WEB-ENABLED
REMOTE TERMINAL UNIT
Model: DL30-G

USERS MANUAL

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1. Introduction

Thank you for choosing M-System.
Before use, check the following information.

1.1 Corresponding Versions

This Users Manual corresponds to the following versions of M-System's products.

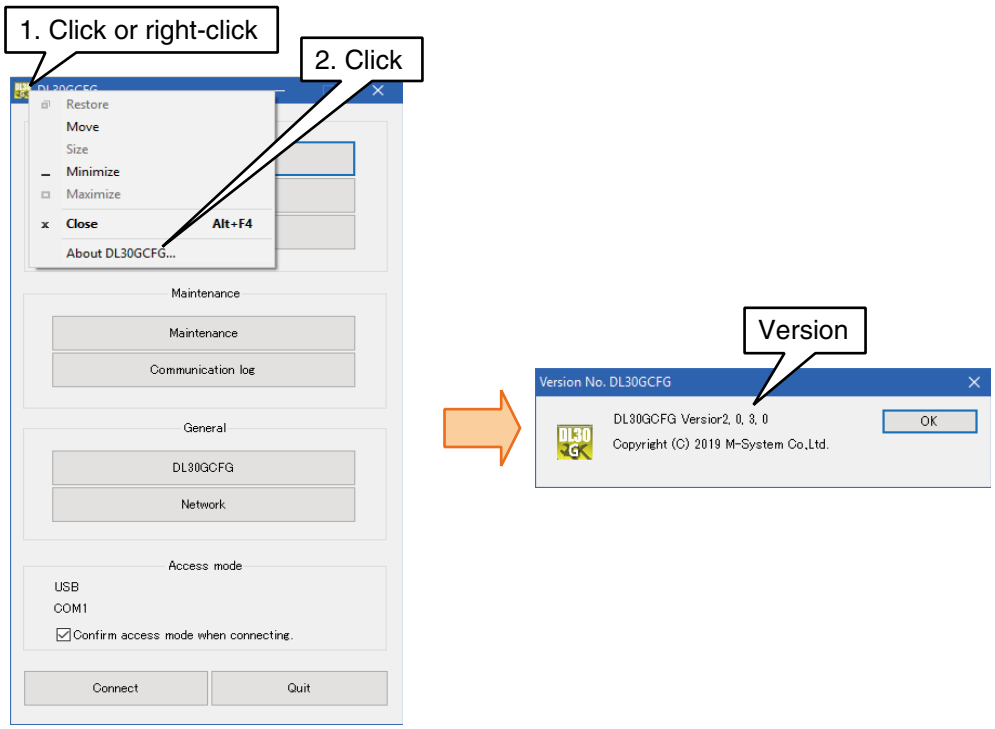
■ UNIT VERSION

This Users Manual corresponds to model DL30-G Unit version 2.2 or later.
Refer to the section on [Maintenance] for the method to confirm the unit version.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Confirming unit version

■ DL30GCFG CONFIGURATOR SOFTWARE VERSION

This Users Manual corresponds to model DL30GCFG version 2.1 or later.
The DL30GCFG version can be confirmed as follows.

(1) Click (or right click) at the top left of the initial window.
(2) Click [About DL30GCFG ...] to display the version information dialog.



1.2 Precautions

■ CONFORMITY WITH EU DIRECTIVES

- The equipment must be mounted inside the instrument panel of a metal enclosure.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input signal for safety.
- The unit is not hot swappable. When the unit is used in combination with R30 I/O modules, the R30 I/O modules also cannot be hot swapped.
- Before you remove the terminal block or mount it, turn off the power supply for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within 0 to 50°C (32 to 122°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Max. wiring length for FE terminal should be 3 meters.
- Be sure to attach the terminal cover for safety.

■ ABOUT SD CARDS

- Do not turn off the power of the unit during writing data. Insert or eject an SD card according to the specified procedure.
- Confirm the front and back side of the SD card.

■ CALENDAR CLOCK

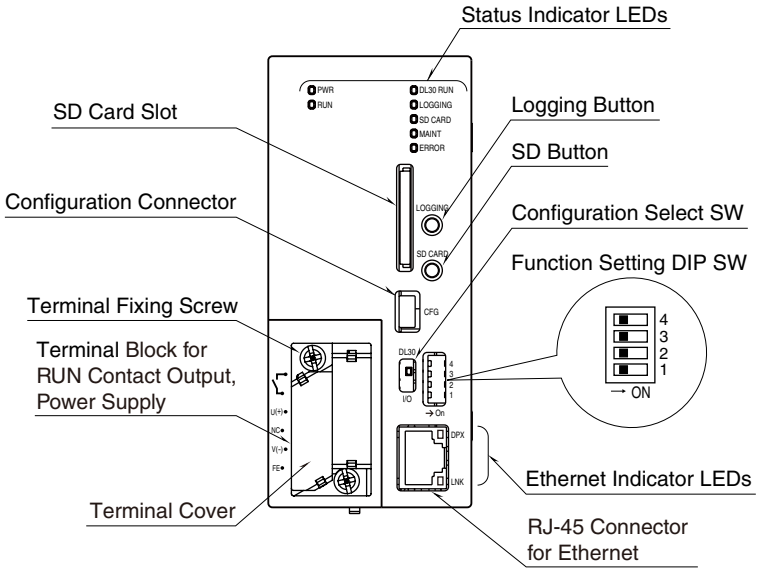
- A backup battery is employed for calendar clock IC. Backup period without power supply is approx. 2 years.
- With power on, the battery is not drained. When total power off period is approx. 2 years, the battery cannot backup the calendar clock data, and the calendar clock cannot keep correct date and time.
- The battery is not replaceable by customer. When replacement is required, consult M-System.

■ AND ....

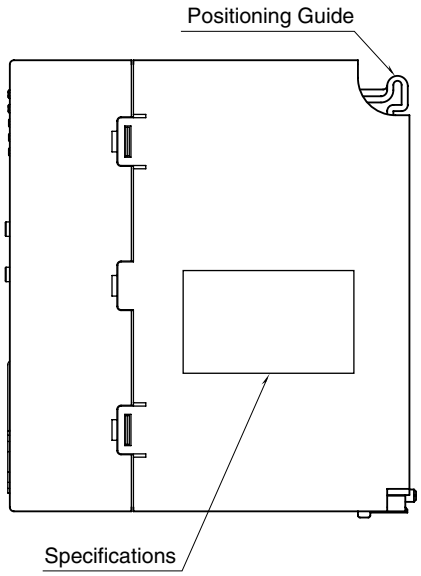
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

1.3 Component identification

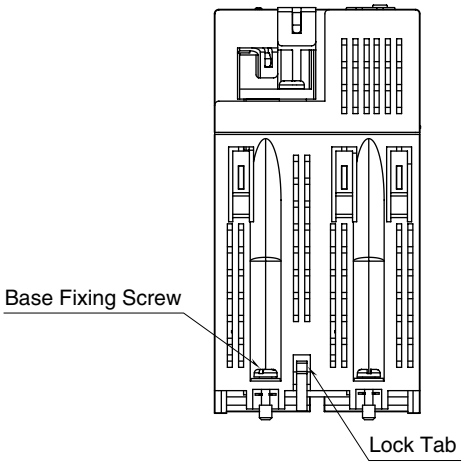
■ **FRONT VIEW**



■ **SIDE VIEW**



■ **BOTTOM VIEW**



■ STATUS INDICATOR LED

LED	COLOR	FUNCTION
PWR	Green	ON when the power supply is on. OFF when the power supply is off.
RUN	Green	ON in normal operation *1 OFF in abnormality (internal memory error, SD card error, R30 module error) *1
DL30 RUN	Green	ON after boot-up OFF in abnormality (IP address unassigned) Blinking while the DL30-G module is in communication.
LOGGING	Green	OFF when logging is stopped. ON while logging
SD CARD	Green	ON when SD card is recognized. Blinking while accessing to the SD card. OFF when SD card is not recognized or removed.
MAINT	Orange	ON when the mail reporting is disabled or in the maintenance mode. OFF in normal operation
ERROR	Red	Blinking in abnormality (internal memory error, SD card error, R30 module error) *1 OFF in normal operation *1

*1. RUN contact output turns on in normal operation, off when the power is not supplied or in abnormality (internal memory error, SD card error, R30 module error).

■ ETHERNET INDICATOR LED

LED	COLOR	FUNCTION
DPX	Green	ON during full duplex transmission
LNK	Amber	ON while link is established.

■ CONFIGURATOR SELECT SW

SW POSITION	CONFIGURATION OBJECT
DL30	Configuring the DL30-G using the DL30GCFG or a terminal software program (*)
I/O	Configuring the R30 series I/O modules using the R30CFG

(*) Factory setting

■ DIP SW

SW1	DL30-G CONFIGURATION USB CONNECTION
OFF	DL30GCFG (*)
ON	Terminal software

SW2	MAIL REPORTING
OFF	Enable (*)
ON	Disable

SW3	MAINTENANCE MODE
OFF	Disable (*)
ON	Enable (Logging, e-mailing, and schedule outputs are halted)

SW4	CALENDAR CLOCK BATTERY BACKUP
OFF	Disable (*)
ON	Enable

(*) Factory setting

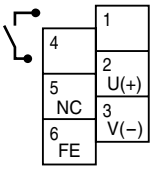
■ LOGGING BUTTON

Pressing and holding the button for 1 second starts and stops logging.

■ SD BUTTON

Pressing and holding the button for 4 seconds turns SD CARD LED off to make the card safely removed.

■ TERMINAL ASSIGNMENT



NO.	ID	FUNCTION
1	RUN contact output	RUN contact output
2	U(+)	Power supply (24 V DC)
3	V(−)	Power supply (0 V DC)
4	RUN contact output	RUN contact output
5	NC	Not used
6	FE	Functional earth

2. Installation

2.1 Things to prepare

Modules

- Web data logger model: DL30-G (hereinafter also referred to as “DL30,” “unit,” or “device”)
- R30 series I/O modules
- Installation base model: R30BS

Other than modules

- PC
- USB cable (USB (A) male - USB (mini B) male)
- SD card (See [8.2.4 SD card] for specified SD cards.)
- DL30-G configurator software (Model: DL30GCFG) *1
- R30 configurator software (Model: R30CFG) *1
- Instruction/Users Manual for each of the above *1

*1. The software programs and manuals are available for downloading at M-System web site:
➔ http://www.m-system.co.jp/

Depending on the system configuration, a Wi-Fi router or a fixed IP address contract is necessary.

2.2 Installation and wiring

Mount the DL30-G and R30 series I/O Modules on the Installation Base (Model: R30BS).
For details, see the instruction manual (EM-8571-A) supplied with the device and those for the respective I/O modules.

2.3 Preparation of configurator software

Install the configurator software programs on a PC in order to set up the DL30-G and each I/O module.

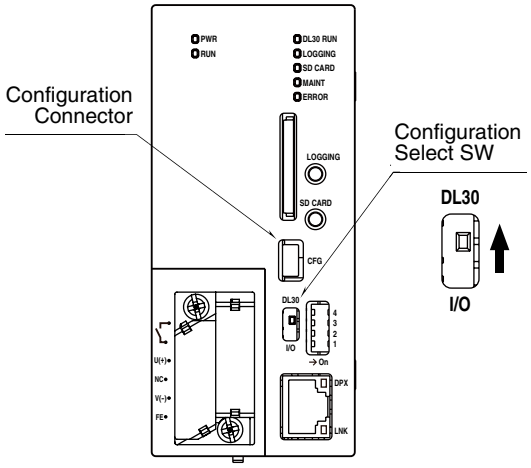
2.3.1 Configurator software for DL30-G: DL30GCFG

Installing DL30GCFG

Download DL30GCFG from the website of M-System, and complete the installation simply by extracting it into any folder.
Use a shortcut to DL30GCFG.exe which has been extracted to the desktop as required.

Starting DL30GCFG

(1) Turn [Configuration Select SW] to the [DL30] side.



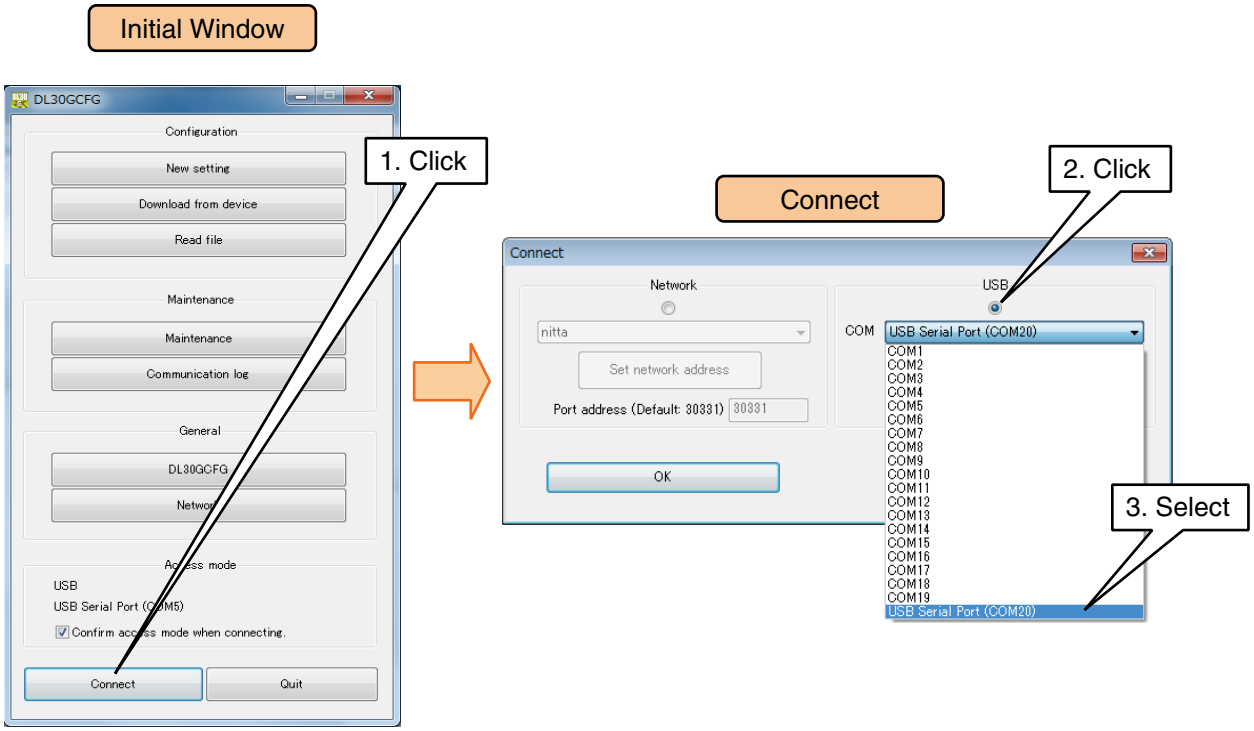
(2) Turn on the power supply to the device.

(3) Connect the PC and the device using a USB cable.
An FTDI chip is used for DL30-G.
When connecting the device to DL30GCFG, the dedicated driver software needs to be installed on a PC.
A new serial port will be created by the installed driver software. Select this port as a COM port.
With a PC connected to the Internet, the driver software will be automatically installed by the function of Windows Update when connecting to the device via a USB cable.

(4) Start up DL30GCFG, and click [Connect] to open the [Connect] window.

(5) Check the radio button of [USB].

(6) Select the COM port having been added when the PC connected to the device, and click [OK].



NOTES

- If the driver software is not automatically installed, and/or the added COM port is not listed in the options, download the driver from M-System website http://www.m-system.co.jp and install it.
- The added COM port No. varies from PC to PC.

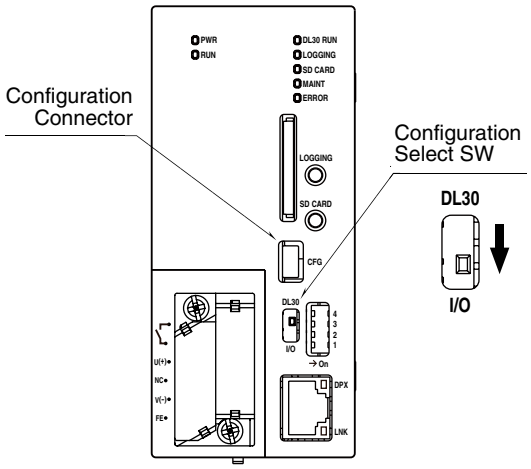
2.3.2 Configurator software for I/O modules: R30CFG

Installing R30CFG

Refer to the R30CFG Users Manual to install the software program.

Starting R30CFG

(1) Turn [Configuration Select SW] to the [I/O] side.



(2) Turn on the power supply to the device.

(3) Connect the PC and the device using a USB cable.

(4) Start up R30CFG, and select the same COM port selected in DL30GCFG.
For details, refer to the R30CFG Users Manual.

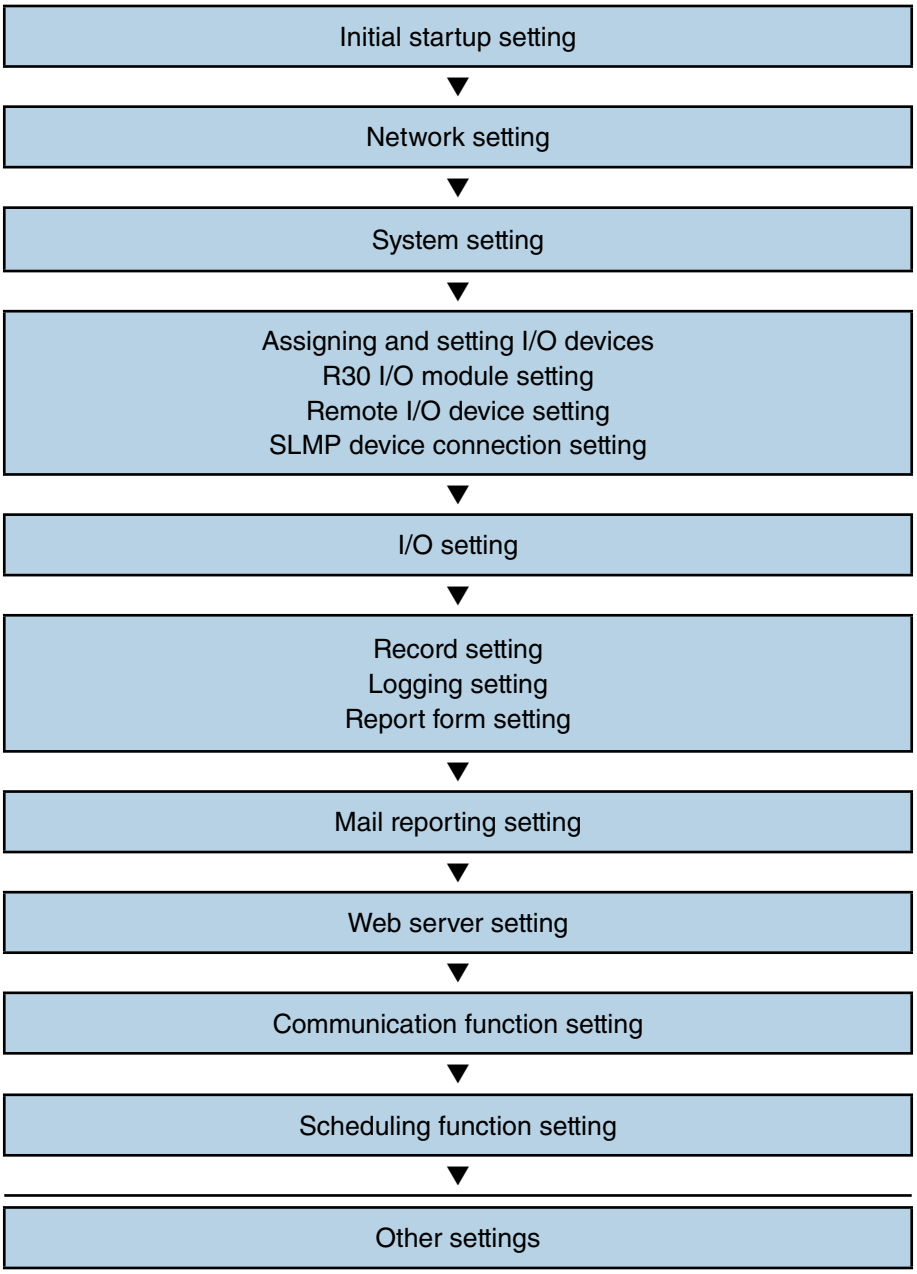
2.4 Explanation about basic working and terms

Term	Explanation
Channel CH	5 types of input channels, 2 types of output channels, and grouped digital output are defined in DL30-G. The I/O signals are in the form of fully encoded digital data. AI : Analog input (16 bit signed integer, unsigned integer) DI : Discrete input (1 bit) PI : Pulse input (32 bit unsigned integer, signed integer, floating point) MA : Function input (32 bit floating point) MD : Function input (1 bit) AO : Analog output (16 bit signed integer) DO : Discrete output (1 bit) GDO : Grouped digital output
Pen	Pens are used for trend graph, data logging, and report forms. Channels are assigned to pens, respectively when the DL30-G stores trend waveforms and data values, and generates report forms.
Alarm zone transition	For AI, PI, and MA, the allowable range of input values can be divided into a maximum of 5 zones. The shift between zones caused by a change in the input value is called 'alarm zone transition'. DI and MD can only be ON/OFF, and hence a change in the input signal is equivalent to an alarm zone transition.
Event	Indicates the information that [There has been an alarm zone transition].
Trend	Indicates the waveform data assigned to the pen and recorded.
Logging data	Indicates the history of data values at the point of each storing cycle for the respective channels assigned to pens.
Event data	Includes 'Event Log', 'System Log', and 'Communication Log'. Event log : Data of events listed in chronological order of occurrence System log : Data of the internal system activities listed in chronological order Communication log: Data of communication results listed in chronological order Schedule log : Data of execution and/or change of schedules listed in chronological order
Report form data	Indicates the data integrated by day, month, or year for the channels assigned to pens.
Internal memory	When the DL30-G records data, trend data, logging data, event data, and report form data are recorded in the internal nonvolatile memory of the device. This memory is called 'internal memory'.
Sampling rate	The time cycles used for acquiring I/O values for logging by the DL30-G; fixed at 1 second.
Storing rate	The time cycles used for recording I/O values for logging data and report form data. Data acquired at the sampling rate are computed and stored in the storing rate.
Mail template	Specific combinations of Subject, Body, and Mail recipients can be predefined and stored. Each set is identified by the mail template number.

3. Setting

3.1 Setting flow

Before starting to record using the device, follow the procedure given below to configure the setting.

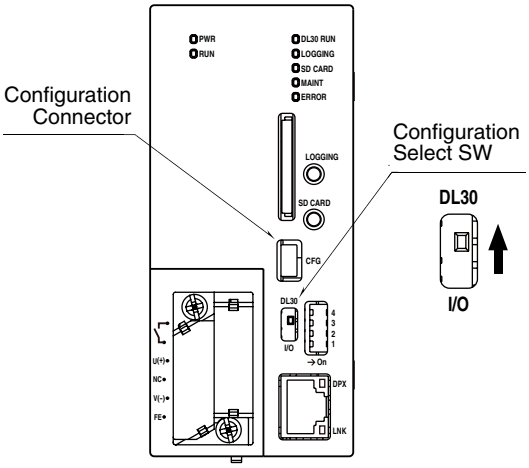


Refer to the FAQ on M-System web site.
➔ http://www.m-system.co.jp/

3.2 Initial startup setting

The calendar clock battery backup is disabled in the factory default setting in order to prevent drain of the battery. Hence, the clock will not have the correct time in the initial state.
Confirm that the function setting DIP SW4 is OFF to disable the calendar clock battery backup, and correct the time of the device by the following procedure.

(1) Turn [Configuration Select SW] to the [DL30] side.

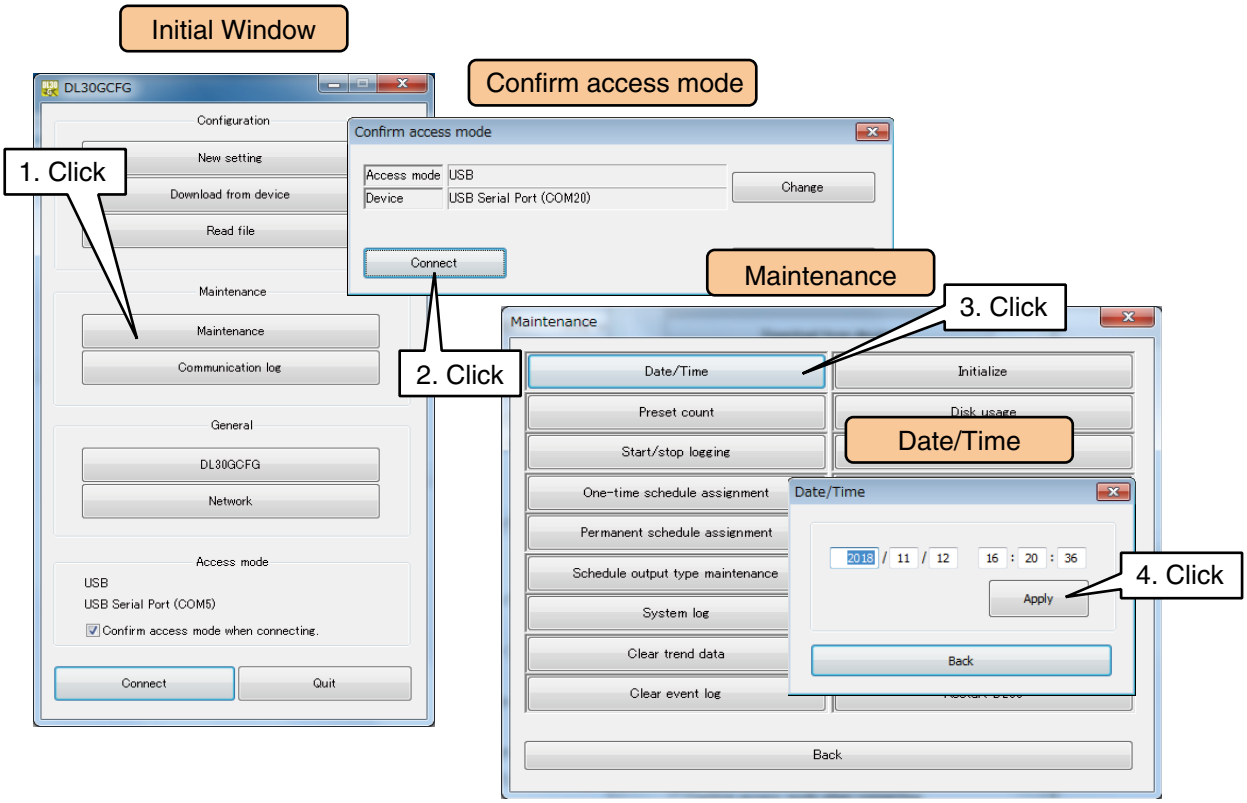


(2) Connect the DL30-G to the PC on which DL30GCFG is installed using a USB cable, and start up DL-30GCFG.

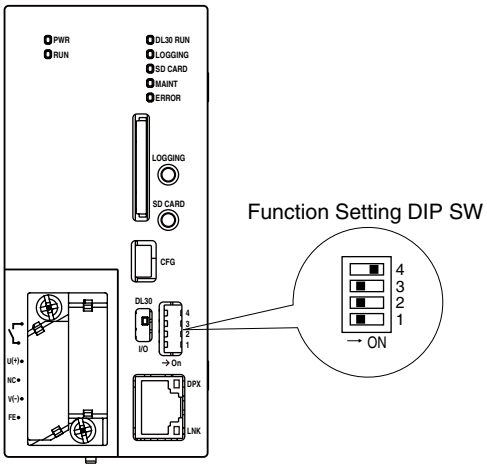
(3) Click [Maintenance] button in the initial window to display the [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button to display the [Maintenance] window.
To skip the [Confirm access mode] window, refer to 3.15.1 Skipping access mode confirmation in DL-30GCFG for details.

(5) Click [Date/Time] button. The current time of the PC is initially displayed.
Enter the time to be set and click [Apply] button.
The new time setting is applied to the calendar IC of the device.



(6) Turn on the function setting DIP SW4 to enable the calendar clock battery backup.



CAUTION

If the calendar clock battery backup has been enabled, but the device does not start with the correct time, the battery may be exhausted. Consult M-System in such a case.

3.3 Network setting

The DL30-G is equipped with Web server functions, which enable remote monitoring using a PC, tablet terminal, or smartphone.

The setting of DL30-G can be changed remotely through network, and the data stored in the DL30-G can be transferred/deleted to/from a PC or using the FTP server function.

There are two methods of connecting the DL30-G via a network.
Set appropriately to suit the usage environment.

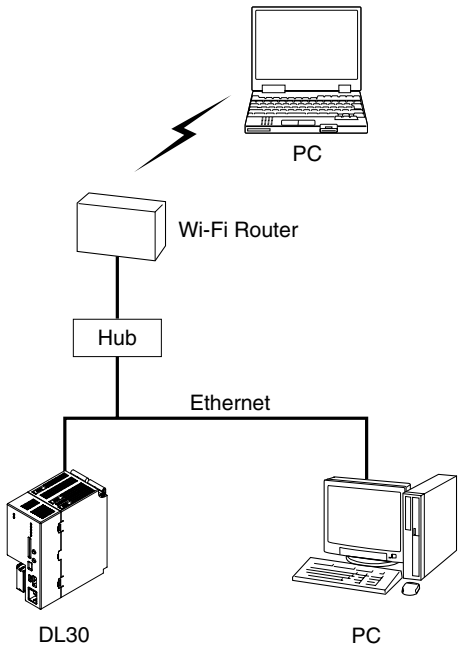
■ Connecting via local network (LAN)

This is a method in which one DL30-G device connected to the inhouse LAN is monitored by a terminal located within the same network.

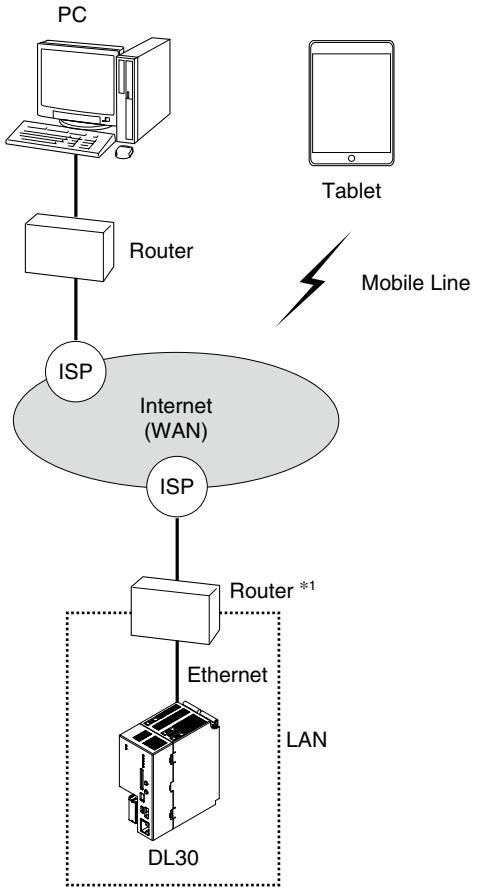
■ Connecting via Internet (WAN)

This is a method in which one DL30-G device connected to a broadband router is remotely monitored via the Internet.

■ VIA LOCAL NETWORK (LAN)



■ VIA INTERNET (WAN)



*1. D.DNS service or static IP address is reguired.

3.3.1 Connecting via local area network (LAN)

The table below shows network settings required for the respective server functions of the DL30-G.
Consult the network administrator for details about the setting.

Server function	Network setting for DL30-G
Web server	Set the IP address manually.
FTP server Used to transfer and delete data of DL30-G	
Maintenance DL30-G setting is configured via network by DL30GCFG.	

3.3.2 Connecting via Internet (WAN)

The table below shows router settings required for the respective server functions of the DL30-G.
See the router User Manual for information on how to set the router.

Server function	Network setting for DL30-G	Router setting
Web server	Set the IP address manually.	A fixed IP address or a dynamic DNS contract is necessary. Set so that an external HTTP packet (TCP port 80: Can be changed from DL30GCFG) is allowed into the IP address set in the DL30-G.
FTP server Used to transfer and delete data of DL30-G	Set the IP address manually.	A fixed IP address or a dynamic DNS contract is necessary. Set so that an external FTP packet (FTP control port 21 and FTP data port 45967 thru 45970) is allowed into the IP address set in the DL30-G.
Maintenance DL30-G setting is configured via network by DL30GCFG.	Set the IP address manually.	A fixed IP address or a dynamic DNS contract is necessary. Set so that an external DL30GCFG packet (TCP port 30341: Can be changed from DL30GCFG) is allowed into the IP address set in the DL30-G.

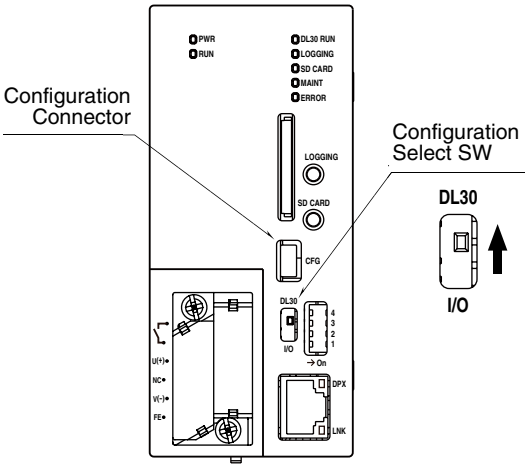
NOTES

- DHCP is also supported.
- It is strongly recommended to use VPN in terms of security.

3.3.3 IP address setting

Use DL30GCFG to configure the network setting.

(1) Turn [Configuration Select SW] to the [DL30] side.



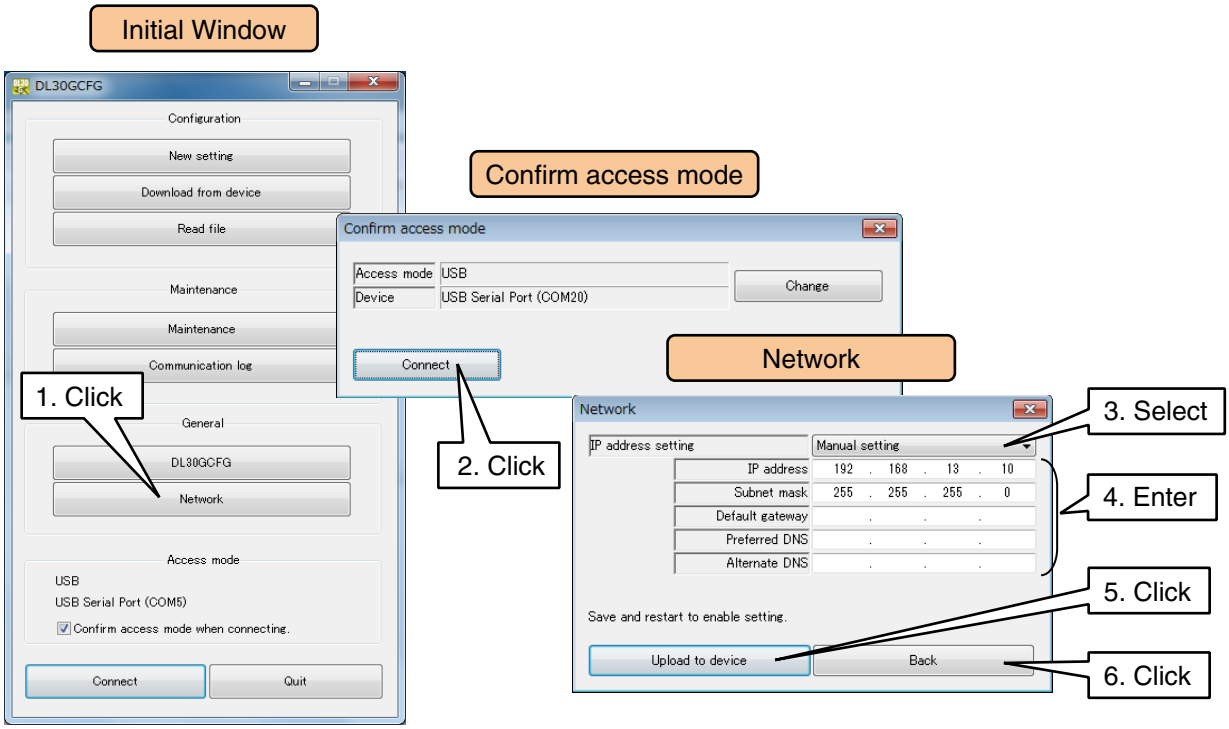
(2) Connect the PC and the device using a USB cable.

(3) Start up DL30GCFG and click [Network] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] to display the [Network] window.

(5) To set a fixed IP address, select [Manual setting], and set the IP address, etc.
Set the parameters by referring to the table on the next page.

(6) Click [Upload to device] button to transfer the IP address to the DL30-G (At this point, the IP address is not yet changed). Click [Back] to return to the initial window.



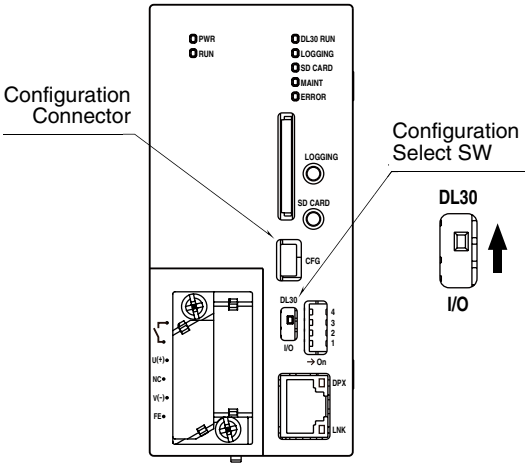
Parameter	Description
IP address setting	• Manual setting Specify IP address and other parameters manually. • Automatic setting (DHCP) Get IP address and other parameters automatically from the DHCP server. Once DHCP is selected, IP address cannot be changed manually.
IP address	Specify the IP address of the DL30-G.
Subnet mask	Specify the Subnet mask.
Default gateway	Specify the IP address of the default gateway.
Preferred DNS	Specify the IP address of the preferred DNS server.
Alternate DNS	Specify the IP address of the alternate DNS server.

(7) Turn off and on the power supply to the device or restart to activate the transferred IP address.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Restarting DL30-G

3.3.4 Enabling configuration via network (remote access authorization)

The DL30-G configurations can be changed via network using DL30GCFG.
Follow the DL30GCFG setting procedures given below to allow remote access to the DL30-G.

(1) Turn [Configuration Select SW] to the [DL30] side.



(2) Connect the PC and the device using a USB cable.

(3) Start up DL30GCFG, and click [DL30GCFG] button to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) The setting information is loaded from the DL30-G, and the [DL30GCFG via network] window is displayed. Set the parameters by referring to the table below.

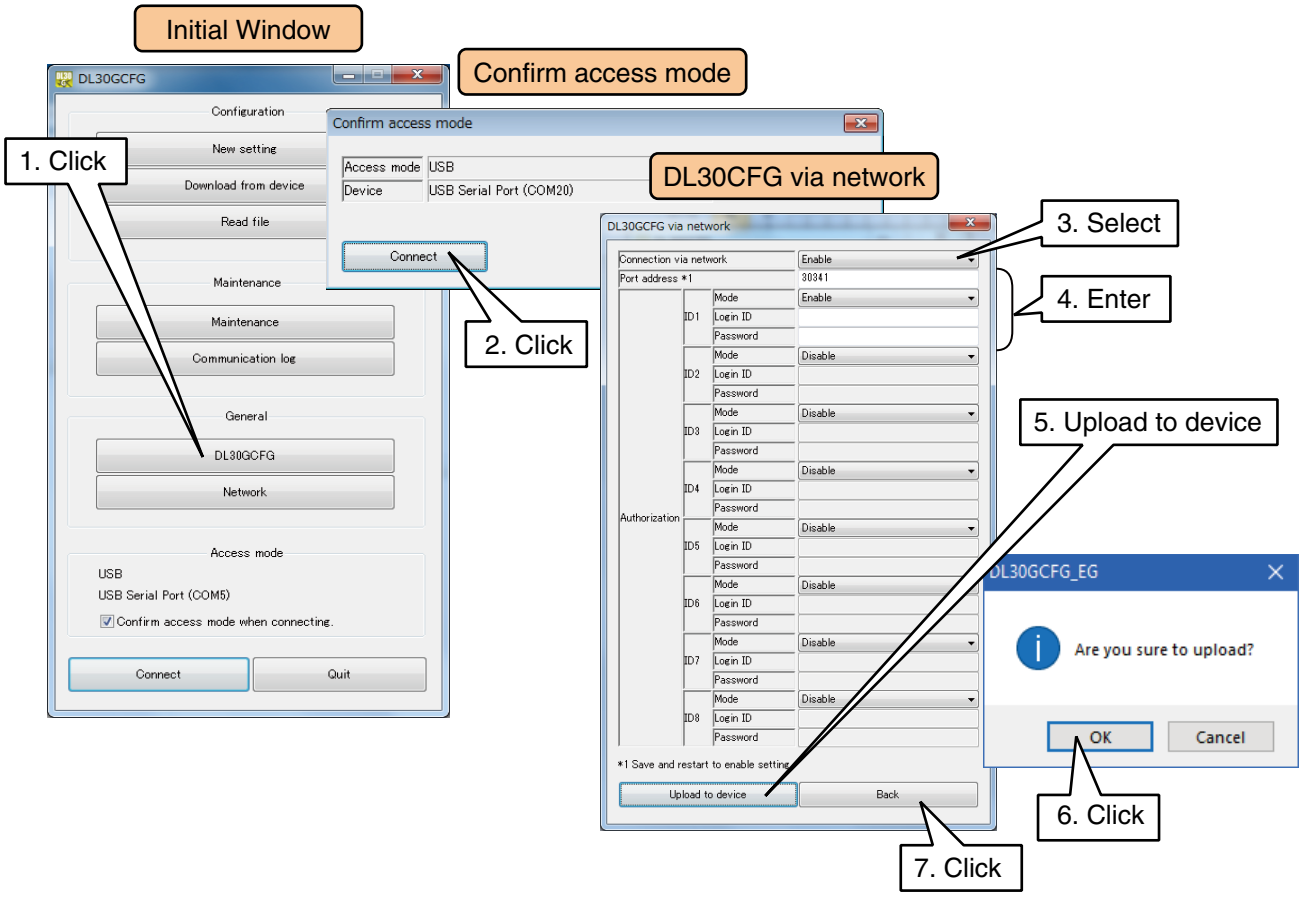
Parameter	Description	Default value
Connection via network	Set as [Enable].	Disable
Port address	Set between 0 – 65535.	30341
Mode	When connecting via a network, set at least 1 ID as [Enable].	ID1 : [Enable]. Others: [Disable]
Login ID	Use up to 16 single byte alphanumeric characters (If there is no entry, leave blank).	admin
Password	Use up to 16 single byte alphanumeric characters (If there is no entry, leave blank).	admin

Note: Up to 8 sets of login ID/password can be set.

NOTES

- A login ID and password for the remote access authorization also allows the user to perform various control/setting operations such as:
  (1) manipulating MA, AO, DO, and/or GDO (➔ 4.2.2 Data display operation);
  (2) logging in the web browser and changing settings on the web browser (➔ 4.9 Setting change on browser); and
  (3) maintenance (➔ 6.2 Maintenance on Web browser).
- These operations are also allowed for an ID when the Mode is set to [Enable], even if the [Connection via network] is set to [Disable].
- Be sure to change the default ID and password.
- It is highly recommended to change the password regularly.

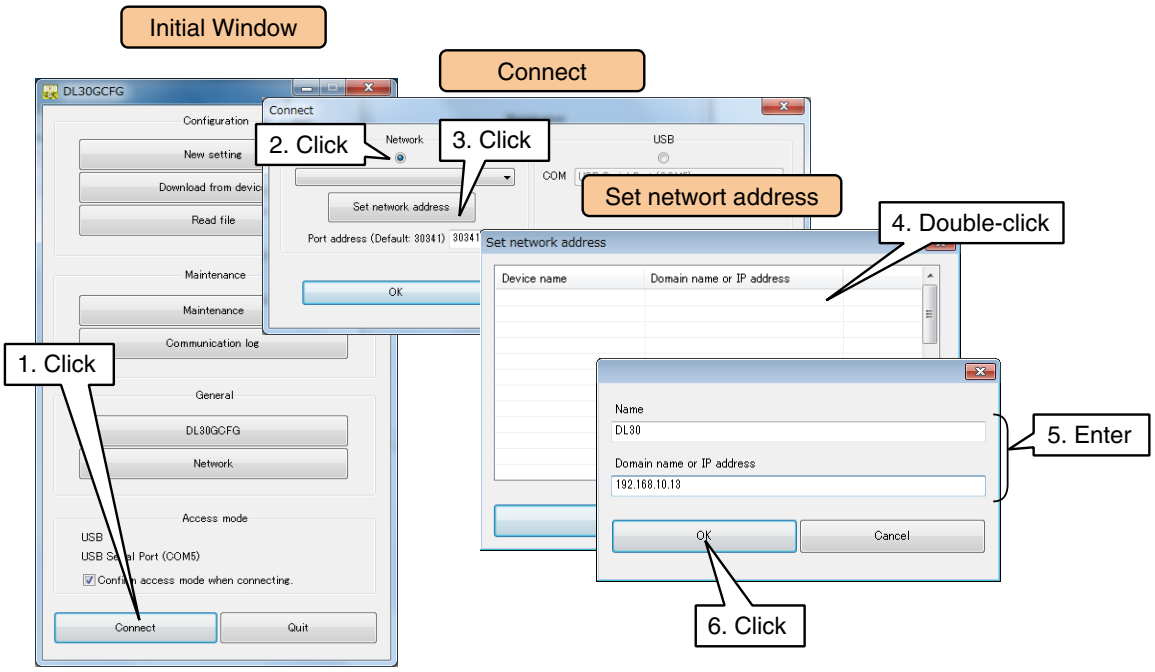
(6) Click [Upload to device] button to transfer the setting to the device.
Click [Back] and return to the initial window.



(7) If the port address has been changed, turn off and on the power supply to the device to activate the transferred setting.

(8) Click [Connect] button in the initial window to display the [Connect] window.
Check the radio button of [Network], and click [Set network address] button to display the [Set network address] window.

(9) Double-click a row in the network address list table to display the registration dialog.
Set the name and connection destination (Domain name or IP address), and click [OK].
Up to 32 connection destinations can be registered.

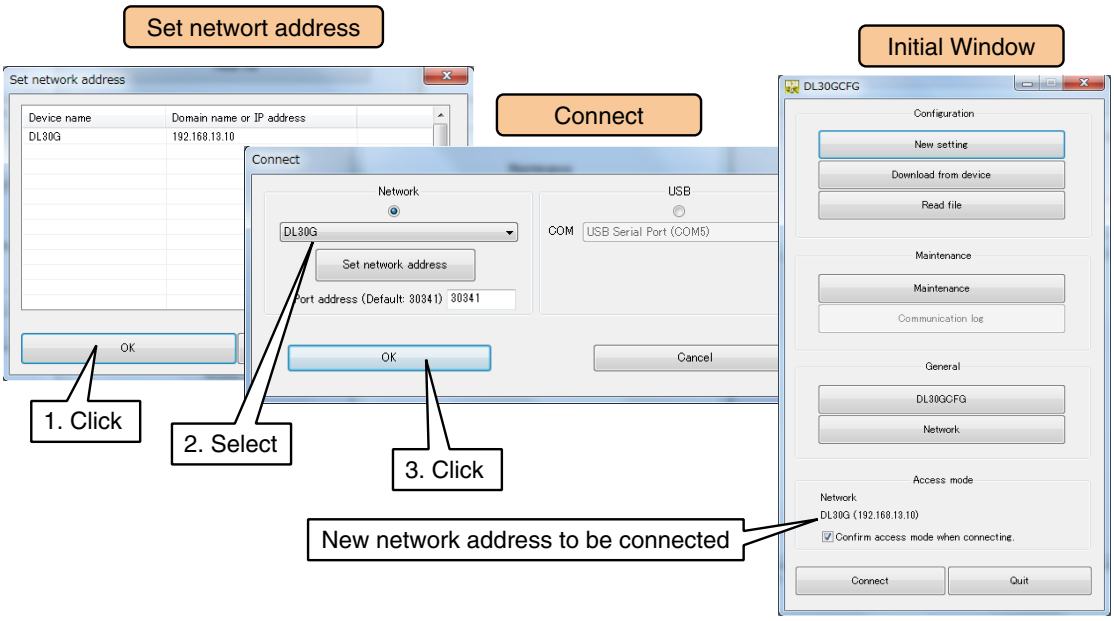


(10) Confirm that the destination entered in the registration dialog has been added, and click [OK].

(11) The registered connection destinations are added to the options in the [Connect] window. Select one.

(12) Click [OK] to return to the initial window, and check that the selected connection destination is displayed.

(13) The network connection procedure is the same as for the USB connection.
At the time of network connection, a dialog is displayed. Enter the login ID and password set in (5).



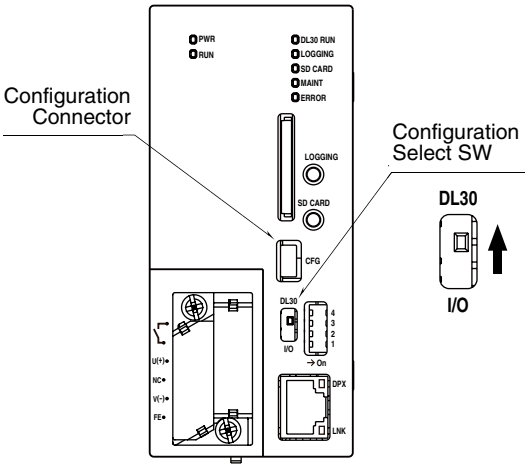
CAUTION

General Settings (DL30GCFG, Network) cannot be modified via network.

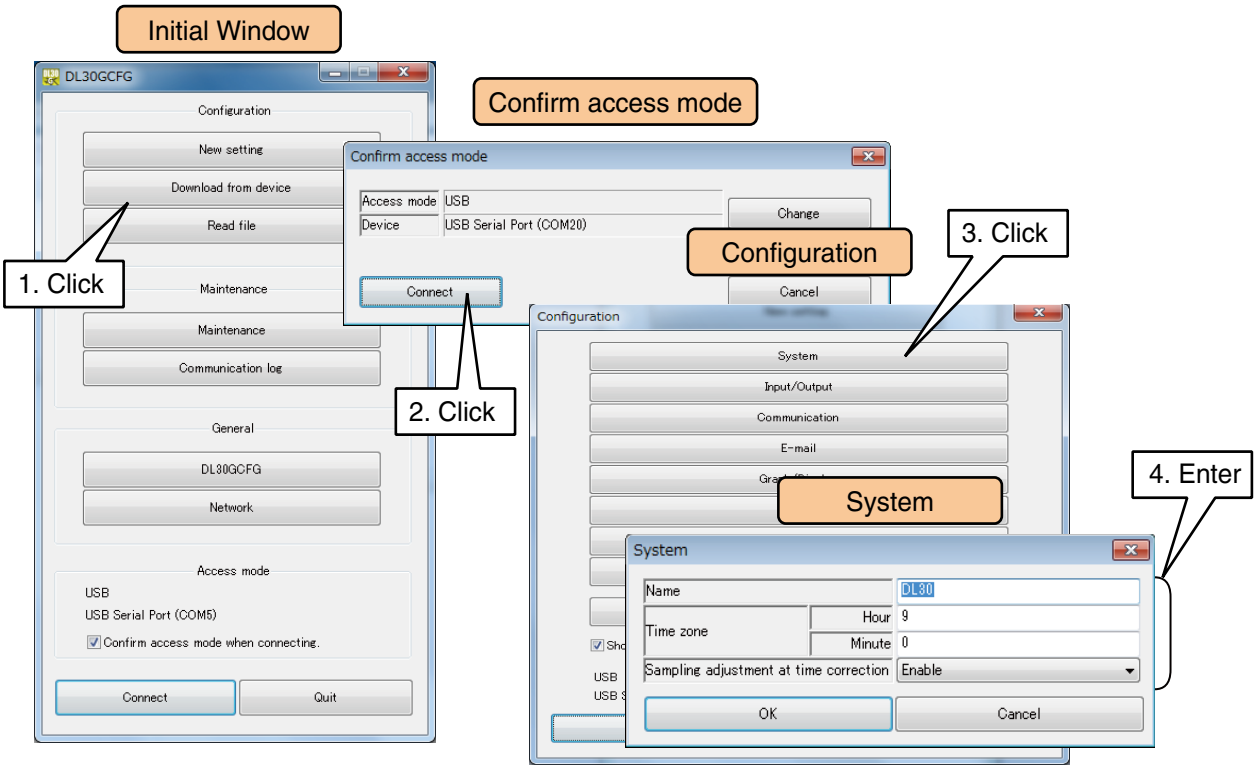
3.4 System setting

An arbitrary system name and time can be displayed on the Web browser view.

(1) Turn [Configuration Select SW] to the [DL30] side.



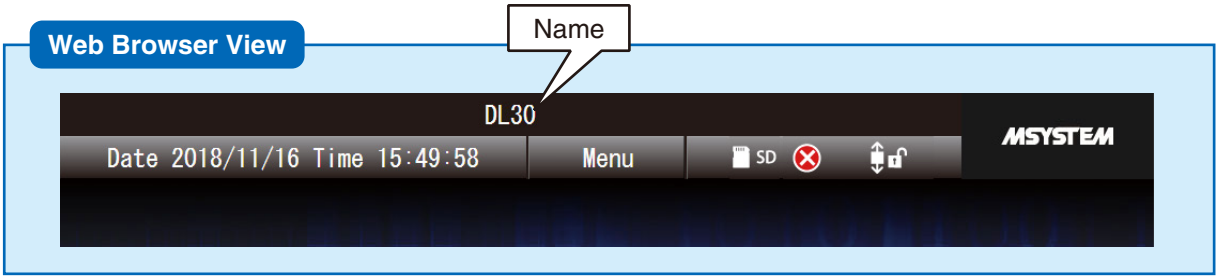
(2) Connect the DL30-G to the PC on which DL30GCFG is installed, and start up DL30GCFG.
(3) Click [Download from device] button to display [Confirm access mode] window.
(4) Check that the device is correct, and click [Connect] button.
(5) Once the setting information has been loaded from the device, the [Configuration] window is displayed.
(6) Click [System] button to display the [System] window.



Refer to the following and configure the name and other parameters.

Name

Specify the name of the DL30-G device using up to 32 characters to be displayed on the Web browser.



Time zone

Set the time zone of your region in Hours: (-12 to 13) and Minutes: (0 to 59)

Sampling adjustment at time correction

When he time has been corrected during logging, time correction can be equalized to constant time so that continuous time is obtained.
To validate equalization, set [Sampling adjustment at time correction] as [Enable].
Time correction when [Sampling adjustment at time correction] is set as [Enable] is as follows.

• Correction within 0 to -10 seconds
Sampling period is made longer until corrected current time catches up storing time.
After catching up, sampling period returns to normal.

• Correction within 0 to 10 seconds
Insufficient sampling number of data is complemented.
Also, sampling period is made shorter until storing time catches up corrected current time.
After catching up, sampling period returns to normal.

• Other than above
Updated immediately.

NOTES

When time correction is carried out again during equalization, operation is as follows.

Sampling adjustment is maintained when the difference between current time after correction and current time before correction is within 10 seconds and the difference between current time after correction and storing time is within 10 seconds.

Updated immediately other than above.

CAUTION

Enable [Sampling adjustment at time correction] when the SNTP is used.

Language

Select the language of the Web browser between English and Japanese.

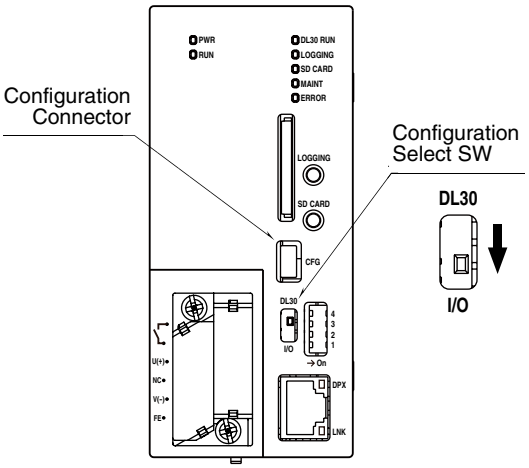
(7) To activate the setting, return to [Configuration] and click [Upload to device] button.I/O device assignment and setting

3.5 I/O module setting

3.5.1 R30 I/O module setting

Configure setting of each R30 series I/O module using R30CFG.

(1) Set the [Configuration Select Switch] of the device as [I/O].



(2) Connect the PC on which R30CFG is installed with the GL30-G using a USB cable.

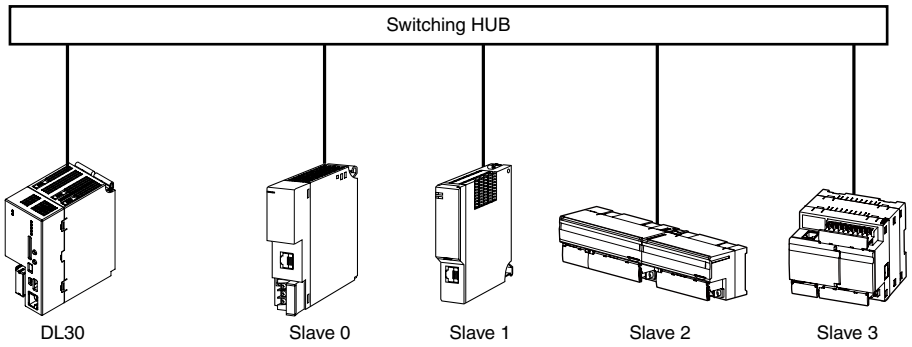
(3) Refer to the [R30CFG Users Manual] and configure setting such as the I/O range, etc.

