001 to 49999, and 400001 to 465535.

Span (Point)
Set the parameter decimal point position.

Span (L)
Set the lower control span value between -30000 to 30000.

Span (U)
Set the upper control span value between -30000 to 30000.

5.4 Control Function General Settings

This section describes settings for the internal loop control functions. Enter settings for the internal loop control functions, using the [Control Loop] tab and [Control Group] on the [Setting] tab. You can also enter these settings by choosing [Control Setting] - [SETUP [Regular] Setting] - [Control Loop], or [Control Settings] - [SETUP [Regular] Setting] - [Control Group].
On the [Control Loop] tab, click the button (LOOP01, LOOP02, ...) of each loop number that you want to set, and then enter the settings for that loop. The label of the selected loop number button is red. Select each item (Control Input, PID/Alarm, Operation Related, Linearizer, and Control Function) with the option buttons.

Control Input

A different menu is displayed when PV/SP computation function in the control basic settings is turned ON or OFF.

When PV/SP computation function is OFF

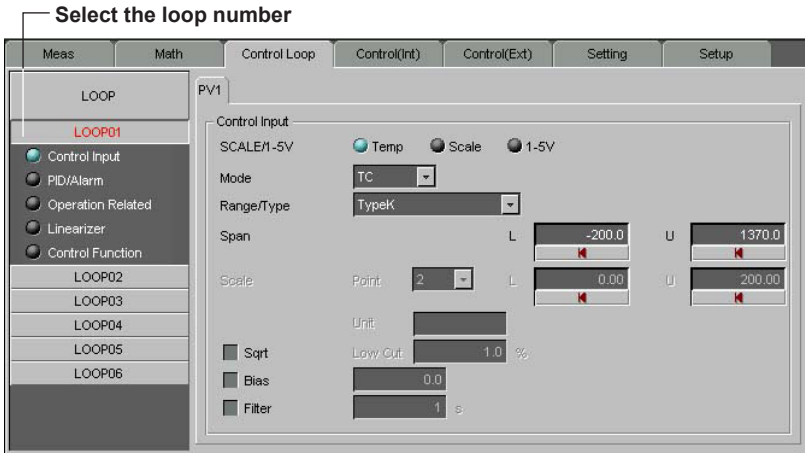
The control input settings vary depending on the Control Mode setting selected under [Internal Loop] in the [Setup] tab. You can make settings for the inputs [PV1], [PV2], [Remote], and [PVrange]. They appear in the following situations.

		PV1	PV1	Remote	PVrange
Basic	**Odd loops**	○		○	
	Even loops	○		○	
Cascade	**Odd loops**	○		○	
	Even loops	○			
PVSwitching	**Odd loops**	○	○	○*	○
	Even loops	○	○		○
Analog Re-transmission (Style 3 or later)*	**Odd loops**	○		○	
	Even loops	○		○	

*: With 6 loops, disabled when 6/4LOOP Select set to 6 loops.

Remote appears if the Setup tab's Internal Loop > Remote setting is set to Remote.

The settings displayed depend on the input type, [PV 1], [PV2], [Remote], and [PVrange], but the settings are the same.



SCALE/1-5V (PV1, PV2, Remote)
Select the channel measurement mode from [Temp], [Scale], or [1-5V].

Mode (PV1, PV2, Remote)

Select a channel input mode of [VOLT], [TC], or [RTD]. When [SCALE/1-5V] is set to [1-5V], the mode is fixed [VOLT].

Range/Type (PV1, PV2, Remote)
Select the voltage range, thermocouple, and resistive temperature detector type.
- VOLT: 20mV, 60mV, 200mV, 2V, 6V, 20V, or 50V
- TC: TypeK, TypeJ, TypeT, TypeB, TypeS, TypeR, TypeN, TypeE, TypeL, TypeU, TypeW, PLATINEL, PR40-20, or WRe3-25
- RTD: JPt100 or Pt100

When [SCALE/1-5V] is set to [1-5V], [Range/Type] is fixed to [6V].

Span (PV1, PV2, Remote)
Specify the measurement span such that the upper limit is greater than the lower limit.

Scale (PV1, PV2, Remote)
Specify the scale for each loop between -30000 and 30000, such that upper limit > lower limit, and upper limit - lower limit ≤ 30000. Set the decimal place in the range from 0 to 4. Only available when [Scale] is selected under [Scale/1-5V]. For details, refer to the CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E).

Unit (PV1, PV2, Remote)
Specify the units for each loop.
Use a maximum of 6 alphanumeric characters.

Sqrt (PV1, PV2, Remote)
Select or clear the check box to turn the square root function ON or OFF.
When it is ON, set [Low Cut] between 0.0% and 5.0%.

Bias (PV1, PV2, Remote)
Select the check box to turn the bias ON/OFF.
When it is ON, enter the setting for EUS (-100 to 100%) of the measurement span.

Filter (PV1, PV2, Remote)
Select the check box to turn the filter ON/OFF.
When it is ON, set between 1 and 120.

Ratio setting (Remote)
Turn ON when applying the designated ratio to remote measurement input.
When turned ON, set the value in the range from -30000 to 30000. Set the decimal place in the range from 0 to 4.
With Style 2 or earlier, the setting range is from 0.001 to 9.999.

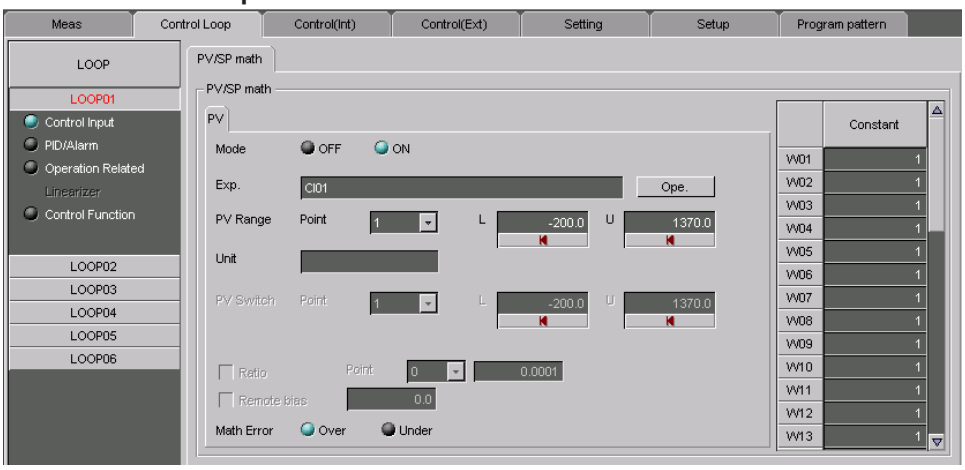
PV Range (PV Range)
Enter the maximum value, minimum value, decimal place, and units.
Set the max. and min. values between –30000 and 30000 such that max. > min., and max. - min. ≤ 30000.

PV Switching (PV Range)
Set within the input range. When setting [Method] to [Range] in the [Control Action] within the Setup tab's internal loop item, or when setting [Method] to [PVHigh], only the upper limit is set. If you set [Method] to [Signal], the PV Switching setting is not available.

Note

When the PV/SP computation function is ON, the above settings for the input related settings are entered for each control input channel item on the Setup tab. See page 7-30 for the setting method.

When PV/SP Computation Function is ON



Enter PV or SP related settings.
When the control mode is analog retransmission, the setting menu for that mode is displayed. See the next page.

PV/SP Computation Function
Select whether to enter settings for PV, PV1, PV2, or SP. Enter PV if the control mode is single loop control or cascade control, or PV1, PV2 for 2 input switching control. SP can be entered when the Setup tab's Internal Loop > [Remote Setting] is set to [Remote].

Mode
Select ON or OFF.
ON: Activates the equation.
OFF: Assigns the following control input channels to the equation.

Control mode	Single loop control		Cascade control		2 input switching control (4 loops)			2 input switching control (6 loops)		
	PV	SP	PV(1)	SP	PV1	PV2	SP	PV1	PV2	SP
Loop 1	CI01	CI02	CI01	CI02	CI01	CI02	CI03	CI01	CI02	CI01
Loop 2	CI04	CI05	CI04	—	CI04	CI05	CI01	CI04	CI05	CI01
Loop 3	CI06	CI07	CI06	CI07	CI06	CI07	CI08	CI06	CI07	CI01
Loop 4	CI09	CI10	CI09	—	CI09	CI10	CI01	CI09	CI10	CI01
Loop 5	CI03	CI01	—	—	—	—	—	—	—	—
Loop6	CI08	CI01	—	—	—	—	—	—	—	—

Equation
Enter the PV/SP equation. If the mode is OFF, the equation cannot be entered.

PV range (PV or PV1)
Set the maximum value, minimum value, decimal place (0–4), and units using 6 alphanumeric characters or less.
Set the max. and min. values between -30000 and 30000 such that max. > min., and max. - min. ≤ 30000.
PV1 can be set even if the mode is OFF.

Input Switching (PV1)
Set within the PV range. Set the decimal place (0–4), upper limit (U) and lower limit (L). When setting [Method] to [Range] in [Control Action] under the Setup tab's Internal Loop item, and when setting the upper limit (U), lower limit (L), and [Method] to [PV High], only the upper limit value is set. If you set [Method] to [Signal], the PV Input Switching setting is not available. This can be set even if the [Mode] is OFF.

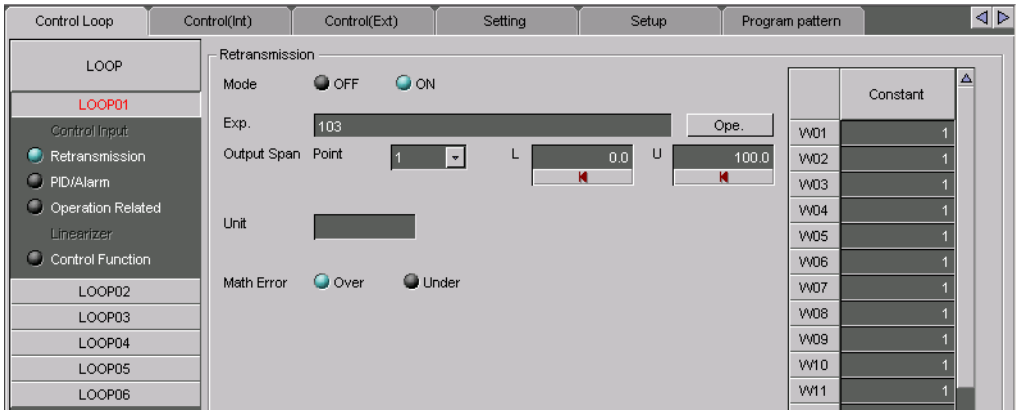
Ratio (Remote)
Turns ON when a given ratio is applied to SP.
When turned ON, set the ratio in the range from 0.0001–30000. Set the decimal place in the range from 0 to 4.

Remote Bias
You can select ON or OFF to determine whether bias is applied to SP.
When turned ON, set the bias value in the PV range of “EUS(-100% to 100%).”

Math Error
If a computation error occurs, specify whether to process it as a PV/SP, overrange, or underrange.

Constants
Set the constants to be used for PV/SP computation, analog retransmission, and logic computation. Constants are common for analog retransmission and logic computation.

Analog Retransmission



Sets the equation and output span on loops whose control mode is analog retransmission.

Mode
Select ON or OFF.
ON: Activates the equation.
OFF: Analog retransmission does not function.

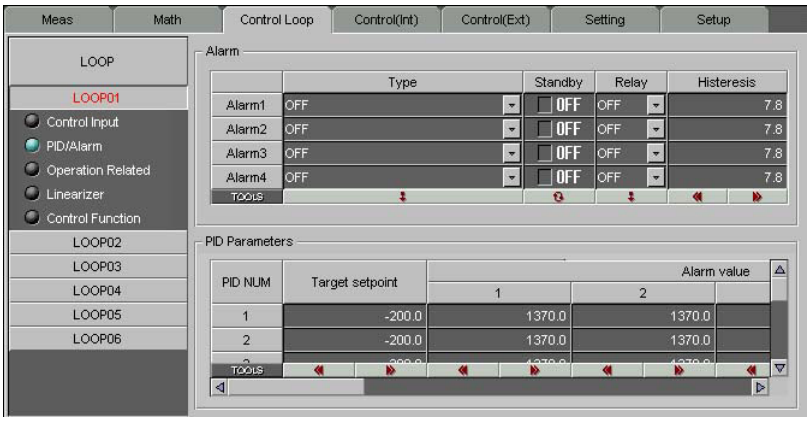
Equation
Enter the analog retransmission equation.

Output Span
Set the maximum value, minimum value, decimal place (0–4), and units using 6 alphanumeric characters or less.
Set the max. and min. values between -30000 and 30000 such that max. > min., and max. - min. ≤ 30000.

Math Error
Select whether to set to an overrange or underrange when computed results in an error.

Constants
Set the constants to be used for PV/SP computation, analog retransmission, and logic computation.

PID/Alarm



- Alarm
  Specify an alarm for each loop.

  Type
  Select the type of alarm from the following:
  [PV-High], [PV-Low], [Deviation-High], [Deviation-Low], [Deviation-H&L], [Dev-within-H&L], [SP-High], [SP-Low], [Output-High], and [Output-Low].

  Standby
  Turn standby ON or OFF.
  For details about the alarms that can be turned on or off, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

  Relay
  Select the type of relay
  DO001 to DO006: Loop2
  DO101 to DO106: Loop4 (CX2000 only)
  DO201 to DO206: Loop6 (with 4/6 loop selection, selection is only possible for a CX2000 set to 6 loops.)
  RO001-RO012: Control extension DIO (only a CX2000 with the control extension DIO)
  SW001-SW036: internal switches (SW001–SW018 for the CX1000, Style 3 or later)

  Hysteresis
  Specify the alarm hysteresis in EUS (0.0 to 10.0%).

- PID Parameters
  Specify the PID parameters for each loop.

  Target setpoint
  Specify the target setpoint in EU (0.0 to 100.0%).
  Set between the target setpoint's upper and lower limits.

  Alarm value (1 to 4)
  Set the alarm value. (The setting depends on the type of alarm.)

PV and SP alarms:	EU (0 to 100%)
Deviation-High and Deviation-Low alarms:	EUS (-100 to 100%) of the measurement span
Other deviation alarms:	EUS (0 to 100%) of the measurement span
Output alarms:	-5.0 to 105.0% of the output value

Proportional band (P)
Specify between 0.1 and 999.9%.

Integral Time(I)
Specify between 0 and 6000s.

Derivative Time(D)
Specify between 0 and 6000s.

Output Lower Limit
Set the output lower limit between –5.0 and 105.0% such that upper limit > lower limit.

Output Upper Limit
Set the output upper limit between –5.0 and 105.0% such that upper limit > lower limit.

Shutdown
Turn the shutdown function ON or OFF. Available when the Setup tab's Internal Loop > Output Process > Control output setting is set to Current output, and analog retransmission is set to 4-20 mA.

Manual Reset
Set the manual reset between –5.0 and 105.0% of the output value.

Relay Hysteresis (Value)
Set the relay hysteresis in EUS (0.0 to 100.0%).

Relay Hysteresis (Point)
Select the Hysteresis operating point when using ON/OFF control from [Mid], [Lower Limit], or [Upper Limit].

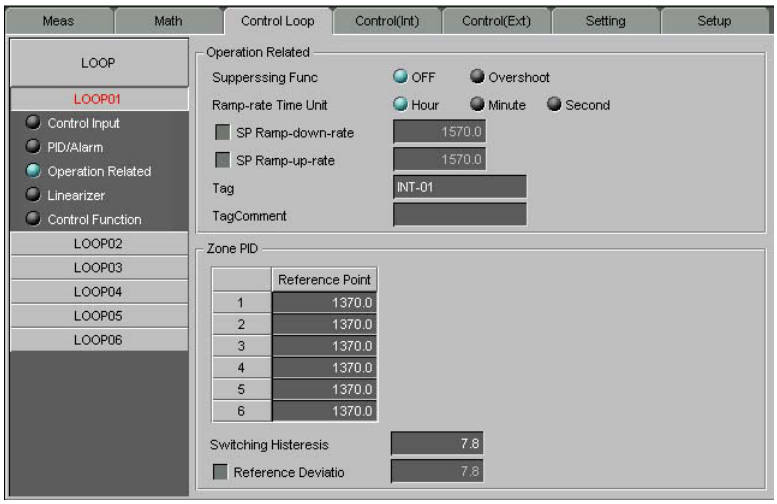
Preset Out
Select a fixed control output value from -5.0 to 105.0% to be used when operation is stopped.

Reverse/Direct
Select reverse/direct switching from [Direct] or [Reverse].

Note

[Relay Hysteresis (Value)] and [Relay Hysteresis (Point)] appear in PID Parameters when [Control Output] is set to [On/Off-control] under [Setup] > [Internal Loop] > [Output process]. In that case, [PID], [Output Limit], [Shutdown], and [Manual Reset] are not shown.

Operation Related



- Operation Related
  Enter internal loop control operation-related settings.

  Suppressing Function
  Select [OFF] or [Overshoot].

  Ramp-rate Time Unit
  Set the ramp-rate time units.

  SP Ramp-down-rate
  Set between 1 digit and EUS (100%) of the measurement span.

  SP Ramp-up-rate
  Set between 1 digit and EUS (100%) of the measurement span.

  Tag
  Specify a tag.
  Use a maximum of 8 characters.

  Tag Comment
  Specify a comment for the tag.
  Use a maximum of 8 characters.

- Zone PID
  Specify the internal loop control zone PID.
  The zone PID setting appears when [Zone PID] is [ON] in [Setup] - [Control Action].

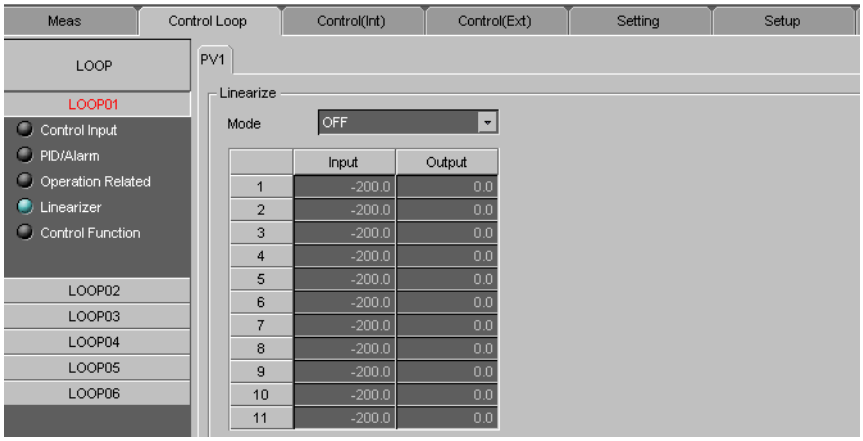
  Reference Point (displayed when the PID number is 3 or higher)
  Specify the reference point with the measurement input span EU (0.0 to 100.0%).
  The number of points depends on the number of PID. ([PID Number]-2.) Therefore, it is not displayed when the PID number is 2 or less.
  The value of each point is such that 1≤2≤...≤6 is set.

  Switching Hysteresis
  Specify the switching hysteresis value with the measurement input span EU (0.0 to 10.0%). It is not displayed when the PID number is 1 or less (or 2 or less with style number S1).

Reference Deviation

Turn the reference deviation ON or OFF, and specify the value from 1 digit of the measurement span to EUS (100.0%). With style number S1 (system setting), it is not displayed if the PID number is 1. With style 2 or later, it is not displayed when the PID number is 2 or less.

Linearize (When PV/SP Computation Is OFF)



Mode

Select the linearize mode from [OFF], [Biasing], or [Approximation].

Input

Enter the linearize input value. (The value depends on the linearize mode.)

Biasing: Set with EU (-5.0 to 105.0%) of the measurement input span.

Approximation: Set with EU (-5.0 to 105.0%) of the measurement input span. Set between 2 and 11 points.

Output

Enter the linearize output value. (The value depends on the linearize mode.)

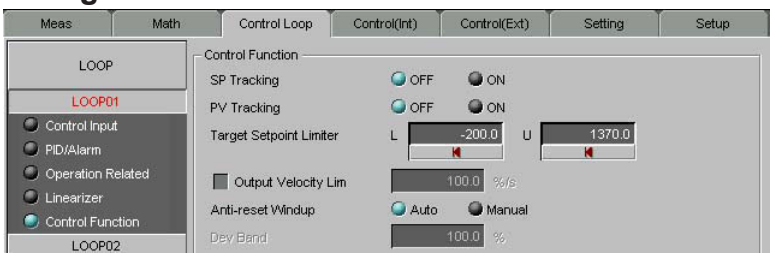
Biasing: Set with EUS (-100.0 to 100.0%) of the measurement input span.

Approximation: Set with EU (-5.0 to 105.0%) of the measurement input span.

Note

- With linearize bias, set so that input + output is EU(0-100%). Also, set so that linearizer input + linearizer output is greater than or equal to the previous linearizer input + linearizer output.
- Set so that linearizer approximation output is more than the previous value.
- Starting from the third point, if you set a value smaller than the previous value, all settings after that point become disabled.
- When the PV/SP computation function is ON, the above settings are entered for each control input channel item under Control Input Channel on the Setting tab. See page 5-30 for the setting method.

Control Function Settings



SP Tracking
Turn the target setpoint tracking ON or OFF.

PV Tracking
Turn the measurement value tracking ON or OFF.

Target Setpoint Limiter
Specify the target setpoint limiter in the measured span's EU (0.0–100.0%) range so that L < U.

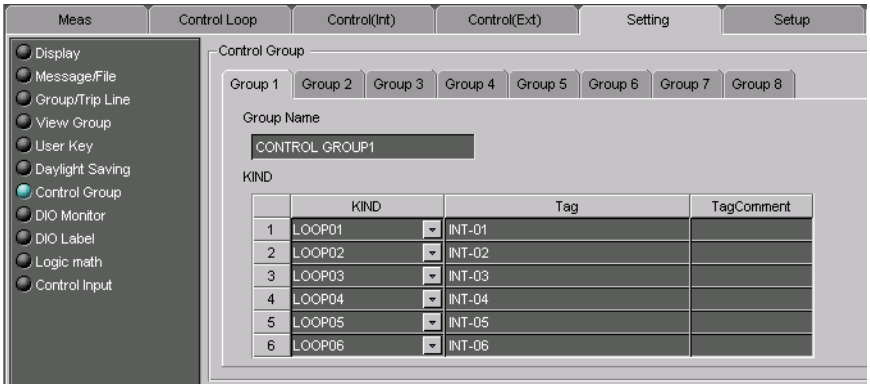
Output Velocity Lim
Select or clear the check box to turn the output velocity limiter ON or OFF, and specify a value between 0.1 and 100.0%/s. This is unavailable for style number S2 or later if you set [Control Output] to [On/Off control] in the [Setup] tab for [Internal Loop].

Anti-reset Windup
Select an anti-reset windup of [Auto] or [Manual]. This is unavailable for style number S2 if you set [Control Output] to [On/Off control] in the [Setup] tab for [Internal Loop].

Dev Band
Set the deviation band of the anti-reset windup between 50.0 and 200.0%.
This setting is only valid when the [Anti-reset Windup] is set to [Manual].

Control Groups

Set the groups to which control functions apply.



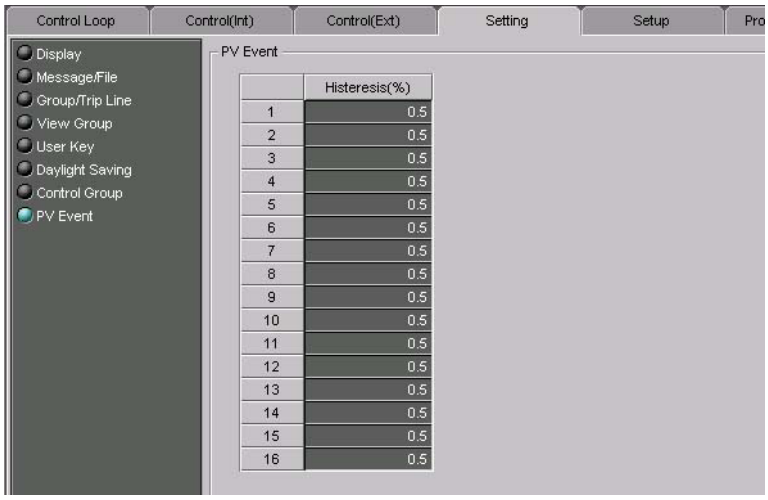
From the [Setting] tab, select [Control Group].

Group Name
Enter a group name using a maximum of 16 alphanumeric characters.

KIND
Select the loops, measurement channels, and DIO numbers (Style 3 or later) you want to assign to a group. For the CX1000, you can select 1-2 internal loops, 1-4 external loops, and 1-12 DIOs. For the CX2000, you can select 1-6 internal loops, 1-16 external loops, and 1-36 DIOs.
On the CX1000, group1 consists of up to 4 types of control loops and measurement channels. On the CX2000, it consists of up to 6 types.

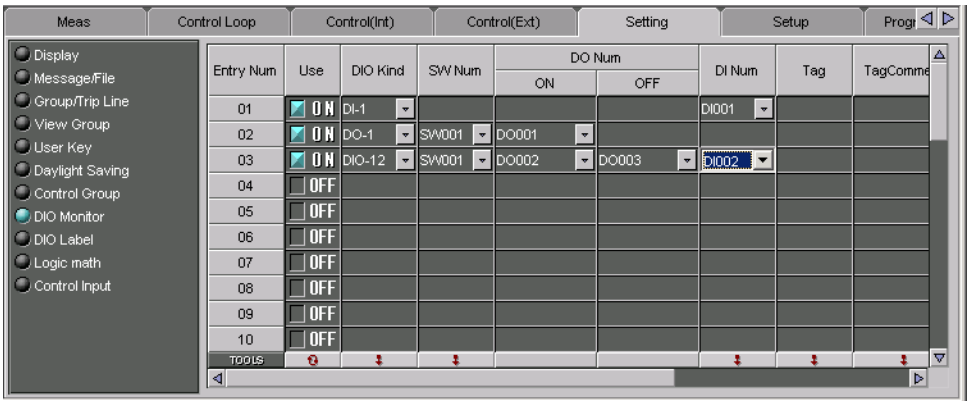
PV Event Hysteresis (Style 2 or earlier)

This is available for style number S2 if you set [Program Control] to [On] in the [Setup] tab for [Internal Loop].



From the [Setting] tab, select [PV Event].

DIO Operation Monitoring Function (CX Style Number S3 or Later)



DIO Operation Monitoring Number
Enter an integer between 1 and 36.

DIO Operation Monitoring Function
Turns the specified DIO operation monitor number ON and OFF.

DIO Types
Select the DIO operation monitoring method.

- DI-1: Displays the input status of the specified DI. The status of the internal switches are output.
- DO-1: The status of the internal switches are output to one DO. 1 (ON) is output when the internal switches are ON, and 0 (OFF) is output when they are OFF.
- DO-2: You can output the ON and OFF statuses of the internal switches to separate DOs. 1 (ON) is output from the ON output DO when the internal switches are ON, and 0 (OFF) is output from the OFF output DO when they are OFF. 0 (OFF) is output from the ON output DO when the internal switches are OFF, and 1 (ON) is output from the OFF output DO when they are ON.
- DIO-11: The same action as the DO-1 is performed while displaying the input status of the specified DI.
- DIO-12: The same action as the DO-2 is performed while displaying the input status of the specified DI.
- DO-2P: You can output the ON and OFF statuses of the internal switches to separate DOs. A pulse signal having a 1 to 2 second pulse width is output from the ON output DO when the internal switches are ON, and from the 0 (OFF) output DO when they are OFF.
- DOI-12P: The same action as the DO-2P is performed while displaying the input status of the specified DI.

SW Number
Set the internal switches assigned to DO.

DO Number
Set the DO performing DIO operation monitoring. If the DIO type is DO-2, DIO-12, DO-2P, or DIO-12P, specify a separate DO with ON and OFF. DO numbers may not overlap with other numbers, including DIO operation monitoring numbers.
Not displayed when the DIO type is DI-1.

