
**User's
Manual**

**WX104
DAQEXPLORER**

vigilantplant®

Foreword

Thank you for purchasing the DAQEXPLORER.

This manual explains the operating procedures of the DAQEXPLORER on Windows 2000, Windows XP, and Windows Vista.

Keep this manual in a safe place for quick reference in the event a question arises.

Furthermore, for handling precautions, functions, and operating procedures of the DX100, DX200, MV100, MV200, CX1000, CX2000, DX1000, DX2000, MV1000, MV2000 (referred to collectively as the RECORDER in this manual) main unit, or for the handling and operating procedures of Windows, please see the manuals for those respective products.

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How to Use this Manual

Structure of the Manual

This manual consists of the following 6 chapters and an index.

Chapter	Title	Description
1	Before Use	Describes the PC requirements needed to run the DAQEXPLORER, the installation procedures, and other information.
2	Using the DAQ Desktop	Describes the DAQ desktop used to start various software programs. It also describes the procedures to setup communications between the RECORDER ¹ and the PC.
3	Using the Data Monitor	Describes the operations used when monitoring the data in real-time on the monitor connected to the RECORDER ¹ via network.
4	Displaying Data with the Data Viewer	Describes the operations used when monitoring the stored data on the hard disk or converting the stored data to other formats such as ASCII.
5	Configuring the DX100/DX200/MV100/MV200	Describes the procedures used to configure the DX100/DX200/MV100/MV200 such as measurement conditions.
6	Configuring the DX1000/DX2000	Describes the procedures used to configure the DX1000/DX2000 such as measurement conditions.
7	Configuring the MV1000/MV2000	Describes the procedures used to configure the MV1000/MV2000 such as measurement conditions.
8	Configuring the CX1000/CX2000	Describes the procedures used to configure the CX1000/CX2000 such as measurement condition and control function.
9	Error Messages and Their Corrective Actions	Describes error messages and their countermeasures.
Index		Gives an index.

¹ In this manual, the DX100, DX200, MV100, MV200, CX1000, CX2000, DX1000, DX2000, MV1000, and MV2000 are collectively referred to as the RECORDER.

The Scope of This Manual

This manual does not explain the basic operations of Windows 2000, Windows XP, and Windows Vista. For information regarding the basic operations of Windows, see the Windows user's manual.

Conventions Used in this Manual

Unit

K Denotes 1024. Example 100 KB

M Denotes 1024K. Example 10 MB

G Denotes 1024M. Example 2 GB

Notations of menus, commands, dialog boxes, and buttons

Enclosed with [].

Symbols

Note

Calls attention to information that is important for proper operation of the instrument.

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Chapter 9 Error Messages and Their Corrective Actions

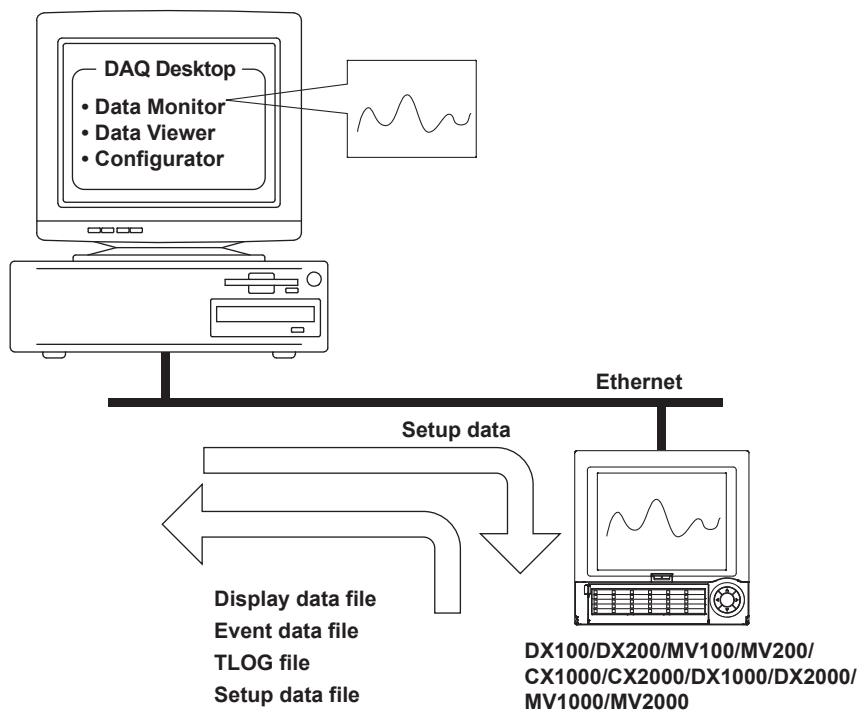
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1.1 DAQEXPLORER Overview

The DAQEXPLORER consists of the following four software programs:

- DAQ Desktop
- Data Monitor
- Data Viewer
- Configurator



DAQ Desktop

The DAQ Desktop can be used to perform the following operations:

- Mount the RECORDER on the network (make it accessible from the DAQEXPLORER).
- Start the Data Monitor, Data Viewer, and Configurator programs.
- Check the files residing in the internal memory or external storage medium of the RECORDER.
- Snap shot display of the RECORDER display screen.
- Automatic transfer of the RECORDER data.
- Copy RECORDER data to the DAQ Desktop.
- Send triggers to the RECORDER.

Note

The DAQ Desktop and Data Viewer are automatically registered under [Programs] of the [Start] menu of Windows 2000, Windows XP, and Windows Vista when the DAQEXPLORER is installed.

Data Monitor

Monitor the RECORDER data using a PC connected to the network by viewing the trend waveform, for example. The following types of monitor screens are available:

- Alarm Monitor : Lists the alarm conditions of each group or alarms that occurred in the past. It can be used to monitor alarms.
- Trend Monitor : Displays the waveforms of the measured and computed data. This is useful when you wish to observe the data trend.
- Color Graph Monitor : Displays the measured and computed data using colors that correspond to specific values. This is useful when you wish to observe the overall tendency of the measured and computed data.
- Numerical Monitor : Displays the measured and computed data using numerical (digital) values. This is useful when you wish to read the exact values.
- Meter Monitor : Displays the measured and computed data using analog meters. You can select bar graph, meter, or thermometer. This provides a useful way to display the current conditions graphically.
- Circular Monitor : Displays the measured and computed data in a circular fashion.

Data Viewer

The following five types of data files generated by RECORDER can be displayed as trends, digital values or in a circular fashion on the screen or printed.

- Display data file (.dds, .cds, .DAD)
- Event data file (.dev, .cev, .DAE)
- TLOG file (.dtg) (Note that this excludes the DX1000/DX2000/MV1000/MV2000.)
- Report file: .dhr (hourly), .ddr (daily), .dwr (weekly), .dmr (monthly), and DAR (DX1000/DX2000/MV1000/MV2000 report file)
- Manual sample file (.dmn), .DAM (DX1000/DX2000/MV1000/MV2000 manual sample file)

You can also use cursors to read the values of the displayed data, perform computation over a specified region, and convert data to a file in ASCII format or a format that can be opened using Excel/Lotus.

Configurator

The Configurator is used to configure RECORDER setup data such as the configuration of the measurement channels and computation channels, the screen display format, etc. Configuration data can also be stored to or retrieved from the hard disk on the connected PC. There are three methods for setting the RECORDER:

- Retrieving the current setup data from the connected DX/MV/CX and subsequently modifying the settings.
- Loading saved setup data from the PC and changing the settings.
- Configuring a new system and settings.

1.2 System Requirements

Operating System

Run DAQWORX under any of the following operating systems.

- Windows 2000 Professional SP4
- Windows XP Home Edition SP2, SP3
- Windows XP Professional SP2, SP3 (excluding Windows XP Professional x64 Edition)
- Windows Vista Home Premium, SP1 (excluding the 64-bit edition)
- Windows Vista Business, SP1 (excluding the 64-bit edition)

The language displayed by the software under different language versions of the OS are as follows.

OS Language	Software Language
Japanese	Japanese
German	German
French	French
Chinese	Chinese
Other	English

Note

- If daylight savings exists in the specified time zone, check "Automatically adjust clock for daylight savings changes."
- Do not specify time zone settings in the Windows autoexec.bat file. If you see a line such as "TZ=GMT0" in the autoexec.bat file, deactivate it by attaching a REM command in front.
- This program cannot handle data after year 2038.

Hardware

PC

A PC that runs one of the OS above, and that meets the following CPU and memory requirements.

When Using Windows 2000 or Windows XP

Pentium 4, 1.6 GHz or faster

512 MB or more of memory

When Using Windows Vista

Pentium 4, 3 GHz or faster

2 GB or more of memory

Free disk space

200 MB or more

CD-ROM Drive

CD-ROM drive (for installing the DAQEXPLORER)

Mouse

A mouse supported by the operating system

Monitor

When Using Windows 2000 or Windows XP

A monitor supported by the OS of 1024 × 768 dot or higher and 65,536 colors or more.

When Using Windows Vista

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

Communication Card

An Ethernet card supported by Windows. The TCP/IP protocol must also be installed.

Printer

Printer supported by Windows. You will also need an appropriate printer driver.

1.3 Configuring the Network

The network must be configured so that the RECORDER and the PC can communicate properly using DAQEXPLORER.

Set the network configuration on the RECORDER side.

For the configuration procedure, see the respective communication interface user's manual.

1. Press the MENU key to display the setting mode menu.
2. Press the FUNC key for approximately three seconds to display the basic setting mode menu.

For the DX100/MV100/CX1000

3. Press the [#10 (Communications)] soft key ([#9] (Communications) soft key on CX1000), then the [#1 (Ethernet, IP address)] soft key. Then, press the [#2 (Ethernet, DNS)] soft key.

For the DX200/MV200/CX2000

3. Press the [#6 (Communications)] soft key ([#7] (Communications) soft key on CX2000), then the [#1 (Ethernet)] soft key to display the following communication function menu:

4. Enter these three parameters.

Ethernet		Serial	
IP-address	10.0.232.87	Baud rate	38400 bps
Subnet mask	255.255.254.0	Data length	8 bit
Default gateway	10.0.232.1	Parity	Odd
DNS On/Off	Off	RS-232 Handshaking	Off:Off
Server search order		RS-422A/485 Address	1
Primary	0.0.0.0	Protocol	Normal
Secondary	0.0.0.0		
Host name	DW-TEST4	Memory out	Ethernet
Domain name			
Domain suffix search order			
Primary			
Secondary			

5. Enter a name.

With the DX1000

3. Choose **Communication (Ethernet) > IP address**. Enter the IP address, subnet mask, and default gateway, then choose **Communication (Ethernet) > Host settings**, and enter the host name.

With the DX2000

3. Choose **Communication (Ethernet) > IP address**, Host settings, then enter the IP address, subnet mask, default gateway, and host name.

* Host name The name that is specified here is used as an identification name for the RECORDER that can be mounted from within the network folder. If a name is not specified, the IP address will be used as the identification name.

With the MV1000

Enter an IP address and host settings with the following procedure.

- Press the **MENU** key, then click **Menu tab > Basic setting mode > Menu tab > Communication (Ethernet) > IP address**. Enter the IP address.
- Press the **MENU** key, then click **Menu tab > Basic setting mode > Menu tab > Communication (Ethernet) > Host settings**. Enter the host settings.

With the MV2000

Press the **MENU** key, then click **Menu tab > Basic setting mode > Menu tab > Communication (Ethernet) > IP address, Host Settings**. Enter the IP address and host settings.

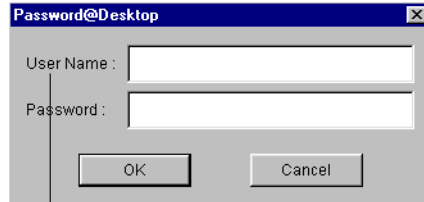
Note

- In using this software, the DNS, domain name, and suffix search order do not need to be configured.
- You can check and save the configuration using the TCP/IP menu of the Configurator.
- If you change the IP address, make sure to reboot the DX/MV/CX.

2.1 Starting and Exiting the DAQ Desktop

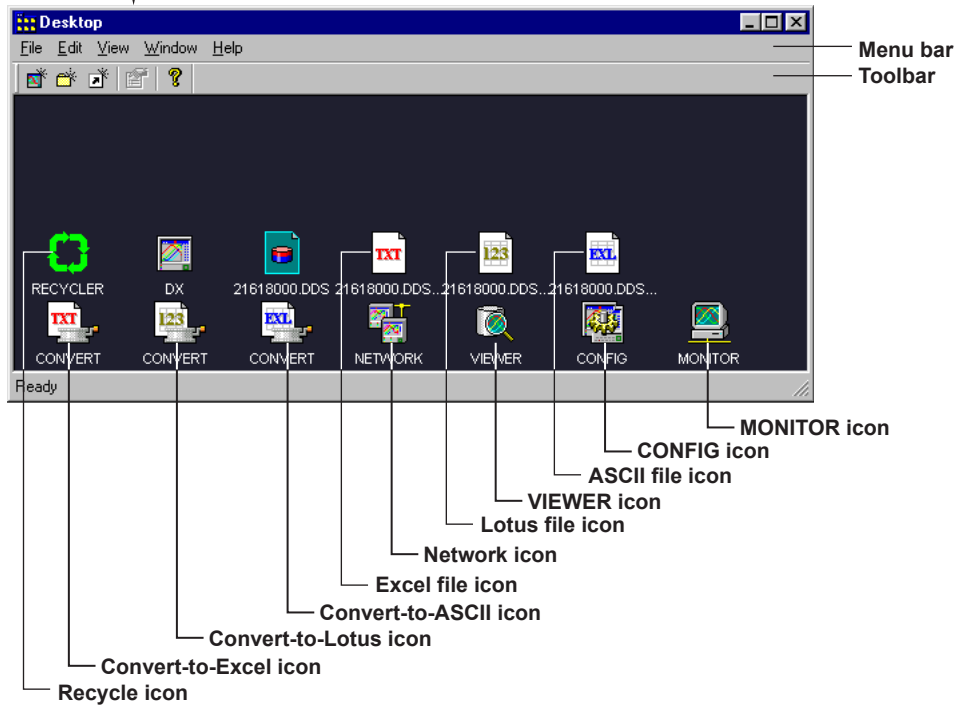
Starting the DAQ Desktop

1. From the Start menu, select [Programs] - [YOKOGAWA DAQWORX] - [DAQEXPLORER] - [Desktop].
2. The password confirmation dialog box opens.



3. Enter the user name and password.

4. The DAQ Desktop opens.



Password confirmation

If the Ethernet login on the RECORDER is set to [On] at the [admin] level, enter the user name and password of the administrator that was registered on the DX/MV/CX.

If the Ethernet login is set to [Not] (not used), you do not have to enter the user name or password. Clicking the [OK] or the [Cancel] button starts the DAQ Desktop.

2.1 Starting and Exiting the DAQ Desktop

Note

- If there are multiple RECORDERS that have the Ethernet login configured, only the RECORDER with the matching user name and password specified in step 3 will be mountable.
 - If you double-click the icon of an Excel or text file in the destination folder for automatic transfer, Excel or a text editor launches and displays the data.
 - To display files, the programable to display each file (hereinafter referred to as the external viewer) must be installed, and the OS file associations must be valid. For information about file associations, see the manuals for the external viewer and the OS.
 - DAQ Desktop cannot determine the condition of files being displayed by the external viewer. Problems may be experienced if files being displayed on the external viewer are deleted or moved using DAQ Desktop. Therefore, when deleting or moving files with DAQ Desktop, first close the file displayed on the external viewer.
-






DAQ Desktop Functions

The DAQ Desktop has the following functions:

Menu bar

- File
 - New Mount: Mounts the RECORDER with the specified host name or IP address onto the DAQ Desktop.
 - New Folder: Creates a new folder. You can also make the folder the data transfer destination.
 - New Shortcut: Creates a new shortcut icon on the desktop. You cannot create shortcuts for the following folders.
 - Root directory such as drive C
 - DAQStation and ~recycler folders
 - Folders in the ~DX___, MV___ and CX___ folders
 - Folders that are displayed on the desktop
 - Folders for which a shortcut already exists
 - Property: Displays the properties of the RECORDER.
 - Set Time: Sets the date and time of all mounted RECORDERS at once.
 - Port No.: You can check or change the port number.
 - Exit: Exits the DAQ Desktop and returns to the Windows screen.
 - Edit: Copies and Pastes selected files.
 - View: Refreshes information, selects the display format of the list, and shows or hides the toolbar and status bar.
- Window: Closes all windows.
- Help: Displays the version information of the DAQ Desktop.
- Print Setup: Specify a device for printing snapshot screens and other output.

Toolbar

-  (New Mount): This icon is equivalent to selecting [File] - [New Mount] from the menu bar.
-  (New Folder): This icon is equivalent to selecting [File] - [New Folder] from the menu bar.
-  (New Shortcut): This icon is equivalent to selecting [File] - [New Shortcut] from the menu bar.
-  (Property): This icon is equivalent to selecting [File] - [Property] from the menu bar.
-  (Version Information): This icon is equivalent to selecting [Help] - [About] from the menu bar.

Network icon

- Lists the RECORDERS that are on the same segment of the network.
- Mounts the RECORDER that is on the network onto the DAQ Desktop.

Recycle icon

Deletes files and folders and dismounts the RECORDER.

VIEWER icon Starts the Data Viewer program.

MONITOR icon Starts the Data Monitor program.

CONFIG icon Starts the Configurator program.

DX/MV/CX icon

The following operations can be performed:

- Start/Stop the data acquisition to the internal memory of the RECORDER.
- Start the Data Monitor, Data Viewer, Configurator programs.
- Snap shot.
- View the files residing in the internal memory or the external storage medium of the RECORDER.
- View and change the RECORDER configuration.
- Create automatic transfer destination for the RECORDER data and list the transfer data.

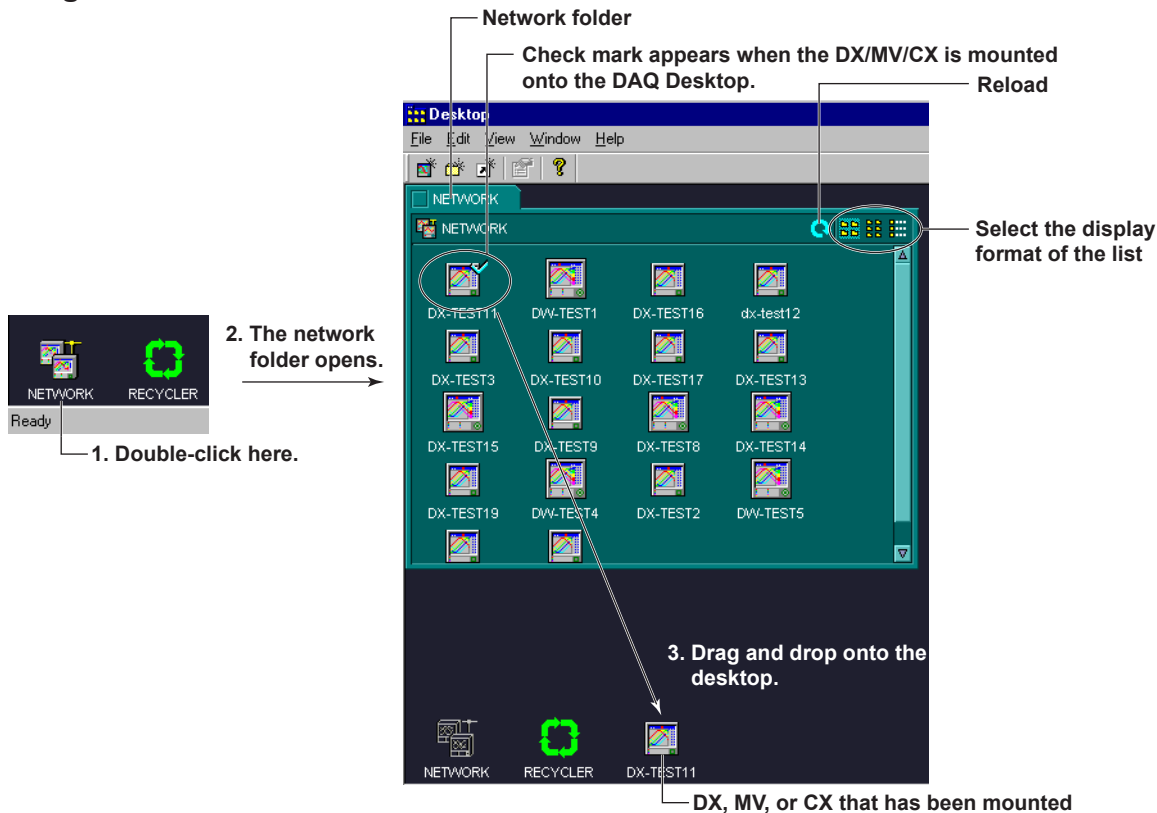
Folder icon

This is the automatic transfer destination for the RECORDER data. For the procedures to create folder icons, see section 2.5.

Note

- Files and folders that are dragged and dropped onto the recycler icon are temporarily placed in the following folder: DAQEXPLORER\desktops\DAQStation\recycler.
- When the DAQEXPLORER is restarted, all the data in the recycler folder are deleted.

Mounting the RECORDER



2.1 Starting and Exiting the DAQ Desktop

Network folder

The network folder will list the mountable RECORDERS that are within the same segment.

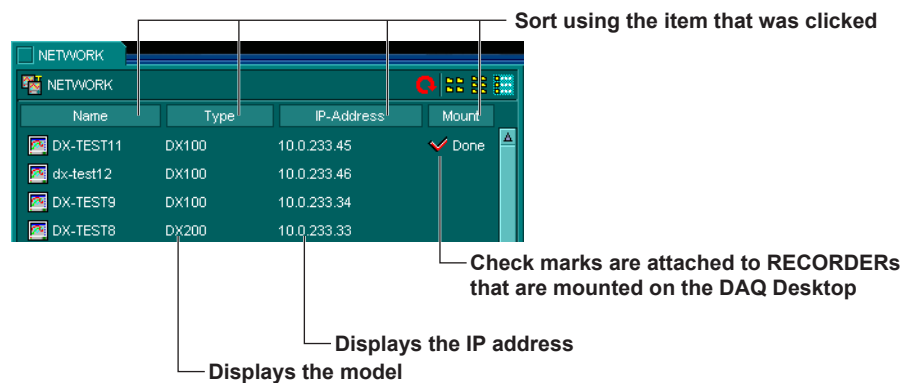
The RECORDER icons that have already been mounted onto the DAQ Desktop will display red check marks.

In addition, the list of RECORDER icons will show the host names that were specified in section 1.3.

Methods used to display the list

You can select Icons, List, or Details.

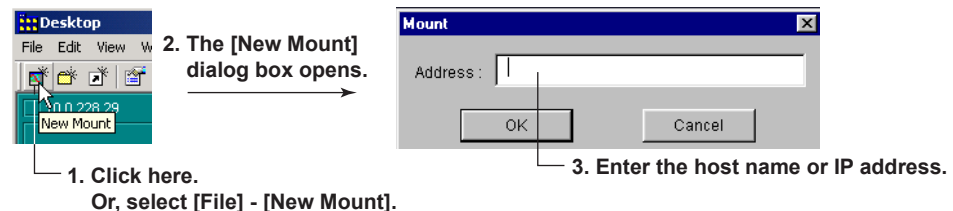
- **Display example when details is selected**



Note

Depending on the network conditions, the RECORDER, even when it is in the same segment, may not be listed. In this case, mount the RECORDER by specifying the IP address or host name. For details related to mounting, see the next page.

Mounting by Specifying the IP Address or Host Name



New Mount

Mount the RECORDER by specifying the IP address or host name.

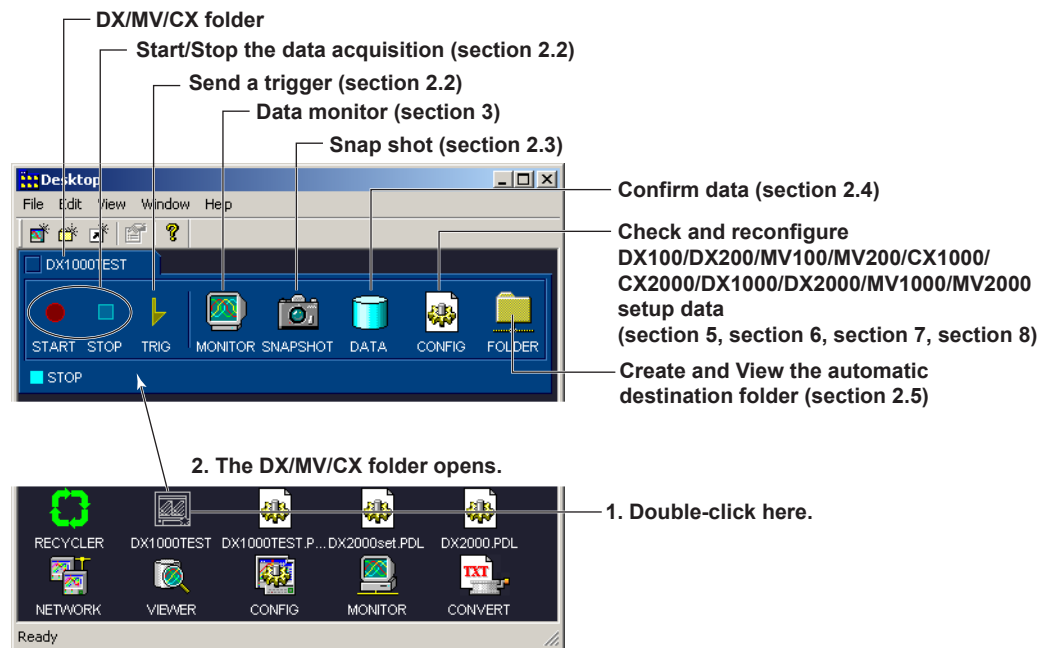
This method is used to mount a RECORDER residing in another network.

Clicking the [OK] button displays the icon of the RECORDER that has been mounted on the DAQ Desktop.

Note

- The maximum number of RECORDERS that can be mounted is 16.
- The icon of the RECORDER that could not be connected is indicated with a red "x" mark.
- Connecting is not possible in the following cases:
 - The DX/MV/CX is not turned ON.
 - The DX/MV/CX with the specified IP address or host name does not exist.
 - The user name and password (see page 2-1) do not match.
 - Another user is using the particular DX/MV/CX.

Opening the DX/MV/CX Folder



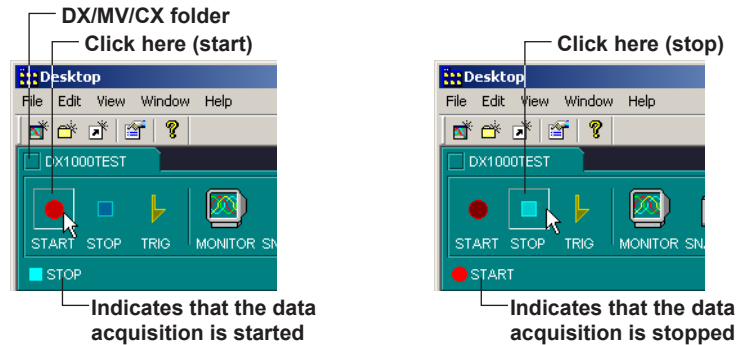
Exiting the DAQ Desktop

If you attempt to exit the program while the Data Monitor, Data Viewer, or Configurator is running and the desktop is busy carrying out some operation, a message "Now working! Do you exit all compulsory?" is displayed.

Note

You cannot exit from the DAQ Desktop, if you are editing a file that is outside the management of the DAQ Desktop on the Data Viewer that was started from the Start menu or on the Configurator program.

2.2 Starting and Stopping Data Acquisition on the DX/MV/CX, Send a Trigger



Starting

Clicking the start button starts the data acquisition to the internal memory of the RECORDER.

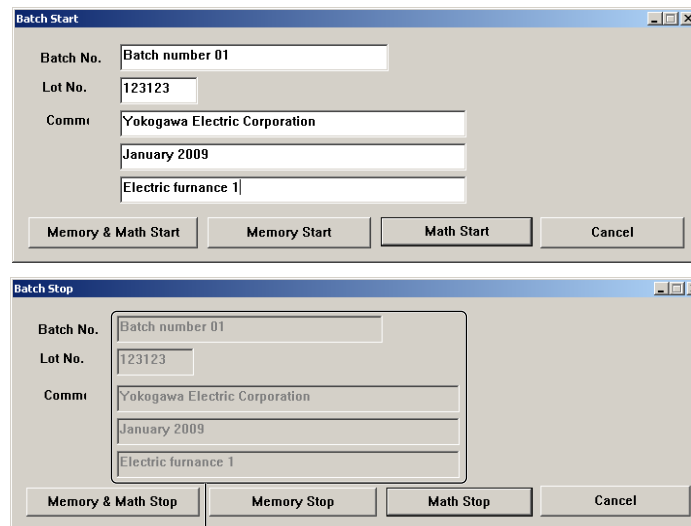
Stopping

When you click the stop button, a message, “Do you stop recording?” appears. Clicking the [OK] button stops the data acquisition to the internal memory of the RECORDER.

Starting and Stopping When Connecting the DX1000/DX2000/MV1000/MV2000 with the Batch Function

If the Batch function is OFF, recording and math start simultaneously. If the Batch function is ON, or with multibatches, recording and math start separately. When you click the START button, the Batch Start dialog box appears allowing you to start recording and math by individual batch, or for all batches. When you click the STOP button, the Batch Stop dialog box appears allowing you to stop recording and math by individual batch, or for all batches.

When the Batch Function Is Included

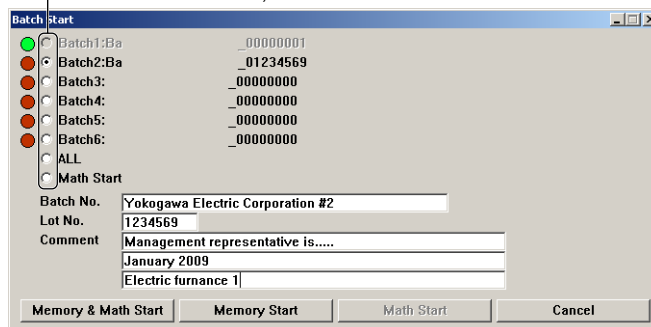


Batch information

Shows the batch information set on the DX1000/DX2000/MV1000/MV2000

When the Multibatch Function Is Included

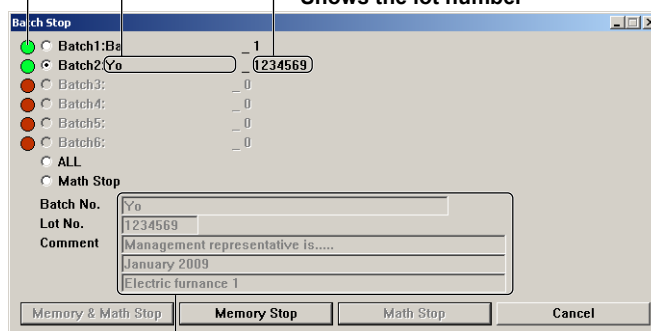
Select one item for recording or math start, fill in the text boxes, then click the **Start** button.



Green indicates batches that have started

Shows the batch number

Shows the lot number



Shows the batch information set on the DX1000/DX2000 (release number 3 or later)

After selecting the batch number or computation to start, enter the batch number, lot number, and comments if necessary. If you select individual batch numbers and computations before clicking either the Memory & Math Start, Memory Start, or Math Start button, these items will be much clearer.

Batch No.: Up to 32 alphanumeric and the following characters can be entered: %()+-.,°_@[].

Square brackets [] can be used with DX1000/DX2000 release 3 or later.

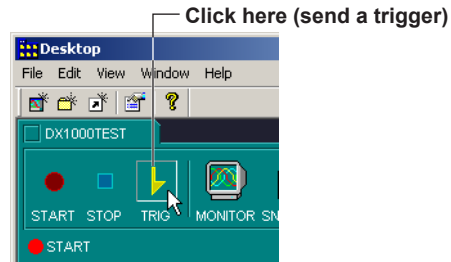
Lot No.: Up to 8 alphanumeric characters can be entered. The number of characters that can be entered depends on the number of digits of the lot number set on the DX/MV/CX.

Comment: Up to 50 characters per line can be input. Alphanumerics and some symbols can be entered.

Note

- If starting and stopping is carried out on the DX/MV/CX, and in other cases, the start/stop status display may not be correct.
- If the Batch function is ON, batch information cannot be input when the connected instrument has started memory sampling. Also, the Memory & Math Stop and Memory Stop buttons are not available.

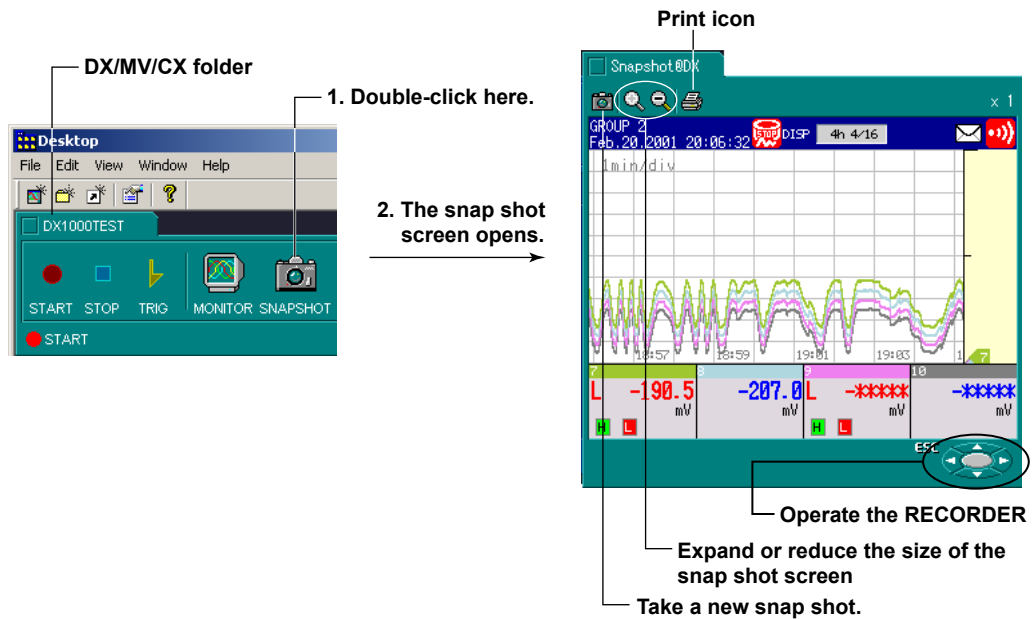
2.2 Starting and Stopping Data Acquisition on the DX/MV/CX, Send a Trigger



Trigger

Sends the trigger signal used to store the event data to the internal memory. The trigger is valid when the mode used to store the event data to the internal memory of the DX, MV or CX is [Trigger] or [Rotate], trigger type is set to key trigger ([Manual Trigger] is set to [ON], see page 5-17, 6-24, 7-23, or 8-41) and the DX, MV or CX is in the trigger-wait condition after you press the Start button. The trigger button is invalid during all other operations.

2.3 Using the Snap Shot Function



Saving the snap shot screen

Drag and drop the snap shot screen that you wish to save onto the DAQ Desktop or onto a folder on the DAQ Desktop.

The screen data that are dragged and dropped onto the DAQ Desktop are saved to the DAQEXPLORER\desktop\DAQStation folder in the drive where the DAQEXPLORER was installed.

The extension of the saved data file is [png].

The data that are saved cannot be opened using the DAQEXPLORER. You will need a separate software program that can open the screen data.

Procedure for the RECORDER

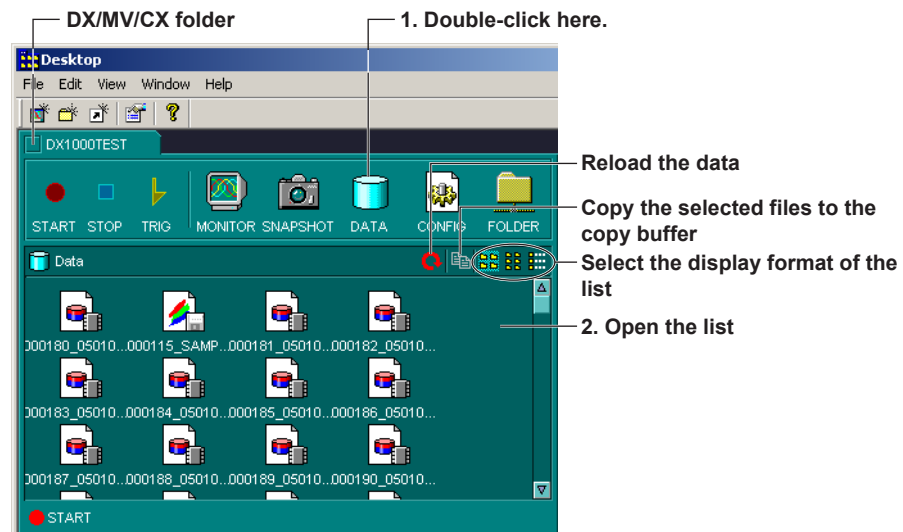
You can operate the snap shot screen with the keys appearing in the lower right. Even if you double click the image data file (.png) of the screen display created by the DX/MV, the snapshot folder appears but you cannot operate the DX/MV.

Printing the Snap Shot Screen

If you click the print icon, the current snap shot screen is printed out. For printer settings, choose File > Print Setup.

2.4 Confirming the RECORDER Data

Confirming the Data













Displaying the data list

Displays a list of the files in the active folder of the internal memory or the external storage medium of the RECORDER.

Data that can be displayed

The following data files can be listed:

-  Display data file (*.DDS and *.CDS(CX), *.DAD (DX1000/DX2000))
-  Event data file (*.DEV and *.CEV (CX), *.DAE (DX1000/DX2000))
- Report file
 -  Hourly report file (*.DHR)
 -  Daily report file (*.DDR)
 -  Weekly report file (*.DWR)
 -  Monthly report file (*.DMR)
 -  DX1000/DX2000/MV1000/MV2000 report file (*.DAR)
-  TLOG file (*.DTG)
-  Manual sample file (*.DMN, *DAM (DX1000/DX2000))
-  Display image data file (*.png)

Of the files listed above, display files, event files, and TLOG files can be opened using the Data Viewer (See section 3).

Methods used to display the list

You can select Icons, List, or Details.

- Display example when details is selected

Name	Size	Type	Time	Media	Transport	Batch Group
B03108_08120...	14KB	Display	2008/12/05 18:19:32	Mem.	Trans.	2
A03107_08120...	13KB	Display	2008/12/05 18:18:58	Mem.	Trans.	1
A03109_08120...	12KB	Display	2008/12/05 18:20:14	Mem.	Done	1
303071_08111...	40KB	Display	2008/11/14 16:51:48	Ext.	Done	
303075_08111...	12KB	Display	2008/11/14 18:21:02	Ext.	Trans.	
303079_08111...	12KB	Display	2008/11/14 18:43:46	Ext.	Trans.	

Note

When viewing the contents of the external storage medium, only the data files in the directory that was specified as the data save destination on the DX/MV/CX are listed.

Copying Files to the DAQ Desktop

You can copy the file that is located in the DX/MV/CX to the DAQ Desktop by dragging and dropping the file onto the DAQ Desktop.

Copying and pasting files

To copy the files, select the files and select [Edit] - [Copy].

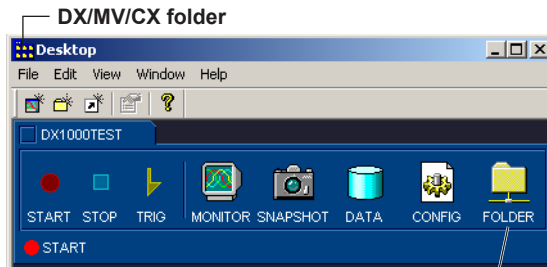
The files that are copied can be pasted to the active window by selecting [Edit] - [Paste].

Note

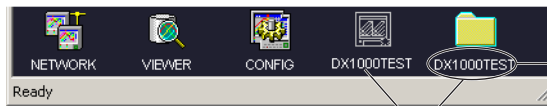
When the data are reloaded, the files residing the copy buffer are cleared.

2.5 Automatically Transferring Data in the DX/MV/CX

Setting the Automatic Transfer Destination



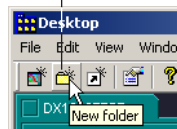
1. Drag and drop onto the DAQ desktop.



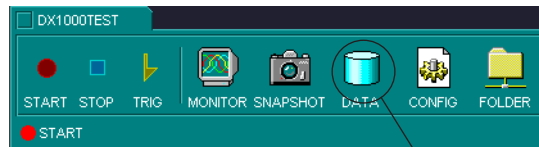
2. The folder name is set to the same name as the icon of the DX100/DX200/MV100/MV200/CX1000/CX2000 hat was mounted. This folder is the automatic transfer destination.

Renaming the automatic transfer destination folder

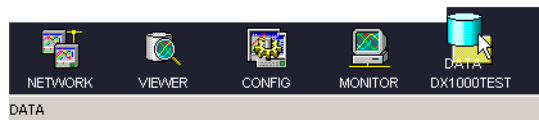
1. Click here ([File] - [New Folder]).



2. A new folder is created.
3. Enter the folder name.

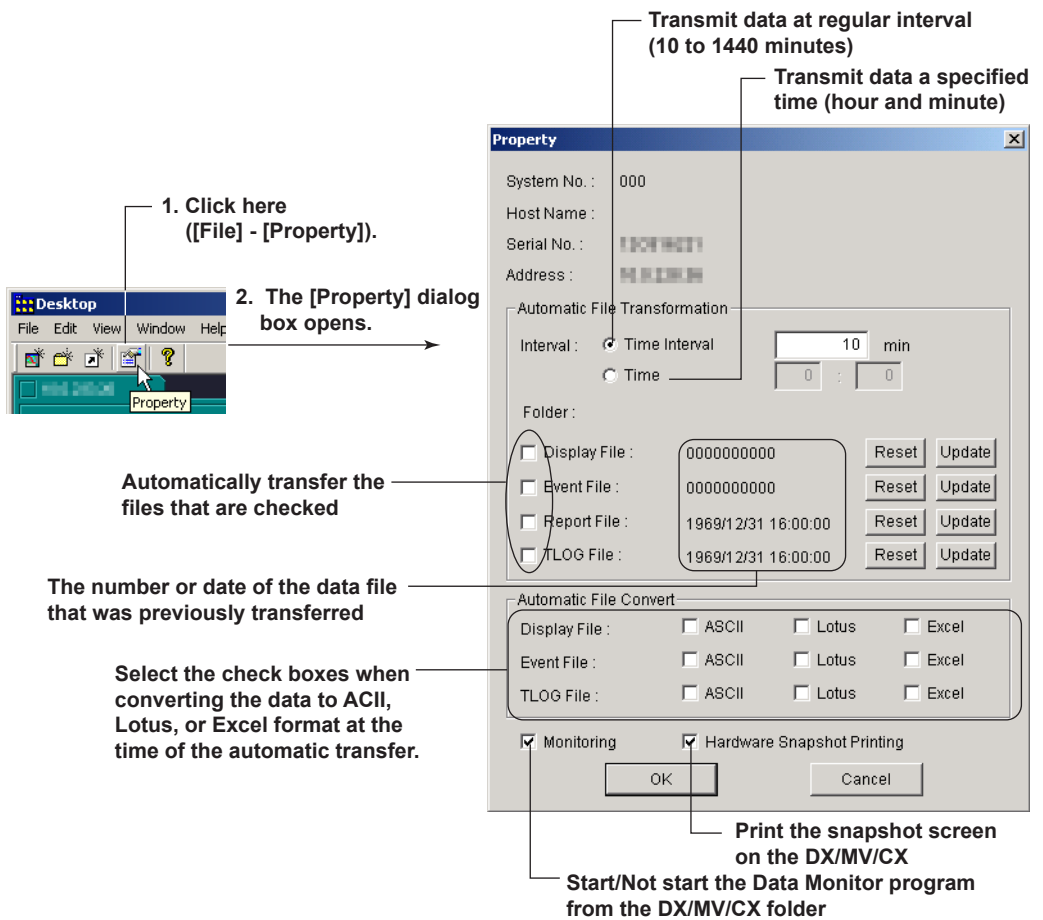


4. Drag and Drop onto the newly created folder icon. (The automatic transfer destination is set to the newly created folder.)



The data residing in the internal memory or external storage medium of the DX/MV/CX can be automatically transferred to the specified folder on the PC.

Selecting the Files to be Automatically Transferred



Files that can be automatically transferred

The following files residing in the internal memory or the external storage medium of the RECORDER can be automatically transferred:

- Display data file
- Event data file
- Report file
- TLOG file (Excluding the DX1000/DX2000/MV1000/MV2000)

Resetting

All existing files of the selected types are automatically transferred at the time of the data transfer immediately after the [Reset] button is clicked.

Updating

All files of the selected types that are created after the [Update] button is clicked are automatically transferred during the next data transfer.

Monitoring

Select whether or not to start the Data Monitor program from the DX/MV/CX folder. If you deselect the check box, you will not be able to select the MONITOR icon of the DX/MV/CX folder.

Note

- If the DAQEXPLORER is terminated with some files still selected to be transferred (denoted on each file by a check mark), the selected files will be transferred when the first data transfer is performed once the DAQEXPLORER has been restarted.
- The property icon ([File] - [Property]) cannot be selected unless the DX/MV/CX folder is active (the DX/MV/CX folder is selected).

2.5 Automatically Transferring Data in the DX/MV/CX

Automatic File Convert

You can automatically convert an automatically-transferred file to create a file in ASCII, Lotus, or Excel format. However, the DX1000/DX2000 cannot perform automatic file conversion because it does not create TLOG files.

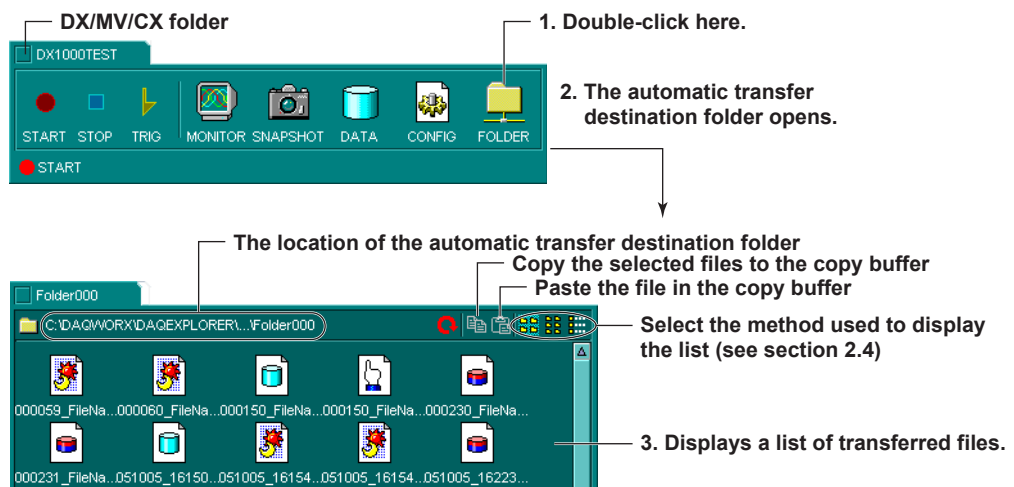
Printing the Snap Shot Screen on the DX/MV/CX

If you select the Hardware Snapshot Printing check box under Properties on the previous page and take a snapshot on the DX/MV/CX main unit, the snapshot is automatically output to the specified printer. For instructions on printer settings, see page 2-7.

Data Conversion

You can automatically create conversion files from the automatically transferred files.

Confirming the Transferred Files



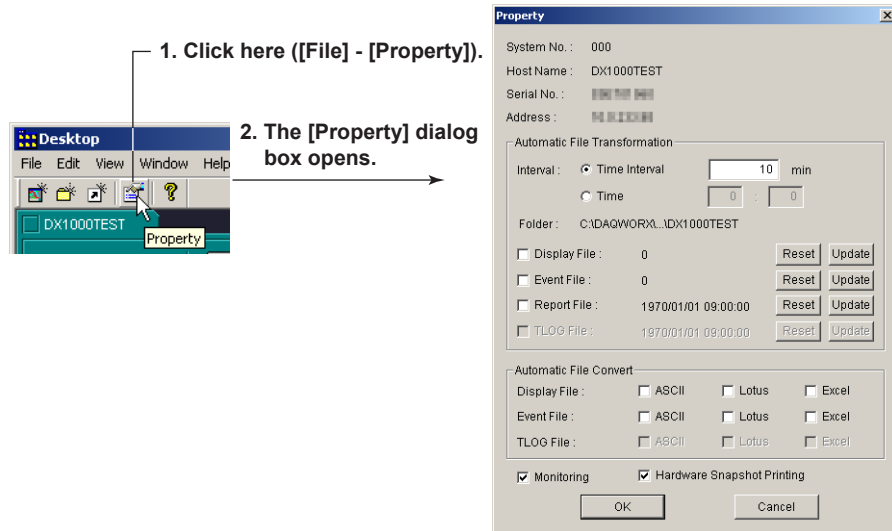
You can also open the above folder by double-clicking the automatic transfer destination folder located on the DAQ Desktop.

Note

- When the list of data residing in the internal memory or external storage medium of the RECORDER is displayed, data that have been transferred are indicated with red check marks.
- If you double-click the icon of an Excel or text file in the destination folder for automatic transfer, Excel or a text editor launches and displays the data.
- To display files, the programable to display each file (hereinafter referred to as the external viewer) must be installed, and the OS file associations must be raised. For information about file associations, see the manuals for the external viewer and the OS.
- DAQ Desktop cannot determine the condition of files being displayed by the external viewer. Problems may be experienced if files being displayed on the external viewer are deleted or moved using DAQ Desktop. Therefore, when deleting or moving files with DAQ Desktop, first close the file displayed on the external viewer.

2.6 Viewing the Property and Version Information

Property



The properties of the active RECORDER are displayed. The following items are displayed:

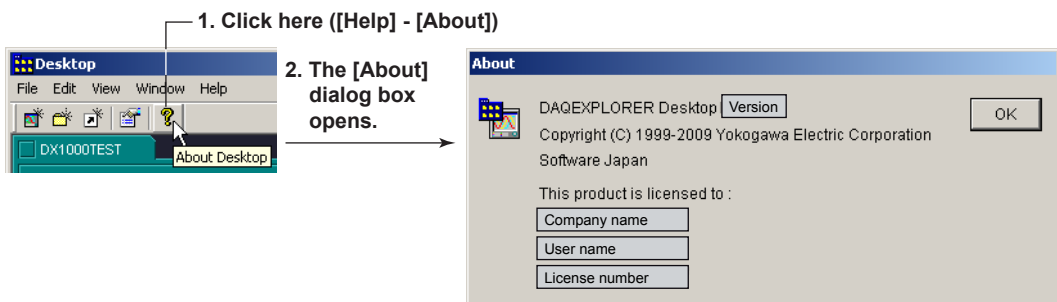
- System No.: Number used on the Data Monitor
- Host Name: RECORDER host name
- Serial No.: RECORDER serial number
- Address: RECORDER IP address or host name
- Interval: Automatic transfer interval of data (10 to 120 minute range)
- Folder¹: Automatic transfer destination for the data
- Automatic file convert¹: Automatic data format conversion during automatic transfer
- Reset: Transfer all existing data files
- Update: Transfer only newly created data files.
- Monitoring: Use/Not use the Data Monitor program.
- Interval: Interval at which the data is automatically transmitted (at regular intervals or at a specified time)
- Hardware Snapshot Printing: Whether or not screen snap shots taken on the DX/MV/CX are automatically printed

¹ For the DX1000/DX2000, TLOG file information is not displayed.

Note

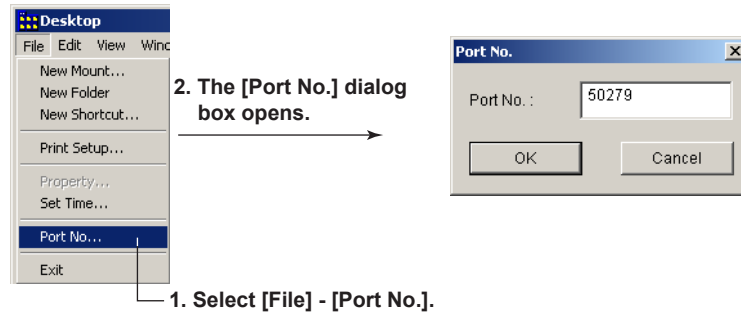
The property icon ([File] - [Property]) cannot be selected unless the DX/MV/CX folder is active (the DX/MV/CX folder is selected).

Version Information



The version information of the DAQ Desktop is displayed.

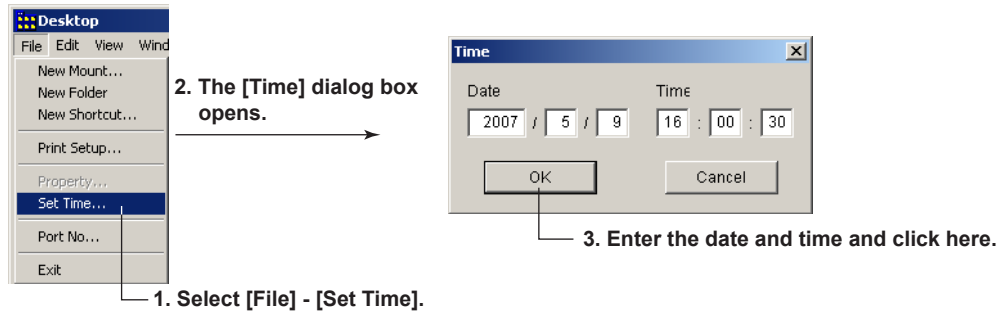
2.7 Confirming the Port Number Setting the Time on the DX/MV/CX



Note

The above dialog box can be used to change the port number. However, please consult your network administrator when changing the port number.

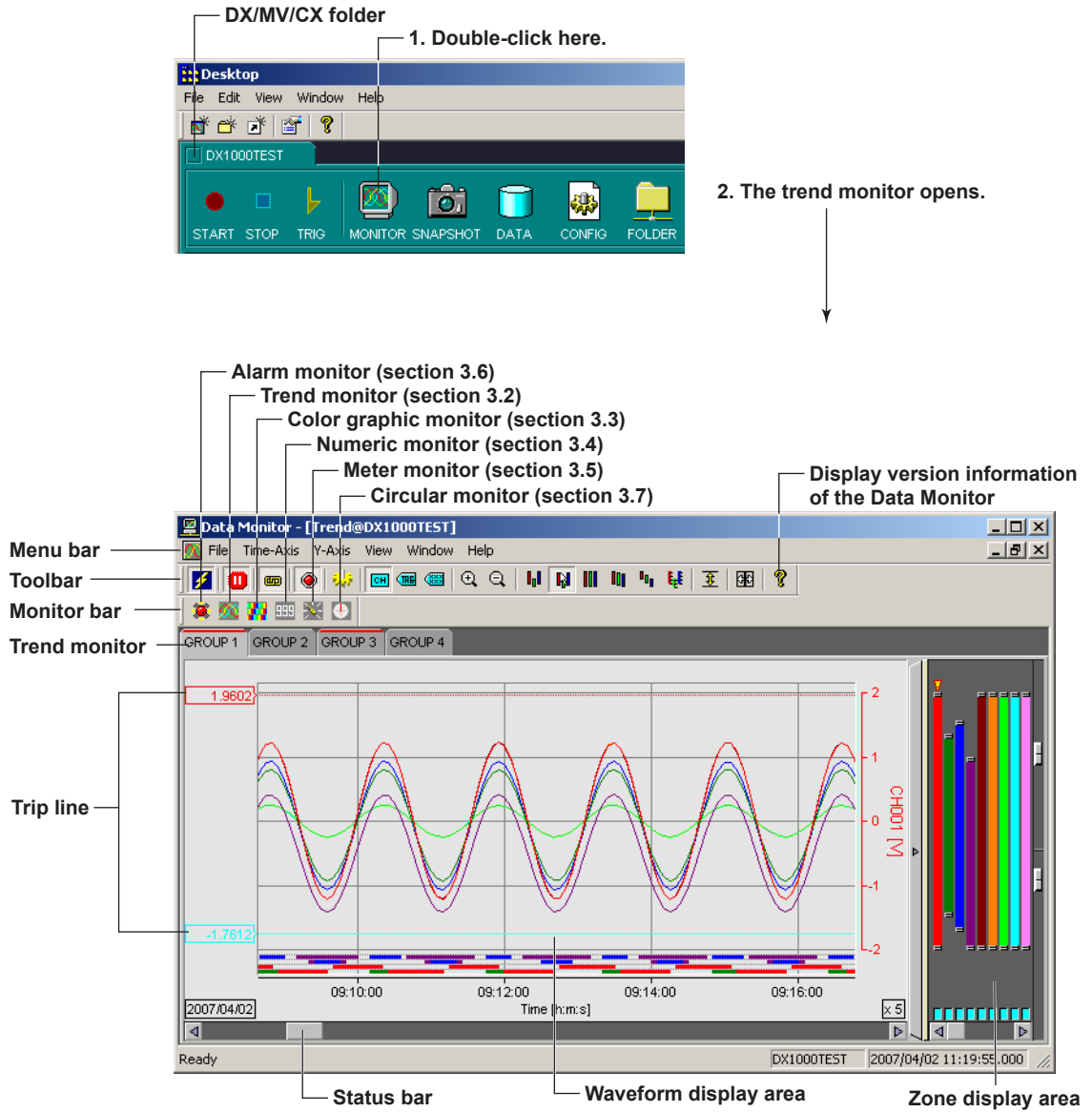
Setting the Time on the DX/MV/CX



Sets the date and time of all mounted RECORDERS at once.

3.1 Starting the Data Monitor

Starting the Data Monitor (From the DX/MV/CX Folder)



The Data Monitor can be used to monitor the measured/computed data and the alarms of the RECORDER. The following six monitoring methods are available:

- Alarm monitor
- Trend monitor
- Color graph monitor
- Numeric monitor
- Meter monitor
- Circular monitor

3.1 Starting the Data Monitor

Toolbar, monitor bar, and status bar

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

Note

- You cannot launch the Data Monitor using the MONITOR icon, if the Data Monitor is already running.
 - You can monitor the data on the Data Monitor, even if the data acquisition to the internal memory of the DX/MV/CX is stopped.
 - The trend screen is initially displayed when the Data Monitor is started.
 - The DX/MV/CX folder is displayed by double-clicking the DX/MV/CX icon on the DAQ Desktop.
 - If the connection conditions are saved by selecting [File] - [Save], they will be restored the next time the Data Monitor is opened.
-

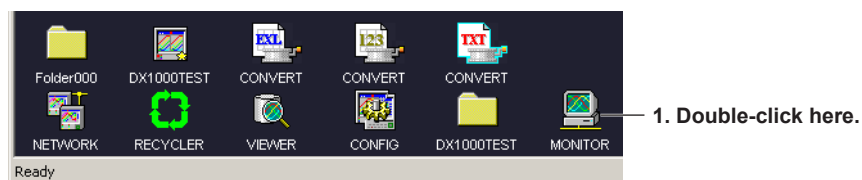
Displaying Groups

If the recorder's Batch or Multibatch function is turned ON, the data monitor's initial display group will start from batch group 1, and up to 50 groups will be assigned in order from the display groups in that batch group whose displays are turned ON. The displayed group name is the one specified on the recorder.

Time Display When Using the DST Function

When displaying data on this software's Data Monitor or Data Viewer, the data time on the recorder varies depending on the recorder's DST setting and the PC's time zone setting. If the recorder is set for DST, when recorder data is loaded on the PC, the time of the data reverts to the time before the DST adjustment and is then adjusted according to the PC time zone setting. The resulting time is displayed in the Data Viewer or Data Monitor. To unify the times on the recorder and the Data Viewer/Data Monitor, match the DST setting (in the Basic Settings) on the recorder with the PC's time zone setting.

Starting the Data Monitor (From the Desktop)

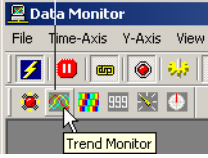


For the operations that follow, see section 3.8, "Connecting Communications between the Data Monitor and the DAQ Desktop."

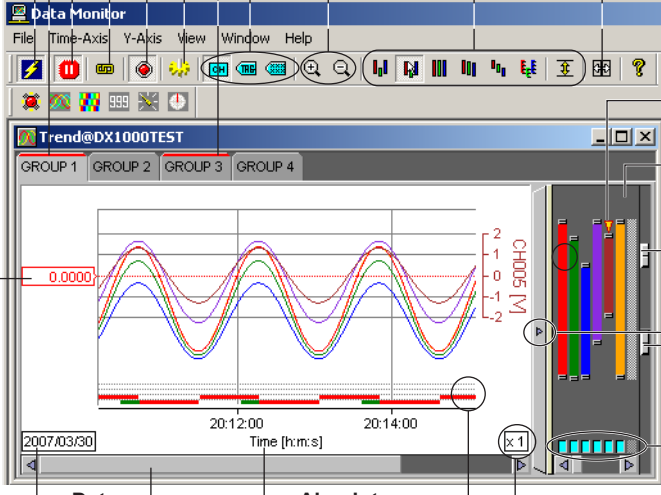
3.2 Displaying the Trend

Displaying the Trend

1. Click here ([Window] - [Trend Monitor]).



2. The trend monitor opens.



Connect/Disconnect the monitor (section 3.8, 3.10)
 Select the displayed group
 Pause the monitor (section 3.9)
 Turn ON/OFF the link (section 3.9)
 Turn ON/OFF the alarm display
 Set general display settings
 The red bar blinks when an alarm occurs
 Characters used to identify channels
 Zoom in or zoom out of the time axis
 Set the Y-axis
 Display the cursor's value

Mark the active waveform
 Zone display area
 Grid brightness adjustment knob
 Show/Hide zone display area
 Brightness adjustment knob of the waveform display area
 Turn ON/OFF waveform display

Date
 Trip line
 Absolute or relative time
 Zoom factor
 Alarm display
 Move the waveform display position (scroll bar)

Select the displayed group

Select the group for which the trend is to be displayed from the groups specified in [General Display Settings]. The registration of channels to groups is done at [General Display Settings] - [Channel No.].

General Display Settings

1. Click here ([Window] - [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
See section 3.5, "Displaying the Meter."