CAUTION

The I/O modules cannot be configured via network.

3.5.2 Remote I/O device setting

Using the Modbus/TCP master function of the DL30-G, I/O can be expanded using remote I/O nodes with Modbus/TCP slave function.



A maximum of 32 remote I/O nodes can be connected to one device.
Set different IP addresses which do not overlap with the address of the DL30-G for the remote I/O devices (Slave 0 to Slave 31).

■ Remote I/O nodes which can be connected

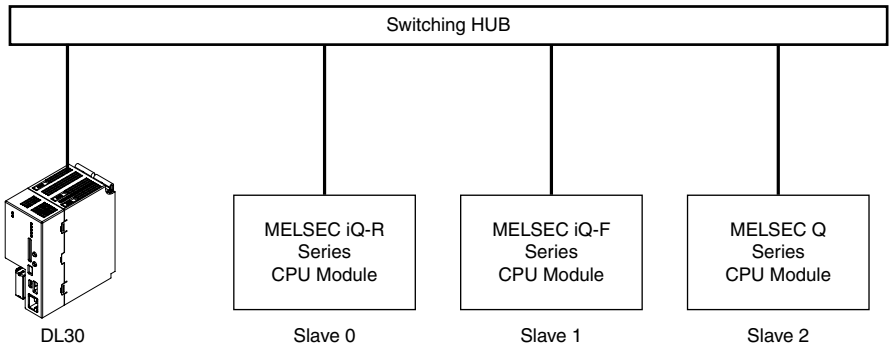
- TR30-G
- TR3EX
- DL8
- GR8-EM
- R3-NE1
- R5-NE1
- R6-NE1
- R30NE1
- R6-NE2
- R7E
- R9EWTU
- IT Series
- 72EM2-M4
- 73VR Series

NOTES

- See the Users Manual of each product for the remote I/O setting.
- When connecting to the DL30-G via WAN, It is strongly recommended to use VPN in terms of security.

3.5.3 SLMP device connection setting

Using the SLMP client function of the DL30-G, I/O can be expanded using SLMP devices.



A maximum of 32 SLMP devices can be connected to single DL30-G device.
Set different IP addresses which do not overlap with the address of the DL30-G for the SLMP device (Slave 0 to Slave 31).

■ SLMP-compatible devices that can be connected to the DL30-G

- MELSEC iQ-R Series (Mitsubishi Electric)
- MELSEC iQ-F Series (Mitsubishi Electric)
- MELSEC Q Series (Mitsubishi Electric)

(Tested and verified)

- R04CPU
- FX5U-32M
- Q03UDECPU

■ Connecting CPU modules for SLMP

The DL30-G is connected to SLMP devices by TCP/IP over the Ethernet.
In order that the DL30-G communicates with an SLMP device, register the device on Ethernet Configuration setting window and set as follows:

Communication data code: Binary
Communication method: SLMP
Protocol: TCP
IP address: IP address specified in the I/O slave setting of the DL30GCFG
Port No.: Port No. specified in the I/O slave setting of the DL30GCFG

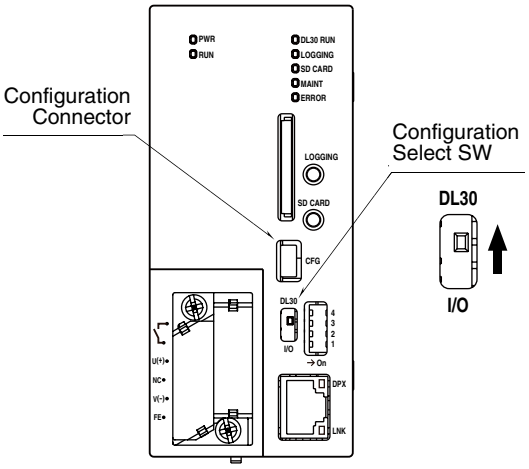
NOTES

See the User Manual of each product for the SLMP setting.
When connecting to the DL30-G via WAN, It is strongly recommended to use VPN in terms of security.

3.6 I/O setting

Configure the I/O setting. Use DL30GCFG to configure the setting.

(1) Turn [Configuration Select SW] to the [DL30] side.



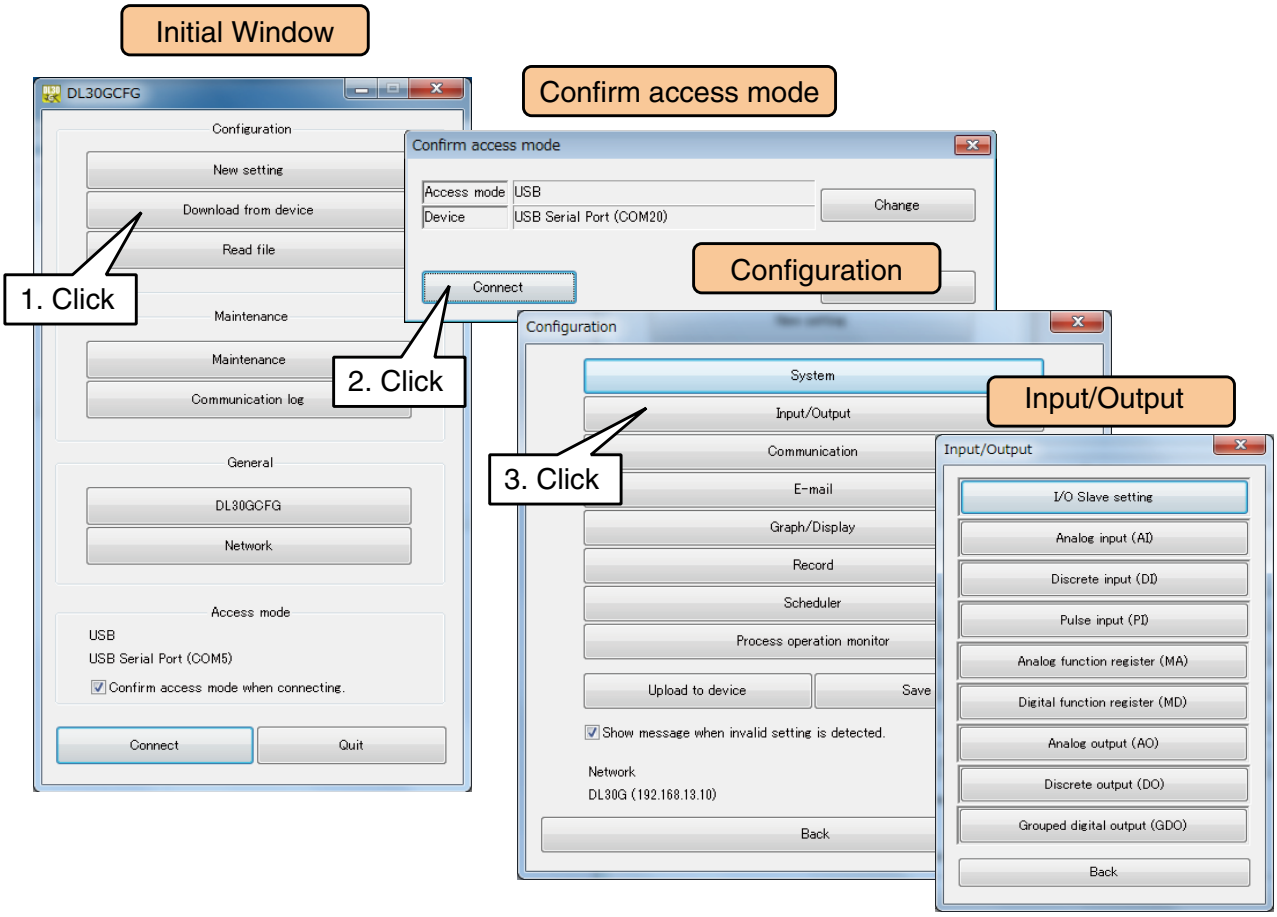
(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) After the setting information is downloaded from the device, the [Configuration] window is displayed.

(6) Click [Input/Output] button to open the [Input/Output] window.



NOTES

The parameters for which the engineering unit value is set in DL30GCFG can be set between ±10,000,000,000.

The maximum number of digits that can be entered after the decimal point equals the number of digits which is displayed on the window.

For example, since the scale 0% for the analog input has an initial value of 0.000, when [123.4567890] is entered, it is rounded off to 3 digits after the decimal point to match the initial value 0.000, and therefore becomes [123.457] (The 4th digit after the decimal point is rounded off).

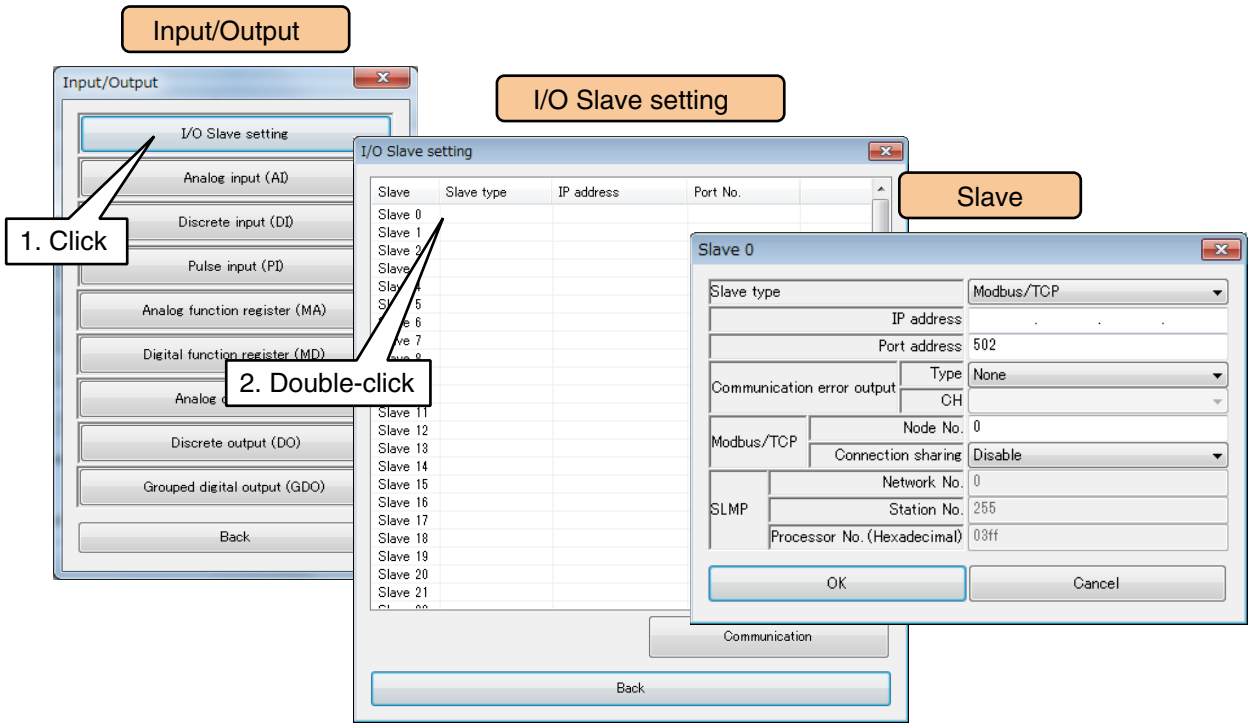
3.6.1 I/O slave setting

Modbus/TCP remote I/O and SLMP devices that are used to communicate with the DL30-G must be identified with respective IP addresses and relevant settings.
The Pause period and Timeout setting are common to all slave devices.

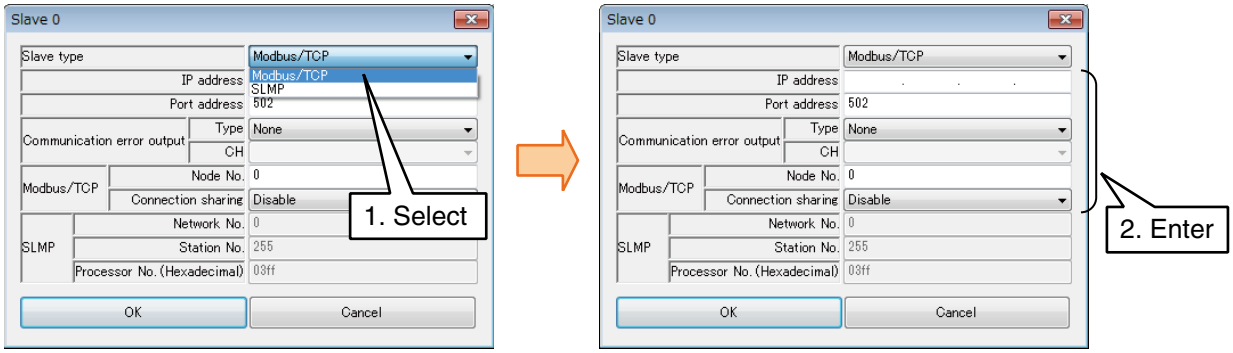
Assigning remote I/O

(1) In the [Input/Output] window, click [I/O slave setting] button.

(2) Double-click a row of the slave to be set to open the slave setting window.



(3) Choose [Modbus/TCP] as the Slave time. Enter IP address and other required parameters for the remote I/O device selected in [3.5.2 Remote I/O device setting]. Click [OK] to temporarily store the setting.



Parameter	Description
IP address	Set an IP address.
Port address	Set a Port address.
Communication error output	Communication error per slave unit can be notified as error output to MD or DO. The error output remains ON while the communication with the slave is lost, and returns to OFF automatically when it is recovered. Specify a channel from MD (digital function register), DO (discrete output), or GDP (discrete output group).
Node No.	Set Node No. of the remote I/O device.
Connection sharing	Specify a slave No. with which connection is shared. The DL30-G communicates with the slave through the shared connection.

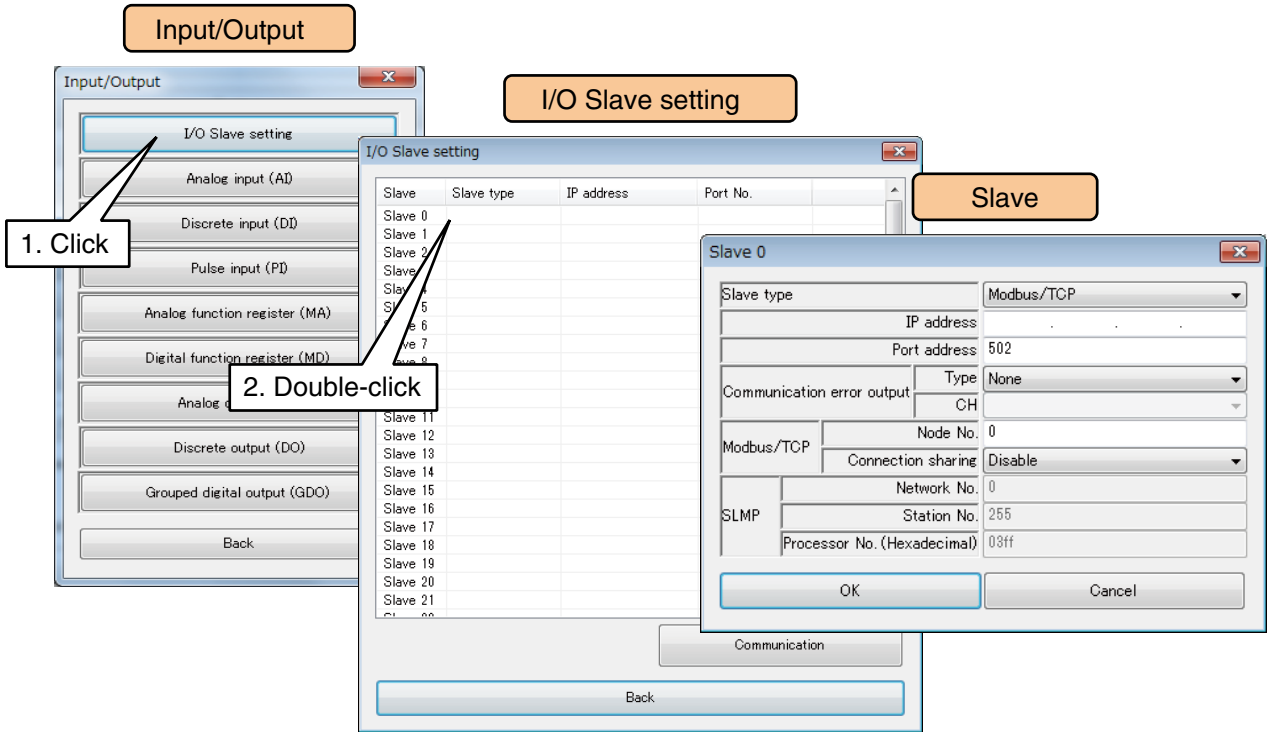
NOTES

To register a remote I/O which is connected to the 72EM2-M4 through Modbus-RTU (RS-485), set the IP address of 72EM2-M4 in the [IP address], and the Modbus-RTU node number in the [Node No.]. The maximum number of connections is limited by the number of slaves specified in Modbus/TCP master (I/O slave setting) window.
The same applies to other gateways such as model GR8-EM.

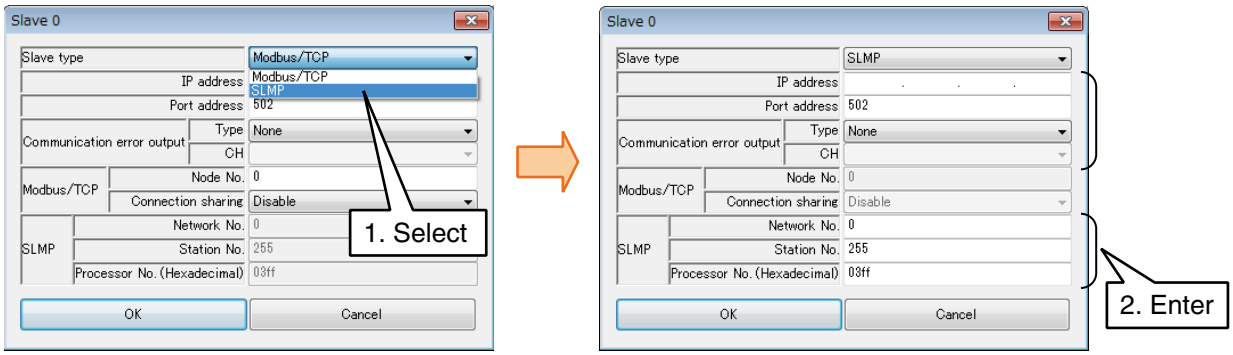
Assigning SLMP device

(1) In the [Input/Output] window, click [I/O slave setting] button.

(2) Double-click a row of the slave to be set to open the slave setting.



(3) Choose [SLMP] as the Slave type.
Enter IP address and other required parameters for the SLMP device selected in [3.5.3 SLMP device connection setting]. Click [OK] to temporarily store the setting.

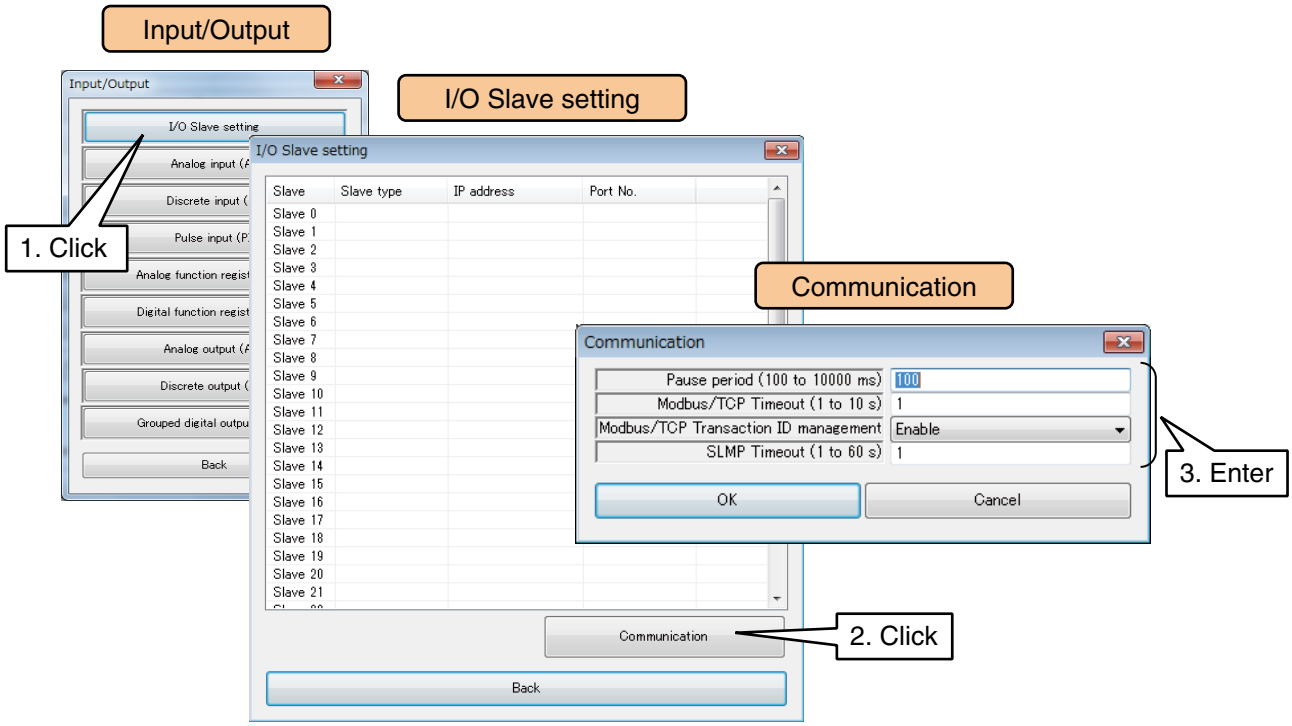


Parameter	Description
IP address	Set an IP address.
Port address	Set a Port address.
Communication error output	Communication error per slave unit can be notified as error output to MD or DO. The output remains ON while the communication with the slave is lost, and returns back to OFF automatically when it is recovered. Specify a channel from MD (digital function register), DO (discrete output), or GDO (grouped digital output).
Network No.	Set Network No. of the SLMP device.
Station No.	Set Station No. of the SLMP device
Processor No. (HEX)	Set processor No. of the SLMP device.

Communication setting

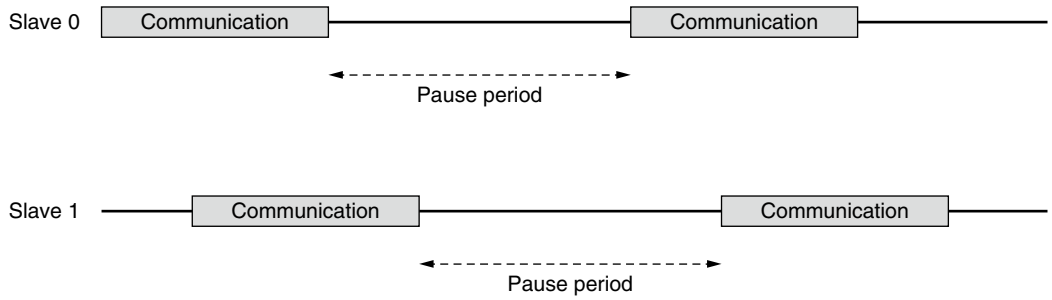
(1) In the [Input/Output] window, click [I/O slave setting] button to display the [I/O slave setting] window.

(2) Click [Communication] button to display the [Communication] setting window.



• Pause period

Considering the communication pertaining to all the registered slaves and all the channels as one batch, set the time from one communication batch to the next.
This is roughly the same value as the sampling interval.



• Modbus/TCP Timeout

Set the wait time for a response after a query has been sent in Modbus/TCP communication.

• Modbus/TCP Transaction ID management

Unintended messages are skipped by the management of Modbus message IDs.

• SLMP Timeout

Set the wait time for a response after a query has been sent in SLMP communication.

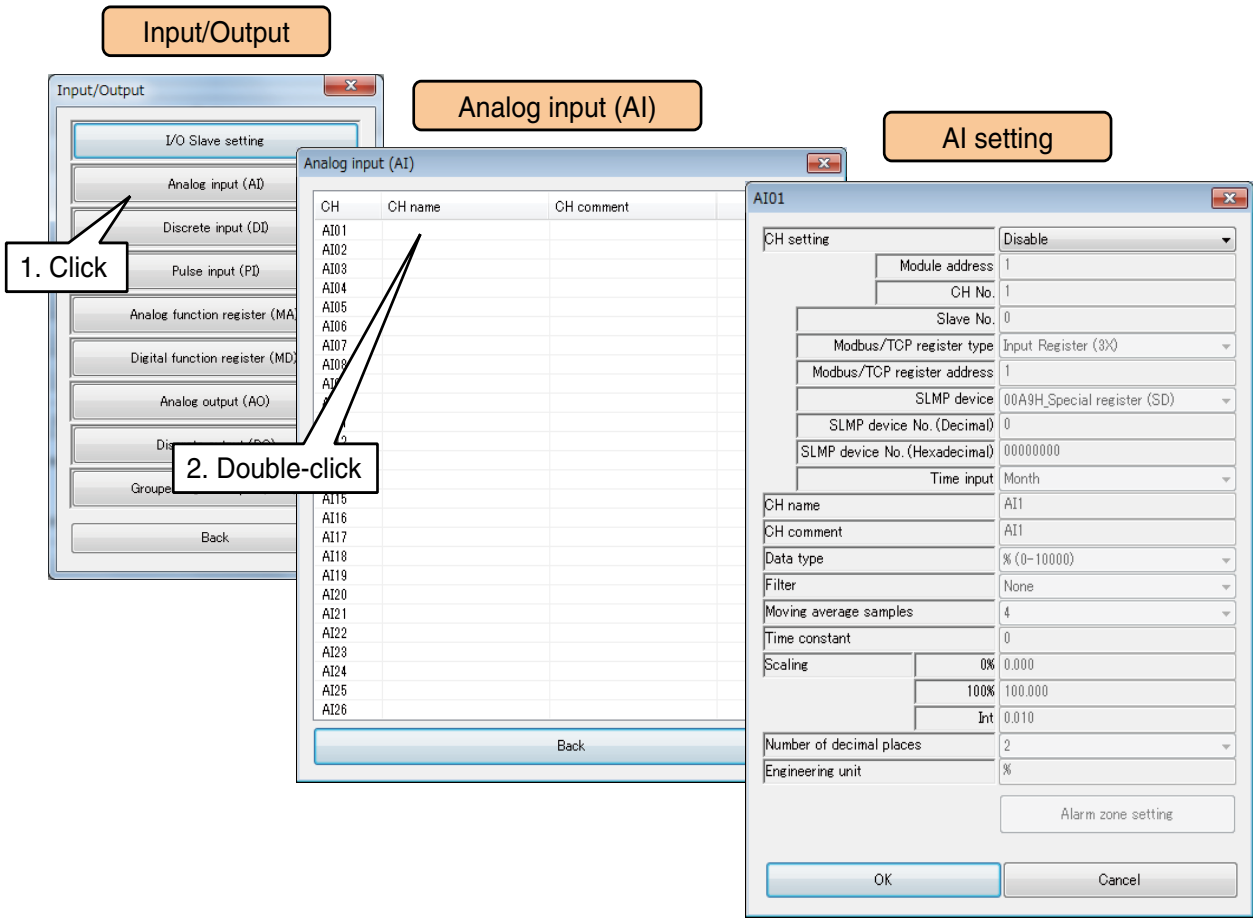
3.6.2 Analog input (AI)

A maximum of 128 points (AI1 to AI128) of analog inputs can be monitored.
Assign the analog inputs from the I/O module, remote I/O, or SLMP device connected to the DL30-G by the following procedure.

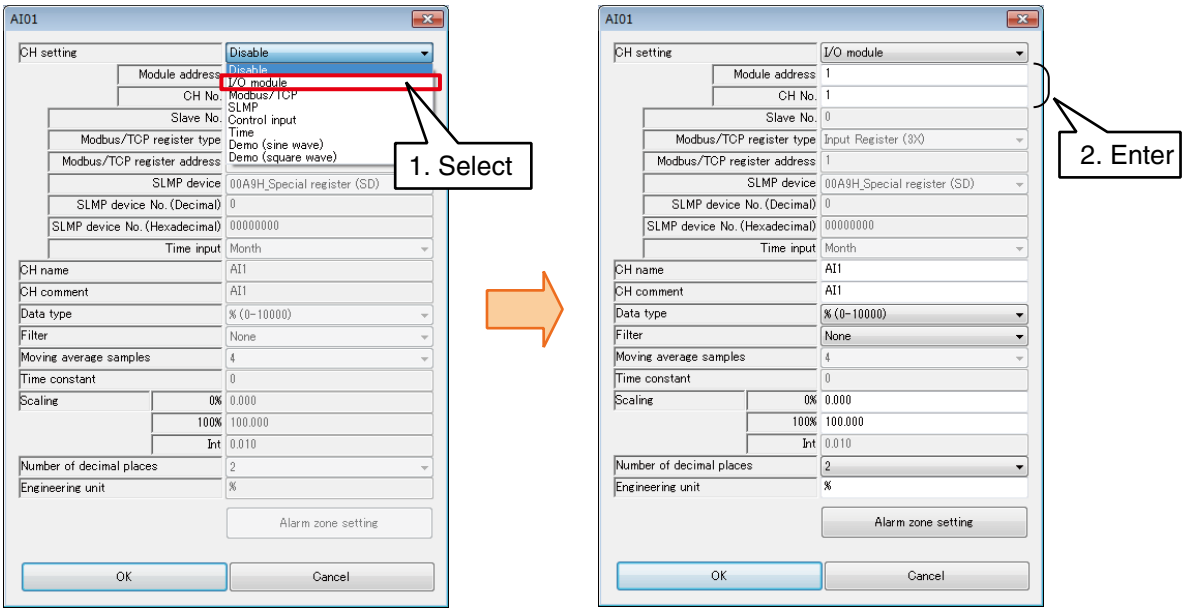
Assigning I/O module to AI

(1) Click [Analog input (AI)] button on the [Input/Output] window to display the [Analog input (AI)] window.

(2) Double-click a row of the AI channel to be set to display the [AI setting] window.



(3) Set the [CH setting] as [I/O module] to enable the [Module address] and [CH No.] fields.
Enter the CH value to be assigned.



Up to 4 analog channels can be assigned per module.

Module category	Compatible module	CH No.	Module address	CH No. in the module
2 ch module	R30US2 R30SV2	CH1	N	1
		CH2	N	2
4 ch module	R30SV4 R30SVF4 R30TS4 R30RS4 R30MS4 R30US4 R30CT4E R30GCIE1 R30GECT1	CH1	N	1
		CH2	N	2
		CH3	N	3
		CH4	N	4

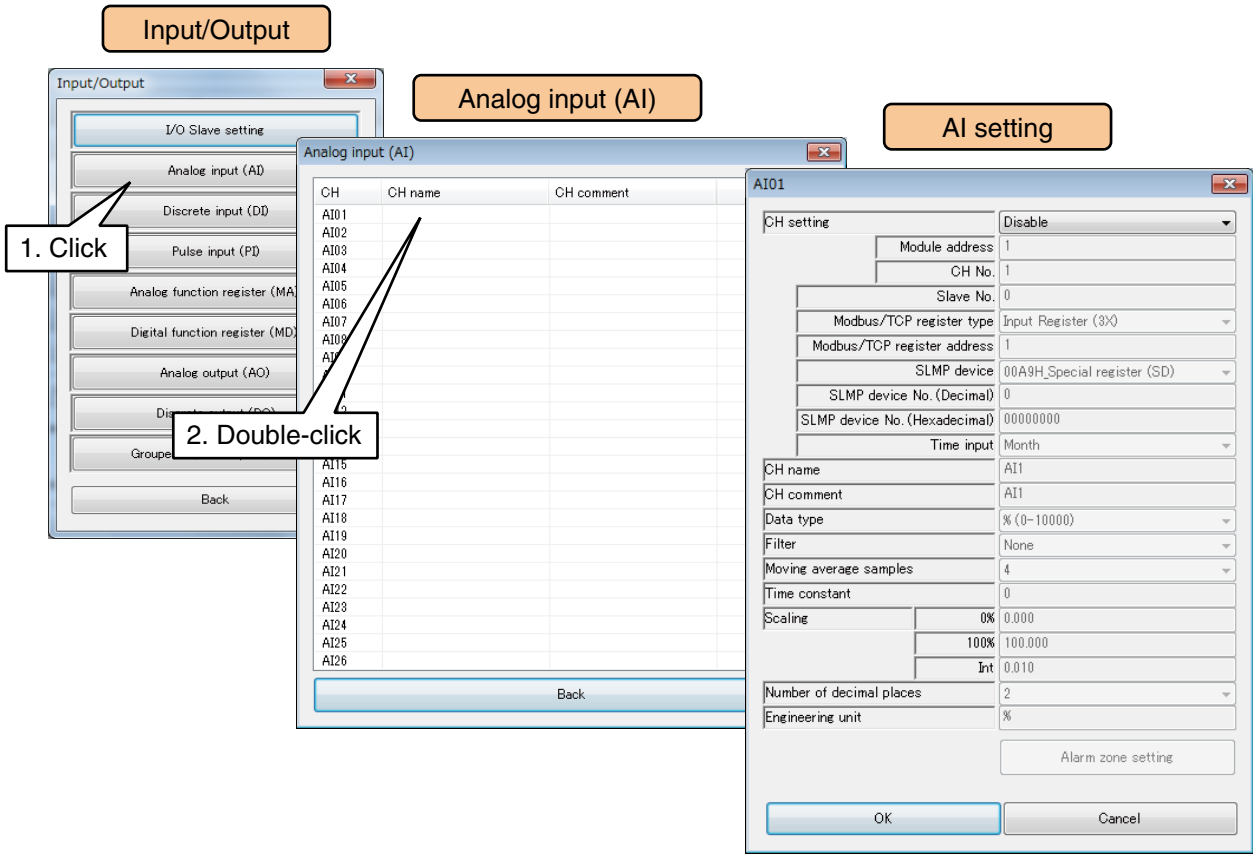
N: Module address

Assigning remote I/O to AI

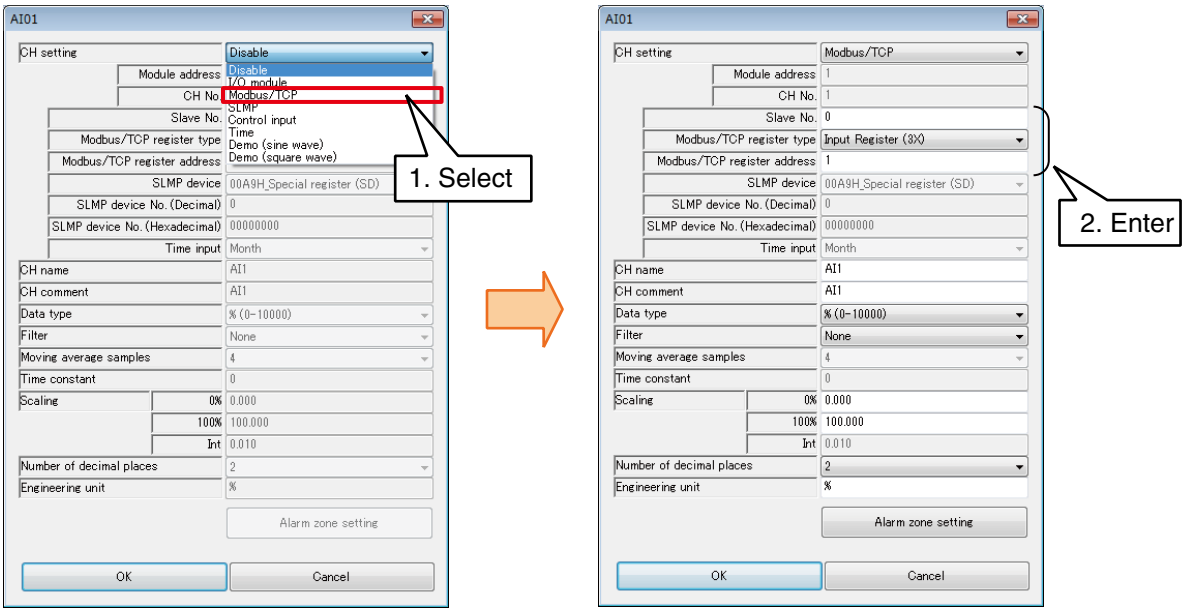
(1) First, perform the I/O slave setting for the remote I/O device.
➔ 3.6.1 I/O slave setting

(2) Click [Analog input (AI)] button on the [Input/Output] window to display the [Analog input (AI)] window.

(3) Double-click a row of the AI channel to be set to display the [AI setting] window.



(3) Set the [CH setting] as [Modbus/TCP], and enter the [Slave No.], [Modbus/TCP register type], and [Modbus/TCP register address].



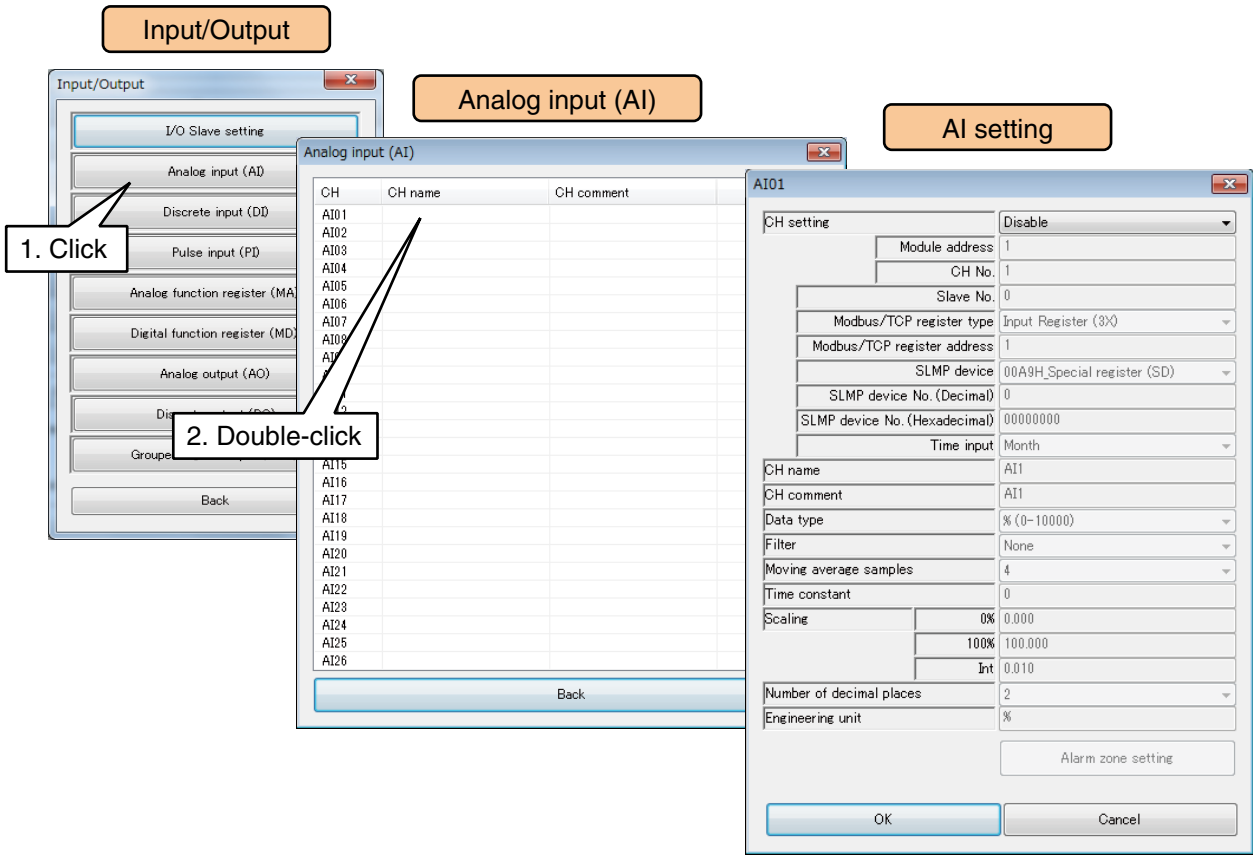
Parameter	Description
Modbus/TCP slave No.	Enter the slave No. (0 to 31) set in (1).
Modbus/TCP register type	Select from [Input Register (3X)] or [Holding Register (4X)].
Modbus/TCP register address	Set the register address (1 to 65536) in the above register type.

Assigning SLMP device to AI

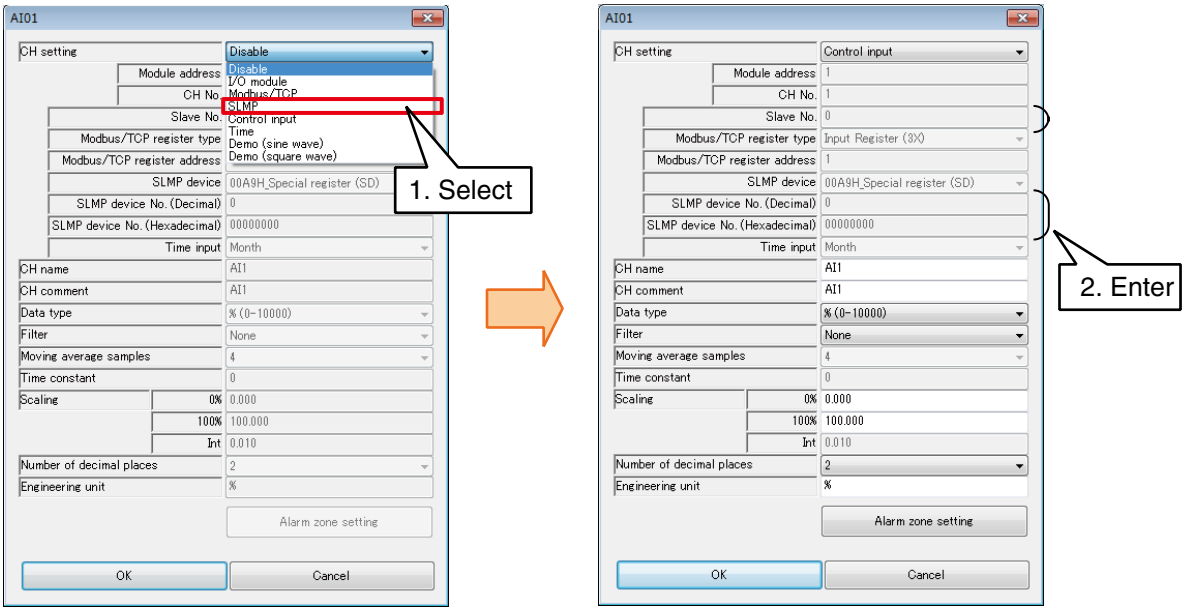
(1) First, perform the I/O slave setting for the SLMP device.
➔ 3.6.1 I/O slave setting

(2) Click [Analog input (AI)] button on the [Input/Output] window to display the [Analog input (AI)] window.

(3) Double-click a row of the AI channel to be set to display the [AI setting] window.



(3) Set the [CH setting] as [SLMP], and enter the parameters referring to the table below.



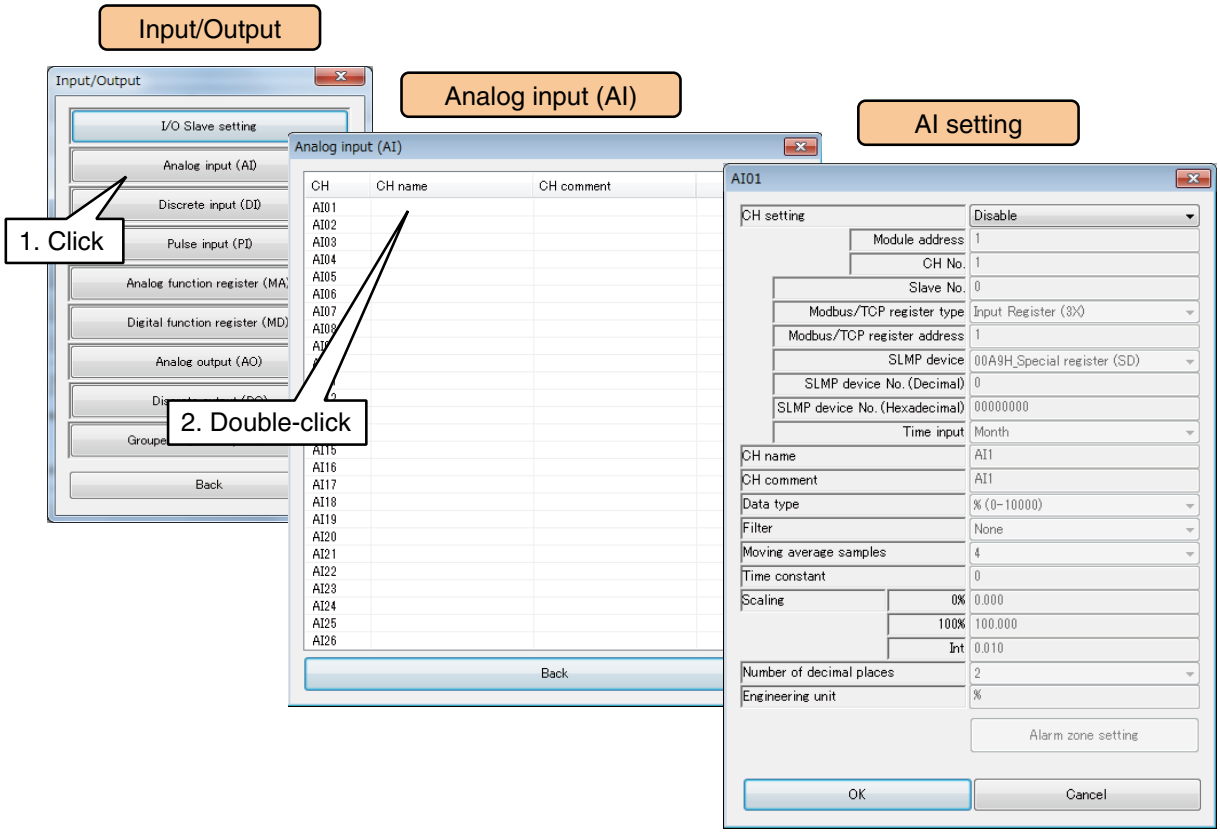
Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
SLMP device	Choose the device code of the SLMP device to be connected.
SLMP device No.	Set the device No. of the SLMP device to be connected.

Assigning control input to AI

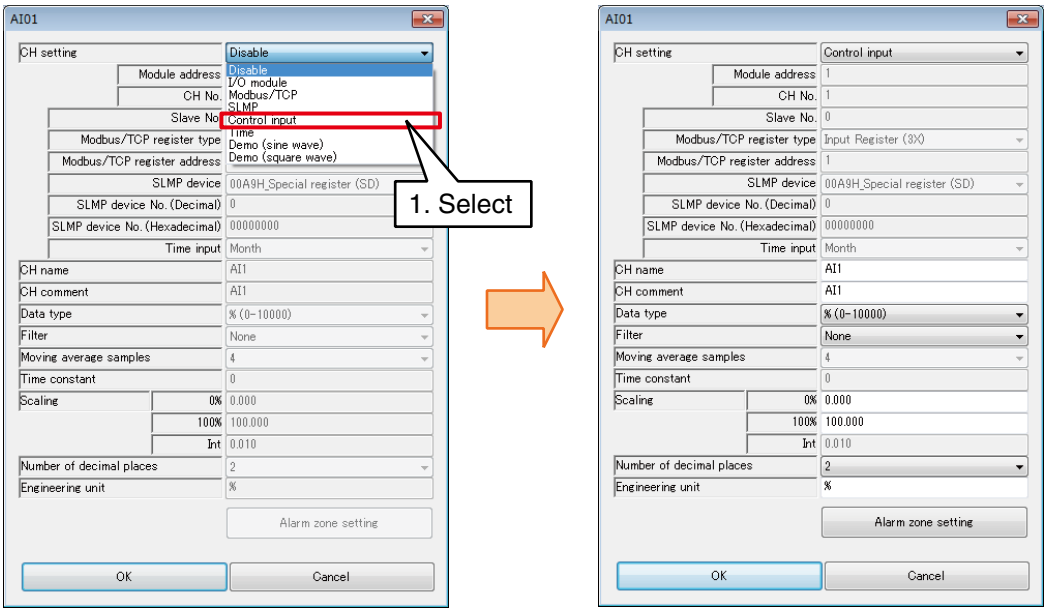
Input values can be specified from remote locations by writing values in the internal registers using the Modbus/TCP slave function.

(1) Click [Analog input (AI)] button on the [Input/Output] window to display the [Analog input (AI)] window.

(2) Double-click a row of the AI channel to be set to display the [AI setting] window.



(2) Set the [CH setting] as [Control input].



NOTES

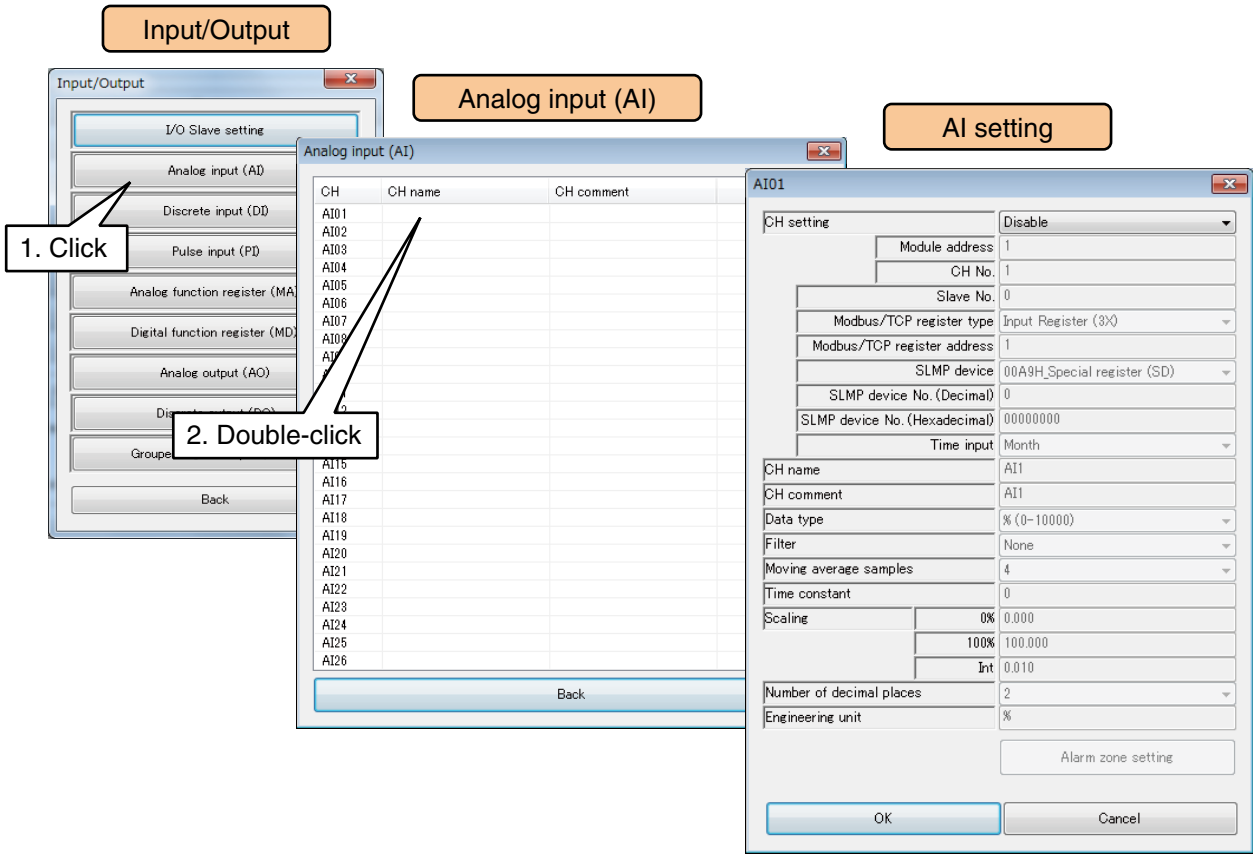
See [3.12.3 Modbus/TCP slave] and [8.2.6 Modbus/TCP slave] for information on the Modbus/TCP slave function and internal registers.

Assigning time input to AI

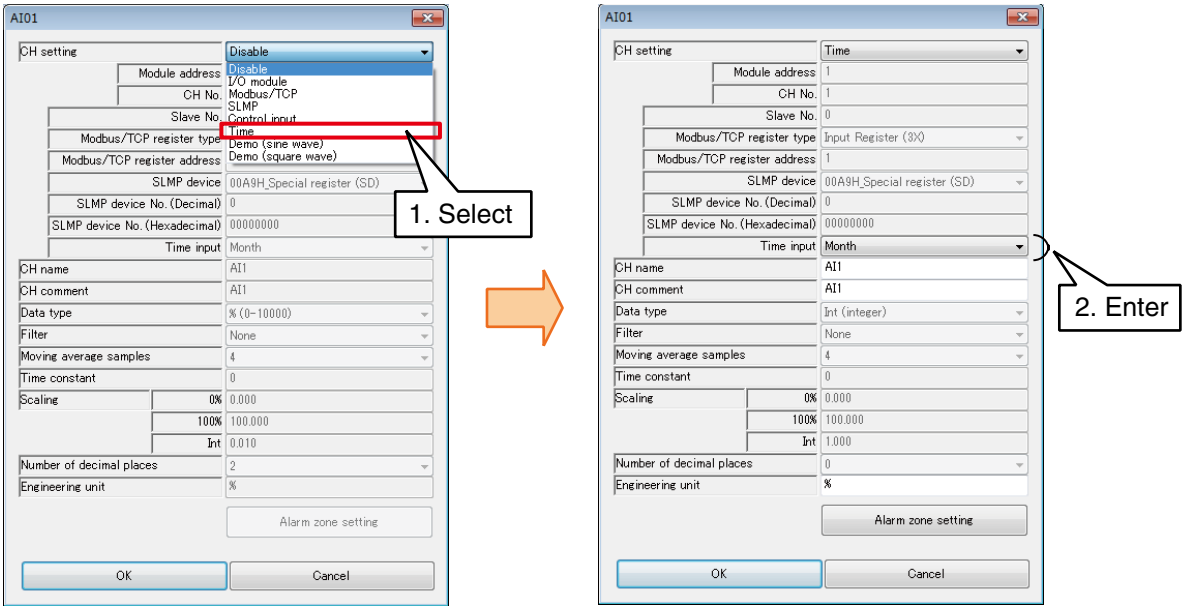
The current time consisting of the month / date / day (SUN: 0, MON: 1, ...SAT: 6) / hour (0 – 23) / minutes (0 – 59) / seconds (0 – 59) can be used as the input value to AI.
By setting the zone, the totalized value (PI) or function value (MA) can be reset in a fixed cycle.

(1) Click [Analog input (AI)] button on the [Input/Output] window to display the [Analog input (AI)] window.

(2) Double-click a row of the AI channel to be set to display the [AI setting] window.

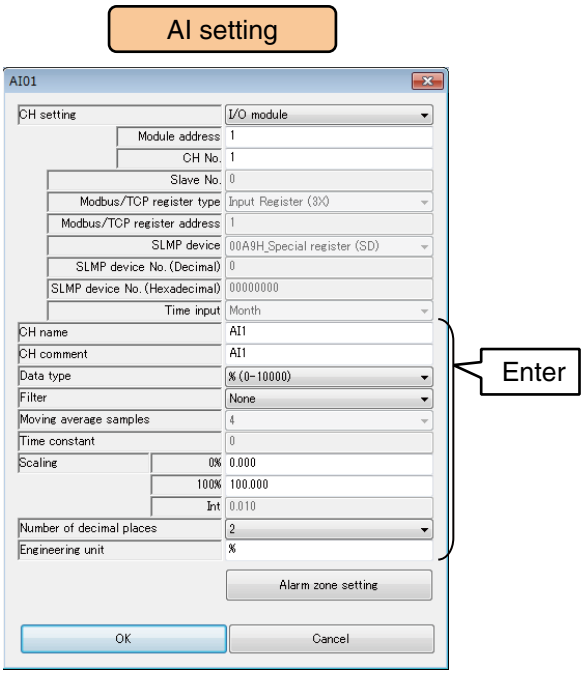


(2) Set the [CH setting] as [Time], and select the item to be used as the input value from [hour / minutes / seconds].



Basic setting (AI)

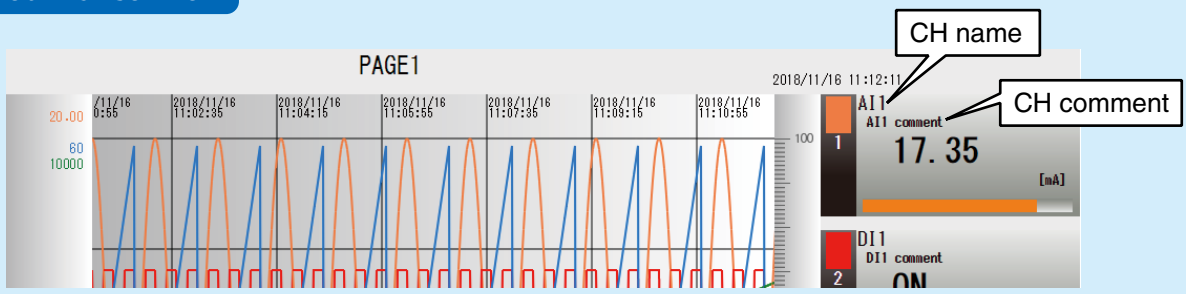
Once the assignment is complete, configure the following basic setting.
Click [OK] to temporarily store the setting.