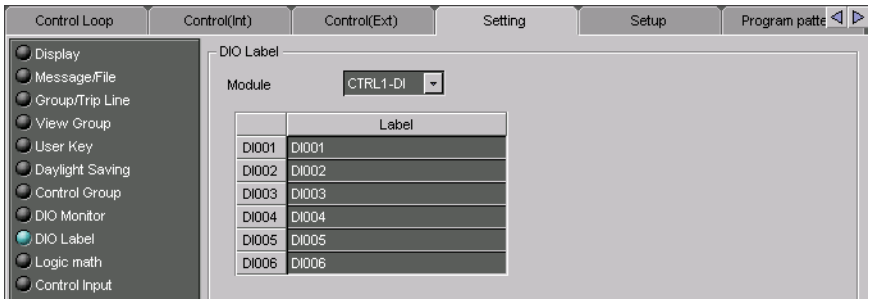
DI Number
Set the DI number to perform operation monitoring.

Tag
Enter tags.
Up to 8 alphanumeric characters can be used.

Tag Comment
Enter tag comments.
Up to 8 alphanumeric characters can be used.

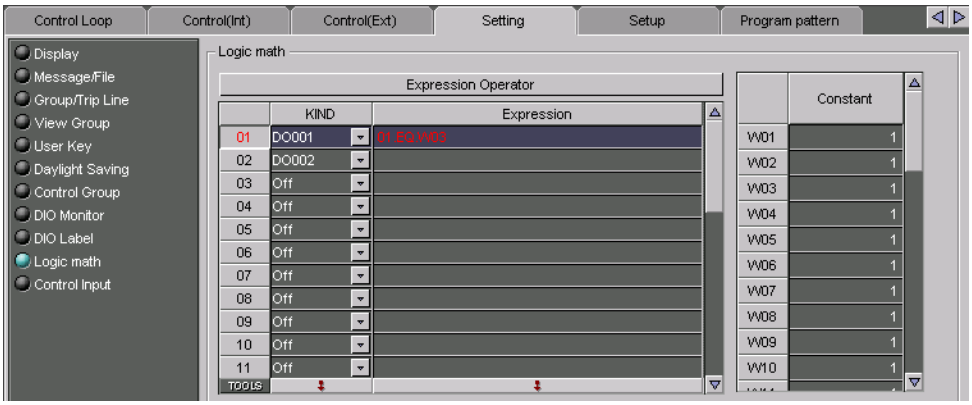
Operation Status Display
Set the label and display colors when displaying operation status.

DIO Labels (CX Style Number S3 or Later)



Set the DIO labels.

Logic Computation (CX Style Number S3 or Later)



Type
Select the output destination for the computed results.

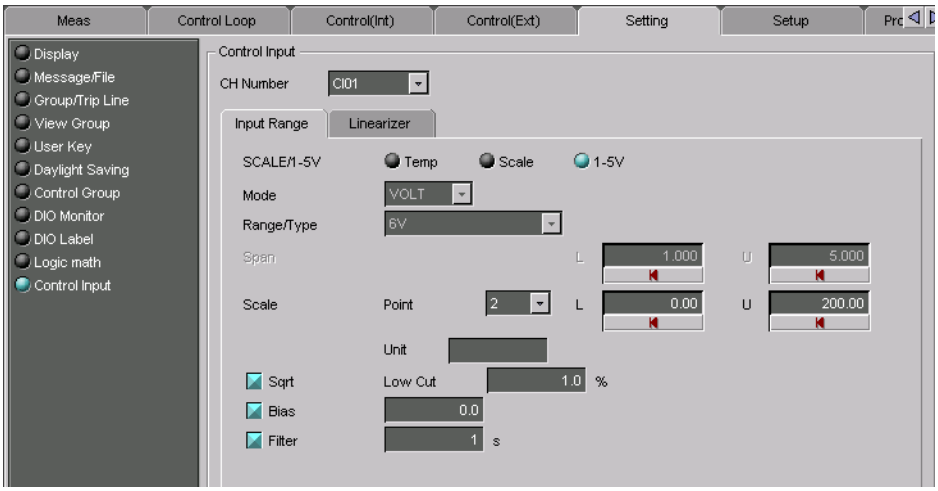
Equation
Input an equation. Click the Operator button to display the operators that can be entered.

Constants
You can specify the constants used in equations.
Constants are common with PV/SP computation and analog retransmission constants.

Control Input Channel (CX Style Number S3 or Later)

When the PV/SP computation function is ON, you can set the input range and ten segment linearizer output for each channel.

[Input Range] tab



SCALE/1-5V
Select a channel measurement mode from [Temp], [Scale], or [1-5V].

Mode
Select a channel input mode of [VOLT], [TC], or [RTD]. When [SCALE/1-5V] is set to [1-5V], the mode is fixed to [VOLT].

Range/Type
Select the voltage range, thermocouple, and resistive temperature detector type.

- VOLT: 20mV, 60mV, 200mV, 2V, 6V, 20V, or 50V
- TC: TypeK, TypeJ, TypeT, TypeB, TypeS, TypeR, TypeN, TypeE, TypeL, TypeU, TypeW, PLATINEL, PR40-20, or WRe3-25
- RTD: JPt100 or Pt100

When [SCALE/1-5V] is set to [1-5V], [Range/Type] is fixed to [6V].

Span
Specify the measurement span such that the upper limit is greater than the lower limit.

Scale
Specify the scale for each loop between -30000 and 30000, such that upper limit > lower limit, and upper limit - lower limit ≤ 30000. Only available when [Scale] is selected under [SCALE/1-5V]. For details, refer to the CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E).

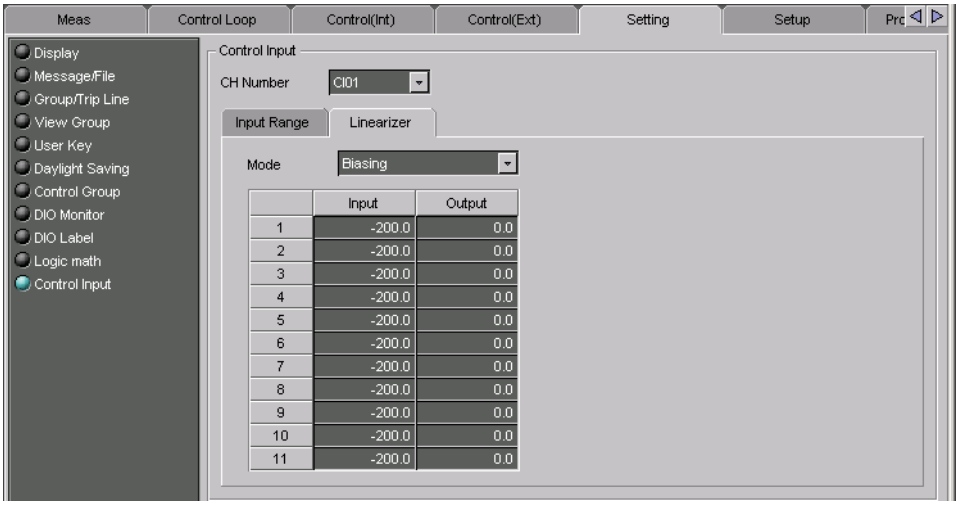
Unit
Specify the units for each loop.
Use a maximum of 6 alphanumeric characters.

Sqrt
Select or clear the check box to turn the square root function ON or OFF.
When it is ON, set [Low Cut] between 0.0% and 5.0%.

Bias (PV1, Remote)
Select the check box to turn the bias ON/OFF.
When it is ON, enter the setting for EUS (-100 to 100%) of the measurement span.

Filter (PV1, Remote)
Select the check box to turn the filter, ON/OFF.
When it is ON, set between 1s and 120s.

[Linearizer] tab



Mode
Select the linearize mode from [OFF], [Biasing], or [Approximation].

Input
Enter the linearize input value. (The value depends on the linearize mode.)
Biasing: Set with measurement input span EU (–5.0 to 105.0%).
Approximation: Set with measurement input span EU (–5.0 to 105.0%).
Set between 2 and 11 points.

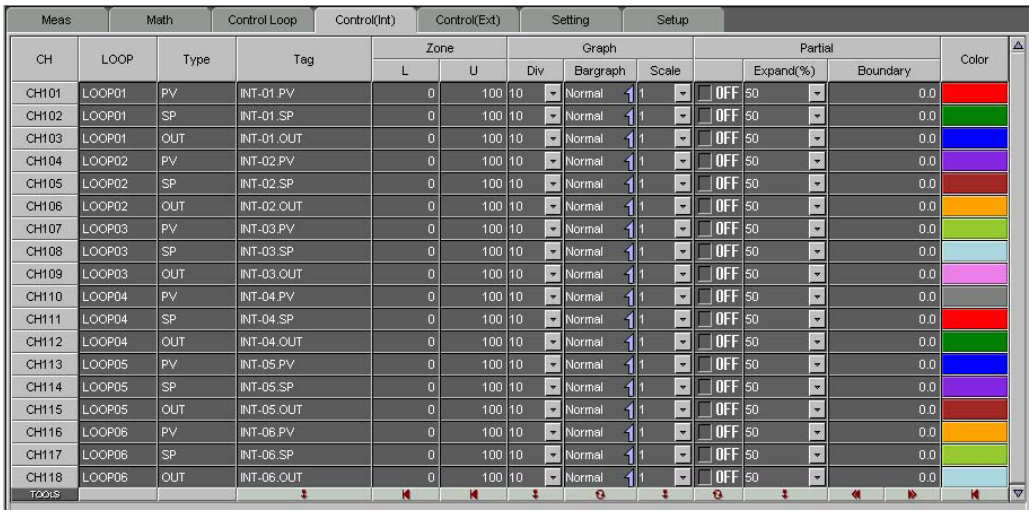
Output
Enter the linearize output value. (The value depends on the linearize mode.)
Biasing: Set with measurement input span EUS (–100.0 to 100.0%).
Approximation: Set with measurement input span EU (–5.0 to 105.0%).

Note

- With linearize bias, set so that input + output is EU (0-100%). Also, set so that linearizer input + linearizer output is greater than or equal to the previous linearizer input + linearizer output.
- Set so that linearizer approximation output is more than the previous value.
- Starting from the third point, if you set a value smaller than the previous value, all settings after that point become disabled.
- When the PV/SP computation function is OFF, the above settings are entered for each loop item on the Setting tab. See page 7-25 for the setting method.

5.5 Control Channel Settings (Internal/External)

The following settings apply to the internal and external loop's SP, PV, and OUT displays. To enter control channel settings, click the [Control(Int)] tab. Or, you can select the items by choosing [Control Setting] - [SET [Basic] Setting] - [Control Channels (Internal)].



Tag

Enter a tag using maximum of 16 alphanumeric characters.

You can select tags instead of channel numbers to be displayed on the screen. Select whether the channel name or tag is displayed in the [Setup] tab under [Aux] > [Tag/Channel]. By selecting [Tag] in [Aux] of the [Setup] tab, you can select the tag No./tag comment or tag in the Data Monitor or Data Viewer.

Zone

You can select the range on the CX's screen where each channel waveform is displayed. Set the lower and upper limits as percentages on the scale displayed.

The zone setting conditions are as follows:

- Setting range: 0 to 100%
  Lower limit < Upper limit
- Difference between upper and lower limits: at least 5%

Graph

Div

Select the number of bar graph divisions from 4 to 12, or C10.

When selecting C10 , the scale of the trend display is divided into 10 or some other number of major divisions, numbered at the [0], [30], [50], [70], and [100]% marks.

Bar graph

Select the bar graph reference point. When the bar graph is displayed vertically, [Center] is invalid, even if selected. During the data check it is changed back to [Normal].

Scale

When the scale is displayed in the trend display, select the scale display position.

For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Partial

Expand(%)

The boundary value is displayed as a percentage along the width of the display, between 1 and 99%.

Boundary

The setting conditions depend on the internal control channel and external control channel as follows:

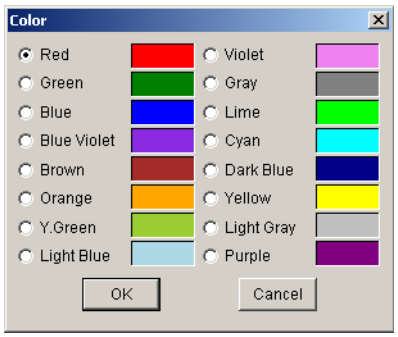
- Internal control channel
  PV /SP: EU (0%) < boundary value < EU (100%)
  OUT: EU (-5.0%) < boundary value < EU (105.0%)
  However, with OUT for analog retransmission, minimum value of span < boundary value < maximum value of span.
- External control channel
  span L + 1 digit < boundary value < span U - 1 digit
  However, when external loop is OFF, the partial expansion/reduction is also OFF.

Note

- The partial expansion/reduction settings are valid when [Partial] is set to [Use] in [Aux] of the [Setup] tab.
- For the external control channel, set a boundary within the span determined by the internal span -50–1050 and the specified decimal point. Normally there is one decimal place, so it can be set to -5.0% < boundary < 105.0%.

Color

Click in the display color setting field to display a color selection dialog box.
You can select the display color of each channel from 16 colors.

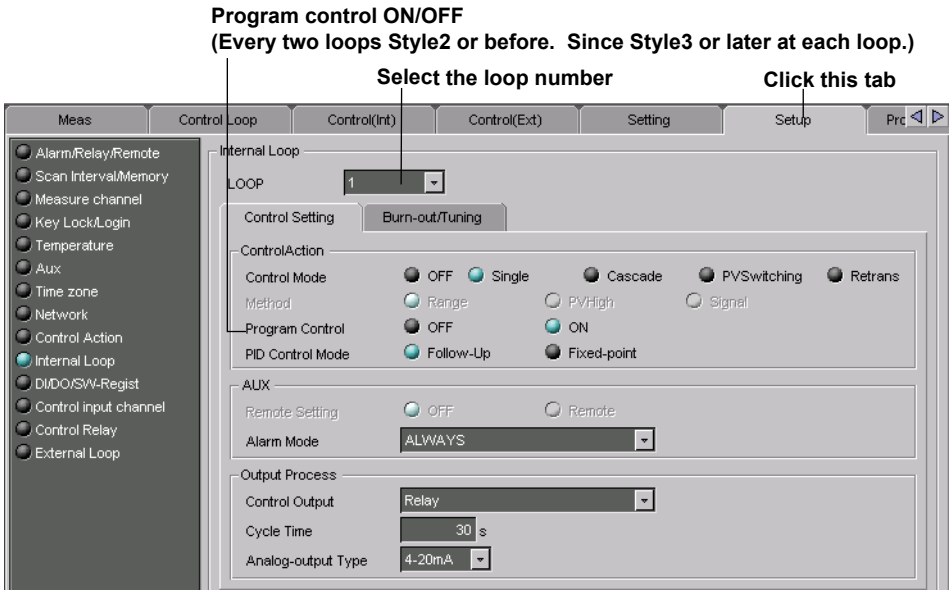


5.6 Program Control Related Setup Operations

This section describes optional program control related operations.

Turn ON/OFF Program Control

Program control can be turned ON and OFF under Internal Loop in the Setup tab. Click the Setup tab then select Internal Loop from the list that appears on the left of the screen. Or, you can select the items by choosing Control Settings > Setup Basic Setting > Internal Loop.

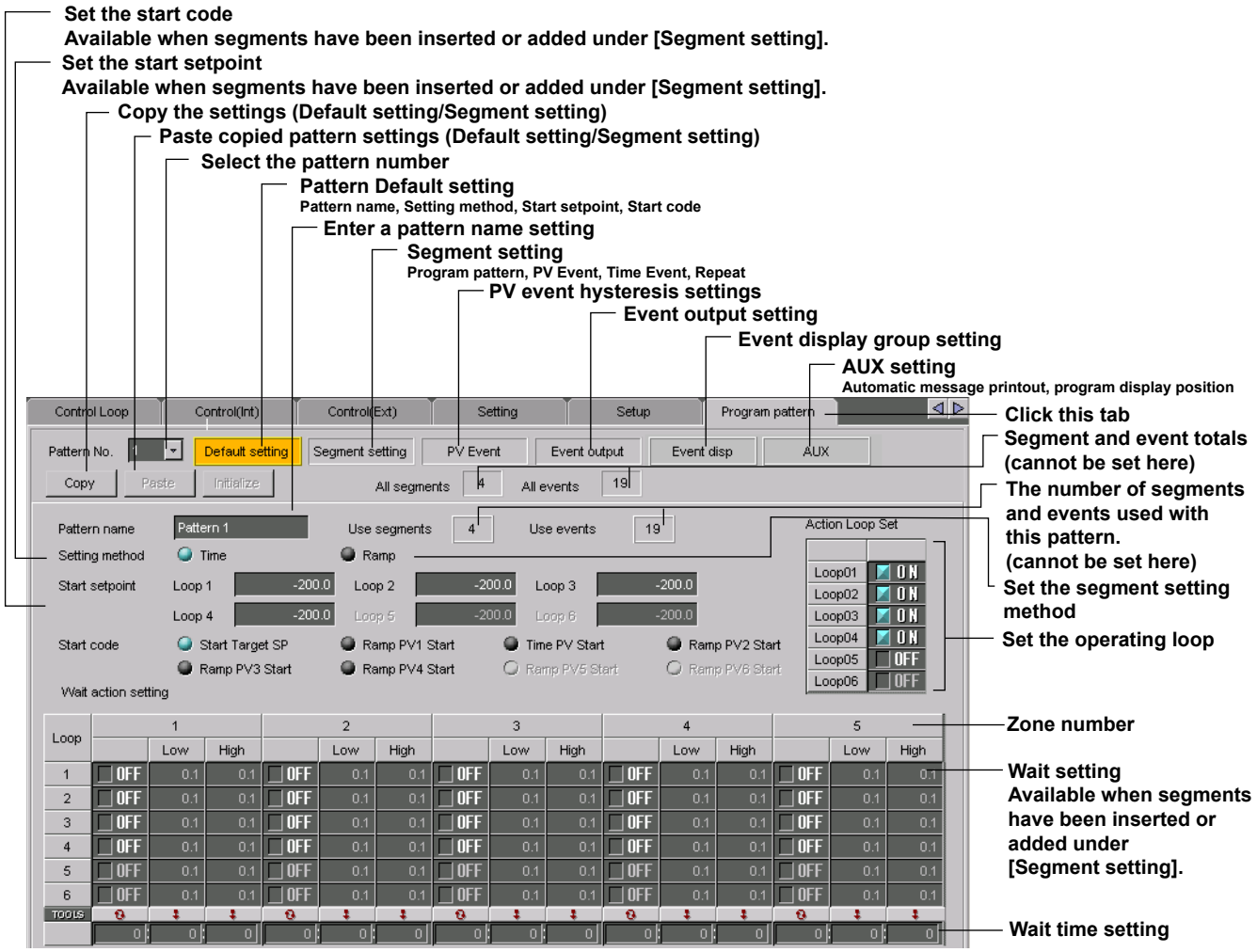


Note

You must first turn ON program control to carry out the program control related settings below.

Initial Program Patterns

You can set the initial program patterns. You can set the initial (default) program patterns by clicking the [Program pattern] tab, then selecting [Default setting]. Settings cannot be entered when the number of segments is 0. Add segments using [Segment setting].



Pattern number

Select the number of the desired pattern from [1] to [30] ([1] to [4] for models with /PG1 option).

Pattern name

Enter the pattern name using up to 16 alphanumeric characters.

Segment setting method

Select segment time setting method or segment time ramp grade setting method. If you change this setting, the program pattern setting corresponding to the pattern number is initialized.

Start target setpoint

Set the start SP, a starting condition, in the range of [EU (0.0% to 100.0%)] (initial value is 0%) of the measurement span. For style 3 or later, the PV event hysteresis setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. Only the loops that are set as follows are displayed: [Setup] tab > [Internal Loop] > [Program control] to [On]. During cascade control, even-numbered loops within the same terminal block are not displayed.

Start code

Select the operation start condition from the following. Note that only the possible loop conditions are displayed.
Starting target setpoint start, PV1 to PV 6 ramp-prioritized PV start, time-prioritized ramp start (not displayed for segment time ramp setting method).

Wait action setting

Set the wait zones for 6 (number of loops) × 5 (number of zones) (CX1000: 2 (number of loops) × 5 (number of zones))in the range of [EUS (0.0 to 100.0%)] of the measurement span. For style 3 or later, the wait action setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered.

Wait time

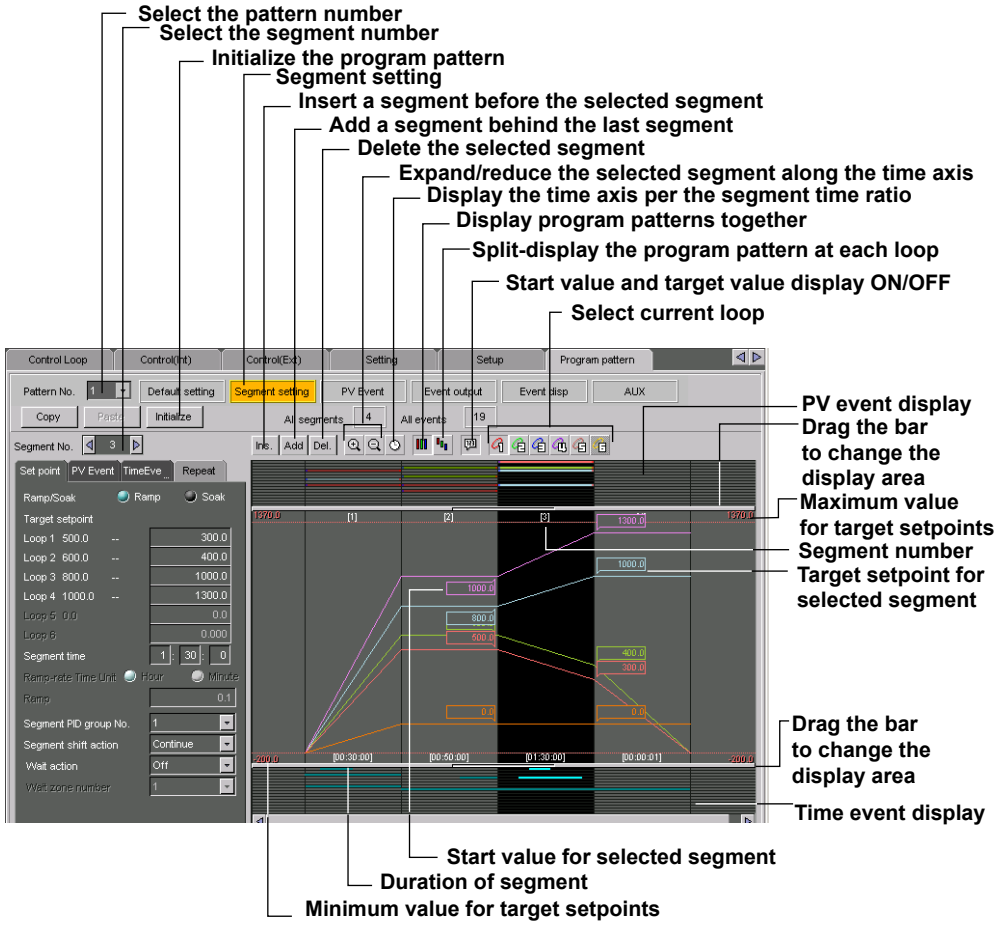
Set the wait time in [hh:mm:ss] format (selectable range: [00:00:00] to [99:59:59]) for all the available zones. The setting applies to the same zones in each loop. Wait time cannot be set if the wait zone for all loops is set to OFF.

Operating Loop Designation

Set the loops to operate.
Select from loops whose program control is ON.

Program Pattern Setting (Segment setting)

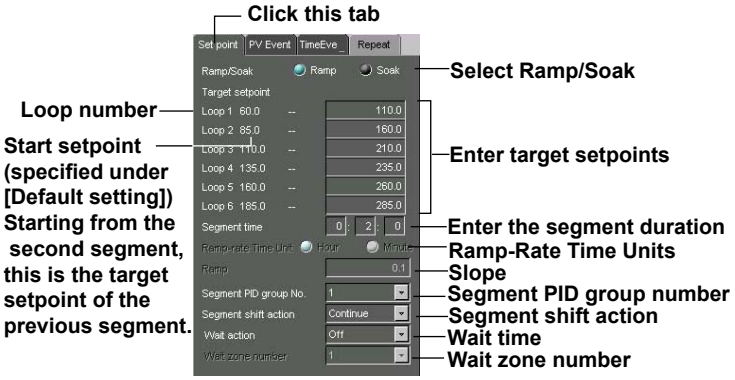
You can enter a program pattern for each segment. Set the program patterns by clicking the [Program pattern] tab, then selecting [Segment settings].



Select the Segment

Click the [Segment No.] arrow or click the desired segment in the program pattern display screen.

Select Setpoints Enter a program pattern for each segment.



Note

The program pattern waveform displayed on screen is not strictly accurate.

- Ramp/Soak select
  Select the type of segment to be specified ([Ramp] or [Soak]).
- Target setpoint (ramp segment only)
  Set the final SP of the ramp segment in the range of “EU (0.0% to 100.0%)” (initial value is 0%) of the measurement span. For style 3 or later, the target setpoint setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. Only the loops that are set as follows are available: [Setup] tab> [Internal Loop] > [Control mode] to a mode other than [Off] and [Program control] to [On] During cascade control, even-numbered loops within the same terminal block are not displayed.
- Segment time
  Set the segment time in the range of [0:00:01] to [99:59:59] (0 hour 0 min 1 s to 99 hour 59 min 59 s). This item is available at all times during segment time setting method and only when soak is selected during segment time ramp setting method.
- Ramp-rate time unit
  Set the ramp-rate time unit for ramps to [Hour] or [Minute]. This item is available only during segment time setting method.
- Ramp
  Set the ramp per unit time in the range of “1 digit to EUS (100%) of the measurement span.” The measurement span and decimal point position of the selectable range vary depending on the smallest numbered loop to be specified. This item is available only during ramp in the segment time ramp setting method.
- Segment PID group No.
  Select the segment PID group number [1] to [8]. This item is not displayed when zone PID is selected. Only the PID group numbers that can be specified through [Setup] tab > [Control action] > [PID number] are displayed.

- Segment shift action
  Set the segment shifting action to [Continue], [Hold] (hold after end of segment), [Local] (local mode after completing the last segment), or [Reset] (reset mode after completing the last segment).

Note

When creating the program pattern, data is created so that the segment set to [Local] or [Reset] is the last segment of program control.

- Wait action
  Set the wait action type to [Shift] or [Within]. To disable the wait action, select [Off].
- Wait zone number
  Select the wait zone number from [1] to [5]. This item is available only when [Wait action] is set to [Shift] or [Within].

PV Event

Set the PV Event.

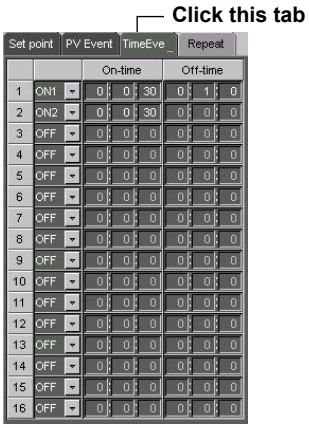
- Loop
  Set the target loop number [1] to [6] of the PV event (only selectable loop numbers). Up to 16 events can be assigned. Select [Off] (initial setting) for the number of the loops to which the event is not to be assigned.
- Type
  Select the type of PV event from the following.
  PV high-limit, PV low-limit, deviation high-limit, deviation low-limit, deviation high & low limit, deviation within high & low limits, SP high-limit, SP low-limit , output high-limit , and output low-limit
- Value
  Set the value in the following range according to the type of PV event.
  PV/SP event: EU (0.0 to 100.0%) of the measurement span
  Deviation high-limit event/low-limit event: EUS (–100.0 to 100.0%) of the measurement span
  Deviation high & low limit/within high & low limits: EUS (0.0 to 100.0%) of the measurement span
  Output event: –5.0% to 105.0% of output

PV event display

A bar showing that the PV event was set is displayed in the upper part of the program pattern display screen.

Time Event

Set the Time Event.