Enter the display range

Enter the display position

Show/Hide the trip line

Enter the trip line

Display color

No.	Channel No.	Y-Axis	Form.	Meter Type	Scale		Zone		Trip 1	Trip 2	Color
					Min	Max	Min	Max			
W01	CH001	Linear			-2.0000E0	2.0000E0	0	100	1.7037E0	-1.7612E0	Red
W02	CH002	Linear			-2.0000E0	2.0000E0	13	84	0.0000E0	0.0000E0	Green
W03	CH003	Linear			-2.0000E0	2.0000E0	7	89	0.0000E0	0.0000E0	Blue
W04	CH004	Linear			-2.0000	2.0000	0	75	0.0000	0.0000	Purple
W05	CH005	Linear			-2.0000	2.0000	0	100	0.0000	0.0000	Orange
W06	CH006	Linear			-2.0000	2.0000	0	100	0.0000	0.0000	Yellow
W07	CH007	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	Cyan
W08	CH008	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	Magenta
W09	CH009	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	White
W10	CH010	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	Black
W11	CH011	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	Grey
W12	CH012	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	White
W13	<None>	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	White
W14	<None>	Linear			-10.0000	10.0000	0	100	0.0000	0.0000	White

OK Cancel Apply Copy Setting... Copy Paste

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

Initialize

Activate the settings

Set the selected range at once

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

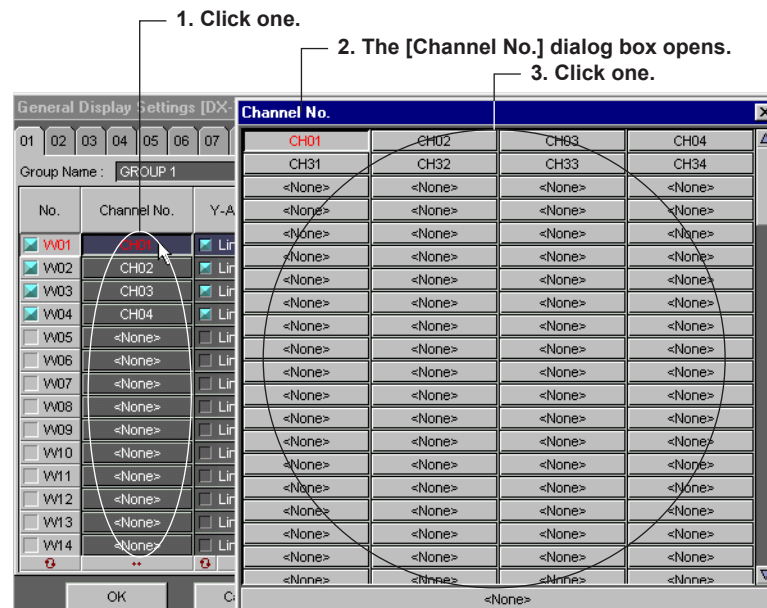
A maximum of 50 groups can be set. A maximum of 32 channels can be registered in one group.

You can change the group name. Up to 16 alphanumeric characters can be entered.

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



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 3-7, 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 -10^{16} to 10^{16} , excluding the decimal point.

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 3-7), the trip lines of all displayed waveforms that are checked are displayed.

When the monitor is paused (section 3.9), you can change the position of the trip line by dragging it.

3.2 Displaying the Trend

Display color

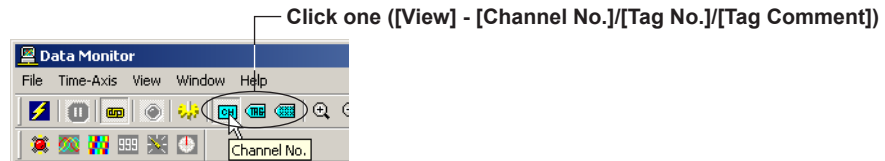
You can select the color of each waveform. To create custom colors, click the [Define Custom Colors] button in the [Color] dialog box.

Copy/Paste

The parameters that are checked in the [Copy Setting] dialog box, that opens when the [Copy Setting] button is clicked, are copied.

When the [Copy] button is clicked, the settings of the waveform corresponding to the waveform No. that was activated (displayed in red) are copied. When the [Paste] button is clicked, the settings are copied to the waveform corresponding to the waveform No. that was activated.

Selecting the Characters Used to Identify Channels



Select the character string used to identify the channel from channel No., tag No., and tag comment. The selected character string will be used as a label to indicate the waveform name.

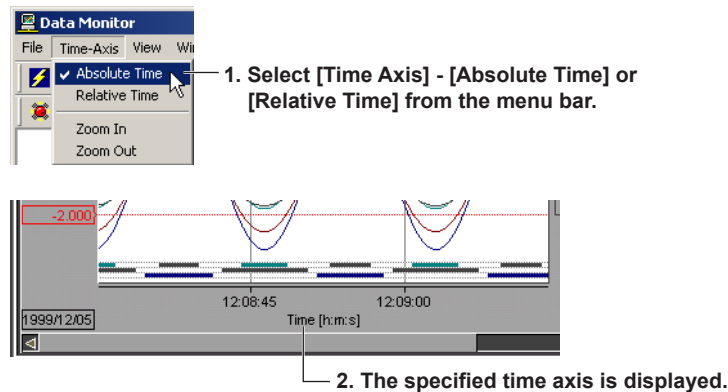
The string can be registered on the RECORDER directly or by using the Configurator. If [Tag No.] is selected the first sixteen characters of the registered character string are used. If [Tag Comment] is selected all the characters are used.

Note

When the identification string is switched, the channel character string displayed on each monitor, [Cursor Value] window, and [General Display Setting] window will change accordingly.

Setting the Time Axis

Selecting absolute or relative time display



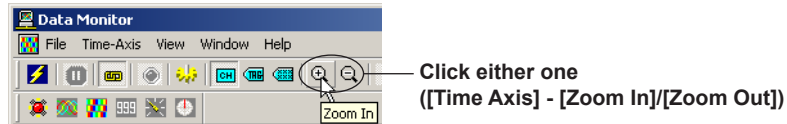
Absolute Time: Displays the time.

Relative Time: Displays the relative time from the first data point.

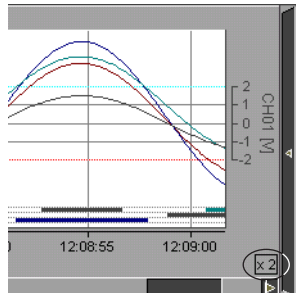
Note

The time information display of the cursor's value display is set to the specified setting (absolute or relative).

Zooming in or zooming out of the time axis

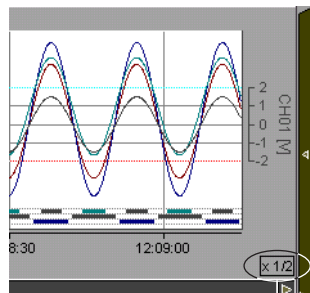


• Zoom In Example



Expanded by 2

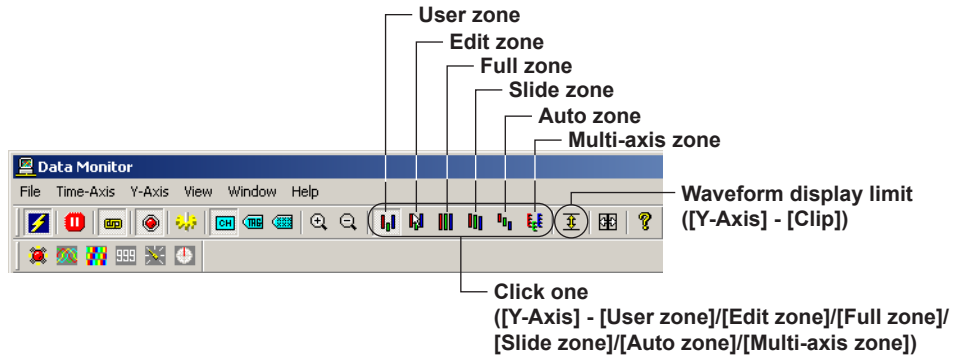
• Zoom Out Example



Reduced to 1/2

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.

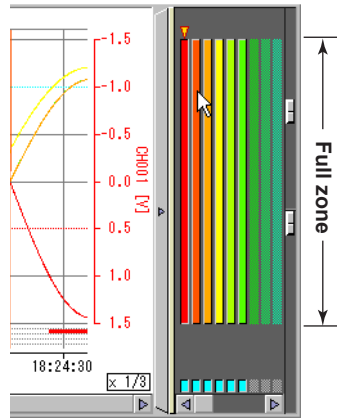
Note

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.

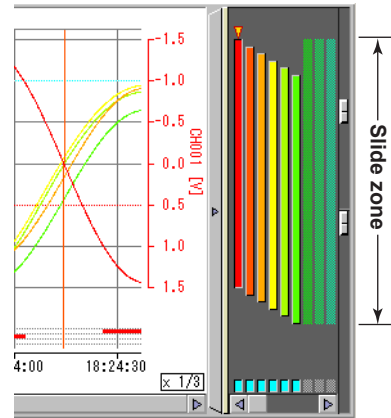
3.2 Displaying the Trend

Examples of the Various Zone Settings

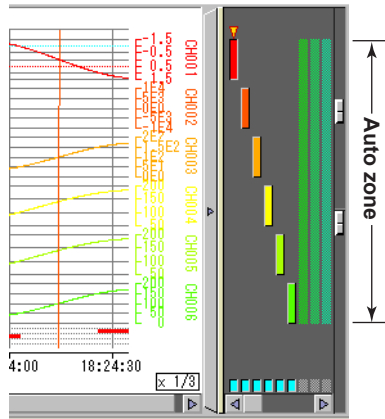
- Full zone



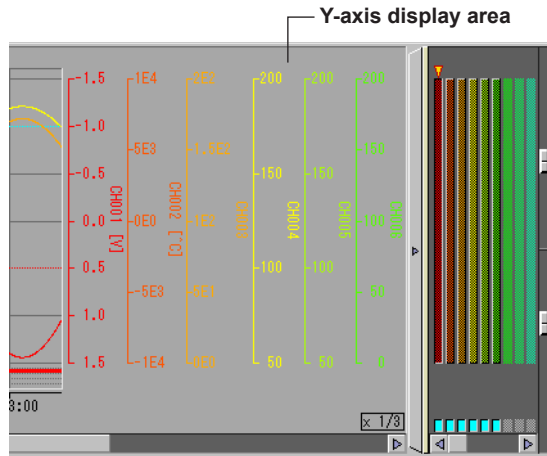
- Slide zone



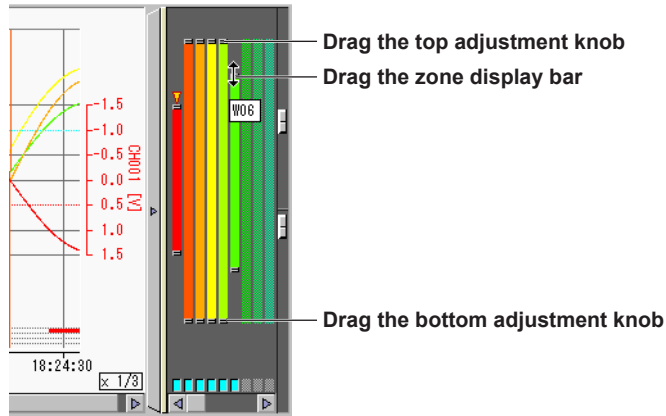
- Auto zone



- Multi-axis zone



Editing zones

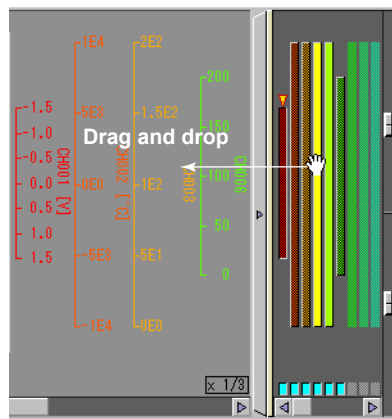


You can change the waveform display zone on the trend display screen by clicking the edit zone icon or by selecting [Y-Axis] - [Edit Zone].
 The size of the zone can be changed by dragging the top and bottom adjustment knobs.
 The entire zone can be moved by dragging the zone display bar.
 The zones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

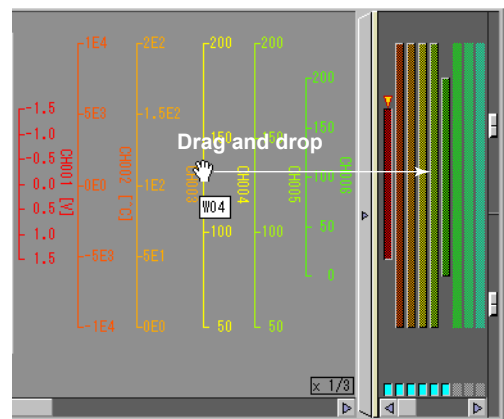
Displaying multiple Y-axis

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.
 The Y-axis can only be added or deleted by dragging or dropping when the monitor is paused.

• Adding a Y-axis



• Deleting a Y-axis



3.2 Displaying the Trend

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

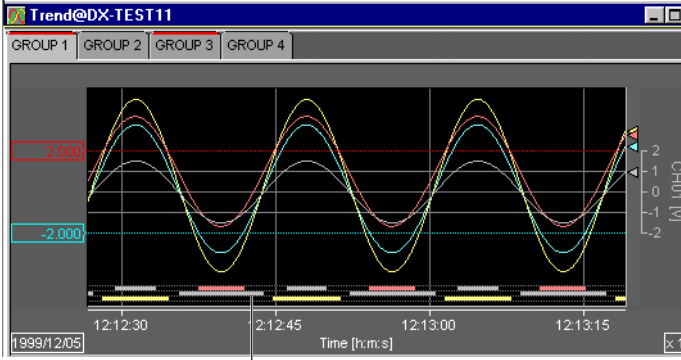



- Example in which Display Limit is Disabled



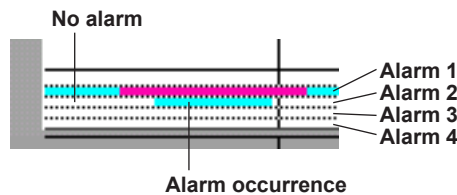
Turning ON/OFF the Alarm Display

1. Click here ([View] - [Alarm]).



2. The alarm is displayed.

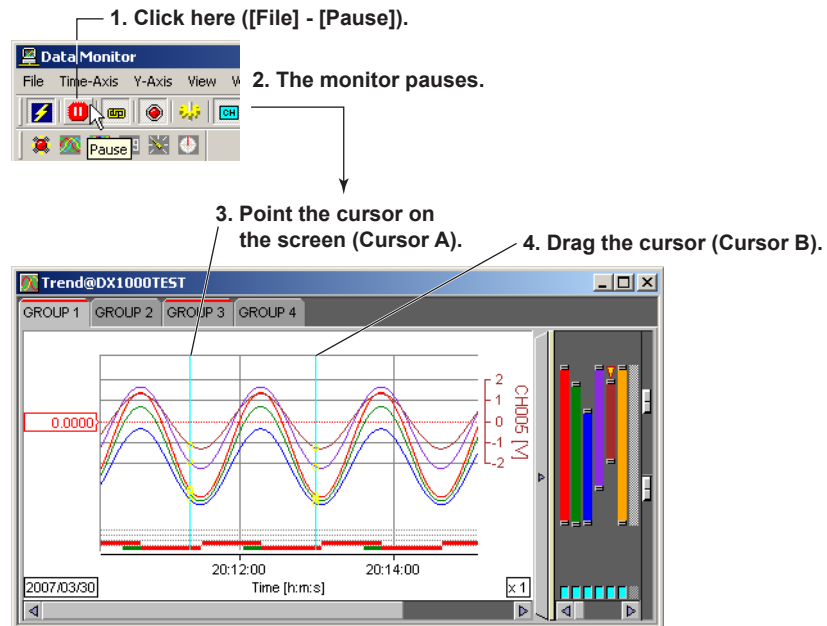
Alarm display



The alarm of the active waveform is displayed in front.

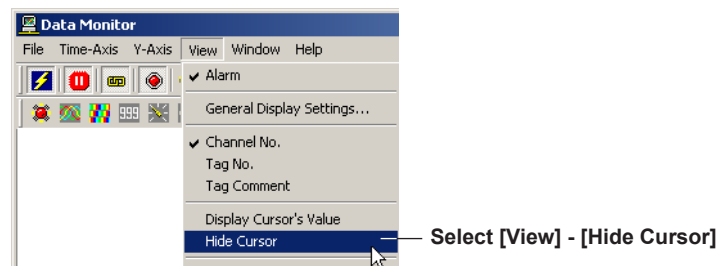
Showing/Hiding Cursors

Showing the cursor

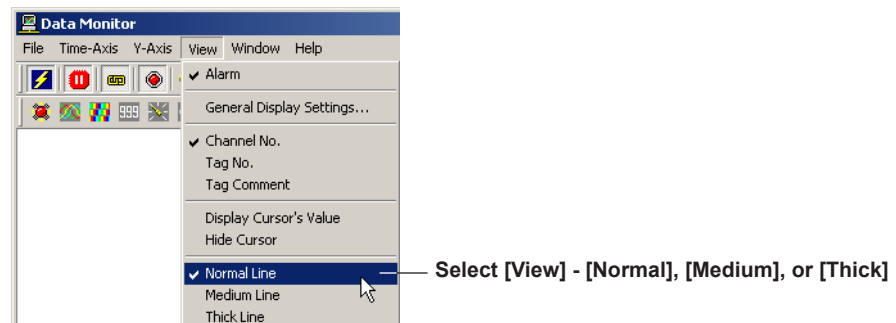


When the mouse is pointed on the screen, Cursor A and Cursor B are overlapped. Cursors can be displayed only when the monitor is paused. Pause the monitor before pointing the cursor on the trend screen.

Hiding the cursor

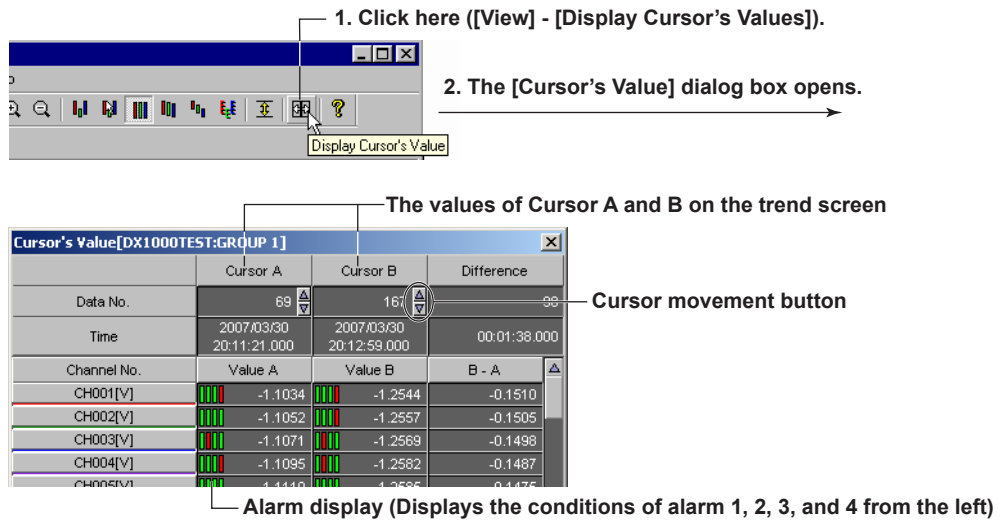


Selecting the Line Type of the Waveform (Normal/Medium/Thick)



You can select the thickness of the line of the displayed waveform from Normal, Medium, and Thick.

Displaying Cursor's Values



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. If the alarm is not set, the indicator is black.

Displaying numeric values of abnormal data

The abnormal data are displayed as follows:

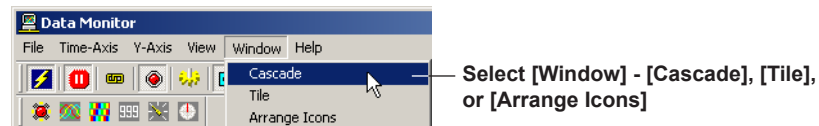
- +OVER: Measured/computed data are over the positive limit
- OVER: Measured/computed data are under the negative limit
- LACK: Computation error or data dropout

Note

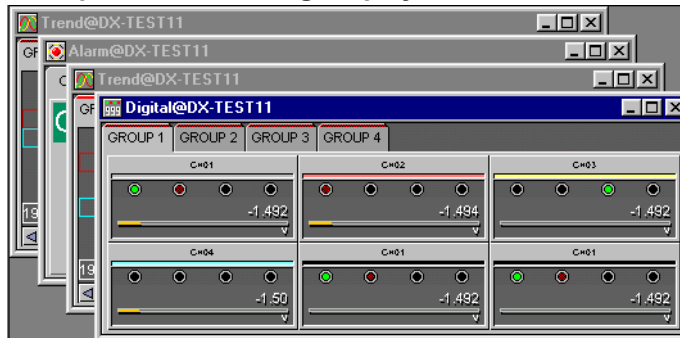
When a cursor is not displayed on the trend screen, the cursor's value display area becomes blank.

Setting the Window

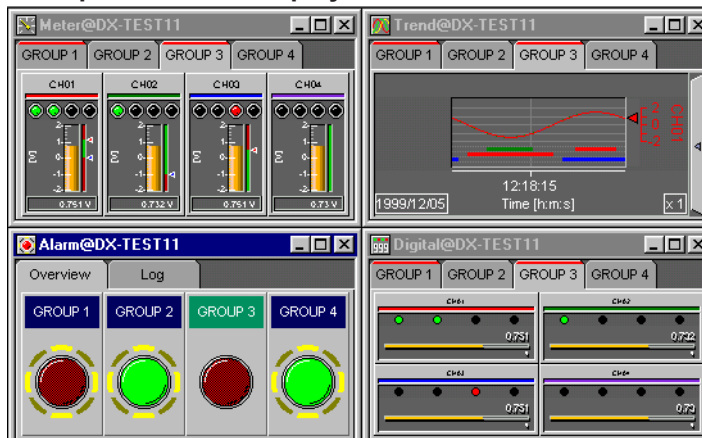
Cascade/Tile/Arrange Icons



- Example of a Cascading Display



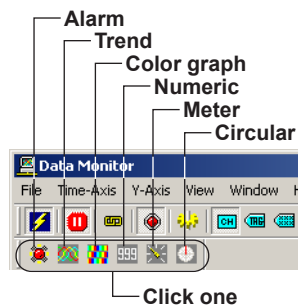
- Example of a Tiled Display



- Example of Arranged icons



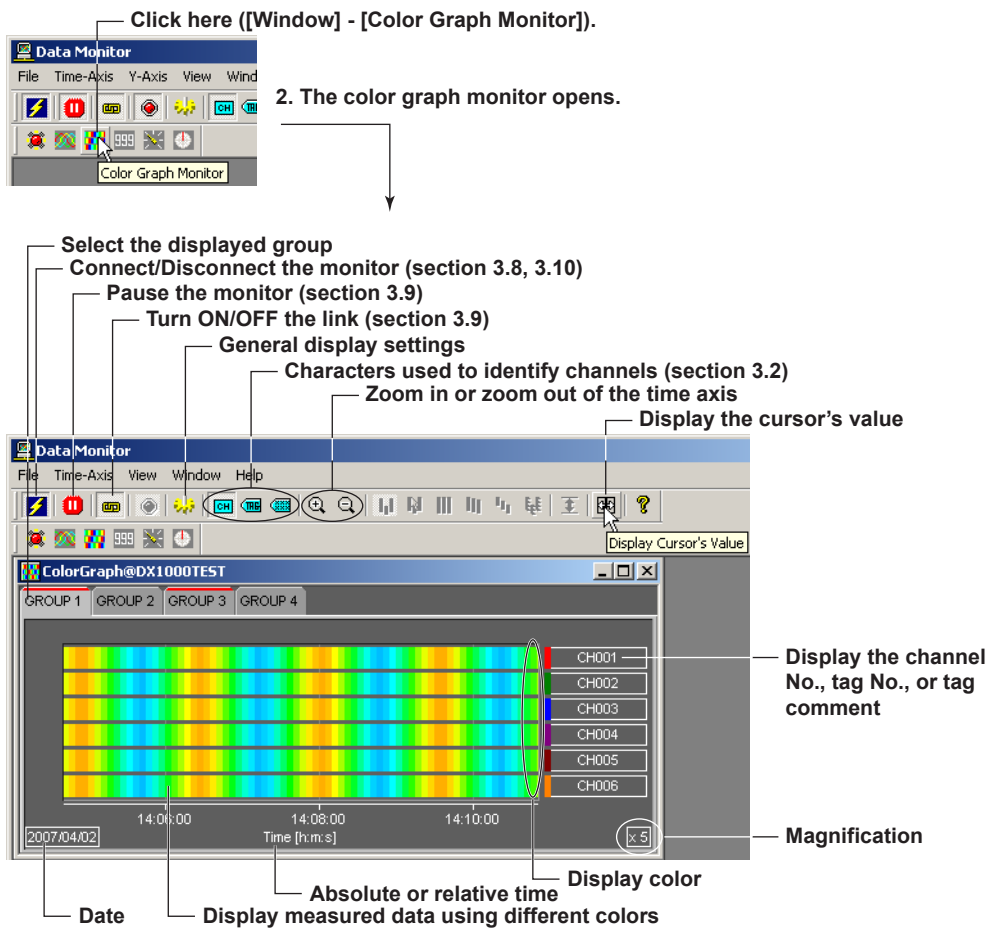
Displaying a new trend monitor, color graph monitor, numeric monitor, meter monitor or circular monitor



A new monitor opens every time the icon is clicked. This is useful when you wish to view multiple groups simultaneously.

3.3 Displaying the Color Graph

Displaying the Color Graph



General Display Settings

The parameters in the [General Display Settings] dialog box related to the color graph display are as follows:

- Turn ON/OFF waveform display: The color graph of the waveform that has channels registered and is turned ON is displayed.
- Registering the channel: The measured or computed data of the registered channel can be displayed.
- Setting the displayed range: By assigning 50 different colors from the minimum to the maximum values of the scale, the measured values are displayed using those colors. The measured data are colored in the following order: blue (minimum value), light blue, green, yellow, and red (maximum value).
- Display color

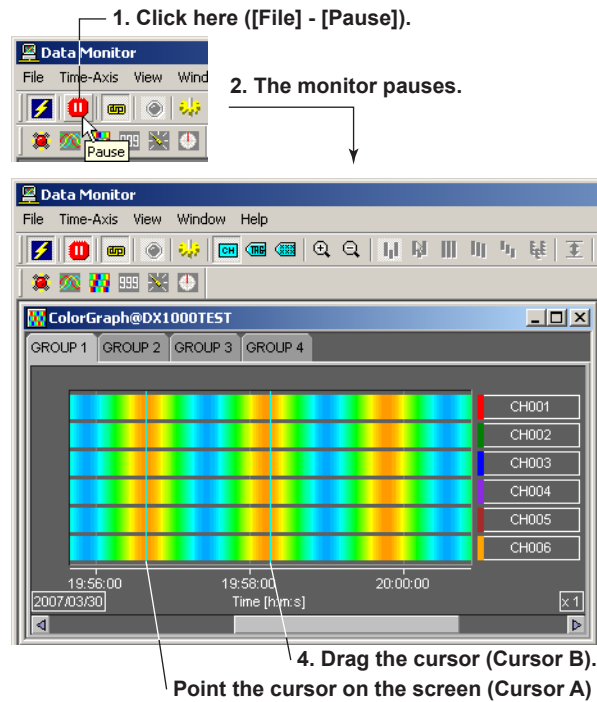
For details related to the setting procedures, see "General Display Settings" in section 3.2, "Displaying the Trend."

Setting the Time Axis and Cursor Display

Selecting absolute or relative time display, zooming in or out of the time axis, displaying cursor's values

For details, see "Setting the time axis" and "Displaying Cursor's Values" in section 3.2, "Displaying the Trend."

Showing the cursor



Cursors can be displayed only when the monitor is paused. Pause the monitor before pointing the cursor on the screen.

Hiding the cursor

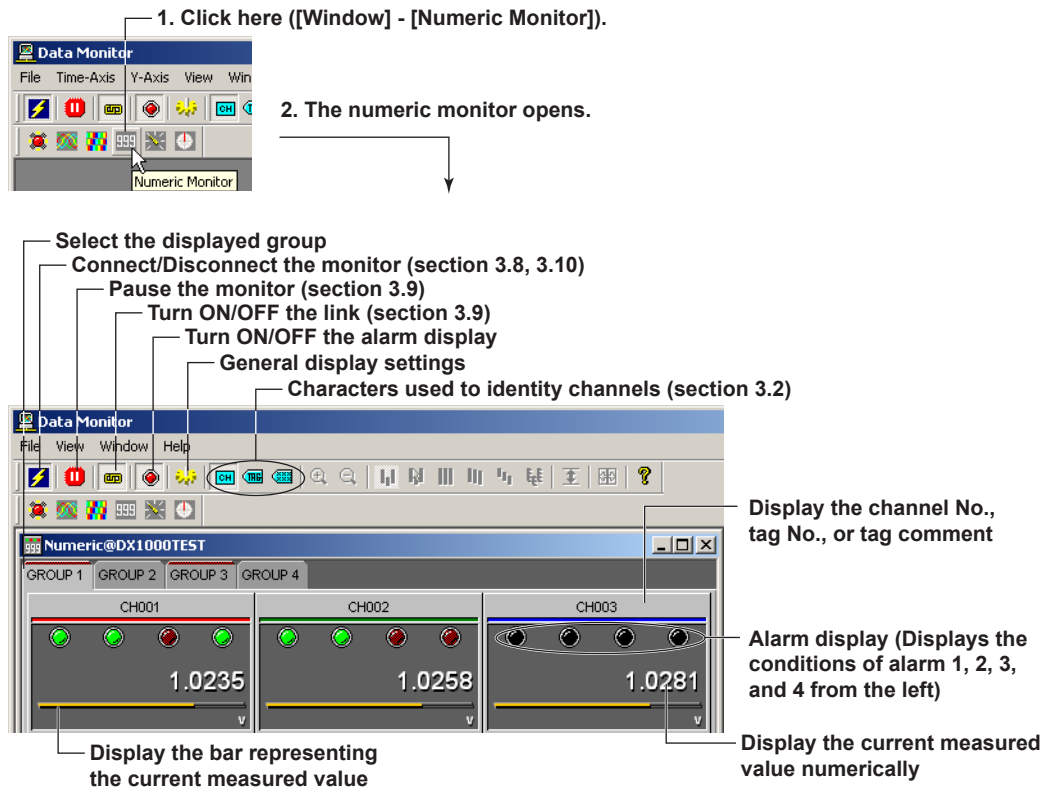
For details, see "Hiding the Cursor" in section 3.2, "Displaying the Trend."

Setting the Window

For details, see "Setting the Window" in section 3.2, "Displaying the Trend."

3.4 Displaying Numeric Values

Displaying Numeric Values



General Display Settings

The parameters in the [General Display Settings] dialog box related to the numeric display are as follows:

- Turn ON/OFF waveform display
- Registering the channel
- Setting the displayed range: The bar representing the current measured value is displayed by normalizing it to the minimum and maximum values of the scale.

For details related to the setting procedures, see “General Display Settings” in section 3.2, “Displaying the Trend.”

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. If the alarm is not set, the indicator is black.

Setting the Window

For details, see “Setting the Window” in section 3.2, “Displaying the Trend.”

Note

For the numeric display of abnormal data, see page 3-12.

3.5 Displaying the Meter

Displaying the Meter

1. Click here ([Window] - [Meter Monitor]).

2. The meter monitor opens.

Connect/Disconnect the monitor (section 3.8, 3.10)
 Select the displayed group
 Pause the monitor (section 3.9)
 Turn ON/OFF the link (section 3.9)
 Turn ON/OFF the alarm display
 General display settings
 Characters used to identify channels (section 3.2)

Display the channel No., tag No., or tag comment

Bar meter

Analog meter

Thermometer

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

Display the current measured value numerically

Display the meter representing the current measured value

The screenshot shows the 'Data Monitor' application window. The 'Meter Monitor' sub-window is active, displaying four channels: CH001, CH002, CH003, and CH004. Each channel has a set of four colored indicator lights (green, red, yellow, black) at the top. Below the lights are different types of meters: CH001 has a bar meter, CH002 has an analog meter, CH003 has a thermometer, and CH004 has a bar meter. Numerical values are displayed at the bottom of each channel: -0.8025 V, -0.7895 V, -0.7965 V, and -0.7937 V respectively. The interface includes a menu bar (File, View, Window, Help) and a toolbar with various control icons.

Note

For the numeric display of abnormal data, see page 3-12.

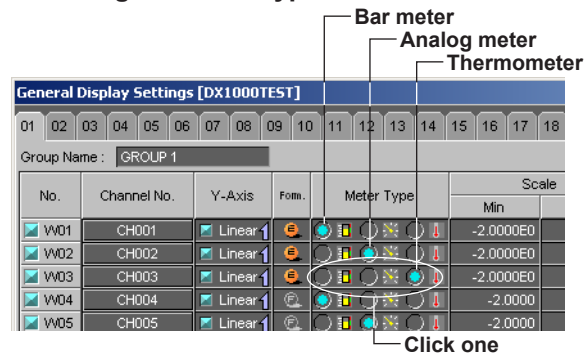
General Display Settings

The parameters in the [General Display Settings] dialog box related to the meter display are as follows:

- Turn ON/OFF waveform display
- Registering the channel
- Meter type: Select the meter from bar meter, analog meter, and thermometer.
- Setting the displayed range: The minimum and maximum values of the scale become the lower and upper limits of the meter scale.

For details related to the setting procedures, see “General Display Settings” in section 3.2, “Displaying the Trend.”

Selecting the meter type



Turn ON/OFF the Alarm Display

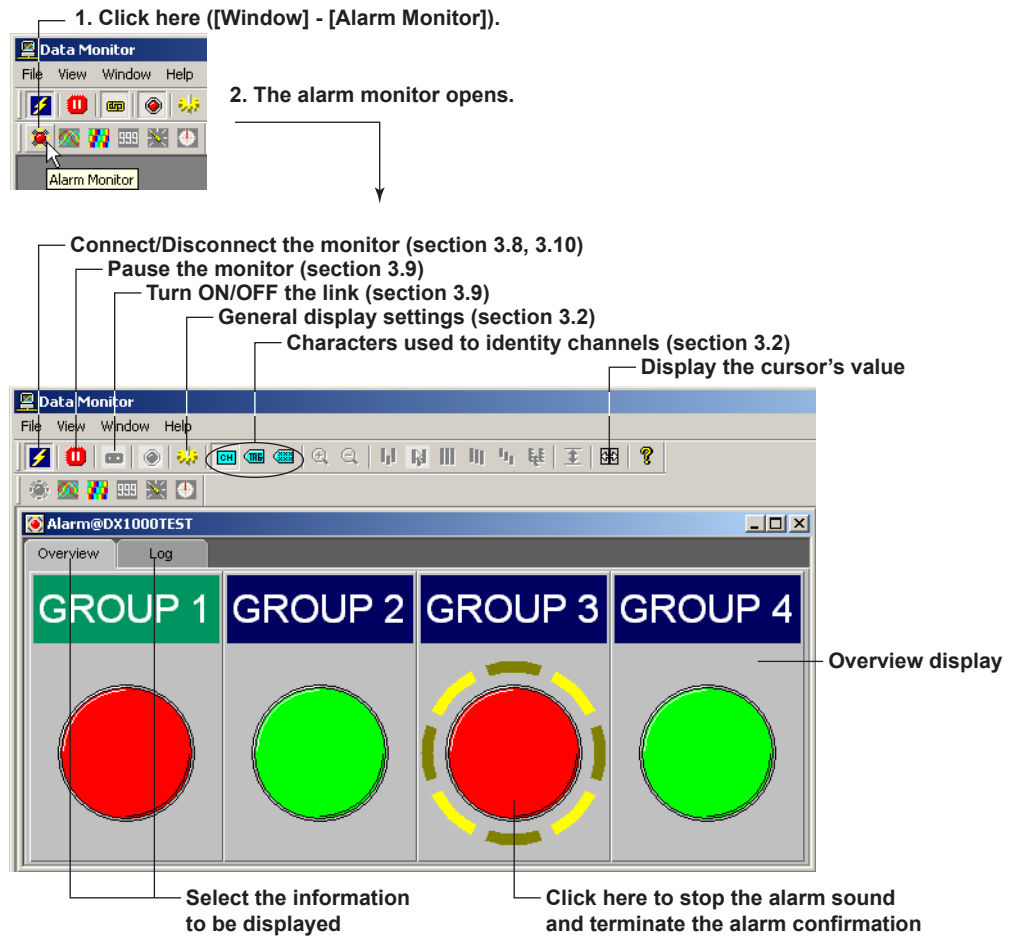
For details, see section 3.4, “Displaying Numeric Values.”

Setting the Window

For details, see “Setting the Window” in section 3.2, “Displaying the Trend.”

3.6 Displaying Alarms

Displaying Alarms



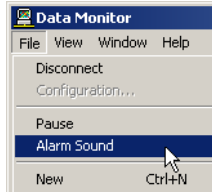
General Display Settings

The parameters in the [General Display Settings] dialog box related to the alarm display are as follows:

- Turn ON/OFF waveform display
- Registering the channel
- Group Name

For details related to the setting procedures, see “General Display Settings” in section 3.2, “Displaying the Trend.”

Turn ON/OFF the Alarm Sound

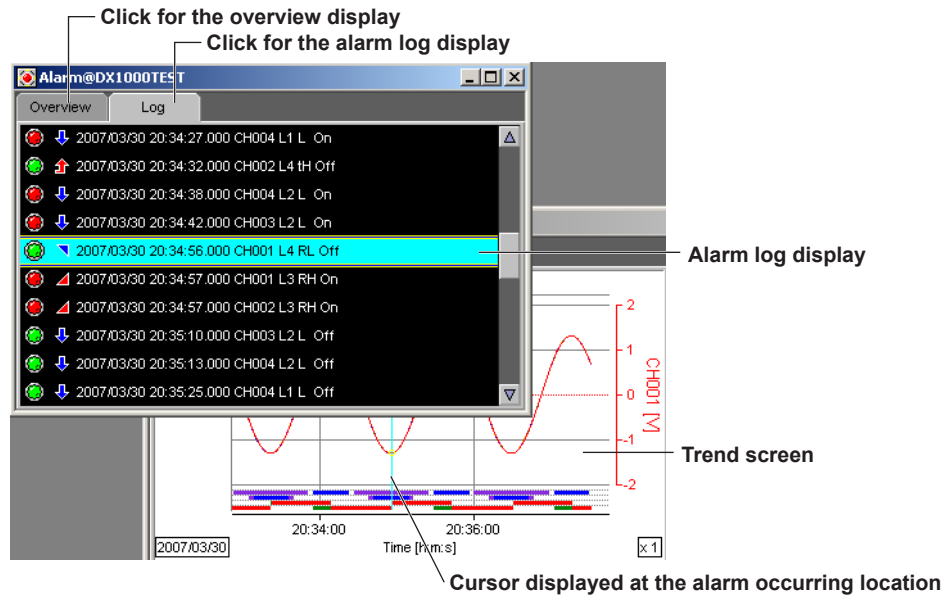


An alarm sound can be generated when an alarm occurs. To stop the alarm sound, confirm all alarms by clicking all groups in which alarms are occurring or select [View] - [Alarm Hold Reset].

Note

- Only one alarm monitor can be displayed for one connection. If you displayed multiple alarm monitors, select [File] - [Connect] to reconnect to the host. For details related to the connection, see section 3.8.
- To use the alarm sound, a sound source (sound card) must be installed on the PC.

Selecting the Information to be Displayed



Overview and log

The following two types of alarm displays are available:

- **Overview**
 The following four types of lamps are used to display the alarm conditions within the group:
 - Green lamp: No alarms are occurring.
 - Red lamp: An alarm is occurring.
 - Green lamp and blinking ring: No alarms are occurring, but there are alarms that have occurred in the past that have not been confirmed.
 - Red lamp and blinking ring: An alarm is occurring. In addition, there are alarms that have occurred in the past that have not been confirmed.












Note

By displaying the overview and clicking the group in which the alarm is occurring, the alarm can be confirmed. You can also confirm alarms by selecting [View] - [Alarm Hold Reset]. The blinking ring disappears when a confirmation is made.

- **Alarm log**

Displays a list of the type, the time of occurrence and release, and the channel of the alarms that occurred in the past. A maximum of 100 alarm logs can be displayed.

The symbols used in the alarm log are as follows:

	: Upper limit alarm
	: Lower limit alarm
	: Delay upper limit alarm
	: Delay lower limit alarm
	: Difference upper limit alarm (red)
	: Difference lower limit alarm (blue)
	: Upper limit on rate-of-change alarm
	: Lower limit on rate-of-change alarm
	: Deviation upper & lower limit
	: Deviation within upper & lower limits
	: Others

The following operations are possible on the alarm log display when the monitor is paused.

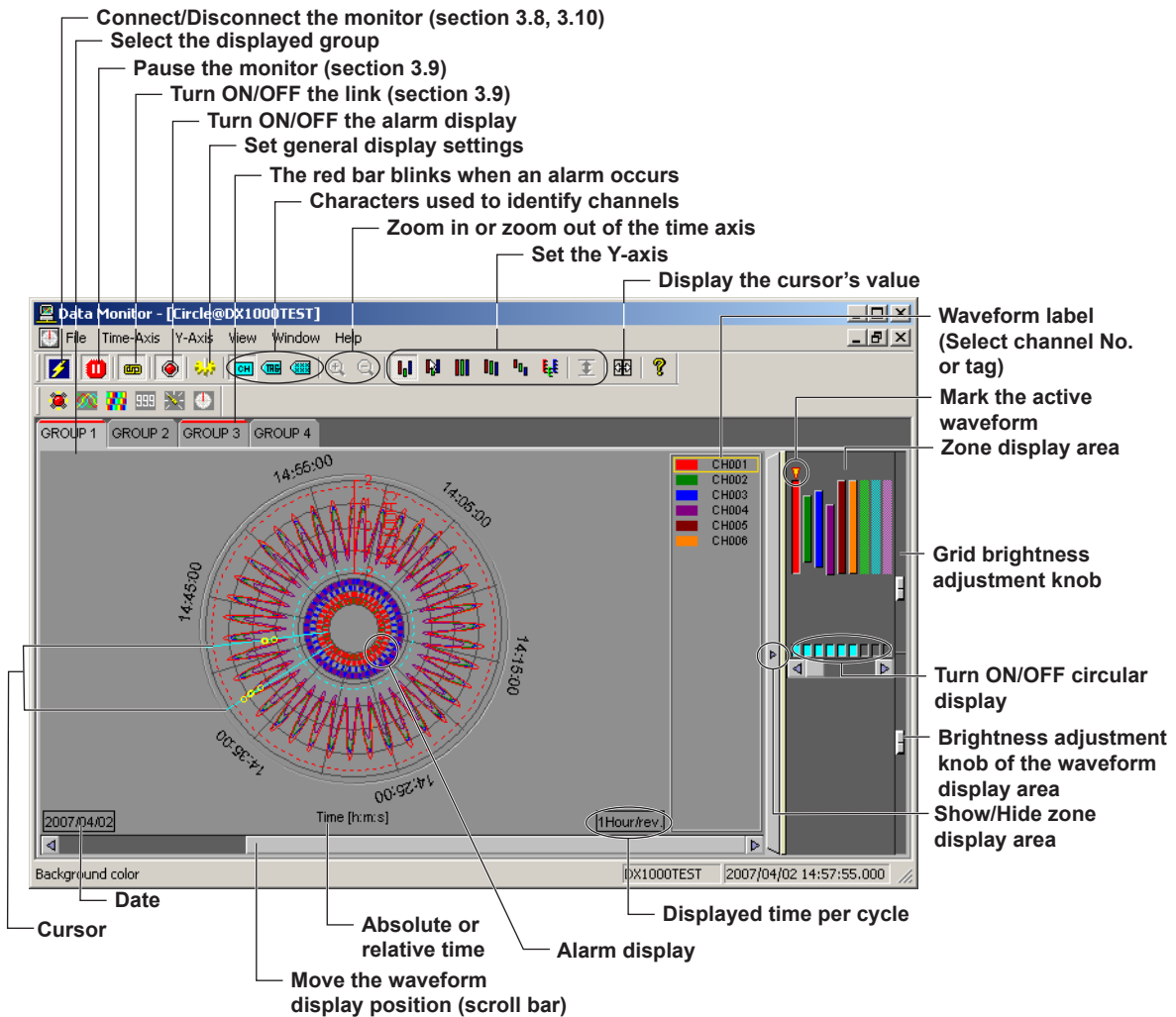
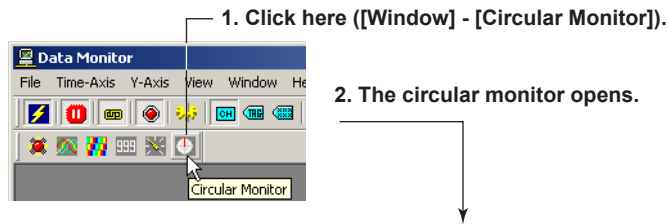
- If an item is clicked, the cursor on the trend screen or the color graph screen will move to the corresponding time.
- Scroll the displayed items

Displaying Cursor's Values and Setting the Window

For details, see “Displaying Cursor's Values” and “Setting the Window” in section 3.2, “Displaying the Trend.”

3.7 Circular Display

Circular Display



General Display Settings

The parameters in the [General Display Settings] dialog box that are different between the circular display and the trend display (section 3.2) are as follows:

Trip line

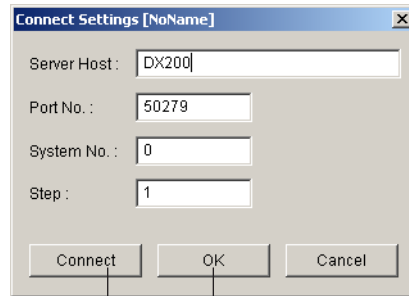
The trip lines on the circular screen cannot be dragged and dropped.

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

3.8 Connecting Communications between the Data Monitor and the DAQ Desktop

Connecting Communications

1. Select [File] - [New] from the menu bar. A trend monitor screen without data is displayed.
2. Select [File] - [Connect] or [Configuration] from the menu bar. The [Connect] dialog box opens.



3. Enter search conditions.

4. Click either one.

Connection Conditions

Specify the following four items of the DAQ Desktop you wish to connect: Up to 16 DAQ Desktops can be connected. The maximum number of connections is 16.

- Host Name: The host name or IP address of the PC that is running the DAQ Desktop that is to be connected.
- Port No.: The port number to be used. The default value is 50279 (The number can be confirmed using Port No. as described in section 2.7).
- System No.: The number assigned by the DAQ Desktop to the mounted RECORDER. (The number can be confirmed using Property - System No. as described in section 2.6.)
- Step: Set the step value used to acquire data points from the host. For example, a value of 1 will result in every data point being acquired, a value of 2 will acquire every other data point, a value of 3 acquires every third data point, and so on. The default value is 1.

If the connection conditions are already specified, selecting [File] - [Connect] will connect the communications between the Data Monitor and the DAQ Desktop.

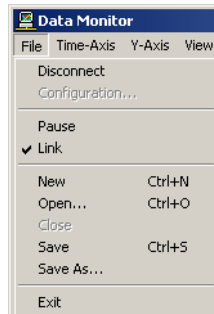
Connecting

Clicking the [Connect] button connects the communications between the Data Monitor and the DAQ Desktop. Clicking the [OK] button activates the specified information and closes the dialog box (not connected, yet). Clicking the [Cancel] button discards the specified information and closes the dialog box.

Note

- If the Data Viewer is launched by double-clicking the MONITOR icon of the DX/MV/CX folder, the communications between the Data Monitor and the DAQ Desktop are automatically connected.
- The port number must match the port number that was specified in the DAQ Desktop.
- Depending on the line condition, the connection may be stopped. In that case, reconnect to the host.
- If you clicked the [OK] button, you can click the [Connect/Disconnect] icon on the toolbar or select [File] - [Connect] to connect to the DAQ Desktop.

Saving the Connection Conditions



Select [File] - [Save As] or [Save]. The [Save As] dialog box opens. Specify the file name and the destination directory and click the [Save] button.

Note

- If the data monitor is started (connected) by double-clicking the MONITOR icon in the DX/MV/CX folder and you select [File] - [Save], the [Save As] dialog box does not appear and the file is saved to the following location:
DAQEXPLORER-desktops-DAQStation folder - DX/MV/CX icon name
The file extension is [rmt].
In addition, at the time of reconnection, the conditions saved using [File] - [Save] (such as the type of displayed monitor and cascaded windows) are used to start the data monitor.

Connecting Using the Preexisting Connection Conditions

The following methods can be used to connect to the DAQ Desktop:

- Communication that is deactivated is resumed by clicking the connect icon on the toolbar or selecting [File] - [Connect].
- Select [File] - [Open] and specify the file in the [Open] dialog box to connect.

3.9 Pausing the Monitor and Turning ON/OFF the Link

Pausing the Monitor



The display data are continuously acquired even when the monitor is paused. Thus, when the monitor is restarted, the measured values acquired while the monitor was paused are also displayed.

The monitors that pause are those on the same connection as the active window.

Turn ON/OFF the Link



You can specify whether or not to link the group display operation of the data monitor (trend monitor, color graphics monitor, numeric monitor, meter monitor, and circular monitor) of the same connection.

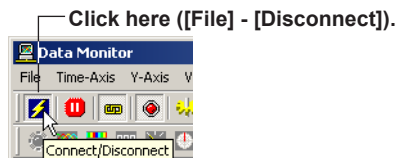
When the link is turned ON and the displayed group is changed in one Data Monitor, the displayed groups in all monitors that have the link turned ON also change.

Note

- As default, all monitor links are turned ON.
- There is no link setting for the alarm monitor, because it displays all groups.

3.10 Stopping Communications between the Data Monitor and DAQ Desktop and Exiting the Data Monitor

Disconnecting from the DAQ Desktop



When you attempt to disconnect, a message, “Communication in progress. Cancel communications?” is displayed. Clicking the [OK] button stops communication with the active data monitor.

The communication is resumed by clicking the connect icon on the toolbar or selecting [File] - [Connect].

Exiting the Data Monitor

After stopping communications, select [File] - [Exit] or click the [x] button to exit the Data Monitor.

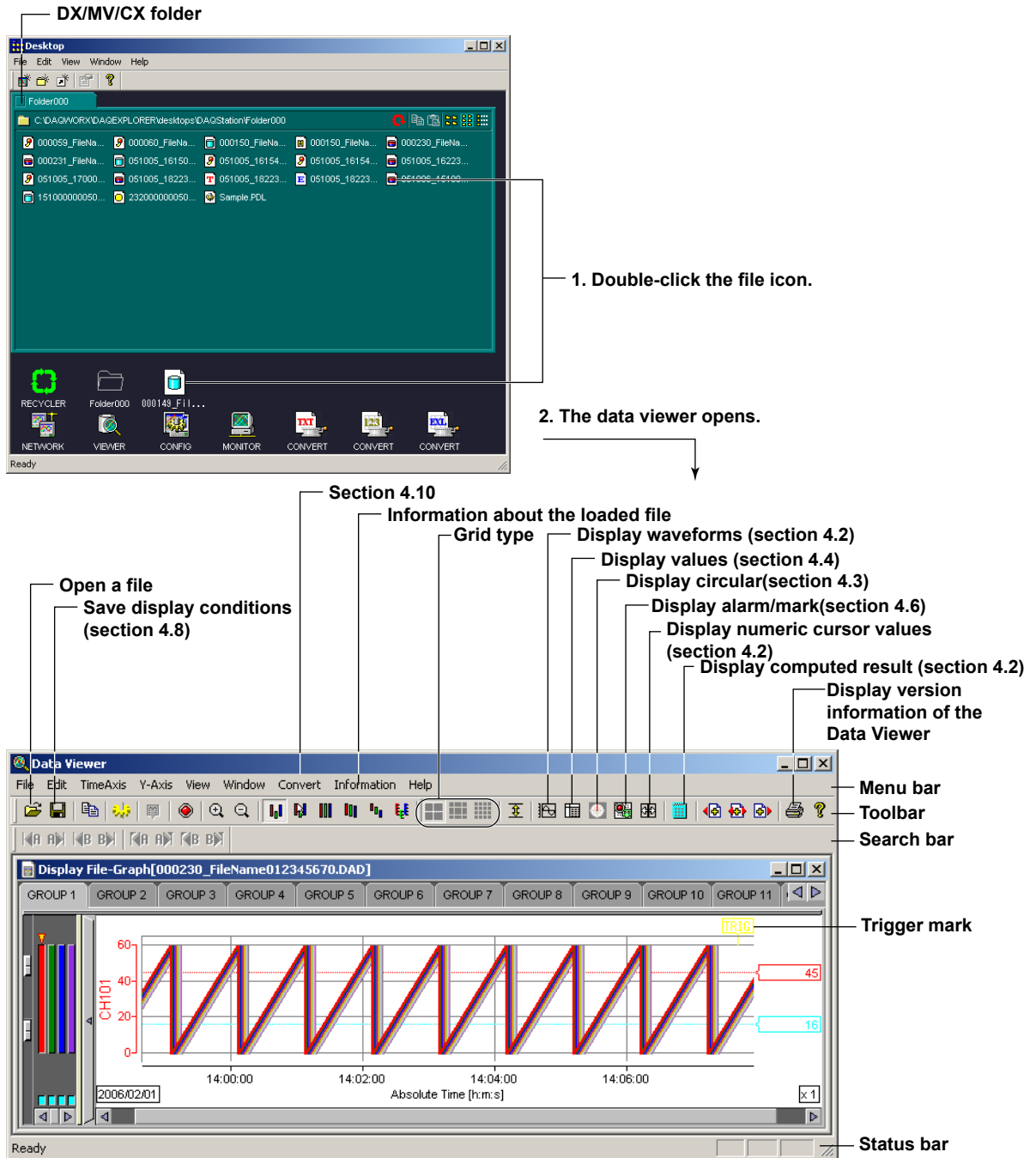
If you attempt to exit while the communication is active, a message, “Communication in progress. Cancel all communications?” is displayed. Clicking the [OK] button stops communication with the active data monitor. Then, carry out the exit operation again.

Note

[File] - [Connect] of the menu bar switches to [File] - [Disconnect] when the connection is activated.

4.1 Starting and Exiting the Data Viewer

Starting the Data Viewer













You can also start the program by selecting [Start] - [Programs] - [YOKOGAWA DAQWORX] - [DAQEXPLORER] - [Viewer]. In addition, you can start the program from the desktop.

Starting with revision R4.07, multiple Data Viewers cannot be started. After setting file associations, you can start the Viewer by double-clicking the file icon. You can also drag the Viewer icon onto a file to start the Viewer.

4.1 Starting and Exiting the Data Viewer

Files that launch the Data Viewer

The Data Viewer starts by opening the following three types of files:

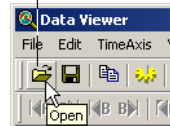
-  : Display data file (*.dds and *.cda (CX), *.DAD (DX1000/DX2000))
-  : Event data file (*.dev and *.cev (CX), *.DAE (DX1000/DX2000))
-  : TLOG file (*.dtg)
-  : Link setting file (*.ldx)
-  : Hourly report file (*.dhr)
-  : Daily report file (*.ddr)
-  : Weekly report file (*.dwr)
-  : Monthly report file (*.dmr)
-  : Report file (*.DAR)
-  : Manual sampling file (*.dmn, *.DAM)

Toolbar, search bar, and status bar

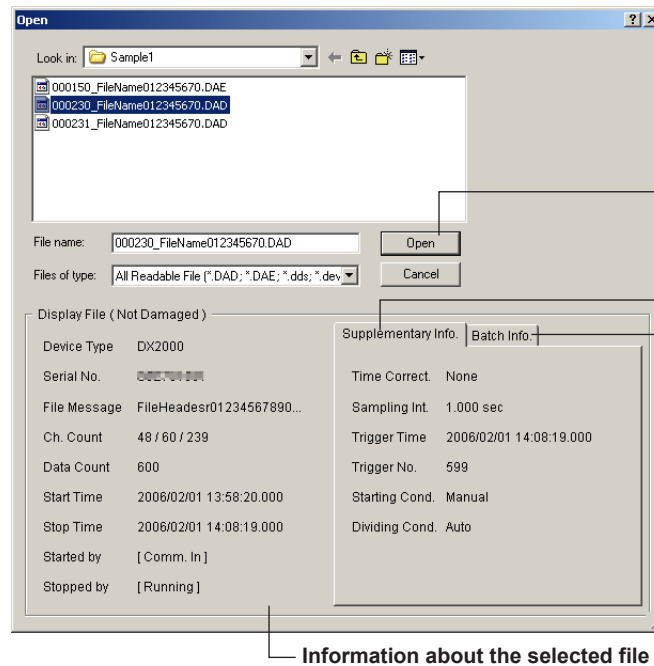
Clicking [View] - [Toolbar], [Search Bar], or [Status Bar] from the menu bar displays the corresponding bar in the window. The bar will disappear if the check is removed.

Opening the File by Specifying its Location

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



2. The [Open] dialog box opens.

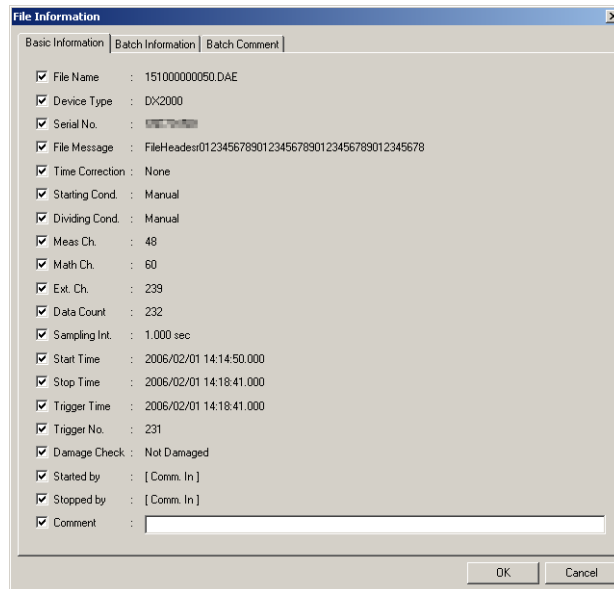
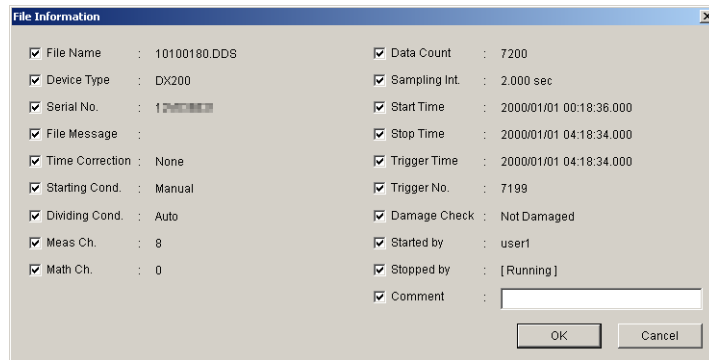


You can open a file by specifying the location. You cannot specify the internal memory or the external storage medium of the RECORDER.

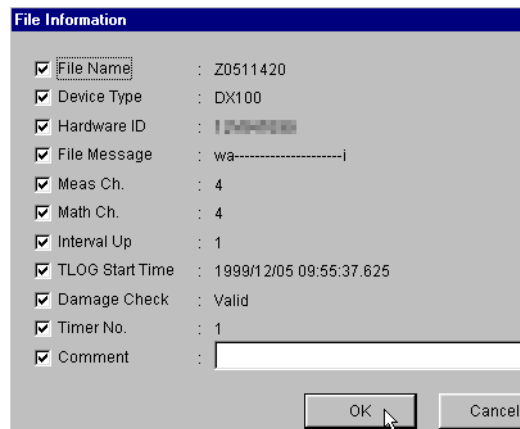
Checking the information about the loaded file

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

- For waveform 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.

Time Display When Using the DST Function

When displaying data on this software's Data Monitor or Data Viewer, the data time on the recorder varies depending on the recorder's DST setting and the PC's time zone setting. If the recorder is set for DST, when recorder data is loaded on the PC, the time of the data reverts to the time before the DST adjustment and is then adjusted according to the PC time zone setting. The resulting time is displayed in the Data Viewer or Data Monitor. To unify the times on the recorder and the Data Viewer/Data Monitor, match the DST setting (in the Basic Settings) on the recorder with the PC's time zone setting.

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

Link previous and next files collectively

Link the next file

Color overview

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

Trip line of the active waveform

Alarm display area

Magnification

Ready

Date

Waveform display area

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

Turn ON/OFF waveform display

Absolute Time [h:m:s]

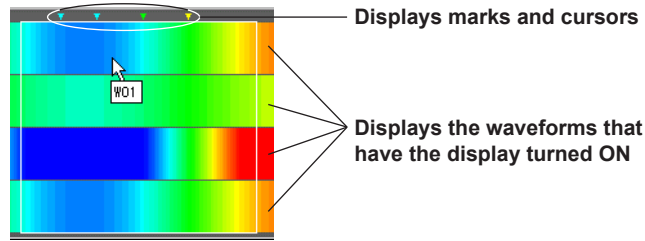
Move the waveform display position (Scroll bar)

Absolute or relative time

The screenshot shows the 'Data Viewer' application window. At the top, there is a menu bar with 'File', 'Edit', 'TimeAxis', 'Y-Axis', 'View', 'Window', 'Convert', 'Information', and 'Help'. Below the menu bar is a toolbar with various icons. The main display area is divided into several sections. On the left, there is a 'GROUP' selection area with two tabs, 'GROUP 1' and 'GROUP 2'. Below this is a 'Waveform label' area with a dropdown menu. The main display area shows a 'Color overview' at the top, which is a heatmap of the waveform data. Below this is a 'Waveform display area' showing a line graph of the waveform. The y-axis is labeled 'CH001 [°C]' and ranges from -100 to 300. The x-axis is labeled 'Absolute Time [h:m:s]' and ranges from 19:20:00 to 19:32:00. There are several annotations pointing to various parts of the interface, including a 'Zone display area' (a white frame around a portion of the waveform), a 'Trip line of the active waveform' (a horizontal line at 240.0), and an 'Alarm display area' (a horizontal line at -20.0). There are also buttons for 'Link the previous file', 'Link previous and next files collectively', and 'Link the next file'. A 'Magnification' control is located at the bottom right of the waveform display area. A 'Date' field shows '2005/10/05'. A 'Ready' status bar is at the bottom left. A scroll bar is at the bottom of the waveform display area.