Parameter	Description
CH name	Set a name for the channel using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Data type	Select the data type from the following 3 types. • % %×100 format data (-2000 to 12000) (equivalent to the voltage/current data for remote I/O) • Int Signed 16 bit integer format data (-32768 to 32767) (equivalent to the temperature data for remote I/O) • Uint Unsigned 16 bit integer format data (0 to 65535)
Filter	Set the filter function. Select from None / Moving average / Delay buffer.
Moving average samples	If the filter is set as [Moving average], set the number of data samples. Select from 4 / 8 / 16 / 32 / 64.
Time constant	If the filter is set as [Delay buffer], set its time constant. Set a numeric value between 0 and 100 for the [Sampling cycle] of the device.
Scaling	• When the data type is [%] Set the actual corresponding values at 0% and 100%, respectively as numeric values. • When the data type is [Int] or [Uint] Set the numeric value by which to multiply data in order to convert it to its actual value. For example, if the temperature data is the actual value × 10, enter as [0.1].
Number of decimal places	Set the number of digits after the decimal point for the values displayed as numeric values on the Web browser view. Select from 0 / 1 / 2 / 3.
Engineering unit	Set the engineering unit for the actual value set in the [Scaling]. Can be set using up to 8 characters.

The CH name and CH comment which have been set are displayed in the initial window or the trend of the Web window.

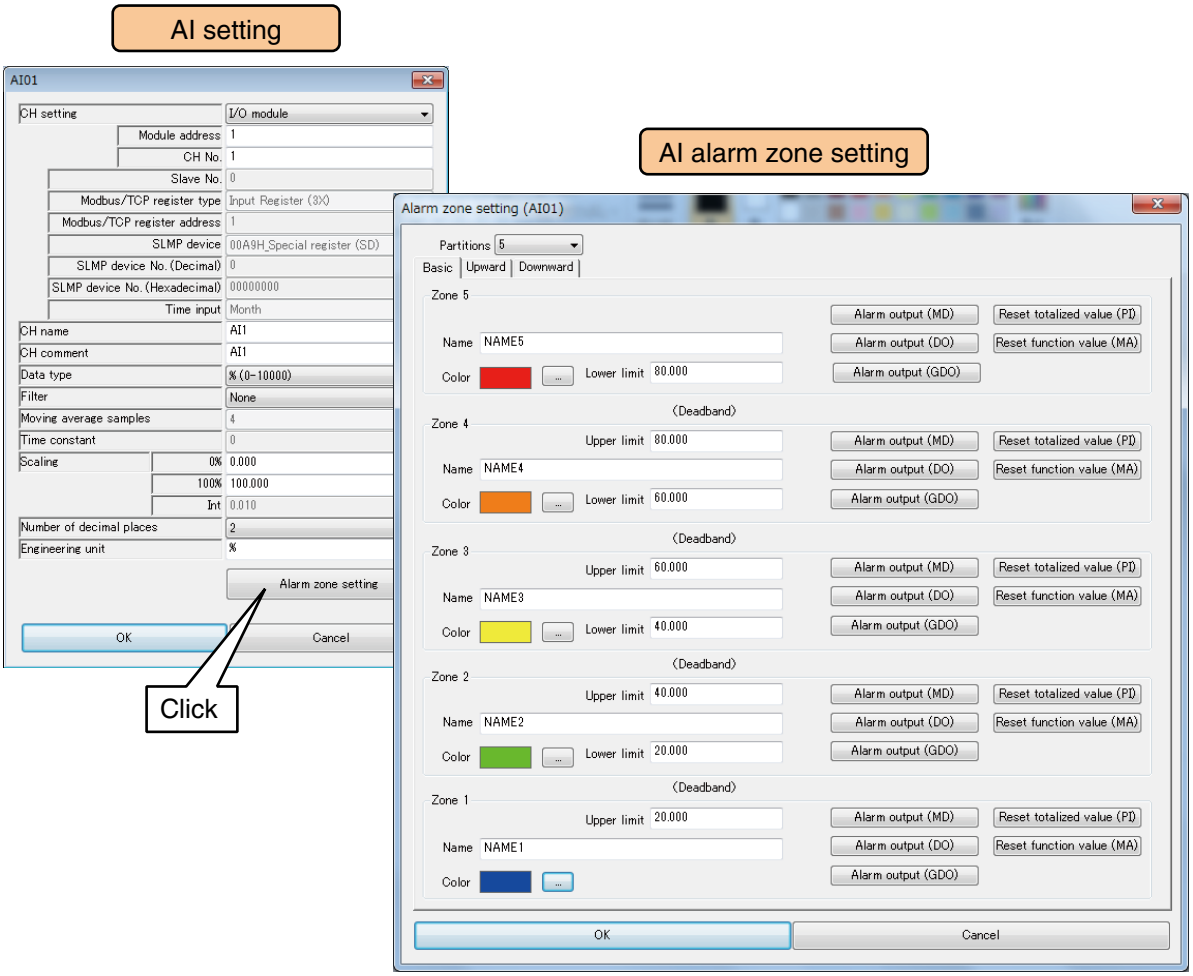
Web Browser View



Alarm zone setting (AI)

Configure alarm zones corresponding to the input values.
A maximum of 5 zones can be set, and deadband can also be set between zones.

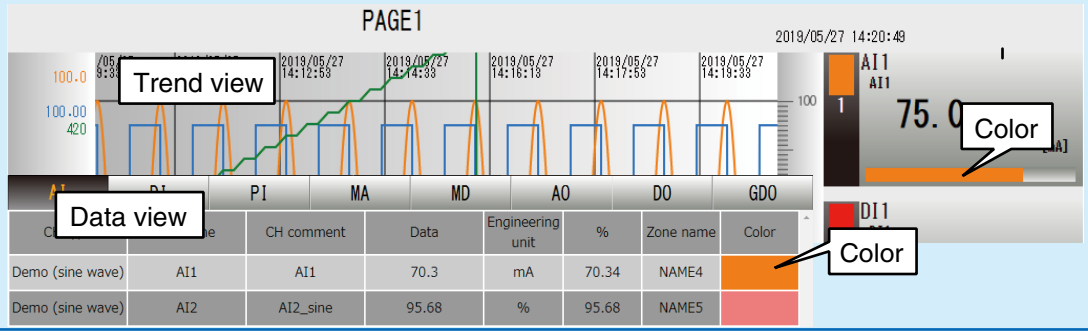
(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting] window.



(2) Set relevant parameters by referring to the table below.

Parameter	Description
Partitions	Set the number of partitions to be used. Select from: Disable / 2 / 3 / 4 / 5.
Name	Set a name for each zone using up to 32 characters.
Color	Set a color to represent each zone which will be displayed on the Web browser view.
Upper limit : : : Lower limit	Set the upper and lower limit values for these zones as actual values. Set such that the upper limit value > lower limit value. • When the deadband is set When a deadband is set between zone 1 and zone 2, set the values so that the deadband is between the upper limit value for zone 1 and the lower limit value for zone 2. Set similarly for the other zones as well. • When the deadband is not set When the deadband is not set between zone 1 and zone 2, set the same value for the upper limit value of zone 1 and the lower limit value of zone 2. Set similarly for the other zones as well.

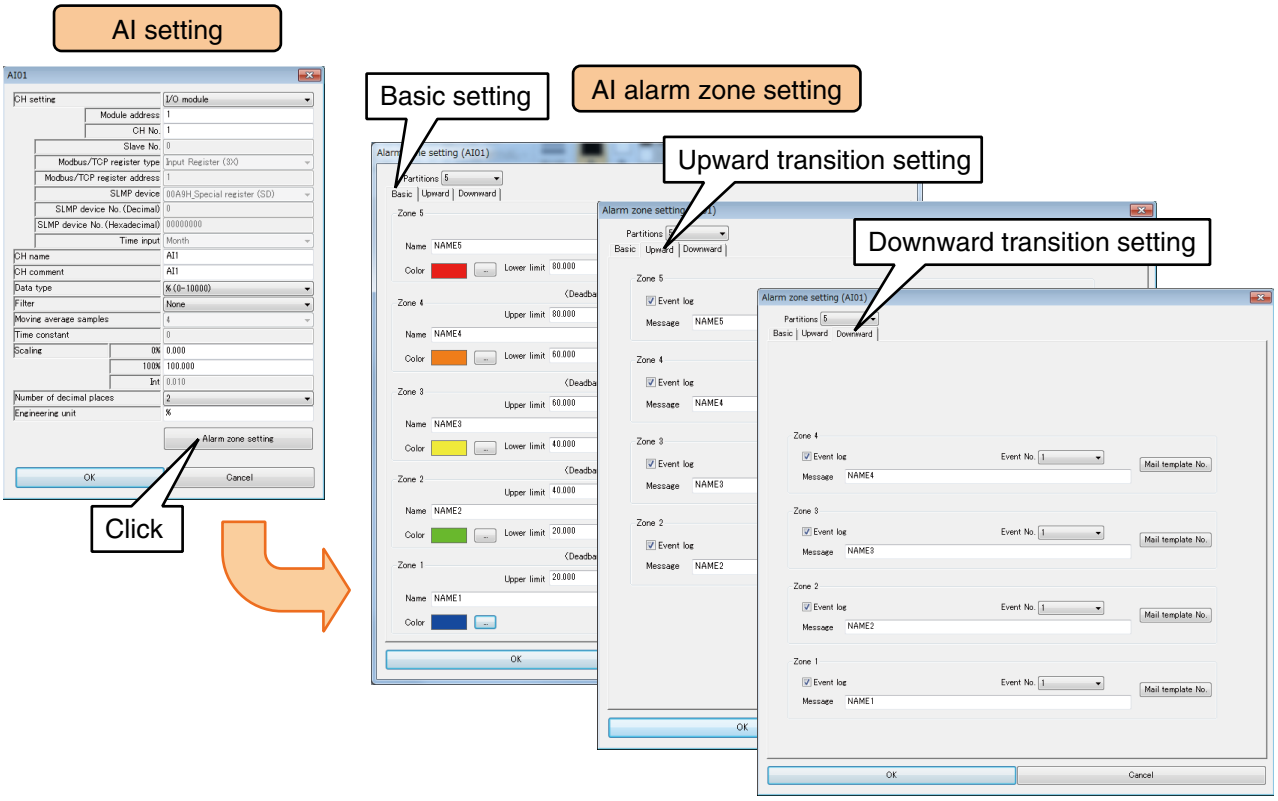
Web Browser View



Upward/downward transition setting (AI)

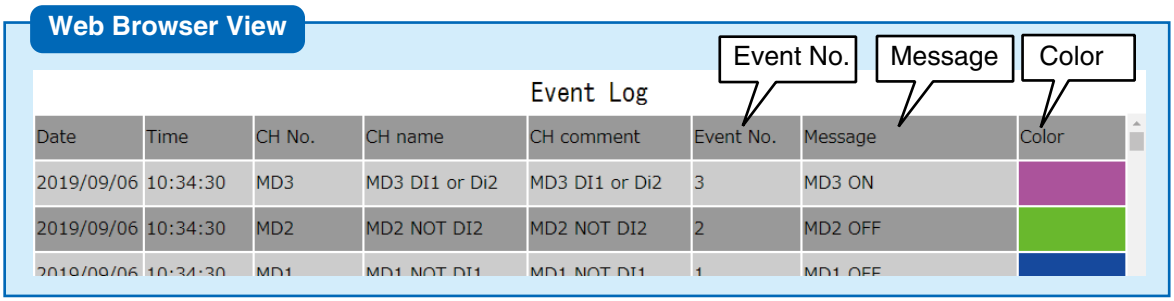
An event occurs when the zones set in the [Alarm zone setting] window shift from one to another.

(1) Click [Alarm zone setting] button in the [AI setting] window to display the [Alarm zone setting] window. Click the [Upward] or [Downward] tab.



(2) Set relevant parameters by referring to the table below.
Once the setting is complete, click [OK] to temporarily store the setting.

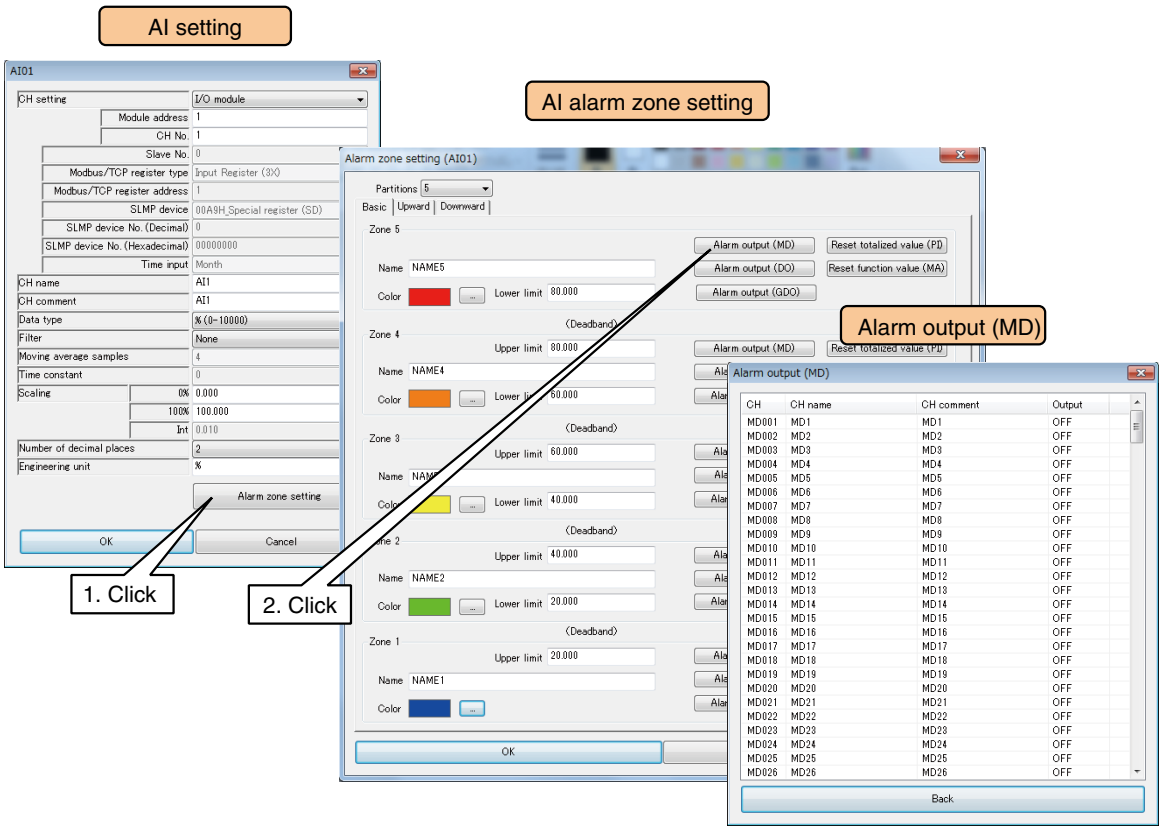
Parameter	Description
Event log	Set whether or not to record an event when the input value has changed and entered a certain zone. Check the box to record events.
Event No.	Set the event number to be assigned to each event log. (Setting range: 1 to 64)
Message	Set a message to be displayed when an event occurs using up to 32 characters.
Mail template No.	Set the mail template number to be sent when an event occurs. Multiple mail templates can be specified. Create the templates in advance. ➔ 3.10.2 Mail template setting



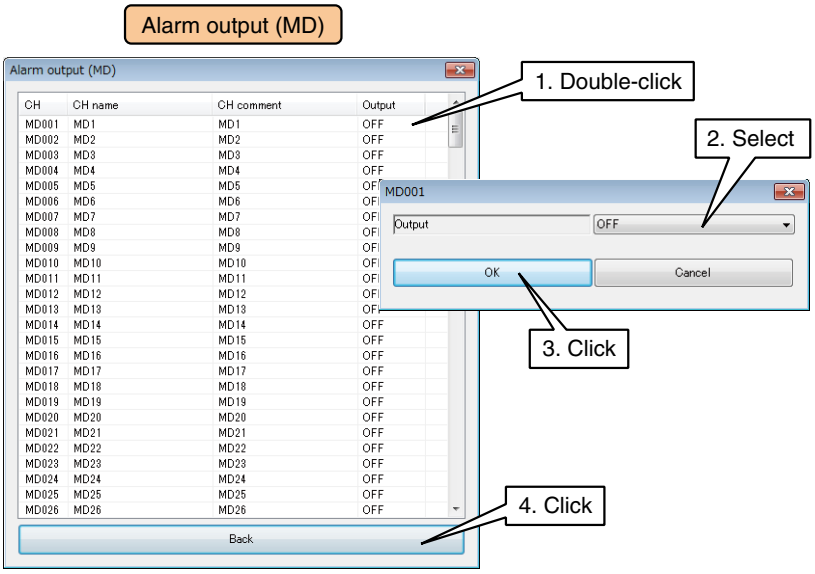
MD alarm output (AI)

A specific MD can be turned ON for each zone.

(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting].
Click [Alarm output (MD)] button of a specific zone to display the [Alarm output (MD)].



(2) Double-click the MD channel to be operated and set as ON/OFF, and click [OK].



(3) Click [Back] to return to the [AI alarm zone setting] window.

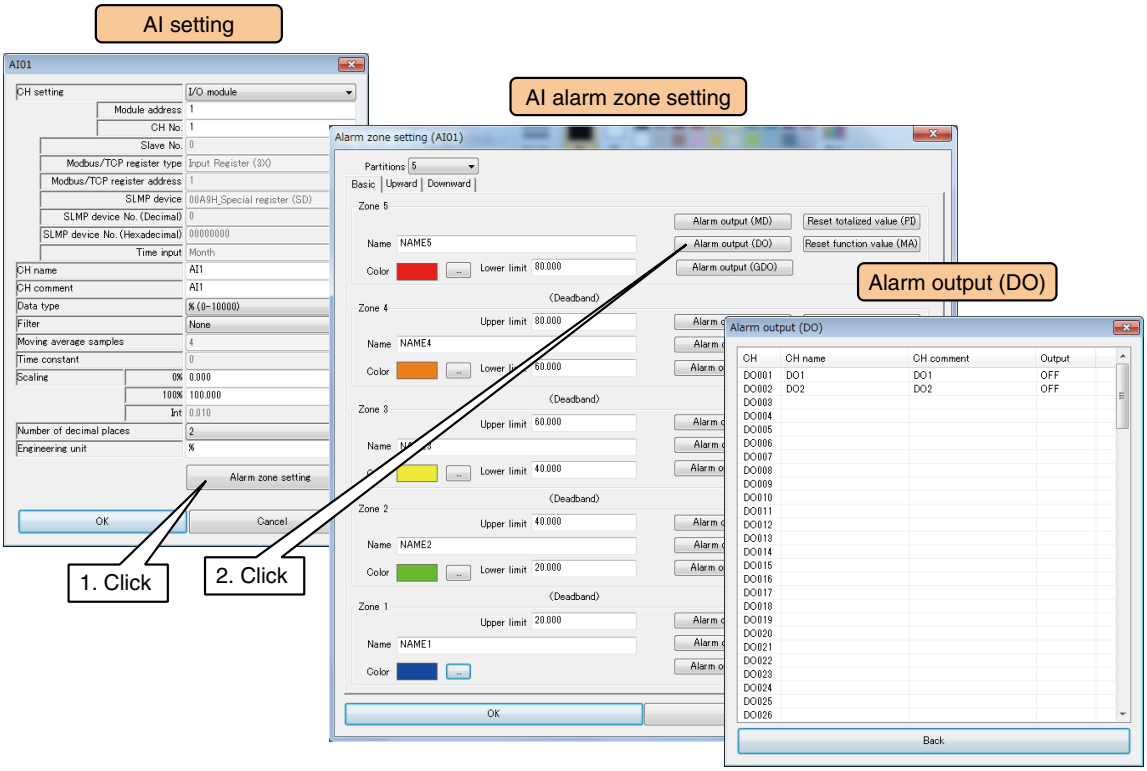
CAUTION

- When MD is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

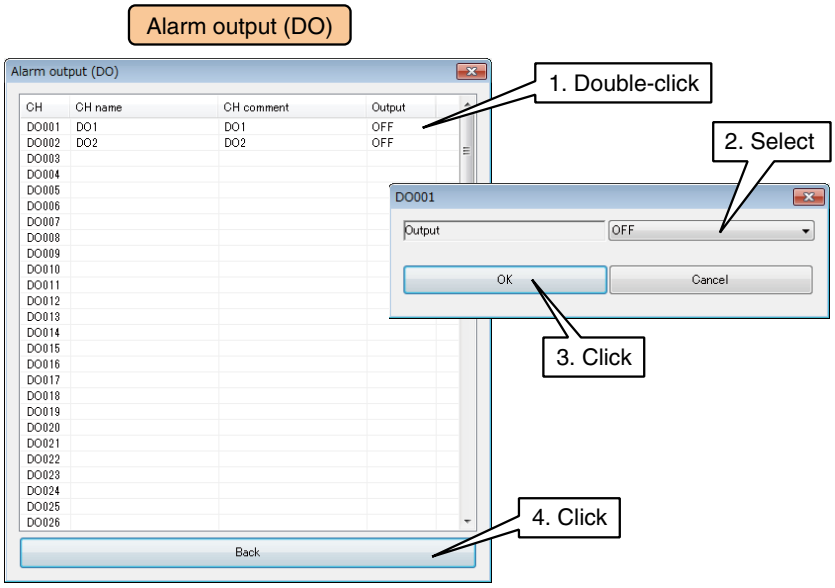
DO alarm output (AI)

A specific DO can be turned ON for each zone.
Configure the DO setting before configuring these setting. ➔ 3.6.8 Discrete output (DO)

(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting] window.
Click [Alarm output (DO)] button of a specific zone to display the [Alarm output (DO)].



(2) Double-click the DO channel to be operated and set as ON/OFF, and click [OK].



(3) Click [Back] to return to the [AI alarm zone setting] window.

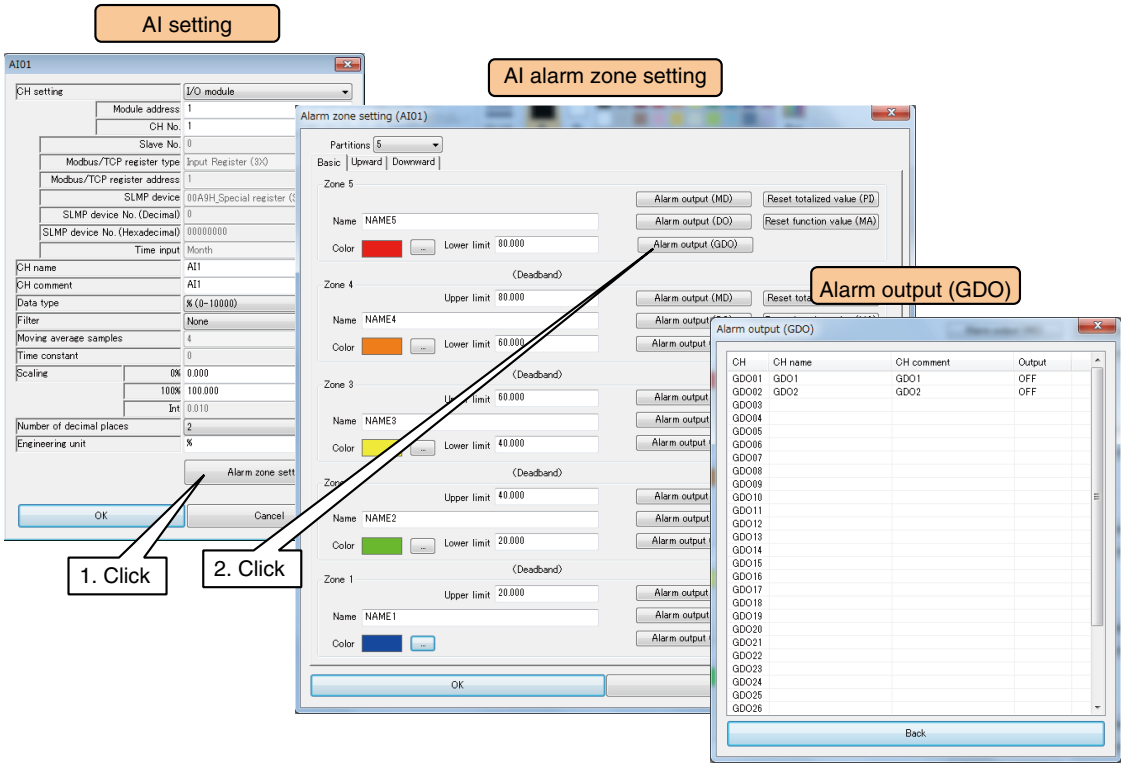
CAUTION

- When DO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

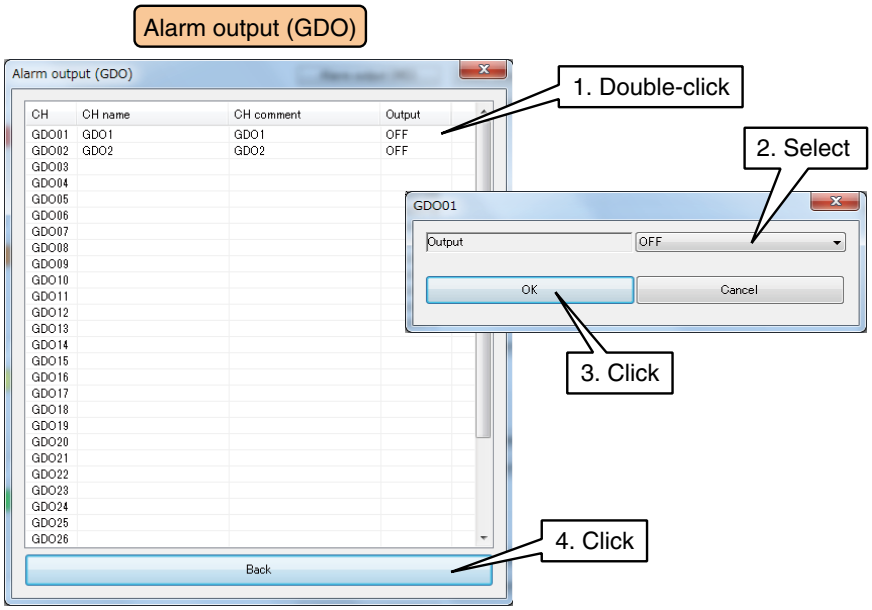
GDO alarm output (AI)

A specific GDO can be turned ON for each zone.
Configure the GDO setting before configuring these setting. ➔ 3.6.9 Grouped digital output (GDO)

(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting] window.
Click [Alarm output (GDO)] button of a specific zone to display the [Alarm output (GDO)].



(2) Double-click the GDO channel to be operated and set as ON/OFF, and click [OK].



(3) Click [Back] to return to the [AI alarm zone setting] window.

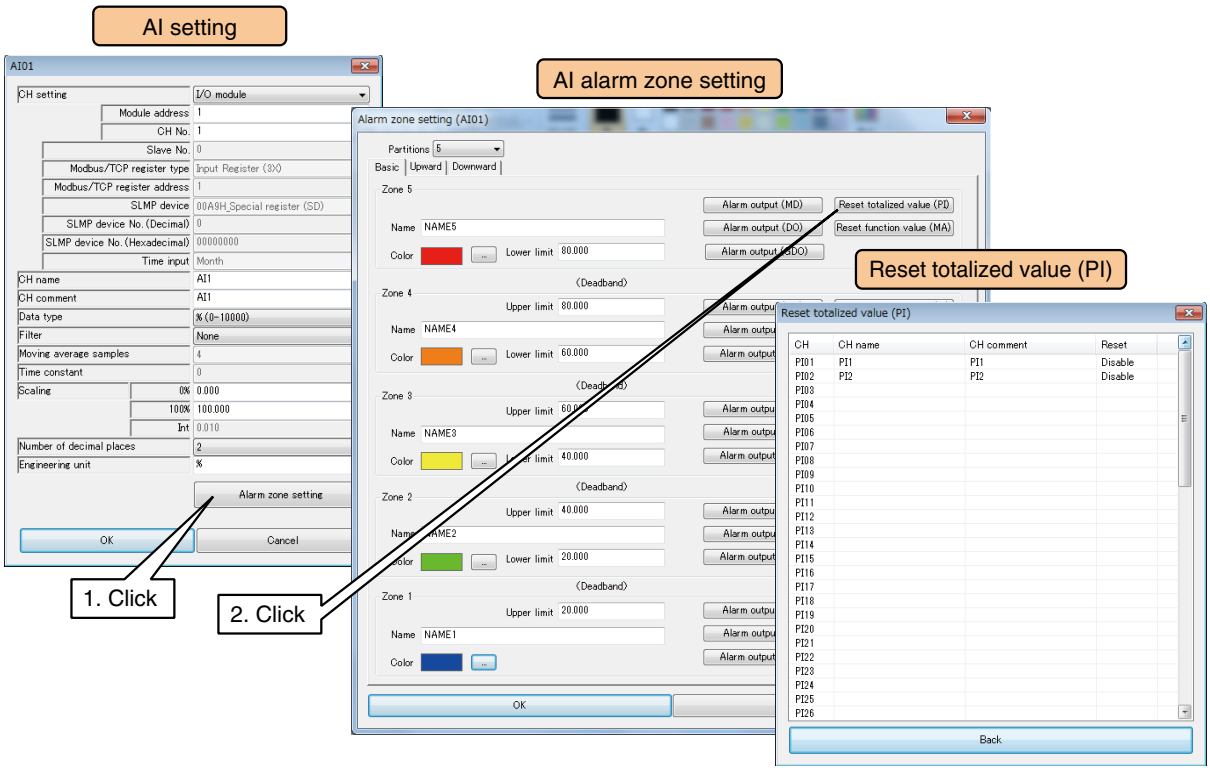
CAUTION

- When GDO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

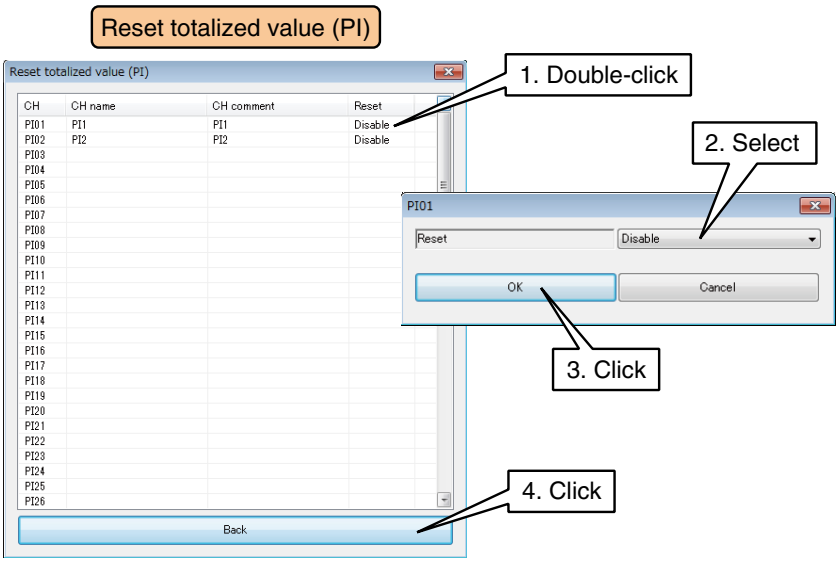
Resetting PI totalized value (AI)

The cumulative total value of a specific PI can be reset at the timing of zone transition.
The PI channel to be operated needs to assigned in advance. ➔ 3.6.4 Pulse input (PI)

(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting] window.
Click [Reset totalized value (PI)] button in a specific zone to display the [Reset totalized value (PI)] window.



(2) Double-click the PI channel to be operated and set as Disable / Enable, and click [OK].

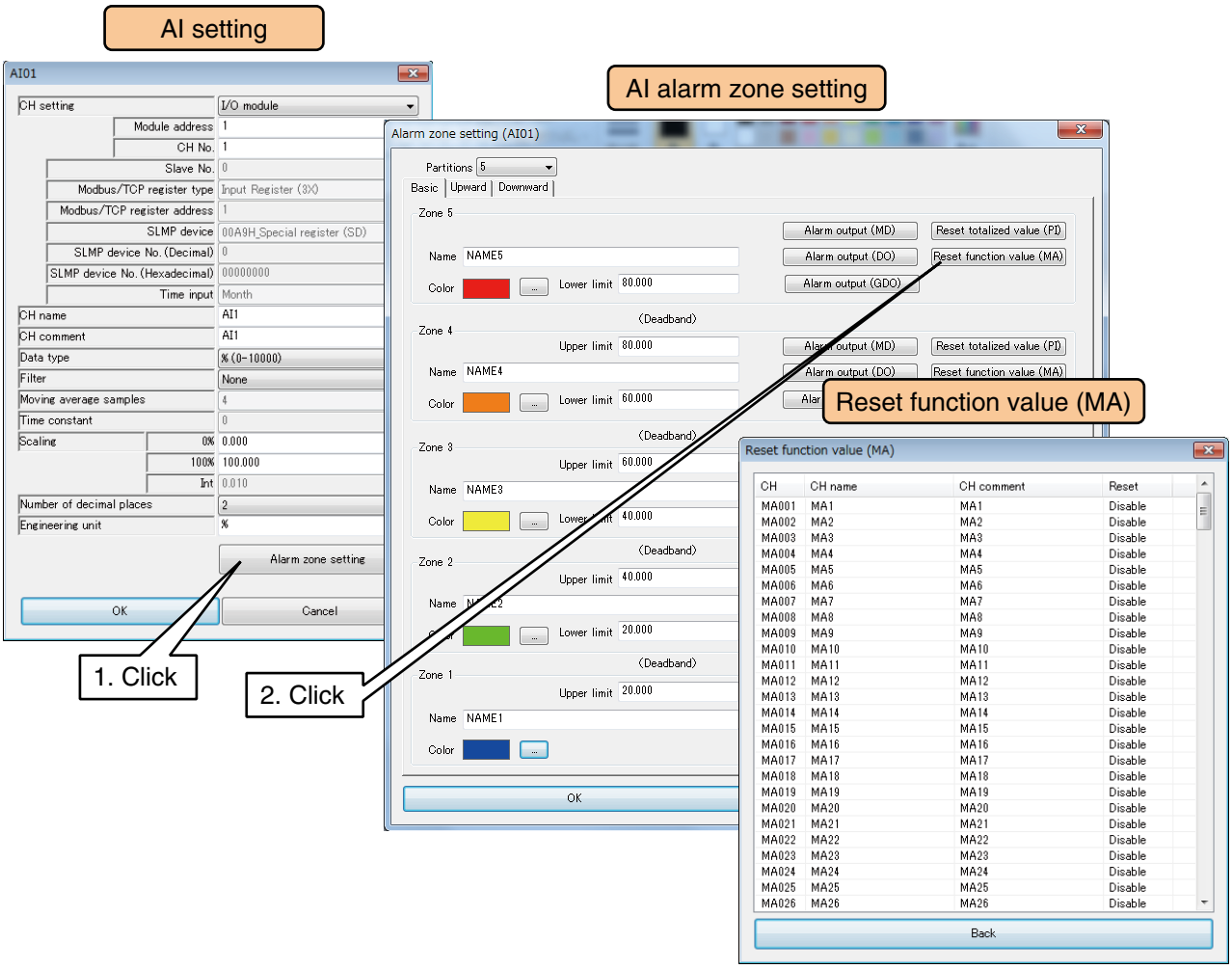


(3) Click [Back] to return to the [AI alarm zone setting] window.

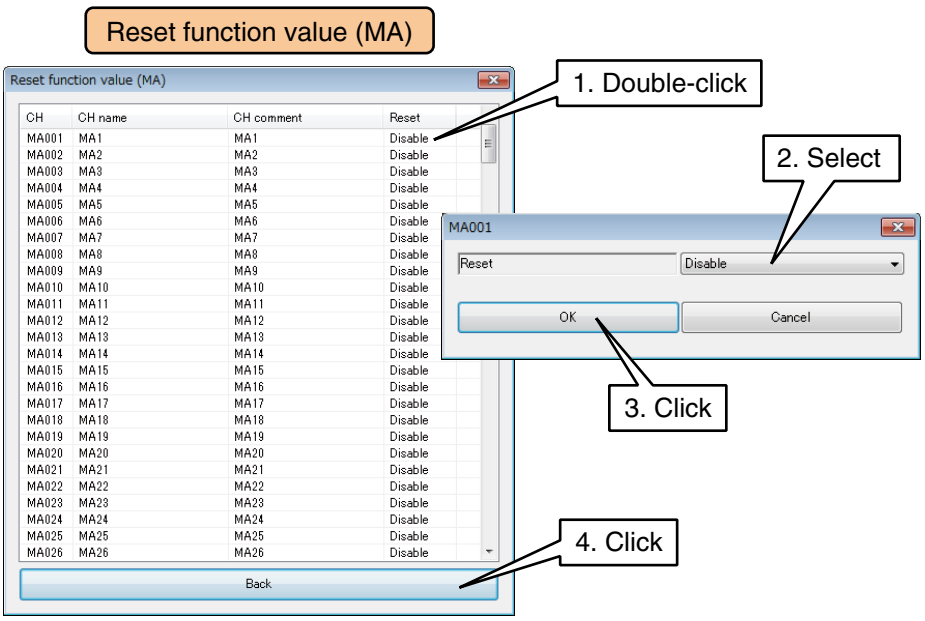
Resetting MA function value (AI)

The operation of a specific MA can be reset at the timing of zone transition.
The MA channel to be operated needs to be assigned in advance. ➔ 3.6.5 Analog function register (MA)

(1) Click [Alarm zone setting] button in the [AI setting] to display the [Alarm zone setting] window.
Click [Reset function value (MA)] button in a specific zone to display the [Reset function value (MA)].



(2) Double-click the MA channel to be operated and set as Disable / Enable, and click [OK].



(3) Click [Back] to return to the [MA alarm zone setting] window.

Once the setting is complete, click [OK] to temporarily store the setting.

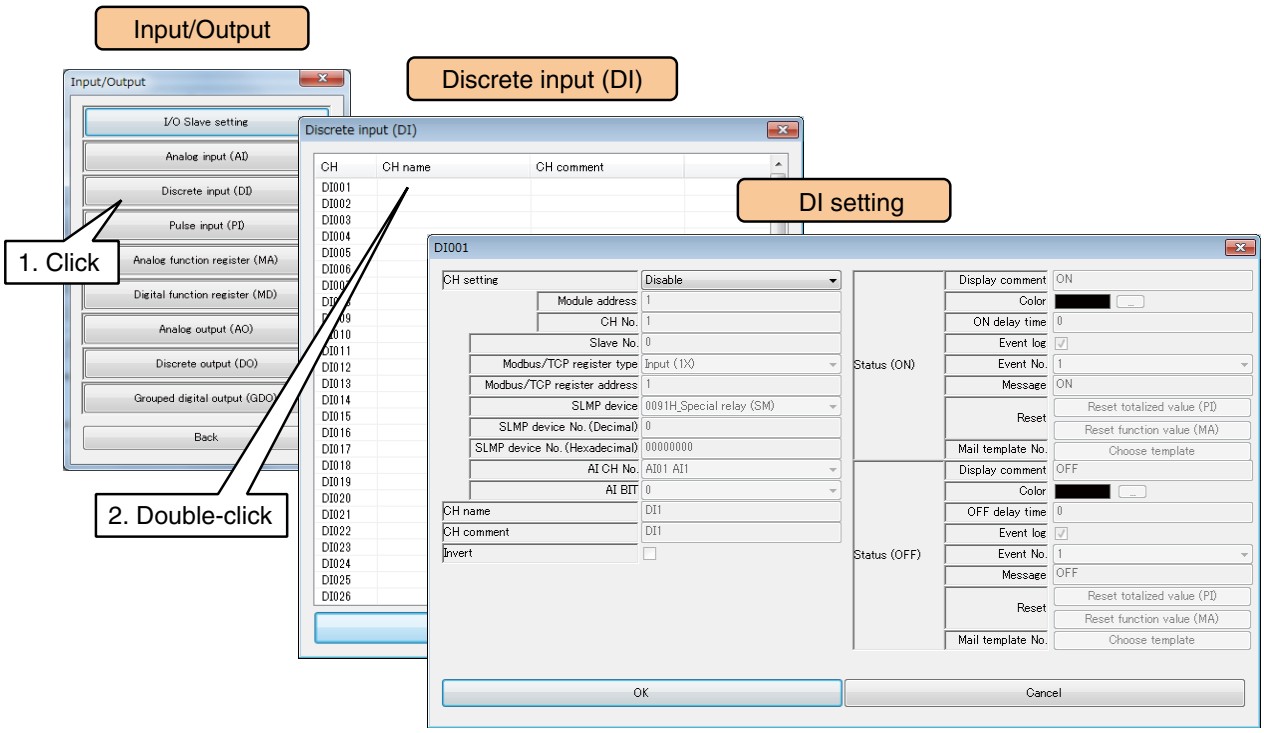
Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Analog input (AI)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

3.6.3 Discrete input (DI)

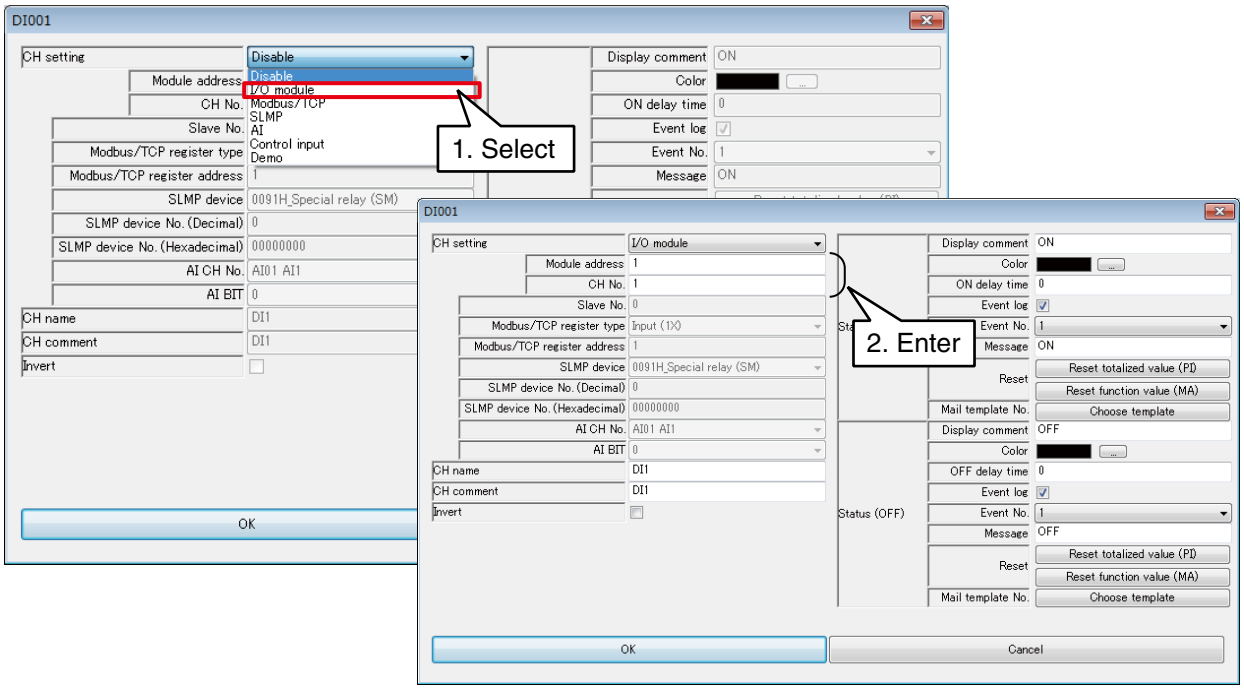
A maximum of 256 points (DI1 to DI256) of discrete inputs can be monitored.
Assign the discrete input from the I/O module, remote I/O, or SLMP device connected to the DL30-G by the following procedure.

Assigning I/O module to DI

(1) Click [Discrete input (DI)] button in the [Input/Output] window to display the [Discrete input (DI)]. Double-click a row of the DI channel to be set in this window to display the [DI setting] window.



(2) Set the [CH setting] as [I/O module] to enable the [Module address] and [CH No.] fields.
Enter the CH value to be assigned.



Up to 16 DI channels can be assigned per module.

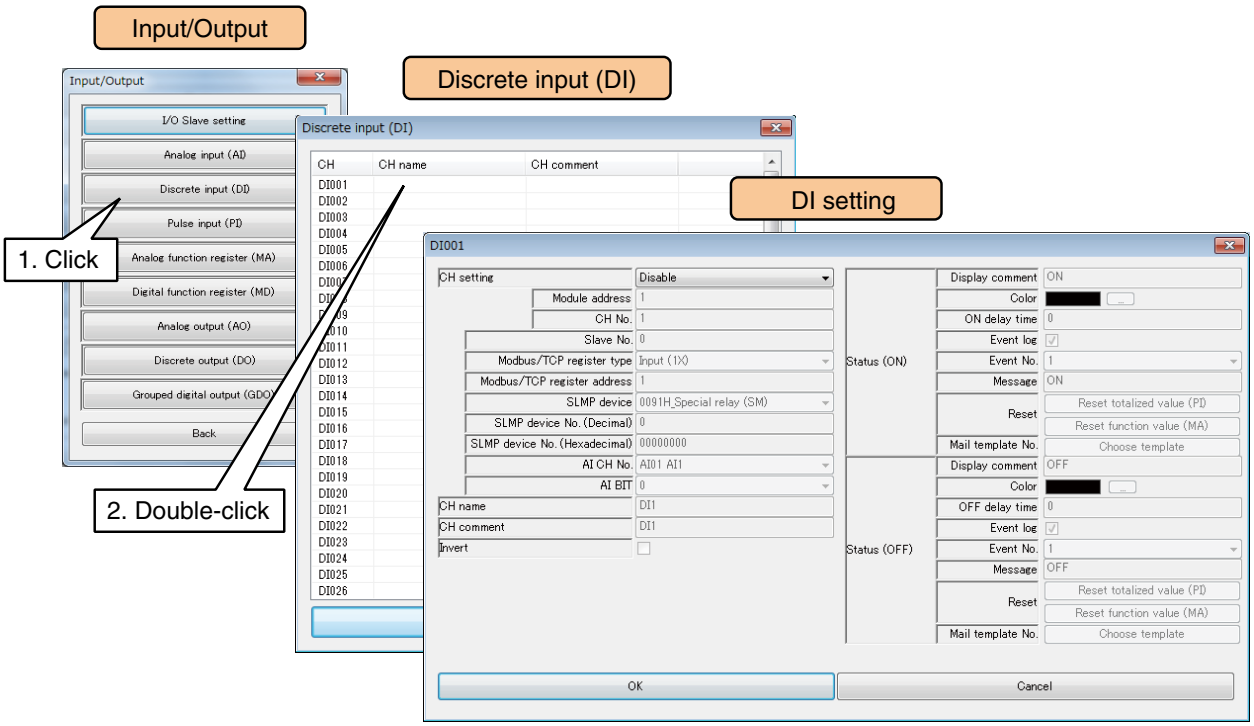
Module type	Compatible module	CH No.	Module address	CH No. in the module
16 ch module	R30XN16A	CH1	N	1
		CH2	N	2
		CH3	N	3
		CH4	N	4
		CH5	N	5
		CH6	N	6
		CH7	N	7
		CH8	N	8
		CH9	N	9
		CH10	N	10
		CH11	N	11
		CH12	N	12
		CH13	N	13
		CH14	N	14
		CH15	N	15
		CH16	N	16

N: Module address

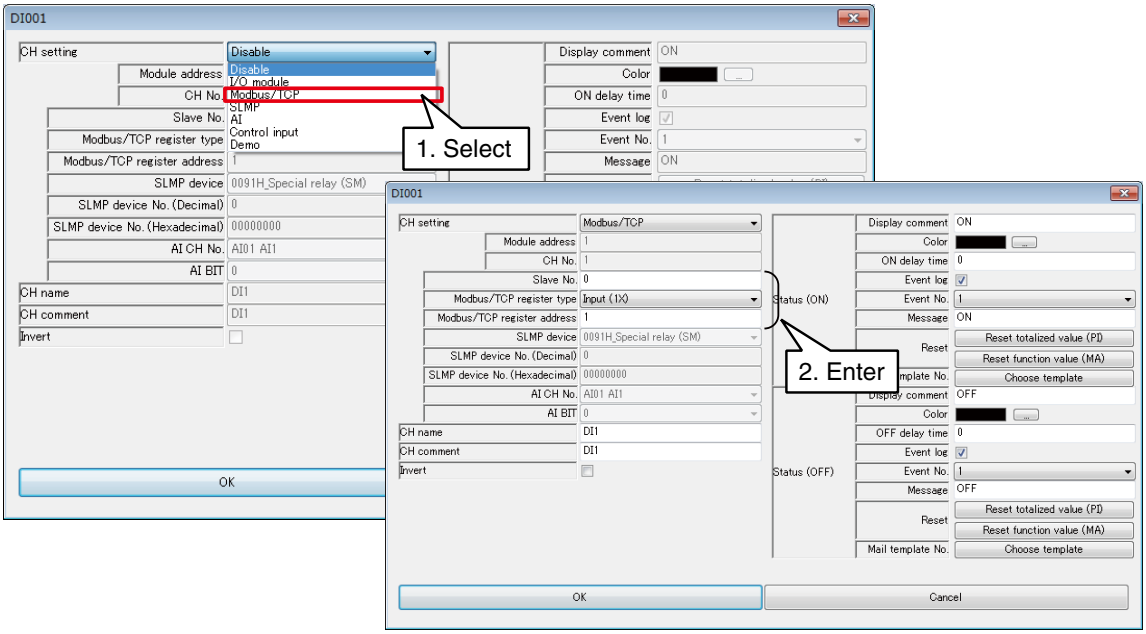
Assigning remote I/O to DI

(1) First, perform the I/O slave setting for the remote I/O device.
➔ 3.6.1 I/O slave setting

(2) Click [Discrete input (DI)] button in the [Input/Output] window to display the [Discrete input (DI)]. Double-click a row of the DI channel to be set in this window to display the [DI setting] window.



(3) Set the [CH setting] as [Modbus/TCP], and enter the [Slave No.], [Modbus/TCP register type], and [Modbus/TCP register address].

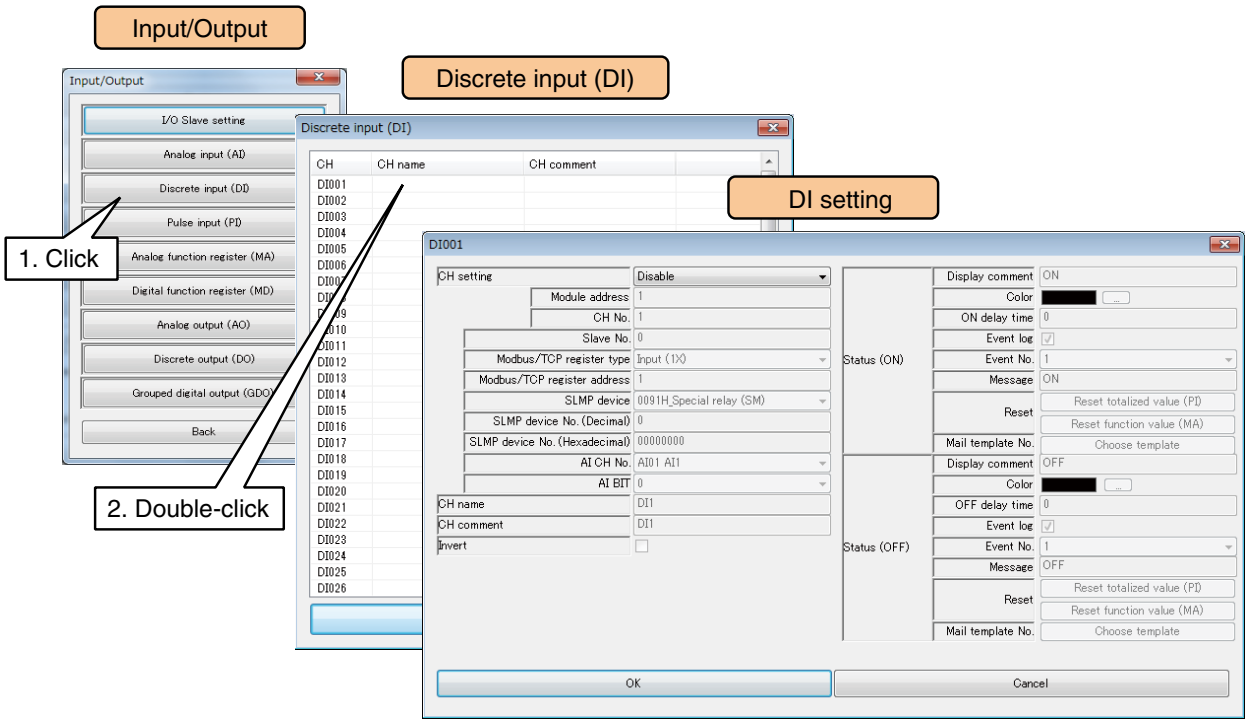


Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
Modbus/TCP register type	Select between [Coil (0X)] and [Input (1X)].
Modbus/TCP register address	Set the register address in the above register type (1 to 65536).

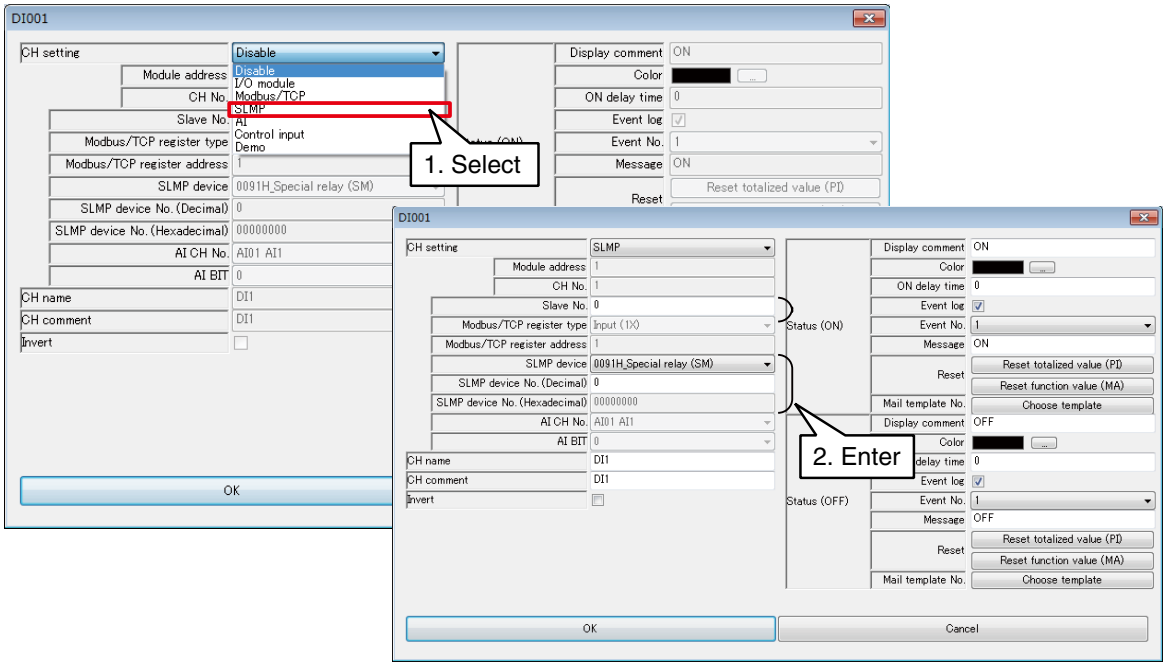
Assigning SLMP device to DI

(1) First, perform the I/O slave setting for the SLMP device.
➔ 3.6.1 I/O slave setting

(2) Click [Discrete input (DI)] button in the [Input/Output] window to display the [Discrete input (DI)]. Double-click a row of the DI channel to be set in this window to display the [DI setting] window.



(3) Set the [CH setting] as [SLMP], and enter the parameters referring to the table below.

