
**User's
Manual**

**DXA120
DAQSTANDARD**

vigilantplant.®

Foreword

Thank you for purchasing the DAQSTANDARD (model name: DXA120). This manual explains how to use the software. 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 five 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	Functions of Launcher	Explains Launcher which is used to start the utility programs. Also explains how to set communications between the recorder and your computer.
3	Configuring the DX1000/DX2000	Explains how to set measurement conditions of the DX1000/DX2000.
4	Displaying Data with the Data Viewer	Explains how to display data stored in the hard disk etc. Also explains how to convert data to various data formats such as ASCII.
5	Troubleshooting	Gives a list of error messages and corrective measures.
6	Configuring the MV1000/MV2000	Explains how to configure MV1000/MV2000 measurement conditions and other settings.
7	Configuring the CX1000/CX2000	Explains how to configure CX1000/CX2000 measurement conditions and other settings.
8	Configuring the DX100/DX200/DX200C/MV100/MV200	Explains how to configure DX100/DX200/DX200C/MV100/MV200 measurement conditions and other settings.
Index		Gives a list of important terms used in this manual.

Range of Explanation in this Manual

This manual does not provide a description of basic operations of the operating systems. 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.

Products Covered in This Manual

Item	Described in This Manual
DX1000/DX1000N/DX2000	Up to the release number 2 (firmware's version 2.0x).
MV1000/MV2000	Up to the release number 1 (firmware's version 1.0x).
CX1000/CX2000	Up to the style number S3.
DX100/DX200/DX200C	Up to the style number S4.
MV100/MV200	Up to the style number S4.
DAQSTANDARD	Up to the firmware's version 8.0x.

Revision History

Edition	Changes
2	Adjusted to cover recorder version 1.21.
3	Adjusted to cover recorders with release number 2.
4	Adjusted to cover recorders MV1000/MV2000, CX1000/CX2000, DX100/DX200, and MV100/MV200.

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1.1 Overview of the DAQSTANDARD

The DAQSTANDARD consists of the following three utility programs.

- Launcher
- Hardware Configurator
- Data Viewer

Launcher

Launcher is provided to start the last two utility programs. It also allows you to set communication conditions between the recorder and this DAQSTANDARD. Launcher and Data Viewer will be automatically registered to the Start menu of Windows when the DAQSTANDARD is installed.

Hardware Configurator

Allows you to set the recorder hardware (measurement/math channels, display method etc.). It also allows transfer of the setup data to the recorder and saving it to the personal computer's hard disk. Setup data can be set by the following three methods.

- Receiving the setup data from the recorder currently connected to the PC
- Loading existing setup data
- By configuring a system

Data Viewer

Displays the following four types of data generated by the recorder and prints them. The data can be displayed graphically or digitally.

- Display data file
- Event data file
- TLOG file
- Report file
- Manual sampled data file

Note

If you want to open a single Data Viewer, select [Program] - [DAQSTANDARD] - [Viewer].

1.2 Required PC System Environment

Hardware

Personal Computer

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

CPU and Main Memory

- **When Using Windows 2000 or Windows XP**

Pentium II 333 MHz or higher (Pentium III 600 MHz or higher is recommended).

Free disk space of 32 MB or more (generally, 128 MB or more recommended, though the computer performance depends on the graphics board). However, some application programs may require more memory. Also, memory requirements depended on the OS.

- **When Using Windows Vista**

Pentium 4, 3 GHz or faster

2 GB or more of memory

Hard Disk

A free space of 100 MB or more.

CD-ROM Drive

To be used for installing the software.

Mouse

A mouse supported by Windows.

Monitor

- **When Using Windows 2000 or Windows XP**

A monitor supported by the OS of 800 × 600 dpi or higher and 32K colors or more. A monitor of 1024 × 768 dpi or higher and 65,536 colors or more is recommended.

- **When Using Windows Vista**

A video card recommended for use with Vista and a monitor supported by the OS of 1024 × 768 dpi or higher and 65,536 colors or more.

Interface Port

An RS-232 port or an Ethernet port supported by the OS.

Printer

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

Operating System (OS)

This software program runs on the following operating systems.

- Windows 2000
- Windows XP
- Windows Vista Home Premium (excluding the 64-bit edition))
- Windows Vista Business (excluding the 64-bit edition))

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 Installing the DAQSTANDARD

The DAQSTANDARD is provided by a CD-ROM. To install the software, an appropriate serial number needs to be entered. The serial number is indicated on the CD.

Operating Method

1. Start Windows. Log onto Windows as an administrator.
2. Insert the CD into the CD-ROM drive of the computer.
3. The installation program starts automatically. Follow the instructions on the screen to proceed with the installation.

If the installation program does not start automatically when you insert the CD-ROM into the CD-ROM drive, use the following procedure to start it.

4. In [My Computer], double-click the CD-ROM icon.
5. Double-click the setup.exe file in the root directory. Installation starts. Follow the instructions on the screen to complete the installation.

Note

- Before starting installation, make sure that all the resident programs such as anti-virus programs are exited.
- When installation is complete, Launcher and Data Viewer will be registered to the Start menu.
- To re-install the software, first uninstall it, then re-install it.
- To uninstall the software, follow the procedure given below.
 1. In the [Control Panel], double-click [Add/Remove Programs]. The [Add/Remove Programs Properties] dialog box will appear. From the list, select [DAQSTANDARD] and uninstall it.
 2. If necessary, back up the following files to another directory.
 - Setup data file (*.pdl) saved under the directory where the DAQSTANDARD has been installed
 3. From Windows Explore, delete all the files (data files and subdirectories) created after installation as well as the directory where the software was installed.

1.4 Starting/Exiting the Utility Software

Starting

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



After installing the software, when you first start it, the [Network] dialog box appears. For details about the setting method, see section 2.3, "Setting the Communication Method". If the recorder is not turned ON or connected, the [Network] dialog box opens. Press Esc to close the Network dialog box.

2. Click the start button of the desired utility, or select the desired utility from the Launcher menu. [Hardware Configurator], [Data Viewer], and [Network Configuration] appear on the [Launcher] menu.

Note

- Once Hardware Configurator, Data Viewer or [Network] dialog box has started, the corresponding start button will be disabled until it is exited.
- If you want to open a single Data Viewer, select [Program] - [DAQSTANDARD] - [Viewer].
- Once Hardware Configurator has started, it is not possible to open the [Network] dialog box.
- Once the [Network] dialog box is opened, it is not possible to start Hardware Configurator and Data Viewer.

Exiting

To exit Hardware Configurator or Data Viewer, select [File] - [Exit], or click the [X] button.
To exit the [Network] dialog box, click [OK], [Cancel] or [X] button.
To exit Launcher, select [Launcher] - [Exit], or click the [X] button.

Note

- Before exiting Launcher, make sure that all the utilities are exited.
- When Launcher is exited, the DAQSTANDARD will also be exited.

2.1 Functions of Launcher

The utilities of the DAQSTANDARD can be started from Launcher.

Starting

From the Start menu, select [Programs] - [DAQSTANDARD] - [Launcher]. Launcher starts, and the following window appears. If communications have not been set, the [Network] dialog box appears. Hardware Configurator (CONFIG), Data Viewer (VIEWER) and [Network] dialog box (NETWORK) can be started from Launcher.



Description of Each Button

The following three tool buttons are available.

CONFIG	Hardware Configurator Start button. Used to start Hardware Configurator. Once Hardware Configurator has started, this button will be disabled.
VIEWER	Data Viewer Start button. Used to start Data Viewer. Once Data Viewer has started, this button will be disabled.
NETWORK	[Network] Dialog Box Display button. Used to open the [Network] dialog box to set communication conditions. Once Hardware Configurator has started, this button will be disabled.

Description of Each Menu

The following two menus are available.

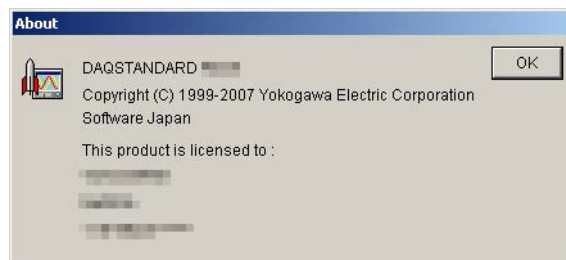
Launcher	Hardware Configurator	Same as the CONFIG button
	Data Viewer	Same as the VIEWER button
	Network Configuration	Same as the NETWORK button
Help	About	Displays the version number of Launcher.

2.2 Displaying the Version Information

To confirm the version of the DAQSTANDARD, open the [About] dialog box.

Operating Method

1. From the menu bar of Launcher, select [Help] - [About].
The [About] dialog box appears.



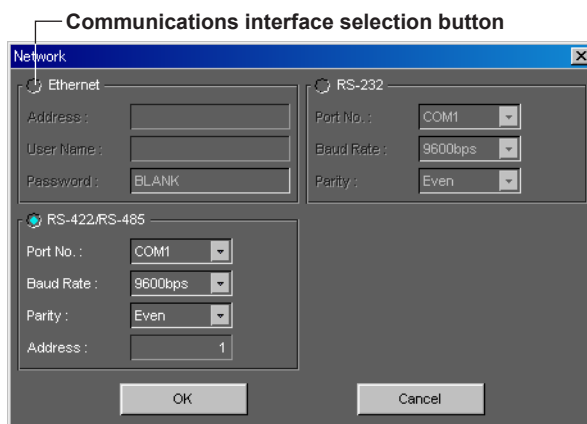
2. To close the dialog box, click [OK].

2.3 Setting the Communication Method

Set the communications interface and parameters according to the connection between your PC and the recorder.

Operating Method

1. Click the CONFIG button of Launcher, or select [Launcher] - [Network Configuration] from the menu bar.
The [Network] dialog box appears.



2. Select the desired network type. The color of the selected network turns blue.
3. Set each communication parameter.
4. When all the communication parameters are set, click [OK]. To cancel the settings, click [Cancel].

The dialog box closes, and the settings are applied to enable communications. (If communications are in progress, the dialog box closes and communications are re-started.)

Description of Each Communication Parameter

Ethernet

Address: Specify the IP address or host name.
User Name: Specify the user name.
Password: Specify the password of the user name.

Serial Interface (RS-232 or RS-422/RS-485)

Port No.: Specify the port no. (COM1 to COM9) to be used.
Baud Rate: Specify the baud rate (2400 to 38400).
Parity: Specify the parity check (None, Odd or Even).
Address: Specify the address (for RS-422/RS-485 only)

Information about the Connected Recorder

Carry out the procedure below to display information about the connected recorder.

1. Click the [CONFIG] button in the Launcher window to start the Hardware Configurator.
2. Choose [Comm.] - [Action] - [Hardware info] from the menu bar.

3.1 Starting the Hardware Configurator

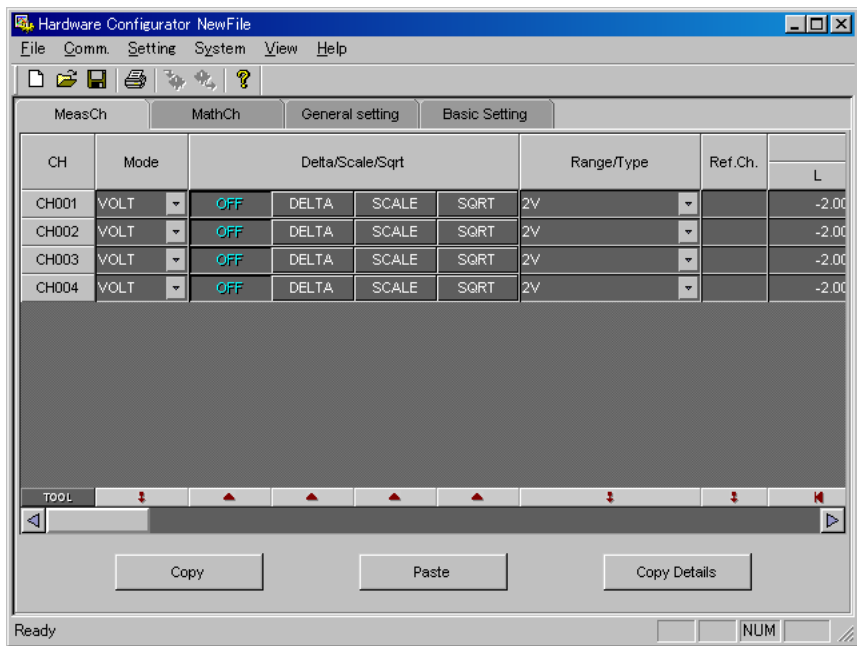
The Hardware Configurator can transmit and receive the setup data, change the setup data, and create new setup data. **The setting screen may differ from your actual screen.**

Starting the Hardware Configurator

1. Click the [CONFIG] button in the Launcher window.



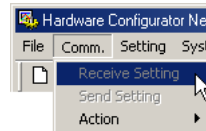
The setting screen is displayed. The DX2000 setting screen appears by default.



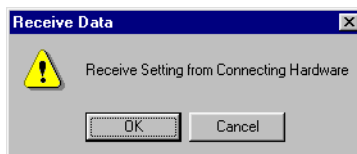
To Load Setup Data from the DX1000/DX2000

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 choose [Comm.] - [Receive Setting] from the menu bar.



The [Receive Data] dialog box opens.



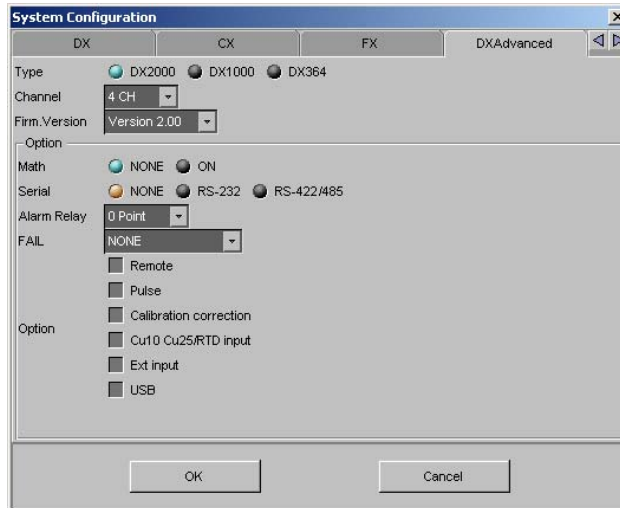
2. Click the [OK] button.
Receiving starts.

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.



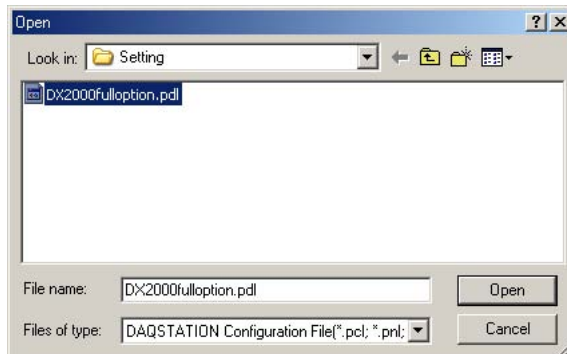
2. Enter all settings on the [DXAdvanced] tab, then click the [OK] button. The DX1000/DX2000 setting screen is displayed.

Loading Preexisting 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 Setup Data

Changing/Checking the System Configuration

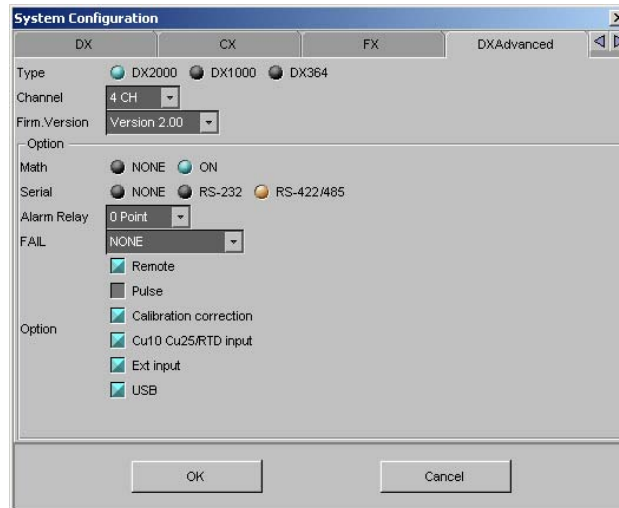
You can create new hardware configuration files, or open existing configuration files and then check the system configuration or change the configuration according to the specifications of the connected DX1000/DX2000.

Normally, a system is set up according to the specifications of the DX1000/DX2000 to be set up.

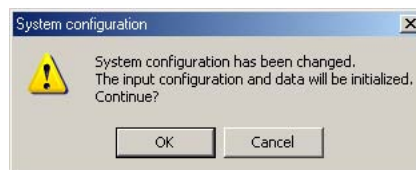
1. Choose [System] - [System Configuration] from the menu bar.



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



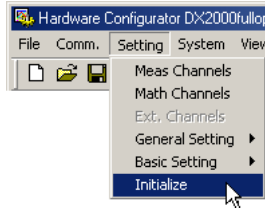
2. Change the various settings according to the DX1000/DX2000 that you will connect to (blue and brown items are selected, gray items are cleared).
The settings in the Option group differ depending on the model and options of the instrument.
For example, for the DX1000, or for the DX2000 with eight channels 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.

Hardware Configurator NewFile

File Comm. Setting System View Help

MeasCh MathCh General setting Basic Setting

CH	Mode	Delta/Scale/Sqrt			Range/Type	Ref.Ch.	Span		
		L	U	Point			L		
CH001	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.0000	2.0000	
CH002	VOLT	OFF	DELTA	SCALE	SGRT	20mV	-2.0000	2.0000	
CH003	VOLT	OFF	DELTA	SCALE	SGRT	60mV	-2.0000	2.0000	
CH004	VOLT	OFF	DELTA	SCALE	SGRT	200mV	-2.0000	2.0000	
CH005	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.0000	2.0000	
CH006	VOLT	OFF	DELTA	SCALE	SGRT	BV	-2.0000	2.0000	
CH007	VOLT	OFF	DELTA	SCALE	SGRT	20V	-2.0000	2.0000	
CH008	VOLT	OFF	DELTA	SCALE	SGRT	50V	-2.0000	2.0000	
CH009	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.0000	2.0000	
CH010	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.0000	2.0000	

Tool: [Range select shortcut buttons]

Copy Paste Copy Details

Ready NUM

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.

Hardware Configurator NewFile

File Comm. Setting System View Help

MeasCh MathCh General setting Basic Setting

CH	Green Band			Mark kind	Scale display	Alarm Mark				Calibration Correction
	Color	L	U			Mark color 1	Mark color 2	Mark color 3	Mark color 4	
CH001	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH002	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH003	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH004	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH005	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH006	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH007	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH008	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH009	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off
CH010	Green	0.0000	0.0100	Alarm	OFF	Red	Yellow	Red	Red	Off

Tool: [Range select shortcut buttons]

Copy Paste Copy Details

3.3 Setting the Measurement Channels, Ext. Channels

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.

Select this tab
 Double-click to set the channel
 Select the input mode
 Difference computation
 Scaling
 Square root
 Select the reference channel for the difference computation
 Set the span
 Enter the scale

Measure channel	Math channel	Ext channel	General setting	Basic setting	CH	Mode	Delta/Scale/Sqrt			Range/Type	Ref.Ch	Span			Scale		
							Delta	Scale	Sqrt			L	U	Point	L	U	
					CH001	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.0000	2.0000			
					CH002	VOLT	OFF	DELTA	SCALE	SQRT	2V	1	-2.0000	2.0000			
					CH003	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.0000	2.0000	2	0.00	200.00
					CH004	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.0000	2.0000	2	0.00	200.00
					CH005	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.0000	2.0000			

Set all
 Select the range/type
 Initialize

Enter the scale unit
 Set the low cut
 Select the alarm type
 Enter the alarm value
 Select the relay number
 Select the ON/OFF

Unit	Low Cut	Low Cut point	Type	Alarm 1			Alarm 2			Type	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect	Type	Value
				Value	Alarm Relay	Detect	Value	Alarm Relay	Detect										
			H	0.0000	S01		H	0.0000	None		OFF		OFF	0.00	None		OFF	0.00	
			L	0.0000	S02		OFF	0.0000	None		OFF		OFF	0.00	None		OFF	0.00	
			R	0.01	S03		OFF	0.00	None		OFF		OFF	0.00	None		OFF	0.00	
	UN	0.5	r	0.01	S04		OFF	0.00	None		OFF		OFF	0.00	None		OFF	0.00	
			H	0.00	None		OFF	0.00	None		OFF		OFF	0.00	None		OFF	0.00	

Set the value to the maximum value possible
 Set the value to the minimum value possible
 Enter the alarm delay time
 Enter the sampling count
 Enter the tag name

Alarm 3				Alarm 4				Alarm Delay	Moving Average	Tag
Type	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect			
OFF	0.0000	None		OFF	0.0000	None		10 sec	ON	2
OFF	0.0000	None		OFF	0.0000	None		10 sec	ON	2
OFF	0.00	None		OFF	0.00	None		10 sec	ON	2
OFF	0.00	None		OFF	0.00	None		10 sec	OFF	2
OFF	0.00	None		OFF	0.00	None		10 sec	OFF	2

Copy the settings of the first channel in the selected range to all other channels

Enter the display zone
 Select the graph setting
 Turn ON/OFF the partial expanded display

Memory Sampling	Zone		Graph				Partial			
	L	U	Scale display position	Scale divide position	Bar display position	Bar divide number	Bound position	Boundary		
ON	0	100	1	10	Center	-1	10	ON	50	0.0000
ON	0	100	2	10	Center	-1	11	ON	50	0.0000
ON	0	100	3	10	Center	-1	12	ON	50	0.01
ON	0	100	4	10	Normal	-1	10	ON	50	0.01

Select the channel display color
 Set the green band
 Select the mark type
 Click here to set the calibration correction (see page 3-8)

Color	Green Band				Mark kind	Scale display	Alarm Mark				Calibration Correction
	Region	Color	L	U			Mark color 1	Mark color 2	Mark color 3	Mark color 4	
Inside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Red	Off	
Outside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Red	Off	
Inside	Green	0.00	1.00	Fixed	ON	Red	Yellow	Red	Red	Off	
Outside	Green	0.00	1.00	Alarm	ON	Red	Yellow	Red	Red	Off	

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 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.

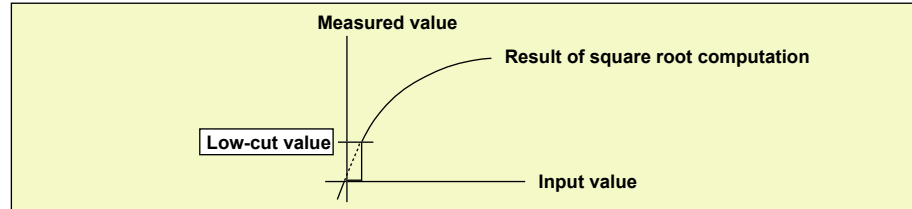
3.3 Setting the Measurement Channels, Ext. Channels

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.

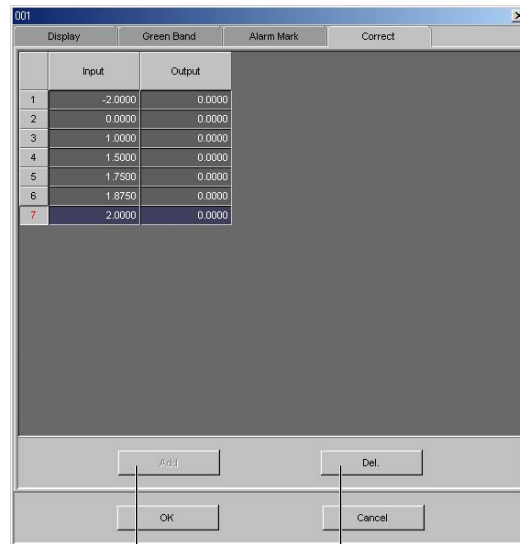
Low-cut value (Can be set when the mode is VOLT with square root (SQRT) selected.)

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

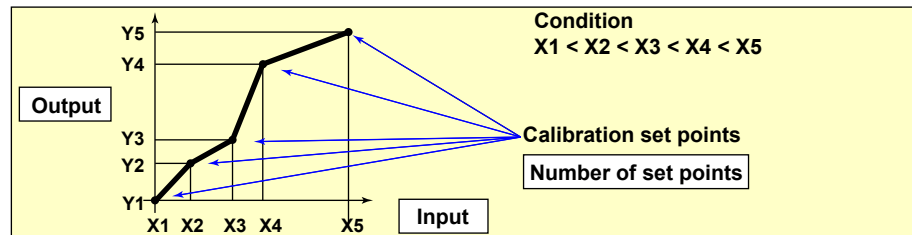


Calibration Correction

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 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

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

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 [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).

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.

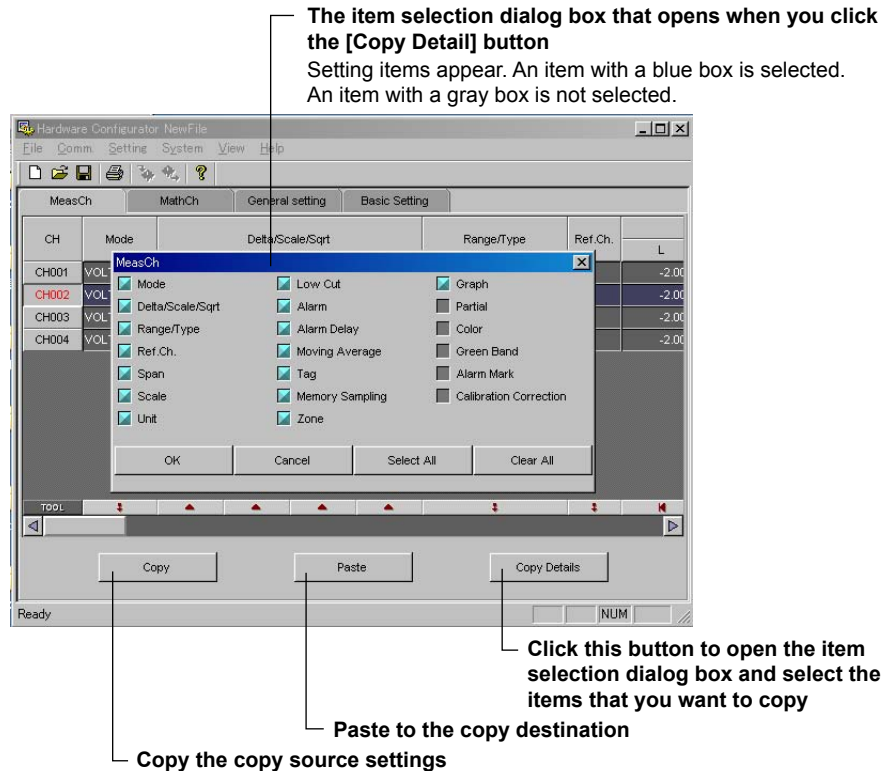
Copying and Pasting Setup Data

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.



Copying and Pasting Settings

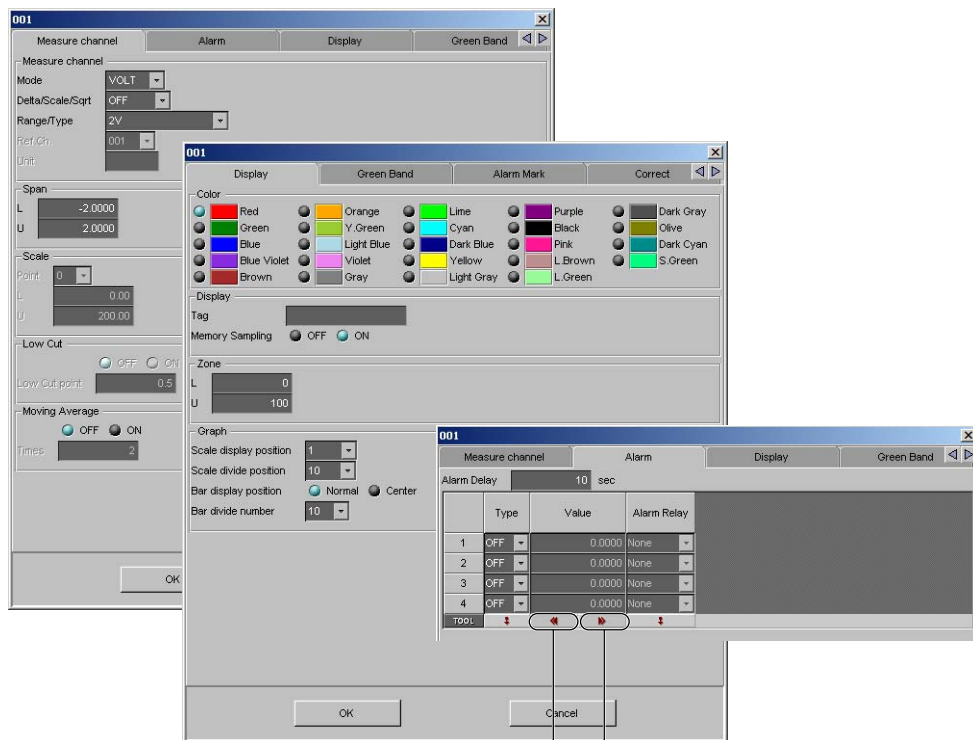
1. Select the copy source numbers (the [CH] row in this figure) and click the [Copy] button.
* To specify multiple copy sources, drag over the numbers to select them.
2. Select the copy destination numbers (the [CH] row in this figure) and click the [Paste] button.
* To specify multiple copy destinations,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

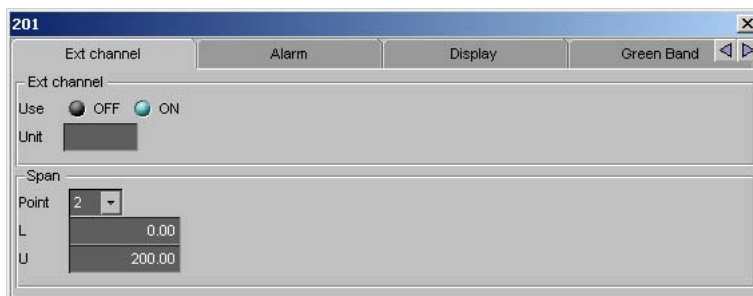
Meas	Math	Setting	Setup
CH	Mode	Delta/Scale	
CH01	VOLT	OFF	DELTA SC
CH02	VOLT	OFF	DELTA SC
CH03	VOLT	OFF	DELTA SC

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 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

Double-click when setting each channel

Turn ON/OFF computation

Select this tab

Enter the expression

Select the number of digits to the right the decimal

Set the display span

Enter the unit

Enter the constant used in the expression

CH	Use	Expression
CH101	ON	(001+002)*K01
CH102	ON	201-002+K02
CH103	ON	001.K03
CH104	ON	003*K04
CH105	OFF	001

Point	Span	Unit	Timer	Sum Scale	Reset	Constant
0	0	20000	1	/s	ON	K01 0.1
1	0.0	2000.0	1	/min	ON	K02 1
2	0.00	200.00	1	/h	ON	K03 2
3	0.000	20.000	1	OFF	ON	K04 3
2	0.00	200.00	1	OFF	OFF	K05 1

Turn ON/OFF all at once

Set the TLOG computation

Set the rolling average

Timer	Sum Scale	Reset	Interval	Count	Type	Value	Alarm Relay	Detect
1	/s	ON	10s	1	OFF	0	None	
1	/min	ON	10s	1	OFF	0.0	None	
1	/h	ON	10s	1	OFF	0.00	None	
1	OFF	ON	10s	1	OFF	0.000	None	

Select the alarm type

Enter the alarm value

Select the relay number

Select the ON/OFF

Alarm 1				Alarm 2				Alarm 3			
Type	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect
H	0	None		H	0	S01		H	0	S05	
L	0.0	None		L	0.0	S02		L	0.0	S06	
T	0.00	None		T	0.00	S03		T	0.00	S07	
t	0.000	None		t	0.000	S04		t	0.000	S08	
OFF	0.00	None		OFF	0.00	None		OFF	0.00	None	

Enter the alarm delay time

Enter the tag

Display zone

Type	Value	Alarm Relay	Detect	Alarm Delay	Tag	Memory Sampling	Zone		
							L	U	Scale display position
OFF	0	None		10 sec		ON	0	100	1
OFF	0.0	None		10 sec		ON	0	100	1
OFF	0.00	None		10 sec		ON	0	100	1
OFF	0.000	None		10 sec		ON	0	100	1
OFF	0.00	None		10 sec		ON	0	100	1

Set the graph

Turn ON/OFF the partial expanded display

Select the channel display color

Graph					Partial		Color	
Scale display position	Scale divide position	Bar display position	Bar divide number	Bound position	Boundary	Region		
1	10	Normal	1	50	1	OFF		
1	10	Normal	1	50	0.1	OFF		
1	10	Normal	1	50	0.01	OFF		
1	10	Normal	1	50	0.001	OFF		
1	10	Normal	1	50	0.01	OFF		

Set the green band

Select the mark type

Turn ON/OFF scale display

Select the mark color

Green Band						Alarm Mark			
Region	Color	L	U	Mark kind	Scale display	Mark color 1	Mark color 2	Mark color 3	Mark color 4
inside	Green	0	100	Fixed	ON	Red	Yellow	Yellow	Red
Outside	Green	0.0	10.0	Fixed	ON	Red	Yellow	Yellow	Red
OFF	Green	0.00	1.00	Alarm	ON	Red	Yellow	Yellow	Red
OFF	Green	0.000	0.100	Alarm	ON	Red	Yellow	Yellow	Red
OFF	Green	0.00	1.00	Alarm	OFF	Red	Yellow	Yellow	Red

Use (Turning ON/OFF Computation)

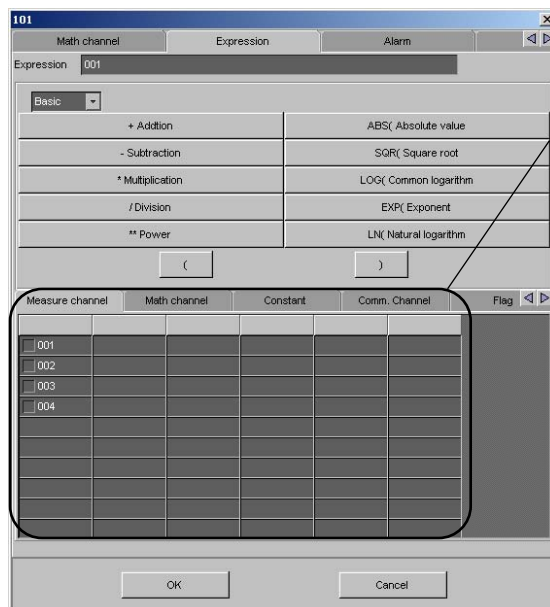
Select whether or not to perform computation for each channel.

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

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

Select the 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 "m³/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

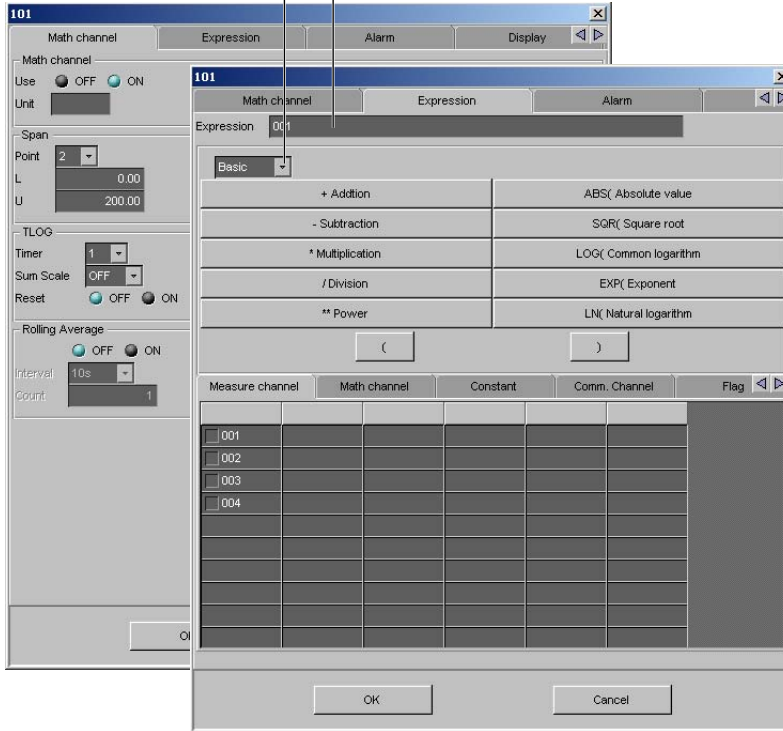
1. Double-click the channel you wish to set.

MeasCh	MathCh	E
CH	Use	
CH101	<input checked="" type="checkbox"/> ON	(001+002)*K01
CH102	<input checked="" type="checkbox"/> ON	201-002+K02
CH103	<input checked="" type="checkbox"/> ON	001/K03

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

Summer Time

MeasCh MathCh Ext.Ch General setting Basic Setting

Summer time

On/Off Not Use

Start Time APR 1st SUN 2 :00

End Time OCT Last SUN 1 :00

- 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 switch 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.

Group	Use	Group Name	Channel Configuration	Use	Position	Color	Trend Line
1	<input checked="" type="checkbox"/> ON	GROUP 1	001.002.003.004.005.006.007.008.009.010	<input checked="" type="checkbox"/> ON	50	Red	2
2	<input checked="" type="checkbox"/> ON	GROUP 2	011.012.013.014.015.016.017.018.019.020	<input checked="" type="checkbox"/> ON	50	Red	2
3	<input checked="" type="checkbox"/> ON	GROUP 3	021.022.023.024.025.026.027.028.029.030	<input checked="" type="checkbox"/> ON	50	Red	2
4	<input checked="" type="checkbox"/> ON	GROUP 4	031.032.033.034.035.036.037.038.039.040	<input checked="" type="checkbox"/> ON	50	Red	2
5	<input checked="" type="checkbox"/> ON	GROUP 5	041.042.043.044.045.046.047.048	<input checked="" type="checkbox"/> ON	50	Red	2
6	<input type="checkbox"/> OFF	GROUP 6	001.002.003.004.005.006.007.008.009.010	<input type="checkbox"/> OFF	50	Red	2
7	<input type="checkbox"/> OFF	GROUP 7	011.012.013.014.015.016.017.018.019.020	<input type="checkbox"/> OFF	50	Red	2
8	<input type="checkbox"/> OFF	GROUP 8	021.022.023.024.025.026.027.028.029.030	<input type="checkbox"/> OFF	50	Red	2
9	<input type="checkbox"/> OFF	GROUP 9	031.032.033.034.035.036.037.038.039.040	<input type="checkbox"/> OFF	50	Red	2
10	<input type="checkbox"/> OFF	GROUP 10	041.042.043.044.045.046.047.048	<input type="checkbox"/> OFF	50	Red	2

Copy Paste Copy Details

Channel Configuration Trip Line

Use OFF ON

Group Name GROUP 1

Channel Configuration 001.002.003.004.005.006.007.008.009.010

MeasCh	MathCh	Ext.Ch 201	Ext.Ch 261	Ext.Ch 321	Ext.Ch 381
<input checked="" type="checkbox"/> 001	<input checked="" type="checkbox"/> 011	<input checked="" type="checkbox"/> 021	<input checked="" type="checkbox"/> 031	<input checked="" type="checkbox"/> 041	
<input checked="" type="checkbox"/> 002	<input checked="" type="checkbox"/> 012	<input checked="" type="checkbox"/> 022	<input checked="" type="checkbox"/> 032	<input checked="" type="checkbox"/> 042	
<input checked="" type="checkbox"/> 003	<input checked="" type="checkbox"/> 013	<input checked="" type="checkbox"/> 023	<input checked="" type="checkbox"/> 033	<input checked="" type="checkbox"/> 043	
<input checked="" type="checkbox"/> 004	<input checked="" type="checkbox"/> 014	<input checked="" type="checkbox"/> 024	<input checked="" type="checkbox"/> 034	<input checked="" type="checkbox"/> 044	
<input checked="" type="checkbox"/> 005	<input checked="" type="checkbox"/> 015	<input checked="" type="checkbox"/> 025	<input checked="" type="checkbox"/> 035	<input checked="" type="checkbox"/> 045	
<input checked="" type="checkbox"/> 006	<input checked="" type="checkbox"/> 016	<input checked="" type="checkbox"/> 026	<input checked="" type="checkbox"/> 036	<input checked="" type="checkbox"/> 046	
<input checked="" type="checkbox"/> 007	<input checked="" type="checkbox"/> 017	<input checked="" type="checkbox"/> 027	<input checked="" type="checkbox"/> 037	<input checked="" type="checkbox"/> 047	
<input checked="" type="checkbox"/> 008	<input checked="" type="checkbox"/> 018	<input checked="" type="checkbox"/> 028	<input checked="" type="checkbox"/> 038	<input checked="" type="checkbox"/> 048	
<input checked="" type="checkbox"/> 009	<input checked="" type="checkbox"/> 019	<input checked="" type="checkbox"/> 029	<input checked="" type="checkbox"/> 039		
<input checked="" type="checkbox"/> 010	<input checked="" type="checkbox"/> 020	<input checked="" type="checkbox"/> 030	<input checked="" type="checkbox"/> 040		

OK Cancel

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 (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

MeasCh	MathCh	Ext.Ch	General setting	Basic Setting
<input checked="" type="radio"/> Summer time <input checked="" type="radio"/> Group <input checked="" type="radio"/> Display <input type="radio"/> View group <input type="radio"/> Message <input type="radio"/> Timer <input type="radio"/> Manual Sample <input type="radio"/> Event Action <input type="radio"/> File <input type="radio"/> Custom menu				
Logging				
Trend Interval[dev]			1min	
Save Interval			1h	
Circular Time Per revolution[rev]			1day	
Circular Save Interval			1day	
Circular Offset Time			OFF	
Trend				
Display Update 2nd Interval			1min	
Direction			<input checked="" type="radio"/> Horizon	<input type="radio"/> Vertical <input type="radio"/> Wide <input type="radio"/> Split
Trend Clear			<input checked="" type="radio"/> OFF	<input type="radio"/> ON
Message Direction			<input checked="" type="radio"/> Horizon	<input type="radio"/> Vertical
Scale Digit			<input checked="" type="radio"/> Normal	<input type="radio"/> Copy Details
Value Indicator			<input checked="" type="radio"/> Mark	<input type="radio"/> Bargraph
Full Circle Action			<input type="radio"/> New	<input type="radio"/> Update
Trend Line			2	
Grid			Auto	
Display				
Bar Graph Direction			<input type="radio"/> Horizon	<input checked="" type="radio"/> Vertical
Brightness			2	
Backlight Saver Mode			<input type="radio"/> Off	<input type="radio"/> Dimmer <input checked="" type="radio"/> Time off
Backlight Saver Time			1h	
Backlight Restore			<input type="radio"/> Key	<input checked="" type="radio"/> Key & Alarm
Trend Background			<input checked="" type="radio"/> White	<input type="radio"/> Black
Historical Trend Background			<input type="radio"/> White	<input checked="" type="radio"/> Black <input type="radio"/> Cream <input type="radio"/> Light Gray
Scroll Time			10s	
Jump Default Display			OFF	

3.5 Entering General Settings

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 Trend interval setting.

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

* Selectable on the DX1002, DX1002N, DX1004, DX1004N, DX2004 and DX2008.

Circular Time Per revolution [/rev]

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

* Selectable on the DX2004 and DX2008.

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 [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.

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.

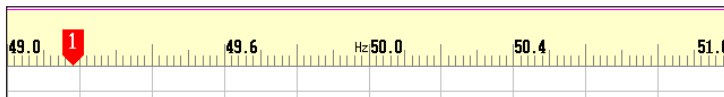
Message direction

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.

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.

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.

3.5 Entering General Settings

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

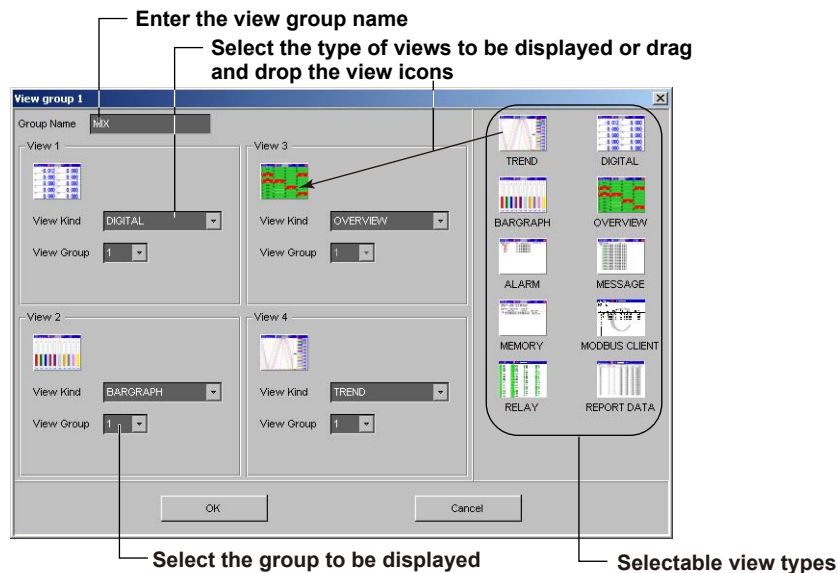
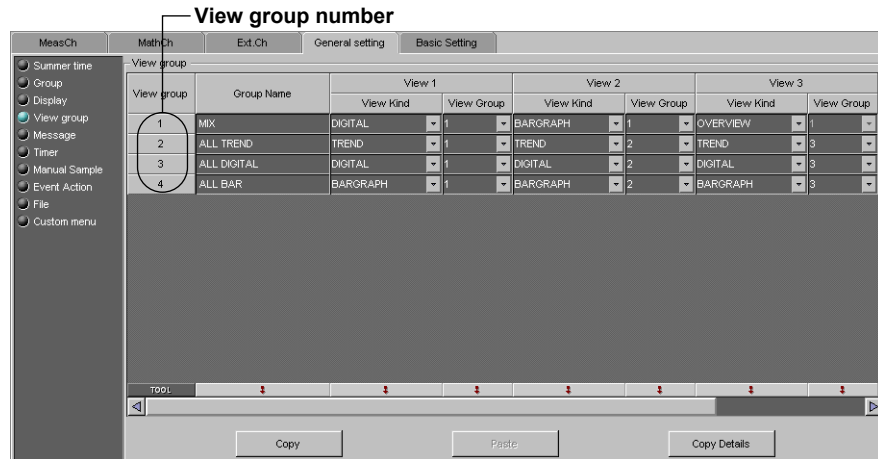
Returns to a preset display if there is no key operation for a specific time.

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

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.



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

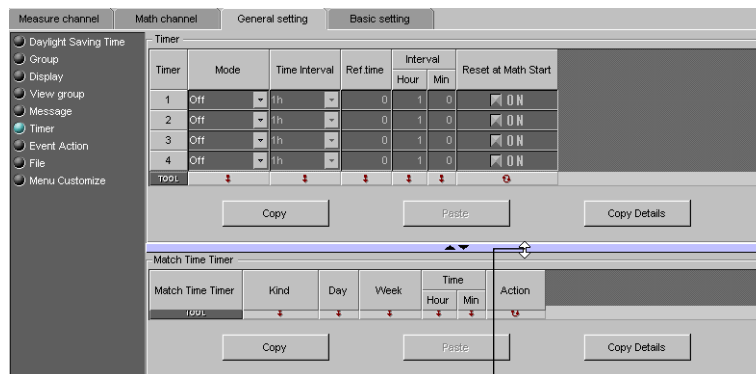
Up to four view groups can be registered.

Message



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

Timer



Changes the upper/lower display area

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.

3.5 Entering General Settings

Match Time Timer

Set the time match condition used in event action.

- **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.

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

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

- **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.