4.2 Displaying the Waveform

Color overview display



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.

No.	Channel	Y-Axis	Form	Scale		Zone		Trip 1	Trip 2	Color			
				MIN	MAX	MIN	MAX						
<input checked="" type="checkbox"/>	W01	CH001	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000E0	2.0000E0	0	100	<input checked="" type="checkbox"/>	0.0000E0	<input checked="" type="checkbox"/>	0.0000E0	Red
<input checked="" type="checkbox"/>	W02	CH002	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000E0	2.0000E0	0	100	<input checked="" type="checkbox"/>	0.0000E0	<input checked="" type="checkbox"/>	0.0000E0	Green
<input checked="" type="checkbox"/>	W03	CH003	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000E0	2.0000E0	0	100	<input checked="" type="checkbox"/>	0.0000E0	<input checked="" type="checkbox"/>	0.0000E0	Blue
<input checked="" type="checkbox"/>	W04	CH004	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000	2.0000	0	100	<input checked="" type="checkbox"/>	0.0000	<input checked="" type="checkbox"/>	0.0000	Purple
<input checked="" type="checkbox"/>	W05	CH005	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000	2.0000	0	100	<input checked="" type="checkbox"/>	0.0000	<input checked="" type="checkbox"/>	0.0000	Orange
<input checked="" type="checkbox"/>	W06	CH006	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-2.0000	2.0000	0	100	<input checked="" type="checkbox"/>	0.0000	<input checked="" type="checkbox"/>	0.0000	Yellow
<input checked="" type="checkbox"/>	W07	CH007	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-22.0000	22.0000	0	100	<input checked="" type="checkbox"/>	22.0000	<input checked="" type="checkbox"/>	-22.0000	Light Green
<input checked="" type="checkbox"/>	W08	CH008	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-22.0000	22.0000	0	100	<input checked="" type="checkbox"/>	22.0000	<input checked="" type="checkbox"/>	-22.0000	Cyan
<input checked="" type="checkbox"/>	W09	CH009	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-22.0000	22.0000	0	100	<input checked="" type="checkbox"/>	22.0000	<input checked="" type="checkbox"/>	-22.0000	Magenta
<input type="checkbox"/>	W10	CH010	<input checked="" type="checkbox"/> Linear	<input checked="" type="checkbox"/>	-22.0000	22.0000	0	100	<input checked="" type="checkbox"/>	22.0000	<input checked="" type="checkbox"/>	-22.0000	Pink
<input type="checkbox"/>	W11	<None>	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/>	22.00	<input type="checkbox"/>	-22.00	Grey
<input type="checkbox"/>	W12	<None>	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/>	22.00	<input type="checkbox"/>	-22.00	Grey
<input type="checkbox"/>	W13	<None>	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/>	22.00	<input type="checkbox"/>	-22.00	Grey
<input type="checkbox"/>	W14	<None>	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/>	22.00	<input type="checkbox"/>	-22.00	Grey
<input type="checkbox"/>	W15	<None>	<input type="checkbox"/> Linear	<input type="checkbox"/>	-22.00	22.00	0	100	<input type="checkbox"/>	22.00	<input type="checkbox"/>	-22.00	Grey

Set the maximum and minimum values of the measured data the maximum and minimum values of the scale.

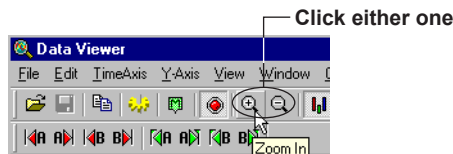
For details related to the setting procedures, see “General Display Settings” in section 3.2, “Displaying the Trend.”

Setting the Time Axis

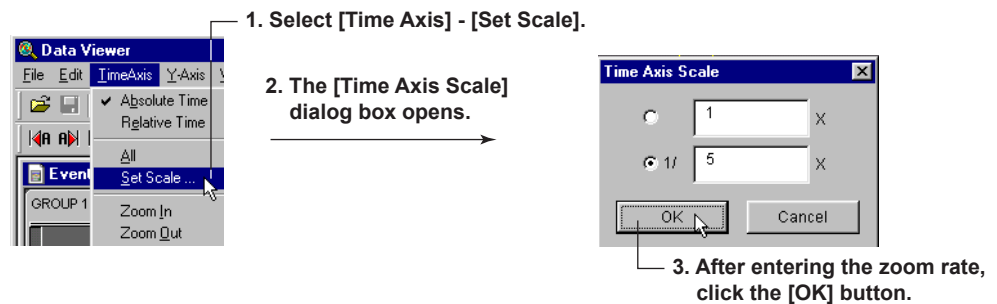
Selecting absolute or relative time display



Zoom in or zoom out on the time axis

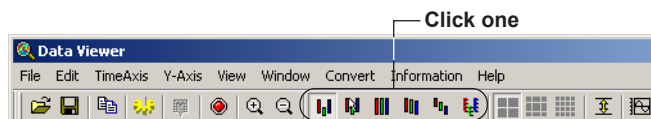


By selecting [Time Axis] - [All], the time axis is adjusted so that all the data can be displayed. If you wish to zoom in or out by specifying the zoom rate, take the following steps (resolution is 1/1000 to 20):



Setting the Y-axis

Selecting the waveform display zone

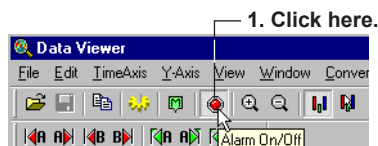


For zone setting examples and the edit zone operation, see section 3.2, "Displaying the Trend."

Waveform Display Limit

See "Waveform display limit (clip)" in section 3.2.

Turn ON/OFF the Alarm Display



The alarm conditions of alarm 1 to 4 are displayed in the alarm display area. For details related to the alarm display, see "Turning ON/OFF the Alarm Display" in section 3.2, "Displaying the Trend."

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 name.

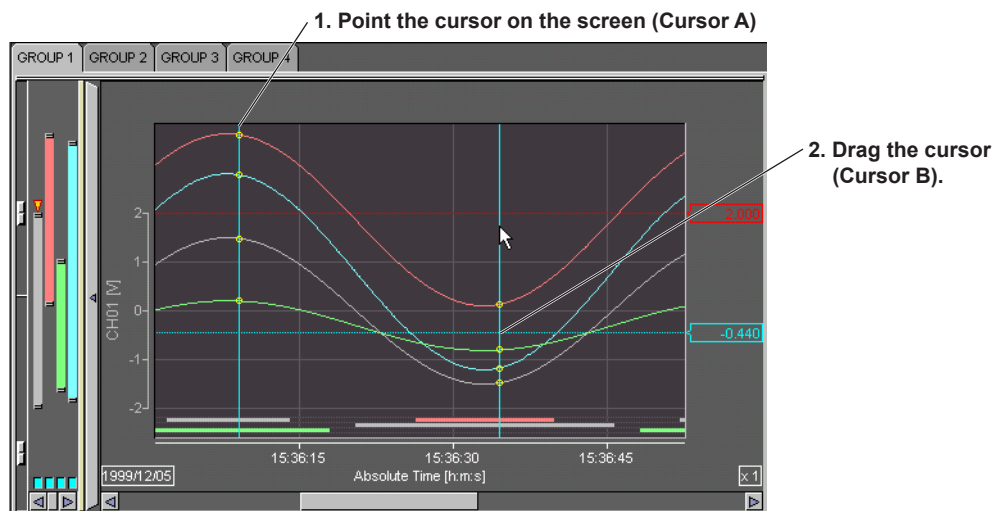
The character string is registered on the RECORDER or by using the Configurator.

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] window, 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

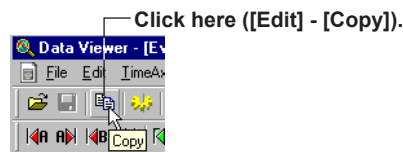


By selecting [Edit] - [Select All], Cursor A and Cursor B moves to the beginning and the end of the data, respectively.

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.

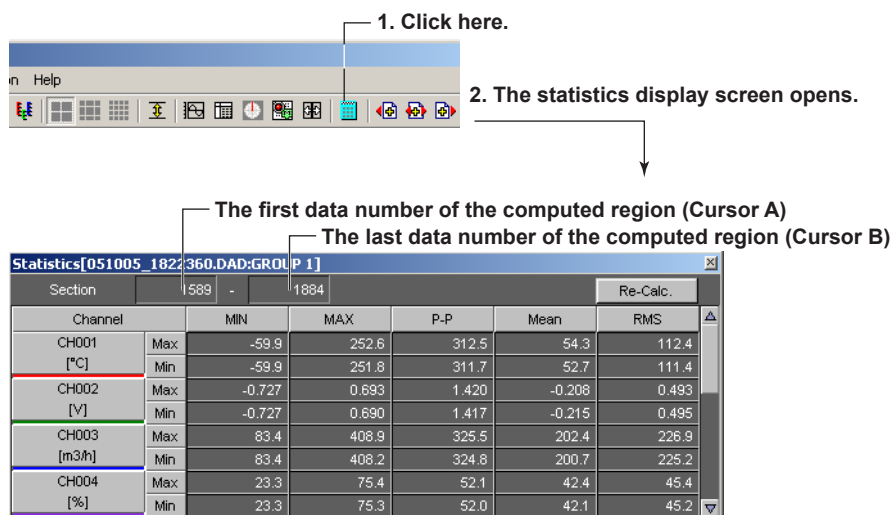
Note

- 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. For details related to [Control] dialog box, see "Displaying cursor's values" in section 3.2, "Displaying the Trend."

Displaying Statistics



1. Click here.

2. The statistics display screen opens.

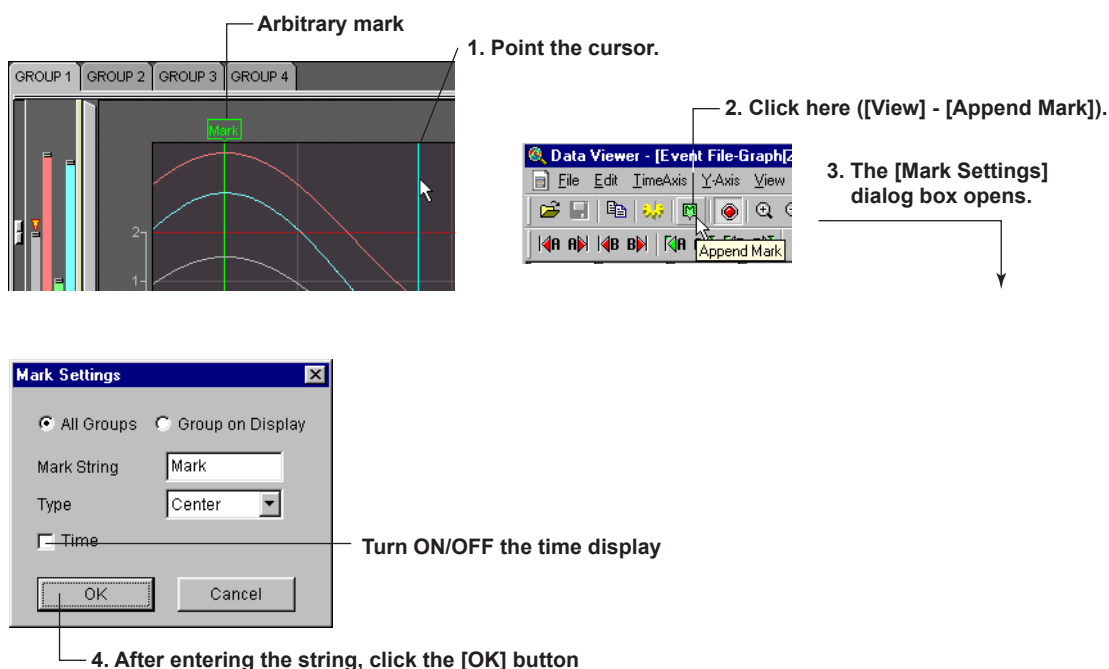
The first data number of the computed region (Cursor A)

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

Section		589	-	1884		Re-Calc.
Channel						
CH001 [°C]	Max	-59.9		252.6	312.5	54.3
	Min	-59.9		251.8	311.7	52.7
CH002 [V]	Max	-0.727		0.693	1.420	-0.208
	Min	-0.727		0.690	1.417	-0.215
CH003 [m3/h]	Max	83.4		408.9	325.5	202.4
	Min	83.4		408.2	324.8	200.7
CH004 [%]	Max	23.3		75.4	52.1	42.4
	Min	23.3		75.3	52.0	45.2

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. If you change a computation condition such as the computation interval and click the [Calculate] button, the results are computed again and displayed.

Adding Arbitrary Marks



Arbitrary mark

1. Point the cursor.

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

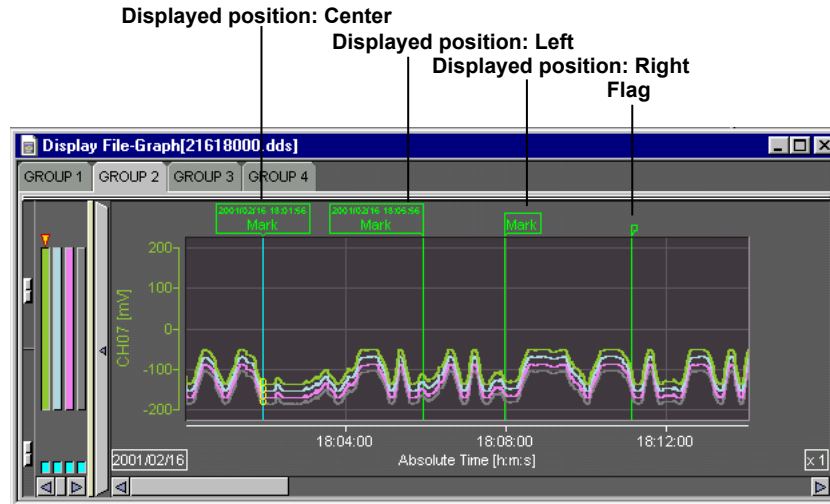
3. The [Mark Settings] dialog box opens.

Turn ON/OFF the time display

4. After entering the string, click the [OK] button

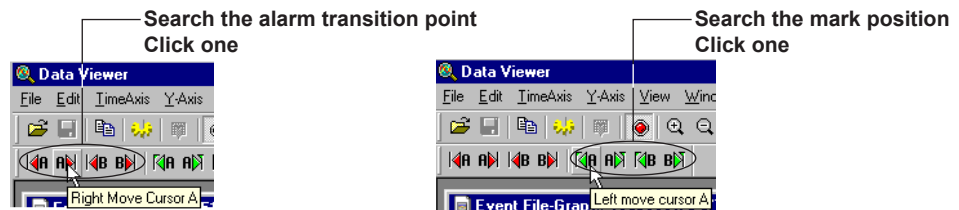
When Cursor A and Cursor B are at the same position, arbitrary marks can be placed. You can select whether to put the arbitrary marks on all groups or only on the displayed group. In addition, double-clicking a mark, that has been created using the Data Viewer, opens the [Mark] dialog box in which you can change the displayed group and the mark name.

4.2 Displaying the Waveform



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.

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.

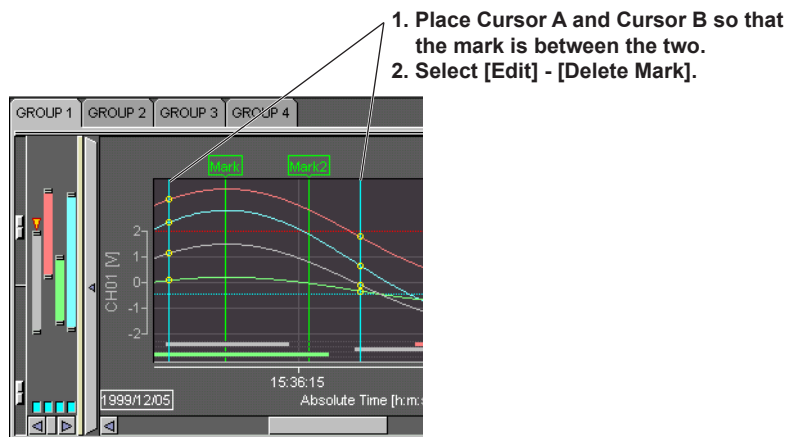
Searching the mark position

Moves Cursor A or Cursor B to the mark position (arbitrary mark or trigger mark) of the active channel. 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.

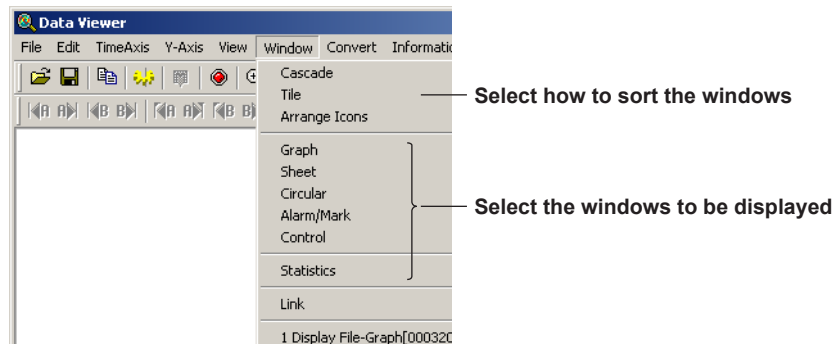
Note

- The arbitrary marks placed on the Data Viewer are green. The arbitrary marks (messages) and trigger points placed on the RECORDER are yellow.
- With Data Viewer, the maximum number of characters that can be entered for the name of a mark is thirty-two (from revision R4.07).

Resetting Marks

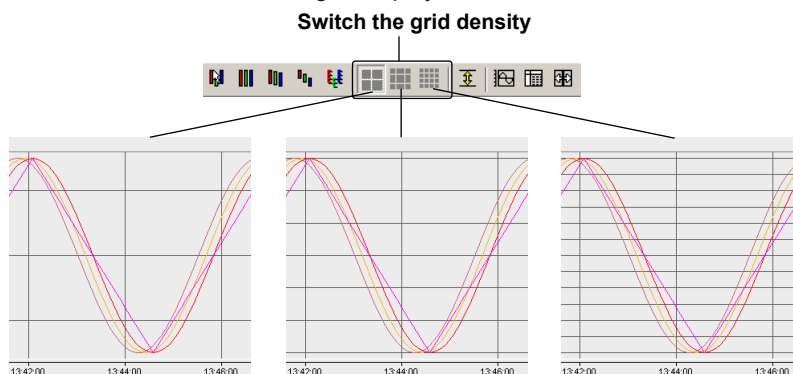
All arbitrary marks created on the Data Viewer are erased by selecting [Edit] - [Reset Mark]. The marks (messages) and the trigger point that were created on the RECORDER but deleted on the Data Viewer are displayed again.

Setting the Window



Changing the Grid Display

Specify a grid type by clicking the grid density button on the toolbar, or by choosing Y-axis on the menu bar. The grid display switches.



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

Display the cursor value

Waveform label (Select channel No. or tag)

Select the active waveform

Alarm display area

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

Circular display area

Absolute or relative time

Move the waveform display position (Scroll bar)

General Display Settings

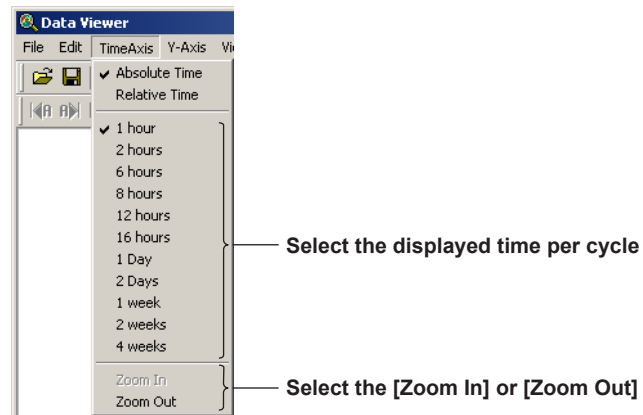
For details related to the setting procedures, see “General Display Settings” in section 3.7, “Circular Display.”

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

Waveform display limit

See section 3.7, “Circular Display.”

Turning ON/OFF the Alarm Display

For details on the alarm display, see Alarm Display in section 3.7, “Circular Display.”

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 4.9)

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)

Click here to make the waveform active

Mark on the active waveform

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 [°C]		CH002 [V]	
	Min	Max	Min	Max
2005/10/05 18:22:36.000(00000000)	113.0	115.5	0.059	0.070
2005/10/05 18:22:38.000(00000001)	110.6	113.0	0.048	0.059
2005/10/05 18:22:40.000(00000002)	108.2	110.6	0.037	0.048
2005/10/05 18:22:42.000(00000003)	105.8	108.2	0.026	0.037
2005/10/05 18:22:44.000(00000004)	103.3	105.8	0.015	0.026
2005/10/05 18:22:46.000(00000005)	101.1	103.3	0.004	0.015
2005/10/05 18:22:48.000(00000006)	98.6	101.1	-0.006	0.004
2005/10/05 18:22:50.000(00000007)	96.2	98.6	-0.017	-0.006
2005/10/05 18:22:52.000(00000008)	93.6	96.2	-0.029	-0.017
2005/10/05 18:22:54.000(00000009)	91.4	93.8	-0.039	-0.029
2005/10/05 18:22:56.000(00000010)	88.9	91.4	-0.050	-0.039
2005/10/05 18:22:58.000(00000011)	86.6	88.9	-0.061	-0.050

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:

- Turn ON/OFF numeric value display
- Registering the channel

For details related to the setting procedures, see “General Display Settings” in section 3.2, “Displaying the Trend.”

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

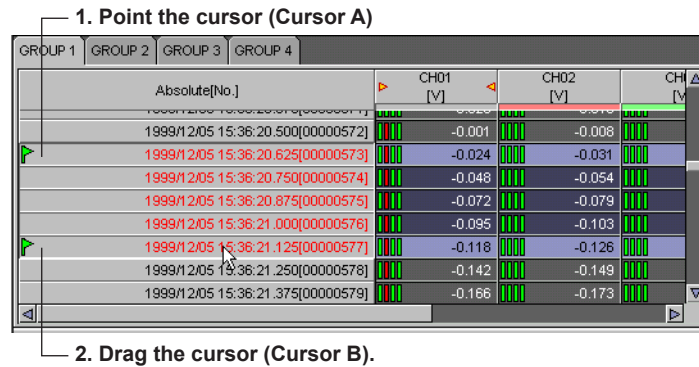
The alarm conditions of alarms 1 to 4 are displayed on the screen by clicking the alarm display icon or selecting [View] - [Alarm] and turning ON the alarm display. When an alarm is in effect, the indicator is red. When it is not, the indicator is green.

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



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

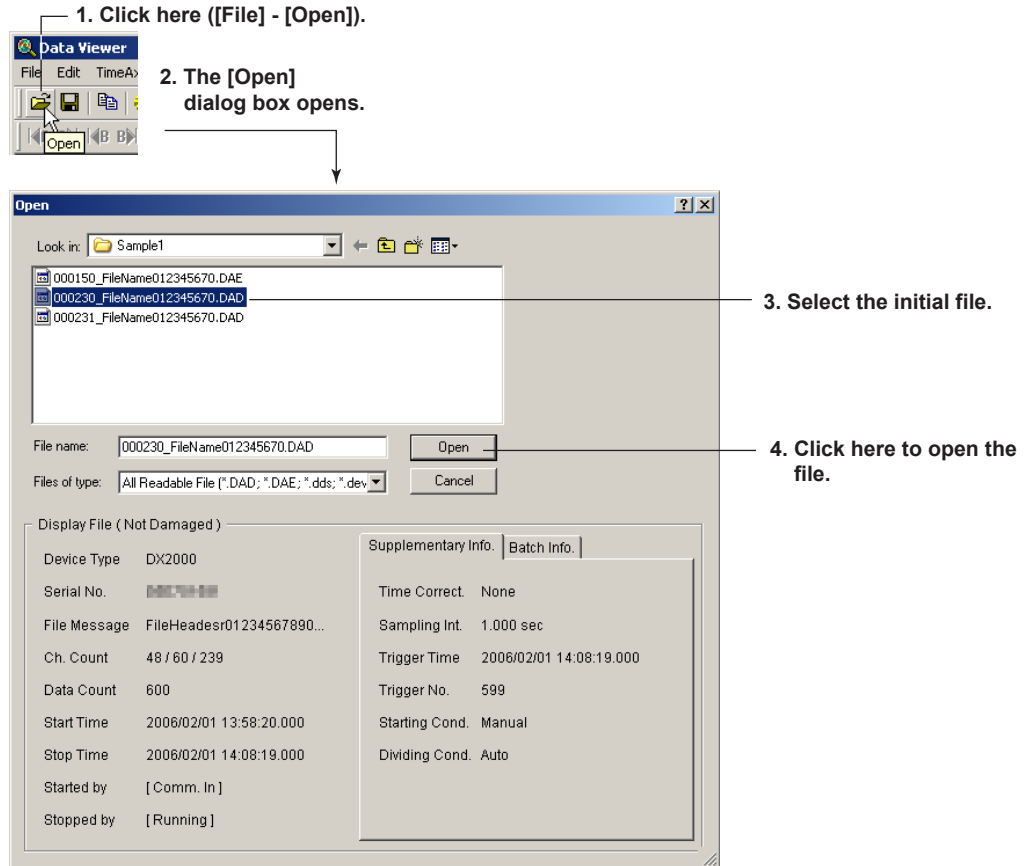
For details, see “Adding Arbitrary Marks,” “Deleting Marks,” and “Resetting Marks” in section 4.2, “Displaying the Waveform.”

4.5 Linking Files and Saving the Link Settings File

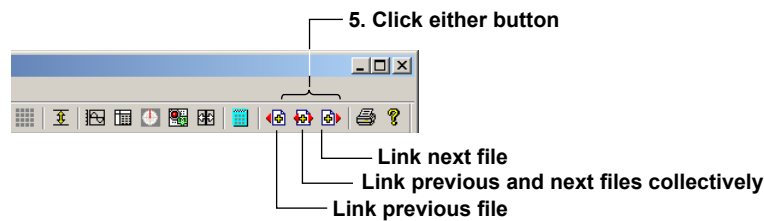
Linking Files

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

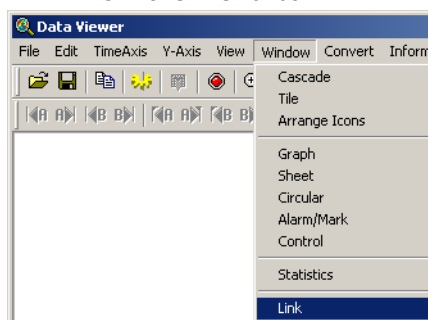
The files that can be linked are those that exist in the same directory. There are two methods to link files, from the toolbar and from the menu bar.



From the toolbar

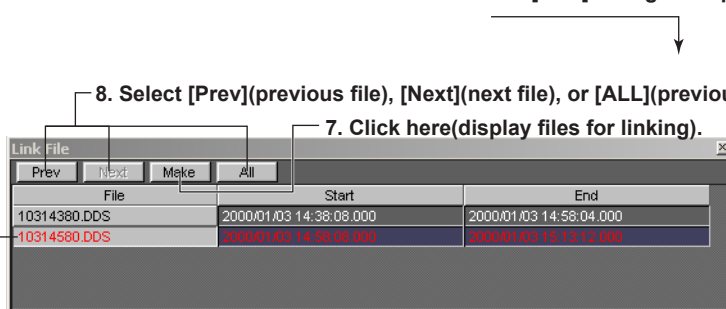


From the menu bar



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

6. The [Link] dialog box opens.



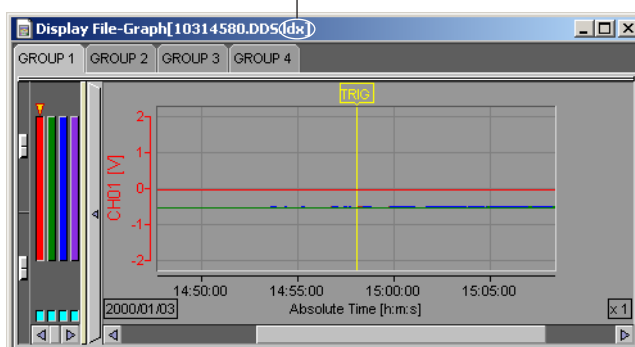
8. Select [Prev](previous file), [Next](next file), or [ALL](previous and next files).

7. Click here(display files for linking).

9. Displays the linked files.

10. Displays the linked files in a different color.

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



When linking and displaying files, make sure that the number of data points after linking does not exceed 5000000.

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 scan interval and a power failure occurs over a period of one week or longer, the data before and after the power failure cannot be linked and displayed.

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].

4.6 Listing Alarms and Marks and Converting the List

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

1. Click here([Window]-[Alarm/Mark]).

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

3. Click here([Alarm List]).

Label

Channel	Level	Type	Alarm ON	Alarm OFF
CH01	L1	H ↑	2000/08/14 19:32:02.250[00000011]	2000/08/14 19:32:29.625[00000024]
CH32	L1	H ↑	2000/08/14 19:32:03.625[00000011]	2000/08/14 19:32:27.750[00000023]
CH31	L2	L ↓	2000/08/14 19:32:11.875[00000015]	2000/08/14 19:32:19.500[00000019]
CH01	L2	L ↓	2000/08/14 19:33:10.875[00000045]	2000/08/14 19:33:38.375[00000059]
CH32	L2	L ↓	2000/08/14 19:33:11.875[00000045]	2000/08/14 19:33:37.000[00000058]
CH31	L1	H ↑	2000/08/14 19:33:20.625[00000050]	2000/08/14 19:33:28.250[00000054]
CH01	L1	H ↑	2000/08/14 19:34:19.750[00000079]	2000/08/14 19:34:47.125[00000093]

Pointer

3. Click here([Mark List])

DX/MV/CX display

Status	Channel	Level	Type	Absolute Time
ON	CH001	L1	H ↑	2005/10/05 20:22:20.000[00003593]
ON	CH006	L1	H ↑	2005/10/05 20:21:33.000[00003569]
OFF	CH007	L1	L ↓	2005/10/05 20:21:17.000[00003561]
OFF	CH007	L2	L ↓	2005/10/05 20:19:42.000[00003514]

Mark created on the DX/MV/CX DX1000/DX2000 display

Mark created on the viewer

Trigger mark

Cursor

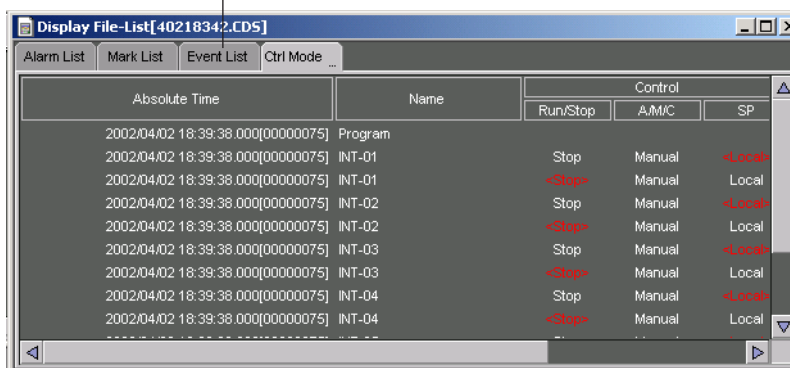
3. Click here([Event List])

Display File-List[40218342.CDS]

Name	Level	Type	Event ON	Event OFF
INT-01	L01	PVH ↑	2002/04/02 18:34:31.000	2002/04/02 18:34:31.000
INT-01	L03	DVO ⇄	2002/04/02 18:34:31.000	2002/04/02 18:34:31.000
TIME EVENT	L01	TM ⌚	2002/04/02 18:35:01.000[00000006]	2002/04/02 18:35:01.000[00000006]
TIME EVENT	L02	TM ⌚	2002/04/02 18:35:01.000[00000006]	2002/04/02 18:35:01.000[00000006]
TIME EVENT	L01	TM ⌚	2002/04/02 18:36:41.000[00000031]	2002/04/02 18:36:41.000[00000031]

4.6 Listing Alarms and Marks and Converting the List

3. Click here([Ctrl Mode...])



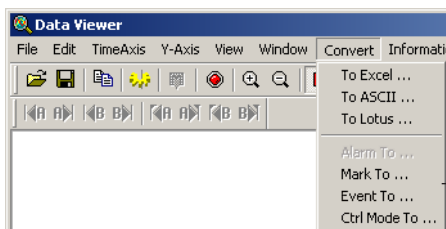
For the alarm list or the event list, click a label to sort using the label. The first click will sort the list in the ascending order; the second click will sort the list in the descending order.

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.

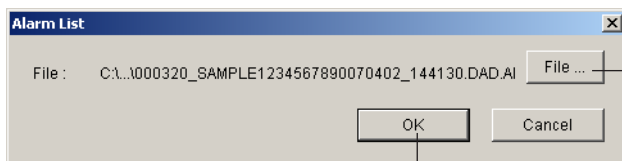
Converting and outputting the alarm or mark list

The Alarm or Mark List can be converted to ASCII, Lotus, and Excel formats.



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

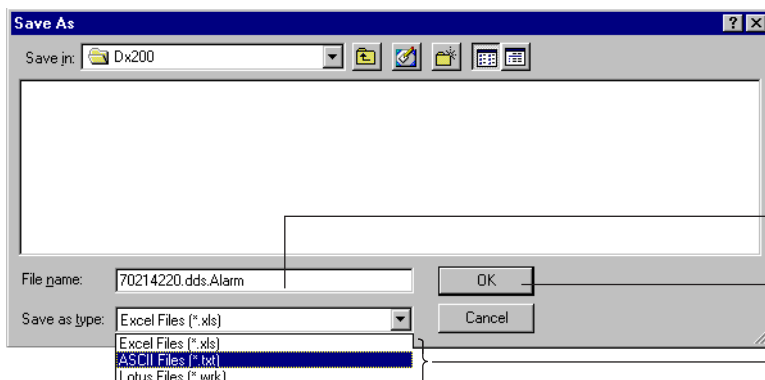
2. The [Alarm List] or [Mark List] dialog box opens.



3. Click here.

4. The [Save As] dialog box opens.

6. Click here.



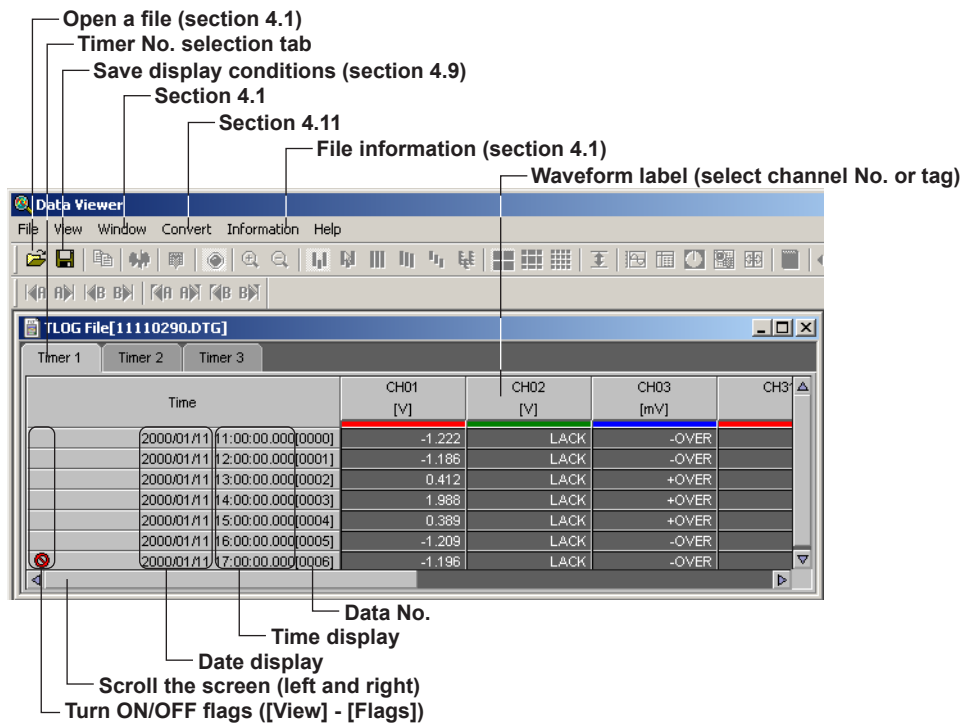
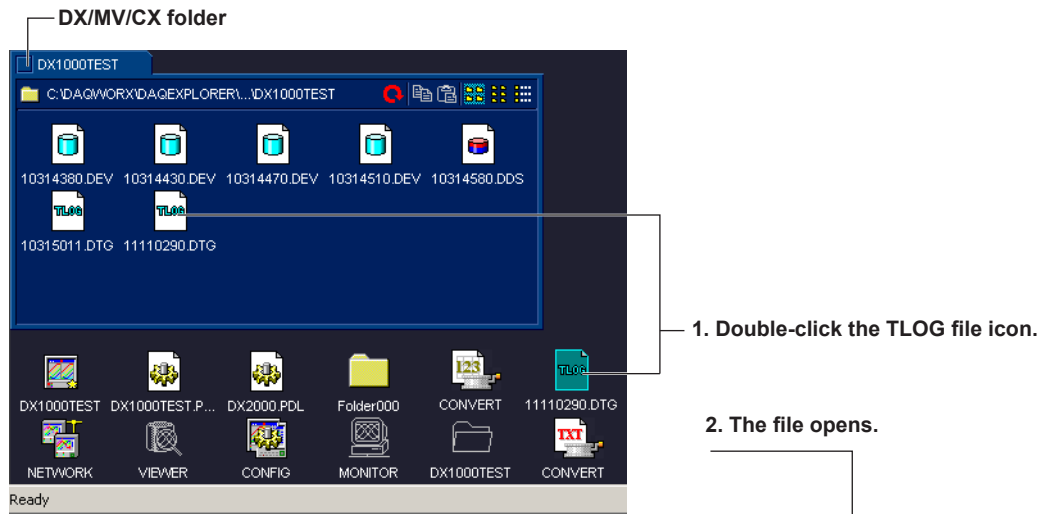
Enter the file name.

5. Set the items and click here.

Select one.




4.7 Displaying the TLOG File

Displaying the TLOG File



Turning ON/OFF Flags

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

-  : Stopped TLOG computation.
-  : The DX/MV/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.

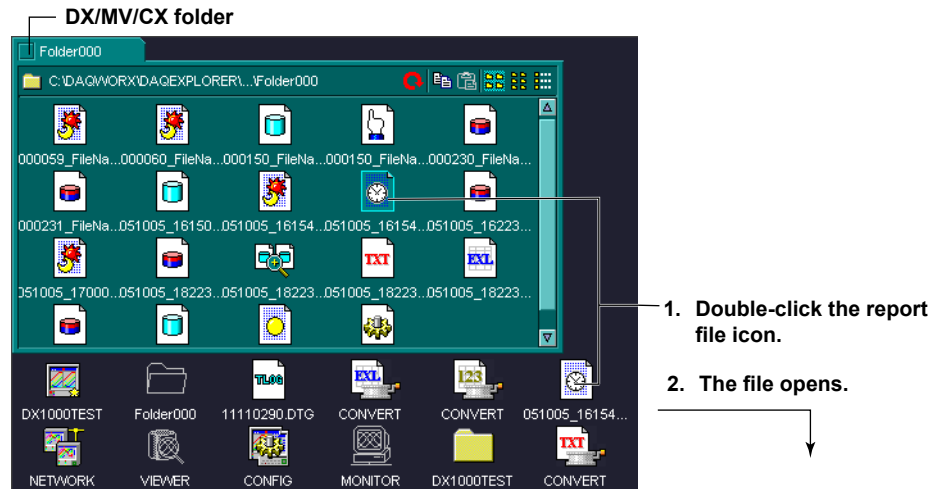
Data No.

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, “Displaying the Waveform.”

4.8 Displaying the Report File



Example of a DX1000/DX2000/MV1000/MV2000 Report File

[Hourly] tab

Data Viewer

File View Window Help

Report File[000210_080122_010000HD.DAR]

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	

Ready NUM

- 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.

[Daily] Tab

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
2008/01/23 00:00:00	Status				
	Ave	100.08	100.08	100.07	100
	Max	112.50	111.29	110.08	108
	Min	87.52	88.74	89.94	91
	Sum	8.647197E+06	8.648530E+06	8.645862E+06	8.645232E+

Ready NUM

[All] Tab

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

Hourly Daily All COLUMN BAR

Date Time	Report kind	Data Kind	CH001 W	CH002 W	CH003 W
2008/01/22 01:00:00	Hourly	Status			
		Ave	95.11	95.58	96
		Max	101.22	101.10	100
		Min	89.90	90.89	91
		Sum	3.423792E+05	3.440932E+05	3.458022E+
2008/01/22 02:00:00	Hourly	Status			
		Ave	106.91	106.24	105
		Max	111.35	110.24	109
		Min	101.21	101.10	100

Ready NUM

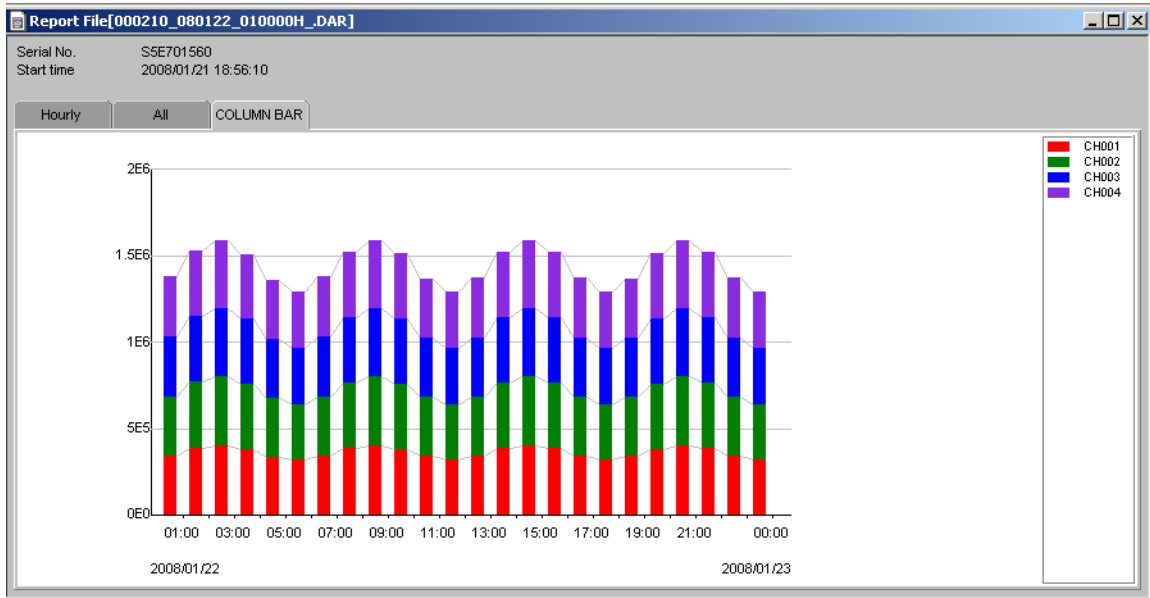
4.8 Displaying the Report File

Displaying a Stacked Bar Graph of Report Data

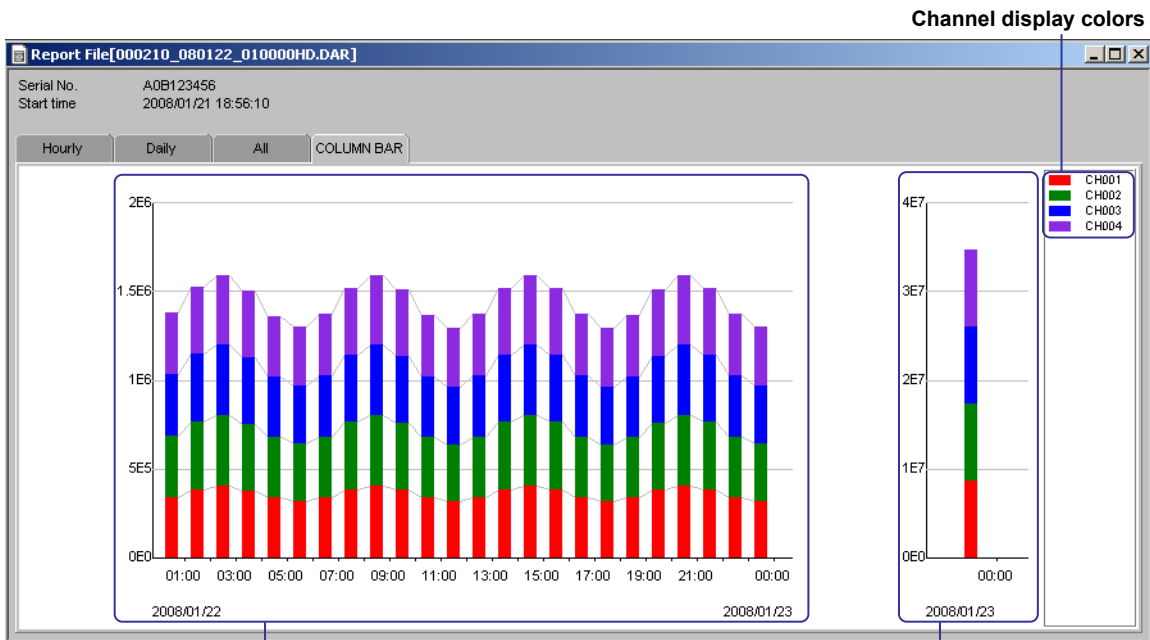
You can display report data generated by the DX1000, DX1000N, DX2000, MV1000, or MV2000 on a stacked bar graph.

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



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.

Example of a Report File from a Model Other Than the DX1000/DX2000

Vertical display

		2001/02/16 18:00			
		Status	AVE	MIN	MAX
CH01	[mV]		0.3	99999	-99999
CH02	[mV]		-14.3	99999	-99999
CH03	[mV]		-32.2	99999	-99999
CH04	[mV]		-51.0	99999	-99999
CH05	[mV]		-67.5	99999	-99999
CH06	[mV]		-84.7	99999	-99999
CH07	[mV]		-91.1	99999	-99999

Horizontal display

		CH01 [mV]	CH02 [mV]	CH03 [mV]	CH04 [mV]
2001/02/16 18:00	Status				
	AVE	0.3	-14.3	-32.2	-51.0
	MIN	99999	99999	99999	99999
	MAX	-99999	-99999	-99999	-99999
SUM		7.866000E+02	-4.485020E+04	-1.006384E+05	-1.591344E+05



: Measurement or computation error occurred during the period for the report.



: Range or computation over occurred during the period for the report.



: Power failure occurred during the period for the report.

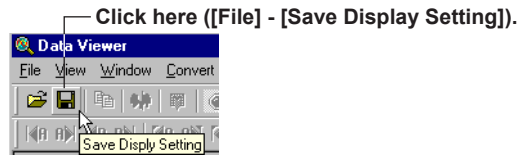


: Time was changed during the period for the report.



: Burnout occurred during the period for the report.

4.9 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.

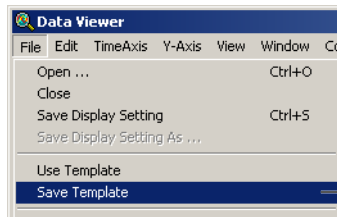
When the data with the same file name is reopened, the display settings that were saved are used. If you do not wish to open the data using the saved settings, delete the display setting file ([vdx] extension) before opening the data file.

Note

When the data residing in the internal memory or the external storage medium of the RECORDER are being displayed, the display settings cannot be saved.

4.10 Saving Display Template

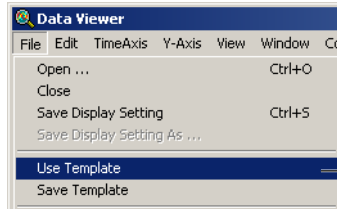
Saving Templates



1. Click here [File] - [Save Template]

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

Using Templates



1. Click here [File] - [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.

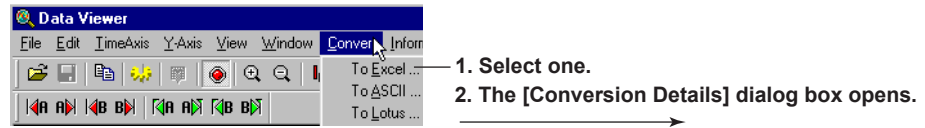
If the currently displayed data file is accompanied by its display settings file, it is displayed according to the setting information of the display settings file.

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.

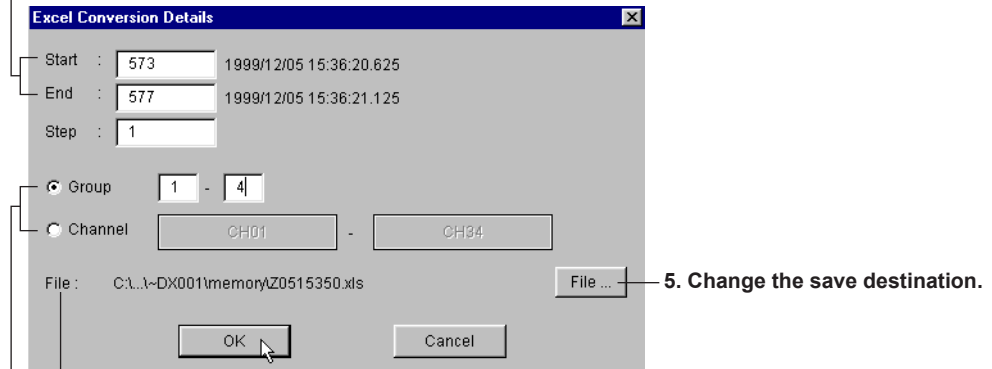
- Print comment
- Y-axis zone setting
- ON/OFF condition of the clipping of the displayed waveform
- Settings specified in the General Display Settings
- Zoom rate of the time axis
- Display mode of the time axis (absolute/relative)
- Waveform display area
- Grid type
- The channel identification string 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

4.11 Converting the Data



When waveform display or numeric display is open

3. Enter the conversion range.



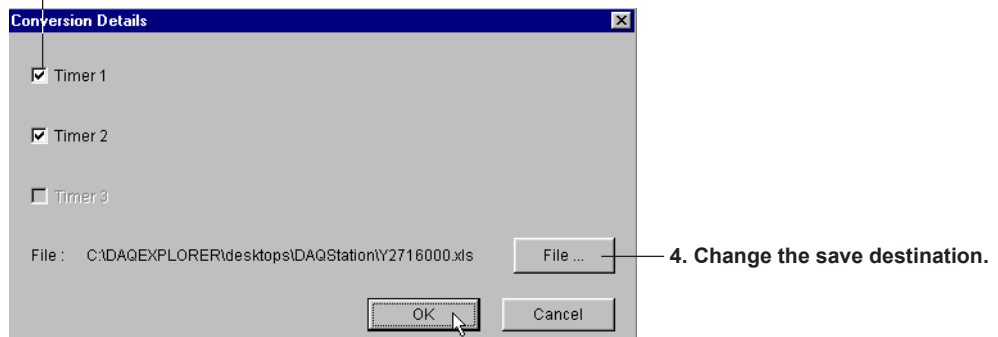
Save destination and file name

4. Select either one.

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

When displaying the TLOG File

3. Check the timer No. to be converted.



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.

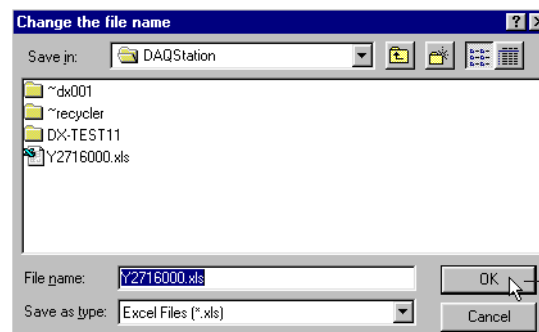
Step

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.
- 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

```
"DAQEXPLORER", "DAQEXPLORER"
"Data Viewer", "Data Viewer"
"Yokogawa", "DAQEXPLORERdata", "xxxxxxxxxxxxxxxx"
"Device Type", "DX2000"
"Serial No.", "XXXXXXXXXX"
"File Message", "DATAファイル"
"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"
"Started by", "[ Ineffective ]"
"Stopped by", "[ Running ]"
"Batch No.", ""
"Lot No.", "000002"
"Discription1", ""
"Discription2", ""
"Discription3", ""
"Discription4", ""
"Discription5", ""
"Discription6", ""
"Discription7", ""
"Discription8", ""
"Batch Comment1", ""
"Batch Comment2", ""
"Batch Comment3", ""
"Num. of Converted Data", "371"
```

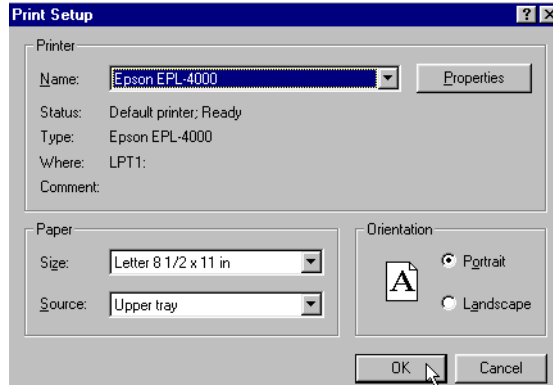
Excel conversion file

	A	B	C	D	E
1	DAQEXPLORER		DAQEXPLORER		
2	Data Viewer		Data Viewer		
3	Yokogawa		DAQEXPLORERdata		xxxxxxxxxxxxxxxx
4					
5	Device Type		DX2000		
6	Serial No.		XXXXXXXXXX		
7	File Message		DATAファイル		
8	Time Correction		None		
9	Starting Condition		Auto		
10	Dividing Condition		Auto		
11	Meas Ch.		10		
12	Math Ch.		0		
13	Ext Ch.		0		
14	Data Count		3600		
15	Sampling Interval		2.000 sec		
16	Start Time		2005/10/05	18:22:36	0.000
17	Stop Time		2005/10/05	20:22:34	0.000
18	Trigger Time		2005/10/05	20:22:34	0.000
19	Trigger No.		3599		
20	Damage Check		Not Damaged		
21	Started by		[Ineffective]		
22	Stopped by		[Running]		
23					
24	Batch No.				
25	Lot No.		000002		
26	Discription1				
27	Discription2				
28	Discription3				
29	Discription4				
30	Discription5				

4.12 Printing

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

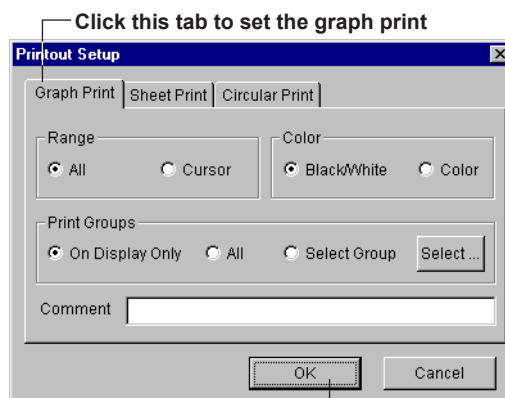
Set the printer according to the configuration of the system that you are using.

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 is not necessary when printing the TLOG 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

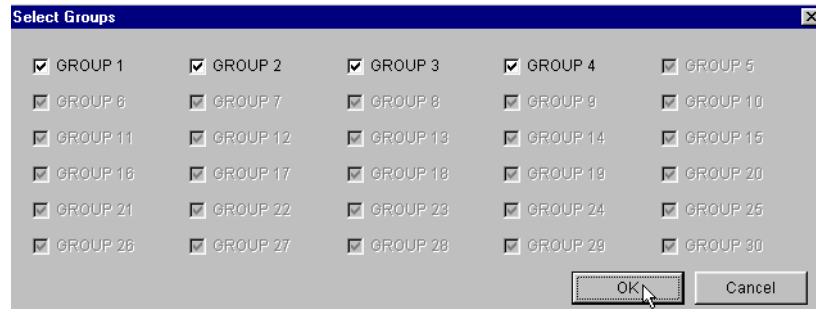


Click this tab to set the graph print

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

4.12 Printing

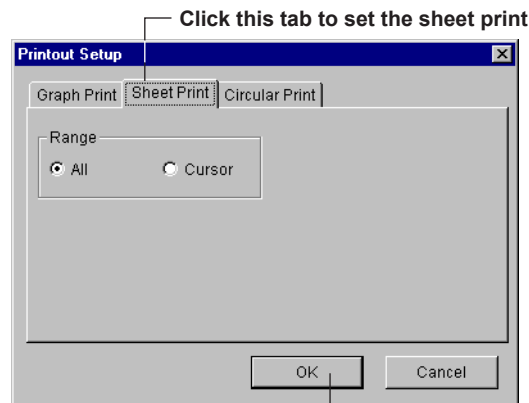
If you selected [Select Group], click the [Select] button. The [Select Groups] dialog box opens. Select the groups to be printed. Click the [OK] button to close the dialog box.



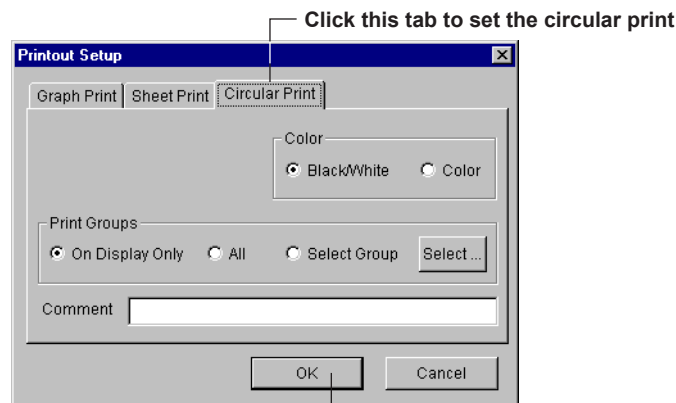
Note

- 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.

Setting sheet print



Setting circular print



For the operations that follows, see “Setting graph print.”

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

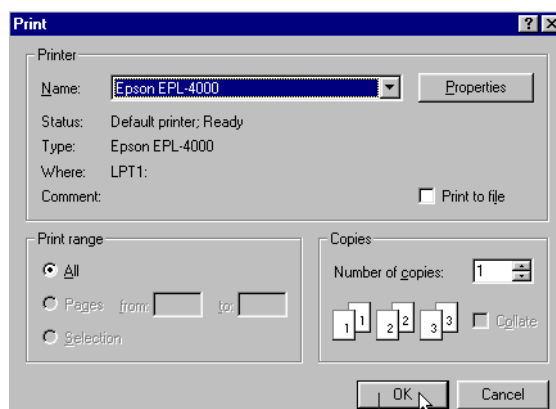
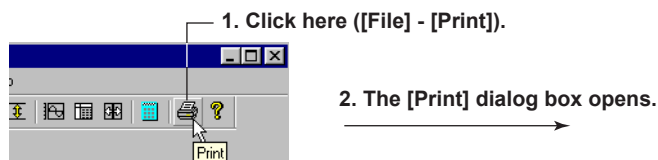
You can preview the print layout before actually printing the data.

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



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

5.1 Starting the Configurator

The following two types of files can be opened using the Configurator:
Settings cannot be entered on the DX1000/DX2000.

CONFIG file

This is the file located in the DX/MV folder. It allows a direct view of the setup data of the DX100/DX200/MV100/MV200. Only one CONFIG file exists in one DX/MV folder.

You can change the setting on the Configurator, but the file cannot be saved.

Setup data file (*.PNL)

This is the file that is saved to the PC such as to the DAQ Desktop. You can change the settings on the Configurator and save the file and create new setup data.

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.

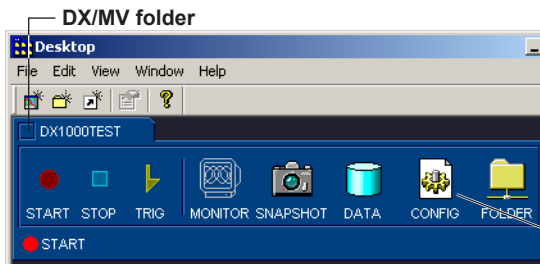
DX/MV	Style1	Style2	Style3	Style4
DX100	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>
DX200	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>
MV100		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MV200			<input type="radio"/>	<input type="radio"/>

Copying the Setup Data to the DAQ Desktop

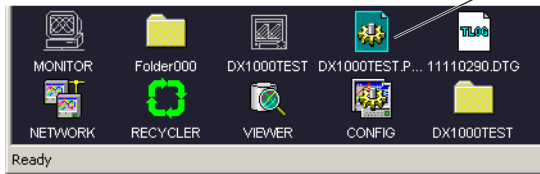
You can copy the CONFIG file to the DAQ Desktop by dragging and dropping the CONFIG icon of the DX/MV folder onto the DAQ Desktop.

The extension of the file that is copied becomes [PNL].

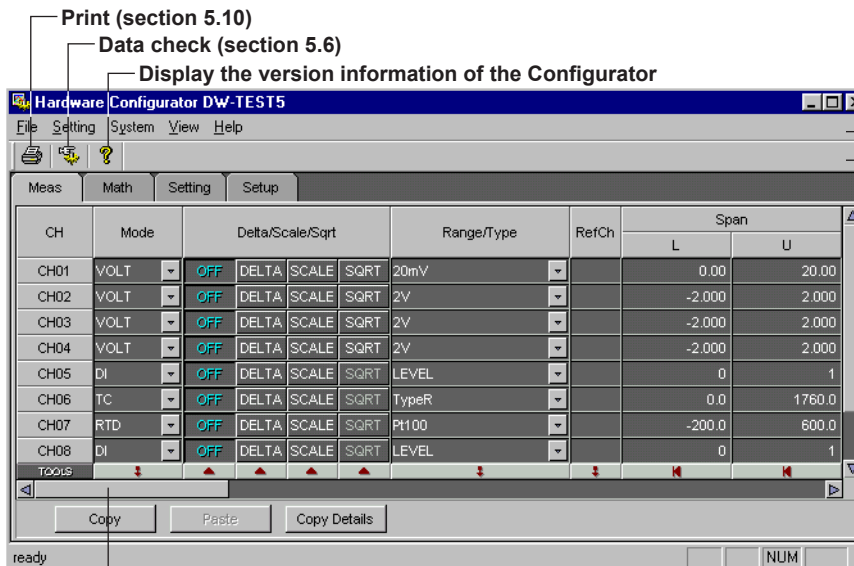
Starting the Configurator



1. Double-click here.



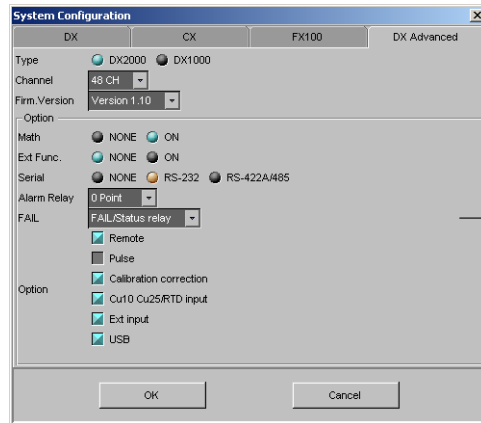
2. The DX/MV Configurator opens.