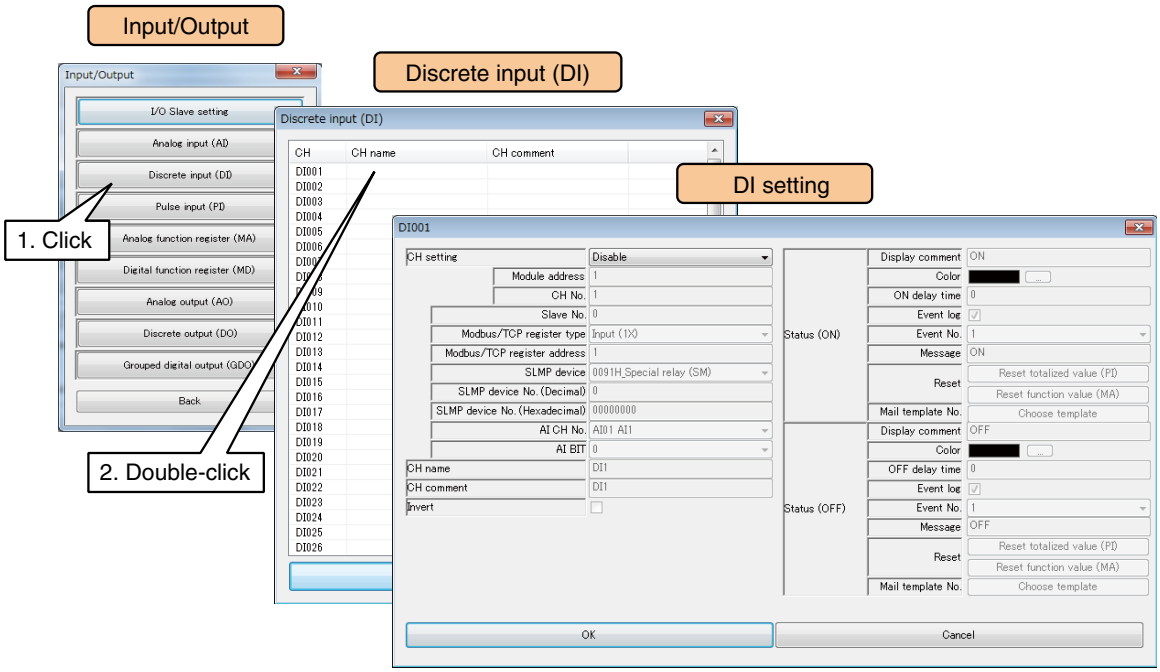


Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
SLMP device	Choose the device code of the SLMP device to be connected.
SLMP device No.	Set the device No. of the SLMP device to be connected.

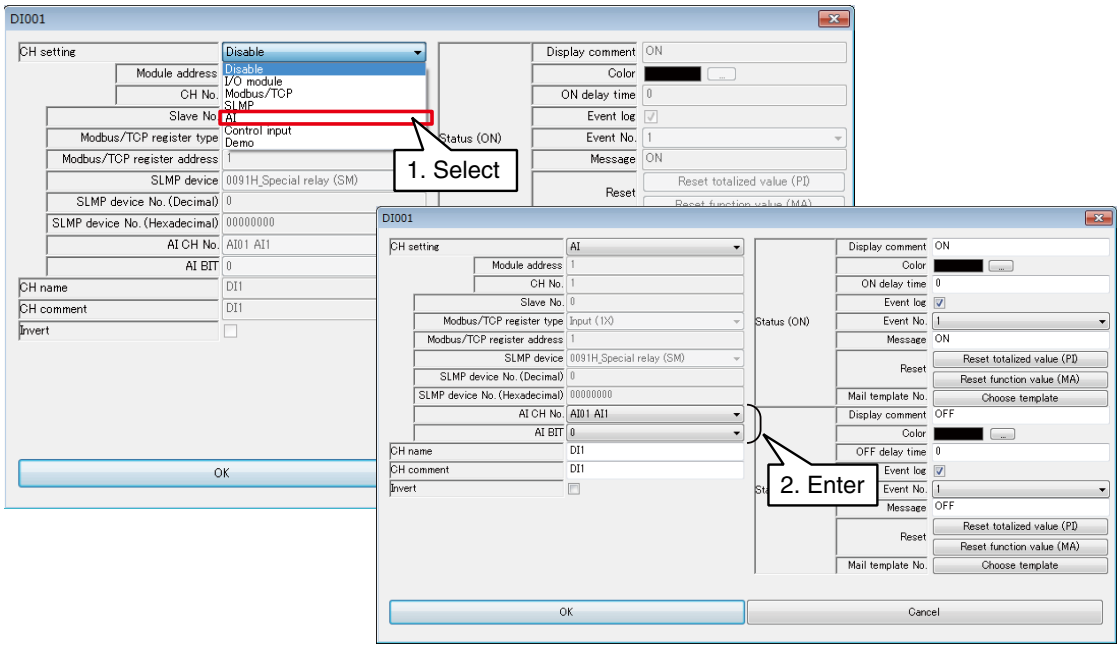
Assigning analog input (AI) to DI

A specific bit among 16 bits of AI word data can be assigned to a single DI.

(1) Click [Discrete input (DI)] button in the [Input/Output] window to display the [Discrete input (DI)]. Double-click a row of the DI channel to be set in this window to display the [DI setting] window.



(2) Set the [CH setting] as [AI], and enter the parameters referring to the table below.

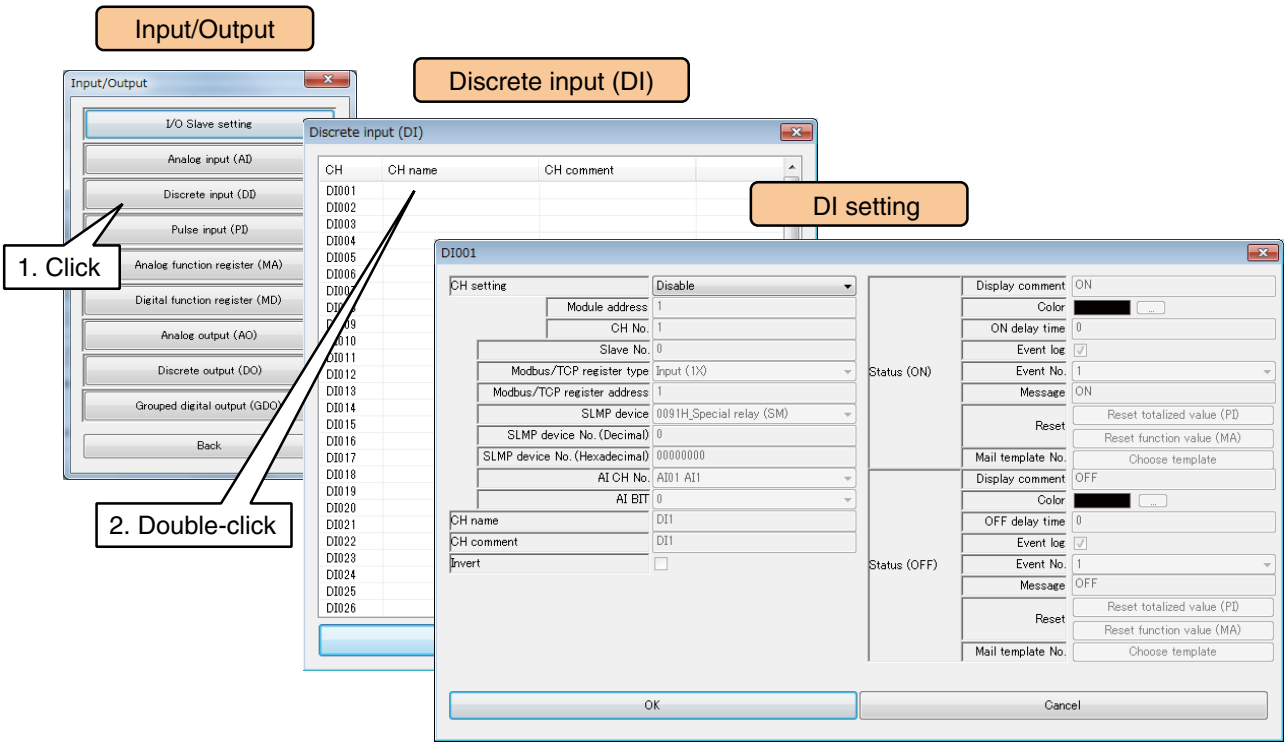


Parameter	Description
AI CH No.	Choose an AI channel to be used for DI
AI BIT	Choose a bit position of the AI word.

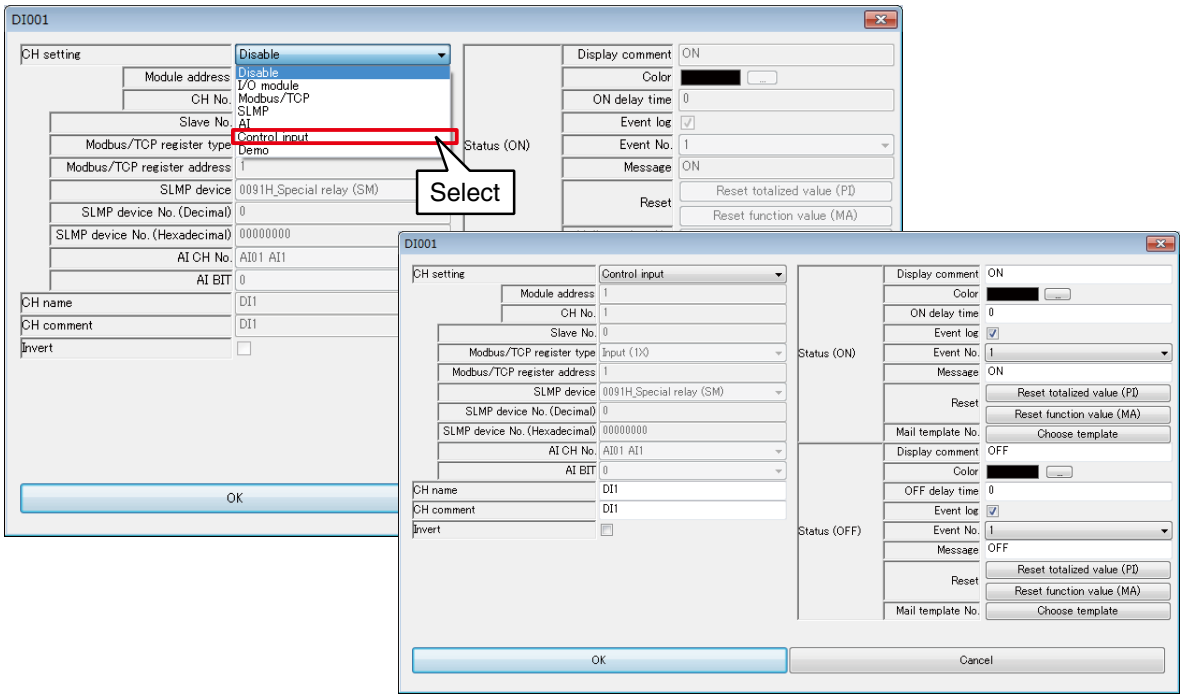
Assigning control input to DI

Input values can be specified from remote locations by writing values in the internal registers using the Modbus/TCP slave function.

(1) Click [Discrete input (DI)] button in the [Input/Output] window to display the [Discrete input (DI)]. Double-click a row of the DI channel to be set in this window to display the [DI setting] window.



(2) Set the [CH setting] as [Control input].

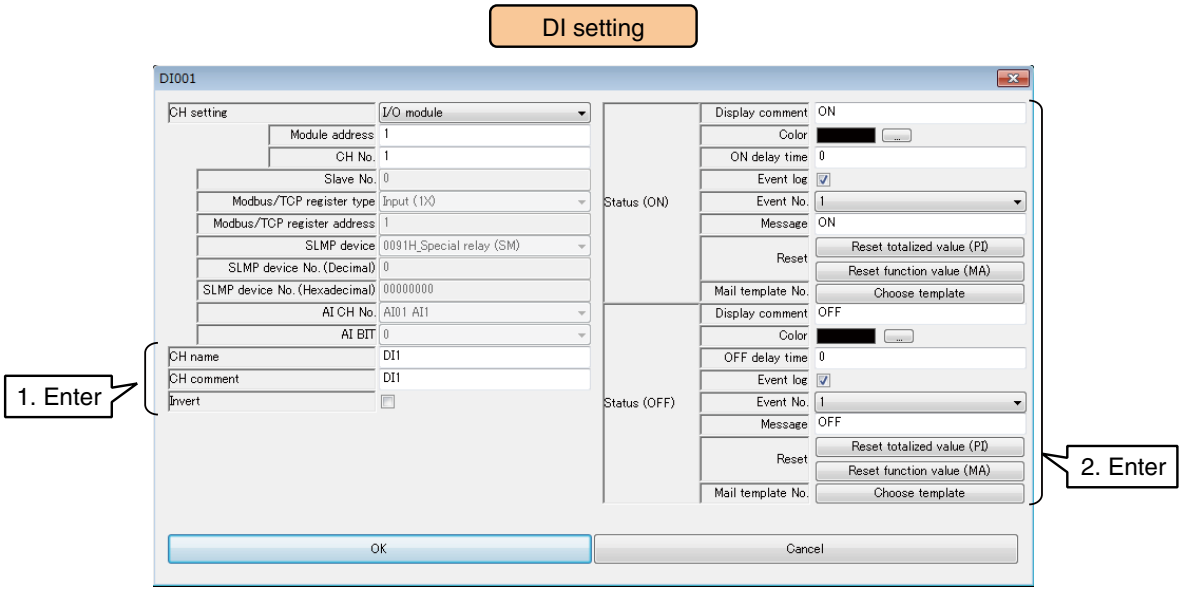


NOTES

See [3.12.3 Modbus/TCP slave] and [8.2.6 Modbus/TCP slave] for information on the Modbus/TCP slave function and internal registers.

Basic setting (DI)

(1) Once the assignment is complete, configure the following basic setting.

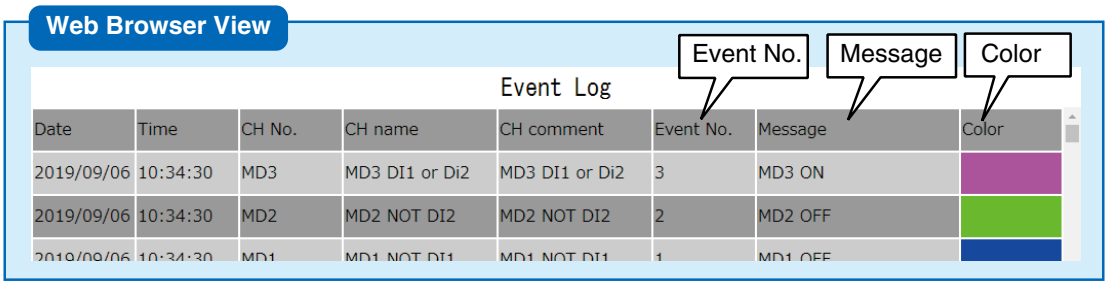


Parameter	Description
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Invert logic	If the ON/OFF in the input signal and the ON/OFF in the application signal are the reverse of each other, put a check in the check box.

(2) Specify detailed setting for each of ON and OFF state.

Parameter	Description
Display comment	Set strings corresponding to ON/OFF, respectively using up to 8 characters.
Color	Set the color which represents ON/OFF status displayed on the Web browser view.
ON delay time/ OFF delay time	Set the number of samples for each of the ON and OFF delay times. (Setting range: 0 to 999) For example, when set to 10, delay time will be 10 seconds (sampling cycle 1 sec. x 10). Thus, the unit is recognized as being ON when the input signal has been continuously ON for 10 seconds.
Event log	Set whether or not to record the event summary from the Web browser when there is a change in the input values. Check the box to record event logs.
Event No.	Set the event numbers for ON and OFF, respectively. The event number is assigned to each event log. (Setting range: 1 to 64)
Message	Set a message to be displayed for each event using up to 32 characters.
Mail template No.	Set the mail template number to be sent when an event occurs. Multiple mail templates can be specified. Create the templates in advance. ➔ 3.10.2 Mail template setting

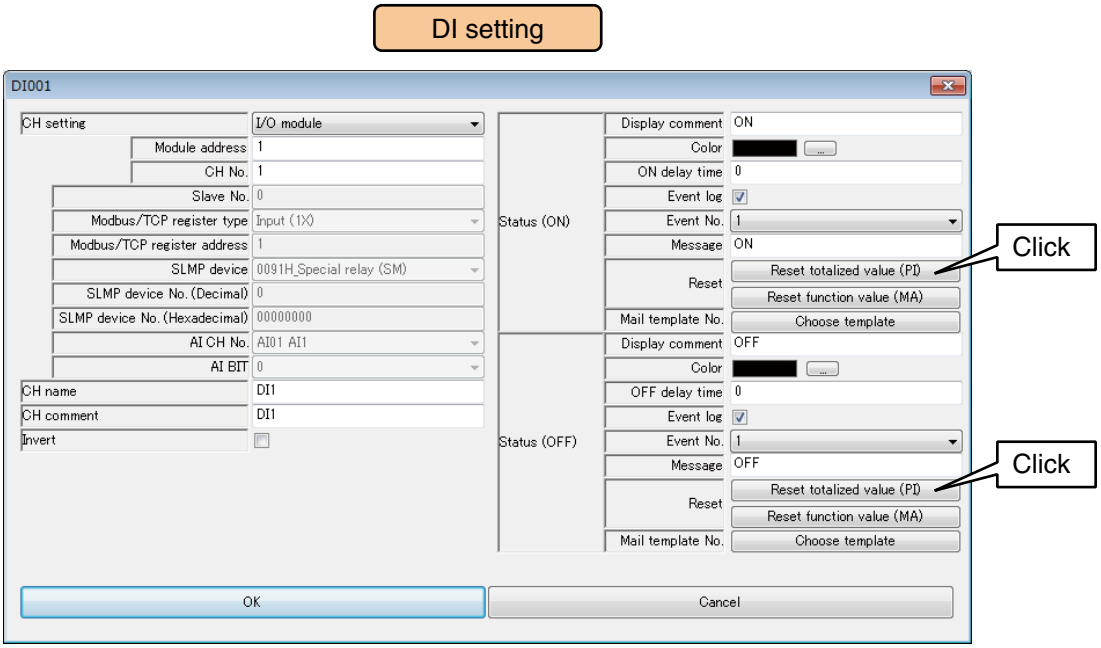
(3) Click [OK] to temporarily store the setting.



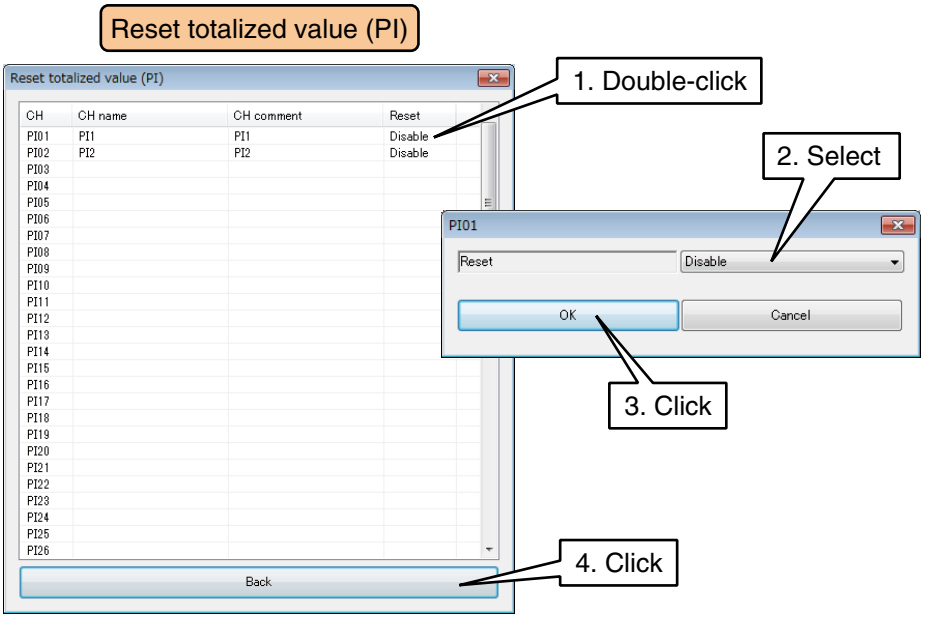
Resetting PI totalized value (DI)

The cumulative total value of a specific PI can be reset by detecting a rising edge of DI.
The PI channel to be operated needs to be assigned in advance. ➔ 3.6.4 Pulse input (PI)

(1) Click [Reset totalized value (PI)] button in the [DI setting] window to display the [Reset totalized value (PI)].



(2) Double-click the PI channel to be operated and set as Disable / Enable.

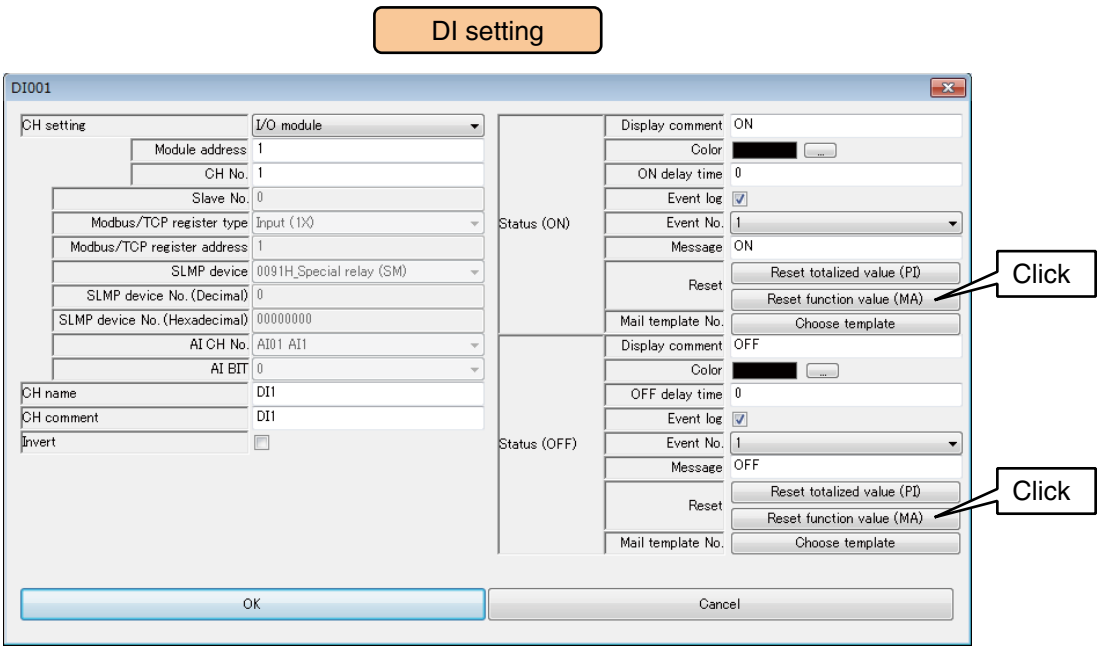


(3) Click [Back] to return to the [DI setting] window.

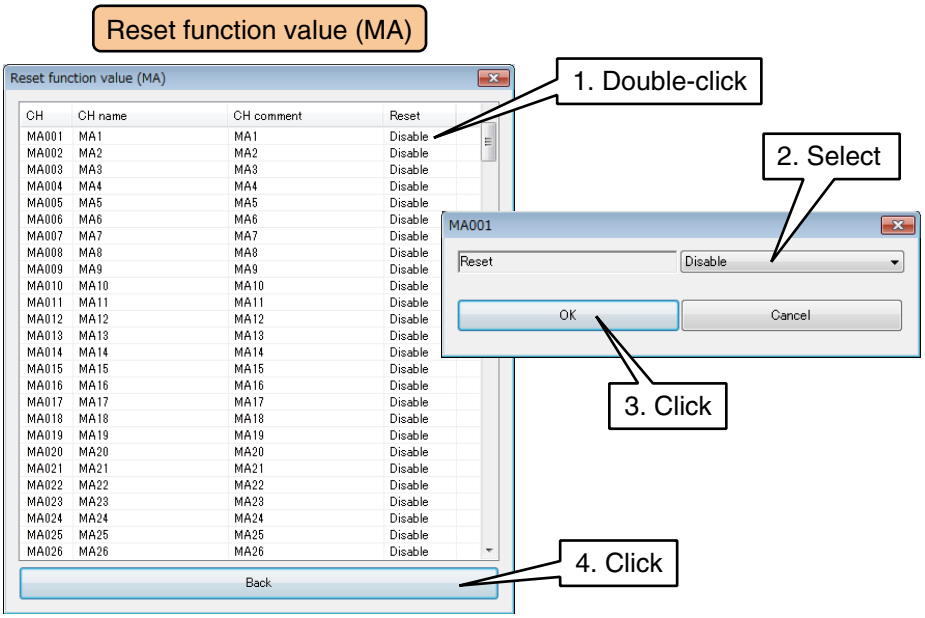
Resetting MA function value (DI)

The operation of a specific MA can be reset by the timing of ON to OFF and OFF to ON of DI.
The MA channel to be operated needs to be assigned in advance. ➔ 3.6.5 Analog function register (MA)

(1) Click [Reset function value (MA)] button in the [DI setting] window to display the [Reset function value (MA)] window.



(2) Double-click the MA channel to be operated and set as Disable / Enable.



(3) Click [Back] to return to the [DI setting] window.

Once the setting is complete, click [OK] to temporarily store the setting.

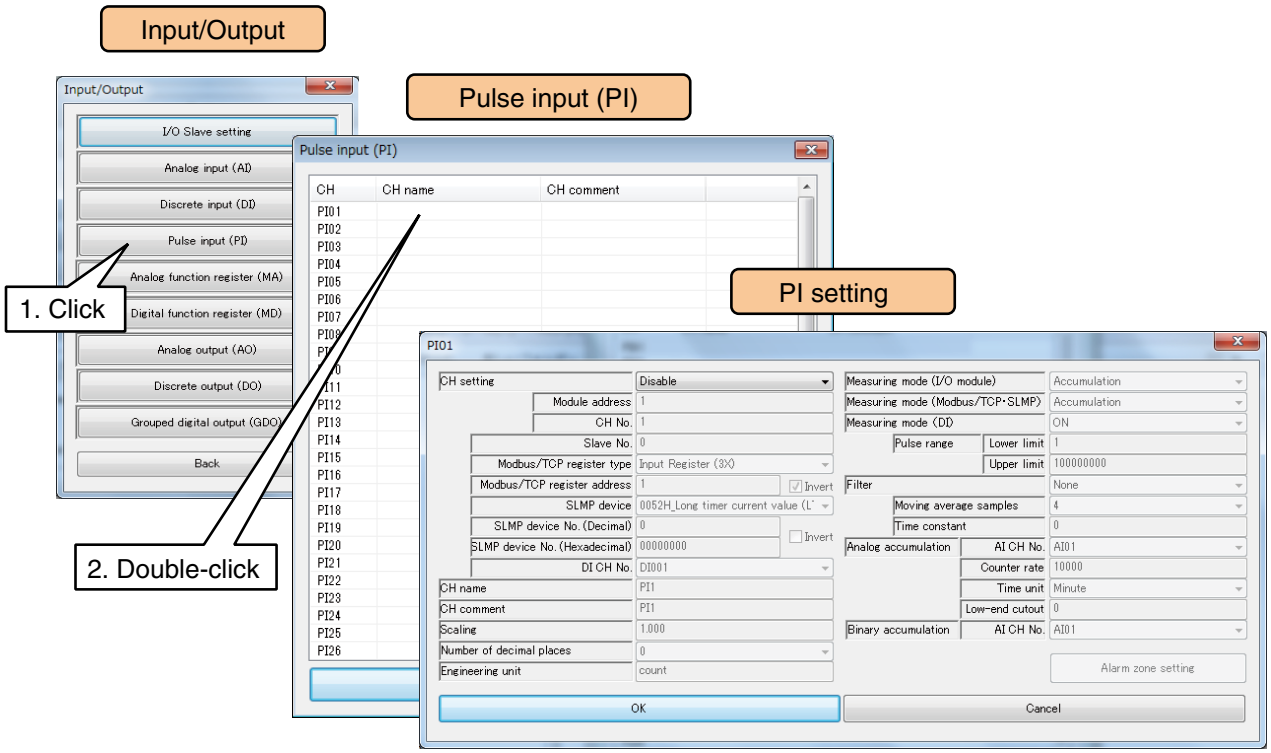
Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Discrete input (DI)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

3.6.4 Pulse input (PI)

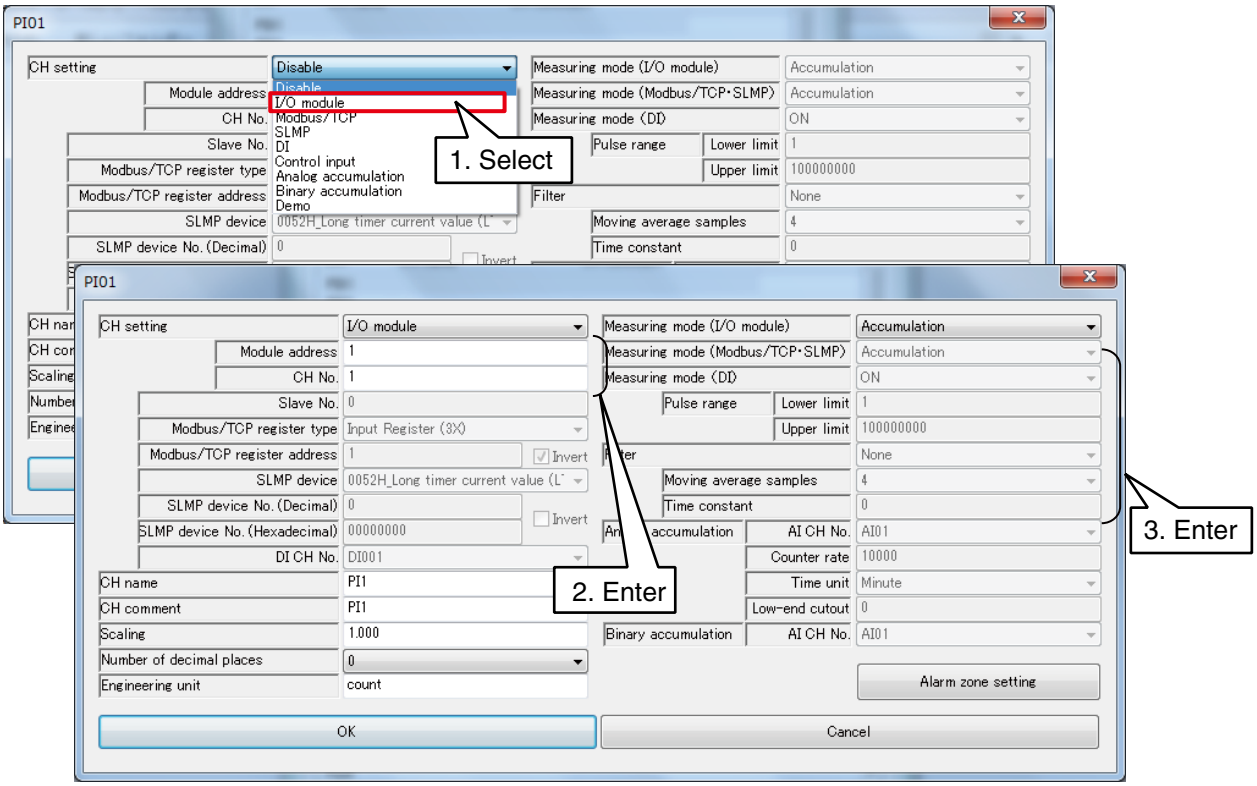
A maximum of 128 points (PI1 to PI128) of pulse inputs can be monitored.
32 bit integer data such as energy data can also be assigned to PI.
Assign the pulse inputs from the I/O module, remote I/O, or SLMP device connected to the DL30-G by the following procedure.

Assigning I/O module to PI

(1) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)].
Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



(2) Set the [CH setting] as [I/O module] to enable the [Module address] and [CH No.] fields.
Enter the CH value to be assigned.



Up to 2 PI channels can be assigned per module.

Module type	Compatible module	CH No.	Module address	CH No. in the card
2 ch module	R30PA2	CH1	N	1
		CH2	N	2

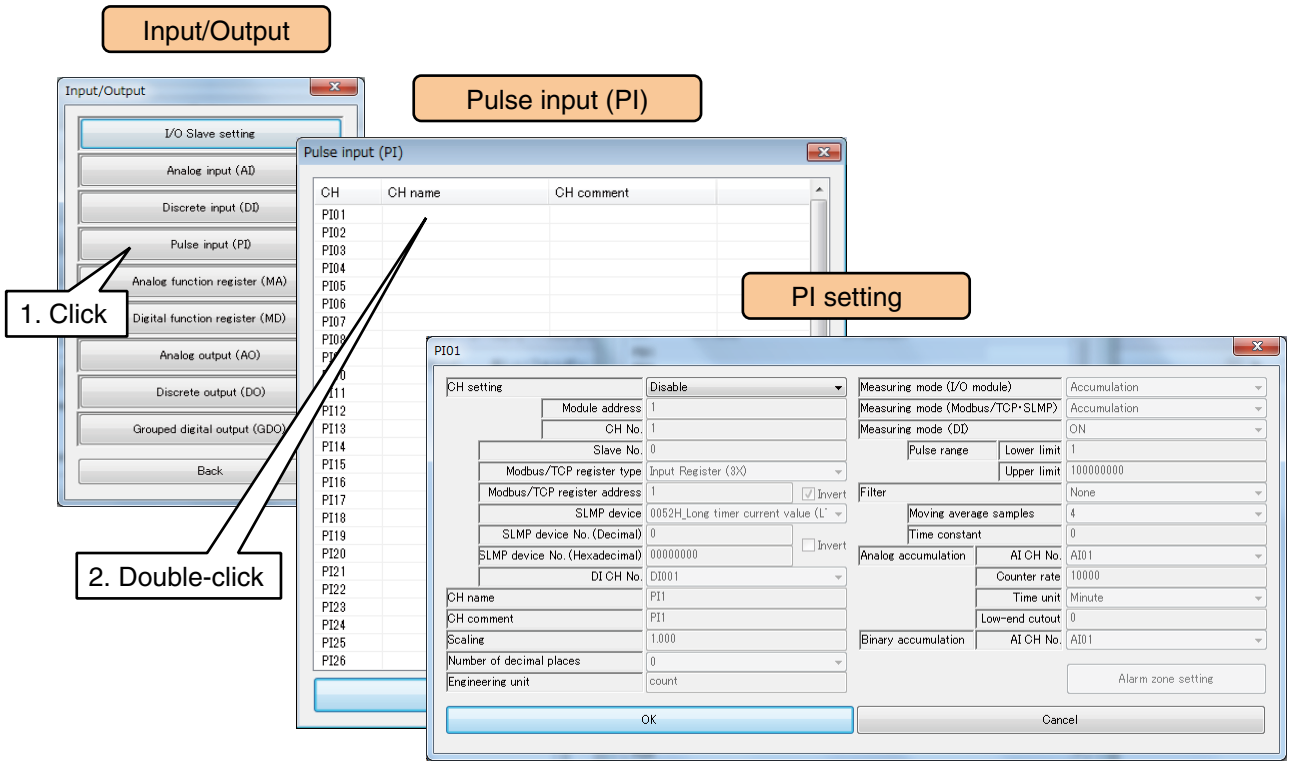
(3) Set the parameter items in the table below.

Parameter	Description
Measurement mode (module)	Set the type of the 32 bit data read from the I/O module. • Accumulation The cumulative total is calculated by accumulating the difference between the value at the start of cumulative totalizing and the value when it is reset, for each sampling duration. Select 'Accumulation' when using the totalized pulse input module (model: R30PA2). • Actual value The retrieved data is recognized as a signed 32 bit integer, and its value is taken as sampling data.
Filter	Set the filter function. Select from None / Moving average / Delay buffer. Selectable only for the actual (engineering unit) values.

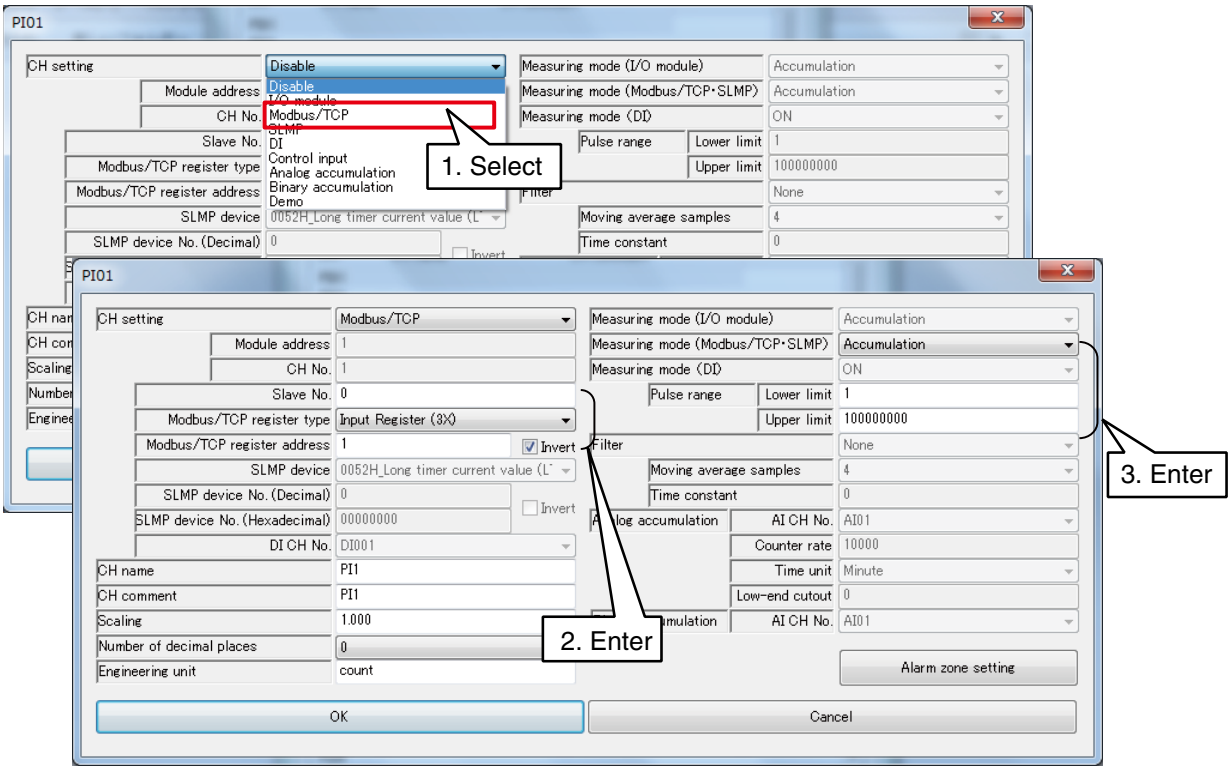
Assigning remote I/O to PI

(1) First, perform the I/O slave setting for the remote I/O device.
➔ 3.6.1 I/O slave setting

(2) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)].
Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



(3) Set the [CH setting] as [Modbus/TCP], and enter the [Slave No.], [Modbus/TCP register type], and [Modbus/TCP register address].

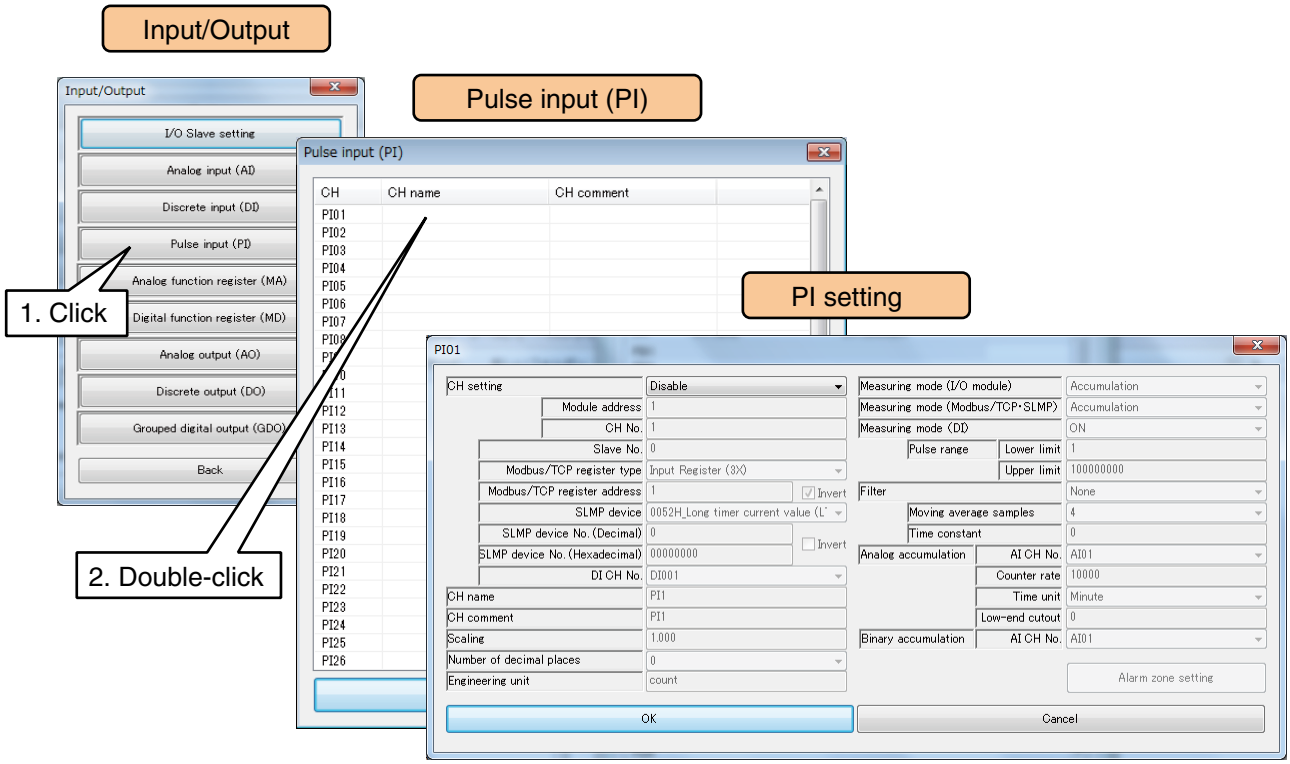


Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
Modbus/TCP register type	Select either [Input Register (3X)] or [Holding Register (4X)].
Modbus/TCP register address	Set the register address (1 to 65535) in the above register type. Since the PI data is 32 bit data set in two consecutive addresses, specify the register address of the smaller number. Check or uncheck the [Invert] check box depending on the order of high/low registers. That is, when unchecked, the set register address is handled as upper data and the subsequent address is handled as lower data. Refer to the specification of each remote I/O for the register address allocation.
Measuring mode (Modbus/TCP·SLMP)	Set the type of the 32 bit data read from the remote I/O. Select from the following. • Accumulation The cumulative total is calculated by accumulating the difference between the value at the start of cumulative totalizing and the value when it is reset, for each sampling duration. This corresponds to the cumulative total data of the remote I/O. • Actual value The retrieved data is recognized as a signed 32 bit integer, and its value is taken as sampling data. This corresponds to the power data of the remote I/O. • Float The retrieved data is recognized as single precision floating point, and its value is taken as sampling data. This corresponds to the power data of the remote I/O.
Pulse range	Set the same value as the pulse range set in the remote I/O. For details, see the Users Manual for the remote I/O. Settable only for the Accumulation.
Filter	Slect the filter function from None / Moving average / Delay buffer. Selectable only for the actual (engineering unit) values.

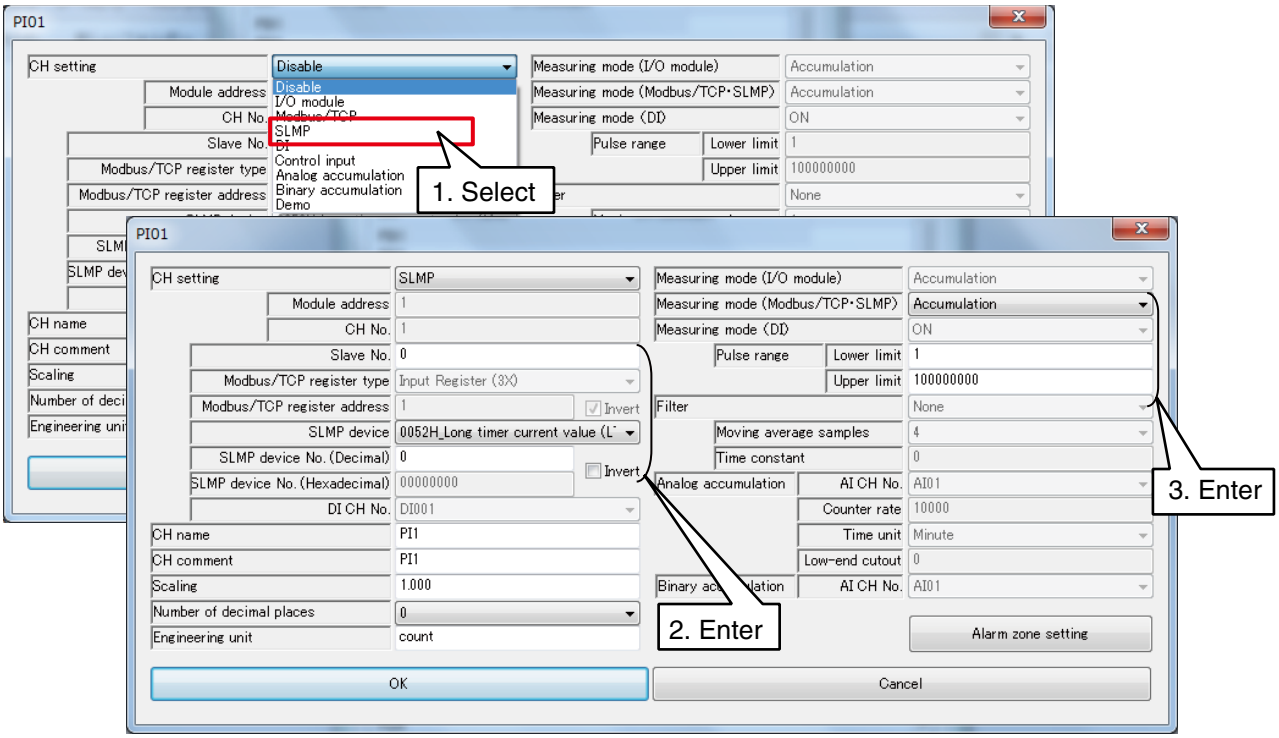
Assigning SLMP device to PI

(1) First, perform the I/O slave setting for the SLMP device.
➔ 3.6.1 I/O slave setting

(2) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)].
Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



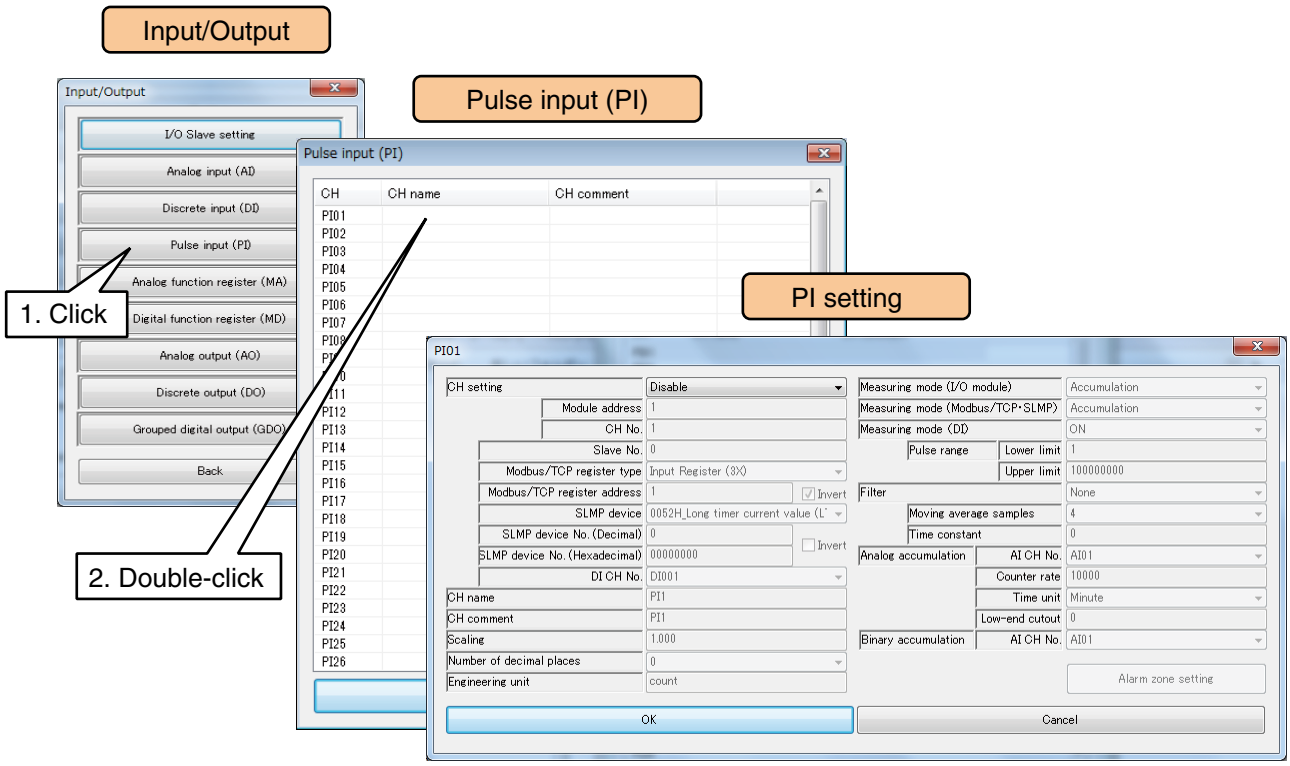
(3) Set the [CH setting] as [SLMP], and enter the parameters referring to the table below.



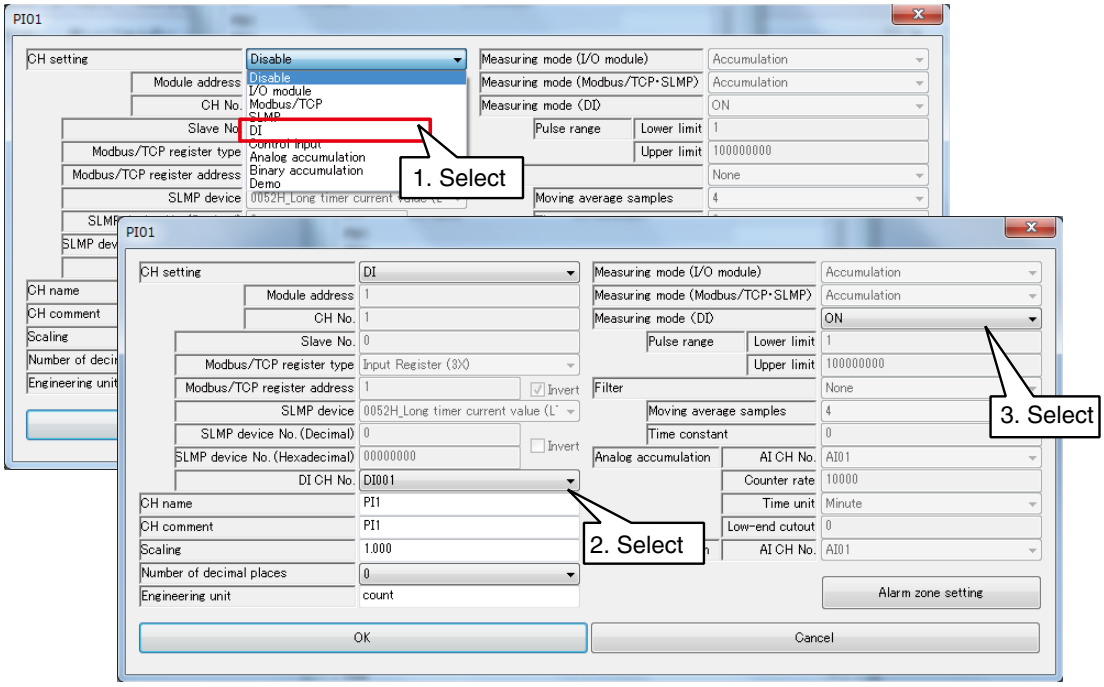
Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
SLMP device	Choose the device code of the SLMP device to be connected.
SLMP device No.	Set the device No. of the SLMP device to be connected. PI data is 32 bit data set in two addresses. When setting 16 bit devices, set the device of the smaller device No., and check or uncheck the [Invert] check box depending on the order of high/low devices.
Measuring mode (Modbus/TCP·SLMP)	Set the type of the 32 bit data read from the remote I/O. Select from the following. • Accumulation The cumulative total is calculated by accumulating the difference between the value at the start of cumulative totalizing and the value when it is reset, for each sampling duration. This corresponds to the cumulative total data of the SLMP device. • Actual value The retrieved data is recognized as a signed 32 bit integer, and its value is taken as sampling data. This corresponds to the power data of the SLMP device. • Float The retrieved data is recognized as single precision floating point, and its value is taken as sampling data. This corresponds to the power data of the SLMP device.
Pulse range	Set the same value as the pulse range set in the SLMP device. For details, see the Users Manual for the SLMP device. Settable only for the Accumulation.
Filter	Select the filter function from None / Moving average / Delay buffer. Selectable only for the actual (engineering unit) values.

Assigning discrete input (DI) to PI

(1) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)]. Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



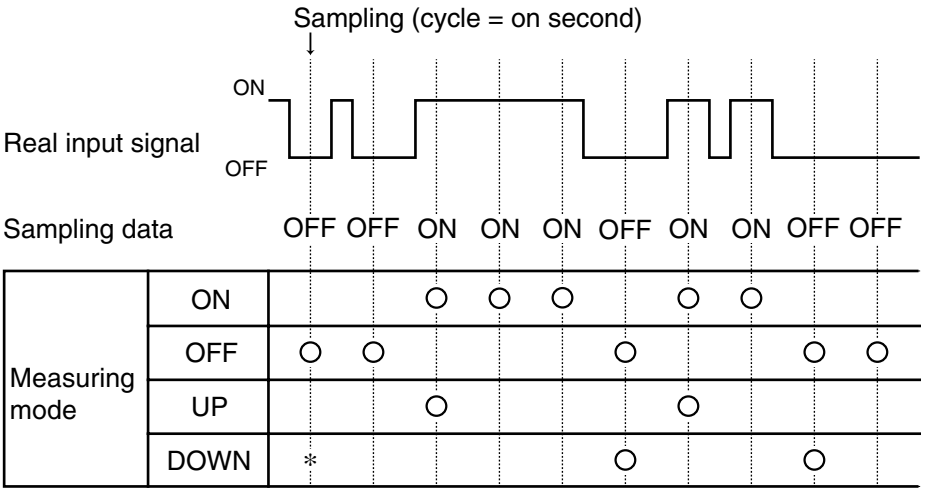
(2) Set the [CH setting] as [DI], and and enter the parameters referring to the table below.



Item	Description
DI CH Number	Select the CH Number of DI to be assigned.
Measuring mode (DI)	Select the measuring mode from ON / OFF / UP / DOWN. Input values are determined based on signal at every sampling time. ON : Considering the time (second) of ON as input values of PI. OFF : Considering the time (second) of OFF as input values of PI. UP : Counting as 1 pulse per one time of the rising of the DI. DOWN : Counting as 1 pulse per one time of the falling of the DI.

■ The difference of the action by measuring mode

[ON] : Determined to be [ON for one second] if the sampling data is ON.
[OFF] : Determined to be [OFF for one second] if the sampling data is OFF.
[UP] : Counted as [One pulse] in the condition that the previous sampling data is OFF, and the current sampling data is ON.
[DOWN]: Counted as [One pulse] in the condition that the previous sampling data is ON, and the current sampling data is OFF.

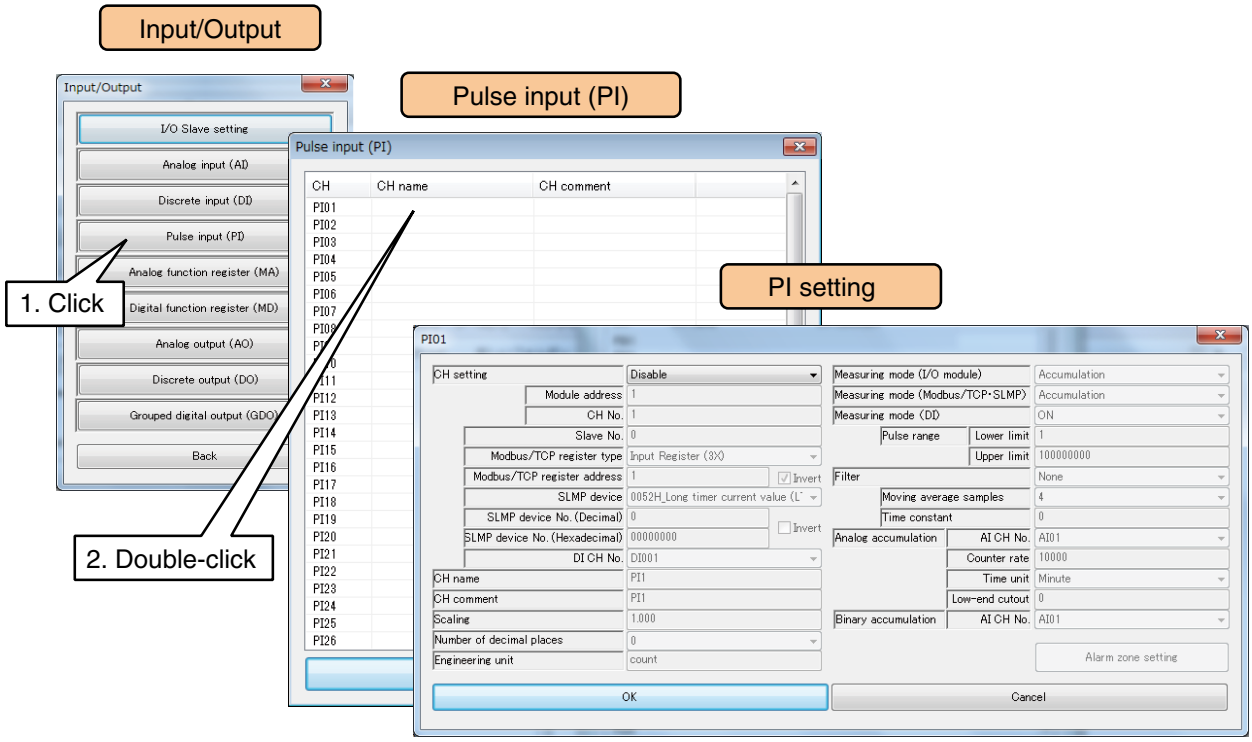


* Counted if the previous sampling data is ON and not counted if OFF.