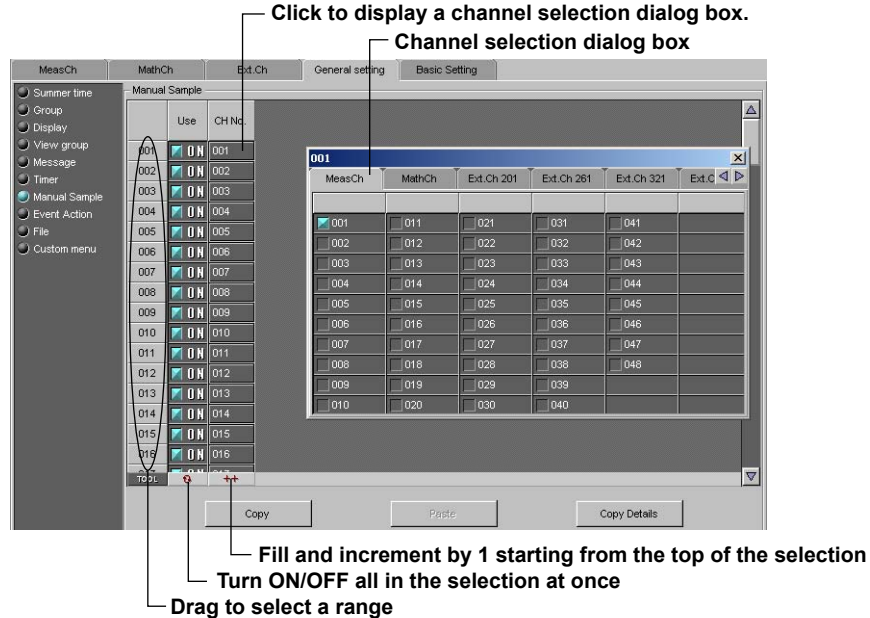
- **Timer action**

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

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

Manual Sample

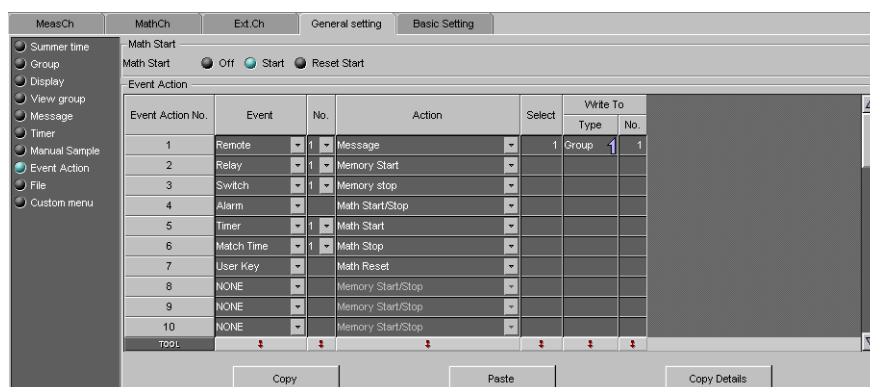
- **Use**

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



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	-

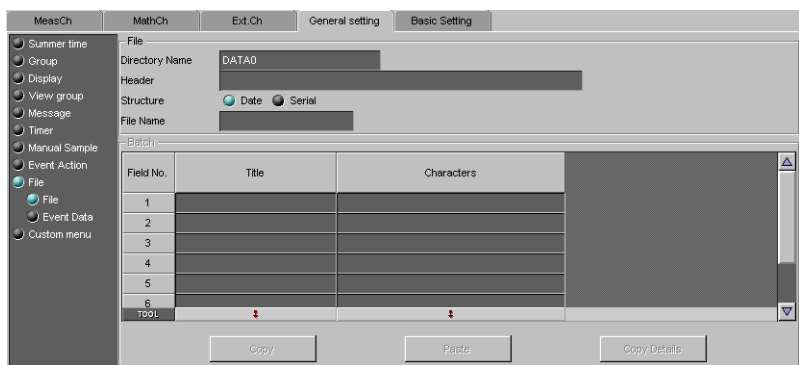
Action

The action to be executed when an event occurs.

Settings	Description
Memory Start/Stop	-
Memory Start	-
Memory Stop	-
Trigger	Can be specified when the 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	Can be specified only when the event is set to [Remote].

3.5 Entering General Settings

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)

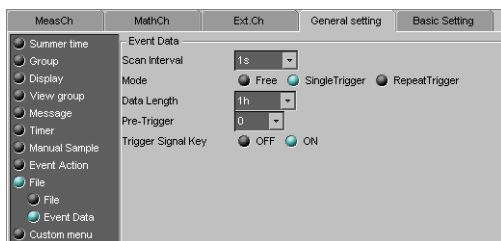
Symbols that can be used: #, %, (,), +, -, ., @, °, and _.

Field Title, Field Characters

Set the string.

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

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” on the next page. 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 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 DX1002, DX1002N, DX1004, DX1004N, DX2004 and DX2008

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%.

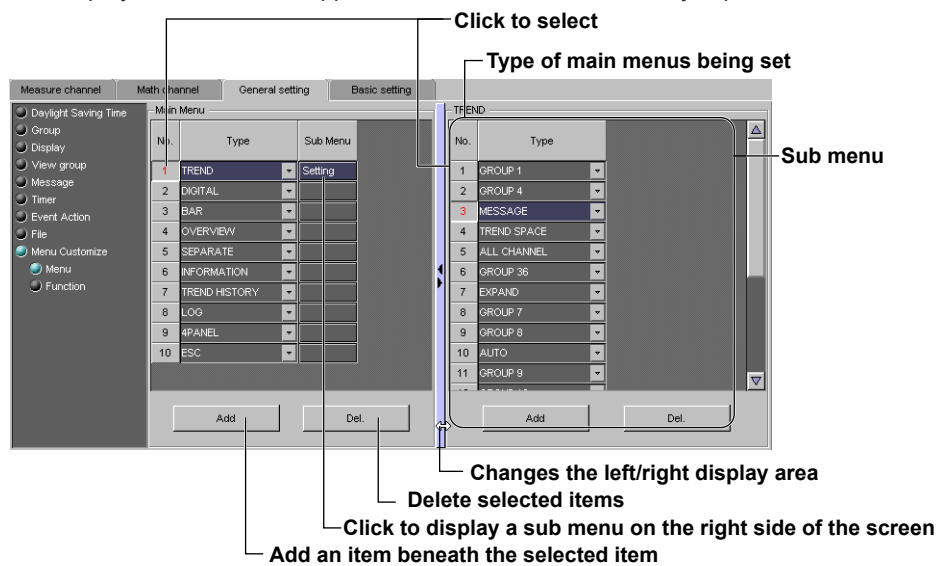
Trigger Signal Key

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

Custom Menu

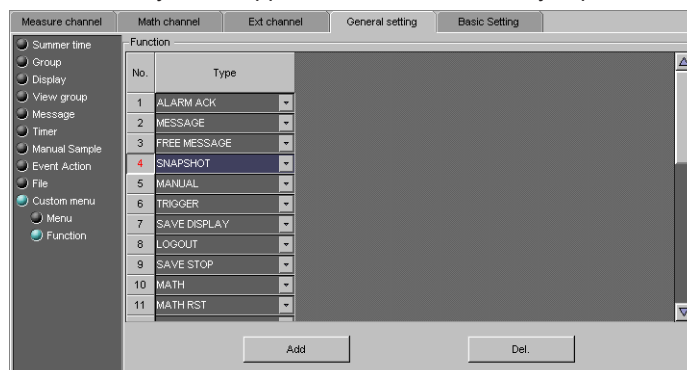
Menu

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



Function

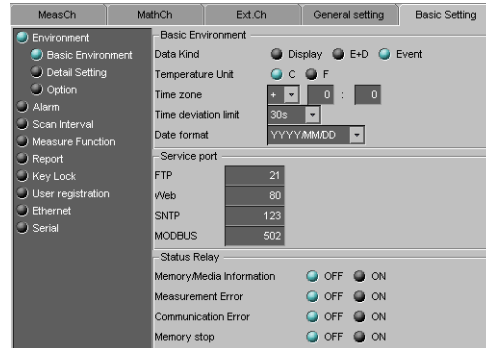
The FUNC key menu appears when the FUNC key is pressed.



3.6 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.

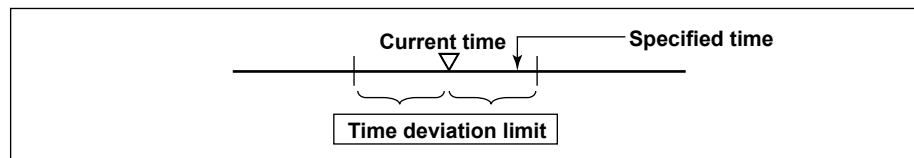
- **Temperature Unit**

Select C or F.

- **Time zone**

Set the time zone of the region in which the 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 \pm (the value specified here), the time on the DX 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 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.

- **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).

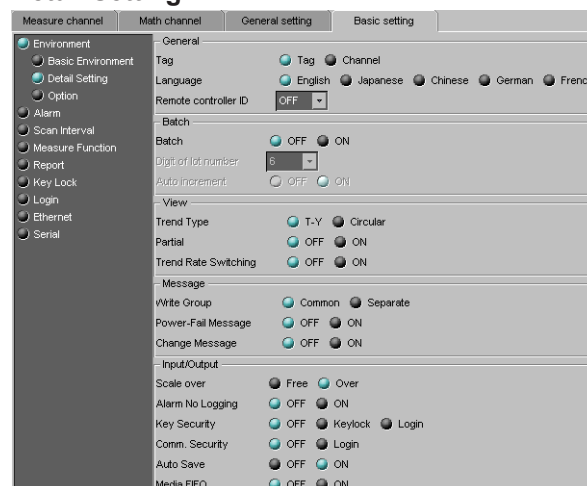
*2 The port number is fixed.

*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**

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] (/F2 option) or [FAIL/Status relay] (/F1 option), 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

- **Remote controller ID**

Select the remote controller ID from 0 to 31. When not using the remote control terminal, select [OFF].

- **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.

3.6 Entering Basic Settings

- **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 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 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.

- **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 DX 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 DX via communications. The [User registration] is displayed in the basic setting mode menu.
OFF	Disables the security functions.

- **Auto Save**

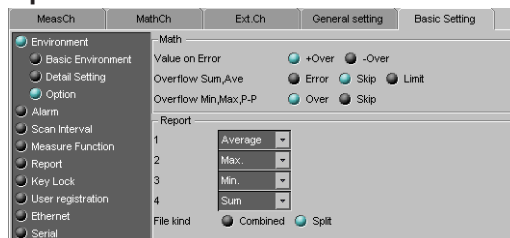
Settings	Description
ON	Automatically saves the measured data to the CF card.
OFF	Does not automatically save the data. Save the measured data manually to the CF card or USB flash memory (/USB1 option).

- **Media FIFO**

You can select this with 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.

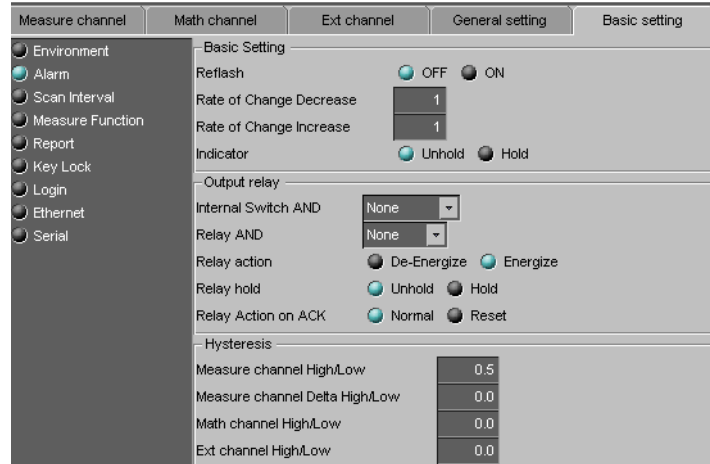
3.6 Entering Basic Settings

- **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

You can select this with DX main unit firmware version 2.0x or later.

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

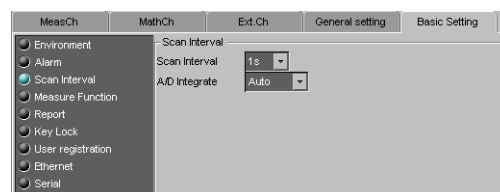
Sets the hysteresis width of the alarm occurrence/release of the difference high/low limit alarm specified on measurement channels.

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 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.

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

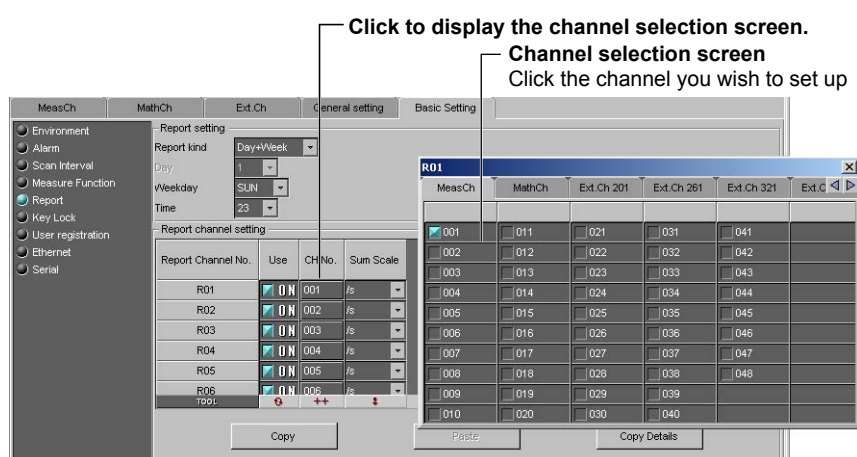
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

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.

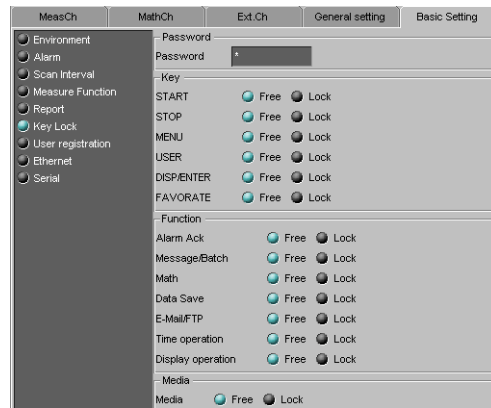
Sum Scale

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 "m³/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

Mode	User Name	Password
1 Comm	Admin1	*
2 Web	Admin2	*
3 Off	Admin3	*
4 Off	Admin4	*
5 Off	Admin6	*

- **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. (Up to 8 characters)

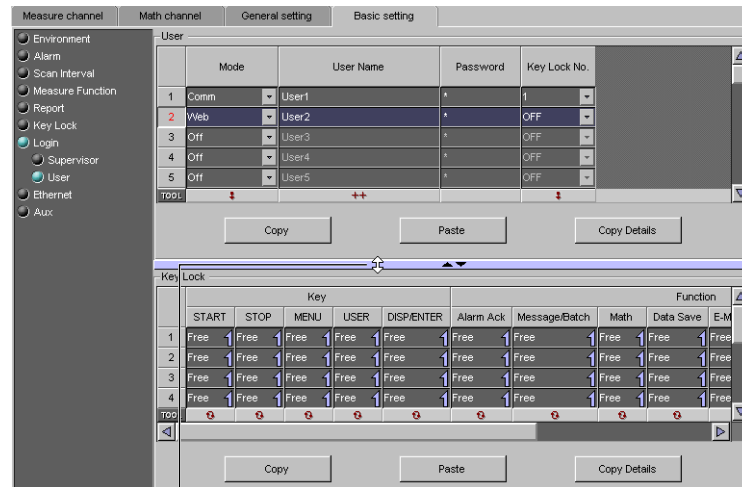
An entered password is displayed as "*****."

- You cannot register "quit" or a password containing all spaces.

3.6 Entering Basic Settings

User

Up to 30 names can be registered.



Changes the upper/lower display area

- **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 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 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

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 DX behind a firewall that requires the passive mode. The default setting is [OFF].

3.6 Entering Basic Settings

- **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 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

The screenshot shows the 'MODBUS Client' configuration window. On the left is a navigation menu with options like Environment, Alarm, Scan Interval, Measure Function, Report, Key Lock, Login, Ethernet, TCP/IP, FTP, Modbus client, E-Mail, SNMP client, Server functions, and Serial. The 'Modbus client' option is selected. The main area is divided into 'Basic Setting', 'Modbus Server Setting', and 'Command setting'. The 'Modbus Server Setting' table has columns for Server No., Host Name, and Port. The 'Command setting' table has columns for Client Command No., Command, Start channel, End channel, Connect to, Register, and Type. A callout box with an arrow points to a small icon in the 'Modbus Server Setting' table, with the text: 'Click to display the channel selection screen' and 'Changes the upper/lower display area'.

Click to display the channel selection screen
Changes the upper/lower display area

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.

3.6 Entering Basic Settings

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 DX2000s 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 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).

E-mail

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.
- **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.

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.

3.6 Entering Basic Settings

Scheduled

The screenshot shows the 'Scheduled' configuration page. On the left is a navigation menu with options like Environment, Alarm, Scan Interval, Measure Function, Report, Key Lock, User registration, Ethernet, TCP/IP, FTP, MODBUS client, E-Mail, SNTP client, Server functions, and Serial. The main area is titled 'Basic Setting' and contains fields for SMTP server name, Port No. (set to 25), Address 1, Address 2, and Sender. Below these are four tabs: Alarm, Scheduled, System, and Report. The 'Scheduled' tab is selected, showing settings for two recipients. Recipient1 and Recipient2 each have an 'OFF' radio button selected, an interval of 24h, and a reference time of 0:0. There are also checkboxes for 'Include INST' and 'Include source URL', both of which are 'OFF'. The subject is 'Periodic_data' and there are fields for Header1 and Header2.

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

The screenshot shows the 'System' configuration page. It has the same navigation menu and SMTP settings as the 'Scheduled' page. The 'System' tab is selected, showing settings for Recipient1 and Recipient2. Both have 'OFF' radio buttons selected. The 'Include source URL' checkbox is 'OFF'. The subject is 'System_warning' and there are fields for Header1 and Header2.

Specify the settings for sending e-mail when the DX 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

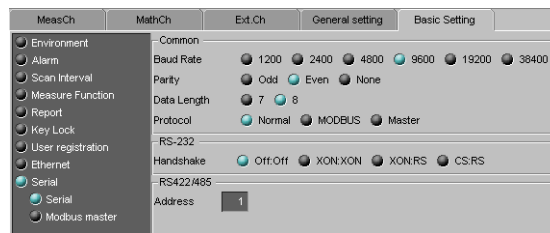
- **Use**
Select [Use] to use the SNTP client function; Otherwise, select [Not]. If you select [Use], the SNTP client settings are displayed.
- **Server Name**
Set the SNTP server name using up to 64 alphanumeric characters.
 - If the DNS is used, you can set the host name as a server name.
 - You can 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 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

MeasCh	MathCh	Ext.Ch	General setting	Basic Setting
- FTP Server				
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>				
- Web server				
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>				
Operator <input type="radio"/> OFF <input checked="" type="radio"/> ON				
Access Control Administrator				
Command <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>				
Monitor <input type="radio"/> OFF <input checked="" type="radio"/> ON				
Access Control OFF				
- SNTP Server				
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>				
- Modbus Server				
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>				

- **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**

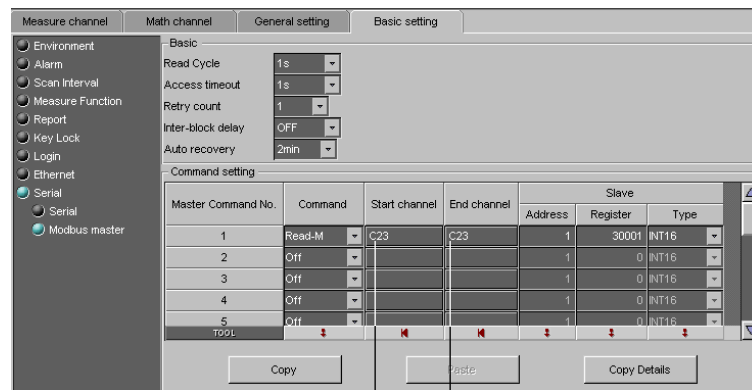
- **Baud Rate**
Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Parity**
Set the parity check method to Odd, Even, or None.
- **Data length**
Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Handshaking**
Select Off:Off, XON:XON, XON:RS, or CS:RS.
- **Address**
For Modbus 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.

3.6 Entering Basic Settings

Modbus master



Click to display the channel selection screen

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 DX2000s with the external input channel (/MC1 option) installed.
[R-Math] and [W-Math] 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 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).

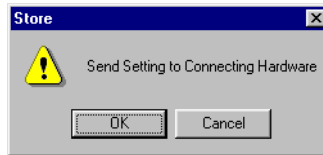
3.7 Sending the Setup Data to the DX1000/DX2000

Data cannot be sent while the DX1000/DX2000 is starting up (while loading data into memory) or Math in progress.

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



The send settings dialog box opens.



2. Click [OK] to start sending. A message is displayed when sending is complete. Click [OK] to clear the message.

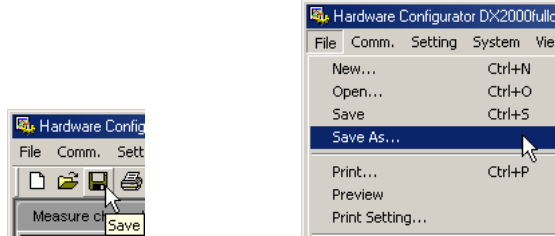
Note

The following items located on the setup tab cannot be sent.

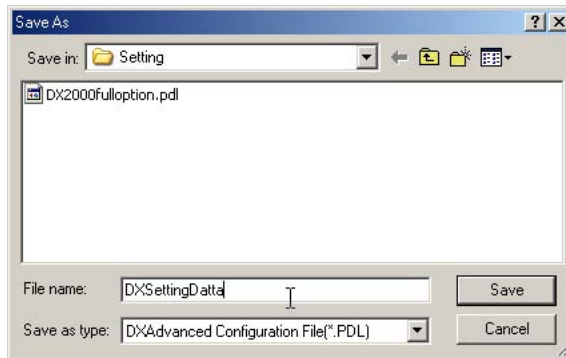
- The [Ethernet communication] - [TCP/IP] and [Server functions] setting items
- All serial communication settings

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

The setup data are overwritten to the preexisting file (*.PDL). The [Save As] dialog box does not open.

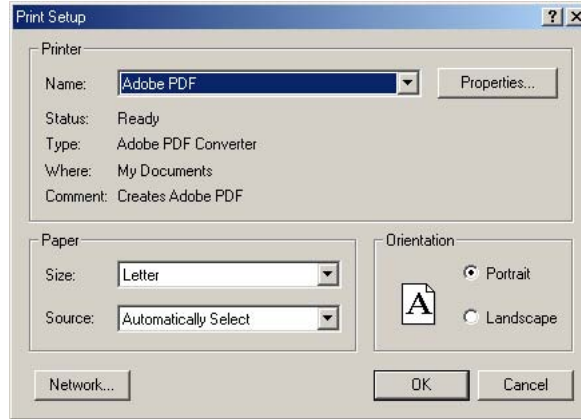
Save As

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

3.9 Printing the Setup Data

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

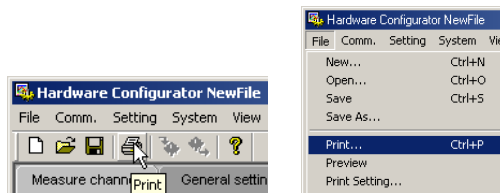
Set the printer according to the environment of the system that you are using.

Print Preview

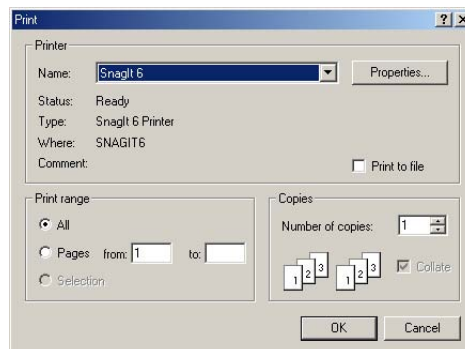
You can preview the print layout before actually printing the data. Selecting [File] - [Print Preview] displays the print preview screen.

Printing

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



The [Print] dialog box opens.



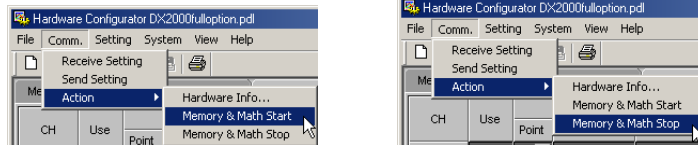
2. Click the [OK] button to start printing.

3.10 Starting and Stopping Measurement on the DX1000/DX2000, Checking the DX1000/DX2000 System Configuration

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

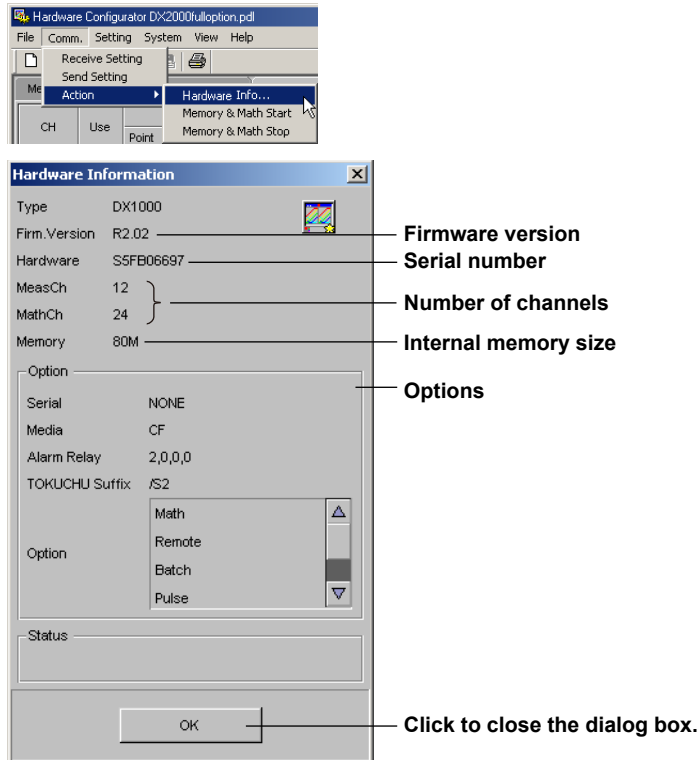
Starting and Stopping Measurement

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



Displaying DX1000/DX2000 System Configuration Information

1. Choose [Comm.] - [Action] - [Hardware info] from the menu bar.



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
	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	

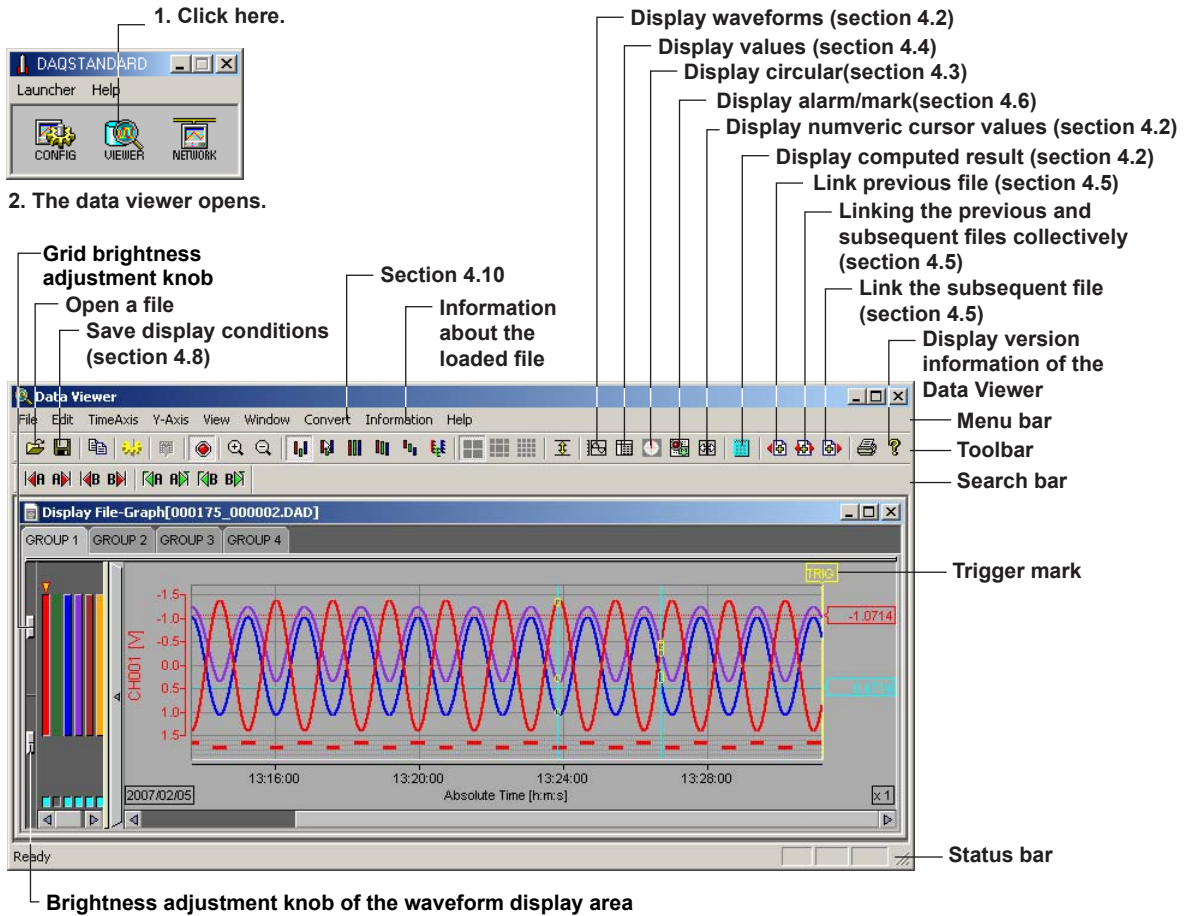
(SP) means “space.”

“ ° ” is the symbol for degrees (of temperature). Input, output and indicated using “ ^ .”

“ [” and “] ” are only allowed in expressions.

4.1 Starting and Exiting the Data Viewer

Starting the Data Viewer



You can also start the program by selecting [Start] - [Programs] - [DAQEXPLORER] - [Viewer].

You cannot start multiple Data Viewers. If you set file associations you can start Data Viewer by double-clicking a data file. You can start Data Viewer by dragging a data file onto the Data Viewer icon.

Files That the Data Viewer Can Display (Extension)

File Type	DX1000/ DX1000N/ DX2000	MV1000/ MV2000	CX1000/ CX2000	DX100/ DX200/ DX200C	MV100/ MV200
Display data file	DAD	DAD	cds	dds	dds
Event data file	DAE	DAE	cev	dev	dev
TLOG file	-	-	dtg	dtg	dtg
Link settings file	ldx	ldx	ldx	ldx	ldx
Report file	DAR*	DAR*	dhr, ddr, dwr, dmr	dhr, ddr, dwr, dmr	dhr, ddr, dwr, dmr
Manually sampled data file	DAM	DAM	dmn	dmn	dmn

* Can be displayed in stacked bar graphs (column bar).

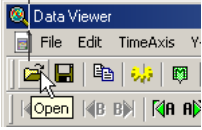
Toolbar, Search Bar, and Status Bar

Clicking [View] - [Toolbar], [Search Bar], or [Status Bar] from the menu bar displays the corresponding bar in the window. The bar will disappear if the check is removed.

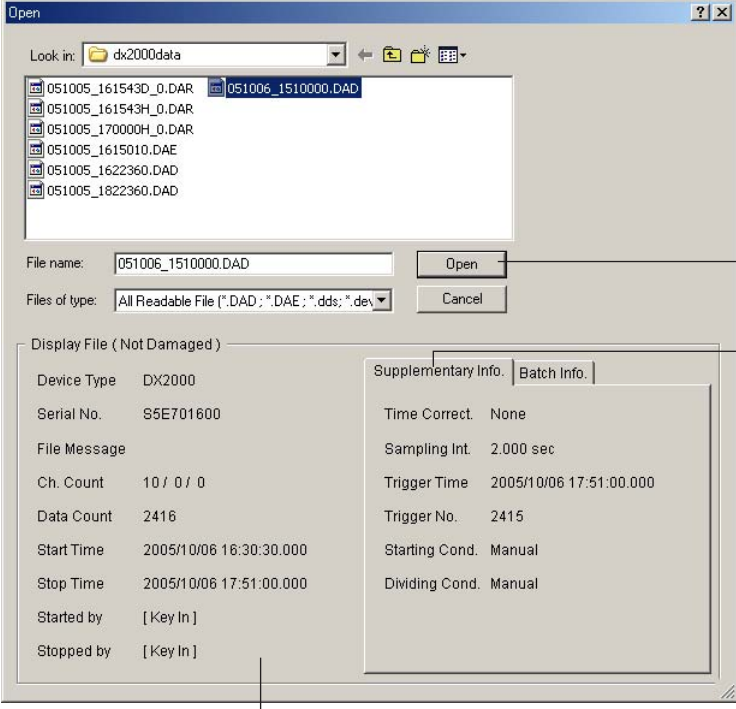
4.1 Starting and Exiting the Data Viewer

Opening the File

1. Click here ([File] - [Open]).



2. The [Open] dialog box opens.



3. Select the desired file and click the [Open] button.

Supplementary Info. tab

Display File (Not Damaged)	
Device Type	DX2000
Serial No.	S5E701600
File Message	
Ch. Count	10 / 0 / 0
Data Count	2416
Start Time	2005/10/06 16:30:30.000
Stop Time	2005/10/06 17:51:00.000
Started by	[Key In]
Stopped by	[Key In]

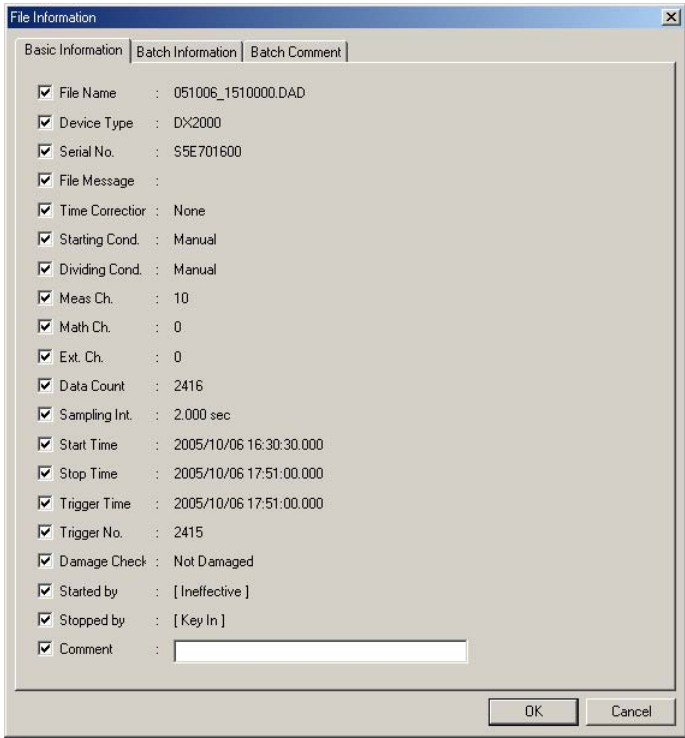
Supplementary Info.	
Time Correct.	None
Sampling Int.	2.000 sec
Trigger Time	2005/10/06 17:51:00.000
Trigger No.	2415
Starting Cond.	Manual
Dividing Cond.	Manual

Information about the selected file

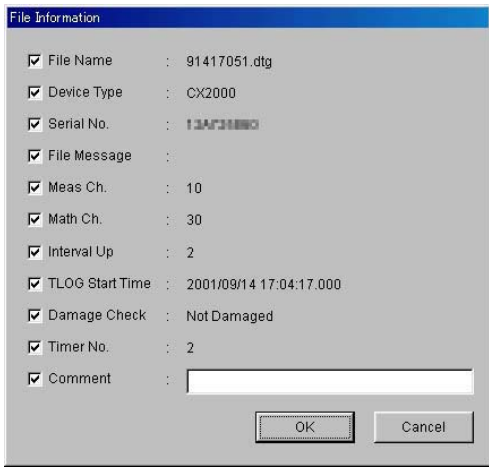
Checking the Information About the Loaded File

You can check the information about the active data file by selecting [Information] - [About Document].

• For display data files and event data files



• For TLOG files



The items that are checked are output in the header when printed.

Note

- Multiple files can be opened simultaneously.
- The number of files that can be opened simultaneously depends on the memory size of the PC and the free disk space.

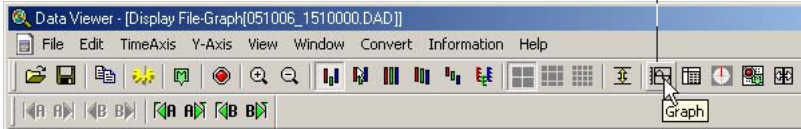
Exiting the Data Viewer

Select [File] - [Exit] or click the [x] button. If you changed the settings in any of the windows, a message "Save changes to ****.****?" is displayed. Click the [Yes] button, if you wish to save the settings and exit the Data Viewer. Click the [No] button, if you do not wish to save the settings and exit the Data Viewer.

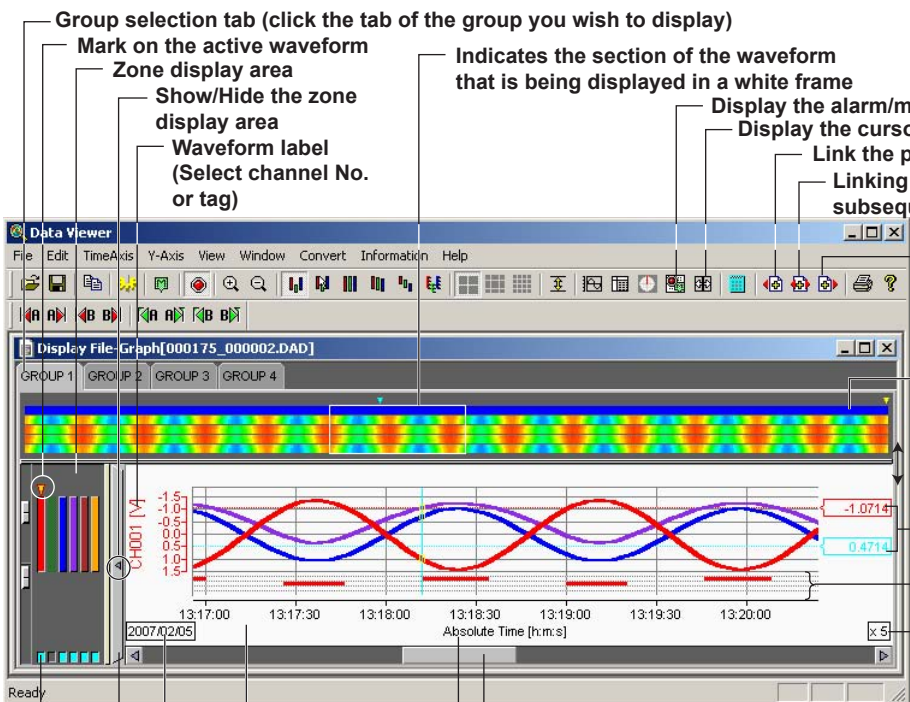
4.2 Displaying the Waveform

Displaying the Waveform

1. Click here ([Window] - [Graph]).



2. The waveform display screen opens.



Group selection tab (click the tab of the group you wish to display)

Mark on the active waveform

Zone display area

Show/Hide the zone display area

Waveform label (Select channel No. or tag)

Indicates the section of the waveform that is being displayed in a white frame

Display the alarm/mark list

Display the cursor value

Link the previous file

Linking the previous and subsequent files collectively

Link the subsequent file

Color overview

Color display adjuster (turn ON/OFF the color overview display)

Trip line of the active waveform

Alarm display area

Magnification

Date

Waveform display area

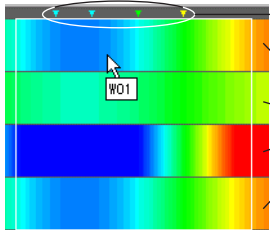
Move the waveform display position (Scroll bar)

Absolute or relative time

Drag this bar to change the size of the zone display area

Turn ON/OFF waveform display

Color Overview Display



Displays marks and cursors

Displays the waveforms that have the display turned ON

The measured values of the entire data are displayed using various colors. By assigning 50 different colors from the minimum to the maximum values of the scale, the measured values are assigned to those colors.

If the data are display data, the maximum value is displayed at the top of the space allocated to a single waveform, and the minimum value is displayed at the bottom.

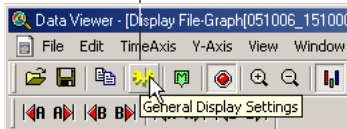
If you click or drag the cursor on the color overview display area, the section of the waveform is displayed in the waveform display area.

Note

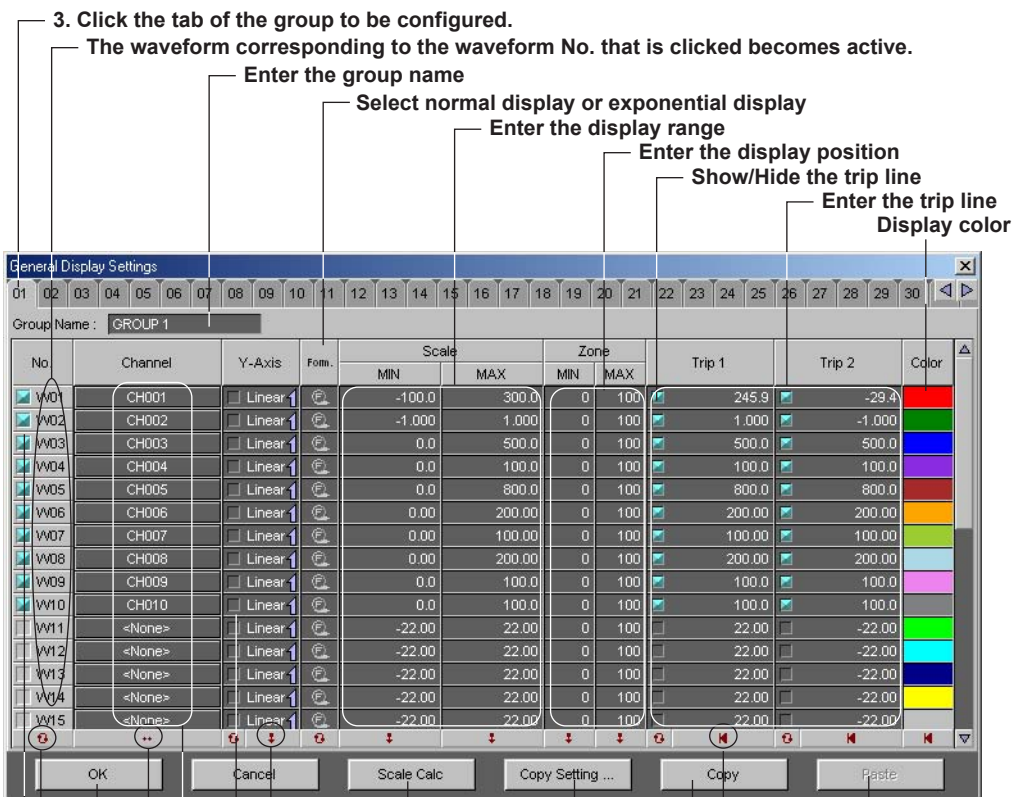
The color overview is turned OFF as default.

General Display Settings

1. Click here ([View] - [General Display Settings]).



2. The [General Display Settings] dialog box opens.



3. Click the tab of the group to be configured.
 The waveform corresponding to the waveform No. that is clicked becomes active.
 Enter the group name
 Select normal display or exponential display
 Enter the display range
 Enter the display position
 Show/Hide the trip line
 Enter the trip line
 Display color

Initialize
 Paste the copied setup data to the active waveform number
 Copy the setup data of the active waveform number
 Select the items to be copied
 Set the maximum and minimum values of the measured data the maximum and minimum values of the scale.
 Copy the settings of the first channel in the selected range to all other channels
 Show/Hide the Y-axis
 Register the channel
 Assign numbers to the channels in the selected range in ascending order
 Activate the settings and close the dialog box
 Turn ON/OFF at once
 Turn ON/OFF waveform display (Blue is ON)

Group

A maximum of 50 groups can be set. A maximum of 32 channels can be registered in one group.

4.2 Displaying the Waveform

Turn ON/OFF the Display

Check the box of the waveform number to be displayed. This is synchronized to the ON/OFF button of the waveform display of the zone display area.

Registering the Channel

1. Click one.

2. The [Channel No.] dialog box opens.

3. Click one.

No.	Channel	Y-Axis	Form.	Scale		Zone		Trip 1	Trip 2	Color
				MIN	MAX	MIN	MAX			
<input checked="" type="checkbox"/>	W001	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-100.0	300.0	0	100	<input checked="" type="checkbox"/> 245.9	<input checked="" type="checkbox"/> -29.4	Red
<input checked="" type="checkbox"/>	W002	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-1.000	1.000	0	100	<input checked="" type="checkbox"/> 1.000	<input checked="" type="checkbox"/> -1.000	Green
<input checked="" type="checkbox"/>	W003	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	0.0	500.0	0	100	<input checked="" type="checkbox"/> 500.0	<input checked="" type="checkbox"/> 500.0	Blue
<input checked="" type="checkbox"/>	W004	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 100.0	<input checked="" type="checkbox"/> 100.0	Purple
<input checked="" type="checkbox"/>	W005	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 800.0	<input checked="" type="checkbox"/> 800.0	Orange
<input checked="" type="checkbox"/>	W006	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00	Yellow
<input checked="" type="checkbox"/>	W007	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 100.00	<input checked="" type="checkbox"/> 100.00	Light Green
<input checked="" type="checkbox"/>	W008	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00	Light Blue
<input checked="" type="checkbox"/>	W009	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/> 100.0	<input checked="" type="checkbox"/> 100.0	Pink
<input checked="" type="checkbox"/>	W010	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	0.0	100.0	0	100	<input checked="" type="checkbox"/> 100.0	<input checked="" type="checkbox"/> 100.0	Grey
<input type="checkbox"/>	W011	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/> 22.00	<input type="checkbox"/> -22.00	Cyan
<input type="checkbox"/>	W012	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/> 22.00	<input type="checkbox"/> -22.00	Blue
<input type="checkbox"/>	W013	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/> 22.00	<input type="checkbox"/> -22.00	Dark Blue
<input type="checkbox"/>	W014	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/> 22.00	<input type="checkbox"/> -22.00	Yellow
<input type="checkbox"/>	W015	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/> 22.00	<input type="checkbox"/> -22.00	Light Blue

Types of Y-axis and Turning ON/OFF the Y-axis

Select linear or logarithmic by clicking the Y-axis display area. If [Multi-Axis Zone] (page 4-8, Setting the Y-axis) is selected, you can select whether or not to display the Y-axis. The Y-axis of the waveform for which the check box is shown in [blue] will be displayed.

Scale (display range)

The range of minimum and maximum values is from -1.0×10^{-16} to 1.0×10^{16} . Click the scale value display area to enter values.

Zone (display position)

The range is as follows:

- Minimum value: 0 to 99%
- Maximum value: 1 to 100%

Specify the waveform display position by taking the bottom edge of the waveform display area of the trend display screen to be 0% and the top edge to be 100%. Click the zone display area to enter values.

Trip Line

Two trip lines (trip 1 is red, trip 2 is blue) can be set for each waveform. Only the trip lines of the active waveform are displayed on the trend screen. However, on the auto zone display screen ("Setting the Y-axis" on page 4-8), the trip lines of all displayed waveforms that are checked are displayed.

You can change the waveform display zone on the trend display screen by clicking the edit zone icon on the tool bar or by selecting [Y-Axis] - [Edit Zone] in the menu bar.

Display Color

You can select the color of each waveform. To create custom colors, click the [Define Custom Colors] button in the [Color] dialog box.