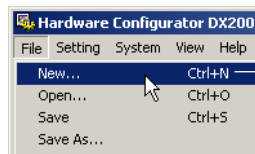
Creating Setup Data by Configuring a New System



1. Double-click the CONFIG icon on the desktop.
2. The [System Configuration] dialog box opens.



3. Click the appropriate items and click the [OK] button to open the Configurator screen.



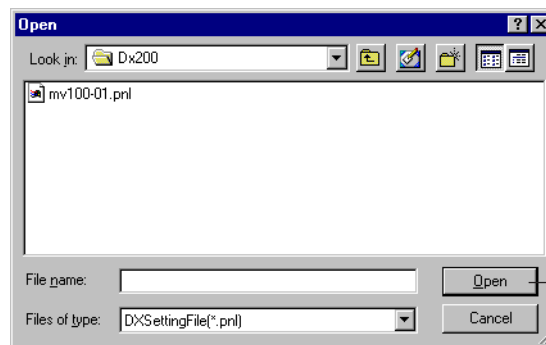
- Select [File]-[New] to create new setup data from the second time.

Create the setup data according to step 2 and 3.

Loading Preexisting Setup Data



1. 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.

5.2 Setting the Measurement Channels

Select this tab
Double-click to set the channel
Difference computation
Scale
Square root
Select the reference for the difference computation

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	20V		-2.00	2.00

Select the input mode
Select the range/type
Set the span

Enter the scale
Enter the scale unit
Enter the alarm value

Point	Scale		Unit	Alarm 1			Alarm 2		
	L	U		Type	Value	Relay	Type	Value	Relay
				H	1.100	01	L	0.000	NONE
	0.00	200.00		L	-1.00	NONE	OFF	0.00	NONE
	0.00	200.00		R(RH)	0.00	NONE	OFF	0.00	NONE
				OFF	0.00	NONE	OFF	0.00	NONE

Select the relay number
Select the alarm type

Enter the delay period
Enter the tag name

Alarm 3			Alarm 4			Alarm Delay	Moving Ave	Tag
Type	Value	Relay	Type	Value	Relay			
OFF	0.000	NONE	OFF	0.000	NONE	10 sec	OFF	
OFF	0.00	NONE	OFF	0.00	NONE	10 sec	OFF	
OFF	0.00	NONE	OFF	0.00	NONE	10 sec	OFF	
OFF	0.000	NONE	OFF	0.000	NONE	10 sec	OFF	

Select sampling count

Enter the display zone
Select the graph setting
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	
0	100	10	Normal	1	OFF	50	0.000	

Initialize
Set the value to the maximum value possible
Set the value to the minimum value possible
Turn ON/OFF the partial expanded display

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 greater than or equal to 2. The selectable alarms vary depending on the input mode and computation type. For details, see section 6.2 in the *User's Manual IM04L02A01-01E*.

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

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, 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 name instead of the channel name to be displayed on the screen.

The [Setup] screen is used to select whether to display the channel name or the tag name on the screen.

If tag is selected in the [Setup] screen, you will be able to select tag No., tag comment, or tag in the Data Monitor or Data Viewer.

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/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.

Copying and Pasting Setup Data

You can copy and paste settings by using the Copy, Paste, and Details buttons.

Selecting the Items to Copy and Paste

1. Click the Details button. A setting item selection screen is displayed.
2. Select the items to copy and paste. Choose items to copy and paste by selecting the corresponding check boxes. Click the × button to close the setting item selection screen.

5.2 Setting the Measurement Channels

The setting item selection screen that opens when you click the Details button. The names of setting items are displayed.

Click to display the setting item selection screen, then select the setting items you wish to copy.

Paste to the copy destination

Read the copy source setting

Copying and Pasting

1. Select the copy source number, then click the Copy button.
 - * You can drag to select multiple copy source numbers.
2. Select the copy destination number, then click the Paste button.
 - * You can drag to select multiple copy destination numbers. The specified settings are copied and pasted.

Setting One Channel at a Time

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

2. The channel setting dialog box opens.

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.

5.3 Setting the Computation Channels

Double-click when setting each channel
Select this tab

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 computation

Select the number of digits to the right the decimal

CH	ON/OFF	Expression
CH31	ON	K01
CH32	ON	TLOG.SUM(31)
CH33	ON	TLOG.SUM(31)-K02
CH34	OFF	01
CH35	OFF	01
CH36	OFF	01
CH37	OFF	01

Span						Unit	Ty	Constant	
Point	L	U							
0	-10	10	K01	OFF			K01	1	
0	-100	700	Times	H			K02	100	
0	-200	200		OFF			K03		
2	-200.00	200.00		OFF			K04	1	
2	-200.00	200.00		OFF			K05	1	
2	-200.00	200.00		OFF			K06	1	
2	-200.00	200.00		OFF			K07	1	

Set the alarm (section 5.2)

Alarm 1			Alarm 2			Alarm 3		
Type	Value	Relay	Type	Value	Relay	Type	Value	Relay
OFF	0	NONE	OFF	0	NONE	OFF	0	NONE
H	200	NONE	L	100	NONE	OFF	0	NONE
OFF	0	NONE	OFF	0	NONE	OFF	0	NONE
OFF	0.00	NONE	OFF	0.00	NONE	OFF	0.00	NONE
OFF	0.00	NONE	OFF	0.00	NONE	OFF	0.00	NONE

Enter the alarm period

Enter the tag (section 5.2)

Alarm 4			Alarm Delay	TLOG		Rolling Average			Tag
Type	Value	Relay	Timer	Sum	Scale	Interval	Times		
OFF	0.00	NONE	10 sec	1	OFF	10s	1		
OFF	0.00	NONE	10 sec	1	OFF	10s	1		
OFF	0.00	NONE	10 sec	1	OFF	10s	1		
OFF	0.00	NONE	10 sec	1	OFF	10s	1		
OFF	0.00	NONE	10 sec	1	OFF	10s	1		

Display zone (section 5.2)

Set the graph (section 5.2)

Partial expansion (section 5.2)

Display color (section 5.2)

Zone		Graph			Partial			Color	Constant	
L	U	Div	Bargraph	Scale	Expand(%)	Boundary				
0	100	10	Normal	1	OFF	50	0	Red	K01	1
0	100	10	Normal	1	OFF	50	0	Yellow	K02	100
0	100	10	Normal	1	OFF	50	0	Blue	K03	1
0	100	10	Normal	1	OFF	50	0.00	Purple	K04	1
0	100	10	Normal	1	OFF	50	0.00	Red	K05	1

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/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 5.2, "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 5.2, "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/MV200, respectively.

Setting One Computation Channel at a Time

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

Meas	Math	Setting
CH		
CH31	<input checked="" type="checkbox"/> ON	K01
CH32	<input checked="" type="checkbox"/> ON	TLOG-SUM
CH33	<input checked="" type="checkbox"/> ON	TLOG-SUM

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

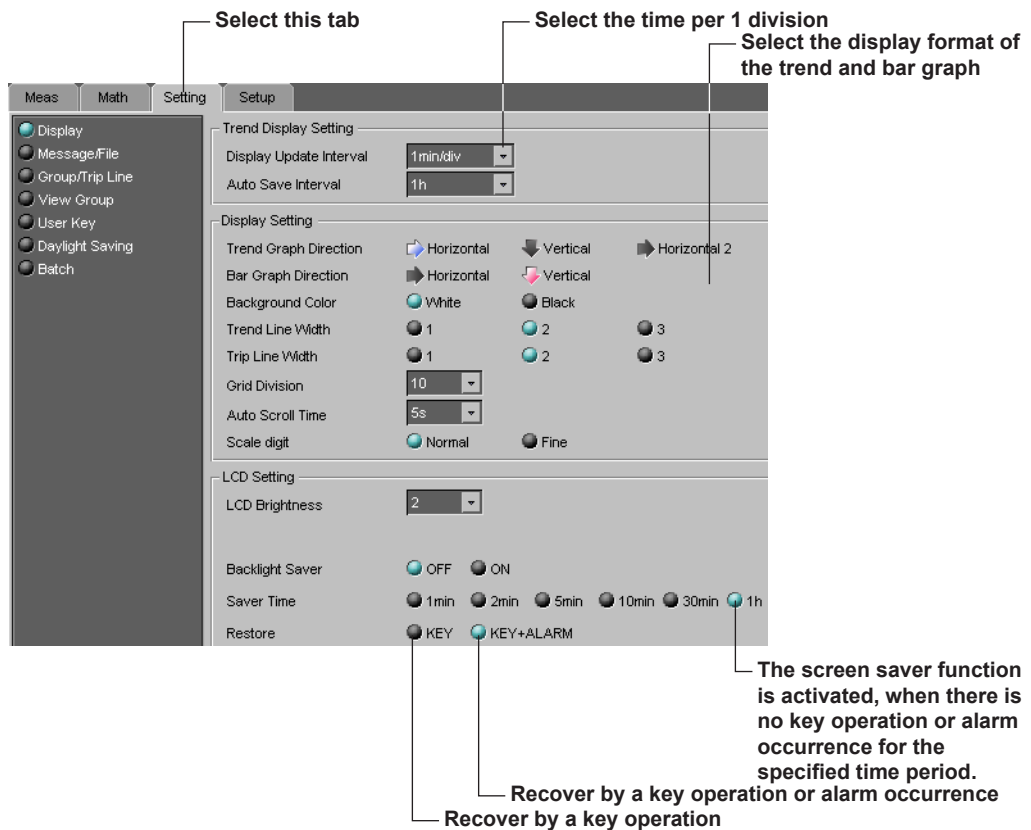
The items in the math channel tab can be configured for each channel. The items that are configured are the same as those configured on the spreadsheet. For details, see the page corresponding to the item.

Copying and Pasting Setup Data

See section 5.2, "Setting the Measurement Channel."

5.4 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 1 min/div, 2 min/div, 5 min/div, 10 min/div, 20 min/div, 30 min/div, 1 h/div, 2 h/div, and 4 h/div. In addition to these selections, 15 sec/div and 30 sec/div can also be selected on the MV102, MV104, MV204, and MV208 when the style number is greater than or equal to 3.

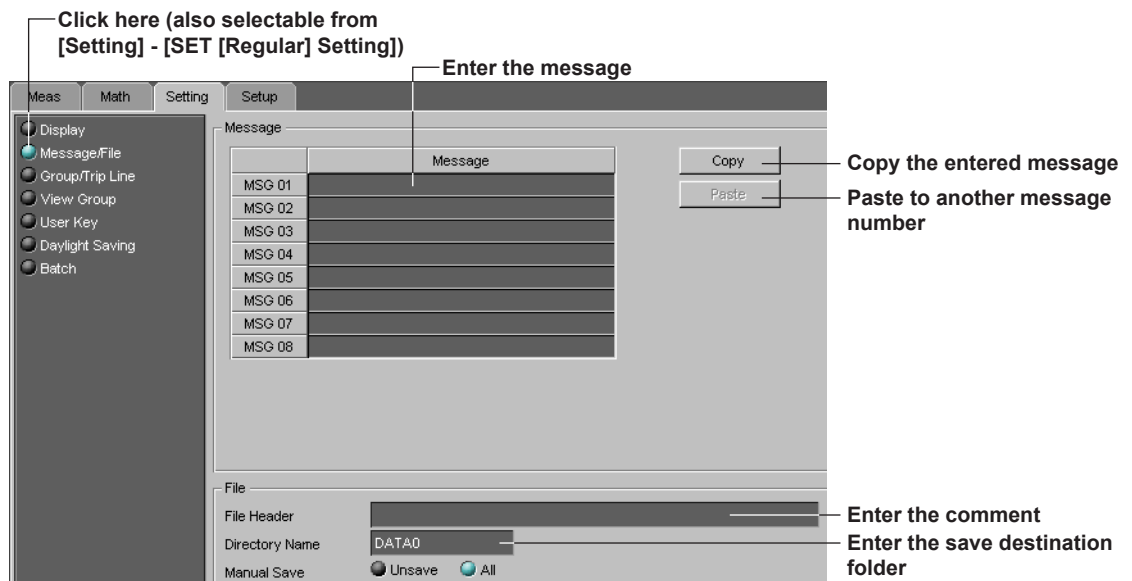
Auto save interval

The auto save interval can be specified when the [Save] is set to [Auto] (see page 5-17) 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 greater than or equal to 2.

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.

Directory name

Set the name of the folder in which the measurement/computation data files is to be saved.

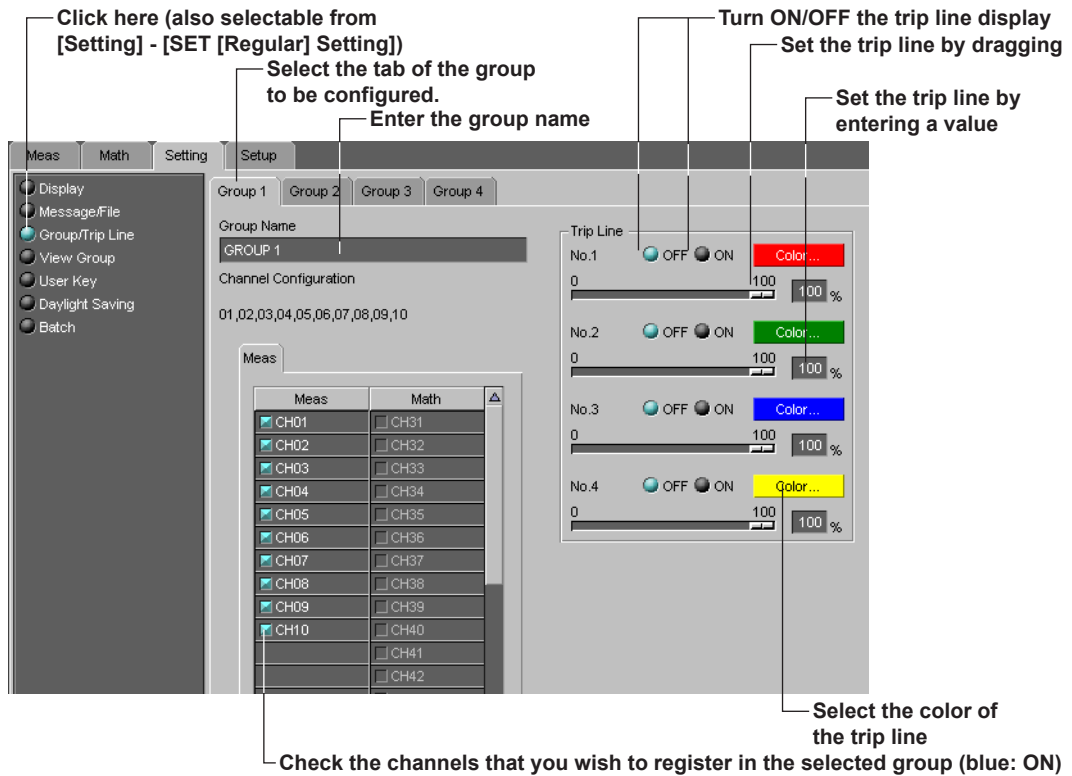
Note

- 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/MV200 and DX100/MV100, respectively. The assigned channels are listed under [Channel Configuration].

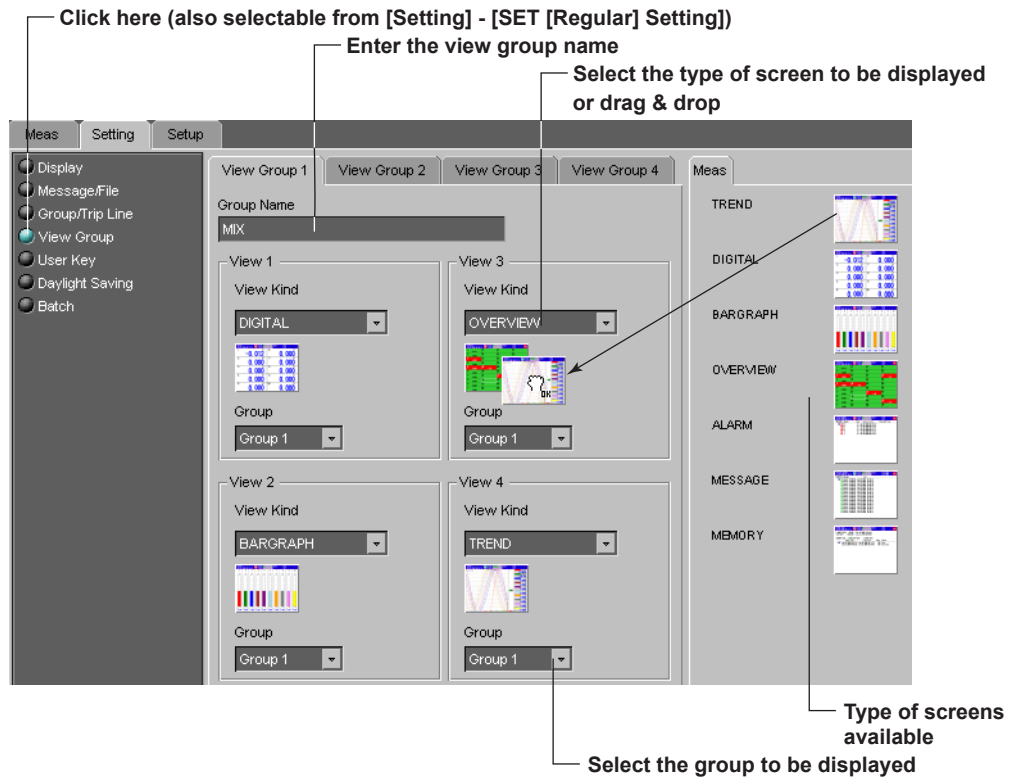
If no channels are specified, CH01 is automatically assigned.

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, MV200 Only)



View group

Up to four view groups can be registered.

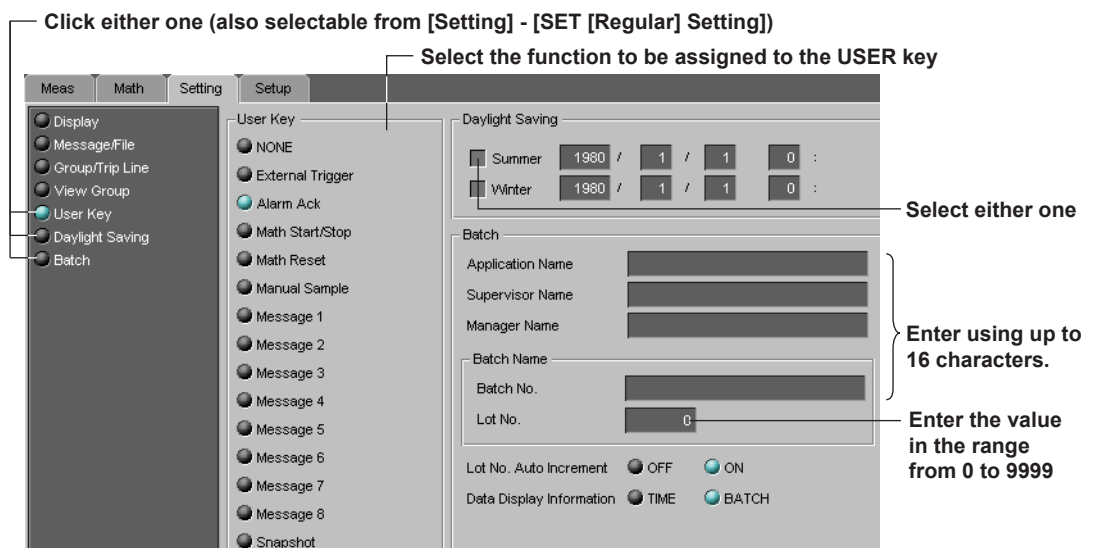
Group Name

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.

View Kind

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

User Key (DX100, DX200 and MV200 Only), Daylight Saving, Batch (Option, When the Style Number is Greater than or Equal to 2)



5.5 Configuring the Setup Mode

Alarm/Relay/Remote

The screenshot shows the 'Setup' tab selected in the top navigation bar. The left sidebar contains a list of settings: Alarm/Relay/Remote (selected), Scan Interval/Memory, Channel, Key Lock/Login, Timer, Report, Temperature, Aux, Time zone, and Network. The main area is divided into 'Alarm/Relay' and 'Remote' sections.

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'.
- Rate of Change Decrease: A dropdown menu set to '1'.
- 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

Buttons for 'Copy' and 'Paste' are located to the right of the Remote table.

Annotations:

- '1. Select this tab' points to the 'Setup' tab in the top navigation bar.
- '2. Click here (also selectable from [Setting] - [SETUP [Basic] Setting]-[Setting])' points to the 'Alarm/Relay/Remote' option in the left sidebar.
- 'Select from 1 to 15 times' points to the 'Rate of Change Increase' and 'Rate of Change Decrease' dropdown menus.
- 'Copy/Paste the selected range' points to the 'Copy' and 'Paste' buttons.
- 'Select the controlled item' points to the 'Action' column of the Remote table.

Alarm

Select the alarm format. The selected items become blue.

Relay AND

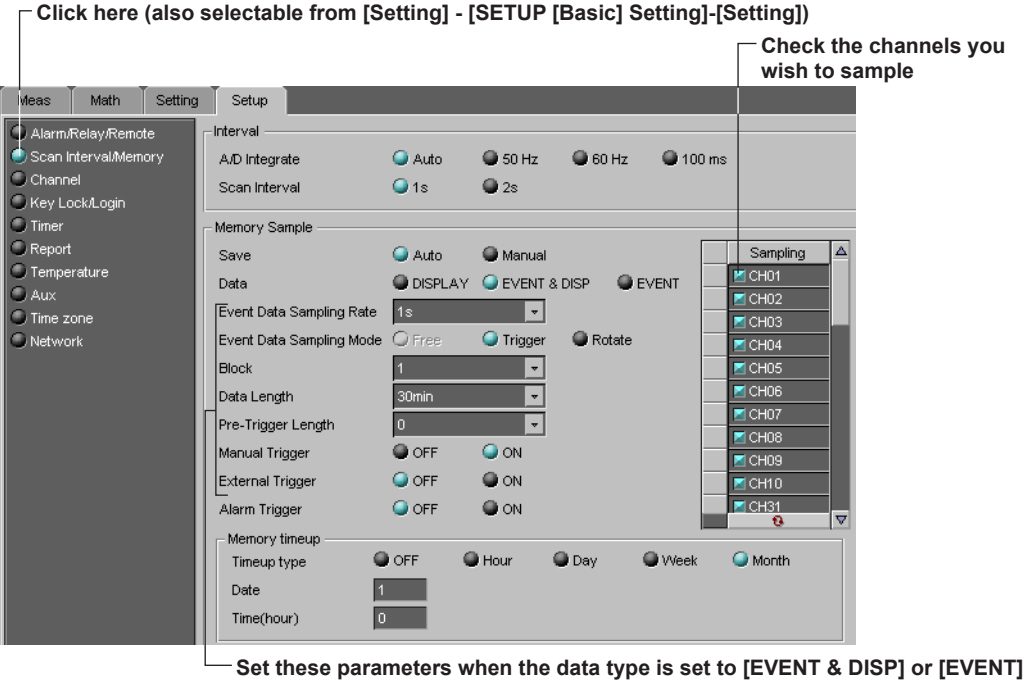
Set the range of relays (from the first alarm relay) to take the AND logic. All other relays will be set to OR logic. If [NONE] is selected, all relays will operate using the OR logic.

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 5-7.

Scan Interval/Memory



A/D Integrate

100 ms can be selected only when the scan interval is set to 2 s.

Scan interval

The selectable scan intervals vary depending on the model as follows:
 DX102, DX104, DX204, DX208, MV102, MV104, MV204, and MV208: 125 ms and 250 ms
 DX106, DX112, DX210, DX220, DX230, MV106, MV112, MV220, and MV230: 1s and 2 s

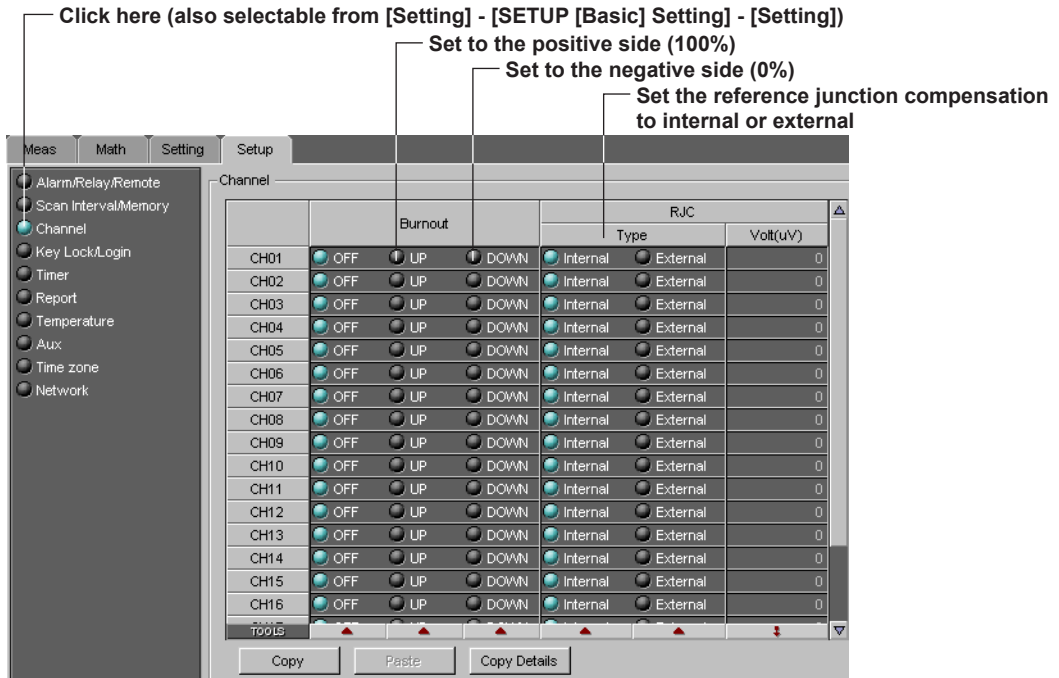
Memory Sample (save method of measured/computed data)

- 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)

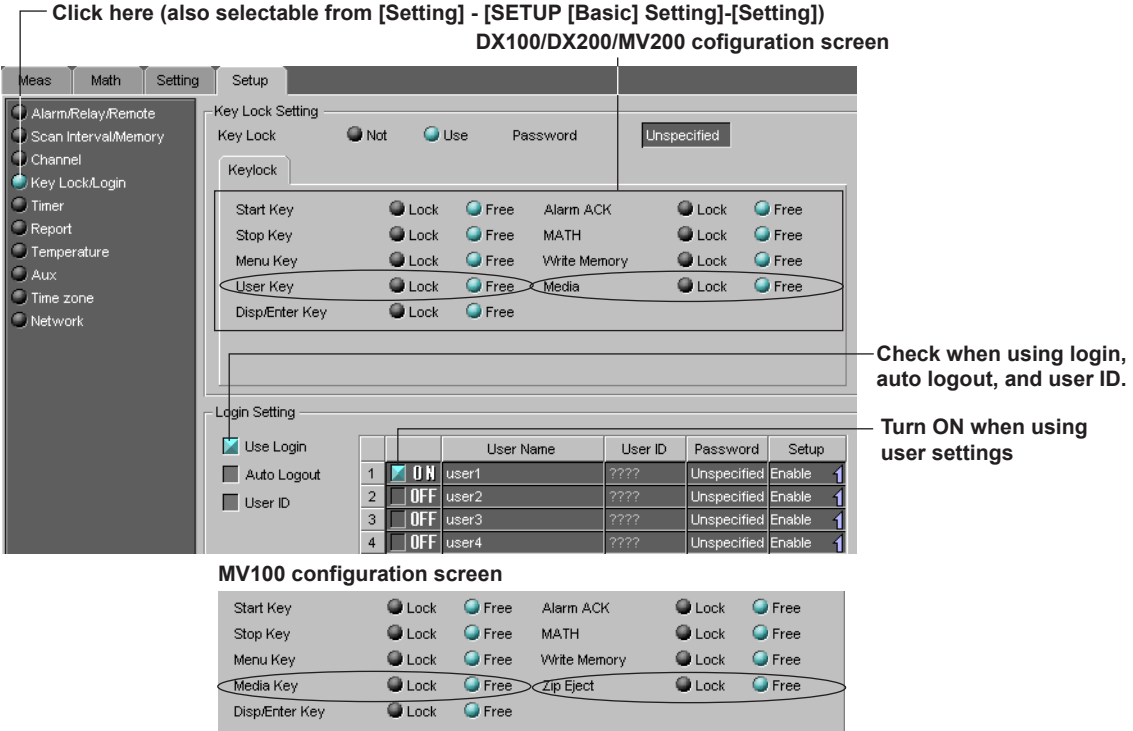
When the reference junction compensation is set to [External], set the compensation value in the range from -20,000 to 20,000.

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.

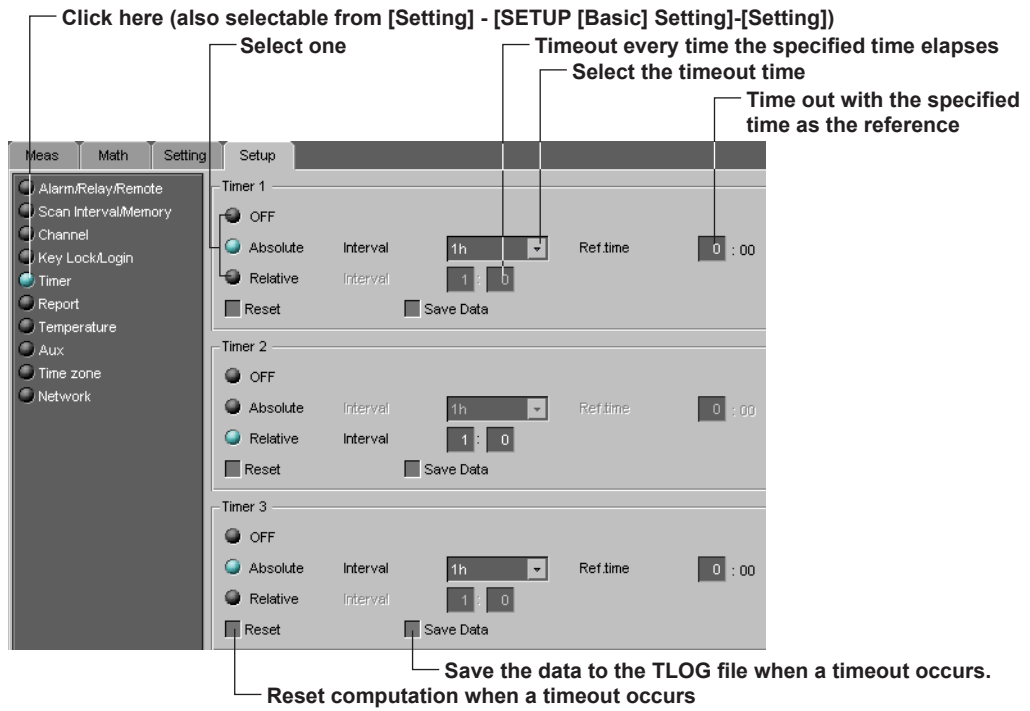
Setting the login

- 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)



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)

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

Set the date and time at which to create the report

	RefCh	Sum Scale
REPORT 01	1	Off Sec Min Hour Day
REPORT 02	2	Off Sec Min Hour Day
REPORT 03	3	Off Sec Min Hour Day
REPORT 04	4	Off Sec Min Hour Day
REPORT 05	5	Off Sec Min Hour Day
REPORT 06	6	Off Sec Min Hour Day
REPORT 07	7	Off Sec Min Hour Day
REPORT 08	8	Off Sec Min Hour Day
REPORT 09	9	Off Sec Min Hour Day
REPORT 10	10	Off Sec Min Hour Day
REPORT 11	11	Off Sec Min Hour Day
REPORT 12	12	Off Sec Min Hour Day
REPORT 13	13	Off Sec Min Hour Day
REPORT 14	14	Off Sec Min Hour Day
REPORT 15	15	Off Sec Min Hour Day

Select the channel to be reported
Enable (ON)/Disable (OFF) the report channel settings

Report channel

There are 30 channels and 12 channels on the DX200/MV200 and DX100/MV100, respectively.

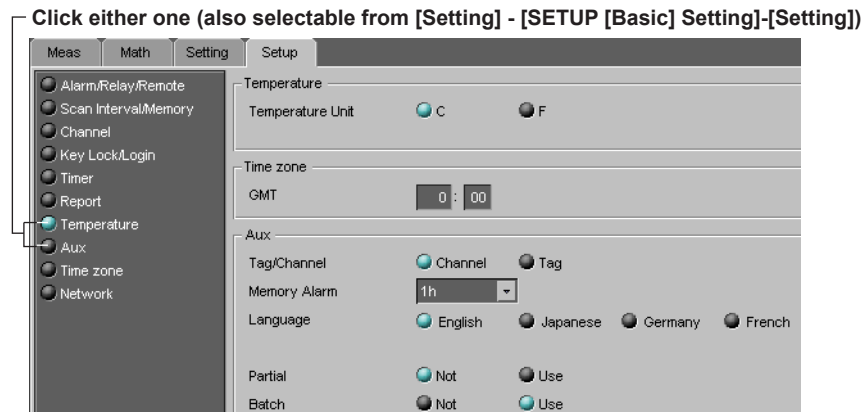
Converting the reference unit time

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 5-7.

Setting the Temperature, Tag, Memory Alarm Time, Displayed Language, and Partial Expanded Display



Temperature

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

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 3-6). If you select tag name, you can select the label display from tag and channel.

Memory alarm time

Free space in the internal memory is monitored, and the memory full relay 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 greater than or equal to 2, 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)

You can set the batch function when the style number of the DX or MV is greater than or equal to 2.

Network

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

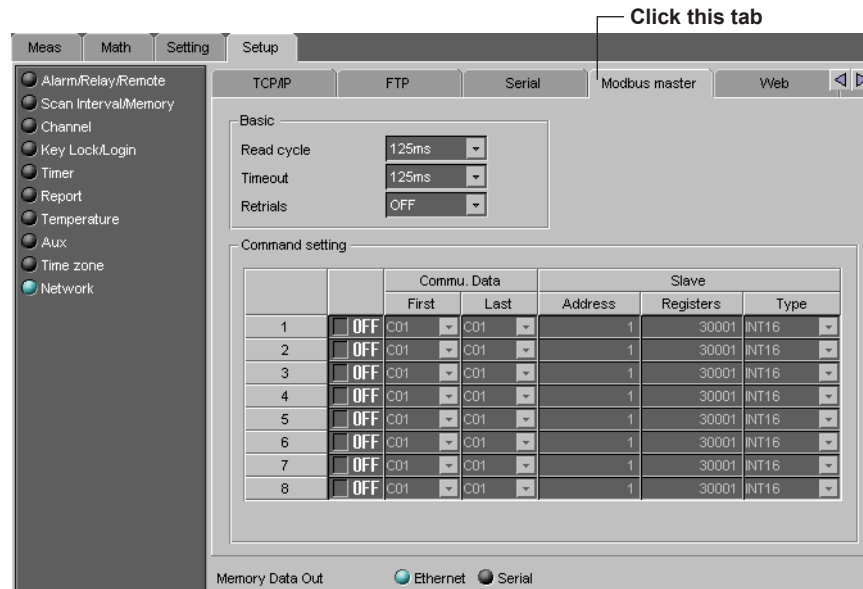
When using serial communications between the CX and other devices, set the parameters required for serial communications. In the [Protocol] settings, if [MODBUS MASTER] is selected, you must to click the [Modbus master] tab and make Modbus master settings.

Click this tab

5.5 Configuring the Setup Mode

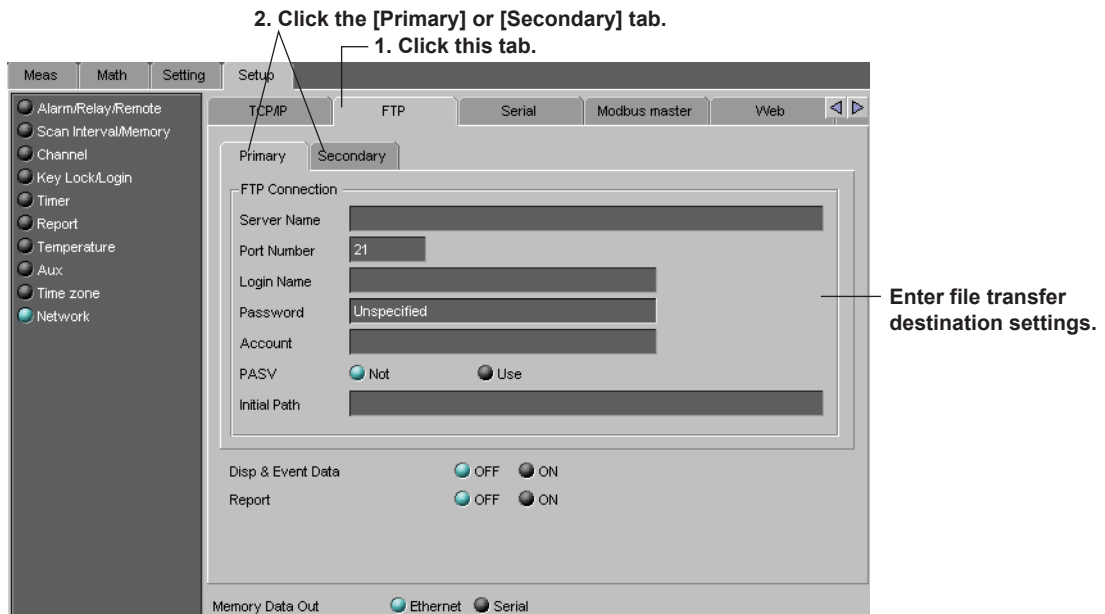
Modbus Master Settings

When using the CX as a Modbus master, enter the Modbus master basic and command settings. For details about the settings.



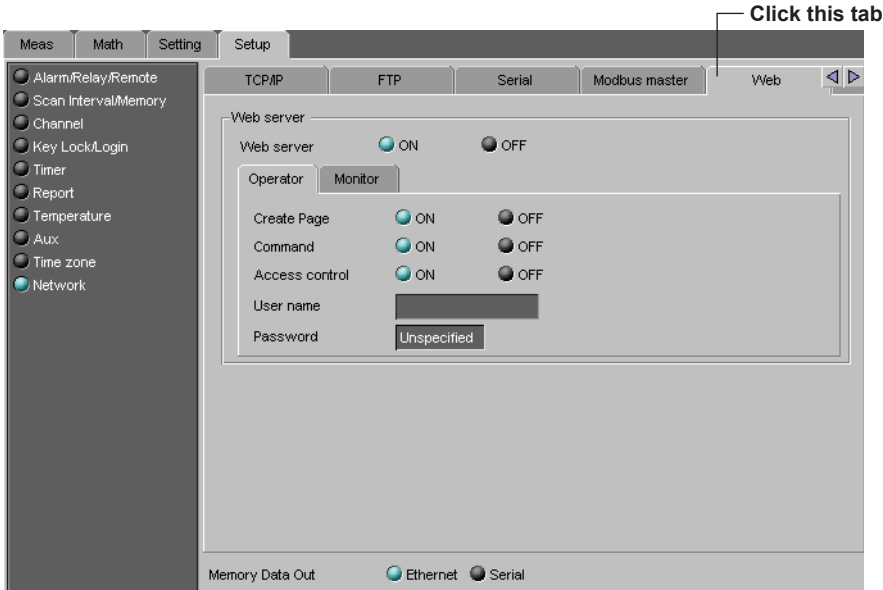
FTP Settings

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 necessary [FTP Connection] settings in the dialog box below.



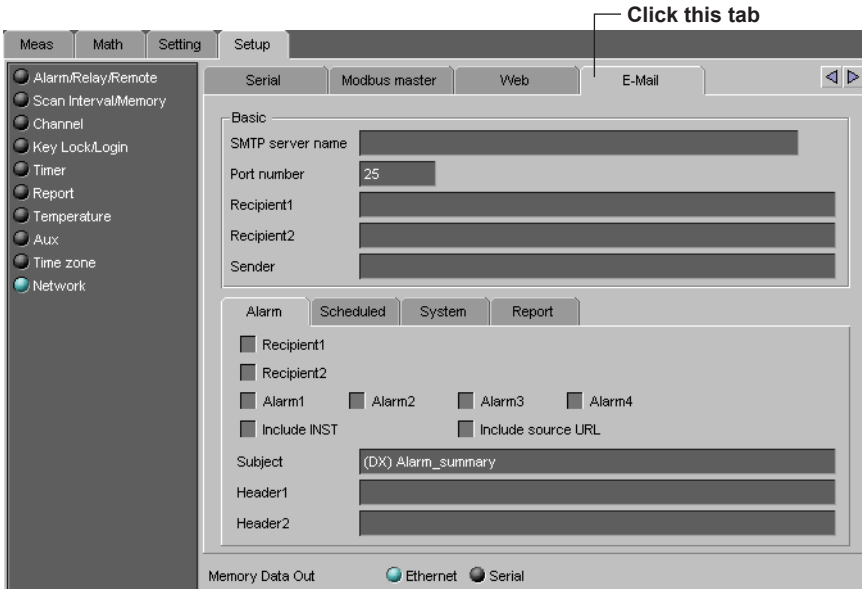
Web Server Settings

When using Ethernet communications, the CX can be set up as a web server. Set [Web Server] to [ON], and then set the access certification for the operator page and monitor page.



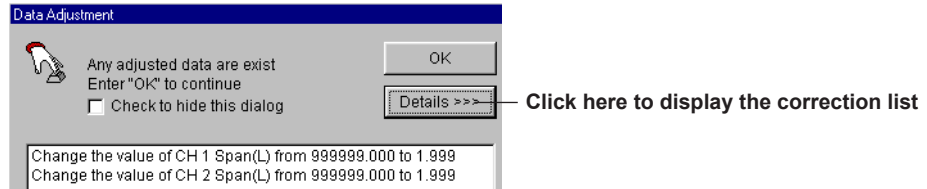
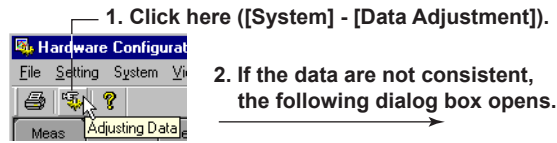
E-mail Transmission Settings

When using e-mail transmission, specify [SMTP server name], [Port number], [Recipient1], etc. For details about the settings.



By clicking the [Alarm], [Scheduled], [System], or [Report] tab, you can make settings separately for each type of e-mail message.

5.6 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.

5.7 Sending the Setup Data to the DX/MV

The method used to send the data varies depending on whether a CONFIG file or setup data file is being transmitted.

CONFIG file

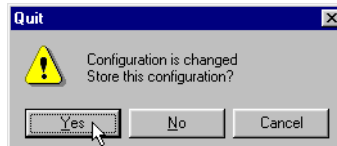
The following two methods are available:

- **Selecting from the toolbar**



The setup data are sent when [File] - [Store] is selected.

- **Clicking the [X] button**



When the Configurator is closed by clicking the [X] button, a confirmation dialog box is displayed.

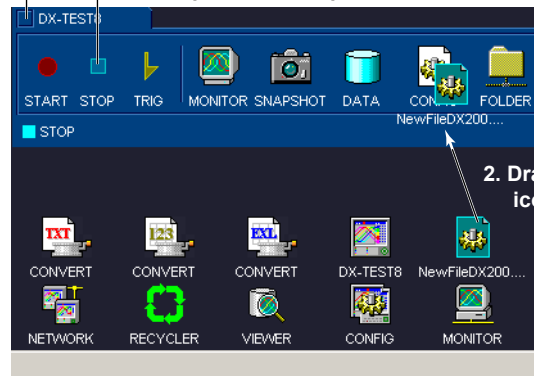
To send the new setup data to the DX100/DX200/MV100/MV200, click the [Yes] button.

Otherwise, click the [No] or [Cancel] button.

If the DX100/DX200/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.

Setup data file

1. Stop the data acquisition to the memory.



2. Drag and drop the file onto the CONFIG icon of the DX/MV folder

The contents of the setup data file (*.PNL) located on the DAQ Desktop can be transmitted. If the DX100/DX200/MV100/MV200 is acquiring data to the memory, the data will not be sent in this case.

Note

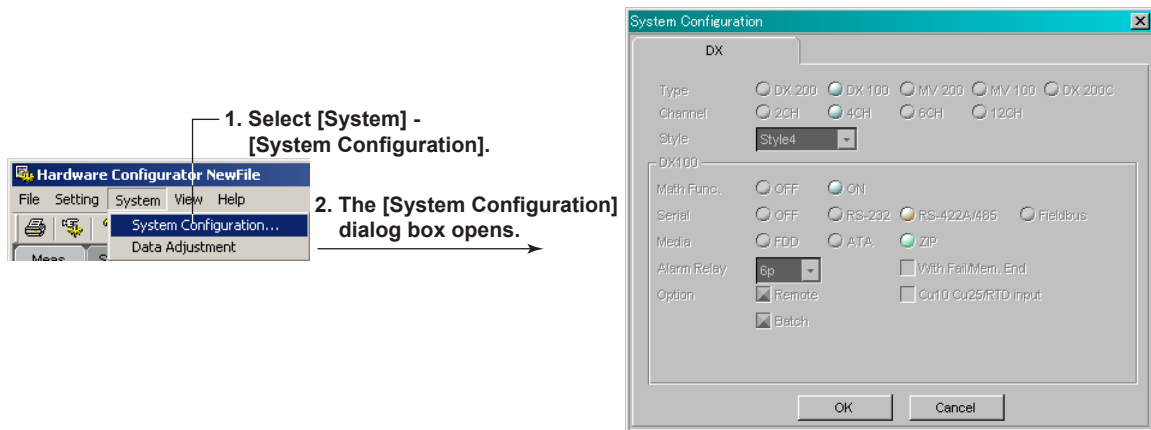
Of the network settings in the [Setup] tab, the following items are not transmitted.

- [IP Address] under the [TCP/IP] tab
- All settings under the [Serial], [Modbus master], and [Web] tabs

5.8 Checking the System Configuration and Initializing Setup Data

Checking the System Configuration

On the DX/MV Configurator of the connected DX100, DX200, MV100, or MV200, selecting [System Configuration] from the [System] menu opens the [System Configuration] dialog box. You can only view the system configuration on this [System Configuration] dialog box.

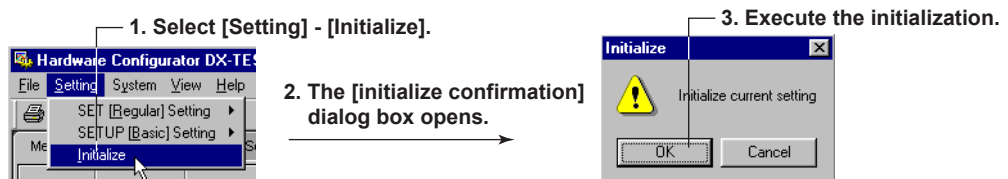


Note

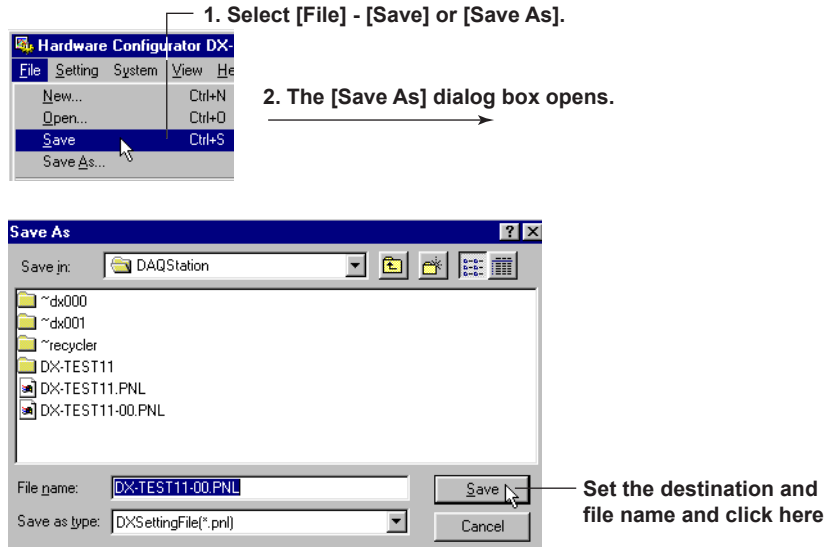
If you select [System Configuration] from the [System] menu on the DX/MV Configurator that was opened by double-clicking the setup data file on the DAQ desktop or loading the setup data, a [System Configuration] dialog box in which you can change the system configuration opens. If the system configuration is changed in this dialog box and the [OK] button is clicked, a message "System Configuration is changed Input&Data are Initialized" appears. Click the [OK] button to initialize the data.

Initializing the Setup Data

To initialize the settings, select [Initialize] from the [Setting] menu on the DX/MV Configurator.



5.9 Saving the Setup Data



Save

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

Save As

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

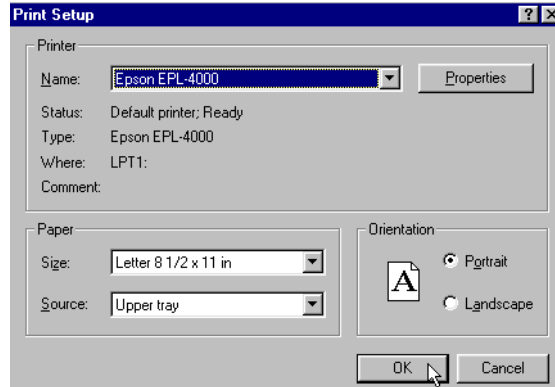
Note

The CONFIG file (directly view the setup data of the DX100/DX200/MV100/MV200) cannot be saved using [Save] or [Save As].

5.10 Printing the Setup Data

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

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

Print Preview

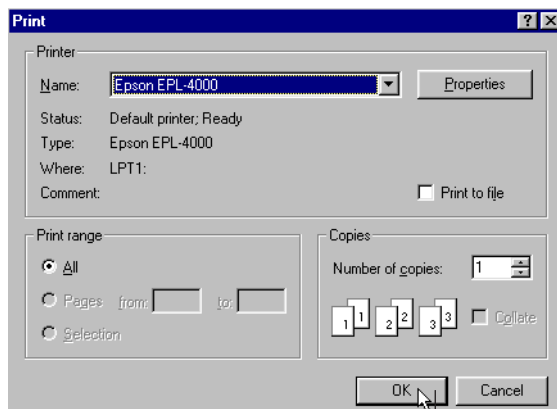
You can preview the print layout before actually printing the data. Selecting [File] - [Print Preview] displays the print preview screen.

Printing

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



2. The [Print] dialog box opens.



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

5.11 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.

6.1 Starting the Configurator

The following two types of files can be opened using the Configurator:

CONFIG file

This is the file located in the DX1000/DX2000 folder. It allows a direct view of the setup data of the DX1000/DX2000. Only one CONFIG file exists in one DX1000/DX2000 folder.

You can change the setting on the Configurator, but the file cannot be saved.

Setup data file (*.PDL)

This is the file that is saved to the PC such as to the DAQ Desktop. You can change the settings on the Configurator and save the file and create new setup data.

The Configurator can transmit and receive the setup data, change the setup data, and create new setup data. It can configure the following software version of DX1000/DX2000.

DX1000/DX2000: Firmware version 1.00 or later

Copying the Setup Data to the DAQ Desktop

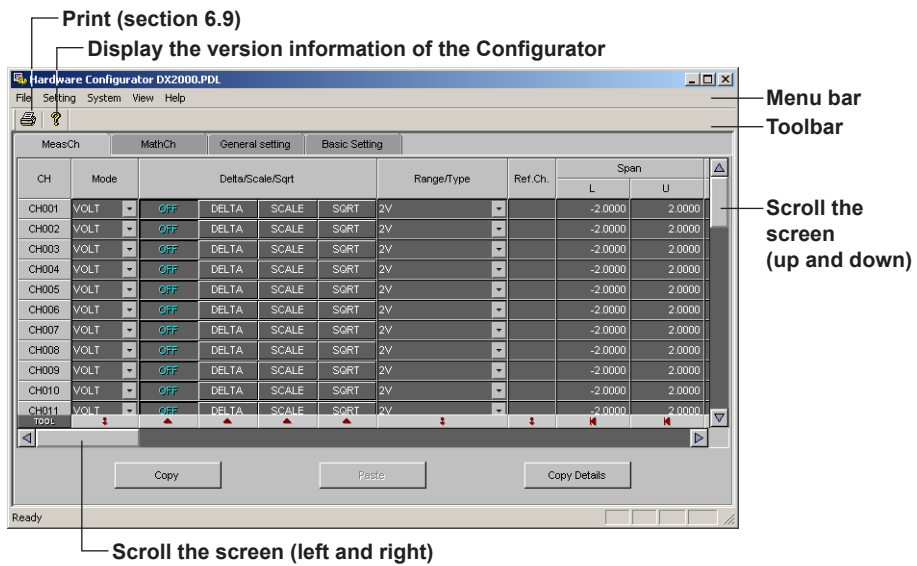
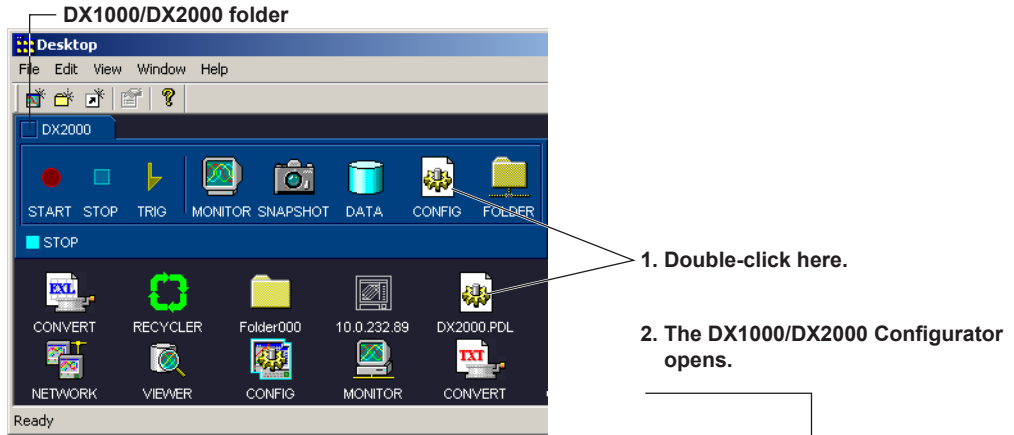
You can copy the CONFIG file to the DAQ Desktop by dragging and dropping the CONFIG icon of the DX1000/DX2000 folder onto the DAQ Desktop.

The extension of the file that is copied becomes [PDL].

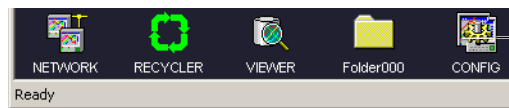
6.1 Starting the Configurator

Starting the Configurator

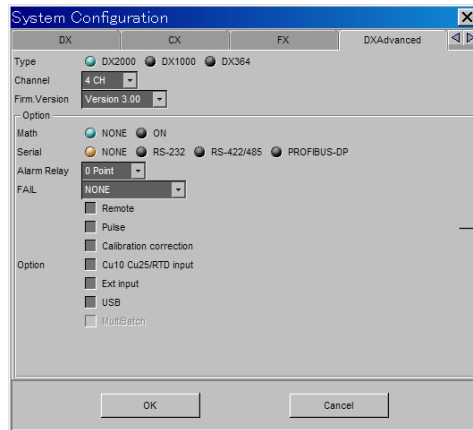
To create a new setup data file apart from the connected DX1000/DX2000, double-click the CONFIG icon on the DAQ desktop or choose **File > New** in the DX1000/DX2000 Configurator to display the System Configuration dialog box. Configure the system, then open the DX1000/DX2000 setting screen.



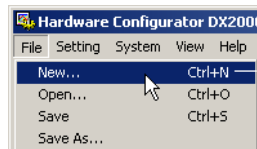
Creating Setup Data by Configuring a New System



1. Double-click the CONFIG icon on the desktop.
2. The [System Configuration] dialog box opens.



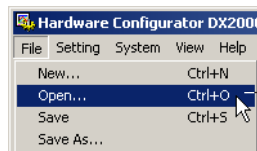
3. Click the appropriate items and click the [OK] button to open the Configurator screen.



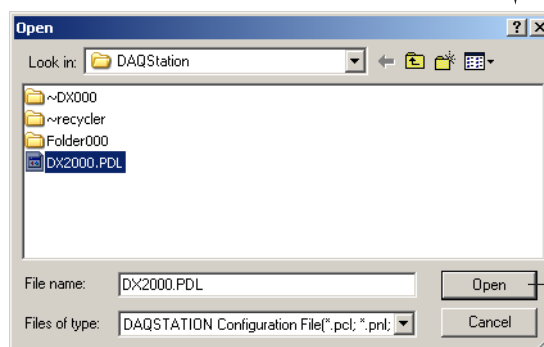
- Select [File]-[New] to create new setup data from the second time.

Create the setup data according to step 2 and 3.

Loading Preexisting Setup Data



1. Select [File]-[Open].
2. The [Open] dialog box opens.



- Select a file with .PDL extension and click here.

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

6.2 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
 Scale
 Square root
 Select the reference for the difference computation
 Set the span
 Enter the scale

MeasCh	MethCh	Ext Ch	General setting			Basic Setting			Ref.Ch	Span			Scale	
CH	Mode		Delta/Scale/Sqrt		Range/Type				L	U	Point	L	U	
CH001	VOLT		OFF	DELTA	SCALE	SGRT	2V		-2.0000	2.0000				
CH002	VOLT		OFF	DELTA	SCALE	SGRT	2V	1	-2.0000	2.0000				
CH003	VOLT		OFF	DELTA	SCALE	SGRT	2V		-2.0000	2.0000	2	0.00	200.00	
CH004	VOLT		OFF	DELTA	SCALE	SGRT	2V		-2.0000	2.0000	2	0.00	200.00	
CH005	VOLT		OFF	DELTA	SCALE	SGRT	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	Type	Alarm 1			Alarm 2			Type	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect	Type	Value
	Low Cut point		H	Value	Alarm Relay	Detect	H	Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect	Type	Value		
			H	0.0000	S01		H	0.0000	None		OFF	0.0000	None		OFF	0.0000		
			L	0.0000	S02		H	0.0000	None		OFF	0.0000	None		OFF	0.0000		
			R	0.01	S03		H	0.00	None		OFF	0.00	None		OFF	0.00		
	0.5	r	H	0.01	S04		H	0.00	None		OFF	0.00	None		OFF	0.00		
			H	0.00	None		H	0.00	None		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
 Enter the sampling count
 Enter the tag name
 Enter the tag number

Alarm 4				Alarm Delay	Moving Average	Tag		Tag No.
Type	Value	Alarm Relay	Detect	10 sec	Times			
OFF	0.0000	None	ON	10 sec	OFF	2		
OFF	0.0000	None	ON	10 sec	OFF	2		
OFF	0.00	None	ON	10 sec	OFF	2		
OFF	0.00	None	ON	10 sec	OFF	2		
OFF	0.0000	None	ON	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	10	ON	50	0.0000
ON	0	100	2	10	Center	11	ON	50	0.0000
ON	0	100	3	10	Center	12	ON	50	0.01
ON	0	100	4	10	Normal	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

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
Red	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 values in the Range/Type list box vary depending on the above settings.

The following input types have been added in release number 3.

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

Span L, Span U

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

The selectable range for Type N has been expanded (from -270.0 to 1300.0°C) in release number 3.

Note

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

Linear Scaling (SCALE)

Converts the unit to obtain the measured value.

- **Scale L, Scale U**

Input range after converting the unit. The selectable range is from -30000 to 30000 .

- **Point**

Set the number of digits to the right the decimal to four digits or less (0 to 4).

Note

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

Difference Computation (DELTA)

Displays the difference between the input and the reference channel.

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

6.2 Setting the Measurement Channels, Ext. Channels

Ref. CH

The reference channel for difference computation.

Square Root

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

Unit

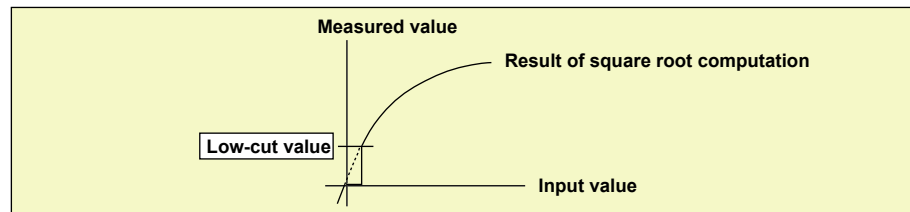
Enter the unit using up to six characters.

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

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

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

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



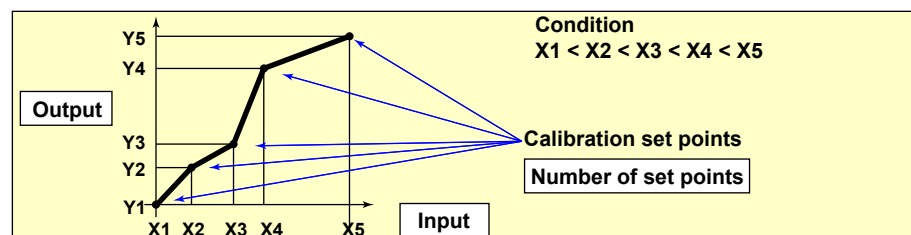
Calibration Correction

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

	Input	Output
1	-2.0000	0.0000
2	0.0000	0.0000
3	1.0000	0.0000
4	1.5000	0.0000
5	1.7500	0.0000
6	1.8750	0.0000
7	2.0000	0.0000

Buttons: Add, Del, OK, Cancel

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 [No Logging] is turned [ON] under [Alarm] - [Alarm action] in the [Basic Setting] tab.