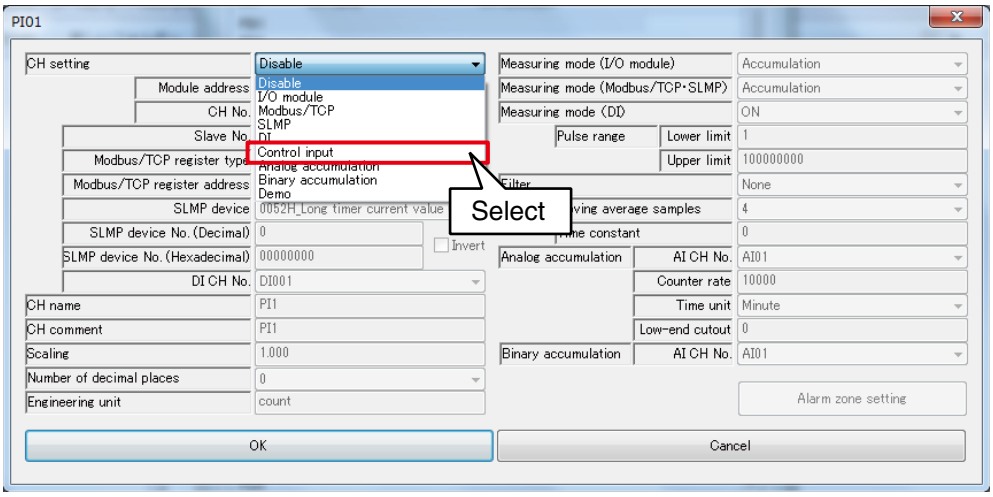
Assigning control input to PI

Input values can be specified from remote locations by writing values in the internal registers using the Modbus/TCP slave function.

(1) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)]. Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



(2) Set the [CH setting] as [Control input].



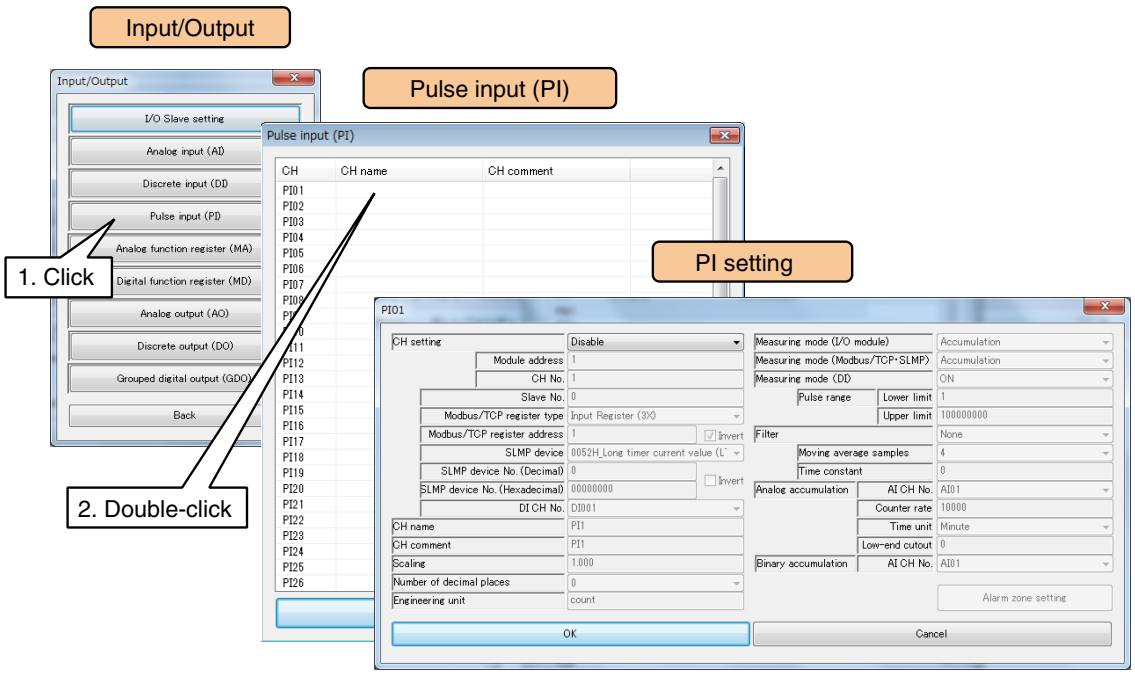
NOTES

See [3.12.3 Modbus/TCP slave] and [8.2.6 Modbus/TCP slave] for information on the Modbus/TCP slave function and internal registers.

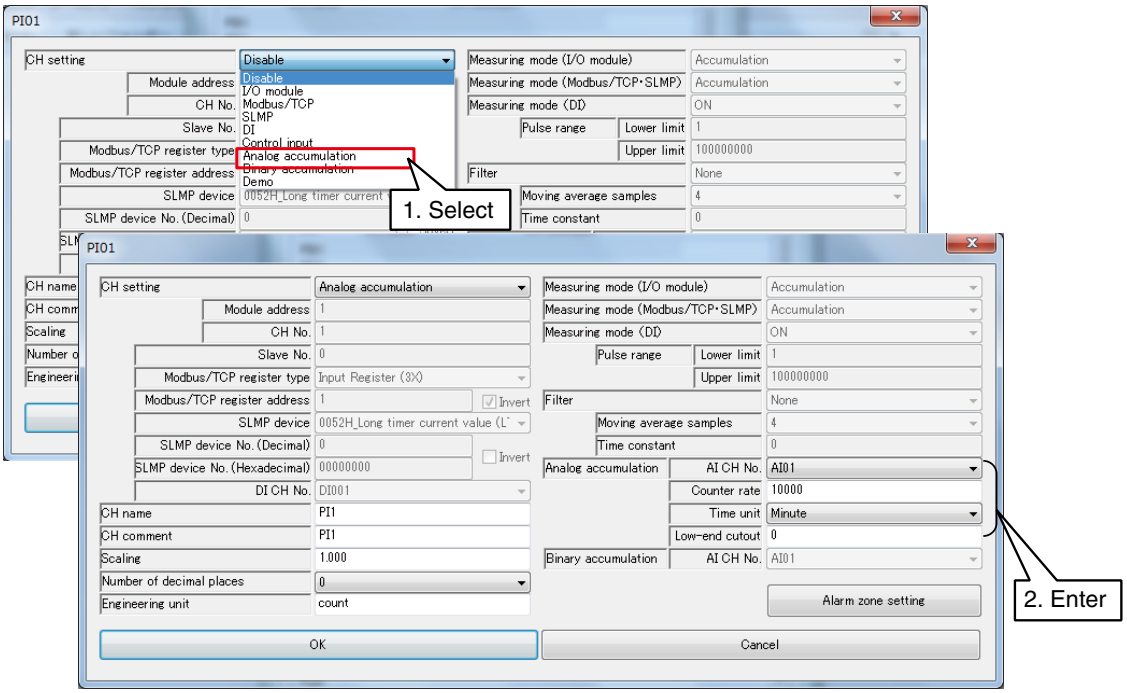
Assigning analog accumulation to PI

The cumulative total can be obtained by considering the AI input values as the number of pulses.

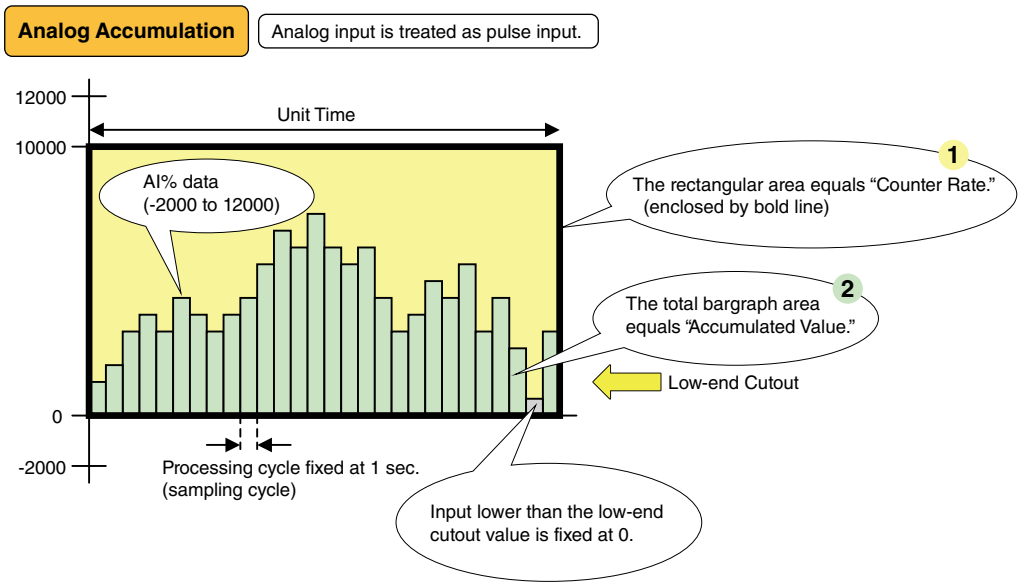
(1) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)].
Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



(2) Set the [CH setting] as [Analog accumulation], and enter the parameters referring to the table below.



Parameter	Description
AI CH No.	Select AI CH to use for accumulation.
Counter rate	Set the number of pulse counts corresponding to continuous 100% input status for the time unit. (0 to 10000)
Time unit	Choose among Minute / Hour / Day.
Low-end cutout	The lower limit value for AI sampling data (-2000 to 12000)



When the AI% data remains at 100% (10000) for the unit time period, it is converted to a preset number of pulses called "Counter Rate." The rectangular area in the above graphs corresponds to the Counter Rate. 1

Actual AI% value (0 to 10000) is accumulated and converted as "Accumulated Value" into the number of pulses using the Counter Rate. The total graph area in the above graphs corresponds to the Accumulated Value. 2

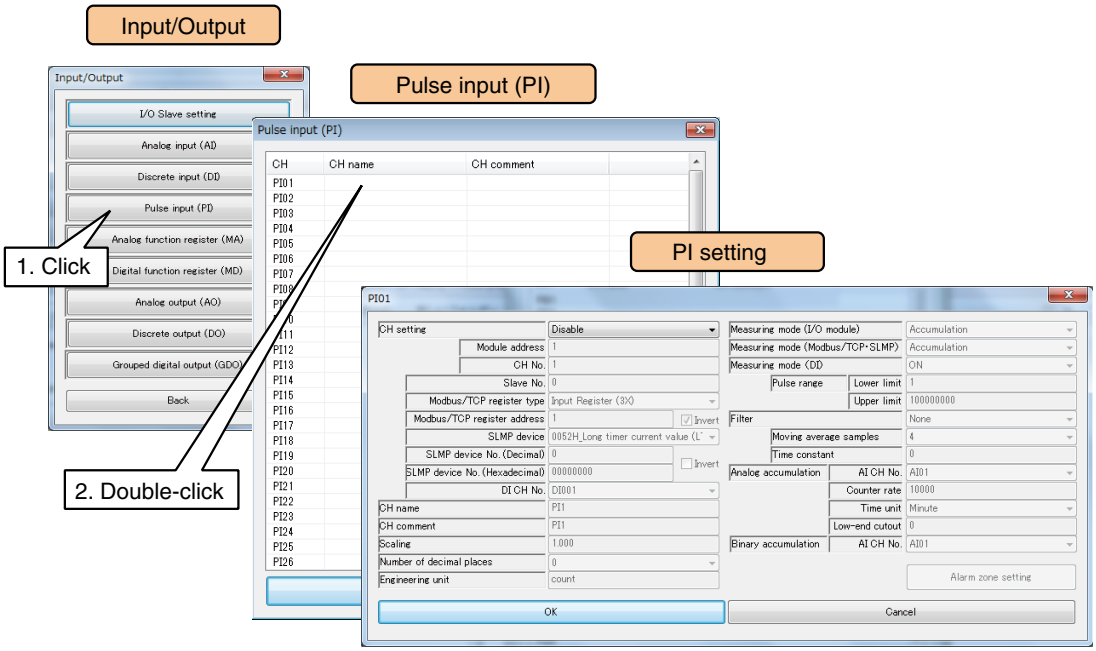
The Accumulated Value is treated just like other pulse inputs, multiplied by "Scaling" into an engineering unit value.

[Example]
Flow value is sent as a voltage signal. 1 V corresponds to 0 m^3/h, while 5 V corresponds to 30 m^3/h.
In order to use analog accumulation, choose "%" as "Data Type". 1 V at 0%, 5 V at 100%.
Choose "Hour" as "Time Unit" for the engineering unit m^3/h.
If "Counter Rate" is set to "30" an accumulated value of 30 is given when AI remains at 100% (5 V) for 1 hour.

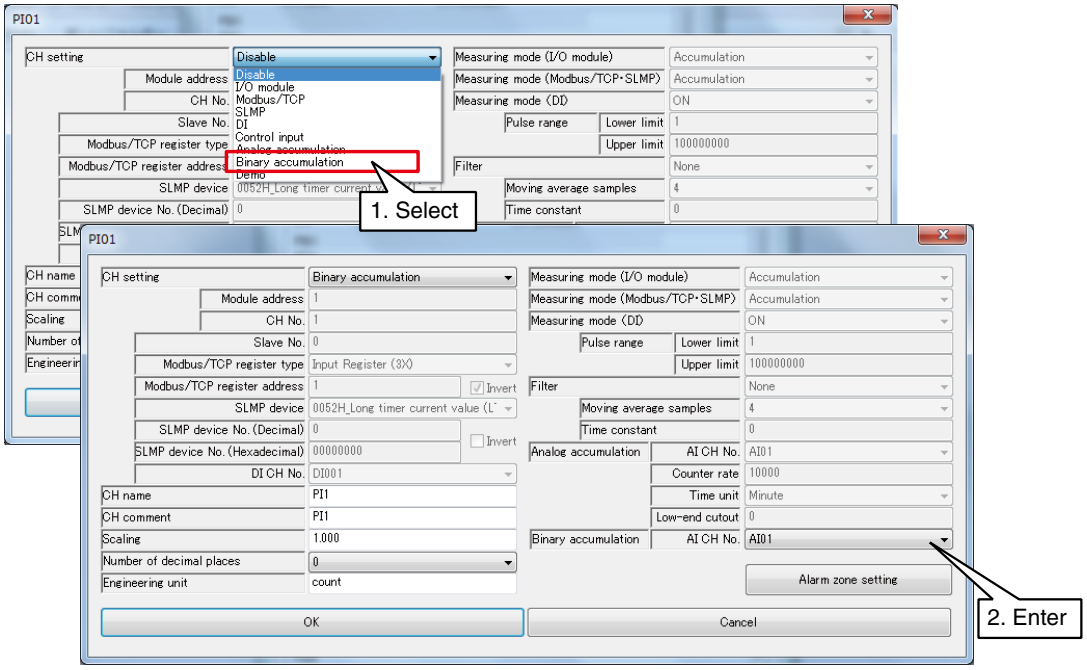
Assigning binary accumulation to PI

The cumulative total is calculated by considering AI input values as a 16 bit unsigned integer and calculated value is obtained as a 32 bit unsigned integer.

(1) Click [Pulse input (PI)] button in the [Input/Output] window to display the [Pulse input (PI)]. Double-click a row of the PI channel to be set in this window to display the [PI setting] window.



(2) Set the [CH setting] as [Binary accumulation], and enter the [AI CH No.].



Parameter	Description
AI CH No.	Select AI CH to use for binary accumulation.

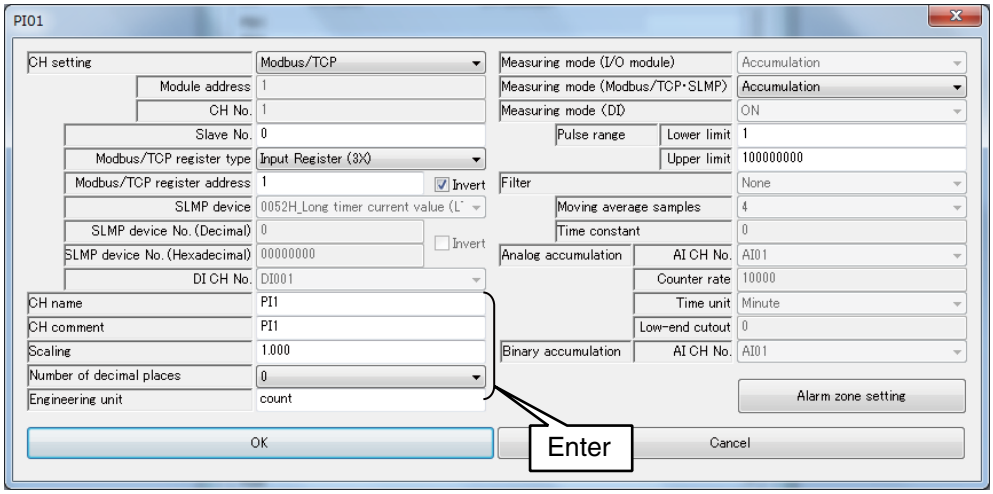
NOTES

Make sure that the AI range is set between 0 – 65535 and the pulse count is reset to 0 when a count overflow occurs. Note that the DL30-G resets the pulse count to 0 also when the current value is smaller than the previous value.

Basic setting (PI)

Once the assignment is complete, configure the following basic setting.
Click [OK] to temporarily store the setting.

PI setting

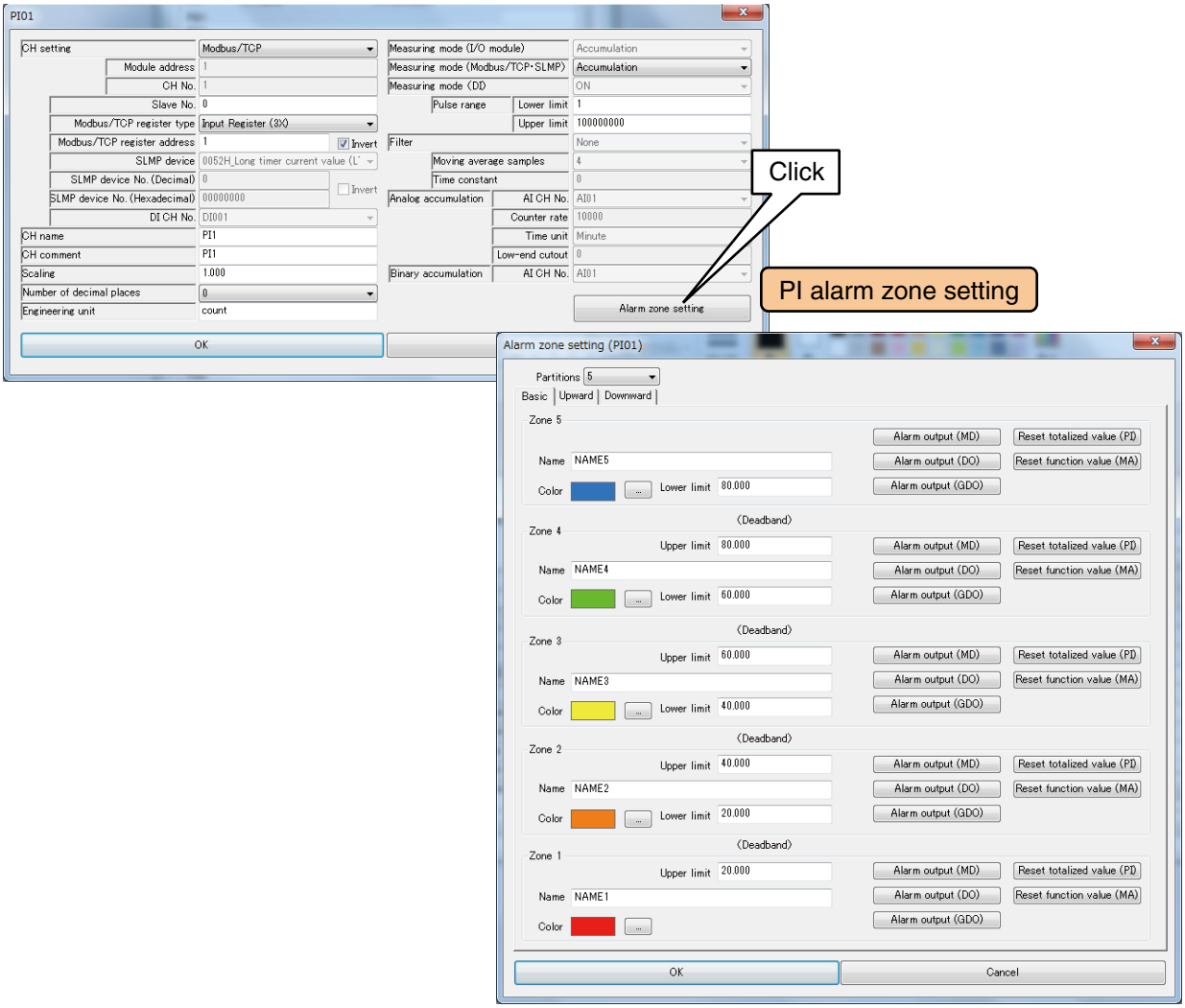


Parameter	Description
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Scaling	Set the weight per pulse as a numeric value.
Number of decimal places	Set the number of digits after the decimal point in the values displayed as numeric values in the Web browser view. Select from 0 / 1 / 2 / 3.
Engineering unit	Set the engineering unit corresponding to the actual value set in the [Scaling]. Can be set using up to 8 characters.

Alarm zone setting (PI)

Configure alarm zones corresponding to the input values. A maximum of 5 zones can be set, and deadbands can also be set between zones.

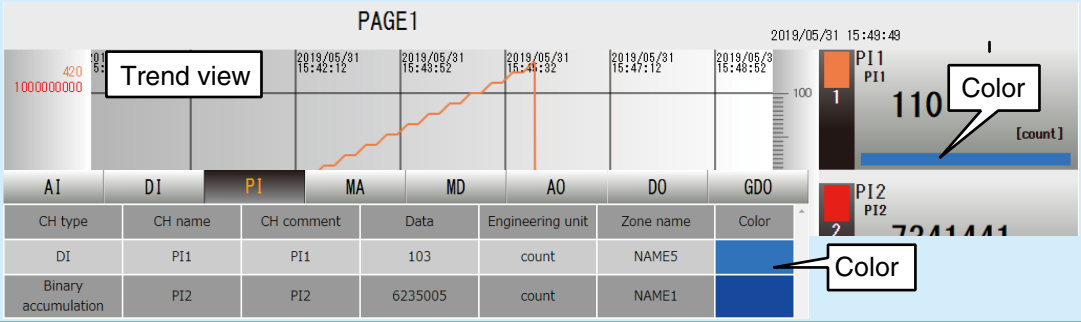
(1) Click [Alarm zone setting] button in the [PI setting] window to display the [PI Alarm zone setting] window.



(2) Set relevant parameters by referring to the table below.

Parameter	Description
Partitions	Set the number of partitions to be used. Select from: Disable / 2 / 3 / 4 / 5.
Name	Set a name for each zone using up to 32 characters.
Color	Set a color to represent each zone which will be displayed on the Web browser view.
Upper limit : : : Lower limit	Set the upper and lower limit values for these zones as actual values. Set such that the upper limit value > lower limit value. • When the deadband is set When a deadband is set between zone 1 and zone 2, set the values so that the deadband is between the upper limit value for zone 1 and the lower limit value for zone 2. Set similarly for the other zones as well. • When the deadband is not set When the deadband is not set between zone 1 and zone 2, set the same value for the upper limit value of zone 1 and the lower limit value of zone 2. Set similarly for the other zones as well.

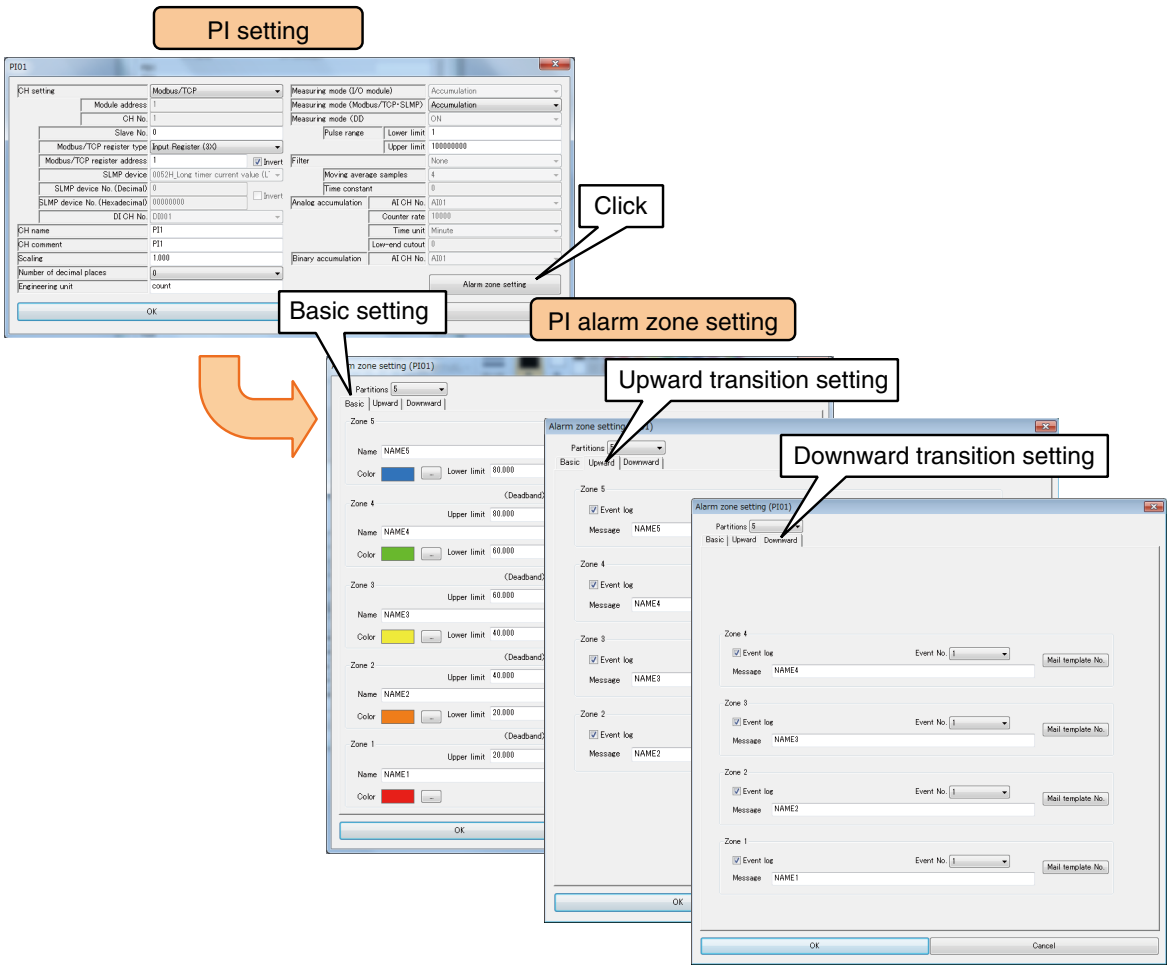
Web Browser View



Upward/downward transition setting (PI)

An event occurs when the zones set in the [Alarm zone setting] window shift from one to another.

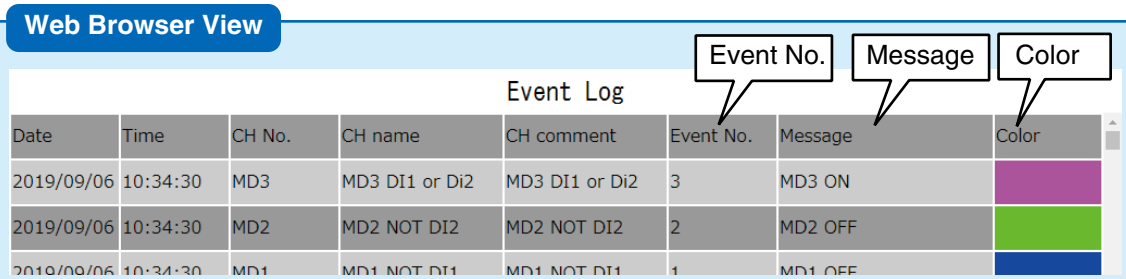
(1) Click [Alarm zone setting] button in the [PI setting] window to display the [PI Alarm zone setting] window. Click the [Upward] or [Downward] tab.



(2) Set relevant parameters by referring to the table below.
Once the setting is complete, click [OK] to go back to the [PI setting] window.

Parameter	Description
Event log	Set whether or not to record an event when there is a change in the input value and it enters a certain zone. Check the check box to record event logs.
Event No.	Set the event number to be assigned to each event log. (Setting range: 1 to 64)
Message	Set a message to be displayed when an event occurs using up to 32 characters.
Mail template No.	Set the mail template number to be sent when an event occurs. Multiple mail templates can be specified. Create the templates in advance. ➔ 3.10.2 Mail template setting

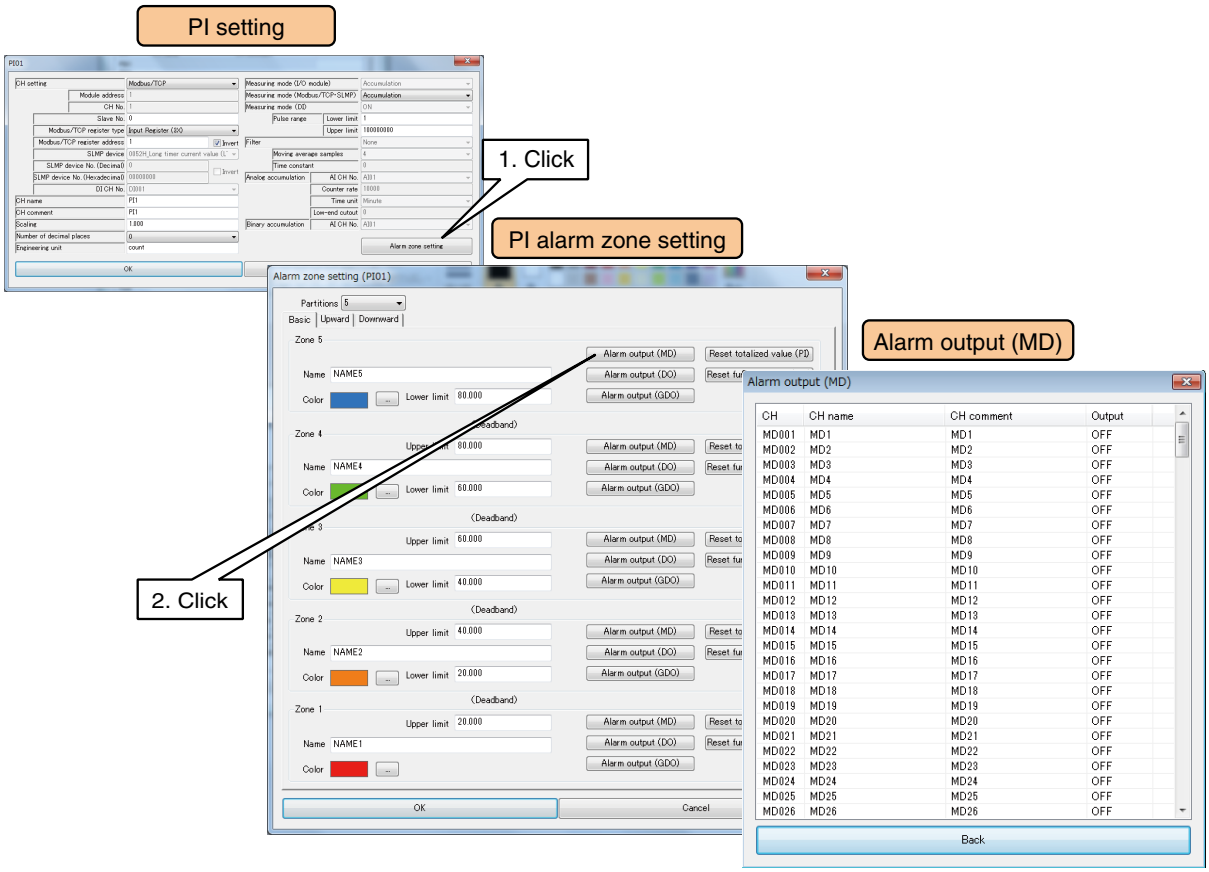
Web Browser View



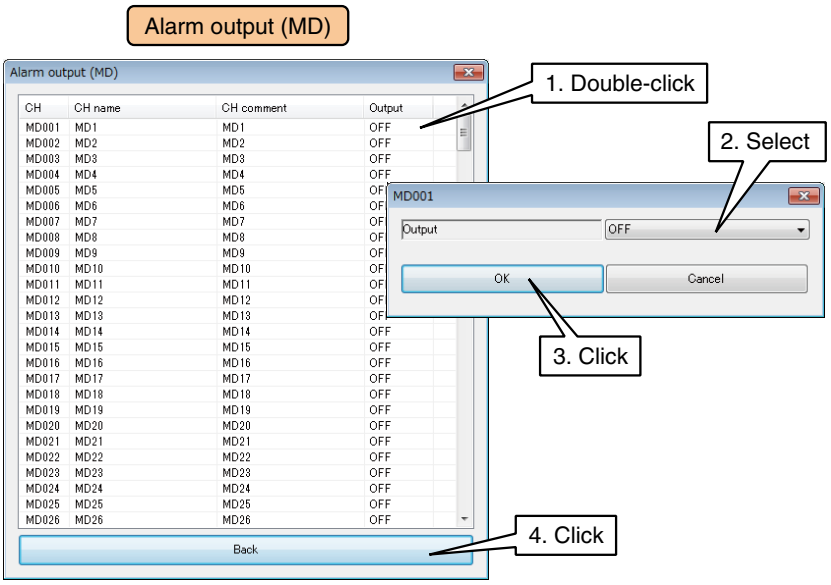
MD alarm output (PI)

A specific MD can be turned ON for each zone.

(1) Click [Alarm zone setting] button in the [PI setting] window to display the [Alarm zone setting] window. Click [Alarm output (MD)] button of a specific zone to display the [Alarm output (MD)].



(2) Double-click the MD channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [PI Alarm zone setting] window.

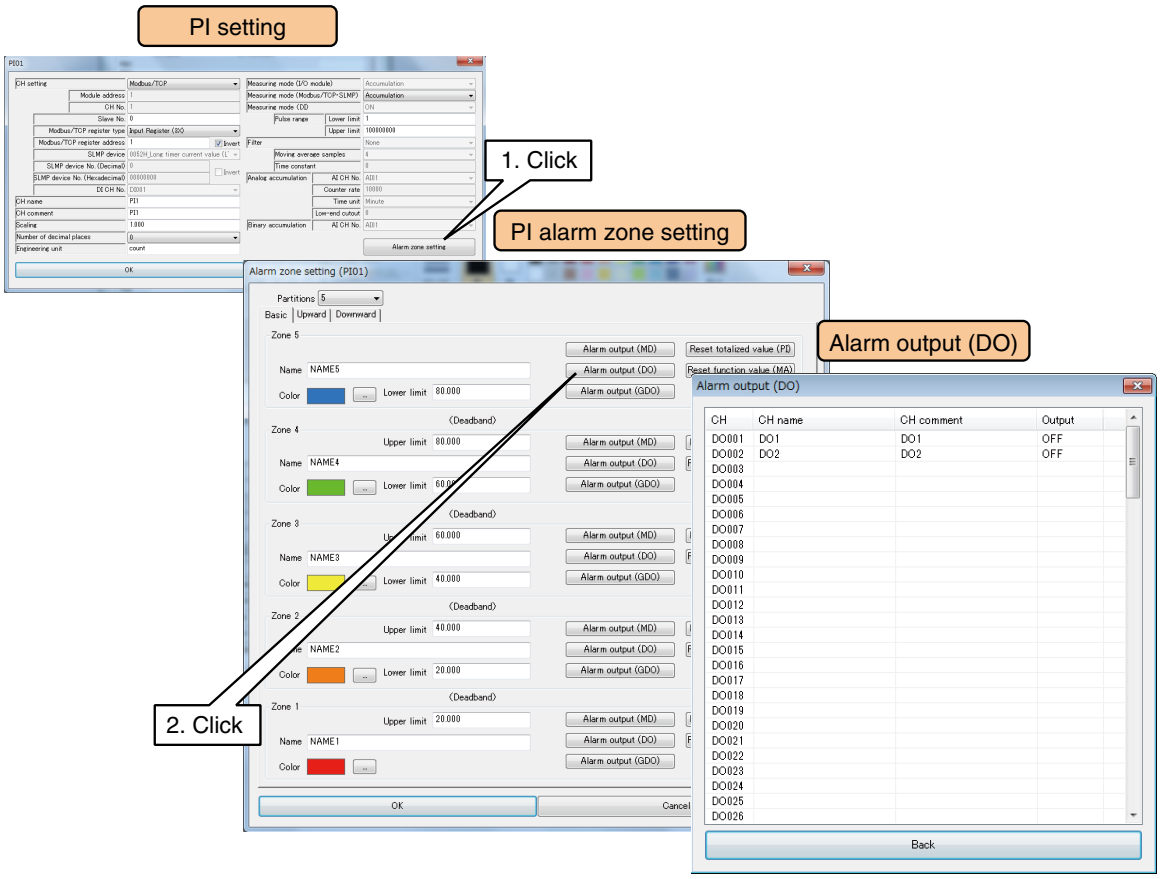
CAUTION

- When MD is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

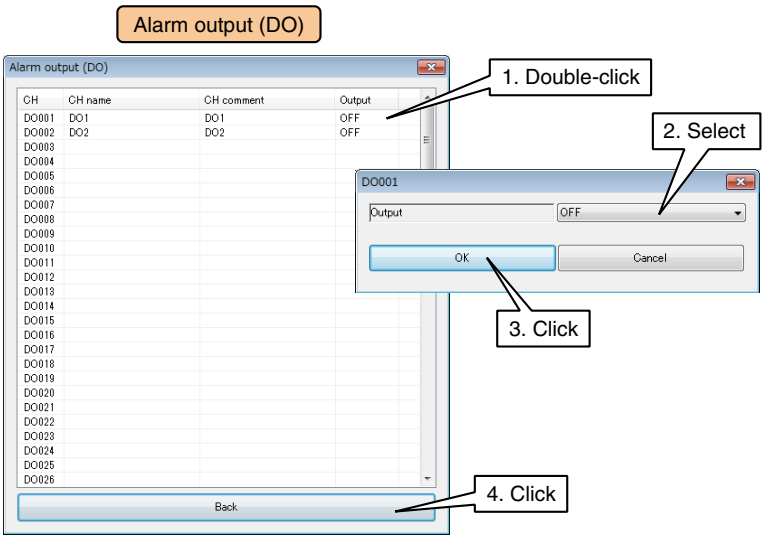
DO alarm output (PI)

A specific DO can be turned ON for each zone.
Configure the DO setting before configuring this setting. ➔ 3.6.8 Discrete output (DO)

(1) Click [Alarm zone setting] button in the [PI setting] window to display the [PI Alarm zone setting] window. Click [Alarm output (DO)] button in a specific zone to display the [Alarm output (DO)].



(2) Double-click the DO channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [PI Alarm zone setting] window.

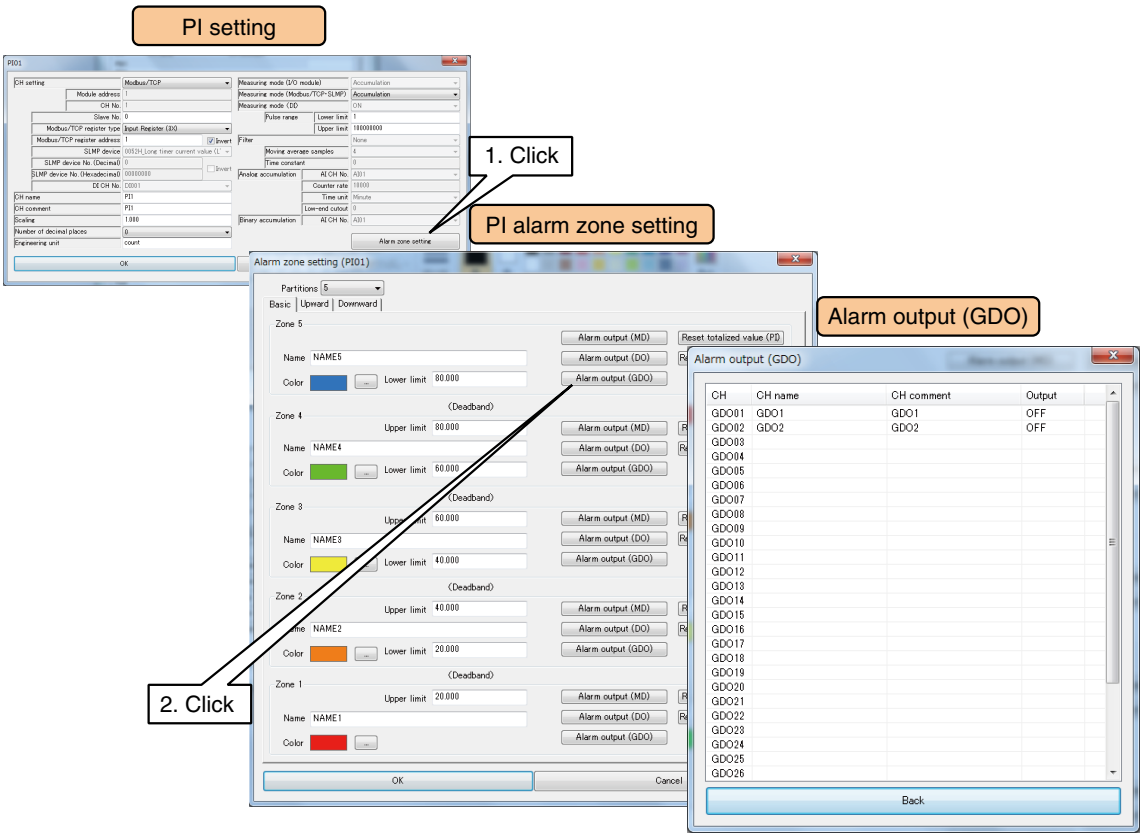
CAUTION

- When DO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

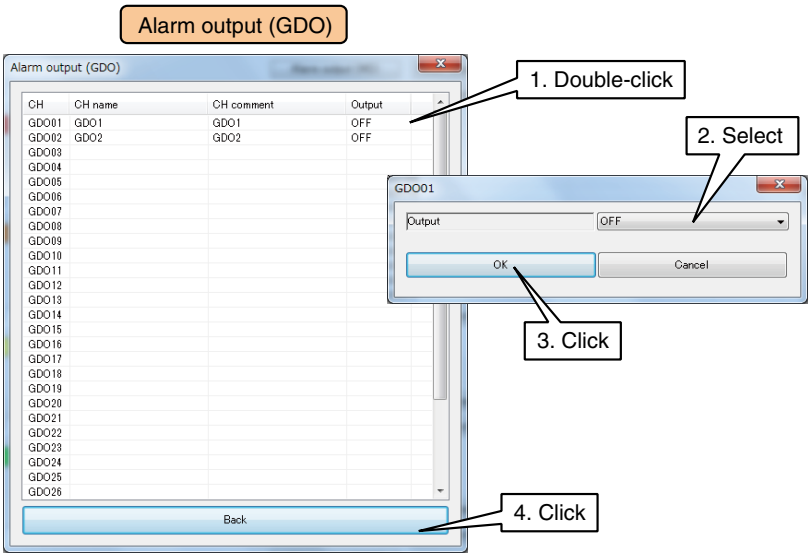
GDO alarm output (PI)

A specific GDO can be turned ON for each zone.
Configure the GDO setting before configuring this setting. ➔ 3.6.9 Grouped digital output (GDO)

(1) Click [Alarm zone setting] button in the [PI setting] window to display the [PI Alarm zone setting] window. Click [Alarm output (GDO)] button in a specific zone to display the [Alarm output (GDO)].



(2) Double-click the GDO channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [PI Alarm zone setting] window.

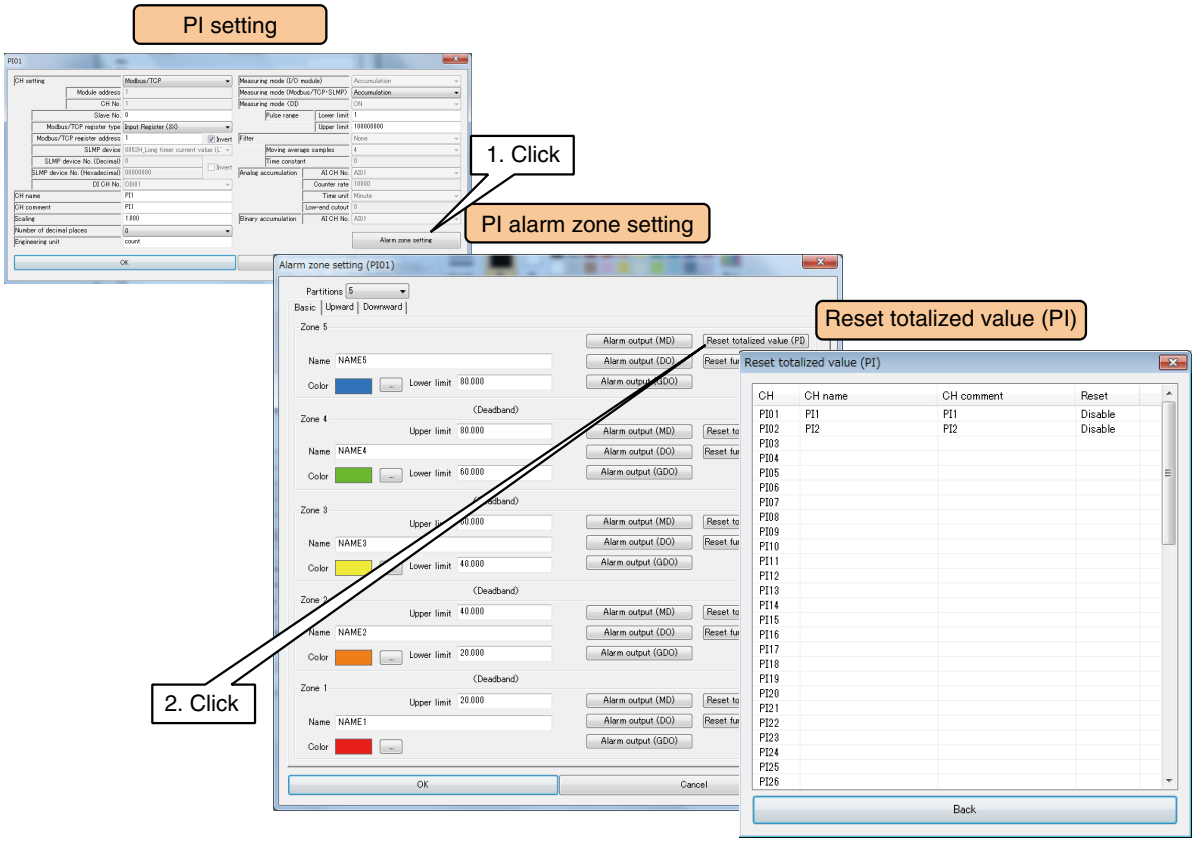
CAUTION

- When GDO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

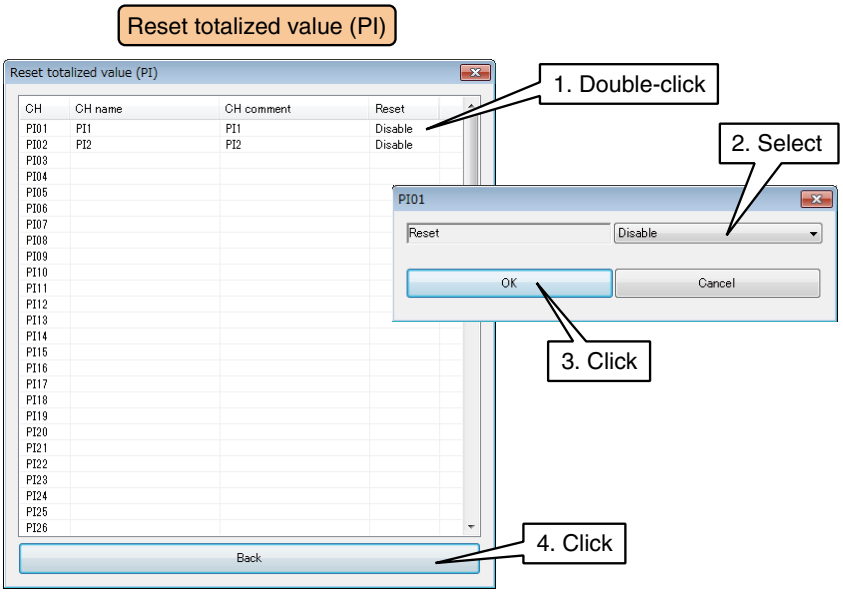
Resetting totalized value (PI)

The cumulative total value of a specific PI can be reset at the timing of zone transition.
The PI channel to be operated needs to be assigned in advance. ➔ 3.6.4 Pulse input (PI)

(1) Click [Alarm zone setting] button in the [PI setting] to display the [PI Alarm zone setting]. Click [Reset totalized value (PI)] button in a specific zone to display the [Reset totalized value].



(2) Double-click the PI channel to be operated and set as Disable/Enable.

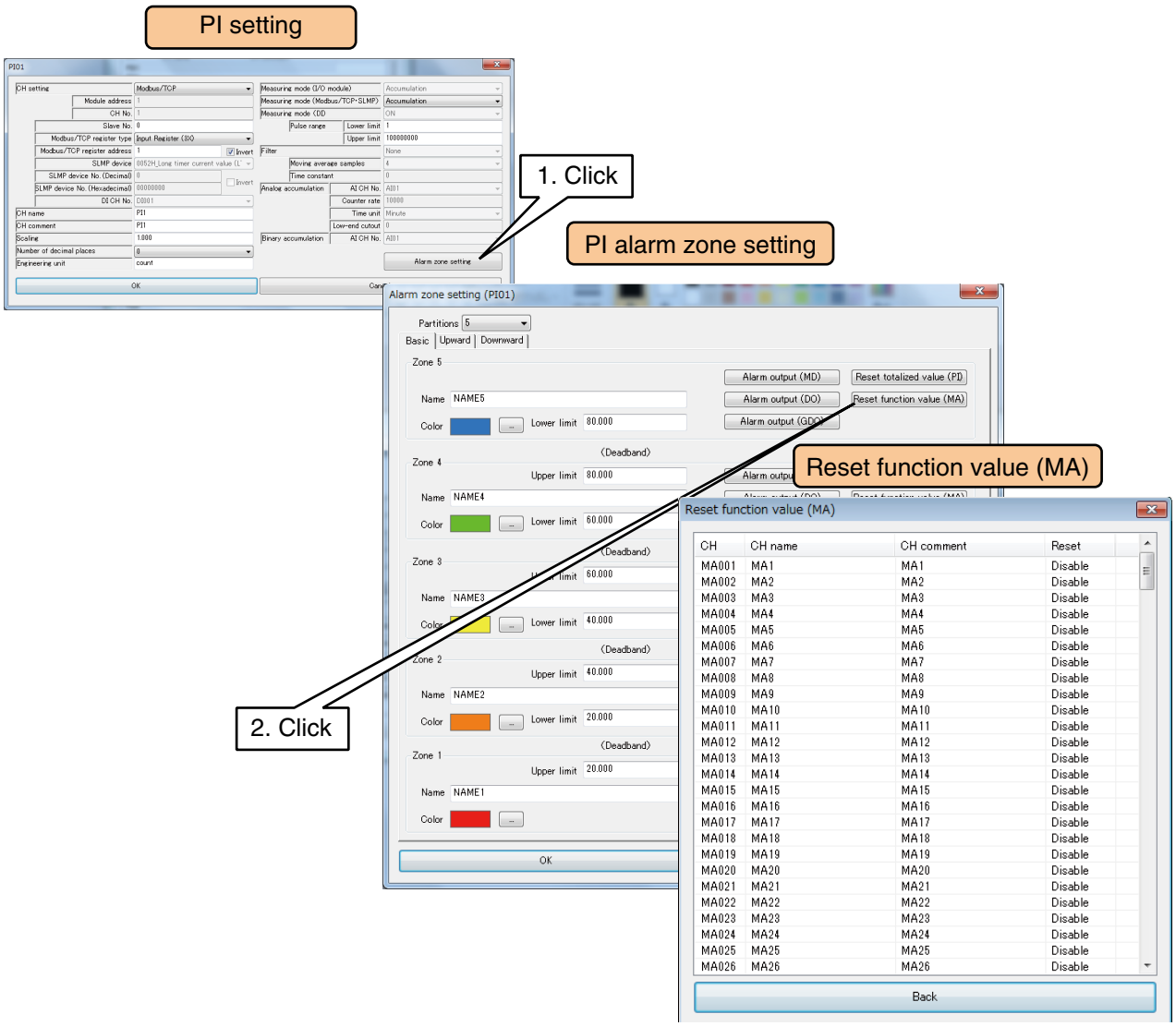


(3) Click [Back] to return to the [PI Alarm zone setting] window.

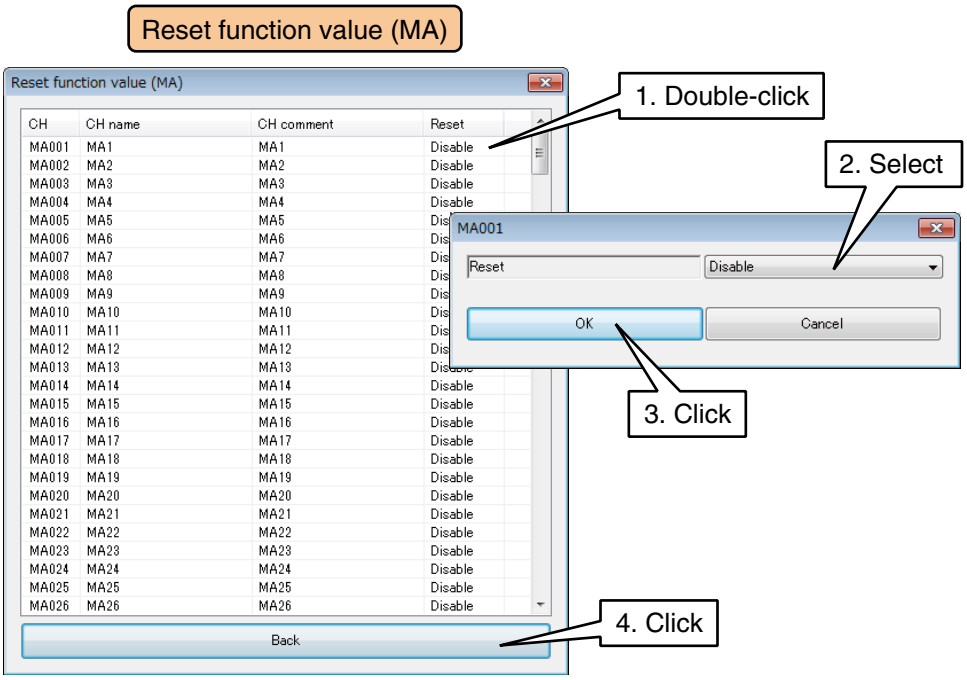
Resetting MA function value (PI)

The operation of a specific MA can be reset at the timing of zone transition.
The MA channel to be operated needs to be assigned in advance. ➔ 3.6.5 Analog function register (MA)

(1) Click [Alarm zone setting] button in the [PI setting] window to display the [PI Alarm zone setting] window. Click [Reset function value (MA)] button in a specific zone to display the [Reset function value].



(2) Double-click the MA channel to be operated and set as Disable / Enable.



(3) Click [Back] to return to the [PI Alarm zone setting] window.

Once the setting is complete, click [OK] to temporarily store the setting.

Set each CH by following the above procedure.
The CH setting for which the setting is complete in the [Pulse input (PI)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

Resetting PI counts in regular intervals

Time input is used to reset PI counts in regular time intervals to continuously accumulate and store pulse counts over certain time period.

Given below are examples of parameter setting for logging PI1 while resetting the counts in a regular interval by using AI1.

■ Logging pulse counts for 1 minute by resetting PI every minute

Parameter			Setting
AI1	CH setting		Time input
	Time input		Second
	Alarm zone setting	Partitions	2
		Zone 1, Upper limit	10
		Zone 2, Lower limit	10
		Zone 1, Reset totalized value (PI)	Enable, PI1
PI1	Assign a pulse input channel to be measured.		
Logging	Storing rate time unit	Mode	Minute
		Min.	1
	Pen		Assign a pen with PI1.

■ Logging pulse counts for 1 hour by resetting PI every hour on the hour

Parameter				Setting
AI1	CH setting			Time input
	Time input			Minute
	Alarm zone setting	Partitions		2
		Zone 1, Upper limit		10
		Zone 2, Lower limit		10
		Zone 1, Reset totalized value (PI)		Enable, PI1
PI1	Assign a pulse input channel to be measured.			
Logging	Storing rate time unit	Mode		Hour
		Choose hour and offset (Apply same setting to all hours (00 to 23)	Logging	Enable
			Offset (min.)	0
			Offset (sec.)	0
	Pen			Assign a pen with PI1.