Copy/Paste

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 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 at the bottom of the window. The setup data is pasted in the active waveform(s).

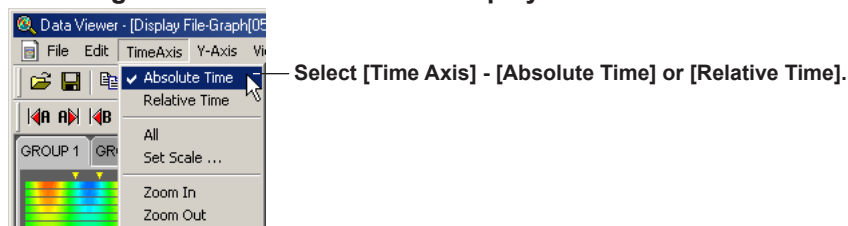
You can also copy and paste specific channel items.

After selecting the copy source in step 1, click the [Copy Details] button to display the [Copy Details] dialog box.

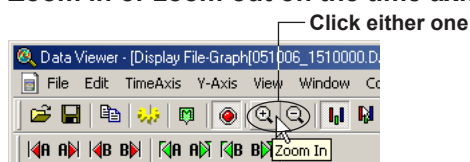
Select the items that you want to copy.

Setting the Time Axis

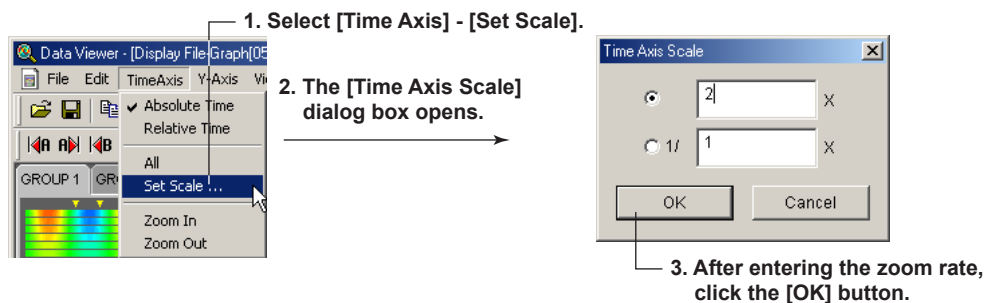
Selecting absolute or relative time display



Zoom in or zoom out on the time axis

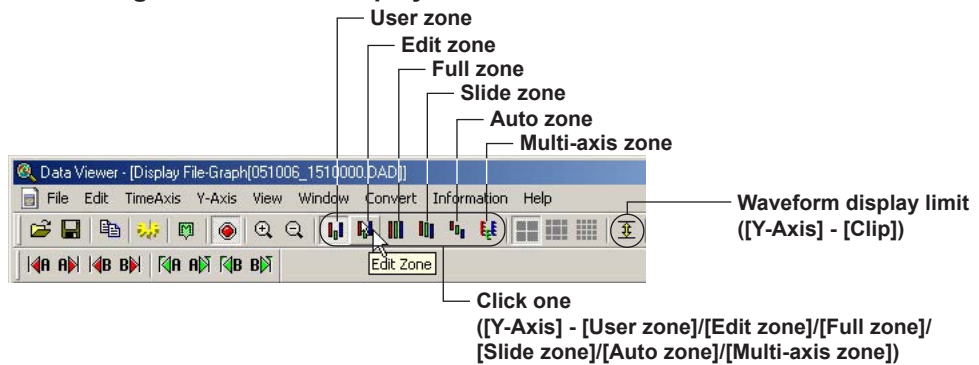


By selecting [Time Axis] - [All], the time axis is adjusted so that all the data can be displayed. If you wish to zoom in or out by specifying the zoom rate, take the following steps (resolution is 1/1000 to 20):



Setting the Y-axis

Selecting the waveform display zone



Select from the following list of choices:

For the display examples of each zone, see the next page.

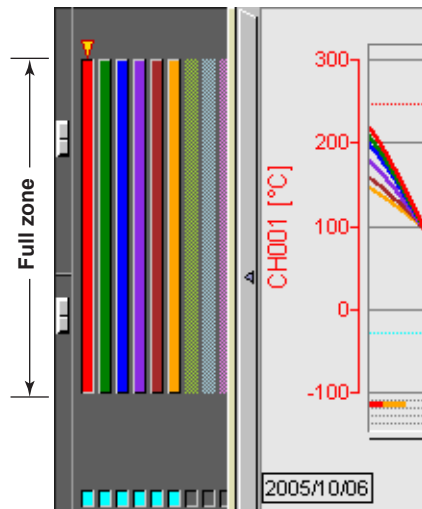
- User zone: Each waveform is displayed in the range specified in [Zone] under the [General Display Setting] (the zone cannot be changed on the trend display screen).
- Edit zone: Each waveform is displayed in the range specified in [Zone] under the [General Display Setting] (the zone can be changed on the trend display screen).
- Full zone: Display all waveforms using full zones.
- Slide zone: Display the waveforms in a cascade fashion from the top to the bottom of the waveform display area.
- Auto zone: Display the waveforms by equally dividing the waveform display area by the number of displayed waveforms.
- Multi-axis zone: Display the Y-axis of multiple waveforms.

Note

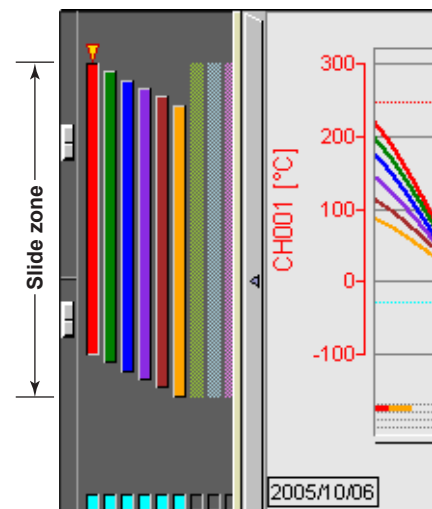
If the waveform display zone is set to some setting other than multi-axis zone and auto zone, only the Y-axis of the active waveform is displayed.

Examples of the Various Zone Settings

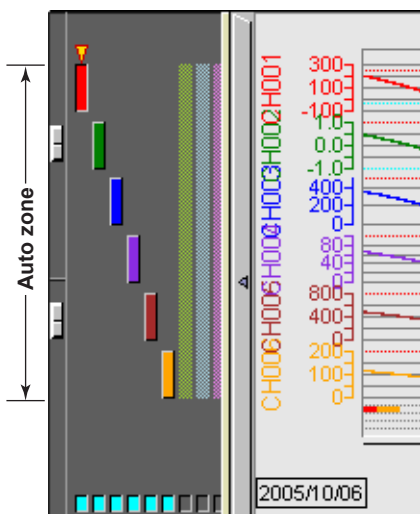
- Full zone



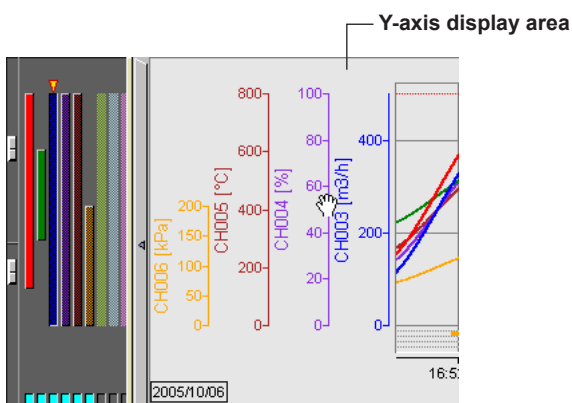
- Slide zone



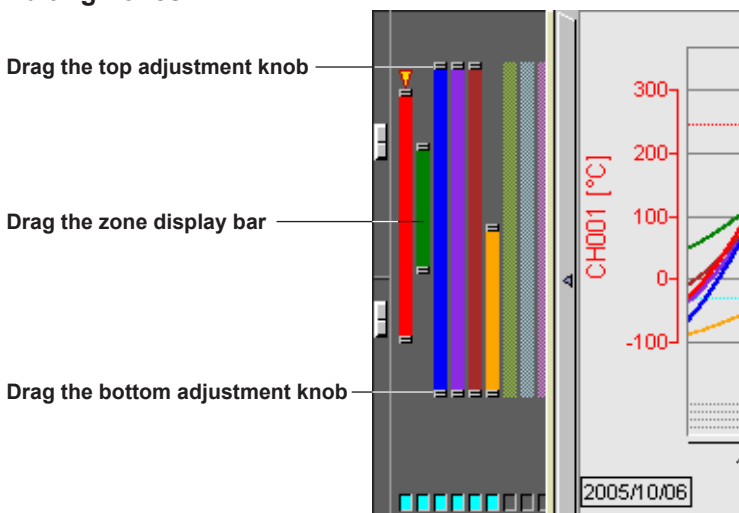
- Auto zone



- Multi-axis zone



Editing Zones



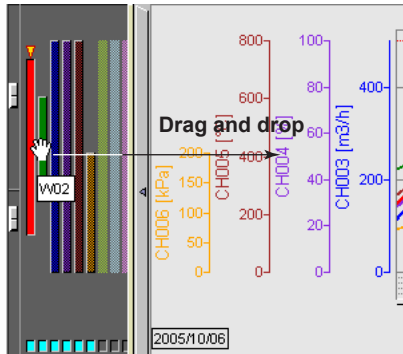
You can change the waveform display zone on the trend display screen by clicking the edit zone icon on the tool bar or by selecting [Y-Axis] - [Edit Zone] in the menu bar. The size of the zone can be changed by dragging the top and bottom adjustment knobs. The entire zone can be moved by dragging the zone display bar. The zones that are set in [Edit Zone] are reflected in the [Zone] setting of the [General Display Settings].

4.2 Displaying the Waveform

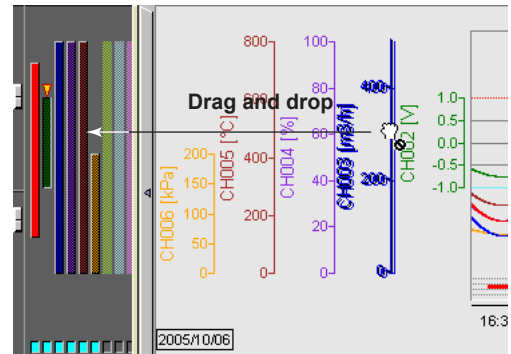
Displaying Multiple Y-axis

When multi-axis zone is selected, the Y-axis scales corresponding to the [Y-Axis] boxes in the [General Display Settings] that are checked will be displayed.

- Adding a Y-axis

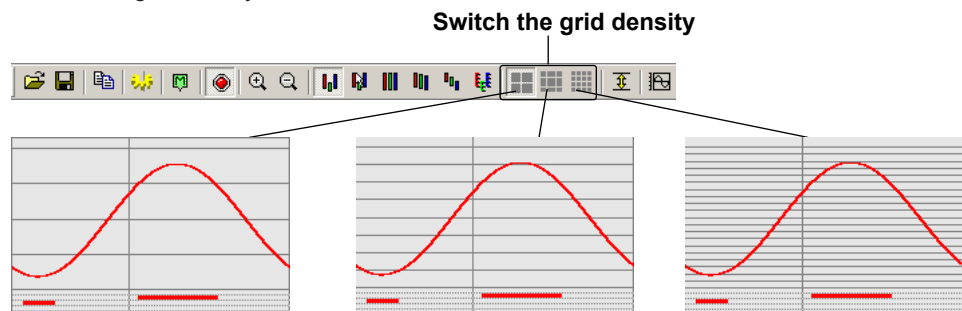


- Deleting a Y-axis



Changing the Grid Display

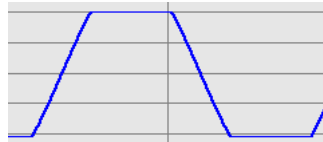
Select the grid type by clicking Grid density on the toolbar, or Y-axis on the menu bar. Switch the grid density.



Waveform Display Limit (clip)

When the waveform display limit is enabled by clicking the clip icon or by selecting [Y-Axis] - [Clip], the Y-axis display range of the waveform are limited to the minimum and maximum values that were specified under [General Display Settings] - [Scale]. Measured values that are less than the minimum value are set to the minimum value and values that are greater than the maximum value are set to the maximum value.

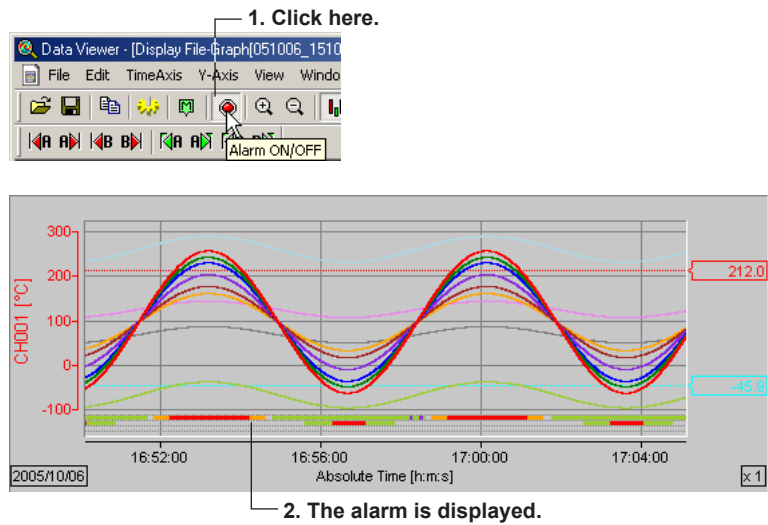
- Example in which Display Limit is Enabled



- Example in which Display Limit is Disabled

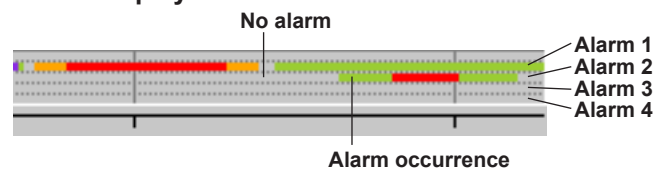


Turn ON/OFF the Alarm Display



The alarm conditions of alarm 1 to 4 are displayed in the alarm display area.

Alarm display



The alarm of the active waveform is displayed in front.

4.2 Displaying the Waveform

Selecting the Characters Used to Identify Channels

You can select the channel No. or tag as the character string used to identify the channels by selecting [View] - [Channel No.] or [Tag]. The selected character string will be used as a label to indicate the waveform.

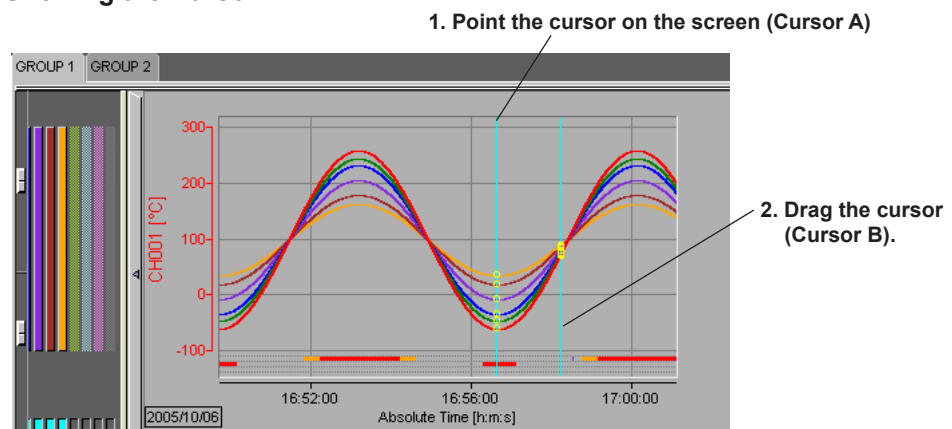
The character string is registered on the recorder or by using the Hardware Configurator.

Note

- When the identification string is switched, the channel character string displayed on the Y-axis of the waveform display window, circular display window, numeric window, list display window, [Cursor Value] window, [Computed Result] window, [General Display Setting] dialog box, and data conversion dialog box will change accordingly.
- Both the channel No. and tag are used in the output result of the data conversion.

Showing/Hiding Cursors

Showing the Cursor



By selecting [Edit] - [Select All], Cursor A and Cursor B moves to the beginning and the end of the data, respectively.

Hiding the Cursor

Select [View] - [Hide Cursor].

Copying the Data to the Clipboard



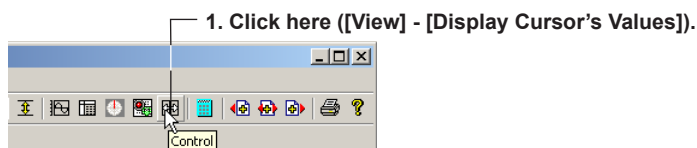
On the numerical window and list display window (section 4.6), you can copy the data between Cursor A and Cursor B to the Windows clipboard. On the waveform display window and circular display window, the displayed image can be copied to the clipboard.

Note

- The maximum number of data points that can be copied to the clipboard is 1000.
- The channels that are copied to the clipboard are those that are registered in the selected group with the waveform display turned ON.
- When the display mode of the time axis is set to absolute time, the absolute time is output. If it is set to relative time, the relative time from the first data point is output.
- Contents that have been copied to the clipboard can be pasted to other applications for use.

Displaying Cursor's Values

Clicking the control icon or selecting [Window] - [Control] displays the [Control] dialog box.



2. The [Cursor's Value] dialog box opens.

The values of Cursor A and B on the trend screen

Cursor movement button

		Cursor A	Cursor B	Difference
Data No.		784	837	48
Absolute Time		2005/10/06 16:56:38.000	2005/10/06 16:58:14.000	00:01:36.000
Channel		Value A	Value B	Value B-A
CH001 [°C]	Max	-59.7	75.5	135.2
	Min	-60.0	70.8	130.8
CH002 [V]	Max	-0.726	-0.111	0.615
	Min	-0.727	-0.133	0.594
CH003 [m3/h]	Max	83.6	224.6	141.0
	Min	83.4	219.6	136.2
CH004 [%]	Max	23.4	45.9	22.5
	Min	23.3	45.1	21.8

Alarm display
(Displays the conditions of alarm 1, 2, 3, and 4 from the left)

A list of Cursor A and B values and their differences on the trend screen is displayed. You can change the values of Cursor A and B by clicking the cursor movement buttons. When the alarm display is turned ON, the alarm conditions are displayed. When an alarm is in effect, the indicator is red. When it is not, the indicator is green.

Displaying Numeric Values of Abnormal Data

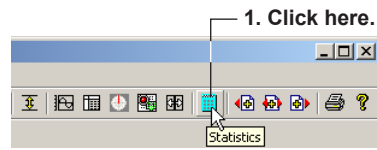
The abnormal data are displayed as follows:

- +OVER: Measured/computed data are over the positive limit
- OVER: Measured/computed data are under the negative limit
- LACK: Computation error or data dropout

Note

When a cursor is not displayed on the trend screen, the cursor's value display area becomes blank. Difference becomes INVALID.

Displaying Statistics



2. The statistics display screen opens.

The first data number of the computed region (Cursor A)
 The last data number of the computed region (Cursor B)

Section	778	-	032	Re-Calc.		
Channel	MIN	MAX	P-P	Mean	RMS	
CH001 [°C]	Max	-60.0	75.5	135.5	-17.1	45.8
	Min	-60.0	70.8	130.8	-19.7	45.5
CH002 [V]	Max	-0.727	-0.111	0.616	-0.532	0.566
	Min	-0.727	-0.133	0.594	-0.544	0.575
CH003 [m3/h]	Max	83.4	224.6	141.2	128.0	135.5
	Min	83.4	219.6	136.2	125.4	132.5
CH004 [%]	Max	23.3	45.9	22.6	30.5	31.3
	Min	23.3	45.1	21.8	30.1	30.8

Note

$$RMS = \sqrt{\frac{1}{n} \sum_{k=0}^{n-1} (x_k)^2}$$

n : number of data
 x_k : value

The minimum value, maximum value, P-P, mean, and rms value for each waveform in the range specified by Cursors A and B are computed and displayed. If the cursor is not displayed, the computation is performed over the entire data. As the results of the computation do not update automatically, you must click the ReCalc. button in the Statistics dialog box to update the computed results if you change the position of Cursor A or B.

Adding Arbitrary Marks

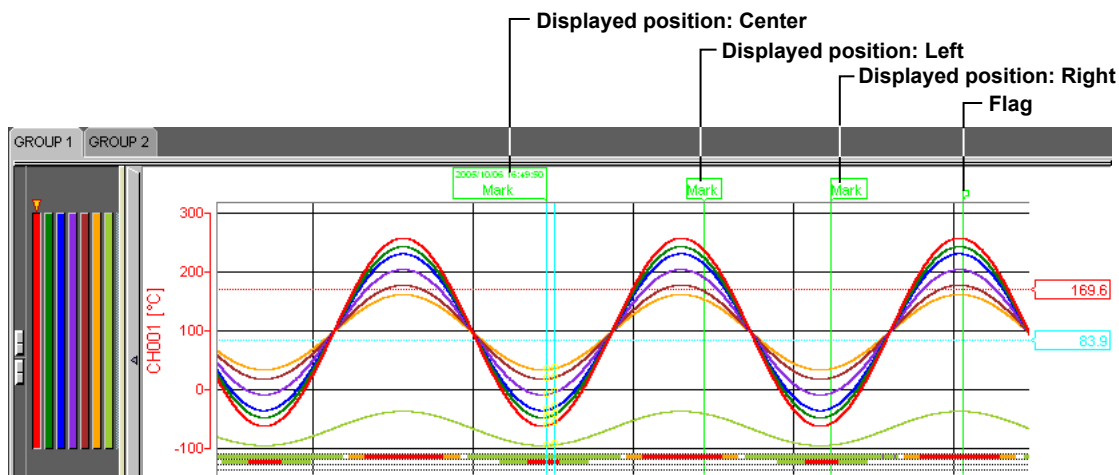
1. Point the cursor.

2. Click here ([View] - [Append Mark]).

3. The [Mark Settings] dialog box opens.

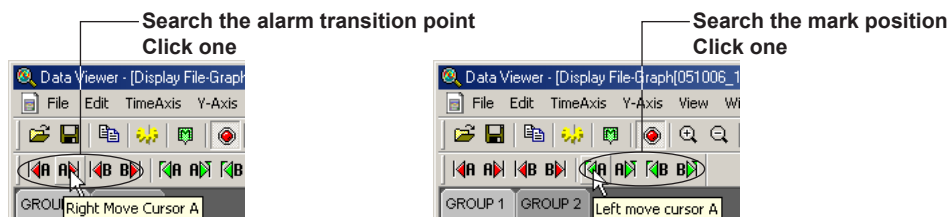
4. After entering the string, selecting the displayed position, or selecting whether the time is displayed, click the [OK] button.

When Cursor A and Cursor B are at the same position, arbitrary marks can be placed. You can select whether to put the arbitrary marks on all groups or only on the displayed group. And you can set the displayed position of the mark and select whether the time is displayed by the mark. The displayed time is either the absolute time or relative time depending on the time axis setting.



If you left-click the mark while pressing the “Ctrl” key, the mark is displayed in front. If you left-click the mark while pressing the “Shift” key, the mark is displayed in the back. Double-clicking a mark, that has been created using the Data Viewer, opens the [Mark] dialog box in which you can change the displayed group and the mark name.

Searching the Alarm Transition Point and Mark Position



Searching the Alarm Transition Point

Moves Cursor A or Cursor B to the alarm transition point (the point at which the alarm occurred and the point at which the alarm was released) of the active channel. Searching is possible to the left and right of the cursor.

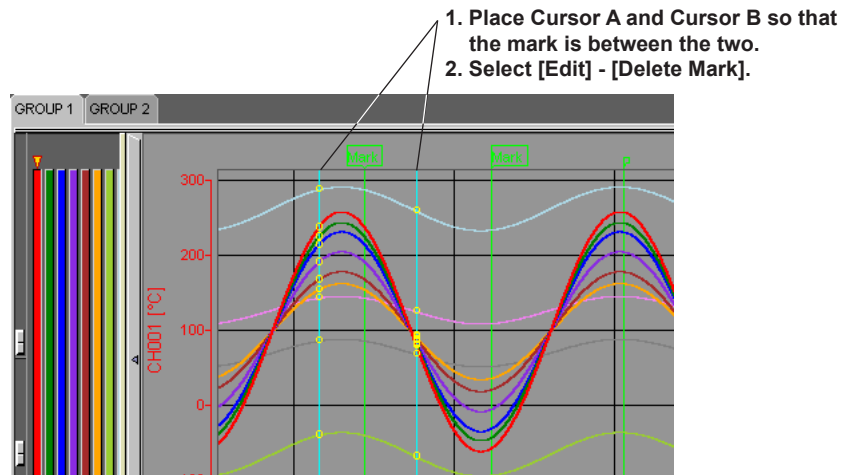
Searching the Mark Position

Moves Cursor A or Cursor B to the mark position (arbitrary mark or trigger mark) of the active group. Searching is possible to the left and right of the cursor.

Note

- The searching function cannot be used, if the cursor is not displayed.
- The search function cannot be used, if there are no arbitrary marks or when the alarm display is OFF.

Deleting Marks



The arbitrary marks (green/yellow) and trigger marks (yellow) between Cursor A and Cursor B are deleted.

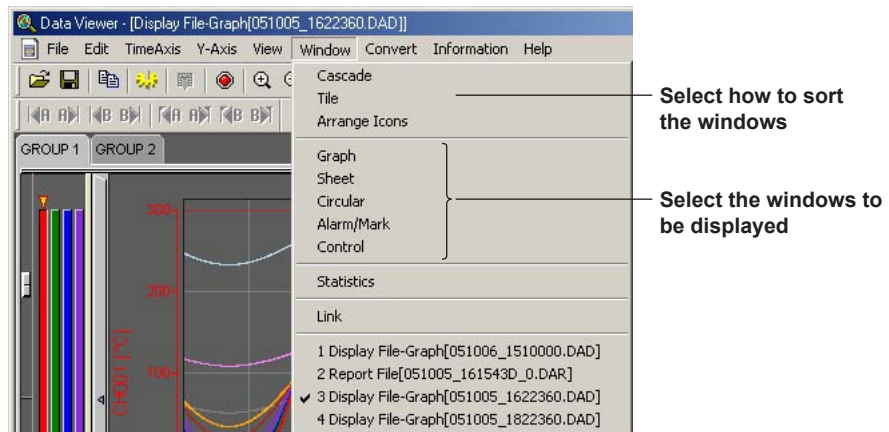
Note

- The arbitrary marks placed on the Data Viewer are green. The arbitrary marks (messages) and trigger points placed on the recorder are yellow.
 - Up to 32 characters can be used for a mark name.
-

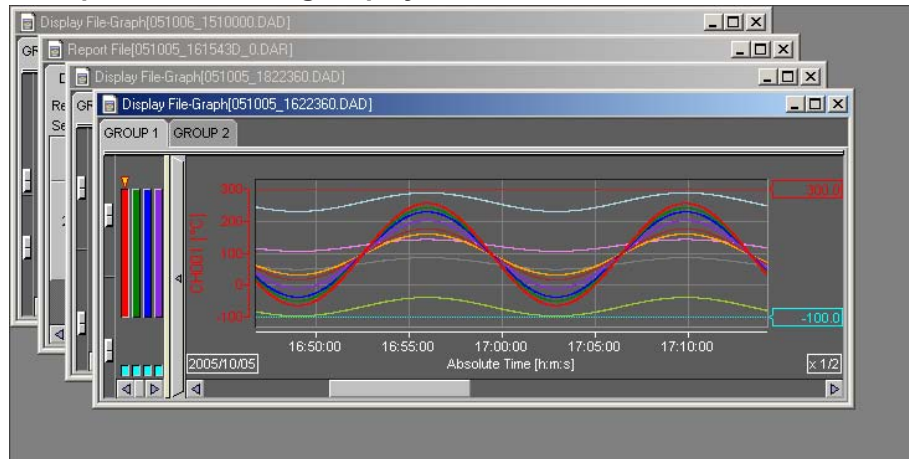
Resetting Marks

All arbitrary marks created on the Data Viewer are erased by selecting [Edit] - [Reset Mark]. The marks (messages) and the trigger point that were created on the recorder but deleted on the Data Viewer are displayed again.

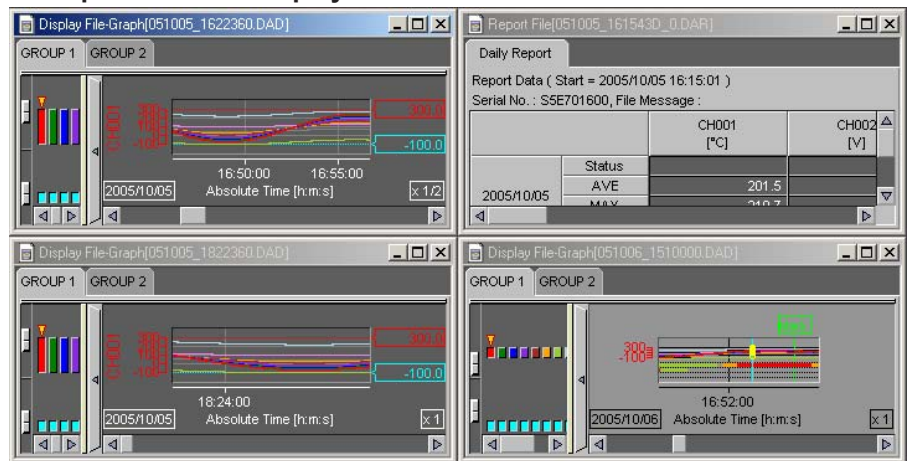
Setting the Window



- Example of a Cascading Display



- Example of a Tiled Display




- Example of a Arranged Icon



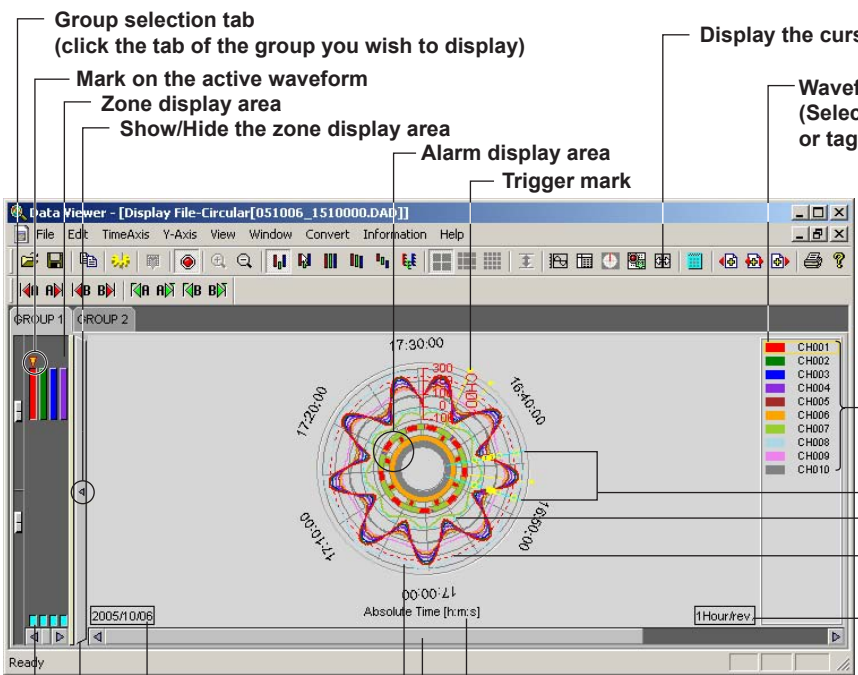
4.3 Circular Display

Circular Display

1. Click here ([Window] - [Circular]).



2. The circular display screen opens.



Group selection tab (click the tab of the group you wish to display)

Mark on the active waveform

Zone display area

Show/Hide the zone display area

Alarm display area

Trigger mark

Display the cursor value

Waveform label (Select channel No. or tag)

Select the active waveform

Cursor

Trip line of the active waveform

Displayed time per cycle

Date

Drag this bar to change the size of the zone display area

Turn ON/OFF waveform display

Absolute or relative time

Move the waveform display position (Scroll bar)

Circular display area

General Display Settings

The parameters in the [General Display Settings] dialog box that are different between the circular display and the trend display (section 4.2) are as follows:

Trip Line

The trip lines on the circular screen cannot be dragged and dropped.

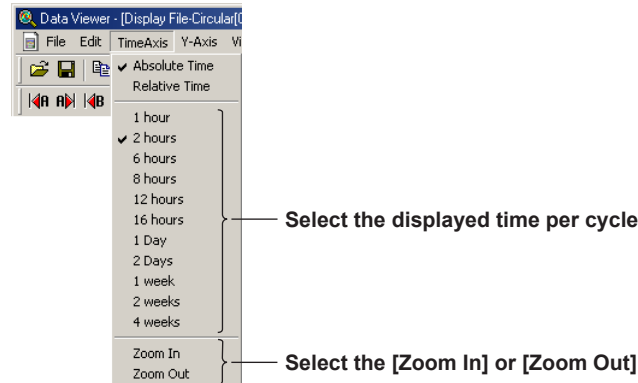
You can change the position of the trip lines by changing the values in the [General Display Settings] dialog box.

Setting the Time Axis

Selecting absolute or relative time display and zooming in or zooming out on the time axis.

See section 4.2, "Displaying the Waveform."

Selecting the displayed time

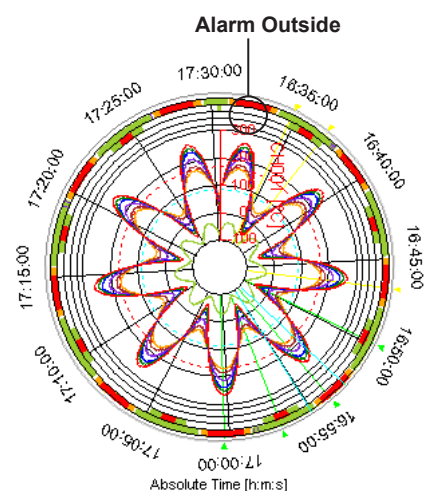
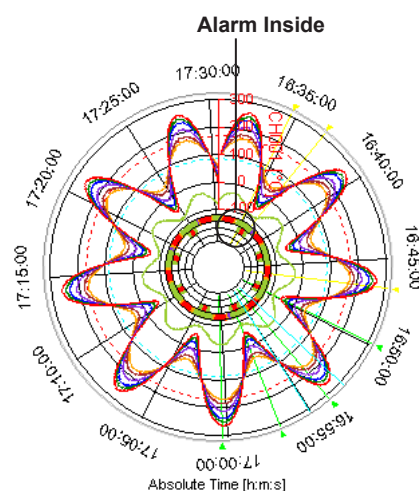
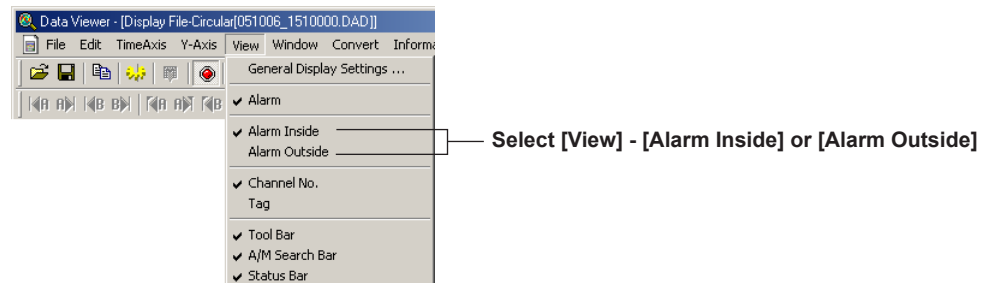


Setting the Y-axis

The circular screen always displays the waveform that is limited to the values between the maximum and minimum values of the Y-axis display range. The range is set using [Scale] in the [General Display Settings] dialog box.

Turning ON/OFF the Alarm Display


You can select whether to display the alarm on the inside or the outside of the waveform display section of the circular screen.



4.4 Displaying Numeric Values

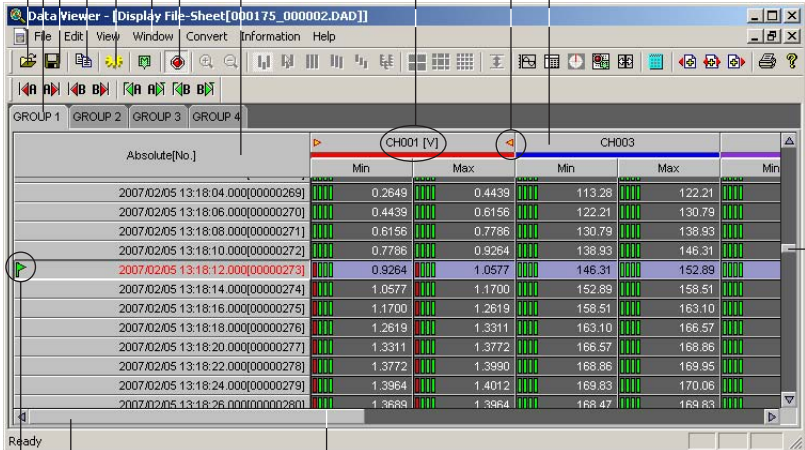
Displaying Numeric Values

1. Click here ([Window] - [Sheet]).



2. The numeric display screen opens.

Open a file (section 4.1)
 Group selection tab (click the tab of the group you wish to display)
 Save display conditions (section 4.8)
 Copy to clipboard (section 4.2)
 General display settings
 Section 4.2
 Turn ON/OFF the alarm display
 Absolute or relative time
 Waveform label (select channel No. or tag)
 Mark on the active waveform
 Click here to make the waveform active



Scroll the screen (up and down)

Scroll the screen (left and right)
 Alarm display (Displays the conditions of alarm 1, 2, 3, and 4 from the left)
 Mark (arbitrary mark or trigger mark)

Absolute[No.]	CH001 [V]		CH003		Min
	Min	Max	Min	Max	
2007.02.05 13:18:04.000[00000269]	0.2649	0.4439	113.28	122.21	
2007.02.05 13:18:06.000[00000270]	0.4439	0.6156	122.21	130.79	
2007.02.05 13:18:08.000[00000271]	0.6156	0.7786	130.79	138.93	
2007.02.05 13:18:10.000[00000272]	0.7786	0.9264	138.93	146.31	
2007.02.05 13:18:12.000[00000273]	0.9264	1.0577	146.31	152.89	
2007.02.05 13:18:14.000[00000274]	1.0577	1.1700	152.89	158.51	
2007.02.05 13:18:16.000[00000275]	1.1700	1.2619	158.51	163.10	
2007.02.05 13:18:18.000[00000276]	1.2619	1.3311	163.10	168.57	
2007.02.05 13:18:20.000[00000277]	1.3311	1.3772	168.57	168.86	
2007.02.05 13:18:22.000[00000278]	1.3772	1.3990	168.86	169.95	
2007.02.05 13:18:24.000[00000279]	1.3964	1.4012	169.83	170.06	
2007.02.05 13:18:26.000[00000280]	1.3699	1.3964	169.47	169.83	

General Display Settings of the Numeric Display

Clicking the General Display Settings icon or selecting [View] - [General Display Settings] opens the [General Display Settings] dialog box. Of the parameters in the [General Display Settings] dialog box, those that relate to the numeric display are as follows:

- Normal or Exponential display of numerical values
- Registering the channel and turn the display ON or OFF

For details related to the setting procedures, see "General Display Settings" in section 4.2, "Displaying the Waveform."

Setting the Time Axis

Select [View] - [Absolute Time] or [Relative Time]. Then, select the time display format using [Format].

Turn ON/OFF the Alarm Display

The alarm conditions of alarms 1 to 4 are displayed on the screen by clicking the alarm display icon or selecting [View] - [Alarm] and turning ON the alarm display. When an alarm is in effect, the indicator is red. When it is not, the indicator is green.

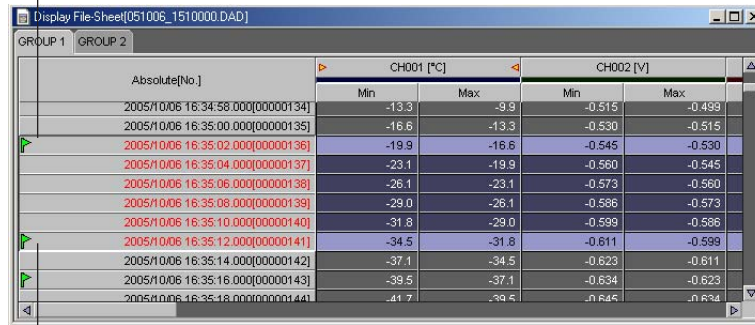
Selecting the Characters Used to Identify Channels

For details, see “Selecting the Characters Used to Identify Channels” in section 4.2, “Displaying the Waveform.”

Showing/Hiding Cursors

Showing the cursor

1. Point the cursor (Cursor A)



Absolute[No.]	CH001 [°C]		CH002 [V]	
	Min	Max	Min	Max
2005/1/06 16:34:58.000[00000134]	-13.3	-9.9	-0.515	-0.499
2005/1/06 16:35:00.000[00000135]	-16.6	-13.3	-0.530	-0.515
2005/1/06 16:35:02.000[00000136]	-19.9	-16.6	-0.545	-0.530
2005/1/06 16:35:04.000[00000137]	-23.1	-19.9	-0.560	-0.545
2005/1/06 16:35:06.000[00000138]	-26.1	-23.1	-0.573	-0.560
2005/1/06 16:35:08.000[00000139]	-29.0	-26.1	-0.586	-0.573
2005/1/06 16:35:10.000[00000140]	-31.8	-29.0	-0.599	-0.586
2005/1/06 16:35:12.000[00000141]	-34.5	-31.8	-0.611	-0.599
2005/1/06 16:35:14.000[00000142]	-37.1	-34.5	-0.623	-0.611
2005/1/06 16:35:16.000[00000143]	-39.5	-37.1	-0.634	-0.623
2005/1/06 16:35:18.000[00000144]	-41.7	-39.5	-0.645	-0.634

2. Drag the cursor (Cursor B).

By selecting [Edit] - [Select All], Cursor A and Cursor B moves to the beginning and the end of the data, respectively.

Showing the Cursor Value, Displaying Statistics and Hiding the Cursor

For details, see “Displaying Cursor’s values,” “Hiding the Cursor,” “Displaying Statistics” in section 4.2, “Displaying the Waveform.”

Adding Arbitrary Marks, Deleting Marks, and Resetting Marks

For details, see “Adding Arbitrary Marks,” “Deleting Marks,” and “Resetting Marks” in section 4.2, “Displaying the Waveform.”

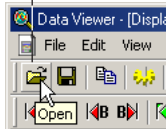
4.5 Linking Files and Saving the Link Settings File

Linking Files

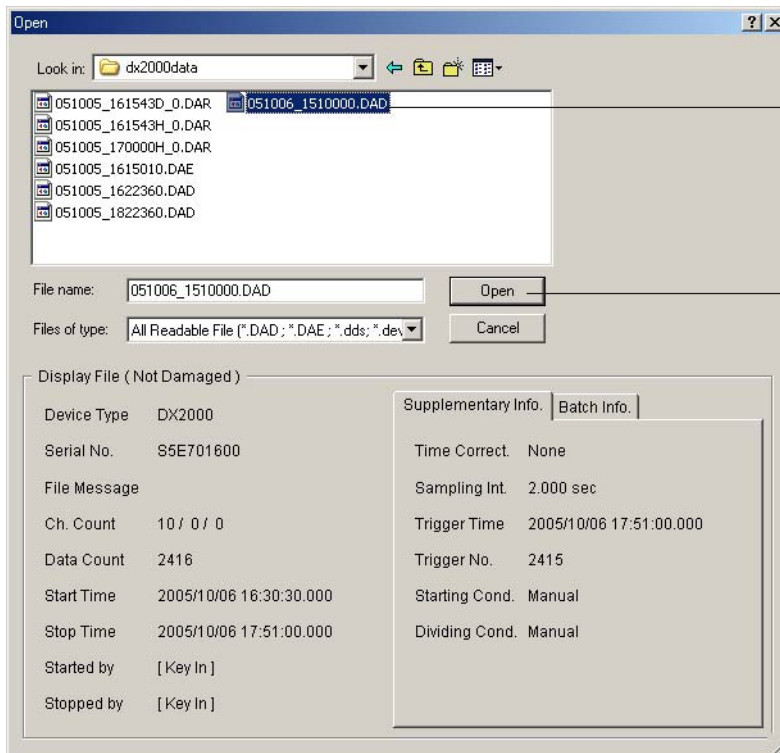
You can link and display files that have been divided by the auto save function, power failures, or other means (factors) on the recorder.

The files that can be linked are those that exist in the same directory. There are two methods to link files, from the toolbar and from the menu bar.

1. Click here ([File] - [Open]).



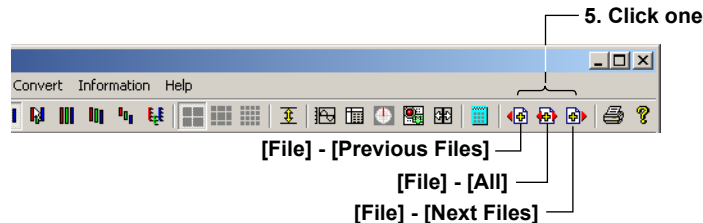
2. The [Open] dialog box opens.



3. Select the initial file.

4. Click here to open the file.

From the Toolbar

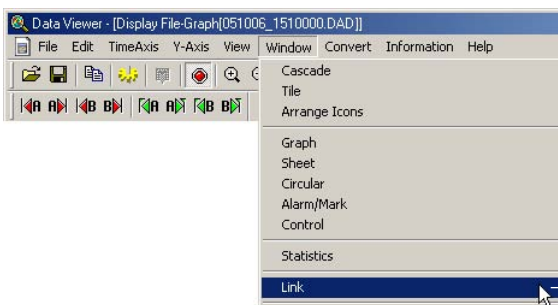


5. Click one

Linking Previous and Subsequent Files Collectively

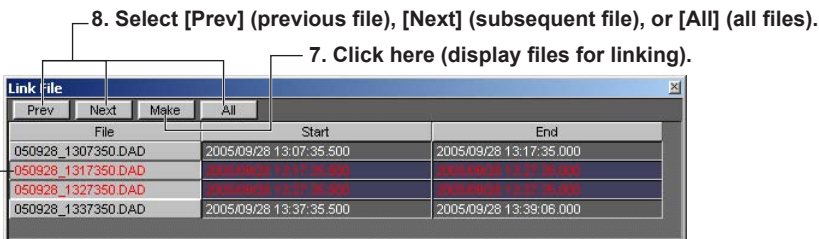
This function is available with revision R7.21 or later. You can collectively link previous and subsequent files to the current file, and display them. All files available for linking are shown together in a display.

From the Menu Bar



5. Click here ([Window]-[Link]).

6. The [Link] dialog box opens.



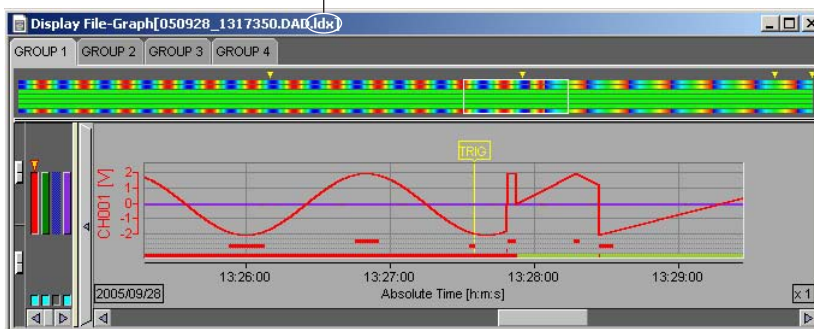
8. Select [Prev] (previous file), [Next] (subsequent file), or [All] (all files).

7. Click here (display files for linking).

10. Displays the linked files in a different color.

9. Displays the linked files.

The file extension .idx is appended to the original file name



Note

When linking and displaying files, make sure that the number of data points after linking does not exceed 5242880.