Select whether to show or hide the alarm indication when an alarm occurs. If set to [OFF], a signal is output to the alarm output relay or internal switch when an alarm occurs, but it is not indicated on the screen. The alarm is also not recorded in the alarm summary.

Moving Average

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

Tag and Tag No.

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

Release number 2 or earlier

You can enter tags using up to 16 characters.

Release number 3 or later

You can enter tags using up to 32 characters.

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

Memory Sampling

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

Zone (Zone L and U)

You can select the range of the screen in which the waveform of each channel is to be displayed.

Specify positions (%) on the display scale for the upper and lower limits.

The conditions for setting the zones are as follows:

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

Graph

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

Scale display position

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

Scale divide position

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

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

Bar display position

Select [Normal], [Center], [Lower]¹, or [Upper]¹.

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

Bar divide number

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

Partial (Partial Expanded Display)

Bound position (%)

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

Boundary

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

Example: Input range: –6 V to 6V. Bound position: 30. Boundary: 0

The –6 V to 0 V range is displayed in the 0% to 30% range, and the 0 V to 6 V range is displayed in the 30% to 100% range.

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

- Measurement channel
 - When SCALE and SQRT are not used: $\text{Span L} < \text{boundary} < \text{span U}$
 - 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

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

Color (Display Color)

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

Green Band

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

Region (Band area)

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

Color

Set the display color.

L and U

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

L: Lower limit of the area.

U: Upper limit of the area.

Alarm Mark

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

Mark kind

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

Scale display

To display alarm point marks, select [ON].

Mark color

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

Copying and Pasting Setup Data

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

Selecting the Items That You Want to Copy

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

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

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

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

Copy the copy source settings

Paste to the copy destination

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.

6.2 Setting the Measurement Channels, Ext. Channels

Setting One Channel at a Time

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

CH	Mode	Delta/Scale	Delta/Scale
CH001	VOLT	OFF	DELTA
CH002	VOLT	OFF	DELTA
CH003	VOLT	OFF	DELTA

2. The channel setting dialog box opens.

Type	Value	Alarm Relay
1	OFF	0.0000 None
2	OFF	0.0000 None
3	OFF	0.0000 None
4	OFF	0.0000 None

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.

6.3 Setting the Computation Channels

Double-click when setting each channel
 Select this tab
 Enter the expression

MeasCh	MathCh	Ext.Ch	General sett
CH	Use	Expression	
CH101	<input checked="" type="checkbox"/>	(001+002)*K01	
CH102	<input checked="" type="checkbox"/>	201-002*K02	
CH103	<input checked="" type="checkbox"/>	001.K03	
CH104	<input checked="" type="checkbox"/>	003*K04	
CH105	<input type="checkbox"/>	001	

Turn ON/OFF computation

Set the display span
 Enter the unit

Ch	Span		Unit	TLOG			Constant
	L	U		Timer	Sum Scale	Reset	
0	0	20000		1	/s	<input checked="" type="checkbox"/>	K01 0.1
1	0.0	2000.0		1	/min	<input checked="" type="checkbox"/>	K02 1
2	0.00	200.00		1	/h	<input checked="" type="checkbox"/>	K03 2
3	0.000	20.000		1	OFF	<input checked="" type="checkbox"/>	K04 3
2	0.00	200.00		1	OFF	<input type="checkbox"/>	K05 1

Select the number of digits to the right the decimal

Set the alarm

Timer type	TLOG			Rolling Average		Alarm 1		
	Timer	Sum Scale	Reset	Interval	Count	Type	Value	Alarm Relay
Timer	1	OFF	<input checked="" type="checkbox"/>	10s	1	OFF	0.00	None
Timer	1	OFF	<input checked="" type="checkbox"/>	10s	1	OFF	0.00	None
Timer	1	OFF	<input checked="" type="checkbox"/>	10s	1	OFF	0.00	None
Timer	1	OFF	<input checked="" type="checkbox"/>	10s	1	OFF	0.00	None

Turn ON/OFF all at once

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	

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

Enter the alarm delay time
 Enter the tag
 Enter the tag number
 Display zone

Alarm 4				Alarm Delay	Tag	Tag No.	Memory Sampling	Zone		
Type	Value	Alarm Relay	Detect					L	U	S
OFF	0	None	<input checked="" type="checkbox"/>	10 sec			<input checked="" type="checkbox"/>	0	100	1
OFF	0.0	None	<input checked="" type="checkbox"/>	10 sec			<input checked="" type="checkbox"/>	0	100	1
OFF	0.00	None	<input checked="" type="checkbox"/>	10 sec			<input checked="" type="checkbox"/>	0	100	1
OFF	0.000	None	<input checked="" type="checkbox"/>	10 sec			<input checked="" type="checkbox"/>	0	100	1
OFF	0.00	None	<input checked="" type="checkbox"/>	10 sec			<input checked="" type="checkbox"/>	0	100	1

Initialize

Set the graph
 Partial expansion
 Display color

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

Select the mark type
 Turn ON/OFF scale display

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
Red	Inside	Green	0	100	Fixed	<input checked="" type="checkbox"/>	Red	Yellow	Yellow	Red
Green	Outside	Green	0.0	10.0	Fixed	<input checked="" type="checkbox"/>	Red	Yellow	Yellow	Red
Blue	OFF	Green	0.00	1.00	Alarm	<input checked="" type="checkbox"/>	Red	Yellow	Yellow	Red
Blue	OFF	Green	0.000	0.100	Alarm	<input checked="" type="checkbox"/>	Red	Yellow	Yellow	Red
Blue	OFF	Green	0.00	1.00	Alarm	<input type="checkbox"/>	Red	Yellow	Yellow	Red

Use (Turning ON/OFF Computation)

Select whether or not to perform computation for each channel.

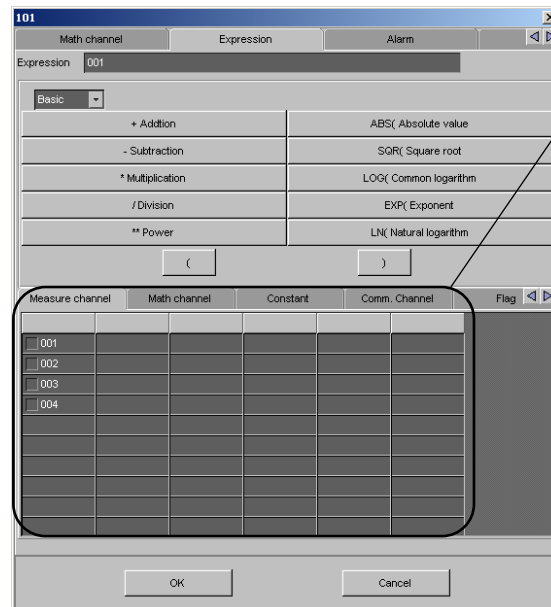
6.3 Setting the Computation Channels

Turning Computation ON/OFF

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

Entering Expressions

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



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

Span (Display Span) and Point

Sets the upper and lower limits of the display.

The range is from -9999999 to 99999999. Set the number of digits to the right the decimal to four digits or less (0 to 4).

Unit

Enter the unit using up to six characters.

TLOG (TLOG Computation)

Timer

Select Timer or MatchTimeTimer.

Sum Scale

Set the sum scale to [1/s], [1/min], [1/h] to match the unit of the measured value.

Example: If the unit of the measured value is "m³/min," select [1/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.”

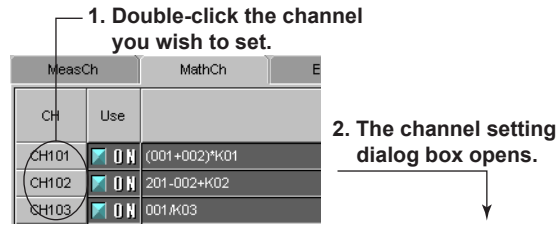
Constant

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



Clicking here and selecting the list of operators switches the display

Select arbitrary channels from the measure channel, Math channel, and Ext channel tab pages, then select arbitrary operators to create an expression.

Click to switch the tab display

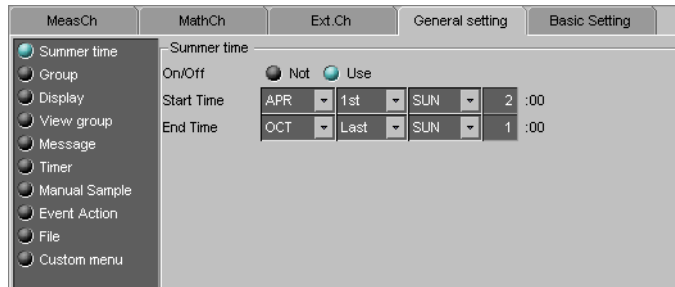
The dialog box shows the 'Expression' tab selected. The 'Basic' operator list includes: + Addition, - Subtraction, * Multiplication, / Division, and ** Power. The channel selection grid below has columns for Measure channel, Math channel, Ext channel 201, Ext channel 261, and Ext channel. The grid contains checkboxes for channels 001 through 048.

The items for the selected tab are displayed

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.

6.4 Entering General Settings

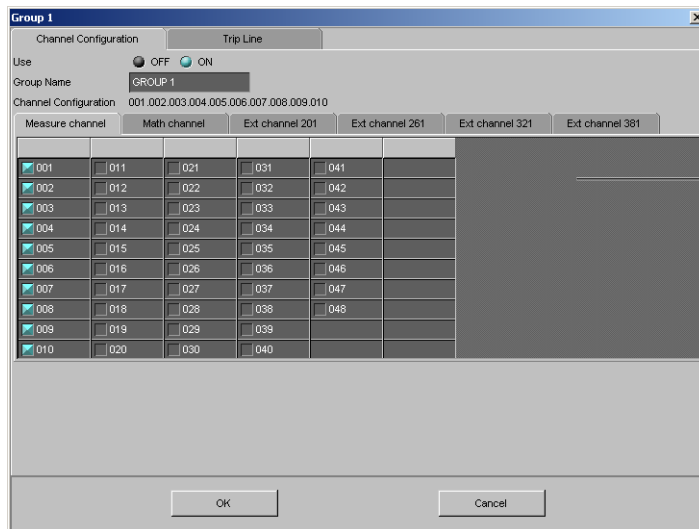
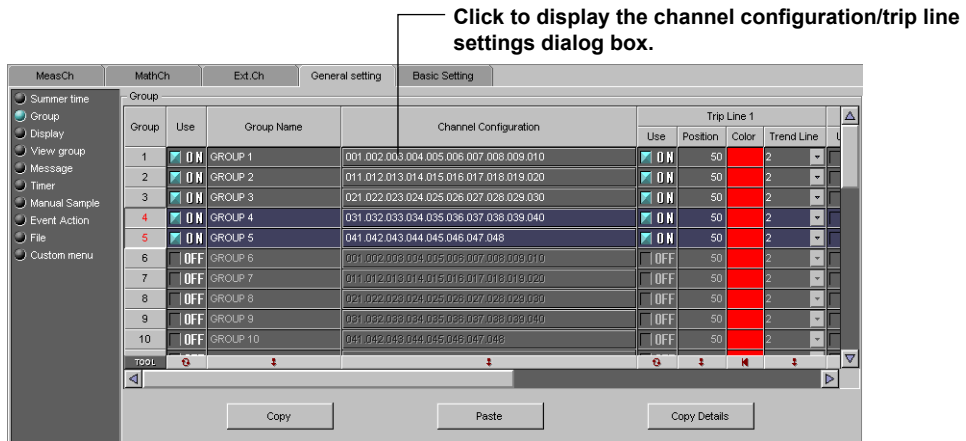
Summer Time



Start Time and End Time

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

Screen Display



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

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

6.4 Entering General Settings

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

Measure channel	Math channel	General setting	Basic setting
- Logging			
		Trend Interval[div.]	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 type="radio"/> OFF <input checked="" type="radio"/> ON
		Message Direction	<input checked="" type="radio"/> Horizon <input type="radio"/> Vertical
		Scale Digit	<input checked="" type="radio"/> Normal <input type="radio"/> Fine
		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 checked="" type="radio"/> Dimmer <input 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
- FAVORITE 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

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

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

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

Circular Time Per revolution [/rev]

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

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

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

This is fixed at [ON] if you are using the multi batch function (/BT2 option; release number 3 or later). You can set the multi batch function by setting [Batch operation qty] under [Environment] - [Detail Setting] in the [Basic setting] tab.

6.4 Entering General Settings

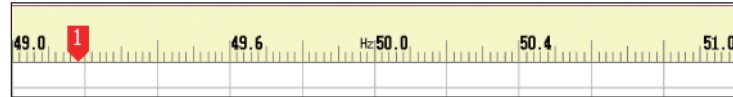
Message direction

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 Direction

Select Bar graph direction.

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.

Select whether to automatically switch on the operation display.

Jump Default Display

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

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

FAVORITE Key action (Release number 3 or later)

- **Action**

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

- **Group display**

This setting is valid when [Action] is set to [Favorite].

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

- **Time axis zoom**

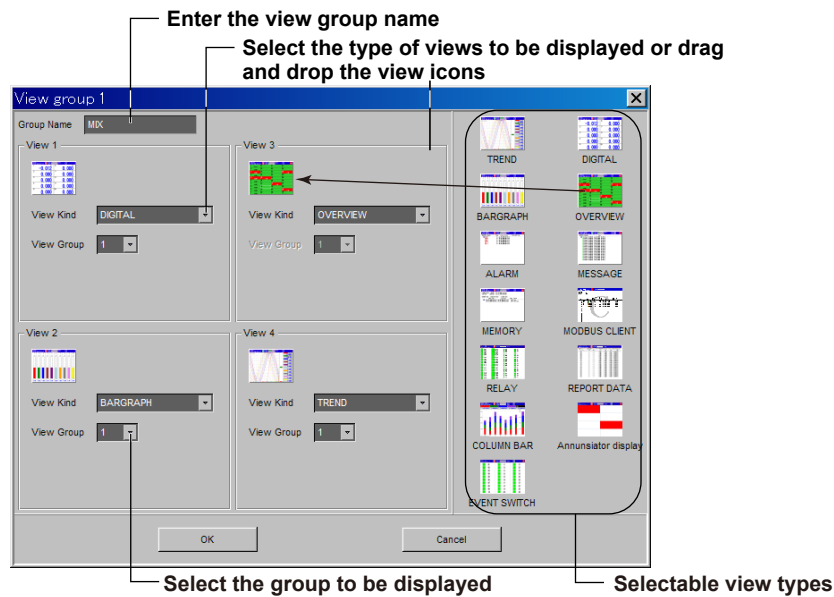
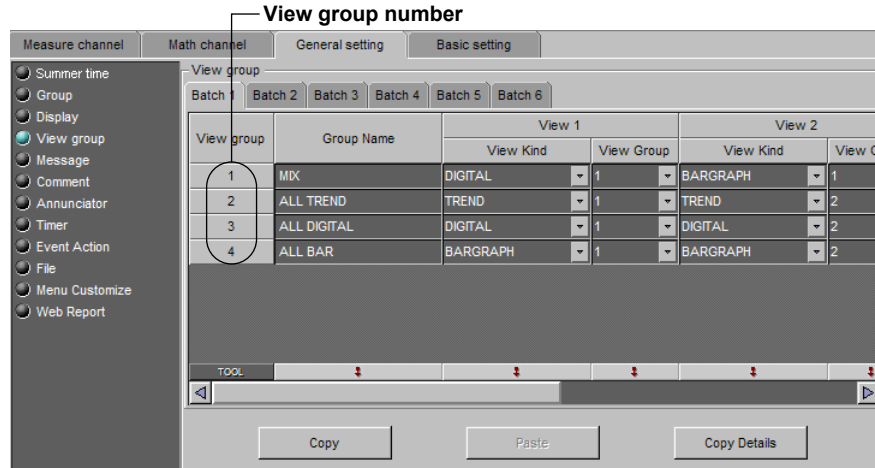
This setting is valid when [Action] is set to [Favorite].

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

View Group

Set the screens that will be displayed in the 4 panel display. This function is for the DX2000 only.

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



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

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

Group Name

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

View Kind

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

You can also select the COLUMN BAR, Annunciator display, and EVENT SWITCH screens (release number 3 or later).

View Group

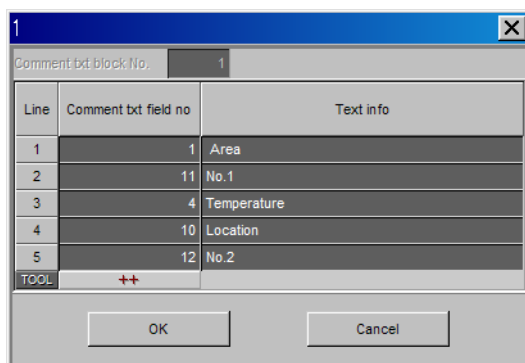
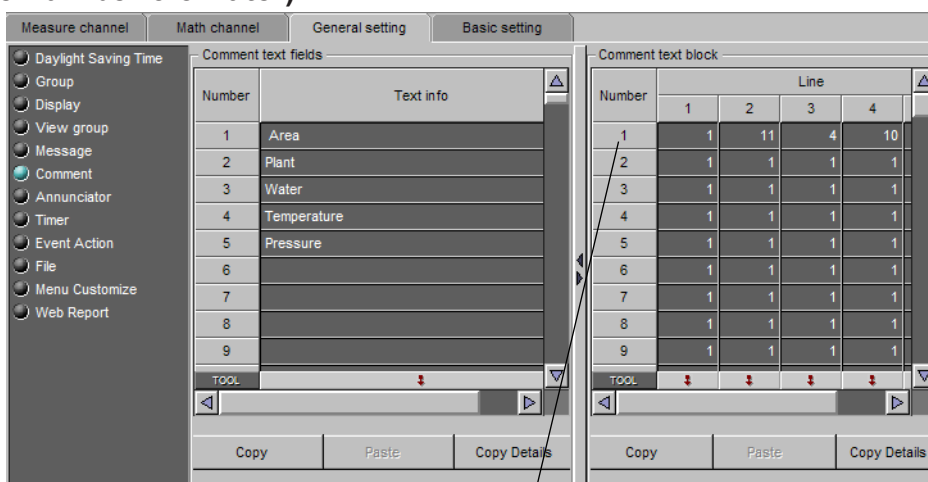
Up to four view groups can be registered. Specify the group to display. If you select COLUMN BAR, specify the COLUMN BAR group.

Message



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

Comment (Release number 3 or later)



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

Comment text fields

- **Number and Text info**

You can register text strings to Text info boxes.

Text string: You can enter up to 32 characters.

Model	Number of comment text fields
DX1000	100
DX2000	200

6.4 Entering General Settings

Comment text block

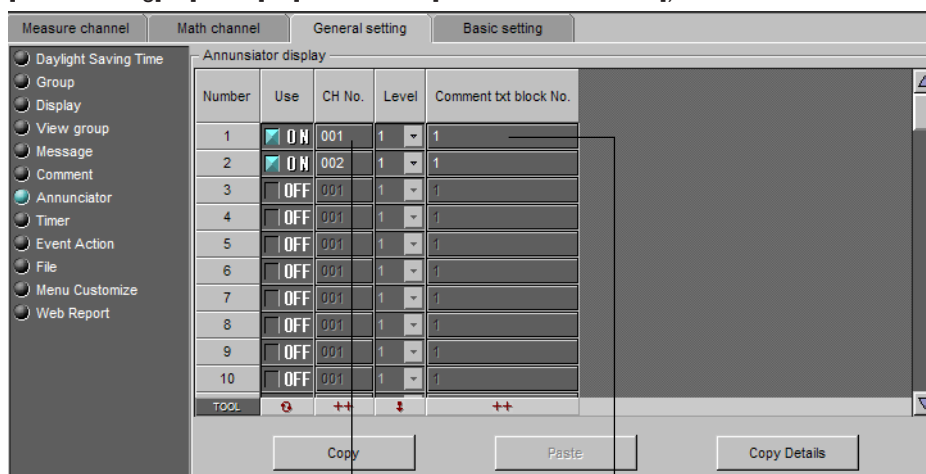
- **Number and Line**

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

Model	Number of comment text blocks
DX1000	50
DX2000	100

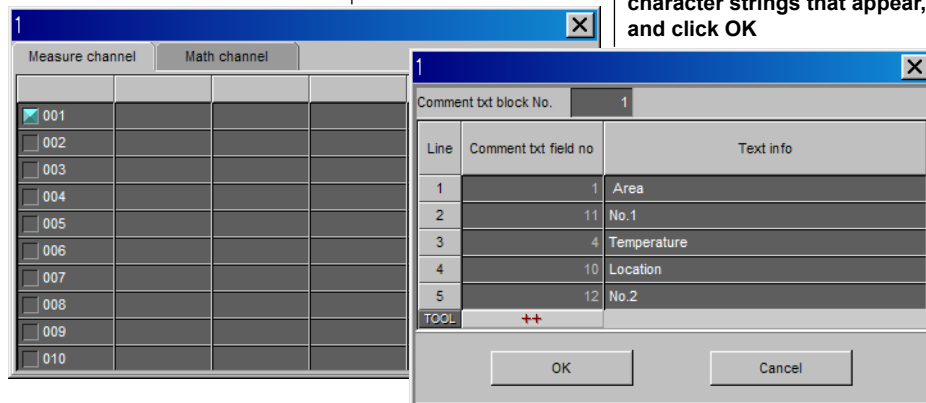
Annunciator (Release number 3 or later)

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



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

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



Number

The position of the annunciator window.

Model	Displayed Windows
DX1000	24 or less
DX2000	80 or less

Use

Set the annunciator position that you want to use to [ON].

Starting with 1, consecutively set all annunciator positions that you want to use to [ON].

After a position has been set to [OFF], all of the positions after it will also be turned off even if they are set to [ON].

CH No. and Level

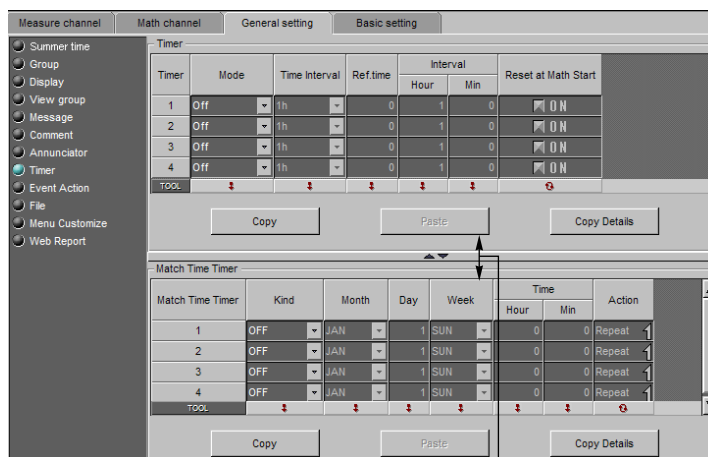
You can assign alarms to annunciator windows by specifying channel numbers and alarm levels.

You can set [Level] to [1], [2], [3], [4], or [All]. If you select [All], all of the alarms in the specified channel are assigned to the specified window.

Comment txt block No.

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

Timer



Changes the upper/lower display area

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

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

When Using an Absolute Timer

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

When Using a Relative Timer

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

6.4 Entering General Settings

Match Time Timer

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

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

- **Kind**

Day Set the time match condition of a day.

Week Set the time match condition of a week.

Month Set the time match condition of a month.

Year Set the yearly time match conditions (release number 3 or later).

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

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

- **Day**

Set the day.

- **Weekday**

Set the day of the week.

- **Hour:Minute**

Set the time in the range of 00:00 to 23:59.

- **Timer action**

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

Manual Sample

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

Click to display a channel selection dialog box.
Channel selection dialog box

Fill and increment by 1 starting from the top of the selection
Copy top of selection to all other items in the selection
Drag to select a range

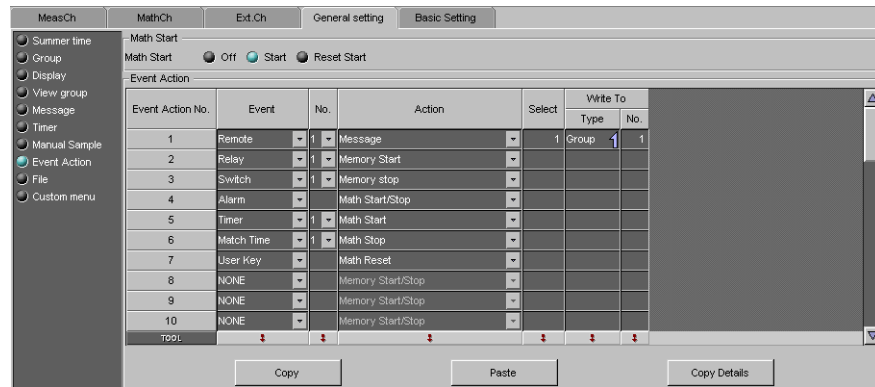
Manual sample number

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	-
Level*	Select the event level switch number.
Edge*	Select the event edge switch number.

* Available in release numbers 3 and later.

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 to write the message and the destination. Set the message destination to all groups (All) or a group number.
Snapshot	-
Display Update Internal 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.
Alarm Display Reset	You can specify this when the annunciator sequence is set to use the "ISA-M" annunciator and the event is set to [Remote], [User Key], or [Edge].
Comment Display	Specify the comment text block number to display.
Favorite Display	Choose which registered display to switch to. Set [Action] to [Key] or [Select].
	Settings Description
	Key Performs the same operation as pressing the favorite key.
	Select Displays the specified favorite screen. Set the registration numbers of the screens you want to specify in the [No.] boxes.

* Available in release numbers 3 and later.

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

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

6.4 Entering General Settings

File

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

The screenshot shows the 'Basic Setting' dialog box. The 'File' section contains a table with the following structure:

Field No.	Title	Characters
1		
2		
3		
4		
5		
6		
TOOL		

The 'Batch' section is currently empty.

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

The screenshot shows the 'Basic Setting' dialog box with the multi batch function enabled. The 'File' section contains a table with the following structure:

Batch No.	Header	Structure	File Name
1		Batch Name	
2		Batch Name	
3		Batch Name	
TOOL			

The 'Batch' section contains a table with the following structure:

Field No.	Title	Characters
1		
2		
3		
TOOL		

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	User-assigned character string + date
Serial	User-assigned character string + serial number
Batch	Batch name + serial number (when using the batch function)

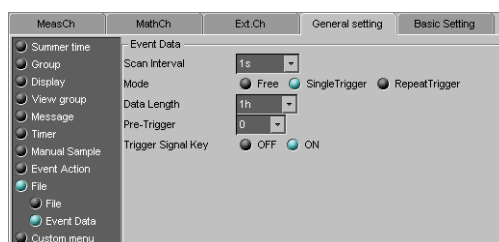
File name

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

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

Field Title, Field Characters

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

Event 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. 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 and Repeat	Records data when the trigger condition is met.

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

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

*1 You cannot choose an interval that is faster than the scan interval.

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

*3 Release number 3 or later.

Pre-Trigger

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

Trigger Signal Key

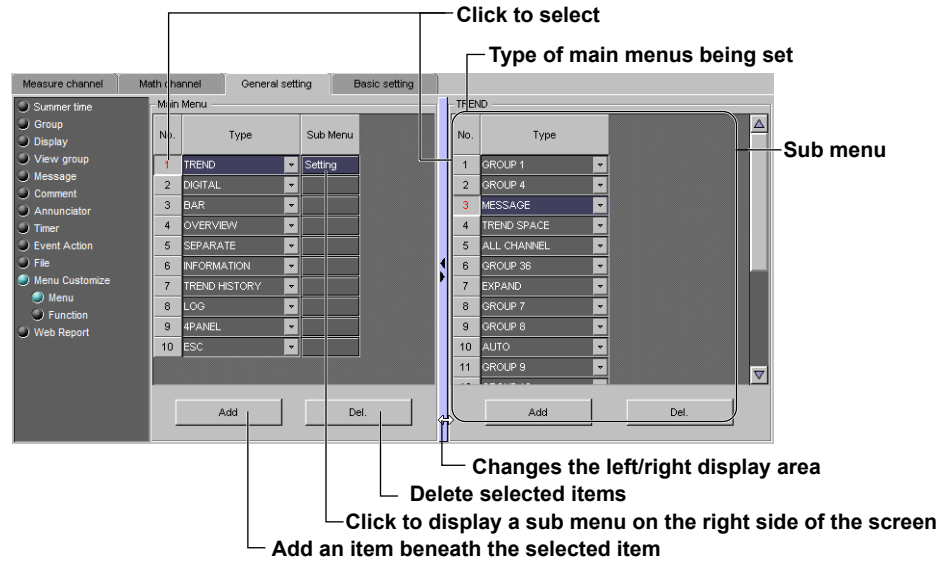
Select [ON] if you want to activate the trigger using key operation.

Custom Menu

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

Main Menu

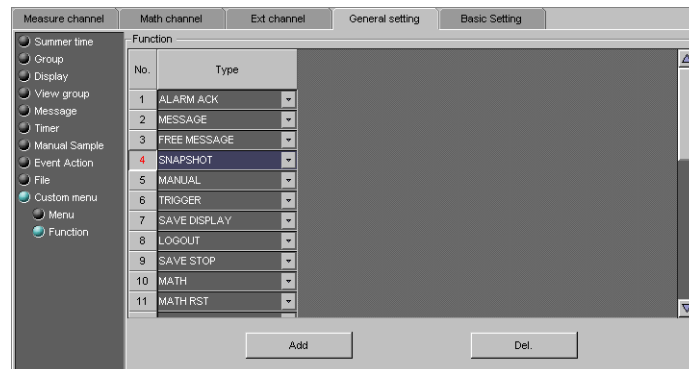
The display selection menu appears when the DISP/ENTER key is pressed.



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

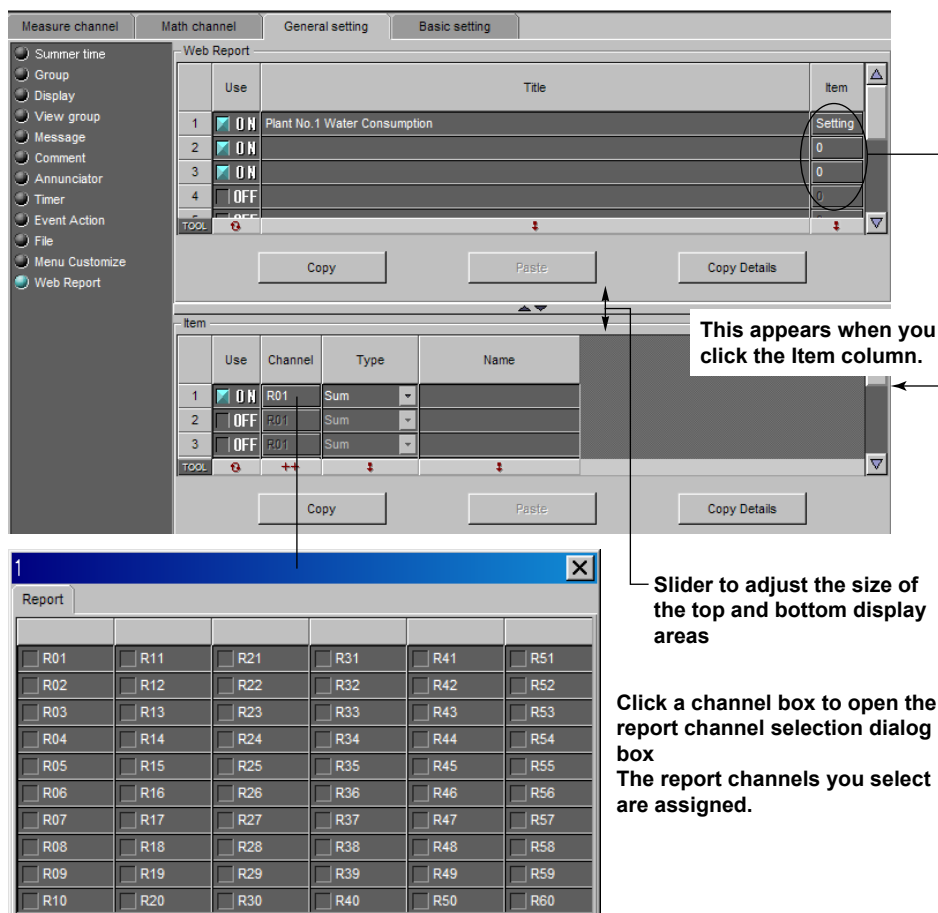
Function

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



See section 5.17 of the *DX1000 manual (IM04L41B01-01E)*, or section 5.18 of the *DX2000 manual (IM04L42B01-01E)*.

Web Report (Release number 3 or later)



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

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

Web Report

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

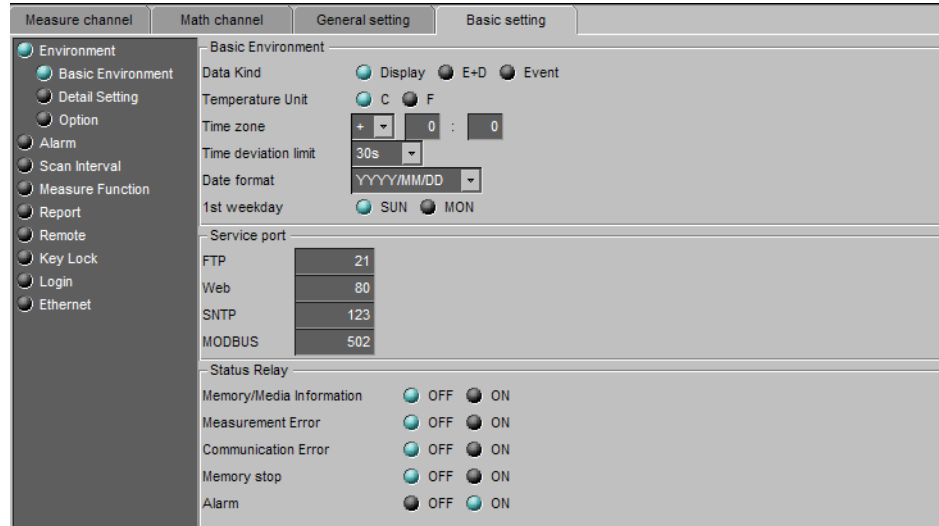
Item

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

6.5 Entering Basic Settings

Environment

Basic Environment



- **Data Kind**

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

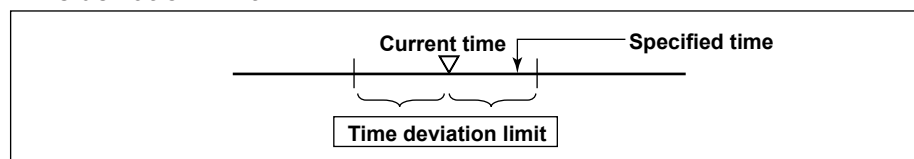
- **Temperature Unit**

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.

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

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

- **Service port**

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

Function	Maximum Number of Connections	Number of Simultaneous Uses Administrator User	Port Number
FTP server	2	2 ^{*1}	21/tcp ^{*3}
Web server	–		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)*.

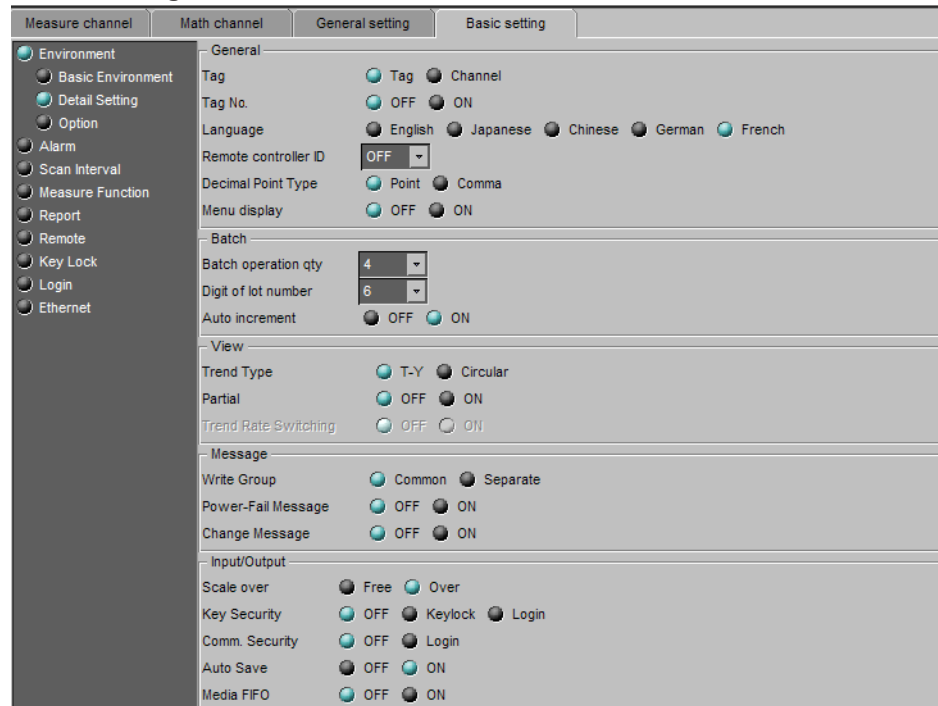
*2 The port number is fixed.

*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**

The relay contact output is turned on when an item that is set to [ON] occurs. [Alarm] is available in release numbers 3 and later. 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 or tag numbers. Channel numbers are displayed for channels that do not have tags or tag numbers assigned to them.
Channel	Displays channel numbers.

• **Tag No. (Release number 3 or later)**

Select [ON] to use tag numbers.

• **Language**

Select the display language

• **Remote controller ID**

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

• **Decimal Point Type (Release number 3 or later)**

You can set the decimal point type for the display and files saved in text format. You can select [Point] or [Comma].

• **Menu display (Release number 3 or later)**

To display [Basic setting mode] (menu item for switching to basic setting mode) in the setting mode menu, select [ON].

• **Batch**

Batch (when the multi batch function is not installed)

Select [ON] to use the batch function.

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

Specify the number of batches to use.

Settings	Description								
OFF	Disables the multi batch function and the batch function.								
1	Enables the single batch function.								
2 or higher	Enables the multi batch function. The table below shows the number of batches supported by the DX1000 and DX2000.								
	<table border="1"> <thead> <tr> <th>Model</th> <th>Number of Batches Supported</th> </tr> </thead> <tbody> <tr> <td>DX1000</td> <td>2 to 6</td> </tr> <tr> <td>DX2000 (standard memory model)</td> <td>2 to 6</td> </tr> <tr> <td>DX2000 (large memory model)</td> <td>2 to 12</td> </tr> </tbody> </table>	Model	Number of Batches Supported	DX1000	2 to 6	DX2000 (standard memory model)	2 to 6	DX2000 (large memory model)	2 to 12
Model	Number of Batches Supported								
DX1000	2 to 6								
DX2000 (standard memory model)	2 to 6								
DX2000 (large memory model)	2 to 12								

- **Digit of lot number**
Select the number of digits of the lot number from 4, 6, or 8. Select [OFF] to disable the lot number.
- **Auto increment**
ON Automatically sets the lot number of the next measurement to “the lot number of the current measurement + 1.”

- **Trend Type**
Function for the DX2000 only.

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

- **Partial**
Turn Partial [ON] (partially expand) or [OFF] (do not partially expand).
- **Trend Rate Switching**
ON Enables the function that switches the trend interval while the memory sampling is in progress. The “Second interval [div]” item is displayed in the setting mode.
 - When [Trend Rate Switching] is set to [ON], you cannot set [Data Kind] under [Environment] - [Basic Environment] in the [Basic setting] tab to [E+D].
 - This setting is fixed at [OFF] if you set [Batch operation qty] to [2] or higher on models with the multi batch function (/BT2 option; release number 3 or later).

- **Write Group**

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

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

6.5 Entering Basic Settings

- **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).

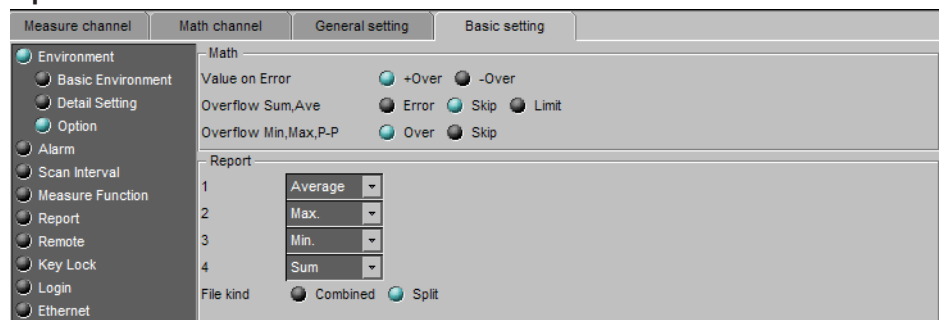
- **Media FIFO**

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.

- **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

The screenshot shows the 'Alarm' configuration page with a sidebar menu on the left containing: Environment, Alarm (selected), Scan Interval, Measure Function, Report, Remote, Key Lock, Login, and Ethernet. The main content area is titled 'Basic Setting' and includes the following sections:

- Basic Setting:** Reflash (radio buttons OFF and ON), Rate of Change Decrease (input field 1), Rate of Change Increase (input field 1), Indicator (radio buttons Unhold and Hold).
- Output relay:** Internal Switch AND (dropdown menu None).
- Hysteresis:** Measure channel High/Low (input field 0.5), Measure channel Delta High/Low (input field 0.0), Math channel High/Low (input field 0.0).
- Alarm action:** No Logging (radio buttons OFF and ON), Annunciator mode (radio buttons OFF and ON), Sequence (dropdown menu ISA-M), Time off color (radio buttons Green and White).
- Alarm display:** Level (dropdown menu 1-4-3-2), Alarm 1 (radio buttons Red, Orange, Pink, Yellow), Alarm 2 (radio buttons Red, Orange, Pink, Yellow), Alarm 3 (radio buttons Red, Orange, Pink, Yellow), Alarm 4 (radio buttons Red, Orange, Pink, Yellow).

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

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

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

Internal Switch AND

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

Relay AND

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

Relay action

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

Relay hold

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

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

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 on ACK

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

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

Note

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

Measure channel High/Low

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

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

Measure channel Delta High/Low

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

Selectable range: 0.0% to 5.0% of the span

Math channel High/Low, Ext channel High/Low

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

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

Alarm action

- **No Logging**

Select [ON] to hide alarm indication. The [Detect] setting is enabled in the Measure channel, Math channel, Ext channel tab(s).

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

- **Annunciator mode and Sequence (Release number 3 or later)**

To use the annunciator function, select [ON] and set the sequence.

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

- **Time off color (Release number 3 or later)**

The annunciator window display color when no alarms are activated. You can select [White] or [Green].

Alarm display (Release number 3 or later)

- **Level**

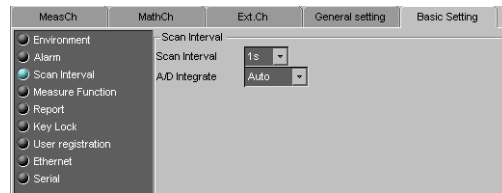
When multiple alarms occur, the DX gives higher priority to the display of alarms with higher levels.

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

- **Alarm 1, Alarm 2, Alarm 3, and Alarm 4**

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

Scan Interval



Scan interval

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

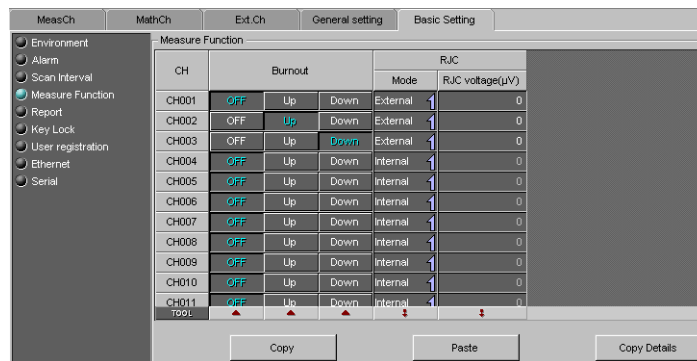
- Models equipped with external input channels (/MC1 option)
- Models with the multi batch function (/BT2 option; release number 3 or later)

A/D integrate

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

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

Measure Function



Burnout

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

RJC Mode

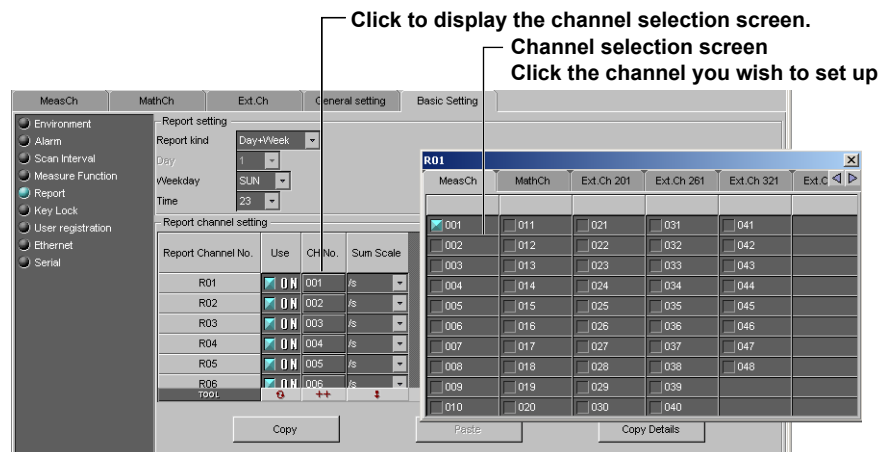
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

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

RJC voltage (μV)

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

Report



Report kind

Select the type of report to be created.

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

Day, Week day, and Time (hour)

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

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

* You cannot specify 29, 30, or 31.

Report Channel No.

The report is output in order by this number.

Use

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

CH No.

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

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

Sum Scale


Set the sum scale to [s] to [day] to match the unit of the measured value.

Example: If the unit of the measured value is “m³/min,” select [min].

OFF Sums as-is the measured data per scan interval.

Remote (Release number 3 or later)

Number	Remote Input
D01	N.O.
D02	N.O.
D03	N.O.
D04	N.O.
D05	N.O.
D06	N.O.
D07	N.O.
D08	N.O.

TOOL 

Copy Paste Copy Details

Number

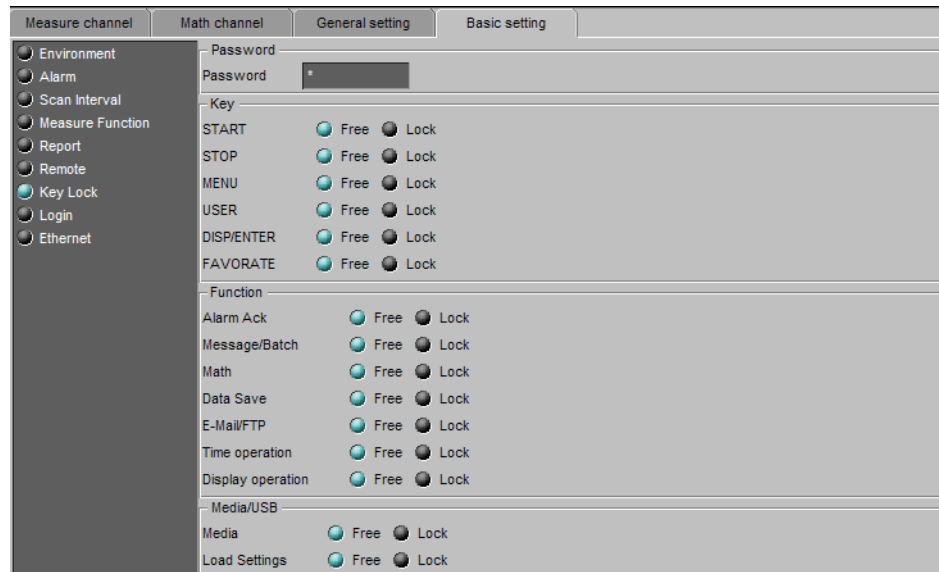
Remote control terminal numbers. The number of settings that appears corresponds to the number of remote control terminals.

Remote Input

Specify an operation for each remote control terminal.

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

Key Lock



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

Password

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

Key, Function, Media

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

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

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 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)

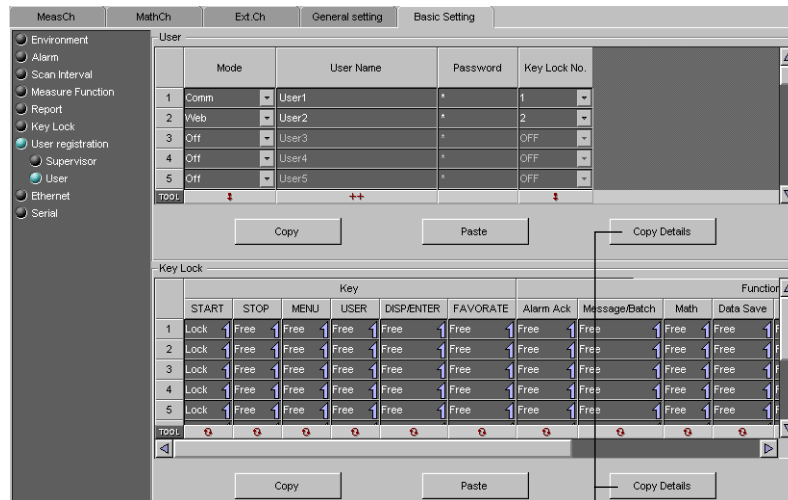
An entered password is displayed as "*****".

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

6.5 Entering Basic Settings

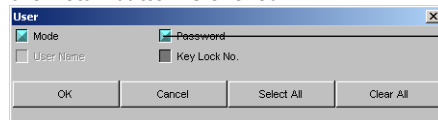
User

Up to 30 names can be registered.



Click to display a dialog box for selecting items to copy/paste

Example of the dialog box displayed when the Detail button is clicked



Select the check boxes (blue) of the items you wish to copy and paste

- **Mode**

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

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

- **User Name, Password**

Same as the supervisor settings.

- **Key Lock No.**

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

- **Key lock**

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

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

Ethernet

TCP/IP

The screenshot shows the TCP/IP configuration screen with the following settings:

- Host Information:**
 - Automatically: OFF
 - Host Name: [Empty]
 - IP Address: 0 . 0 . 0 . 0
 - Subnet Mask: 0 . 0 . 0 . 0
 - Default Gateway: 0 . 0 . 0 . 0
- DNS:**
 - DNS reception: OFF
 - Domain Name: [Empty]
 - Server Primary: 0 . 0 . 0 . 0
 - Server Secondary: 0 . 0 . 0 . 0
 - Domain Primary: [Empty]
 - Domain Secondary: [Empty]
- Control:**
 - Keep Alive: ON
 - Time out: ON
 - Timeout time(min.): 1
 - Host Name Register: OFF

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

When using a fixed IP address

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

When obtaining the IP address from DHCP

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

Keep Alive

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

Time out

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

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

Checking the communication status

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

FTP

FTP Transfer File

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.

Output Directory Format (Release number 3 or later)

Set the directory output format to [MS-DOS] or [UNIX].

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.

6.5 Entering Basic Settings

- **Account**
Enter the account (ID) for accessing the FTP server using up to 32 alphanumeric characters.
- **PASV**
Select [ON] when using the DX behind a firewall that requires the passive mode. The default setting is [OFF].
- **Initial Path**
Enter the directory of the file transfer destination using up to 64 alphanumeric characters. The delimiter for directories varies depending on the implementation of the destination FTP server.
Example: When transferring files to the “data” directory in the “home” directory of an FTP server on a UNIX file system.
 /home/data

If the file transfer to both primary and secondary destinations fails, the DX aborts the file transfer. When the connection recovers, the DX transfers the data that could not 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. The 'Basic Setting' tab is active, displaying 'Communication interval' set to 1s and 'Auto recovery' set to 2min. Below this is the 'Modbus Server Setting' table:

Server No.	Host Name	Port No.	Unit
1		502	Auto
2		502	Auto
3		502	Auto
4		502	Auto

Below the table are 'Copy', 'Paste', and 'Copy Details' buttons. The 'Command setting' tab is also visible, showing a table for client commands:

Client Command No.	Command	Start channel	End channel	Server		
				Connect to	Register	Type
1	Read	201	201	1	30001	INT16
2	Read-M	C01	C01	1	30001	INT32_B

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 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)*.

In release number 3, FLOAT has been added as a data type for measurement channel data and computation channel data.

E-mail

Measure channel	Math channel	General setting	Basic setting
<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"/> Remote <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"/> SMTP client <input type="radio"/> Server functions <input type="radio"/> Connect limits			
Basic Setting SMTP server name Port No. 25 Security <input type="radio"/> OFF <input checked="" type="radio"/> POP Before SMTP Address 1 Address 2 Sender			
POP3 settings POP3 Server name Port number 110 Login name Password * Send delay [second] 2 POP3 Login <input checked="" type="radio"/> PLAIN <input type="radio"/> APOP			
Alarm Scheduled System Report Alarm Recipient1 <input checked="" type="radio"/> OFF <input type="radio"/> ON Recipient2 <input checked="" type="radio"/> OFF <input type="radio"/> ON Alarm1 <input checked="" type="radio"/> OFF <input type="radio"/> ON Alarm2 <input checked="" type="radio"/> OFF <input type="radio"/> ON Alarm3 <input checked="" type="radio"/> OFF <input type="radio"/> ON Alarm4 <input checked="" type="radio"/> OFF <input type="radio"/> ON Include INST <input checked="" type="radio"/> OFF <input type="radio"/> ON Include source URL <input checked="" type="radio"/> OFF <input type="radio"/> ON Subject Alarm_summary Header1 Header2 Send alarm action <input type="radio"/> On+Off <input checked="" type="radio"/> ON Include tag/ch in Subject <input checked="" type="radio"/> OFF <input type="radio"/> ON			

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 (Release number 3 or later)**
Select [POP before SMTP] if you need to enable 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 (Release number 3 or later)

- **POP3 Server name and Port number**
Enter the POP3 server host name or IP address.
- **Port number**
Use the default setting unless you need to change it. The default value is 110.
- **Login name**
Enter the POP3 server login name.
- **Password**
Enter the POP3 server login password using up to 32 characters.
- **Send delay [second]**
Set the delay between POP3 server authentication and transmission to a value from 0 to 10 seconds.
- **POP3 Login**
To encrypt the password when logging into the POP3 server, select APOP. To send it in plain text, select PLAIN.

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.
- **Send alarm action (Release number 3 or later)**
To send an e-mail when an alarm occurs and when it is cleared, select [ON+OFF]. To only send an e-mail when an alarm occurs, select [ON].
- **Include tag/ch in Subject (Release number 3 or later)**
Select [ON] to include a tag number in the subject. If the tag number is not set, the corresponding channel number is included.

Scheduled Settings

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

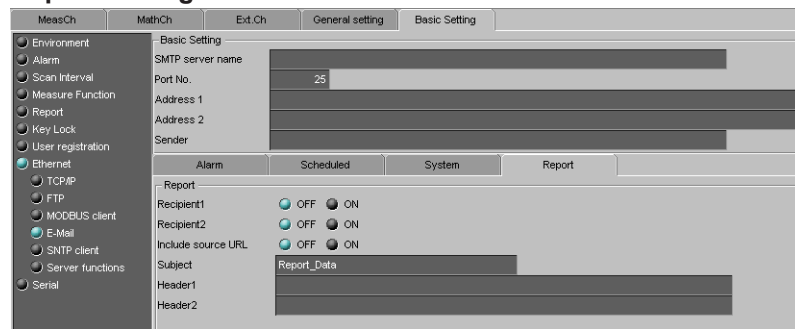
- **Recipient1 and Recipient2**
Set the e-mail recipients. For Recipient1 and Recipient2, select [ON] to send e-mail or [OFF] to not send e-mail.
- **Interval**
Select the interval for sending e-mail to Recipient1 and Recipient2 from 1, 2, 3, 4, 6, 8, 12, and 24 hours.
- **Ref. time**
Enter the time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

System Settings

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.

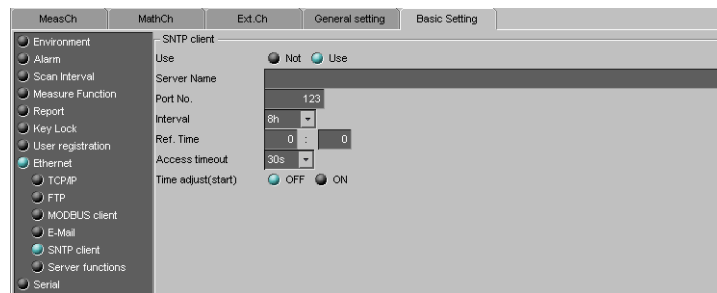
Report Settings



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

Measure channel	Math channel	General setting	Basic setting
<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"/> Remote <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"/> Connect limits			
- FTP Server Use <input checked="" type="radio"/> Not <input type="radio"/> Use			
- Web server Use <input type="radio"/> Not <input checked="" type="radio"/> Use Operator <input type="radio"/> OFF <input checked="" type="radio"/> ON Access Control <input type="text" value="OFF"/> Command <input type="radio"/> Not <input checked="" type="radio"/> Use Monitor <input type="radio"/> OFF <input checked="" type="radio"/> ON Access Control <input type="text" value="OFF"/>			
- SNMP Server Use <input checked="" type="radio"/> Not <input type="radio"/> Use			
- Modbus Server Use <input checked="" type="radio"/> Not <input type="radio"/> Use			
EtherNet/IP Use <input checked="" type="radio"/> Not <input type="radio"/> Use			

- **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).
- **EtherNet/IP (Release number 3 or later)**
Select whether or not to use the DX as an EtherNet/IP server. Select [Use] or [Not] (don't use).

6.5 Entering Basic Settings

Connect limits (Release number 3 or later)

	Use	Allowed IP Address
1	<input checked="" type="checkbox"/> ON	0.0.0.0
2	<input type="checkbox"/> OFF	0.0.0.0
3	<input type="checkbox"/> OFF	0.0.0.0
4	<input type="checkbox"/> OFF	0.0.0.0
5	<input type="checkbox"/> OFF	0.0.0.0
6	<input type="checkbox"/> OFF	0.0.0.0
7	<input type="checkbox"/> OFF	0.0.0.0
8	<input type="checkbox"/> OFF	0.0.0.0

Modbus Server

- **Connect limits**

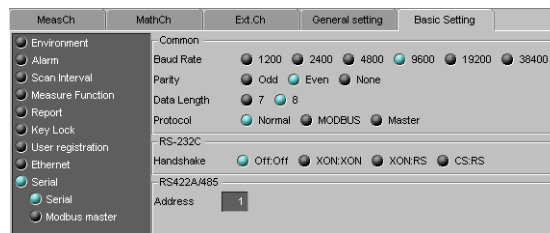
Select [ON] to place connection limits.

- **Allowed IP Address**

If you want to only allow certain IP addresses to connect to the DX Modbus server, set [Use] to [ON] and enter IP addresses (in the range of 0.0.0.0 to 255.255.255.255) in the [Allowed IP Address] boxes. You cannot enter host names.

Only the IP addresses specified here can connect to the DX Modbus server.

Serial



For RS-232

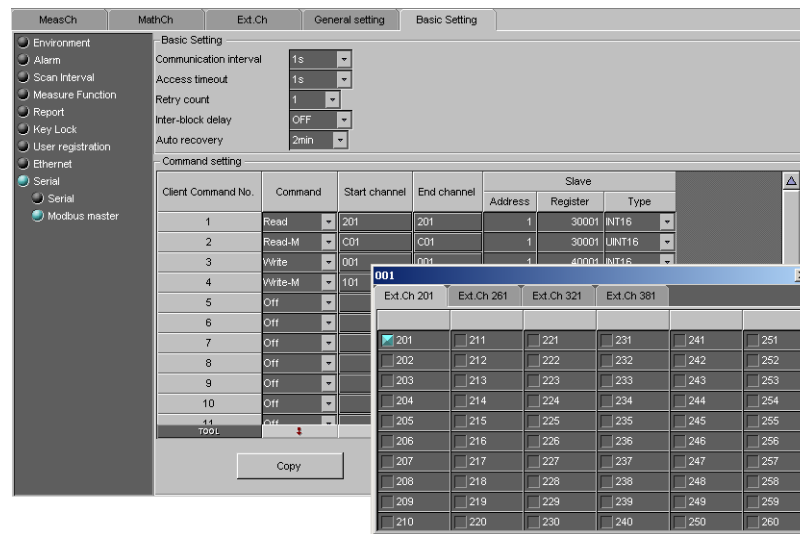
- **Baud Rate**
Select 1200, 2400, 4800, 9600, 19200, or 38400 (bps).
- **Parity**
Set the parity check method to Odd, Even, or None.
- **Data length**
Select 7 or 8 (bits). To output the data in binary format, select 8.
- **Handshaking**
Select Off:Off, XON:XON, XON:RS, or CS:RS.
- **Address**
For Modbus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

6.5 Entering Basic Settings

Modbus master



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

Basic setting

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

Command setting

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

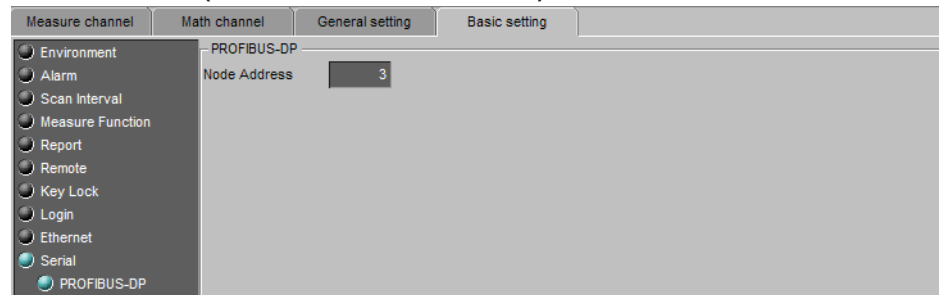
Settings	Description
Read	Read to the external input channel (16-bit signed integer type) from the slave.
R-Math	Read to the communication input channel (32-bit floating point type) from the slave.
Write	Write the measurement channel (16-bit signed integer type) to the slave.
W-Math	Write the measurement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

[Read] can be selected on 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 (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)*.
In release number 3, FLOAT has been added as a data type for measurement channel data and computation channel data.

PROFIBUS-DP (Release number 3 or later)



PROFIBUS-DP

- **Node Address**
Set to a number from 0 to 125.