■ Logging pulse counts for 1 day by resetting PI at 0:00 every day

Parameter				Setting
AI1	CH setting			Time input
	Time input			Hour
	Alarm zone setting	Partitions		2
		Zone 1, Upper		2
		Zone 2, Lower		2
		Zone 1, Reset totalized value (PI)		Enable, PI1
PI1	Assign a pulse input channel to be measured.			
Logging	Storing rate time unit	Mode		Hour
		Choose hour and offset	Logging	Enable only for 00 hour
			Offset (min.)	0
			Offset (sec.)	0
		Dateline (hour)		0
		Day of week		Check all days of the week.
	Pen			Assign a pen with PI1.

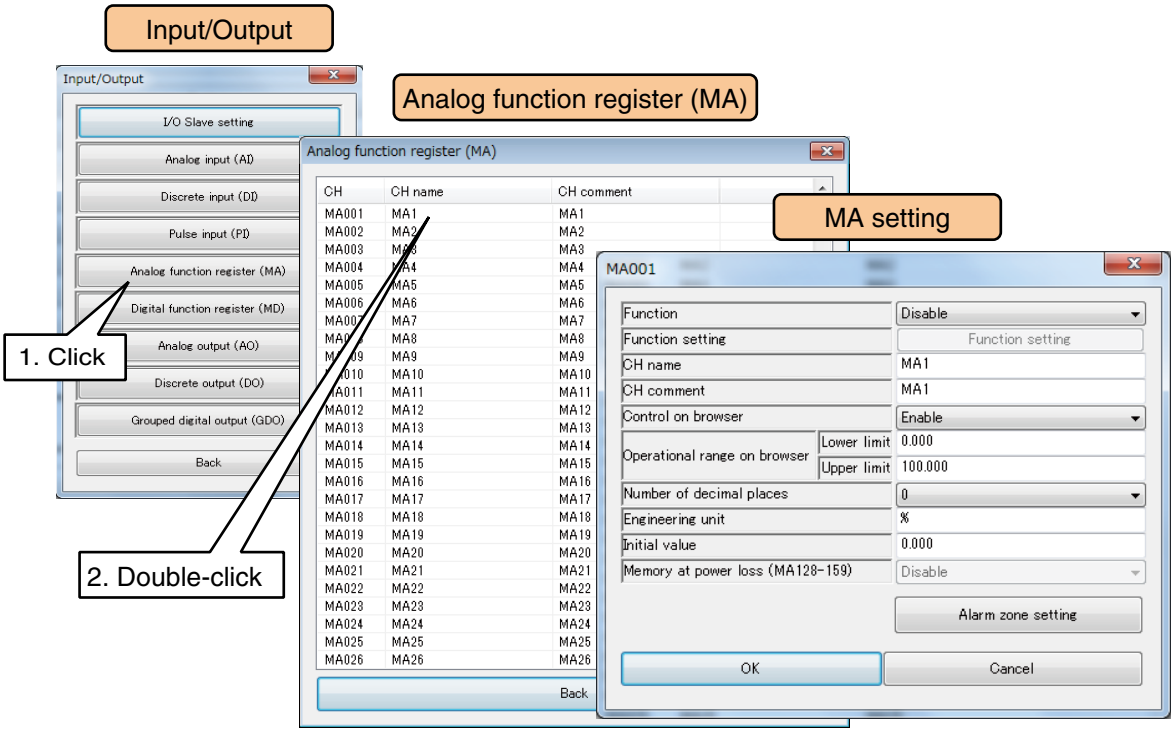
Refer to [3.8.1 Data logging] for detailed settings of data logging.

3.6.5 Analog function register (MA)

A maximum of 256 points of analog computation functions (MA1 to MA256) can be used.
Assign MA channels to the DL30-G following the below procedure.

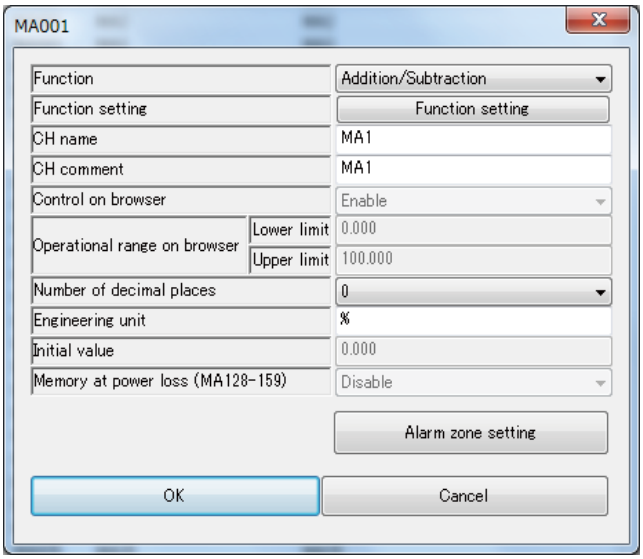
Basic setting (MA)

(1) Click [Analog function register (MA)] button in the [Input/Output] window to display the [Analog function register (MA)] window.
Double-click a row of the MA channel to be set in this window to display the [MA setting] window.



(2) Configure the following basic parameters and click [OK] to temporarily store the setting.

MA setting



Parameter	Description
Function	Select a function among the list in the following table.
Function setting	Set parameters required for the selected function.
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Number of decimal places	Set the number of digits after the decimal point in the values displayed as numeric values in the Web browser view. Select from 0 / 1 / 2 / 3.
Engineering unit	Set the engineering unit. Can be set using up to 8 characters.
Initial value	Enter a value when the [Function] is disabled.
Memory at power loss	Select whether to hold a value immediately before the unit stops due to power failure or reset of the unit. The held value is output when the unit is restarted. This parameter is available for MA128 to MA159 only and when the [Function] is disabled. [Initial value] invalid when this function is enabled.

■ Function specifications

Function name	Formula	Parameters
Addition and subtraction	K1X1 + K2X2 + K3X3 + A0	K1, K2, K3, A0: Constant X1, X2, X3: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Multiplication	(K1X1 + A1)(K2X2 + A2) + A0	K1, K2, A0, A1, A2: Constant X1, X2: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Division	(K1X1 + A1) / (K2X2 + A2) + A0	K1, K2, A0, A1, A2: Constant X1, X2: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Square root	$10\ K1\sqrt{X1}$	K1: Constant X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Moving average		X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 K1: Number of moving averages (4 / 8 / 16 / 32 / 64)
Delay buffer		X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 K1: Time constant (0 to 100 seconds)
Exp	e^{x1}	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Common logarithm	logX1	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Natural logarithm	lnX1	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256
Peak hold (max)	MAX (X1)	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 RST: Initialize (MAX=X1)
Valley hold (min)	MIN (X1)	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 RST: Initialize (MIN=X1)
Analog accumulation		X1: AI1 - 64, PI1 - 64, MA1 - 256 (0 to 100%) K1: Counter rate K2: Time Unit (Minutes / Hours / Days) K3: Low-end cutout (0.000 to 120.000%) K4: Zero, engineering unit value K5: Span, engineering unit value RST: Initialize Zero and Span must not be equal.
Power	$X1^{K1}$	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 K1: Exponent
F value calculation	$\sum 10^{\frac{X1 - K1}{K2}}$	X1: AI1 - 64, PI1 - 32, MA1 - 32, engineering unit value (°C) K1: Reference temperature (°C) K2: Z value (Positive actual number) RST: Initialize
Scaling	K3 + (K4 – K3)(X1 – K1) / (K2 – K1)	X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 Output range: -2000 to 12000 K1: Zero (input) K2: Span (input) K3: Zero (output) K4: Span (output) Zero and span must not be the same value.
Upper/lower signal limiter		X1: AI1 - 64, DI1 - 128, PI1 - 64, MA1 - 256 K1: Lower limit K2: Upper limit Lower limit < Upper limit

Note 1: Engineering unit values are used for AI and PI.
Note 2: DI: ON=1.0, OFF=0.0
Note 3: Values taken within the same sampling cycle are used for AI, DI, and PI.
Note 4: For MA:
Values taken within the same sampling cycle are valid when the relevant CH No. > MA CH No.
Values taken from the previous sampling cycle are valid when the relevant CH No. ≤ MA CH No.

■ Action when there is an error

Operation name	Process
Division	When K2X2 + A2 = 0, values taken from the previous sampling cycle are used. Error is recorded in the system log.
Square root	When X1 is negative, a value taken from the previous sampling cycle is used. Error is recorded in the system log.
Common logarithm	When X1 is <= 0, a value taken from the previous sampling cycle is used. Error is recorded in the system log.
Natural logarithm	When X1 is <= 0, a value taken from the previous sampling cycle is used. Error is recorded in the system log.
Power	When X1 = 0 and K1 <= 0, or X1 is negative and K1 is not an integer value, a value taken from the previous sampling cycle is used. Error is recorded in the system log.
F value calculation	When Z value is <= 0, a value taken from the previous sampling cycle is used. Error is recorded in the system log.

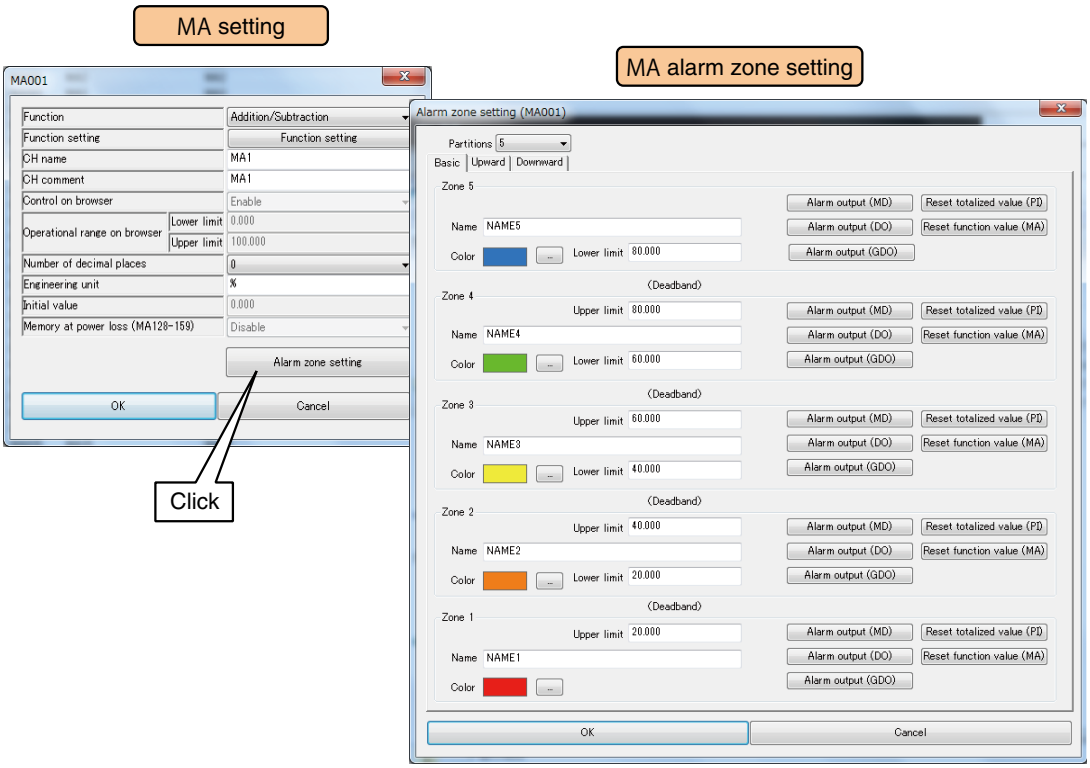
NOTES

Refer to [3.6.4 Pulse input (PI)] > [Assigning analog accumulation to PI] for details of analog accumulation method.

Alarm zone setting (MA)

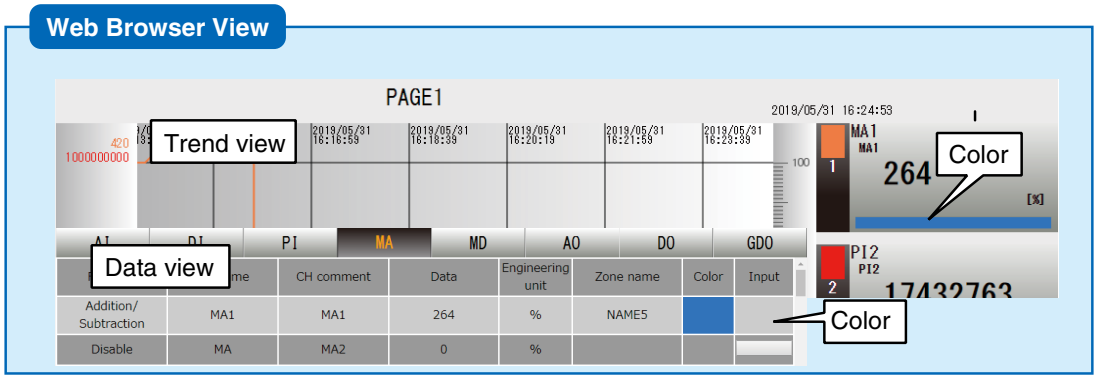
Configure alarm zones corresponding to the input values.
A maximum of 5 zones can be set, and deadbands can also be set between the zones.

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window.



(2) Set relevant parameters by referring to the table below.

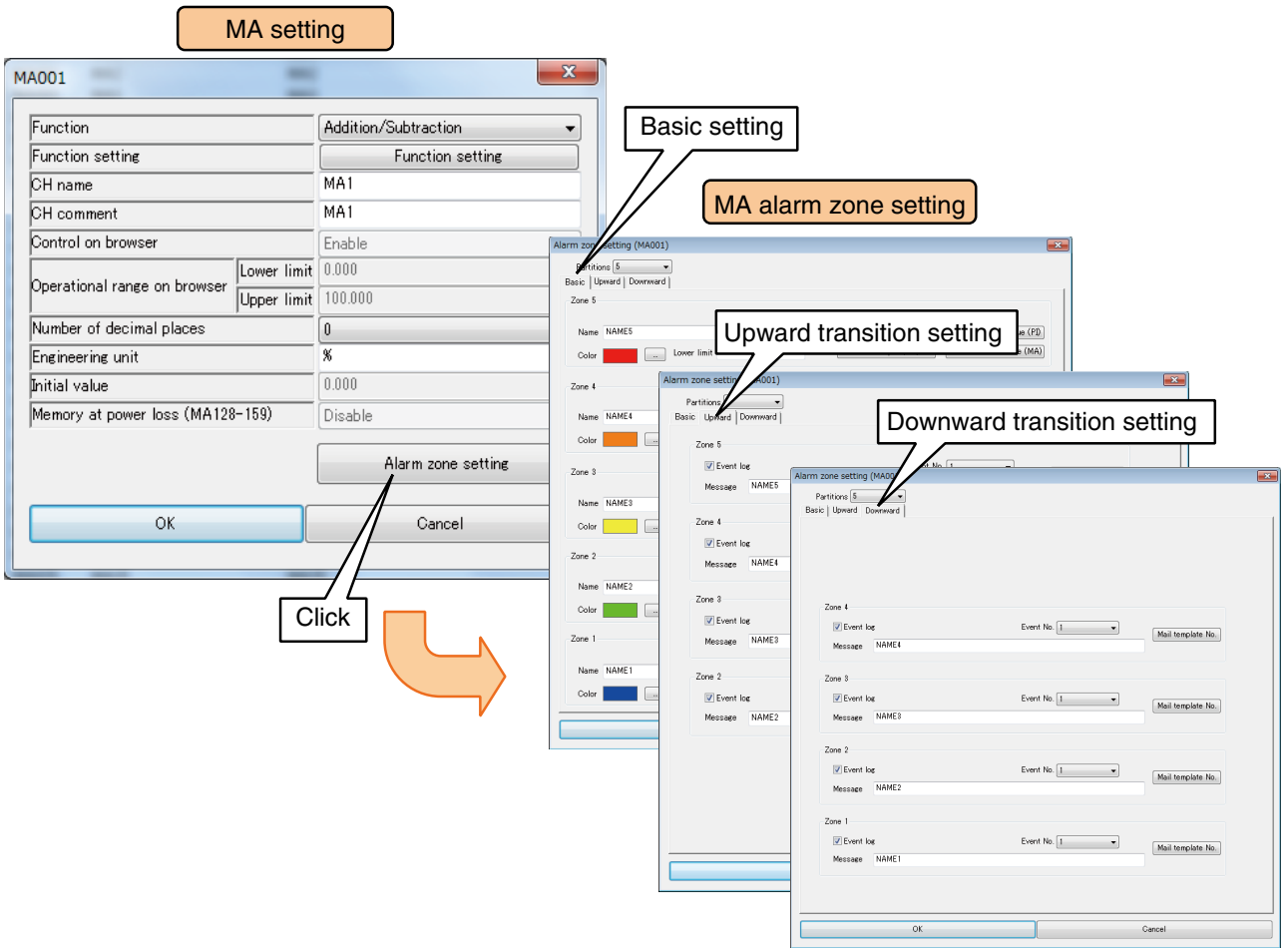
Parameter	Description
Partitions	Set the number of partitions to be used. Select from: Disable / 2 / 3 / 4 / 5.
Name	Set a name for each zone using up to 32 characters.
Color	Set a color to represent each zone which will be displayed on the Web browser view.
Upper limit : : : Lower limit	Set the upper and lower limit values for these zones as actual values. Set such that the upper limit value > lower limit value. • When the deadband is set When a deadband is set between zone 1 and zone 2, set the values so that the deadband is between the upper limit value for zone 1 and the lower limit value for zone 2. Set similarly for the other zones as well. • When the deadband is not set When the deadband is not set between zone 1 and zone 2, set the same value for the upper limit value of zone 1 and the lower limit value of zone 2. Set similarly for the other zone as well.



Upward/Downward transition setting (MA)

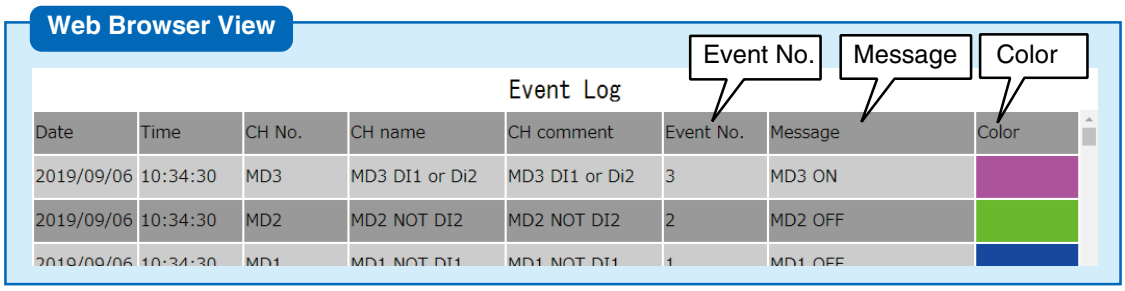
An event occurs when the zones set in the [Alarm zone setting] window shift from one to another.

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window. Click the [Upward] or [Downward] tab.



(2) Set relevant parameters by referring to the table below.
Once the setting is complete, click [OK] to go back to the [MA setting] window.

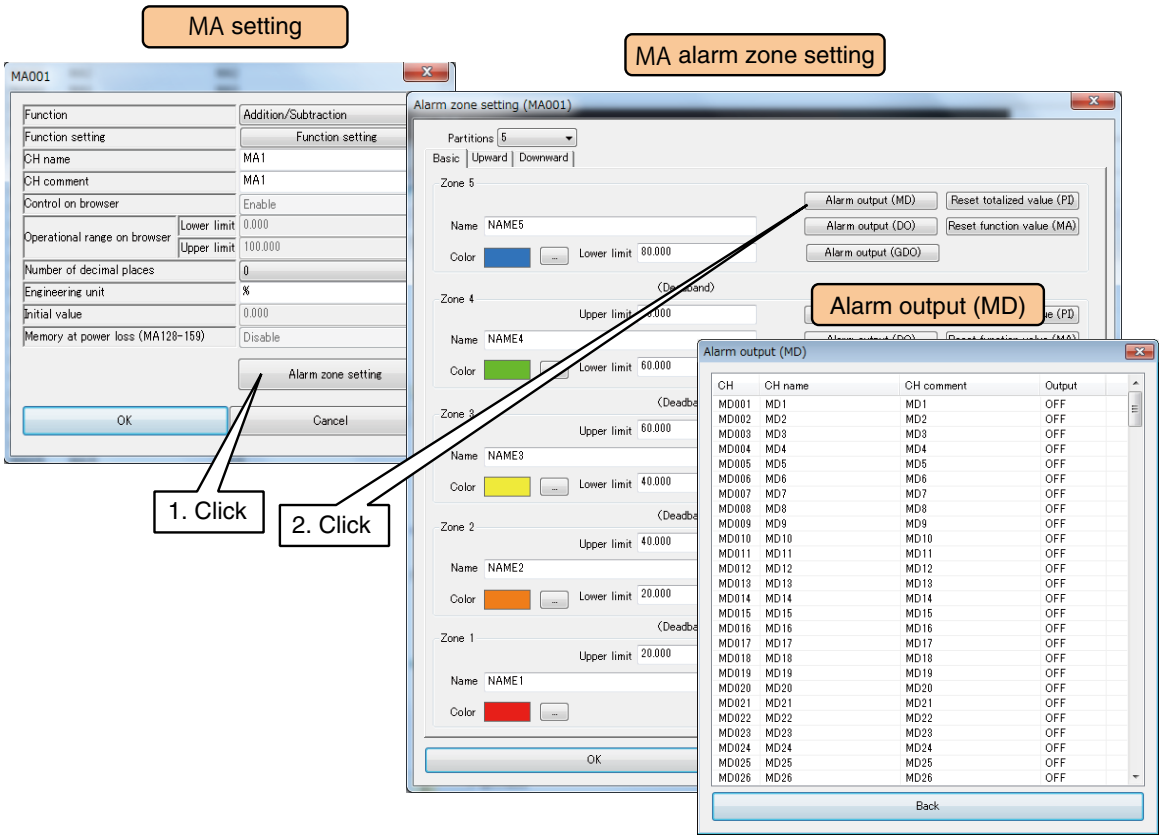
Parameter	Description
Event log	Set whether or not to record an event when there is a change in the input value and it enters a certain zone. Check the box to record event logs.
Event No.	Set the event number to be assigned to each event log. (Setting range: 1 to 64)
Message	Set a message to be displayed when an event occurs using up to 32 characters.
Mail template No.	Set the mail template number to be sent when an event occurs. Multiple mail templates can be specified. Create the templates in advance. ➔ 3.10.2 Mail template setting



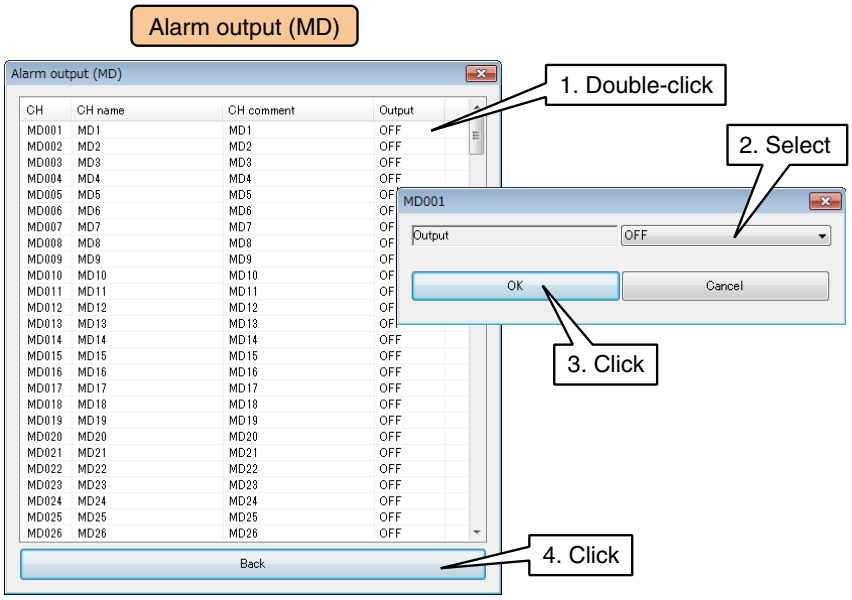
MD alarm output (MA)

A specific MD can be turned ON for each zone.

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window. Click [Alarm output (MD)] button of a specific zone to display the [Alarm output (MD)].



(2) Double-click the MD channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [MA alarm zone setting] window.

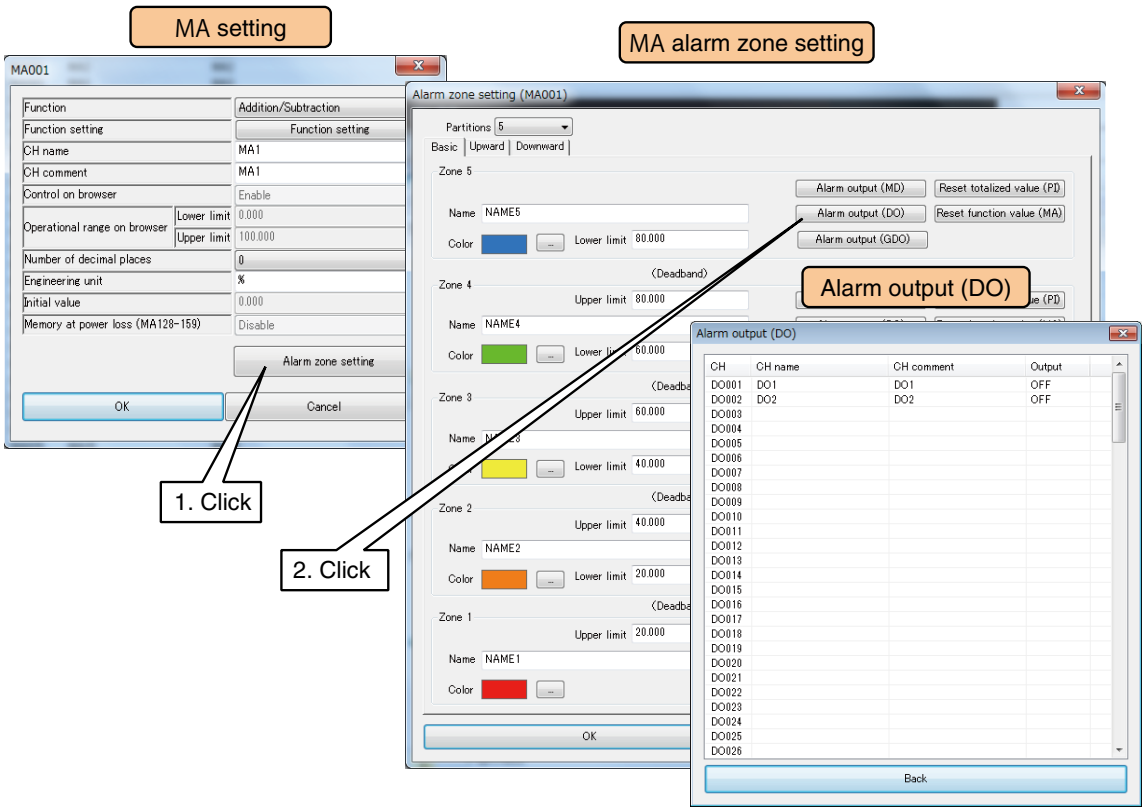
CAUTION

- When MD is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

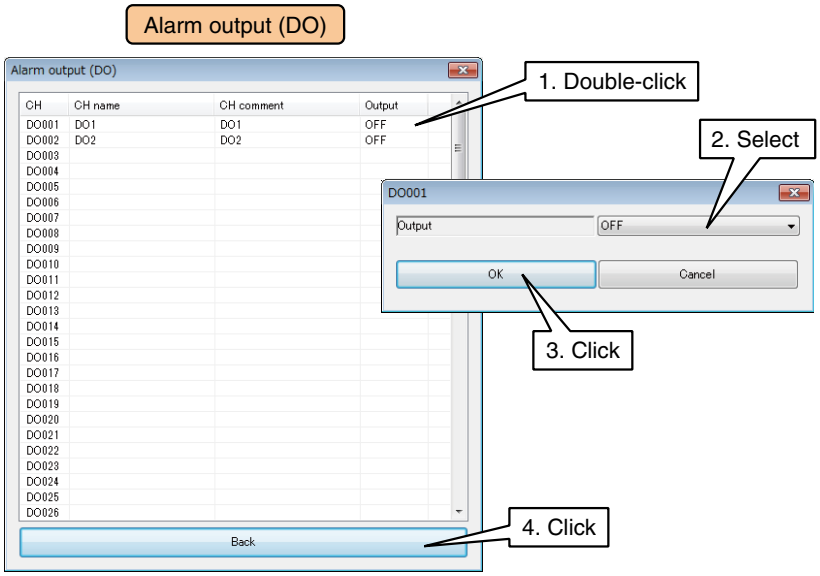
DO alarm output (MA)

A specific DO can be turned ON for each zone.
Configure the DO setting before configuring these setting. ➔ 3.6.8 Discrete output (DO)

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window. Click [Alarm output (DO)] button in a specific zone to display the [Alarm output (DO)].



(2) Double-click the DO channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [MA alarm zone setting] window.

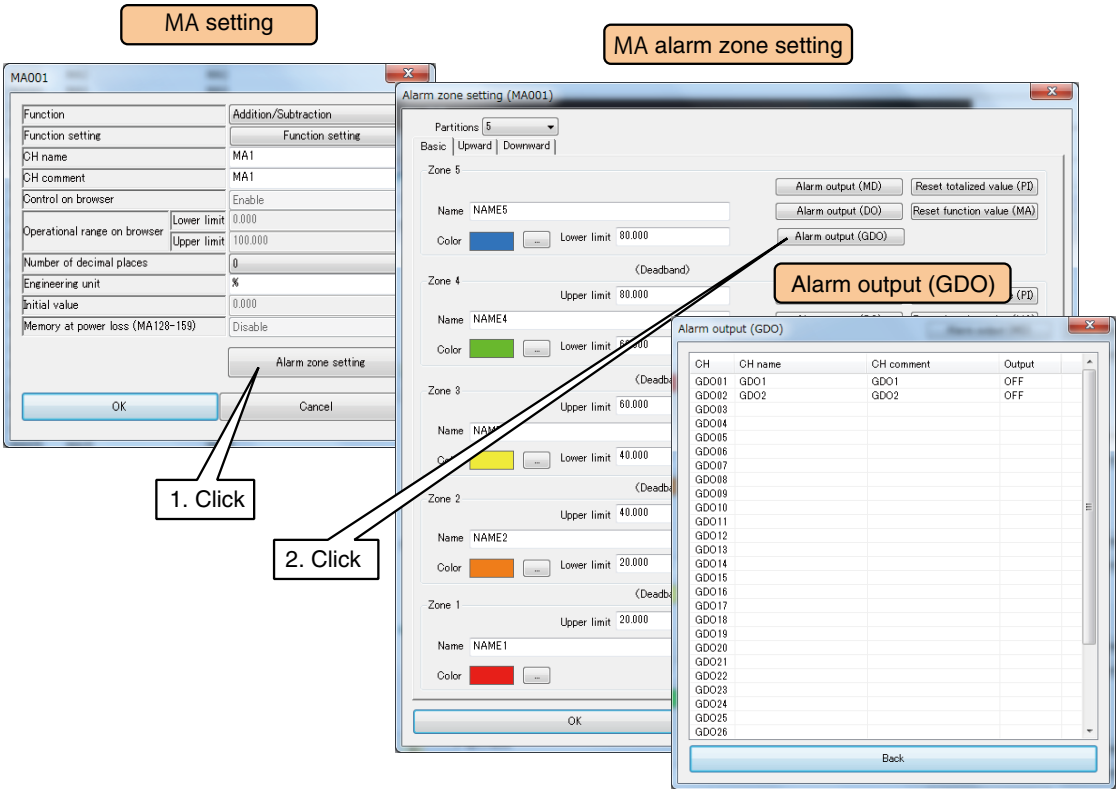
CAUTION

- When DO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

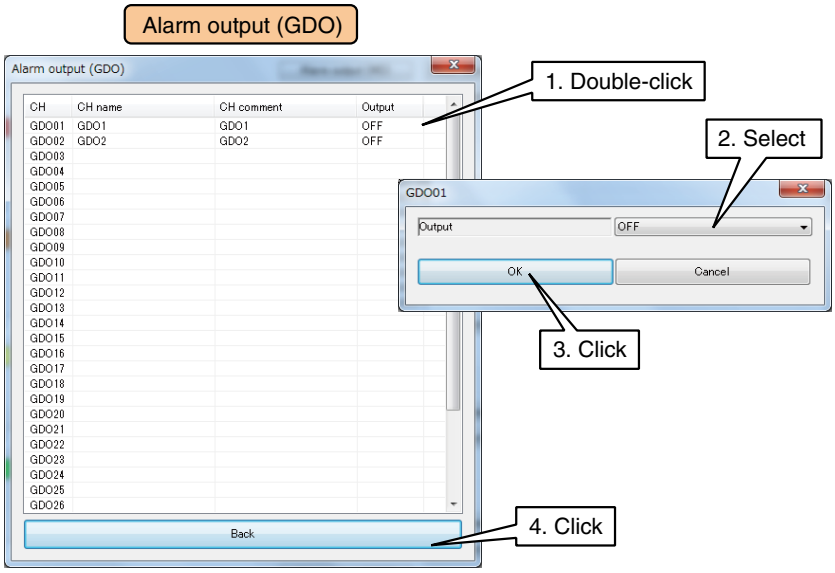
GDO alarm output (MA)

A specific GDO can be turned ON for each zone.
Configure the GDO setting before configuring these setting. ➔ 3.6.8 Discrete output (DO)

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window. Click [Alarm output (GDO)] button in a specific zone to display the [Alarm output (GDO)].



(2) Double-click the GDO channel to be operated and set as ON/OFF.



(3) Click [Back] to return to the [MA alarm zone setting] window.

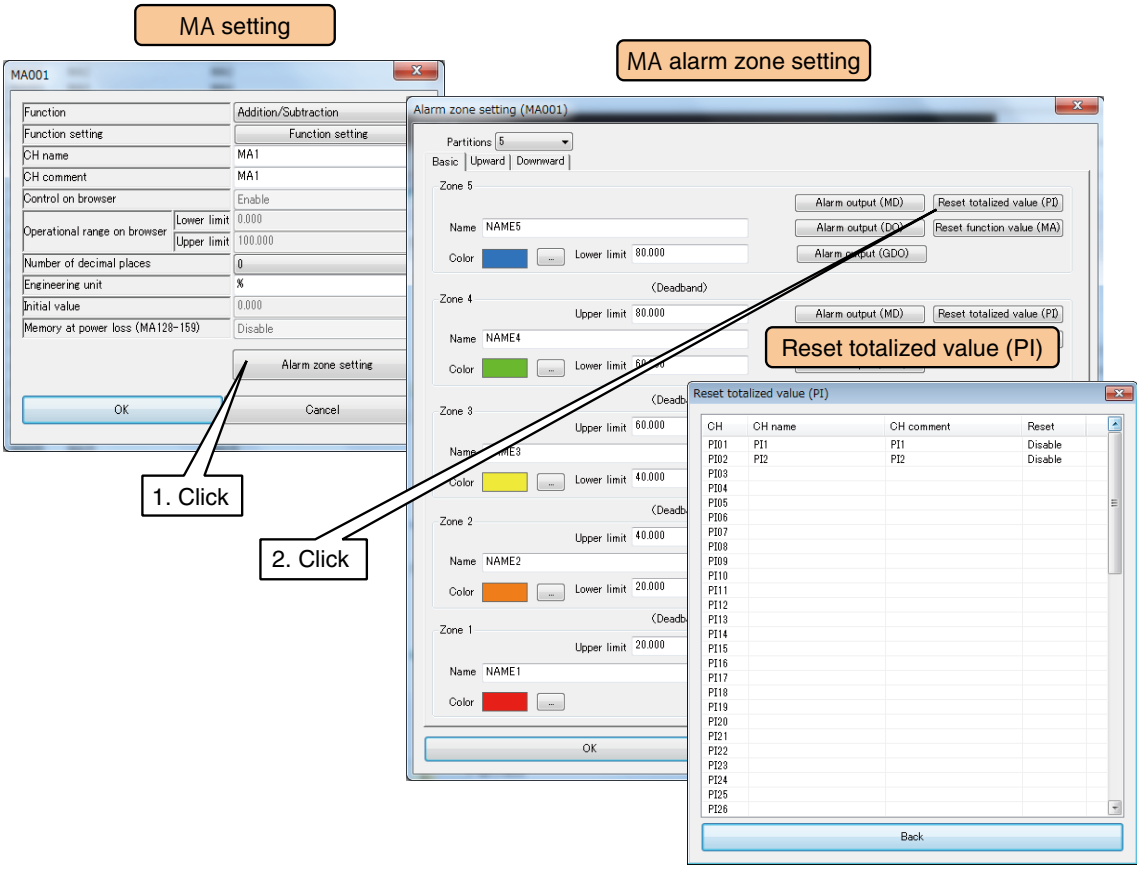
CAUTION

- When GDO is turned ON in the alarm output, the ON output continues as long as the input value is within that zone.
- If the alarm output is not used, set it as OFF.

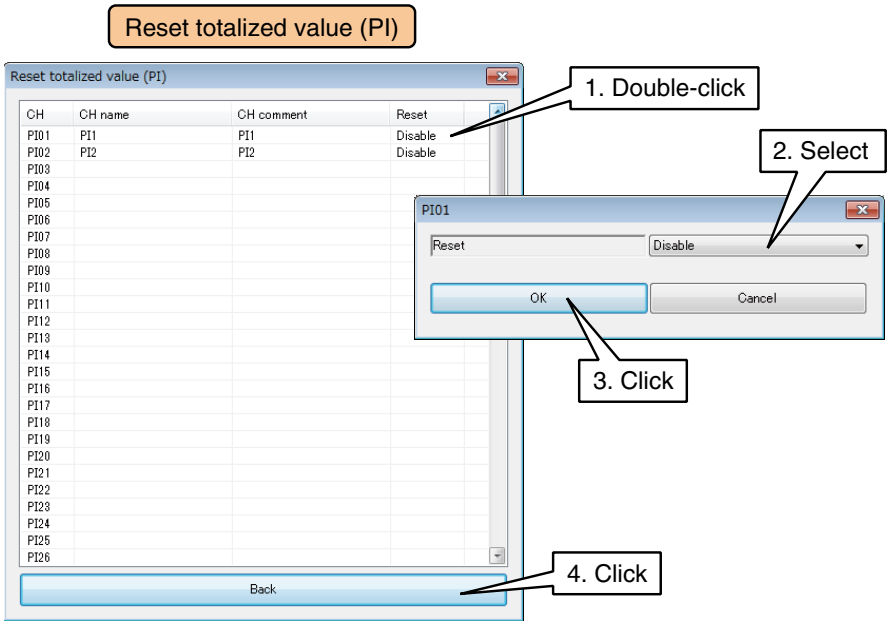
Resetting totalized value (MA)

The cumulative total value of a specific PI can be reset at the timing of zone transition.
The PI channel to be operated needs to be assigned in advance. ➔ 3.6.4 Pulse input (PI)

(1) Click [Alarm zone setting] button in the [MA setting] window to display the [MA alarm zone setting] window. Click [Reset totalized value (PI)] button in a specific zone to display the [Reset totalized value (PI)].



(2) Double-click the PI channel to be operated and set as Disable/Enable.

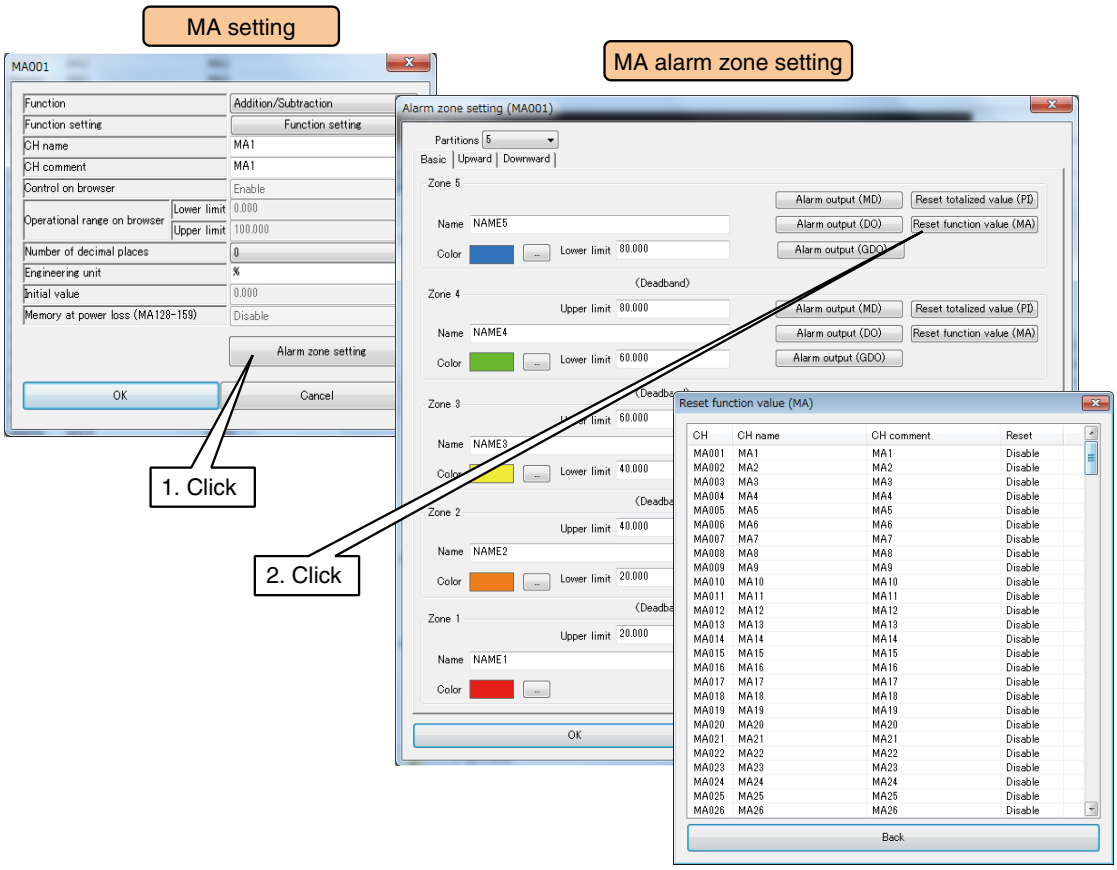


(3) Click [Back] to return to the [MA alarm zone setting] window.

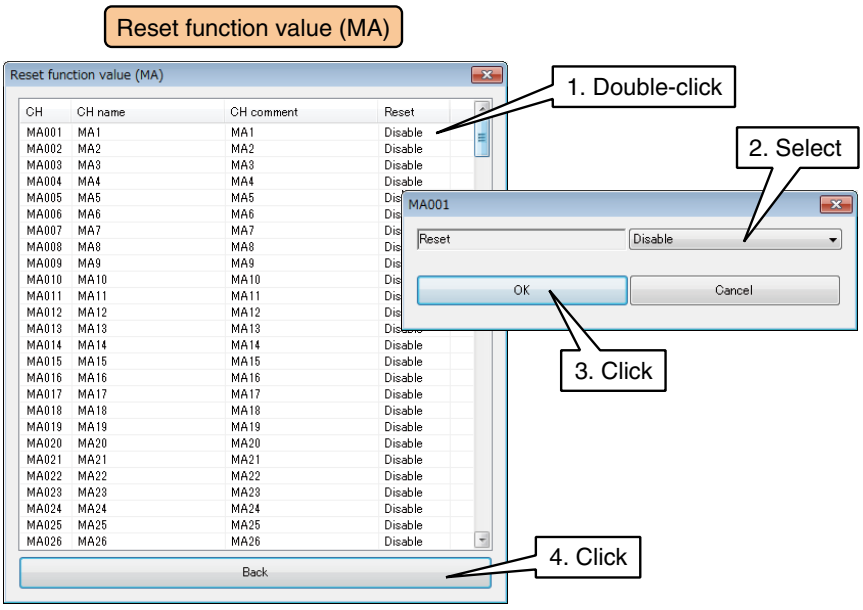
Resetting function value (MA)

The operation of a specific MA can be reset at the timing of zone transition.
The MA channel to be operated needs to be assigned in advance. ➔ 3.6.5 Analog function register (MA)

(1) Click [Alarm zone setting] button in the [MA setting] to display the [Alarm zone setting (MA)].
Click [Reset function value (MA)] button in a specific zone to display the [Reset function value (MA)].



(2) Double-click the MA channel to be operated and set as Disable / Enable.

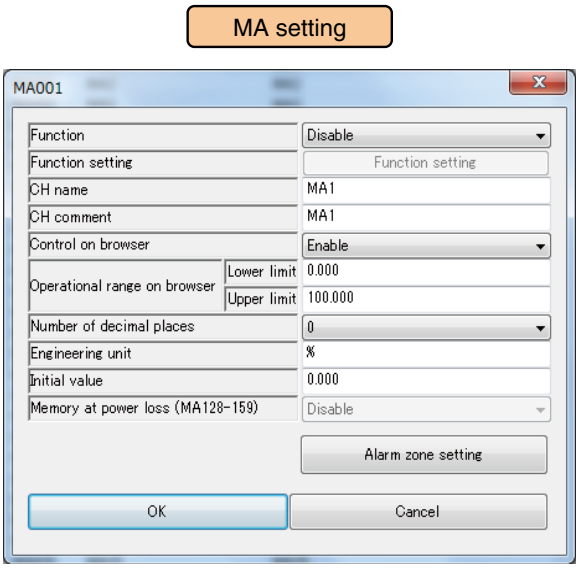


(3) Click [Back] to return to the [MA alarm zone setting] window.

Control on Web browser (MA)

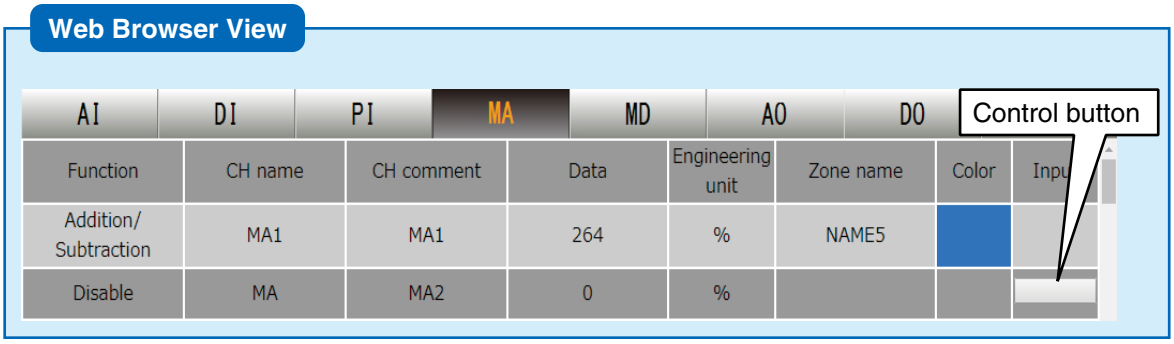
MA register values can be configured via Web browser.

1) Set [Function] as [Disable] and set 'Control on browser' as [Enable] in the [MA setting] window.



(2) Set the relevant parameter below.

Parameter	Description
Operational range on browser	Specify the available range for register values in engineering unit values to be entered via the Web browser.



CAUTION

- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

When all the settings of [MA alarm zone setting] are complete, click [OK] to return to the [MA setting] window, then click [OK].

Set each CH by following the above procedure.
The CH setting for which the setting is complete in the [Analog function register (MA)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

3.6.6 Digital function register (MD)

A maximum of 256 points of digital computation functions (MD1 to MD256) can be used.

Results of logic operations (Equal, AND, OR, XOR, NOT, RUN) by DI channels can be handled as new DI.

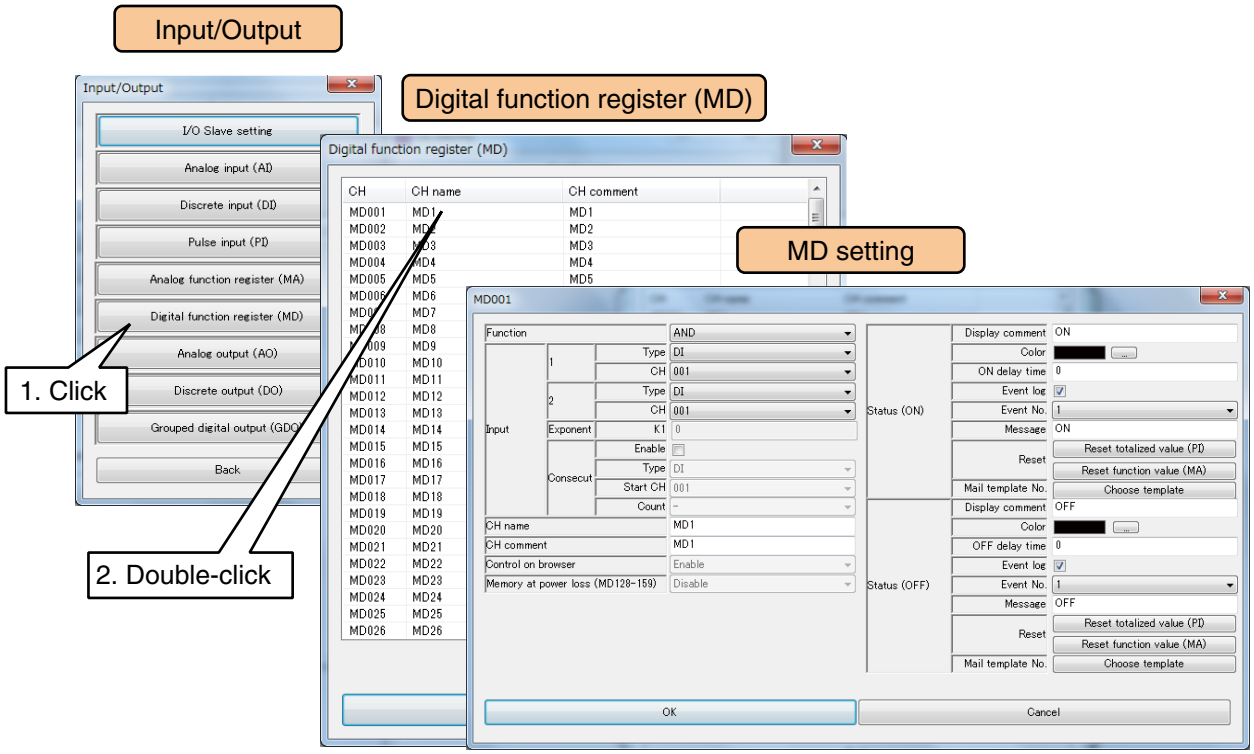
Logic operations are executed from channel No. DI1 in ascending order.

When a larger No. DI channel is used to generate a result for a smaller No. DI channel, the previous sampling data is used for the computation.

Assign MD channels to the DL30-G following the below procedure.

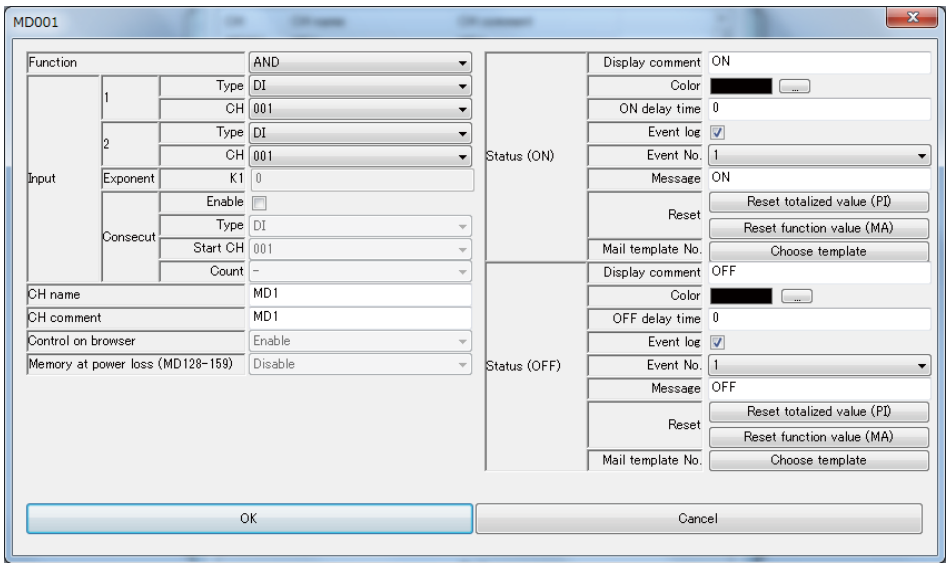
Basic setting (MD)

(1) Click [Digital function register (MD)] button in the [Input/Output] window to display the [Digital function register (MD)] window.
Double-click a row of the MD channel to be set in this window to display the [MD setting] window.



(2) Configure the following basic parameters and click [OK] to temporarily store the setting.

MD setting

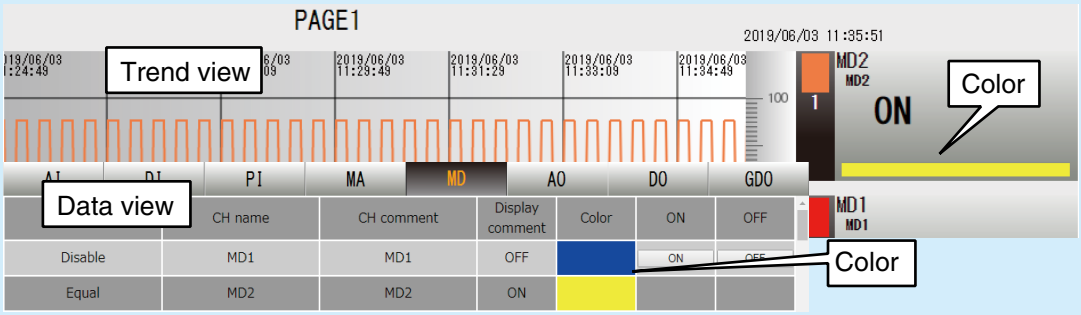


Parameter	Description
Function	Select a function among: None / Equal / AND / OR / XOR / NOT / RUN. RUN: MD turns on when the DL30-G is started up.
Input	Set parameters required for the selected function. Consecutive: 3 or more consecutive channels can be used for AND and OR operation. Check [Enable] and specify the top channel in [Type] and [Start CH], and the number of channels in [Count]. For example, for OR operation for “3” points starting at “DI001," set as follows. [Type]: DI [Start CH]: 001 [Count]: 3 When [Function] is set as [Enabled], 'Self-reset timer' (0 to 999 sec.) can be set in the [K1] field of [Exponent]. Set '0' to disable the 'Self-reset timer'. The timer starts when the Self-reset timer MD detects OFF-ON operation and stops when the set time period has elapsed and the Self-reset timer MD turns ON and OFF. The timer also stops when the Self-reset timer MD is turned OFF while in operation.
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Memory at power loss	Select whether to hold a value immediately before the unit stops due to power failure or reset of the unit. The held value is output when the unit is restarted. This parameter is available for MD128 to MD159 only and when the [Function] is disabled.

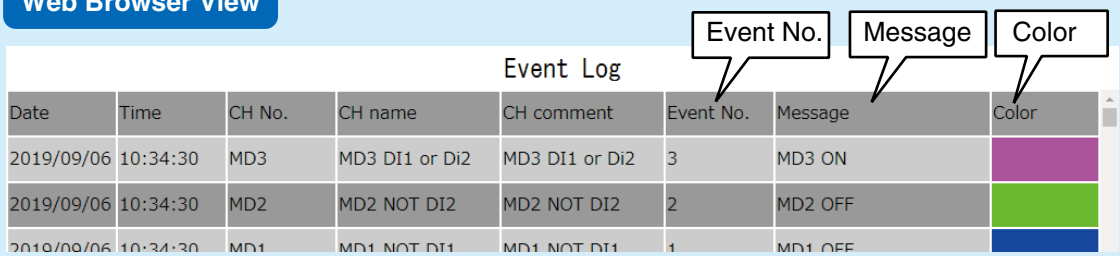
(3) Specify detailed setting for each of ON and OFF status.