- On1/On2/On3/Off
  Set the ON/OFF setting type of each event (16 events) from the following. Select [Off] for events that are not to be assigned.
  On1: Use On time and Off time
  On2: Use On time only
  On3: Use Off time only

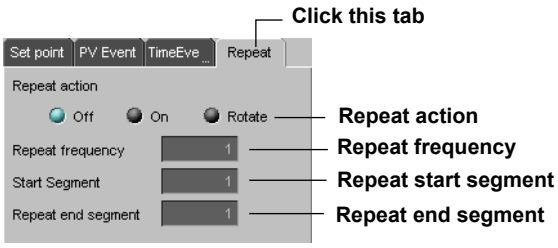
- On-time/Off-time
  Set the ON-time/OFF-time of the time event in “hh:mm:ss” format. The selectable range is “00:00:00 to 99:59:59.” Make sure that Set On-time ≤ Off-time.

Time event display

At the bottom of the program pattern display screen, a bar showing setting of time events is displayed according to the specified ON and OFF times.
If time events overlap with those of other segments, or in other such cases, the specified time event may not occur. For details, see the CX1000/CX2000 User’s Manual (IM04L31A01-01E or IM04L31A01-03E).

Repeat

Set the repeat action.
The repeat start segment, repeat end segment, and repeat frequency is displayed in the program display screen.



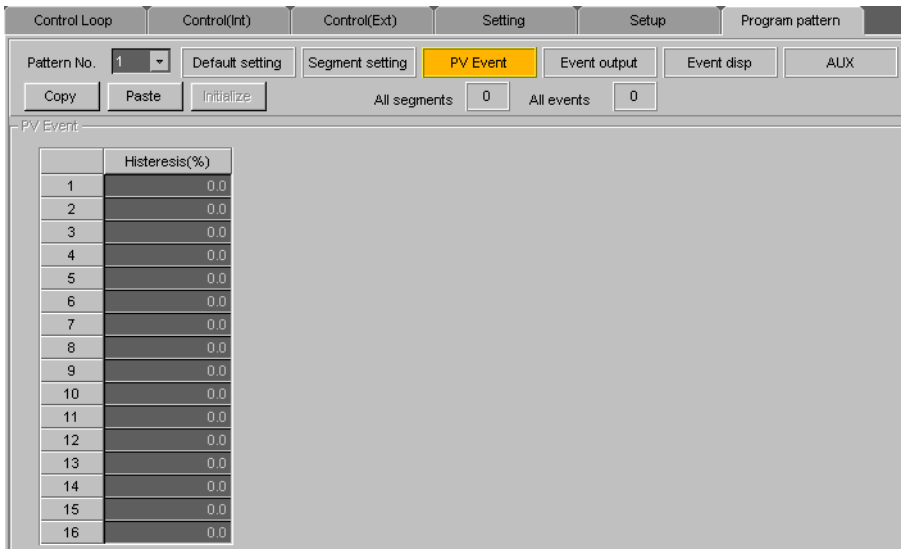
- Repeat action
  Select the repeat function from [Off], [On], and [Repeat].

- Repeat frequency
  Set the number of repetitions when the repeat function is turned ON in the range of [1] to [999].

- Repeat start segment/Repeat end segment
  Set the repeat start segment number and the repeat end segment number when the repeat function is turned ON or when repeating in the range of “1 to 99.” However, the maximum value is the maximum segment number set for the pattern. The selectable range for the maximum value is
  Set repeat start segment ≤ repeat end segment.

PV Event (CX Style Number S3 or Later)

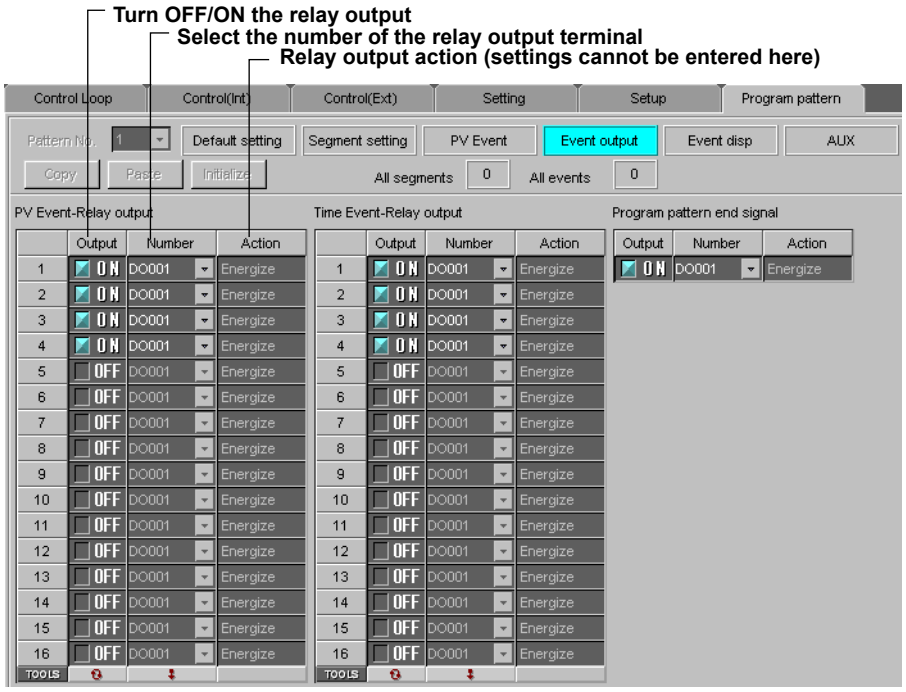
The selectable range for the maximum value is 0.0 to 10.0.



With Style2 or earlier, set in the setting menu of the [Setting] tab.

Event Output Setting (PV event-relay output/Time event-relay output/Program pattern end signal)

You can set the PV event relay output, time event relay output, program pattern end signal, and displayed groups.



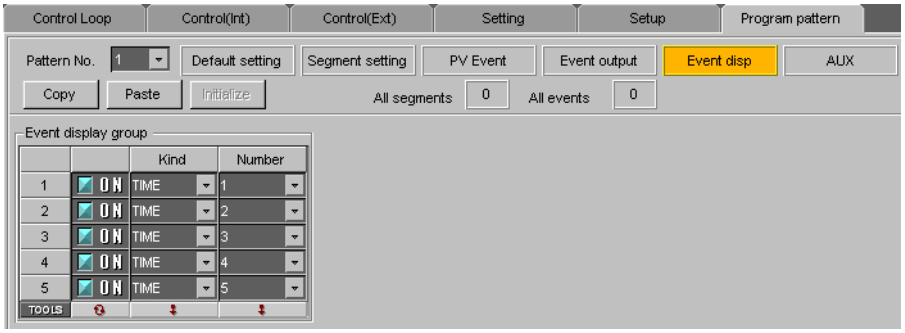
PV Event-Relay output/Time Event-Relay output/Program pattern end signal

Relay Output
Turn OFF/ON the relay output.

Number
Select the number of the relay output terminal from the following.
DO001 to 006, DO101 to 106, DO201 to 206, RO001 to 012 only (on models with the expansion DIO terminal block), SW001 to SW036 (internal switches, Style3 or later).

Action
Displays the relay output action (Energized/De-Energize) per the [Control Relay] settings on the [Setup] tab.

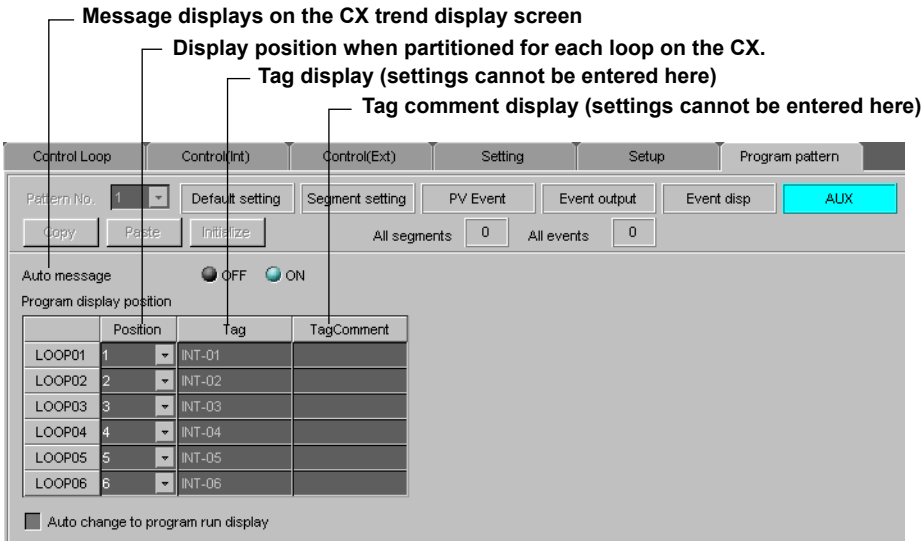
Event Display Group



You can select events for when groups are displayed in the CX program selection screen or program operation screen. Up to 5 events can be specified.
ON/OFF
Turns the display ON or OFF.
Kind
Select either time event or PV event.
Number
Set the event number.

AUX (Automatic Message, Display Position, Operation Display Automatic Switching)

Turn message display ON/OFF, and set the loop display position on the CX.



Auto message

If you select [On] (initial setting), a message is automatically written on the trend display when program control is started and when program control is stopped. If you do not wish to write messages, select [Off]. The message when starting program operation is "PROGRAM RUN"; the message when stopping the program operation is "PROGRAM RESET."

Position

On the program selection screen and program operation screen, the specified patterns and PV waveforms can be displayed in the same display frame (full display), and data can be displayed by dividing the display position per loop (split display). When using split display, select the display position number from [1] to [6] for each loop. For Style 3 or later, the position setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, only settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. During cascade control, even-numbered loops within the same terminal block are not available.

Operation Display Automatic Switching (Style Number S3 or Later)

When a program execution command is sent via the communication function, you can have it switch to the program operation display.

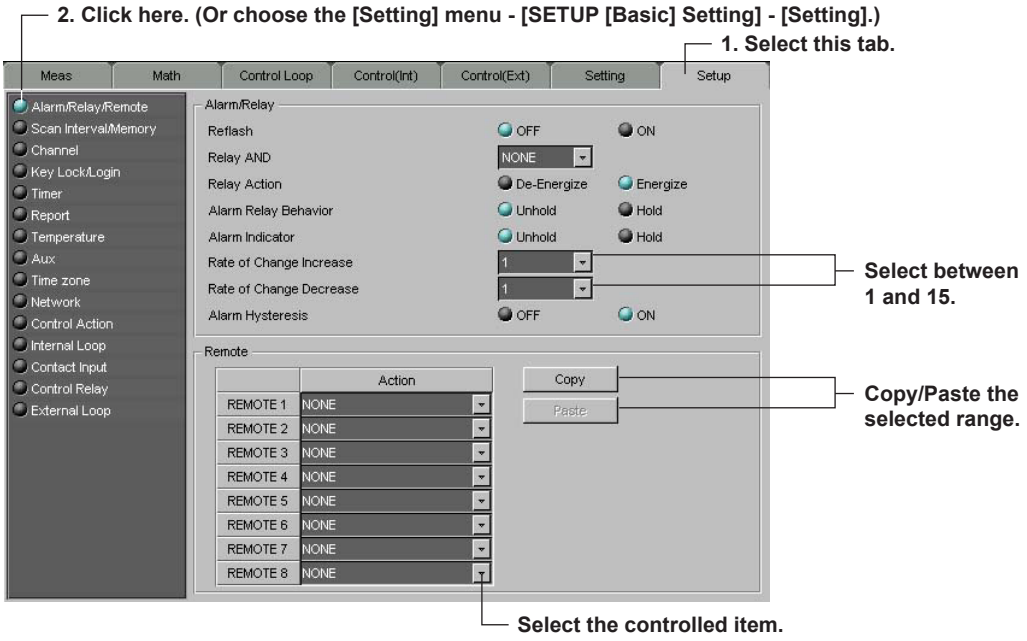
ON: Switches to the program operation display when a program execution command is sent.

OFF: Does not switch to the program operation display (default) even if a program execution command is sent.

5.7 Measurement Function Basic Settings

To enter measurement function basic settings, click the [Setup] tab. Or, you can select the items by choosing [Setting] - [SETUP [Basic] Setting] - [Setting].

Alarm/Relay/Remote



Alarm/Relay

Select the alarm format. The selected items are blue.

Reflash

Set whether to use the alarm relay output reflash (ON or OFF).

Relay AND

Set the range of relays (from the first alarm relay) using the AND logic gate. All other relays are set to the OR logic gate. If [NONE] is selected, all relays use the OR logic gate.

Relay Action

Select whether the alarm output relay should be [Energize] or [De-Energize] when an alarm occurs.

Alarm Relay Behavior

Select the output relay when returning from an alarm to the normal state of operation (when the alarm is released). This applies to all alarm output relays. If the measuring alarm output option is not active, this setting is invalid.

Unhold (Default): When the alarm is released, the output relay stays off.

Hold: The output relay stays on until an Alarm ACK operation is performed.

Alarm Indicator

Select the alarm indicator when returning from an alarm to the normal state of operation.

Unhold (Default): The alarm display ends when the alarm is released.

Hold: The alarm display stays on until an Alarm ACK operation performed.

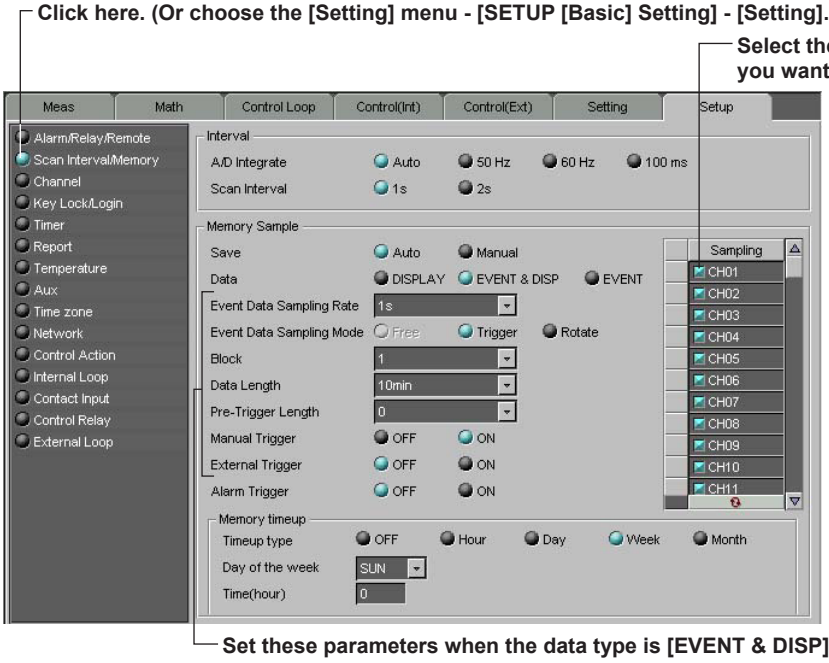
Rate of Change Increase
Select the number of data samples that determines the interval of the rate of change of an upper limit alarm between [1] and [15].

Rate of Change Decrease
Select the number of data samples that determines the interval of the rate of change of a lower limit alarm between [1] and [15].

Alarm Hysteresis
Set the alarm hysteresis to [ON] or [OFF]. When it is [ON], the hysteresis is set to 0.5% of the scale or the measurement span.

Remote (Option)
You can assign items to be controlled by the eight remote control terminals. This setting is available with the measurement remote input function. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.
Select a remote number, and then click the [Copy] button. This copies the setting of that remote number. When you want to paste the copied setting, select the remote number where you want to paste the setting, and then click the [Paste] button.

Scan Interval/Memory



A/D Integrate
Select from [Auto], [50 Hz], [60 Hz], and [100 ms]. The [Auto] setting automatically detects the CX power supply frequency, and switches the integration time.

Scan Interval
Select [1s] or [2s].

Memory Sample (save method of measured/computed data)

Save

Select the save method of internal memory data to an external storage media from [Auto] or [Manual].

Manual: Inserting the external storage media into the drive and closing the cover displays a “save confirm” message, from which you can save data. When the operation is complete, remove the external storage media from the drive, so that the next set of data save operation can be performed. You can select whether to save all of the data from internal memory or only to update the data still not saved to an external storage media.

Auto: If an external storage media is always in the drive, data is saved automatically at a preset interval.

Data

Select the data to be written to internal memory from the following: [DISPLAY] (displayed data only), [EVENT & DISP] (event data and displayed data), or [EVENT] (event data only).

Event Data Sampling Rate

Select the interval at which event data is saved from the following: [1s], [2s], [5s], [10s], [30s], [60s], [120s], [300s], or [600s].

Event Data Sampling Mode

Select [Free], [Trigger] or [Rotate].

Block

When the data type is [EVENT&DISP], select 1, 2, or 4.
When the data type is [EVENT], select 1, 2, 4, 8, or 16.

Data Length

Set the interval corresponding to the amount of data (data length) that can be written as a block of the event data storage region. The data length that can be set depends on the event data sampling rate. It also depends on the block setting and number of Meas and Math channels, and number of loops (internal loop and external loops).

Pre-Trigger Length

If 0% is selected, the event file entirely consists of data after the trigger. If 100% is selected, the event file entirely consists of data before the trigger.

Manual Trigger

To activate triggers with keys, select [ON].

External Trigger

When applying trigger signals by remote input, select [ON].

Alarm Trigger

When applying alarms as triggers, select [ON].

Sampling

Select the channels to be saved to the memory.

Memory Timeup

When [Save] is set to [Auto] under [Memory Sample], specify the date and time of the save operation.

Timeup type

Select the timing of saving from [OFF], [Hour], [Day], [Week], or [Month]. When you are not using this function, select [OFF].

Day of the week/Date

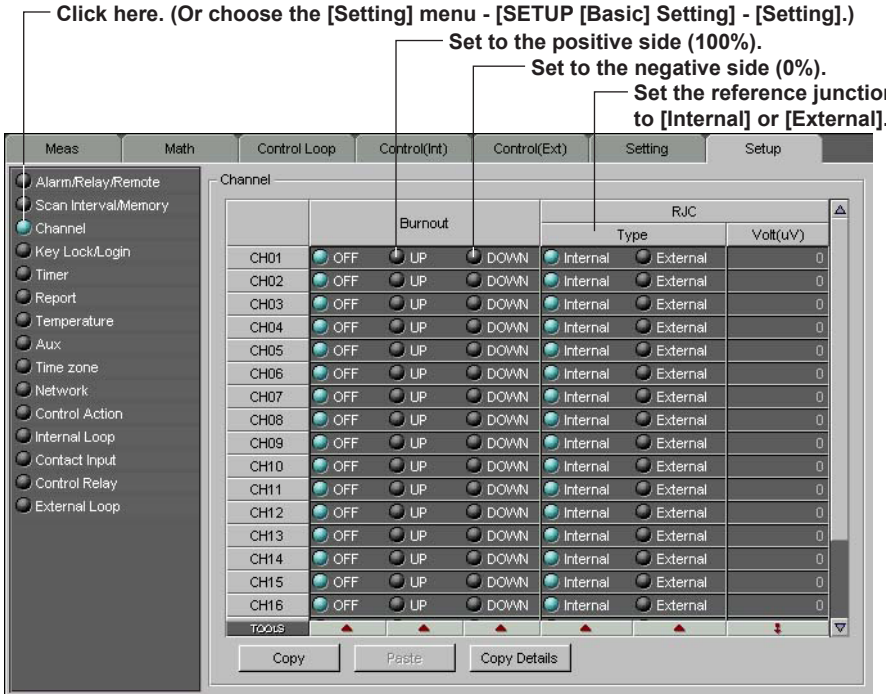
When [Timeup type] is [Week], select a day.

When [Timeup type] is [Month], specify the date, between 1 and 28. It is not possible to specify dates 29 to 31.

Time (hour)

When [Day], [Week], or [Month] is selected as [Timeup type], specify the time of the save operation. When [Timeup type] is [Hour], this setting is invalid. Specify between [00] and [23].

Channel (Setting the Burnout and RJC)



Burnout

Set the burnout operation. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

RJC Volt (uV)

This is the reference junction compensation setting for thermocouple inputs. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Note

"Channel" settings cannot be entered on 0 measurement channel models. The Channel command does not appear in the menu.

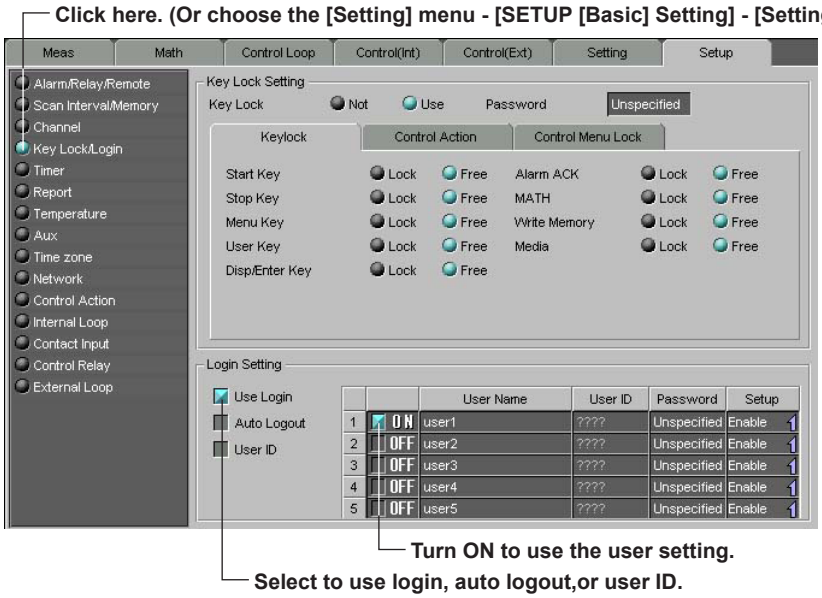
Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom left of the window.
3. Click the destination channel number. To select many channels, click the first destination channel, then drag over all the channels where you want to paste.
4. Click the [Paste] button.

You can also copy and paste specific channel items.
After selecting the copy source in step 1, click the [Copy Details] button to display the [Setup Channel Copy Details] dialog box.
Select the items that you want to copy.

Key Lock/Login



Key Lock Setting

Key Lock

When using the key lock function, select whether or not to activate the key lock function (lock or free). For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Password

Enter the password used to release the key lock using up to six characters. [???] is displayed after the password is entered.

Login Setting

Use Login

To use the login, auto-logout, or user ID, select the appropriate items.

Auto Logout

Selected: If idle for ten minutes, logs out automatically.
Clear: Requires the logout procedure to log out.

User ID
Specify whether to use a user ID when logging in. User ID entry is enabled when the check box is selected.

User Setting List

User name
Use up to 16 alphanumeric characters for the user name.

User ID
Up to 4 alphanumeric characters can be entered for the User ID. [???] is displayed after the item is entered.

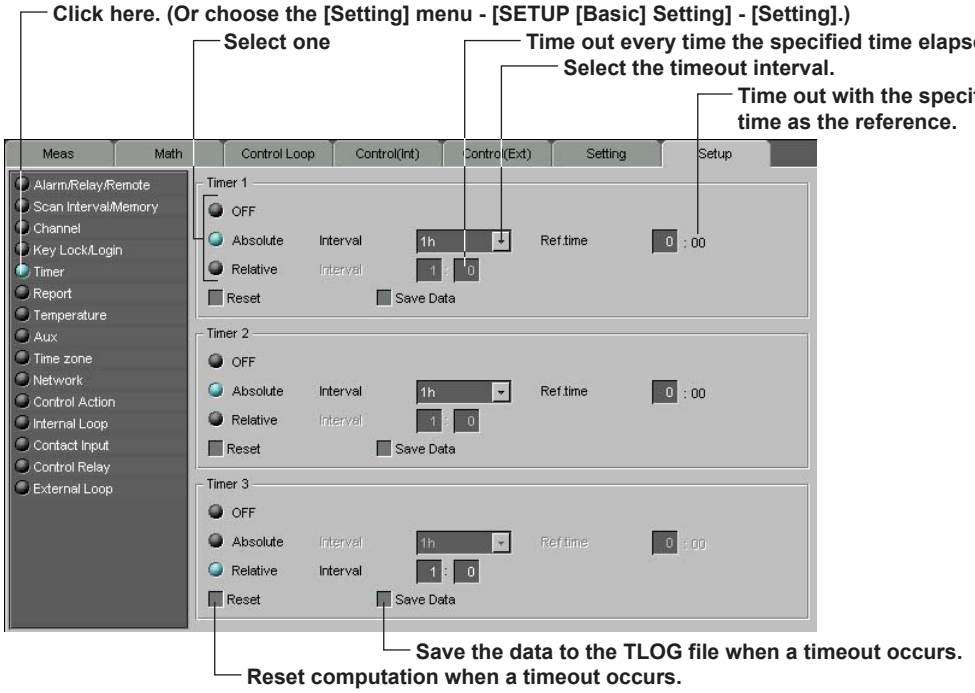
Password
Up to 6 alphanumeric characters can be entered for the password. [???] is displayed after the item is entered.

Setup
Select whether to allow setting changes in the setup mode for the user.

Note

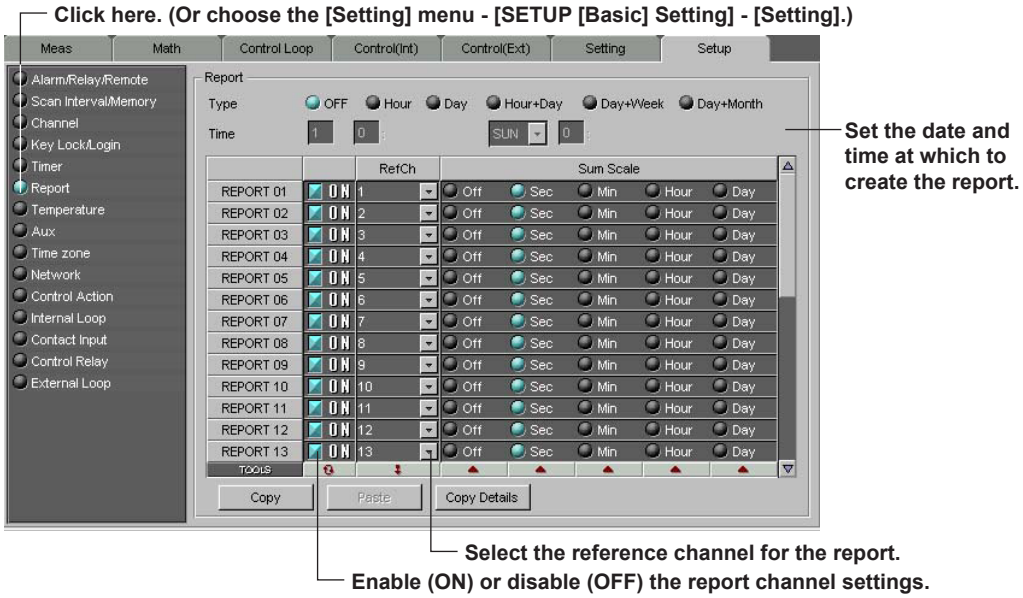
- If there is a duplicate [User Name] turned ON, the user with the larger user number is turned OFF.
- If [Setup] of all users that are turned ON is set to [Disable], the [Setup] of the user with the smallest number is set to [Enable].

Timer (Option)



You can set three types of timers to be used in the statistical computation. You can save the data to a TLOG file or reset the computation when the specified timeout interval elapses. This function is available only if the Computation function is installed.
For details about the types of timers and various settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Report (Creating Hourly/Daily/Weekly/Monthly Reports, Setting Available When the Computation Function Option is Active)



Note

Measurement channels cannot be set for reference channels on 0 measurement channel models.

Type

Specify the report creation time. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Time

Specify the report creation time. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Report Channel

There are 12 report channels for the CX1000 and 30 report channels for the CX2000. The check boxes on the right of the report channels are used to select what report to create. Clear ([OFF]) the reports you do not want to produce.

