User's Manual

DAQSTANDARD

YOKOGAWA
Yokogawa Electric Corporation

IM 04L31A01-61E
4th Edition

Foreword

Thank you for purchasing the DAQSTANDARD.
This manual explains how to use the software. Please read this manual carefully before operating the software to ensure its correct use. DAQSTANDARD can display settings and data of the DX and MV series, but is not explained in this manual. Refer to the manuals supplied with these products. After you have read this manual, keep it in a safe place where it can be referred to anytime a question arises.

Notes

- This manual covers the DAQSTANDARD version 5.
- This software supports the CX style number S3.
- The contents of this manual are subject to change without prior notice.
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How to Use This Manual

Structure of the Manual

This manual consists of the following five chapters and index.

Chapter	Title	Content
1	**Before Using the DAQSTANDARD**	Lists the PC system requirements for use of the software. Also explains how to install it.
2	**Functions of Launcher**	Explains Launcher which is used to start other programs. Also explains how to setup communications between the CX and your computer.
3	**Configuring the CX**	Explains how to enter settings such as the CX control settings, measurement ranges, and measurement conditions.
4	**Displaying Data with the Data Viewer**	Explains how to display data stored on the hard disk, etc. Also explains how to convert data to formats such as Microsoft Excel.
5	**Troubleshooting**	Gives a list of error messages and corrective measures.
Index		Gives a list of important terms used in this manual.

Range of Explanation in This Manual

This manual does not provide a description of basic operations of Windows 98, Windows Me, Windows NT 4.0, Windows 2000, and Windows XP. For those descriptions, refer to the Windows User's Guide.

Conventions Used in This Manual

- **Units**
  K=1024, as in 100 KB

- **Menus, Commands, Dialog Boxes and Buttons**
  Enclosed in brackets [ ].

- **Note**
  Provides useful information regarding operation of the software.

Contents

1.1 Overview of the DAQSTANDARD

The DAQSTANDARD consists of the following three programs.

- Launcher
- Hardware Configurator
- Data Viewer

Launcher

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

Hardware Configurator

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

- Receiving the setup data from the CX currently connected to the PC
- Loading existing setup data
- Configuring a system

Data Viewer

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

- Display data files (.cds)
- Event data files (.cev)
- TLOG files (.dtg)
- Reports (.dhr, .ddr, .dwr, .dmr)
- Manual sample files (.dmn)

1.2 Required PC System Environment

Hardware

Personal Computer

A computer which runs on Windows 98, Windows Me, Windows NT 4.0, Windows 2000, or Windows XP, and is equipped with a Pentium processor, 166 MHz or higher (Pentium II, 266 MHz or higher is recommended).

Main Memory

32 MB or more. (Generally, 64 to 96 MB is recommended, though the computer performance depends on the graphic board.) However, some applications may require more memory. Also, memory requirements depend on the OS.

Hard Disk

100 MB or more

CD-ROM Drive

To be used for installing the software.

Mouse

A mouse supported by Windows 98, Windows Me, Windows NT 4.0, Windows 2000, or Windows XP.

Monitor

A monitor supported by Windows 98, Windows Me, Windows NT 4.0, Windows 2000, or Windows XP. Resolution: 800 × 600 pixels or higher, number of colors: 32 K or more. (A monitor with 1024 × 768 pixels and 65536 colors is recommended.)

Interface Board

For RS-232, a COM port (COM1, COM2, COM3, COM4) with PC supported by Windows. For RS-422A/RS-485, a converter must be connected to the RS-232 port with PC. This software supports a 4-wire system. For Ethernet, an Ethernet card supported by Windows is required. TCP/IP protocol also needs to be installed.

Printer

A printer supported by Windows 98, Windows Me, Windows NT 4.0, Windows 2000, or Windows XP is required. An appropriate printer driver is also required.

Operating System (OS)

Windows 98, Windows Me, Windows NT 4.0, Windows 2000, or Windows XP

Note

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

1.3 DAQSTANDARD Installation

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

Procedure

1. Turn on the computer. Windows starts.
2. Insert the CD-ROM into the CD-ROM drive of the computer.
3. The installation program starts automatically. Follow the instructions on the screen to proceed with the installation.

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

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

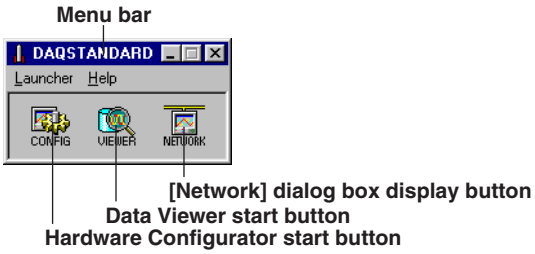
Note

- Before starting the installation, make sure to exit all resident programs such as anti-virus programs.
- When the installation is complete, the Launcher and Data Viewer are registered on the Start menu.
- To reinstall the software, first remove it, then reinstall it.
- To remove the software, follow the procedure below.
  1. In the [Control Panel], double-click [Add/Remove Programs]. The [Add/Remove Programs Properties] dialog box appears. From the list, select [DAQSTANDARD] to remove it.
  2. If necessary, back up the following files to another folder.
     - Setup data files (*.pcl) and CX display data files saved in the folder where the DAQSTANDARD has been installed
  3. In Windows Explorer, delete all the files (data files and folders) created after the installation, as well as the folder where the software was installed.

1.4 Starting/Exiting the Utility Software

Starting

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



   After installing the software, when you first start it, the [Network] dialog box appears. For details about the setting method, see section 2.3 “Communication Method Settings”. If the CX is not turned ON or connected when the communications settings are completed, the [Network] dialog box opens.

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

Note

- Once the Hardware Configurator, Data Viewer or [Network] dialog box starts, the corresponding start button is disabled until it is closed.
- If you want to open two or more Data Viewers, select [Programs] - [DAQSTANDARD] - [Viewer] on the Start menu.
- Once the Hardware Configurator starts, it is not possible to open the [Network] dialog box.
- Once the [Network] dialog box opens, it is not possible to start the Hardware Configurator or Data Viewer.

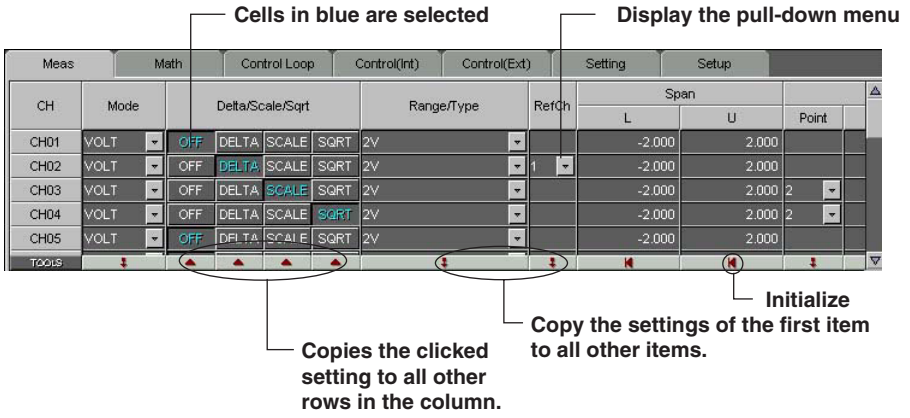
Exiting

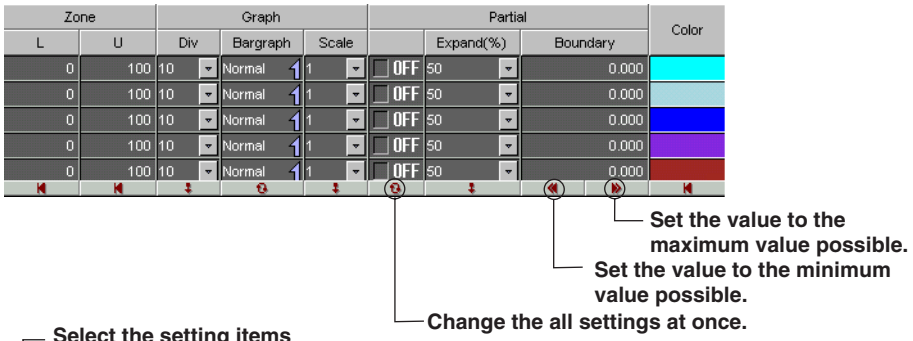
- To exit the Hardware Configurator or Data Viewer, select [File] - [Exit], or click the [X] button.
- To exit the [Network] dialog box, click the [OK], [Cancel], or [X] button.
- To exit the Launcher, select [Launcher] - [Exit], or click the [X] button.

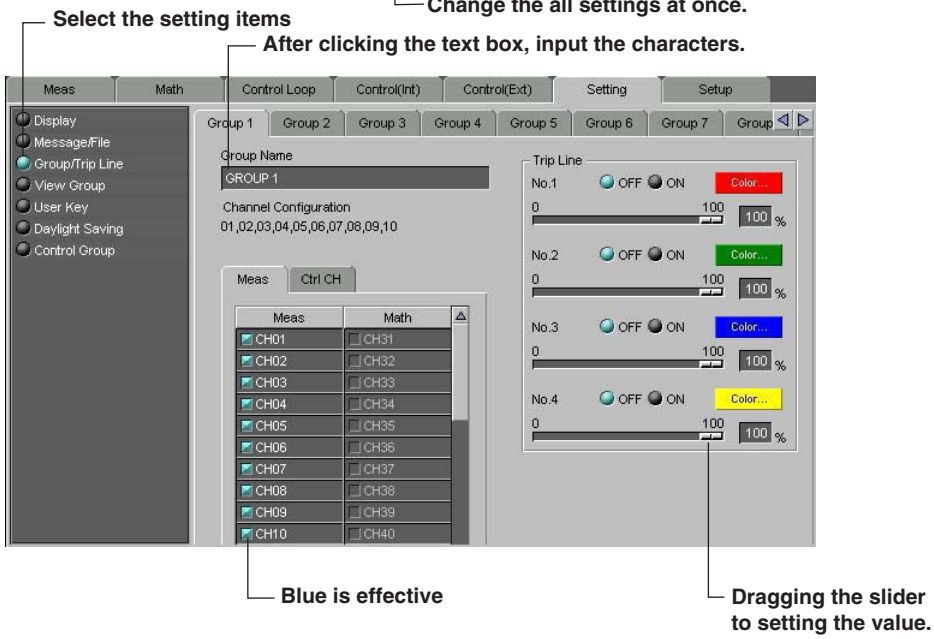
Note

- Before exiting Launcher, make sure that all the utilities are closed.
- When you exit the Launcher, the DAQSTANDARD also closes.

1.5 Common Operation







2.1 Functions of Launcher

Starting

The utilities of the DAQSTANDARD can be started from Launcher.

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

Description of Each Button

The following three buttons are available.

CONFIG	The Hardware Configurator start button. Used to start the Hardware Configurator. Once the Hardware Configurator starts, this button is disabled.
VIEWER	The Data Viewer start button. Used to start the Data Viewer. Once Data Viewer starts, this button is disabled.
NETWORK	The [Network] dialog box display button. Used to open the [Network] dialog box to set communication conditions. Once the Hardware Configurator starts, this button is disabled.

Description of Each Menu

The following two menus are available.

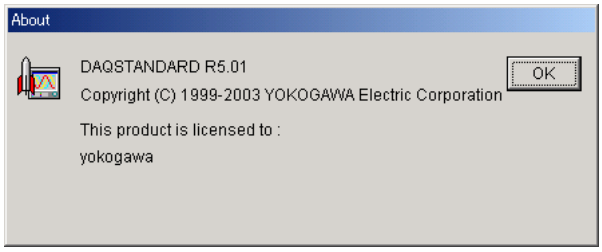
Launcher	Hardware Configurator	Same as the CONFIG button.
	Data Viewer	Same as the VIEWER button.
	Network Configuration	Same as the NETWORK button.
Help	About...	Displays the version number of Launcher.

2.2 Displaying the Version Information

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

Procedure

1. On the [Help] menu of Launcher, click [About].
   The [About] dialog box appears.



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

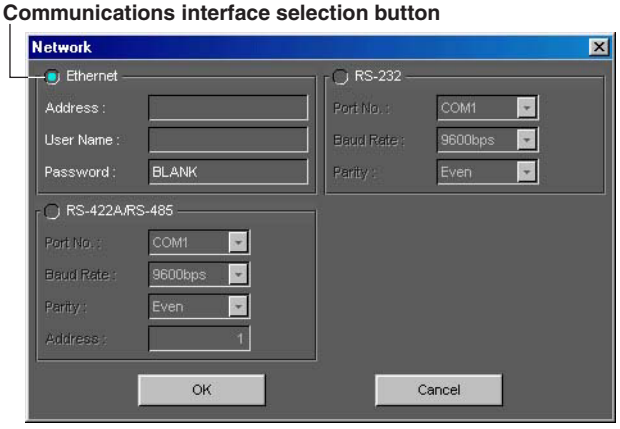
2.3 Communication Method Settings

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

Procedure

1. Click the CONFIG button of the Launcher or click [Network Configuration] on the [Launcher] menu. The [Network] dialog box appears. Ethernet or serial interface (RS-232 or RS-422A/RS-485) can be used.

Communications interface selection button



2. Select the desired network type. The color of the selected network turns blue.
3. Set each communication parameter.
4. When all the communication parameters are set, click [OK]. To cancel the settings, click [Cancel].
   The dialog box closes and the settings are applied to enable communications. (If communications are in progress, the dialog box closes and communications are re-started.)

Description of Each Communication Parameter

Ethernet

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

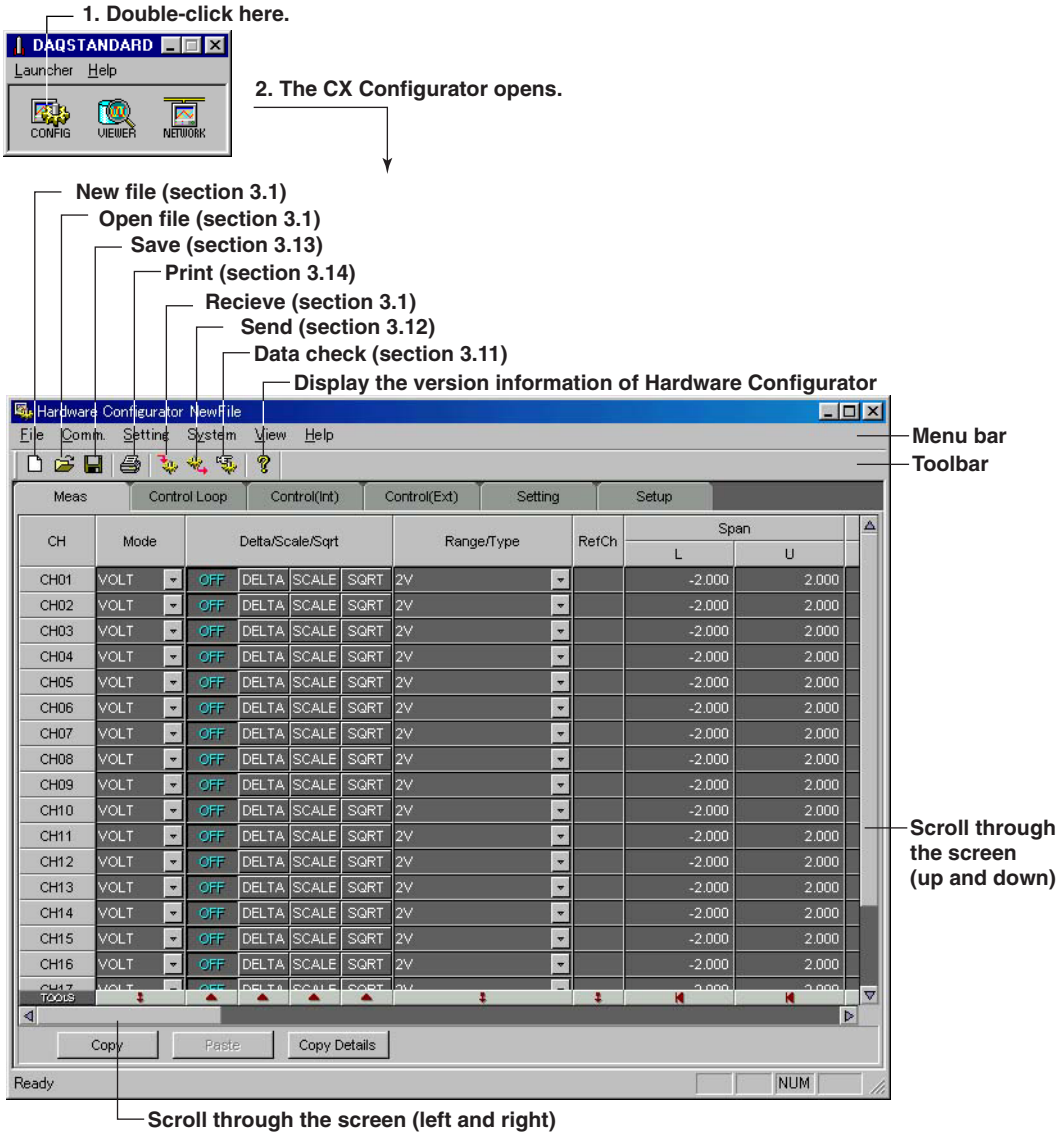
Serial Interface (RS-232 or RS-422A/RS-485)

Port No.: Specify the port number (COM1 to COM4) to be used.
Baud Rate: Specify the baud rate (2400 to 38400 bps).
Parity: Specify the parity check (None, Odd, or Even).
Address: Specify the address (for RS-422A/RS-485 only).

3.1 Starting the Hardware Configurator, the Hardware Configurator Window, and System Configuration Settings

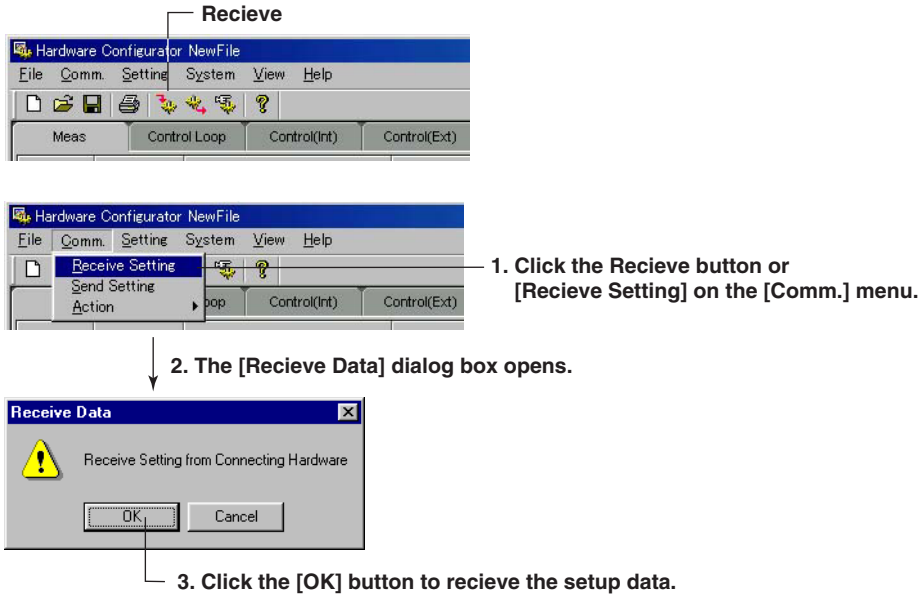
The Hardware Configurator can be used to transmit and receive the setup data, change the setup data, and create new setup data for CX style number S1.

Starting the Hardware Configurator



Loading Setup Data from the CX

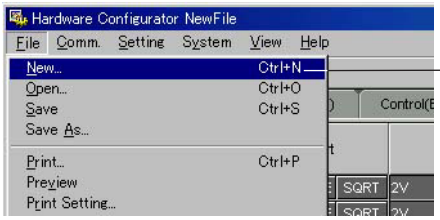
Before performing the following procedure, please make sure that the communication method and parameters are correct. (For details, see section 2.3 “Communication Method Settings”.)



Note

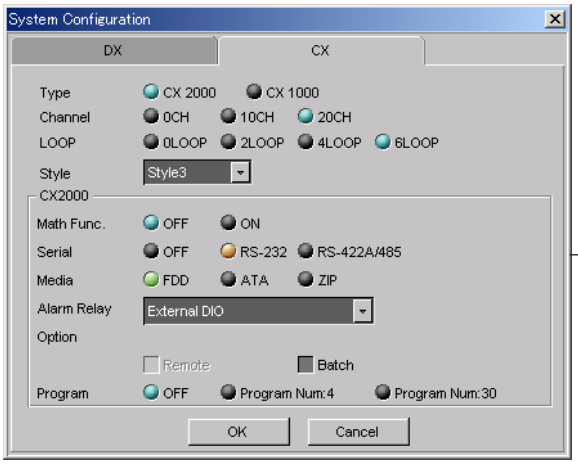
Do not load measured data when entering program control function settings on the CX, or when a medium is being accessed. Doing so will cause a communications error.

Creating Setup Data by Configuring a New System



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

2. The [System Configuration] dialog box opens.



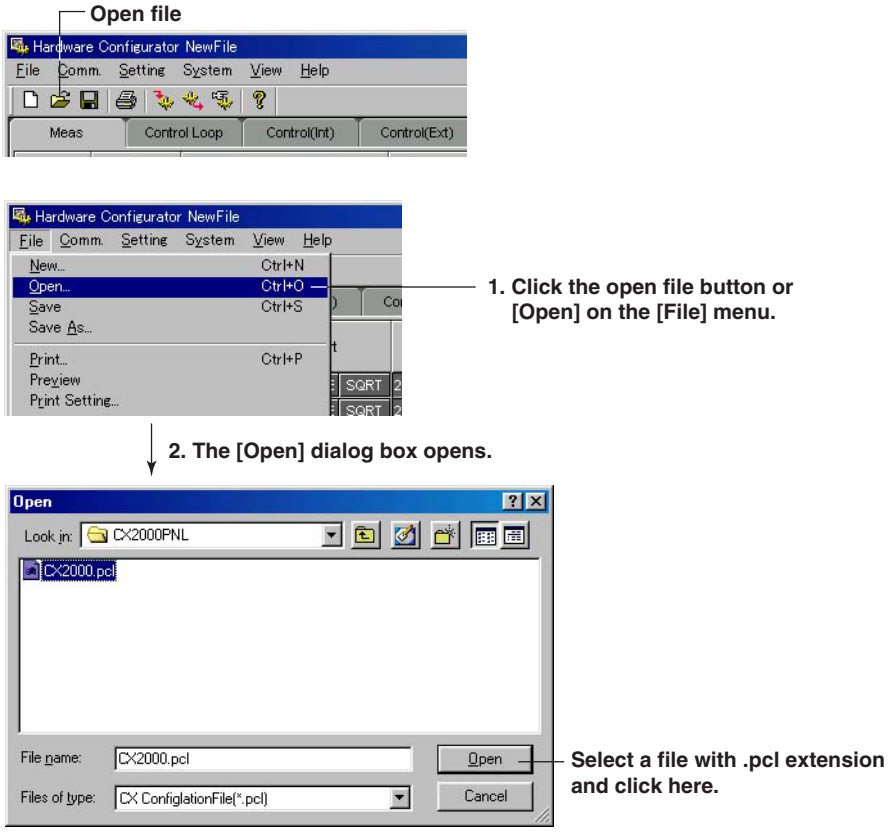
3. Click the appropriate items and click the [OK] button to return to the Hardware Configurator window.

For details about the settings in the [System Configuration] dialog box, see section 3.2 “Setting and Checking the System Configration and Initializing Setup Data”.

Note

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

Loading Preexisting Setup Data

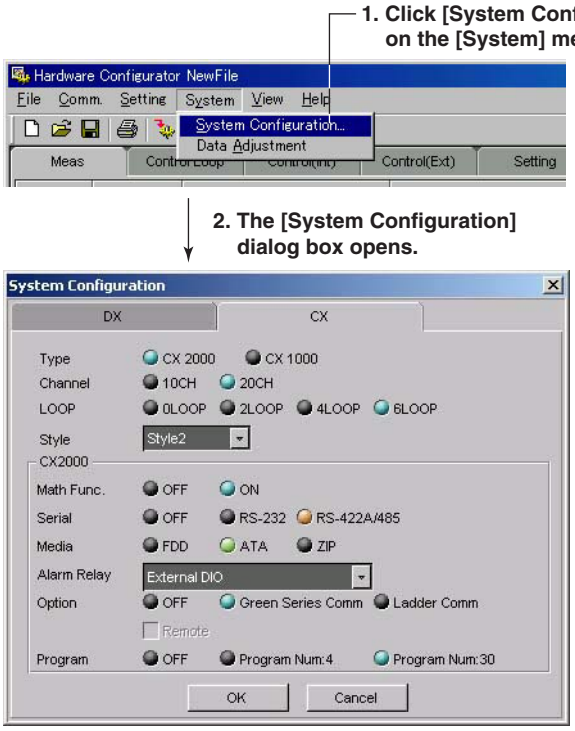


Specify the location of the setup data file and open the setup file.

3.2 Setting and Checking the System Configuration and Initializing Setup Data

Entering and Checking System Settings

You can create new configuration files or open existing configuration files, and then enter or check system configuration according to the connected CX specifications.
Normally these settings should be entered per the specifications of the CX being setup.



You can enter the following settings in this dialog box.

Type

Select either CX2000 or CX1000.

Channel

Select the number of channels of the CX.
CX1000: 0 (when set to Style 2 or later), or 6 channels
CX2000: 0 (when set to Style 2 or later), 10, or 20 channels

LOOP

Select the number of loops.
CX1000: [0LOOP], [2LOOP]
CX2000: [0LOOP], [2LOOP], [4LOOP], [6LOOP]
Select the CX style number. The default is Style1.

Math Function

Select whether or not to enable the math functions.

Serial

Select the serial communications mode from [OFF], [RS-232], or [RS-422A/485].

Media

Select the external storage media from [FDD], [ATA], or [ZIP].

Alarm Relay

Select the type of alarm relay from [NONE], [4p+With Fail/Mem. End], [6p], or [External Loop] (only for CX2000). If you select 2LOOP for the CX1000, the Alarm Relay is automatically set to NONE.

The items that can be selected vary depending on the model, number of channels, and number of loops.

Options

If set to a style before Style 2, the following options can be selected.

- Green Series Comm
  Select whether communication options are installed and an external environmental monitoring system. This option can only be selected when [Serial] is set to [RS-232] or [RS-422A/485].
- Ladder Comm
  Select whether a ladder communication option is installed. This option can only be selected when [Serial] is set to [RS-232] or [RS-422A/485].
  Also, this option is not available if 0LOOP is selected.

Remote

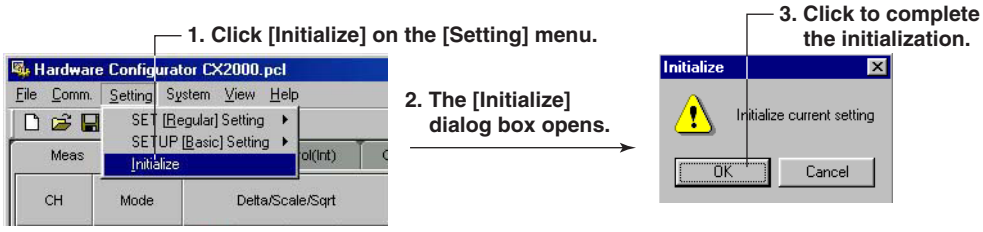
Select whether a remote option. This option is installed can only be selected when [Alarm Relay] is set to [4p+With fail/Mem. End] or [6p].

Program

Select [None], [Program Num#:4], or [Program Num#:30].

When you change the system configuration and click the [OK] button, the “System configuration has been changed. The input configuration and data will be initialized. Continue?” message appears. Click the [OK] button to initialize the data.

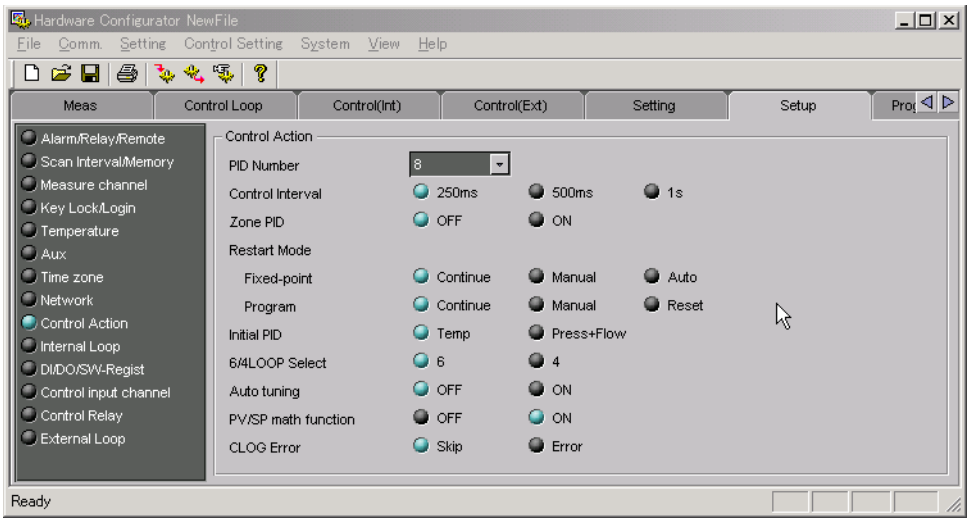
Initializing the Setup Data



3.3 Control Function Basic 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



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 the PV/SP computation function ON or OFF. When ON, you can set the PV/SP equation.

CLOG Error (CX Style Number S3 or Later)

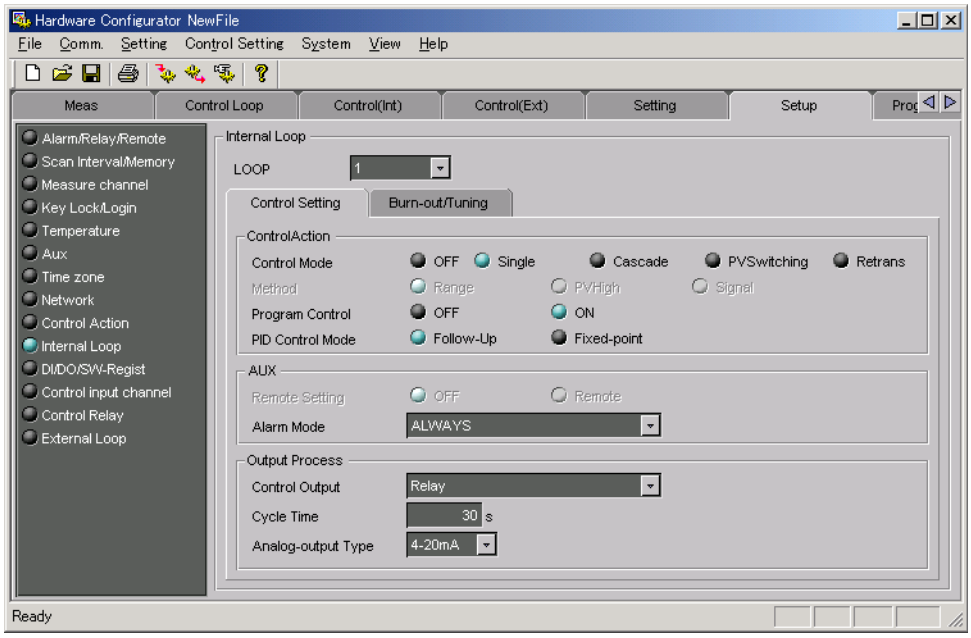
Set the method for dealing with abnormalities in the channel data for CLOG, a PV/SP computation function and analog transmission operator.

Error: process as a computation error

Skip: skip any abnormal data and complete the computation

Internal Loop

For each loop there are Control Setting and Burn-out/Tuning items.



LOOP

Select the loop number (CX1000: 1 and 2, CX2000: 1 to 6) 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], [PVSwitching], 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 and earlier, there is a common setting for 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.