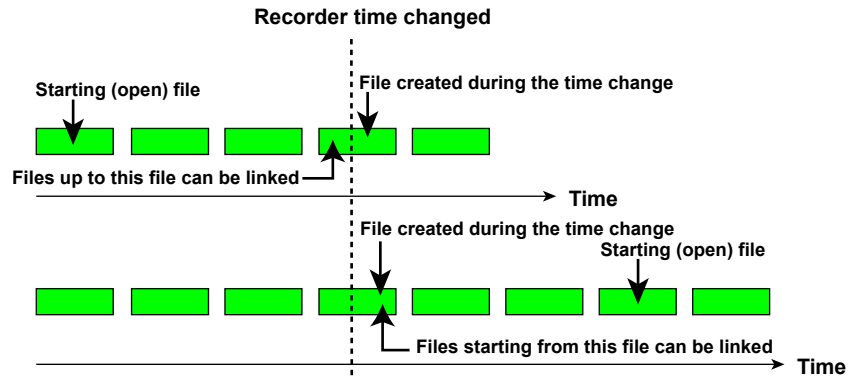
In addition, if there is a period over which data does not exist such as when a power failure occurs, data is counted as if the data is acquired at the given scan interval even during that period. The scan interval and the maximum period for linking files are indicated below.

Interval	Period
25 ms	36.4 hour
1/8 s	7.5 days
1 s	60.6 days
10 s	606.8 days

For example, if data is captured continuously at a 1/8-second interval and there is a one or more week long power failure, the data from before and after the power failure cannot be linked and displayed.

4.5 Linking Files and Saving the Link Settings File

- If you open a file that was created prior to a time change on the recorder and then link subsequent files, files from the open file up to the point of the time change are linked. If you open a file that was created after a time change on the recorder and then link previous files, files starting from the point of the time change are linked.



- The linked data display is based on the time of the starting file.
-

Saving the Link Settings File

Select [File] - [Save Display Setting As] to save the link settings file to the same directory as the linked files.

The file name takes the form of the original file name with the file extension .idx.

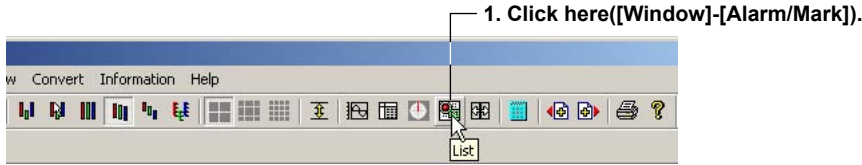
You can save the file by specifying the file name and the destination directory by selecting [File] - [Save Display Setting].

Note

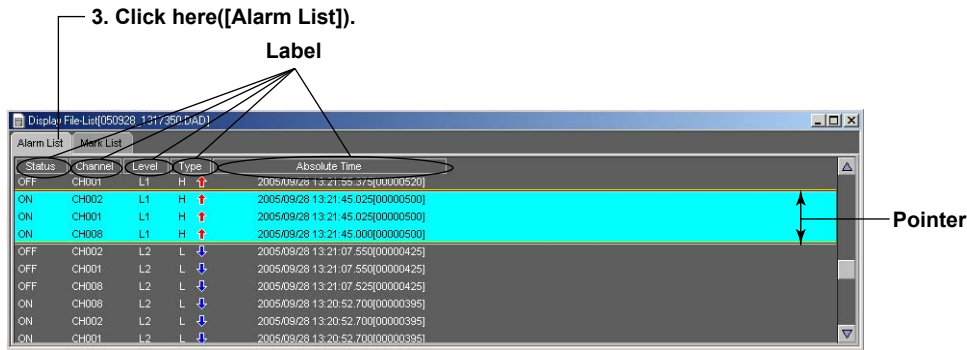
Files with the extension .idx contain only link settings. To reopen a linked file, you must have the original data file.

4.6 Listing Alarms, Marks, and Control Modes, and Converting the List

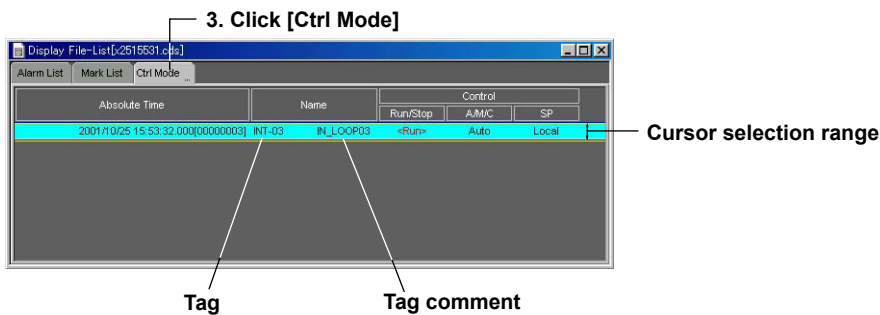
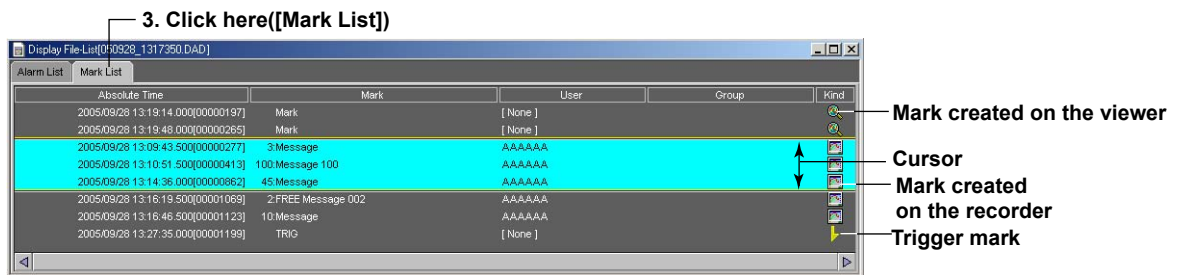
A list of alarms, marks, and control modes is displayed with the display file or event file opened.



2. The [Display File List] dialog box opens.



	High limit alarm		Delay high limit alarm
	Low limit alarm		Delay low limit alarm
	High limit on rate-of-change alarm		Difference high limit alarm
	Low limit on rate-of-change alarm		Difference low limit alarm



Click a label on the "Alarm List" display screen to sort using the label. The first click will sort the list in the ascending order; the second click will sort the list in the descending order.

4.6 Listing Alarms, Marks, and Control Modes, and Converting the List

Note

If you drag on the "Alarm List" display screen, a pointer is displayed. The cursor on the waveform display, circular display, numerical display, and cursor value display are not synchronized to this pointer.

Converting and Saving an Alarm List, Mark List, or Control Mode List

An alarm list, mark list, or control mode list can be converted to Excel, ASCII, and Lotus formats.

The image shows a sequence of three screenshots from the Data Viewer software, illustrating the steps to convert and save an alarm list.

1. Click here([Convert]-[Alarm to] or [Mark to])

The first screenshot shows the 'Data Viewer' application window. The 'Convert' menu is open, displaying options: 'To Excel ...', 'To ASCII ...', 'To Lotus ...', 'Alarm To ...', and 'Mark To ...'. A line points to the 'Alarm To ...' option.

2. The [Alarm List] or [Mark List] dialog box opens.

The second screenshot shows the 'Alarm List' dialog box. The 'File' field contains 'C:\...050928_1317350.DAD.Alarm.xls'. There are 'File ...', 'OK', and 'Cancel' buttons. A line points to the 'File ...' button.

3. Click here.

A line points to the 'OK' button in the 'Alarm List' dialog box.

6. Click here.

A line points to the 'OK' button in the 'Alarm List' dialog box.

4. The [Save As] dialog box opens.

The third screenshot shows the 'Save As' dialog box. The 'Save in:' field shows 'display data'. The 'File name:' field contains '050928_1317350.DAD.Alarm.xls'. The 'Save as type:' dropdown menu is open, showing options: 'Excel Files (*.xls)', 'ASCII Files (*.txt)', and 'Lotus Files (*.wrk)'. A line points to the 'File name:' field.

Enter the file name.

5. Set the items and click here.

A line points to the 'OK' button in the 'Save As' dialog box.

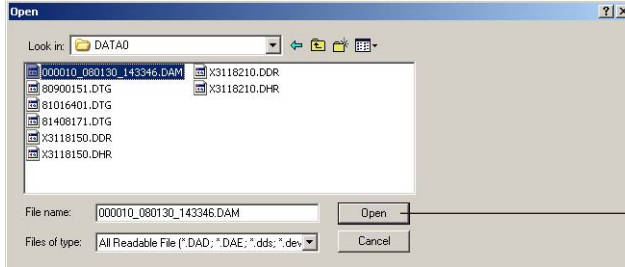
Select one.

A line points to the 'Save as type:' dropdown menu in the 'Save As' dialog box.

4.7 Displaying the Manually Sampled Data Files

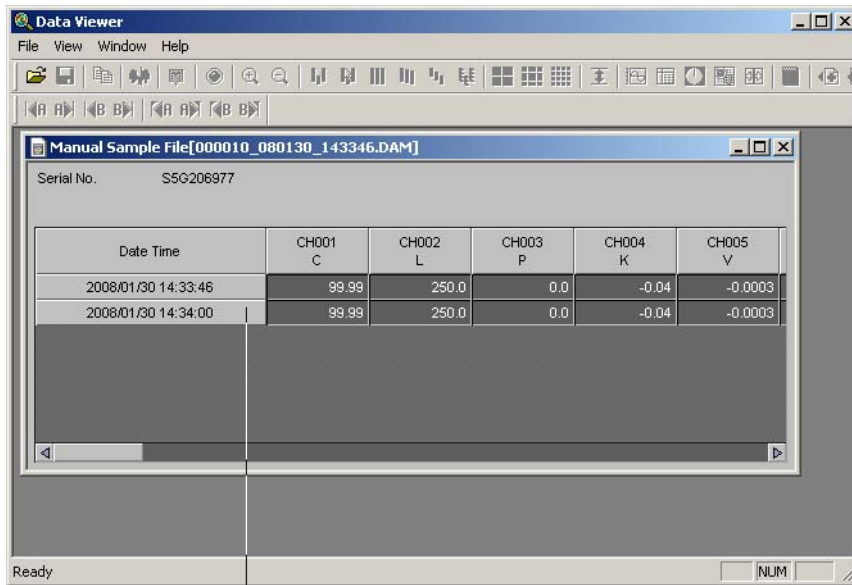
This section explains how to display a manually sampled data file.

1. Click the Open icon or choose [Open] from the [File] menu.



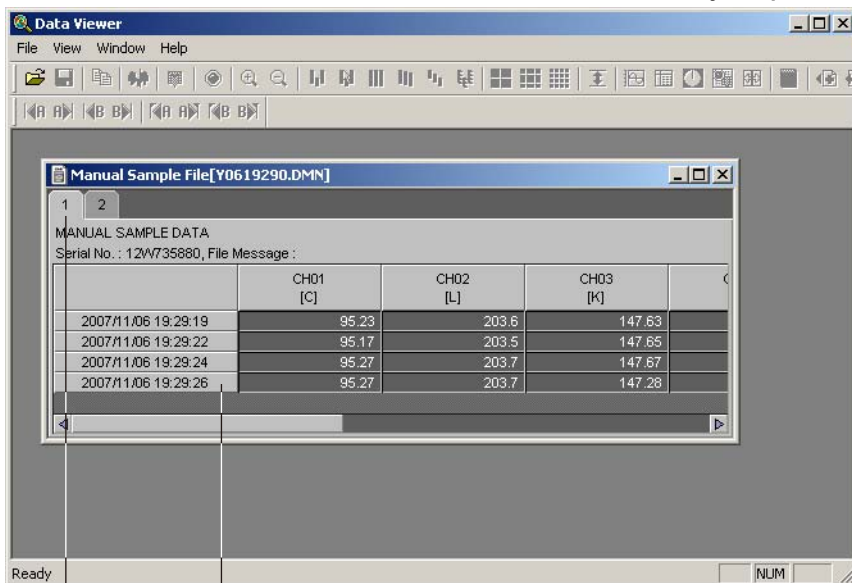
2. Select the desired file, and click the [Open] button.
Extension: .DAM or .dmn

DX1000, DX1000N, DX2000, MV1000, and MV2000 manually sampled data file (.DAM extension)



Date/time of manual sampling

CX1000, CX2000, DX100, DX200, DX200C, MV100, and MV200 manually sampled data file (.dmn extension)



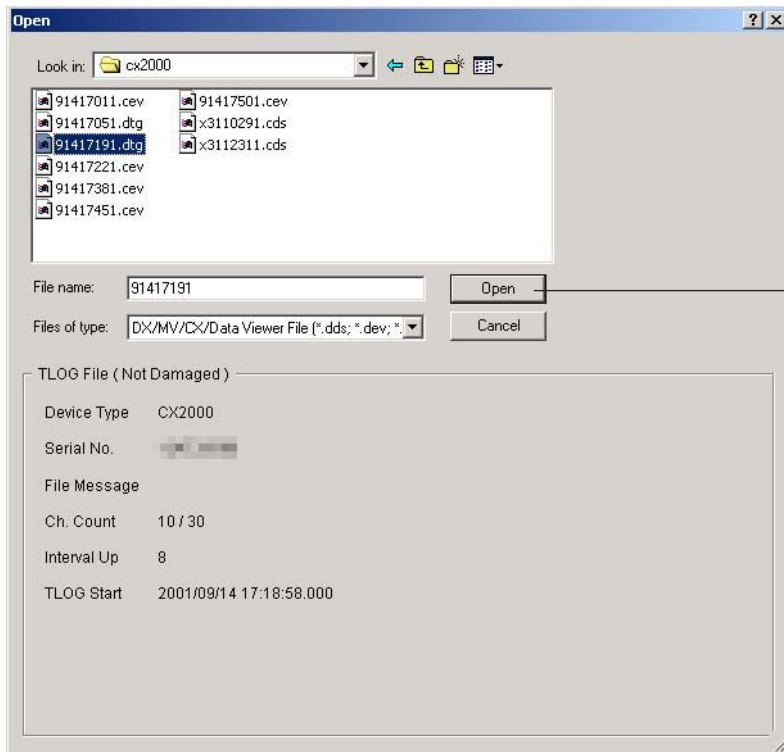
Date/time of manual sampling

If a file contains manually sampled data that has been acquired under different conditions, they are displayed separately using tabs.

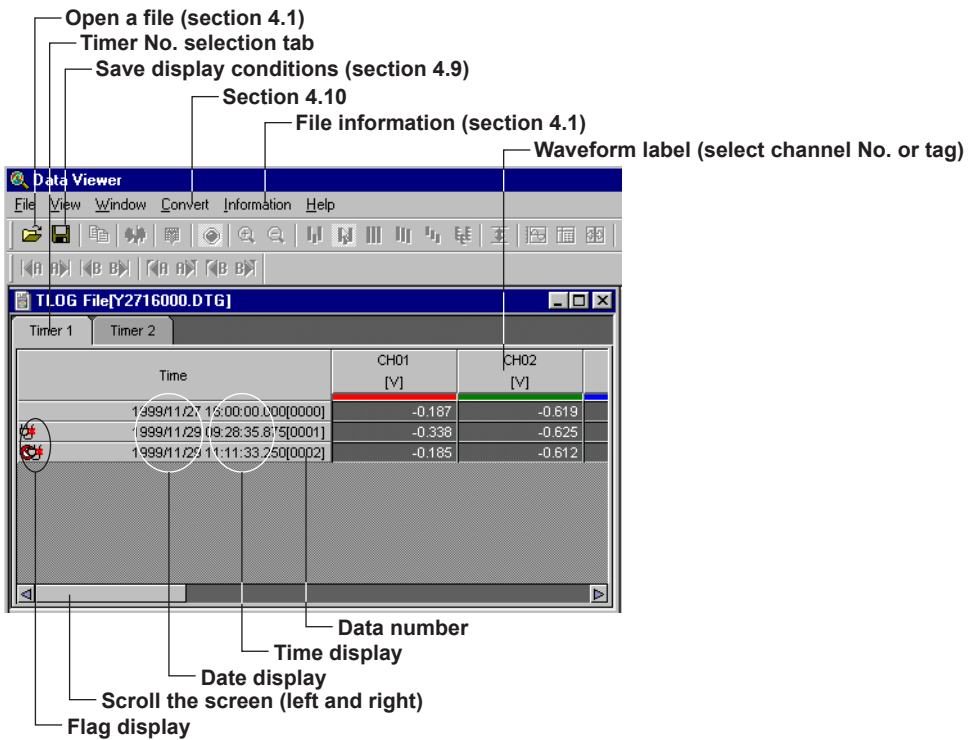
4.8 Displaying the TLOG Files

This section explains how to display a TLOG File that has been created by the CX1000, CX2000, DX100, DX200, DX200C, MV100, or MV200. The TLOG file name extension is .dtg.

1. Click the [Open] button or select [File] - [Open].






2. Select the desired file (.dtg) and click the [Open] button.



Turning ON/OFF Flags

When [View] - [Flags] is selected, the following status information is displayed:

-  : Stopped TLOG computation.
-  : The CX time and date was changed during TLOG computation.
-  : Power failure occurred during TLOG computation.

Date/Time Display

Select [View] - [Date Format] or [Time Format] to select the display format. If [None] is selected, the date or time will not be displayed.

Data No.

When [View] - [Data No.] is checked, the data number is displayed.

Selecting the Characters Used to Identify Channels

For details, see “Selecting the Characters Used to Identify Channels” in section 4.2, “Waveform Display.”

4.9 Displaying the Report Files

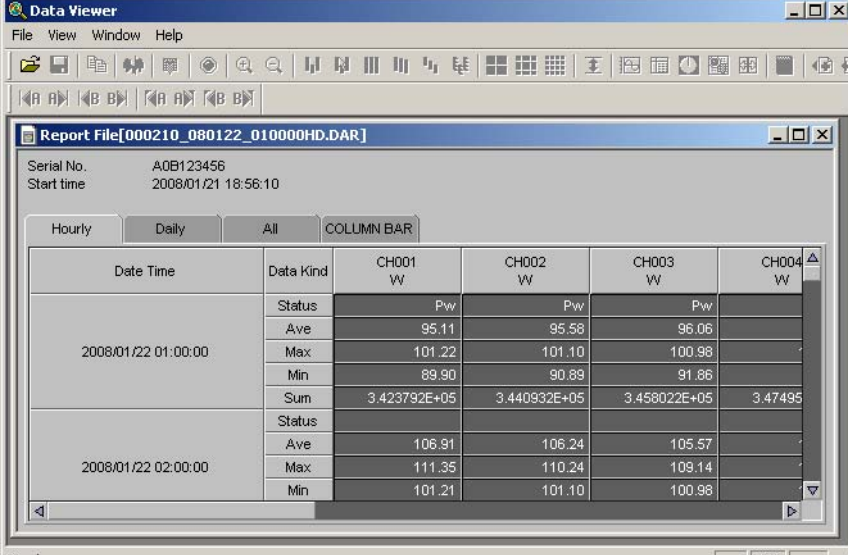
Report Files Generated by the DX1000/DX1000N/DX2000/MV1000/MV2000

The report file name extension is .DAR.

Displaying Report Data Numerically

1. Click the Open icon or choose [Open] from the [File] menu.
2. Select a report file.

The report appears. The following figure is an example in which hourly report and daily report are stored in a single report file.



Serial No. A0B123456
Start time 2008/01/21 18:56:10

Hourly Daily All COLUMN BAR

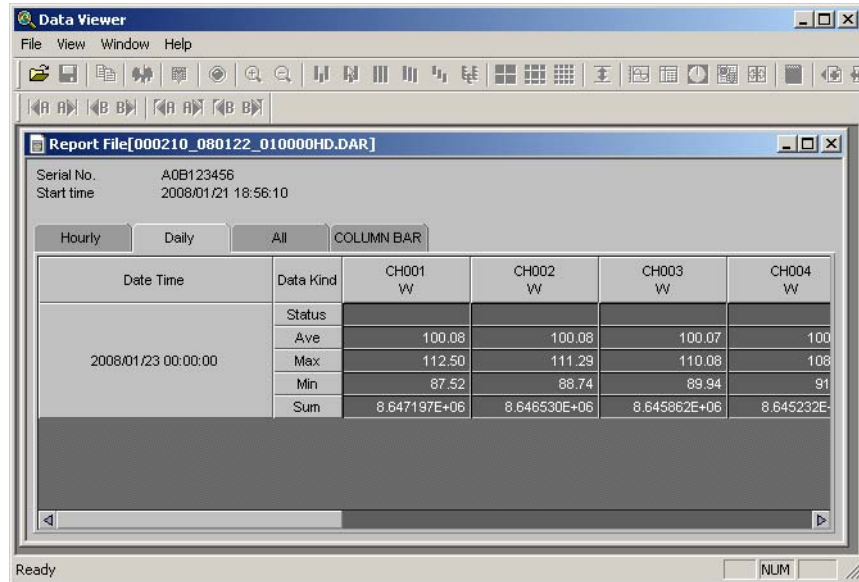
Date Time	Data Kind	CH001 W	CH002 W	CH003 W	CH004 W
2008/01/22 01:00:00	Status	Pw	Pw	Pw	
	Ave	95.11	95.58	96.06	
	Max	101.22	101.10	100.98	
	Min	89.90	90.89	91.86	
	Sum	3.423792E+05	3.440932E+05	3.458022E+05	3.47495
2008/01/22 02:00:00	Status				
	Ave	106.91	106.24	105.57	
	Max	111.35	110.24	109.14	
	Min	101.21	101.10	100.98	

Status

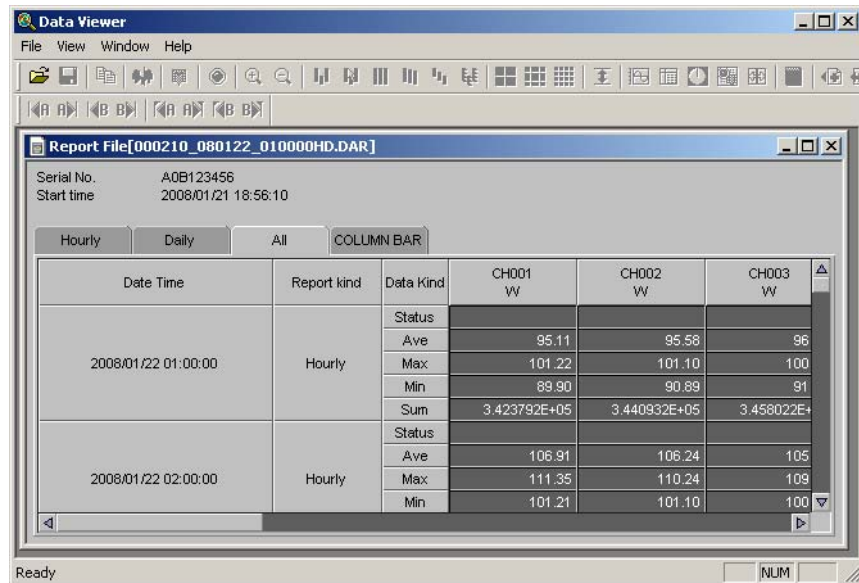
The following icons are displayed in Status.

- Er : A measurement error or computation error occurred during the period over which the report was created.
- Ov: An ober range or computation overflow occurred during the period over which the report was created.
- Pw: A power failure occurred during the period over which the report was created.
- Cg: The time was changed during the period over which the report was created.
- Bo: The burn out occurred during the period for the report.

- **[Hourly] Tab**
Displays hourly reports in the file.
- **[Daily] Tab**
Displays daily reports in the file.



- **[All] Tab**
Displays all reports in the file.



4.9 Displaying the Report Files

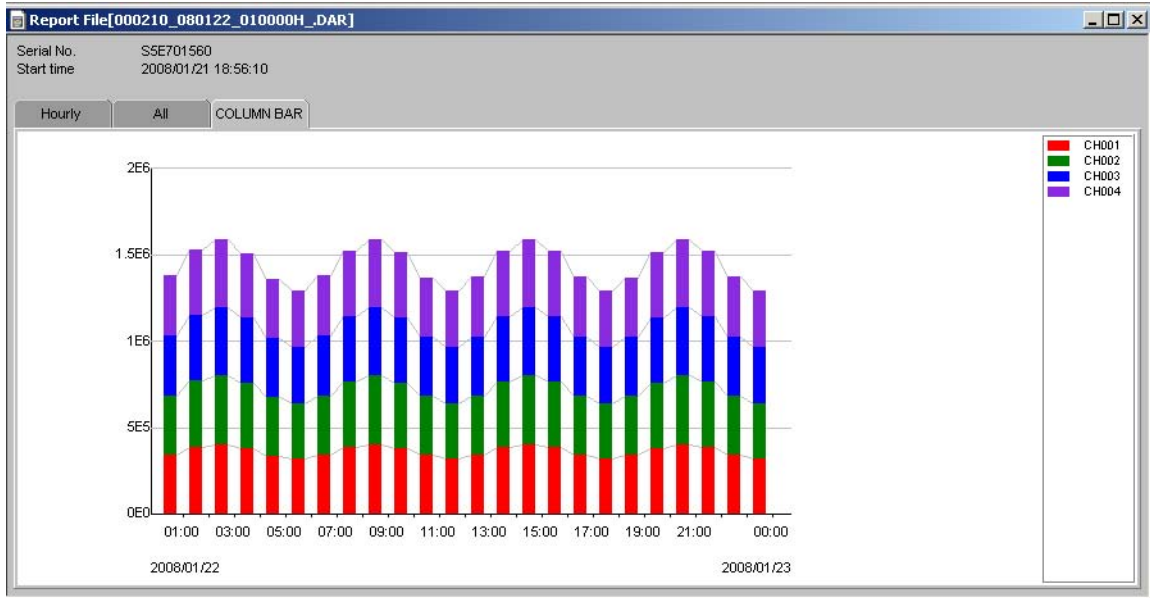
Displaying a Stacked Bar Graph of Report Data

You can display report data generated by the DX1000, DX1000N, DX2000, MV1000, or MV2000 on a stacked bar graph.

1. Click the Open icon or choose [Open] from the [File] menu.
2. Select a report file.
3. Click the [COLUMN BAR] tab.

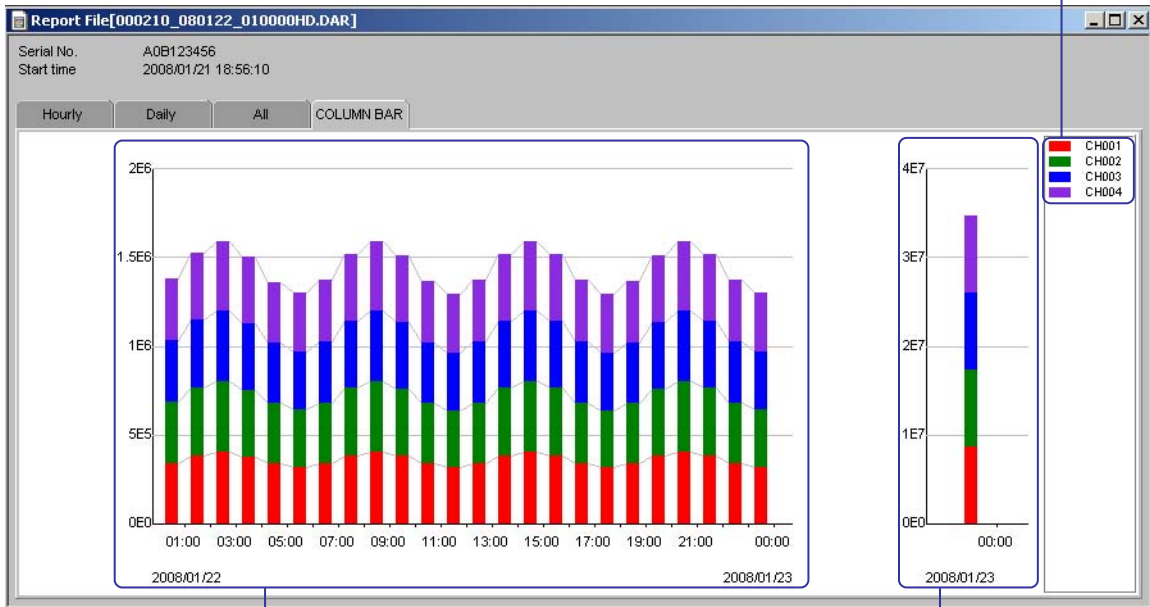
If the report data type is hourly

The example below shows a stacked bar graph of hourly reports for channels 001 to 004.



If the report data type is hourly + daily

Channel display colors



Hourly
 Displays hourly for hourly + weekly
 Displays hourly for hourly + monthly

Daily
 Displays weekly for daily + weekly
 Displays monthly for hourly + monthly

Note

- The channel colors are fixed. You cannot change them.
- All channels in the report file are displayed on one screen.
- Channels containing errors, overflow, or negative values are not displayed.

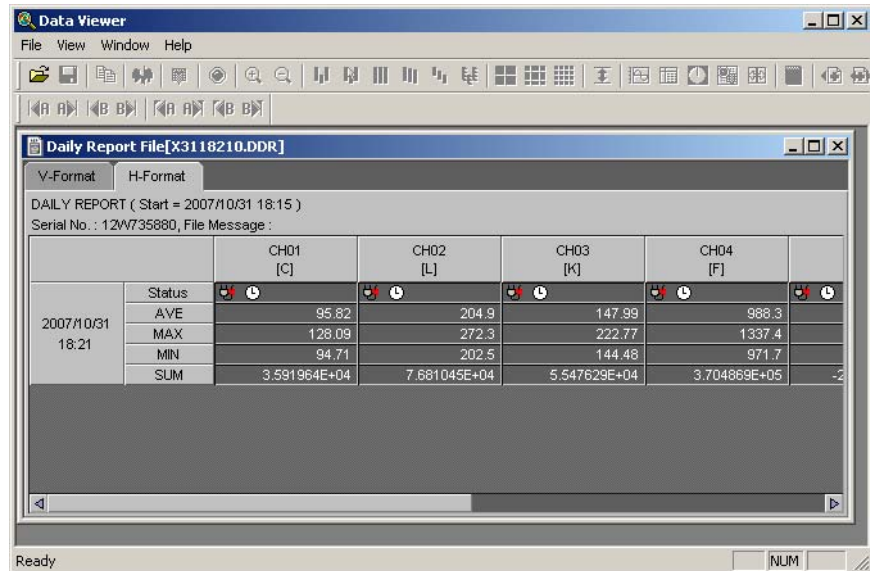
Report Files Generated by the CX1000/CX2000/DX100/DX00L/DX200/DX200C/MV100/MV200

The report file name extension is .DHR, .DDR, .DWR, or .DMR.

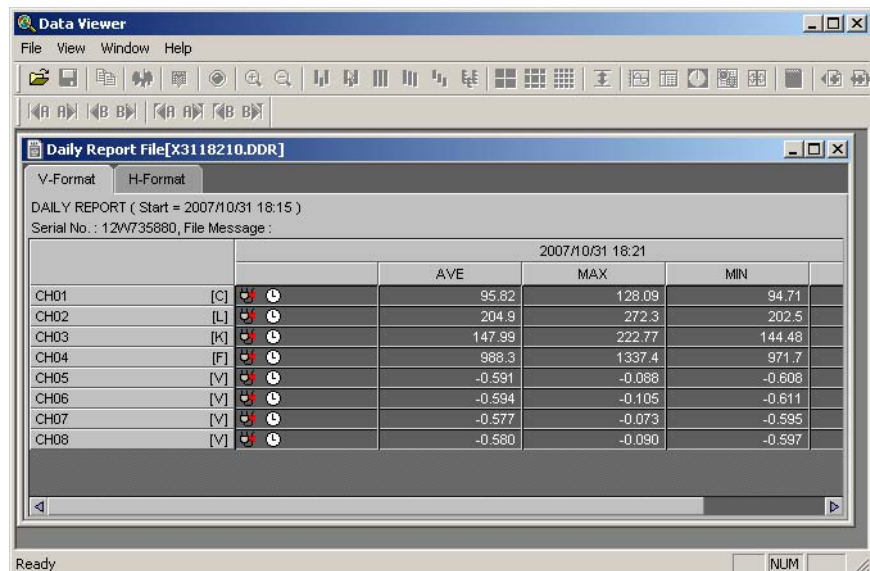
Displaying Report Data Numerically

1. Click the Open icon or choose [Open] from the [File] menu.
2. Select a report file.

The report appears. The following figure is an example of a daily report.



You can select [V-Format] or [H-Format]. The figure above is an example of H-Format. The following figure is an example of V-Format.

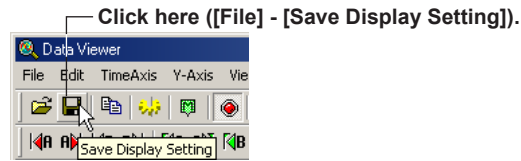


Status

The following icons are displayed in Status.

- : A measurement error or computation error occurred during the period over which the report was created.
- : An ober range or computation overflow occurred during the period over which the report was created.
- : A power failure occurred during the period over which the report was created.
- : The time was changed during the period over which the report was created.
- : The burn out occurred during the period for the report.

4.10 Saving the Display Settings



The display settings can be saved to a file. The following display settings can be saved:

For Display File, Event File, and Link File Displays

- Print comment
- Cursor A and Cursor B positions
- ON/OFF condition of the clipping of the displayed waveform
- Settings specified in the General Display Settings
- Mark information
- Zoom rate of the time axis
- Display mode of the time axis (absolute/relative)
- Waveform display area
- Grid type
- The channel identification string mode (channel/tag)
- ON/OFF condition of file information items (see section 4.1)
- The background and grid color of the waveform display area
- Y-axis zone setting
- The active waveform
- The height of the data overview of each group
- The width of the zone display area of each group
- Show/Hide condition of the zone display area
- Selected group
- ON/OFF condition of the alarm display
- Position of the display screen

For TLOG File Display

- ON/OFF condition of TLOG file information items (see section 4.1) and print comment
- The string to be used (channel/tag)
- Timer No.
- Display format of date and time

The information is saved to the same directory as the data files. The name of the saved file is the name of the data file being displayed, with an added [vdx] extension (Y1116040.DDS.vdx, for example).

This display setting file can be overwritten unlimited number of times.

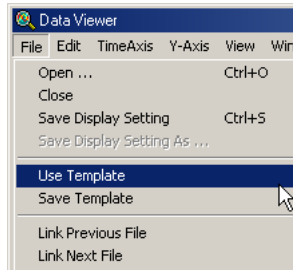
When the data with the same file name is reopened, the display settings that were saved are used. If you do not wish to open the data using the saved settings, delete the display setting file ([vdx] extension) before opening the data file.

4.11 Saving Display Template

Saving Templates

1. From the File menu, choose Save Template.

The currently displayed settings are saved as a template file to the same folder as the displayed data.



Using Templates

1. From the File menu, choose Use Template.

If the currently displayed data file is not accompanied by its display settings file, it is displayed according to the setting information of the template file residing in the same folder.

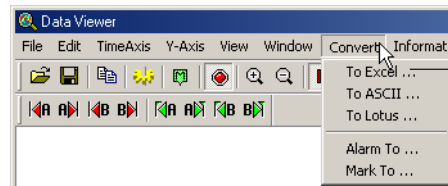
If the currently displayed data file is accompanied by its display settings file, it is displayed according to the setting information of the display settings file.

If you do not wish to use the template, select File > Use Template again to clear the check mark.

The template file is saved with the name default.tdx in the folder of the currently displayed data. When using a template file, the template file residing in the same folder as the displayed data is used. The setting information saved to the template file is as follows.

- Print comment
- Y-axis zone setting
- ON/OFF condition of the clipping of the displayed waveform
- Settings specified in the General Display Settings
- Zoom rate of the time axis
- Display mode of the time axis (absolute/relative)
- Waveform display area
- Grid type
- The channel identification string mode (channel/tag)
- ON/OFF condition of file information items (see section 4.1)
- The background and grid color of the waveform display area
- The width of the zone display area of each group
- The active waveform
- The height of the data overview of each group
- Show/Hide condition of the zone display area
- Selected group
- ON/OFF condition of the alarm display
- Position of the display screen

4.12 Converting the Data

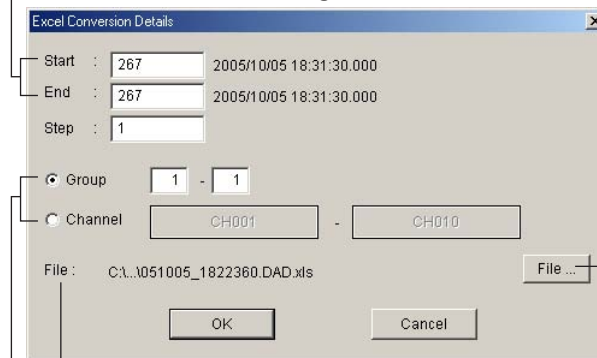


1. Select one.

2. The [Conversion Details] dialog box opens.

When Viewing the Trend Display or Digital Display

3. Enter the conversion range.



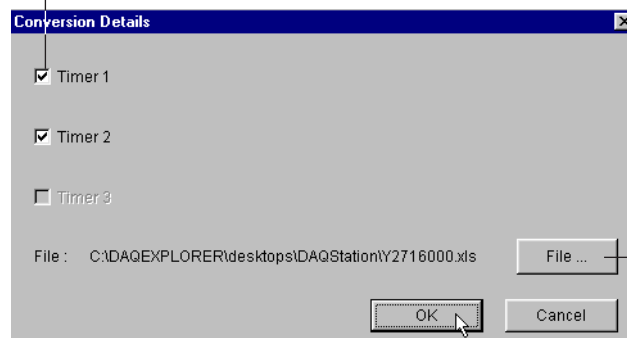
5. Change the save destination.

Save destination and file name

4. Select either one.

When Displaying a TLOG File

3. Select the timer numbers to be converted.



4. Change the save destination.

The measured data can be converted to ASCII, Lotus, and Excel formats.

Start Point and End Point

Cursor A and Cursor B are used to set the start point and end point of the range, respectively. If Cursor A and Cursor B are not specified or the cursors were erased, the data numbers of the start and end points are automatically set to [0] and [total number of data points - 1], respectively.

To convert all the data in the specified range, set the step number to 1.

Step

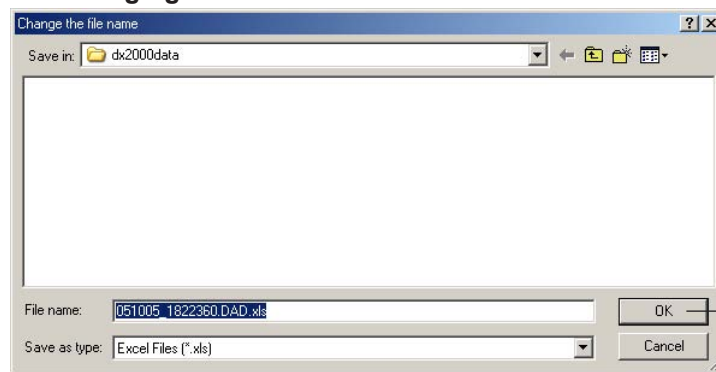
To convert all the data in the specified range, set the step number to 1.

Group/Channel

If you select [Group], enter the range of groups to be converted.

If you select [Channel], enter the range of channels to be converted.

Changing the Save Destination



Select the destination folder and file and click the [OK] button

To change the destination folder or the name of the file containing the converted data, click the [File] button. The [Change the file name] dialog box opens.

Note

- The default group is set to the number of the group that is currently being displayed. The default channel is set to all channels.
- The name of the destination file is automatically set to the displayed file name followed by the extension that identifies the data format. For ASCII, Lotus, and Excel conversions, the file extensions [txt], [wrk] (can be loaded using version 2.0 or later, and [xls] (can be loaded by version 4.0 or later) are attached, respectively.
- The conversion format of files with and without batch information differs.
- There is a limit in the number of data points that Lotus1-2-3 and Excel can handle. For these programs, specify the number of data points to be converted before performing the conversion. Note that even if the number of data points to be converted is within the limits, it still may not be possible to load the data if there is not enough free memory available on the PC. If the limit is exceeded, perform automatic division prior to conversion. A serial number is attached to the file name.
- Do not specify a floppy disk or an external storage medium as the save destination as it will take a long time for the save operation.
- Do not specify the root directory as the save destination.
- Prepare enough free space on the destination disk.

Conversion Example

ASCII conversion file

```
"DAQSTANDARD", " "
"Data viewer", " "
"Device Type", "dx2000"
"Serial No.", "S5E701600"
"File Message", "DATA01"
"Time Correction", "None"
"Starting Condition", "Auto"
"Dividing Condition", "Auto"
"Meas Ch.", 10
"Math Ch.", 0
"Ext Ch.", 0
"Data Count", 3600
"Sampling Interval", 2.000, "sec"
"Start Time", "2005/10/05", "18:22:36", 0.000
"Stop Time", "2005/10/05", "20:22:34", 0.000
"Trigger Time", "2005/10/05", "20:22:34", 0.000
"Trigger No.", 3599
"Damage Check", "Not Damaged"
"Batch No.", " "
"Lot No.", "000002"
"Discription1", " "
"Discription2", " "
"Discription3", " "
```

4.12 Converting the Data

Excel conversion file

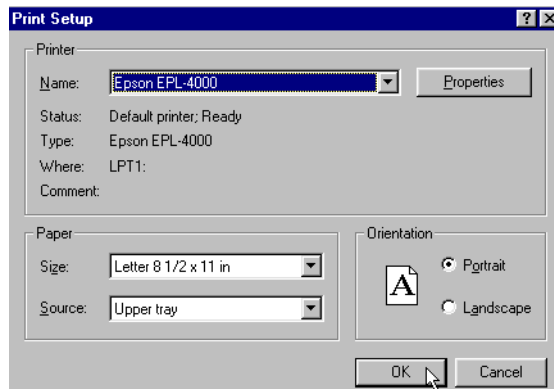
	A	B	C	D	E	F
1	DAQSTANDARD					
2	Data Viewer					
3						
4						
5	Device Type		Unknown			
6	Serial No.		S5E701624			
7	File Message		DATA01			
8	Time Correction		None			
9	Starting Condition		Auto			
10	Dividing Condition		Auto			
11	Meas Ch.		8			
12	Math Ch.		0			
13	Ext Ch.		0			
14	Data Count		24000			
15	Sampling Interval		0.025	sec		
16	Start Time		2005/09/28	13:27:35	0.425	
17	Stop Time		2005/09/28	13:37:35	0.400	
18	Trigger Time		2005/09/28	13:37:35	0.400	
19	Trigger No.		23999			
20	Damage Check		Not Damaged			
21						
22	Batch No.					
23	Lot No.		1			
24	Discription1					
25	Discription2					
26	Discription3					

4.13 Printing

You can print a display data file, event data file, manually sampled data file, TLOG file, or report file.

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

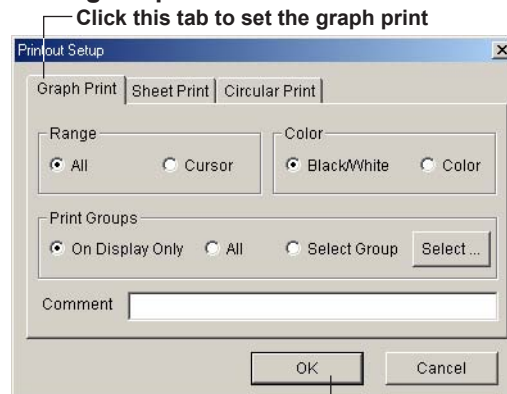
Set the printer according to the configuration of the system that you are using.

Specifying the Contents to be Printed (for Display Data File and Event Data File)

Specify the contents to be printed before executing the print. This setting is not necessary if you are printing a manually sampled data file, TLOG file, or report file.

Select [File] - [Print Settings]. The [Printout Setup] dialog box opens. When the waveform is displayed, printing is carried out according to the settings under the Graph Print tab of the [Printout Setup] dialog box. If numeric values are displayed, printing is carried out according to the settings under the Sheet Print tab.

Setting Graph Print



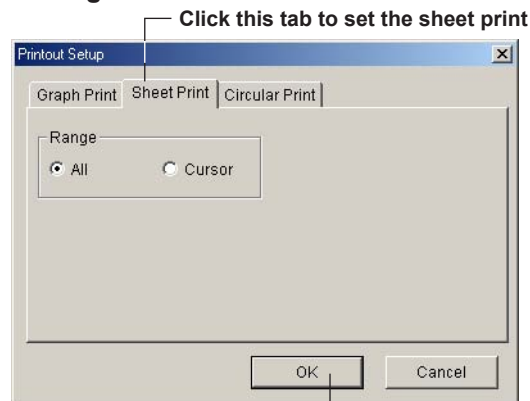
Set the range, color, print group, and comment, then click the [OK] button

If you selected [Select Group], click the [Select] button. The [Select Groups] dialog box opens. Select the groups to be printed. Click the [OK] button to close the dialog box.

4.13 Printing

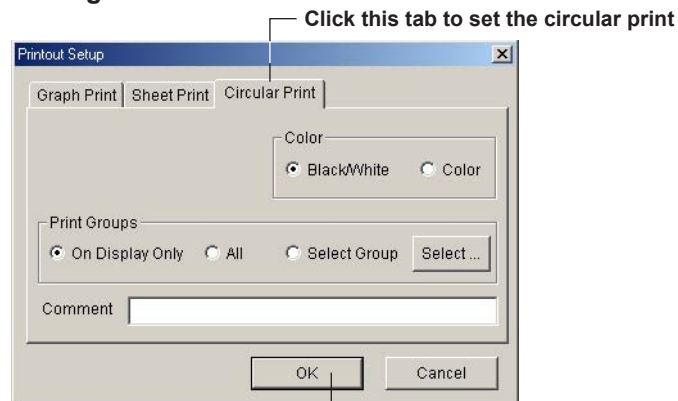


Setting Sheet Print



Select the range to be printed, and click the [OK] button

Setting Circular Print



Select the range to be printed, and click the [OK] button

Note

- The [Comment] can be entered or changed using [About Document] (see "Checking the Information About the loaded File" page 4-3). When the print comment is entered or changed, it is reflected in the comment of [About Document] dialog box.
- Up to 127 characters can be entered in the [Comment] entry box. However, the number of characters that is actually printed is limited.
- When the cursor is not displayed, select the [All] button under [Range] in the [Printout Setup] dialog box.

Header

A header can be printed when printing the waveform or a TLOG file.

Of the items that are displayed in the file information dialog box ([Information] - [About Document]), those that are checked are printed in the header section. For details related to the file information, see section 4.1.

Print Preview

You can preview the print layout before actually printing the data.

Selecting [File] - [Print Preview] displays the print preview screen.

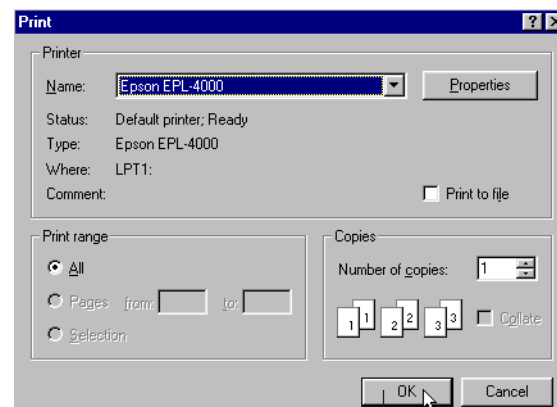
Note

- The preview screen will display the print image of the specified range.
- The file information is also displayed when previewing the graph. If the color overview, alarm, [Cursor value] window, and [Statistics] window are displayed, these are also displayed on the preview screen along with the graph
- For the print preview operation, see the instruction manual that came with your operating system.