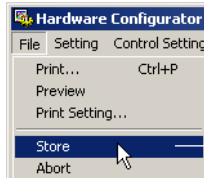
6.6 Sending the Setup Data to the DX1000/DX2000

The method used to send the data varies depending on whether a CONFIG file or setup data file is being transmitted.

CONFIG file

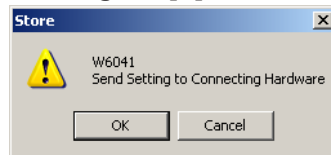
The following two methods are available:

- **Selecting from the toolbar**



The setup data are sent when [File] - [Store] is selected.

- **Clicking the [X] button**



When the Configurator is closed by clicking the [X] button, a confirmation dialog box is displayed.

To send the new setup data to the DX1000/DX2000, click the [Yes] button.

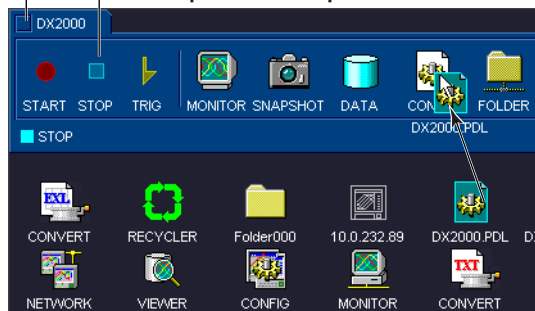
Otherwise, click the [No] or [Cancel] button.

If the DX1000/DX2000 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.

Setup data file

DX1000/DX2000 folder

1. Stop the data acquisition to the memory.



2. Drag and drop the file onto the CONFIG icon of the DX1000/DX2000 folder

The contents of the setup data file (*.PDL) located on the DAQ Desktop can be transmitted. If the DX1000/DX2000 is acquiring data to the memory, the data will not be sent in this case.

Note

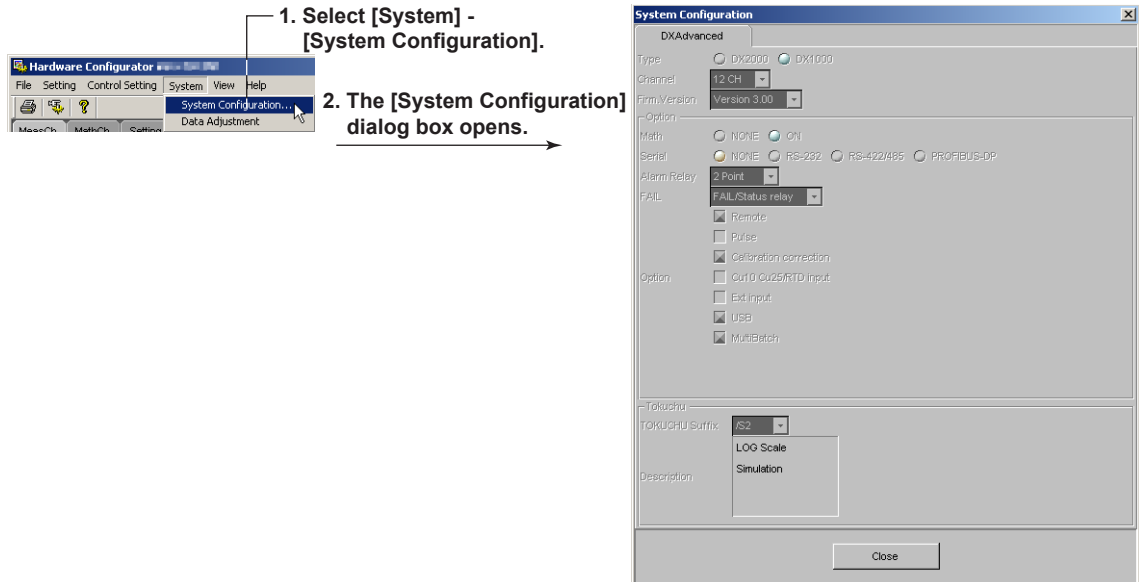
Of the network settings in the Basic Setting tab, the following items are not sent.

- Settings under [Ethernet] > [TCP/IP] and [Server functions].
- All settings under [Serial] > [Serial].

6.7 Checking the System Configuration and Initializing Setup Data

Checking the System Configuration

On the DX1000/DX2000 Configurator of the connected 1000/DX2000, selecting [System Configuration] from the [System] menu opens the [System Configuration] dialog box. You can only view the system configuration on this [System Configuration] dialog box.

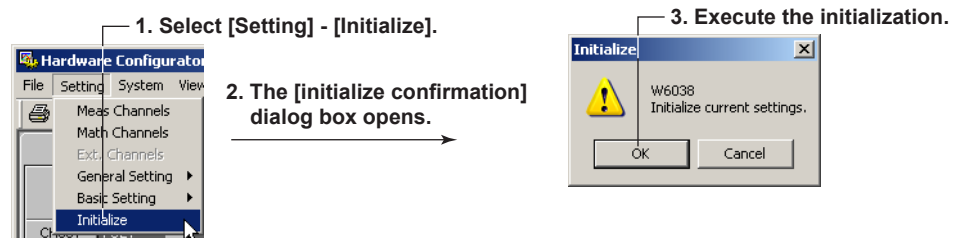


Note

If you select [System Configuration] from the [System] menu on the DX1000/DX2000 Configurator that was opened by double-clicking the setup data file on the DAQ desktop or loading the setup data, a [System Configuration] dialog box in which you can change the system configuration opens. If the system configuration is changed in this dialog box and the [OK] button is clicked, a message "System Configuration is changed Input&Data are Initialized" appears. Click the [OK] button to initialize the data.

Initializing the Setup Data

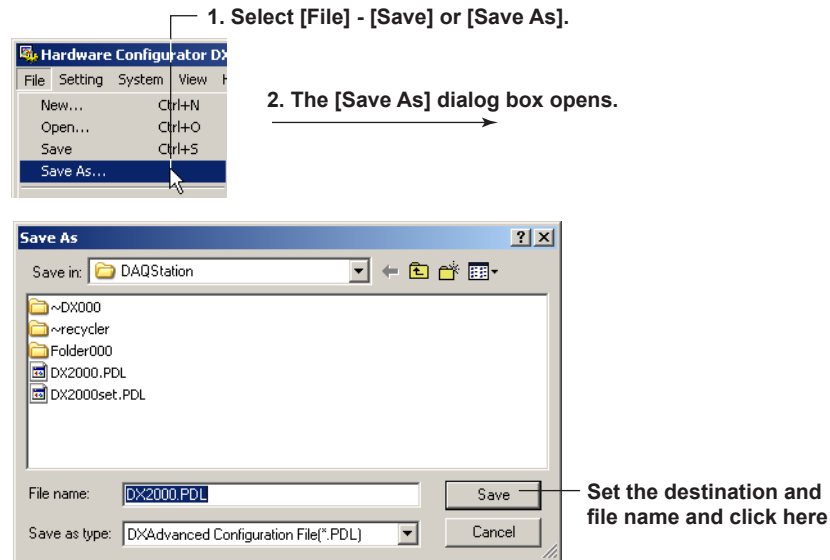
To initialize the settings, select [Initialize] from the [Setting] menu on the DX1000/DX2000 Configurator.



6.8 Saving the Setup Data

Changed settings can be saved on the PC with the procedure below.

To send saved setup data to the connected DX1000/DX2000 and edit them, see section 6.6, "Sending the Setup data to the DX1000/DX2000." Also, you can save stored setup data to a memory card or other medium, and load data saved on an external storage medium on the DX1000/DX2000 main unit.



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.

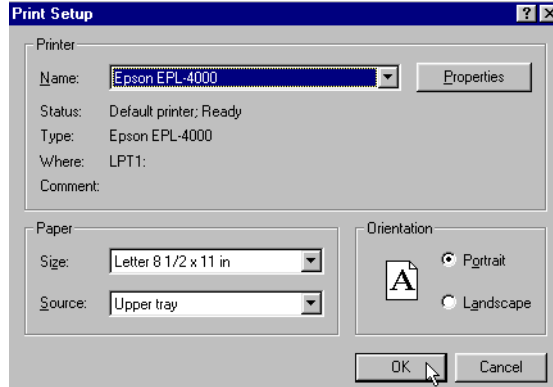
Note

The CONFIG file (directly view the setup data of the DX1000/DX2000) cannot be saved using [Save] or [Save As].

6.9 Printing the Setup Data

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

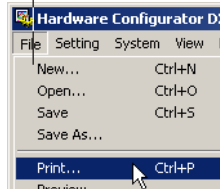
Set the printer according to the environment of the system that you are using.

Print Preview

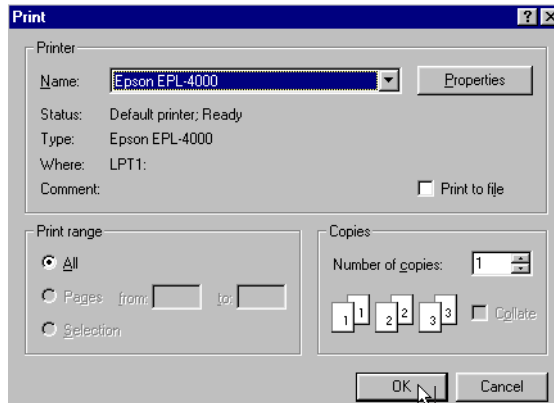
You can preview the print layout before actually printing the data. Selecting [File] - [Print Preview] displays the print preview screen.

Printing

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



2. The [Print] dialog box opens.



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

6.10 Characters that can be Used

List of Input Types

Type	Allowed Characters		Item
	Alphanumeric characters	Symbol	
Arbitrary string	Yes	Yes	Tag, group name, comment text field, Web report title/item name
	Yes	No	Batch field title/characters, file header, mail header
Alphanumeric character string	Yes	Yes	Unit, user name, password, character string account, tag number
	Yes	Yes (including [,])	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.

7.1 Starting the Hardware Configurator (Opening the Hardware Configurator Window)

The following two types of files can be opened using the Configurator:

CONFIG file

This is the file located in the MV1000/MV2000 folder. It allows a direct view of the setup data of the MV1000/MV2000. Only one CONFIG file exists in one MV1000/MV2000 folder.

You can change the setting on the Configurator, but the file cannot be saved.

Setup data file (*.PDL)

This is the file that is saved to the PC such as to the DAQ Desktop. You can change the settings on the Configurator and save the file and create new setup data.

The Configurator can transmit and receive the setup data, change the setup data, and create new setup data.

Copying the Setup Data to the DAQ Desktop

You can copy the CONFIG file to the DAQ Desktop by dragging and dropping the CONFIG icon of the MV1000/MV2000 folder onto the DAQ Desktop.

The extension of the file that is copied becomes [PDL].

7.1 Starting the Hardware Configurator (Opening the Hardware Configurator Window)

Starting the Configurator

To create a new setup data file apart from the connected MV1000/MV2000, double-click the CONFIG icon on the DAQ desktop or choose **File > New** in the MV1000/MV2000 Configurator to display the System Configuration dialog box. Configure the system, then open the MV1000/MV2000 setting screen.

The image shows two screenshots illustrating the process of starting the Hardware Configurator. The first screenshot shows a Windows desktop with a folder named "MV1000/MV2000 folder" open. Inside the folder, there is a "CONFIG" icon. An arrow points to this icon with the text "1. Double-click here." Another arrow points to the "CONFIG" icon with the text "2. The MV1000/MV2000 Configurator opens." The second screenshot shows the "Hardware Configurator DX2000.PDL" window. The window has a menu bar (File, Setting, System, View, Help) and a toolbar. Below the toolbar is a table with columns: CH, Mode, Delta/Scale/Sqrt, Range/Type, Ref. Ch., and Span (L, U). The table contains 11 rows of channel data. Below the table are buttons for "Copy", "Paste", and "Copy Details". An arrow points to the table with the text "Scroll the screen (up and down)". Another arrow points to the bottom of the window with the text "Scroll the screen (left and right)".

MV1000/MV2000 folder

1. Double-click here.

2. The MV1000/MV2000 Configurator opens.

Print (section 7.9)

Display the version information of the Configurator

Menu bar

Toolbar

Scroll the screen (up and down)

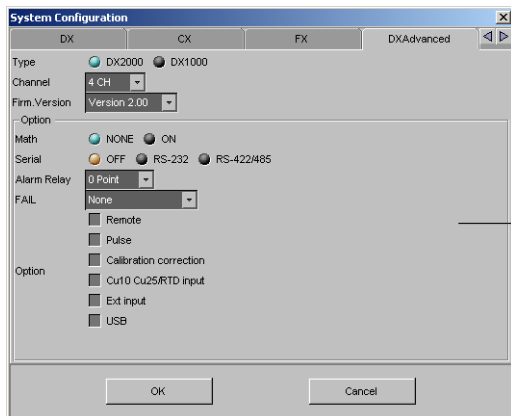
Scroll the screen (left and right)

CH	Mode	Delta/Scale/Sqrt			Range/Type	Ref. Ch.	Span	
							L	U
CH001	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH002	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH003	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH004	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH005	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH006	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH007	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH008	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH009	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH010	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000
CH011	VOLT	OFF	DELTA	SCALE	SQRT	2V	-2.0000	2.0000

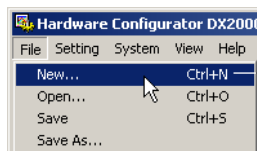
Creating Setup Data by Configuring a New System



1. Double-click the CONFIG icon on the desktop.
2. The [System Configuration] dialog box opens.



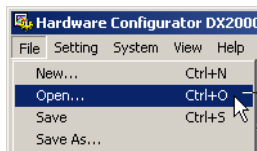
3. Click the appropriate items and click the [OK] button to open the Configurator screen.



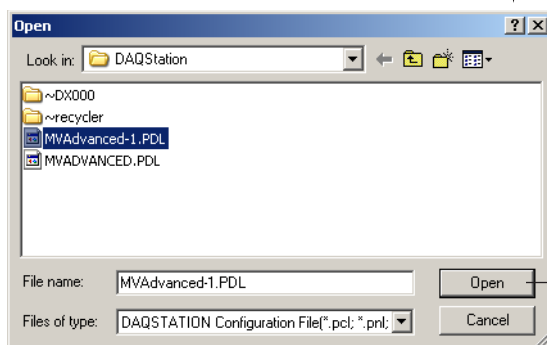
- Select [File]-[New] to create new setup data from the second time.

Create the setup data according to step 2 and 3.

Loading Preexisting Setup Data



1. Select [File]-[Open].
2. The [Open] dialog box opens.



- Select a file with .PDL extension and click here.

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

7.2 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
 Scale
 Square root
 Select the reference for the difference computation
 Set the span
 Enter the scale

MeasCh	MathCh	Ext.Ch	General setting				Basic Setting		Ref.Ct	Span			Scale	
			CH	Mode	Delta/Scale/Sqrt	Range/Type	L	U		Point	L	U		
CH001	VOLT	OFF	DELTA	SCALE	SGRT	2V			-2.0000	2.0000				
CH002	VOLT	OFF	DELTA	SCALE	SGRT	2V		1	-2.0000	2.0000				
CH003	VOLT	OFF	DELTA	SCALE	SGRT	2V			-2.0000	2.0000	2	0.00	200.00	
CH004	VOLT	OFF	DELTA	SCALE	SGRT	2V			-2.0000	2.0000	2	0.00	200.00	
CH005	VOLT	OFF	DELTA	SCALE	SGRT	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			
				Value	Alarm Relay	Detect	Type	Value	Alarm Relay	Detect
			H	0.0000	S01		H	0.0000	None	OFF
			L	0.0000	S02		OFF	0.0000	None	OFF
			R	0.01	S03		OFF	0.00	None	OFF
	0.5		H	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
 Enter the sampling count
 Enter the tag name

Type	Value	Alarm Relay	Detect	Alarm Delay	Moving Average		Tag	Tag No.
					Times	Times		
OFF	0.0000	None	ON	10 sec	OFF	2		
OFF	0.0000	None	ON	10 sec	OFF	2		
OFF	0.00	None	ON	10 sec	OFF	2		
OFF	0.00	None	ON	10 sec	OFF	2		
OFF	0.0000	None	ON	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	10	ON	50	0.0000
ON	0	100	2	10	Center	11	ON	50	0.0000
ON	0	100	3	10	Center	12	ON	50	0.01
ON	0	100	4	10	Normal	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 7-6)

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	
Red	Inside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Off	
Red	Outside	Green	0.0000	0.0100	Fixed	ON	Red	Yellow	Red	Off	
Blue	Inside	Green	0.00	1.00	Fixed	ON	Red	Yellow	Red	Off	
Blue	Outside	Green	0.00	1.00	Alarm	ON	Red	Yellow	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

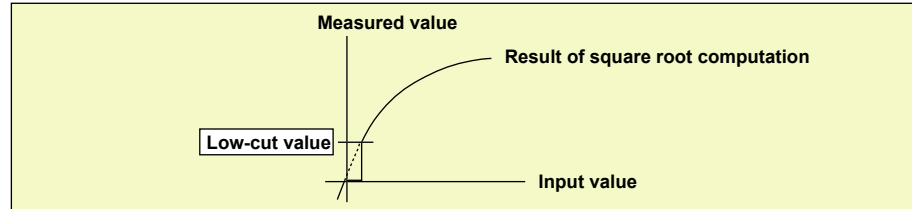
Enter the unit using up to six characters.

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.

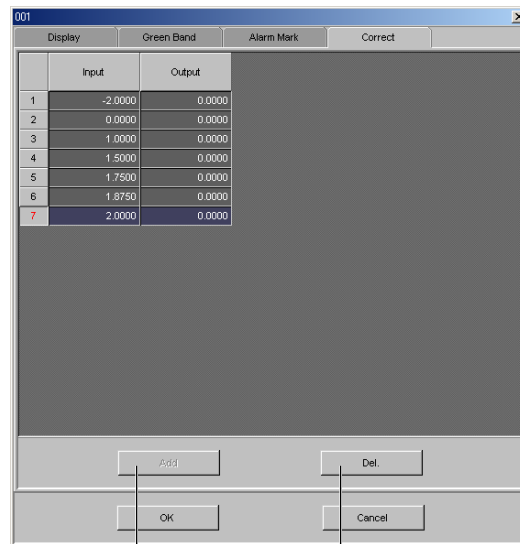
Low-cut value (Can be set when the mode is VOLT with square root (SQRT) selected.)

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

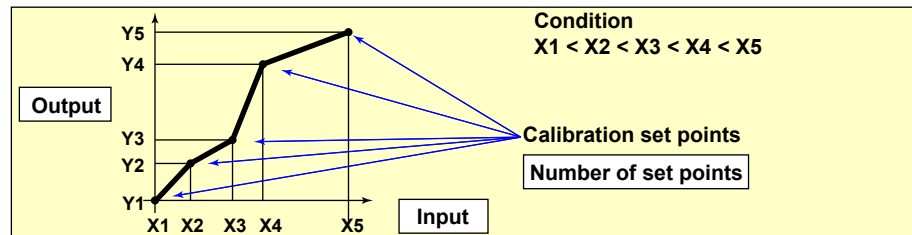


Calibration Correction

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



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

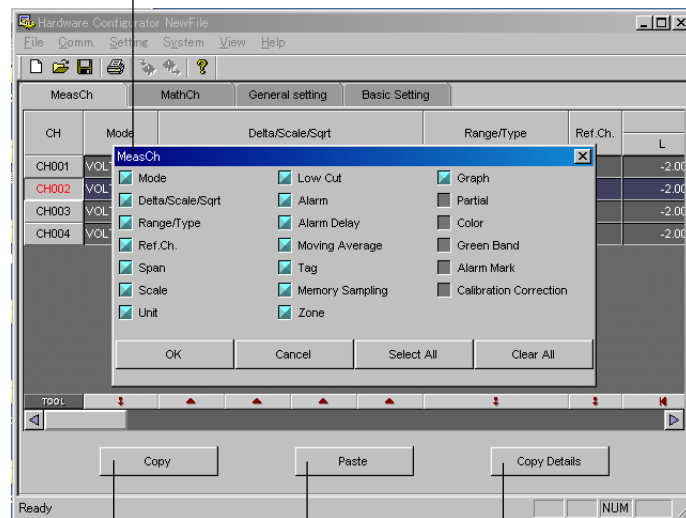
If the [Mark kind] is set to [Fixed], specify the color of the alarm point marks.

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.

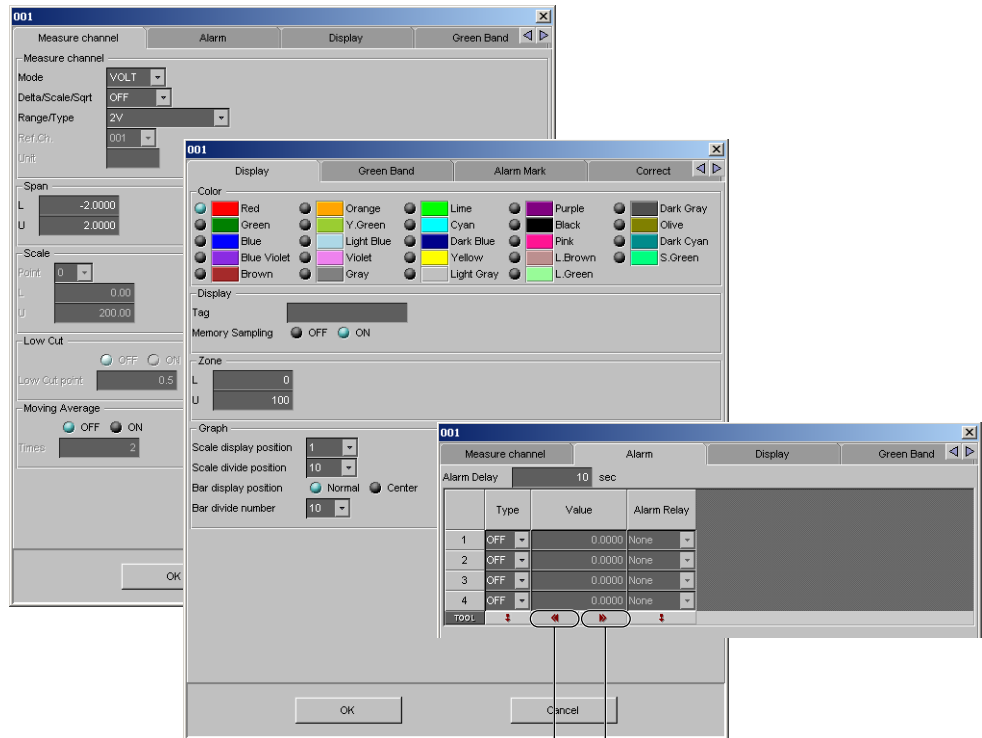
1. Select the copy source channels. Click the [Copy] button.
2. Select the paste destination channels. Click the [Paste] button.

Setting One Channel at a Time

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

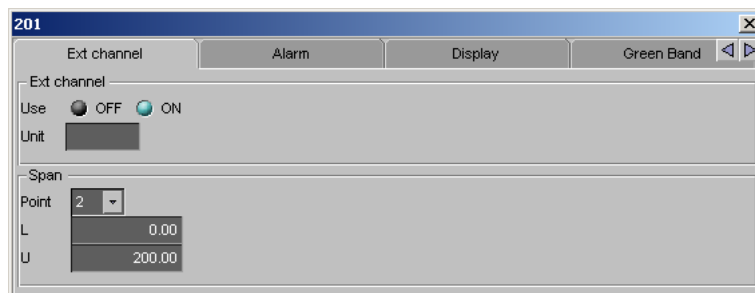
CH	Mode	Delta/Scale
CH01	VOLT	OFF DELTA SC
CH02	VOLT	OFF DELTA SC
CH03	VOLT	OFF DELTA SC

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.

7.2 Setting the Measurement Channels, Ext. 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

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
	L	U					
0	0	20000	1	/s	ON	0	K01 0.1
1	0.0	2000.0	1	/min	ON	0	K02 1
2	0.00	200.00	1	/h	ON	0	K03 2
3	0.000	20.000	1	OFF	ON	0	K04 3
4	0.000	200.00	1	OFF	OFF	0	K05 1

TLOG				Rolling Average		Alarm	
Timer type	Timer	Sum Scale	Reset	Interval	Count	Type	Value
1	OFF	ON	ON	10s	1	OFF	0
1	OFF	ON	ON	10s	1	OFF	0.0
1	OFF	ON	OFF	10s	1	OFF	0.00
1	OFF	ON	OFF	10s	1	OFF	0.000
1	OFF	OFF	OFF	10s	1	OFF	0.00

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	

Alarm 4				Alarm Delay	Tag	Memory Sampling	Zone		Scale display position
Type	Value	Alarm Relay	Detect				L	U	
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

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

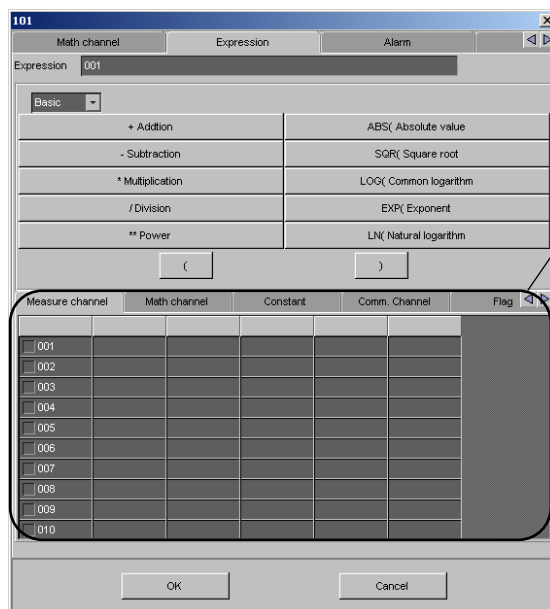
Green Band				Alarm Mark						
Color	Region	Color	L	U	Mark kind	Scale display	Mark color 1	Mark color 2	Mark color 3	Mark color 4
Red	Inside	Green	0	100	Fixed	ON	Red	Yellow	Yellow	Red
Green	Outside	Green	0.0	10.0	Fixed	ON	Red	Yellow	Yellow	Red
Blue	OFF	Green	0.00	1.00	Alarm	ON	Red	Yellow	Yellow	Red
Purple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

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 7.2, "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 Sampling, 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 7.3, “Setting the Measurement Channel, Ext. Channel.”

Setting One Computation Channel at a Time

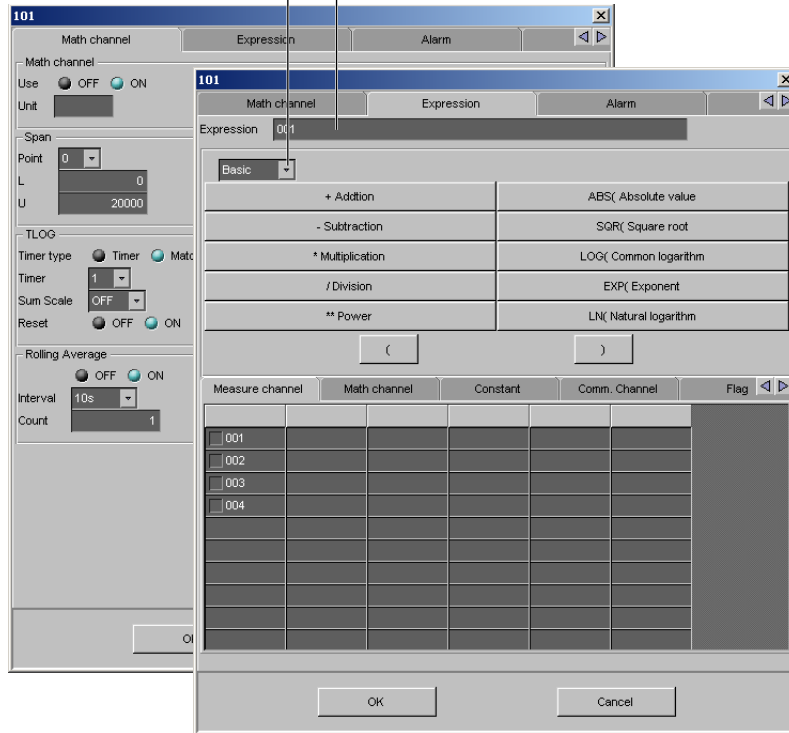
1. Double-click the channel you wish to set.

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.

7.3 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 Sampling, 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 7.3, “Setting the Measurement Channel, Ext. Channel.”

Setting One Computation Channel at a Time

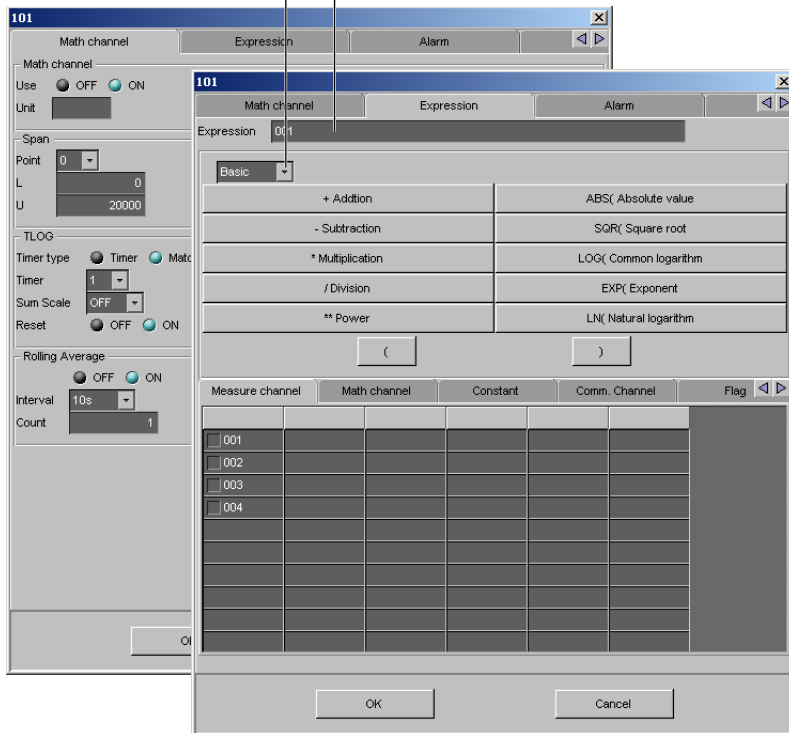
1. Double-click the channel you wish to set.

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

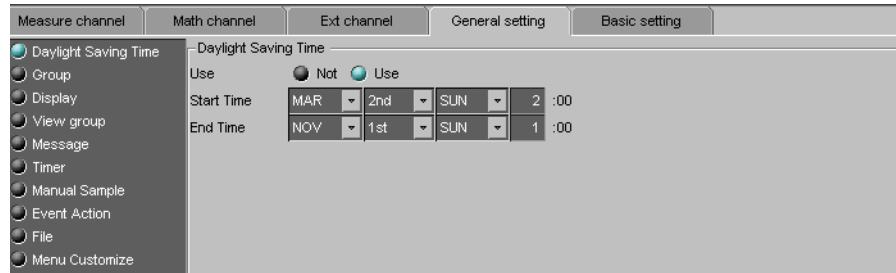
Select channels on the Measure channel, Math channel, and Ext channel tabbed pages and select desired operators to create an expression.



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.

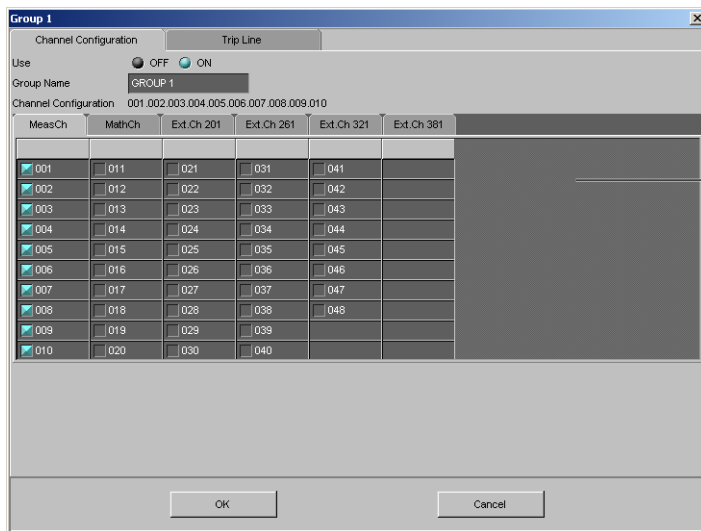
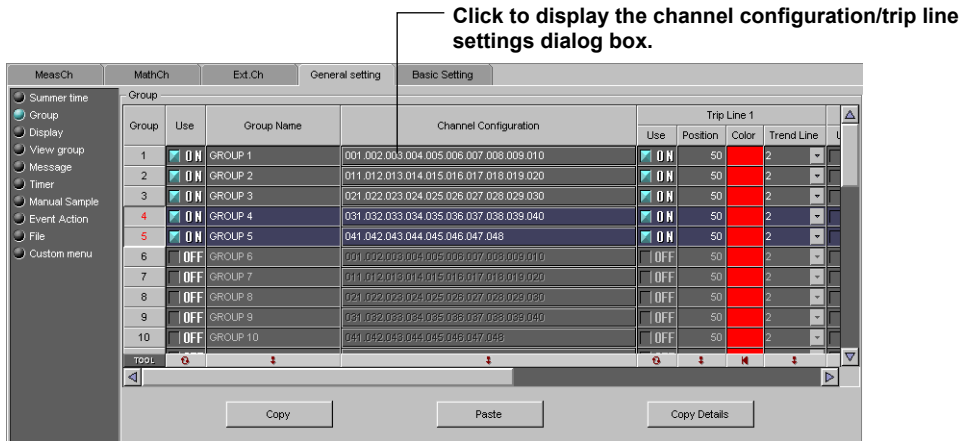
7.4 Entering General Settings

Summer Time



- On/Off** To switch between summer time and standard time, select [On].
- Start Time** Specify the date/time to switch from standard time to summer time. Set the month, the nth week, the day of the week, and the time.
- End Time** Specify the date/time to switch from summer time to standard time. Set the month, the nth week, the day of the week, and the time.

Group



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

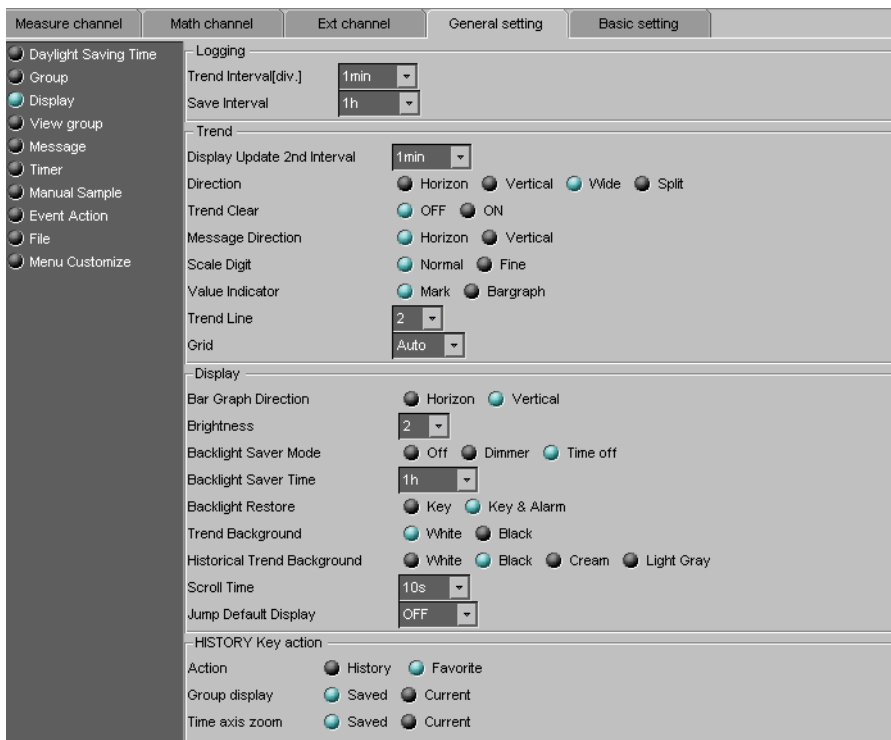
- The trend, digital, and bar graph displays are shown in the specified order.
- A channel can be assigned to multiple groups.
- The same channel cannot be assigned multiple times in a group.

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



7.4 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 min	2 min	4 min	8 min	20 min
Selectable range of auto save interval	1 h to 31 days	1 h to 31 days	2 h to 31 days	4 h to 31 days	8 h to 31 days

Display Update 2nd Interval

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

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

Direction

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

Trend Clear

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

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

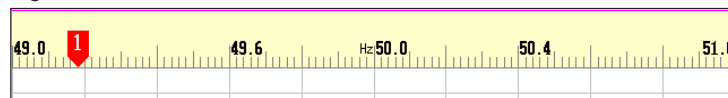
Message direction

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

Scale Digit

Select the [Normal] or [Fine].

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



Value Indicator

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

Trend Line

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

Grid

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

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

Bar Graph Direction

Select Bar graph direction.

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**

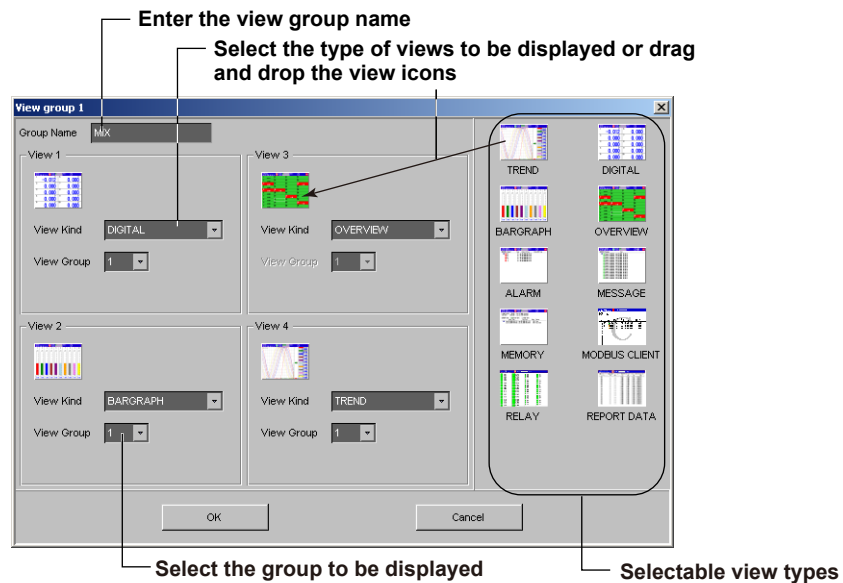
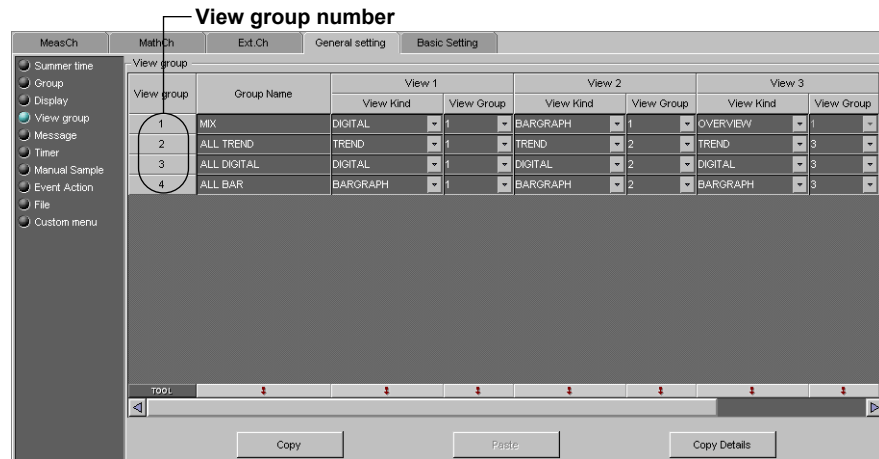
Settings	Description
Current	Displays a favorite display at the current time axis zoom rate.
Saved	Displays a favorite display at the time axis zoom rate that was selected when you registered the favorite display.

7.4 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.

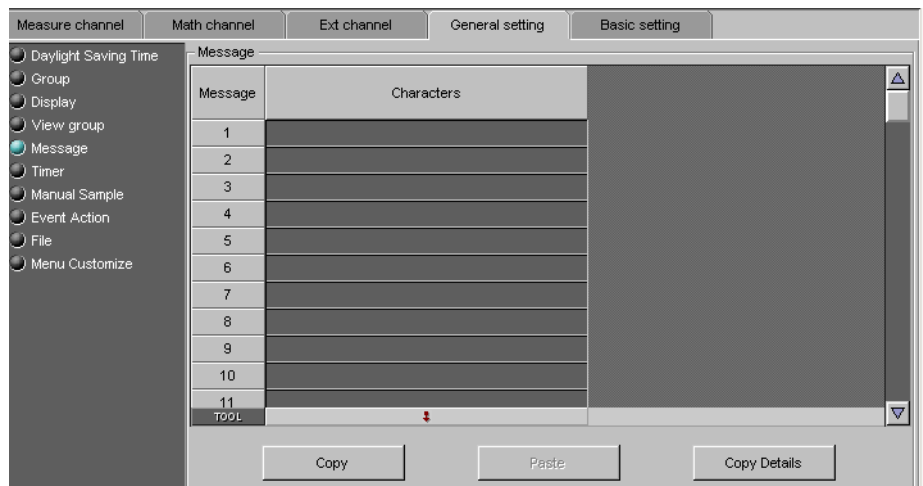
View Kind

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

View Group

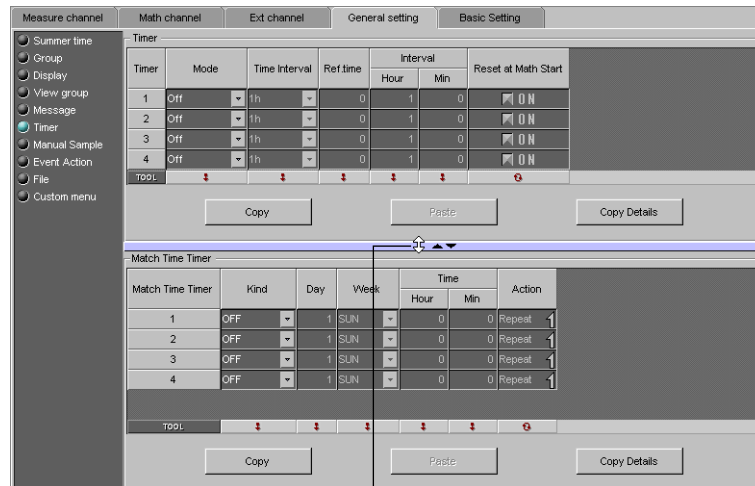
Up to four view groups can be registered.

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.

Click to display a channel selection dialog box.

Channel selection dialog box

Fill and increment by 1 starting from the top of the selection

Turn ON/OFF all in the selection at once

Drag to select a range

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

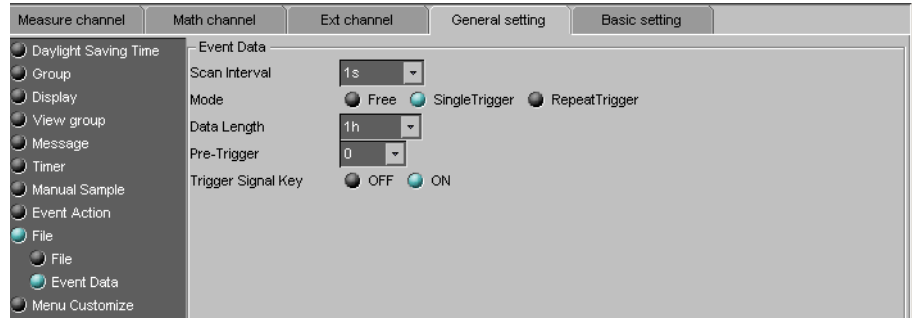
Settings	Description
Text	Display data files and event data files are in text format.
Binary	Display data files and event data files are in binary format.

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
Changes the left/right display area
Delete selected items
Click to display a sub menu on the right side of the screen
Add an item beneath the selected item

No.	Type	Sub Menu
1	ESC	
2	SEPARATE	
3	TREND	
4	TREND HISTORY	
5	DIGITAL	
6	BAR	
7	OVERVIEW	
8	INFORMATION	
9	4PANEL	

No.	Type
1	GROUP 1
2	GROUP 2
3	GROUP 3
4	GROUP 4
5	SEPARATE
6	GROUP 5
7	GROUP 6
8	GROUP 7
9	GROUP 8
10	GROUP 9
11	GROUP 10

Function

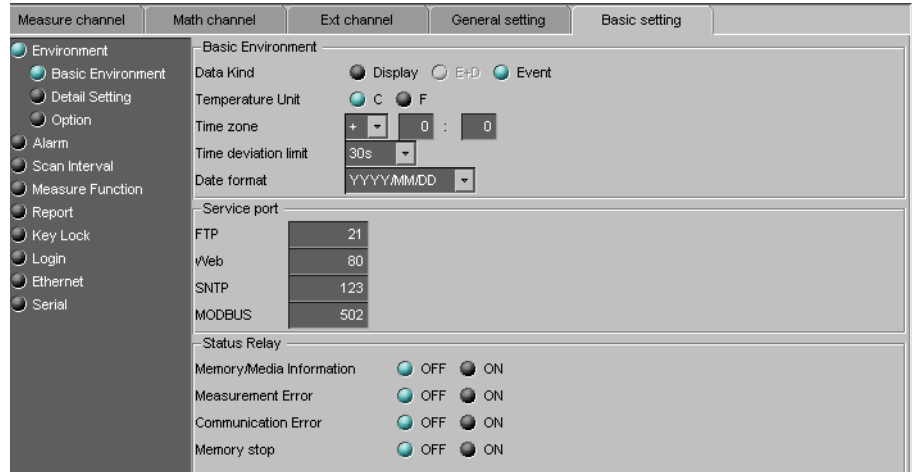
The FUNC key menu appears when the FUNC key is pressed.

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

7.5 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.

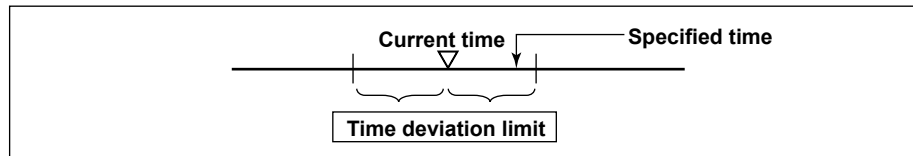
- **Temperature Unit**

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

7.5 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**

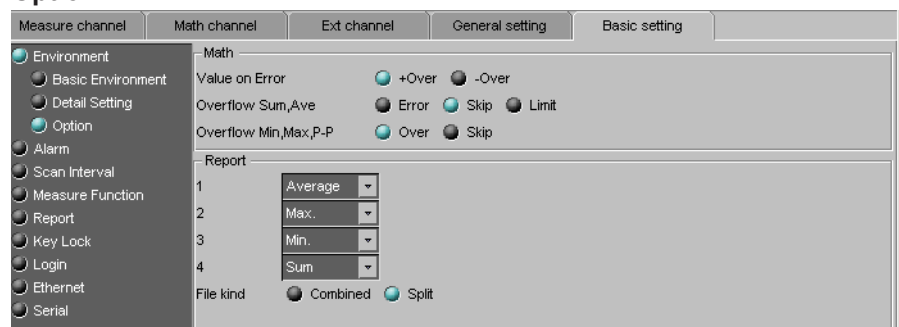
Settings	Description
ON	Automatically saves the measured data to the CF card.
OFF	Does not automatically save the data. Save the measured data manually to the CF card or USB flash memory (/USB1 option).

- **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.

7.5 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

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

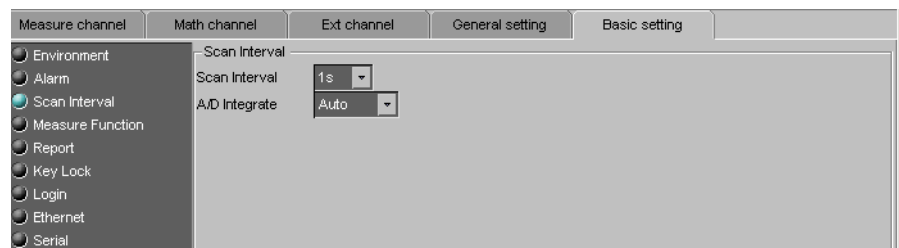
Sets the hysteresis width of the alarm occurrence/release of the difference high/low limit alarm specified on measurement channels.

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**

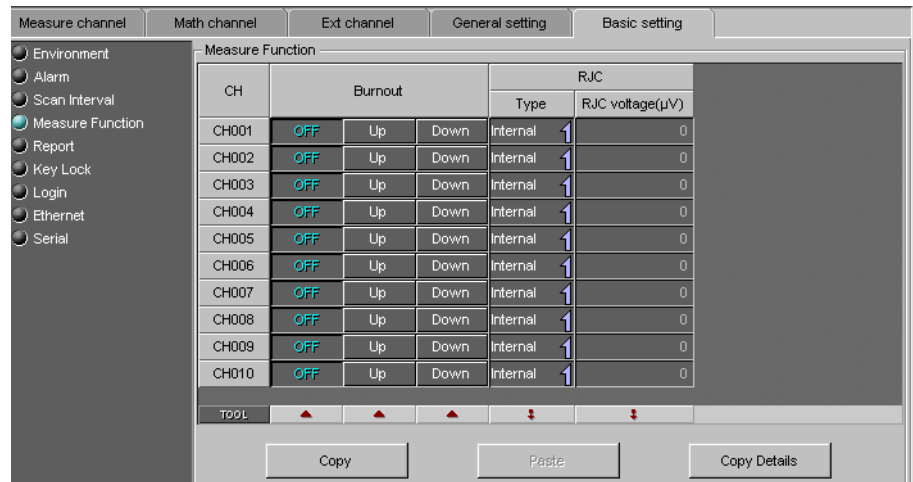
Select a scan interval.

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

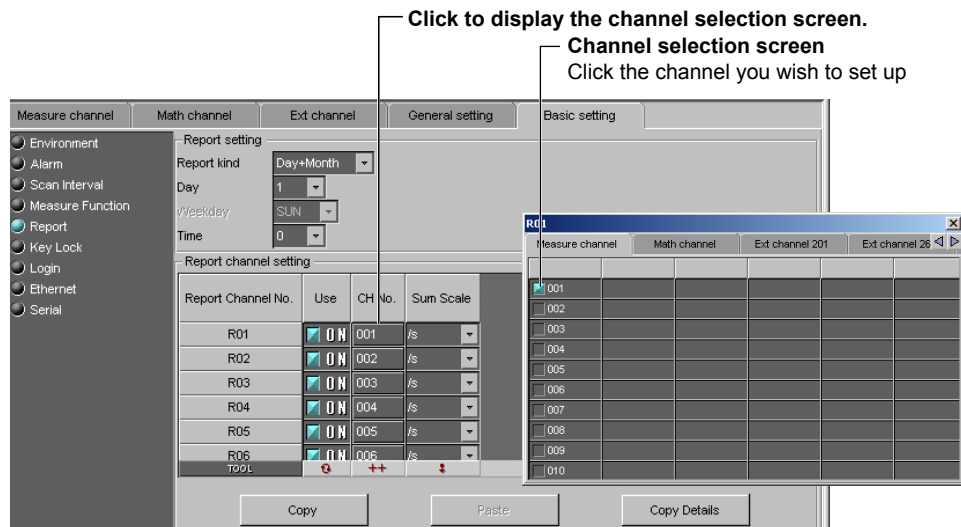
Sets the reference junction compensation method of the thermocouple input. Select [Internal] or [External].

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

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 checked="" type="radio"/> Key Lock <input type="radio"/> Login <input type="radio"/> Ethernet <input type="radio"/> Serial 					- Password Password <input type="password" value="*"/>			
- Key								
START			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
HISTORY			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
MENU			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
USER			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
DISP/ENTER			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
T/DIV			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
- Function								
Alarm Ack			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Message/Batch			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Math			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Data Save			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
E-Mail/FTP			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Time operation			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Display operation			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
- Media/USB								
Media			<input checked="" type="radio"/> Free	<input type="radio"/> Lock				
Load settings			<input checked="" type="radio"/> Free	<input type="radio"/> 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)

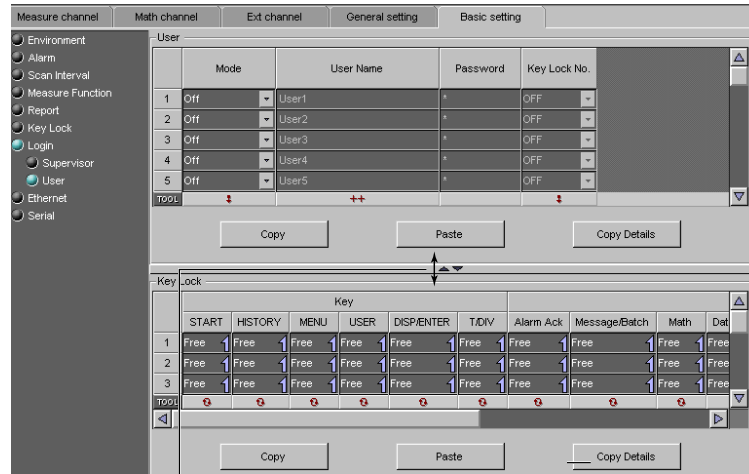
An entered password is displayed as "*****."

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

7.5 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].

7.5 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 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' software interface. The 'Basic Setting' tab is active. The 'Communication interval' is set to 1s and 'Auto recovery' is set to 2min. The 'Modbus Server Setting' table is as follows:

Server No.	Host Name	Port
1		
2		
TOP		

The 'Command setting' table is as follows:

Client Command No.	Command	Start channel	End channel	Server		
				Connect to	Register	Type
1	Read-M	C01	C01	1	30001	INT16
2	Off			1	0	INT16
3	Off			1	0	INT16
TOP						

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 recipients and alarms with radio buttons for ON/OFF, and fields for Include INST, Include source URL, Subject (Alarm_summary), Header1, and Header2.

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).

7.5 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

Measure channel | Math channel | Ext channel | General setting | Basic setting

Environment
Alarm
Scan Interval
Measure Function
Report
Key Lock
Login
Ethernet
TCP/IP
FTP
Modbus client
E-Mail
SNTP client
Server functions
Serial

SNTP client

Use Not Use

Server Name

Port No. 123

Interval 8h

Ref. Time 0 : 0

Access timeout 30s

Time adjust(start) OFF ON

- **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 type="radio"/> Not <input checked="" type="radio"/> Use <input type="radio"/> Operator <input type="radio"/> OFF <input checked="" type="radio"/> ON Access Control <input type="text" value="OFF"/> Command <input checked="" type="radio"/> Not <input type="radio"/> Use Monitor <input type="radio"/> OFF <input checked="" type="radio"/> ON Access Control <input type="text" value="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.

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

7.5 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).

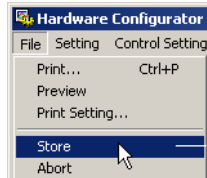
7.6 Sending the Setup Data to the MV1000/MV2000

The method used to send the data varies depending on whether a CONFIG file or setup data file is being transmitted.

CONFIG file

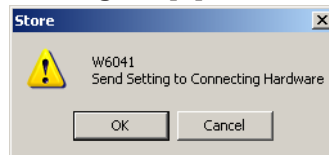
The following two methods are available:

- **Selecting from the toolbar**



The setup data are sent when [File] - [Store] is selected.

- **Clicking the [X] button**



When the Configurator is closed by clicking the [X] button, a confirmation dialog box is displayed.

To send the new setup data to the MV1000/MV2000, click the [Yes] button.

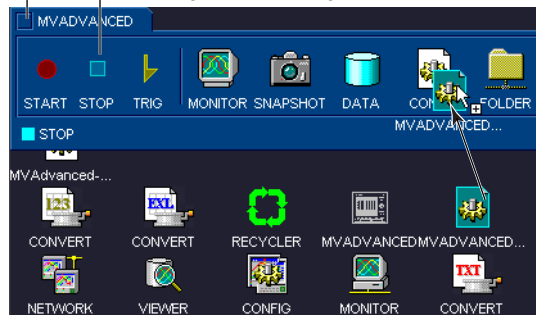
Otherwise, click the [No] or [Cancel] button.

If the MV1000/MV2000 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.

Setup data file

MV1000/MV2000 folder

1. Stop the data acquisition to the memory.



2. Drag and drop the file onto the CONFIG icon of the MV1000/MV2000 folder

The contents of the setup data file (*.PDL) located on the DAQ Desktop can be transmitted. If the MV1000/MV2000 is acquiring data to the memory, the data will not be sent in this case.

Note

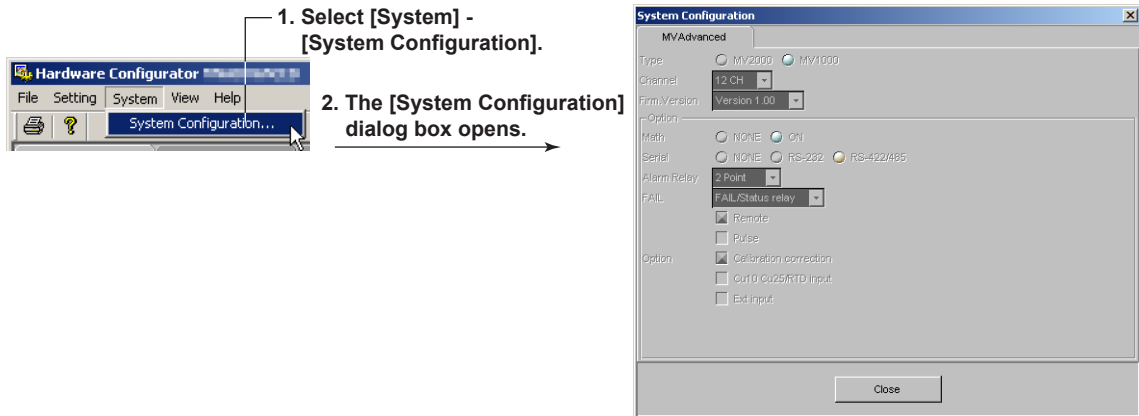
Of the network settings in the Basic Setting tab, the following items are not sent.

- Settings under [Ethernet] > [TCP/IP] and [Server functions].
- All settings under [Serial] > [Serial].

7.7 Checking the System Configuration and Initializing Setup Data

Checking the System Configuration

On the MV1000/MV2000 Configurator of the connected MV1000/MV2000, selecting [System Configuration] from the [System] menu opens the [System Configuration] dialog box. You can only view the system configuration on this [System Configuration] dialog box.

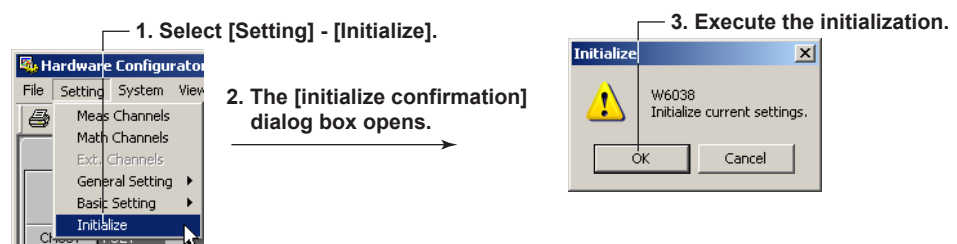


Note

If you select [System Configuration] from the [System] menu on the MV1000/MV2000 Configurator that was opened by double-clicking the setup data file on the DAQ desktop or loading the setup data, a [System Configuration] dialog box in which you can change the system configuration opens. If the system configuration is changed in this dialog box and the [OK] button is clicked, a message "System Configuration is changed Input&Data are Initialized" appears. Click the [OK] button to initialize the data.

Initializing the Setup Data

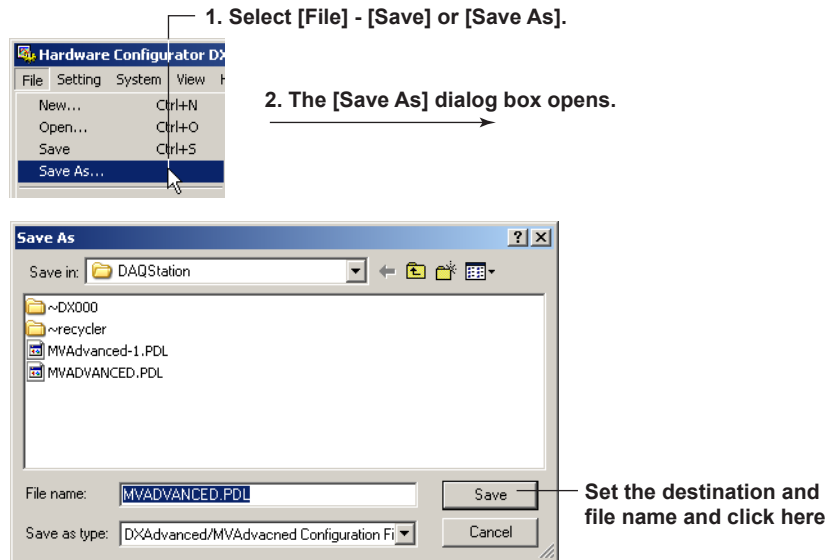
To initialize the settings, select [Initialize] from the [Setting] menu on the MV1000/MV2000 Configurator.



7.8 Saving the Setup Data

Changed settings can be saved on the PC with the procedure below.

To send saved setup data to the connected MV1000/MV2000 and edit them, see section 7.6, "Sending the Setup data to the MV1000/MV2000." Also, you can save stored setup data to a memory card or other medium, and load data saved on an external storage medium on the MV1000/MV2000 main unit.



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.

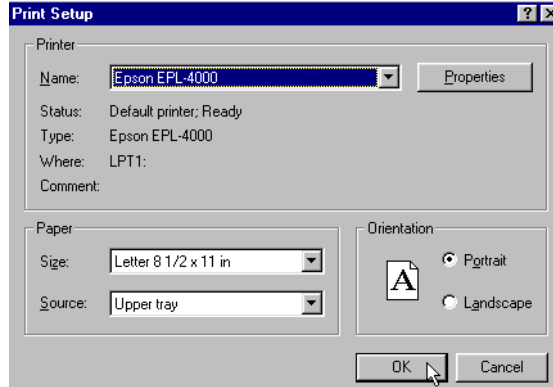
Note

The CONFIG file (directly view the setup data of the MV1000/MV2000) cannot be saved using [Save] or [Save As].