Parameter	Description
Display comment	Set strings corresponding to ON/OFF, respectively. Can be set using up to 8 characters.
Color	Set the color which represents the ON/OFF status displayed on the Web browser view.
ON delay time/ OFF delay time	Set the number of samples for each of the ON and OFF delay times. (Setting range: 0 to 999) For example, if the [On delay time] is set as 10, the unit is recognized as being ON when the input signal has been continuously ON for 10 seconds (Sampling cycle 1 sec. x 10).
Event log	Set whether or not to record event logs when there is a change in the input values. Check the box to record event logs.
Event No.	The event numbers can be set for ON and OFF, respectively. The event numbers are assigned to event logs. (Setting range: 1 to 64)
Message	Set a message to be displayed for each event using up to 32 characters.
Mail template No.	Set the mail template number to be sent when an event occurs. Multiple mail templates can be specified. Create the templates in advance. ➔ 3.10.2 Mail template setting

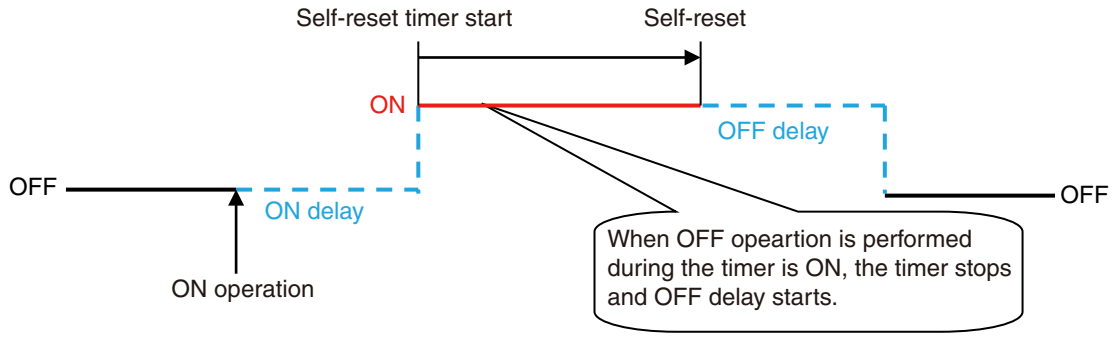
Web Browser View



Web Browser View

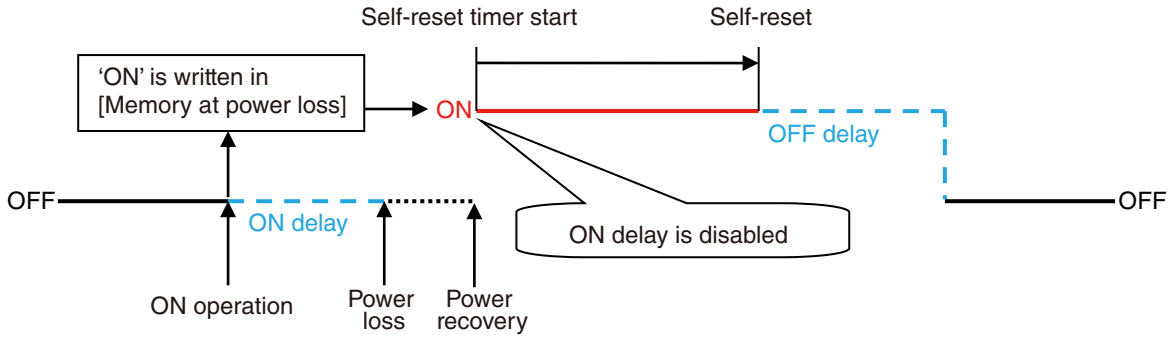


Self-resetting when ON/OFF delay is enabled

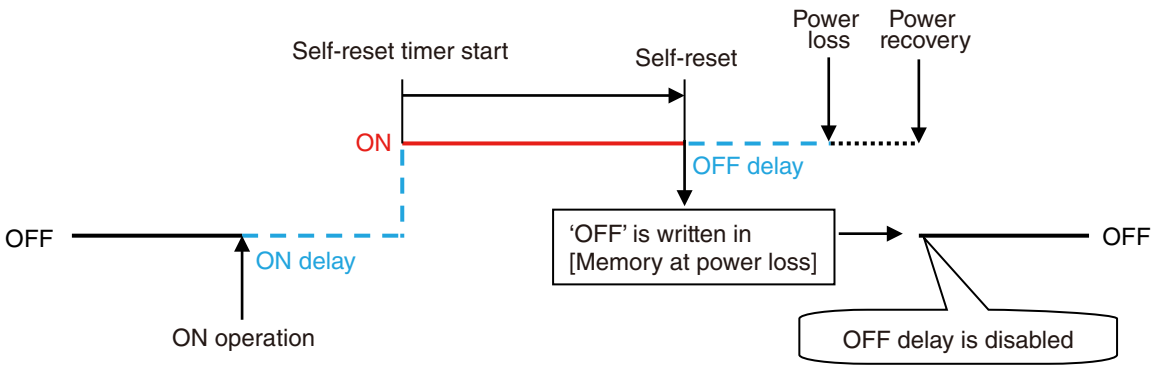


When Self-reset MD detects an OFF-ON opeartion, the MD outputs ON when the ON delay time has elapsed, and the timer turns ON.
As the preset time of Self-reset timer elapses, Self-reset MD turns ON and OFF after the OFF delay time has elapsed.

Self-resetting when 'Memory at power loss' is enabled



When Self-reset MD detects an OFF-ON operation, 'ON' is written in [Memory at power loss].
When power loss occurs, the Self-reset timer operates in ON state with the counter reset to 0 when the power is recovered.



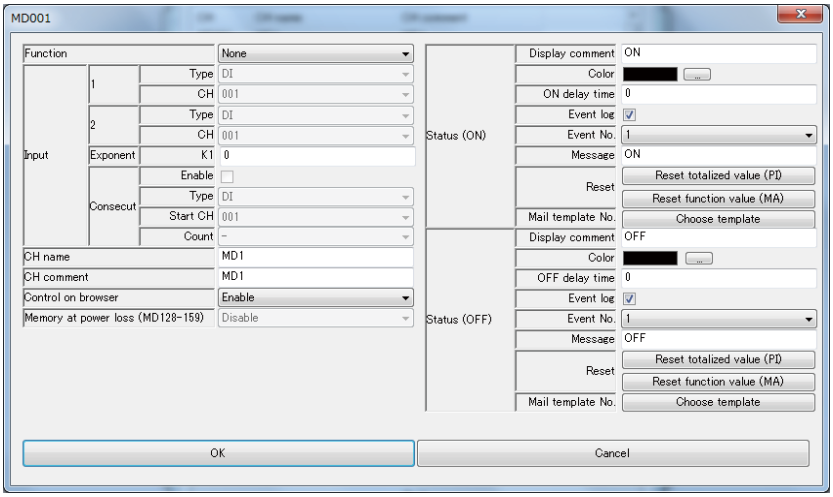
When the preset time of Self-reset timer has elapsed, 'OFF' is written in [Memory at power loss].
When power loss occurs, the Self-reset timer operates in OFF state when the power is recovered.

Control on Web browser (MD)

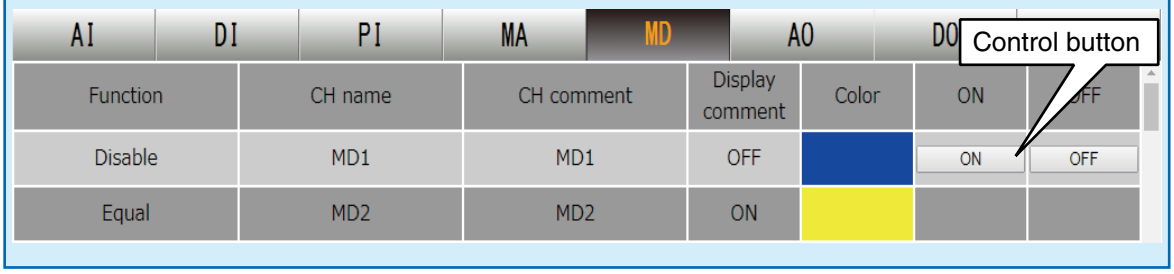
MD register values can be configured via the Web browser.

1) Set [Function] as [Disable] and set [Control on browser] as [Enable] in the [MD setting] window.

MD setting



Web Browser View



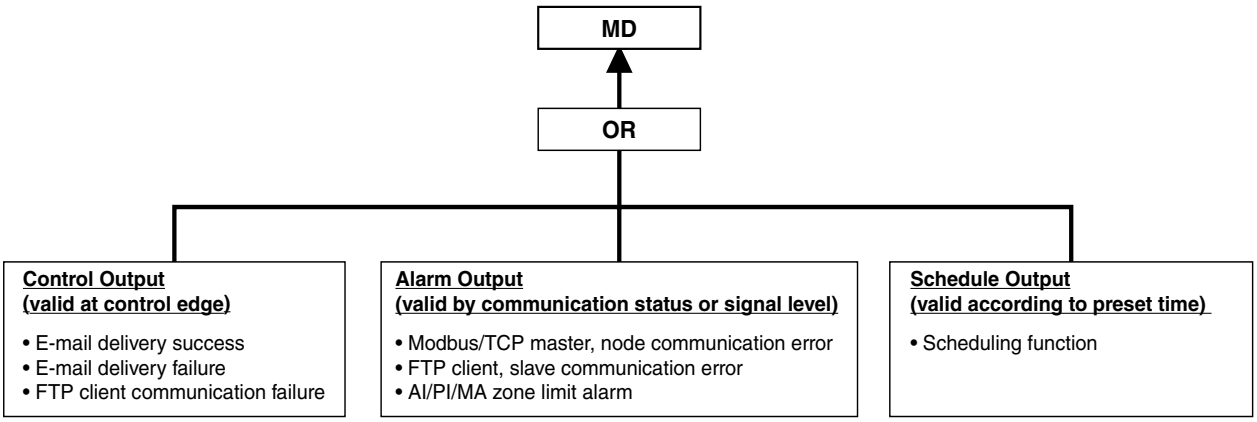
CAUTION

- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

The MD channels are used for the control output, alarm output, function operation output, and schedule output.

The function operation output has priority over other types of outputs if more than one function is assigned to a single channel.

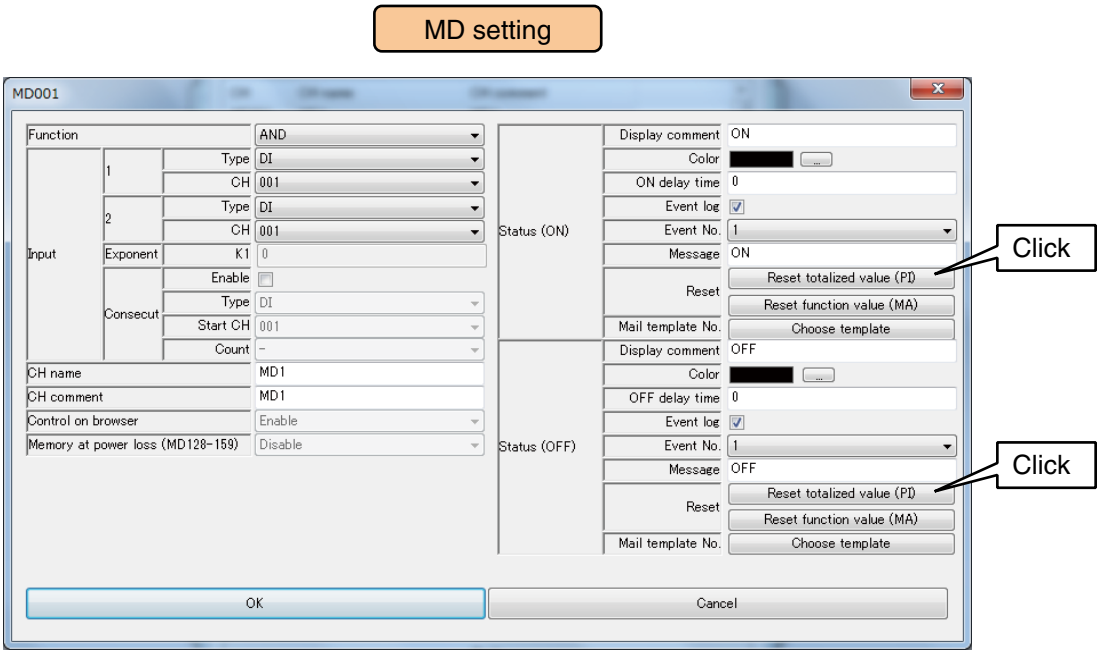
For those no function operation output is assigned, the outputs are handled by OR logic of the control, alarm, and schedule outputs.



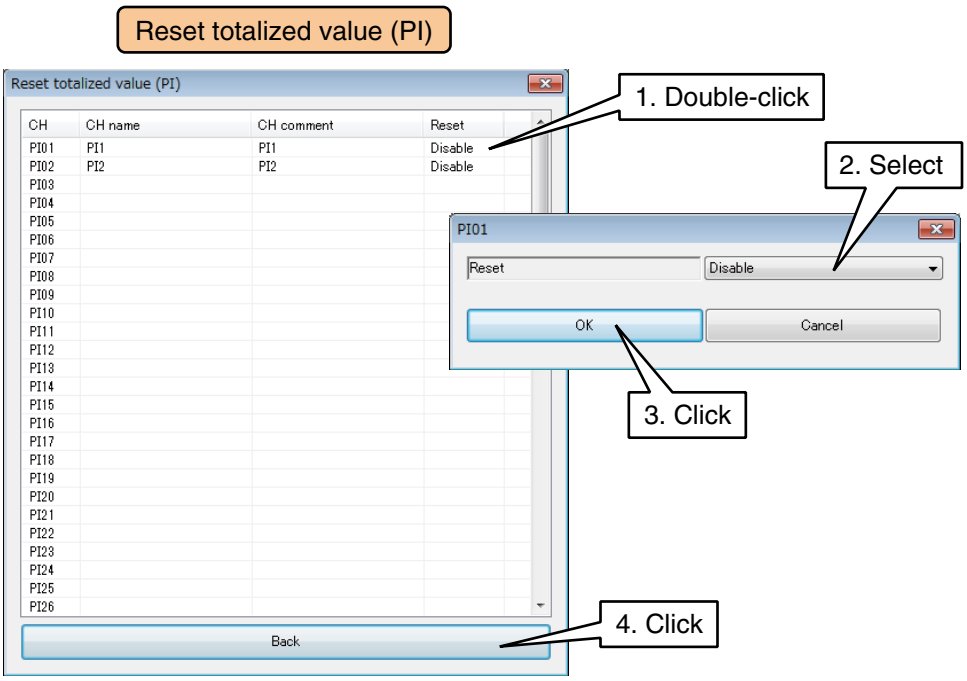
Resetting PI totalized value (MD)

The cumulative total value of a specific PI can be reset by detecting a rising edge of MD.
The PI channel to be operated needs to be assigned in advance. ➔ 3.6.4 Pulse input (PI)

(1) Click [Reset totalized value (PI)] button in the [MD setting] window to display the [Reset totalized value (PI)].



(2) Double-click PI channel to be operated and set as Disable / Enable.

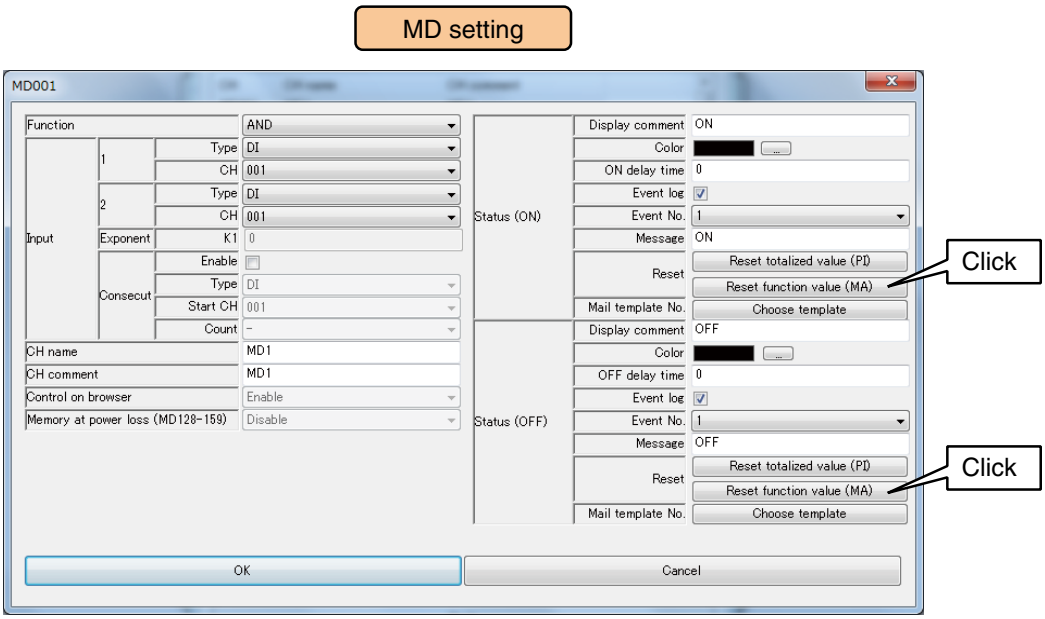


(3) Click [Back] to return to the [MD setting] window.

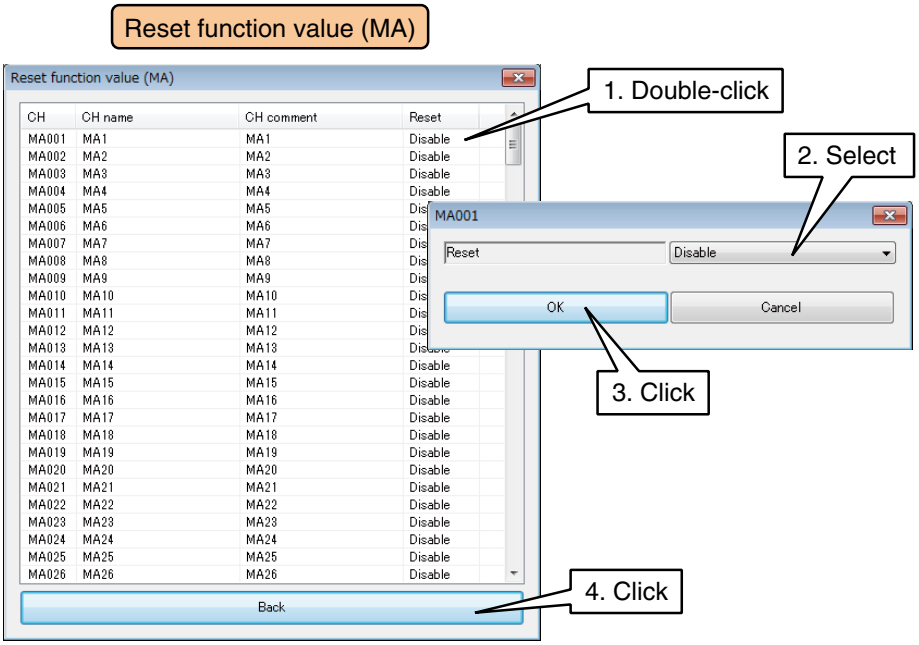
Resetting MA function value (MD)

The operation of a specific MA can be reset by the timing of ON to OFF and OFF to ON of MD.
The MA channel to be operated needs to be assigned in advance. ➔ 3.6.5 Analog function register (MA)

(1) Click [Reset function value (MA)] button to display the [Reset function value (MA)].



(2) Double-click the MA channel to be operated and set as Disable / Enable.



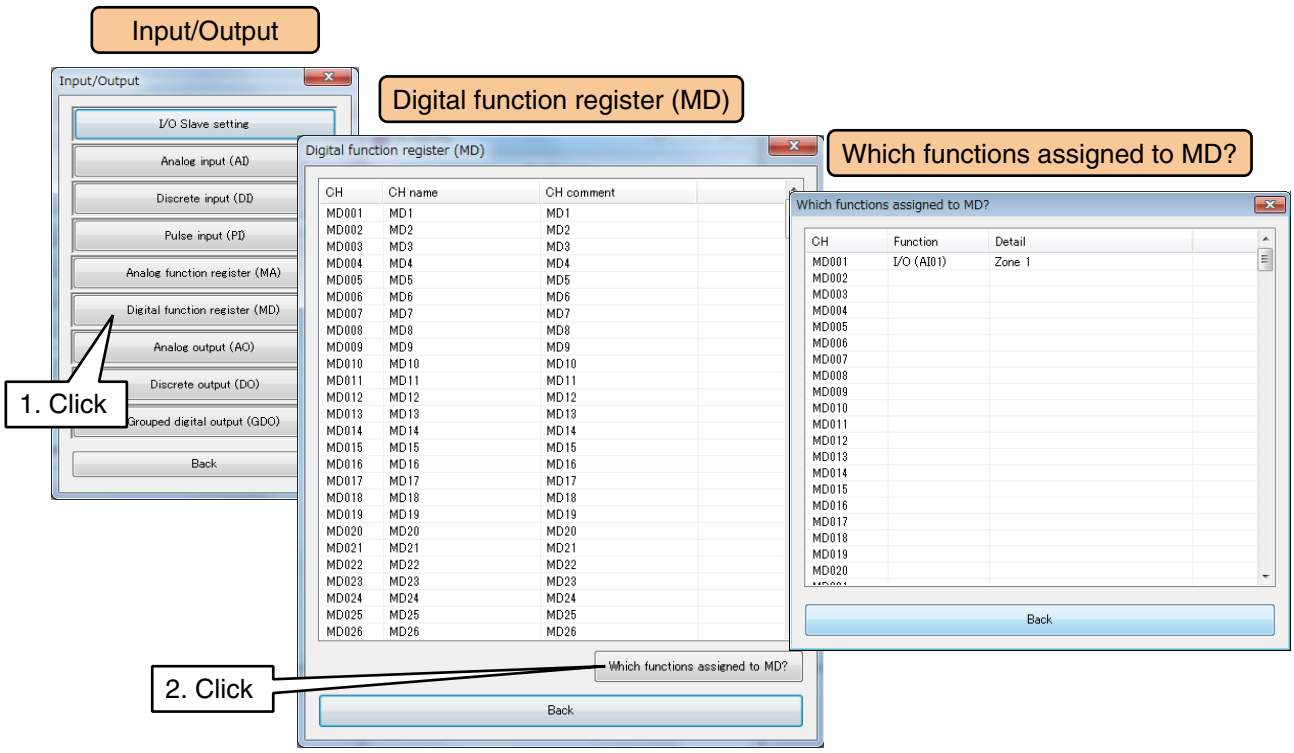
(3) Click [Back] to return to the [MD setting] window.

Once the setting is complete, click [OK] to temporarily store the setting.

Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Digital function register (MD)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

Which functions assigned to MD?

Functions and zones assigned to the respective MD channels are displayed.



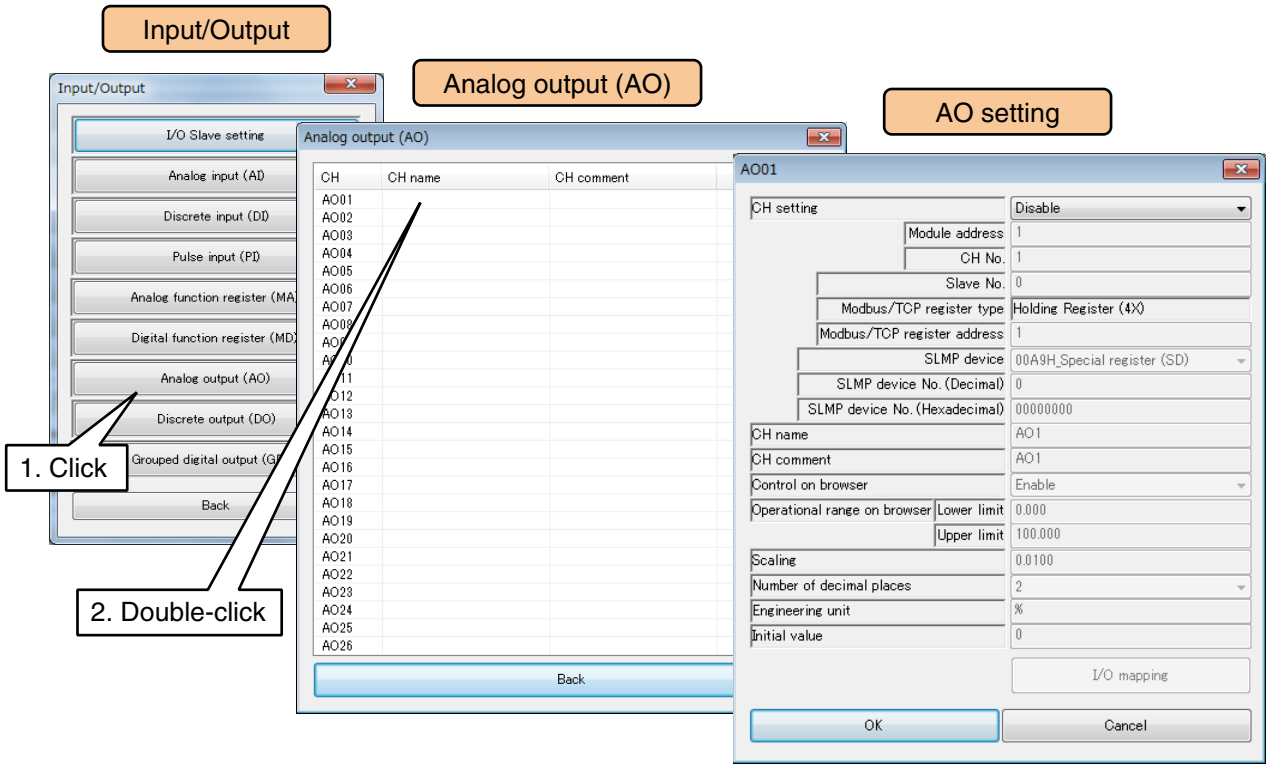
3.6.7 Analog output (AO)

A maximum of 64 analog signals (AO1 to AO64) can be output.
Assign the analog outputs from the I/O module, remote I/O, or SLMP device connected to the DL30-G by the following procedure.

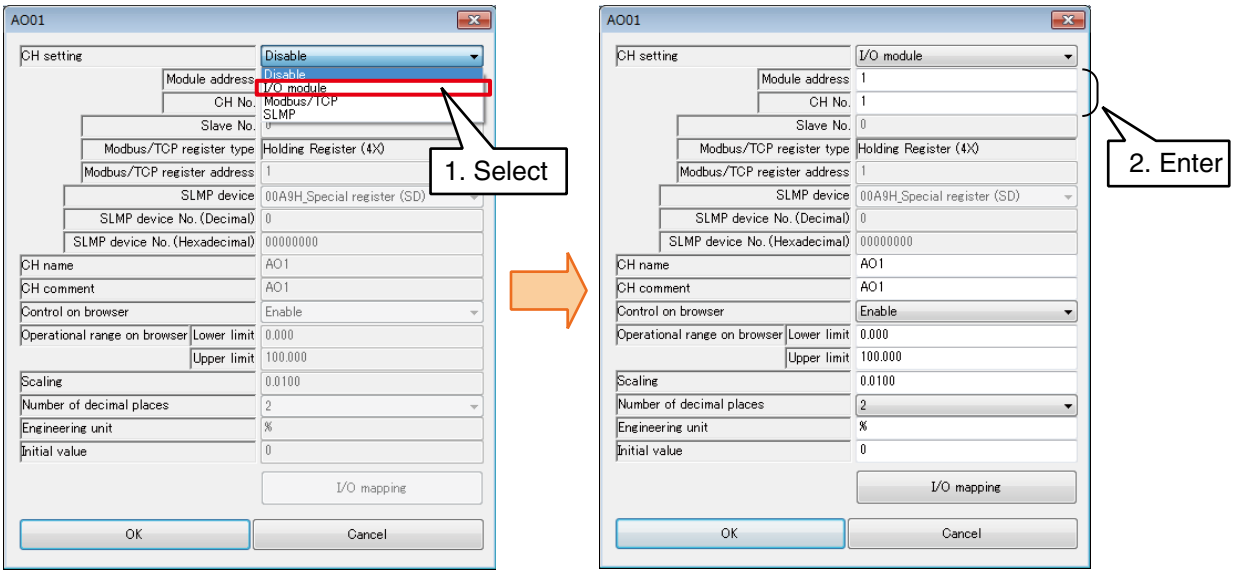
Assigning I/O module to AO

(1) Click [Analog output (AO)] button in the [Input/Output] window to display the [Analog output (AO)] window.

(2) Double-click a row of the AO channel to be set to display the [AO setting] window.



(3) Set the [CH setting] as [I/O module] to enable the [Module address] and [CH No.] fields.
Enter the CH value to be assigned.



Up to 4 AO channels can be assigned per module.

Module category	Compatible module	CH No.	Module address	CH No. in the module
4 ch module	R30SYV4 R30YS4 R30GCIE1 R30GECT1	CH1	N	1
		CH2	N	2
		CH3	N	3
		CH4	N	4

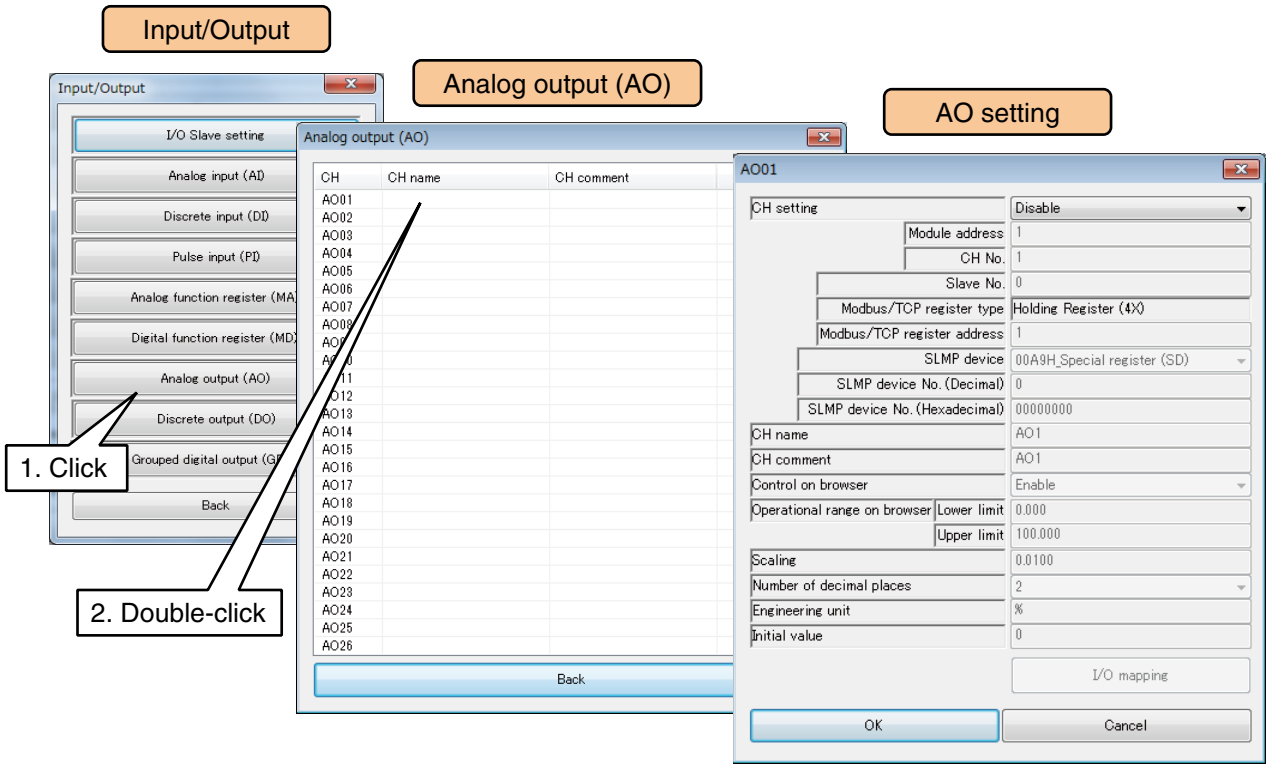
N: Module address

Assigning remote I/O to AO

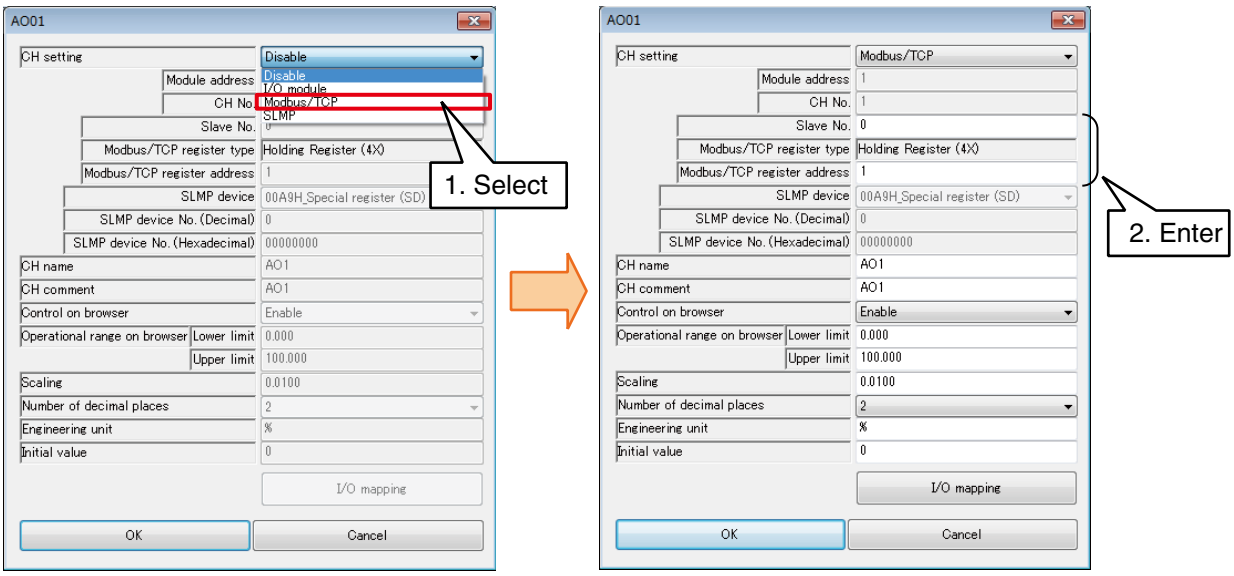
(1) First, perform the I/O slave setting for the remote I/O device. ➔ 3.6.1 I/O slave setting

(2) Click [Analog output (AO)] button in the [Input/Output] window to display the [Analog output (AO)] window.

(3) Double-click a row of the AO channel to be set to display the [AO setting] window.



(4) Set the [CH setting] as [Modbus/TCP], and enter the [Save No.], [Modbus/TCP register type], and [Modbus/TCP register address].



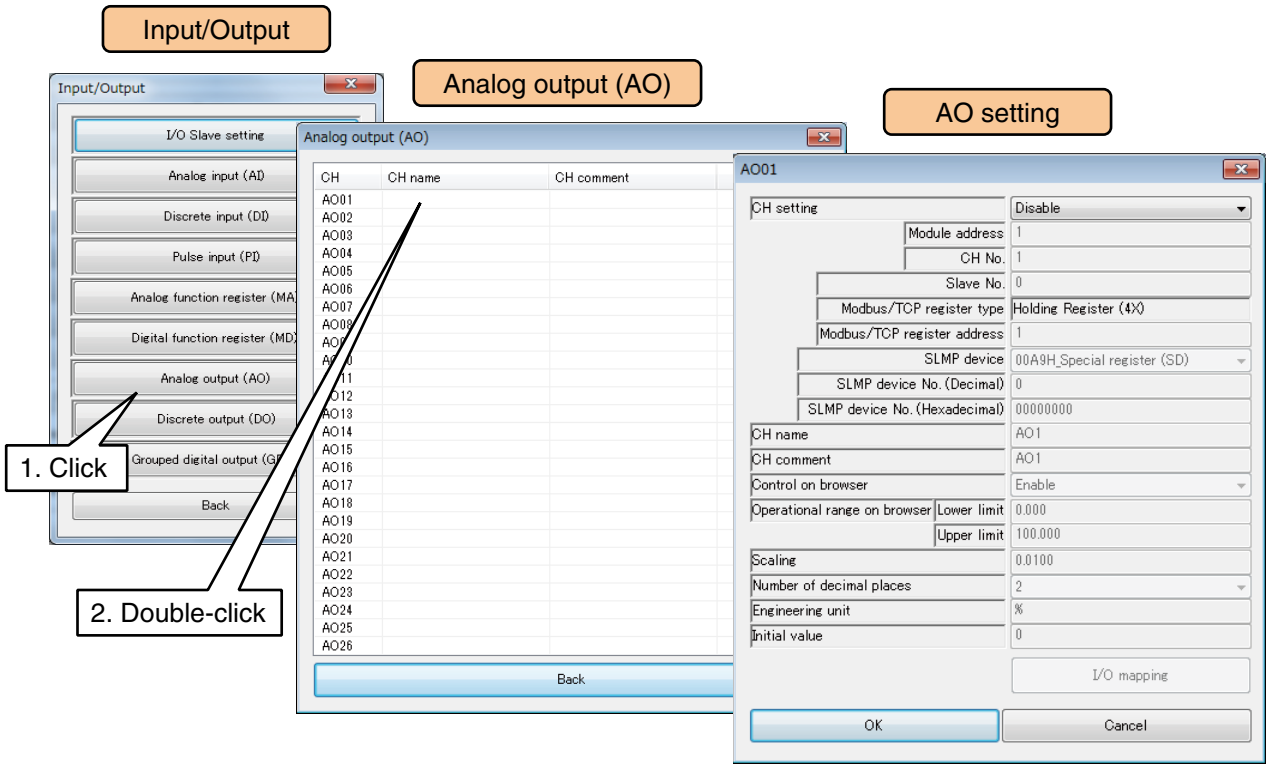
Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
Modbus/TCP register type	Fixed at [Holding Register (4X)].
Modbus/TCP register address	Set the register address (1 to 65536) in the above register type.

Assigning SLMP device to AO

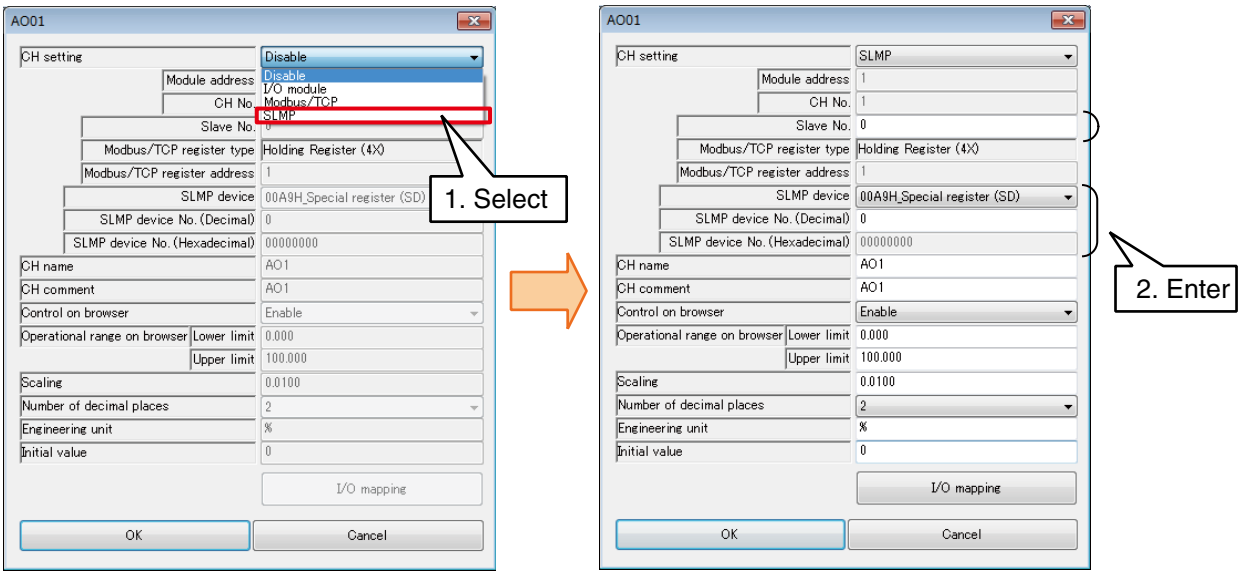
(1) First, perform the I/O slave setting for the SLMP device. ➔ 3.6.1 I/O slave setting

(2) Click [Analog output (AO)] button in the [Input/Output] window to display the [Analog output (AO)] window.

(3) Double-click a row of the AO channel to be set to display the [AO setting] window.



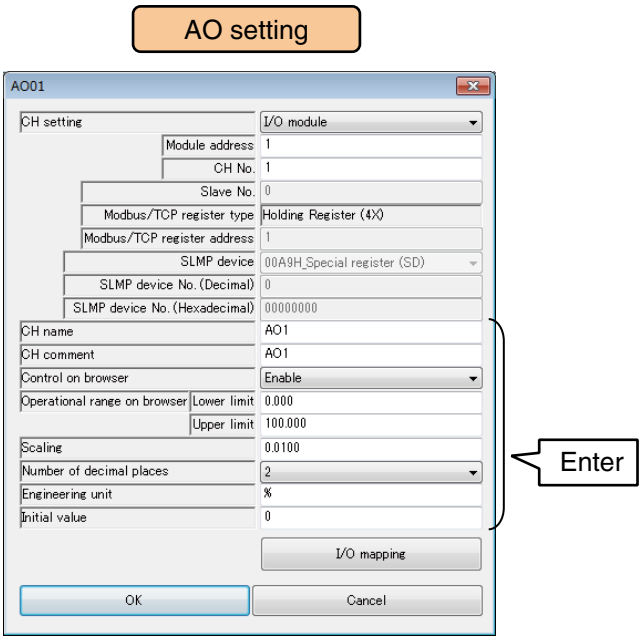
(4) Set the [CH setting] as [SLMP], and enter the parameters referring to the table below.



Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
SLMP device	Choose the device code of the SLMP device to be connected.
SLMP device No.	Set the device No. of the SLMP device to be connected.

Basic setting (AO)

Once the assignment is complete, configure the following basic setting.
Click [OK] to temporarily store the setting.

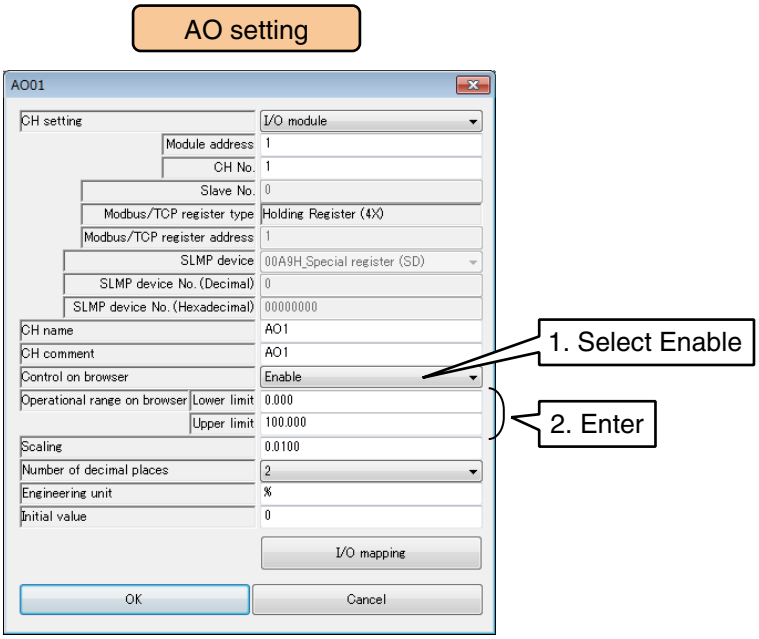


Parameter	Description
CH name	Set a name for the channel using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Scaling	Set the numeric value by which to multiply data in order to convert it to its actual value. For example, if the temperature data is the actual value × 10, enter as [0.1].
Number of decimal places	Set the number of digits after the decimal point for the values displayed as numeric values on the Web browser view. Select from 0 / 1 / 2 / 3.
Engineering unit	Set the engineering unit corresponding for the actual value set in the [Scaling]. Can be set using up to 8 characters.
Initial value	Specify the initial value set to the AO.

Control on browser (AO)

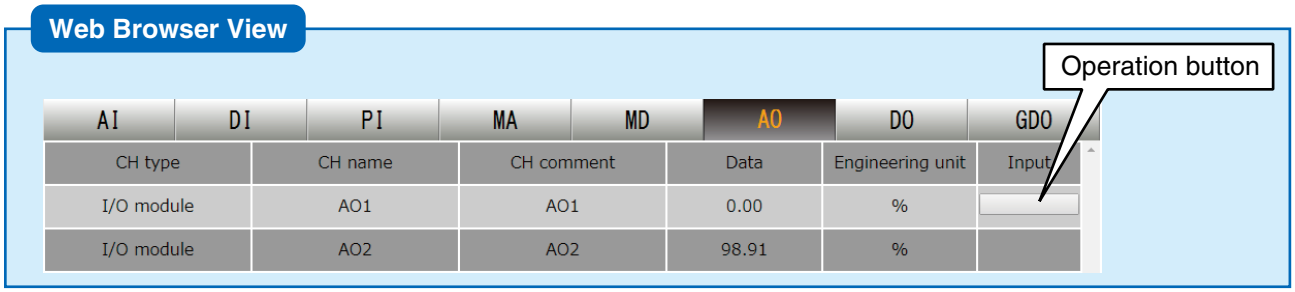
AO values can be controlled on the web browser view.

(1) Set [Control on browser] as [Enable].



(2) Specify the [Operational range on browser].

Parameter	Description
Operational range on browser	Set the available range for AO values in engineering unit values to be entered via the web browser.



CAUTION

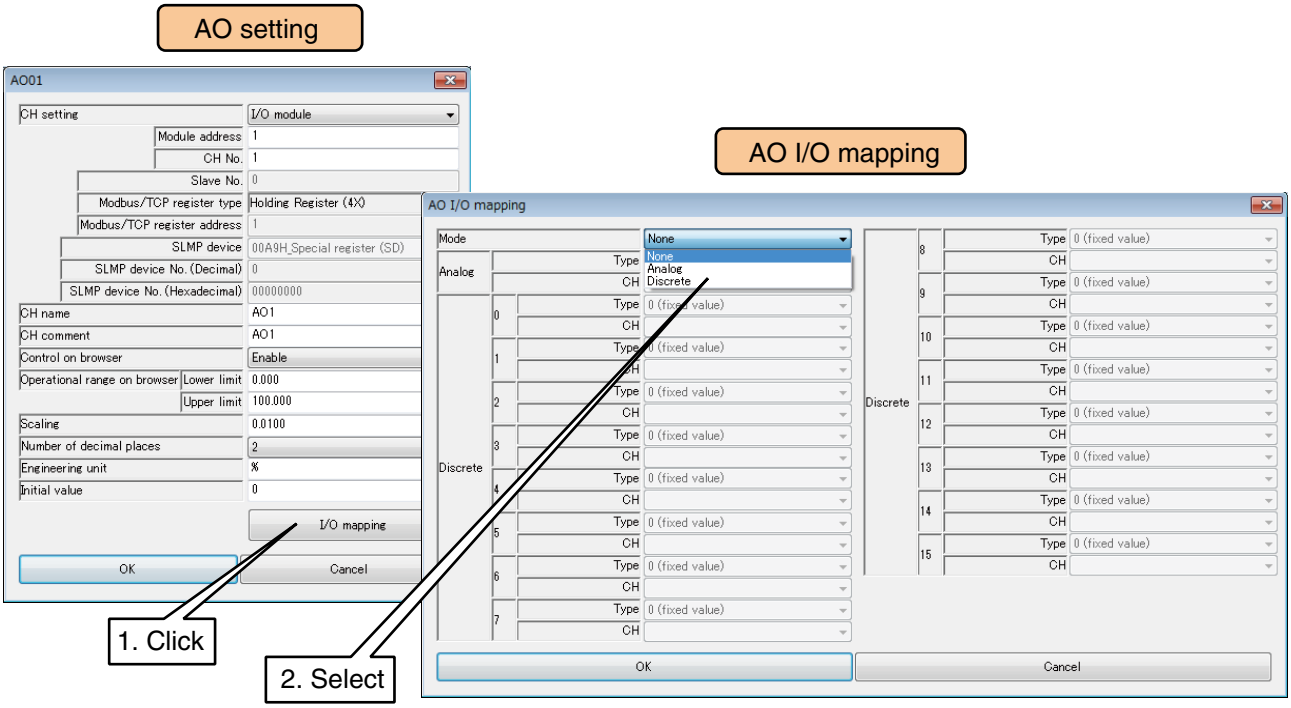
- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

I/O mapping (AO)

I/O mapping function is used to connect between AI and AO, DI and AO, MA and AO, and MD and AO, so that an input is copied as an output in the remote location.

(1) Click [I/O mapping] button in the [AO setting] window to display [AO I/O mapping].

(2) Select the [Mode] from [None], [Analog], and [Discrete].



(3) Set [Type] and [CH] referring to the following tables.

■ Mapping an analog input

Parameter	Description
Type	Choose AI or MA.
CH	Specify an analog input channel.

■ Mapping a discrete input

Assign a discrete input to each bit of AO (0 to 15 bit).

Parameter	Description
Type	Choose among 0 (fixed value) / 1 (fixed value) / DI / MD.
CH	Specify a discrete input channel for DI and MD.

Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Analog output (AO)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

NOTES

Channels assigned for I/O mapping function cannot be controlled on the web browser or used for alarm output. Any setting for the web browser control or the alarm output is invalid.

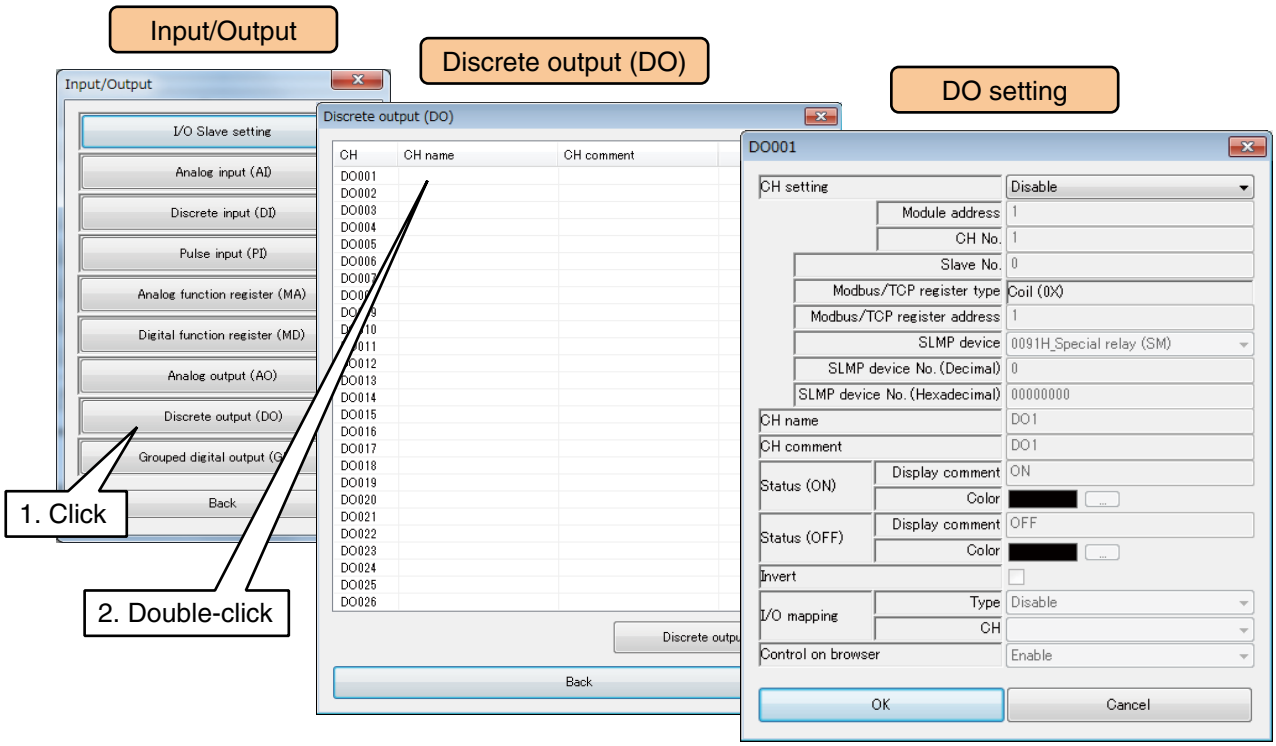
3.6.8 Discrete output (DO)

A maximum of 128 points of discrete signals (DO1 to DO128) can be output.
Assign the discrete outputs from the I/O module, remote I/O, or SLMP device connected to the DL30-G by the following procedure.

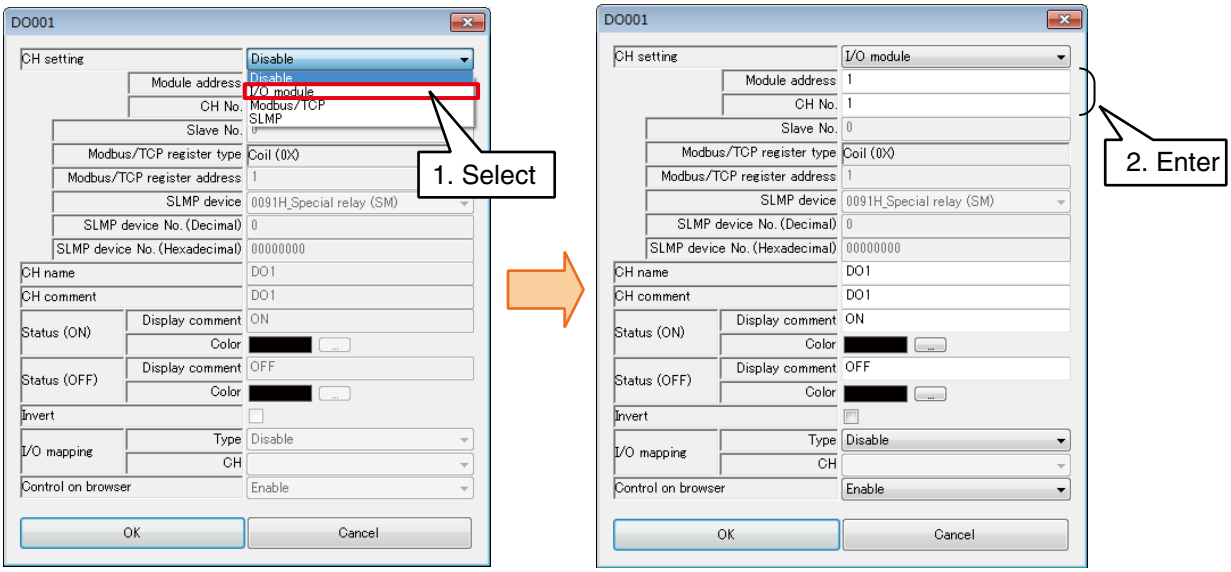
Assigning I/O module to DO

(1) Click [Discrete output (DO)] button in the [Input/Output] window to display the [Discrete output (DO)] window.

(2) Double-click a row of the DO channel to be set to display the [DO setting] window.



(3) Set the [CH setting] as [I/O module] to enable the [Module address] and [CH No.] fields.
Enter the CH value to be assigned.



Up to 16 DO channels can be assigned per module.

Module type	Compatible module	CH No.	Module address	CH No. in the module
16 ch module	R30YN16A R30YN16C	CH1	N	1
		CH2	N	2
		CH3	N	3
		CH4	N	4
		CH5	N	5
		CH6	N	6
		CH7	N	7
		CH8	N	8
		CH9	N	9
		CH10	N	10
		CH11	N	11
		CH12	N	12
		CH13	N	13
		CH14	N	14
		CH15	N	15
		CH16	N	16

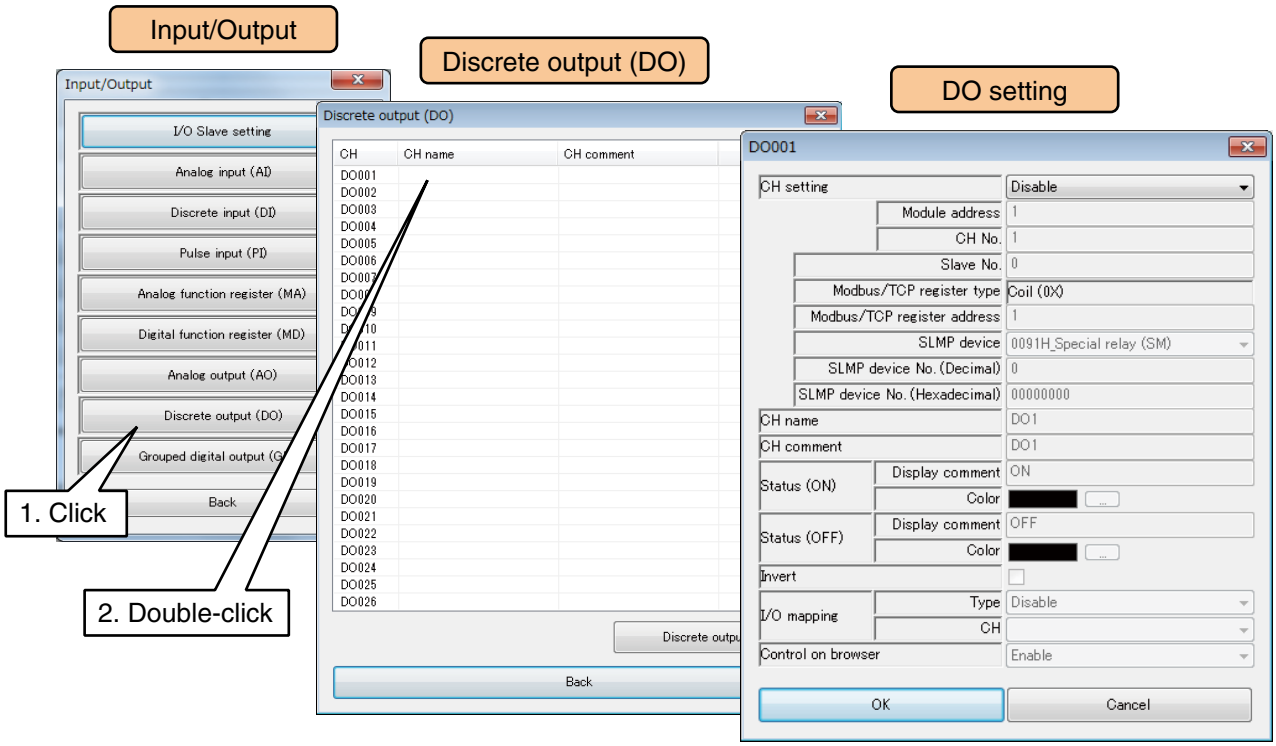
N: Module address

Assigning remote I/O to DO

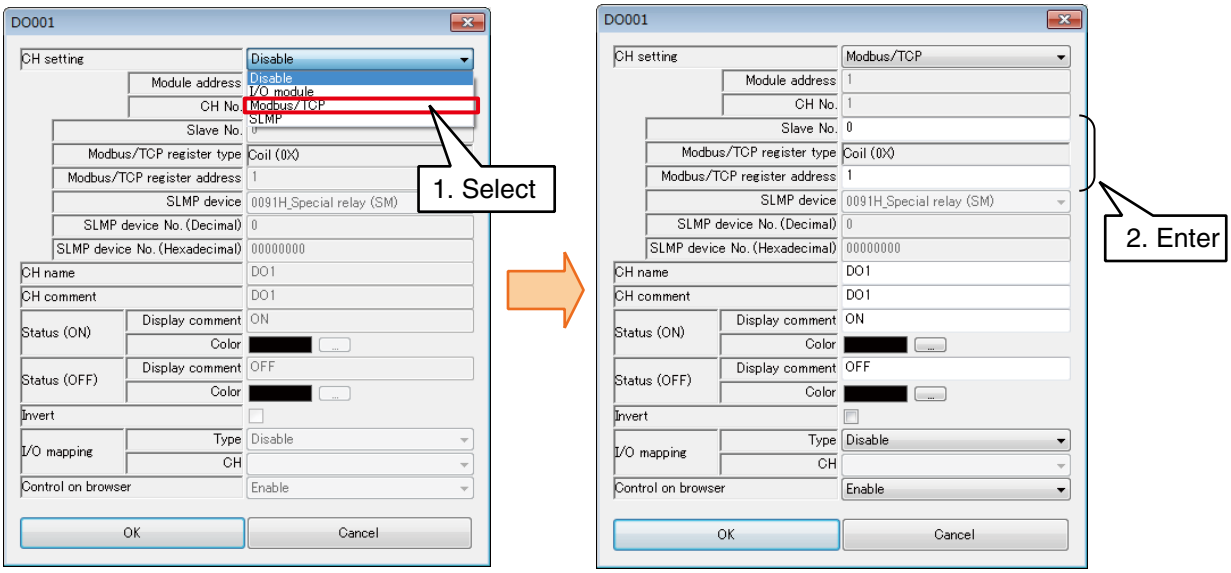
(1) First, perform the I/O slave setting for the remote I/O device. ➔ 3.6.1 I/O slave setting

(2) Click [Discrete output (DO)] button in the [Input/Output] window to display the [Discrete output (DO)] window.