Printing



2. The [Print] dialog box opens.



Select the printer, print range, the number of copies, and click the [OK] button

5.1 Troubleshooting

Launcher

Message	Corrective Action	Reference Section
Check communication settings.	Open the [Network] dialog box and check the settings.	2.3

Hardware Configurator

Warning Message List

Message	Reference Section
System settings have been changed. Input configuration and data will be initialized. Do you want to proceed?	3.1 6.1 7.1 8.1
Data created in 2038 or later cannot be handled.	- - - -
Some A/D converters are faulty. Some items cannot be set.	- - - -
Some information cannot be set. Do you still want to continue?	- - - -
Settings may not be made correctly since the configuration does not match the connected recorder. Do you still want to send?	3.7 6.7 7.13 8.7
The current setup data will be initialized.	3.2 6.2 7.2 8.8
Setup data will be received from the recorder.	3.1 6.1 7.1 8.1
The setup data will be sent.	3.7 6.7 7.13 8.7
Memory sampling will be stopped.	3.10 6.10 7.16 8.11
Memory sampling will be started.	3.10 6.10 7.16 8.11

Error List

Message	Corrective Action	Reference Section
Illegal file to load.	Select another file.	3.1 6.1 7.1 8.1
Failed to load the file.	Try to load the file again. If still not possible, the file may be damaged. Select another file.	3.1 6.1 7.1 8.1
Failed to create a file.	Check the free space in the directory.	- - - -
Memory sampling in progress. Stop sending.	Send after data has been written to the internal memory of the recorder .	- - - -
Math in progress. Stop sending.	Send after math is completed.	- - - -
Memory sampling & math in progress. Stop sending.	Send after data has been written to the internal memory of the recorder and math is completed.	- - - -
Saving to the media. Re-send later.	Send after data has been saved to the external media.	- - - -
Communication error.	Check the communication settings.	2.3
Time out.	Traffic may be busy. Retry later.	- - - -
Illegal user information	Check whether the user name is correct.	- - - -
Failed to connect.	Check the communication settings. Check whether the recorder is powered ON.	2.3
Communication busy.	Retry later.	- - - -
Memory error.	Exit other programs then restart, or reboot the OS then restart.	- - - -
User level error.	No right is given to the login user ID	- - - -

Message

Message
Data has been sent.
Data has been received.
Some information has not been sent.
Not allowed.
A password is required.
A user name is required.
Some information requires attention.

5.1 Troubleshooting

Data Viewer

Message	Corrective Action	Reference Section
Insufficient memory. Exit immediately.	Exit other programs then restart, or reboot the OS then restart.	–
Cannot write to the file.	Check the free space in the directory. The file may be currently used by another program, so check it.	–
Cannot load the file.	Check whether the file exists. Also check whether the file system is correct.	–
Cannot open the file.	Check whether the file exists. Also check whether the file system is correct.	–
Illegal file	Select another file.	4.1
The number of data sets is "0".	Select another file.	4.1
The number of channels is "0".	Select another file.	4.1
Some files may be overwritten. Do you still want to continue?	Continue if OK. If not, change the file names.	–

6.1 Starting the Hardware Configurator

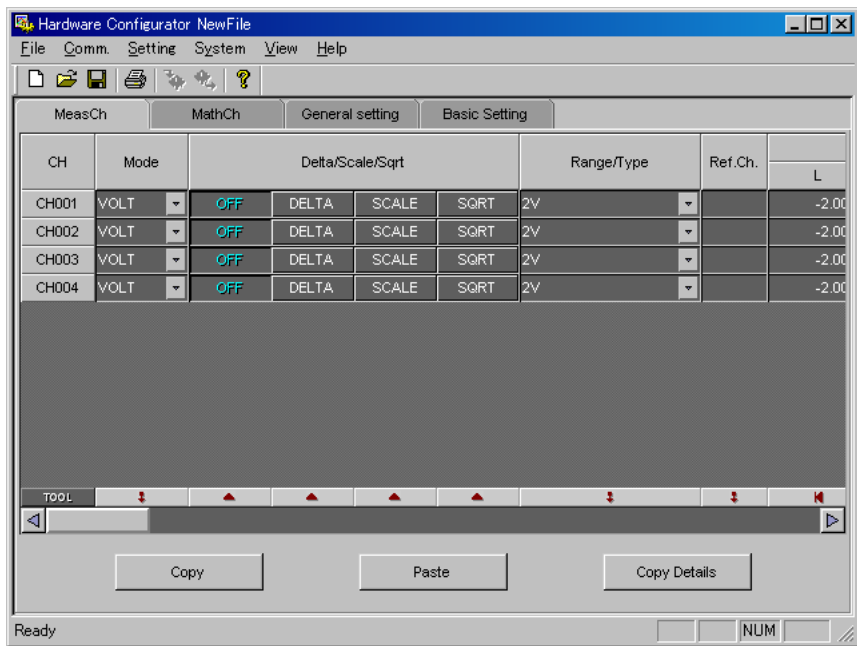
The Hardware Configurator can transmit and receive the setup data, change the setup data, and create new setup data. **The setting screen may differ from your actual screen.**

Starting the Hardware Configurator

1. Click the [CONFIG] button in the Launcher window.



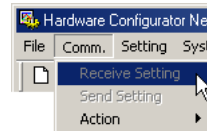
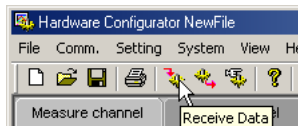
The setting screen is displayed. The DX2000 setting screen appears by default.



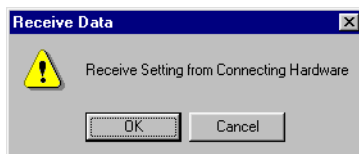
To Load Setup Data from the MV1000/MV2000

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 choose [Comm.] - [Receive Setting] from the menu bar.



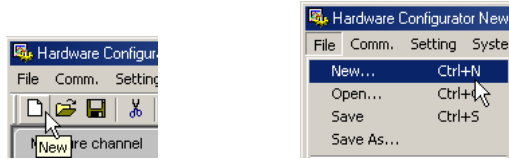
The [Receive Data] dialog box opens.



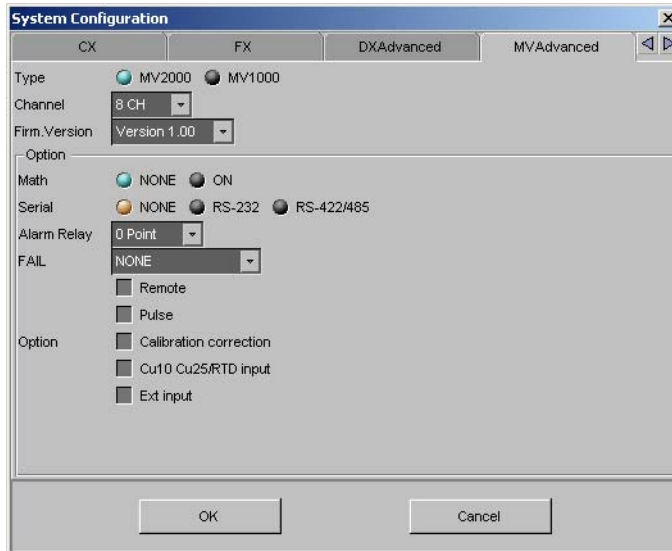
2. Click the [OK] button.
Receiving starts.

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.



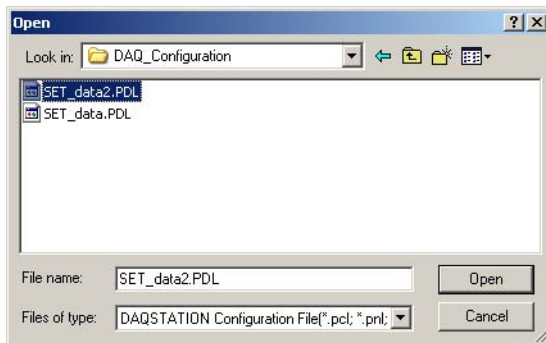
2. Enter all settings on the [MVAdvanced] tab, then click the [OK] button. The MV1000/MV2000 setting screen in displayed.

Loading Preexisting 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).

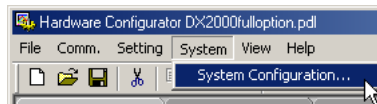
6.2 Setting and Checking the System Configuration and Initializing Setup Data

Changing/Checking the System Configuration

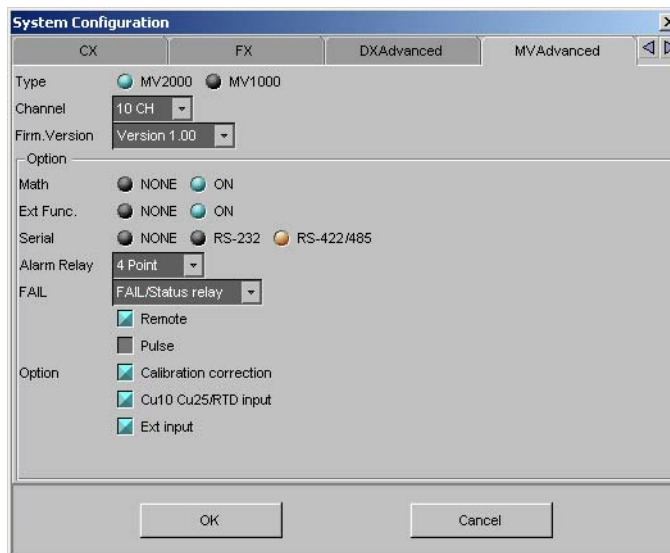
You can create new hardware configuration files, or open existing configuration files and then check the system configuration or change the configuration according to the specifications of the connected MV1000/MV2000.

Normally, a system is set up according to the specifications of the MV1000/MV2000 to be set up.

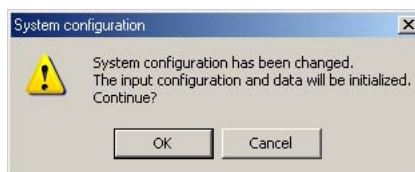
1. Choose [System] - [System Configuration] from the menu bar.



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



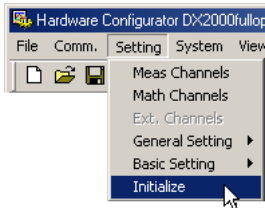
2. Change the various settings according to the MV1000/MV2000 that you will connect to (blue and brown items are selected, gray items are cleared).
The settings in the Option group differ depending on the model and options of the instrument.
For example, for the MV1000, or for the MV2000 with eight channels 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.

6.3 Setting the Measurement Channels, Ext. Channels

Setting Operation

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

Drag to select a range

Turn all channels ON/OFF

Click and select from the list

Click the text box to enter a number

Range select shortcut buttons

Click the button to select the function

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.

Click to display a dialog box to set one channel at a time ([001] dialog box, for example). (In the [Math channel] and [Ext channel] tabs, dialog box for each channel is displayed.)

Click to display the color settings screen.

Click to display the calibration correction setting screen.

Click to toggle ON and OFF.

Click to change the display.

6.3 Setting the Measurement Channels, Ext. Channels

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.

Select this tab
Double-click to set the channel
Select the input mode
Difference computation
Scaling
Square root
Select the reference channel for the difference computation
Set the span
Enter the scale

CH	Mode	Delta/Scale/Sqrt			Range/Type	Ref. Ch.	Span			Scale			
		Delta	Scale	Sqrt			L	U	Point	L	U		
CH001	VOLT	OFF	DELTA	SCALE	SQRT	2V							
CH002	VOLT	OFF	DELTA	SCALE	SQRT	2V	1						
CH003	VOLT	OFF	DELTA	SCALE	SQRT	2V						0.00	200.00
CH004	VOLT	OFF	DELTA	SCALE	SQRT	2V						0.00	200.00
CH005	VOLT	OFF	DELTA	SCALE	SQRT	2V							

Set all **Select the range/type** **Initialize**

Enter the scale unit
Set the low cut
Select the alarm type
Enter the alarm value
Select the relay number
Select the ON/OFF

Unit	Low Cut point	Type	Alarm 1			Alarm 2			Type	Value
			Value	Alarm Relay	Detect	Type	Value	Alarm Relay			Detect
		H	0.0000	S01		H	0.0000	None	OFF	0.0
		L	0.0000	S02		OFF	0.0000	None	OFF	0.0
		R	0.01	S03		OFF	0.00	None	OFF	
	0.5	r	0.01	S04		OFF	0.00	None	OFF	
		H	0.00	None		OFF	0.00	None	OFF	

Set the value to the maximum value possible
Set the value to the minimum value possible
Enter the alarm delay time
Enter the sampling count
Enter the tag name

Type	Value	Alarm Relay	Detect	Alarm 3			Alarm 4			Alarm Delay	Moving Average Times	Tag
				Type	Value	Alarm Relay	Detect	Type	Value				Alarm Relay	Detect
OFF	0.0000	None		OFF	0.0000	None		10 sec	ON	2		
OFF	0.0000	None		OFF	0.0000	None		10 sec	ON	2		
OFF	0.00	None		OFF	0.00	None		10 sec	ON	2		
OFF	0.00	None		OFF	0.00	None		10 sec	OFF	2		
OFF	0.00	None		OFF	0.00	None		10 sec	OFF	2		

Copy the settings of the first channel in the selected range to all other channels

Enter the display zone
Select the graph setting
Turn ON/OFF the partial expanded display

Memory Sampling	Zone		Graph				Partial		
	L	U	Scale display position	Scale divide position	Bar display position	Bar divide number	Bound position	Boundary	
ON	0	100	1	10	Center	-1	10	50	0.0000
ON	0	100	2	10	Center	-1	11	50	0.0000
ON	0	100	3	10	Center	-1	12	50	0.01
ON	0	100	4	10	Normal	-1	10	50	0.01

Select the channel display color
Set the green band
Select the mark type
Click here to set the calibration correction (see page 6-8)

Color	Green Band				Alarm Mark				Calibration Correction		
	Region	Color	L	U	Mark kind	Scale display	Mark color 1	Mark color 2		Mark color 3	Mark color 4
Red	Inside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Red	Off
Green	Outside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Red	Off
Blue	Inside	Green	0.00	1.00	Fixed	ON	Red	Yellow	Red	Red	Off
Purple	Outside	Green	0.00	1.00	Alarm	ON	Red	Yellow	Red	Red	Off

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.

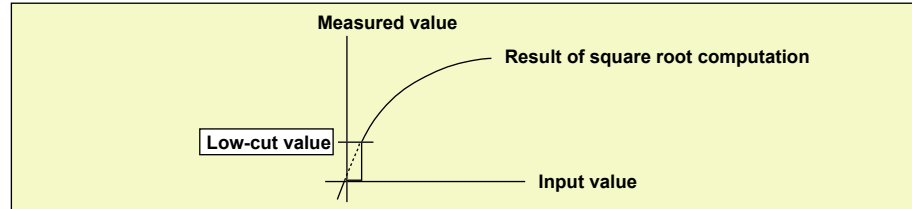
6.3 Setting the Measurement Channels, Ext. Channels

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.

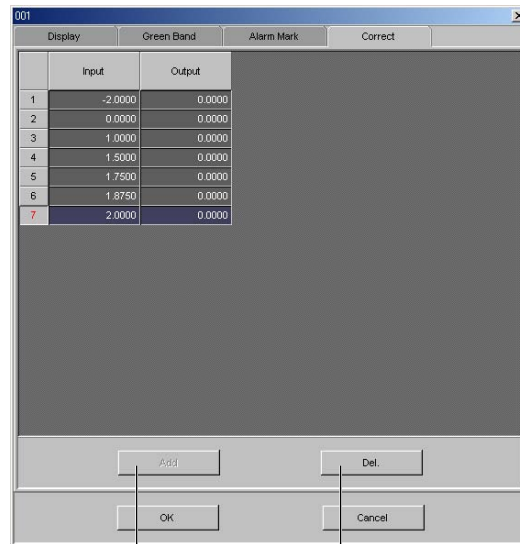
Low-cut value (Can be set when the mode is VOLT with square root (SQRT) selected.)

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

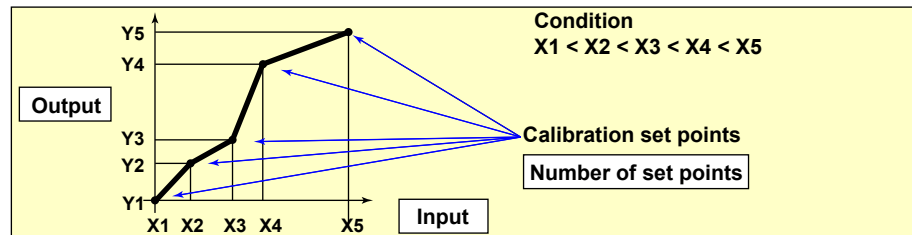


Calibration Correction

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

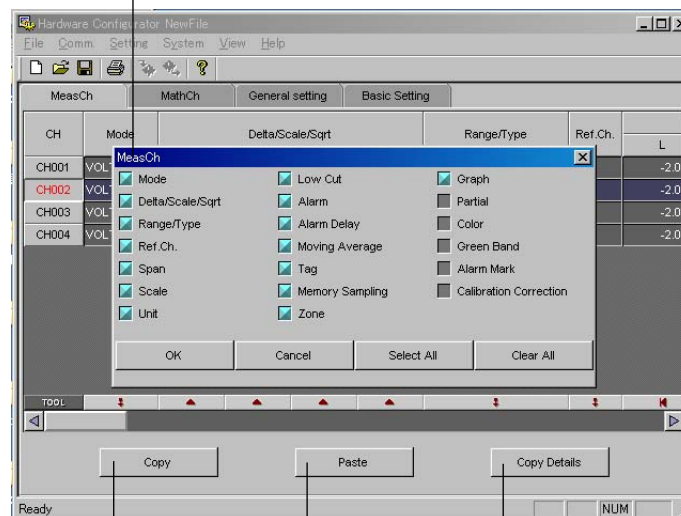
If the [Mark kind] is set to [Fixed], specify the color of the alarm point marks.

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.

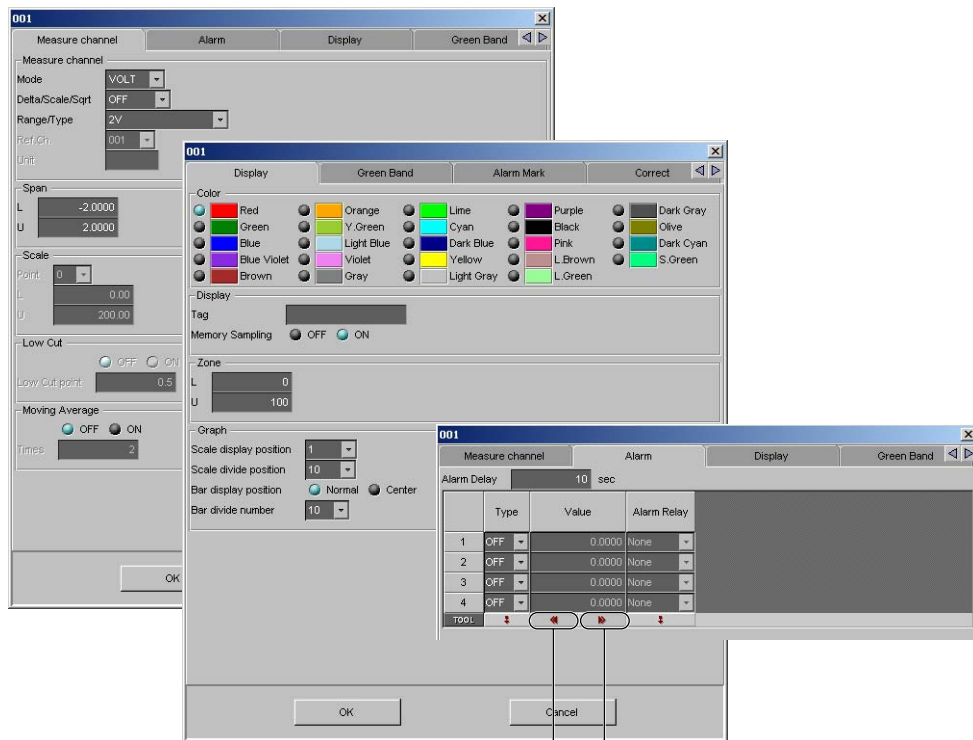
1. Select the copy source channels. Click the [Copy] button.
2. Select the paste destination channels. Click the [Paste] button.

Setting One Channel at a Time

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

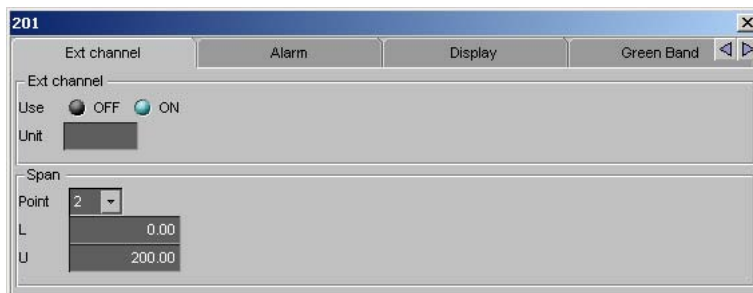
CH	Mode	Delta/Scale
CH01	VOLT	OFF DELTA SC
CH02	VOLT	OFF DELTA SC
CH03	VOLT	OFF DELTA SC

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 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.

6.4 Setting the Computation Channels

Double-click when setting each channel

Turn ON/OFF computation

Select this tab

Enter the expression

Select the number of digits to the right the decimal

Set the display span

Enter the unit

Enter the constant used in the expression

Turn ON/OFF all at once

Set the TLOG computation

Set the rolling average

Select the alarm type

Enter the alarm value

Select the relay number

Select the ON/OFF

Enter the alarm delay time

Enter the tag

Display zone

Set the graph

Turn ON/OFF the partial expanded display

Select the channel display color

Select the mark type

Set the green band

Turn ON/OFF scale display

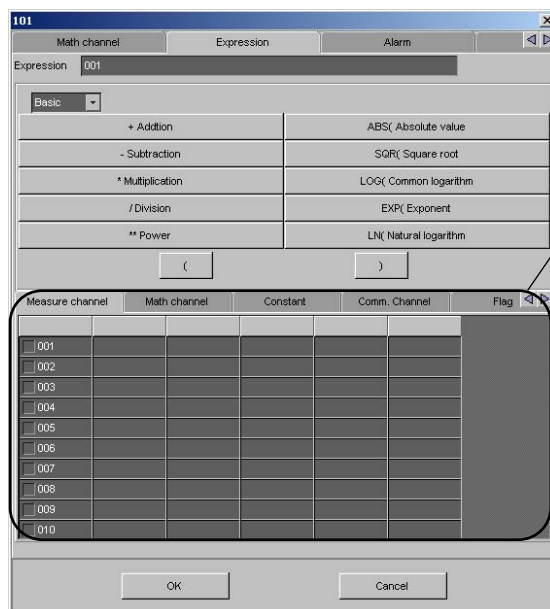
Select the mark color

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.



Click the tab to display a list of that item

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 "m³/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 6.3, "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 6.3, “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 6.3, “Setting the Measurement Channel, Ext. Channel.”

Setting One Computation Channel at a Time

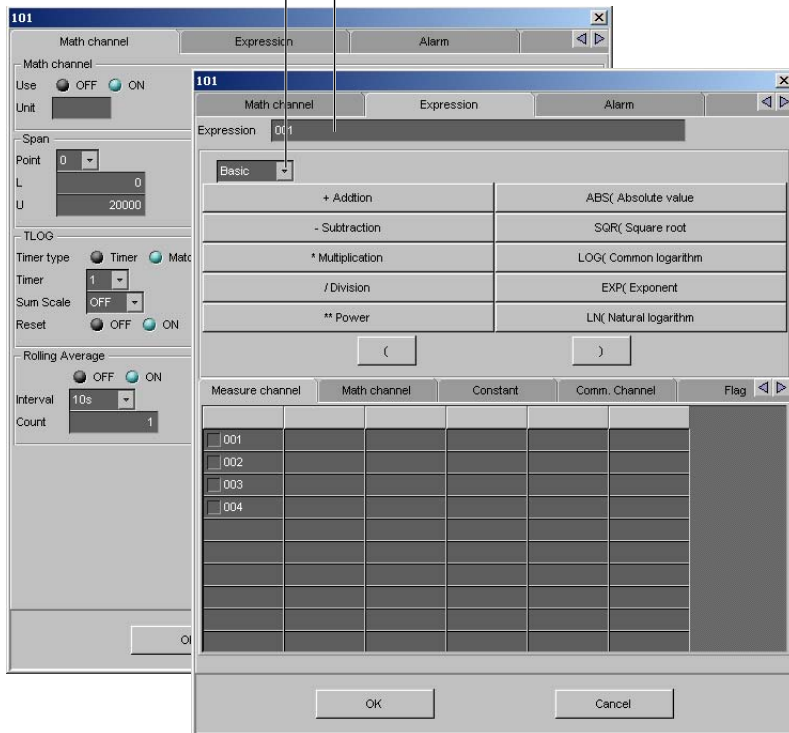
1. Double-click the channel you wish to set.

MeasCh	MathCh	E
CH	Use	
CH101	<input checked="" type="checkbox"/> ON	(001+002)*K01
CH102	<input checked="" type="checkbox"/> ON	201-002+K02
CH103	<input checked="" type="checkbox"/> ON	001/K03

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.

6.5 Entering General Settings

Summer Time

Daylight Saving Time

Use Not Use

Start Time MAR 2nd SUN 2 :00

End Time NOV 1st SUN 1 :00

- 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 switch 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.

Group	Use	Group Name	Channel Configuration	Use	Position	Color	Trend Line
1	<input checked="" type="checkbox"/> ON	GROUP 1	001.002.003.004.005.006.007.008.009.010	<input checked="" type="checkbox"/> ON	50	Red	2
2	<input checked="" type="checkbox"/> ON	GROUP 2	011.012.013.014.015.016.017.018.019.020	<input checked="" type="checkbox"/> ON	50	Red	2
3	<input checked="" type="checkbox"/> ON	GROUP 3	021.022.023.024.025.026.027.028.029.030	<input checked="" type="checkbox"/> ON	50	Red	2
4	<input checked="" type="checkbox"/> ON	GROUP 4	031.032.033.034.035.036.037.038.039.040	<input checked="" type="checkbox"/> ON	50	Red	2
5	<input checked="" type="checkbox"/> ON	GROUP 5	041.042.043.044.045.046.047.048	<input checked="" type="checkbox"/> ON	50	Red	2
6	<input type="checkbox"/> OFF	GROUP 6	001.002.003.004.005.006.007.008.009.010	<input type="checkbox"/> OFF	50	Red	2
7	<input type="checkbox"/> OFF	GROUP 7	011.012.013.014.015.016.017.018.019.020	<input type="checkbox"/> OFF	50	Red	2
8	<input type="checkbox"/> OFF	GROUP 8	021.022.023.024.025.026.027.028.029.030	<input type="checkbox"/> OFF	50	Red	2
9	<input type="checkbox"/> OFF	GROUP 9	031.032.033.034.035.036.037.038.039.040	<input type="checkbox"/> OFF	50	Red	2
10	<input type="checkbox"/> OFF	GROUP 10	041.042.043.044.045.046.047.048	<input type="checkbox"/> OFF	50	Red	2

Group 1

Channel Configuration Trip Line

Use OFF ON

Group Name GROUP 1

Channel Configuration 001.002.003.004.005.006.007.008.009.010

MeasCh	MathCh	Ext.Ch 201	Ext.Ch 261	Ext.Ch 321	Ext.Ch 381
<input checked="" type="checkbox"/> 001	<input type="checkbox"/> 011	<input type="checkbox"/> 021	<input type="checkbox"/> 031	<input type="checkbox"/> 041	
<input checked="" type="checkbox"/> 002	<input type="checkbox"/> 012	<input type="checkbox"/> 022	<input type="checkbox"/> 032	<input type="checkbox"/> 042	
<input checked="" type="checkbox"/> 003	<input type="checkbox"/> 013	<input type="checkbox"/> 023	<input type="checkbox"/> 033	<input type="checkbox"/> 043	
<input checked="" type="checkbox"/> 004	<input type="checkbox"/> 014	<input type="checkbox"/> 024	<input type="checkbox"/> 034	<input type="checkbox"/> 044	
<input checked="" type="checkbox"/> 005	<input type="checkbox"/> 015	<input type="checkbox"/> 025	<input type="checkbox"/> 035	<input type="checkbox"/> 045	
<input checked="" type="checkbox"/> 006	<input type="checkbox"/> 016	<input type="checkbox"/> 026	<input type="checkbox"/> 036	<input type="checkbox"/> 046	
<input checked="" type="checkbox"/> 007	<input type="checkbox"/> 017	<input type="checkbox"/> 027	<input type="checkbox"/> 037	<input type="checkbox"/> 047	
<input checked="" type="checkbox"/> 008	<input type="checkbox"/> 018	<input type="checkbox"/> 028	<input type="checkbox"/> 038	<input type="checkbox"/> 048	
<input checked="" type="checkbox"/> 009	<input type="checkbox"/> 019	<input type="checkbox"/> 029	<input type="checkbox"/> 039	<input type="checkbox"/> 048	
<input checked="" type="checkbox"/> 010	<input type="checkbox"/> 020	<input type="checkbox"/> 030	<input type="checkbox"/> 040		

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

Measure channel	Math channel	Ext channel	General setting	Basic setting
<input type="radio"/> Daylight Saving Time <input type="radio"/> Logging				
<input checked="" type="radio"/> Group Trend Interval[div.] <input type="text" value="1min"/>				
<input checked="" type="radio"/> Display Save Interval <input type="text" value="1h"/>				
<input type="radio"/> View group <input type="radio"/> Trend				
<input type="radio"/> Message Display Update 2nd Interval <input type="text" value="1min"/>				
<input type="radio"/> Timer Direction <input type="radio"/> Horizon <input type="radio"/> Vertical <input checked="" type="radio"/> Wide <input type="radio"/> Split				
<input type="radio"/> Manual Sample Trend Clear <input checked="" type="radio"/> OFF <input type="radio"/> ON				
<input type="radio"/> Event Action Message Direction <input checked="" type="radio"/> Horizon <input type="radio"/> Vertical				
<input type="radio"/> File Scale Digit <input checked="" type="radio"/> Normal <input type="radio"/> Fine				
<input type="radio"/> Menu Customize Value Indicator <input checked="" type="radio"/> Mark <input type="radio"/> Bargraph				
<input type="radio"/> Trend Line <input type="text" value="2"/>				
<input type="radio"/> Grid <input type="text" value="Auto"/>				
<input type="radio"/> Display				
Bar Graph Direction <input type="radio"/> Horizon <input checked="" type="radio"/> Vertical				
Brightness <input type="text" value="2"/>				
Backlight Saver Mode <input type="radio"/> Off <input type="radio"/> Dimmer <input checked="" type="radio"/> Time off				
Backlight Saver Time <input type="text" value="1h"/>				
Backlight Restore <input type="radio"/> Key <input checked="" type="radio"/> Key & Alarm				
Trend Background <input checked="" type="radio"/> White <input type="radio"/> Black				
Historical Trend Background <input type="radio"/> White <input checked="" type="radio"/> Black <input type="radio"/> Cream <input type="radio"/> Light Gray				
Scroll Time <input type="text" value="10s"/>				
Jump Default Display <input type="text" value="OFF"/>				
<input type="radio"/> HISTORY Key action				
Action <input type="radio"/> History <input checked="" type="radio"/> Favorite				
Group display <input checked="" type="radio"/> Saved <input type="radio"/> Current				
Time axis zoom <input checked="" type="radio"/> Saved <input type="radio"/> Current				

6.5 Entering General Settings

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 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 h	2 h	4 h	8 h	20 h
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.

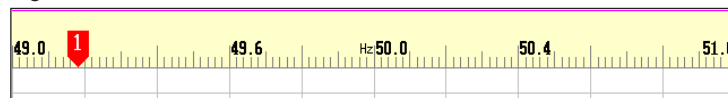
Message direction

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**

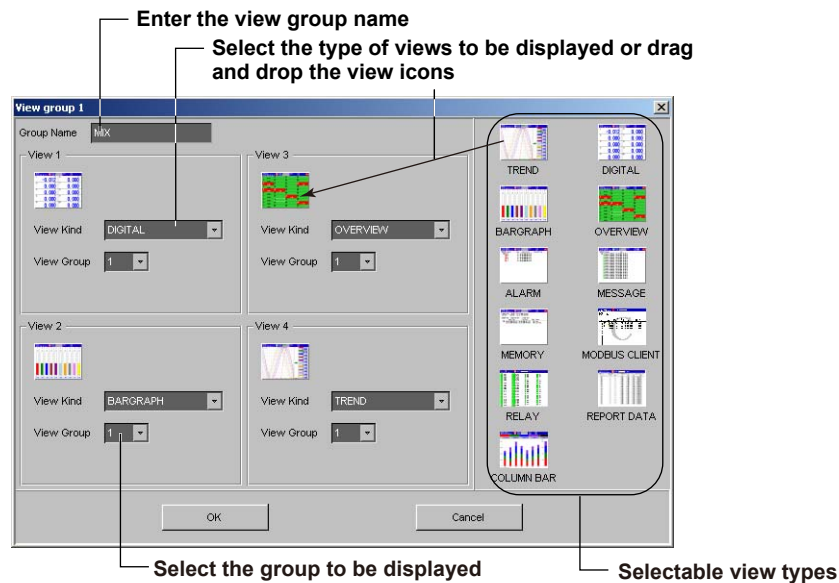
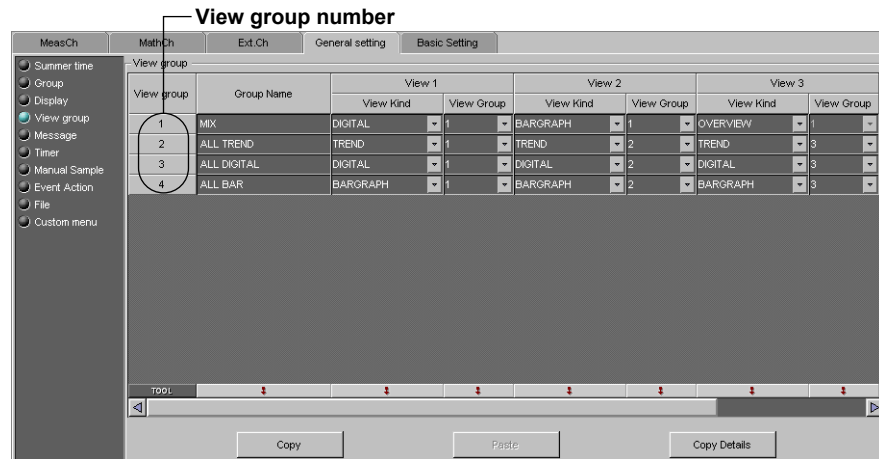
Settings	Description
Current	Displays a favorite display at the current time axis zoom rate.
Saved	Displays a favorite display at the time axis zoom rate that was selected when you registered the favorite display.

6.5 Entering General Settings

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.

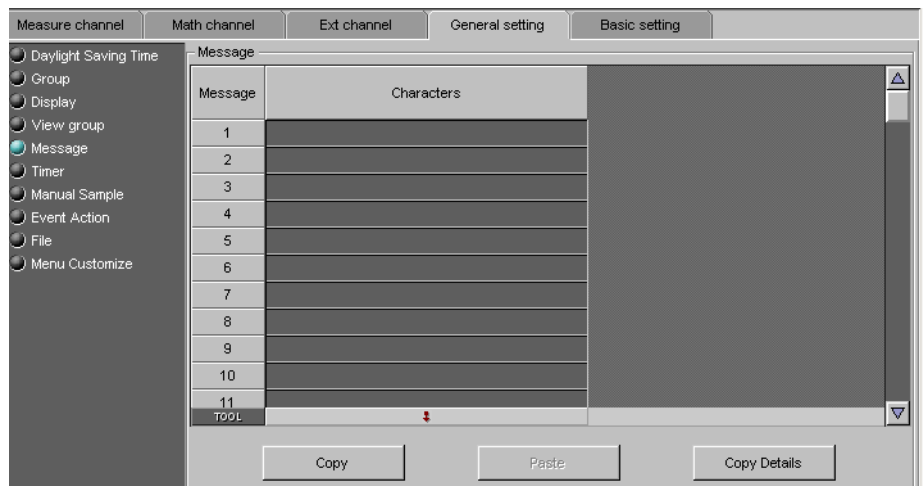
View Kind

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



Changes the upper/lower display area

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.

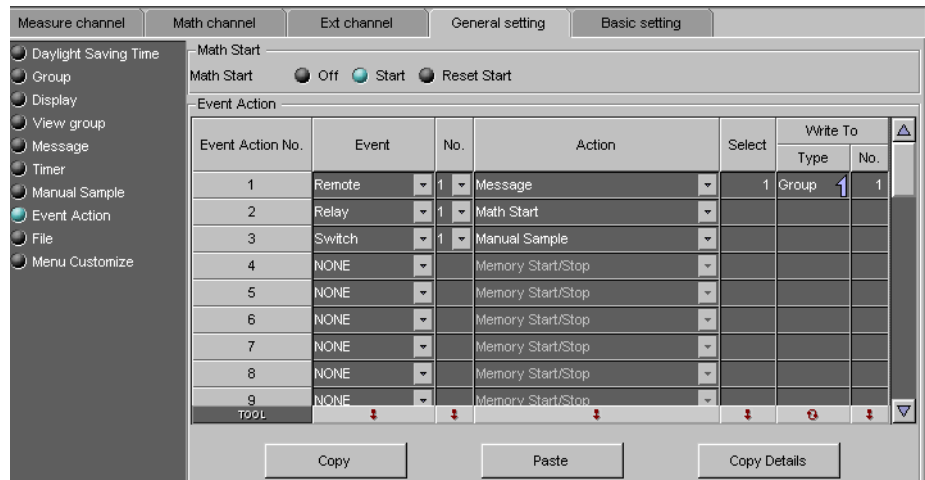
Manual sample number

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



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.
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

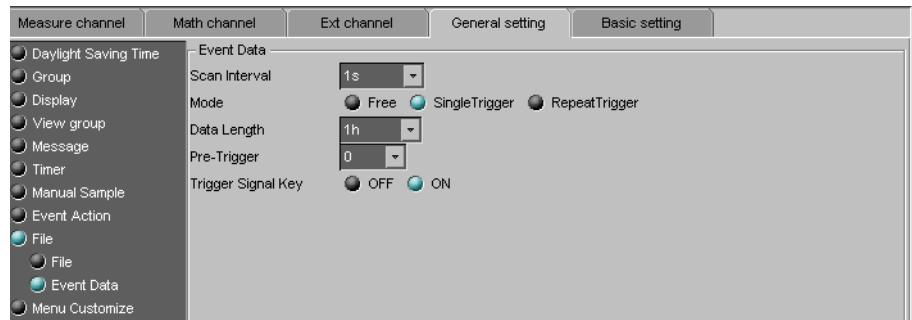
Settings	Description
Text	Display data files and event data files are in text format.
Binary	Display data files and event data files are in binary format.

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 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.

Click to select

Type of main menus being set

Sub menu

Delete selected items

Changes the left/right display area

Add an item beneath the selected item

Function

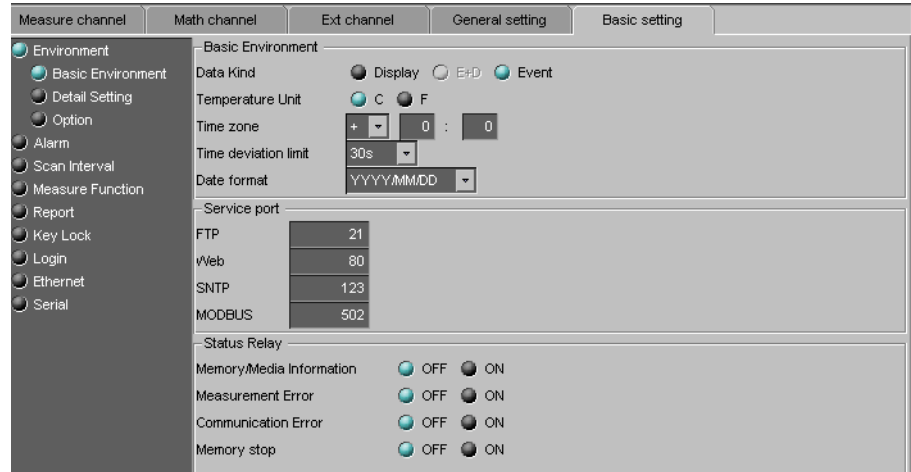
The FUNC key menu appears when the FUNC key is pressed.

No.	Type
1	PAUSE DISPLAY
2	MESSAGE
3	FREE MESSAGE
4	SNAPSHOT
5	MANUAL
6	ALARM ACK
7	LCD SAVER
8	TRIGGER
9	SAVE DISPLAY
10	SAVE EVENT
11	SAVE STOP

6.6 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.

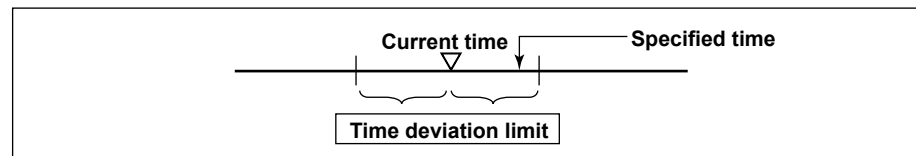
- **Temperature Unit**

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 \pm (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

6.6 Entering Basic Settings

- **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**

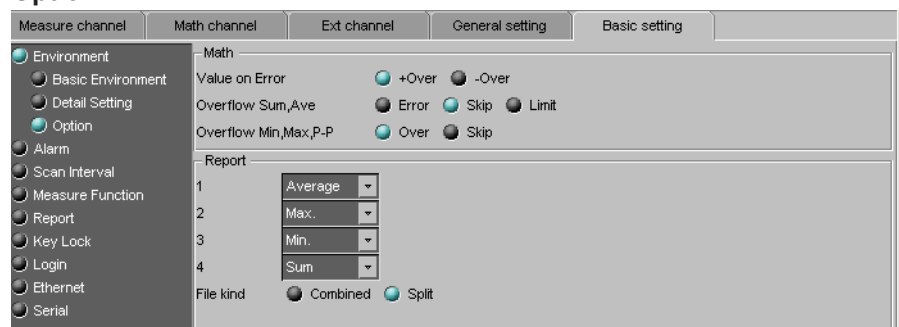
Settings	Description
ON	Automatically saves the measured data to the CF card.
OFF	Does not automatically save the data. Save the measured data manually to the CF card or USB flash memory (/USB1 option).

- **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.

6.6 Entering Basic Settings

- **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

You can select this with MV main unit firmware version 2.0x or later.

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

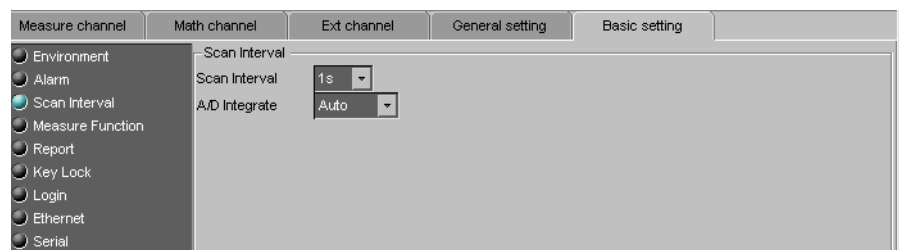
Sets the hysteresis width of the alarm occurrence/release of the difference high/low limit alarm specified on measurement channels.

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**

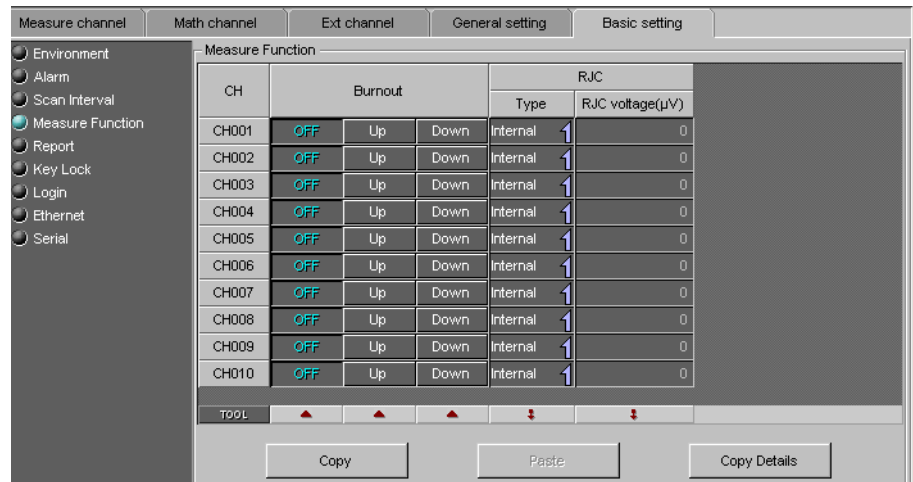
Select a scan interval.

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

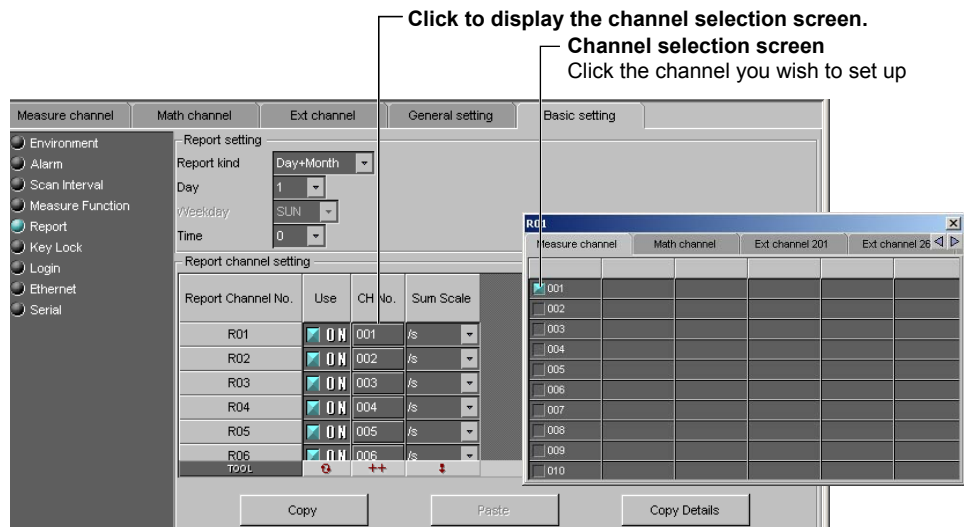
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

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.

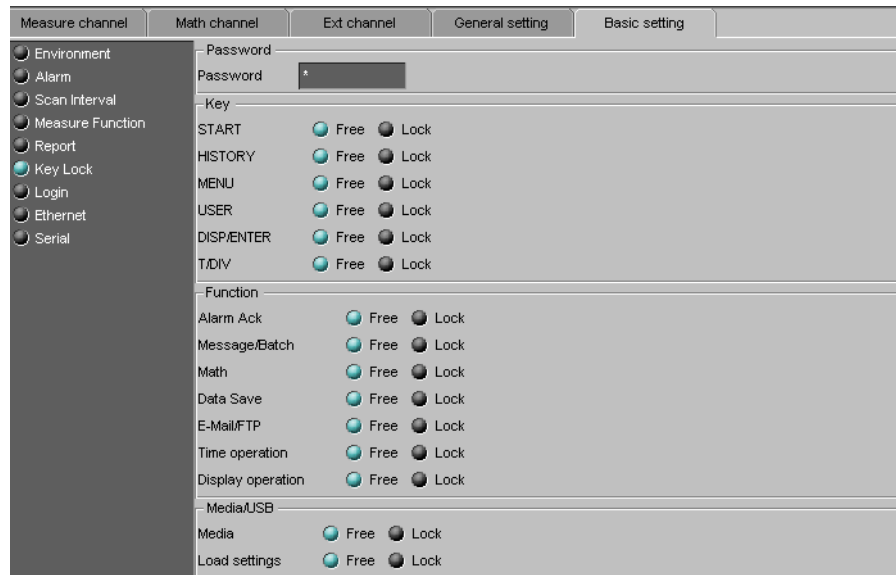
Sum Scale

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 "m³/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)

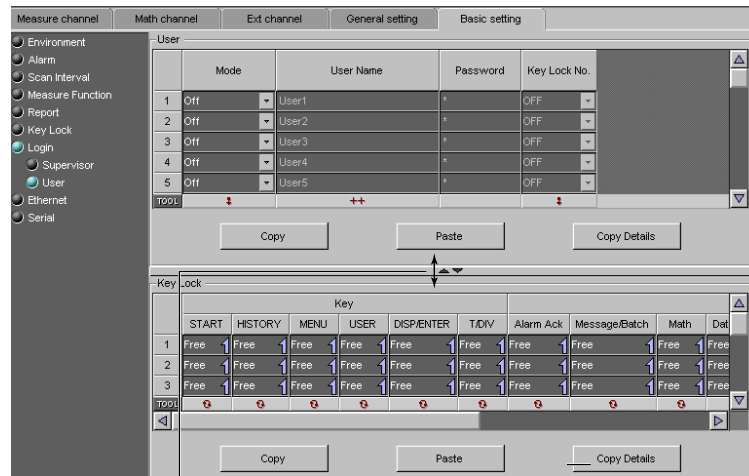
An entered password is displayed as "*****."