  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

  Cycle Time

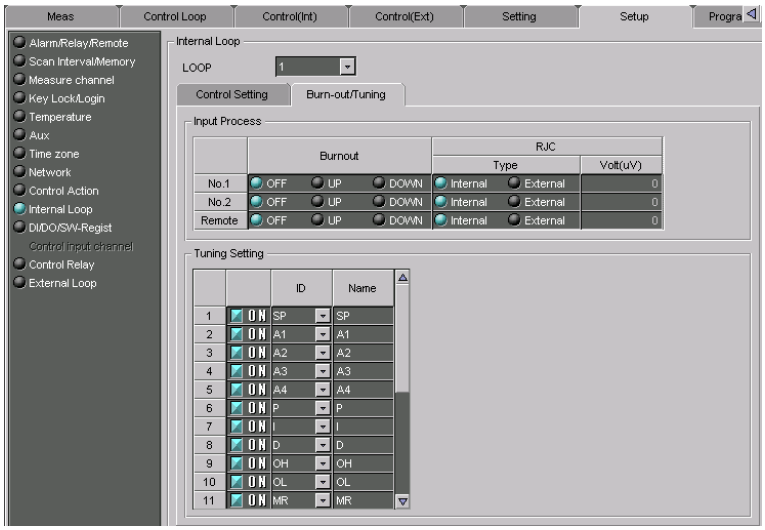
  With a PID proportional to time, set the cycle time (control output cycle) between [1]s and [1000]s.

  Analog-output Type

  For the current output, select the output current range from the following:

  - [4-20mA], [0-20mA], [20-4mA], and [20-0mA].

[Burnout/Tuning] Tab (When PV/SP Computation Is OFF)



- input Process

  Burnout

  Sets the burnout action for the PV inputs of each loop. [Measure2] is valid only when the control mode is set to [PVSwitching]; [Remote] is valid only when the PV input is set to remote input. This setting is invalid for PV inputs other than thermocouples and standard signals.

  When the PV/SP computation function is OFF, enter settings according to page 3-12, “Control Input Channel.“

  RJC (Type, Volt (uV))

  This is the reference junction compensation setting for thermocouple inputs. The setting is entered on the PV inputs of each loop. [Measure2] is valid only when the control mode is set to [PVSwitching]; [Remote] is valid only when the PV input is set to remote input. This setting is invalid for PV inputs other than thermocouples.

  Select from [Internal] and [External] for [Type].

  When [External] is selected, set [Volt (uV)] between -20000 and 20000 uV.

- 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 of the item from the following:

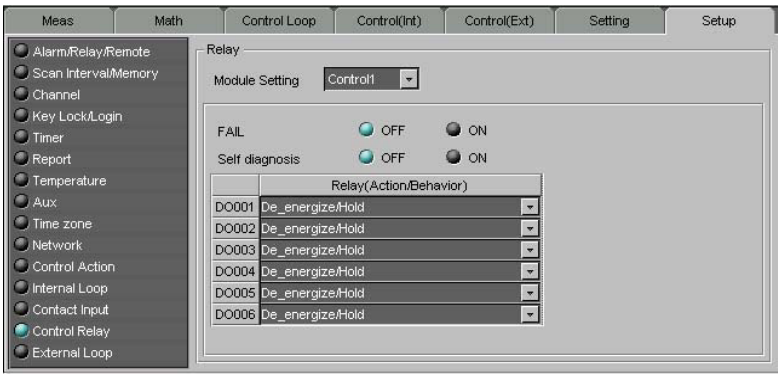
  Internal loop

  SP (target set point), A1 (alarm 1 setting), A2 (alarm 2 setting), A3 (alarm 3 setting), A4 , P (proportional range), I (integration time), D (differentiation time), OH (upper output limit), OL (lower output limit), MR (manual reset), H (hysteresis), DR (control action direction), PO (preset output), ETC (others), BS1 (measured value 1 input bias)*, FL1 (measured value 1 input filter)*, BS2 (measured value 2 input bias)*, FL2 (measured value 2 input filter)*, RT (ratio setting)*, RBS (remote input bias)*, RFL (remote input filter)*, or W01–W36 (control computation constant)*.

  * Applies to style number S3 or later

  BS1, FL1, BS2, FL2, RFL, and W01–W36 cannot be selected when PV/SP computation is ON.

Contact Input



Module Setting

Select the terminal blocks where you want to register contact inputs.

Style 3 or later

[CTRL1-DI] (2 loops or more), [CTRL2-DI] (4 loops or more), [CTRL3-DI] (6 loops or more), [CTRL1-DO] (2 loops or more), [CTRL2-DO] (4 loops or more), [CTRL3-DO] (6 loops or more), [EXT1-RI] (CX2000 with extention output terminal), [EXT1-RO] (CX2000 with extention output terminal), [INT-SW1], [INT-SW2], [INT-SW3]

Style 2 or earlier

[CTRL1-2], [CTRL3-4] (4 loops or more), [CTRL5-6] (6 loops or more), [ETXDIO] (CX2000 with extention output terminal)

Contact

For each contact input number, select the type of contact input from the following. Some items may not be available depending on the system settings and control mode. For details about the contact input settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

- ControlStopAll
- ControlStartAll
- ControlStart/Stop (CX1000: 1 to 2, CX2000: 1 to 6)
- Remote/Local (CX1000: 1 to 2, CX2000: 1 to 6)
- Auto/Man (CX1000: 1 to 2, CX2000: 1 to 6) ← not selectable in cascade control
- Cascade (1-2, 3-4) ← selectable only in cascade control (3-4 is only for CX2000)
- Auto1-2 or 3-4 ← selectable only in cascade control (3-4 is only for CX2000)
- Man1-2 or 3-4 ← selectable only in cascade control (3-4 is only for CX2000)
- SPNumber0 to 3 bit (enter by selecting one of the options under SP Number set).
- PVSwitching (CX1000: 1 to 2, CX2000: 1 to 6) ← selectable only in loop control with PV switching
- Memory Start/Stop
- Trigger
- Alarm ACK
- Time Adjust
- Math Start/Stop
- Math Reset
- Manual Sample
- Panel1 Load to Panel3 Load
- Message1 to 8
- Snapshot

SP Number Set

Select the SP number set to switch to when registering contact inputs.

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)

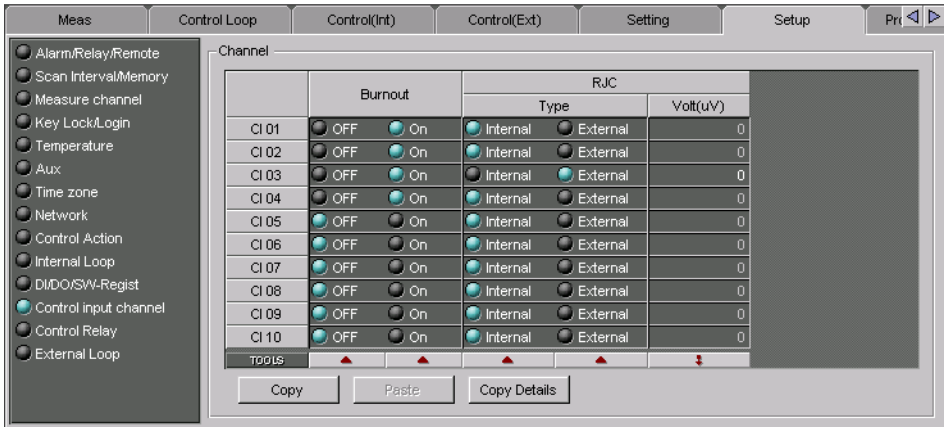
With program control, you can select the range of pattern numbers when switching program patterns through contact input. The pattern numbers are entered in binary according to the number of relays required as shown in the following chart.

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 Computation Is ON, and with CX Style Number S3 or Later)

When PV/SP computation is ON (see control operation), set burnout and RJC (when PV/SP computation is OFF, set in “Internal Loops”).



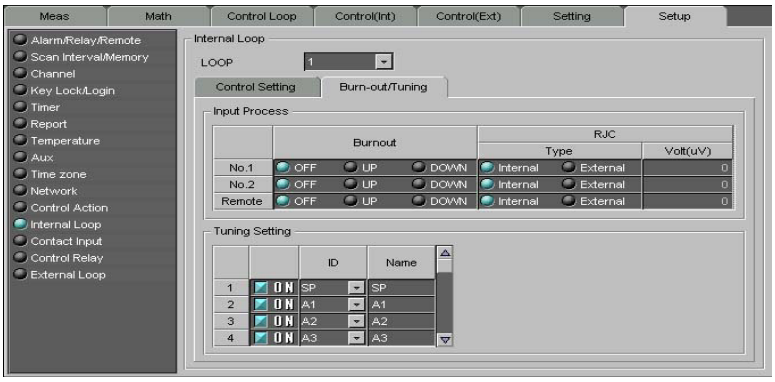
Burnout

Turn each control input channel ON or OFF.

RJC

This is the thermocouple input reference junction compensation setting. Set for each control input channel.

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(With 6/4 loop select, selection is not possible when set to 4 loops.).

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].

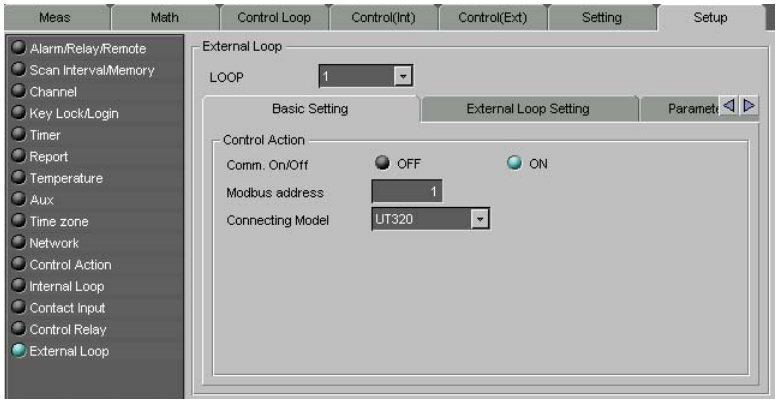
Relay (Action/Behavior)

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

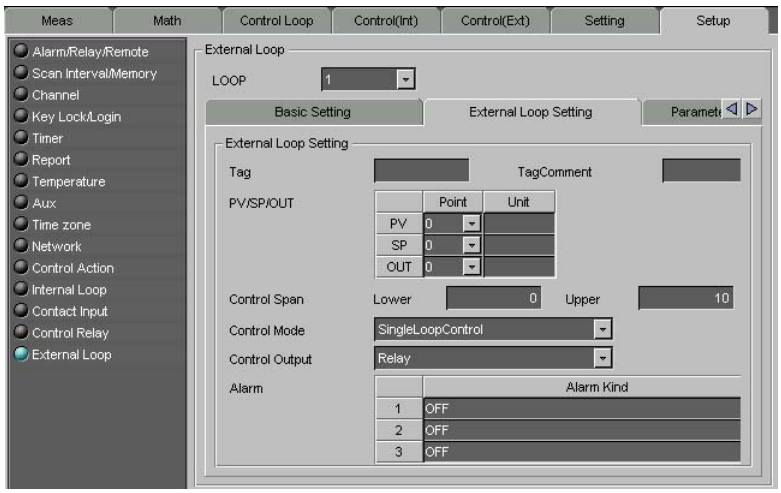
  Enter the Modbus address of the environment used in external loop control.

  Connecting Model

  Select the type of connected UT series controler. 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



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.

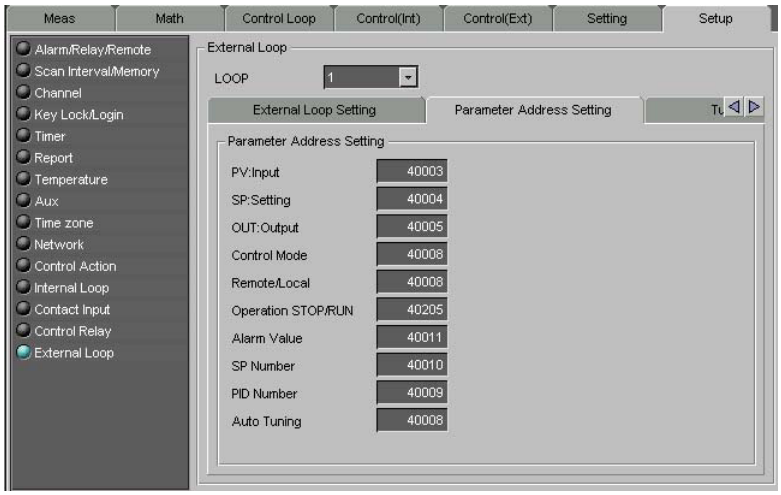
Control Span
Set the control span between the upper and lower limits.

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]

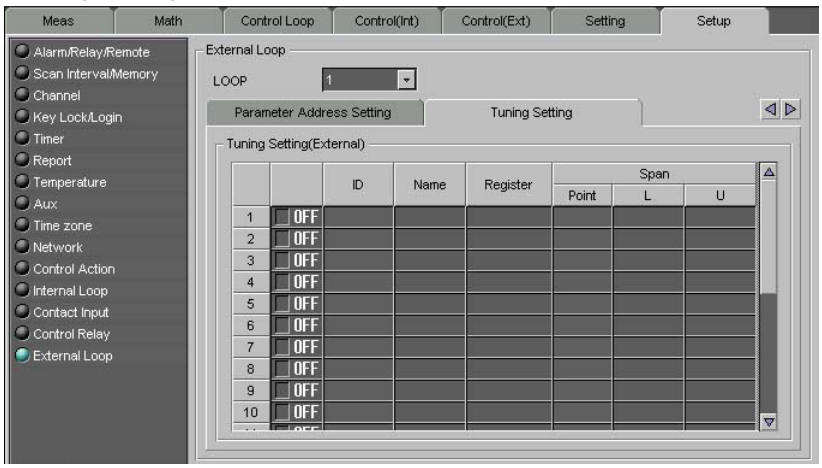
Alarm
Select the type of alarm from the following:
[OFF], [PV-High(Energ)], [PV-Low(Energ)], [Deviation-High(Energ)], [Deviation-Low(Energ)], [Deviation-High(Deenerg)], [Deviation-Low(Deenerg)], [Deviation-H&L(Energ)], [Dev-within-H&L(Energ)], [PV-High(Deenerg)], [PV-Low(Deenerg)], [PV-High(Energ/Standby)], [PV-Low(Energ/Standby)], [Dev-High(Energ/Standby)], [Dev-Low(Energ/Standby)], [Dev-High(Deenerg/Standby)], [Dev-Low(Deenerg/Standby)], [Dev-H&L(Energ/Standby)], [Dev-w-H&L(Energ/Standby)], [PV-High(Deenerg/Standby)], [PV-Low(Deenerg/Standby)], [Timer-upward(h:m)], [Timer-downward(h:m)], [Timer-upward(m:s)], [Timer-downward(m:s)], [Sensor-grounding], [Problem-diagnostic], [FAIL-output], [SP-High], [SP-Low], [Output-High], [Output-Low], [Header-burnout1], and [Header-burnout2].

[Parameter Address Setting] Tab



Select the parameter address settings from the following ranges.
30001 to 39999, 300001 to 365535, 40001 to 49999, 400001 to 465535.

[Tuning Setting] Tab



- Tuning Setting (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 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: cannot select with UT320, UT350, or UT420), P (proportional range), I (integration time), D (differentiation time), OH (upper output limit), OL (lower output limit), MR (manual reset), H (hysteresis), DR (control action direction), PO (preset output), or ETC (others)

Note

When [Connecting Model] in the [Basic Setting] tab of [External Loop] is set to [Other], you can only select [ETC].

Name
Specify the name of the item using 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.

3.4 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

A different menu is displayed when PV/SP computation function in the control basic settings is turned ON or OFF.

When PV/SP computation function is OFF

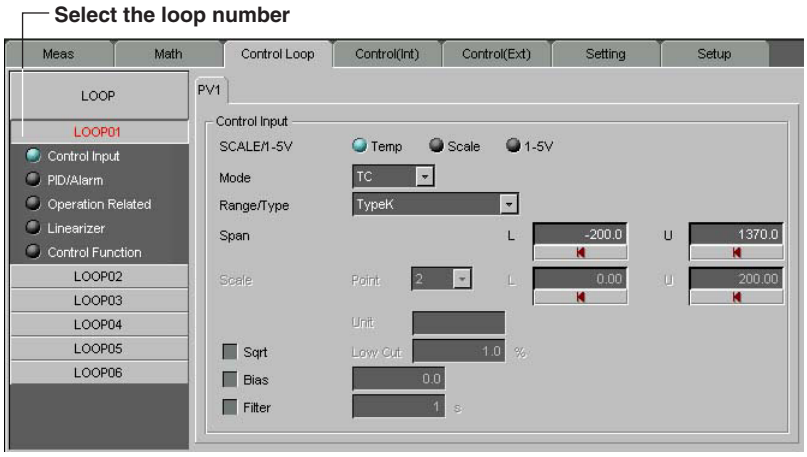
The control input settings vary depending on the [Control Mode] setting selected in [Setup] - [Internal Loop]. You can make settings for the inputs [PV1], [PV2], [Remote], and [PVrange]. They appear in the following situations.

		PV1	PV1	Remote	PVrange
Basic	Odd loops	○		○	
	Even loops	○		○	
Cascade	Odd loops	○		○	
	Even loops	○			
PVSwitching	Odd loops	○	○	○*	○
	Even loops	○	○		○
Analog Re-transmission	Odd loops	○		○	
	Even loops	○		○	

* 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].

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]. Set the decimal place in the range from 0 to 4.

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 turned ON, set the value in the range from -30000 to 30000. Set the decimal place in the range from 0 to 4.
With Style 2 or earlier, the setting range is from 0.001 to 9.999.

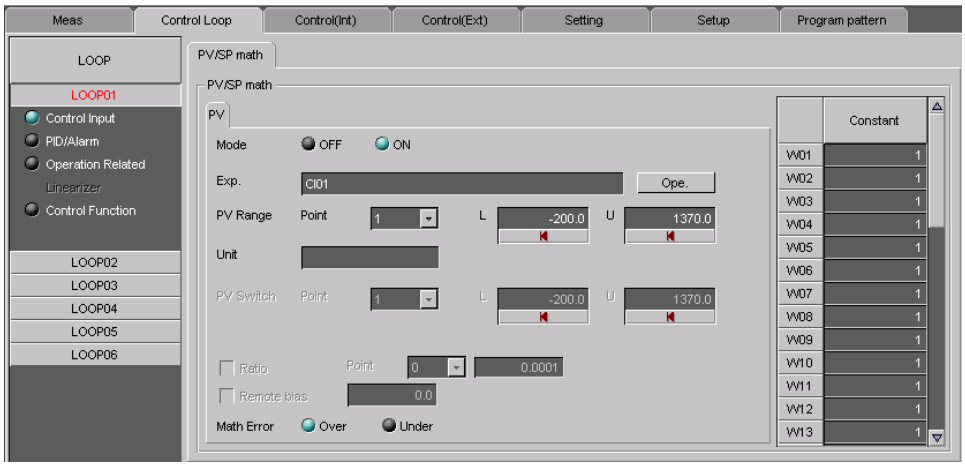
PV Range (PV Range)
Enter the maximum value, minimum value, decimal place, and units.
Set the max. and min. values between –30000 and 30000 such that max. > min., and max. - min. = 30000.

PV Switching (PV Range)
Set within the input range. When setting Method to 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 computation function is ON, the above settings for the input related settings are entered for each control input channel item on the Setup tab. See page 3-29 for the setting method.

When PV/SP Computation Function is ON



Enter PV or SP related settings.
When the control mode is analog retransmission, the setting menu for that mode is displayed.
See the next page.

PV/SP Computation Function
Select whether to enter settings for PV, PV1, PV2, or SP. Enter PV if the control mode is single loop control or cascade control, or PV1, PV2 for 2 input switching control. SP can be entered when the Setup tab's Internal Loop > Select Remote Input option is set to ON.

Mode
Select ON or OFF.
ON: Activates the equation.
OFF: Assigns the following control input channels to the equation.

Control mode	Single loop control		Cascade control		2 input switching control (4 loops)			2 input switching control (6 loops)		
	PV	SP	PV(1)	SP	PV1	PV2	SP	PV1	PV2	SP
Loop 1	CI01	CI02	CI01	CI02	CI01	CI02	CI03	CI01	CI02	CI01
Loop 2	CI04	CI05	CI04	—	CI04	CI05	CI01	CI04	CI05	CI01
Loop 3	CI06	CI07	CI06	CI07	CI06	CI07	CI08	CI06	CI07	CI01
Loop 4	CI09	CI10	CI09	—	CI09	CI10	CI01	CI09	CI10	CI01
Loop 5	CI03	CI01	—	—	—	—	—	—	—	—
Loop6	CI08	CI01	—	—	—	—	—	—	—	—

Equation
Enter the PV/SP equation. If the mode is OFF, the equation cannot be entered.

PV range (PV or PV1)
Set the maximum value, minimum value, decimal place (0–4), and units using 6 characters or less.
Set the max. and min. values between -30000 and 30000 such that max. > min., and max. - min. ≤ 30000.
PV1 can be set even if the mode is OFF.

Input Switching (PV1)
Set within the PV range. Set the decimal place (0–4), upper limit (U) and lower limit (L). When setting Switching Condition to Setting Range in Control Settings under the Setup tab's Internal Loop item, and when setting the upper limit (U), lower limit (L), and Switching Condition to PV Upper Limit Value, only the upper limit value is set. If you set Switching Conditions to Contact Input, the PV Input Switching setting is not available. [3]
This can be set even if the mode is OFF.

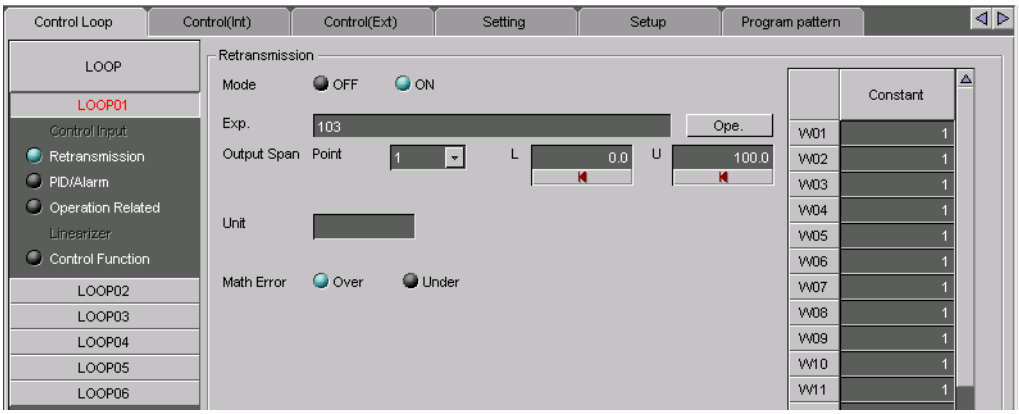
Ratio Setting (Remote)
Turns SP ON when a given ratio is applied.
When turned ON, set the ratio in the range from 0.0001–30000. Set the decimal place in the range from 0 to 4.

Remote Bias
You can select ON or OFF to determine whether bias is applied to SP.
When turned ON, set the bias value in the PV range of “EUS(-100% to 100%).”

Computation Error
If a computation error occurs, specify whether to process it as a PV/SP, overrange, or underrange.

Constants
Set the constants to be used for PV/SP computation, analog retransmission, and logic computation. Constants are common for analog retransmission and logic computation.

Analog Retransmission



Sets the equation and output span on loops whose control mode is analog retransmission.

Mode
Select ON or OFF.
ON: Activates the equation.
OFF: Analog retransmission does not function.

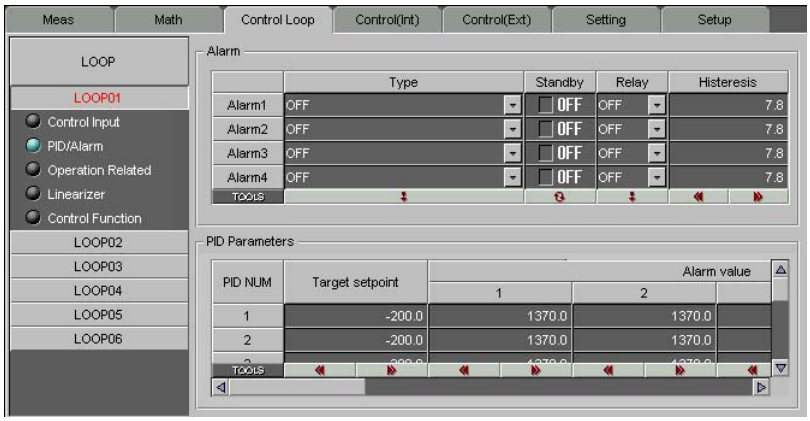
Equation
Enter the analog retransmission equation.

Output Span
Set the maximum value, minimum value, decimal place (0–4), and units using 6 characters or less.
Set the max. and min. values between -30000 and 30000 such that max. > min., and max. - min. ≤ 30000.

Computation Error
Select whether to set to an overrange or underrange when computed results in an error.

Constants
Set the constants to be used for PV/SP computation, analog retransmission, and logic computation.

PID/Alarm



- Alarm
  Specify an alarm for each loop.

  Type
  Select the type of alarm from the following:
  [PV-High], [PV-Low], [Deviation-High], [Deviation-Low], [Deviation-H&L], [Dev-within-H&L], [SP-High], [SP-Low], [Output-High], and [Output-Low].

  Standby
  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: Loop2
  DO101 to DO106: Loop4(CX2000)
  DO201 to DO206: Loop4(With 4/6 loop selection, selection is possible for a CX2000 set to 6 loops.)
  R0001 to R0012 (CX2000 with the control extension DIO)
  SW001-SW036: internal switches (CX1000 is SW001–SW018, Style 3 or later)

  Hysteresis
  Specify the alarm hysteresis in EUS (0.0 to 10.0%).

- PID Parameters
  Specify the PID parameters for each loop.

  Target setpoint
  Specify the target setpoint in EU (0.0 to 100.0%).
  Set between the target setpoint's upper and lower limits.

  Alarm value (1 to 4)
  Set the alarm value. (The setting depends on the type of alarm.)

PV and SP alarms	EU (0 to 100%)
Deviation-High and Deviation-Low alarms	EUS (–100 to 100%)
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 EUS (0.0 to 100.0%).

Relay Hysteresis (Point)
Select the Hysteresis operating point when using ON/OFF control from [Mid], [Lower Limit], or [Upper Limit].

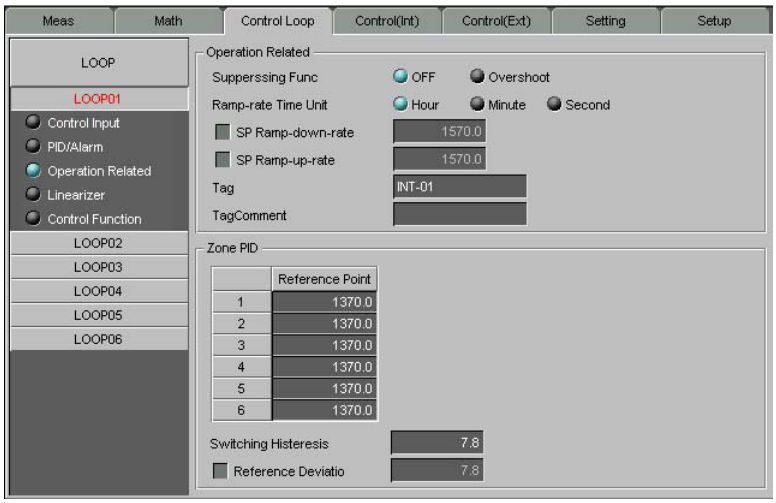
Preset Out
Select from -5.0 to 105.0% to be used when operation is stopped.

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



- 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].

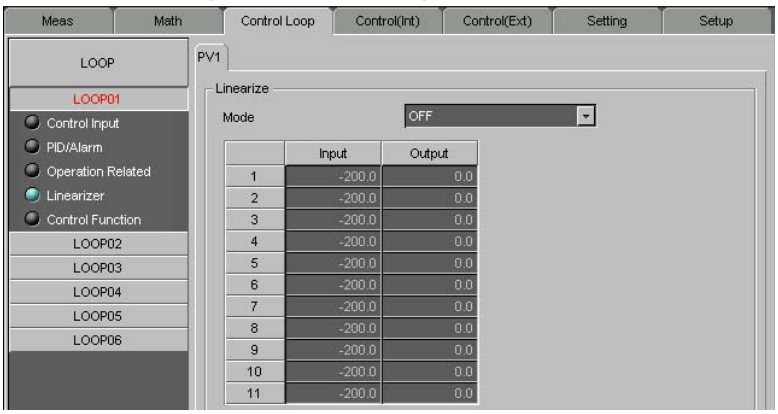
  Reference Point(displayed when the PID number is 3 or higher)
  Specify the reference point with the measurement input span EU (0.0 to 100.0%).
  The number of points depends on the number of PID. ([PID Number]: 2.) Therefore, it is not displayed when the PID number is 2 or less.
  The value of each point is such that 1≤2≤...≤6 is set.

  Switching Hysteresis
  Specify the switching hysteresis value with the measurement input span EU (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 2 or later, it is not displayed when the PID number is 1 or less.

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 PV/SP Computation Is OFF)



Mode

Select the linearize mode from [OFF], [Biasing], or [Approximation].

Input

Enter the linearize input value. (The value depends on the linearize mode.)

Biasing: Set with 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.)

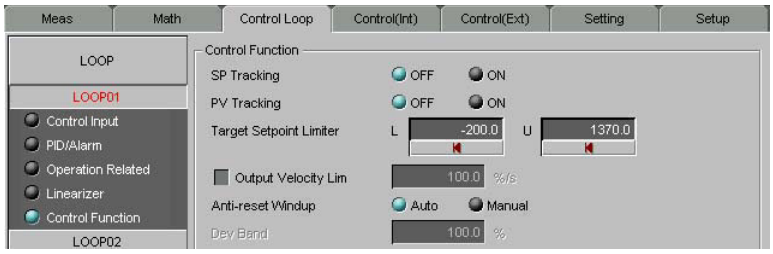
Biasing: Set with measurement input span EUS (–100.0 to 100.0%).

Approximation: Set with measurement input span EU (–5.0 to 105.0%).

Note

- With linearize bias, set so that input + output is EU(0–100%). Also, set so that ten segment linearizer input + ten segment linearizer output is more than the previous ten segment linearizer input + ten segment linearizer output.
- Set so that ten segment linearizer approximation output is more than the previous value.
- Starting from the third point, if you set a value smaller than the previous value, all settings after that point become disabled.
- When the PV/SP computation function is ON, the above settings are entered for each control input channel item on the Setting tab. See page 3-31 for the setting method.

Control Function Settings



SP Tracking
Turn the target setpoint tracking ON or OFF.

PV Tracking
Turn the measurement value tracking ON or OFF.

Target Setpoint Limiter
Specify the terget setpoint limiter in the measured span's EU (0.0–100.0%) range so that L < U.

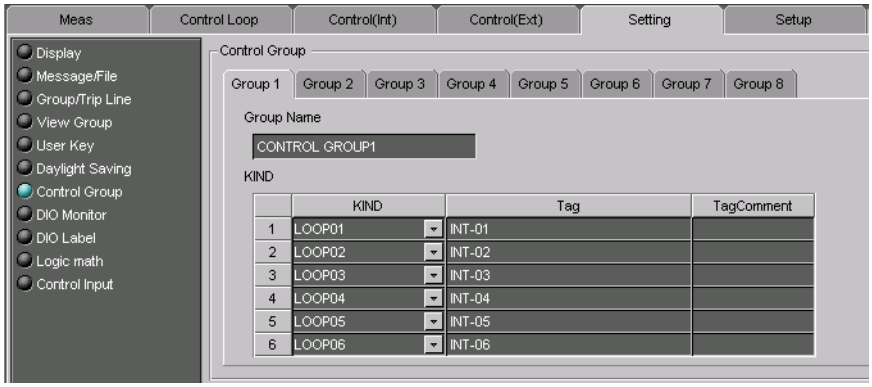
Output Velocity Lim
Select or clear the check box to turn the output velocity limiter ON or OFF, and specify a value between 0.1 and 100.0. This is unavailable for style number S2 if you set [Control Output] to [On/Off control] in the [Setup] tab for [Internal Loop].

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.