RefCh

Selects the report reference channel. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Sum Scale

Select whether to convert the results of the TLOG.SUM computation channels to a specified time unitary value. Select [Off], [Sec], [Min], [Hour], [Day]. This function is available only if the Computation function is installed.
For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Copying and Pasting Setup Data

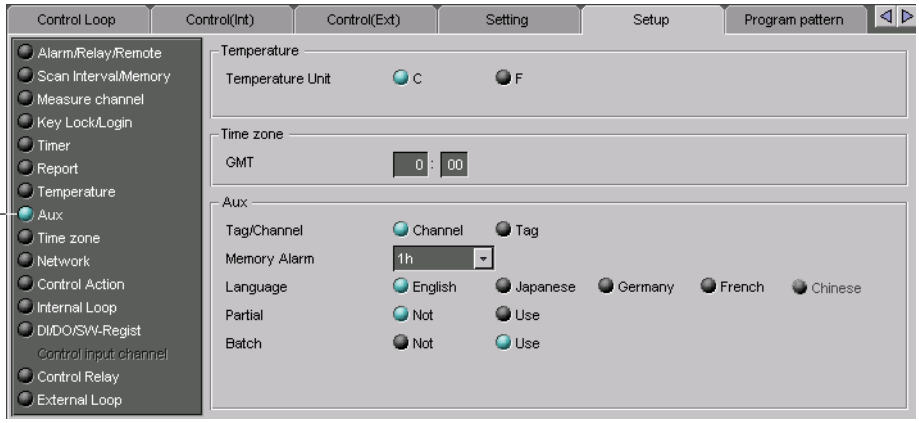
You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the left of the window.
3. Click the destination channel number. To select many channels, click the first destination channel, then drag over all the channels where you want to paste.
4. Click the [Paste] button.

You can also copy and paste specific channel items.
After selecting the copy source in step 1, click the [Copy Details] button to display the [Report Copy Details] dialog box.
Check whether the items you want to copy/paste are selected.

Tag, Memory Alarm Time, Displayed Language, and Partial Expanded Display Settings

Click either one. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)



Tag/Channel

Select whether to use the tag name or channel number as the measurement/computation channel label.
If you select tag name, you can select the label display from tag and channel (see page 5-55).

Memory Alarm

Free internal memory is monitored, and the memory end output can be programmed to activate some period of time before the memory is completely full. This time period is called the *memory alarm time*.

Language

Select the language ([English], [Japanese], [Germany], [French], or [Chinese]) to be used on the CX's display.

Note

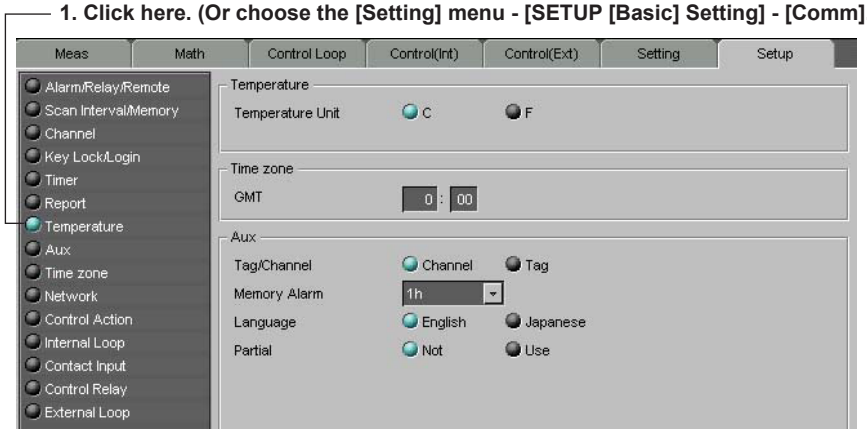
Beware that if you configure the system after receiving setup data from the CX, the received setup data will be initialized. For information on system configuration, refer to section 3.2, "Setting and Checking the System Configuration and Initializing Setup Data."

Partial
If set to [Not], the partial expanded display settings of the [Meas], [Math], and [Control Loop] tabs are void.

Batch (Batch Option, Style3 or later)
Set the information to be added to data written to the CX internal memory.

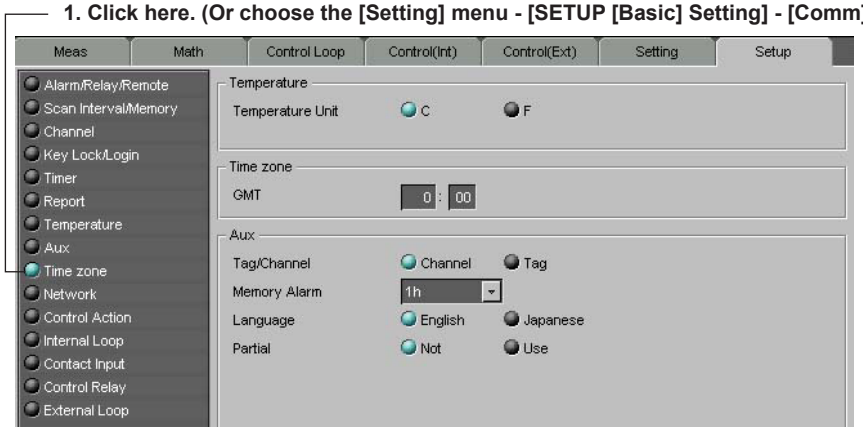
Temperature Unit

Set the temperature unit from [C](Celsius) or [F](Fahrenheit).



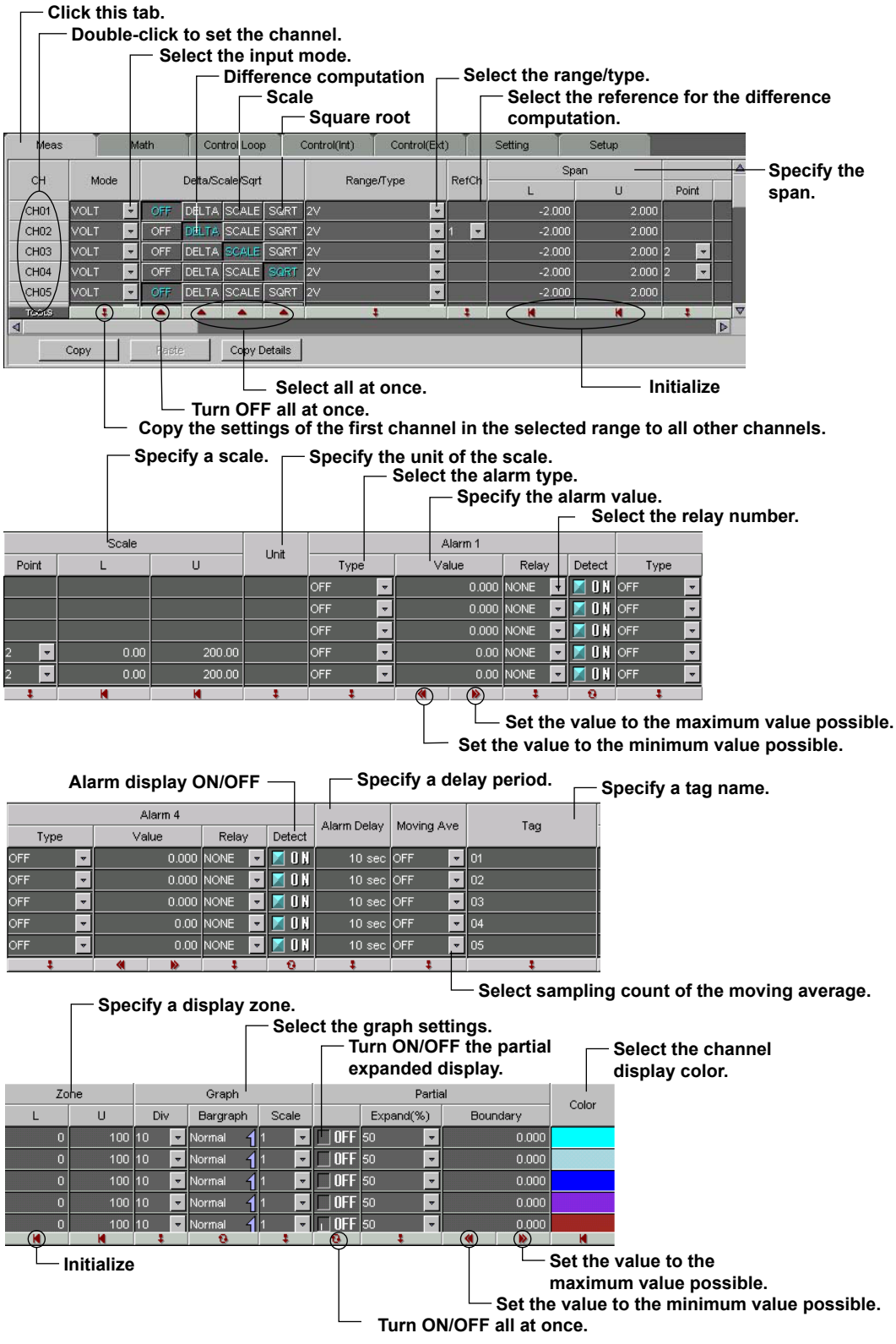
Time Zone

Set the difference in time from the GMT.
For example, with Japanese time this is normally +9:00.



5.8 Measurement Channels Settings

To enter measurement channel settings, click the [Meas] tab. Or, you can select the items by choosing [Setting] - [SET [Regular] Setting] - [Meas Channels]. Measurement channel settings cannot be entered on 0 channel models. The Meas Channels tab and measurement channels on and the setting menu are not shown.



Input Type (Mode and Range/Type)

Select one of the following from the pull-down list.

Mode	Relevant Settings
VOLT (voltage)	Range, span L, and span U
TC (thermocouple)	Type, span L, and span U
RTD (resistance temperature detector)	Type, span L, and span U
DI (voltage level/contact input)	Range, span L, and span U
SKIP (measurement/display OFF)	None

Note

- When a value outside the range is entered or when the span L and span U are set to the same value, they are corrected when the data is checked.
- If SKIP is selected, settings such as Delta/Scale/Sqrt and Range/Type are disabled.

Difference Computation and Reference

Displays the difference between the input and the reference channel.
If difference computation is performed between channels that have different range and type settings, the decimal place of the result is set to that of the channel computing the difference. If the number of decimals of the reference channel is greater than that of the channel computing the difference, the reference value below the least significant digit of the channel the difference is rounded down beforehand.

Square Root

Computes and displays the square root of the input. This setting can be used only when the input mode is set to VOLT. As necessary, set the span, scale, and unit.

Display Span

Sets the upper and lower limits (full scale) of the display.
When the span L and span U are set to the same value or when a value outside the range is entered, they are corrected when the data is checked.

Scale

Scale L, scale U, and Decimal Point

The scale value is displayed by taking the range between scale L and scale U to be the full scale. Enter the upper and lower limits to which you want to convert the raw values. Include the decimal point.
When the scale L and scale U values are set to the same value or when a value outside the range is entered, they are corrected when the data is checked.

Unit

Enter the unit using up to 6 alphanumeric characters.

Alarm

Four alarms (Alarm 1 to 4) can be specified on each channel.

Type

Select H, L, h (dH), l (dL), R (RH), r(RL) T, or t. The selectable alarms vary depending on the input mode and computation type. For details, see section 7.2 of the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Value

Alarm is generated using the specified value as the boundary. The selectable range of alarm values varies depending on the input mode and range.

Relay

Select the output relay number or internal switch number for outputting to relay output or internal switches (Style 3 or later). When not outputting to relays or internal switches, select NONE.

Detect

Select whether to display alarms (ON) or not to display alarms (OFF) when they occur. When turned OFF, they are not retained in the alarm summary.

Alarm Delay

An alarm is generated when the measured value stays above or below the specified value for the specified length of time.

Moving Average

To use the moving average, select the sampling count (2 to 16).

Tag

Use up to 16 alphanumeric characters to specify a tag.
You can select tags instead of channel numbers to be displayed on the screen.
To select whether to display channel names or tag names on the screen, select [AUX] > [Tag/Channel] on the [Setup] tab.
If you select [Tag] in the [Setup] screen, you can select tag No., tag comment, or tag in the Data Monitor or Data Viewer.

Zone

You can select the range of the screen in which the waveform of each channel is displayed.
Specify positions (%) on the display scale for the upper and lower limits.
The conditions for setting the zones are as follows:

- Range: 0% to 100%
  The lower limit must be less than the upper limit
- The difference between the lower and upper limits must be at least 5%.

Graph

Divisions
Select the number of bar graph divisions.

Bar graph
Select the reference position of the bar graph. Selecting [Center] when the bar graph is vertical produces no effect.
It is set back to [Normal] when the data is checked.

Scale
When using scale display on the trend screen, select the scale display position.

Partial

Expand (%)
Set the boundary for the partial expanded display. The range is 1 to 99%.

Boundary
The conditions used to set the boundary vary depending on the measurement and computation channels are as follows:

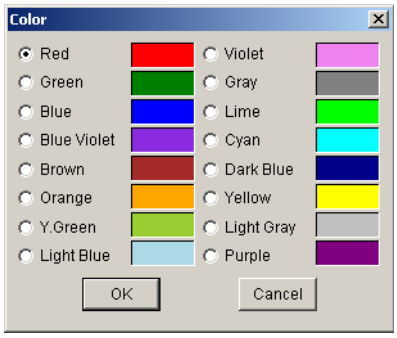
- Measurement channel
  When SCALE and SQRT are not used: Span L < boundary < span U
  When SCALE and SQRT are used: Scale L < boundary < scale U
- Computation channel
  Span L < boundary < span U
  For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Note

The partial expansion settings take effect when the partial expansion function is set to [Use] in the [Aux] section of the [Setup] tab.

Display Color

You can select the display color of each channel from 16 colors.



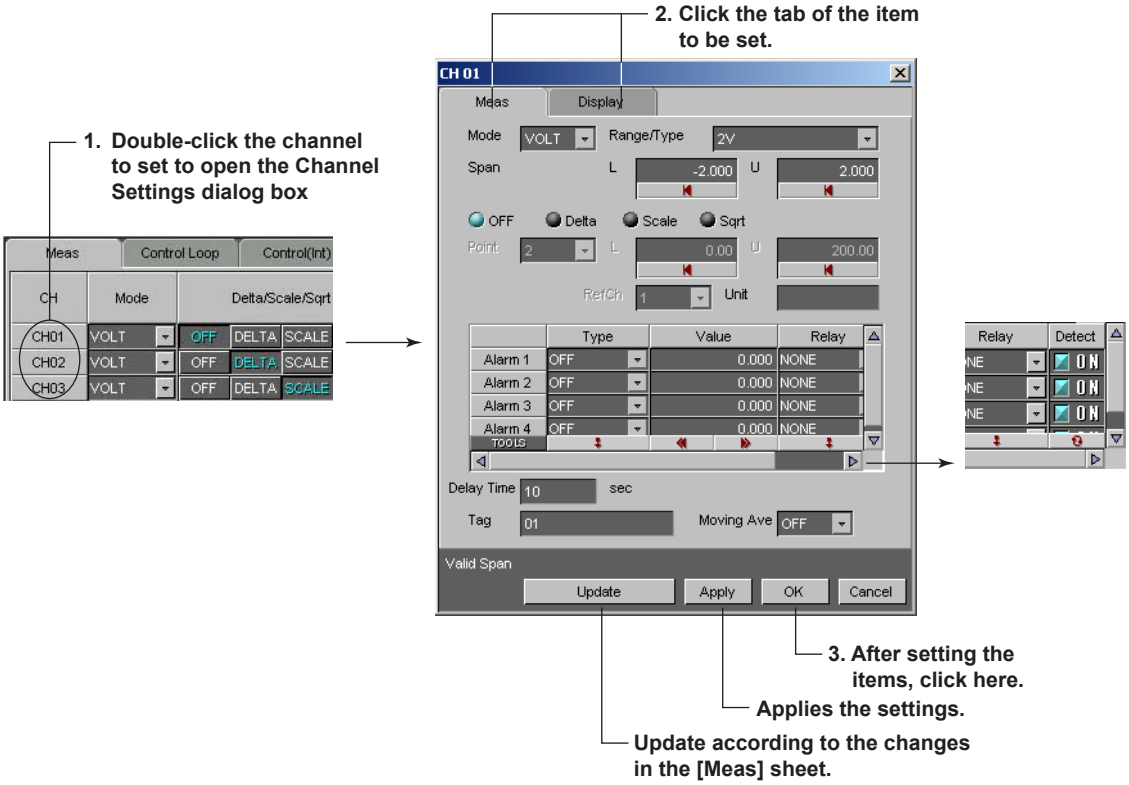
Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom left of the window.
3. Click the destination channel number. To select many channels, click the first destination channel, then drag over all the channels where you want to paste.
4. Click the [Paste] button.

You can also copy and paste specific channel items.
After selecting the copy source in step 1, click the [Copy Details] button to display the [Meas Channel Copy Details] dialog box.
Check whether the items you want to copy/paste are selected.

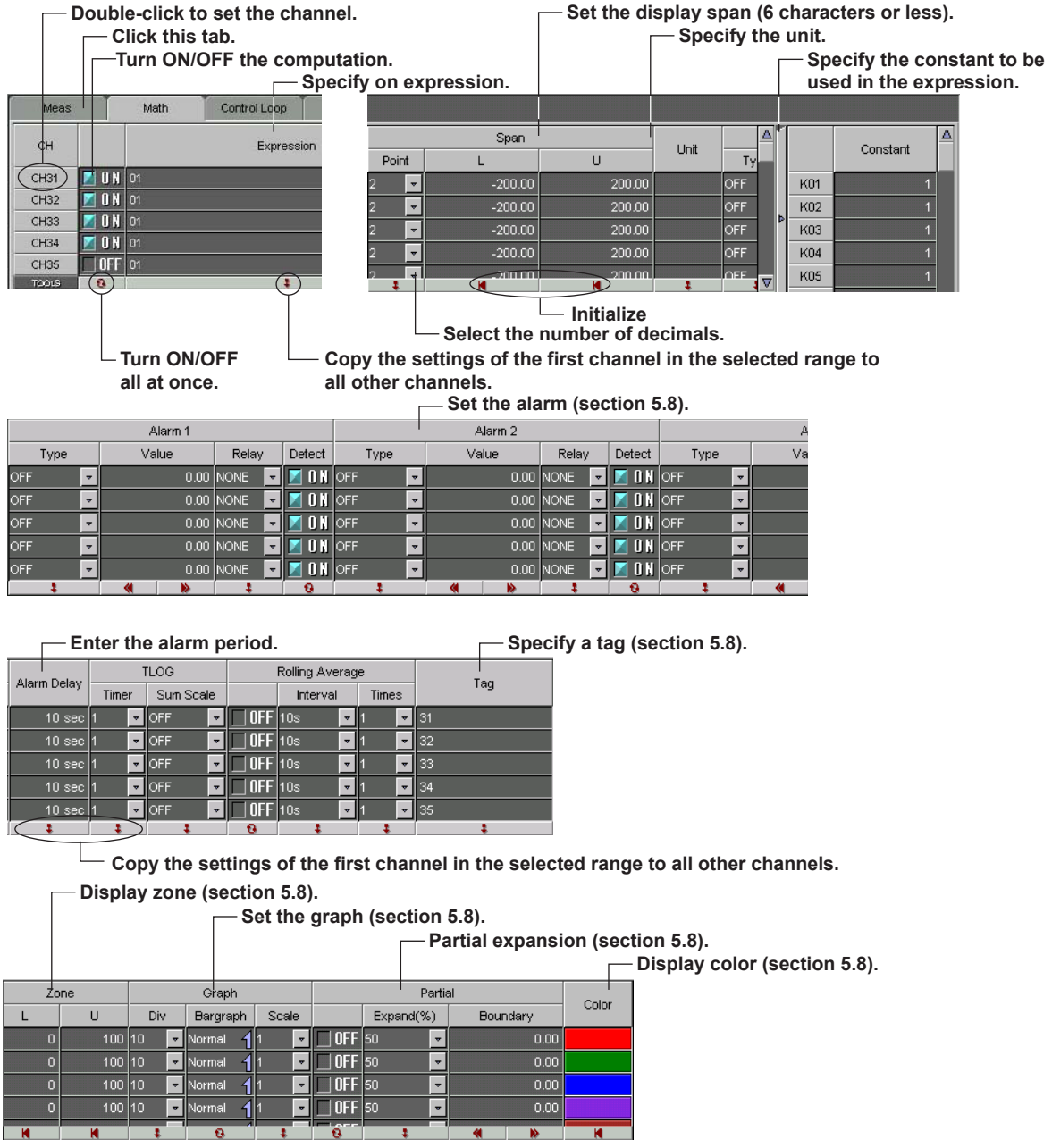
Setting One Channel at a Time



The items of the [Meas] tab can be set for each channel. The items set here are the same as the ones in the [Meas] tab of the Hardware Configurator. For details, see the page corresponding to the item.

5.9 Computation Channel Settings

To enter computation channel settings, click the [Math] tab. Or, you can choose [Setting] - [SET [Regular] Setting] - [Math Functions].



Computation ON/OFF

Select whether to perform computation for each channel.

Expression

Enter an expression using up to 40 characters. For details about expressions, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Expressions cannot be used with measurement channels on 0 measurement channel models.

Display Span

Set the upper and lower limits of the display.
The range is –9999999 to 99999999. Set the number of decimals to four digits or less.

Alarm and Tag

The settings are the same as those of the measurement channels. For details, see section 5.8, “Measurement Channels Settings”.

TLOG Computation

Timer

Select one of the timers (1 to 3) set in the setup mode.
The computation interval of TLOG computation is set to the time assigned to the selected timer.

Sum Scale

Set the sum scale.

Rolling Average

Rolling Average Computation ON/OFF

Select whether to compute the rolling average.

Interval

Select the sampling interval when rolling average is activated.

Times (Number of Samples)

Select the number of samples (number of data points used to compute the rolling average).

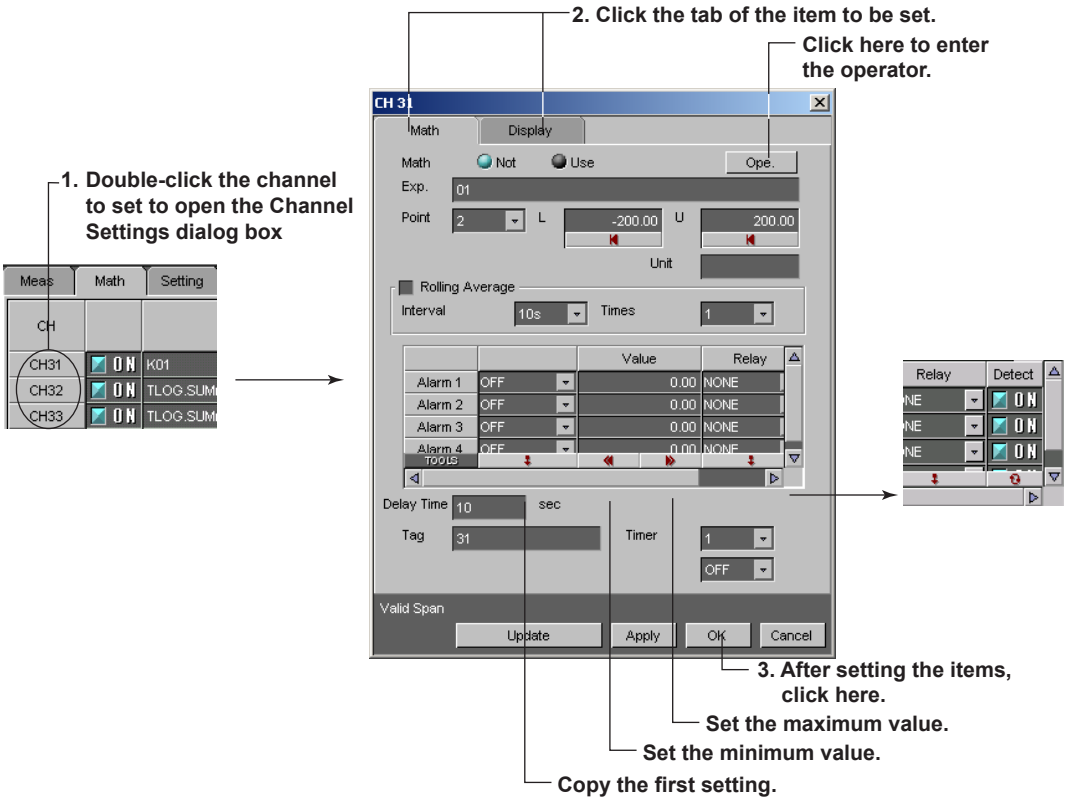
Zone, Graph, Partial, and Color

The setting method is the same as that of the measurement channels. For details, see section 5.8, “Measurement Channels Settings.”

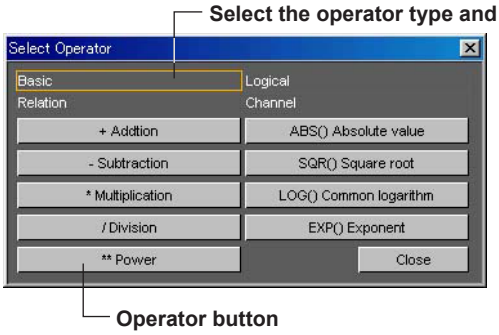
Constants

You can set constants to be used in the expression. Up to 12 constants (CX1000) or up tp 30 constants (CX2000) can be specified.

Setting One Computation Channel at a Time



[Select Operator] dialog box



The items of the [Math] tab can be set for each channel. The items set here are the same as the ones in the [Math] tab of the Hardware Configurator. For details, see the page corresponding to the item.

Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

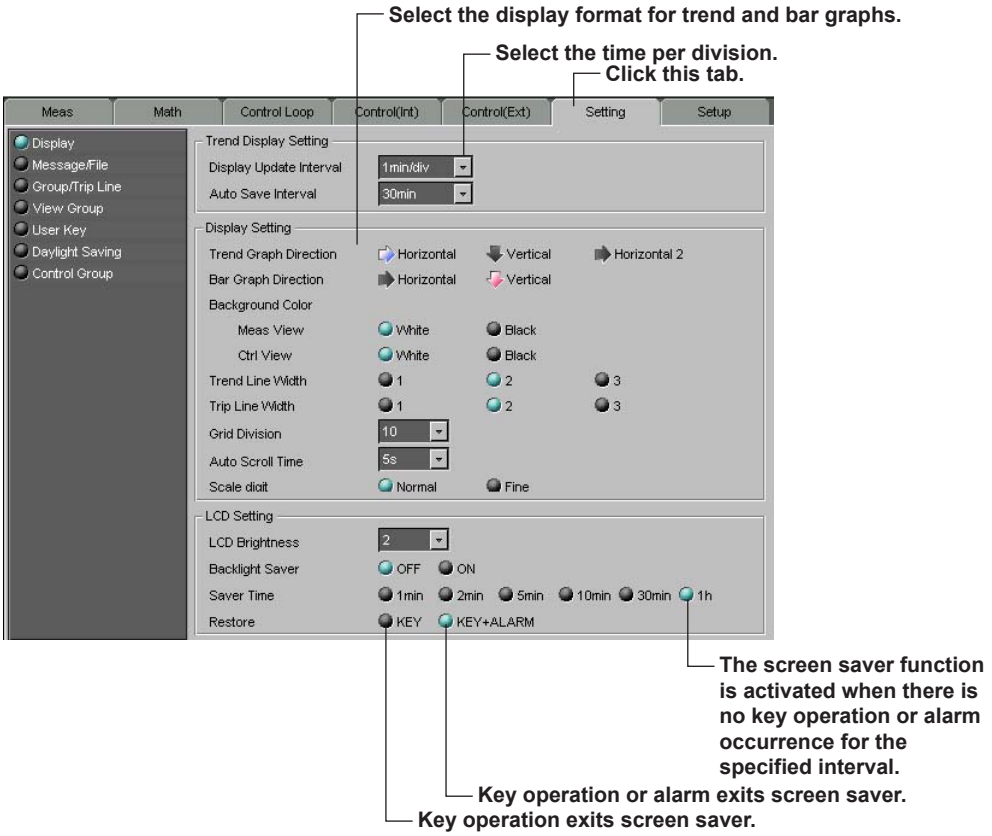
1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom left of the window.
3. Click the destination channel number. To select many channels, click the first destination channel, then drag over all the channels where you want to paste.
4. Click the [Paste] button.

You can also copy and paste specific channel items.
After selecting the copy source in step 1, click the [Copy Details] button to display the [Math Channel Copy Details] dialog box.
Check whether the items you want to copy/paste are selected.