7.9 Printing the Setup Data

Setting the Printer

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



2. Set the printer, paper and orientation.

Note

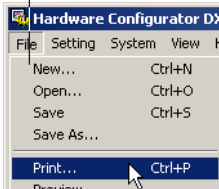
Set the printer according to the environment of the system that you are using.

Print Preview

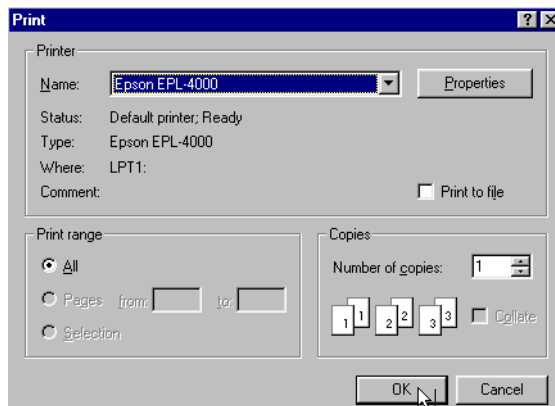
You can preview the print layout before actually printing the data. Selecting [File] - [Print Preview] displays the print preview screen.

Printing

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



2. The [Print] dialog box opens.



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

7.10 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 character string	Yes	Yes	Unit, user name, password, Character string account
	Yes	Yes (including [,])	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.”

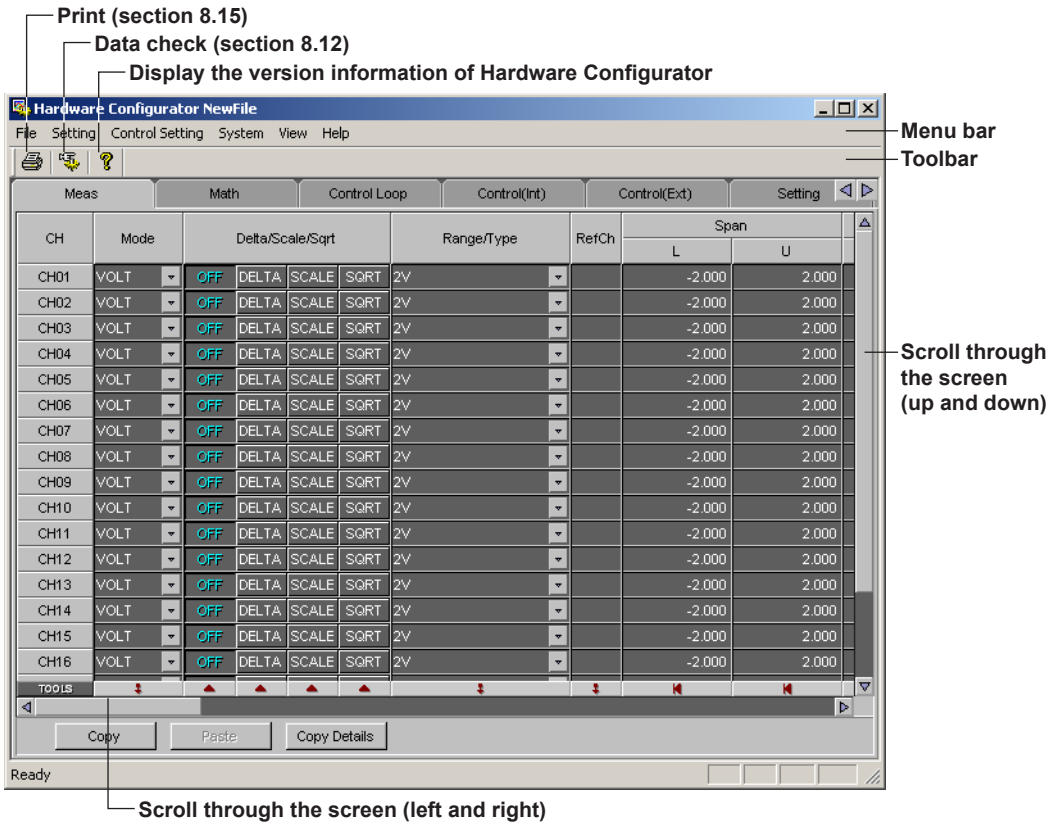
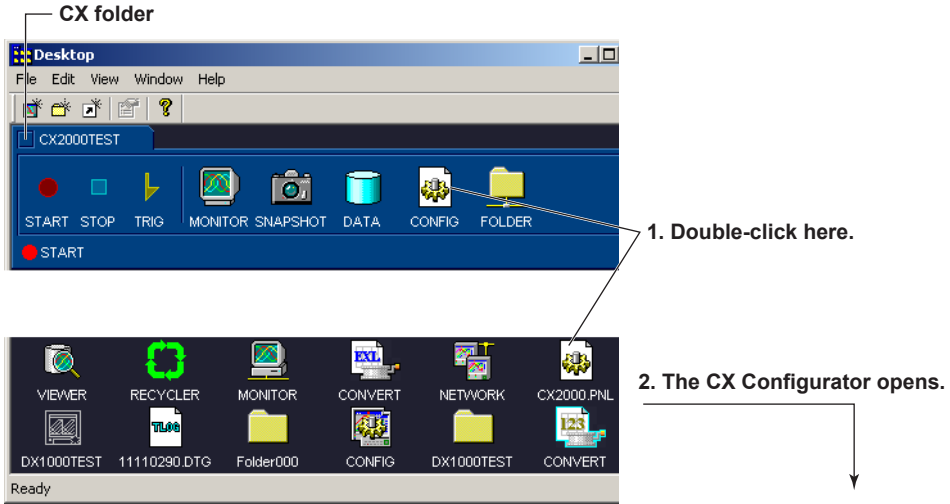
“ ° ” is the symbol for degrees (of temperature). Input, output and indicated using “ ^.”

8.1 Starting the Hardware Configurator (Opening the Hardware Configurator Window)

Starting the Hardware Configurator

To open the Hardware Configurator of the connected CX, double-click the [CONFIG] icon in the CX folder.

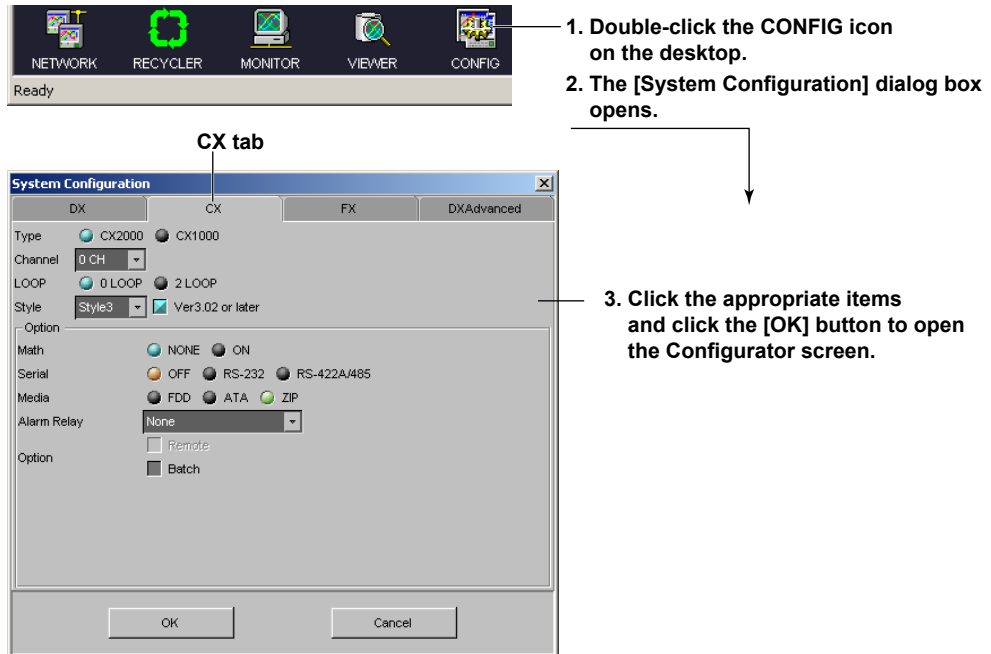
If you double-click a setup data file on the DAQ desktop and open the CX Configurator, the CX Configurator of the data saved on the PC opens.



8.1 Starting the Hardware Configurator (Opening the Hardware Configurator Window)

Opening the CX Configurator by Configuring a New System

If you wish to create a new setup data file independent from the connected CX, double-click the [CONFIG] icon on the DAQ desktop or select [New] from the [File] menu on the CX Configurator to open the [System Configuration] dialog box. Then, configure the system and open the CX Configurator.



You can enter the following settings in this dialog box.

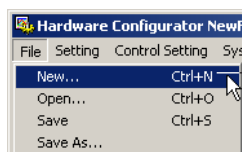
- Type
Select CX2000 or CX1000.
- Channel
Select the number of channels on the CX.
For CX1000, select [0CH] (when the style is set to Style2 or later) or [6CH].
For CX2000, select [0CH] (when the style is set to Style2 or later), [10CH], or [20CH].
- LOOP
Select the number of loops on the CX.
CX1000: [0LOOP] or [2LOOP]
CX2000: [0LOOP], [2LOOP], [4LOOP], or [6LOOP]
- Style
Select the CX style number. Depending on the style number, a version (example: Version 3.02 or later) check box appears to the right.
- Math Func.
Enable/Disable the math function.
- Serial
Select the serial communications mode: [OFF], [RS-232], or [RS-422/485].
- Media
Select the external storage media: [FDD], [ATA], or [ZIP].
- Alarm Relay
Select the type of alarm relay: [NONE], [4p+With Fail/Mem. End], [6p], or [External Loop] (only when the number of loops is 0 on the CX2000). The selectable items vary depending on the Type, Channel, and LOOP settings.
If the number of loops is set to [2LOOP] on the CX1000, the alarm relay is fixed to [NONE].

8.1 Starting the Hardware Configurator (Opening the Hardware Configurator Window)

- Option
The following options can be selected if you set the style to Style2 or earlier. They are not available on Style 3 or later, because they are equipped as standard.
- Green Series Comm
Select whether a communication option with an external Green Series controller is available. This option is valid only when [Serial] is set to [RS-232] or [RS-422/485]. If [LOOP] is set to [0LOOP], the option is fixed to [Green Series Comm].
- Ladder Comm
Select whether a ladder communication option is available. This option is valid only when [Serial] is set to [RS-232] or [RS-422/485]. This option is invalid if [LOOP] is set to [0LOOP].
- Remote
Select whether a remote option is available. This option is valid only when [Alarm Relay] is set to [4p+With Fail/Mem. End] or [6p].
- Program
Select the program control option: [None], [Program Num#:4], or [Program Num#:30]. If the system configuration is changed and the [OK] button is clicked, a message "System Configuration is changed Input&Data are Initialized" appears. Click the [OK] button to initialize the data.

Note

In the procedure for the System Configuration dialog box, make sure that the CX tab is selected before entering settings. If the DX tab is selected, the settings you enter will apply only to those instruments.

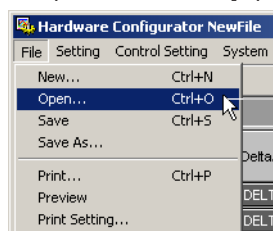


Select [File]-[New] to create new setup data from the second time.

Create the setup data according to step 2 and 3.

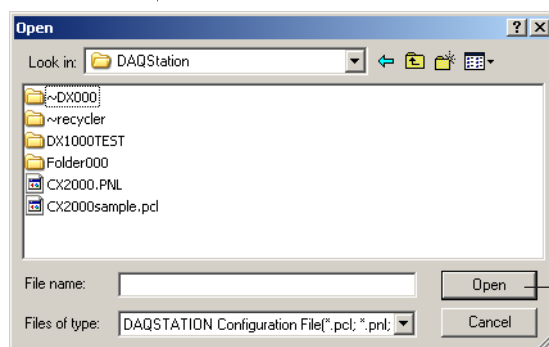
Opening the CX Configurator by Loading Existing Setup Data

Select [Open] from the [File] menu on the CX Configurator, specify the location of the setup data file in the [Open] dialog box, and open the CX Configurator.



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

2. The [Open] dialog box opens.

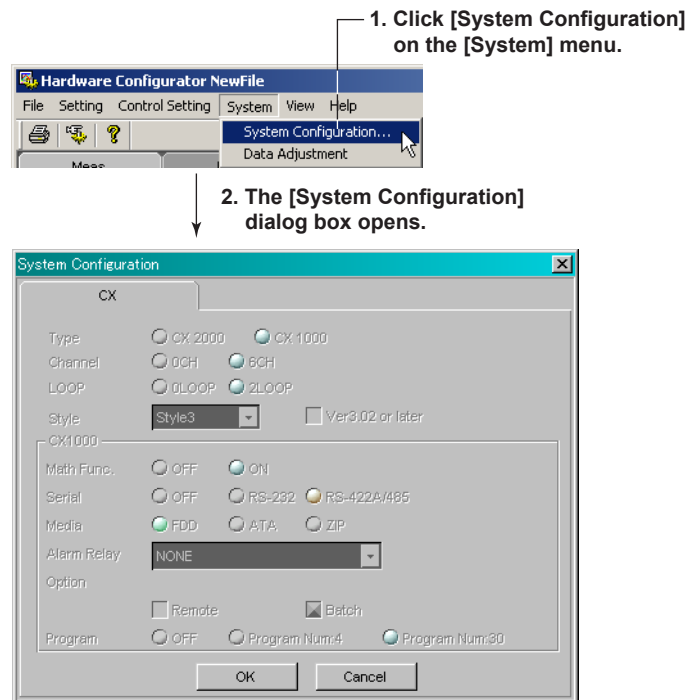


Select a file with .pcl extension and click here.

8.2 Checking the System and Initializing Setup Data

Checking the System

On the Hardware Configurator of the connected CX, selecting [System Configuration] from the [System] menu opens the [System Configuration] dialog box. You can only view the system configuration on this [System Configuration] dialog box.

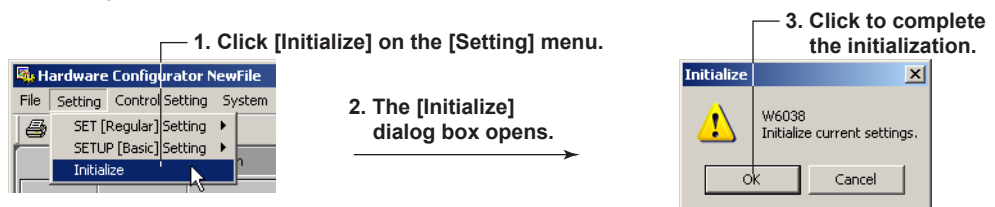


Note

If you select [System Configuration] from the [System] menu on the CX Configurator that was opened by double-clicking the setup data file on the DAQ desktop or loading the setup data, a [System Configuration] dialog box in which you can change the system configuration opens. If the system configuration is changed in this dialog box and the [OK] button is clicked, a message "System Configuration is changed Input&Data are Initialized" appears. Click the [OK] button to initialize the data.

Initializing the Setup Data

To initialize the settings, select [Initialize] from the [Setting] menu on the Hardware Configurator of the CX.



8.3 Basic Control Function Settings

Make the basic settings of control function.

To do so, 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

Meas	Control Loop	Control(Int)	Control(Ext)	Setting	Setup	Prog
<input type="radio"/> Alarm/Relay/Remote	<input type="radio"/> Scan Interval/Memory	<input type="radio"/> Measure channel	<input type="radio"/> Key Lock/Login	<input type="radio"/> Temperature	<input type="radio"/> Aux	<input type="radio"/> Time zone
<input type="radio"/> Network	<input checked="" type="radio"/> Control Action	<input type="radio"/> Internal Loop	<input type="radio"/> DI/DO/SW-Regist	<input type="radio"/> Control input channel	<input type="radio"/> Control Relay	<input type="radio"/> External Loop

Control Action

PID Number: 8

Control Interval: 250ms 500ms 1s

Zone PID: OFF ON

Restart Mode: Continue Manual Auto

Fixed-point: Continue Manual Reset

Program: Temp Press+Flow

Initial PID: 6 4

Auto tuning: OFF ON

PV/SP math function: OFF ON

CLOG Error: Skip Error

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].

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 ON/OFF the PV/SP computation function. When turned ON, you can enter an equation for PV/SP.

8.3 Control Function Basic Settings

CLOG Error (CX Style Number S3 or Later)

Set the error handling when the channel data for CLOG, which is an operator for PV/SP math and retransmission, is in error.

Error: Handle as a computation error

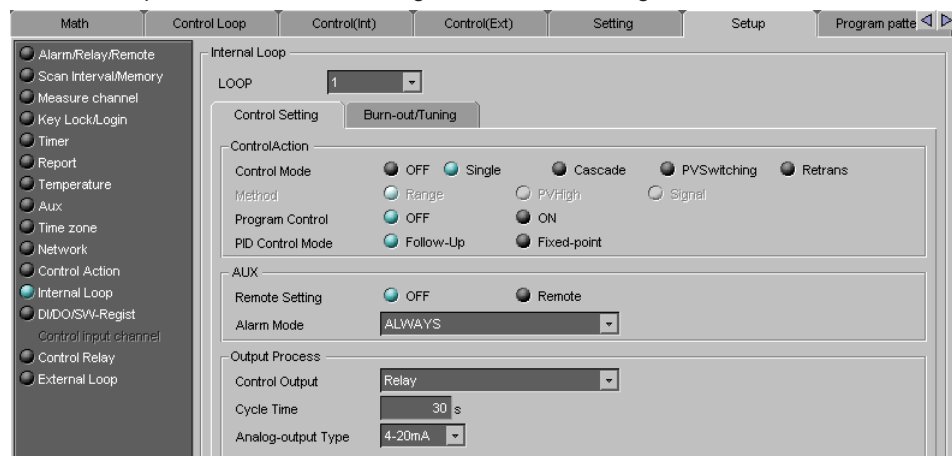
Skip: Skip the erroneous data and compute

Event output setting

On Style 3 Ver. 3.02 or later, event output can be set for each program pattern. To set the event output for each program pattern, select [Separate]. To set the event output for all program patterns, select [Common].

Internal Loop

For each loop there are Control Setting and Burn-out/Tuning items.



LOOP

Select the loop number 1 to 6 (1 or 2 on the CX1000, 1 to 4 if 6/4LOOP Select is set to 4 loops on the CX2000) to which the settings apply. Only the loops for which system settings were entered appear in the list.

[Control Setting] Tab

Contains the basic settings for internal loops.

- Control Action
 - Control Mode
Select the control mode from [Basic], [Cascade], [PVSwitch], or [Retrans] (Style 3 or later). For a loop with no control, select [OFF]. Selecting [Cascade], because of a common setting between two loops of a control output terminal block, when you set loop 1 to cascade, loop 2 can also automatically be set to cascade, for example.
 - Method
Select the switching conditions of two measurement inputs from [TCRange], [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 (on style 2 or earlier, the setting is common to the two loops on a single control output terminal block). This setting applies to both loops of a single control output terminal block.
 - PID Control Mode
Select the PID control mode from [Follow-Up] or [Fixed-point]. You cannot make this selection when [Control mode] is [OFF] for a loop.

- AUX

Remote Setting

When performing measurements by remote, select [Remote]. When [Control Mode] is set to [Cascade], it is not possible to set [Remote] for secondary measurement loop numbers. Selection is not possible for the following:

- Secondary measurement loop numbers when [Control Mode] is set to [Cascade].
- Even-numbered loops when the number of loops is 2, 4, or 6 (6/4LOOP Select is set to 4) and [Control Mode] is set to [PVSwitch] (when PV/SP math function is OFF).
- When the number of loops is 6 (6/4LOOP Select is set to 6) and [Control Mode] is set to [PVSwitch] (when PV/SP math function is OFF).

Alarm Mode

Select from the following whether you want the alarm to be inactive.

ALWAYS:

Alarm is always active.

STOP:

Alarm inactive when operation is stopped.

STOP/MAN:

Alarm is inactive 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.

Control Output

Select the type of control output from the following:

- Relay
- Voltage-pulse
- Current-output
- On/Off-control relay contact output (not selectable for retransmission loops)

Cycle Time

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

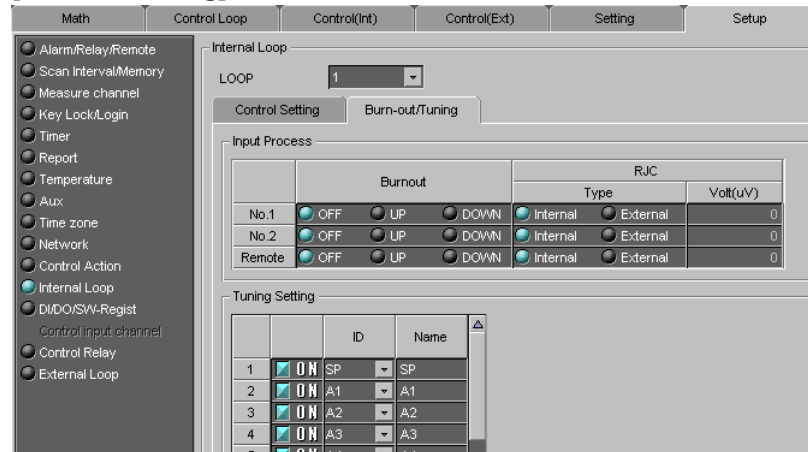
Analog-output Type

For the current output, select the output current range from the following:

- [4-20mA], [0-20mA], [20-4mA], and [20-0mA].

8.3 Control Function Basic Settings

[Burnout/Tuning] Tab



- Input Process

Burnout

For the measurement input to each loop, select the burnout direction (open-circuit detection) from [OFF], [UP], or [DOWN]. The [No.2] setting is valid when [Control Mode] is set to [PVSwitching], and the [Remote] setting is valid when remote input is used as measurement input. This setting is invalid for measurement inputs other than thermocouple and unified signals.

If PV/SP math is OFF, set this in “Control input channel” on page 6-10.

RJC (Type, Volt (uV))

This is the reference contact compensation setting for a thermocouple input. Set for the measurement input of each loop. The [No.2] setting is valid when [Control Mode] is set to [PVSwitching], and the [Remote] setting is valid when remote input is used as measurement input. This setting is invalid for measurement inputs other than thermocouple and unified signals.

Select from [Internal] and [External] for [Type].

When [External] is selected, set [Volt (uV)] between -20000 and 20000 uV.

If PV/SP math is OFF, set this in “Control input channel” on page 6-10.

Tuning Setting

Switch tuning ON or 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 (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), PO (preset output), BS1 (PV1 input bias), FL1 (PV1 input filter), BS2 (PV2 input bias), FL2 (PV2 input filter), RT (ratio setting), RBS (remote input bias), RFL (remote input filter), or W01 to W36 (control computation constant).

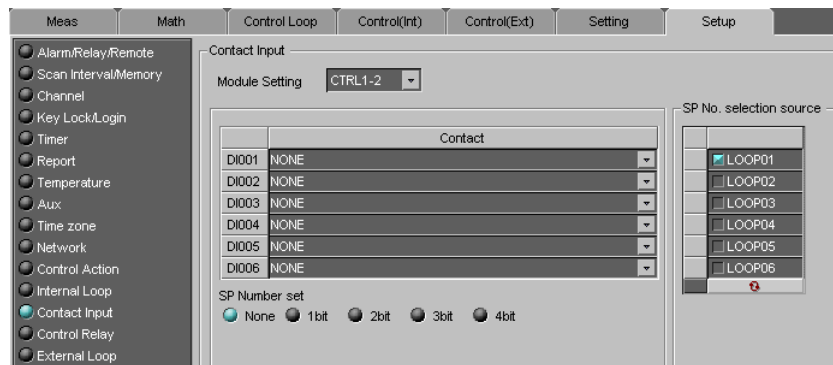
If PV/SP math is ON, you cannot select BS1, FL1, BS2, FL2, and RFL.

BS1, FL1, BS2, FL2, R, RBS, and RFL are valid on Style 3 or later.

Name

Specify the name of the item using a maximum of 6 characters.

Contact Input



Module Setting

Select the terminal blocks where you want to register contact inputs from [CTRL3-4] for a CX2000 with 4 loops or more, [CTRL5-6] for a CX2000 with 6 loops or more, or [EXTDIO] for a CX2000 with External DIO selected for Alarm Relay.

Contact

For each contact input number, select the type of contact input from the following. Some items may not be selectable depending on the system configuration and control mode. For a description of each contact input, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

- ControlStopAll
- ControlStartAll
- ControlStart/Stop
- Remote/Local
- Auto/Man
- Cascade
- Auto
- Man
- SPNumber0 to 3 bit (enter by selecting one of the options under SP Number set).
- PVSwitching
- Start program operation
- Stop program operation
- 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
- Set pattern number 0 to 4 bits (enter by selecting one of the numbers under Pattern Number Selection. Valid when program control is ON)

SP Number Set

Select the SP number set to switch to when registering contact inputs.

8.3 Control Function Basic Settings

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).

Pattern Number Selection

(When [Program Control] for [Internal Loop] is ON)

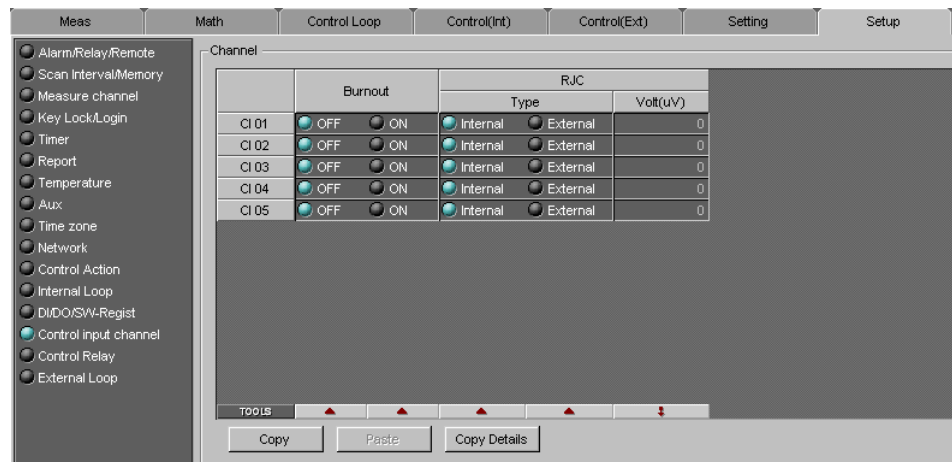
With program control, you can select the range of pattern numbers when switching program patterns through contact input. The pattern numbers are entered in binary according to the number of relays required as shown in the following chart.

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 math is ON, CX Style Number S3 or Later)

When PV/SP math is ON (see Control Action), set the burnout and RJC (set under “Internal Loop” when RV/SP math is OFF).



Burnout

Turn burnout ON/OFF for each control input channel.

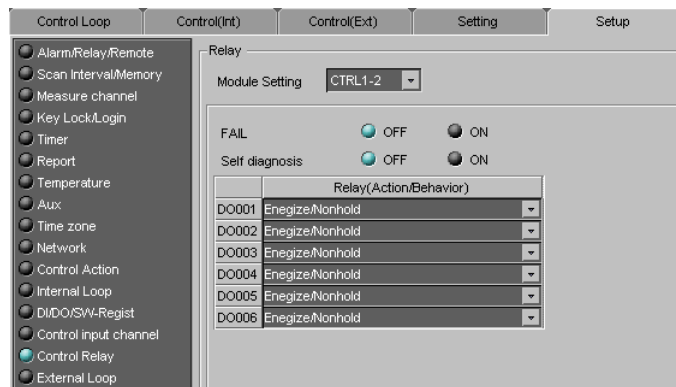
RJC (Type, Volt (uV))

This is the reference junction compensation setting for thermocouple inputs. Set the values for each control input channel. This setting is valid on the CX only for PV inputs using thermocouples.

Select [Internal] or [External] for Type.

When [External] is selected, set [Volt (uV)] between –20000 uV and 20000 uV.

Control Relay



Module Setting

Select the terminal blocks where you want to register contact inputs from [CTRL1-2], [CTRL3-4], [CTRL5-6], or [EXTDIO]. [CTRL3-4], [CTRL5-6], and [EXTDIO] are available only for the CX2000.

FAIL

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 is automatically assigned to [De_energize/Nonhold].

Self Diagnosis

Activates the output of a relay contact signal in the event of input burnout, an A/D converter fault, or reference contact compensation failure. When it is [ON] (default: [OFF]), contact output number [DO002] of control output terminal block 1 is automatically assigned to [De_energize/Nonhold].

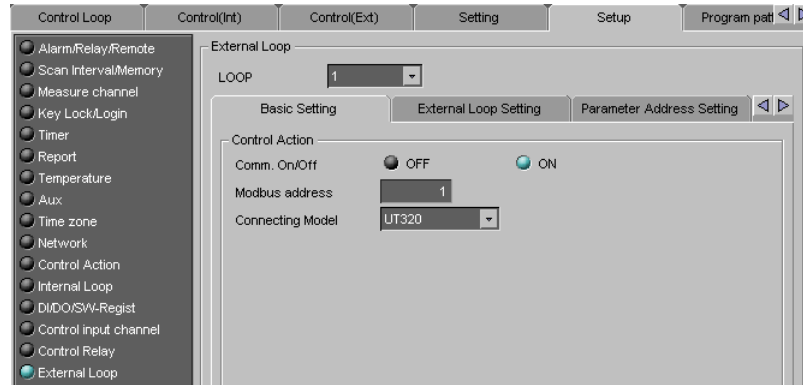
Relay (Action/Behavior)

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.

[Basic Setting] Tab

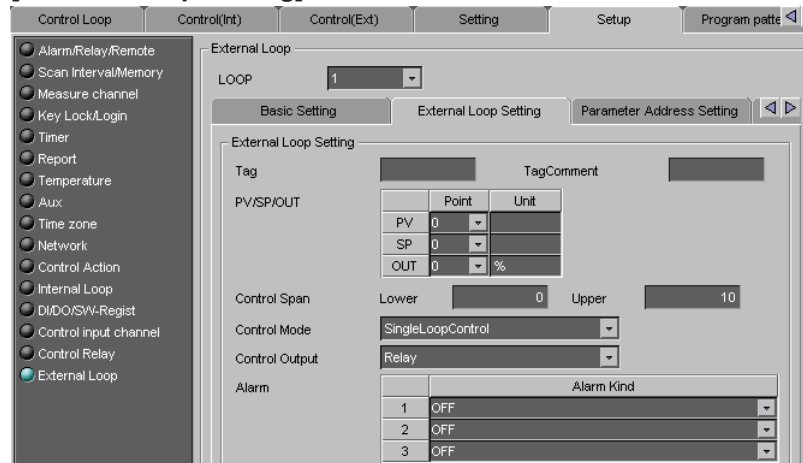


- **Control Action**
Comm. On/Off
 Select to turn the external loop function (the loop controller communications function which allows the CX to communicate with loop controllers) ON or OFF.
 If you select OFF, all settings below will be deactivated.

Modbus address
 Enter the Modbus address of the environment used in external loop control.

Connecting Model
 Select the type of connected UT series controller. Select [Other] when connecting to an adjustor 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, such as the UT550.

Tag

Specify a tag using a maximum of 8 characters.

Tag Comment

Specify a tag comment using a maximum of 8 alphanumeric characters.

PV/SP/OUT

Set the decimal place and units 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 following (The available control modes differ depending on the connected instrument.):

[SingleLoopControl], [CascadePrimaryLoop], [CascadeSecondaryLoop], [CascadeControl], [ControlBackUp], PVSwitching], [PVAutoSelector], or [PVHoldFunction].

Control Output

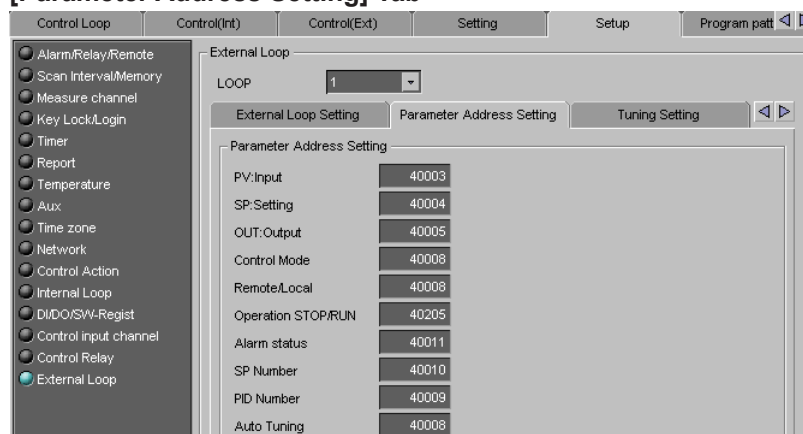
Select the type of control output from the following:

[Relay], [Voltage-pulse], [Current-output], and [On/Off-control]

Alarm

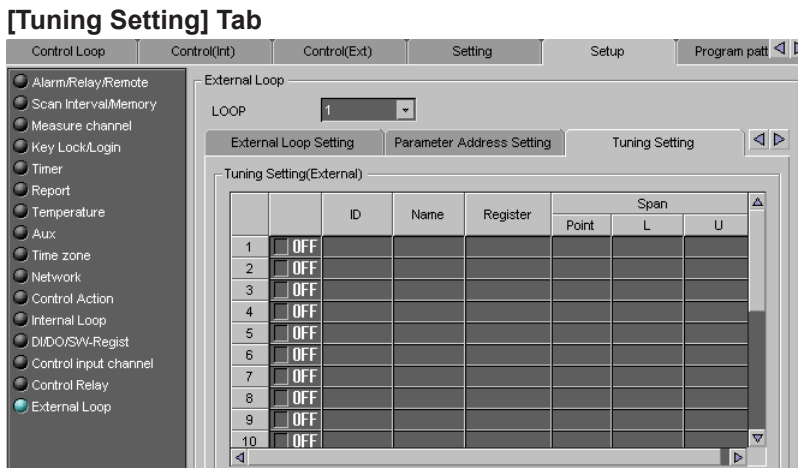
Select the type of alarm from the following:

[OFF], [PV-High(Energy)], [PV-Low(Energy)], [Deviation-High(Energy)], [Deviation-Low(Energy)], [Deviation-High(Deenergy)], [Deviation-Low(Deenergy)], [Deviation-H&L(Energy)], [Dev-within-H&L(Energy)], [PV-High(Deenergy)], [PV-Low(Deenergy)], [PV-High(Energy/Standby)], [PV-Low(Energy/Standby)], [Dev-High(Energy/Standby)], [Dev-Low(Energy/Standby)], [Dev-High(Deenergy/Standby)], [Dev-Low(Deenergy/Standby)], [Dev-H&L(Energy/Standby)], [Dev-w-H&L(Energy/Standby)], [PV-High(Deenergy/Standby)], [PV-Low(Deenergy/Standby)], [Timer-upward(h:m)], [Timer-downward(h:m)], [Timer-upward(m:s)], [Timer-downward(m:s)], [Sensor-grounding], [Problem-diagnostic], [FAIL-output], [SP-High], [SP-Low], [Output-High], [Output-Low], [Header-burnout1], and [Header-burnout2].

[Parameter Address Setting] Tab

Select the parameter address settings from the following ranges.

30001 to 39999, 300001 to 365535, 40001 to 49999, 400001 to 465535.



- Tuning Setting (External)
 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 from the following:

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 (other items), BS1 (PV1 input bias), FL1 (PV1 input filter), BS2 (PV2 input bias), FL2 (PV2 input filter), RT (ratio setting), RBS (remote input bias), RFL (remote input filter), or W01 to W36 (control computation constant)

External loop
 SP (target set point), A1 (alarm 1 setting), A2 (alarm 2 setting), A3 (alarm 3 setting), A4 (alarm 4 setting: not selectable on the UT320/UT321/UT350/UT351/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 (other items)

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 a maximum of 6 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 in the range of 0 to 4.

Span (L)
 Set the lower control span value between -30000 to 30000.

Span (U)
 Set the upper control span value between -30000 to 30000.

8.4 Control Function General Settings

Make 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 make 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

The menu that appears varies depending on whether the PV/SP math function in Control Action is ON/OFF.

When the PV/SP Math Function Is OFF

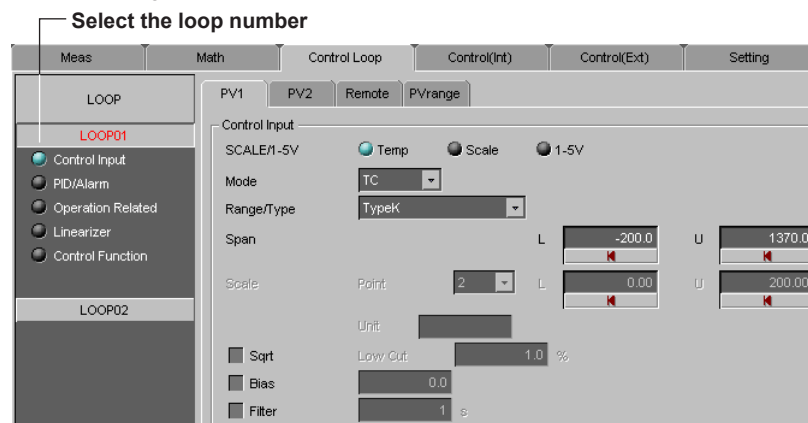
The control input types that appear vary depending on the [Internal Loop] > [Control Mode] setting under the [Setup] tab. The input types that you can select are [PV1], [PV2], [Remote], and [PVrange]. They are displayed under the following conditions.

		PV1	PV2	Remote	PVrange
Basic	Odd loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
	Even loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
Cascade	Odd loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
	Even loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
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"/>
Retransmission (Style 3 or later)	Odd loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
	Even loops	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>

* With 6 loops, and 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].

8.4 Control Function General Settings

Mode (PV1, PV2, Remote)

Select the channel input mode from [VOLT], [TC], or [RTD]. When [SCALE/1.5V] is set to [1.5V], [Mode] is set to [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 set to [6V].

Span (PV1, PV2, Remote)

Specify the measurement span in EU.

Scale (PV1, PV2, Remote)

Specify the scale between -30000 and 30000. However, this is only valid when [SCALE/1-5V] is set to [Scale]. For details, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Unit (PV1, PV2, Remote)

Specify the units.

Use a maximum of 6 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, Remote)

Select the check box to turn the bias ON.

When it is ON, specify a EU (-100 to 100%) value.

Filter (PV1, Remote)

Select the check box to use a filter.

When it is ON, set between 1 and 120.

Ratio setting (Remote)

Turn ON when applying the designated ratio to remote measurement input.

When it is ON, set between -30000 to 30000. Set the decimal point position in the range of 0 to 4.

On Style 2 or earlier, set between 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.

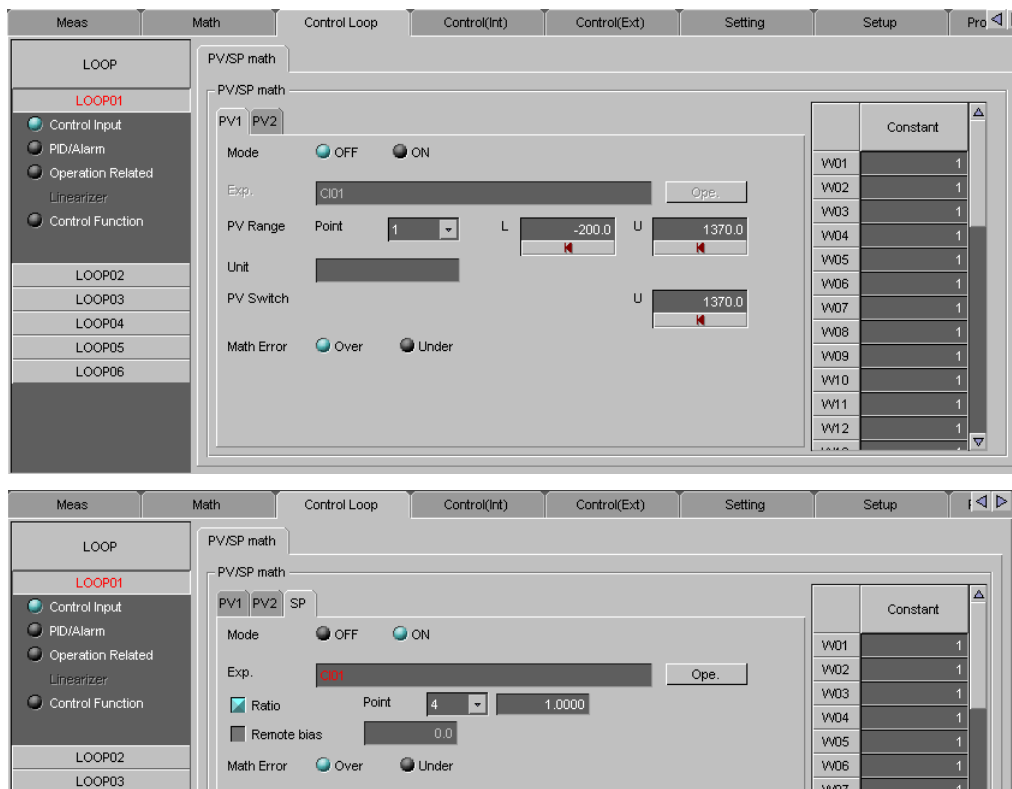
PV Switching (PV Range)

Set within the input range. When setting Method to T/C Range in the Control Setting tab 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 Input Switching setting is not available.

Note

When the PV/SP math function is ON, the input settings are entered using [Control input channel] items under the [Setting] tab. For the setting procedure, see page 8-10.

When the PV/SP Math Function Is ON



Enter PV or SP settings.

If the control mode is set to Retransmission, a menu for entering retransmission settings appears. See the next page.

PV/SP Math Function

Select the item you wish to set, PV, PV1, PV2, or SP. If the control mode is set to Basic or Cascade, set PV. If the mode is set to PVswitch, set PV1 and PV2. You can select SP when [Internal loop] > [Remote setting] under the [Setup] tab is ON.

Mode

Select ON or OFF.

ON: Enables the expression.

OFF: The control input channel below is assigned to the expression.

Control mode	Basic		Cascade		PVswitch (4 loops)			PVswitch (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	—	—	—	—	—	—	—	—
Loop 6	CI08	CI01	—	—	—	—	—	—	—	—

Exp.

Enter the PV/SP expression. You cannot enter the expression if Mode is OFF.

8.4 Control Function General Settings

PV Range (PV or PV1)

Set the maximum value, minimum value, decimal point position (0 to 4), and unit (up to 6 alphanumeric characters).

Set the maximum and minimum values between -30000 and 30000 . The maximum value must be greater than the minimum value and the difference between the two must be less than or equal to 30000 .

You can set PV1 even when the mode is OFF.

PV Switch (PV1)

Set the values within the PV range. Set the decimal point position (0 to 4), upper limit (U), and lower limit (L). If [Method] is set to [TCRange] in the [Control Setting] of the [Internal loop] item under the [Setup] tab, set the upper limit (U) and lower limit (L). If [Method] is set to [PVHigh], set only the upper limit. If [Method] is set to [Signal], the PV Switch setting is not available.

You can set this item even when the mode is OFF.

Ratio (Remote)

Turn this ON when applying a given ratio to the SP.

When it is ON, set the ratio between 0.0001 and 30000 . Set the decimal point position in the range of 0 to 4.

Remote bias

Turn ON/OFF the use of the bias on the SP.

When it is ON, set the bias value in the EUS (-100% to 100%) range of PV Range.

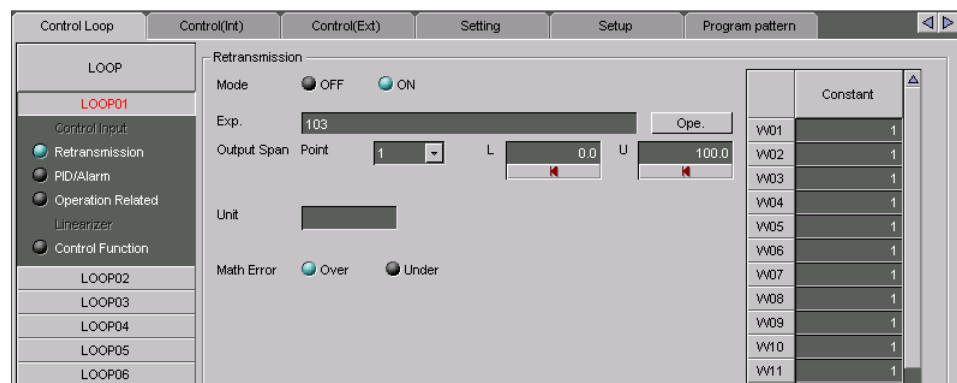
Math Error

Set whether to handle the PV/SP as overrange or underrange when a computation error occurs.

Constant

Set the constants used for PV/SP math, retransmission, and logic math. The constants are common with the constants of retransmission and logic math.

Retransmission



Set the expression or output span on loops whose control mode is set to retransmission.

Mode

Select ON or OFF.

ON: Enables the expression.

OFF: Disables retransmission.

Exp.

Enter the retransmission expression.

Output Span

Set the maximum value, minimum value, decimal point position (0 to 4), and unit (up to 6 alphanumeric characters).

Set the maximum and minimum values between -30000 to 30000 . The maximum value must be greater than the minimum value and the difference between the two must be less than or equal to 30000 .

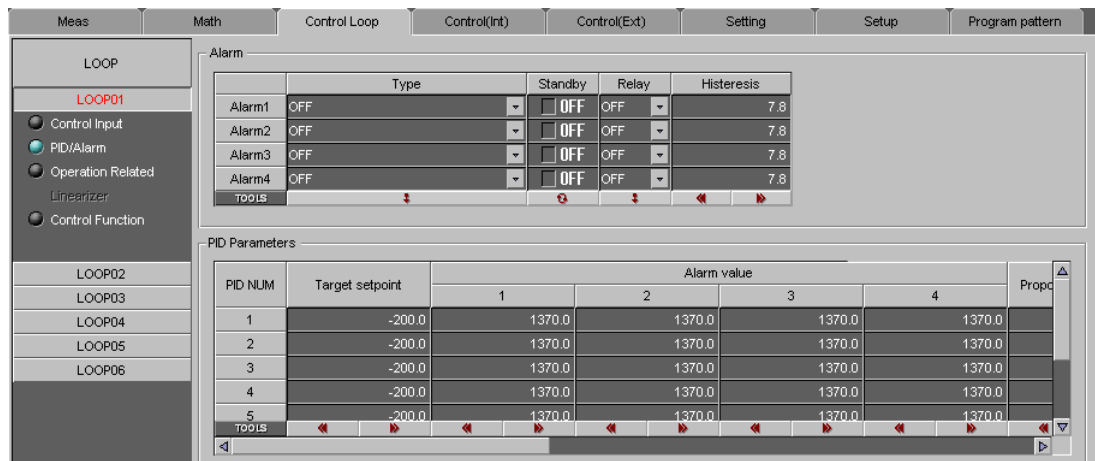
Math Error

Set whether to set the value to overrange value or underrange value when the computed result is in error.

Constant

Set the constants used for PV/SP math, retransmission math, and logic math.

PID/Alarm



- Alarm
Specify an alarm for each loop.

Type

Select the type of alarm from the following:

[PV-High], [PV-Low], [Deviation-High], [Deviation-Low], [Deviation-H&L], [Dev-within-H&L], [SP-High], [SP-Low], [Output-High], and [Output-Low].

Standby

Activate or deactivate standby.

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: Loop 2

DO101 to DO106: Loop 4 (Only on the CX2000)

DO201 to DO206: Loop 6 (only on the CX2000 whose 6/4LOOP Select is set to 6)

RO001 to RO012: Control expansion DIO (only on the CX2000 that has the control expansion DIO installed)

SW001 to SW036: Internal switch (SW001 to SW018 on the CX1000, Style 3 or later)

Hysteresis

Specify the alarm hysteresis in EUS (0.0 to 10.0%).

8.4 Control Function General Settings

- 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%)
Deviation alarms	EUS (0 to 100%)
Output alarms	-5.0 to 105.0%

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.

Lower Limit

Set the output lower limit between -5.0 and 105.0%.

Upper Limit

Set the output upper limit between -5.0 and 105.0%.

Shutdown

Turn the shutdown function ON or OFF.

Manual Reset

Set the manual reset between -5.0 and 105.0%.

Relay Hysteresis (Value)

Set the relay hysteresis in EU (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 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] on the [Internal Loop] tab of the [Setup] tab. In that case, [PID], [Output Limit], [Shutdown], and [Manual Reset] are not shown.

Operation Related

	Reference Point
1	1370.0
2	1370.0
3	1370.0
4	1370.0
5	1370.0
6	1370.0

- Operation Related

Make the 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%).

SP Ramp-up-rate

Set between 1 digit and EUS (100%).

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

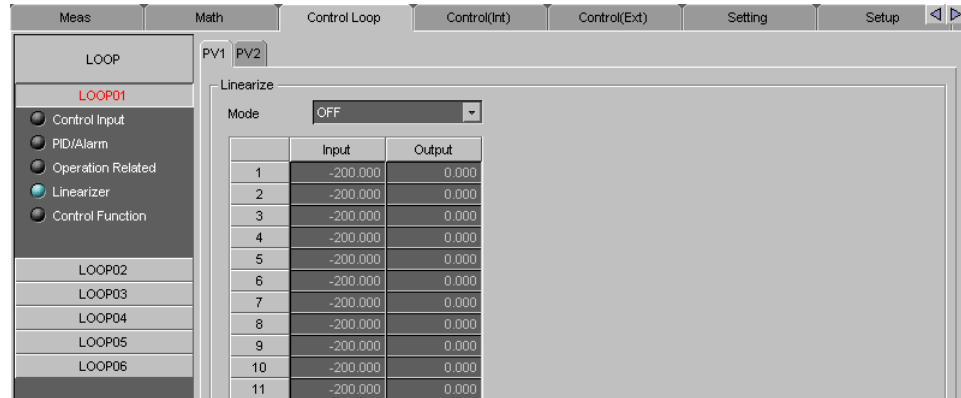
Specify the switching hysteresis value with the measurement input span EUS (0.0 to 10.0%). With style number S1 (system setting), it is not displayed if the PID number is 2 or less. With style # S2, it is not displayed when the PID number is 1 or less.

8.4 Control Function General Settings

Reference Deviation

Turn the reference deviation on or off, and specify the value with the measurement input span one-digit EUS (100.0%). It is not displayed when the PID number is 2 or less.

Linearize (When the PV/SP Math Function is OFF)



Mode

Select the linearize mode from [OFF], [Biasing], or [Approximation].

Input

Enter the linearize input value. (The value depends on the linearize mode.)

Biasing: Set with the measurement input span EU (-5.0 to 105.0%).

Approximation: Set with the measurement input span EU (-5.0 to 105.0%).

You must set between 2 and 11 points total.

Output

Enter the linearize output value. (The value depends on the linearize mode.)

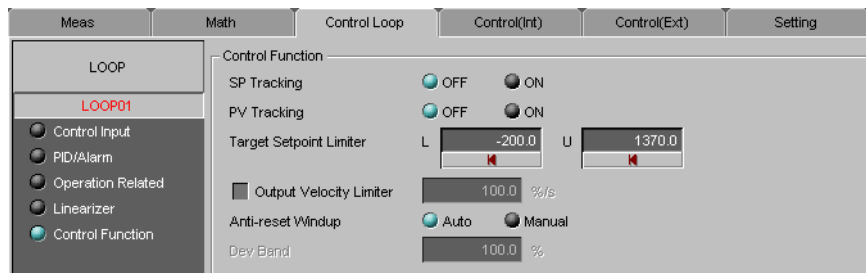
Biasing: Set with measurement input span EUS (-100.0 to 100.0%).

Approximation: Set with measurement input span EU (-5.0 to 105.0%).

Note

- For biasing, set the values so that input + output is EU (0 to 100%). In addition, set the values so that input + output is greater than or equal to the previous input + output.
- Set the approximation output to be greater than or equal to the previous value.
- If a value smaller than the previous value is specified for the third point or later, the settings after that point are invalid.
- When the PV/SP math function is ON, the settings above are entered using [Control input channel] items under the [Setting] tab for each control input channel. For the setting procedure, see page 8-27.

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

Set the value in the measurement span EU (0.0 to 100.0%). L must be smaller than U.

Output Velocity Limiter

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. 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

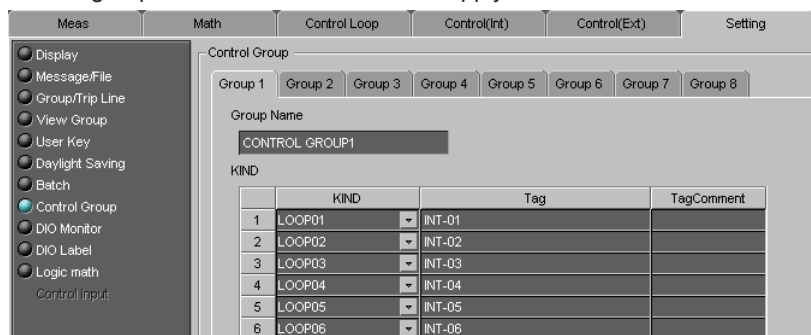
Select the anti-reset windup from [Auto] or [Manual]. This is unavailable for style number S2 if you set [Control Output] to [On/Off control] in the [Setup] tab for [Internal Loop].

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 characters.

8.4 Control Function General Settings

KIND

Select the loops numbers, measurement channel numbers, or DIO numbers (Style 3 or later) you want to assign to a Group. For the CX1000, you can select 1 or 2 internal loops and 1 to 4 external loops. For the CX2000, you can select 1 to 6 internal loops, 1 to 16 external loops, and 1 to 36 DIOs.

Group1 consists of up to 4 types on the CX1000, or up to 6 types on the CX2000 corresponding to the control loops and measurement channels.

DIO Monitor (CX Style Number S3 or Later)

Meas	Control Loop	Control(Int)	Control(Ext)	Setting		Setup	Prog	
				DO Num				
				ON	OFF			
<input type="radio"/> Display	Entry Num	Use	DIO Kind	SW Num	DO Num	DI Num	Tag	TagComme
<input type="radio"/> Message/File	01	<input checked="" type="checkbox"/> ON	DI-1			DI001		
<input type="radio"/> Group/Trip Line	02	<input checked="" type="checkbox"/> ON	DO-1	SW001	DO001			
<input type="radio"/> View Group	03	<input checked="" type="checkbox"/> ON	DIO-12	SW001	DO002	DO003	DI002	
<input type="radio"/> User Key	04	<input type="checkbox"/> OFF						
<input type="radio"/> Daylight Saving	05	<input type="checkbox"/> OFF						
<input type="radio"/> Control Group	06	<input type="checkbox"/> OFF						
<input checked="" type="radio"/> DIO Monitor	07	<input type="checkbox"/> OFF						
<input type="radio"/> DIO Label	08	<input type="checkbox"/> OFF						
<input type="radio"/> Logic math	09	<input type="checkbox"/> OFF						
<input type="radio"/> Control Input	10	<input type="checkbox"/> OFF						
TOOLS								

Entry Num

Set the value in the range from 1 to 36.

Use

Turns ON/OFF the specified DIO entry number.

DIO Kind

Set the method of DIO monitor.

- DI-1: Indicates the DI input status. The internal switch status is not output.
- DO-1: Outputs the internal switch status using a single DO. If the internal switch is ON, 1 (ON) is output. If it is OFF, 0 (OFF) is output.
- DO-2: Outputs the internal switch ON/OFF status using separate DOs. If the internal switch is ON, 1 (ON) is output from the ON output DO. If it is OFF, 0 (OFF) is output from the OFF output DO. If the internal switch is OFF, 1 (ON) is output from the ON output DO. If it is OFF, 0 (OFF) is output from the OFF output DO.
- DIO-11: Displays the input status of the specified DI as well as operates in the same fashion as D0-1.
- DIO-12: Displays the input status of the specified DI as well as operates in the same fashion as D0-2.
- DO-2P: Outputs the internal switch ON/OFF status using separate DOs. If the internal switch is ON, a pulse signal of 1- to 2-second pulse width is output from the ON output DO. If it is OFF, a pulse signal of 1- to 2-second pulse width is output from the OFF output DO.
- DOI-12P: Displays the input status of the specified DI as well as operates in the same fashion as D0-2P.

SW Num

Set the internal switch number to be assigned to the DO.

DO Num

Set the DO that is to perform DIO monitor. If the DIO Kind is set to DO-2, DIO12, DO2P, or DIO-12P, set a separate DO for ON and OFF. The DO numbers cannot overlap including those of other DIO entry numbers.

This does not appear when DIO Kind is DI-1.

DI Num

Set the DI number to be monitored.

Tag

Set the tag.

Enter up to eight alphanumeric characters.

TagComment

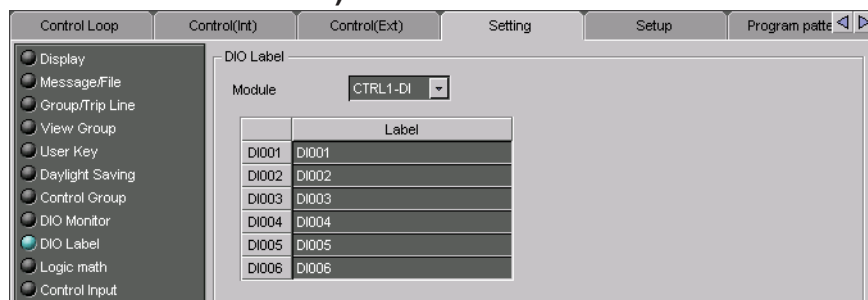
Set the tag comment.

Enter up to eight alphanumeric characters.

Operation Status Display

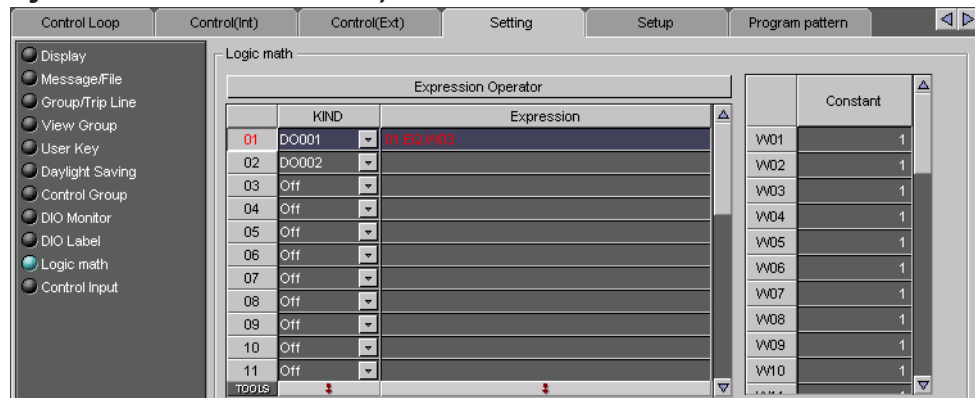
Set the label and color for displaying the status.

DIO Label (CX Style Number S3 or Later)



Set the DIO label.

Logic math (CX Style Number S3 or Later)



KIND

Set the output destination of the computed result.

Expression

Enter the expression. Click the [Expression Operator] button to display the possible operators.

Constant

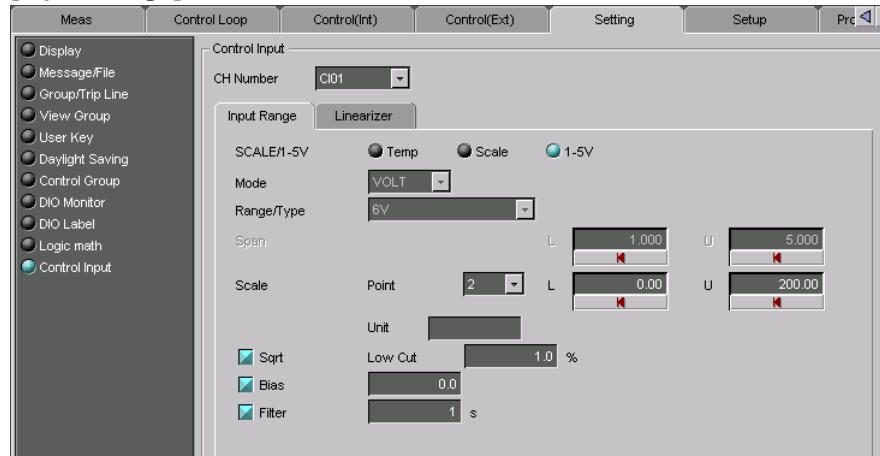
Set constants to be used in the expression.

The constants are common with the constants of PV/SP math and retransmission.

Control Input (CX Style Number S3 or Later)

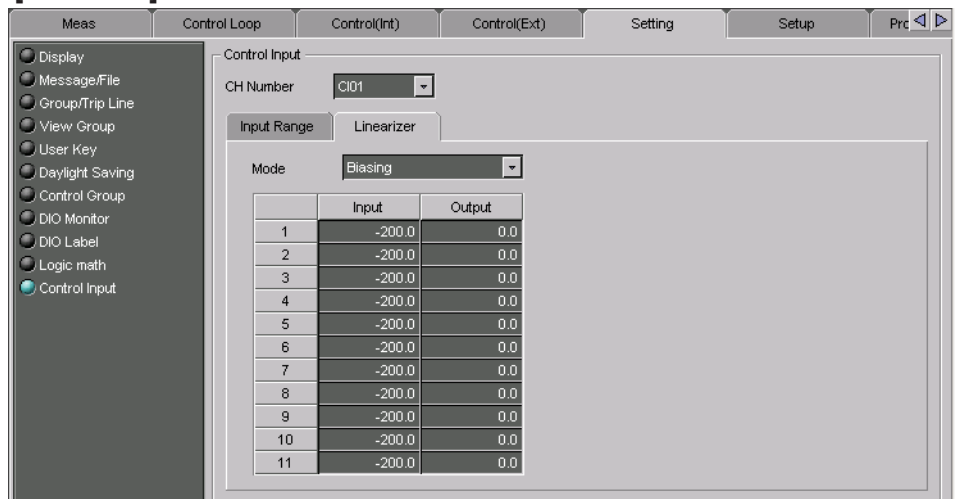
When PV/SP math is ON, set [Input Range] and [Linearizer] for each channel.