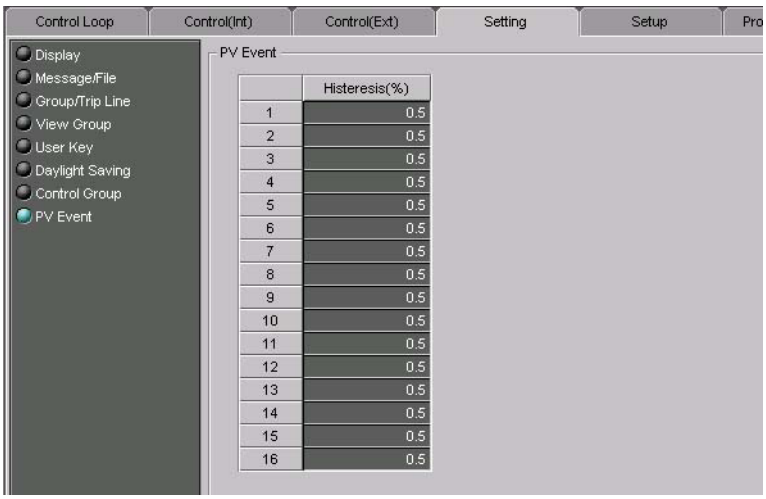
From the [Setting] tab, select [Control Group].

Group Name
Enter a group name using a maximum of 16 characters.

KIND
Select the loops and measurement channels you want to assign to a Group. For the CX1000, you can select 1–2 internal loops and 1–4 external loops. For the CX2000, you can select 1–6 internal loops, and 1–16 external loops.
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.

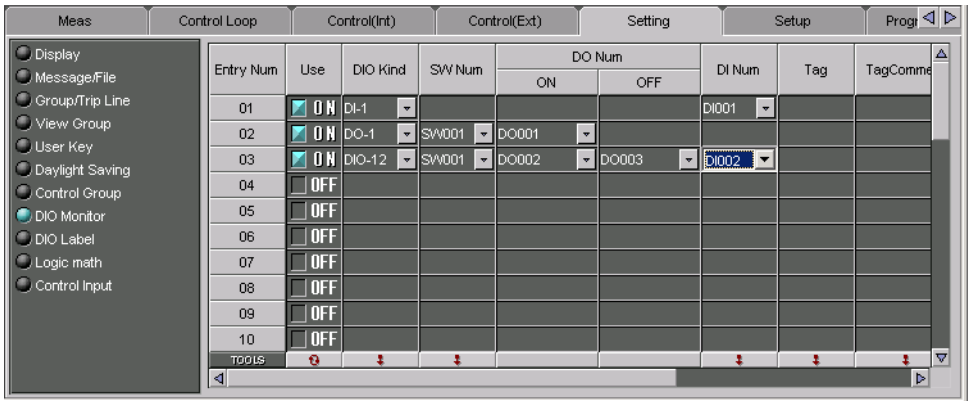
PV Event Hysteresis (Style 2 or earlier)

This is unavailable for style number S2 if you set [Program Control] to [On] in the [Setup] tab for [Internal Loop].



From the [Setting] tab, select [PV Event].

DIO Operation Monitoring Function (CX Style Number S3 or Later)



DIO Operation Monitoring Number

Enter an integer between 1 and 36.

DIO operation monitoring function

Turns the specified DIO operation monitor number ON and OFF.

DIO Types

Select the DIO operation monitoring method.

- DI-1: Displays the input status of the specified DI. The status of the internal switches are output.
- DO-1: The status of the internal switches are output to 1 DO. 1 (ON) is output when the internal switches are ON, and 0 (OFF) is output when they are OFF.
- DO-2: You can output the ON and OFF statuses of the internal switches to separate DOs. 1 (ON) is output from the ON output DO when the internal switches are ON, and 0 (OFF) is output from the OFF output DO when they are OFF. 0 (OFF) is output from the ON output DO when the internal switches are OFF, and 1 (ON) is output from the OFF output DO when they are ON.
- DIO-11: The same action as the DO-1 is performed while displaying the input status of the specified DI.
- DIO-12: The same action as the DO-2 is performed while displaying the input status of the specified DI.
- DO-2P: You can output the ON and OFF statuses of the internal switches to separate DOs. A pulse signal having a 1 to 2 second pulse width is output from the ON output DO when the internal switches are ON, and from the 0 (OFF) output DO when they are OFF.
- DOI-12P: The same action as the DO-2P is performed while displaying the input status of the specified DI.

SW Number

Set the internal switches assigned to DO.

DO Number

Set the DO performing DIO operation monitoring. If the DIO type is DO-2, DIO-12, DO-2P, or DIO-12P, specify a separate DO with ON and OFF. DO numbers may not overlap with other numbers, including DIO operation monitoring numbers.
Not displayed when the DIO type is DI-1.

DI Number

Set the DI number to perform operation monitoring.

Tag

Enter tags.

Up to 8 alphanumeric characters can be used.

Tag Comment

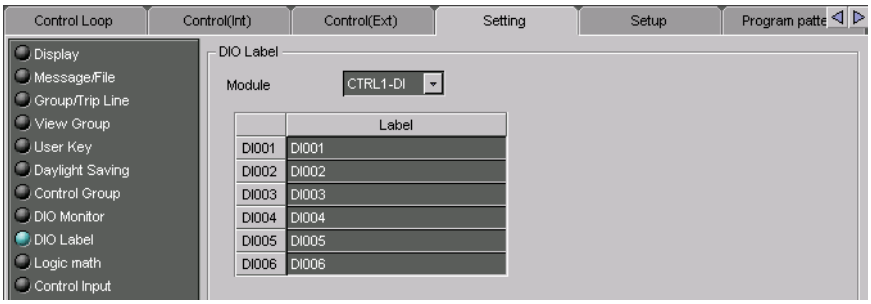
Enter tag comments.

Up to 8 alphanumeric characters can be used.

Operation Status Display

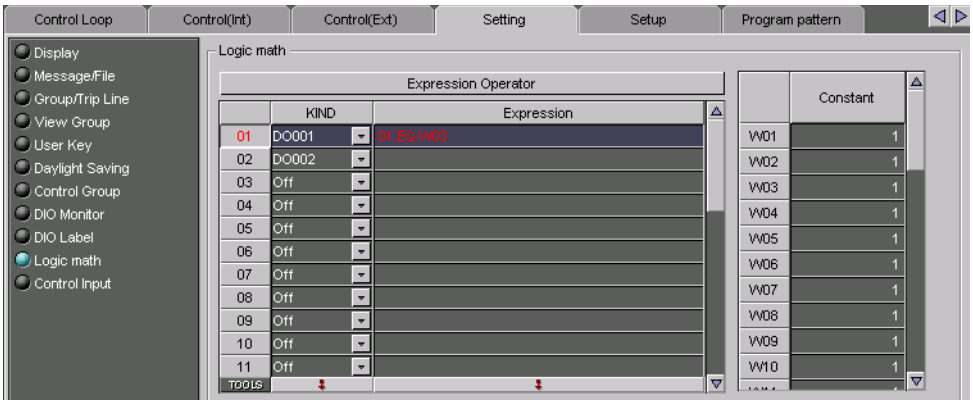
Set the label and display colors when displaying operation status.

DIO Labels (CX Style Number S3 or Later)



Set the DIO labels.

Logic Computation (CX Style Number S3 or Later)



Setting Numbers

Logic computation numbers are entered.

Type

Select the output destination for the computed results.

Equation

Input an equation. Click the Operator button to display the operators that can be entered.

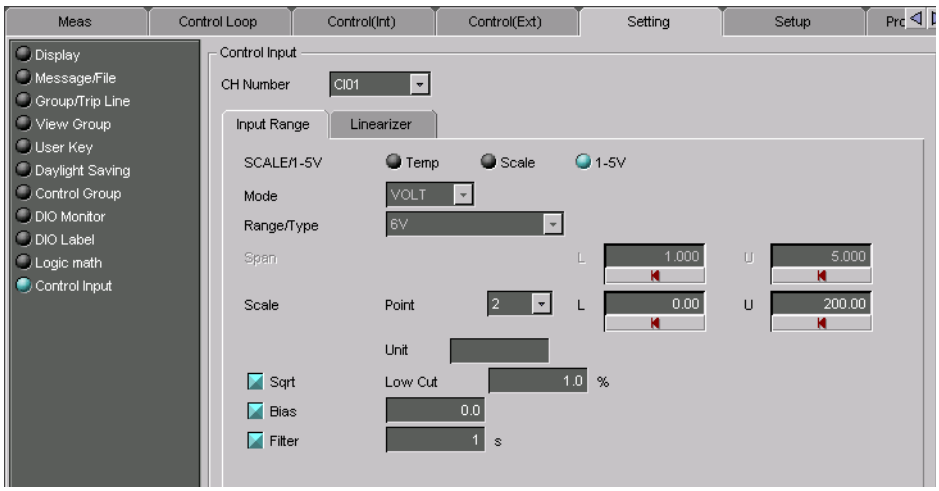
Constants

You can specify the constants used in equations.

Constants are common with PV/SP computation and analog retransmission constants.

Control Input Channel (CX Style Number S3 or Later)

When the PV/SP computation function is ON, you can set the input range and ten segment linearizer output for each channel.



SCALE/1-5V

Select the channel measurement mode from [Temp], [Scale], or [1-5V].

Mode

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

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

Specify the measurement span in EU.

Scale

Specify the scale between –30000 and 30000. However, this is only valid when [SCALE/1-5V] is set to [Scale]. Set the decimal place in the range from 0 to 4.

Unit

Specify the units.

Use a maximum of 6 characters.

Sqrt

Select or clear the check box to turn the square root function ON or OFF.

When it is on, set [Low Cut] between 0.0% and 5.0%.

Bias

Select the check box to turn the bias ON.

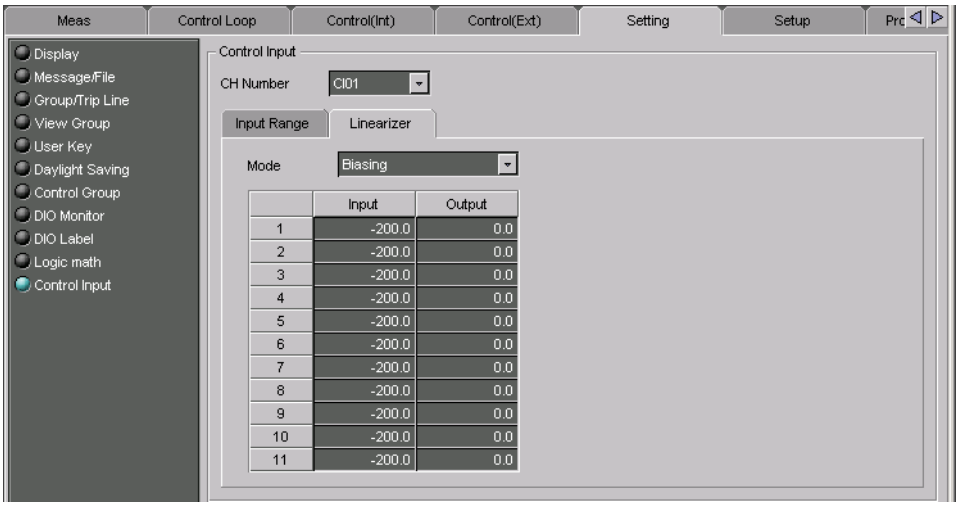
When it is ON, specify a EU (–100 to 100%) value.

Filter

Select the check box to use a filter.

When it is ON, set between 1s and 120s.

[Linearizer] tab



Mode

Select the linearize mode from [OFF], [Biasing], or [Approximation].

Input

Enter the linearize input value. (The value depends on the linearize mode.)

Biasing: Set with 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%).

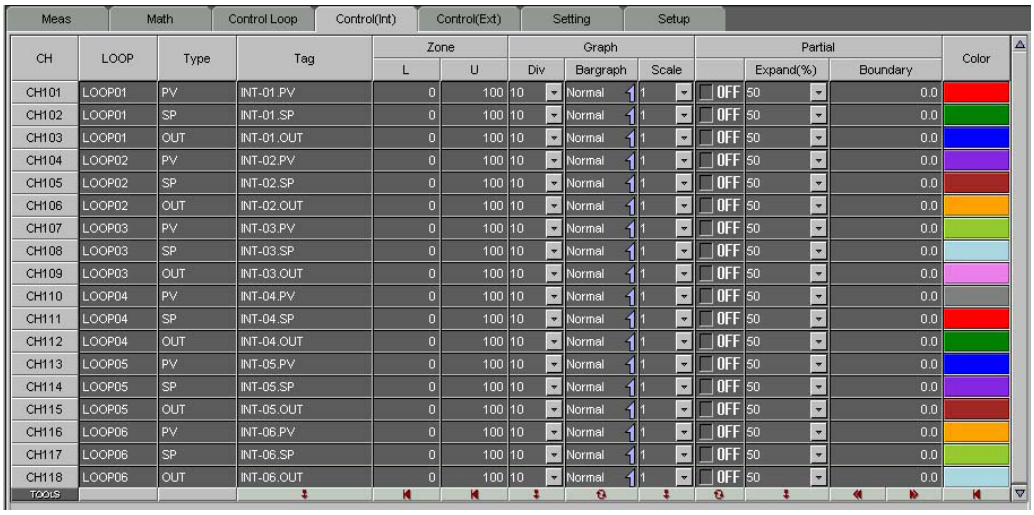
Approximation: Set with measurement input span EU (–5.0 to 105.0%).

Note

- With linearize bias, set so that input + output is EU(0–100%). Also, set so that ten segment linearizer input + ten segment linearizer output is more than the previous ten segment linearizer input + ten segment linearizer output.
- Set so that ten segment linearizer approximation output is more than the previous value.
- Starting from the third point, if you set a value smaller than the previous value, all settings after that point become disabled.
- When the PV/SP computation function is OFF, the above settings are entered for each loop item on the Setting tab. See page 3-25 for the setting method.

3.5 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 contorol channel
  PV /SP: EU(0%) < boundary value < EU(100%)
  OUT: EU(-5.0%) < boundary value < EU(105.0%)
  However, with OUT for analog retransmission, minimum value of span < boundary value < maximum value of span.
- External contorol channel
  span L < boundary value < 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% < boundary < 105.0%.

Color

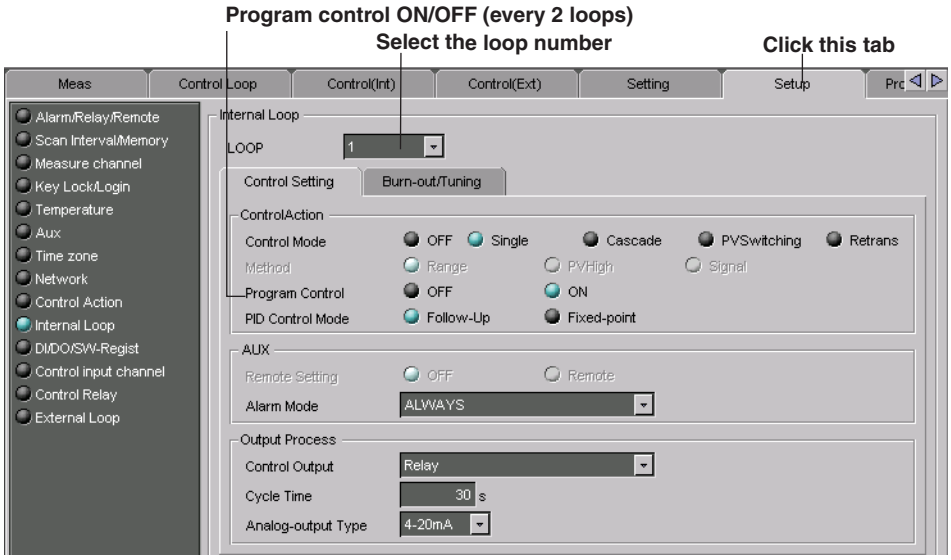
For each channel you can choose from 16 colors.

3.6 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.

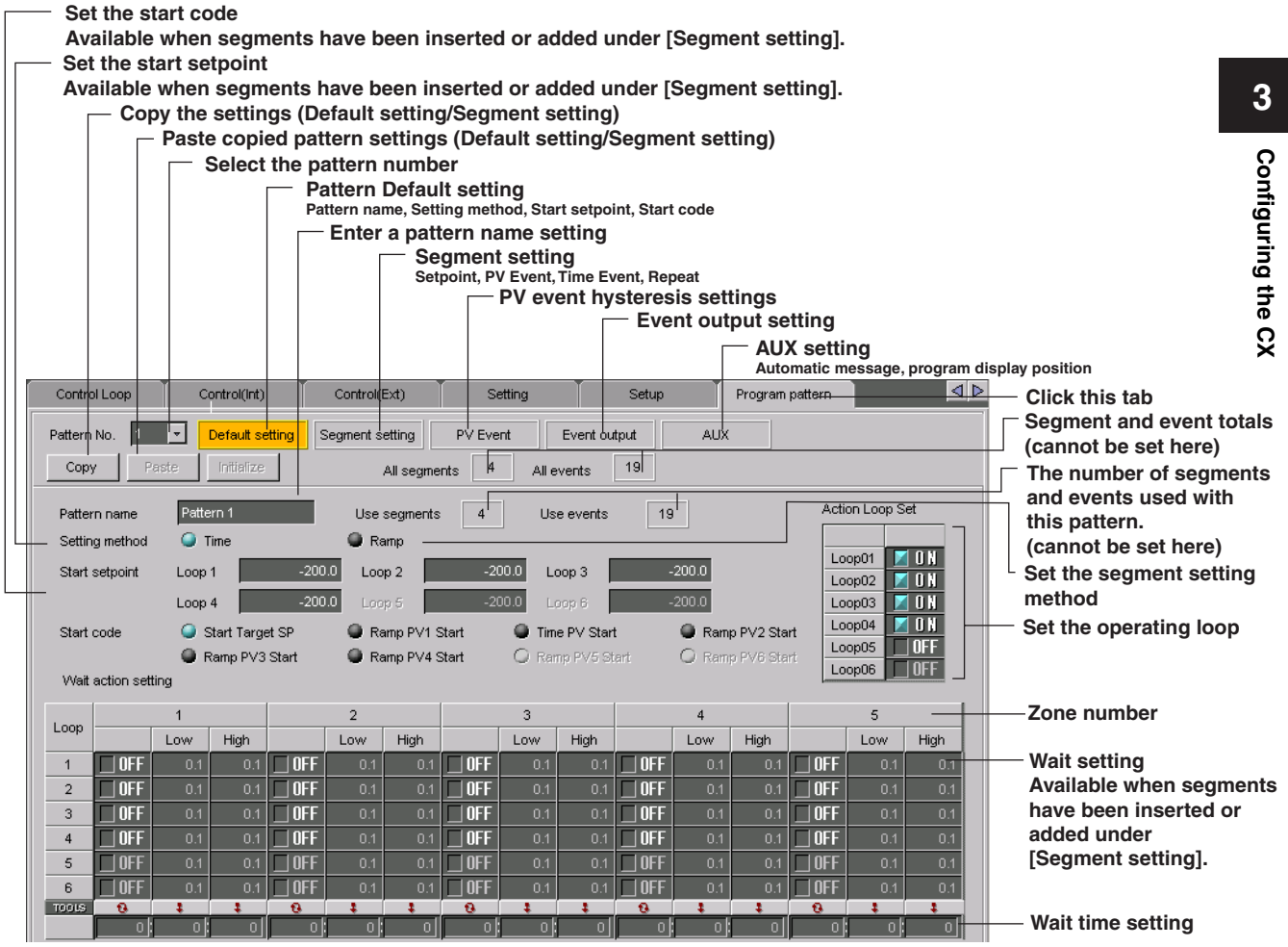


Note

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].



Pattern number

Select the number of the desired pattern from [1] to [30] ([1] to [4] for models with /PG1 option).

Pattern name

Enter the pattern name using up to 16 alphanumeric characters.

Segment setting method

Select segment time setting method or segment time ramp grade setting method. If you change this setting, the program pattern setting corresponding to the pattern number is initialized.

Start target setpoint

Set the start SP, a starting condition, in the range of [EU (0.0% to 100.0%)] (initial value is 0%) of the measurement span. For style 3 or later, the PV event hysteresis setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. Only the loops that are set as follows are displayed: [Setup] tab > [Internal Loop] > [Program control] to [On] During cascade control, even-numbered loops within the same terminal block are not displayed.

Start code

Select the operation start condition from the following. 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 time

Set the wait time in [hh:mm:ss] format (selectable range: [00:00:00] to [99:59:59]) for all the available zones. The setting applies to the same zones in each loop.

Wait action setting

Set the wait zones for 6 (number of loops) × 5 (number of zones) (CX1000: 2 (number of loops) × 5 (number of zones))in the range of [EUS (0.0 to 100.0%)] of the measurement span. For style 3 or later, the wait avtion setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered.

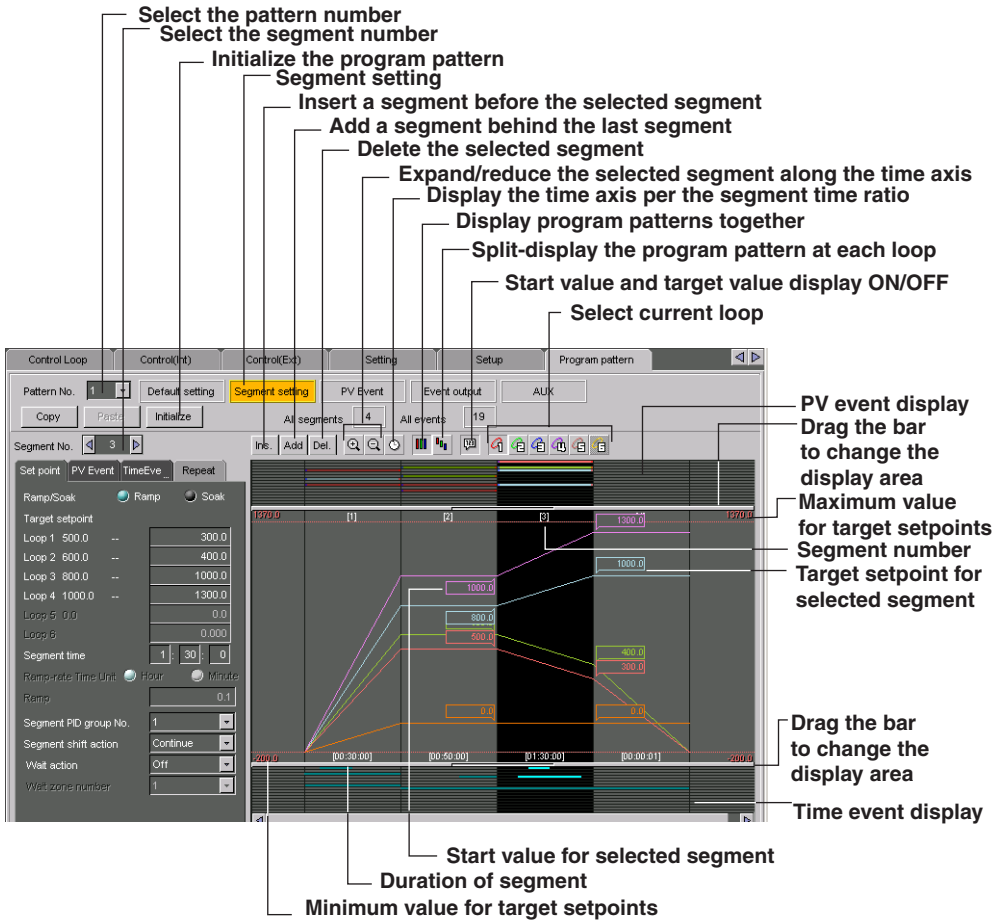
Operating Loop Designation

Set the loops to operate.
Select from loops whose program control is ON.

Program Patern Setting(Segment setting)

Program Pattern Settings (Segment Setting)

Set a program pattern for each segment, by clicking the [Program pattern] tab, then selecting [Segment settings].

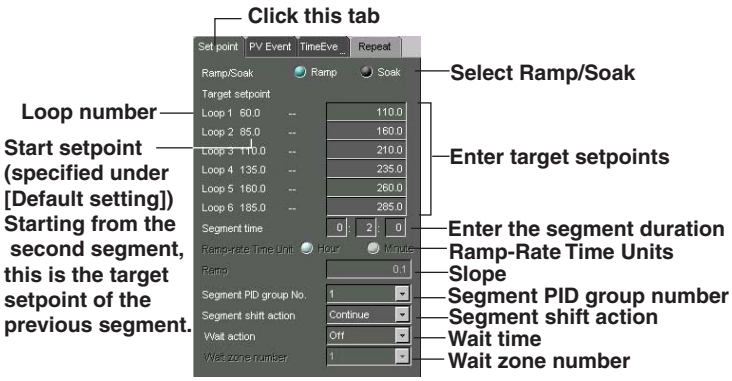


Select the Segment

Click the [Segment No.] arrow to select the desired segment in the program pattern display screen.

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. For style 3 or later, the target setpoint setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. Only the loops that are set as follows are available: [Setup] tab> [Internal Loop] > [Control mode] to a mode other than [Off] and [Program control] to [On] During cascade control, even-numbered loops within the same terminal block are not displayed.

- Segment time
  Set the segment time in the range of [0:00:01] to [99:59:59] (0 hour 0 min 1 s to 99 hour 59 min 59 s). This item is available at all times during segment time setting method and only when soak is selected during segment time ramp setting method.

- Ramp-rate time unit
  Set the ramp-rate time unit for ramps to [Hour] or [Minute]. This item is available only during segment time setting method.

- Ramp
  Set the ramp per unit time in the range of “1 digit to EUS (100%) of the measurement span.” The measurement span and decimal point position of the selectable range vary depending on the smallest numbered loop to be specified. This item is available only during ramp in the segment time ramp setting method.

- Segment PID group No.
  Select the segment PID group number [1] to [8]. This item is not displayed when zone PID is selected. Only the PID group numbers that can be specified through [Setup] tab > [Control action] > [PID number] are displayed.

- Segment shift action
  Set the segment shifting action to [Continue], [Hold] (hold after end of segment), [Local] (local mode after completing the last segment), or [Reset] (reset mode after completing the last segment).

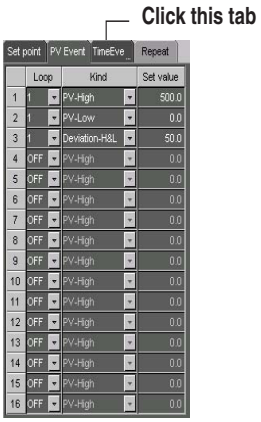
Note

When creating the program pattern, data is created so that the segment set to [Local] or [Reset] is the last segment of program control.

- Wait action
  Set the wait action type to [Shift] or [Within]. To disable the wait action, select [Off].
- Wait zone number
  Select the wait zone number from [1] to [5]. This item is available only when [Wait action] is set to [Shift] or [Within].

PV Event

Set the PV Event.



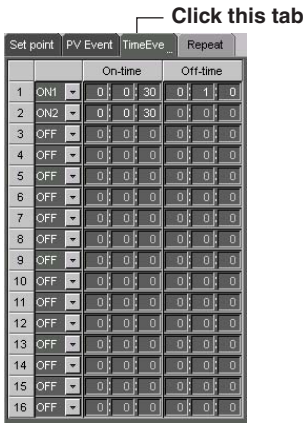
- Loop
  Set the target loop number [1] to [6] of the PV event (only selectable loop numbers). Up to 16 events can be assigned. Select [Off] (initial setting) for the number of the loops to which the event is not to be assigned.
- Type
  Select the type of PV event from the following.
  PV high-limit, PV low-limit, deviation high-limit, deviation low-limit, deviation high & low limit, deviation within high & low limits, SP high-limit, SP low-limit , output high-limit , and output low-limit
- Value
  Set the value in the following range according to the type of PV event.
  PV/SP event: EU (0.0 to 100.0%) of the measurement span
  Deviation high-limit event/low-limit event: EUS (–100.0 to 100.0%) of the measurement span
  Deviation high & low limit/within high & low limits: EUS (0.0 to 100.0%) of the measurement span
  Output event: –5.0% to 105.0% of output (% 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.

Time Event

Set the Time Event.

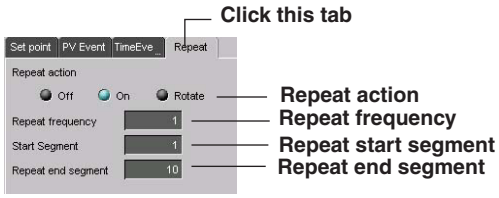


- On1/On2/On3/Off
  Set the ON/OFF setting type of each event (16 events) from the following. Select [Off] for events that are not to be assigned.
  On1: Use On time and Off time
  On2: Use On time only
  On3: Use Off time only

- On-time/Off-time
  Set the ON-time/OFF-time of the time event in “hh:mm:ss” format. The selectable range is “00:00:00 to 99:59:59.” 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.

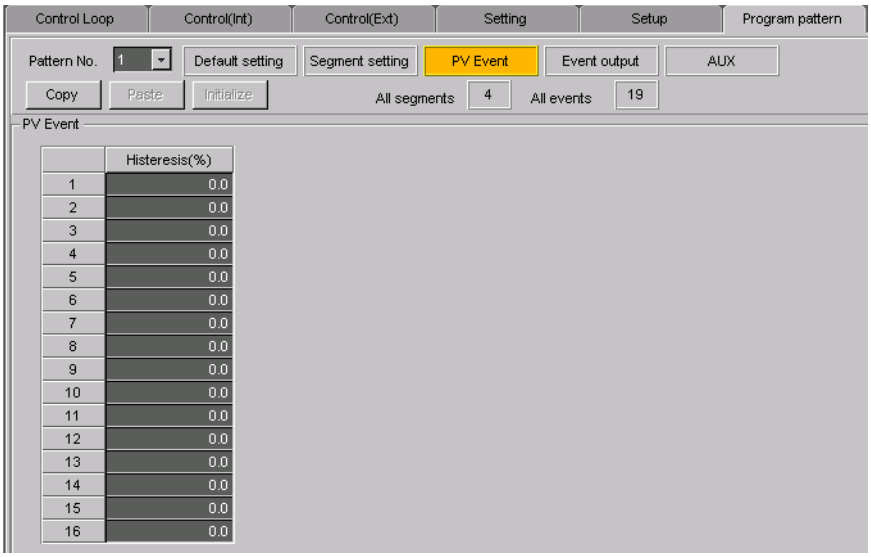


- Repeat action
  Select the repeat function from [Off], [On], and [Repeat].

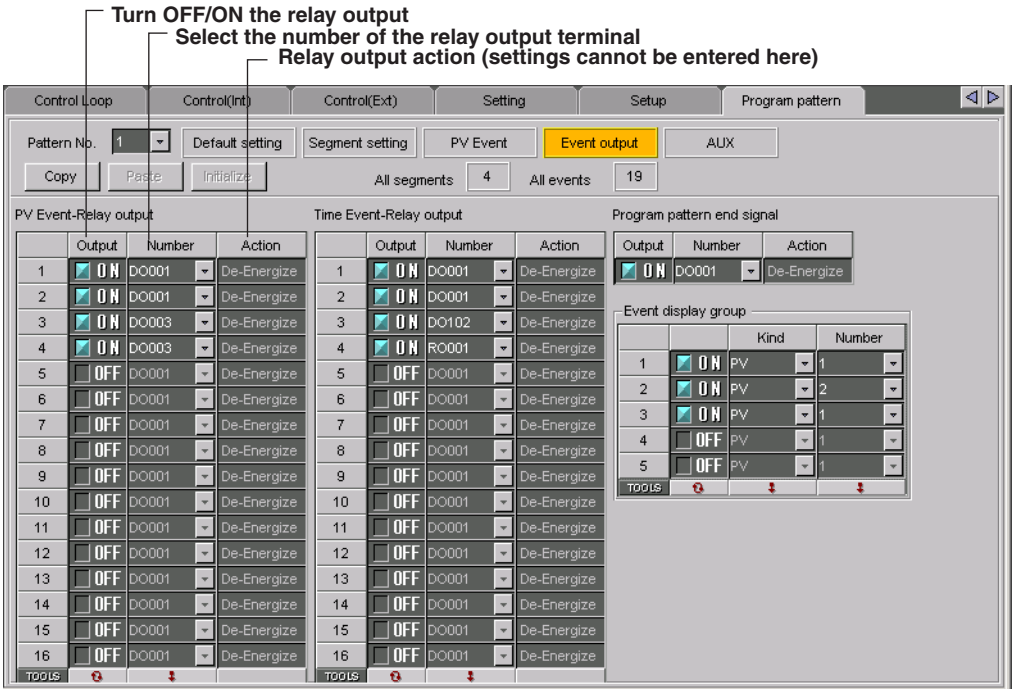
- Repeat frequency
  Set the number of repetitions when the repeat function is turned ON in the range of [1] to [999].