5.10 Display Settings

To enter display settings, click the [Setting] tab. Or, you can select the items by choosing [Setting] - [SET [Regular] Setting] - [Display Setting].

Display



Display Update Interval

You can select the display update interval of the trend display from [1 min/div], [2 min/div], [5 min/div], [10 min/div], [20 min/div], [30 min/div], [1 h/div], [2 h/div], [4 h/div], or [10 h/div] of the time axis.

Auto Save Interval

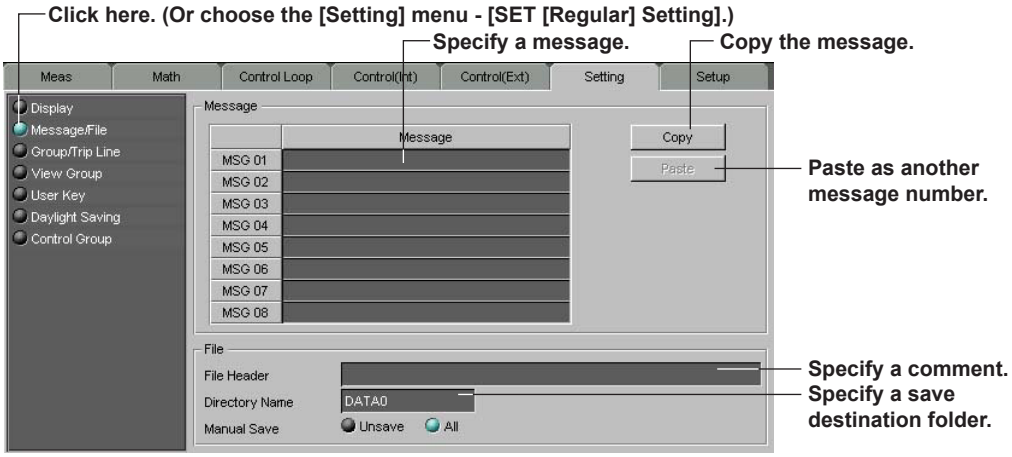
The auto save interval can be specified when the [Save] is set to [Auto] and the data type is set to [DISPLAY] or [EVENT & DISP] in the [Memory Sample] setting of the [Setup] tab.

Auto Scroll Time

This is the time period used to automatically switch the displayed group. Select from [5s], [10s], [20s], [30s], or [1min].

For details about the other settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Message/File



Message
Use up to 16 alphanumeric characters can be entered for the message.

File Header
Add a comment to the header section of the measurement/computation data file.

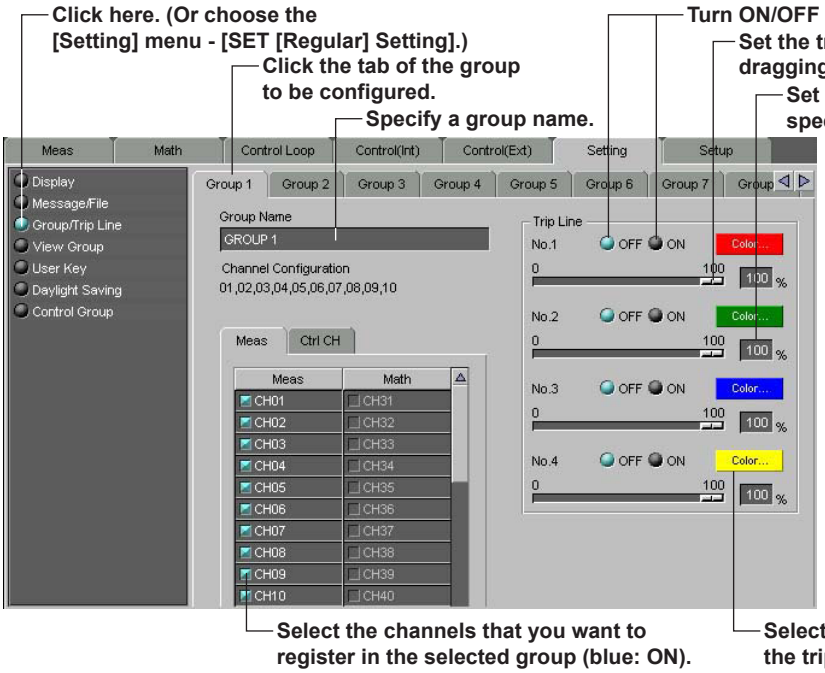
Directory Name
Specify the name of the folder where measurement/computation data files are saved.

Note

- Up to eight characters can be entered for the file header and director, name. AUX, CON, PRN, NUL, and CLOCK cannot be used.
- If the directory name is not specified, DATA0 (default) is automatically set as the directory name.

Manual Save
Select whether to save all the data or data that has not been saved during manual save.

Group/Trip Line



Group Name

Use up to 16 alphanumeric characters can be entered for the group name.

Channel Configuration

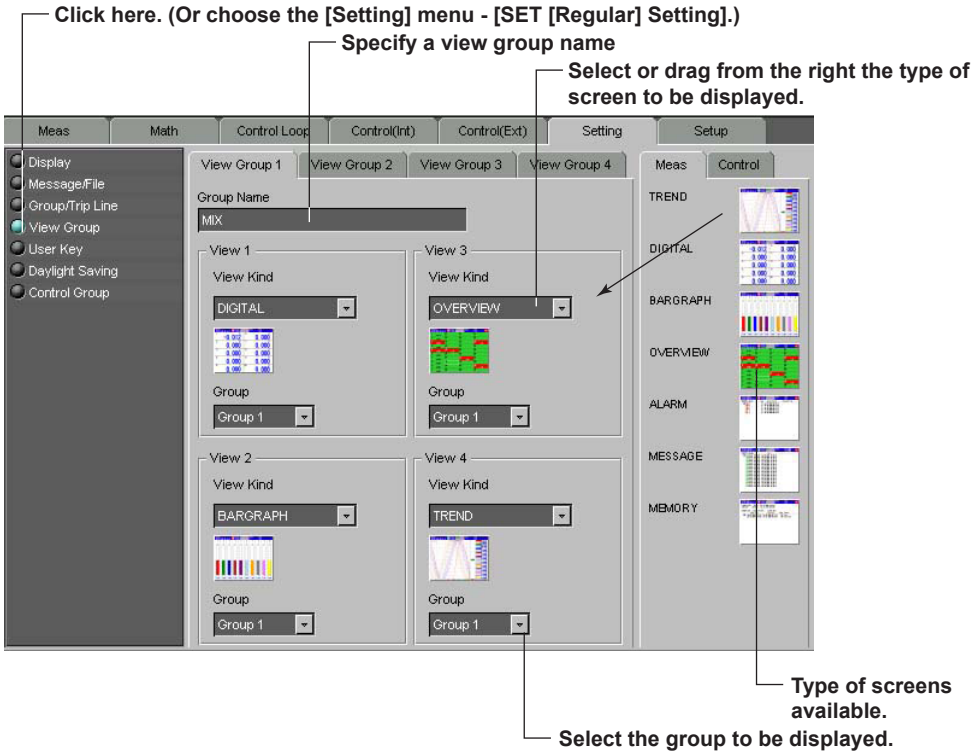
The maximum number of channels that can be assigned to a group is 6 for the CX1000 and 10 for the CX2000. The assigned channels are listed under [Channel Configuration].

Trip Line

Up to four trip lines can be set to one group.

With regard to the trip lines set here, the first and second settings (No.1 and No. 2) refer to the trip lines in Data Monitor and Data Viewer. If you change them here, they also change in Data Monitor and Data Viewer. For details about trip line settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

View Group (CX2000 Only)



View Groups

Up to four view groups can be registered.

Group Name

Use up to 16 alphanumeric characters can be entered for the group name. The group name appears as a submenu of the [4 PANEL] display.

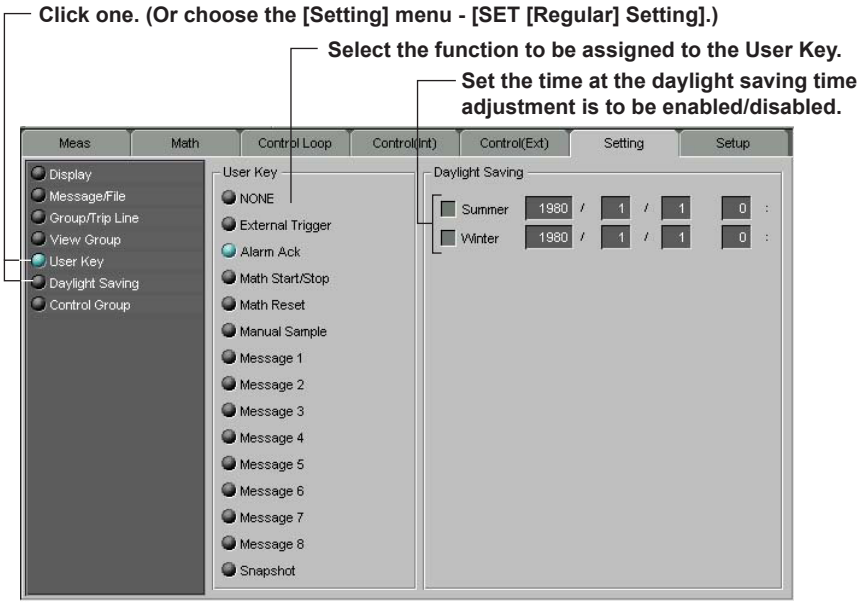
View Kind

The view group consists of four views. Select the type of screen to display in each view. Overview cannot be selected on 0 measurement channel models without the calculation option installed.

Group

The group displayed varies depending on the type of view selected. When selecting measurement screen for the view kind, select the group from the measurement groups (Group 1 to 10). When selecting control screen for the view kind, select the group from the control groups (Group 1 to 8).

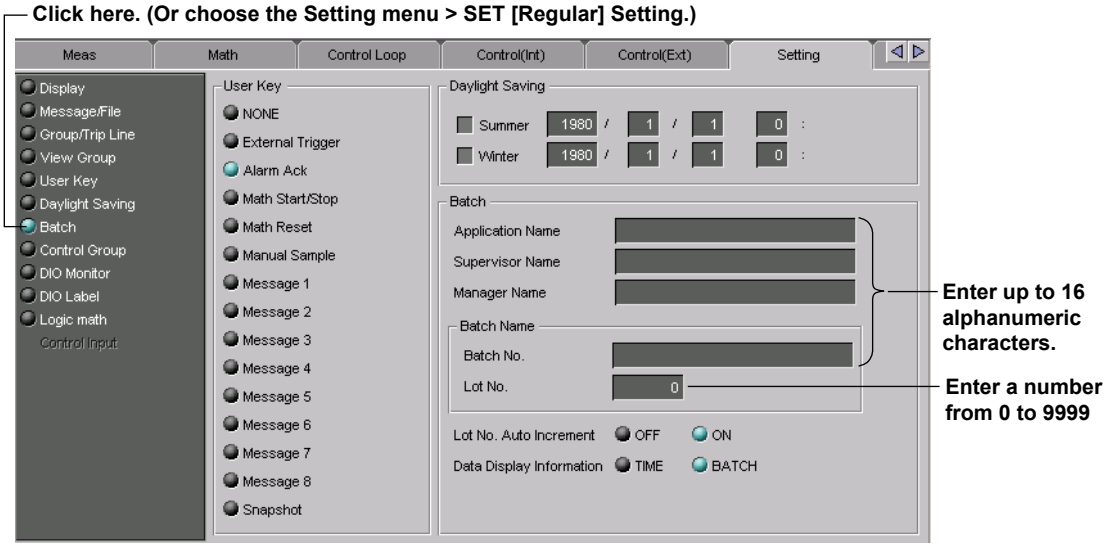
User Key/Daylight Saving



For details about the User Key settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Batch

Enter the header if the option batch headers are active.

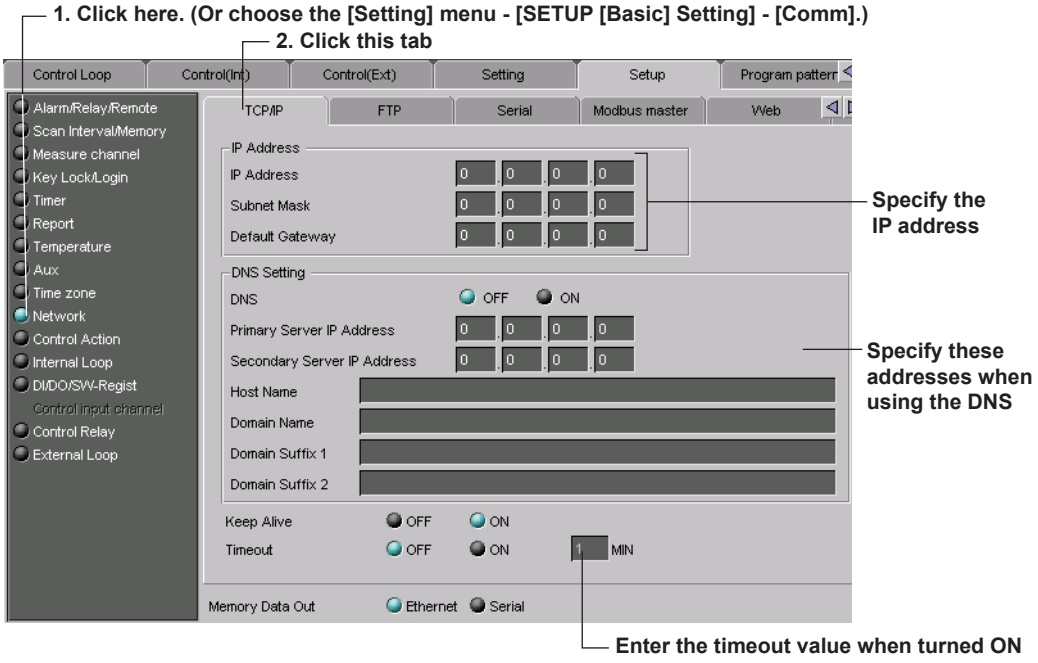


5.11 Network Settings

To enter network settings, click the [Setup] tab, then select [Network] from the list on the left. It is also possible to select the item in [SETUP [Basic] Setting] on the [Setting] menu.

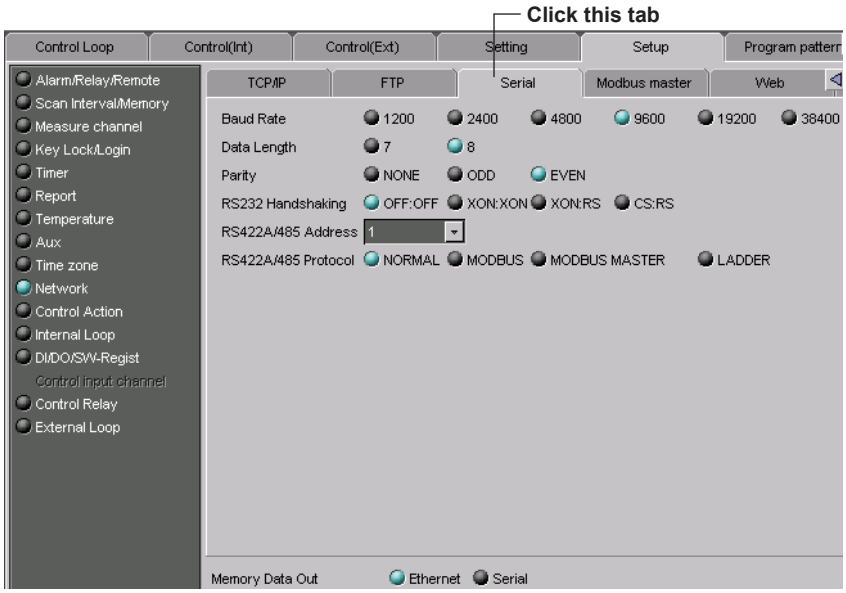
TCP/IP Settings

Connect the CX to the Ethernet and, in the dialog box below, enter TCP/IP settings. Type the same address for [IP Address] as the one of the [Address] box of the [Network Settings] dialog box.



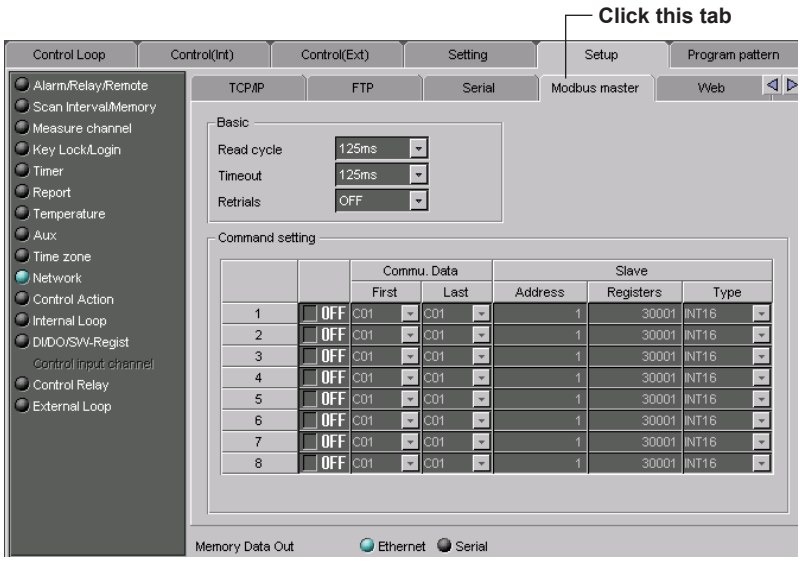
Serial Communication Settings

When using serial communications between the CX and other devices, set the parameters required for serial communications. If [MODBUS MASTER] is selected in the [Protocol] settings, you must click the [Modbus master] tab and enter [Modbus master] settings.



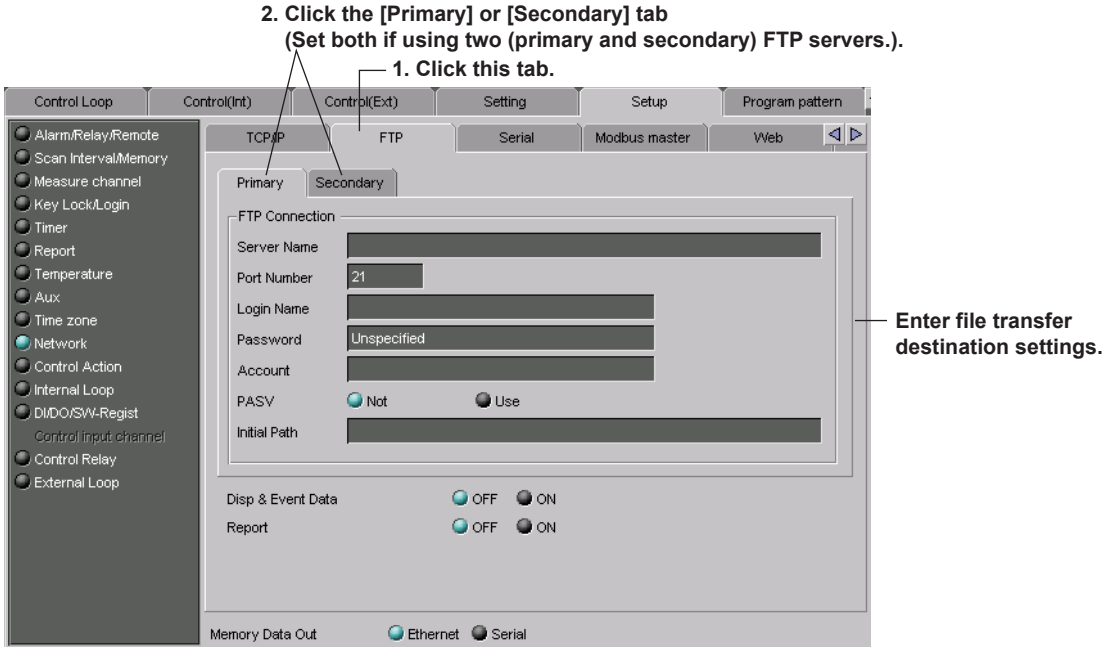
Modbus Master Settings

When using the CX as a Modbus master, enter the Modbus master basic and command settings. For details about the settings, refer to the *CX1000/CX2000 Communication Interface User's Manual (IM 04L31A01-17E)*.



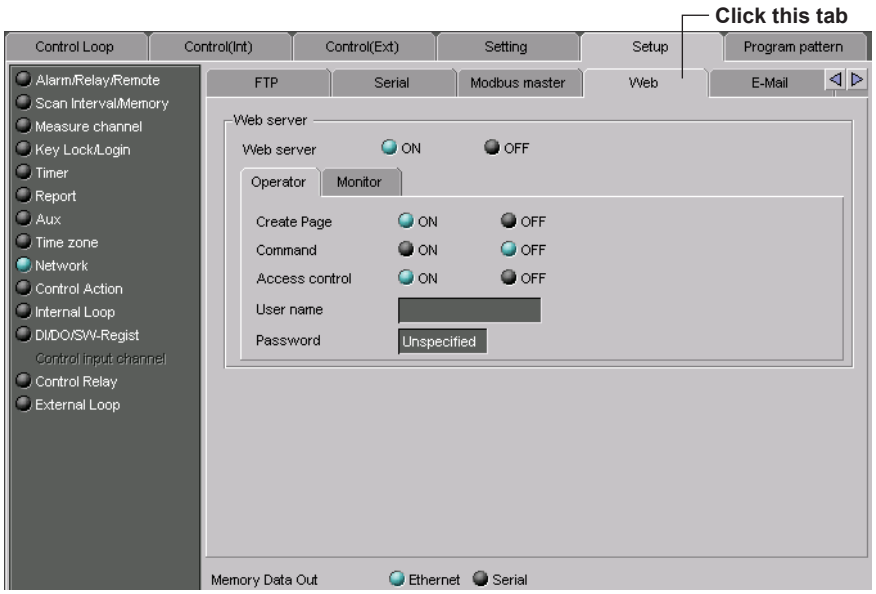
FTP Settings

Using the FTP function, measurement/calculation data can be automatically transferred from the CX to the specified server as files. The FTP function can be used only with Ethernet communications. When using the FTP function, specify the destination server name, port number, and other settings in the dialog box below.



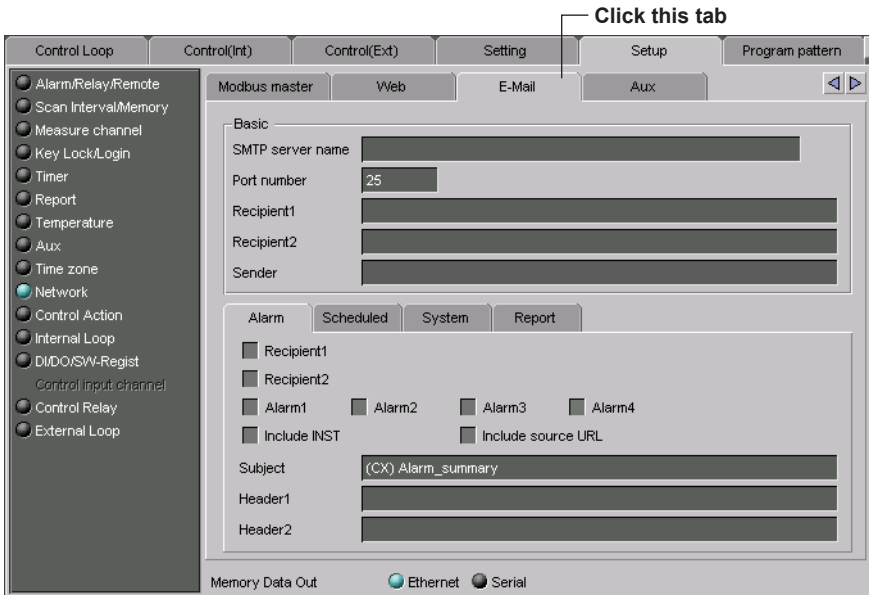
Web Server Settings

When using Ethernet communications, the CX can be set up as a web server. Set Web Server to [ON], and then set the access certification and other settings for the operator page and monitor page.



E-mail Transmission Settings

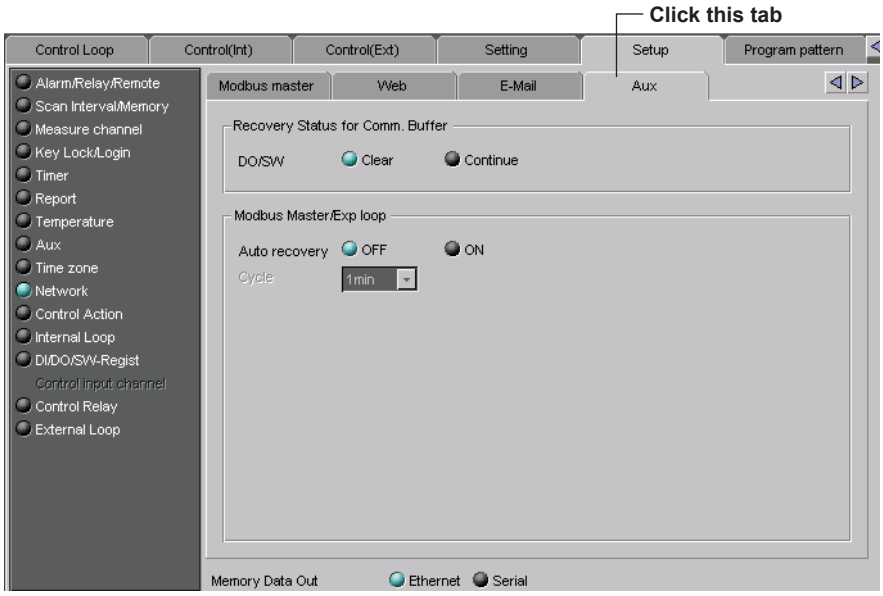
When using e-mail transmission, specify [SMTP server name], [Port number], [Recipient1], and other settings. The e-mail transmission function can be used only with Ethernet communications. For details about the settings, refer to the *CX1000/CX2000 Communication Interface User's Manual (IM 04L31A01-17E)*.



By clicking the [Alarm], [Scheduled], [System], or [Report] tab, you can make settings separately for each type of e-mail message.

Auxiliary Settings

You can set the control output DO when the communication buffer recovers, internal switch status processing, and auto recovery of communication with Modbus master/ temperature controllers valid for serial communications. These settings are available when serial communication is installed.



Recovery Status for Comm. Buffer

You can set the recovery operation for the control output DO/internal switch communication buffer to be performed when the power is turned ON, or when recovering to Operation Mode from Basic Setting Mode. The communication buffer is an internal region for turning the DO/internal switches ON and OFF via communications.

Continue : Holds the status of the control output DO and internal switches
Clear: Clears the status of the control output DO and internal switches

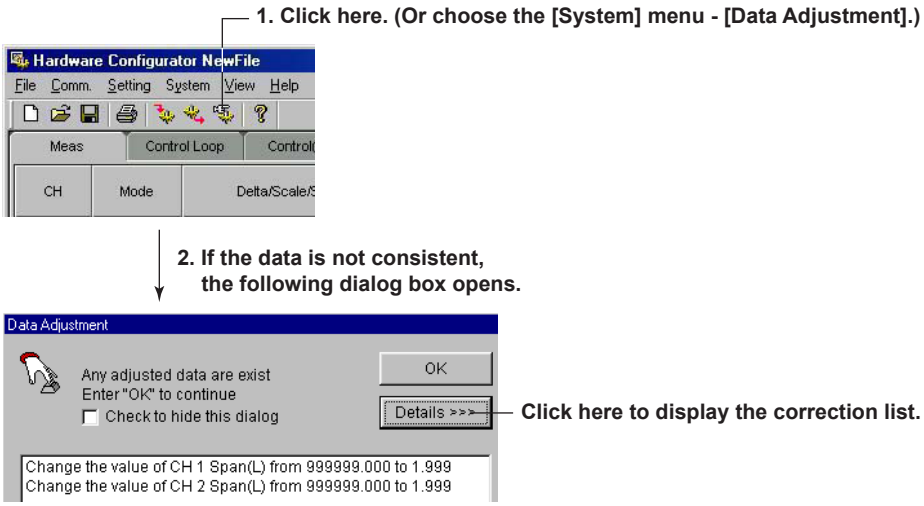
Modbus Master/Exp loop

You can select whether or not to automatically recover communications with modbus mice and temperature meters. If you select automatic recovery, you can also specify the recovery interval. You can select one of the following intervals: 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, or 60 min.