[Input Range] tab



- **Scale/1-5V**
Set the measurement mode of the channel to [Temp], [Scale], or [1-5V].
- **Mode**
Set the channel input mode to [VOLT], [TC], or [RTD]. If [Scale/1-5V] is set to [1-5V], the mode is fixed to [VOLT].
- **Range/Type**
Select the voltage range or the thermocouple or RTD type.
VOLT: 20mV, 60mV, 200mV, 2V, 6V, 20V, or 50V
TC: R, S, B, K, E, J, T, N, W, L, U, PLATINEL, PR40-20, or WRe3-25
RTD: JPt100 or Pt100
If [Scale/1-5V] is set to [1-5V], the range/type is fixed to [6V].
- **Span**
Set the measurement span of each loop. The upper limit (U) must be greater than the lower limit (L).
- **Scale**
Set the scale of each loop between -30000 and 30000. The upper limit (U) must be greater than the lower limit (L) and the difference between the two must be 30000. This is valid only when [Scale/1-5V] is set to [Scale]. For details, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.
- **Unit**
Set the unit of each loop.
Enter up to six alphanumeric characters.
- **Sqrt**
Turn ON/OFF the square root computation.
When it is ON, set the low cut value between 0.0 and 5.0%.

- Bias (PV1/2 or Remote)
Turns ON/OFF the use of the bias.
When it is ON, set the value in the EUS (–100 to 100%) range of the measurement.
- Filter (PV1/2 or Remote)
Turns ON/OFF the use of the filter.
When it is ON, set the value between 1 and 120 s.

[Linearizer] Tab

- Mode
Set the mode to [OFF], [Biasing], or [Approximation].
- Input
Set the linearizer input value. (The value varies depending on the mode.)
Biasing: Set the value in EU (–5.0 to 105.0%) of the measurement span.
Approximation: Set the value in EU (–5.0 to 105.0%) of the measurement span.
You must set between 2 and 11 points total.
- Output
Set the linearizer output value. (The value varies depending on the mode.)
Biasing: Set the value in EUS (–100.0 to 100.0) of the measurement span.
Approximation: Set the value in EU (–5.0 to 105.0%) of the measurement span.

Note

- For biasing, set the values so that input + output is EU (0 to 100%). In addition, set the values so that input + output is greater than or equal to the previous input + output.
- Set the approximation output to be greater than or equal to the previous value.
- If a value smaller than the previous value is specified for the third point or later, the settings after that point are invalid.
- When PV/SP math function is OFF, enter the settings above for each control loop in the [Control Loop] tab. For the setting procedure, see page 6-22.

8.5 Control Channel Settings (Internal/External)

The following settings apply to the internal and external loops' SP, PV, and OUT measurement 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		Graph			Partial		Color
				L	U	Div	Bargraph	Scale	Expand(%)	Boundary	
CH101	LOOP01	PV	INT-01.PV	0	100	10	Normal	1	OFF	50	0.0
CH102	LOOP01	SP	INT-01.SP	0	100	10	Normal	1	OFF	50	0.0
CH103	LOOP01	OUT	INT-01.OUT	0	100	10	Normal	1	OFF	50	0.0
CH104	LOOP02	PV	INT-02.PV	0	100	10	Normal	1	OFF	50	0.0
CH105	LOOP02	SP	INT-02.SP	0	100	10	Normal	1	OFF	50	0.0
CH106	LOOP02	OUT	INT-02.OUT	0	100	10	Normal	1	OFF	50	0.0
CH107	LOOP03	PV	INT-03.PV	0	100	10	Normal	1	OFF	50	0.0
CH108	LOOP03	SP	INT-03.SP	0	100	10	Normal	1	OFF	50	0.0
CH109	LOOP03	OUT	INT-03.OUT	0	100	10	Normal	1	OFF	50	0.0
CH110	LOOP04	PV	INT-04.PV	0	100	10	Normal	1	OFF	50	0.0
CH111	LOOP04	SP	INT-04.SP	0	100	10	Normal	1	OFF	50	0.0
CH112	LOOP04	OUT	INT-04.OUT	0	100	10	Normal	1	OFF	50	0.0
CH113	LOOP05	PV	INT-05.PV	0	100	10	Normal	1	OFF	50	0.0
CH114	LOOP05	SP	INT-05.SP	0	100	10	Normal	1	OFF	50	0.0
CH115	LOOP05	OUT	INT-05.OUT	0	100	10	Normal	1	OFF	50	0.0
CH116	LOOP06	PV	INT-06.PV	0	100	10	Normal	1	OFF	50	0.0
CH117	LOOP06	SP	INT-06.SP	0	100	10	Normal	1	OFF	50	0.0
CH118	LOOP06	OUT	INT-06.OUT	0	100	10	Normal	1	OFF	50	0.0

Tag

Enter a tag of using maximum of 16 characters.

You can enter a tag to be displayed on the screen instead of the channel number. Select whether the channel name or tag is displayed in the [Setup] tab. 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 in 10 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: $EU (0\%) < \text{boundary value} < EU (100\%)$
OUT: $EU (-5.0\%) < \text{boundary value} < EU (105.0\%)$
However, for retransmission OUT, $\text{minimum span value} < \text{boundary value} < \text{maximum span value}$
- External control channel
 $\text{span L} < \text{boundary value} < \text{span U}$
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 $-5.0\% < \text{boundary} < 105.0\%$.

Color

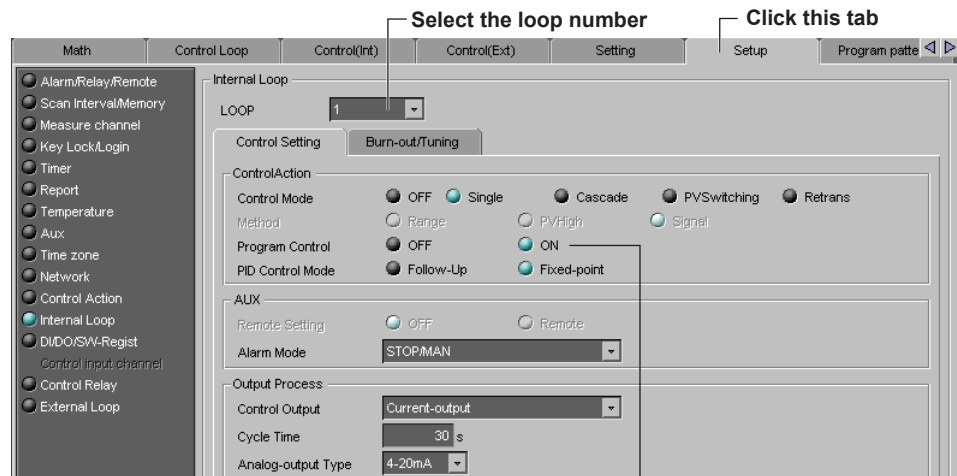
For each channel you can choose from 16 colors.

8.6 Program Control Related Setup Operations

Turn ON/OFF Program Control

Program control can be turned ON and OFF using the internal loop setting of the control function basic settings.

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.



Program control ON/OFF
(For every 2 loops on Style 2 or earlier
For every loop on Style 3 or later)

Note

You must first turn ON program control to carry out the program control related settings below.

Initial Program Patterns

You can set the 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 Default setting and Segment settings
Paste the copied Default setting and Segment setting of another pattern

Select the pattern number
Pattern Default setting
Pattern name, Setting method, Start setpoint, and Start code

Enter the pattern name
Segment setting
Program pattern, PV Event, Time Event, and Repeat

PV event hysteresis setting

Event output setting

Event display group setting (Style 3 Ver. 3.02 or later)

AUX setting
Automatic message and program display position

Select this tab

Segment and event totals (Cannot be set)
The number of segments and events used in this pattern (Cannot be set)

Set the action loops

Set the segment setting method

Zone number

Set the wait
Available when segments have been inserted or added under [Segment setting]

Set the wait time

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.

8.6 Program Control Related Setup Operations

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. Only the loops that are set as follows are displayed: [Setup] tab > [Internal Loop] > [Program control] to [On] During cascade control, even-numbered loops within the same terminal block are not displayed.

Start code

Select the operation start condition from the following. However, 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 $6 \text{ (number of loops)} \times 5 \text{ (number of zones)} \times 2 \text{ (number of loops)} \times 5 \text{ (number of zones)}$ for the CX1000) in the range of "EUS (0.0 to 100.0%)" of the measurement span.

On Style 3 or later, the value can be set on the loop whose Action Loop Set is ON. On Style 2 or earlier, the value can be set on loops whose [Program Control] has been turned ON in [Internal Loop] under the [Setup] tab. During cascade control, even-numbered loops within the same terminal block cannot be set.

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. This item applies to all zones. You cannot set this value when the wait zone is OFF on all loops.

Action Loop Set

Set the loops to activate.

Select from the loops whose program control is ON.

Program Pattern Setting (Segment setting)

Set a program pattern for each segment, 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
Turns the set point display ON/OFF
Select current loop (activates the target value of the selected loop)

PV event display
Drag the bar to change the display area
Maximum value of the span of the current loop
Segment number
Target SP of the selected segment
Drag the bar to change the display area
Time event display
Start value for selected segment
Duration of segment
Minimum value of the span of the current loop

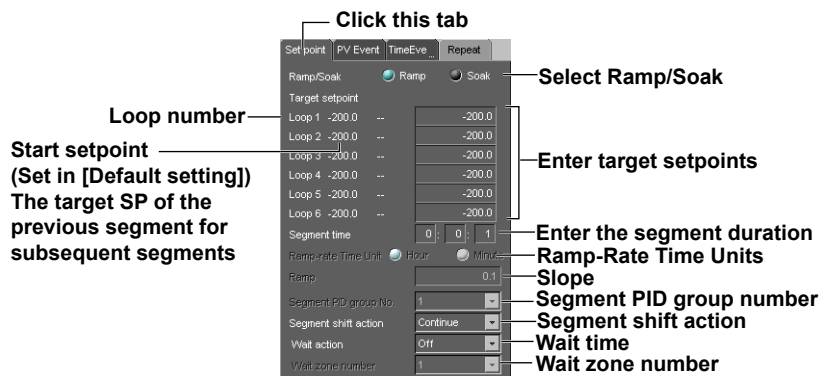
Select the Segment

Click the [Segment No.] arrow to select the desired segment in the program pattern display screen.

8.6 Program Control Related Setup Operations

Select Setpoints

Enter a program pattern for each segment.



- 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. On Style 3 or later, the value can be set on the loop whose Action Loop Set is ON. On Style 2 or earlier, the value can be set on loops whose [Control Mode] has been set to a mode other than [Off] and [Program Control] to [On] in [Internal Loop] under the [Setup] tab. During cascade control, even-numbered loops within the same terminal block cannot be set.
- 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 EvLmt	TimeEve	Repeat
	Loop	Kind	Set value
1	1	PV-High	1370.0
2	1	PV-Low	1370.0
3	1	Deviation-High	1370.0
4	1	Deviation-Low	1370.0
5	OFF	PV-High	1370.0
6	OFF	PV-High	1370.0
7	OFF	PV-High	1370.0
8	OFF	PV-High	1370.0
9	OFF	PV-High	1370.0
10	OFF	PV-High	1370.0
11	OFF	PV-High	1370.0
12	OFF	PV-High	1370.0
13	OFF	PV-High	1370.0
14	OFF	PV-High	1370.0
15	OFF	PV-High	1370.0
16	OFF	PV-High	1370.0

- 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 (% indication only for output events)

PV event display

A bar showing that the PV event was set is displayed in the upper part of the program pattern screen display screen.

8.6 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	0:1:30
2	ON2	0:0:30	0:0:0
3	ON3	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.” Set On-time ≤ Off-time.

Repeat

Set the repeat action.

The repeat start segment, repeat end segment, and repeat frequency is displayed in the program display screen.

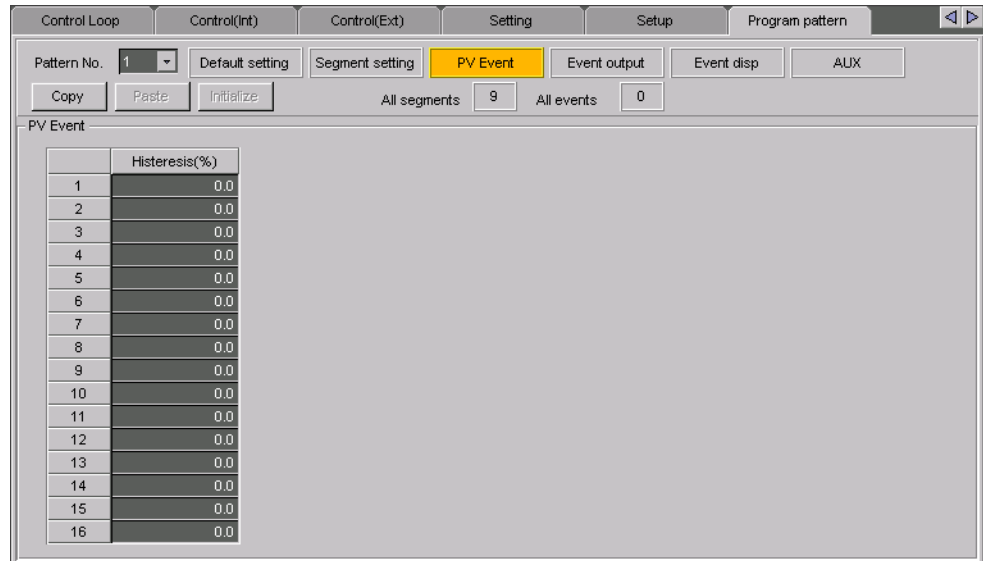
Click this tab

Set point	PV Event	TimeEve	Repeat
Repeat action			
<input type="radio"/> Off <input checked="" type="radio"/> On <input type="radio"/> Rotate			
Repeat frequency			
1			
Start Segment			
1			
Repeat end segment			
4			

- 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.

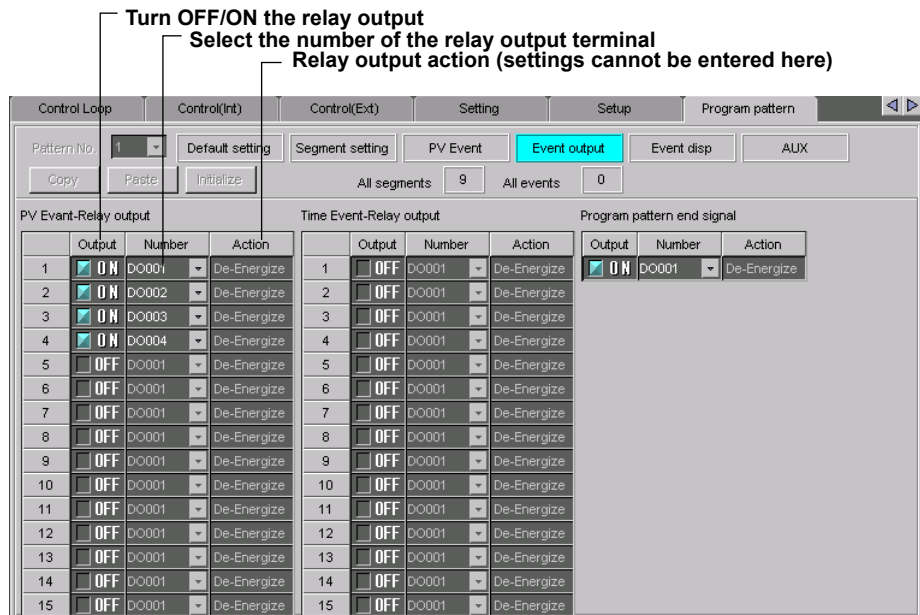
PV Event (CX Style Number S3 or Later)

Set the PV event hysteresis in the range of [0.0] to [10.0].



On Style 2 or earlier, the value is set from the setup menu of the [Setting] tab.

Event Output Setting(PV event-relay output/Time event-relay output/Program pattern end signal)



8.6 Program Control Related Setup Operations

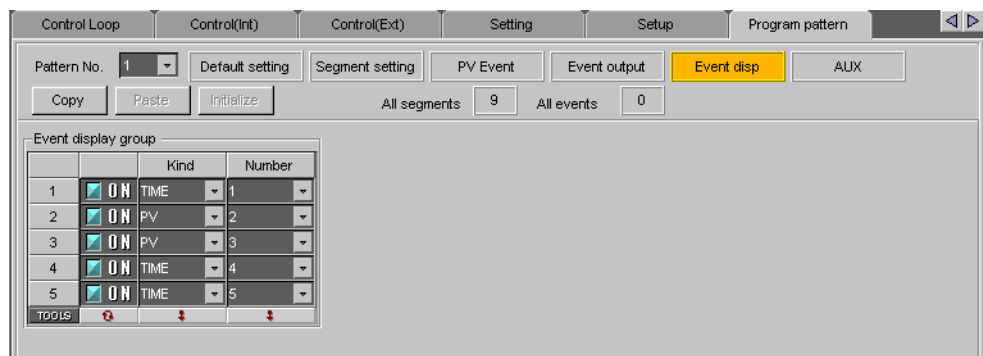
PV Event-Relay output, Time Event-Relay output, and Program pattern end signal

- Output
Turn OFF/ON the control 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 (on models with the expansion DIO terminal block)
- Action
Displays the relay output action (energized or de-energized) according to the [Control Relay] settings under the [Setup] tab.

Event display group

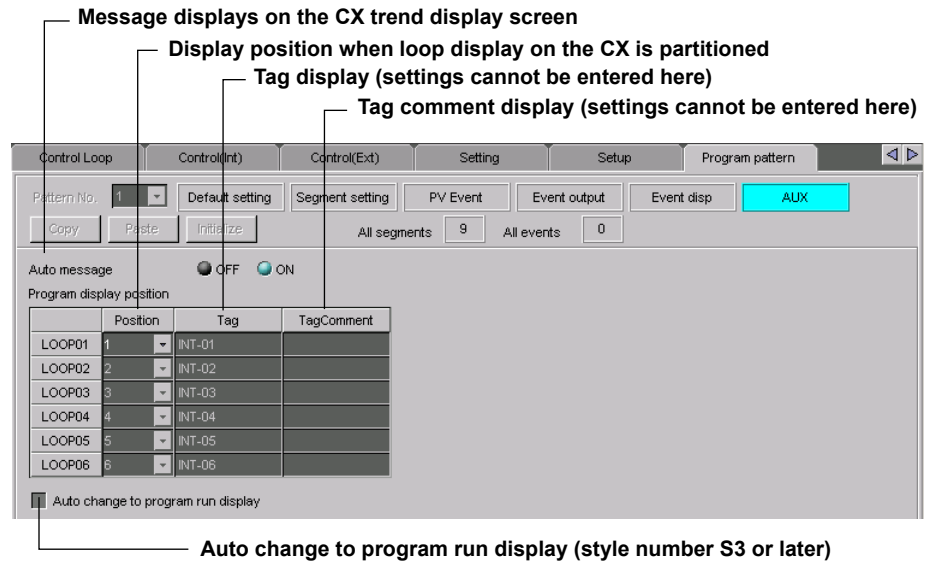
Select the event for displaying groups on the CX Program Selection Display and Program Control Display. Up to 5 events can be specified.

- ON/OFF
Turn ON/OFF the display.
- Kind
Select PV event or time event.
- Number
Set the event number.



AUX (Automatic Message, Display Position)

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 as shown in the figure below. 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 display and program control display, the specified patterns and PV waveforms can be displayed in the same display frame (full display) as well as display data 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. On Style 3 or later, the value can be set on the loop whose Action Loop Set is ON. On Style 2 or earlier, the value can be set on loops whose [Control Mode] has been set to a mode other than [Off] and [Program Control] to [On] in [Internal Loop] under the [Setup] tab. During cascade control, even-numbered loops within the same terminal block cannot be set.

Auto change to program run display (style number S3 or later)

You can set the screen to switch to the Program Control Display when a program execution command is received using the communication function.

ON: When a program execution command is sent, the screen switches to the Program Control Display.

OFF: The screen does not switch to the Program Control Display even when a program execution command is sent (default).

8.7 Basic Measurement Function Settings

To enter basic measurement function 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.

- Reflash
Set whether to use the alarm relay output reflash.
- 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 an 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 is possible, if the measurement remote input is available. 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].

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 the “Save confirmation” message, allowing data to be saved. 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], select 1, 2, 4, 8, or 16.
When the data type is [EVENT & DISP], select 1, 2, or 4.
- **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.
- **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**

When applying 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 the [Save] is set to [Auto] in [Memory Save], specify the date and time of the save operation.

- Timeup type
Select the type of save interval from [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 type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH02	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH03	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH04	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH05	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH06	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH07	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH08	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH09	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Internal	<input type="radio"/> External	0
CH13	<input 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)

Thermocouple input basic contact compensation setting. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Note

You cannot enter [Channel] settings on models with 0 measurement channels. The menu does not show [Channel].

8.7 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 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.

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 when using a login.

Select when using a login, auto logout, and 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**

When you use the login, auto-logout, or user ID, select the appropriate items.

- **Auto Logout**

Selected: if idle for ten minutes, logs out automatically.

Clear: need to perform the logout operation to log out.

- **User ID**
Specify whether you want to use a user ID when logging in. When selected, you can specify user ID.

User Setting List

- **User name**
Use up to 16 characters 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 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.

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

The screenshot shows a software interface for configuring timers. On the left is a navigation menu with options like Alarm/Relay/Remote, Scan Interval/Memory, Measure channel, Key Lock/Login, Timer (selected), Report, Temperature, Aux, Time zone, Network, Control Action, Internal Loop, DI/DO/SW-Regist, Control input channel, Control Relay, and External Loop. The main area is titled 'Setting' and contains three timer configuration sections: Timer 1, Timer 2, and Timer 3. Each section has a status indicator (OFF, Absolute, or Relative), an 'Interval' field with a dropdown menu (set to '1h'), and a 'Ref.time' field (set to '0 : 00'). There are also 'Reset' and 'Save Data' checkboxes for each timer.

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

Note

You cannot set the RefCh to a measurement channel on models with 0 measurement channels.

Type

Select the type of report. For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Time

Specify the time for the report production 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 CX1000 and 30 report channels for CX2000. The check boxes on the right of the report channels are used to select what report to produce. 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.

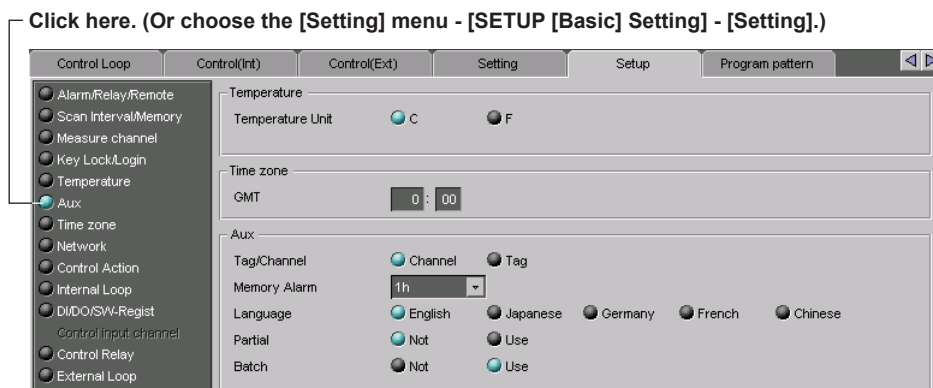
1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom of the window.
3. Click the destination channel number. To select many channels, click the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

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.

Select the items that you want to copy.

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.

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 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], [German], [French], or [Chinese] (selectable on Ver. 3.02 or later)) to be used on the CX's display.

Partial

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

8.7 Basic Measurement Function Basic Settings

Temperature Unit

Set the temperature unit from [C](Celsius) or [F](Fahrenheit).

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

Math Control Loop Control(Int) Control(Ext) Setting Setup

Temperature Unit C F

Time zone
GMT 0 : 00

Aux
Tag/Channel Channel Tag
Memory Alarm 1h
Language English Japanese Germany French Chinese

Partial Not Use
Batch Not Use

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].)

Math Control Loop Control(Int) Control(Ext) Setting Setup

Temperature Unit C F

Time zone
GMT 0 : 00

Aux
Tag/Channel Channel Tag
Memory Alarm 1h
Language English Japanese Germany French Chinese

Partial Not Use
Batch Not Use

8.8 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]. For version R3.02 or later, measurement channel settings are not available on 0 measurement channel models. The Meas tab and the measurement channels in the Setting menu are not displayed.

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.

CH	Mode	Delta/Scale/Sqrt			Range/Type	RefCh	Span		
		Delta	Scale	Sqrt			L	U	Point
CH01	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.000	2.000	
CH02	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.000	2.000	
CH03	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.000	2.000	2
CH04	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.000	2.000	2
CH05	VOLT	OFF	DELTA	SCALE	SGRT	2V	-2.000	2.000	

Copy Paste Copy Details
 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 the unit of the scale.
 Specify a scale.
 Select the alarm type.
 Specify the alarm value.
 Select the relay number.

Scale				Alarm 1				
Point	L	U	Unit	Type	Value	Relay	Detect	Type
2		0.00	200.00	OFF	0.0	NONE	ON	OFF
				OFF	0.00	NONE	ON	OFF
				OFF	0.000	NONE	ON	OFF
				OFF	0.000	NONE	ON	OFF
				OFF	0.000	NONE	ON	OFF

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

Specify a delay period.
 Specify a tag name.

Alarm 4				Alarm Delay	Moving Ave	Tag
Type	Value	Relay	Detect			
OFF	0.0	NONE	ON	10 sec	OFF	01
OFF	0.0	NONE	ON	10 sec	OFF	02
OFF	0.00	NONE	ON	10 sec	OFF	03
OFF	0.000	NONE	ON	10 sec	OFF	04
OFF	0.000	NONE	ON	10 sec	OFF	05

Select sampling count.

Specify a display zone.
 Select the graph settings.
 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
0	100	10	Normal	1	OFF	50	0.000

Initialize
 Turn ON/OFF all 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 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 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 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 six 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. T or t is selectable when the style number is greater than or equal to 2. The selectable alarms vary depending on the input mode and computation type. For details, see section 8.2 of the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

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.

Relay

To output relays or output to the internal switches (Style 3 or later), select the output relay number or internal switch number. Otherwise, select [NONE].

Detect

Select whether to indicate the alarm (ON or OFF) when an alarm occurs. If select OFF, no record remains 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 characters to specify a tag.

You can select tags instead of channel number to be displayed on the screen.

The [Setup] screen is used to select whether to display channel names or tag names on the screen.

If tag is selected in [Tag/Channel] of [Aux] on the [Setup] tab. 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 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 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 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.

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.

Select the items that you want to copy.

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

Relay	Detect
NE	ON
NE	ON
NE	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.

8.9 Computation Channel Settings

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

For version R3.02 or later, measurement channels cannot be used in expressions on 0 measurement channel models.

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.

CH	ON/OFF	Expression	Point	L	U	Unit	Ty	Constant
CH31	ON	01	2	-200.00	200.00		OFF	K01
CH32	ON	01	2	-200.00	200.00		OFF	K02
CH33	ON	01	2	-200.00	200.00		OFF	K03
CH34	ON	01	2	-200.00	200.00		OFF	K04
CH35	OFF	01	2	-200.00	200.00		OFF	K05

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

Set the alarm (section 6.8).

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

Enter the alarm period.
Specify a tag (section 6.8).

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

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

Display zone
Set the graph
Partial expansion
Display color

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

Computation ON/OFF

Select whether to perform computation for each channel.

Expression

Enter an expression using up to 40 characters. For details about the expression, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

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 the measurement channels. For details, see section 8.8, “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 settings are the same as the measurement channels. For details, see section 8.8, “Measurement Channels Settings”.

Constant

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 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.

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.

Select the items that you want to copy.

8.10 Display Settings

To enter display settings, click the [Setting] tab. Or, you can select the items by choosing [Setting] - [SET [Regular] Setting] - [Display Setting].

Screen Display

The screenshot shows the 'Setting' tab of the device's menu. The 'Display' option is selected in the left sidebar. The main area is divided into three sections: Trend Display Setting, Display Setting, and LCD Setting.

- Trend Display Setting:**
 - Display Update Interval: 1min/div (dropdown)
 - Auto Save Interval: 30min (dropdown)
- 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 (dropdown)
 - Auto Scroll Time: 5s (dropdown)
 - Scale digit: Normal (selected), Fine
- LCD Setting:**
 - LCD Brightness: 2 (dropdown)
 - Backlight Saver: OFF (selected), ON
 - Saver Time: 1min, 2min, 5min, 10min, 30min, 1h (selected)
 - Restore: KEY (selected), KEY+ALARM

Annotations in the image:

- "Select the time per division." points to the Display Update Interval dropdown.
- "Click this tab." points to the Setting tab.
- "Select the display format." points to the Trend Graph Direction options.
- "The screen saver function is activated when there is no key operation or alarm occurrence for the specified interval." points to the Saver Time options.
- "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

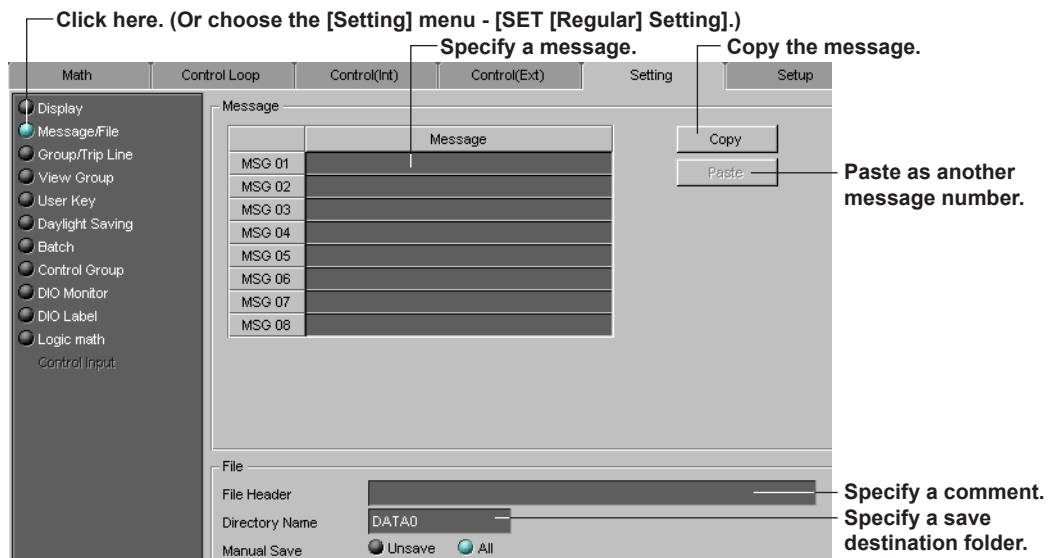
The auto save interval can be specified when the [Save] is set to [Auto] and the data type is set to [DISPLAY] or [EVENT & DISP] in [Scan Interval/Memory] of the [Setup] tab.

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 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.

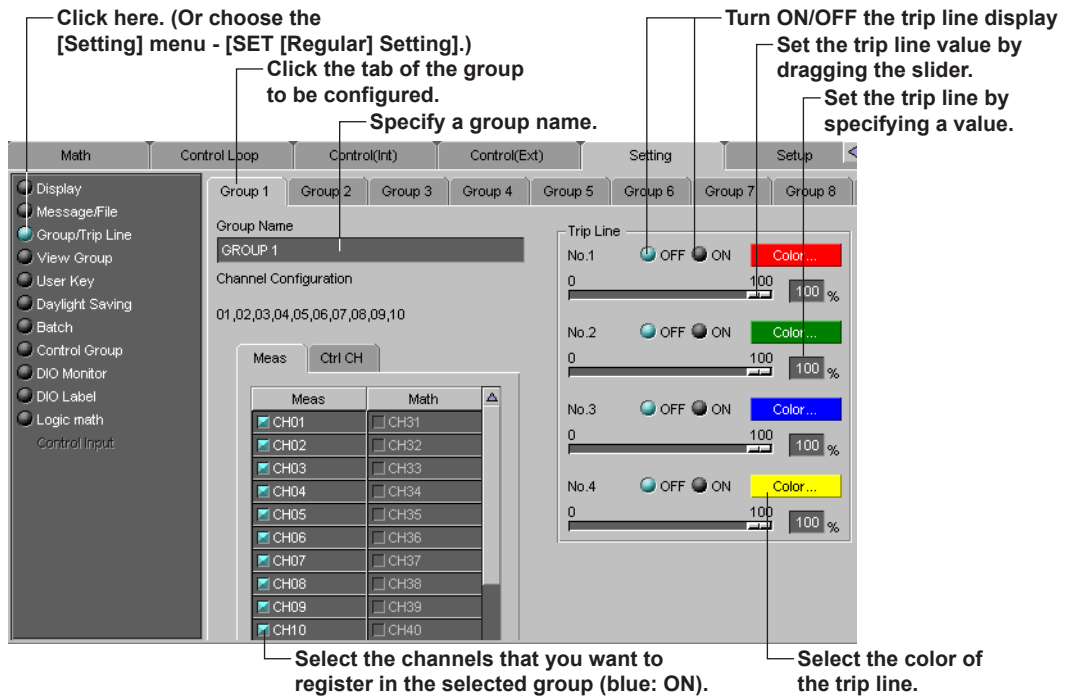
Note

- 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 characters can be entered for the group name.

Channel Configuration

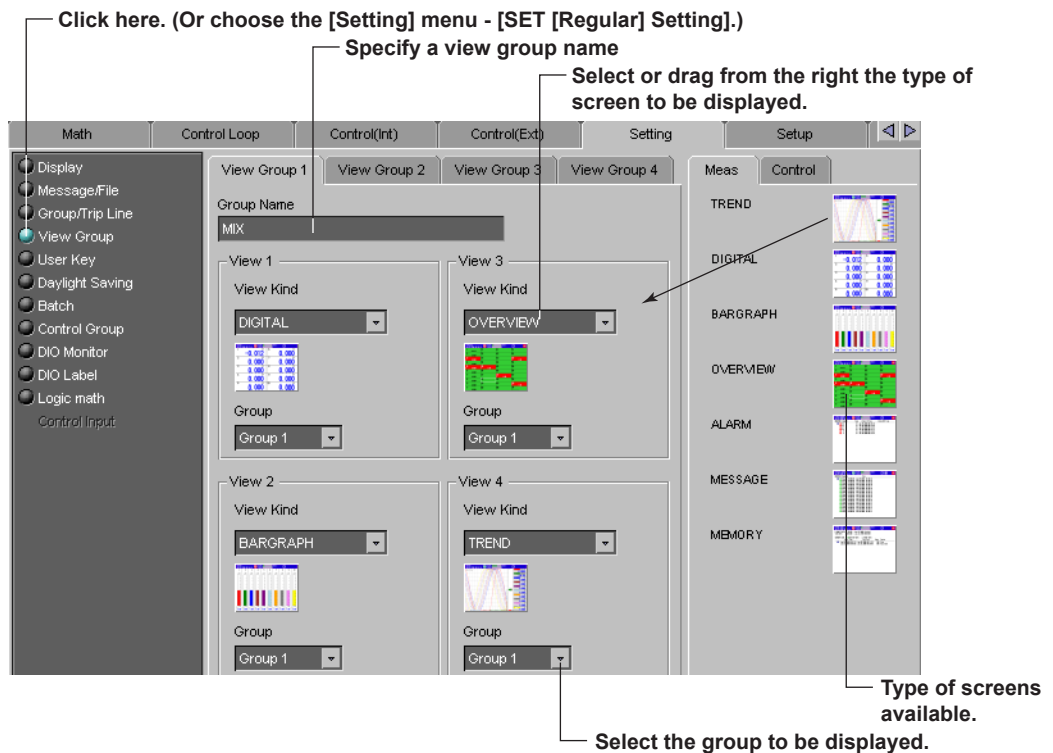
The maximum number of channels that can be assigned to a group is 6 for the CX1000 and 10 for the CX2000. The assigned channels are listed under [Channel Configuration].

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 the other trip line settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

View Group



View Groups

Up to four view groups can be registered.

Group Name

Use up to 16 characters can be entered for the group name. The group name appears as a submenu of the [4 PANEL] display of the CX2000.

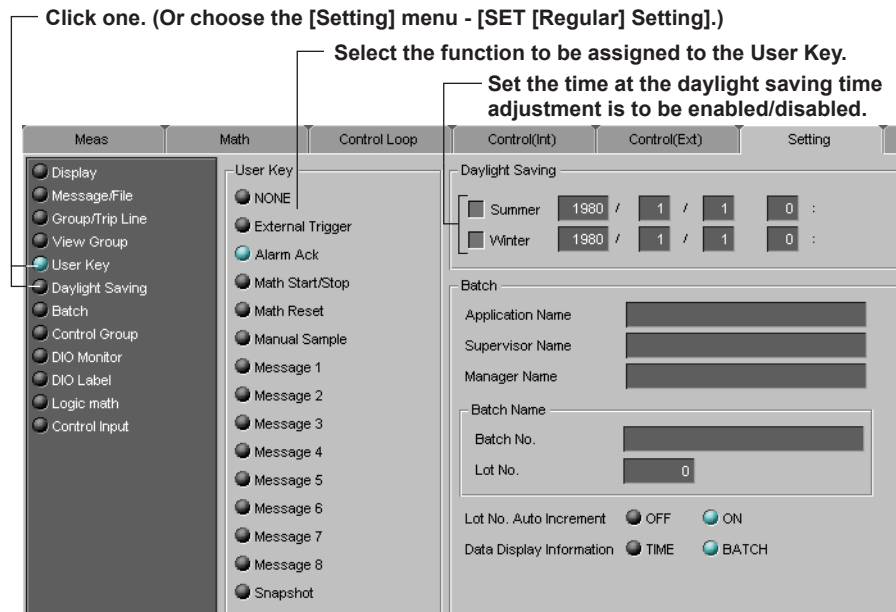
View Kind

The view group consists of four views. Select the type of screen to display in each view. For version R3.02 or later, the OVERVIEW view kind cannot be selected on 0 measurement channel models.

Group

Depending on the type of view selected, the group displayed varies. When selecting a view from the [Meas] tag, select the group from the measurement groups (Group 1 to 10). When you selecting a view from the [Control] tag, select the group from the control groups (Group 1 to 8).

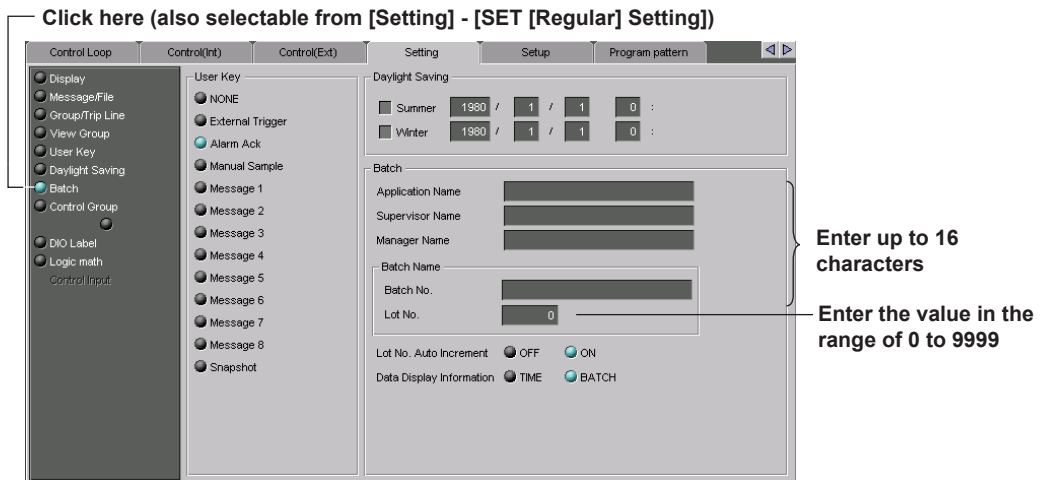
User Key/Daylight Saving



For details about the User Key settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Batch header

Set the header information when the optional batch header is enabled.



8.11 Network Settings

To make network settings, click the [Setup] tab, then select the [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

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

2. Click this tab

The screenshot shows the 'TCP/IP' settings window. The left sidebar has 'Network' selected. The main area has tabs for 'TCP/IP', 'FTP', 'Serial', 'Modbus master', and 'Web'. The 'TCP/IP' tab is active, showing fields for IP Address, Subnet Mask, and Default Gateway, each with four input boxes. Below these are 'DNS Setting' options: a radio button for 'DNS' (OFF), and fields for 'Primary Server IP Address' and 'Secondary Server IP Address', each with four input boxes. There are also fields for 'Host Name', 'Domain Name', 'Domain Suffix 1', and 'Domain Suffix 2'. At the bottom, there are 'Keep Alive' and 'Timeout' options with radio buttons (OFF/ON) and a numeric input field set to '1' with 'MIN' next to it. At the very bottom, there are radio buttons for 'Memory Data Out' (Ethernet and Serial). Annotations with arrows point to the IP address fields, the DNS server IP address fields, and the timeout input field.

Specify the IP address

Specify these addresses when using the DNS

Enter the timeout value when turned ON

For a CONFIG file, you cannot set the IP address.

To communicate with the CX via the Ethernet network, you must enter the IP address, subnet mask, and default gateway on the CX in advance.

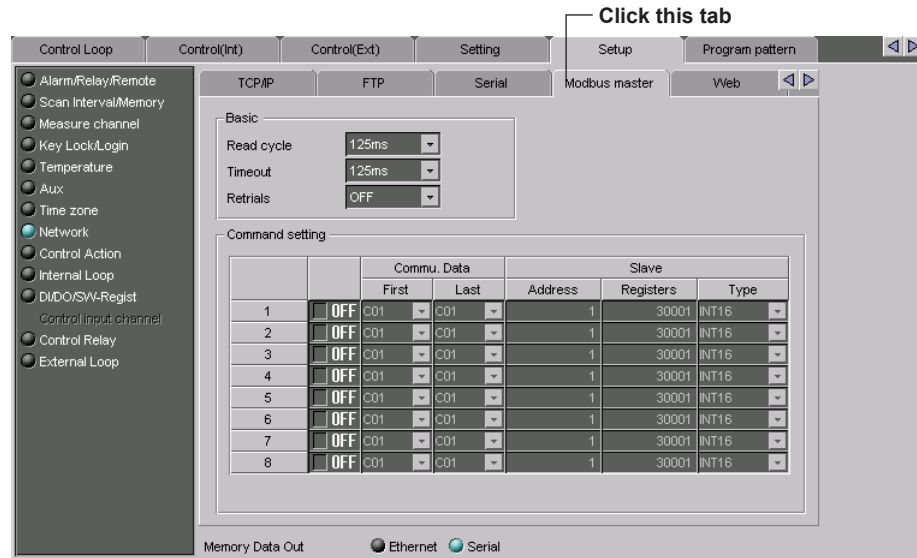
Serial Communication Settings

When using serial communications between the CX and other devices, set the parameters required for serial communications. In the [Protocol] settings, if [MODBUS MASTER] is selected, you must to click the [Modbus master] tab and make Modbus master settings.



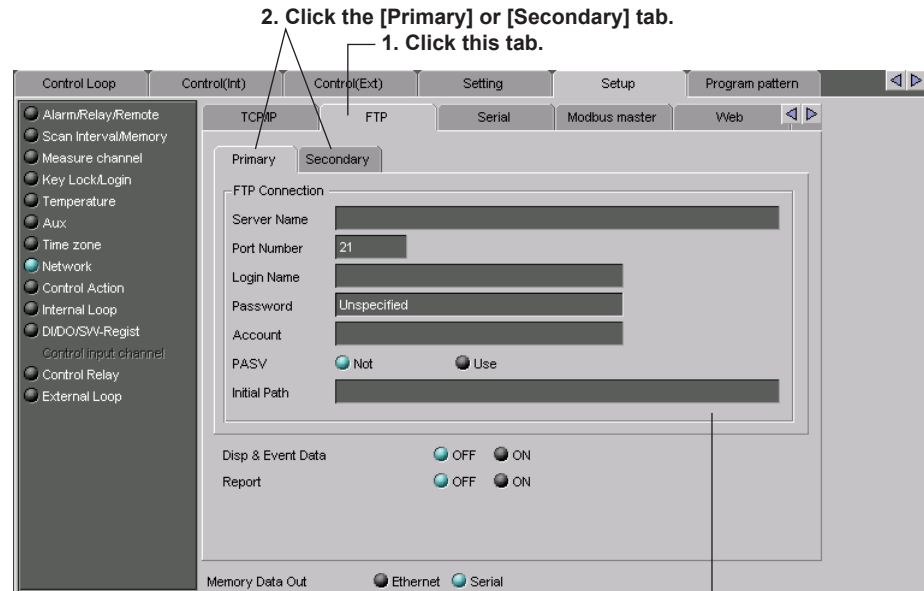
Modbus Master Settings

When using the CX as a Modbus master, enter the Modbus master basic and command settings. For details about the settings.



FTP Settings

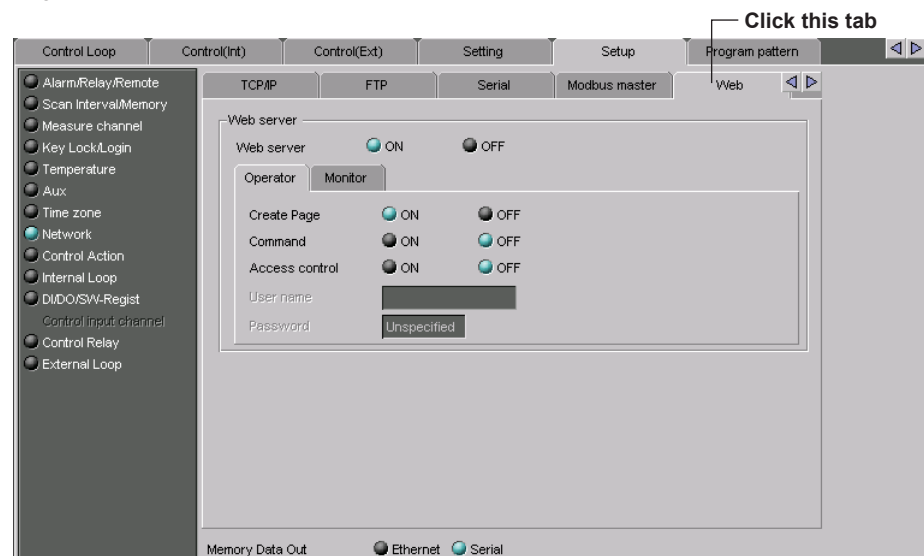
Using the FTP function, measurement/calculation data can be automatically transferred from the CX to the specified server as files. The FTP function can be used only with Ethernet communications. When using the FTP function, specify the necessary [FTP Connection] settings in the dialog box below.



Enter file transfer destination settings.

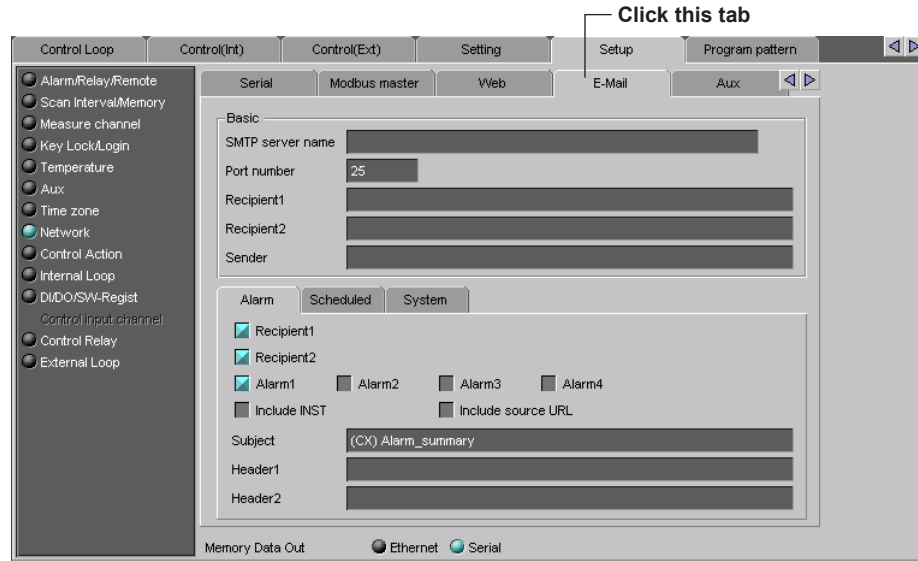
Web Server Settings

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 for the operator page and monitor page.



E-mail Transmission Settings

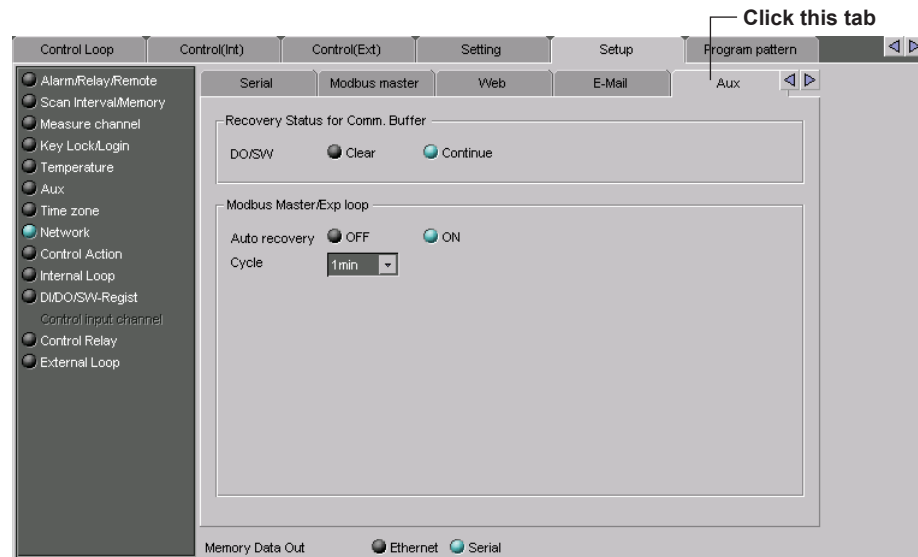
When using e-mail transmission, specify [SMTP server name], [Port number], [Recipient1], etc. For details about the settings.



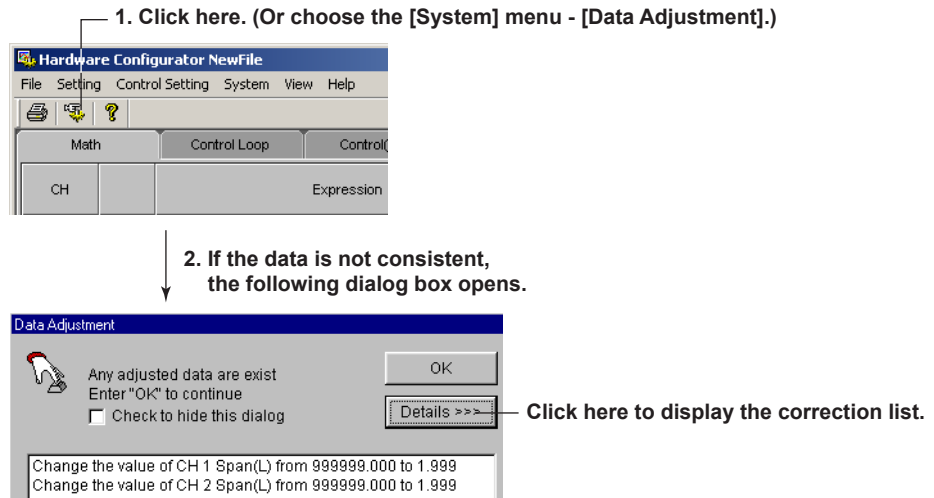
By clicking the [Alarm], [Scheduled], [System], or [Report] tab, you can make settings separately for each type of e-mail message.

Aux

Set the handling of the DO and internal switch when the communication buffer recovers and the auto recovery of the communication with the Modbus master and controller. These items are valid when serial communication is installed.



8.12 Setup Data Adjustment



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:

- 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 checked, the [Data Adjustment] dialog box opens when data is not consistent checking data or transmitting data.

Note

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

8.13 Sending the Setup Data to the CX

The method used to send the data varies depending on whether a CONFIG file or setup data file is being transmitted.

CONFIG file

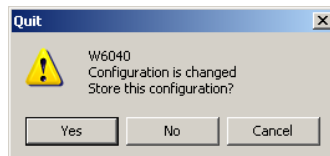
The following two methods are available:

- **Selecting from the toolbar**



The setup data are sent when [File] - [Store] is selected.

- **Clicking the [X] button**



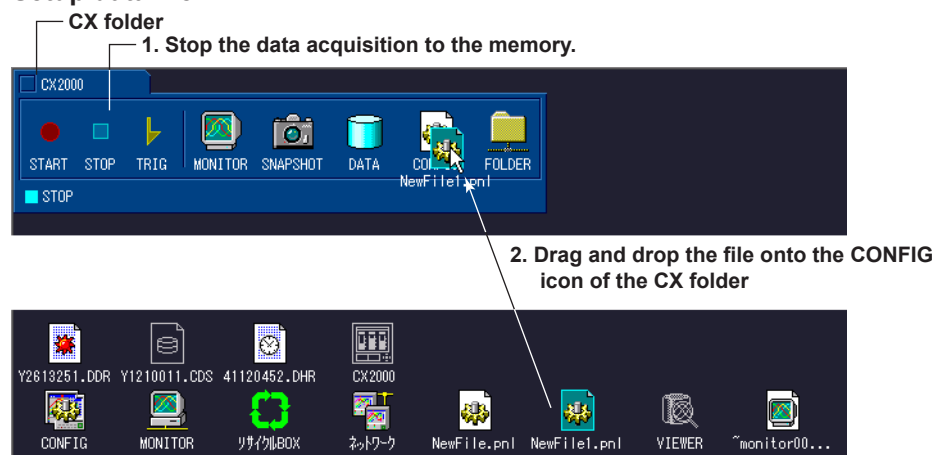
When the Configurator is closed by clicking the [X] button, a confirmation dialog box is displayed.

To send the new setup data to the CX, click the [Yes] button.

Otherwise, click the [No] or [Cancel] button.

If the CX 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.

Setup data file



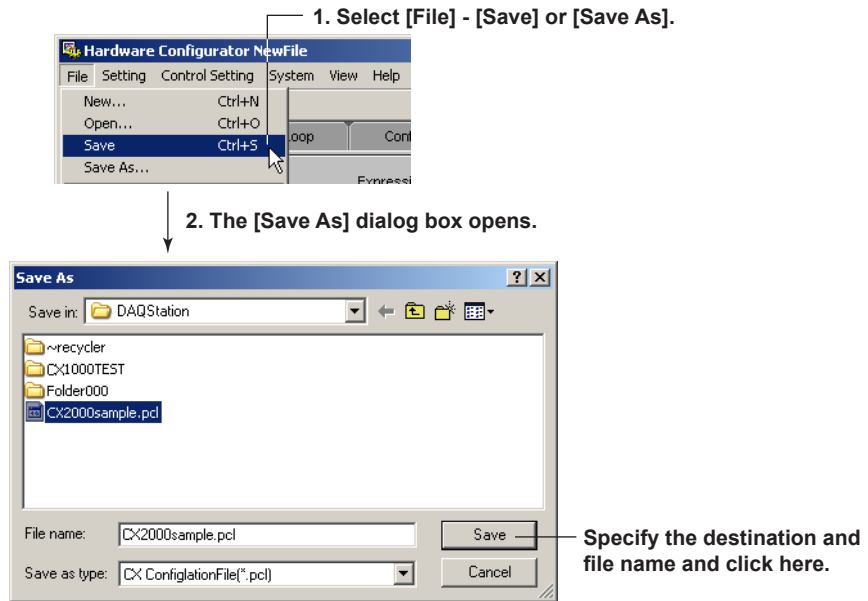
The contents of the setup data file (*.PNL) located on the DAQ Desktop can be transmitted. If the CX is acquiring data to the memory, the data will not be sent in this case.

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], [Modbus master], and [Web] tabs

8.14 Saving the Setup Data



Save

The setup data overwrites a preexisting file (*.pcl). The [Save As] dialog box does not open.

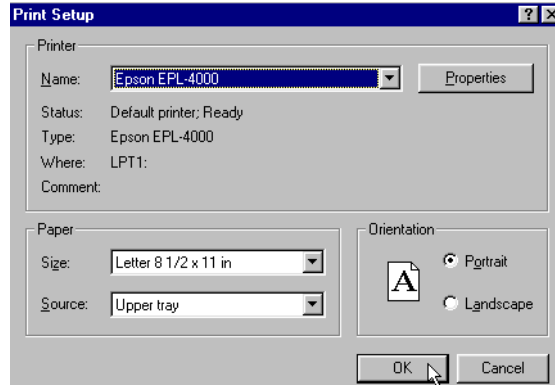
Save As

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

8.15 Printing the Setup Data

Printer Settings

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



2. Set the printer, paper and orientation.

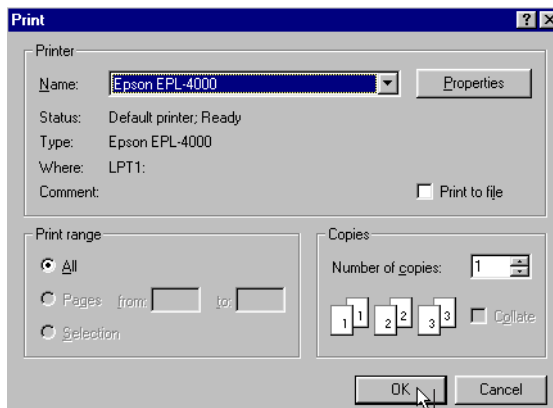
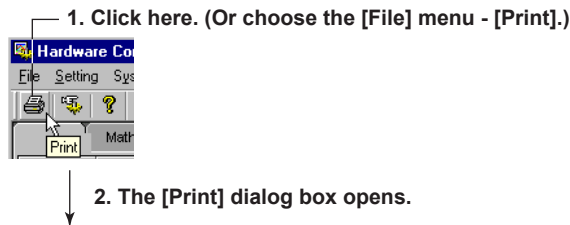
Note

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

Preview

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

Printing



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

8.16 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.

9.1 Error Messages and Their Corrective Actions

Software Common

Message

Message

Failed to store any settings.
Failed to store settings.
Permission denied.
Need a password.
Need a user name.

No. Message

M3701	Do you stop recording?
M3702	Port No. is available for next time.
M3703	Recording/calculating. Please send configuration after you stop recording/calculating.
M3708	Viewer is working. Please open file again after you stop working viewer.
M3709	Monitor is working. Please open file again after you stop working monitor.
M3710	Linking folder is invalid, or a shortcut file linking the same folder has already exist.

Error Message

No.	Message	Corrective Action
E0002	Insufficient memory. Please close at once.	Exit other programs and restart or reboot the OS and restart.
E0004	Invalid license number.	Reinstall using the correct license number.
E0101	Can't be executed by itself.	Launch the program from the DAQ Desktop.
E0211	Can't write to file.	Check the capacity of the directory or check that other programs are not using it.
E0212	Can't read file.	Check that the file exists and check that the file system is normal.

Warning Message

No.	Message
W3704	Now working! Do you exit all compulsory ?
W3706	Fail to copy file.
W3707	Fail to move file.
W3711	Please enter an integer between 0 and ****.

9.1 Error Messages and Their Corrective Actions

Data Viewer

Error Message

No.	Message	Corrective Action
E3106	Data does not exist.	Select another file.
E3107	Channel dose not exist.	Select another file.
E3109	This name's directory already exists.	Overwriting is not possible when a directory with the same name exists. Change the file name.
E3110	Can't overwrite to file	Open the file of the same name, close the other application, then retry the save.
E3111	Can't write to file.	Please perform the operation on a disk with sufficient free space.
E3115	Too many data.	Because the number of data for connection and display exceeds 5 million data points, no file data is displayed. To check the file data that is not displayed, open the corresponding file, then perform the connection and display procedure.

Warning Message

W3108	This file already exists. Replace existing file?
W3115	Converting operation exceeded the limitation of MS Excel. Continue converting?
W3115	Converting operation exceeded the limitation of Lotus 1-2-3. Continue converting?

Configurator

Message

M6061	Data can't be processed after the year 2038.
M6062	Any destroyed A/D converter exist. Any settings may be failed to store.
M6063	Receiving finished
M6064	Sending finished

Error Message

Message	Corrective Action	Reference Page
Communication error.	Check the communication settings.	1-5
Connection timeout	Traffic on the network may be congested. Wait a few moments and try again.	–
Illegal user information	Confirm whether the user name is correct.	5-24
Connection was refused.	Check the communication settings. Check whether the power to the DX/MV/CX is ON.	1-5
Connection is busy.	Wait a few moments and try again.	–
Memory Error	Exit other programs and restart, or restart the operating system.	–
User level Error	The currently logged on user ID is not authorized to perform this action.	–

No.	Message	Corrective Action	Reference Page
E6001	Failed to make file.	Check the capacity of the directory.	–
E6002	Failed to open file.	If the file still cannot be read after a second attempt, the file may be damaged. Select another file.	–
E6003	Unreadable file	Select another file.	5-1, 5-3
E6004	Communication impossible while media in use	Send after media save is completed.	5-27
E6005	Now sampling & calculating. Can't store settings.	Send after writing to the DX/MV/CX internal memory and computation are complete.	5-27
E6006	Now sampling. Can't store settings.	Send after writing to the DX/MV/CX internal memory is complete.	5-27
E6007	Now calculating. Can't store settings.	Send after computation is complete.	–
E6008	Now Controlling. Can't store settings.	Send after control is finished.	–

9.1 Error Messages and Their Corrective Actions

Warning Message

No.	Message	Reference Page, Reference Section
W3435	System settings have been changed. Input configuration and data will be initialized. Do you want to proceed?	5-28
W3453	This pattern configuration will be initialized. Continue?	8-31
W3454	This pattern configuration will be initialized. Continue?	8-33
W6031	Current value is invalid, because the value is the same with line %d.	–
W6032	Save change to %s?	–
W6033	Start Memory sampling/Math.	–
W6034	Memory sampling/computation will be stopped. Stop Memory sampling/Math.	–
W6035	Contains invalid data Contains invalid data Open this setting?	–
W6036	Start Math	–
W6037	Stop Math	–
W6038	The current setup data will be initialized.	5-28, 6-50, 7-52, 8-4
W6039	Settings may not be made correctly since the configuration does not match the connected recorder. Do you still want to send?	Section 5.7, 6.6, 7.6, 8.13
W6040		5-27, 8-68
W6041	The setup data will be sent.	Section 5.7, 6.6, 7.6, 8.13
W6042	Setup data will be received from the recorder.	5-2, 6-2, 7-2, 8-2

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