- 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)



Event Output Setting(PV event-relay output/Time event-relay output/Program pattern end signal)



PV Event-Relay output/Time Event-Relay output/Program pattern end signal

Relay Output

Turn OFF/ON the relay output.

Number

Select the number of the relay output terminal from the following.

DO001 to 006, DO101 to 106, DO201 to 206, RO001 to 012 (on models with the expansion DIO terminal block)

Action

Displays the relay output action (Energized/Nonhold) per the [Control Relay] settings on the [Setup] tab.

Event Display Group

You can select events for when groups are displayed in the CX program selection screen or program operation screen. Up to 5 events can be specified.

ON/OFF

Turns the display ON or OFF.

Kind

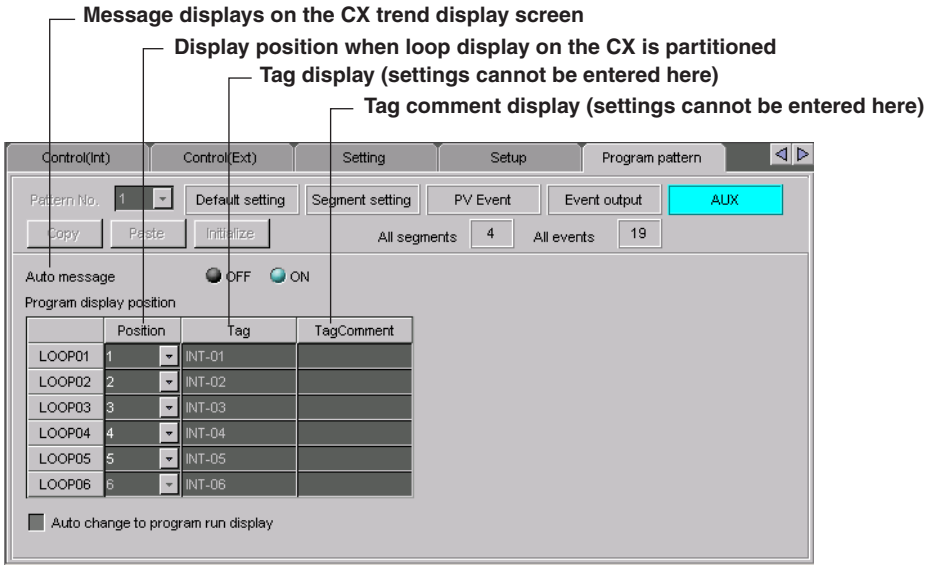
Select either time event or PV event.

Number

Set the event number.

AUX (Automatic Message, Display Position)

Turn message display ON/OFF, and set the loop display position on the CX.



On/Off

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. For style 3 or later, the position setting for loops turned ON in operating loop designation can be entered. With style 2 or earlier, settings for loops turned ON in Program Control under Internal Loops in the Setup tab can be entered. During cascade control, even-numbered loops within the same terminal block are not available.

Operation Display Automatic Switching (Style Number S3 or Later)

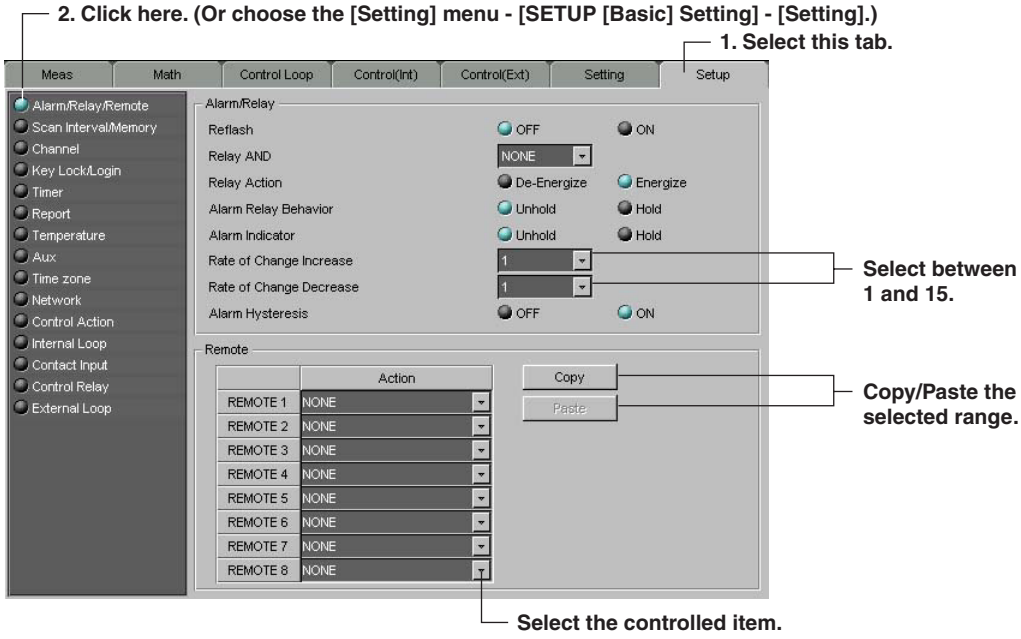
When a program execution command is sent via the communication function, you can have it switch to the program operation display.

- ON: Switches to the program operation display when a program execution command is sent.
- OFF: Does not switch to the program operation display (default) even if a program execution command is sent.

3.7 Basic Measurement Function Basic Settings

To enter measurement function basic settings, click the [Setup] tab. Or, you can select the items by choosing [Setting] - [SETUP [Basic] Setting] - [Setting].

Alarm/Relay/Remote



Alarm/Relay

Select the alarm format. The selected items are blue.

Reflash

Set whether to use the alarm relay output reflash.

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.

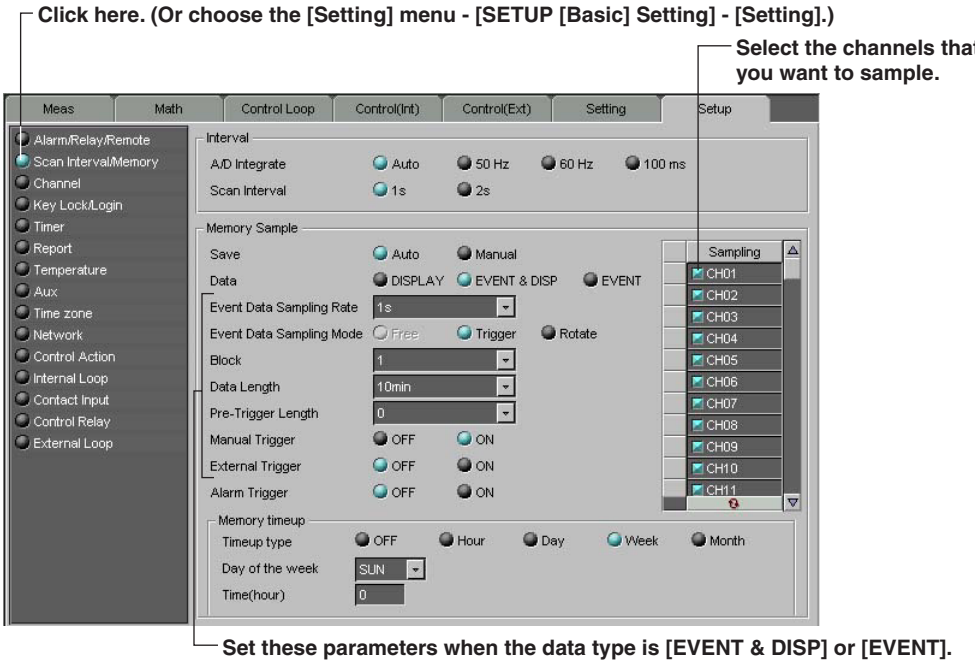
Rate of Change Increase
Select the number of data samples that determines the interval of the rate of change of an upper limit alarm between [1] and [15].

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



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, and number of loop (internal loop and external loop).

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

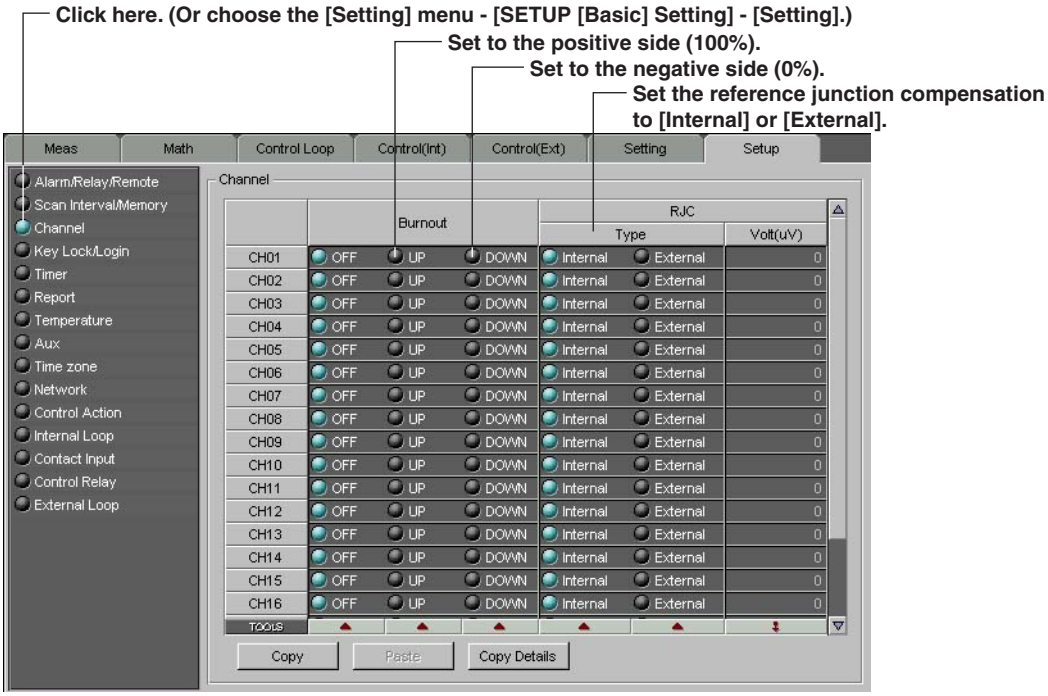
When [Timeup type] is [Week], select a day.

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)



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

"Channel" settings cannot be entered on 0 measurement channel models. The Channel command does not appear in the menu.

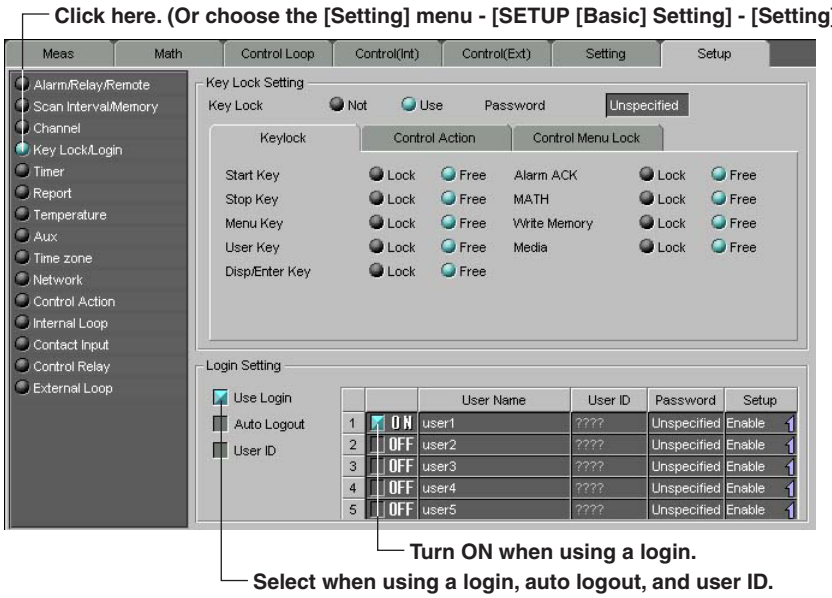
Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

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



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.

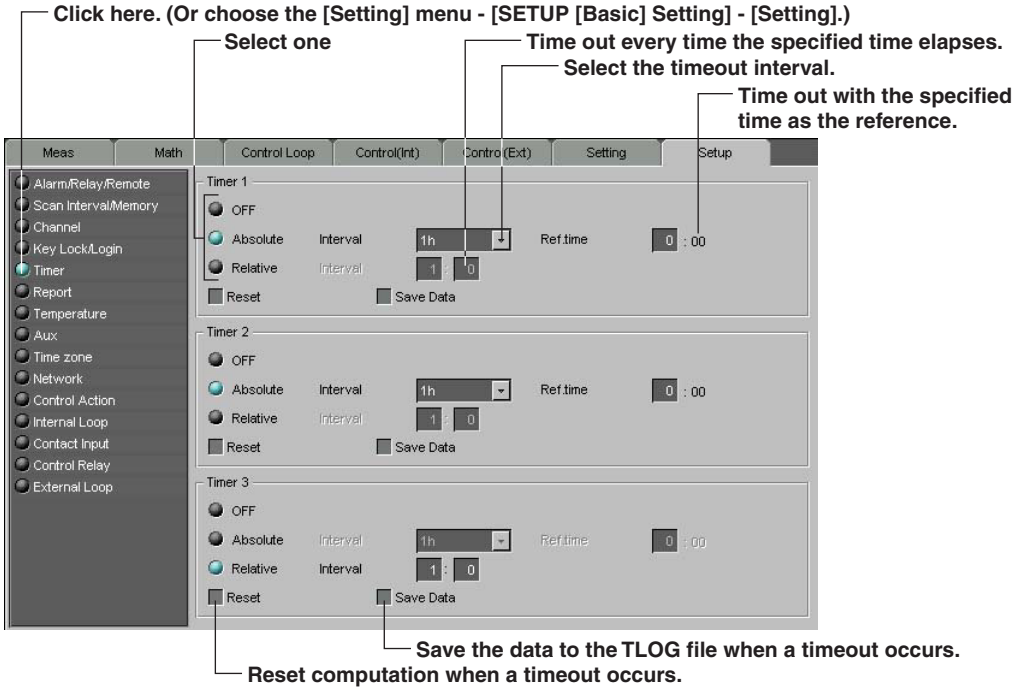
Password
Up to 6 characters can be entered for the password. [???] is displayed after the password is entered.

Setup
Select whether to allow setting changes in the setup mode for the user.

Note

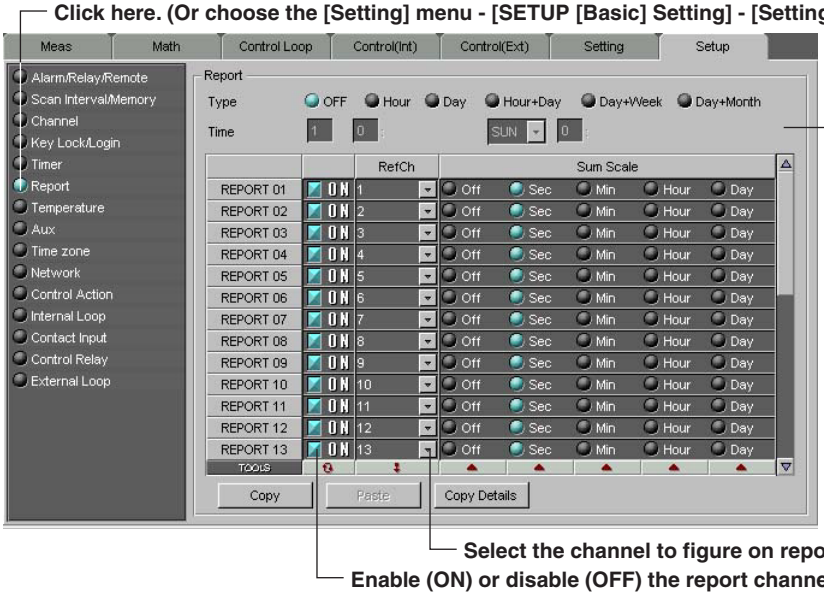
- If there is a duplicate [User Name] turned ON, the user with the larger user number is turned OFF.
- If [Setup] of all users that are turned ON is set to [Disable], the [Setup] of the user with the smallest number is set to [Enable].

Timer (Option)



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.)



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.
Mesurement channels cannot be assigned to report channels on 0 measurement channel model.

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

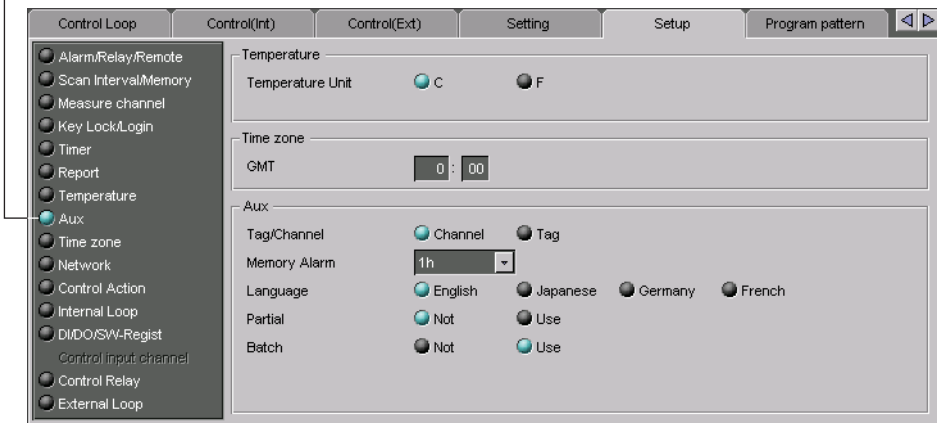
You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

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

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



Tag/Channel

Select whether to use the tag name or channel number as the measurement/computation channel label (See “Selecting the Characters Used to Identify Channels” on page 4-11).
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], [Germany[, or [French]) to be used on the CX’s display.

Note

- [German] and [French] cannot be selected when creating setup data by configuring a new system on the CX in off-line mode using . You must first load setup data from the CX, then select [German] or [French] under [Aux] in [Setup] ().
- Beware that if you configure the system after receiving setup data from the CX, the received setup data will be initialized. For information on system configuration, refer to section 3.2, “Setting and Checking the System Configuration and Initializing Setup Data.”

Partial

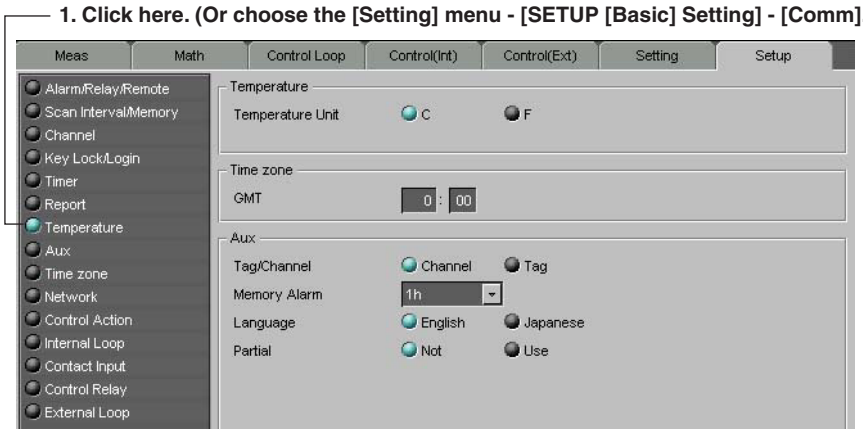
If set to [Not], the partial expanded display settings of the Meas, Math, and Control tabs are void.

Batch

Set the information to be added to data written to the CX internal memory.

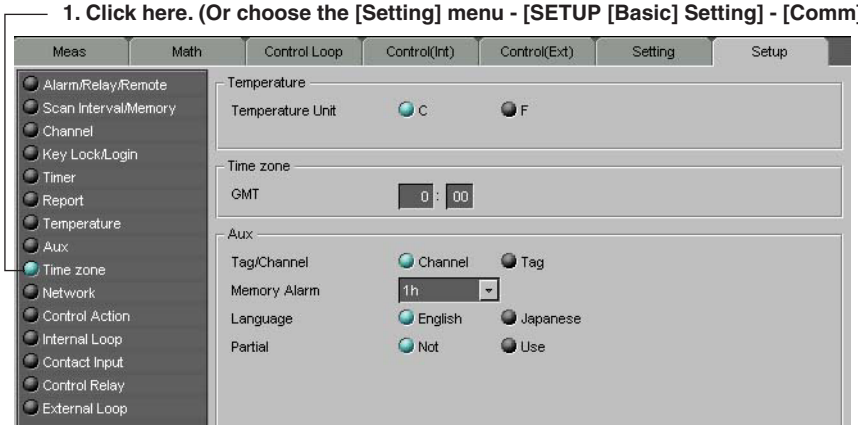
Temperature Unit

Set the temperature unit from [C](Celsius) or [F](Fahrenheit).



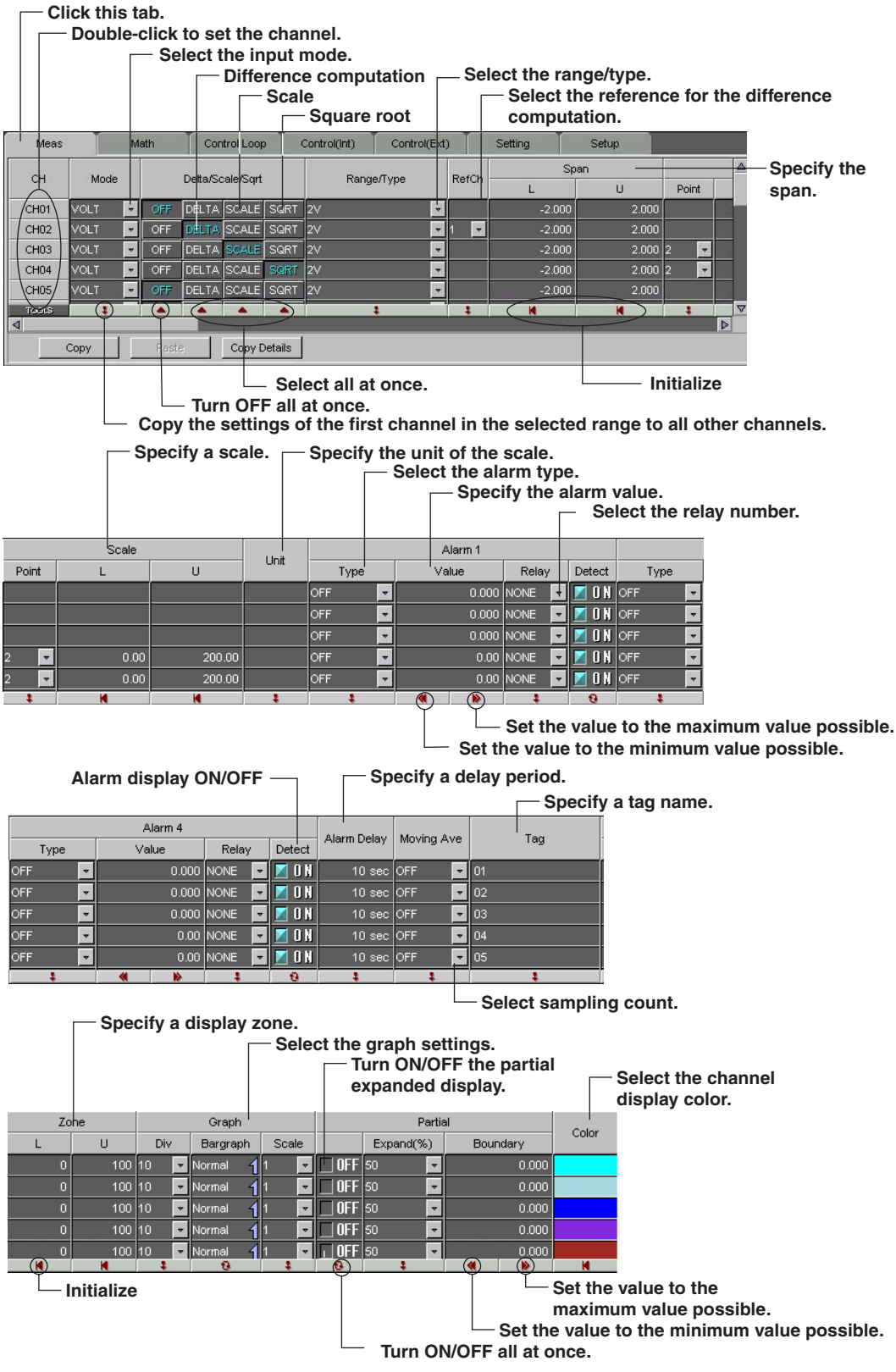
Time Zone

Set the difference in time from the GMT.
For example, with Japanese time this is normally +9:00.



3.8 Measurement Channels Settings

To enter measurement channel settings, click the [Meas] tab. Or, you can select the items by choosing [Setting] - [SET [Regular] Setting] - [Meas Channels]. Measurement channel settings cannot be entered on 0 channel model.



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 7.2 of the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Value

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

Relay

Select the output relay number or internal switch number for outputting to relay output or internal switches (Style 3 or later). When not outputting to relays or internal switches, select NONE.

Detect

Select whether to display alarms (ON) or not to display alarms (OFF) when they occur. When turned OFF, they are not retained in the alarm summary.

Alarm Delay

An alarm is generated when the measured value stays above or below the specified value for the specified length of time.

Moving Average

To use the moving average, select the sampling count (2 to 16).

Tag

Use up to 16 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 back to [Normal] when the data is checked.

Scale

When using scale display on the trend screen, select the scale display position.

Partial

Expand (%)

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

Boundary

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

- Measurement channel
  When SCALE and SQRT are not used: Span L < boundary < span U
  When SCALE and SQRT are used: Scale L < boundary < scale U
- Computation channel
  Span L < boundary < span U
  For details, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Note

The partial expansion settings take effect when the partial expansion function is set to [Use] in the [Aux] section of the [Setup] tab.

Display Color

You can select the display color of each channel from 16 colors.

Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

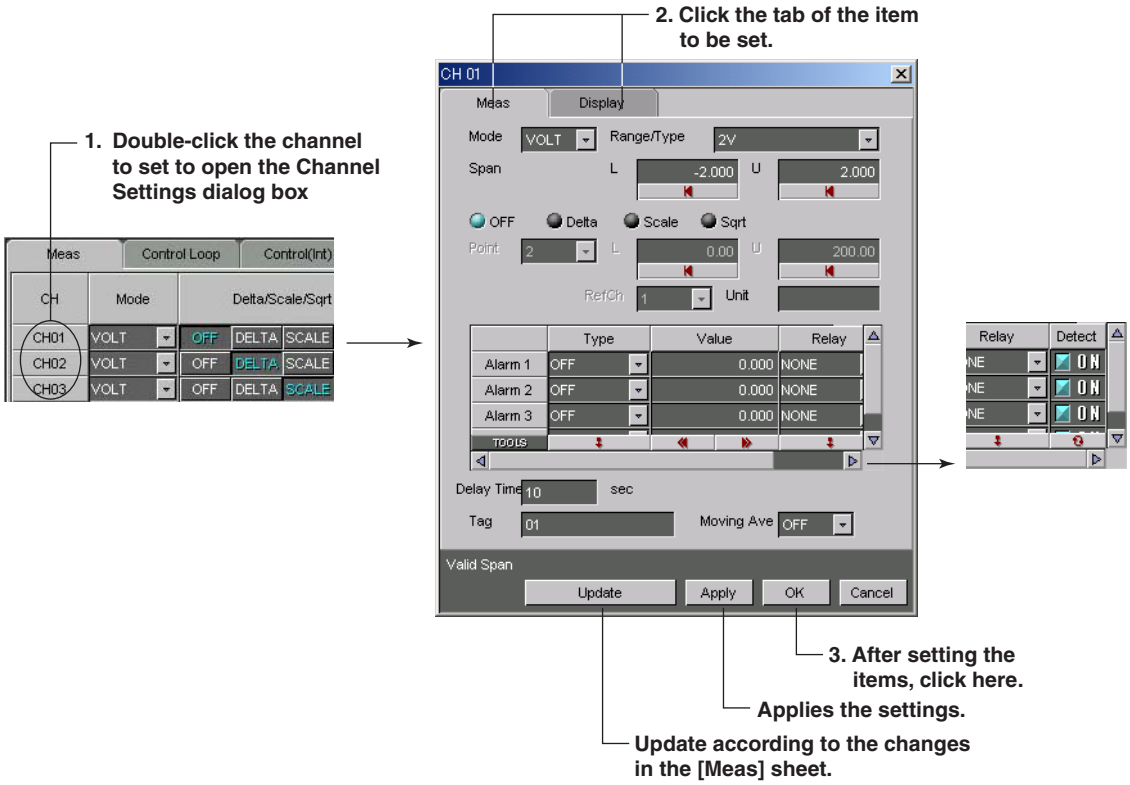
1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom of the window.
3. Click the destination channel number. To select many channels, click the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

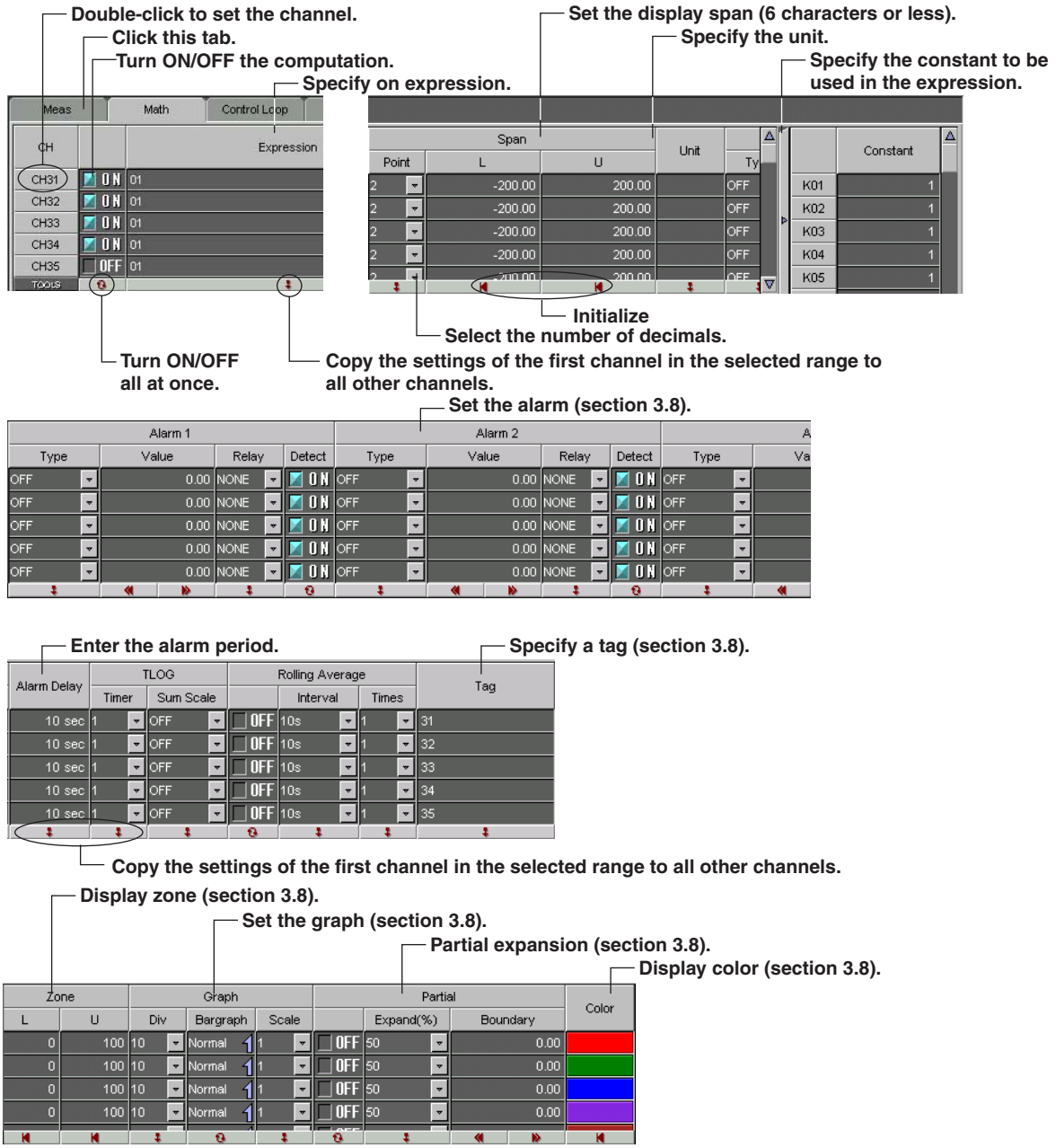
Setting One Channel at a Time



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.