Specifying the Memory Data Out Mode

You can only specify to output memory via Ethernet or serial communications.

5.12 Setup Data Adjustment (Data Check)



Checks whether the specified setup is consistent with the actual system. If not, the data is automatically corrected.
Data is corrected in the following cases:

- In such cases as when values of items of the Meas/Math tab are outside the specified range.
- When an invalid character string is used.

[Data Adjustment] Dialog Box

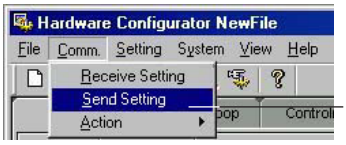
If [Data Adjustment] Dialog on the [View] menu is selected, the [Data Adjutment] dialog box opens whenever data is not consistent when checking or transmitting data.

Note

Perform the data check before sending the new setup data to the CX.

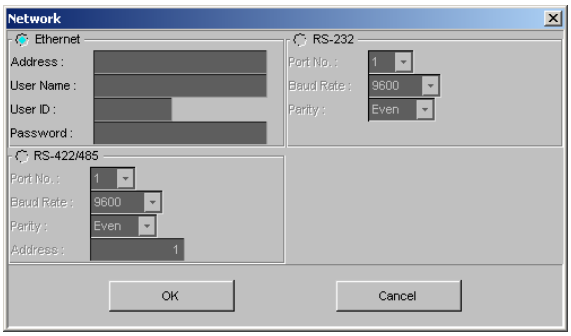
5.13 Sending Setup Data to the CX

You cannot send data to the CX during memory sampling.



Select [Comm.] > [Send Setting] to start sending data.

2. The [Network] dialog box appears.



3. Enter the parameters, and click the [OK] button.

The [Store] dialog box appears.

Click [OK] to start sending the data. A message appears to indicate when data transfer has stopped. Click [OK] to close the message.

Note

Of the network settings in the [Setup] tab, the following items are not transmitted.

- [IP Address] under the [TCP/IP] tab
- All settings under the [Serial] tab.

5.14 Saving Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .pcl.

5.15 Printing Setup Data

For the operating procedure, see section 1.5. You cannot select [Print Format Settings].

5.16 Starting and Stopping Measurement on the CX and Checking the CX Hardware Information

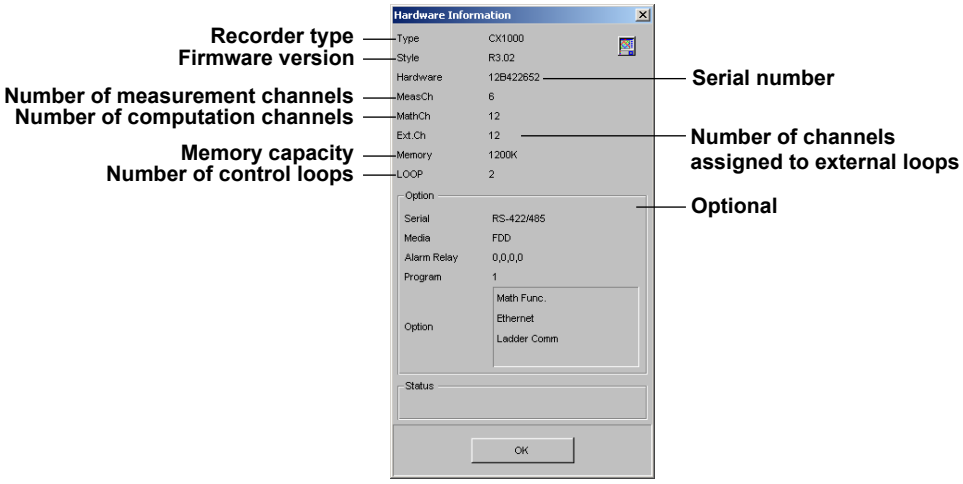
You can start and stop the CX, as well as display CX hardware information from the Hardware Configurator. (Start/Stop operation is only possible with memory sample and math functions. This software does not support this operation for control functions.)

Starting and Stopping Measurement

For the operating procedure, see section 3.10.

Displaying CX Hardware Information

For the operating procedure, see section 3.10.



5.17 Usable Characters

The characters in the following table can be used when entering group names, view group names, messages, comments to file headers, save destination directory names, the password for the key lock function, and login parameters such as user names, user ID, and passwords.

SP	#	%	(	)	*	+	-	.	/
0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z				
_		@							

Note

(*), (+), (.), and (/) cannot be used for folder names where files are saved.

6.1 Starting the Configurator

The Configurator can transmit and receive the setup data, change the setup data, and create new setup data. It can configure the following style numbers of DX and MV. **The setting screen may differ from your actual screen.**

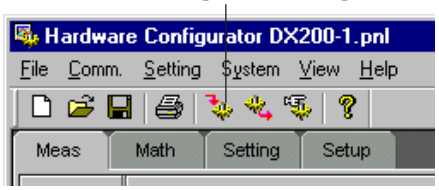
DX/MV (Style Number)	Style1 (S1)	Style2 (S2)	Style3 (S3)	Style4 (S4)
DX100	○	○		○
DX200	○	○		○
DX200C		○		○
MV100		○	○	○
MV200			○	○

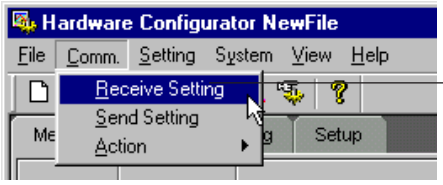
Starting the Hardware Configurator

See section 1.3.

Loading the Setup Data from the DX/MV

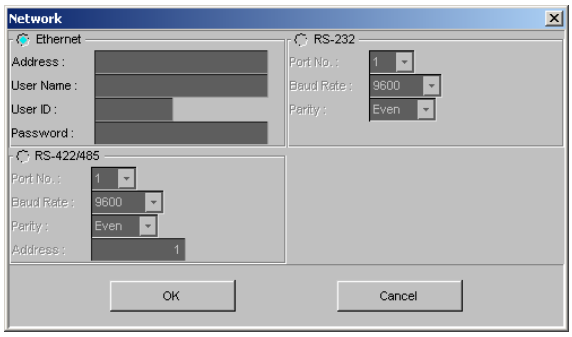
[Receive Data] icon





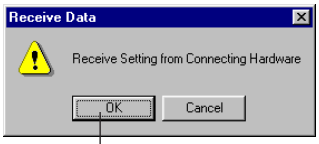
1. Click the [Receive Data] icon, or select [Comm.] > [Receive Setting].

2. The [Network] dialog box appears.



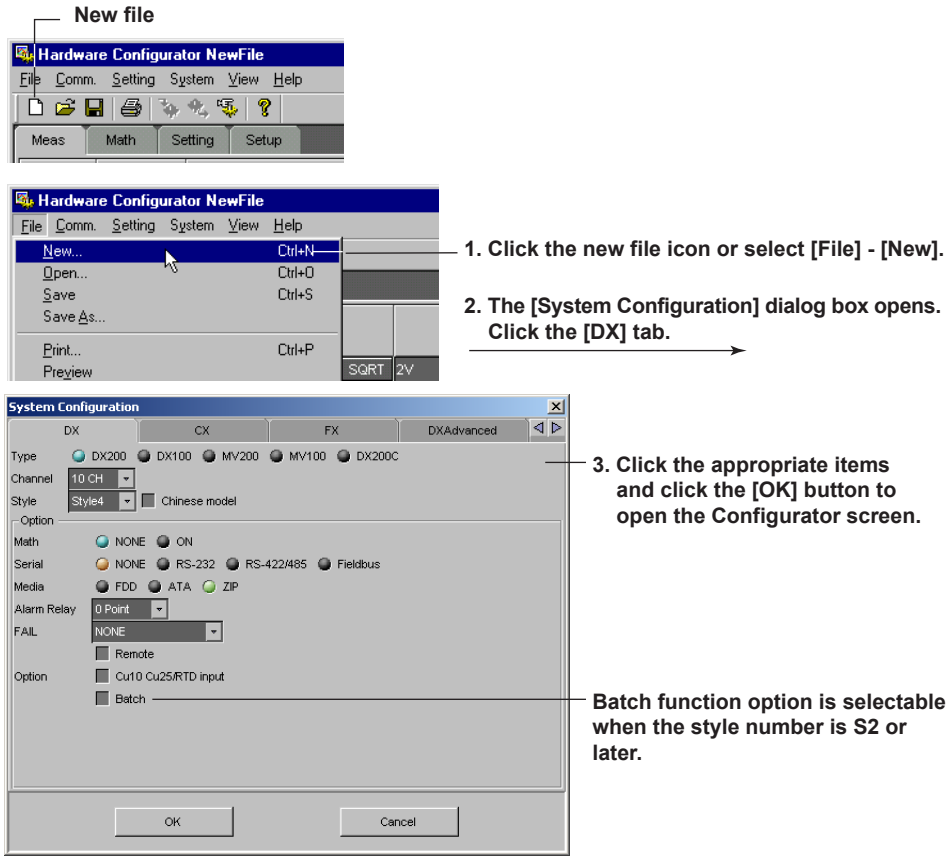
3. Enter the parameters, and click the [OK] button.

The [Receive Data] dialog box appears.

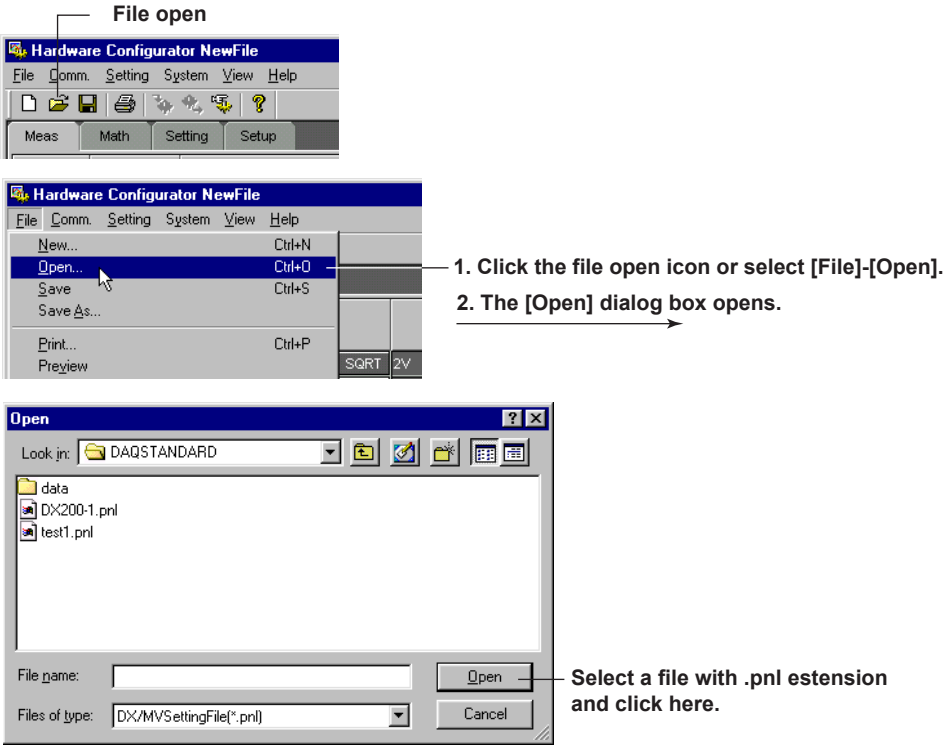


4. Click [OK] to start receiving data.

Creating Setup Data by Configuring a New System

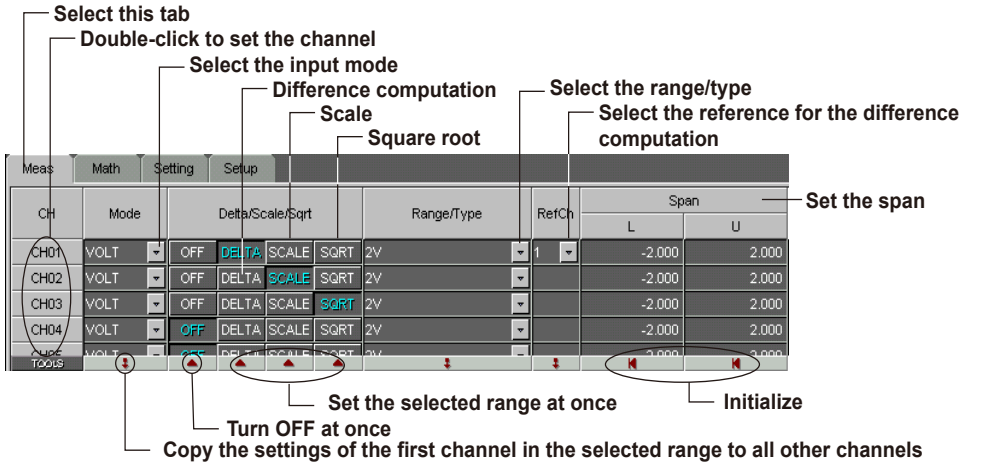


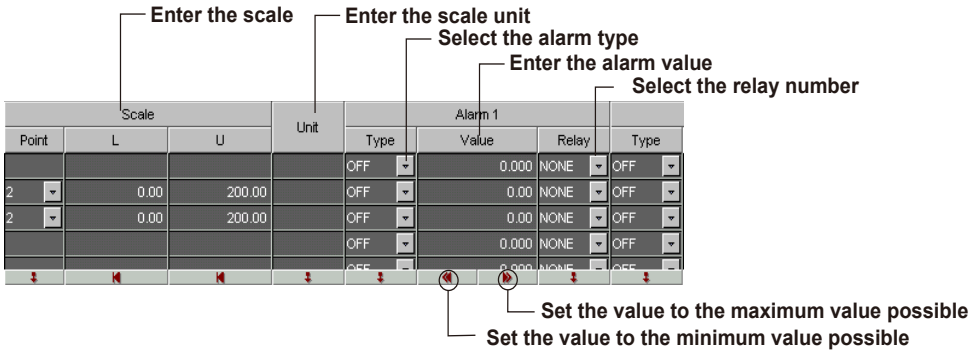
Loading Preexisting Setup Data

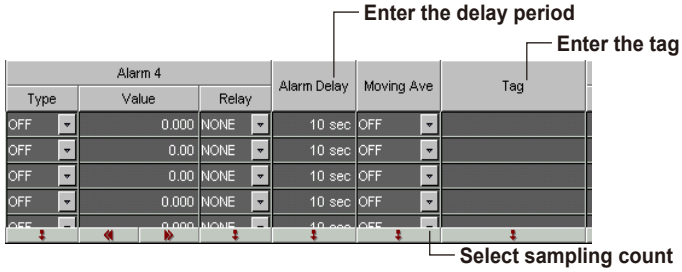


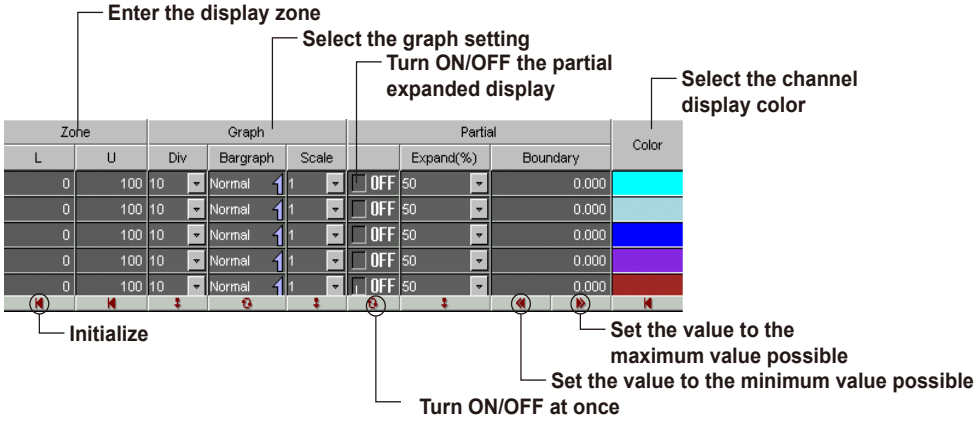
You can specify the location where the setup data file is located and open the Configurator.

6.2 Setting the Measurement Channels









Input Type (Mode and Range/Type)

Select from the list of choices from the pull-down menu.

Mode	Relevant Settings
VOLT (voltage)	Range, span L, and span U
TC (thermocouple)	Type, span L, and span U
RTD (resistance temperature detector)	Type, span L, and span U
DI (voltage level/contact input)	Range, span L, and span U
SKIP (Measurement/Display OFF)	None

Note

- When a value outside the range is entered or when the span L and span U values are set to the same value, they are corrected when the data are checked.
- If SKIP is selected, settings such as Delta/Scale/Sqrt and Range/Type are discarded.

Difference Computation and Reference

Displays the difference between the input and the reference channel.
If difference computation is performed between channels that have different range and type settings, the decimal position of the computed result is set to that of the channel computing the difference. If the number of digits to the right of the decimal of the reference channel is greater than that of the channel computing the difference, the reference value below the least significant digit of the channel computing difference is rounded beforehand.

Display Span

Sets the upper and lower limits (full scale) of the display.
When the span L and span U values are set to the same value or when a value outside the range is entered, they are corrected when the data are checked.

Scale

Scale L, scale U, and decimal point

Scale's value is displayed by taking the range between scale L and scale U to be full scale. Enter the upper and lower limit values to which you wish to convert the raw values. Include the decimal point.
When the scale L and scale U values are set to the same value or when a value outside the range is entered, they are corrected when the data are checked.

Unit

Enter the unit using up to six characters.

Square Root

Computes and displays the square root of the input. This setting can be used only when the input mode is set to VOLT (voltage). As necessary, set the span, scale, and unit.

Alarm

Four alarms (Alarm 1 to 4) can be specified on each channel.

Type

Select H, L, h, l, R, T or t. T or t is selectable when the style number is S2 or later. The selectable alarms vary depending on the input mode and computation type. For details, see section 6.2 in the DX100/DX200/DX200C/MV100/MV200 User's Manual.

Alarm value

Alarm is generated using the specified value as the boundary. The selectable range of alarm values vary depending on the input mode and range.

Alarm delay

Alarm is generated when the measured value stays above or below the specified alarm value for the specified time (delay period).

Relay

To output relays, select the output relay number. Otherwise, select [NONE].

Input Filter and Moving Average

Moving average can be specified on models DX106, DX112, DX210, DX220, DX230, MV106, MV112, MV210, MV220, and MV230.
Input filter can be specified on models DX102, DX104, DX204, DX208, DX204C, DX208C, MV102, MV104, MV204, and MV208.

Input filter

To use the input filter, select the time constant (2 s, 5 s, or 10 s).

Moving average

To use the moving average, select the sampling count (2 to 16).

Tag

Up to 16 characters can be entered for the tag.
You can use the tag instead of the channel number to be displayed on the screen.
The [Setup] screen is used to select whether to display the channel number or the tag on the screen.

Display Zone

You can select the range of the screen in which the waveform of each channel is to be displayed.
Specify positions (%) on the display scale for the upper and lower limits.
The conditions for setting the zones are as follows:

- Range: 0% to 100%
  The lower limit must be less than the upper limit
- The difference between the lower and upper limits is at least 5%.

Graph

Divisions
Select the number of bar graph divisions.

Bar graph
Select the reference position of the bar graph. Selecting [Center] when the bar graph is vertical produces no effect.
It is set back to [Normal] when the data are checked.

Scale
When using scale display on the trend screen, select the position to display the scale.
For details related to divisions, bar graph, and scale, see section 7.10 in the DX100/DX200/DX200C/MV100/MV200 User's Manual.

Partial Expanded Display

Position (%)
Set the boundary for the partial expanded display. The range is from 1 to 99%.

Boundary
The conditions used to set the boundary vary depending on the measurement and computation channels as follows:

- Measurement channel
  When SCALE and SQRT are not used: Span L < boundary < span U
  When SCALE and SQRT are used: Scale L < boundary < scale U

- Computation channel
  Span L < boundary < span U

Note

The partial expansion settings take effect when the partial expansion function is set to [Use] in the [Aux] section of the [Setup] tab.

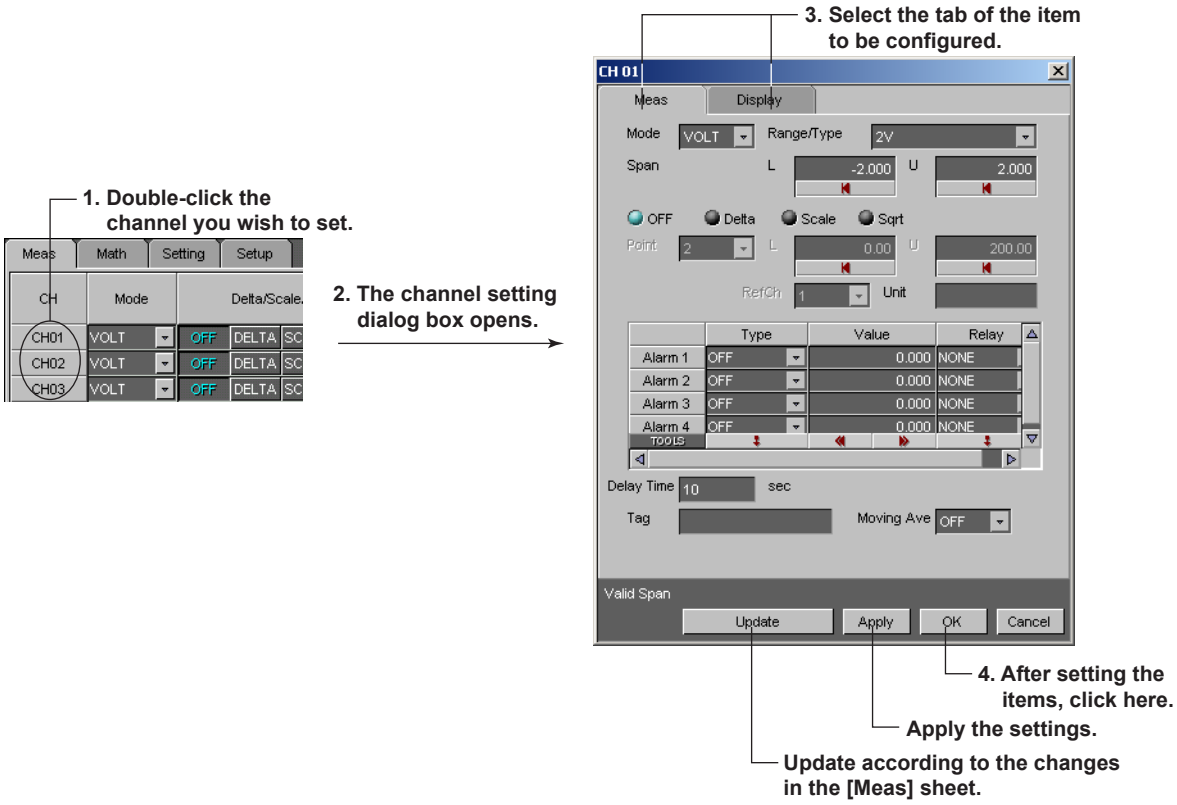
Display Color

You can select the display color of each channel from 16 colors.

Copying and Pasting Setup Data

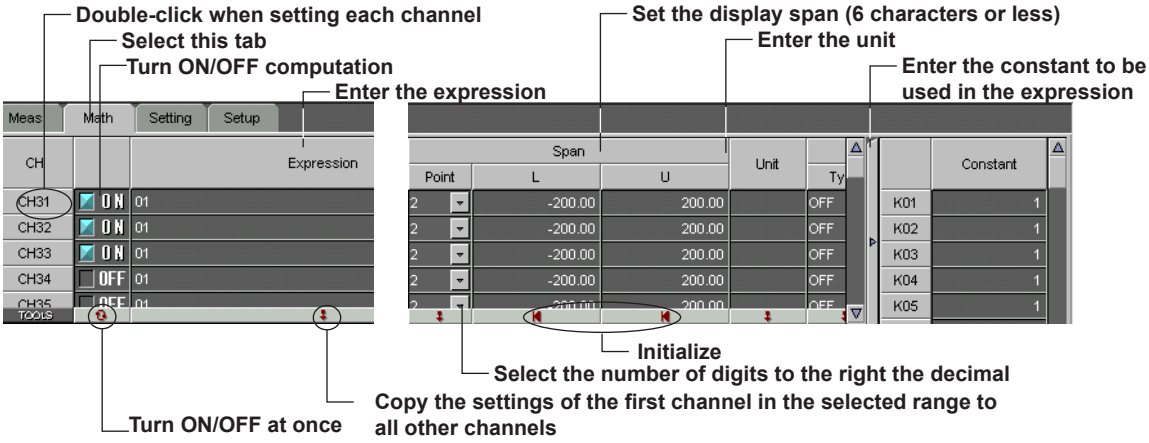
The items checked in [Copy Details] can be copied and pasted. Click the channel number to select the copy source or paste destination.
To select multiple channels to be copied, drag the channel number to specify the range to be copied. To select multiple copy destinations, select the range in a similar fashion.

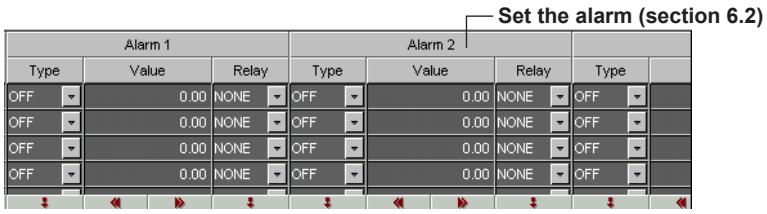
Setting One Channel at a Time

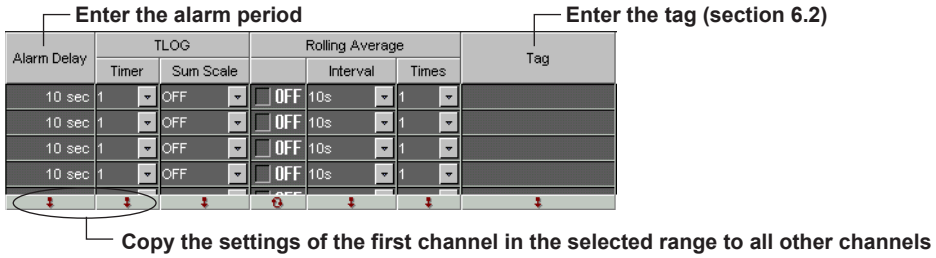


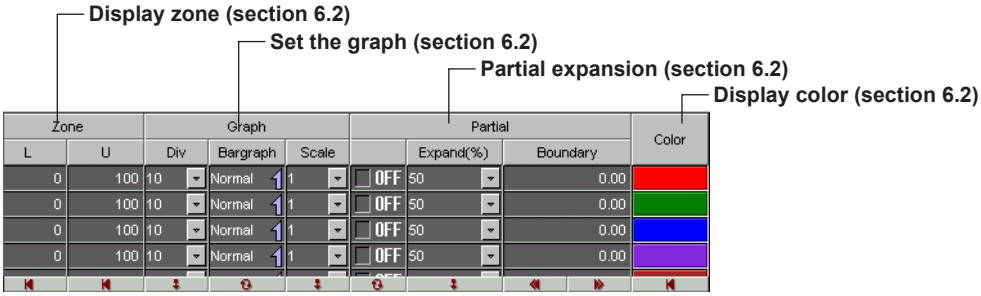
The items in the measurement channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

6.3 Setting the Computation Channels









Turning ON/OFF Computation

Select whether or not to perform computation for each channel.

Expression

Enter the expression using up to 40 characters. For details related to the expression, see the DX100/DX200/DX200C/MV100/MV200 User's Manual.

Display Span

Sets the upper and lower limits of the display.
The range is from -9999999 to 99999999. Set the number of digits to the right the decimal to four digits or less.

Alarm and Tag

The settings are the same as the measurement channels. For details, see section 6.2, “Setting the Measurement Channel.”

TLOG Computation

Timer

Select one of the timers (1 to 3) set in the setup mode.
The computation interval of TLOG computation is set to the time assigned to the selected timer.

Sum scale

Set the sum scale.