- You cannot register "quit" or a password containing all spaces.

6.6 Entering Basic Settings

User

Up to 30 names can be registered.



Changes the upper/lower display area

- **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

Measure channel	Math channel	Ext channel	General setting	Basic setting				
<ul style="list-style-type: none"> <input type="radio"/> Environment <input type="radio"/> Alarm <input type="radio"/> Scan Interval <input type="radio"/> Measure Function <input type="radio"/> Report <input type="radio"/> Key Lock <input type="radio"/> Login <input checked="" type="radio"/> Ethernet <input type="radio"/> TCP/IP <input type="radio"/> FTP <input type="radio"/> Modbus client <input type="radio"/> E-Mail <input type="radio"/> SNMP client <input type="radio"/> Server functions <input type="radio"/> Serial 					Host Information DHCP <input type="radio"/> OFF <input checked="" type="radio"/> ON Host Name <input type="text"/>			
Address IP Address: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> Subnet Mask: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> Default Gateway: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/>								
DNS DNS accession <input checked="" type="radio"/> OFF <input type="radio"/> ON Domain Name <input type="text"/> Server Primary: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> Server Secondary: <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> Domain Primary <input type="text"/> Domain Secondary <input type="text"/>								
Control Keep Alive <input type="radio"/> OFF <input checked="" type="radio"/> ON Time out <input type="radio"/> OFF <input checked="" type="radio"/> ON Timeout time(min.) <input type="text" value="1"/>								

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 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

The screenshot shows the 'MODBUS Client' configuration window. On the left is a sidebar with various function categories. The main area is titled 'Basic setting' and contains the following sections:

- Basic Setting:** 'Communication interval' set to 1s, 'Auto recovery' set to 2min.
- Modbus Server Setting:** A table with columns 'Server No.' and 'Host Name'. It contains two rows with server numbers 1 and 2. Below the table are 'Copy', 'Paste', and 'Copy Details' buttons.
- Command setting:** A table with columns 'Client Command No.', 'Command', 'Start channel', 'End channel', 'Connect to', 'Register', and 'Type'. It contains three rows with commands 'Read-M', 'Off', and 'Off'. Below the table are 'Copy', 'Paste', and 'Copy Details' buttons.

A callout box with an arrow points to a small icon in the 'Modbus Server Setting' table, with the text: 'Click to display the channel selection screen' and 'Changes the upper/lower display area'.

Click to display the channel selection screen
Changes the upper/lower display area

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

The screenshot shows the 'E-mail' configuration page with a sidebar menu on the left and a main configuration area on the right. The sidebar menu includes: Environment, Alarm, Scan Interval, Measure Function, Report, Key Lock, Login, Ethernet (selected), TCP/IP, FTP, Modbus client, E-Mail (selected), SMTP client, Server functions, and Serial. The main configuration area is divided into 'Basic Setting' and 'POP3 settings' sections. The 'Basic Setting' section includes fields for SMTP server name, Port No. (25), Security (OFF/POPbeforeSMTP), Address 1, Address 2, and Sender. The 'POP3 settings' section includes fields for POP3 Server name, Port number (110), Login name, Password, Send delay [second] (2), and POP3 Login (PLAIN/APOP). Below these sections are tabs for Alarm, Scheduled, System, and Report. The 'Alarm' tab is active, showing a list of alarm recipients and settings, including Recipient1-4, Alarm1-4, Include INST, Include source URL, and Subject (Alarm_summary).

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).

6.6 Entering Basic Settings

- **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

Alarm	Scheduled	System	Report
Scheduled			
Recipient1	<input type="radio"/> OFF <input type="radio"/> ON		
Interval	24h		
Ref. Time	0 : 0		
Recipient2	<input type="radio"/> OFF <input type="radio"/> ON		
Interval	24h		
Ref. Time	0 : 0		
Include INST	<input type="radio"/> OFF <input type="radio"/> ON		
Include source URL	<input type="radio"/> OFF <input type="radio"/> ON		
Subject	Periodic_data		
Header1			
Header2			

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

Alarm	Scheduled	System	Report
System			
Recipient1	<input type="radio"/> OFF <input checked="" type="radio"/> ON		
Recipient2	<input type="radio"/> OFF <input checked="" type="radio"/> ON		
Include source URL	<input type="radio"/> OFF <input checked="" type="radio"/> ON		
Subject	System_warning		
Header1			
Header2			

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

Alarm	Scheduled	System	Report
Report			
Recipient1	<input checked="" type="radio"/> OFF <input type="radio"/> ON		
Recipient2	<input checked="" type="radio"/> OFF <input type="radio"/> ON		
Include source URL	<input checked="" type="radio"/> OFF <input type="radio"/> ON		
Subject	Report_Data		
Header1			
Header2			

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

Measure channel	Math channel	Ext channel	General setting	Basic setting				
<ul style="list-style-type: none"> <input type="radio"/> Environment <input type="radio"/> Alarm <input type="radio"/> Scan Interval <input type="radio"/> Measure Function <input type="radio"/> Report <input type="radio"/> Key Lock <input type="radio"/> Login <input checked="" type="radio"/> Ethernet <input type="radio"/> TCP/IP <input type="radio"/> FTP <input type="radio"/> Modbus client <input type="radio"/> E-Mail <input type="radio"/> SNMP client <input checked="" type="radio"/> Server functions <input type="radio"/> Serial 					FTP Server Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>			
Web server								
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>								
Operator <input type="radio"/> OFF <input checked="" type="radio"/> ON								
Access Control <input type="radio"/> OFF <input type="radio"/> ON								
Command <input checked="" type="radio"/> Not <input type="radio"/> Use								
Monitor <input type="radio"/> OFF <input checked="" type="radio"/> ON								
Access Control <input type="radio"/> OFF <input type="radio"/> ON								
SNTP Server								
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>								
Modbus Server								
Use <input checked="" type="radio"/> Not <input type="radio"/> Use <input type="radio"/>								

- **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

Master Command No.	Command	Start channel	End channel	Slave		
				Address	Register	Type
1	Off			1	0	INT16
2	Off			1	0	INT16
3	Off			1	0	INT16
4	Off			1	0	INT16
5	Off			1	0	INT16

Click to display the channel selection screen

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

6.6 Entering Basic Settings

- **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).

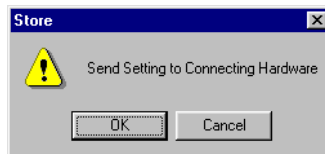
6.7 Sending the Setup Data to the MV1000/MV2000

Data cannot be sent while the MV1000/MV2000 is starting up (while loading data into memory) or Math in progress.

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



The send settings dialog box opens.



2. Click [OK] to start sending. A message is displayed when sending is complete. Click [OK] to clear the message.

Note

The following items located on the setup tab cannot be sent.

- The [Ethernet communication] - [TCP/IP] and [Server functions] setting items
- All serial communication settings

6.8 Saving the Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .PDL.

6.9 Printing the Setup Data

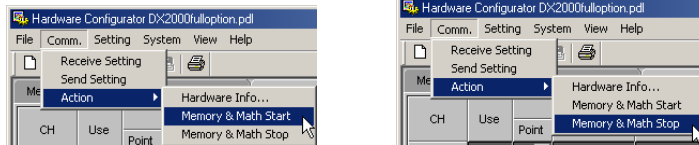
For the operating procedure, see section 3.9.

6.10 Starting and Stopping Measurement on the MV1000/MV2000, Checking the MV1000/MV2000 System Configuration

From this software you can start and stop the MV1000/MV2000, and display MV1000/MV2000 system configuration information.

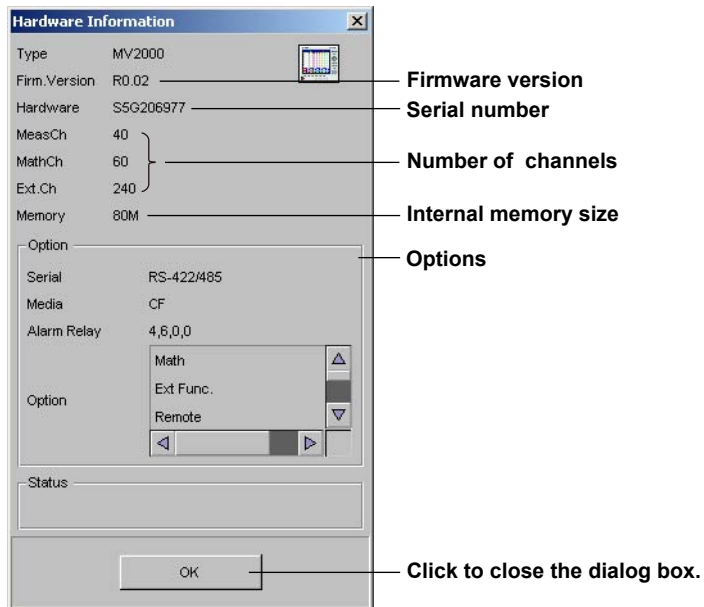
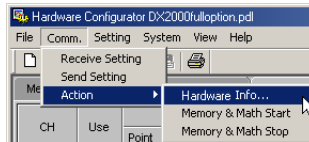
Starting and Stopping Measurement

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



Displaying MV1000/MV2000 System Configuration Information

1. Choose [Comm.] - [Action] - [Hardware info] from the menu bar.



6.11 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 “ ^ .”

7.1 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

1. Double-click here.
2. The Configurator opens.
3. The DX2000 setting screen appears by default. Carry out the procedure in pages 7-2 to 7-4 to switch to the CX setting screen.

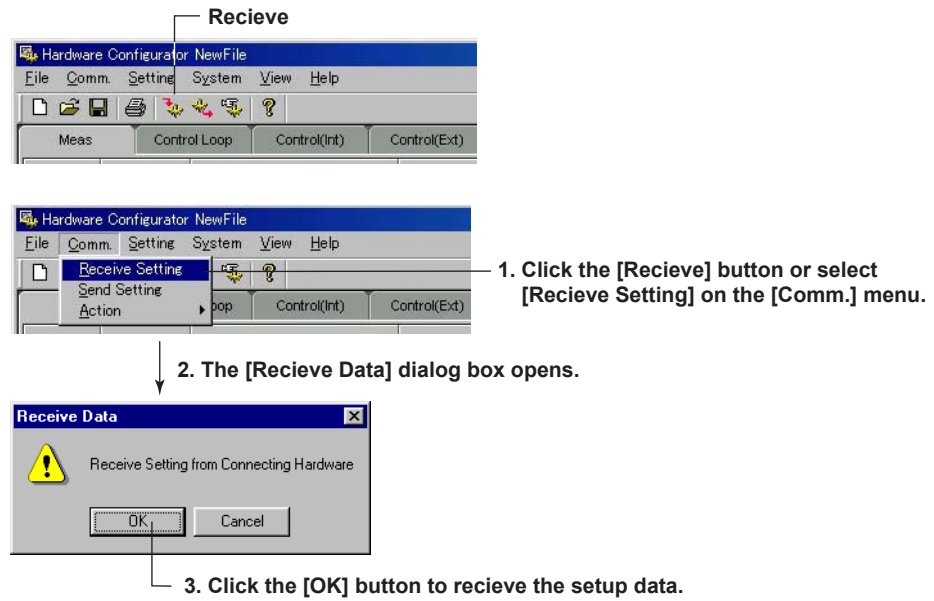
The screenshot shows the 'Hardware Configurator' window with a menu bar (File, Comm, Settings, System, View, Help) and a toolbar. The main area contains a table with columns: CH, Mode, Delta/Scale/Sqrt, Range/Type, RefCh, and Span (L, U). The table lists channels CH01 through CH17, all set to VOLT mode with Delta/Scale/Sqrt values of OFF, DELTA, SCALE, and SQRT, and a Range/Type of 2V. The Span for each channel is L: -2.000 and U: 2.000. At the bottom, there are buttons for Copy, Paste, and Copy Details.

Annotations and labels include:

- Labels for menu items: New file (section 7.1), Open file (section 7.1), Save (section 7.13), Print (section 7.14), Recieve (section 7.1), Send (section 7.12), Data check (section 7.11), and Display the version information of Hardware Configurator.
- Labels for interface elements: Menu bar, Toolbar, and Scroll through the screen (up and down).
- Label for navigation: Scroll through the screen (left and right).

Loading Setup Data from the CX

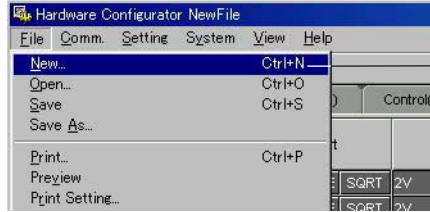
Before performing the following procedure, make sure that the communication method and parameters are correct. For details, see section 2.3, "Setting the Communication Method."



Note

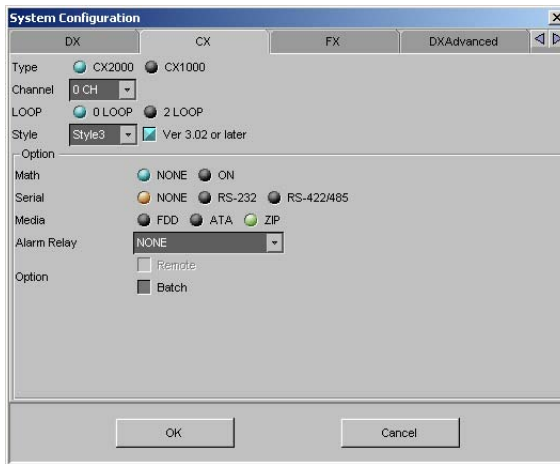
Do not load setup data when entering program control function settings on the CX, or when a medium is being accessed. A communications error can result.

Creating Setup Data by Configuring a New System



1. Click the [New] button or select [New] on the [File] menu.

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



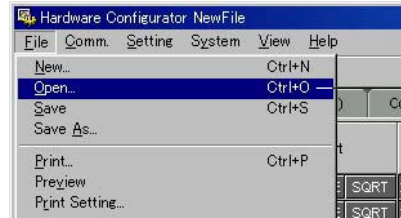
3. Select the appropriate items and click the [OK] button to return to the Hardware Configurator window.

For details about the settings in the [System Configuration] dialog box, see section 7.2 "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 Preexisting Setup Data



1. Click the [Open] button or select [Open] on the [File] menu.

2. The [Open] dialog box opens.



Select a file with .pcl extension and click here.

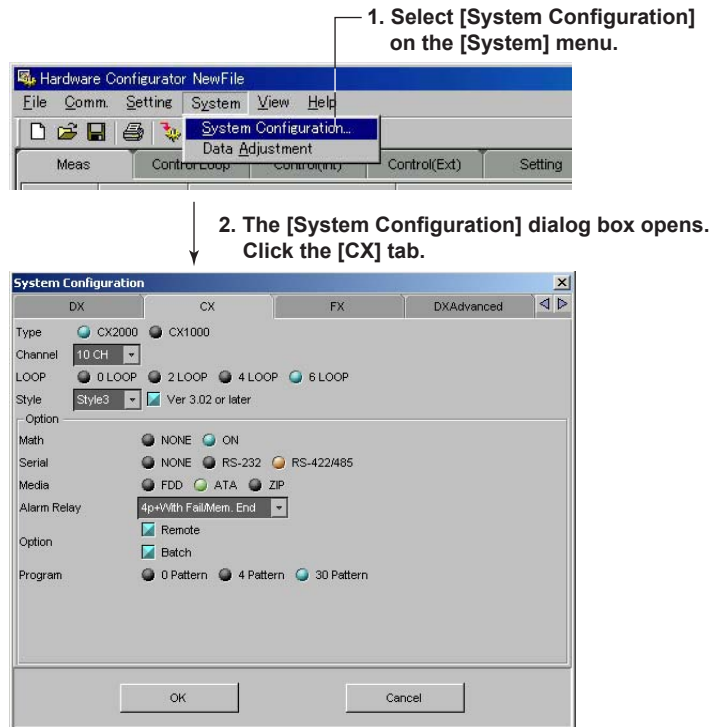
Specify the location of the setup data file and open the setup file.

7.2 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.



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].

7.2 Setting and Checking the System Configuration and Initializing Setup Data

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

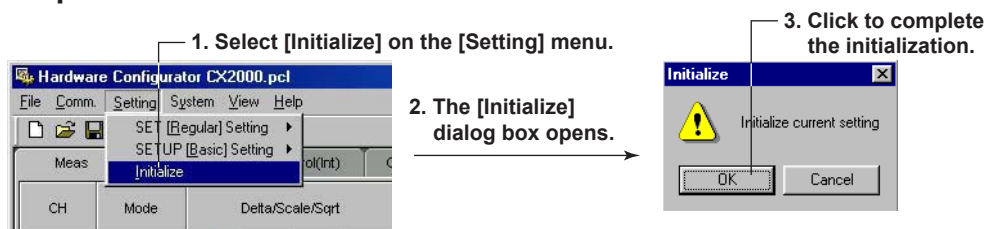
Select whether a batch option is installed. This option applies to style number S3 or later.

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

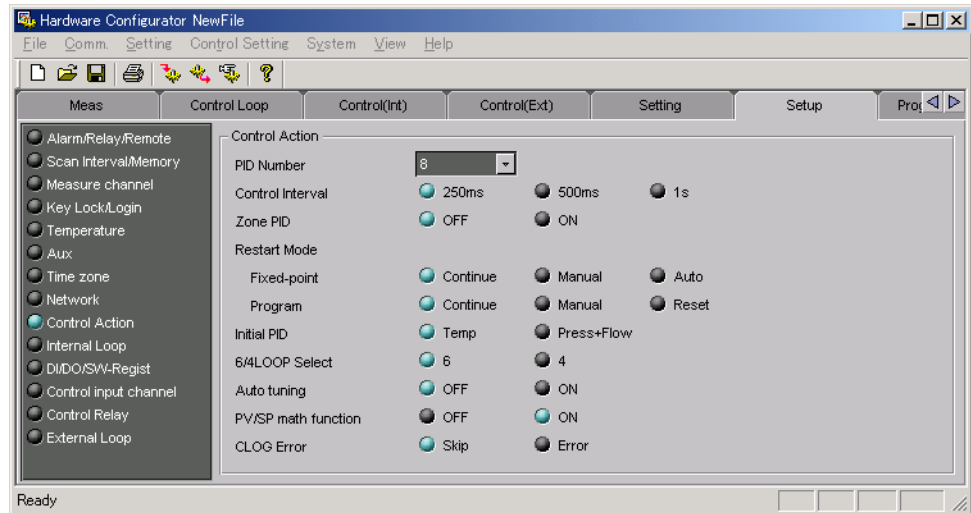


7.3 Control Function Basic Settings

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.

7.3 Control Function Basic Settings

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

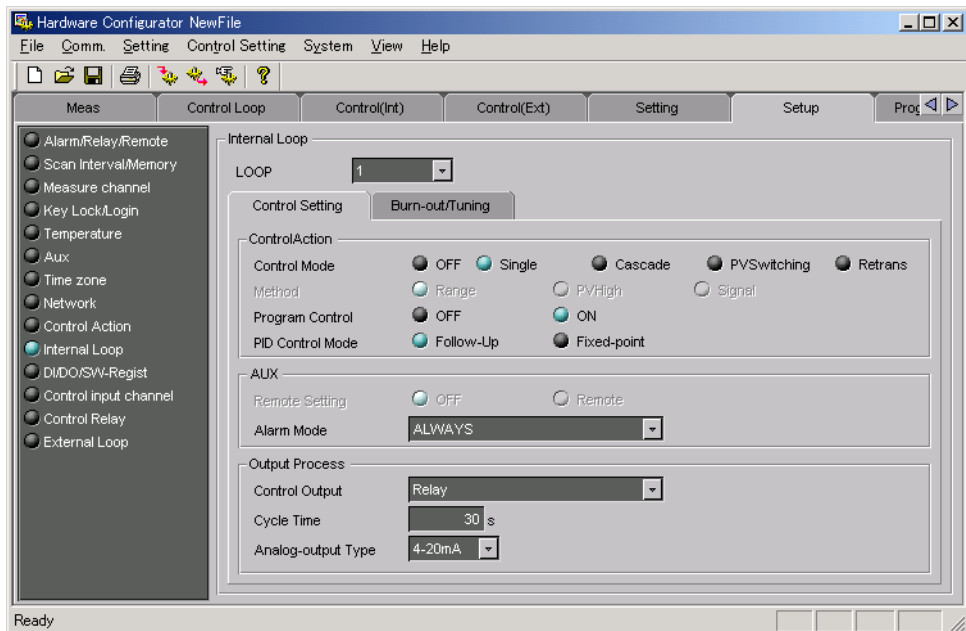
Event Output (CX Style Number S3 or Later)

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

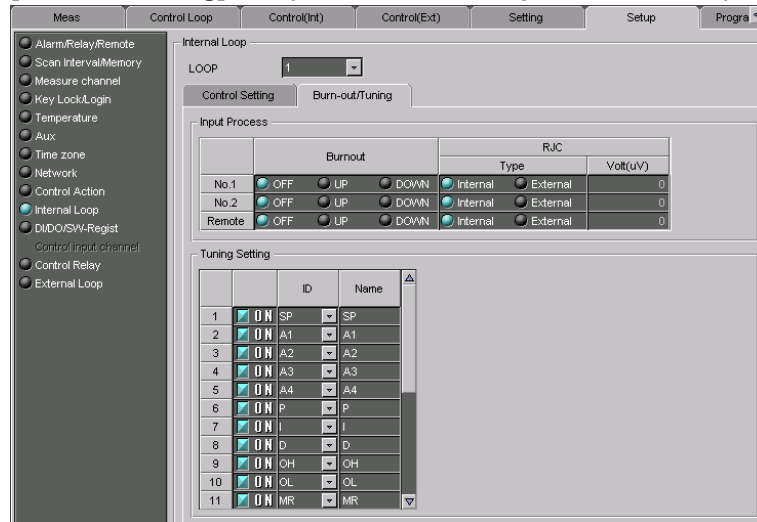
With a PID proportional to time, set the cycle time (control output cycle) between [1]s and [1000]s.

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 7-12.

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 7-12.

- **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

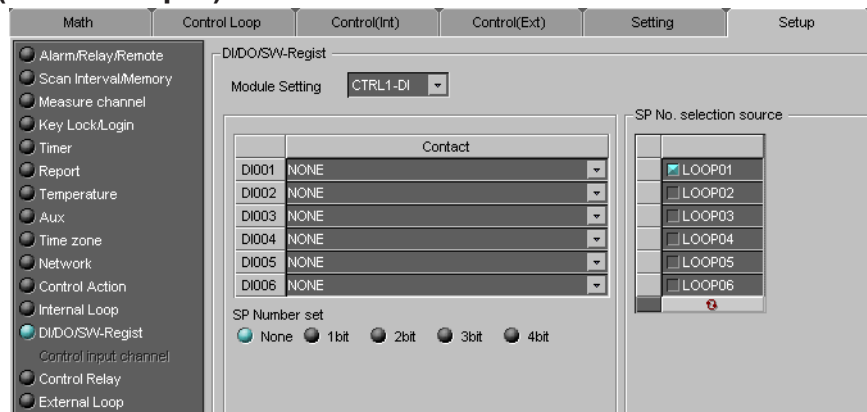
Select the ID of the item from the following:

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.)

7.3 Control Function Basic Settings

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)

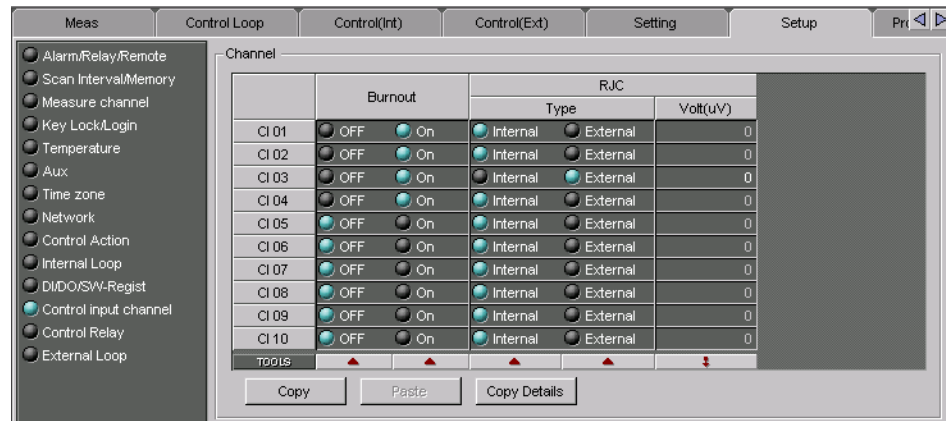
With program control, you can select the range of pattern numbers when switching program patterns through contact input. The pattern numbers are entered in binary according to the number of relays required as shown in the following chart.

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].

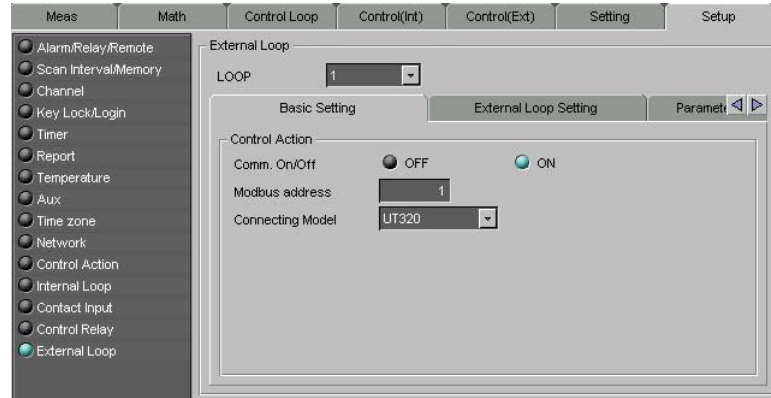
Relay (Action/Behavior)

Set the contact output relay operating mode to [De_energize/Hold], [De_energize/Nonhold], [Energize/Hold], or [Energize/Nonhold].

External Loop

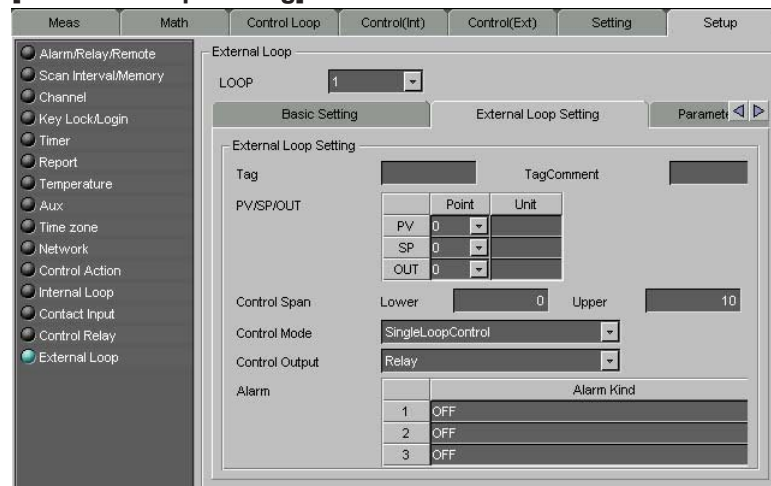
For each loop there are Basic Setting, External Loop Setting, Parameter Address Setting, and Tuning Setting items. For details on external loops, see the CX1000/CX2000 Communication Interface User's Manual (IM04L31A01-17E).

[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]

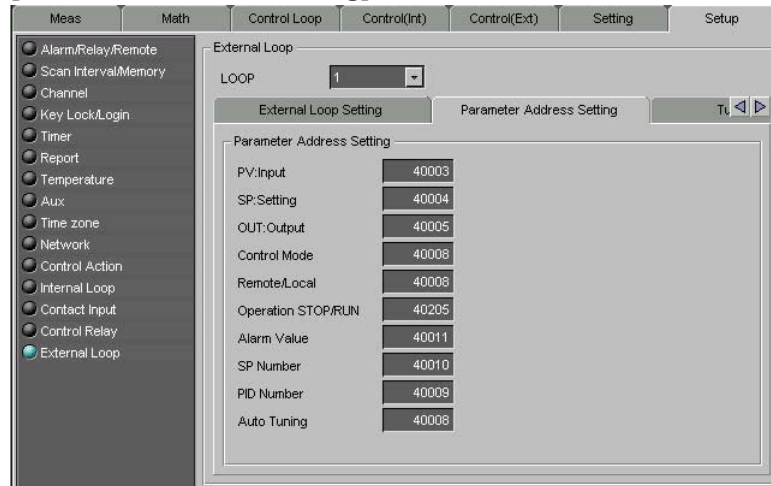
Alarm

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].

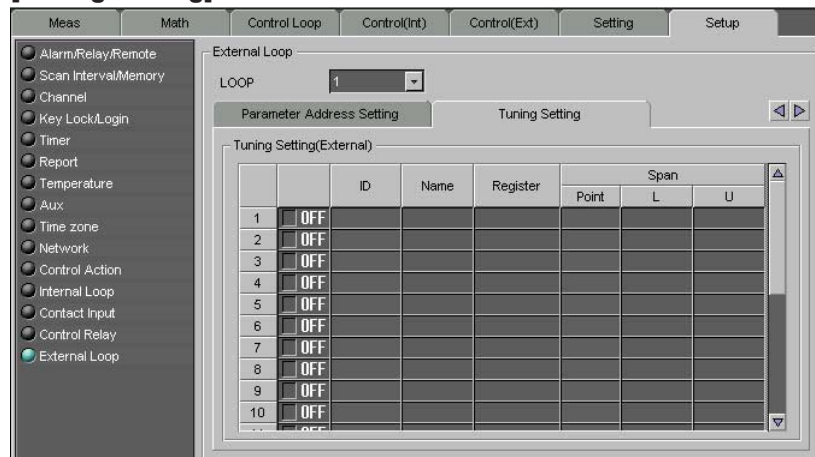
7.3 Control Function Basic Settings

[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.

7.4 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

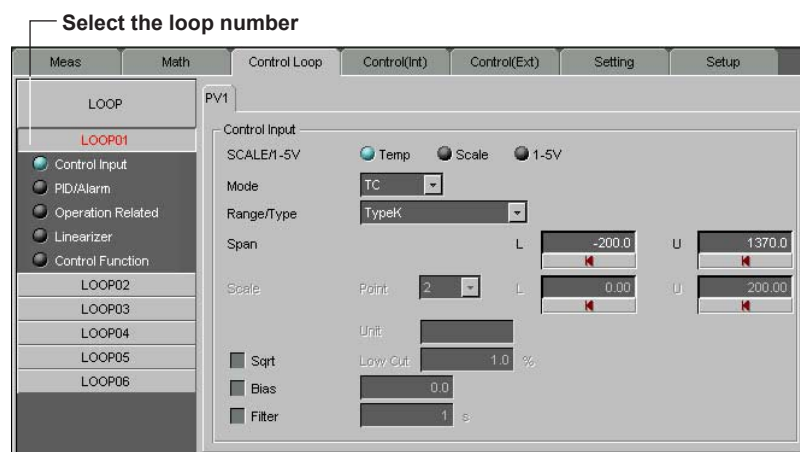
The control input settings vary depending on the Control Mode setting selected under [Internal Loop] in the [Setup] tab. You can make settings for the inputs [PV1], [PV2], [Remote], and [PVrange]. They appear in the following situations.

		PV1	PV1	Remote	PVrange
Basic	Odd loops	<input type="radio"/>	/	<input type="radio"/>	/
	Even loops	<input type="radio"/>	/	<input type="radio"/>	/
Cascade	Odd loops	<input type="radio"/>	/	<input type="radio"/>	/
	Even loops	<input type="radio"/>	/	<input type="radio"/>	/
PVswitching	Odd loops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Even loops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog Re-transmission (Style 3 or later)*	Odd loops	<input type="radio"/>	/	<input type="radio"/>	/
	Even loops	<input type="radio"/>	/	<input type="radio"/>	/

*: 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)

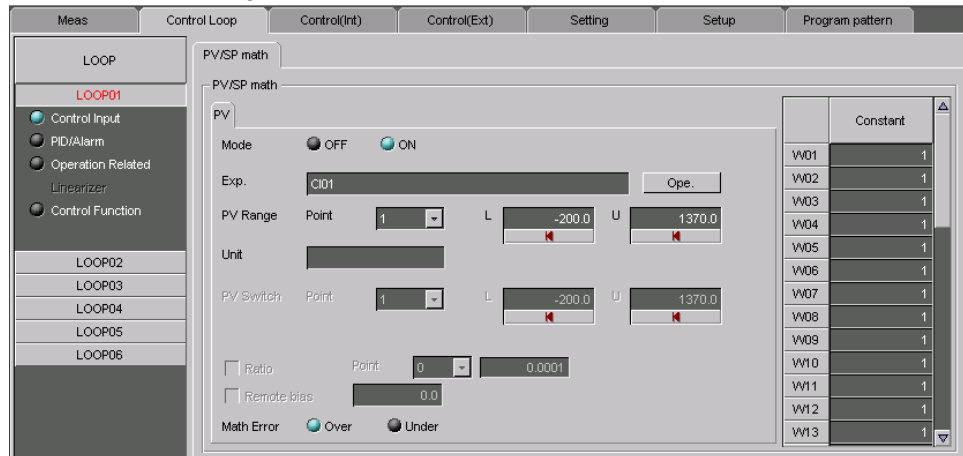
Set within the input range. When setting [Method] to [Range] in the [Control Action] within the Setup tab's internal loop item, or when setting [Method] to [PVHigh], only the upper limit is set. If you set [Method] to [Signal], the PV Switching setting is not available.

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.

7.4 Control Function General Settings

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.

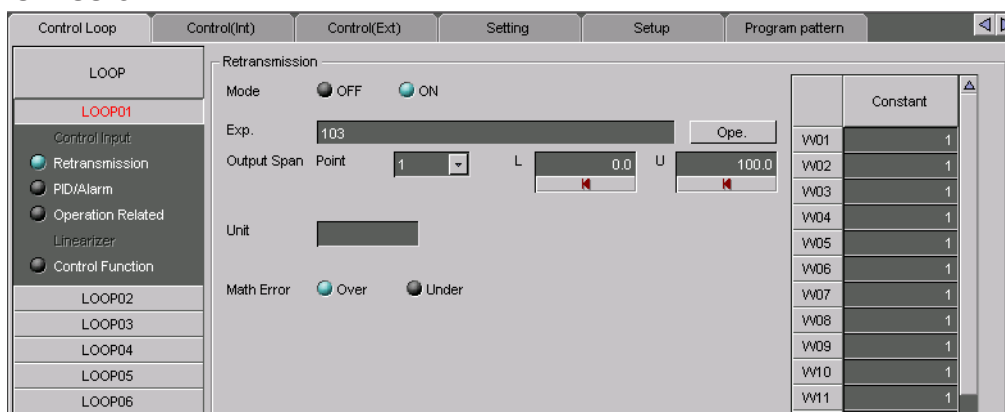
When turned ON, set the bias value in the PV range of “EUS(-100% to 100%).”

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.

7.4 Control Function General Settings

PID/Alarm

Alarm	Type	Standby	Relay	Histeresis
Alarm1	OFF	OFF	OFF	7.8
Alarm2	OFF	OFF	OFF	7.8
Alarm3	OFF	OFF	OFF	7.8
Alarm4	OFF	OFF	OFF	7.8

PID NUM	Target setpoint	Alarm value	
		1	2
1	-200.0	1370.0	1370.0
2	-200.0	1370.0	1370.0

- 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.

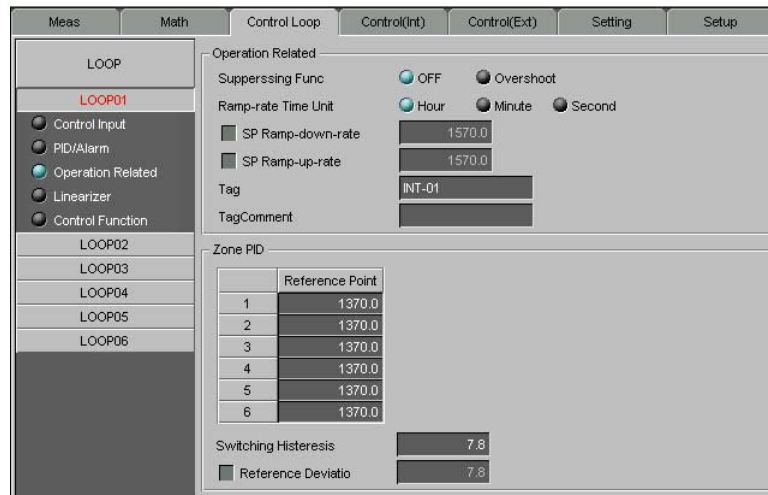
Reverse/Direct

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 $1 \leq 2 \leq \dots \leq 6$ 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)

	Input	Output
1	-200.0	0.0
2	-200.0	0.0
3	-200.0	0.0
4	-200.0	0.0
5	-200.0	0.0
6	-200.0	0.0
7	-200.0	0.0
8	-200.0	0.0
9	-200.0	0.0
10	-200.0	0.0
11	-200.0	0.0

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.)

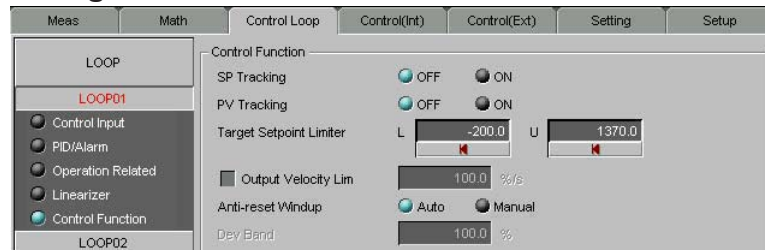
Biasing: Set with EUS (-100.0 to 100.0%) of the measurement input span.

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 7-30 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

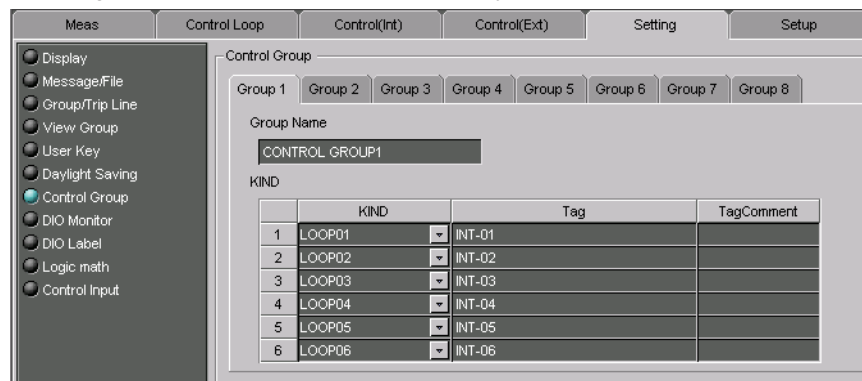
Select an anti-reset windup of [Auto] or [Manual]. This is unavailable for style number S2 if you set [Control Output] to [On/Off control] in the [Setup] tab for [Internal Loop].

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.

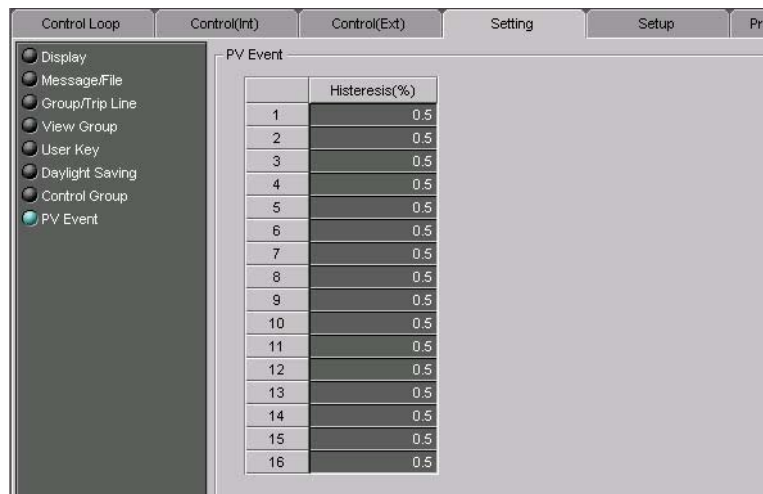
KIND

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.

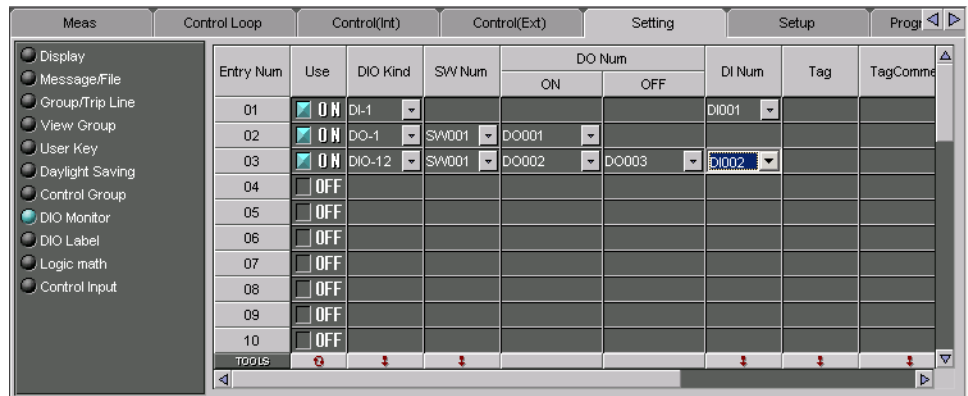
PV Event Hysteresis (Style 2 or earlier)

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.

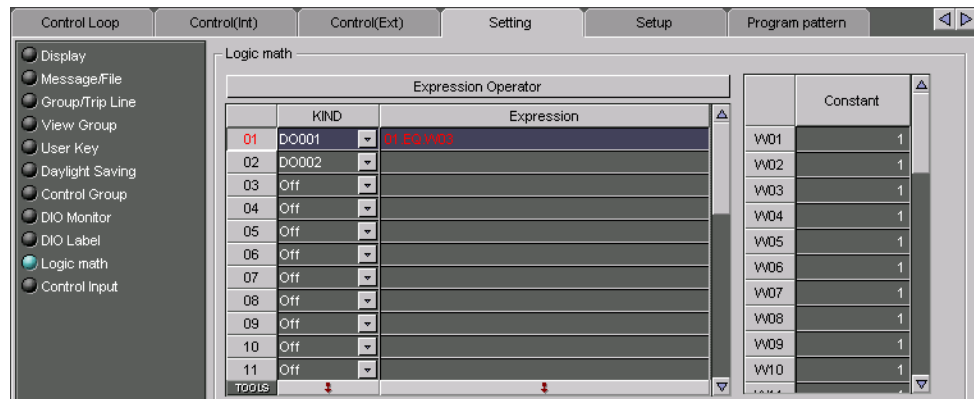
Up to 8 alphanumeric characters can be used.

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

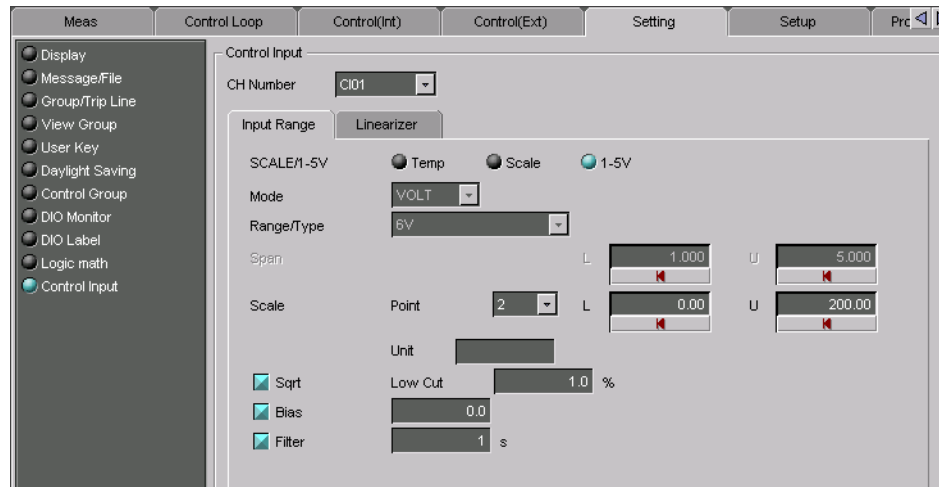
You can specify the constants used in equations.

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.

7.5 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)].

CH	LOOP	Type	Tag	Zone		Div	Graph		Scale	Partial		Color
				L	U		Bargraph	Expand(%)		Boundary		
CH101	LOOP01	PV	INT-01.PV	0	100	10	Normal	1	OFF	50	0.0	Red
CH102	LOOP01	SP	INT-01.SP	0	100	10	Normal	1	OFF	50	0.0	Blue
CH103	LOOP01	OUT	INT-01.OUT	0	100	10	Normal	1	OFF	50	0.0	Green
CH104	LOOP02	PV	INT-02.PV	0	100	10	Normal	1	OFF	50	0.0	Purple
CH105	LOOP02	SP	INT-02.SP	0	100	10	Normal	1	OFF	50	0.0	Red
CH106	LOOP02	OUT	INT-02.OUT	0	100	10	Normal	1	OFF	50	0.0	Orange
CH107	LOOP03	PV	INT-03.PV	0	100	10	Normal	1	OFF	50	0.0	Light Green
CH108	LOOP03	SP	INT-03.SP	0	100	10	Normal	1	OFF	50	0.0	Cyan
CH109	LOOP03	OUT	INT-03.OUT	0	100	10	Normal	1	OFF	50	0.0	Pink
CH110	LOOP04	PV	INT-04.PV	0	100	10	Normal	1	OFF	50	0.0	Grey
CH111	LOOP04	SP	INT-04.SP	0	100	10	Normal	1	OFF	50	0.0	Red
CH112	LOOP04	OUT	INT-04.OUT	0	100	10	Normal	1	OFF	50	0.0	Green
CH113	LOOP05	PV	INT-05.PV	0	100	10	Normal	1	OFF	50	0.0	Blue
CH114	LOOP05	SP	INT-05.SP	0	100	10	Normal	1	OFF	50	0.0	Purple
CH115	LOOP05	OUT	INT-05.OUT	0	100	10	Normal	1	OFF	50	0.0	Red
CH116	LOOP06	PV	INT-06.PV	0	100	10	Normal	1	OFF	50	0.0	Orange
CH117	LOOP06	SP	INT-06.SP	0	100	10	Normal	1	OFF	50	0.0	Light Green
CH118	LOOP06	OUT	INT-06.OUT	0	100	10	Normal	1	OFF	50	0.0	Grey

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.

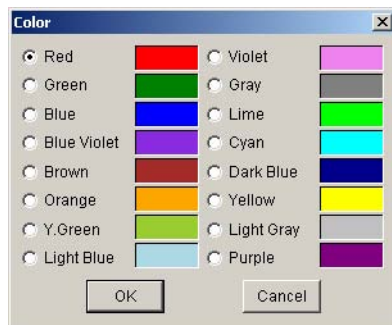
Note

- 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.