3.9 Computation Channel Settings

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



Computation ON/OFF

Select whether to perform computation for each channel.

Expression

Enter an expression using up to 40 characters. For details about the expression, see the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Equations cannot be used with measurement channels on 0 measurement channel model.

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 3.7, “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).

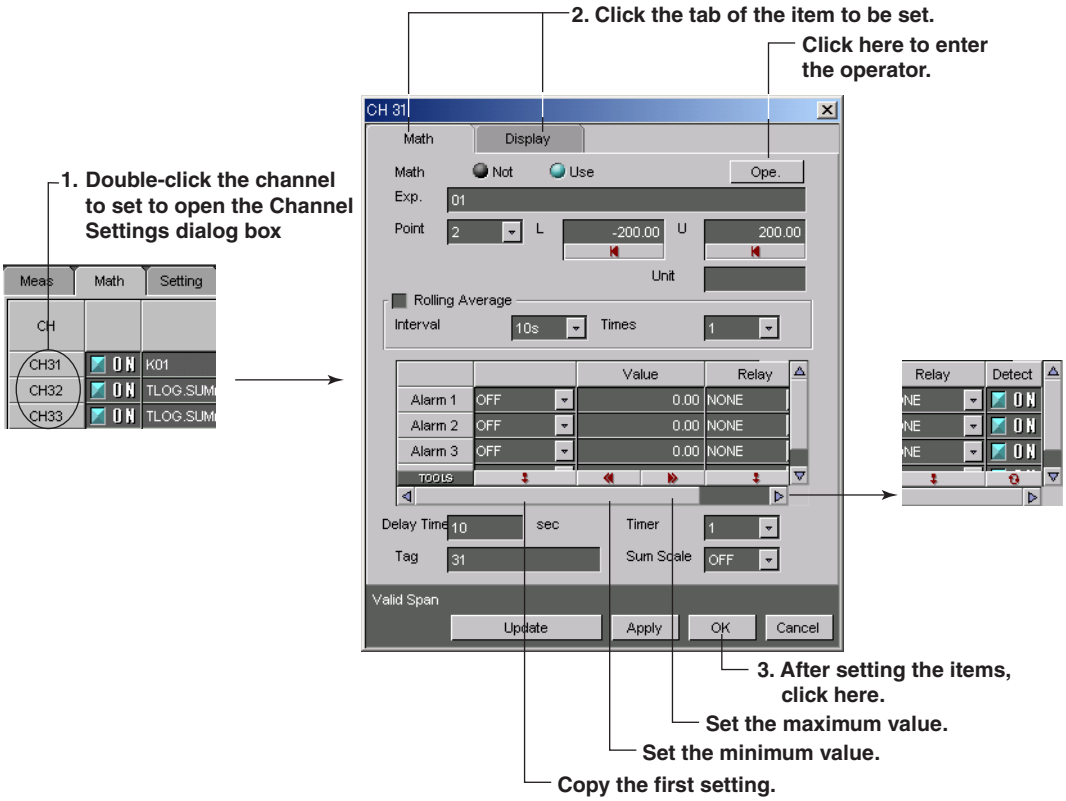
Zone, Graph, Partial, and Color

The settings are the same as the measurement channels. For details, see section 3.7, “Measurement Channels Settings”.

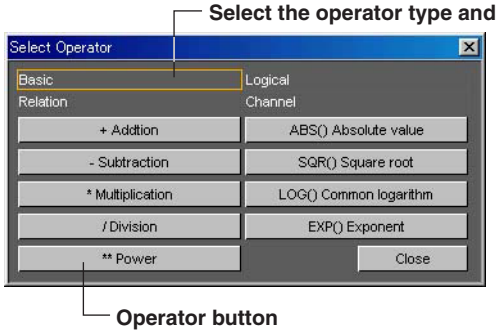
Constant

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

Setting One Computation Channel at a Time



[Select Operator] dialog box



The items of the [Math] tab can be set for each channel. The items set here are the same as the ones in the [Math] tab of the Hardware Configurator. For details, see the page corresponding to the item.

Copying and Pasting Setup Data

You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

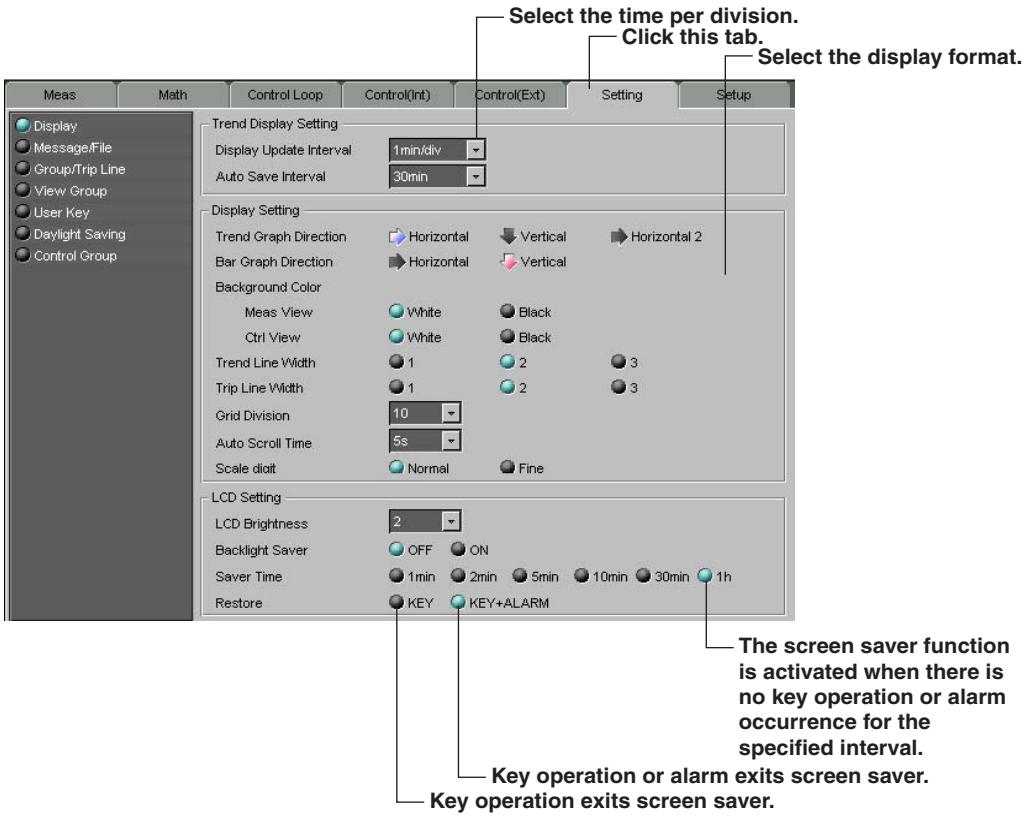
1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom of the window.
3. Click the destination channel number. To select many channels, click the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

3.10 Display Settings

To enter display settings, click the [Setting] tab. Or, you can select the items by choosing [Setting] - [SET [Regular] Setting] - [Display Setting].

Display



Display Update Interval

You can select the display update interval of the trend display from [1 min/div], [2 min/div], [5 min/div], [10 min/div], [20 min/div], [30 min/div], [1 h/div], [2 h/div], [4 h/div], or [10 h/div] of the time axis.

Auto Save Interval

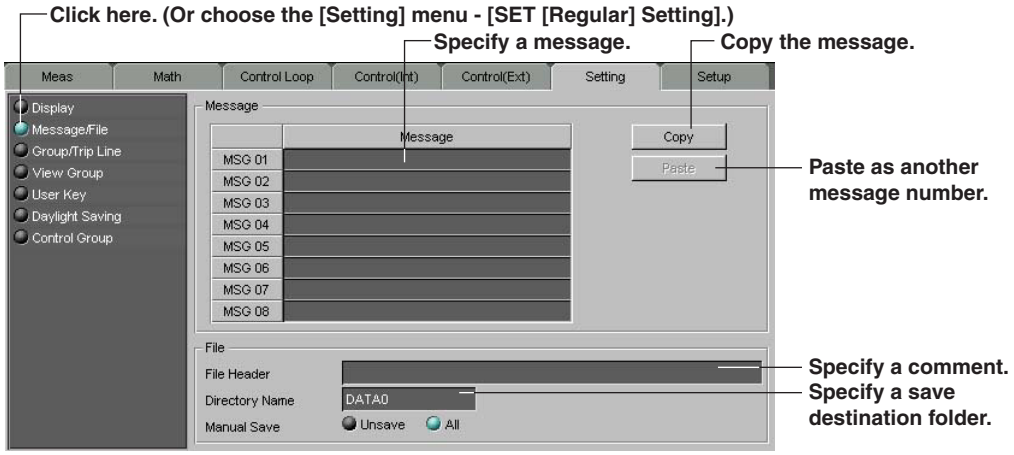
The auto save interval can be specified when the [Save] is set to [Auto] and the data type is set to [DISPLAY] or [EVENT & DISP] in [Scan Interval/Memory] of the [Setup] tab.

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.

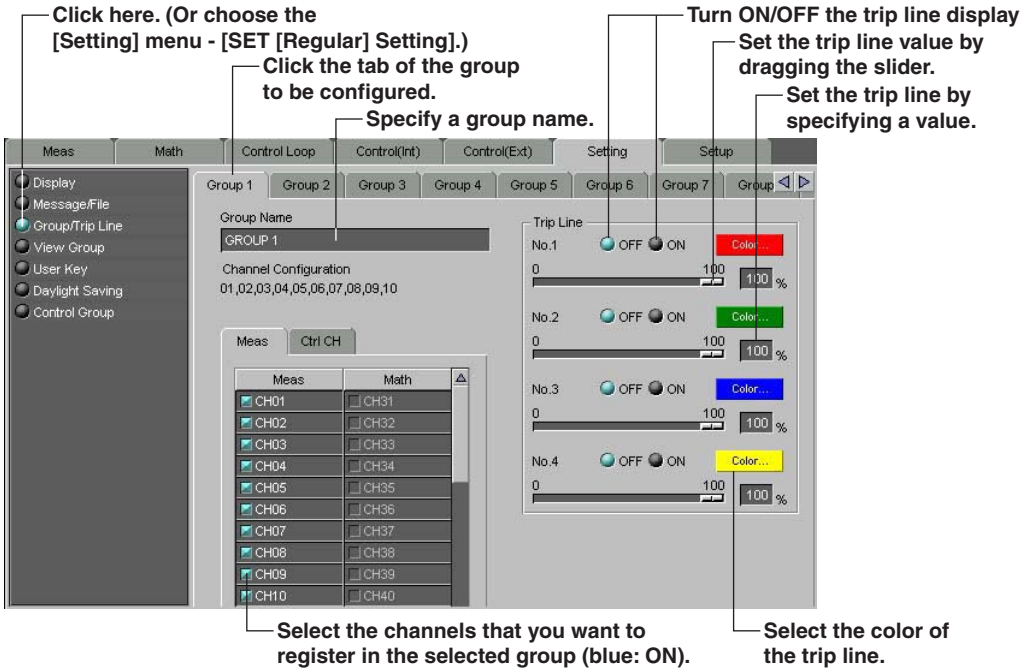
Note

- 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

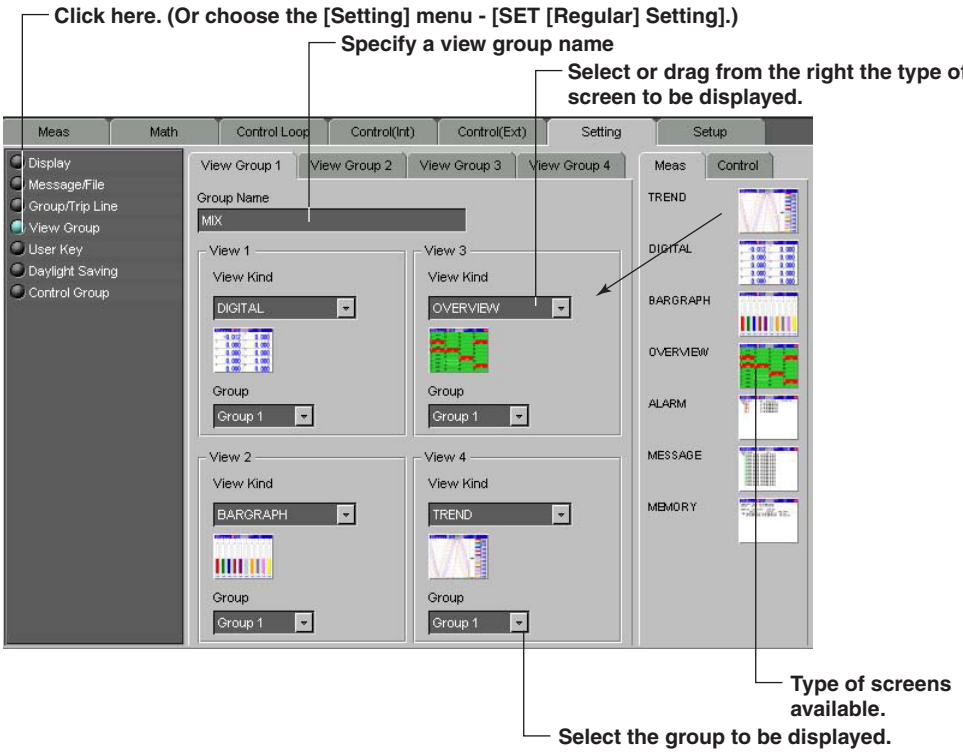
The maximum number of channels that can be assigned to a group is 6 for the CX1000 and 10 for the CX2000. The assigned channels are listed under [Channel Configuration].

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.

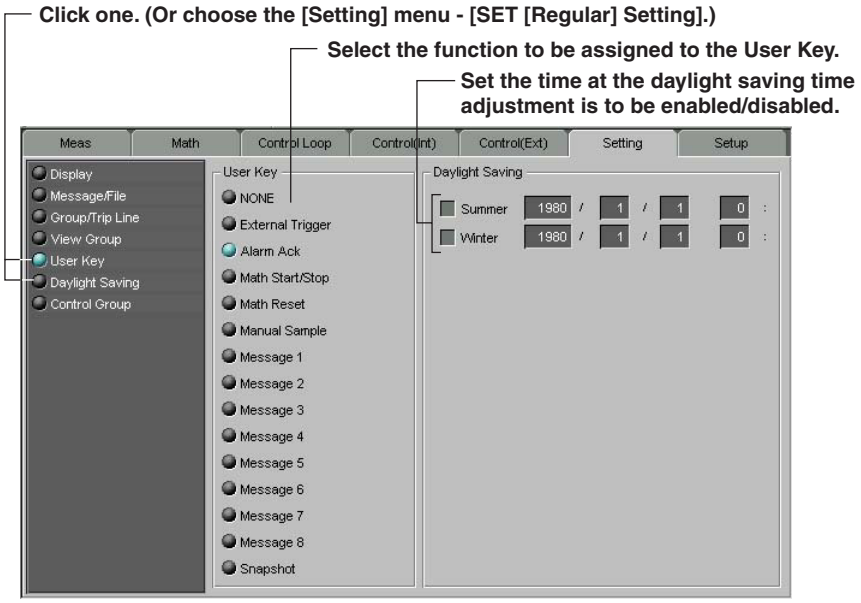
View Kind

The view group consists of four views. Select the type of screen to display in each view. Overview cannot be selected on 0 measurement channel models without the calculation option installed.

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).

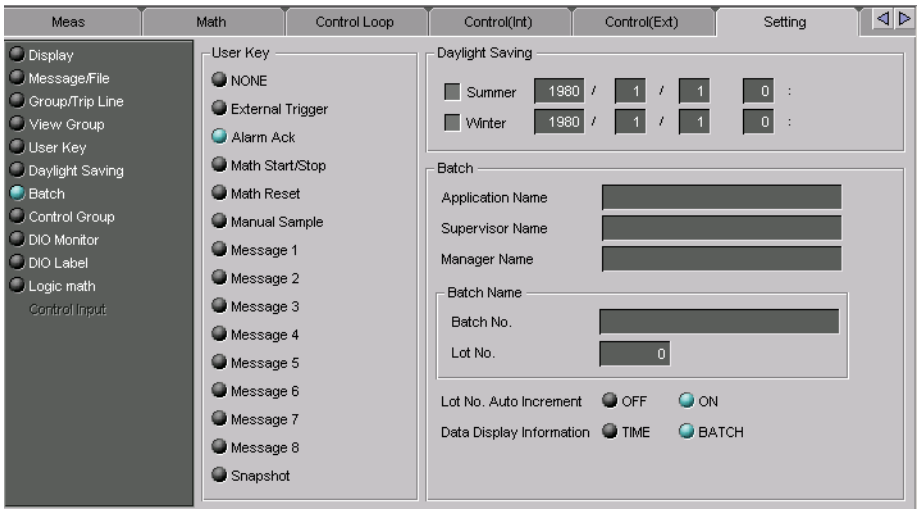
User Key/Daylight Saving



For details about the User Key settings, refer to the *CX User's Manual (IM 04L31A01-01E or IM 04L31A01-03E)*.

Batch Header

Enter the header if option batch headers are active.

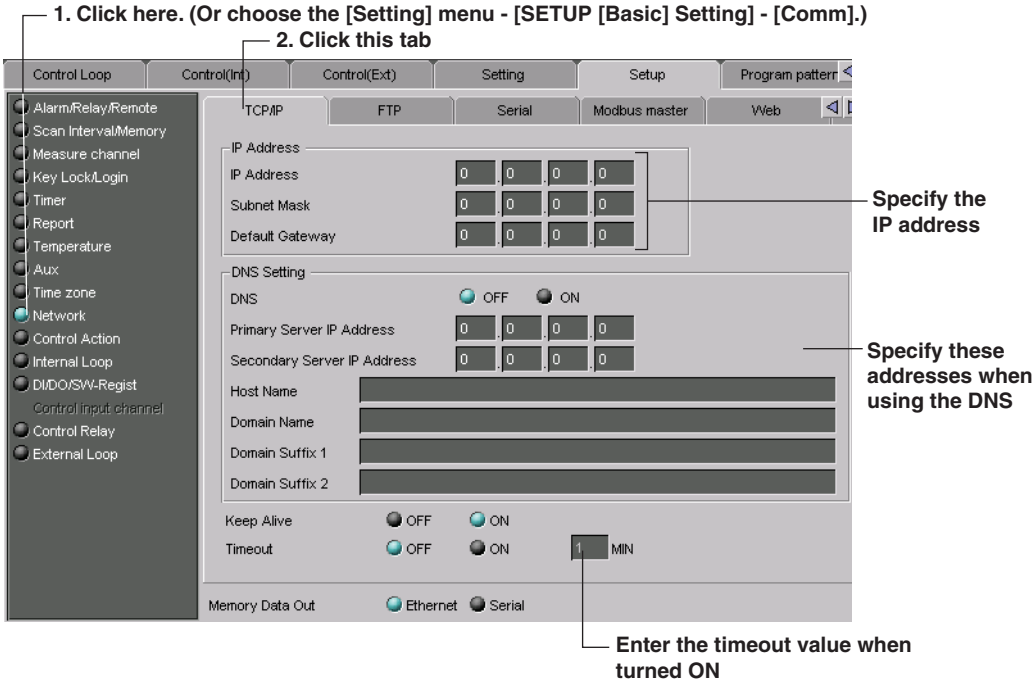


3.11 Network Settings

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.

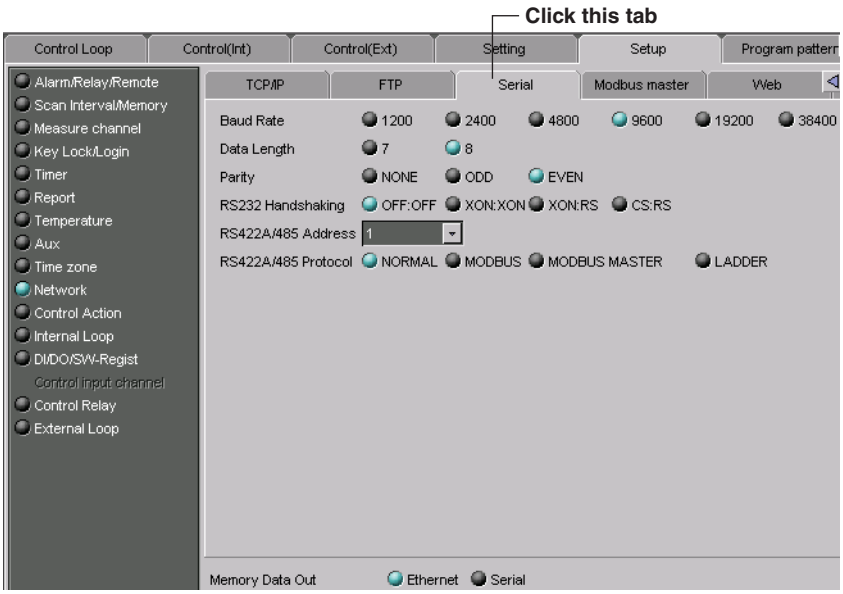
TCP/IP Settings

Connect the CX to the Ethernet and, in the dialog box below, enter TCP/IP settings. Type the same address for [IP Address] as the one of the [Address] box of the [Network Settings] dialog box.



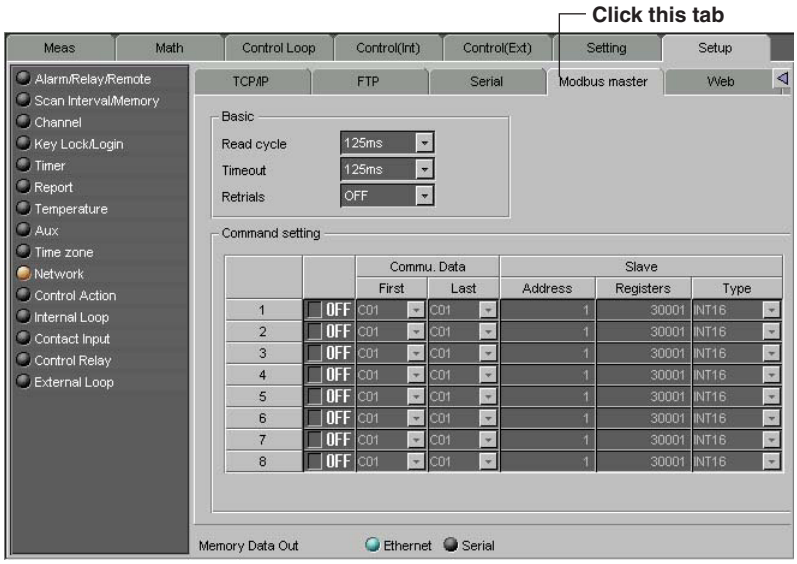
Serial Communication Settings

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



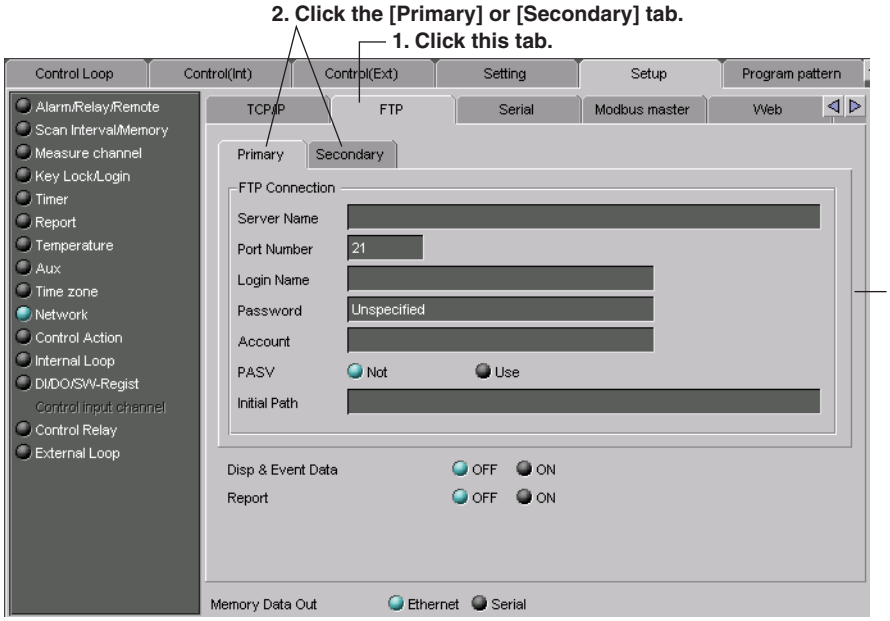
Modbus Master Settings

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



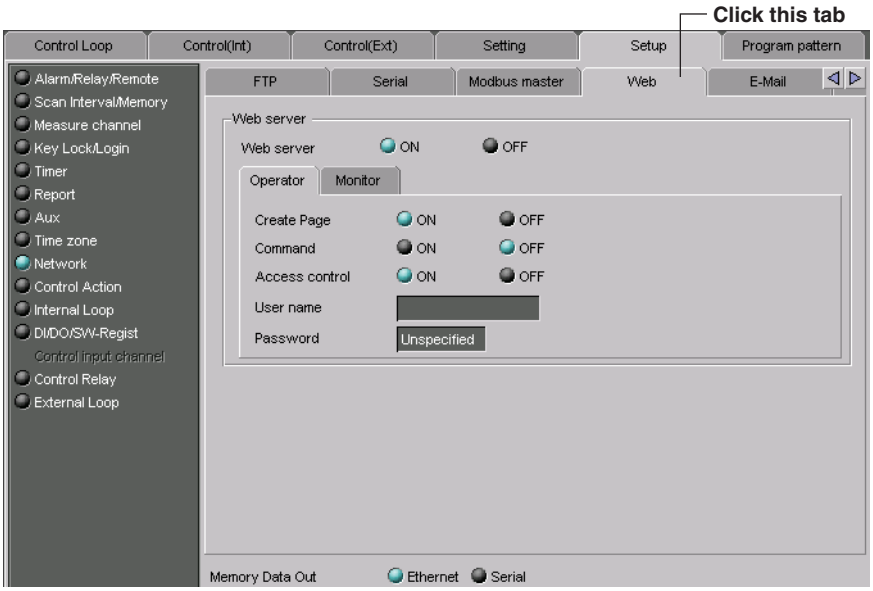
FTP Settings

Using the FTP function, measurement/calculation data can be automatically transferred from the CX to the specified server as files. The FTP function can be used only with Ethernet communications. When using the FTP function, specify the necessary [FTP Connection] settings in the dialog box below.



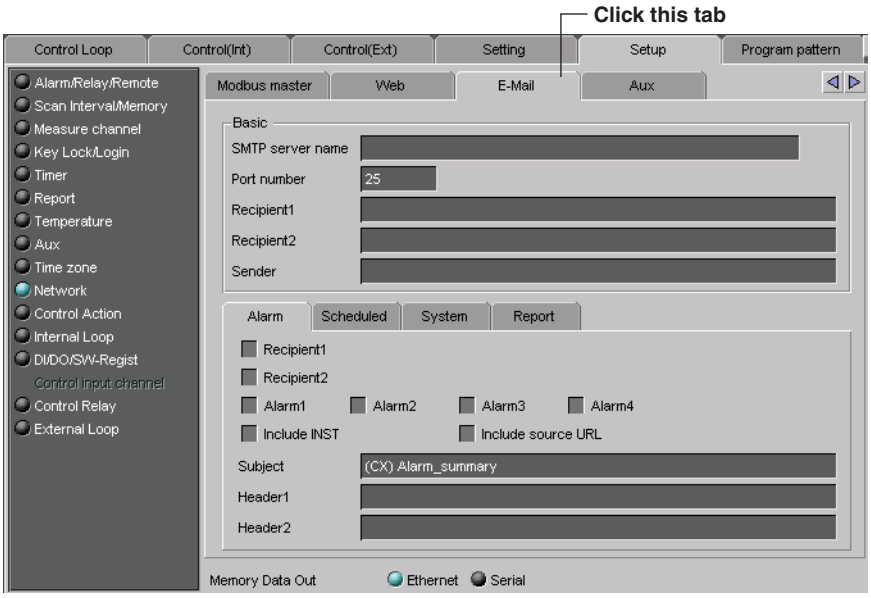
Web Server Settings

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.



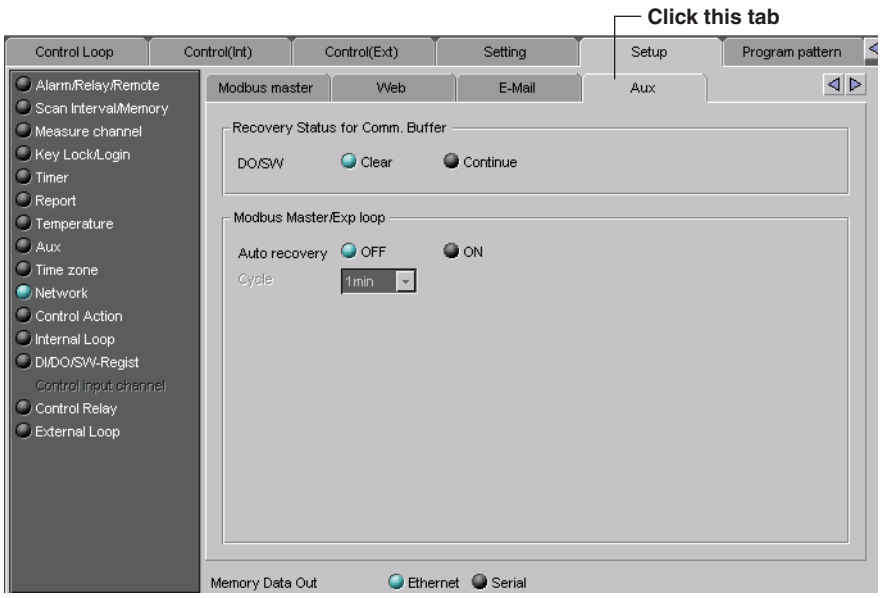
E-mail Transmission Settings

When using e-mail transmission, specify [SMTP server name], [Port number], [Recipient1], etc. For details about the settings, refer to the *CX Communication Interface User's Manual (IM 04L31A01-17E)*.



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

DO/SW Recovery/Automatic Recovery Settings



DO/SW Recovery on communication buffer

You can set the control output DO and internal switch operation to be performed when the communication buffer recovers.

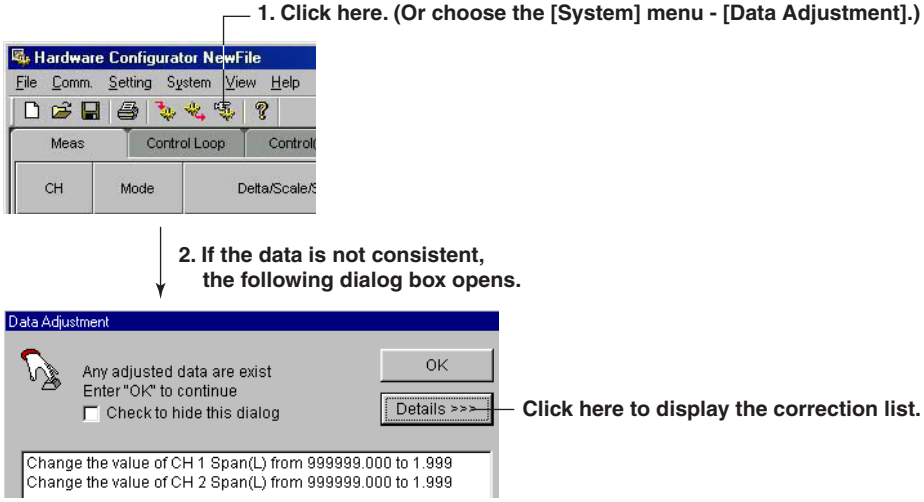
Continue [1]: Holds the status of the control output DO and internal switches

Clear: Clears the status of the control output DO and internal switches

Automatic Recovery Settings

You can select whether or not to automatically recover communications with modbus mice and temperature meters. If you select automatic recovery, you can also specify the recovery interval. You can select one of the following intervals: 1 min, 2 min, 5 min, 10 min, 20 min, 30 min, or 60 min.