Rolling Average

Interval

Select the sampling interval when rolling average is activated.

Times (Number of samples)

Select the number of samples (number of data points used to compute the rolling average).

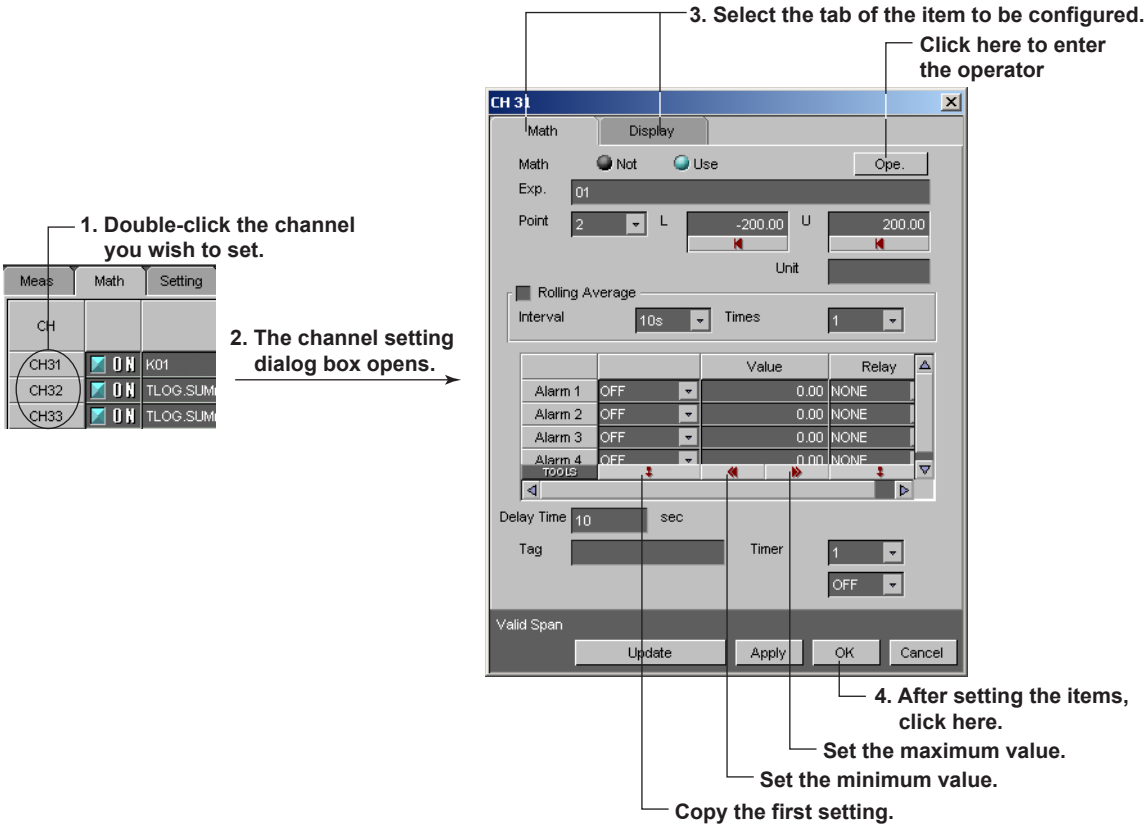
Display Zone, Graph, Partial Expansion, and Color

The settings are the same as the measurement channels. For details, see section 6.2, “Setting the Measurement Channel.”

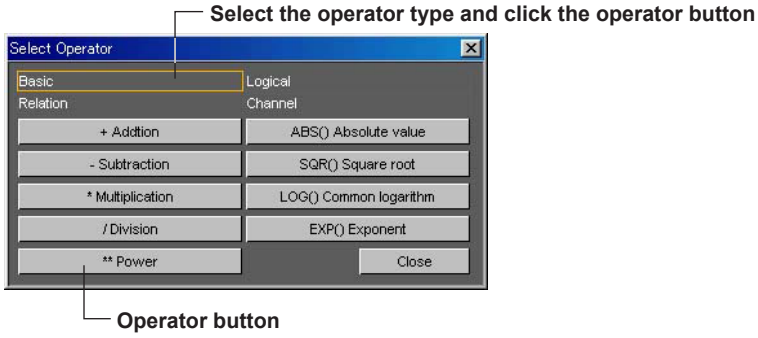
Constant

You can set constants to be used in the expression. Up to 12 and 30 constants can be specified on the DX100/MV100 and DX200/DX200C/MV200, respectively.

Setting One Computation Channel at a Time



<Select Operator dialog box>



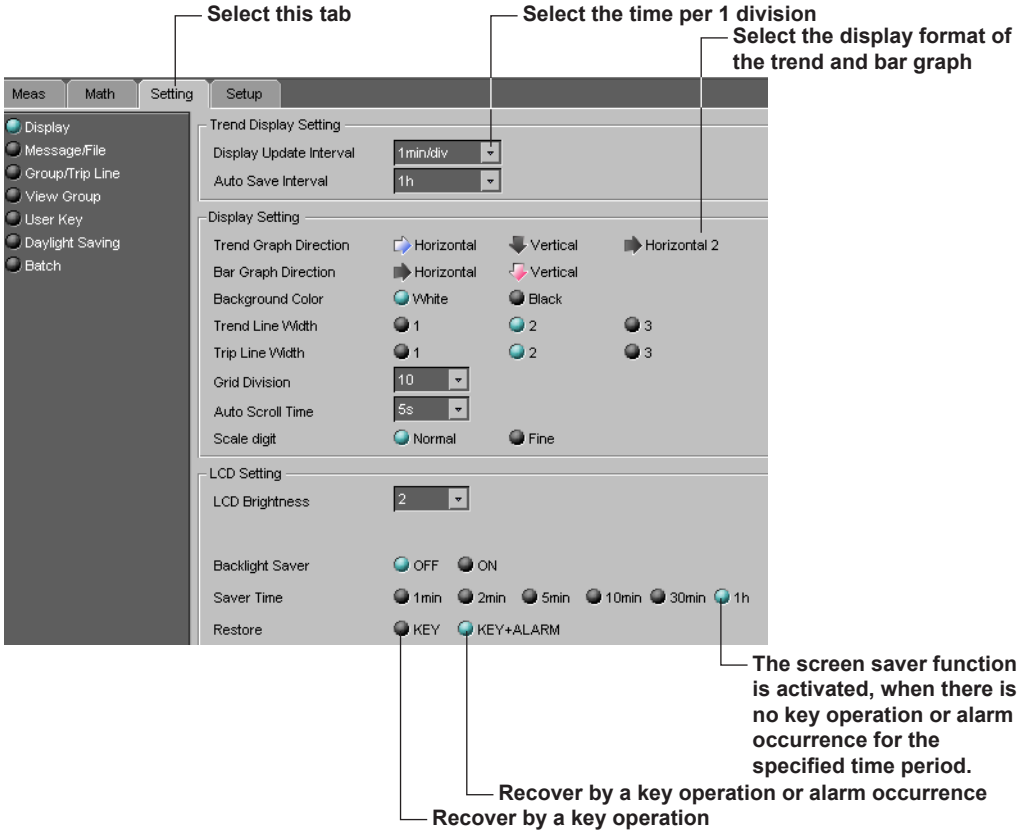
The items in the math channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

Copying and Pasting Setup Data

See section 6.2, “Setting the Measurement Channel.”

6.4 Configuring the Settings

Screen Display



If you selected MV100 in the “System Configuration” dialog box, “User key” on the “Setting” page will not be displayed.

Display update interval

You can select the display update interval from 15 sec/div[*1], 30 sec/div[*1], 1 min/div, 2 min/div, 5 min/div, 10 min/div, 20 min/div, 30 min/div, 1 h/div, 2 h/div, 4 h/div, and 10 h/div[*2].

*1 Can be specified on the DX102, DX104, DX204, DX208, DX204C, DX208C, MV102, MV104, MV204, and MV208 style number S4.

*2 Can be specified on the DX and MV style number S4.

Auto save interval

The auto save interval can be specified when the [Save] is set to [Auto] (see page 8-17) and the data type is set to [DISPLAY] or [EVENT&DISP] in the memory sample section of the setup tab.

Auto scroll time

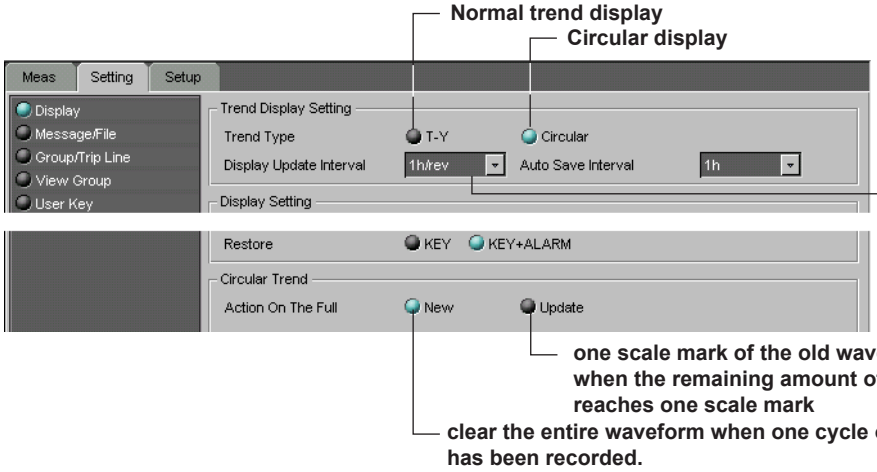
This is the time period used to automatically switch the displayed group. It can be specified when the style number of the DX or MV is S2 or later.

Scale Display Digits

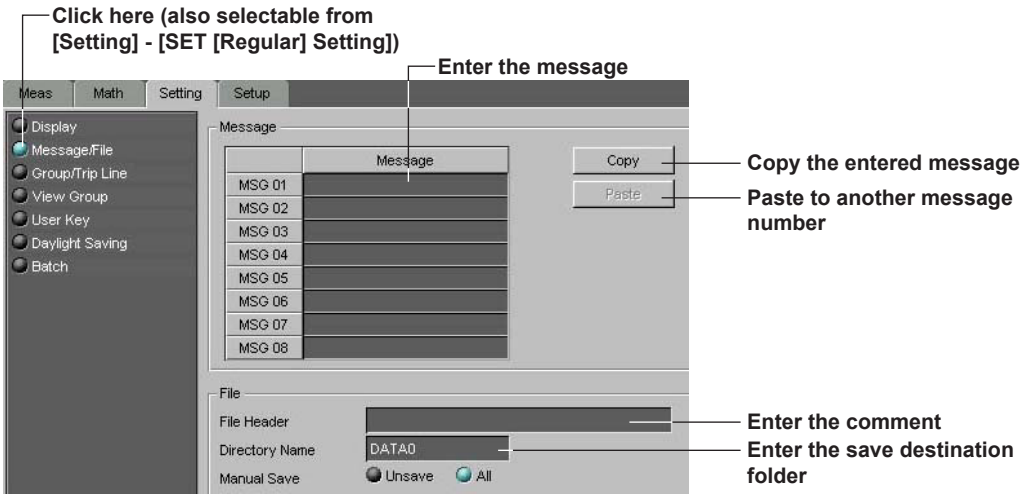
Select [Normal] or [Fine].

Fine If the scale value is displayed with two digits, it can be changed to three digits.

Circular display setting (DX200C Only)



Message/File



Message

Up to 16 characters can be entered for the message.

File header

Adds a comment to the header section of the measurement/computation data file.

Director name

Set the name of the folder in which the measurement/computation data files is to be saved.

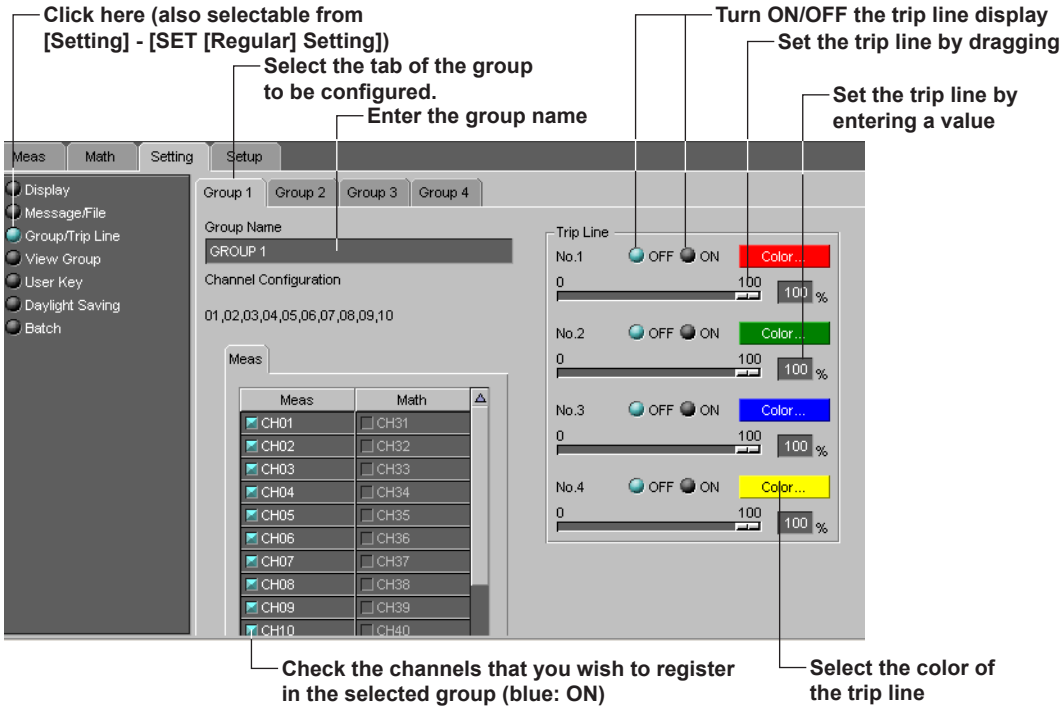
Note

- Up to eight characters can be entered for the file header and director name. AUX, CON, PRN, NUL, and CLOCK cannot be used.
- If the directory name is not specified, DATA0 (default) is automatically set.

Manual save

Select whether to save all the data or data that have not been saved during manual save.

Group/Trip Line



Group name

Up to 16 characters can be entered for the group name.

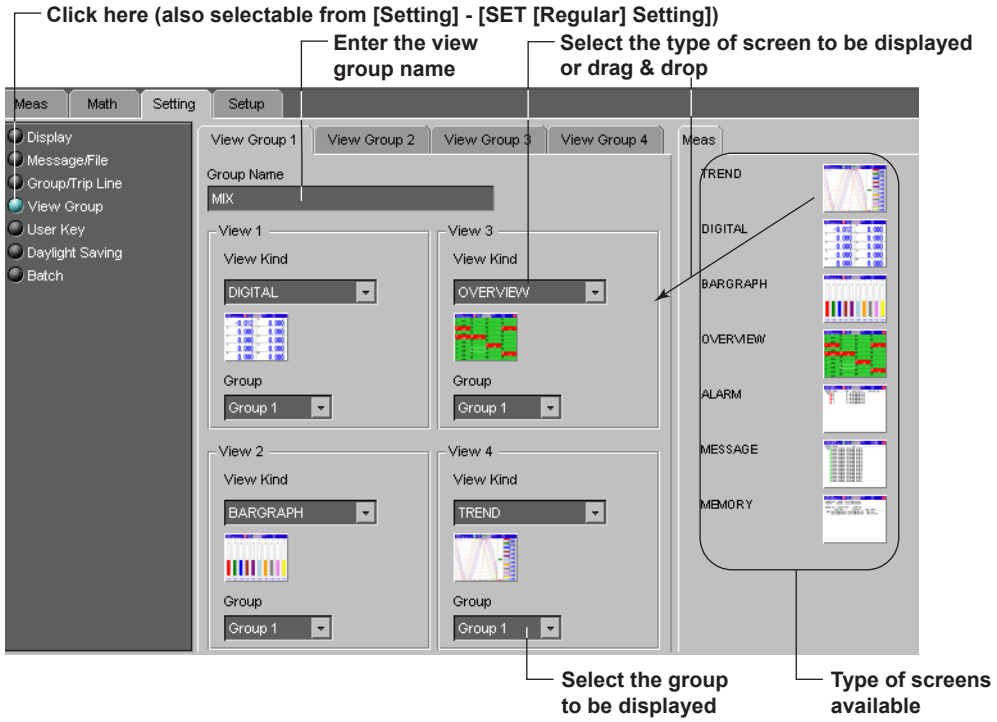
Number of channels

The maximum number of channels that can be assigned to a group is 10 and 6 for DX200/DX200C/MV200 and DX100/MV100, respectively. The assigned channels are listed under [Channel Configuration].
If no channels are specified, CH01 is automatically assigned.

Trip line

Up to four trip lines can be set to one group.
With regard to the trip lines set here, the first and second settings (No.1 and No. 2) refer to the trip lines in the Data Monitor and Data Viewer. If you change them here, they will also change in the Data Monitor and Data Viewer.

Setting the View Group (DX200, DX200C, MV200 Only)



View group

Up to four view groups can be registered.

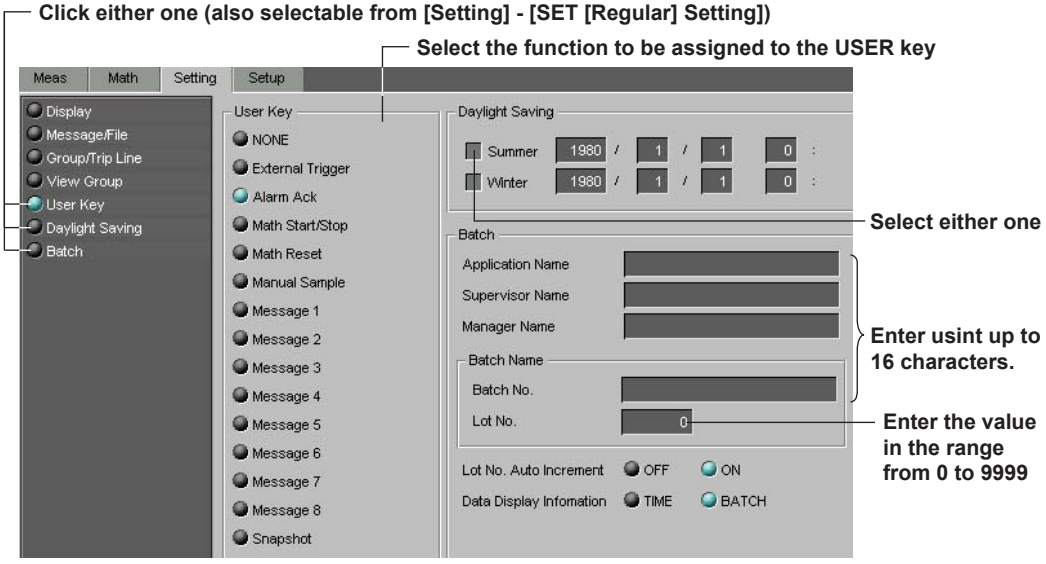
Group Name

Up to 16 characters can be entered for the group name. The specified group name appears as a sub menu of the [4 Panel] display of the DX200/MV200.

Screen type

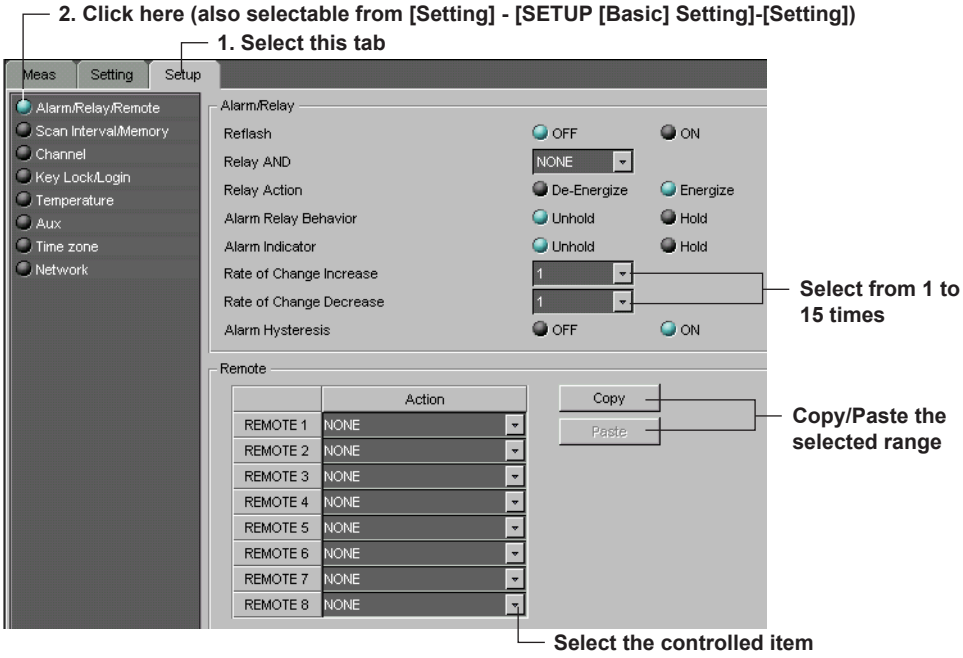
The view group is made up of four screens. Select the type of screen to display in each screen.

USER Key (DX100, DX200, DX200C, and MV200 Only), Dayliht Saving, Batch (Option /BT1, Style Number S2 or Later)



6.5 Configuring the Setup Mode

Alarm/Relay/Remote



Alarm

Select the alarm format. The selected items become blue.

Relay AND

Set the range of relays (from the first alarm relay) to take the AND logic. All other relays will be set to OR logic. If [NONE] is selected, all relays will operate using the OR logic.

Remote (Option)

You can assign items to be controlled by the eight remote control terminals. This is possible, if the remote function is available.

For details related to the copy/paste function, see page 6-7.

Scan Interval/Memory

Scan interval

The selectable scan intervals vary depending on the model as follows:
DX102, DX104, DX204, DX208, DX204C,
DX208C, MV102, MV104, MV204, and MV208 : 125 ms and 250 ms
DX106, DX112, DX210, DX220, DX230,
MV106, MV112, MV220, and MV230 : 1 s and 2 s

A/D Integrate

100 ms can be selected only when the scan interval is set to 2 s.

Memory Sample (save method of measured/computed data)

- Number of blocks
  When the data type is [EVENT], select 1, 2, 4, 8, or 16.
  When the data type is [EVENT&DISP], select 1, 2, or 4.

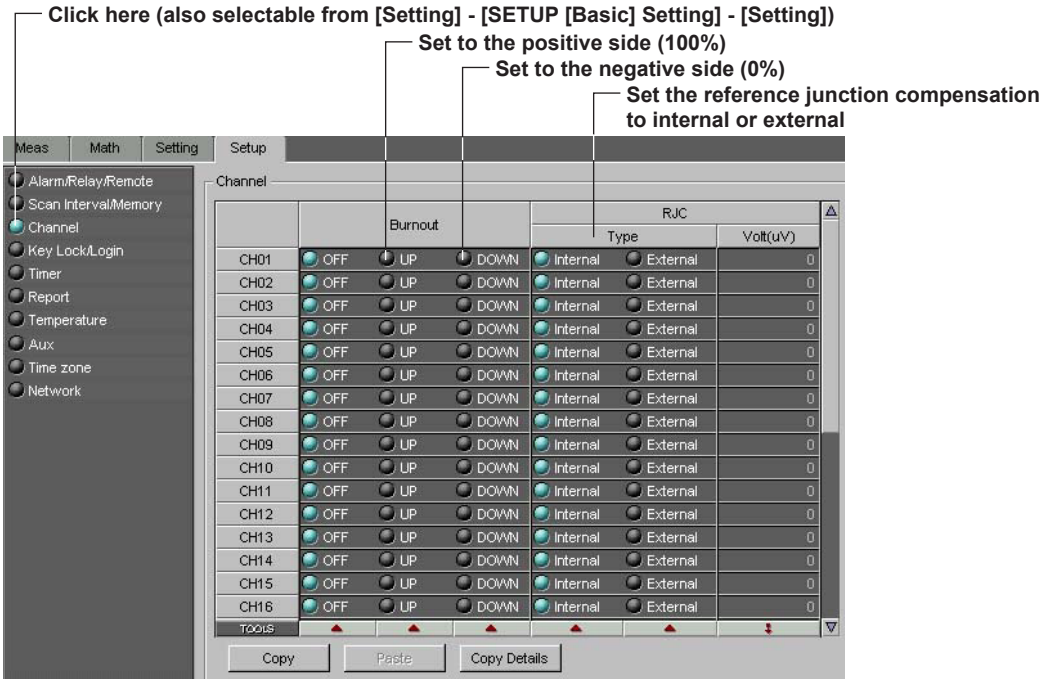
- Pre-Trigger Length
  If 0% is selected, the event file will entirely consist of data after the trigger. If 100% is selected, the event file will entirely consist of data before the trigger.

- Memory Sample
  Select the channels that are to be saved to the memory.

Note

If [Save] is set to [Manual], the data directory is created at a location that cannot be managed by the DAQ Desktop. Therefore, the DAQ Desktop cannot be used to handle data files in that directory.

Channel (Setting the Burnout and RJC)



Burnout

For thermocouple (TC) inputs, select how the measurement results are to be handled when the thermocouple burns out.

RJC Volt (uV)

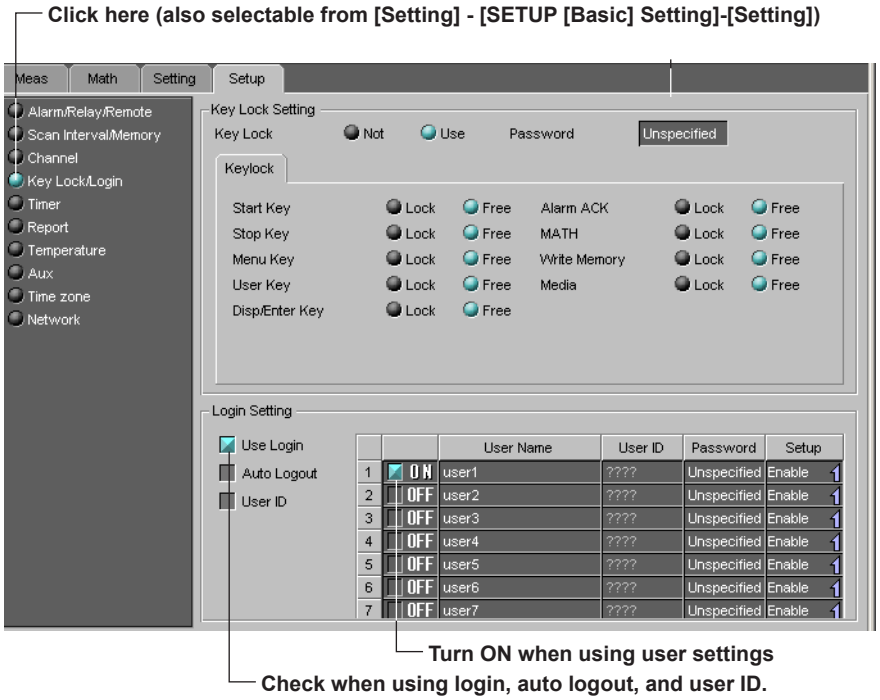
When the reference junction compensation is set to [External], set the compensation value in the range from -20000 to 20000.

Copying and pasting setup data

The items checked in [Copy Details] can be copied and pasted. Click the channel number to select the copy source or paste destination.

To select multiple channels to be copied, drag the channel number to specify the range to be copied. To select multiple copy destinations, select the range in a similar fashion.

Key Lock/Login



Setting the key lock

- **Key Lock**
  When using the key lock function, select whether or not to activate the key lock function (lock or free).

- **Password**
  Enter the password used to release the key lock using up to six characters. [???] is displayed after the password is entered.

Setting the login

- **User name**
  Up to 16 characters can be entered for the user name.

- **User ID**
  Up to 4 characters can be entered for the User ID. [???] is displayed after the password is entered.