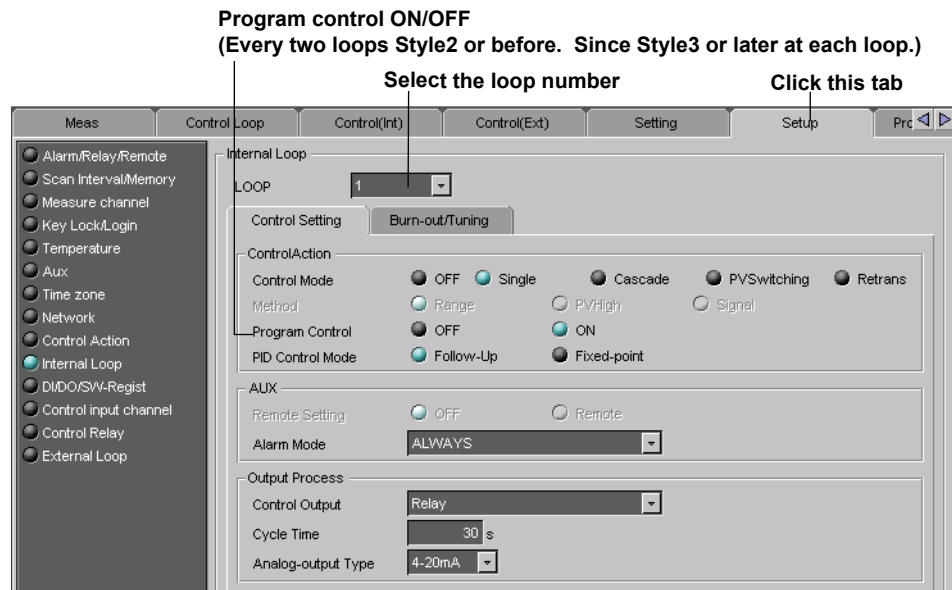


7.6 Program Control Related Setup Operations

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].

Set the start code
Available when segments have been inserted or added under [Segment setting].

Set the start setpoint
Available when segments have been inserted or added under [Segment setting].

Copy the settings (Default setting/Segment setting)

Paste copied pattern settings (Default setting/Segment setting)

Select the pattern number

Pattern Default setting
Pattern name, Setting method, Start setpoint, Start code

Enter a pattern name setting

Segment setting
Program pattern, PV Event, Time Event, Repeat

PV event hysteresis settings

Event output setting

Event display group setting

AUX setting
Automatic message printout, program display position

Click this tab

Segment and event totals (cannot be set here)

The number of segments and events used with this pattern. (cannot be set here)

Set the segment setting method

Set the operating loop

Zone number

Wait setting
Available when segments have been inserted or added under [Segment setting].

Wait time 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.

7.6 Program Control Related Setup Operations

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 pattern number
Select the segment number
Initialize the program pattern
Segment setting
Insert a segment before the selected segment
Add a segment behind the last segment
Delete the selected segment
Expand/reduce the selected segment along the time axis
Display the time axis per the segment time ratio
Display program patterns together
Split-display the program pattern at each loop
Start value and target value display ON/OFF
Select current loop

PV event display
Drag the bar to change the display area
Maximum value for target setpoints
Segment number
Target setpoint for selected segment

Drag the bar to change the display area
Time event display
Start value for selected segment
Duration of segment
Minimum value for target setpoints

7.6 Program Control Related Setup Operations

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.

The screenshot shows a control panel with several tabs: 'Set point', 'PV Event', 'TimeEve', and 'Repeat'. The 'Set point' tab is active. It contains a 'Ramp/Soak' section with radio buttons for 'Ramp' (selected) and 'Soak'. Below this is a 'Target setpoint' table with six rows for 'Loop 1' through 'Loop 6', each with a numerical value in a field. To the right of the table are three input fields for 'Segment time' (0, 2, 0). Below these are radio buttons for 'Ramp-Rate Time Unit' (Hour/Minute), a 'Ramp' slope field (0.1), a 'Segment PID group No.' dropdown (1), a 'Segment shift action' dropdown (Continue), a 'Wait action' dropdown (Off), and a 'Wait zone number' dropdown (1). Annotations with arrows point to various elements: 'Click this tab' points to the 'Set point' tab; 'Select Ramp/Soak' points to the radio buttons; 'Enter target setpoints' points to the target setpoint fields; 'Enter the segment duration' points to the segment time fields; 'Ramp-Rate Time Units' points to the Hour/Minute radio buttons; 'Slope' points to the Ramp field; 'Segment PID group number' points to the PID group No. dropdown; 'Segment shift action' points to the Segment shift action dropdown; 'Wait time' points to the Wait action dropdown; and 'Wait zone number' points to the Wait zone number dropdown. On the left side, text explains that the 'Start setpoint (specified under [Default setting]) Starting from the second segment, this is the target setpoint of the previous segment.' points to the 'Loop 1' target setpoint field.

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.

Click this tab

Set point	PV Event	TimeEve	Repeat
1	Loop	Kind	Set value
1	PV-High		500.0
2	PV-Low		0.0
3	Deviation-H&L		50.0
4	OFF	PV-High	0.0
5	OFF	PV-High	0.0
6	OFF	PV-High	0.0
7	OFF	PV-High	0.0
8	OFF	PV-High	0.0
9	OFF	PV-High	0.0
10	OFF	PV-High	0.0
11	OFF	PV-High	0.0
12	OFF	PV-High	0.0
13	OFF	PV-High	0.0
14	OFF	PV-High	0.0
15	OFF	PV-High	0.0
16	OFF	PV-High	0.0

- 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.

7.6 Program Control Related Setup Operations

Time Event

Set the Time Event.

Click this tab

Set point	PV Event	TimeEve	Repeat
		On-time	Off-time
1	ON1	0:0:30	0:1:0
2	ON2	0:0:30	0:0:0
3	OFF	0:0:0	0:0:0
4	OFF	0:0:0	0:0:0
5	OFF	0:0:0	0:0:0
6	OFF	0:0:0	0:0:0
7	OFF	0:0:0	0:0:0
8	OFF	0:0:0	0:0:0
9	OFF	0:0:0	0:0:0
10	OFF	0:0:0	0:0:0
11	OFF	0:0:0	0:0:0
12	OFF	0:0:0	0:0:0
13	OFF	0:0:0	0:0:0
14	OFF	0:0:0	0:0:0
15	OFF	0:0:0	0:0:0
16	OFF	0:0:0	0:0:0

- 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.

Click this tab

Set point	PV Event	TimeEve	Repeat
Repeat action			
<input checked="" type="radio"/> Off <input type="radio"/> On <input type="radio"/> Rotate			
Repeat frequency			
Start Segment			
Repeat end segment			

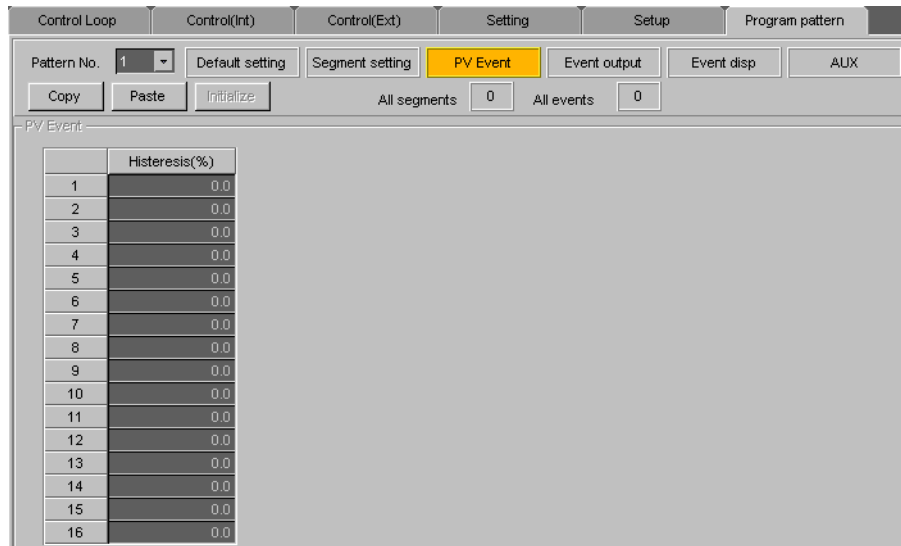
Repeat action
Repeat frequency
Repeat start segment
Repeat end segment

- 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)

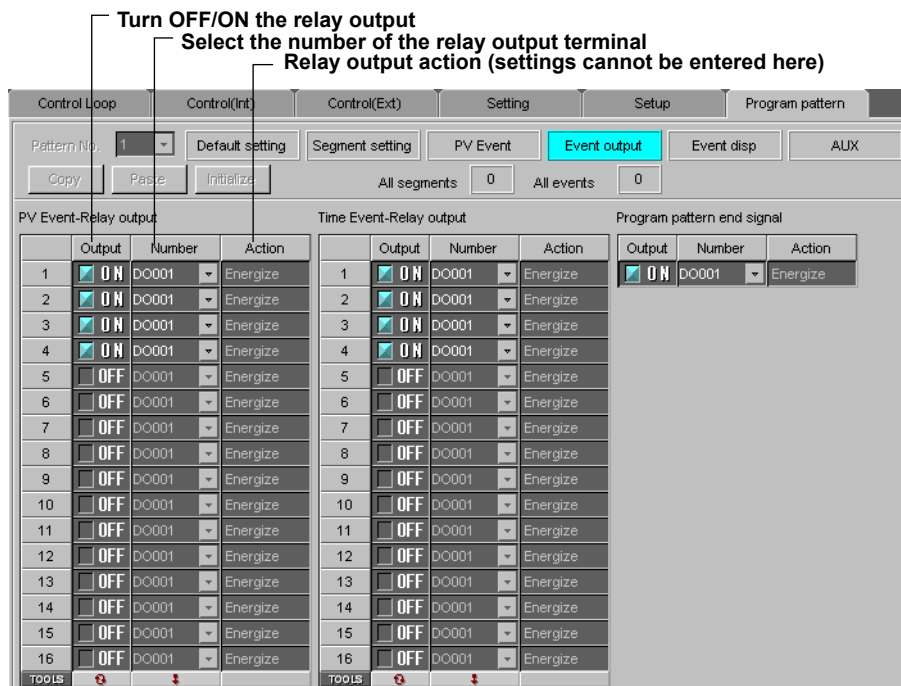
The selectable range for the maximum value is 0.0 to 10.0.



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.



7.6 Program Control Related Setup Operations

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

The screenshot shows a software interface with several tabs: Control Loop, Control(Int), Control(Ext), Setting, Setup, and Program pattern. The 'Event disp' button is highlighted in yellow. Below the tabs, there are buttons for 'Copy', 'Paste', and 'Initialize'. There are also input fields for 'All segments' and 'All events', both set to '0'. The main area is titled 'Event display group' and contains a table with 5 rows. Each row has a checkbox, a text field with 'ON', a dropdown menu with 'TIME', and another dropdown menu with a number from 1 to 5. At the bottom left, there is a 'TOOLS' button and three red arrows pointing downwards.

		Kind	Number
1	<input checked="" type="checkbox"/> ON	TIME	1
2	<input checked="" type="checkbox"/> ON	TIME	2
3	<input checked="" type="checkbox"/> ON	TIME	3
4	<input checked="" type="checkbox"/> ON	TIME	4
5	<input checked="" type="checkbox"/> ON	TIME	5

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

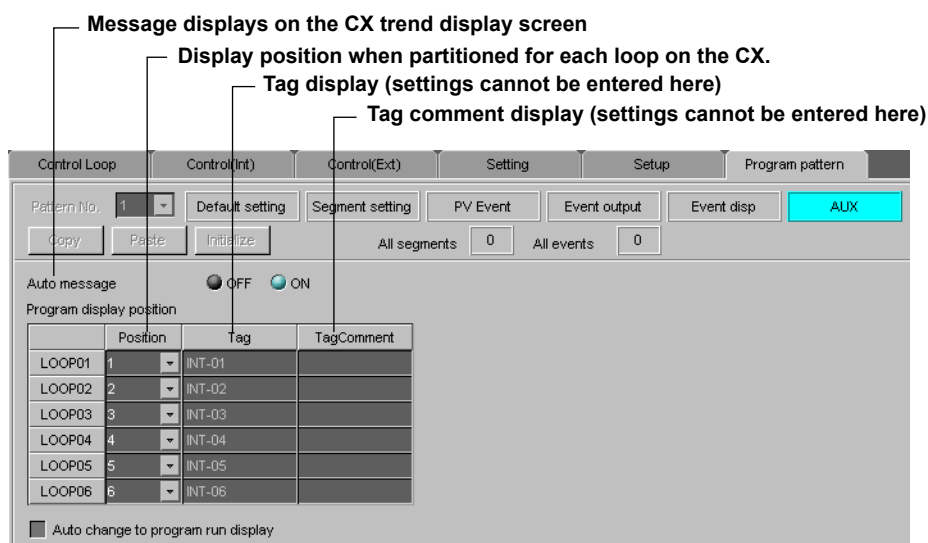
Select either time event or PV event.

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.

7.7 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

2. Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

1. Select this tab.

Select between 1 and 15.

Copy/Paste the selected range.

Select the controlled item.

Alarm/Relay

Select the alarm format. The selected items are blue.

Refresh

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)

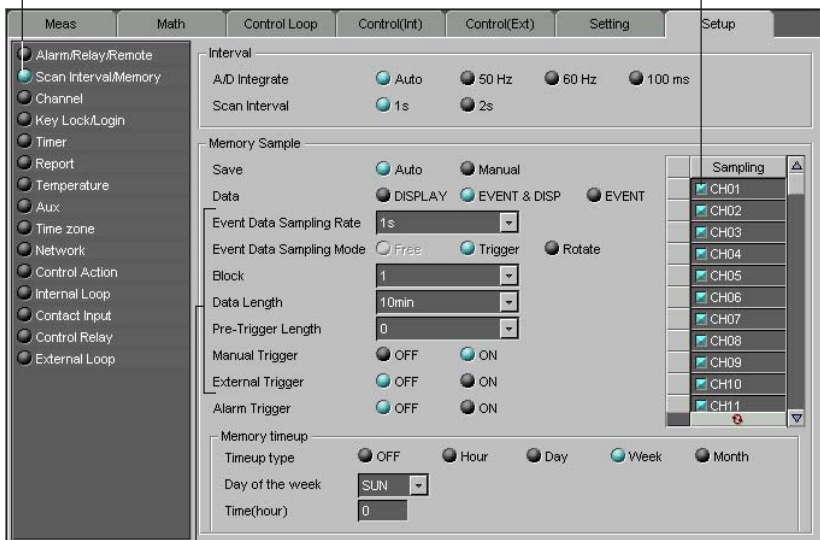
You can assign items to be controlled by the eight remote control terminals. This setting is available with the measurement remote input function. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

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

Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

Select the channels that you want to sample.



Set these parameters when the data type is [EVENT & DISP] or [EVENT].

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].

7.7 Basic Measurement Function Basic Settings

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)

Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

Set to the positive side (100%).

Set to the negative side (0%).

Set the reference junction compensation to [Internal] or [External].

Channel	Burnout			RJC		Volt(uV)
	OFF	UP	DOWN	Type		
CH01	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH02	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH03	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH04	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH05	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH06	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH07	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH08	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH09	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH10	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH11	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH12	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH13	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH14	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH15	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH16	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0

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.

7.7 Basic Measurement Function Basic Settings

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

Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

Turn ON to use the user setting.
Select to use login, auto logout, or user ID.

		User Name	User ID	Password	Setup
1	<input checked="" type="checkbox"/> ON	user1	????	Unspecified	Enable
2	<input type="checkbox"/> OFF	user2	????	Unspecified	Enable
3	<input type="checkbox"/> OFF	user3	????	Unspecified	Enable
4	<input type="checkbox"/> OFF	user4	????	Unspecified	Enable
5	<input type="checkbox"/> OFF	user5	????	Unspecified	Enable

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)

Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

Select one

Time out every time the specified time elapses.
Select the timeout interval.

Time out with the specified time as the reference.

Reset computation when a timeout occurs.

Save the data to the TLOG file when a timeout occurs.

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)

Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Setting].)

Set the date and time at which to create the report.

Select the reference channel for the report.

Enable (ON) or disable (OFF) the report channel settings.

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.

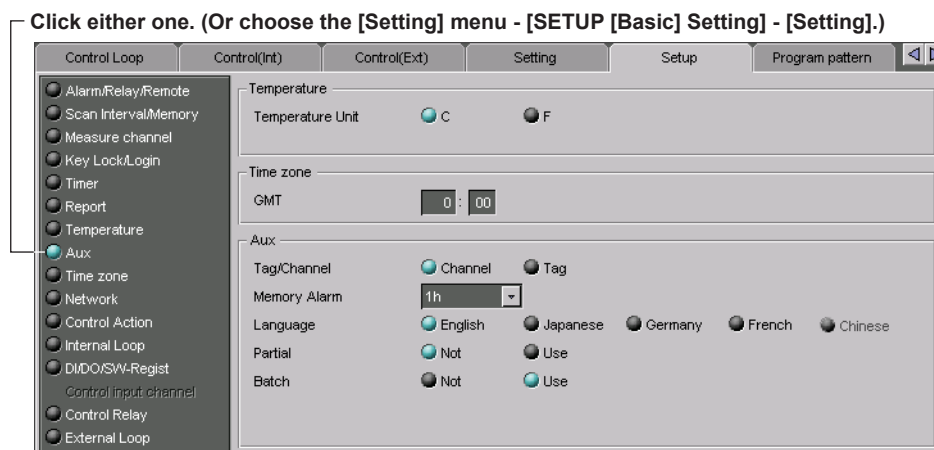
1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the left of the window.
3. Click the destination channel number. To select many channels, click the first 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



Tag/Channel

Select whether to use the tag name or channel number as the measurement/computation channel label (see “Selecting the Characters Used to Identify Channels” on page 4-12). If you select tag name, you can select the label display from tag and channel.

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.”

7.7 Basic Measurement Function Basic Settings

Partial

If set to [Not], the partial expanded display settings of the [Meas], [Math], and [Control Loop] tabs are void.

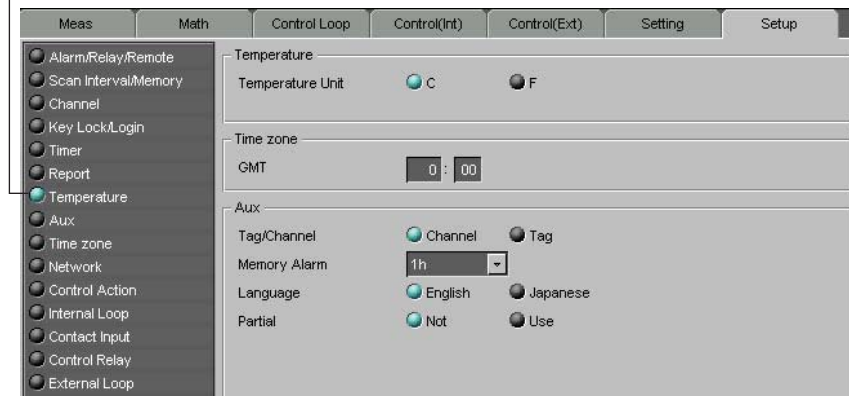
Batch (Batch Option, Style3 or later)

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).

1. Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Comm].)

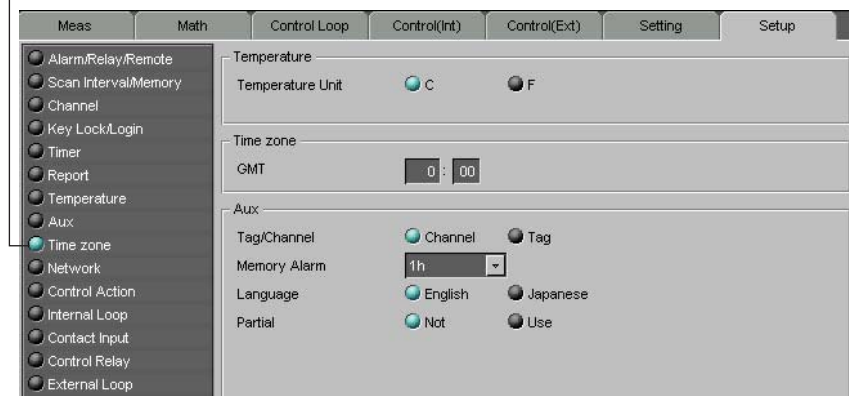


Time Zone

Set the difference in time from the GMT.

For example, with Japanese time this is normally +9:00.

1. Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Comm].)



7.8 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.

Click this tab.

Double-click to set the channel.

Select the input mode.

Difference computation

Scale

Square root

Select the range/type.

Select the reference for the difference computation.

Specify the span.

Select all at once.

Turn OFF all at once.

Copy the settings of the first channel in the selected range to all other channels.

Initialize

Specify a scale.

Specify the unit of the scale.

Select the alarm type.

Specify the alarm value.

Select the relay number.

Set the value to the maximum value possible.

Set the value to the minimum value possible.

Alarm display ON/OFF

Specify a delay period.

Specify a tag name.

Select sampling count of the moving average.

Specify a display zone.

Select the graph settings.

Turn ON/OFF the partial expanded display.

Select the channel display color.

Initialize

Set the value to the maximum value possible.

Set the value to the minimum value possible.

Turn ON/OFF all at once.

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:

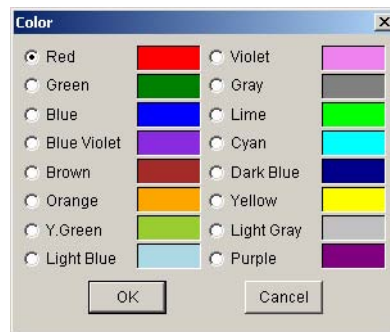
- Measurement channel
When SCALE and SQRT are not used: $\text{Span L} < \text{boundary} < \text{span U}$
When SCALE and SQRT are used: $\text{Scale L} < \text{boundary} < \text{scale U}$
- Computation channel
 $\text{Span L} < \text{boundary} < \text{span U}$
For details, refer to the *CX User's Manual (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

1. Double-click the channel to set to open the Channel Settings dialog box

2. Click the tab of the item to be set.

3. After setting the items, click here. Applies the settings.

Update according to the changes in the [Meas] sheet.

CH	Mode	Delta/Scale/Sqrt
CH01	VOLT	OFF DELTA SCALE
CH02	VOLT	OFF DELTA SCALE
CH03	VOLT	OFF DELTA SCALE

Alarm	Type	Value	Relay
Alarm 1	OFF	0.000	NONE
Alarm 2	OFF	0.000	NONE
Alarm 3	OFF	0.000	NONE
Alarm 4	OFF	0.000	NONE

Relay	Detect
NONE	ON
NONE	ON
NONE	ON

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.

7.9 Computation Channel Settings

To enter computation channel settings, click the [Math] tab. Or, you can choose [Setting] - [SET [Regular] Setting] - [Math Functions].

Double-click to set the channel.
Click this tab.
Turn ON/OFF the computation.
Specify on expression.
Set the display span (6 characters or less).
Specify the unit.
Specify the constant to be used in the expression.
Turn ON/OFF all at once.
Initialize
Select the number of decimals.
Copy the settings of the first channel in the selected range to all other channels.

Set the alarm (section 7.8).

Enter the alarm period.
Specify a tag (section 7.8).
Copy the settings of the first channel in the selected range to all other channels.

Display zone (section 7.8).
Set the graph (section 7.8).
Partial expansion (section 7.8).
Display color (section 7.8).

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 7.8, “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 7.8, “Measurement Channels Settings.”

Constants

You can set constants to be used in the expression. Up to 12 constants (CX1000) or up to 30 constants (CX2000) can be specified.

Setting One Computation Channel at a Time

1. Double-click the channel to set to open the Channel Settings dialog box

2. Click the tab of the item to be set.

Click here to enter the operator.

3. After setting the items, click here.

Set the maximum value.

Set the minimum value.

Copy the first setting.

[Select Operator] dialog box

Select the operator type and click the operator button.

Operator button

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.

7.10 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

The screenshot shows the 'Setting' tab of the device's configuration menu. The 'Display' sub-menu is selected, showing the following settings:

- Trend Display Setting:**
 - Display Update Interval: 1 min/div
 - Auto Save Interval: 30min
- Display Setting:**
 - Trend Graph Direction: Horizontal (selected), Vertical, Horizontal 2
 - Bar Graph Direction: Horizontal (selected), Vertical
 - Background Color:
 - Meas View: White (selected), Black
 - Ctrl View: White (selected), Black
 - Trend Line Width: 1, 2 (selected), 3
 - Trip Line Width: 1, 2 (selected), 3
 - Grid Division: 10
 - Auto Scroll Time: 5s
 - Scale digit: Normal (selected), Fine
- LCD Setting:**
 - LCD Brightness: 2
 - Backlight Saver: OFF (selected), ON
 - Saver Time: 1min, 2min, 5min, 10min, 30min, 1h (selected)
 - Restore: KEY (selected), KEY+ALARM

Callouts from the image:

- "Select the display format for trend and bar graphs." points to the Trend Graph and Bar Graph Direction options.
- "Select the time per division. Click this tab." points to the Display Update Interval dropdown.
- "The screen saver function is activated when there is no key operation or alarm occurrence for the specified interval." points to the Backlight Saver ON option.
- "Key operation or alarm exits screen saver." points to the KEY and KEY+ALARM options.
- "Key operation exits screen saver." points to the KEY option.

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

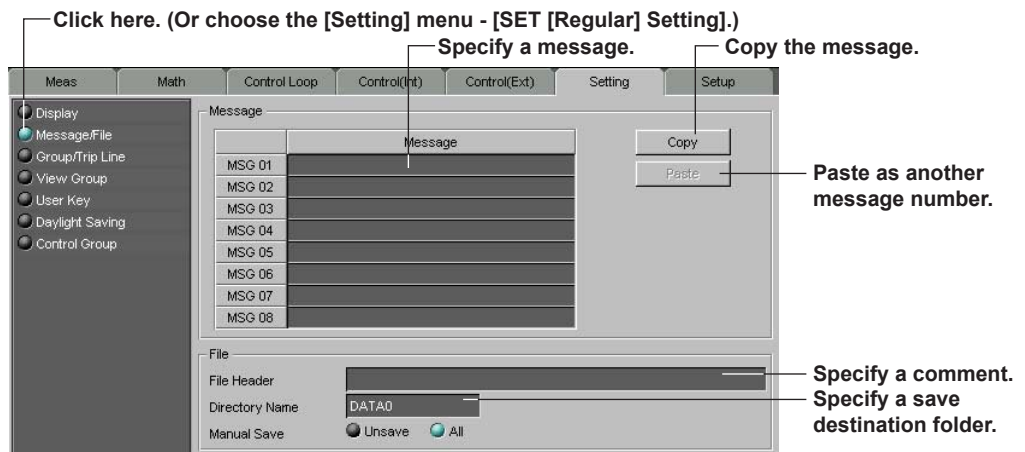
The auto save interval can be specified when the [Save] is set to [Auto] and the data type is set to [DISPLAY] or [EVENT & DISP] in the [Memory Sample] setting of the [Setup] tab.

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.

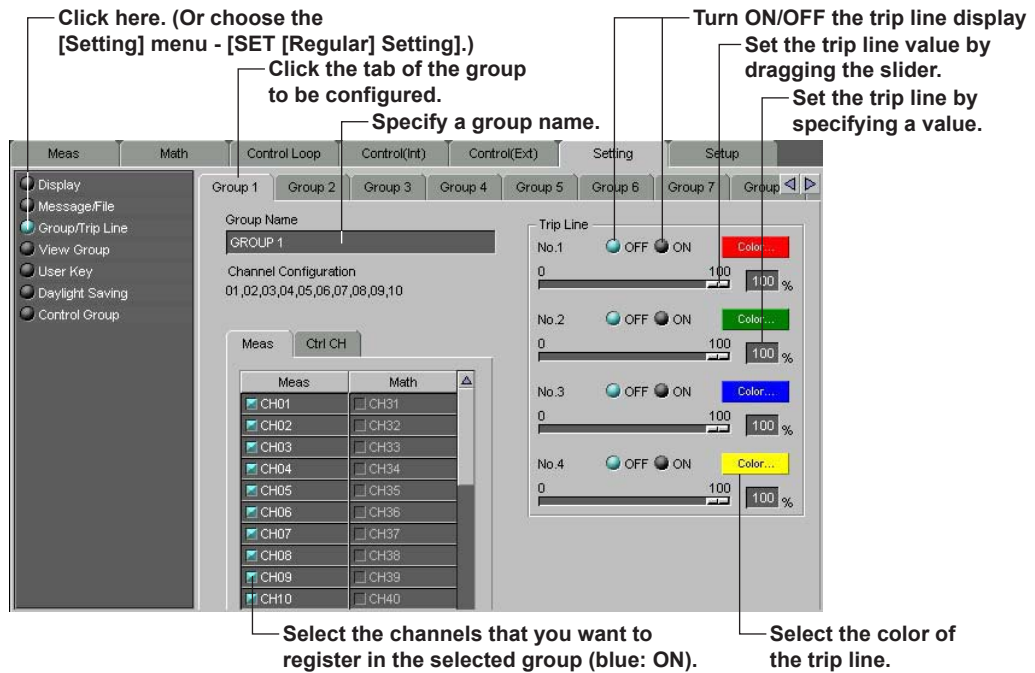
Note

- 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

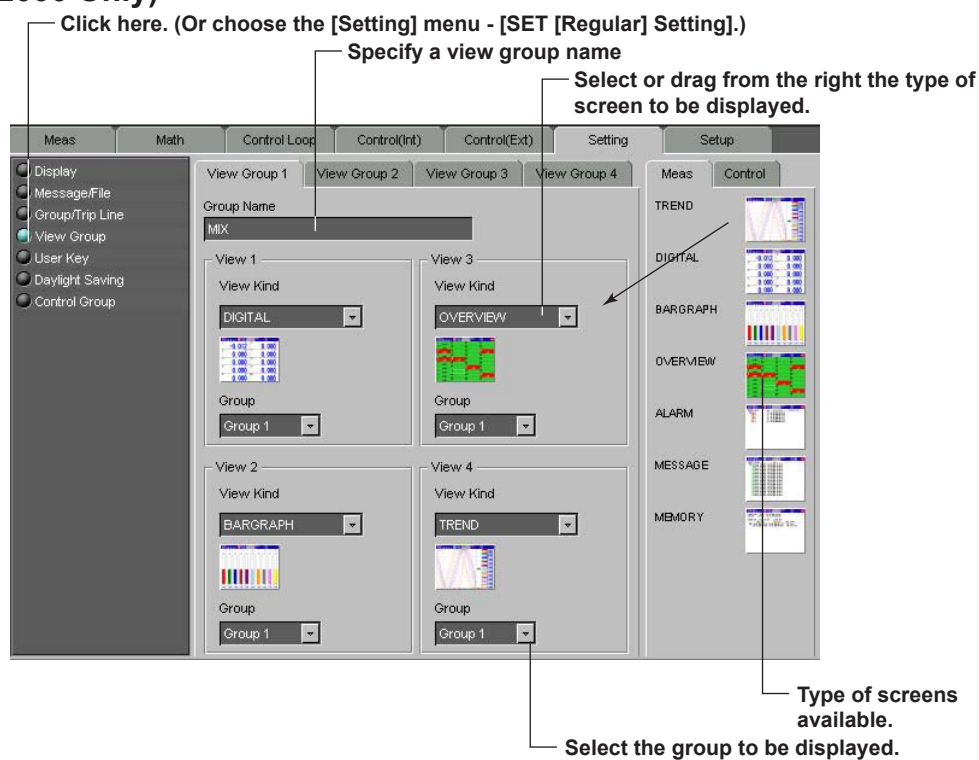
The maximum number of channels that can be assigned to a group is 6 for the CX1000 and 10 for the CX2000. The assigned channels are listed under [Channel Configuration].

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.

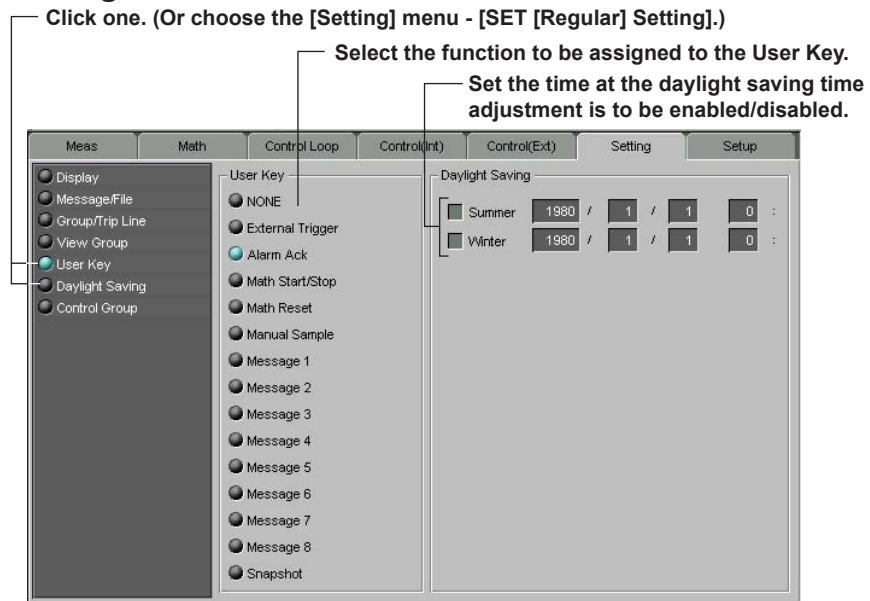
View Kind

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).

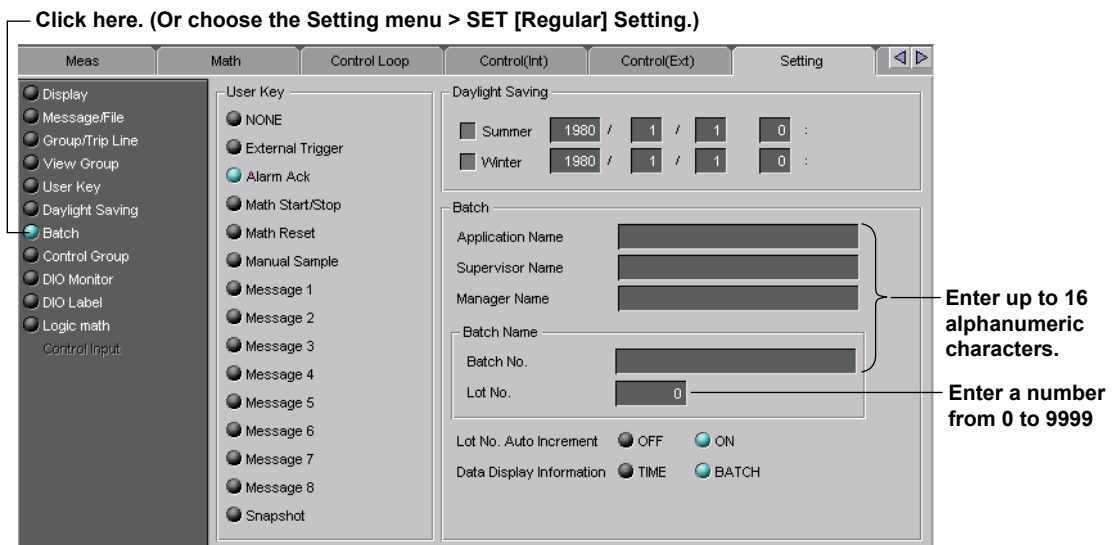
User Key/Daylight Saving



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.



7.11 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.

1. Click here. (Or choose the [Setting] menu - [SETUP [Basic] Setting] - [Comm].)

2. Click this tab

Specify the IP address

Specify these addresses when using the DNS

Enter the timeout value when turned ON

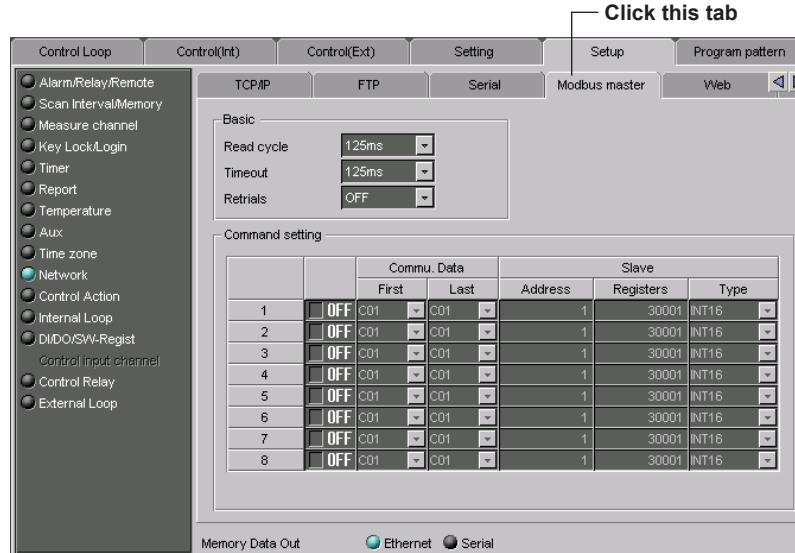
Serial Communication Settings

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.

Click this tab

Modbus Master Settings

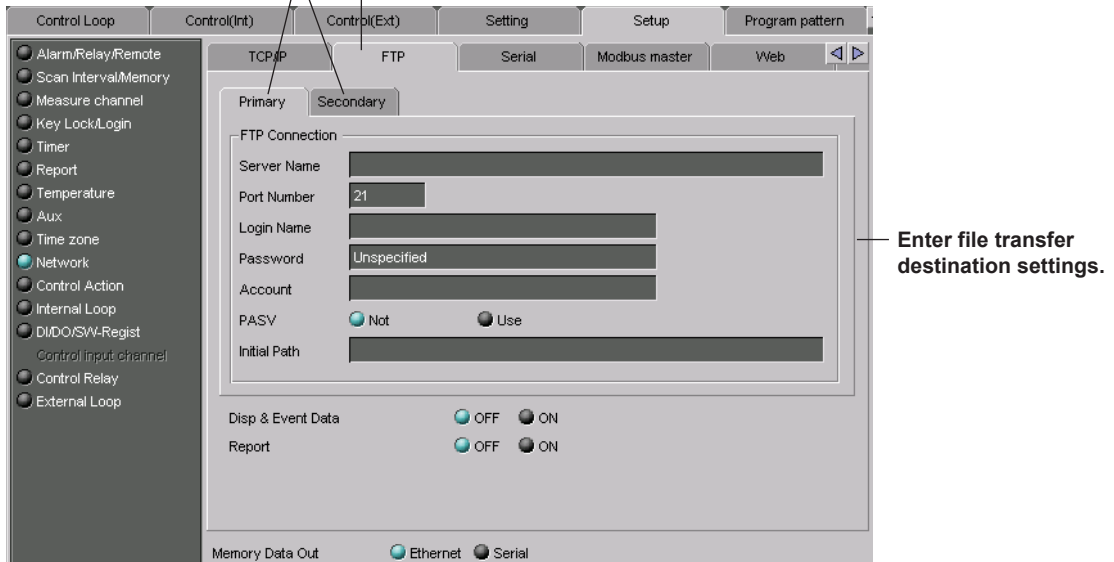
When using the CX as a Modbus master, enter the Modbus master basic and command settings. For details about the settings, refer to the *CX1000/CX2000 Communication Interface User's Manual (IM 04L31A01-17E)*.



FTP Settings

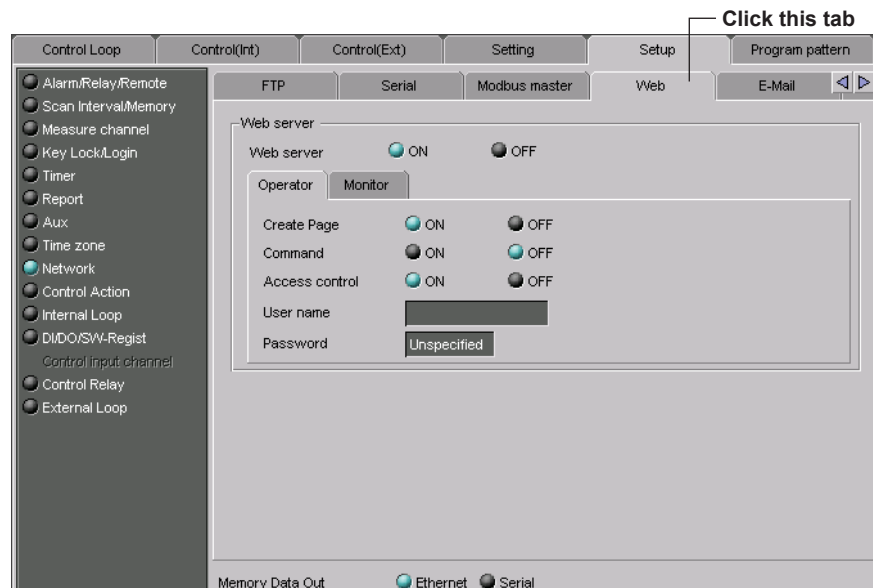
Using the FTP function, measurement/calculation data can be automatically transferred from the CX to the specified server as files. The FTP function can be used only with Ethernet communications. When using the FTP function, specify the destination server name, port number, and other settings in the dialog box below.

2. Click the [Primary] or [Secondary] tab
(Set both if using two (primary and secondary) FTP servers.).
1. Click this tab.



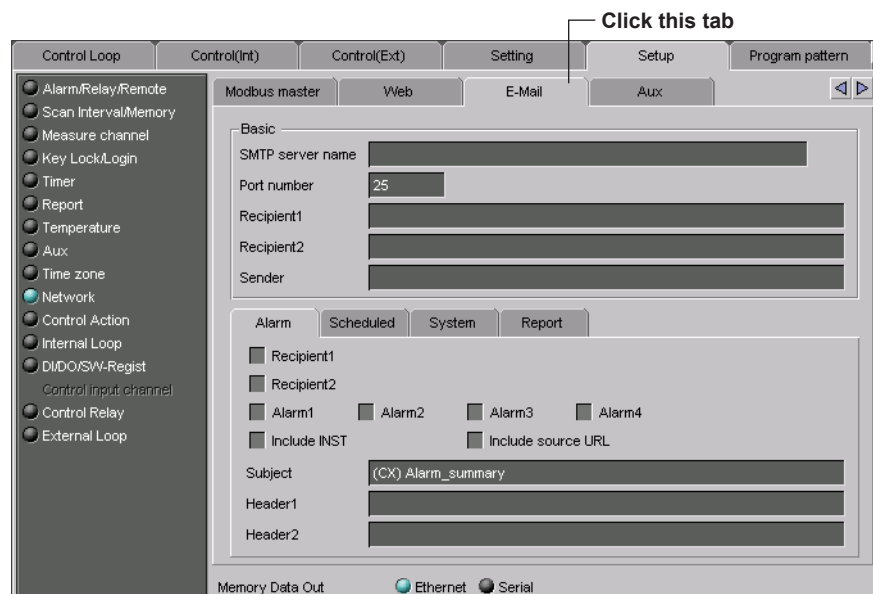
Web Server Settings

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

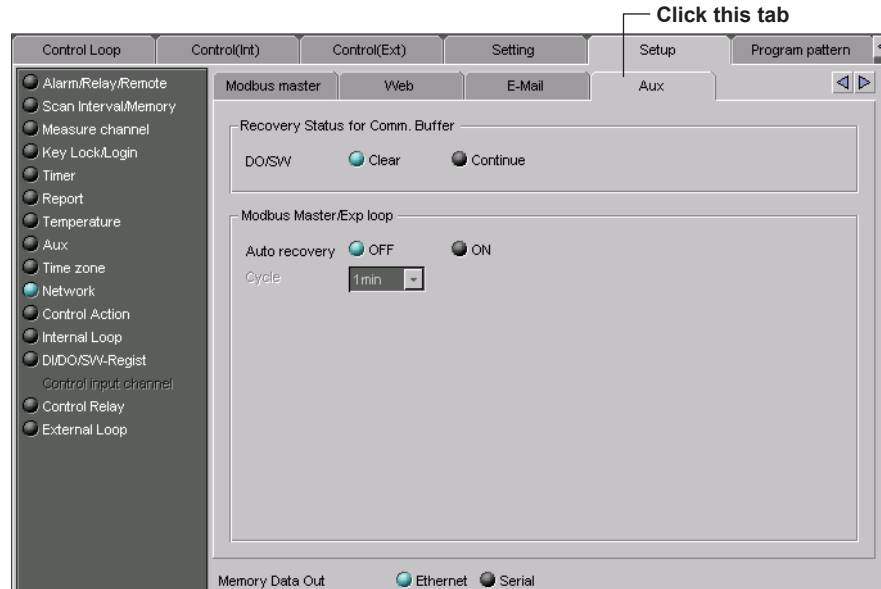
When using e-mail transmission, specify [SMTP server name], [Port number], [Recipient1], and other settings. The e-mail transmission function can be used only with Ethernet communications. For details about the settings, refer to the *CX1000/CX2000 Communication Interface User's Manual (IM 04L31A01-17E)*.



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

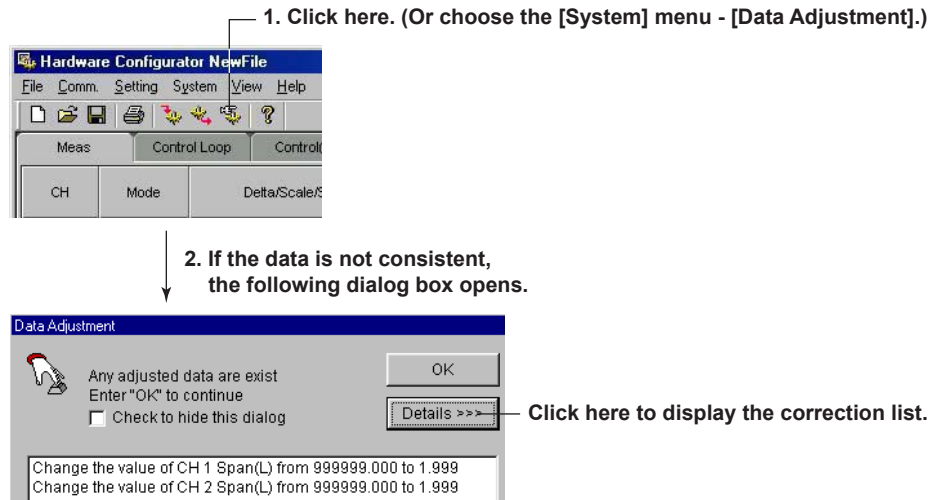
Modbus Master/Exp loop

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.

7.12 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

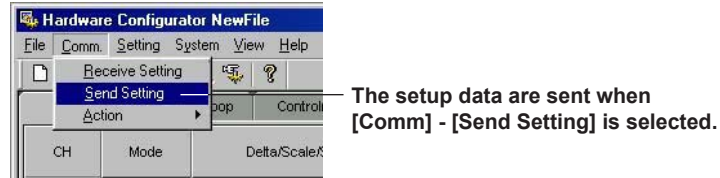
If [Data Adjustment] Dialog on the [View] menu is selected, the [Data Adjustment] dialog box opens whenever data is not consistent when checking or transmitting data.

Note

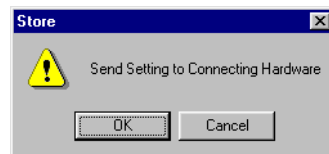
Perform the data check before sending the new setup data to the CX.

7.13 Sending Setup Data to the CX

If the CX is acquiring data to the memory, the setup data will not be sent to the CX. An error message appears.



A confirmation dialog box is displayed.



To send the new setup data to the CX, click the OK button. A message is displayed when the transmission is complete. 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.

7.14 Saving Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .pcl.

7.15 Printing Setup Data

For the operating procedure, see section 3.9.