3.12 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

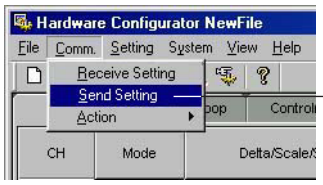
If [Data Adjustment] Dialog on the [View] menu is checked, the [Data Adjustment] dialog box opens when data is not consistent checking data or transmitting data.

Note

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

3.13 Sending Setup Data to the CX

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.



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

A confirmation dialog box is displayed.

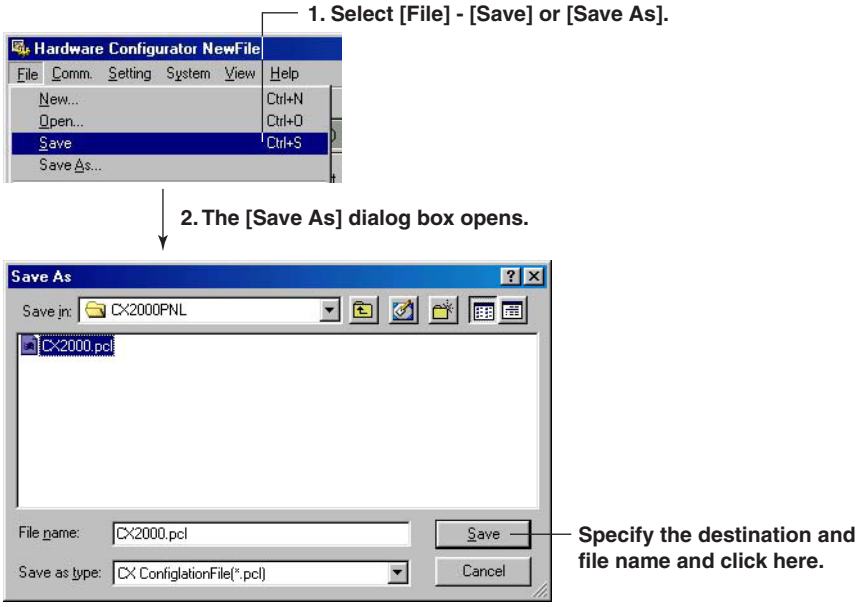
To send the new setup data to the CX, click the [OK] button.

Note

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

- [IP Address] under the [TCP/IP] tab
- All settings under the [Serial] tab.

3.14 Saving Setup Data



Save

The setup data overwrites a preexisting file (*.pcl). The [Save As] dialog box does not open.

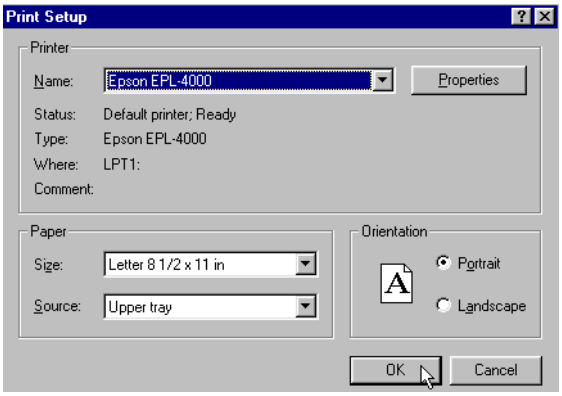
Save As

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

3.15 Printing 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.

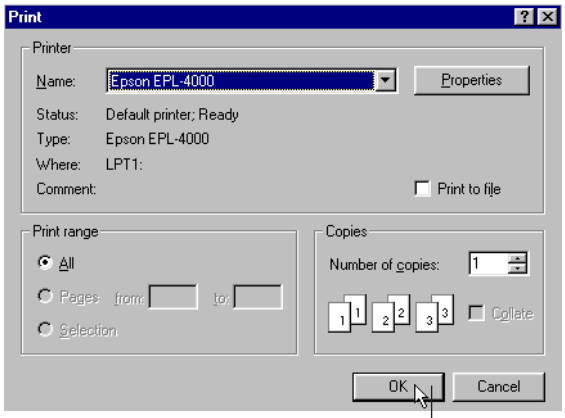
Preview

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

Printing

1. Click here. (Or choose the [File] menu - [Print].)

2. The [Print] dialog box opens.



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

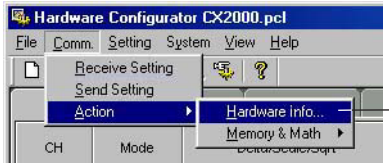
3.16 Starting and Stopping Measurement on the CX and Checking the CX System Configuration

You can start and stop the CX, as well as display CX system configuration information from the Hardware Configurator. (Start/Stop operation is only possible with memory sample and math functions. This software does not support this operation for control functions.)

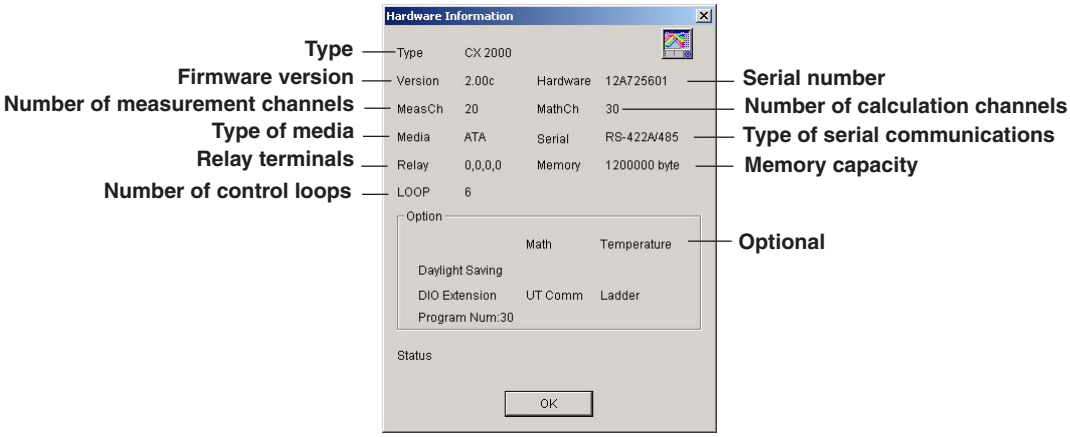
Starting and Stopping Measurement

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

Displaying CX System Configuration Information



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



3.17 Usable Characters

The characters in the following table can be used when entering group names, view group names, messages, comments to file headers, save destination directory names, the password for the key lock function, and login parameters such as user names, user ID, and passwords.

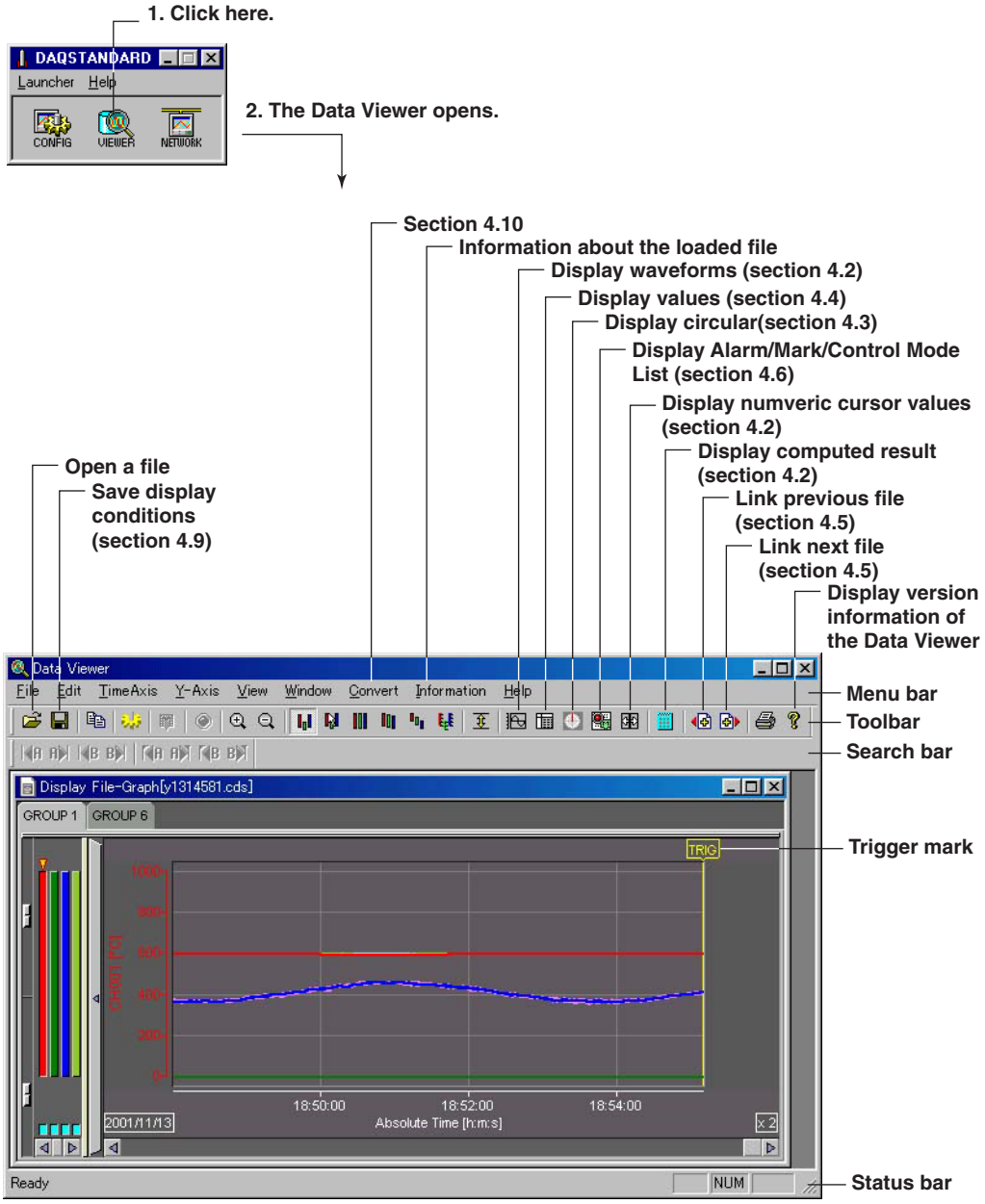
SP	#	%	(	)	*	+	-	.	/
0	1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z				
_	°	@							

Note

(*), (+), (.), and (/) cannot be used for folder names where files are saved.

4.1 Starting and Exiting the Data Viewer

Starting the Data Viewer



You can also start the program by selecting [Programs] - [DAQSTANDARD for CX] - [Viewer] on the Start menu.
You can start multiple Data Viewers by starting the program from the Start menu.

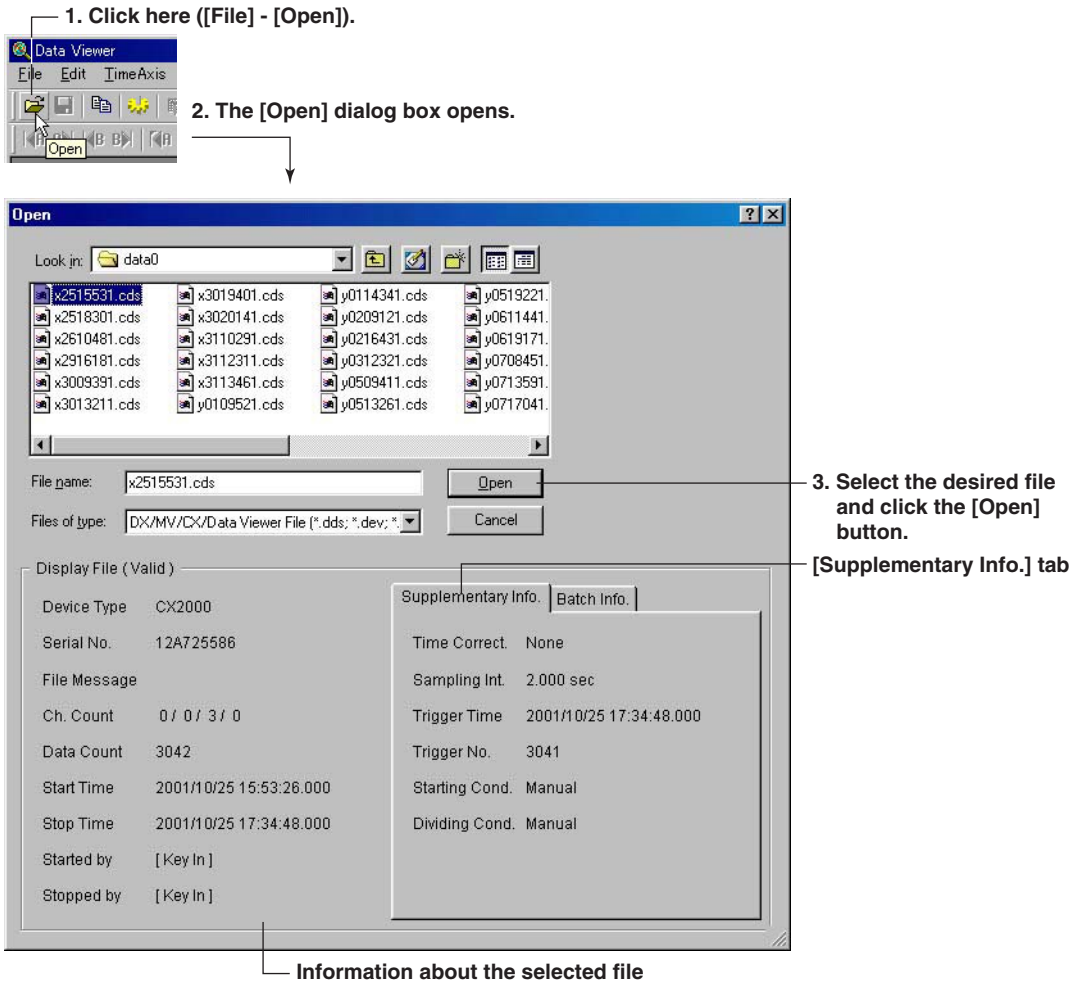
Viewable Files in the Data Viewer

- Display data file (*.cds)
- Event data file (*.cev)
- TLOG file (*.dtg)
- Link setting file (*.ldx)
- Reports (*.dhr, *.ddr, *.dwr, *.dmr)
- Manual sample files (*.dmn)

Toolbar, Search Bar, and Status Bar

Clicking [View] - [Toolbar], [Search Bar], or [Status Bar] displays the corresponding bar in the window. The bar disappears if cleared.

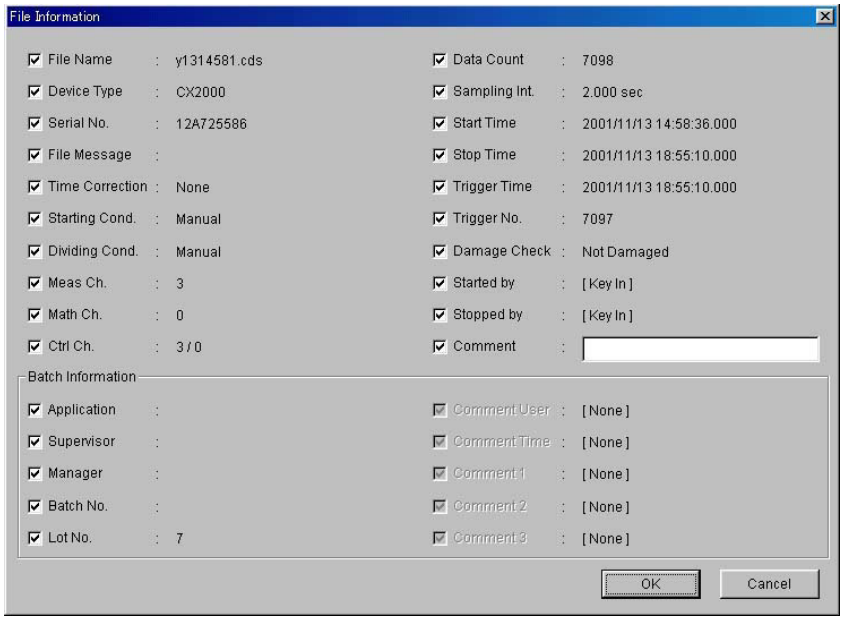
Opening a File by Specifying its Location



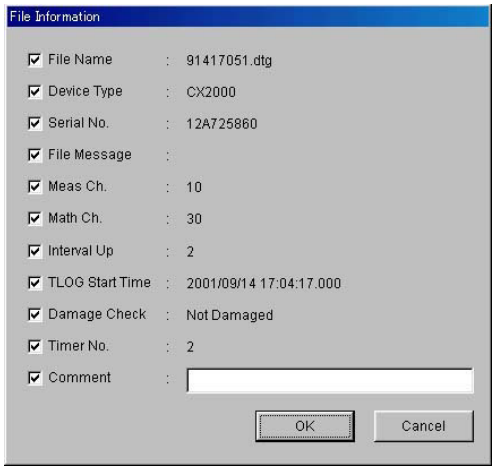
Checking the Information about the Loaded File

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

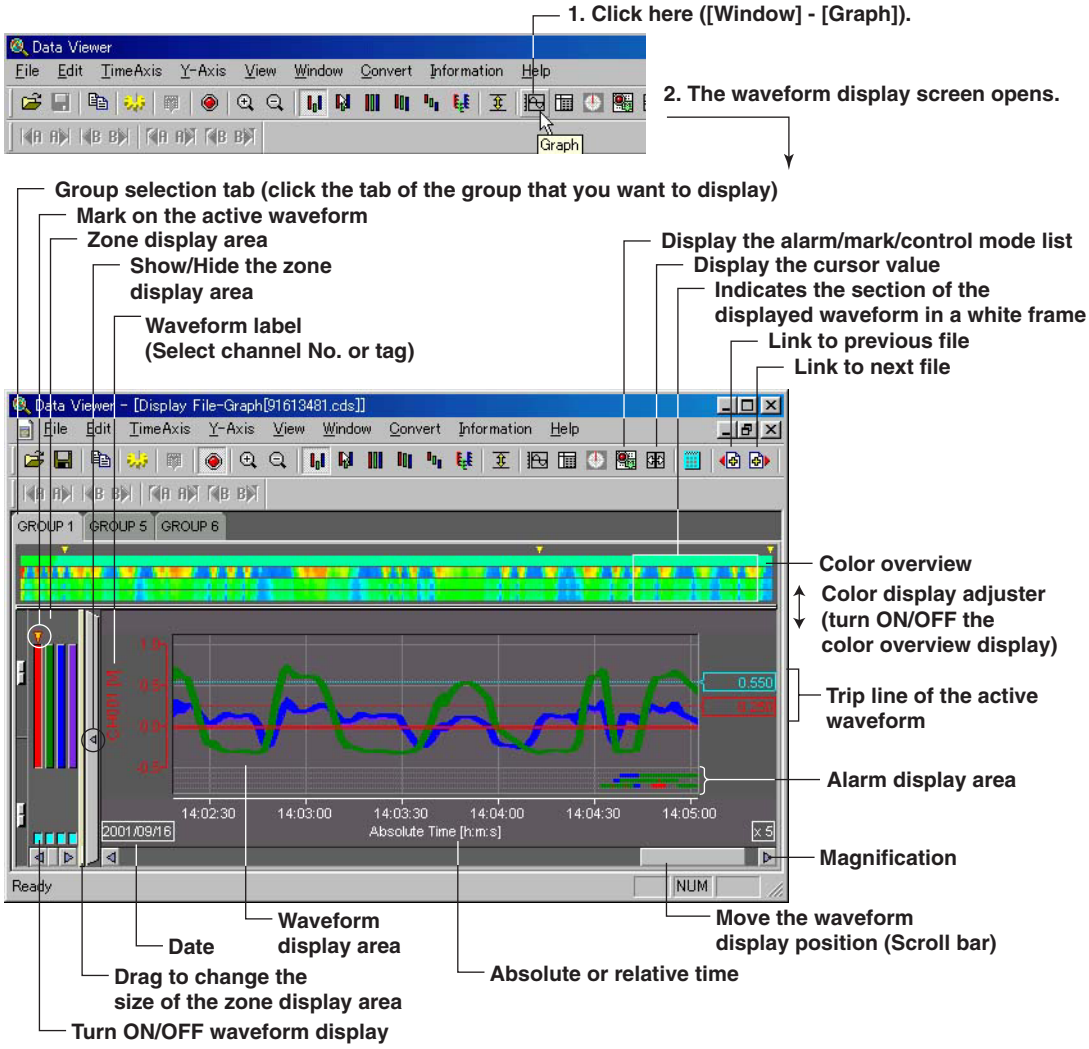
- Several files can be opened simultaneously.
- The number of files that can be opened simultaneously depends on the memory of your PC and the free disk space.

Exiting the Data Viewer

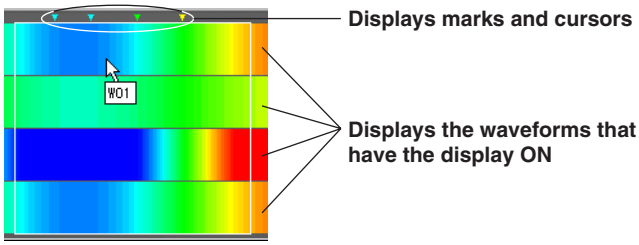
Select [File] - [Exit] or click the [×] button. If you modified any settings, the message “Save changes to ****.***?” appears. Click the [Yes] button, if you wish to save the settings and exit the Data Viewer. Click the [No] button, if you do not wish to save the settings and exit the Data Viewer.

4.2 Waveform Display

Waveform Display



Color Overview Display



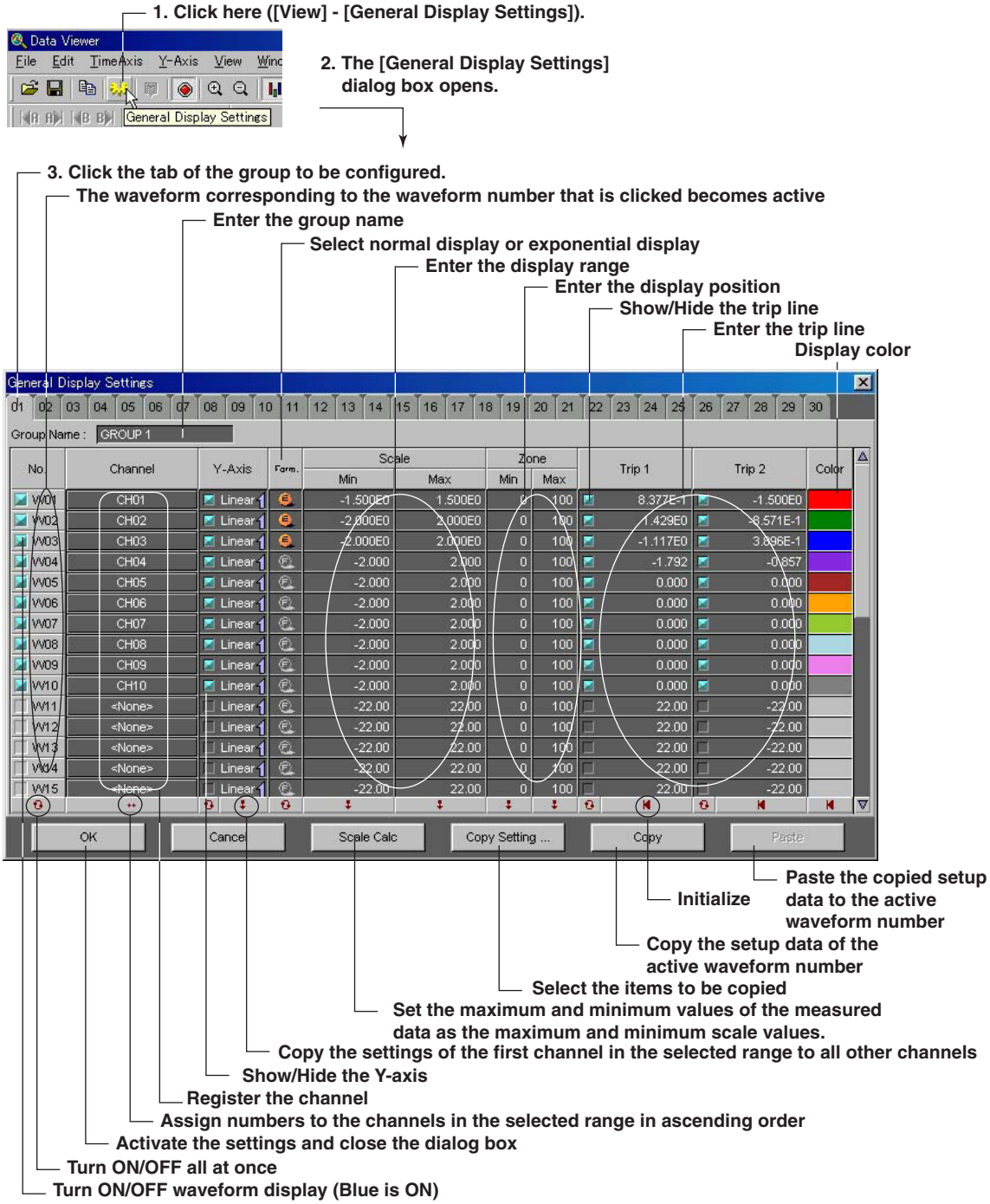
The measured values of the entire data are displayed using various colors. By assigning 50 different colors from the minimum to the maximum values of the scale, the measured values are assigned to those colors.
If the data is display data, the maximum value is displayed at the top of the space allocated to a single waveform, and the minimmum 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

By default, the color overview is OFF.

General Display Settings



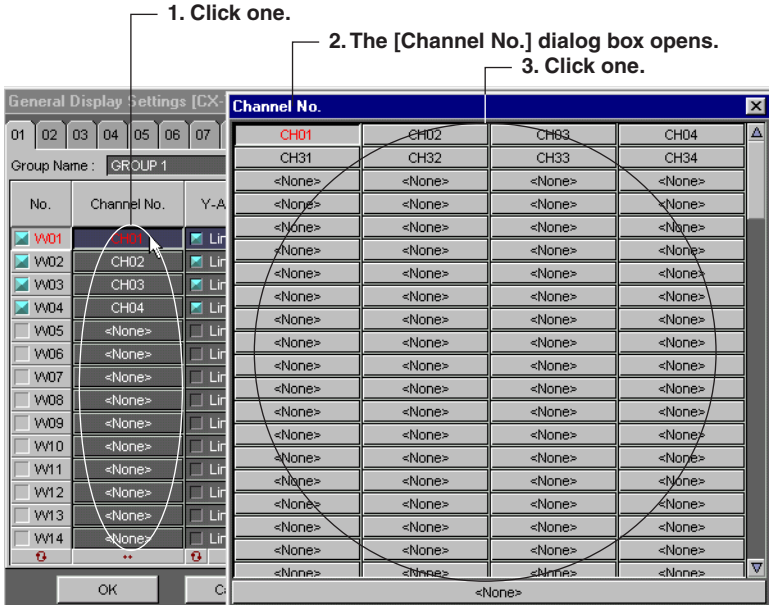
Group

A maximum of 30 groups can be set. A maximum of 32 channels can be registered in one group.

Waveform Display ON/OFF

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.

Channel Registration



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

Select linear or logarithmic by clicking the Y-axis display area. If [Multi-Axis Zone] (page 4-8, Setting the Y-axis) is selected, you can select whether to display the Y-axis. The Y-axis of the selected waveform is displayed.

Scale (Display Range)

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

Zone (Display Position)

The range is as follows:

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

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

Trip Line

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

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 and Paste

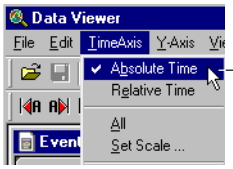
You can copy the setup data of one channel or more to other channels. Use the following procedure to copy and paste.

1. Click the source channel number that you want to copy. To select many channels, click the first source channel, then drag over all the channels that you want to copy.
2. Click the [Copy] button at the bottom of the window.
3. Click the destination channel number. To select many channels, click the first destination channel, then drag over all the channels where you want to paste.
4. Click the [Paste] button at the bottom of the window. The setup data is pasted in the active waveform(s).

You can also copy and paste specific channel items.
After selecting the copy source in step 1, click the [Copy Details] button to display the [Copy Details] dialog box.
Select the items that you want to copy.

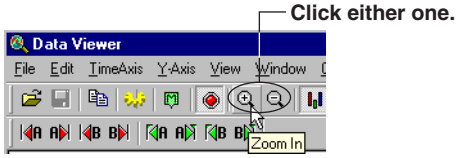
Time Axis Settings

Selecting Absolute or Relative Time Display

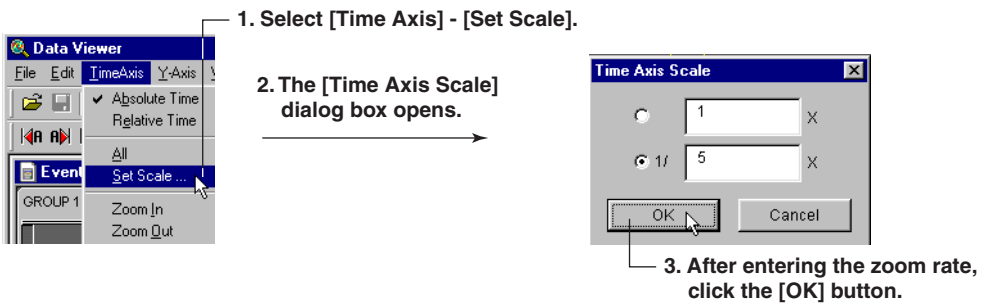


Select [Time Axis] - [Absolute Time] or [Relative Time].

Zoom In or Zoom Out on the Time Axis

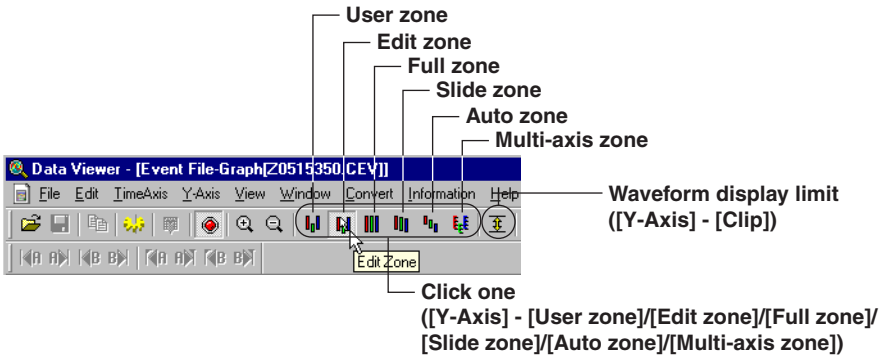


By selecting [Time Axis] - [All], the time axis is adjusted so that all the data can be displayed. If you wish to zoom in or out by specifying the zoom rate, take the following steps (resolution is 1/1000 to 20):



Y-Axis Settings

Selecting the Waveform Display Zone



Select from the following list of choices:

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

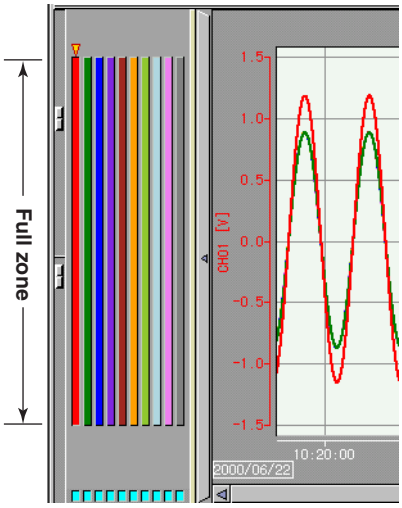
- User zone: Each waveform is displayed in the range specified in [Zone] under the [General Display Setting] (the zone cannot be changed on the trend display screen).
- Edit zone: Each waveform is displayed in the range specified in [Zone] under the [General Display Setting] (the zone can be changed 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

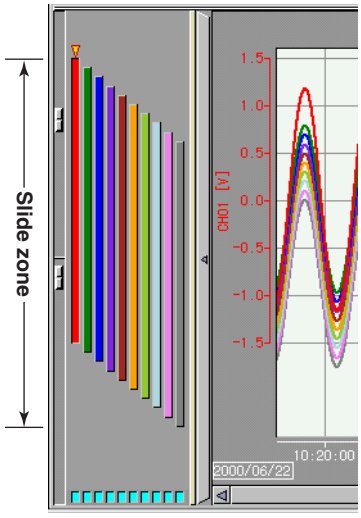
If the waveform display zone is set to some setting other than multi-axis zone and auto zone, only the Y-axis of the active waveform is displayed.