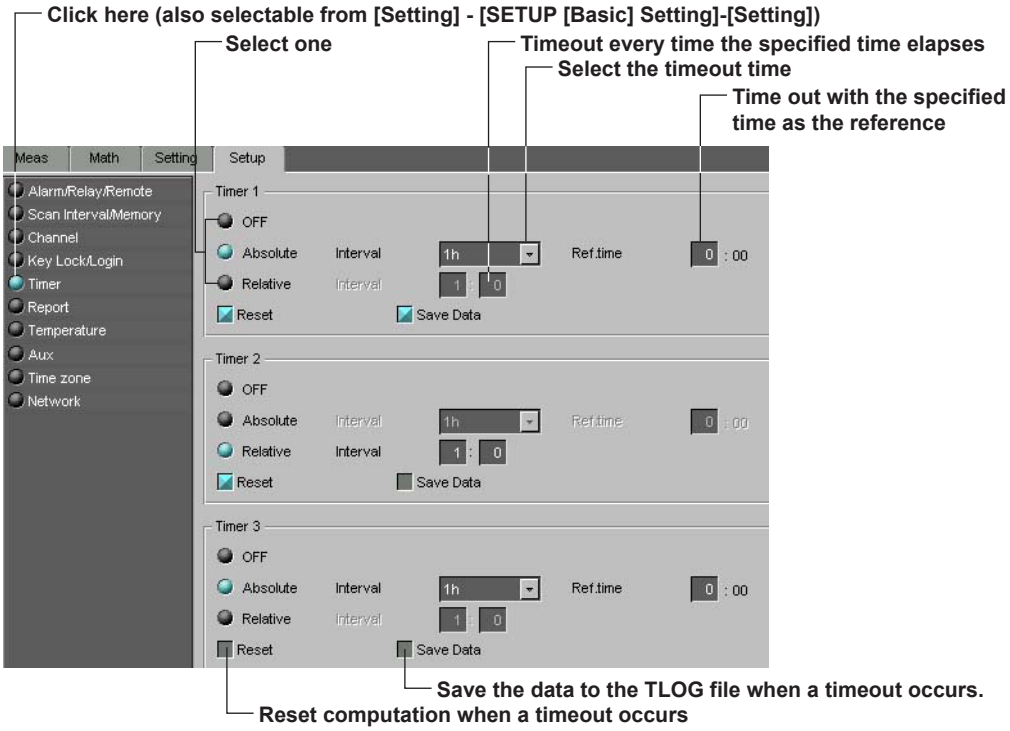
- **Password**
  Up to 6 characters can be entered for the password. [???] is displayed after the password is entered.

- **Setup**
  Select whether or not to allow setting changes in the setup mode.

Note

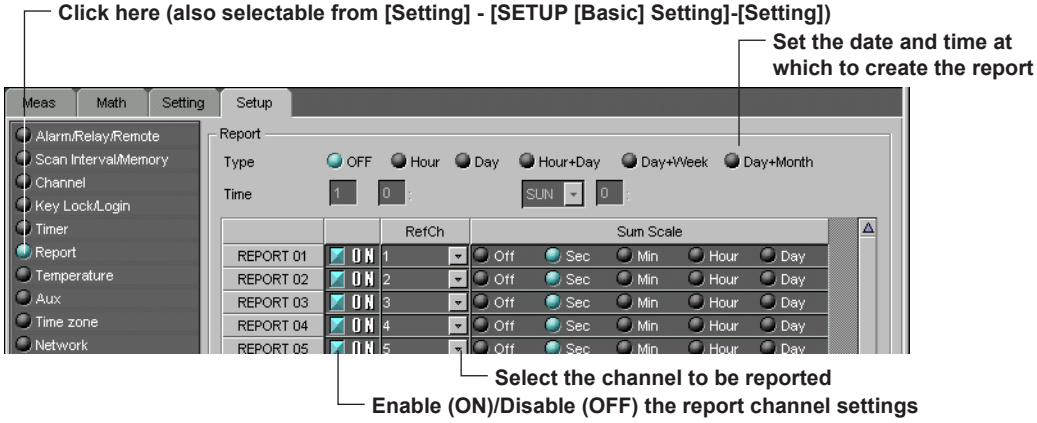
- If there is a duplicate [User Name] that is turned ON, the user with the larger user number is turned OFF.
- If [Setup] of all users that are turned ON is set to [Disable], the [Setup] of the user with the smallest number is set to [Enable].

Timer (Option /M1)



You can set three types of timers to be used in the statistical computation. You can have the data saved to a TLOG file or reset the computation when the specified timeout time elapses.

Report (Creating Hourly/Daily/Weekly/Monthly Reports, Option /M1)



Report channel

There are 30 channels and 12 channels on the DX200/DX200C/MV200 and DX100/MV100, respectively.

Converting the reference unit time

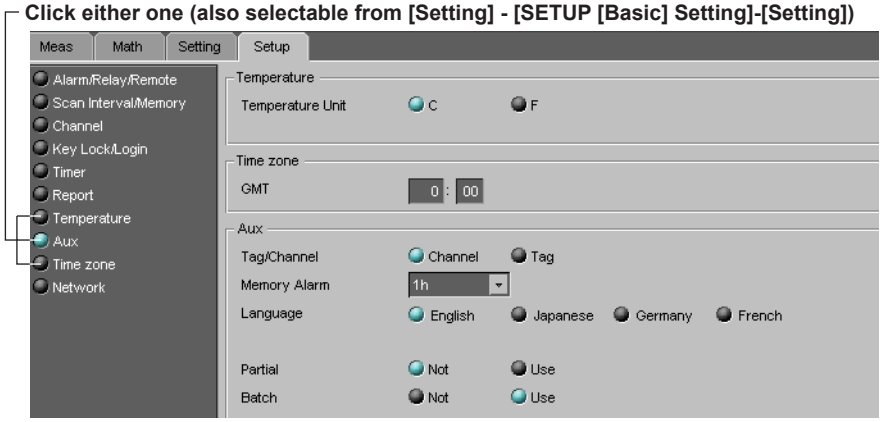
Select whether or not to convert the computed results of the TLOG.SUM computation channels to a specified time unit value. Select [Off (no conversion)], [Sec (seconds)], [Min (minutes)], or [Hour (hours)].

Copy

For details related to the copy/paste function, see page 6-7.

Setting the Temperature Unit, Tag/Channel Display, Memory Alarm Time, Displayed Language, Partial Expanded Display, Batch (Option /BT1, Style Number S2 or Later) and Time Zone

Click either one (also selectable from [Setting] - [SETUP [Basic] Setting]-[Setting])



Temperature

Select the °C or °F for the temperature unit.

Tag/Channel

Select whether to use the tag (see “Tag” on page 6-6) or channel number as the measurement/computation channel label.

If you select tag, you can select the label display from tag and channel (see page 6-6).

Memory alarm time

Free space in the internal memory is monitored, and the memory alarm relay (option /F1) can be programmed to activate some period of time before the memory is completely full. This time period is called the memory alarm time.

Displayed language

Select the language to be used on the display.

The types of displayed language vary depending on the style number of the DX or MV. If the style number is S2 or later, you can select German or French in addition to English and Japanese.

Partial expanded display

If the partial expanded display is set to [Not], the partial expanded display settings of the Meas/Math tab are void.

Batch function (option /BT1, style number S2 or later)

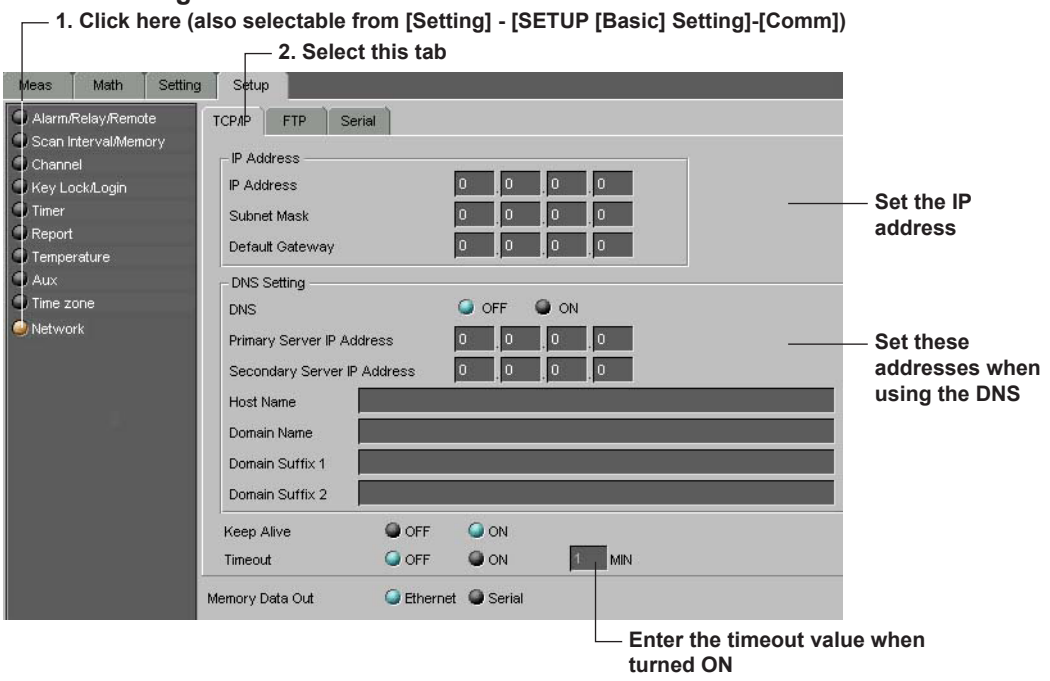
You can set the batch function when the style number of the DX or MV is S2 or later.

Time zone (style number S4)

Set the time difference from the GMT.

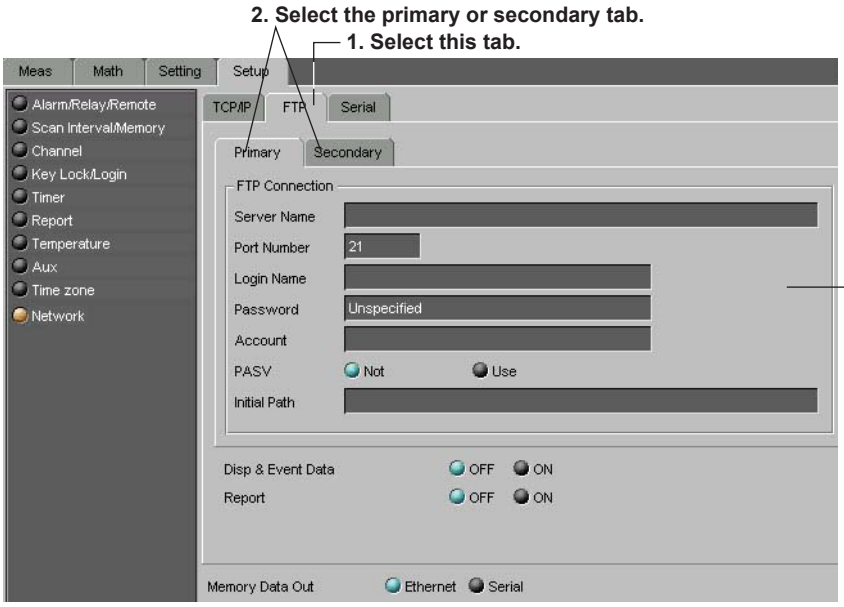
Network

Setting the TCP/IP



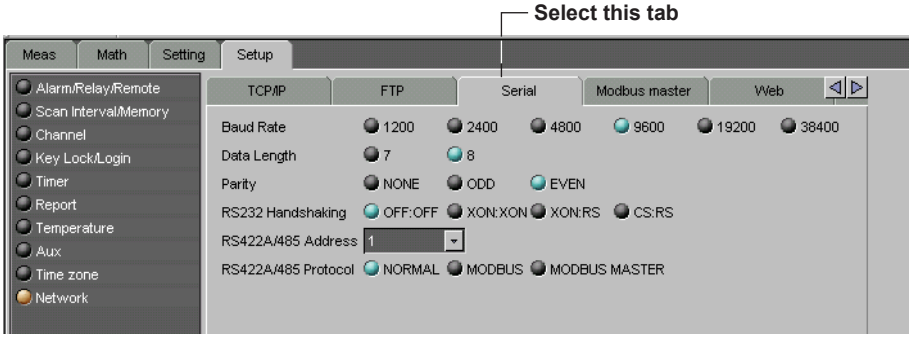
In the case of a CONFIG file, the IP address cannot be configured.
When communicating with the DX100/DX200/MV100/MV200 via Ethernet, the IP address, subnet mask, and default gateway must be set on the DX100/DX200/MV100/MV200 beforehand.

Setting the FTP



By using the FTP function, you can automatically transfer the measured/computed data files to the specified server.

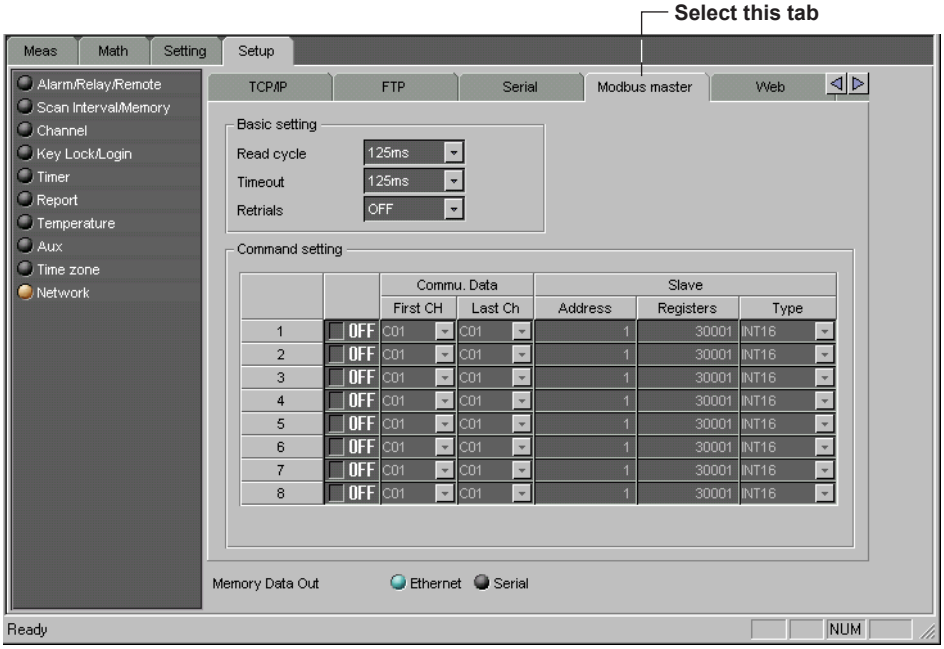
Setting the serial communication (option /C2, /C3)



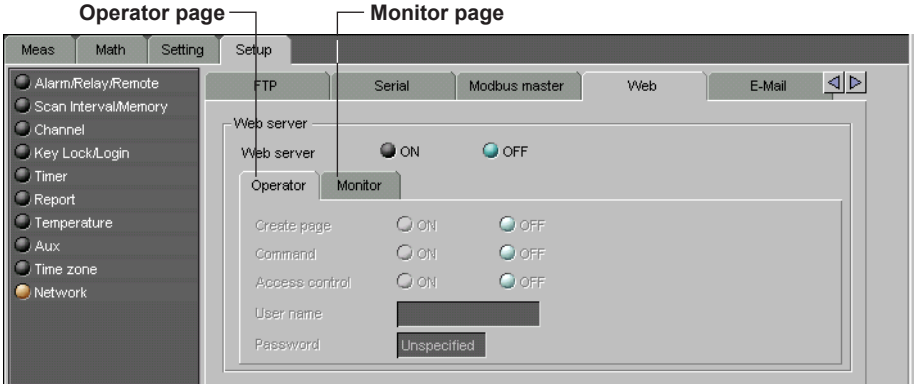
Note

When using modbus, you must set the protocol to MODBUS or MODBUSMASTER.

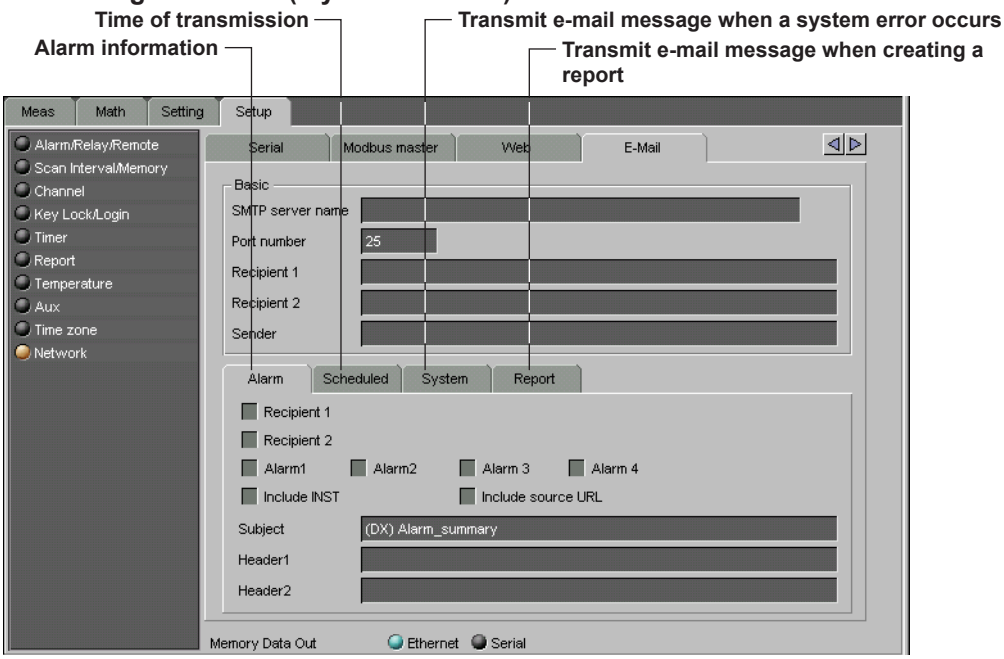
Setting the Modbus Master (option /C2, /C3, style number S4)



Setting the web server (style number S4)

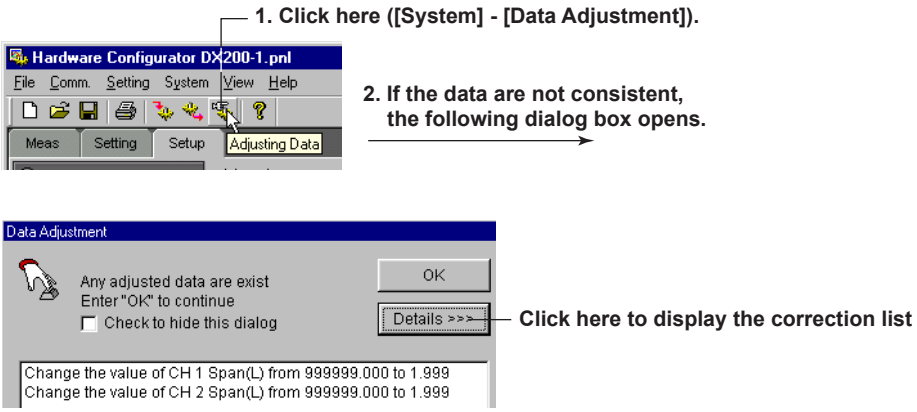


Setting the E-mail (style number S4)



- **SMTP server name**
  Set the SMTP server name (up to 64 alphanumeric characters) or the IP address of the SMTP server.
- **Port number**
  Set the port number to use. The default value is [25].
- Recipient
  Set the transmission destination of the e-mail message using up to 150 alphanumeric characters. You can specify multiple addresses. To specify multiple addresses, delimit the addresses using spaces.
- **Sender**
  Set the e-mail address using up to 64 alphanumeric characters. If the address is not set, the first address set in the recipient box is used as the sender's address instead.
- **Alarm**
  Transmits an e-mail messages when alarm is active/released.
- **Scheduled**
  Transmits an e-mail message when the specified time is reached.
- **System**
  Transmits an e-mail message during recovery from a power failure, when memory end is detected, or when an error related to the external storage medium and FTP client occurs
- **Report**
  Transmits an e-mail message when report is created (only on models with the optional computation function (/M1)
- **Subject, Header1, Header2**
  Subject: Set the subject of the e-mail message using up to 32 alphanumeric characters.
  Header1 and Header2: Set the string to be attached to the e-mail message using up to 64 alphanumeric characters.

6.6 Adjusting the Setup Data (Checking the Data)



Checks whether or not the specified setup is consistent with the actual system. If it is not, the data are automatically corrected.
The data are corrected in the following cases:

- When the values of the items of the Meas/Math tab are outside the range.
- When an invalid character string is used

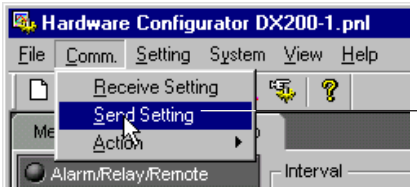
Data adjustment dialog box

If [View] - [Data Adjustment Dialog Box] is checked, the [Data Adjustment] dialog box will open when the data are not consistent at the time of the data check or at the time of data transmission.

Note

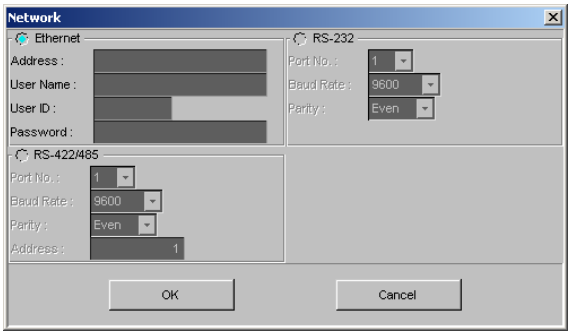
Perform the data check before sending the new setup data to the DX100/DX200/MV100/ Mv200.

6.7 Sending the Setup Data to the DX/MV



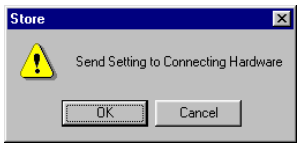
1. Click the [Send Data] icon, or select [Comm.] > [Send Setting].

2. The [Network] dialog box appears.



3. Enter the parameters, and click the [OK] button.

The [Store] dialog box appears.



Click [OK] to start sending the data. A message appears to indicate when data transfer has stopped. Click [OK] to close the message.

You cannot send data to the DX100/DX200/DX200C/MV100/MV200 during memory sampling.

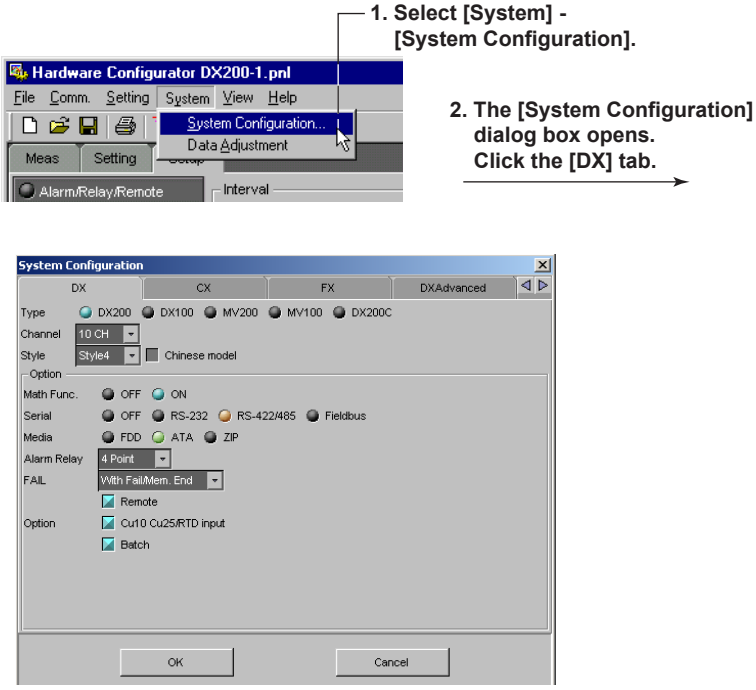
Note

Of the network settings in the [Setup] tab, the following items are not transmitted.

- [IP Address] under the [TCP/IP] tab
- All settings under the [Serial] tab.

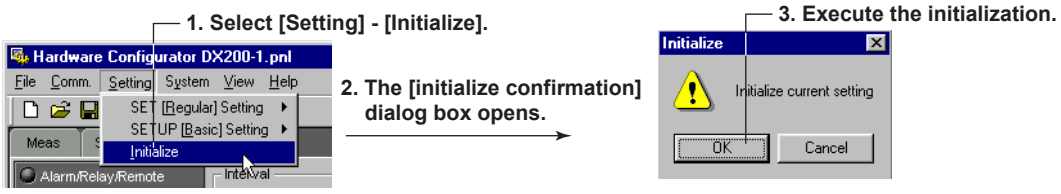
6.8 Checking the System Configuration and Initializing Setup Data

Checking the System Configuration



Only the system configuration in the setup data file can be checked. If the system configuration is changed and the [OK] button is clicked, a message “System Configuration is changed Input & Data are Initialized” appears. Clicking the [OK] button initializes the data.

Initializing the Setup Data



6.9 Saving the Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .pnl.

6.10 Printing the Setup Data

For the operating procedure, see section 1.5. You cannot select [Print Format Settings].

6.11 Starting and Stopping Measurement on the DX/MV, Checking the DX/MV Hardware Information

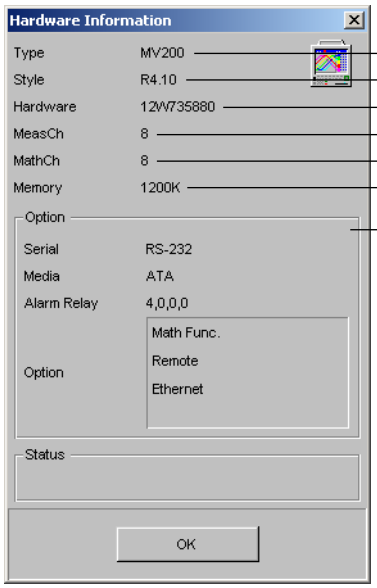
From this software you can start and stop the DX/MV, and display DX/MV hardware information.

Starting and Stopping Measurement

For the operating procedure, see section 3.10.

Display DX/MV hardware information

For the operating procedure, see section 3.10.



Recorder type
Firmware version
Serial number
Number of measurement channels
Number of computation channels
Memory capacity
Optional

6.12 Characters that can be Used

The characters in the following table can be used when entering a group name, a view group name, a message, a comment to the file header, a save destination directory name, the password for the key lock function, and login parameters such as the user name, user ID, and password.

SP	#	%	(	)	*	+	-	.	/
0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z				
_		@							

Note

(*), (+), (.), and (/) cannot be used for the name of the directory where files are to be saved.

7.1 Troubleshooting

Warning Message List

Code	Message
W3435	System configuration has been changed. The input configuration and data will be initialized. Continue?
W3453	All program pattern configuration will be initialized.Continue?
W3454	This pattern configuration will be initialized.Conutinue?
W6031	Current value is invalid, because the value is the same with line %d.(note)
W6035	Contains invalid data. Open this setting?
W6036	Start Memory sampling/Math.
W6037	Stop Memory sampling/Math.
W6038	Initialize current settings.
W6039	Hardware and software configurations don't match. Continue sending data?
W6041	Send Setting to Connecting Hardware.
W6042	Receive Setting from Connecting Hardware.
W6043	The edited settings will be lost. Are you sure you want to continue?
(note)	%d is a number.

Error List

Code	Message	Corrective Action
E0401	Communication Error.	Check the communication settings.
E6001	Failed to make file.	Check the free space in the directory.
E6002	Failed to open file.	Try to load the file again. If still not possible, the file may be damaged. Select another file.
E6003	Unreadable file.	Select another file.
E6004	Communication impossible while media in use.	Execute the operation after data has been saved to the medium.
E6005	Now sampling & calculating. Can't store settings.	Stop memory sampling and calculations (computation).
E6006	Now sampling. Can't store settings.	Stop memory sampling.
E6007	Now calculating. Can't store settings.	Stop calculations (computation).
E6008	Now Controlling. Can't store settings.	Stop controlling.

Message

Code	Message
M6061	Data can't be processed after the year 2038.
M6062	Any destroyed A/D converter exists. Any settings may be failed to store.
M6063	Sending finished.
M6064	Receiving finished.

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Numeric

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