7.16 Starting and Stopping Measurement on the CX and Checking the CX System Configuration

You can start and stop the CX, as well as display CX system configuration 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



1. Select [Comm] - [Action] - [Memory & Math] - [Start].

Displaying CX System Configuration Information



1. Select [Comm] - [Action] - [Hardware Info].

Parameter	Value	Description
Type	CX1000	Recorder type
Style	R3.02	Firmware version
Hardware	12B422652	Serial number
MeasCh	6	Number of measurement channels
MathCh	12	Number of computation channels
Ext.Ch	12	Number of channels assigned to external loops
Memory	1200K	Memory capacity
LOOP	2	Number of control loops
Option	RS-422/485, Ethernet, Ladder Comm	Optional

7.17 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.


8.1 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	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
DX200	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
DX200C	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
MV100	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MV200	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

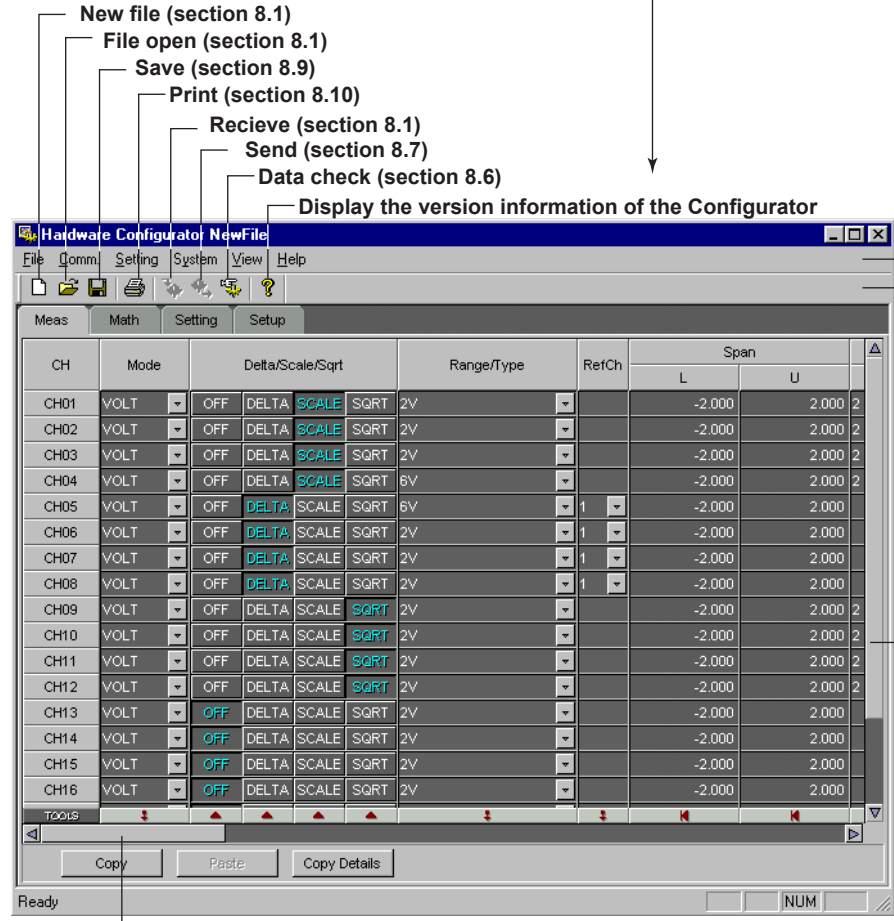
Starting the Hardware Configurator

1. Double-click here.



2. The DX/MV Configurator opens.

3. The DX2000 setting screen appears by default. Carry out the procedure in pages 8-2 and 8-3 to switch to the DX/MV setting screen.



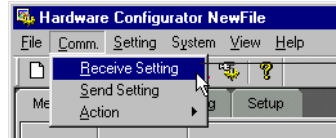
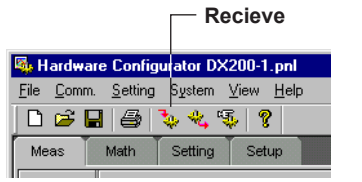
New file (section 8.1)
File open (section 8.1)
Save (section 8.9)
Print (section 8.10)
Recieve (section 8.1)
Send (section 8.7)
Data check (section 8.6)
Display the version information of the Configurator

Menu bar
Toolbar
Scroll the screen (up and down)
Scroll the screen (left and right)

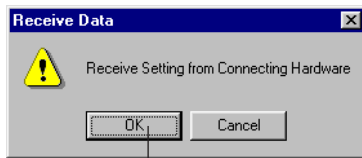
Note

The [Control Settings] menu is not used on this recorder. The explanations in this chapter are given using windows without [Control Settings].

Loading the Setup Data from the DX/MV

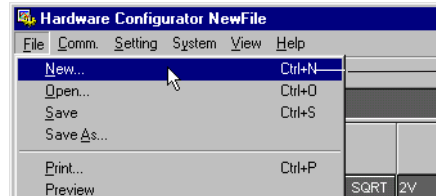
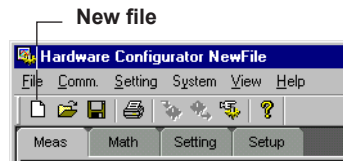


- 1. Click the Recieve icon or select [Comm.] - [Recieve Setting].
- 2. The [Recieve Data] dialog box opens.

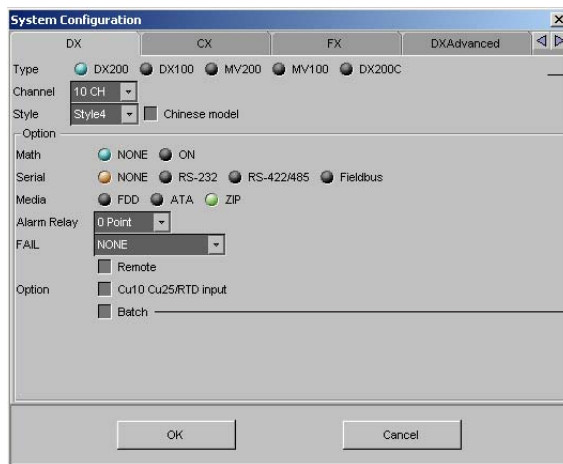


- 3. Click the [OK] button to recieve the setup data.

Creating Setup Data by Configuring a New System

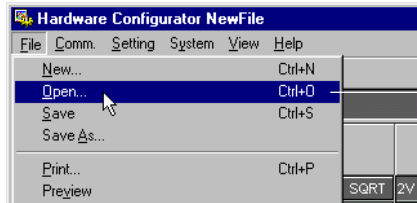
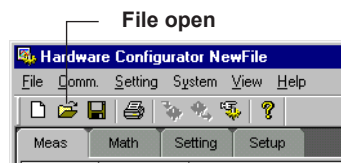


- 1. Click the new file icon or select [File] - [New].
- 2. The [System Configuration] dialog box opens. Click the [DX] tab.



- 3. Click the appropriate items and click the [OK] button to open the Configurator screen.
- Batch function option is selectable when the style number is S2 or later.

Loading Preexisting Setup Data



1. Click the file open icon or select [File]-[Open].
2. The [Open] dialog box opens.



Select a file with .pnl extension and click here.

You can specify the location where the setup data file is located and open the Configurator.

8.2 Setting the Measurement Channels

Select this tab
 Double-click to set the channel
 Select the input mode
 Difference computation
 Scale
 Square root
 Select the range/type
 Select the reference for the difference computation
 Set the span

CH#	Mode	Delta/Scale/Sqrt			Range/Type	RefCh	Span		
		Delta	Scale	Sqrt			L	U	
CH01	VOLT	OFF	DELTA	SCALE	SQRT	2V	1	-2.000	2.000
CH02	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.000	2.000
CH03	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.000	2.000
CH04	VOLT	OFF	DELTA	SCALE	SQRT	2V		-2.000	2.000

Set the selected range at once
 Turn OFF at once
 Copy the settings of the first channel in the selected range to all other channels
 Initialize

Enter the scale
 Enter the scale unit
 Select the alarm type
 Enter the alarm value
 Select the relay number

Point	Scale		Unit	Alarm 1			
	L	U		Type	Value	Relay	Type
2	0.00	200.00		OFF	0.000	NONE	OFF
2	0.00	200.00		OFF	0.00	NONE	OFF
				OFF	0.000	NONE	OFF
				OFF	0.000	NONE	OFF

Set the value to the maximum value possible
 Set the value to the minimum value possible

Enter the delay period
 Enter the tag

Alarm 4			Alarm Delay	Moving Ave	Tag
Type	Value	Relay			
OFF	0.000	NONE	10 sec	OFF	
OFF	0.00	NONE	10 sec	OFF	
OFF	0.00	NONE	10 sec	OFF	
OFF	0.000	NONE	10 sec	OFF	

Select sampling count

Enter the display zone
 Select the graph setting
 Turn ON/OFF the partial expanded display
 Select the channel display color

Zone		Graph			Partial		Color
L	U	Div	Bargraph	Scale	Expand(%)	Boundary	
0	100	10	Normal	1	OFF	50	0.000
0	100	10	Normal	1	OFF	50	0.000
0	100	10	Normal	1	OFF	50	0.000
0	100	10	Normal	1	OFF	50	0.000

Initialize
 Turn ON/OFF at once
 Set the value to the maximum value possible
 Set the value to the minimum value possible

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: $\text{Span L} < \text{boundary} < \text{span U}$
 - When SCALE and SQRT are used: $\text{Scale L} < \text{boundary} < \text{scale U}$
- Computation channel
 - $\text{Span L} < \text{boundary} < \text{span U}$

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

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

CH	Mode	Delta/Scale
CH01	VOLT	OFF DELTA SC
CH02	VOLT	OFF DELTA SC
CH03	VOLT	OFF DELTA SC

2. The channel setting dialog box opens.

3. Select the tab of the item to be configured.

4. After setting the items, click here.

Apply the settings.

Update according to the changes in the [Meas] sheet.

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.

8.3 Setting the Computation Channels

Double-click when setting each channel
 Select this tab
 Turn ON/OFF computation
 Enter the expression
 Set the display span (6 characters or less)
 Enter the unit
 Enter the constant to be used in the expression

Turn ON/OFF at once
 Initialize
 Select the number of digits to the right the decimal
 Copy the settings of the first channel in the selected range to all other channels

Set the alarm (section 8.2)

Alarm 1			Alarm 2					
Type	Value	Relay	Type	Value	Relay	Type	Value	Relay
OFF	0.00	NONE	OFF	0.00	NONE	OFF		
OFF	0.00	NONE	OFF	0.00	NONE	OFF		
OFF	0.00	NONE	OFF	0.00	NONE	OFF		
OFF	0.00	NONE	OFF	0.00	NONE	OFF		

Enter the alarm period
 Enter the tag (section 8.2)

Alarm Delay	TLOG		Rolling Average		Tag
	Timer	Sum Scale	Interval	Times	
10 sec	1	OFF	10s	1	
10 sec	1	OFF	10s	1	
10 sec	1	OFF	10s	1	
10 sec	1	OFF	10s	1	

Copy the settings of the first channel in the selected range to all other channels

Display zone (section 8.2)
 Set the graph (section 8.2)
 Partial expansion (section 8.2)
 Display color (section 8.2)

Zone		Graph			Partial		Color
L	U	Div	Bargraph	Scale	Expand(%)	Boundary	
0	100	10	Normal	1	OFF 50	0.00	Red
0	100	10	Normal	1	OFF 50	0.00	Green
0	100	10	Normal	1	OFF 50	0.00	Blue
0	100	10	Normal	1	OFF 50	0.00	Purple

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 8.2, "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 8.2, "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

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

2. The channel setting dialog box opens.

3. Select the tab of the item to be configured.

Click here to enter the operator

4. After setting the items, click here.

Set the maximum value.

Set the minimum value.

Copy the first setting.

<Select Operator dialog box>

Select the operator type and click the operator button

Operator button

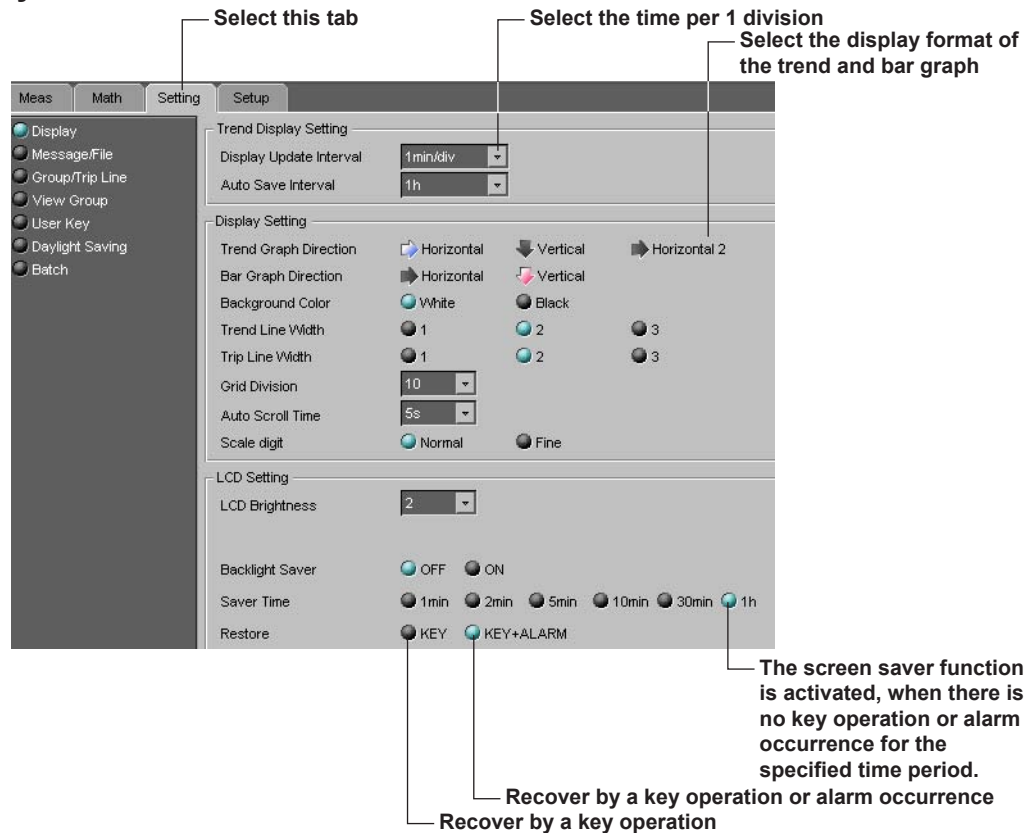
The items in the math channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

Copying and Pasting Setup Data

See section 8.2, “Setting the Measurement Channel.”

8.4 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

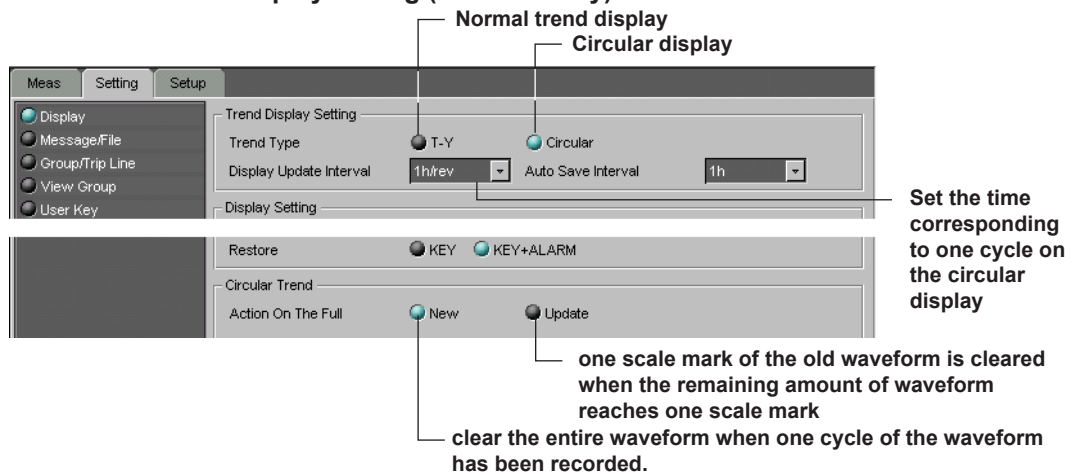
This is the time period used to automatically switch the displayed group. It can be specified when the style number of the DX or MV is S2 or later.

Scale Display Digits

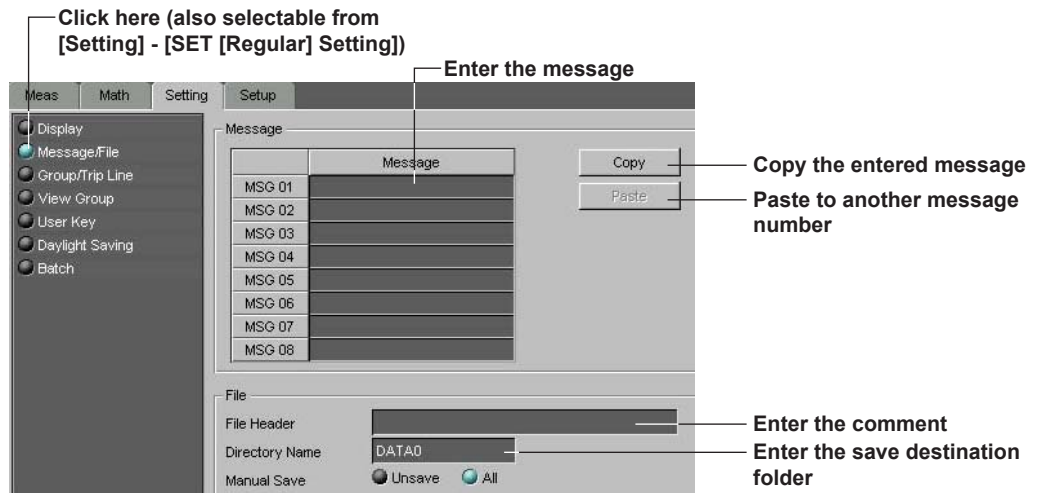
Select [Normal] or [Fine].

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.

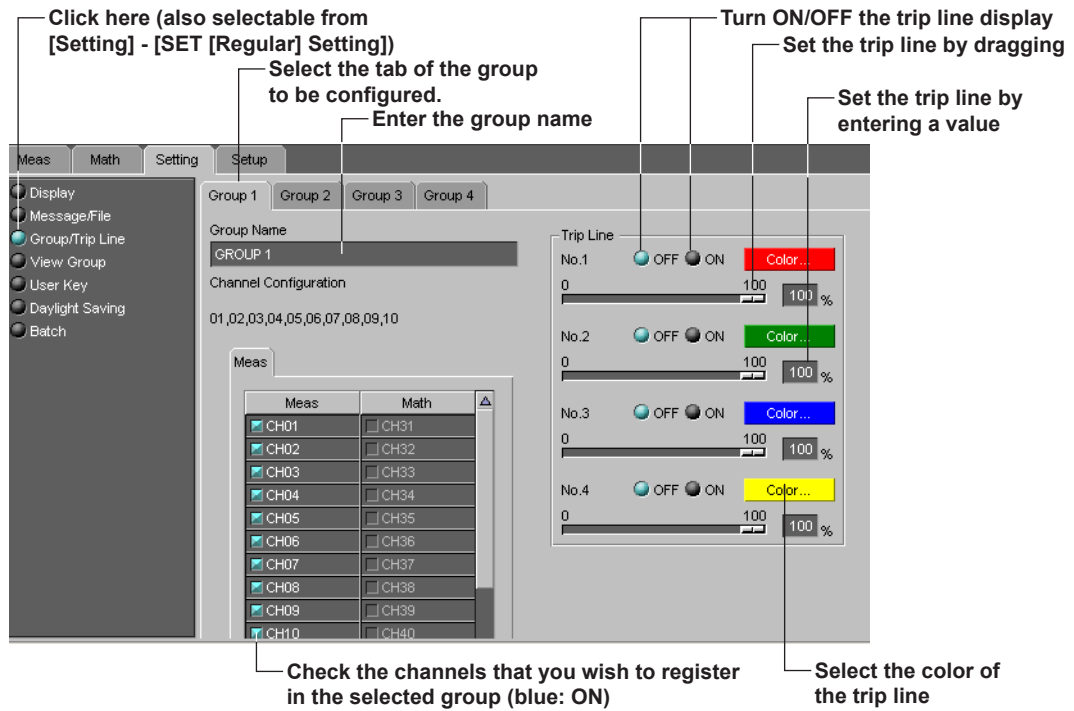
Note

- 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].

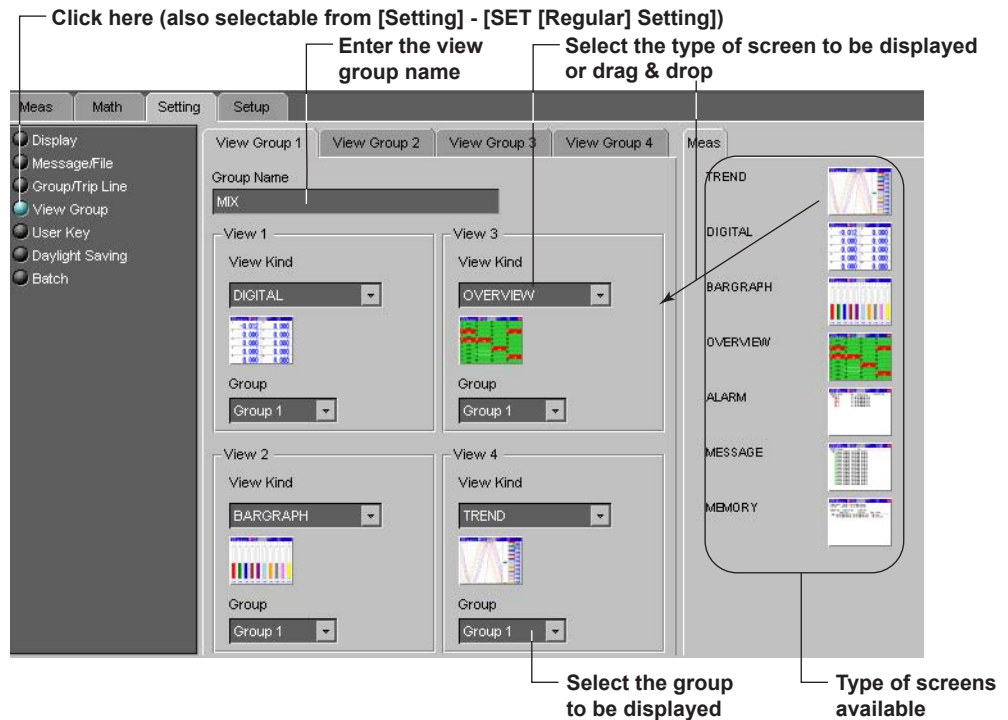
If no channels are specified, CH01 is automatically assigned.

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.

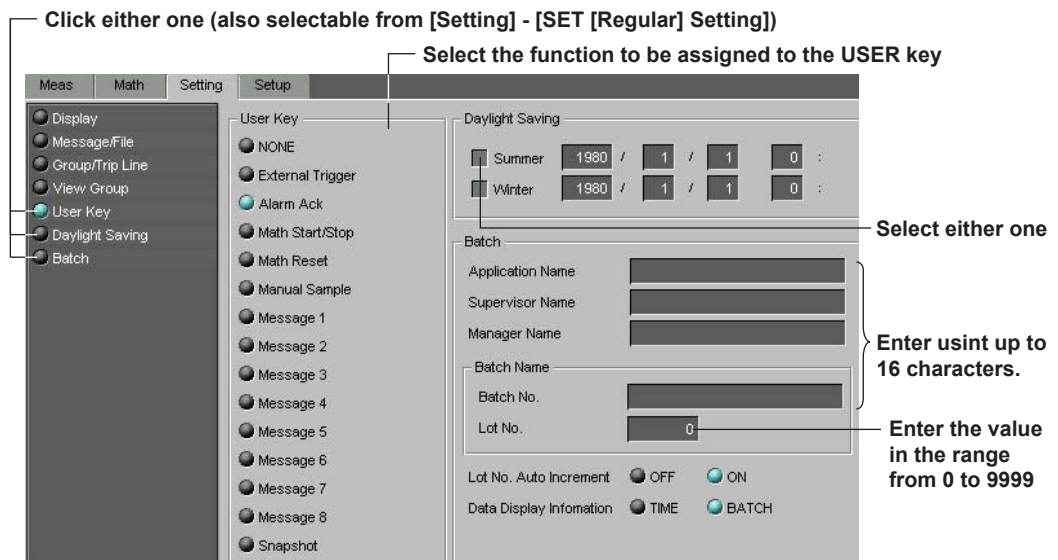
Group Name

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), Daylight Saving, Batch (Option /BT1, Style Number S2 or Later)



8.5 Configuring the Setup Mode

Alarm/Relay/Remote

The screenshot shows the 'Alarm/Relay/Remote' configuration screen. The 'Setting' tab is selected, and the 'Alarm/Relay/Remote' sub-tab is active. The screen is divided into two main sections: 'Alarm/Relay' and 'Remote'.

Alarm/Relay Section:

- Refresh:** Radio buttons for OFF (selected) and ON.
- Relay AND:** A dropdown menu currently set to 'NONE'.
- Relay Action:** Radio buttons for De-Energize (selected) and Energize.
- Alarm Relay Behavior:** Radio buttons for Unhold (selected) and Hold.
- Alarm Indicator:** Radio buttons for Unhold (selected) and Hold.
- Rate of Change Increase:** A dropdown menu set to '1' and a text input field.
- Rate of Change Decrease:** A dropdown menu set to '1' and a text input field.
- Alarm Hysteresis:** Radio buttons for OFF (selected) and ON.

Remote Section:

	Action	
REMOTE 1	NONE	▼
REMOTE 2	NONE	▼
REMOTE 3	NONE	▼
REMOTE 4	NONE	▼
REMOTE 5	NONE	▼
REMOTE 6	NONE	▼
REMOTE 7	NONE	▼
REMOTE 8	NONE	▼

Annotations on the screenshot:

- 1. Select this tab:** Points to the 'Alarm/Relay/Remote' sub-tab in the left sidebar.
- 2. Click here (also selectable from [Setting] - [SETUP [Basic] Setting]-[Setting]):** Points to the 'Setting' tab at the top.
- Select from 1 to 15 times:** Points to the dropdown menus for 'Rate of Change Increase' and 'Rate of Change Decrease'.
- Copy/Paste the selected range:** Points to the 'Copy' and 'Paste' buttons.
- Select the controlled item:** Points to the dropdown arrow of the 'REMOTE 8' row.

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 8-7.

Scan Interval/Memory

Click here (also selectable from [Setting] - [SETUP [Basic] Setting]-[Setting])

Check the channels you wish to sample

Set these parameters when the data type is set to [EVENT & DISP] or [EVENT]

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.

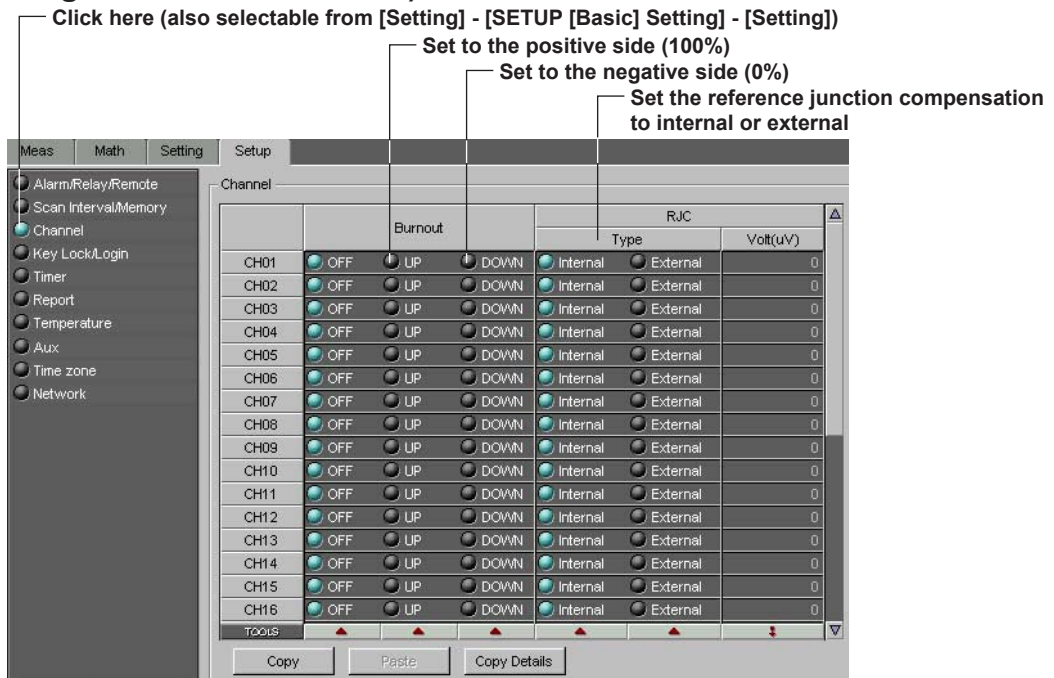
- Memory Sample

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)

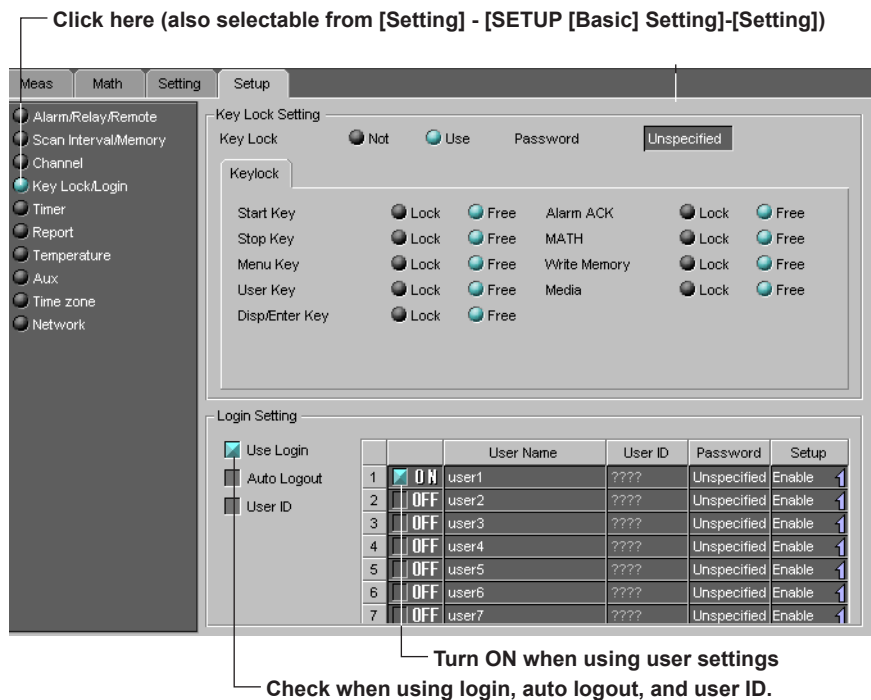
When the reference junction compensation is set to [External], set the compensation value in the range from -20000 to 20000.

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)

Click here (also selectable from [Setting] - [SETUP [Basic] Setting]-[Setting])

Select one

Timeout every time the specified time elapses
Select the timeout time

Time out with the specified time as the reference

Meas Math Setting Setup

Alarm/Relay/Remote
Scan Interval/Memory
Channel
Key Lock/Login
Timer
Report
Temperature
Aux
Time zone
Network

Timer 1
OFF
Absolute Interval 1h Ref.time 0 : 00
Relative Interval 1 : 0
 Reset Save Data

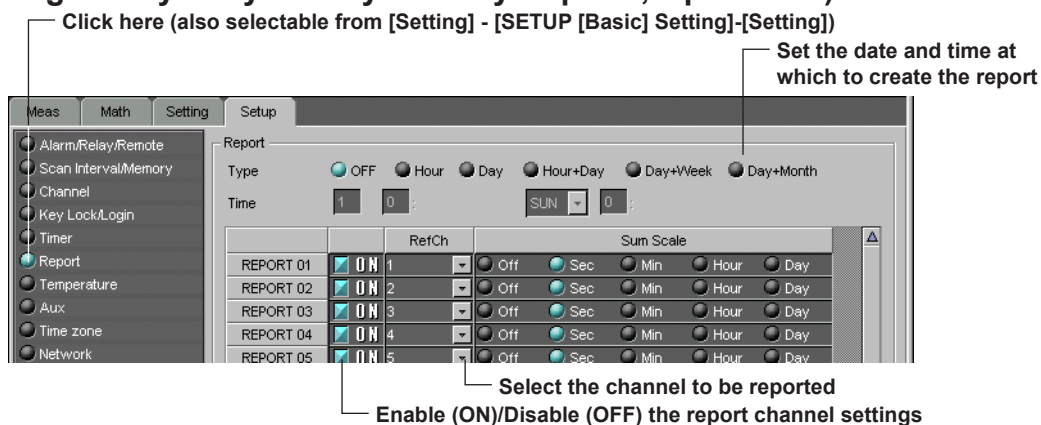
Timer 2
OFF
Absolute Interval 1h Ref.time 0 : 00
Relative Interval 1 : 0
 Reset Save Data

Timer 3
OFF
Absolute Interval 1h Ref.time 0 : 00
Relative Interval 1 : 0
 Reset Save Data

Save the data to the TLOG file when a timeout occurs.
Reset computation when a timeout occurs

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.

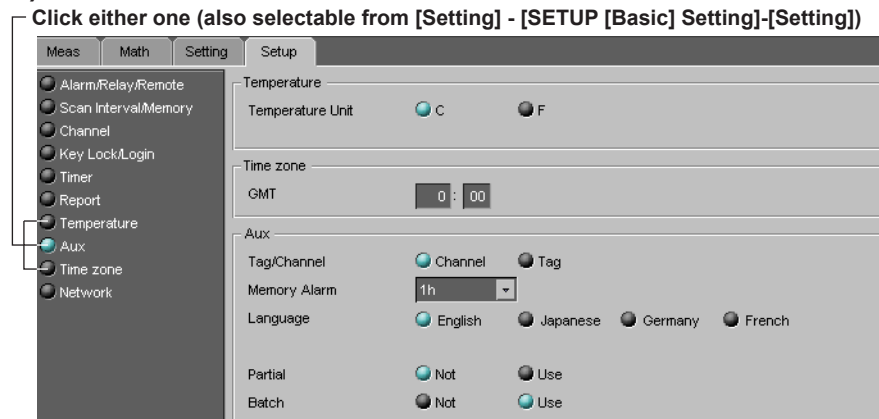
Converting the reference unit time

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 8-7.

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



Temperature

Select the °C or °F for the temperature unit.

Tag/Channel

Select whether to use the tag (see “Tag” on page 8-6) or channel number as the measurement/computation channel label.

If you select tag, you can select the label display from tag and channel (see “Selecting the Characters Used to Identify Channels” on page 4-12).

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

1. Click here (also selectable from [Setting] - [SETUP [Basic] Setting]-[Comm])

2. Select this tab

Set the IP address

Set these addresses when using the DNS

Enter the timeout value when turned ON

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

2. Select the primary or secondary tab.

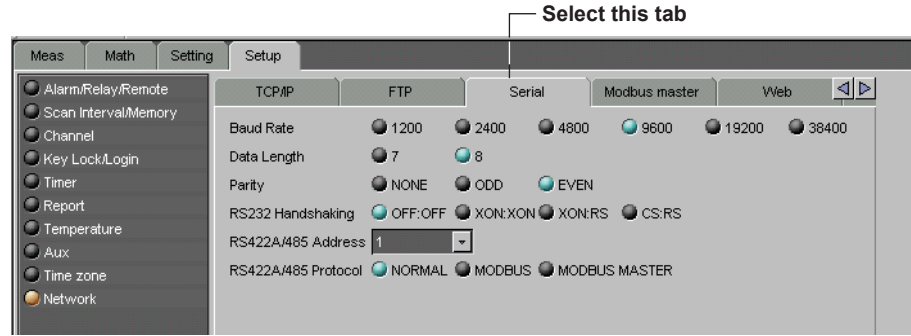
1. Select this tab.

Select the file transfer destination

By using the FTP function, you can automatically transfer the measured/computed data files to the specified server.

8.5 Configuring the Setup Mode

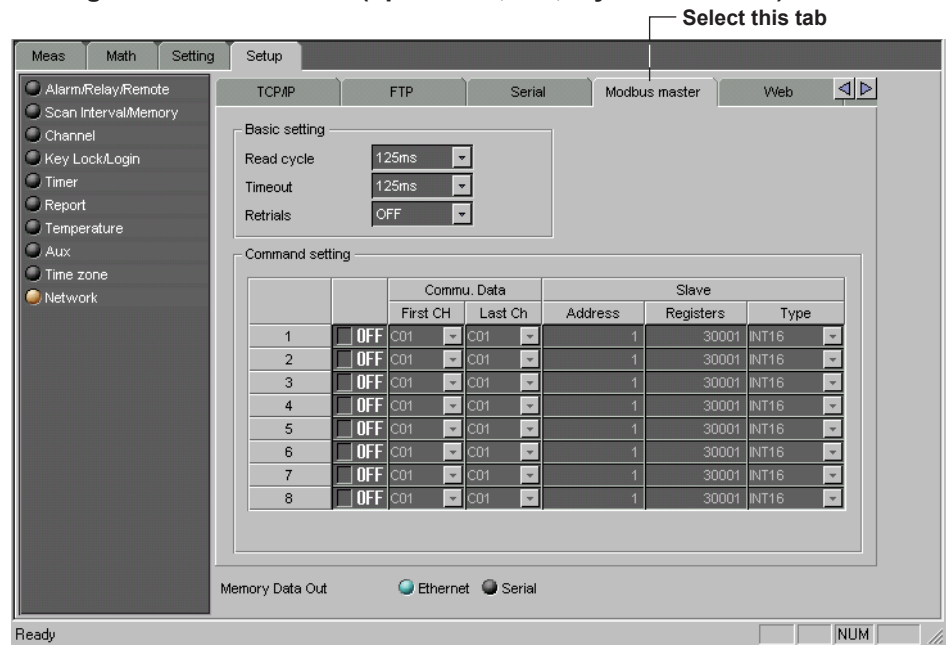
Setting the serial communication (option /C2, /C3)



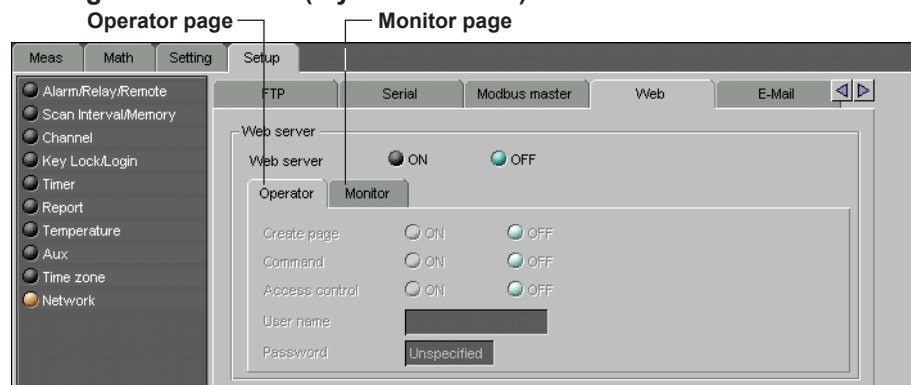
Note

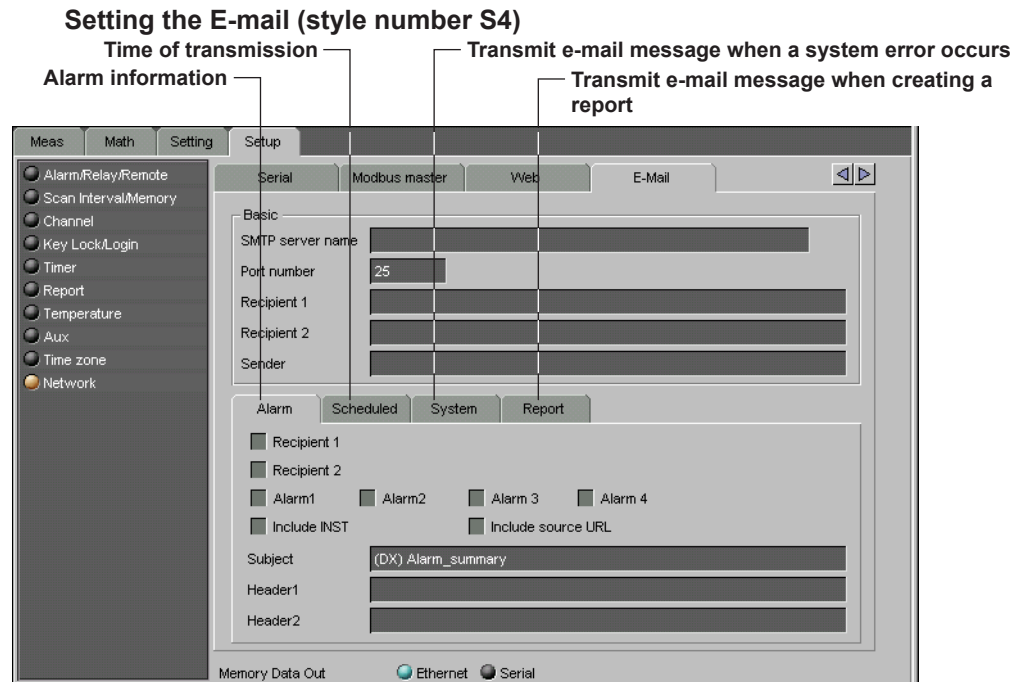
When using modbus, you must set the protocol to MODBUS or MODBUSMASTER.

Setting the Modbus Master (option /C2, /C3, style number S4)



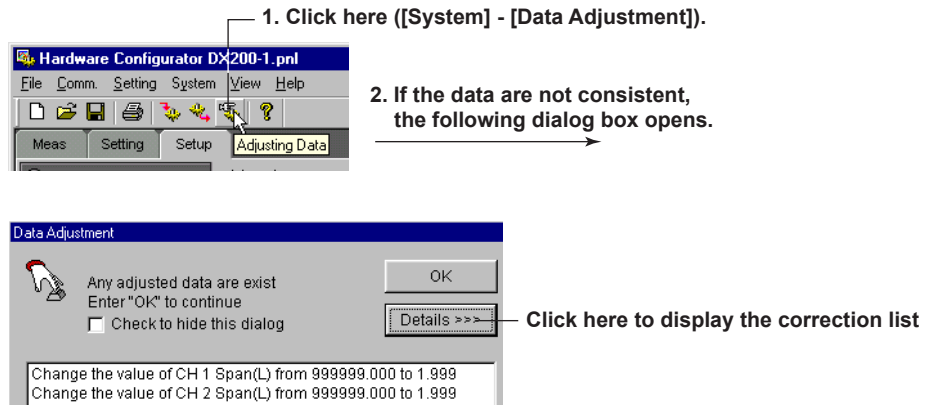
Setting the web server (style number S4)





- **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.

8.6 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

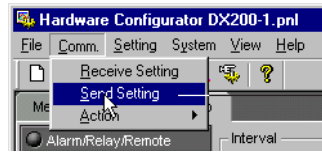
Data adjustment dialog box

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

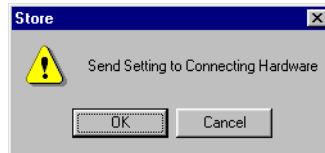
Perform the data check before sending the new setup data to the DX100/DX200/MV100/Mv200.

8.7 Sending the Setup Data to the DX/MV



The setup data are sent when [Comm] - [Send] is selected.

A confirmation dialog box is displayed.



To send the new setup data to the DX100/DX200/DX200C/MV100/MV200, click the [OK] button.

If the DX100/DX200/DX200C/MV100/MV200 is acquiring data to the memory, a message “Now Memory & Math sampling. Can’t store setting” is displayed. The data will not be sent in this case.

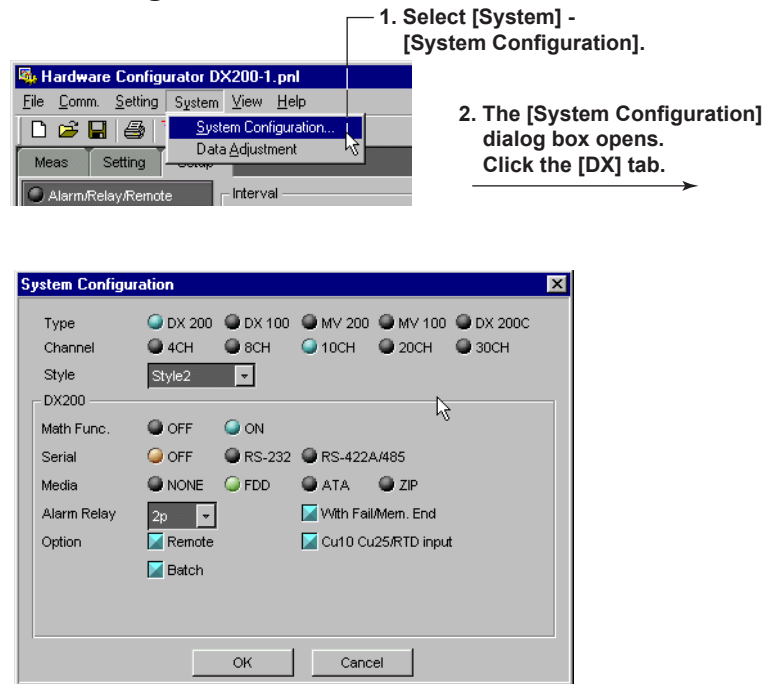
Note

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

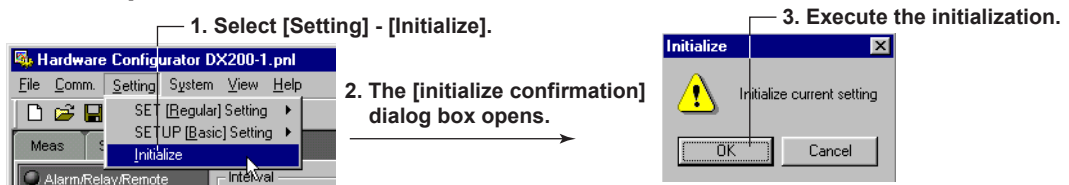
8.8 Checking the System Configuration and Initializing Setup Data

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



8.9 Saving the Setup Data

For the operating procedure, see section 3.8. The setup file name extension is .pnl.

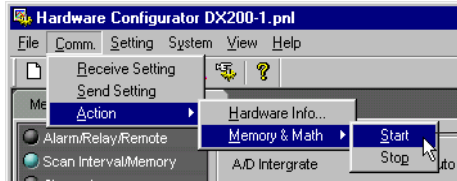
8.10 Printing the Setup Data

For the operating procedure, see section 3.9.

8.11 Starting and Stopping Measurement on the DX/MV, Checking the DX/MV System Configuration

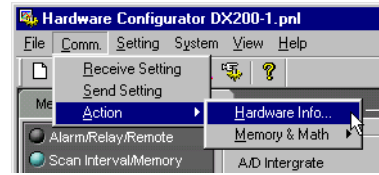
From this software you can start and stop the DX/MV, and display DX/MV system configuration information.

Starting and Stopping Measurement

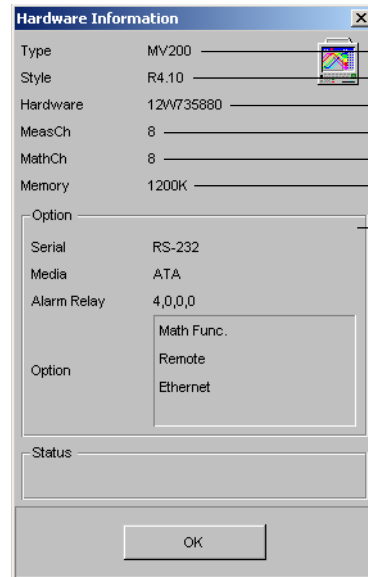


1. Select [Comm] - [Action] - [Memory & Math].

Display DX/MV system configuration information



1. Select [Comm] - [Action] - [Hardware Info].



Recorder type
Firmware version
Serial number
Number of measurement channels
Number of computation channels
Memory capacity

Optional

8.12 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.

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