Zone Setting Examples

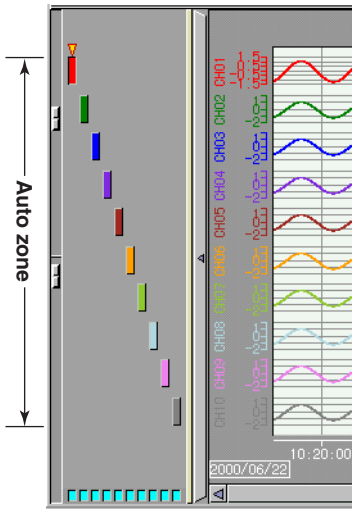
- Full zone



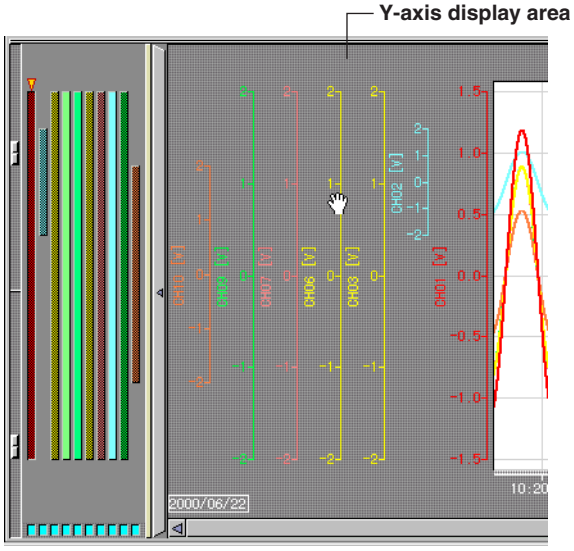
- Slide zone



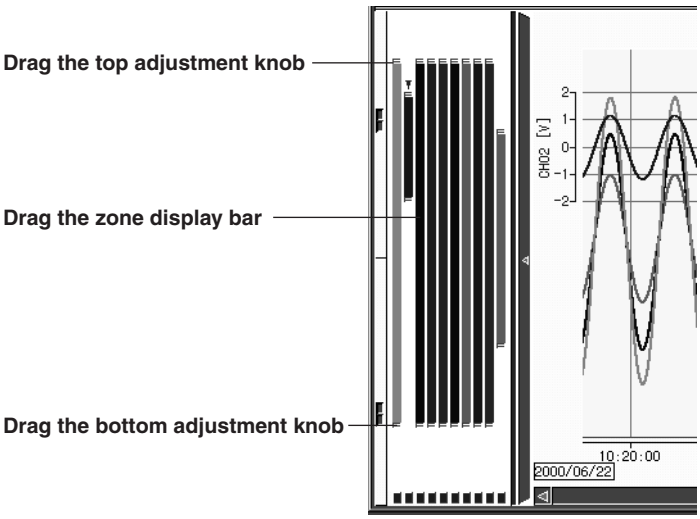
- Auto zone



- Multi-axis zone



Zone Editing

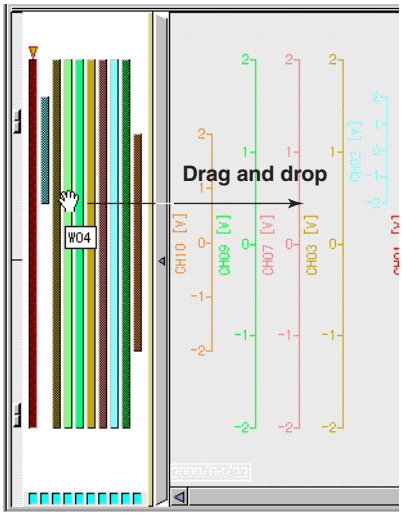


You can change the waveform display zone on the trend display screen by clicking the edit zone icon or by selecting [Y-Axis] - [Edit Zone].
The size of the zone can be changed by dragging the top and bottom adjustment knobs. The entire zone can be moved by dragging the zone display bar.
The zones that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

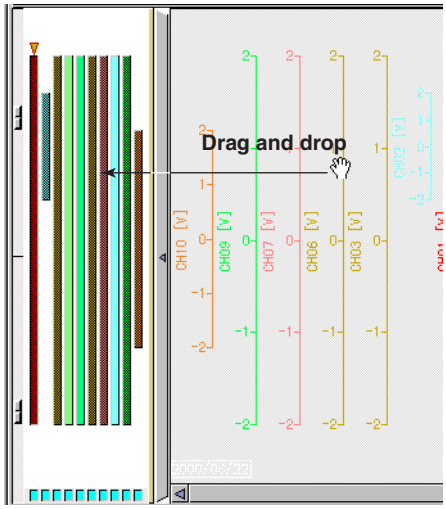
Multiple Y-Axis Display

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

- Adding a Y-axis



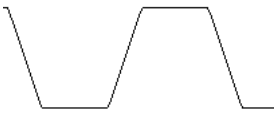
- Deleting a Y-axis



Waveform Display Limit (Clip)

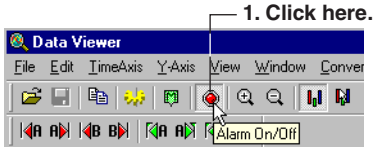
When the waveform display limit is enabled by clicking the clip icon or by selecting [Y-Axis] - [Clip], the Y-axis display range of the waveform are limited to the minimum and maximum values that were specified under [General Display Settings] - [Scale]. Measured values that are less than the minimum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

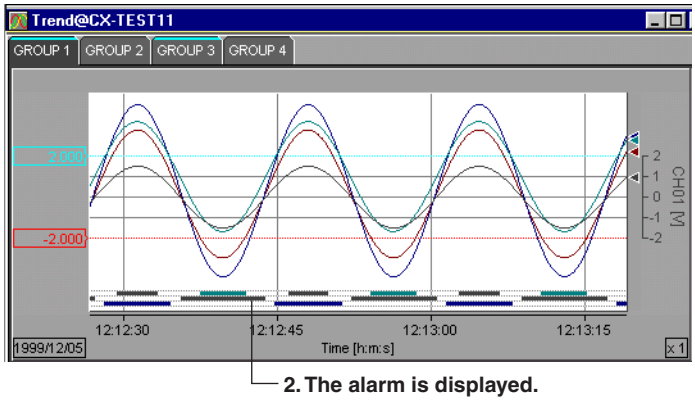


- **Example in which Display Limit is Disabled**

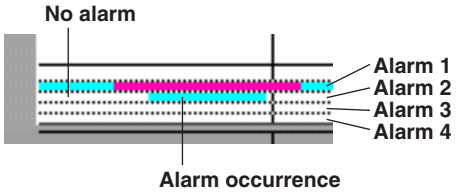
Alarm Display ON/OFF



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



Alarm Display



The alarm of the active waveform is displayed in front.

Selecting the Characters Used to Identify Channels

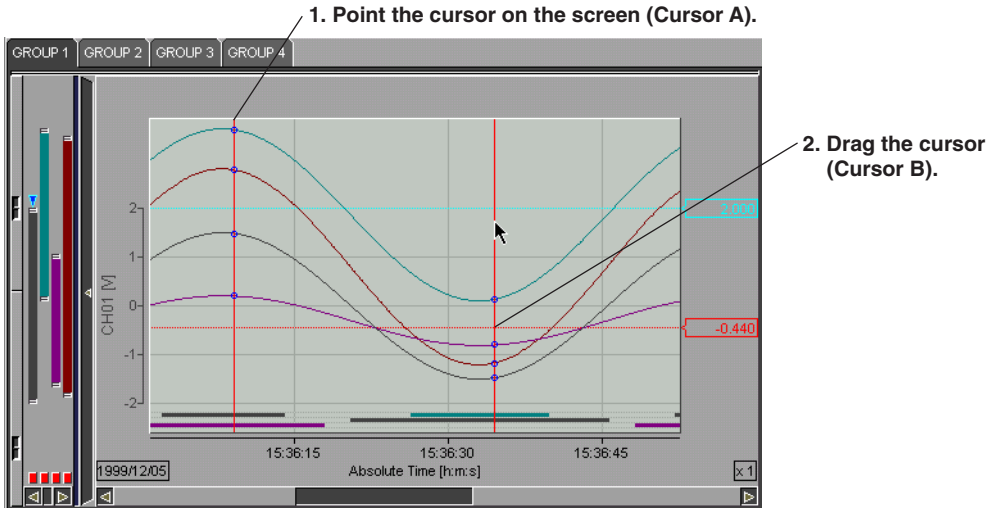
You can select the channel No. or tag as the character string used to identify the channels by selecting [View] - [Channel No.] or [Tag]. The selected character string will be used as a label to indicate the waveform name.
The character string is registered on the CX or by using the Hardware Configurator.

Note

- When the identification string is switched, the channel character string displayed on the Y-axis of the waveform display window, circular display window, numeric window, list display window, [Cursor Value] window, [Computed Result] window, [General Display Setting] 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

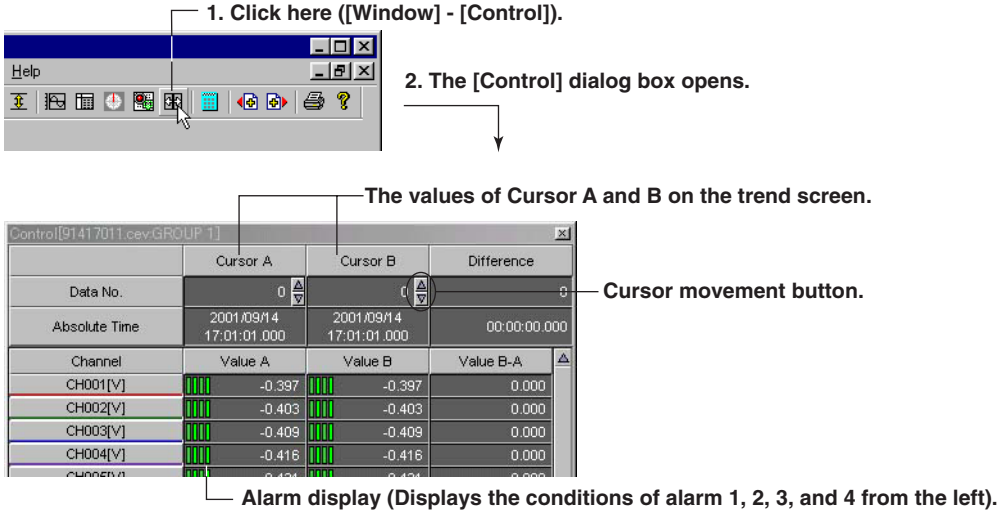
On the numerical window and list display window (section 4.6), you can copy the data between Cursor A and Cursor B to the Windows clipboard. On the waveform display window and circular display window, the displayed image can be copied to the clipboard.

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 Values

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



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

Displaying Numeric Values of Abnormal Data

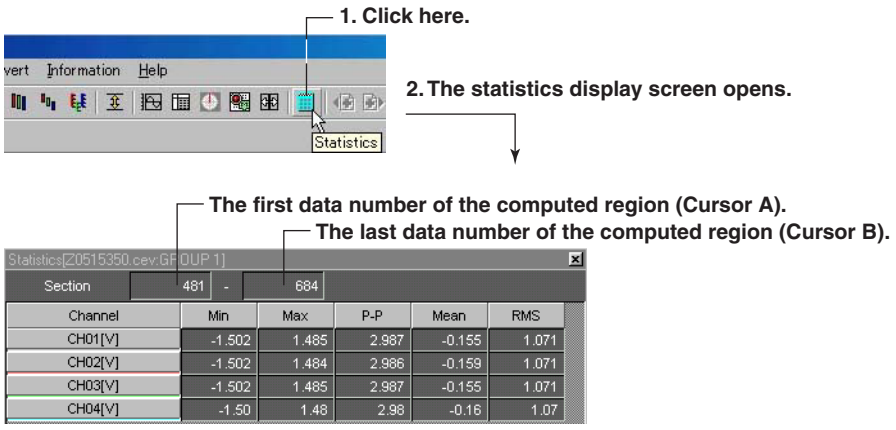
The abnormal data are displayed as follows:

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

Note

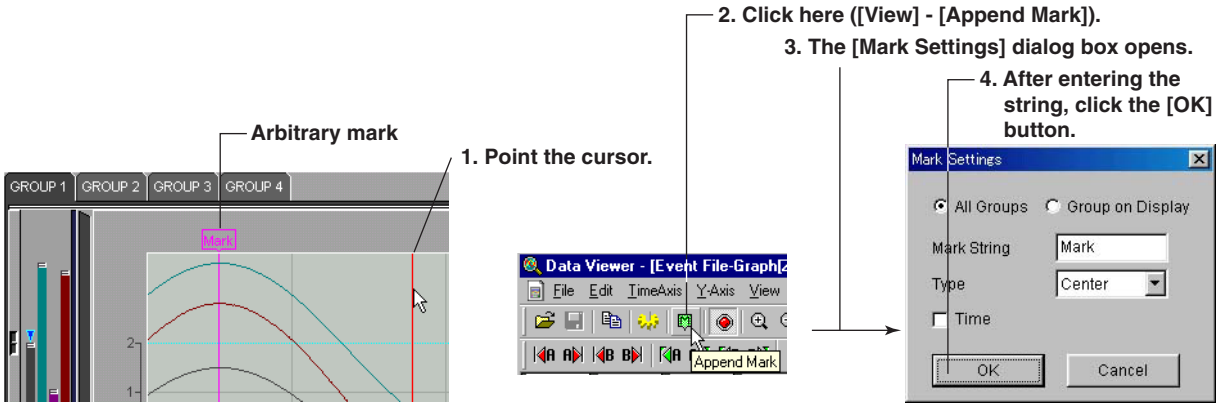
When a cursor is not displayed on the trend screen, the cursor's value display area becomes blank.

Displaying Statistics

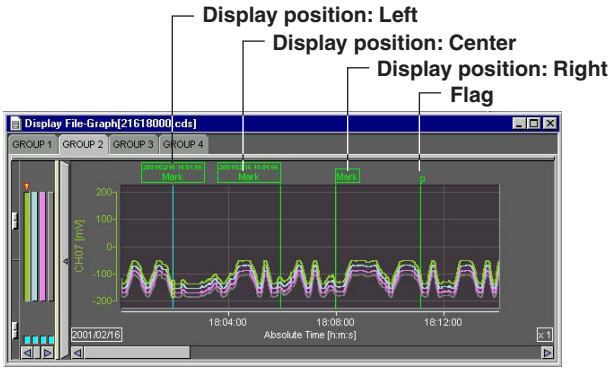


The minimum value, maximum value, P-P, mean, and rms value for each waveform in the range specified by Cursors A and B are computed and displayed. If the cursor is not displayed, the computation is performed over the entire data.

Adding Arbitrary Marks

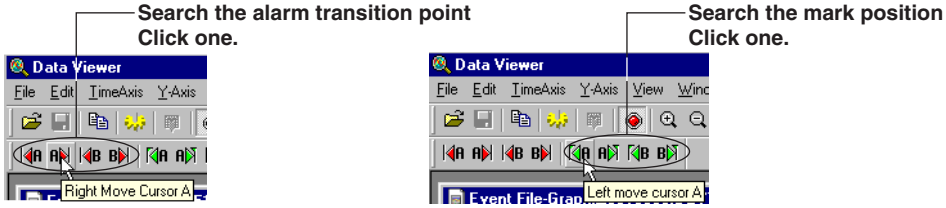


When Cursor A and Cursor B are at the same position, arbitrary marks can be placed. You can select whether to put the arbitrary marks on all groups or only on the displayed group. In addition, double-clicking a mark, that has been created using the Data Viewer, opens the [Mark] dialog box in which you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



Hold the [Ctrl] key and click the mark to display the foremost screen.
Hold down the [Shift] key and click the mark to display the rearmost screen.

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.

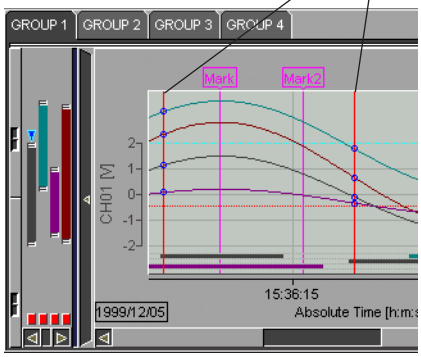
Searching is possible to the left and right of the cursor.

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

1. Place Cursor A and Cursor B so that the mark is between the two.
2. Select [Edit] - [Delete Mark].



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

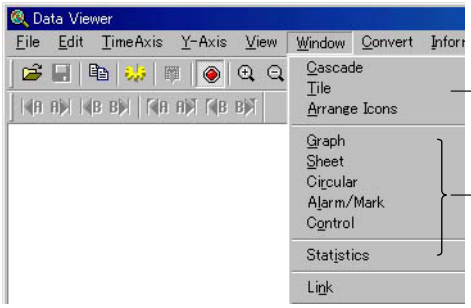
Note

- The arbitrary marks placed on the Data Viewer are green. The arbitrary marks (messages) and trigger points placed on the CX are yellow.
- Up to 16 characters can be used for a mark name.

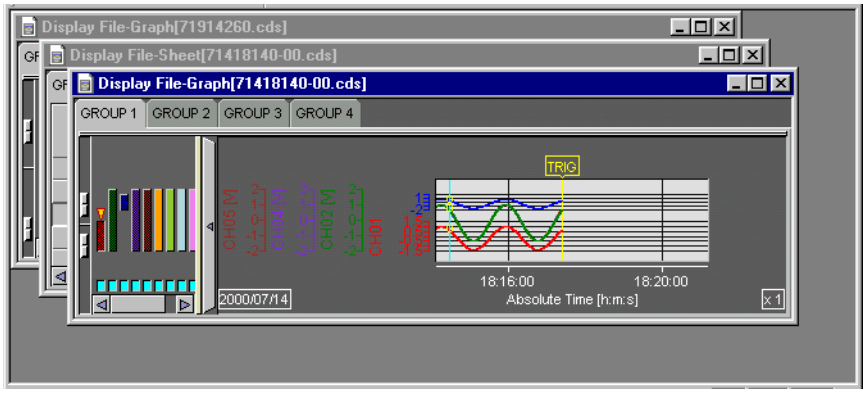
Resetting Marks

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

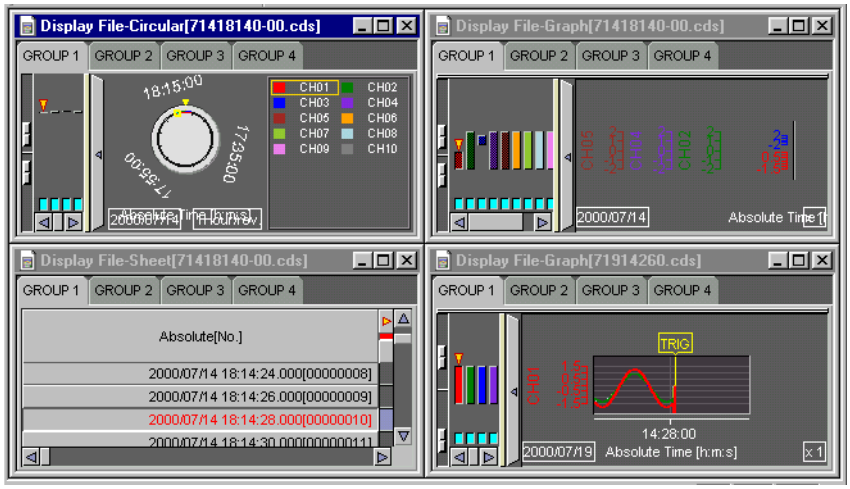
Window Settings



- **Example of a Cascading Display**



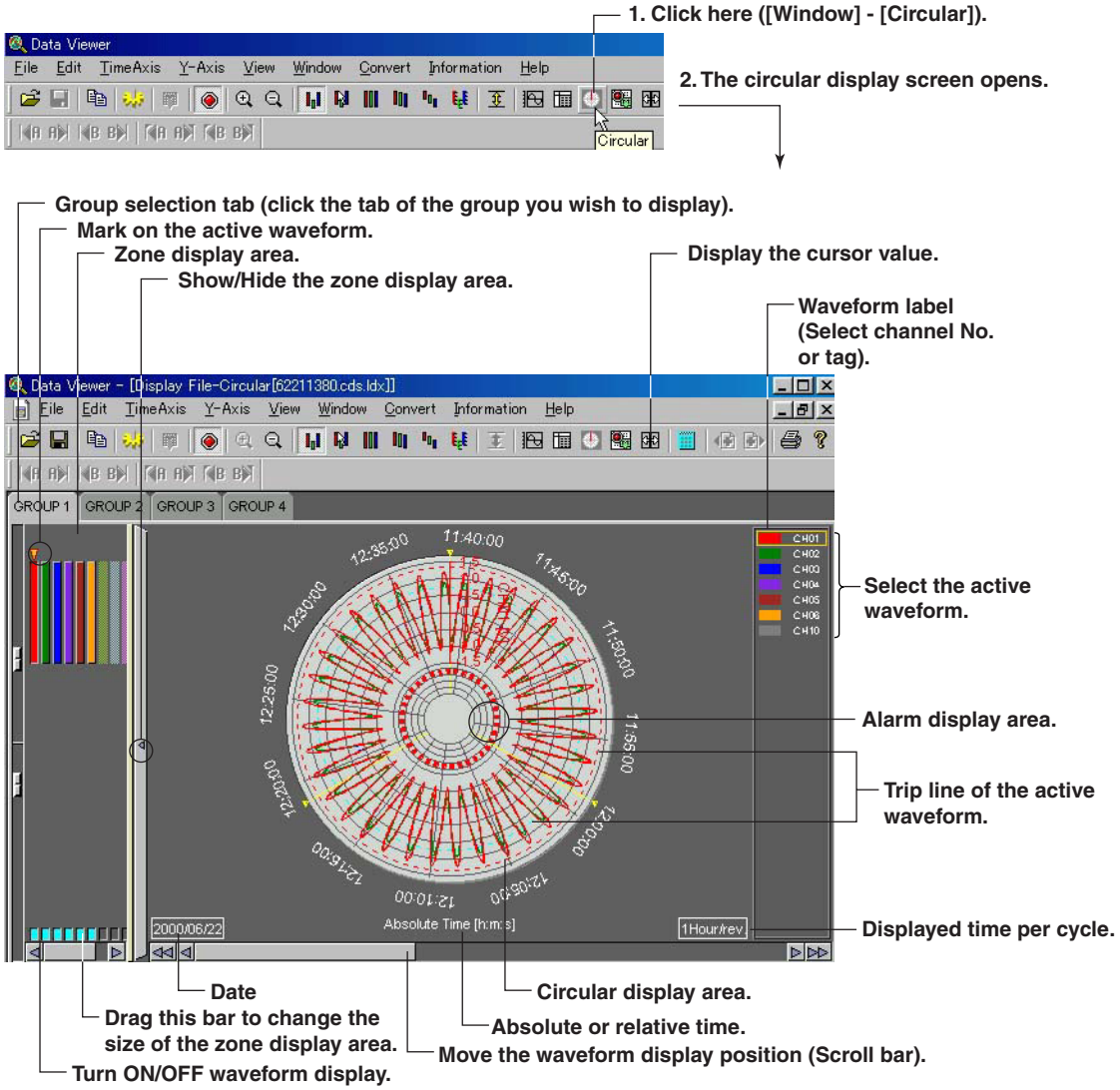
- **Example of a Tiled Display**



- **Example of a Arranged Icon**

4.3 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 4.2) are as follows:

Trip Line

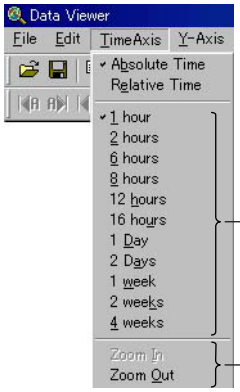
The trip lines on the circular screen cannot be dragged.

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

Time Axis Settings

You can select absolute or relative time display and zooming in or zooming out on the time axis See section 4.2, “Waveform Display.”

Selecting the displayed time



Select the displayed time per cycle.

Select the [Zoom In] or [Zoom Out].

Y-Axis Settings

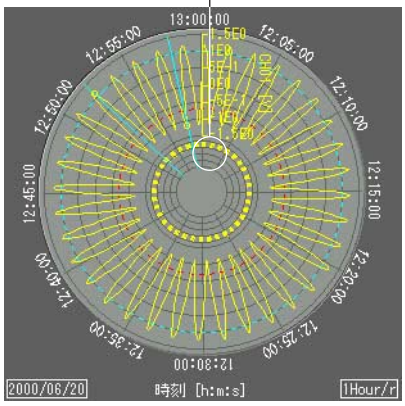
The circular screen always displays the waveform that is limited to the values between the maximum and minimum values of the Y-axis display range. The range is set using [Scale] in the [General Display Settings] dialog box.

Alarm Display ON/OFF

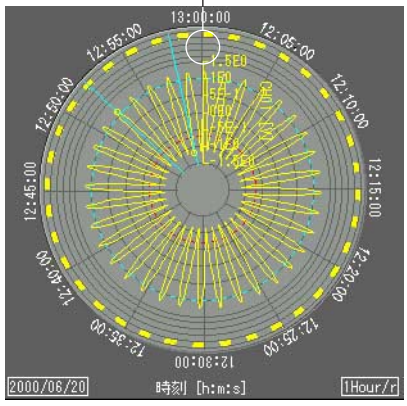
You can select whether to display the alarm on the inside or the outside of the waveform display section of the circular screen.

Select [View] - [Alarm Inside] or [Alarm Outside].

Alarm Inside

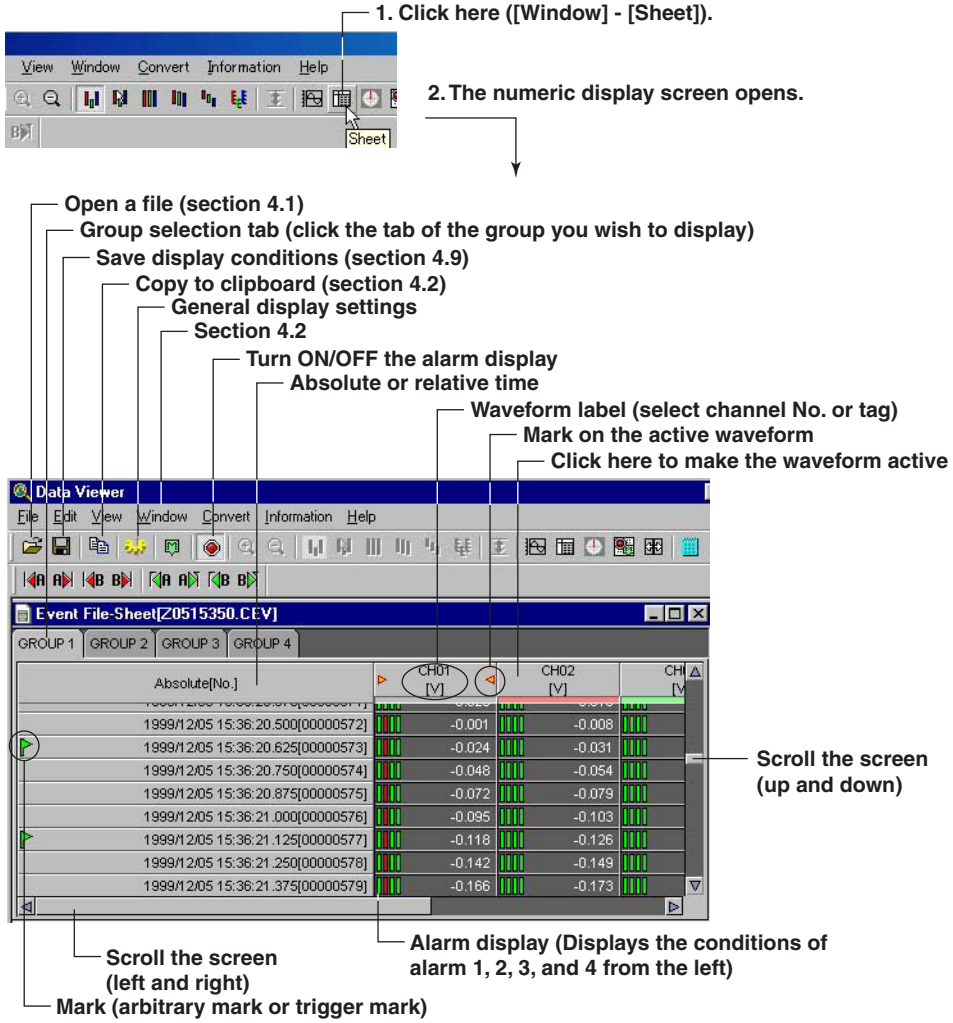


Alarm Outside



4.4 Numeric Value Display

Numeric Value Display



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 4.2, “Waveform Display.”

Time Axis Settings

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

Alarm Display ON/OFF

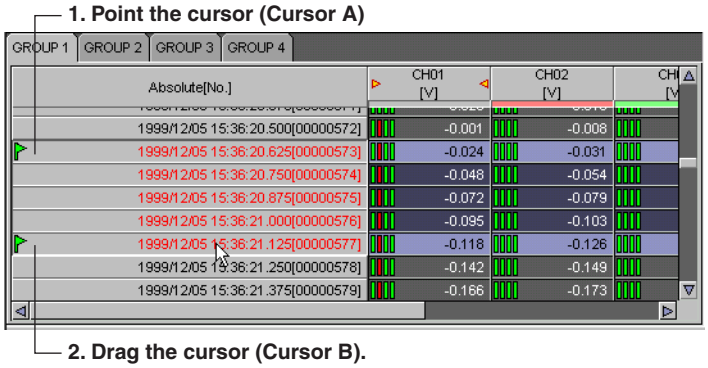
The alarm conditions of alarms 1 to 4 are displayed on the screen by clicking the alarm display icon or selecting [View] - [Alarm] and turning ON the alarm display. When an alarm is in effect, the indicator is red. When it is not, the indicator is green.

Selecting the Characters Used to Identify Channels

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

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 values,” “Hiding the Cursor,” and “Displaying Statistics” in section 4.2, “Waveform Display.”

Adding Arbitrary Marks, Deleting Marks, and Resetting Marks

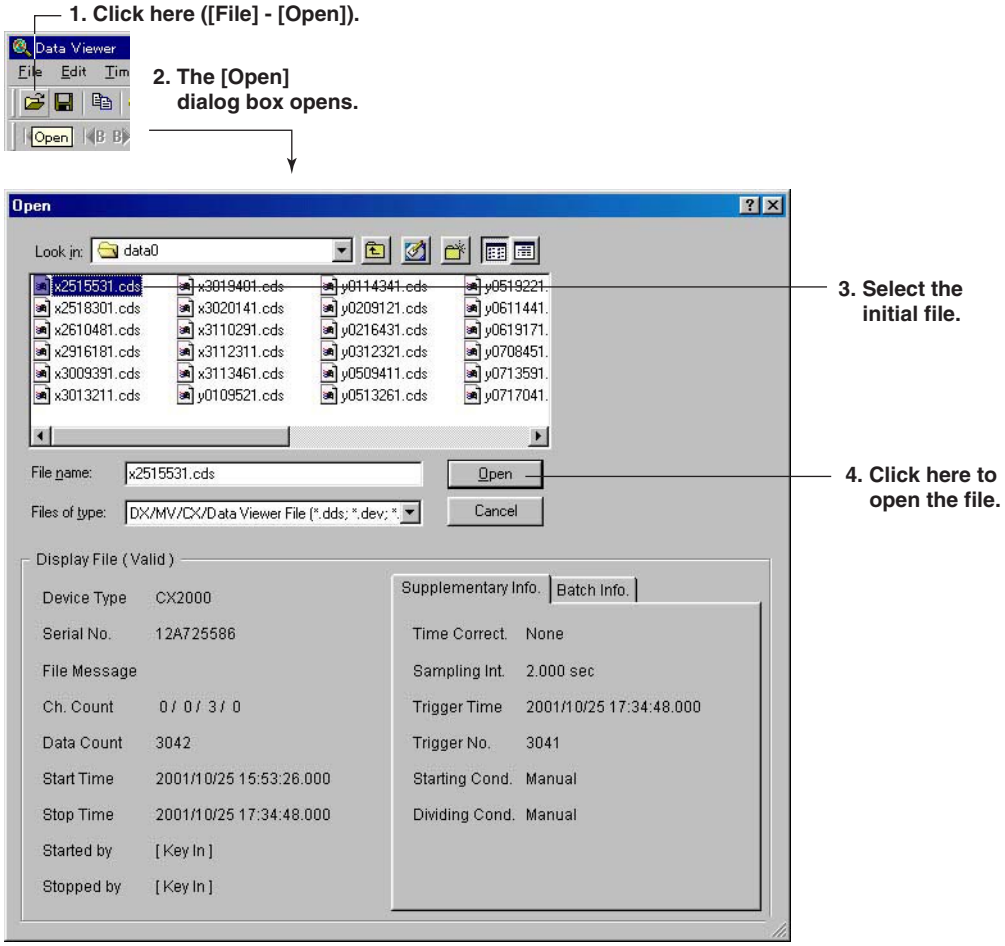
For details, see “Adding Arbitrary Marks,” “Deleting Marks,” and “Resetting Marks” in section 4.2, “Waveform Display.”

4.5 Linking Files and Saving the Link Settings File

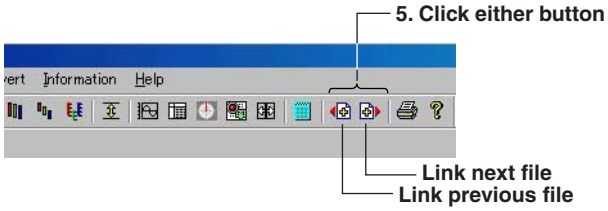
Linking Files

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

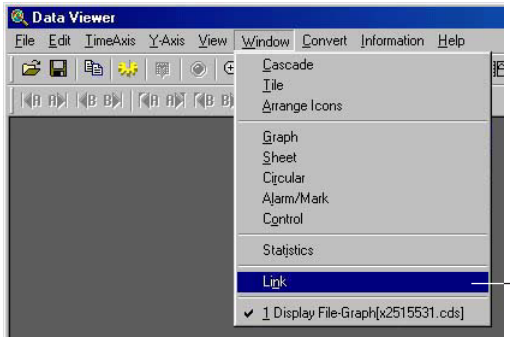
The files that can be linked are those that exist in the same directory. There are two methods to link files, from the toolbar and from the menu bar.



From the toolbar



From the menu bar

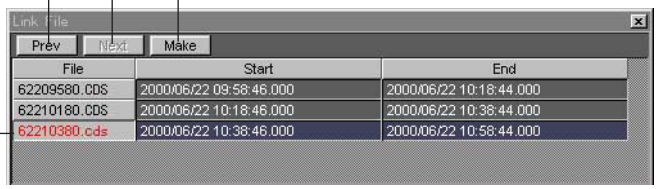


5. Click here. ([Window]-[Link]).

6. The [Link] dialog box opens.

8. Select [Prev] (previous file) or [Next] (next file).

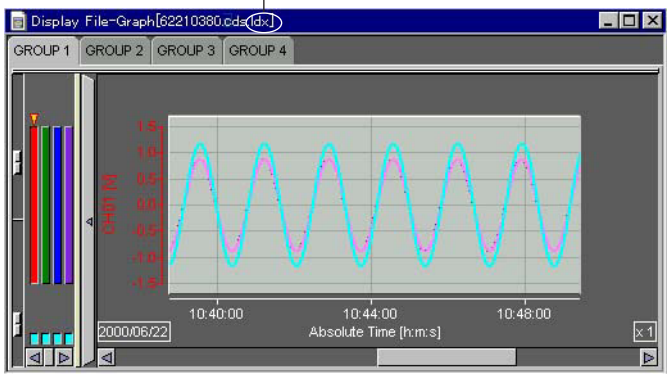
7. Click here. (display files for linking).



9. Displays the linked files.

10. Displays the linked files in a different color.

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



Note

For file connection display, after connecting ensure that the number of data values does not exceed 5000000.

If there is an interval with no data, due for example to a power failure, the number of data values is still counted as though the data had been captured at the specified measurement intervals. The following table shows the measurement cycle and the maximum time of connection.

Cycle	Time
1/8s	7.23 days
1s	1.87 month
10s	1.58 year
60s	9.49 years
10min	94.9 years

For example, if data is captured continuously with a 1/8 second cycle, if there is a two-week power failure, then data from before and after the power failure cannot appear in a connection display.

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 .ldx.

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

4.6 Alarm and Mark List, List Conversion

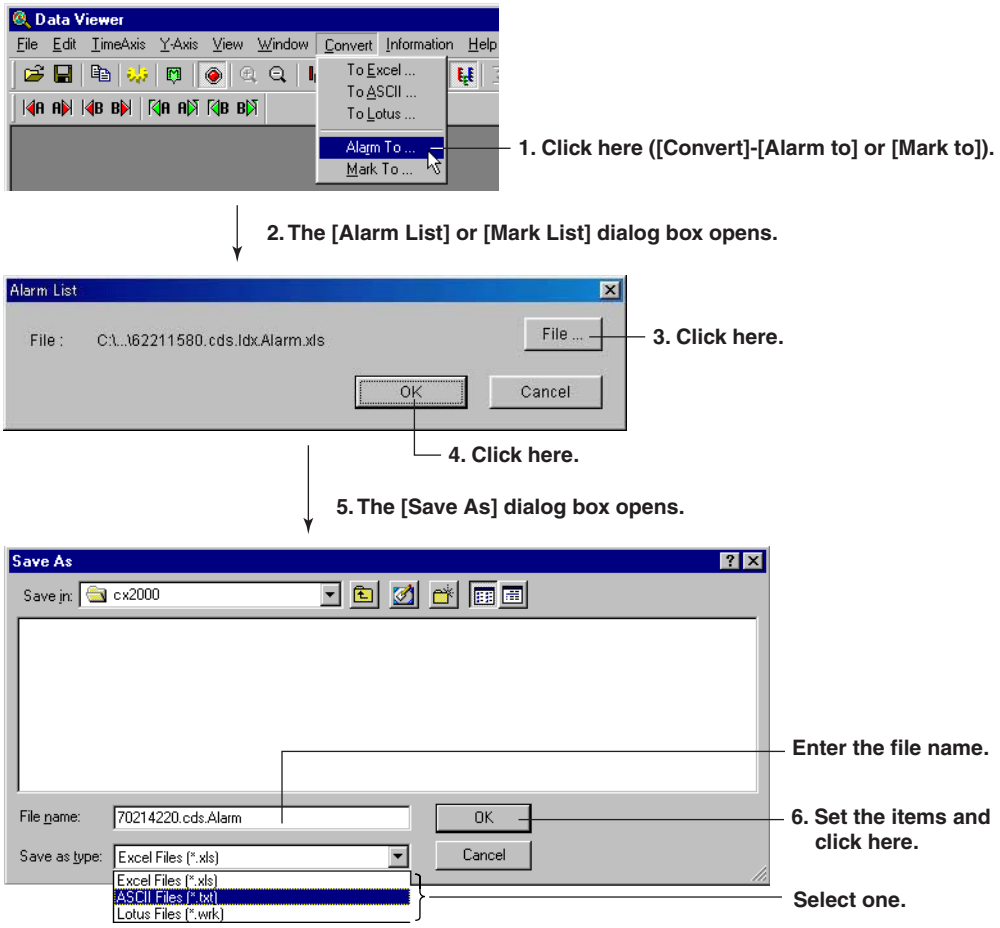
A list of alarms and marks is displayed with the display file or event file opened.

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

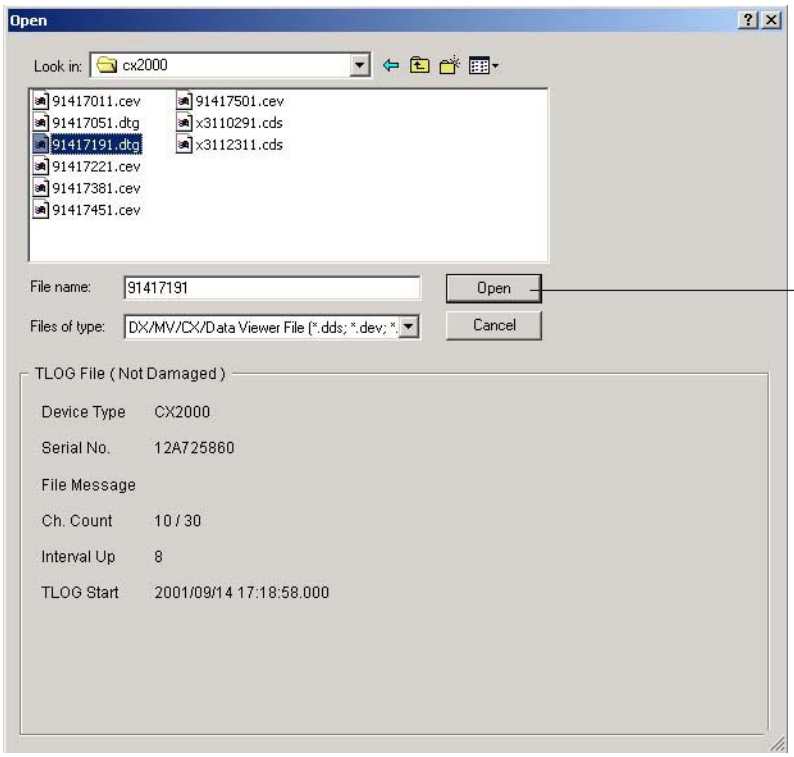
The Alarm or Mark List can be converted to ASCII, Lotus, and Excel formats.



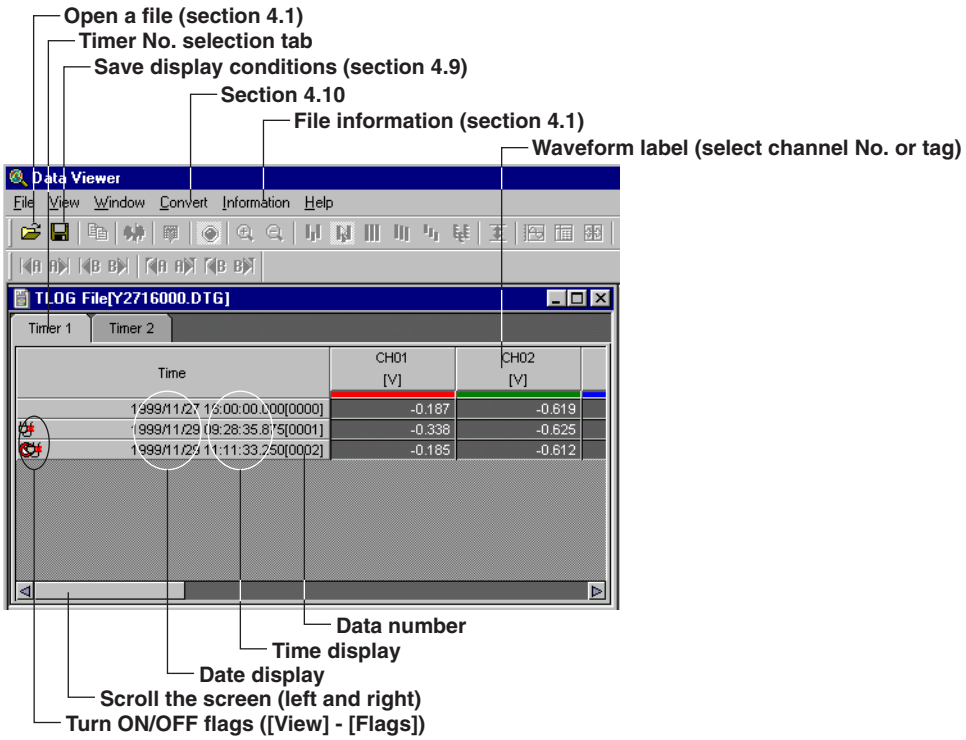
4.7 TLOG File Display

TLOG File Display

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



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



Turning ON/OFF Flags

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

 : Stopped TLOG computation.

 : The CX time and date was changed during TLOG computation.

 : Power failure occurred during TLOG computation.

Date/Time Display

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

Data No.

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

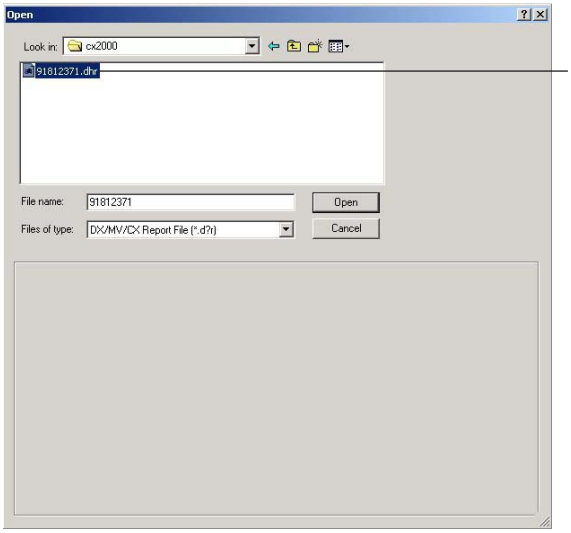
Selecting the Characters Used to Identify Channels

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

4.8 Report File Display

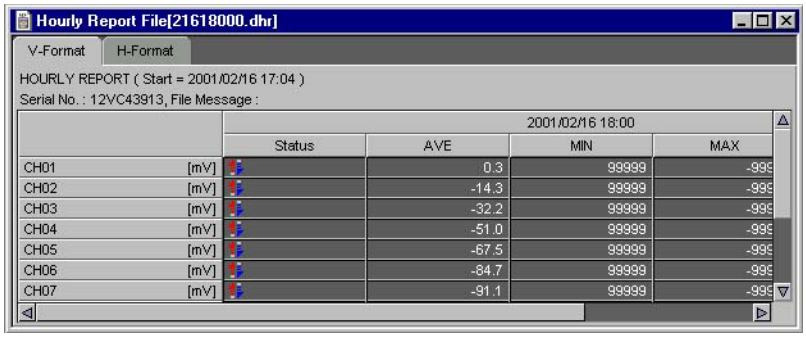
Report File Display

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

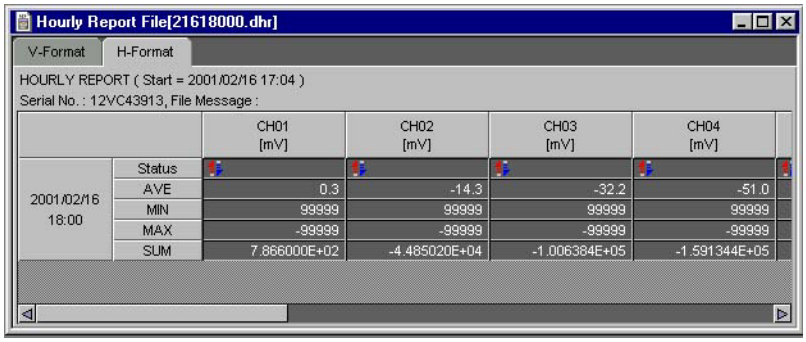


2. Select the desired file (.dhr) and click the [Open] button.

Vertical Display



Horizontal Display



Status

The following icons are shown in Status.

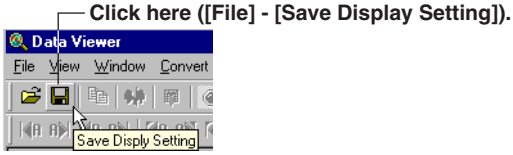
 : A measurement or computation error occurred in the report period.

 : An out-of-range value or computation range error occurred in the report period.

 : A power failure occurred in the report period.

 : The time was changed in the report period.

4.9 Saving 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
- 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

For TLOG File Display

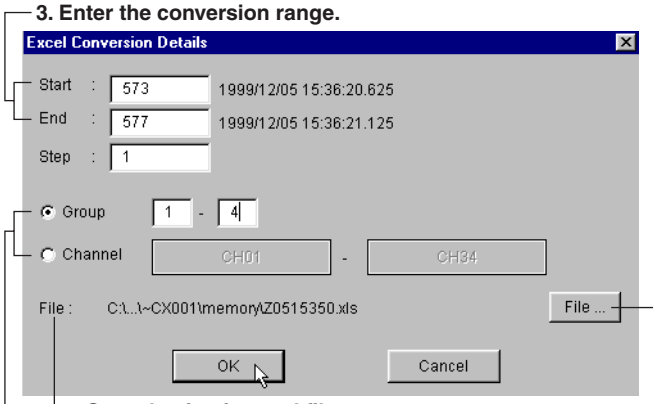
- ON/OFF condition of TLOG file information items (see section 4.1) and print comment
- The string to be used (channel/tag)
- Timer No.
- Display format of date and time

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.CDS.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 (with the .vdx extension) before opening the data file.

4.10 Data Conversion

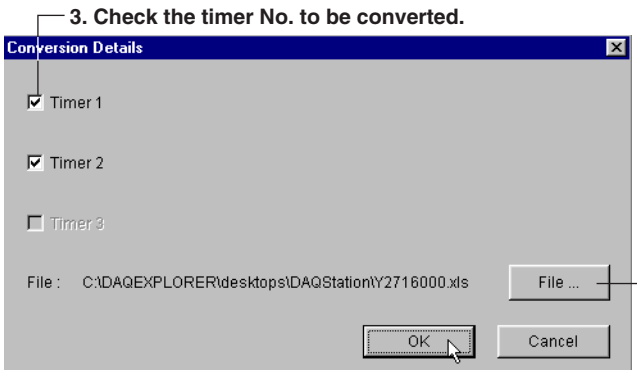
1. Select one.
2. The [Conversion Details] dialog box opens.

When Waveform Display or Numeric Display is Open



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

When Displaying the TLOG File



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.

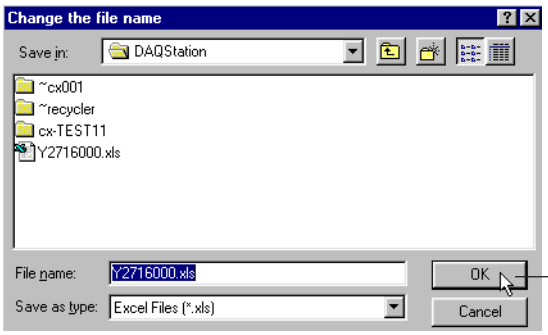
Step

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



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 extensions [.txt] and [.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.
- Do not specify a floppy disk or an external storage medium as the save destination as it will take a long time for the save operation.
- Do not specify the root directory as the save destination.
- Prepare enough free space on the destination disk.

Conversion Example

ASCII Conversion File

```
"DAQSTANDARD","R3.01"
"Data Viewer","R3.01"
"","",""
"Device Type","CX2000"
"Serial No.","12A725586        "
"File Message",""
"Time Correction","None"
"Starting Condition","Manual"
"Dividing Condition","Manual"
"Meas Ch.",         3
"Math Ch.",         0
"Ctrl Ch.",         3,"/",         0
"Data Count",      7098
"Sampling Interval",     2.000,"sec"
"Start Time","2001/11/13","14:58:36",     0.000
"Stop Time","2001/11/13","18:55:10",     0.000
"Trigger Time","2001/11/13","18:55:10",     0.000
"Trigger No.",      7097
"Damage Check","Not Damaged"
"Started by","[ Key In ]"
"Stopped by","[ Key In ]"
"Application",""
"Supervisor",""
"Manager",""
"Batch No.",""
"Lot No.",          7
"Converted Group",          1,"-",          1
"Ch.","CH001","CH002","CH003","CH107","CH108","CH109"
"Tag","01","02","03","INT-03.PV","INT-03.SP","INT-03.OUT"
"Unit","°C","","","°C","°C","%"
"Date","Time","sec","MIN","MAX","MIN","MAX","MIN","MAX","MIN","MAX"
"2001/11/13","14:58:36",     0.000,     593.7,     593.7,      -0.1,
"2001/11/13","14:58:38",     0.000,     593.6,     593.7,      -0.1,
"2001/11/13","14:58:40",     0.000,     593.5,     593.6,      -0.1,
```

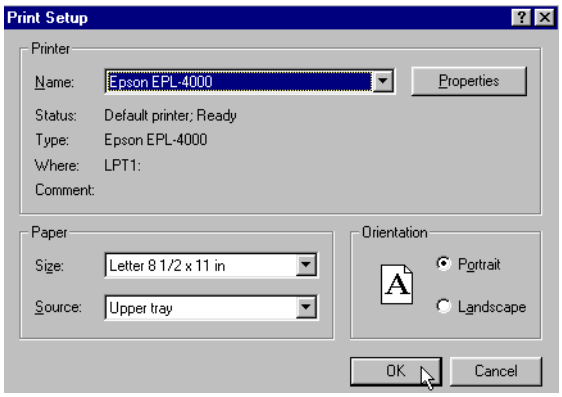
Excel Conversion File

	A	B	C	D	E	F	G
1	DAQSTANDARD		R3.01				
2	Data Viewer		R3.01				
3							
4	Device Type		CX2000				
5	Serial No.		12A725586				
6	File Message						
7	Time Correction		None				
8	Starting Condition		Manual				
9	Dividing Condition		Manual				
10	Meas Ch.		3				
11	Math Ch.		0				
12	Ctrl Ch.		3	/	0		
13	Data Count		7098				
14	Sampling Interval		2.000	sec			
15	Start Time		2001/11/13	14:58:36	0.000		
16	Stop Time		2001/11/13	18:55:10	0.000		
17	Trigger Time		2001/11/13	18:55:10	0.000		
18	Trigger No.		7097				
19	Damage Check		Not Damaged				
20	Started by		[Key In]				
21	Stopped by		[Key In]				
22							
23	Application						
24	Supervisor						
25	Manager						
26	Batch No.						
27	Lot No.		7				
28							
29	Converted Group		1	-	1		
30							
31			Ch.	CH001		CH002	
32			Tag	01		02	
33			Unit	°C			
34	Date	Time	sec	MIN	MAX	MIN	MAX
35	2001/11/13	14:58:36	0.000	593.7	593.7	-0.1	-0.1
36	2001/11/13	14:58:38	0.000	593.6	593.7	-0.1	-0.1
37	2001/11/13	14:58:40	0.000	593.5	593.6	-0.1	-0.1
38	2001/11/13	14:58:42	0.000	593.4	593.5	-0.1	-0.1

4.11 Printing

Printer Settings

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



2. Set the printer, paper, and orientation.

Note

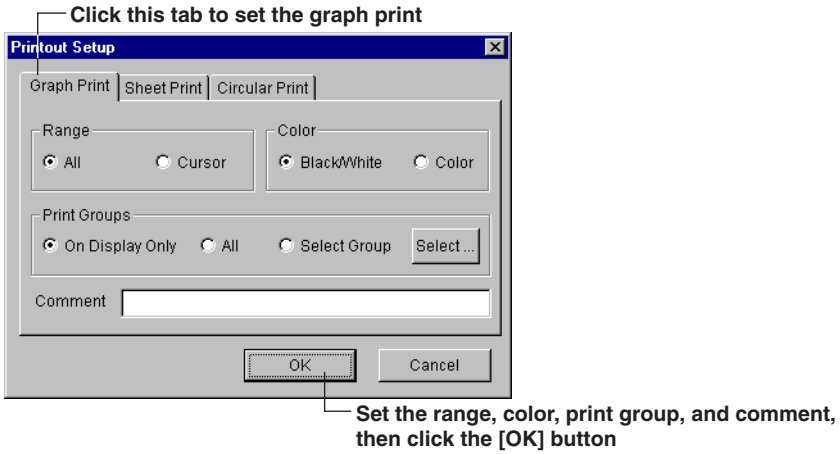
Set the printer according to the configuration of the system that you are using.

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

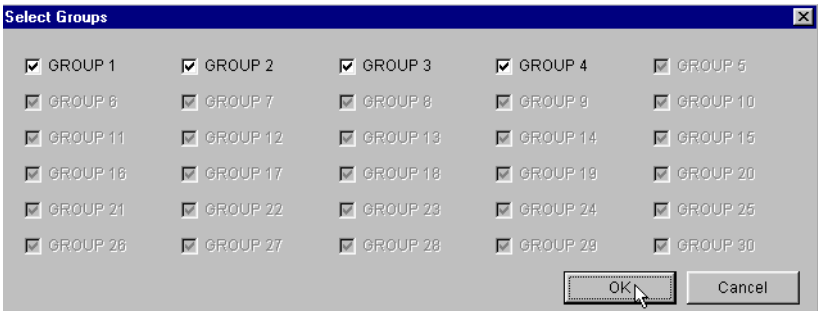
Specify the contents to be printed before executing the print. This is not necessary when printing the TLOG file.

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.

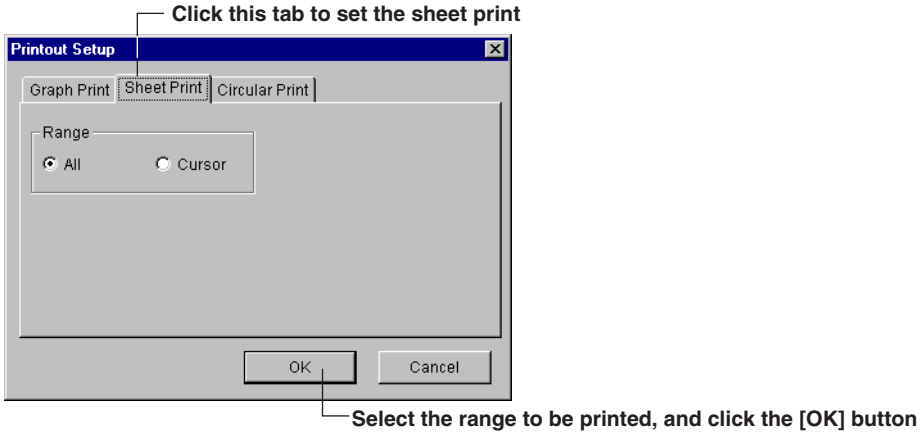
Setting Graph Print



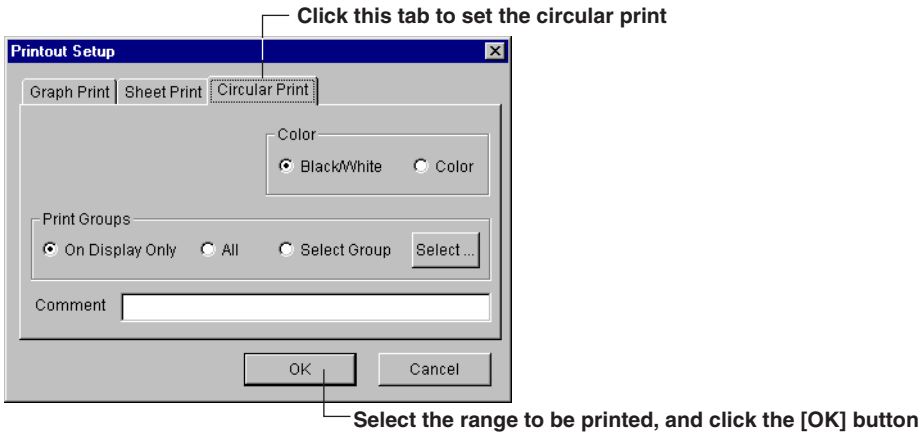
If you selected [Select Group], click the [Select] button. The [Select Groups] dialog box opens. Select the groups to be printed. Click the [OK] button to close the dialog box.



Setting Sheet Print



Setting Circular Print



Note

- The [Comment] can be entered or changed using [About Document] (see “Checking the information about the loaded file” page 4.3). When the print comment is entered or changed, it is reflected in the comment of [About Document] dialog box.
- Up to 127 characters can be entered in the [Comment] entry box. However, the number of characters that is actually printed is limited.
- When the cursor is not displayed, select the [All] button under [Range] in the [Printout Setup] dialog box.

Header

A header can be printed when printing the waveform or a TLOG file.
Of the items that are displayed in the file information dialog box ([Information] - [About Document]), those that are checked are printed in the header section. For details related to the file information, see section 4.1.

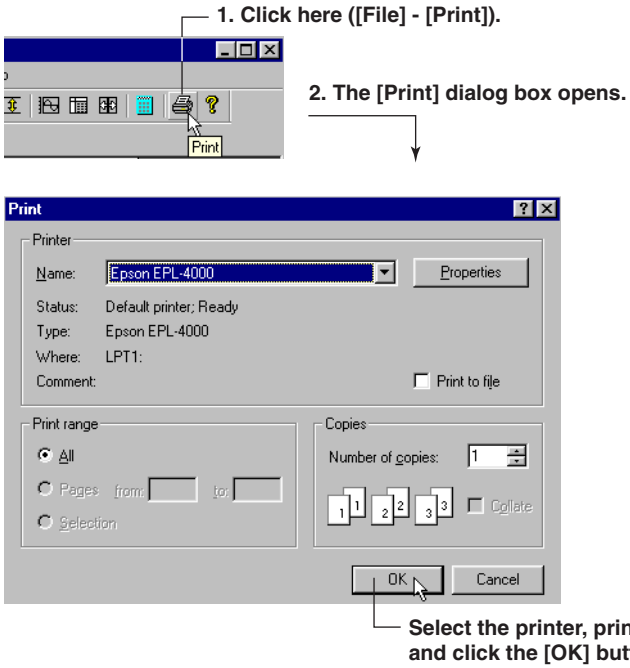
Print Preview

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

Note

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

Printing



5. Troubleshooting

Launcher

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

Hardware Configurator

Warning Message List

Message	Reference Section
System settings have been changed. Input configuration and data will be initialized. Do you want to proceed?	3.2
Data created in 2038 or later cannot be handled.	–
Some A/D converters are faulty. Some items cannot be set.	–
Some information cannot be set. Do you still want to continue?	–
Settings may not be made correctly since the configuration does not match the connected CX. Do you still want to send?	3.12
The current setup data will be initialized.	3.2
Setup data will be received from the CX.	3.1
The setup data will be sent.	3.12
Memory sampling will be stopped.	3.13
Memory sampling will be started.	3.13

Error List

Message	Corrective Action	Reference Section
Illegal file to load	Select another file.	3.1
Failed to load the file.	Try to load the file again. If still not possible, the file may be damaged. Select another file.	3.1
Failed to create a file.	Check the free space in the directory.	–
Memory sampling in progress Stop sending.	Send after data has been written to the internal memory of the CX.	3.13
Math in progress Stop sending.	Send after math is completed.	3.13
Memory sampling & math in progress. Stop sending.	Send after data has been written to the internal memory of the CX and math is completed.	3.13
Now contorolling. can't store settings.		–
Saving to the media. Re-send later.	Send after data has been saved to the external media.	3.13
Communication error	Check the communication settings.	2.3
Time out	Traffic may be busy. Retry later.	–
Illegal user information	Check whether the user name is correct.	3.6
Failed to connect.	Check the communication settings. Check whether the CX is powered ON.	2.3
Communication busy	Retry later.	–
Memory error	Exit other programs then restart, or reboot the OS then restart.	–
User level error	No right is given to the login user ID	–

Message

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

Data Viewer

Message	Corrective Action	Reference Section
Insufficient memory. Exit immediately.	Exit other programs then restart, or reboot the OS then restart.	–
Cannot write to the file.	Check the free space in the directory. The file may be currently used by another program, so check it.	–
Cannot load the file.	Check whether the file exists. Also check whether the file system is correct.	–
Cannot open the file.	Check whether the file exists. Also check whether the file system is correct.	–
Illegal file	Select another file.	4.1
The number of data sets is “0”.	Select another file.	4.1
The number of channels is “0”.	Select another file.	4.1
Some files may be overwritten. Do you still want to continue?	Continue if OK. If not, change the file names.	4.10

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