(3) Double-click a row of the DO channel to be set to display the [DO setting] window.



(4) Set the [CH setting] as [Modbus/TCP], and enter the [Slave No.], [Modbus/TCP register type], and [Modbus/TCP register address].



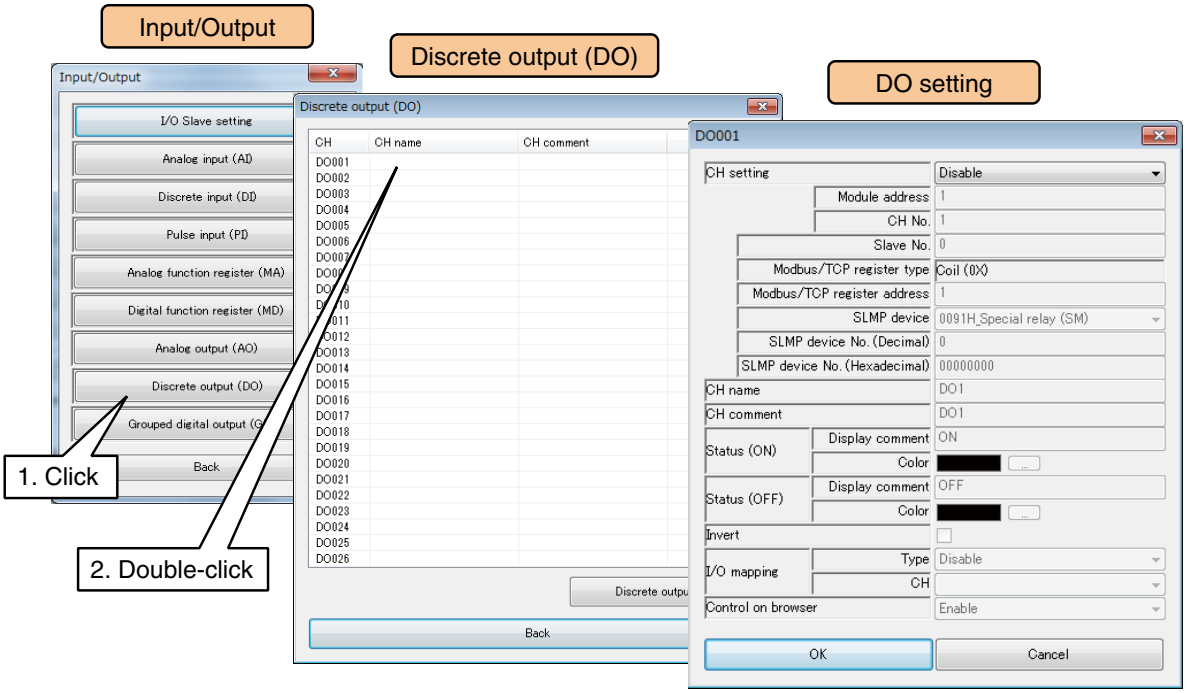
Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
Modbus/TCP register type	Fixed at [Coil (0X)].
Modbus/TCP register address	Set the register address in the above register type (1 to 65536).

Assigning SLMP device to DO

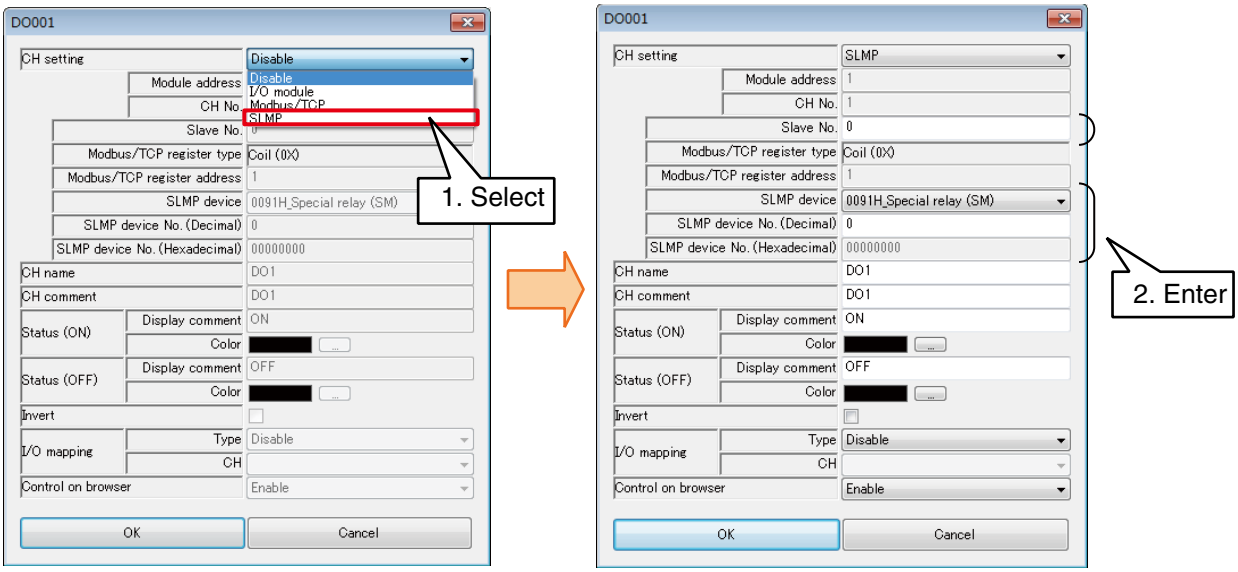
(1) First, perform the I/O slave setting for the SLMP device. ➔ 3.6.1 I/O slave setting

(2) Click [Discrete output (DO)] button in the [Input/Output] window to display the [Discrete output (DO)] window.

(3) Double-click DO row to be set to display the [DO setting] window.



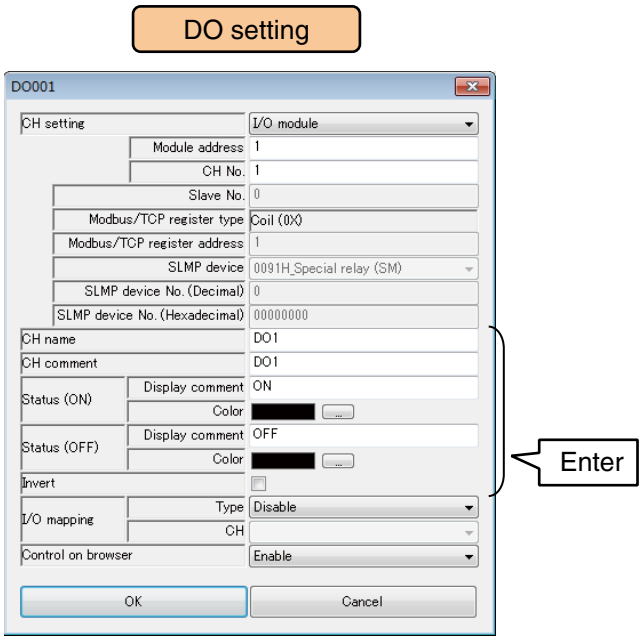
(3) Set the [CH setting] as [SLMP], and enter the parameters referring to the table below.



Parameter	Description
Slave No.	Enter the slave No. (0 to 31) set in (1).
SLMP device	Choose the device code of the SLMP device to be connected.
SLMP device No.	Set the device No. of the SLMP device to be connected.

Basic setting (DO)

Once the assignment is complete, configure the basic setting.
Click [OK] to temporarily store the setting.

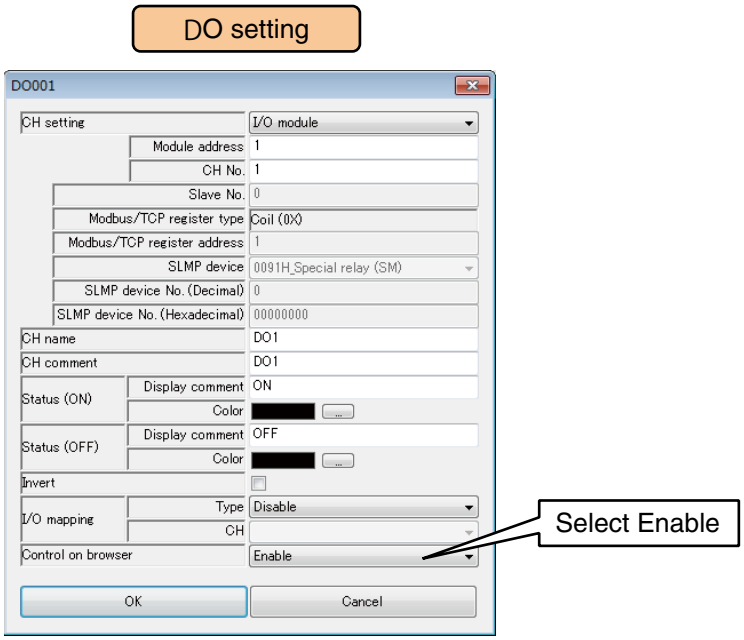


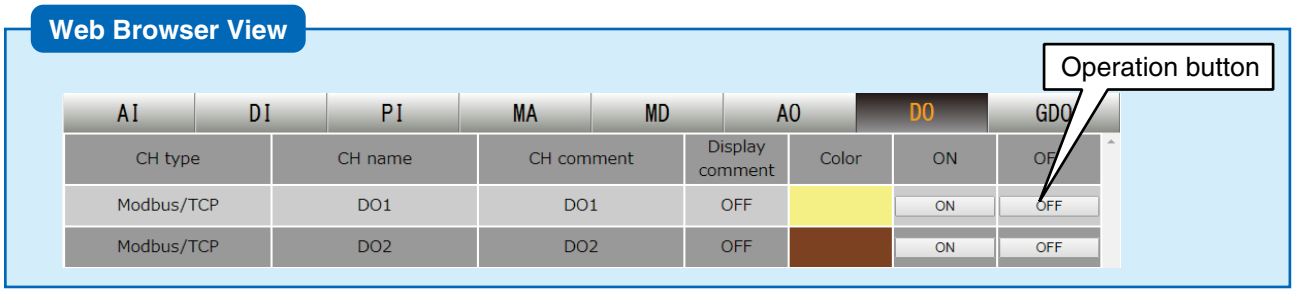
Parameter	Description
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Invert logic	If the ON/OFF of the output signal and the ON/OFF of the application signal are the reverse of each other, put a check in the check box.
Display comment (ON) (OFF)	Set strings corresponding to ON and OFF, respectively. Can be set using up to 8 characters.
Color (ON) (OFF)	Set the colors corresponding to ON and OFF, respectively.

Control on browser (DO)

DO values can be controlled on the web browser view.

Set [Control on browser] as [Enable].





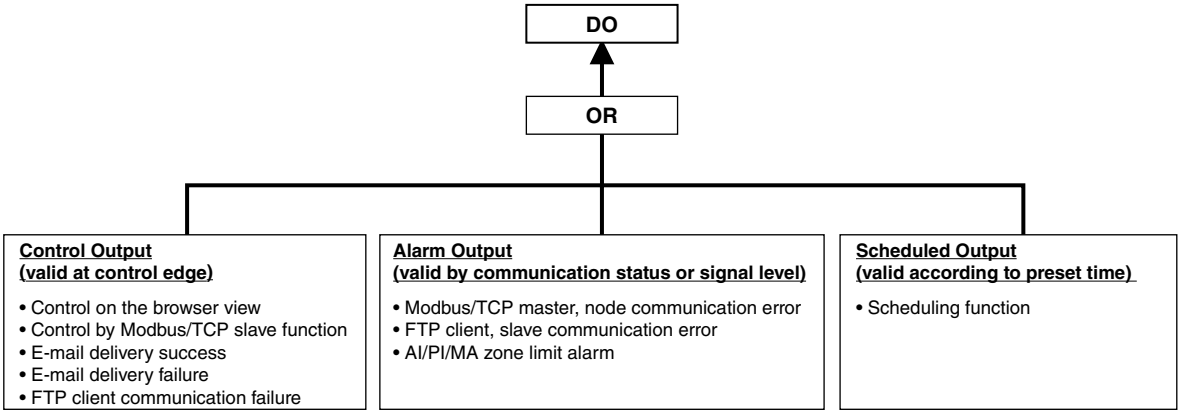
CAUTION

- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

The DO channels are used for the control output, alarm output, I/O mapping output, and schedule output.

The I/O mapping output has priority against other types of outputs if more than one function is assigned to a single channel.

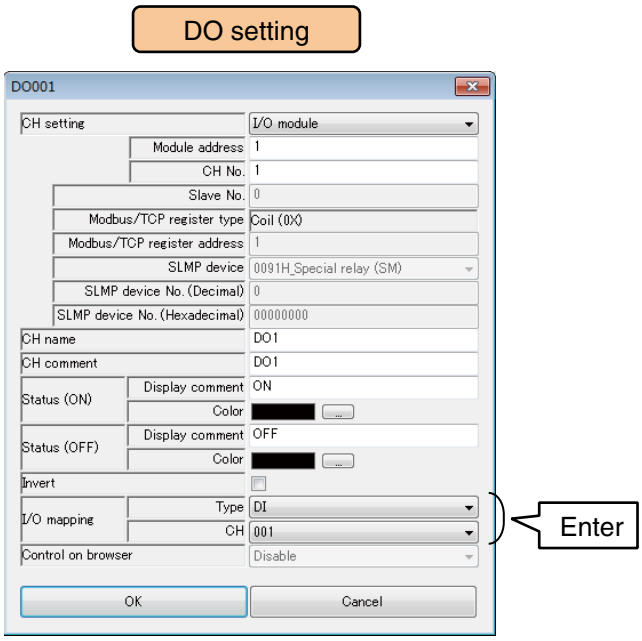
For those no I/O mapping output is assigned, the outputs are handled by OR logic of the control, alarm, and schedule outputs.



I/O mapping (DO)

I/O mapping function is used to connect between DI and DO, and MD and DO so that an input is copied as an output.

(1) Set [Type] and [CH] for [I/O mapping] in the [DO setting window].



(2) Set [Type] and [CH] referring to the following table.

Parameter	Description
Type	Choose DI or MD.
CH	Specify a discrete input channel.

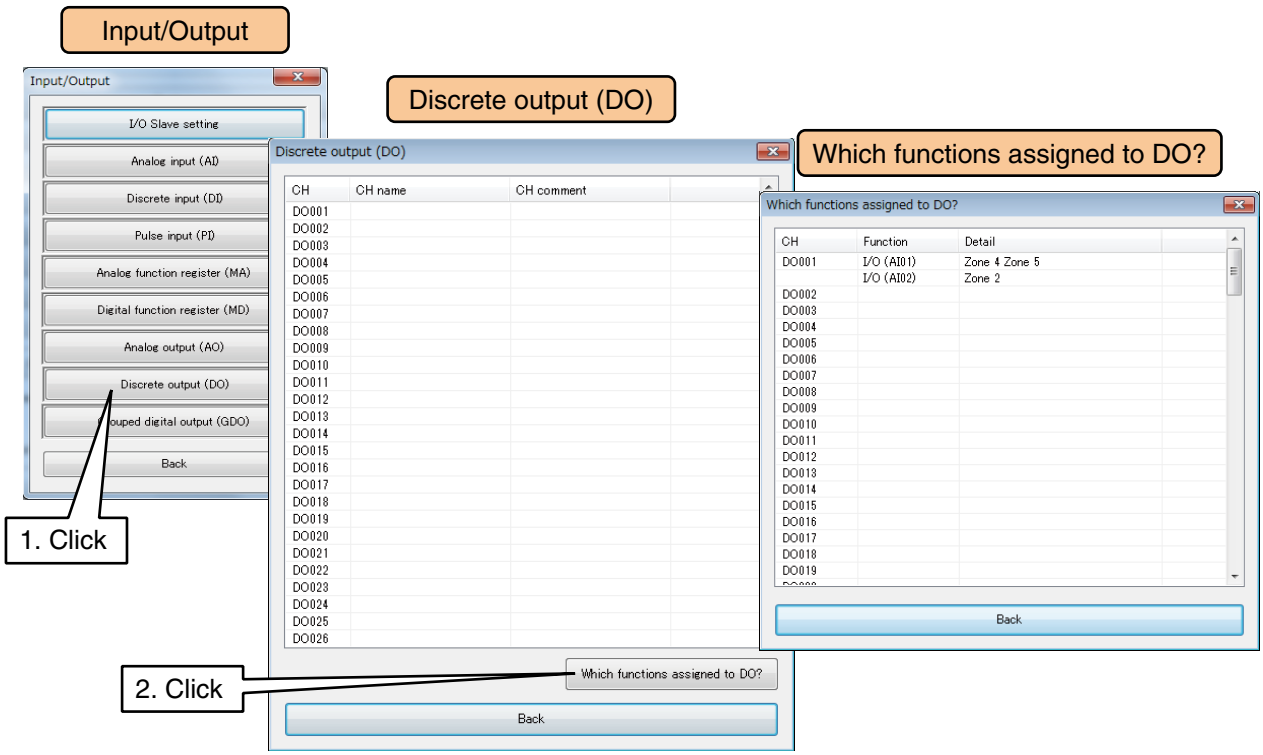
Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Discrete output (DO)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

NOTES

Channels assigned for I/O mapping function cannot be controlled on the web browser and the scheduling function, or used for alarm output.
Any setting for the web browser control, alarm output, or schedule output is invalid.

Which functions assigned to DO?

Functions and zones assigned to the respective DO channels are displayed.

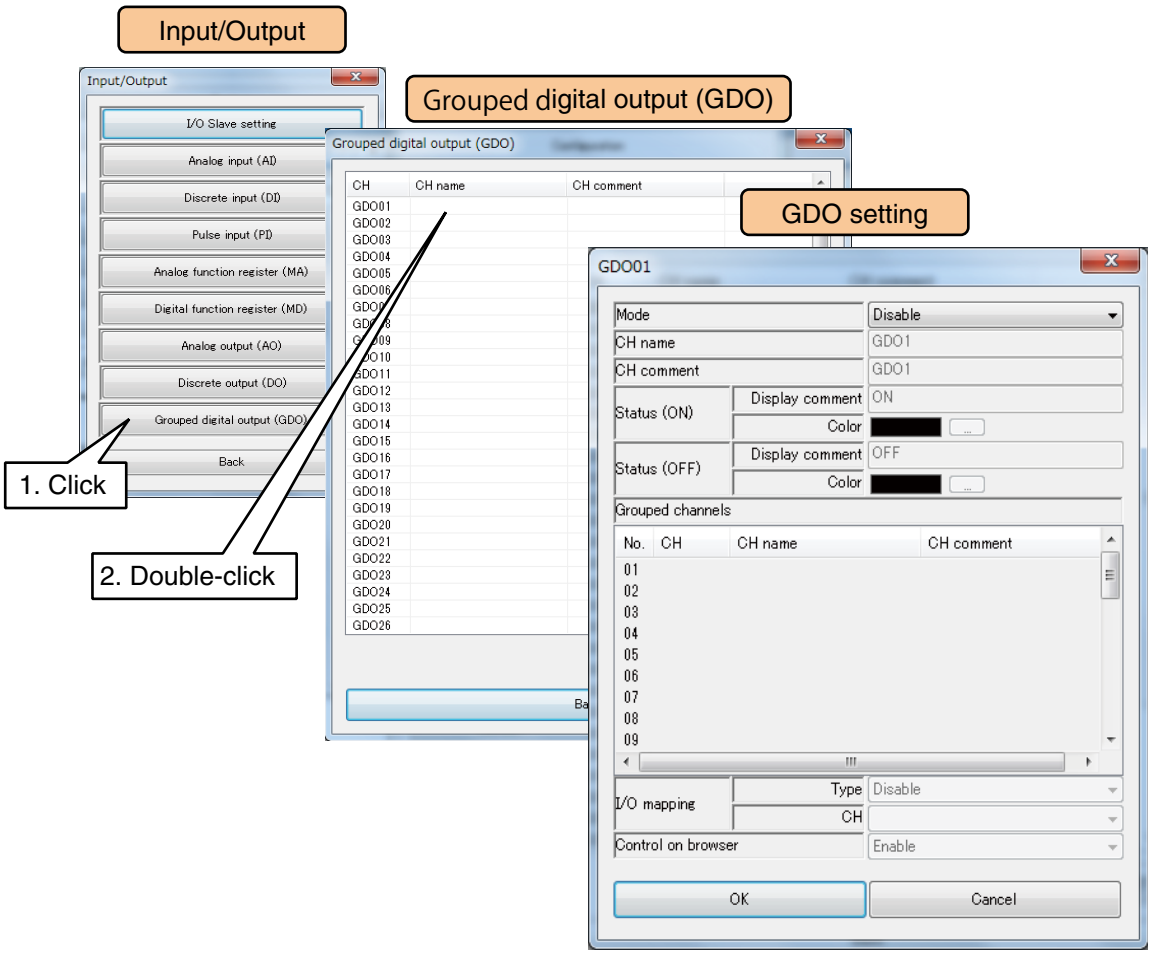


3.6.9 Grouped digital output (GDO)

A maximum of 32 points of grouped digital signals (GDO1 to GDO32) can be output.
Digital function (MD) and Discrete output (DO) channels can be grouped and defined as a virtual channel.
Operation on a single GDO is effective for all MD and DO channels registered in the GDO.
Assign grouped digital outputs to the DL30-G following the procedure given below.

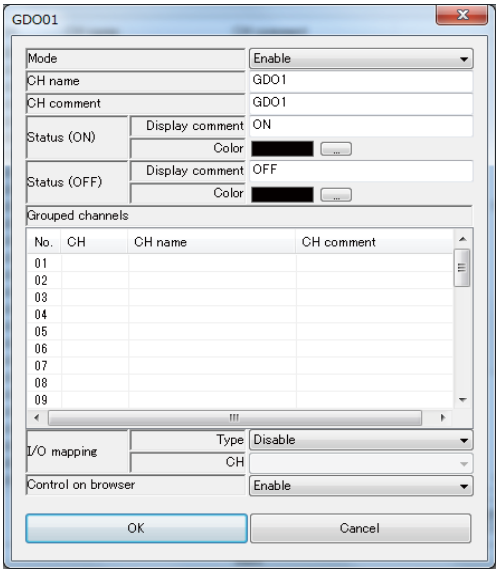
Basic setting (GDO)

(1) Click [Grouped digital output (GDO)] button in the [Input/Output] window to display the [Grouped digital output (GDO)] window.
Double-click a row of the GDO channel to be set to display the [GDO setting] window.



(2) Set [Mode] as [Enable] and configure the basic setting.
Click [OK] to temporarily store the setting.

GDO setting



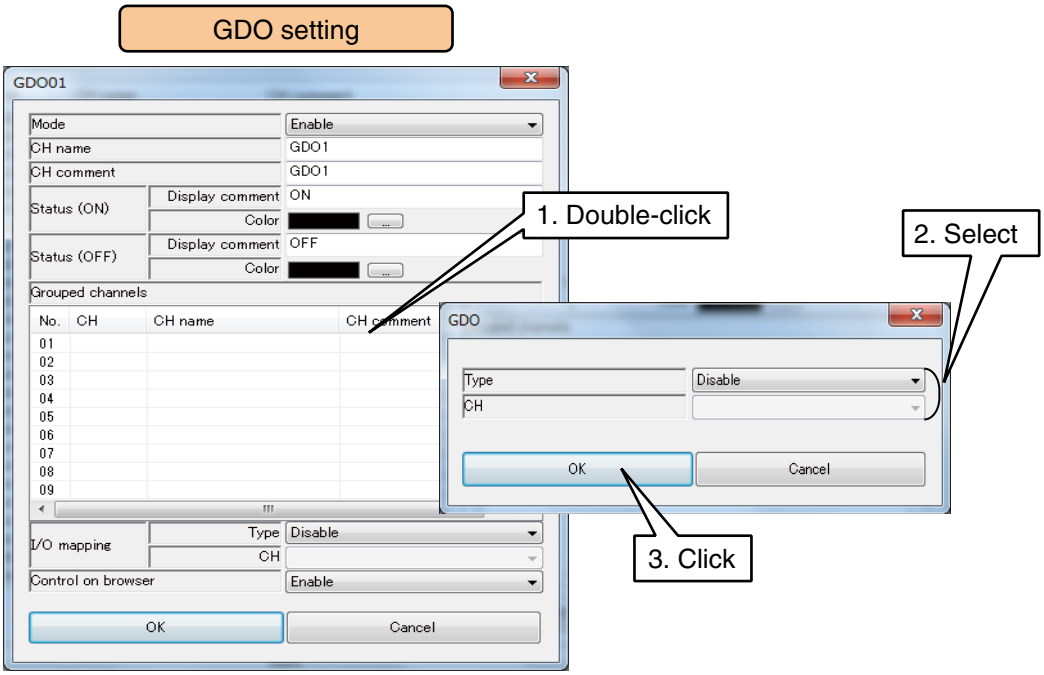
Parameter	Description
CH name	Set a channel name using up to 16 characters.
CH comment	Set a description for the channel using up to 16 characters with the tag name, etc.
Display comment (ON) (OFF)	Set strings corresponding to ON and OFF, respectively. Can be set using up to 8 characters.
Color (ON) (OFF)	Set the colors corresponding to ON and OFF, respectively.

Grouped channels

Assign up to 32 MD and DO channels to be grouped into a GDO.

Double-click the row of the No. to assign MD/DO in the [Grouped channels] frame.

Specify the [Type] and [CH] of each channel to assign referring to the table below and click [OK].



Parameter	Description
Type	Select either 'MD' or 'DO'.
CH	Specify the channel No.

Assign each CH by following the above procedure.

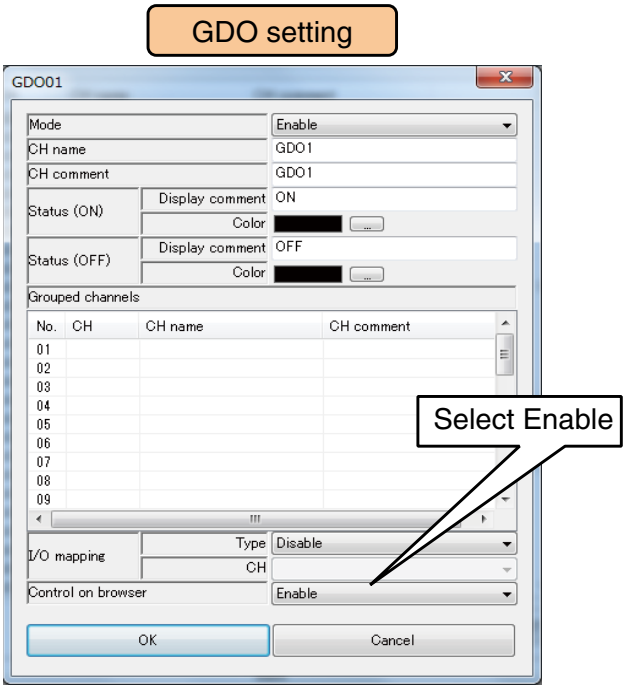
NOTES

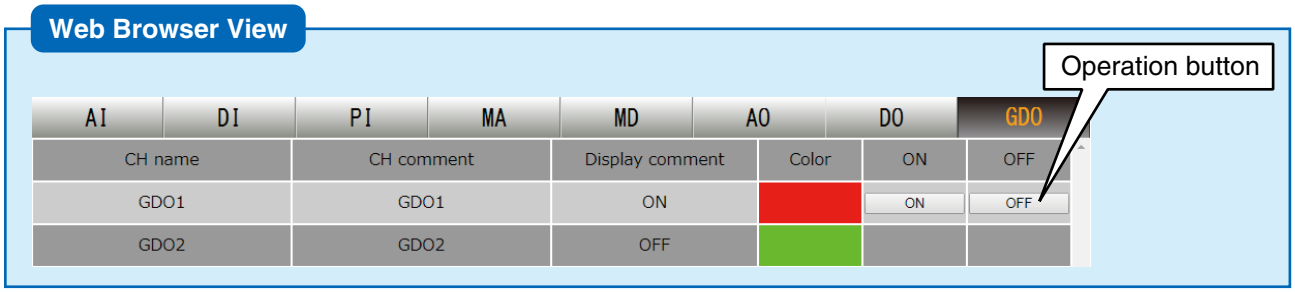
DO assigned for I/O mapping function cannot be added to the [Grouped channels].

Control on browser (GDO)

GDO values can be controlled on the web browser view.

Set [Control on browser] as [Enable].





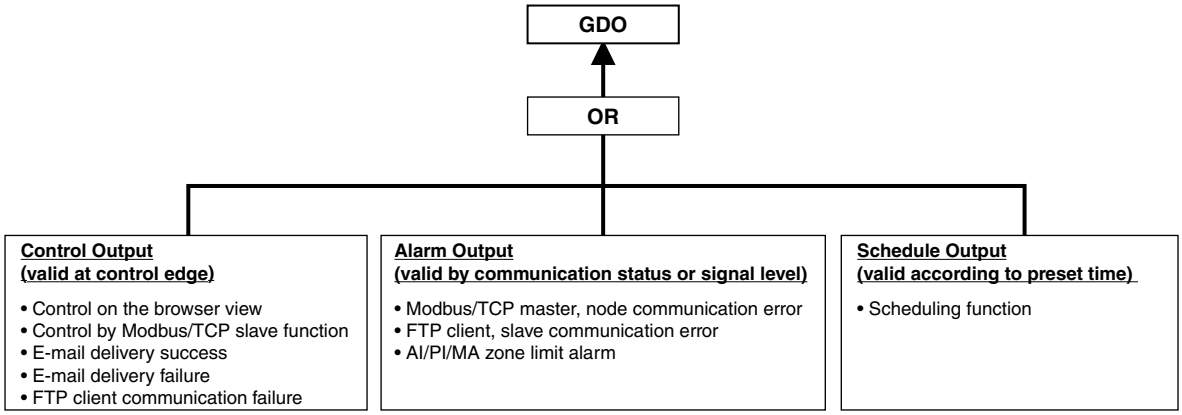
CAUTION

- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

The GDO channels are used for the control output, alarm output, I/O mapping output, and schedule output.

The I/O mapping output has priority against other types of outputs if more than one function is assigned to a single channel.

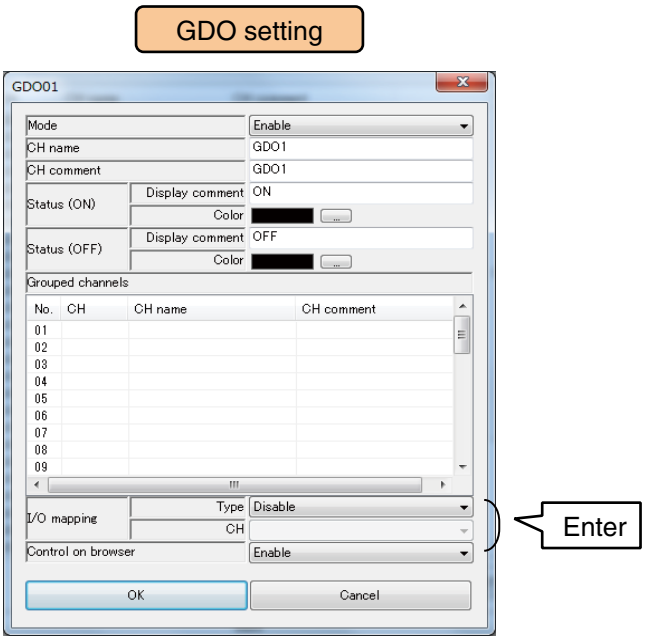
For those GDO channels with no I/O mapping output is assigned, the outputs are handled by OR logic of the control, alarm, and schedule outputs.



I/O mapping (GDO)

I/O mapping function is used to connect between DI and GDO, and MD and GDO so that an input is copied as an output.

(1) Set [Type] and [CH] for [I/O mapping] in the [GDO setting window].



(2) Set [Type] and [CH] referring to the following table.

Parameter	Description
Type	Choose DI or MD.
CH	Specify a discrete input channel.

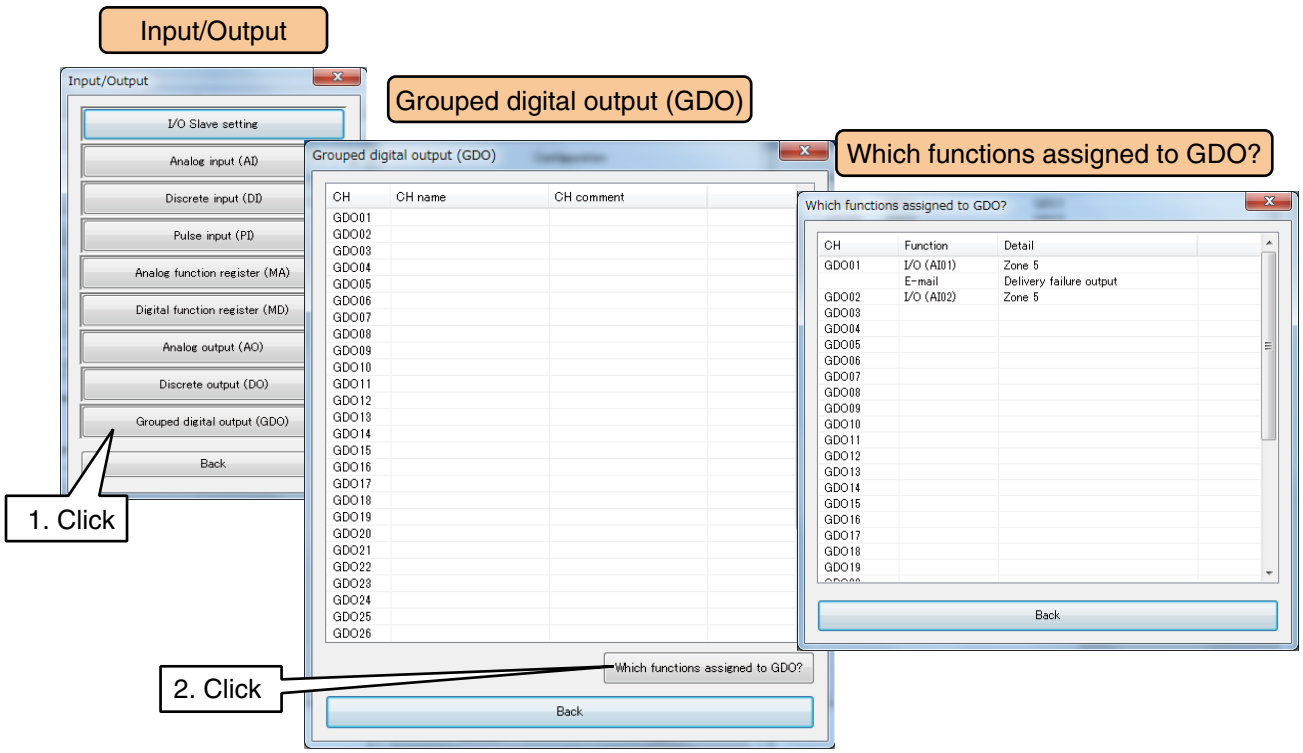
Use the above procedure to set all the CHs.
The CH setting for which the setting is complete in the [Grouped digital output (GDO)] window can also be copied to other CHs and only the required portions can be edited.
➔ 3.6.10 Copying CH setting

NOTES

- Channels assigned for I/O mapping function cannot be controlled on the web browser or the scheduling function, or used for alarm output.
  Any setting for the web browser control, alarm output, or schedule output is invalid.
- When the MD or DO in the GDO which is I/O mapped is grouped into another GDO, output of the MD or DO in the I/O mapped-GDO has priority.

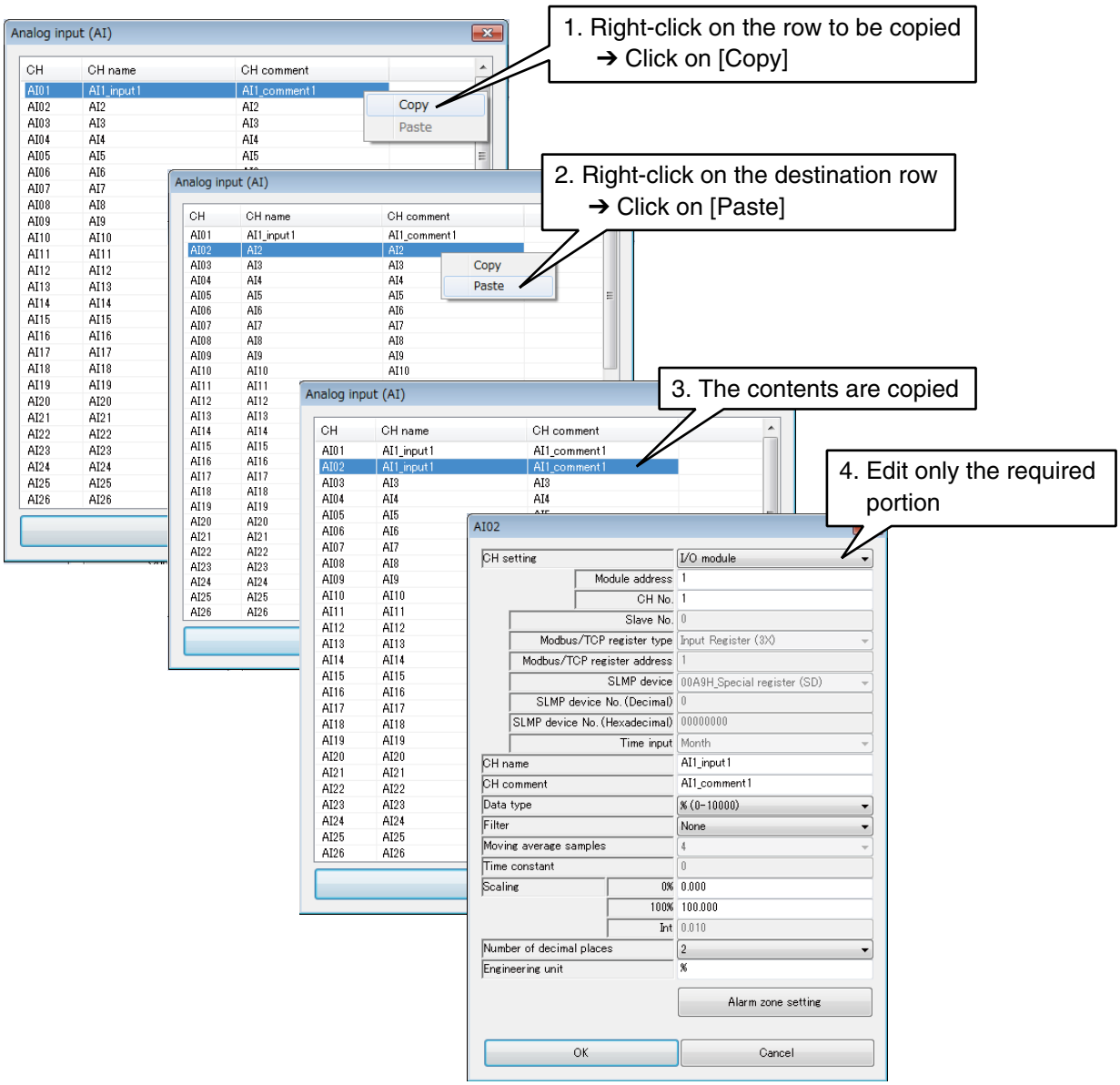
Which functions assigned to GDO?

Functions and zones assigned to the respective GDO channels are displayed.



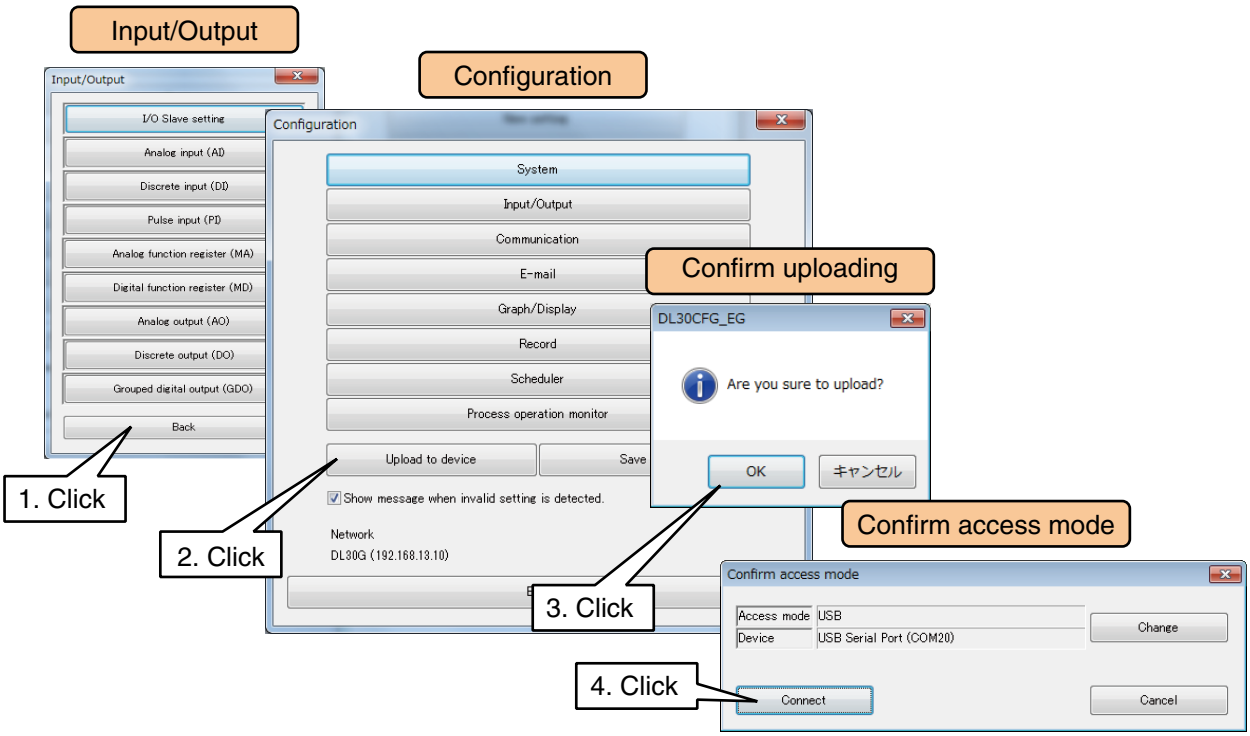
3.6.10 Copying CH setting

The CH setting for which the setting is complete in the CH list window (Example: Analog input (AI) window) can also be copied to other CHs and only the required portions can be edited.



3.6.11 Applying setting

To transfer the temporarily stored setting values to the DL30-G, click [Back] from the [Input/Output] window to return to the [Configuration], and then click [Upload to device] button.



NOTES

To store the setting values in a PC, click [Save file] button in the [Configuration].
➔ 6.1.1 Saving/reading setting values (DL30GCFG)

CAUTION

To validate the settings of some functions such as the FTP server or Modbus/TCP slave function, be sure to turn off and on the power supply or restart the device.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Restarting DL30-G

3.7 I/O mapping setting

I/O mapping function is used to connect between specific inputs and outputs so that an input is copied as an output in the remote location, for the purpose of multiplexing and telemetering.

I/O mapping for analog output

Signal connection is possible between AI and AO, DI and AO, MA and AO, and MD and AO.
Refer to [3.6.7 Analog output (AO)] > [I/O mapping (AO)] for detailed information.

I/O mapping for discrete output

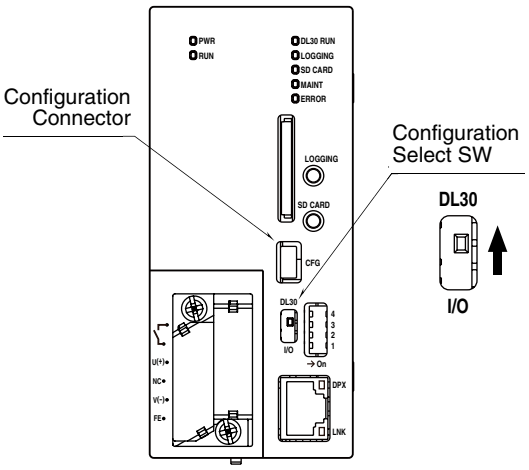
Signal connection is possible between DI and DO, MD and DO, DI and GDO, and MD and GDO.
Refer to [3.6.8 Discrete output (DO)], and [3.6.9 Grouped digital output (GDO)] for detailed information.

NOTES

- Channels assigned for I/O mapping function cannot be controlled on the web browser or used for alarm output. Any setting for the web browser control or the alarm output is invalid.
- MD and DO grouped in the GDO which is assigned for I/O mapping cannot be controlled on the web browser or used for alarm output. Any setting for the web browser control or the alarm output is invalid.
- Values applied for I/O mapping:
  % (AI): Input values are applied as they are to the output.
  Int, Uint (AI): Engineering unit values are applied to the output.
  DI, MD: Current state is applied to the output.

3.8 Logging function setting

(1) Turn [Configuration Select SW] on the device to the [DL30] side.

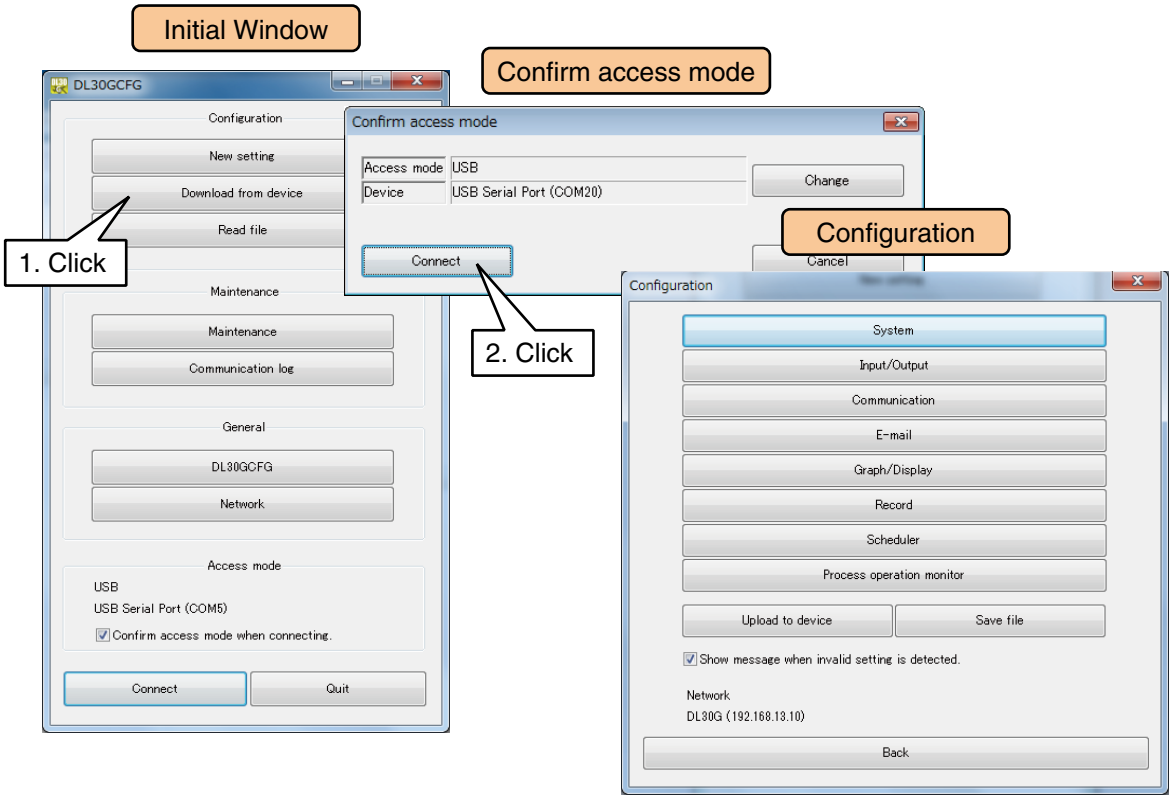


(2) Connect the DL30-G to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.



3.8.1 Data logging

A maximum of 128 channels of data can be stored by assigning Pen 1 through 128.
Data is accumulated in the internal memory and stored as CSV files in a SD card.

Logging data format

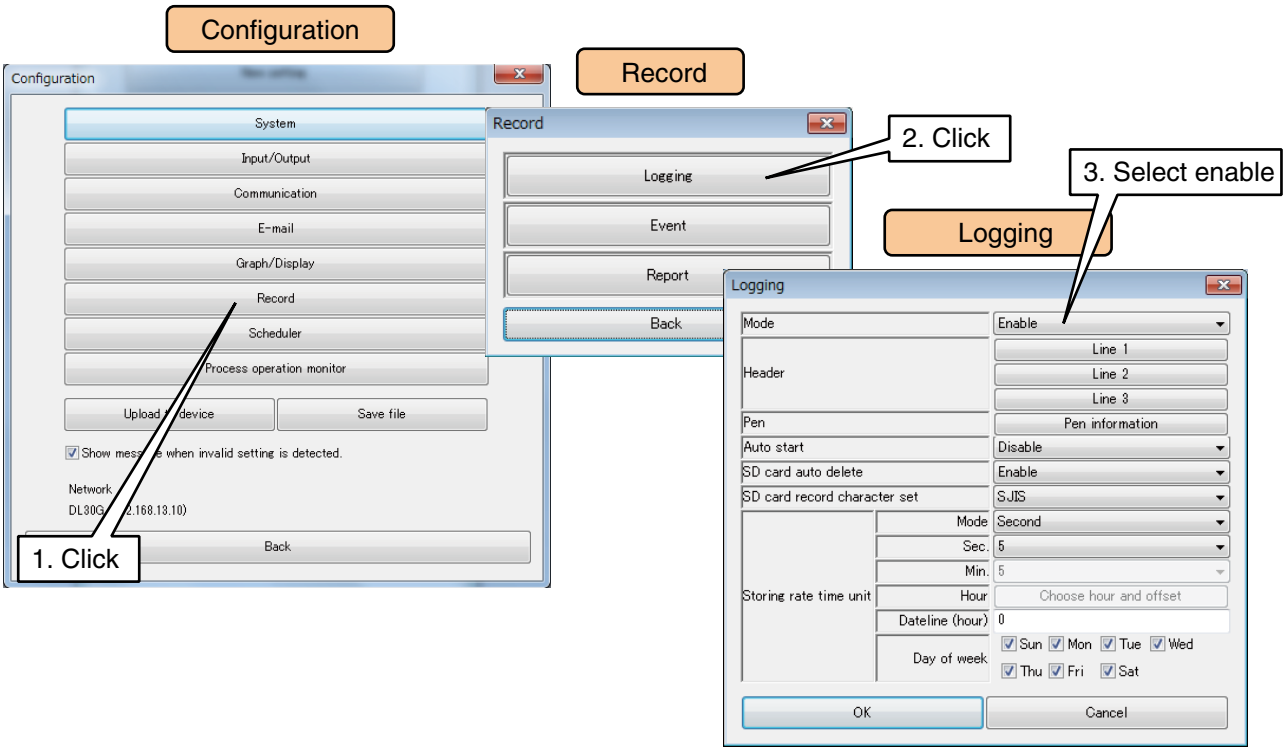
Data stored as CSV file are arranged as shown in the table below. (Example of 128 channels)

	Column 1	Column 2	Column 3	...	Column 129
Row 1	Header 1				
Row 2	Header 2				
Row 3	Header 3				
Row 4	Date and time	CH1 data	CH2 data	...	CH128 data
Row 5	Date and time	CH1 data	CH2 data	...	CH128 data
Row 6	Date and time	CH1 data	CH2 data	...	CH128 data
:	:	:	:	:	:

The first data row advances (no blank row) if one or more Headers are not defined.
If all Headers are blank, the first set of Date and time and CH data starts at the row 1.

Logging setting

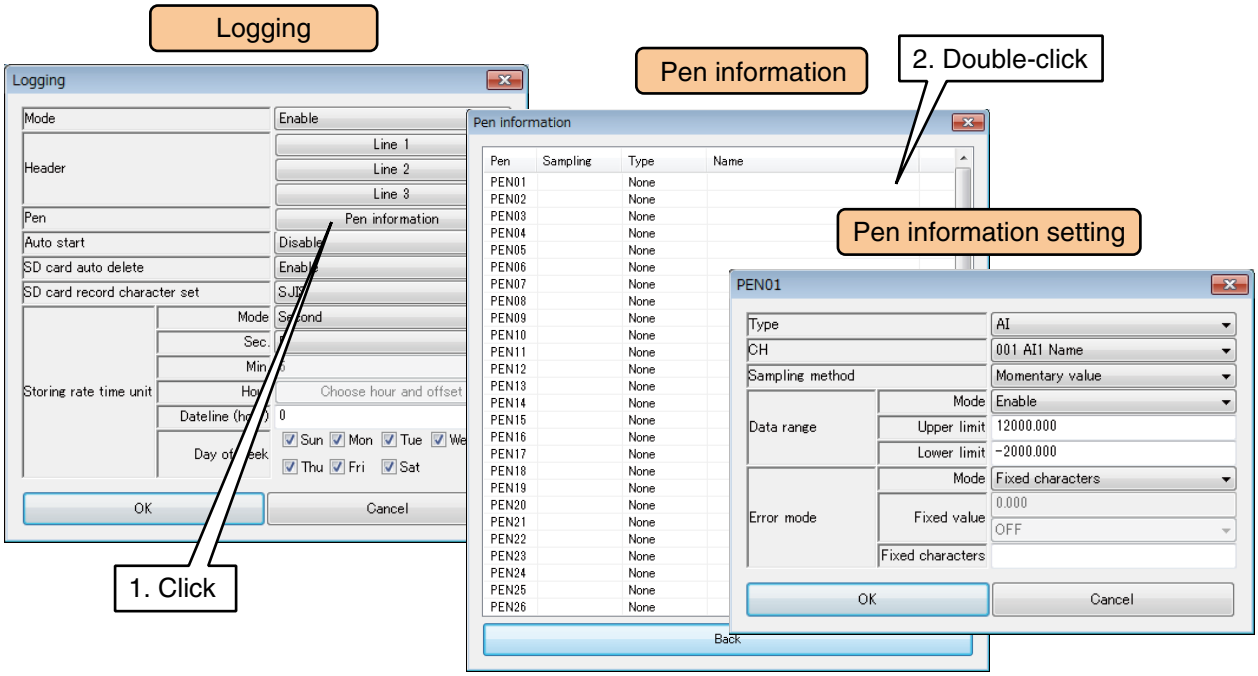
(1) Click [Record] button in the [Configuration] window to display the [Record] window.
Click [Logging] button to display the [Logging] window.
First, be sure to set [Mode] as [Enable], otherwise no data is recorded.



Set relevant parameters by referring to the table below.

Parameter	Description
Header	Enter the descriptions for the header at the top of CSV file. Use up to 1024 one-byte characters in comma-separated string format.
Storing rate time unit	Specify the logging cycle. • Mode Select the time unit among Second / Minute / Hour. • Sec., Min., Hour Sec.: Choose among 1 / 2 / 5 / 10 / 20 / 30 seconds. Min.: Choose among 1 / 2 / 5 / 10 / 15 / 20 / 30 minutes. Hour: Specify which hour(s) of a day the data is to be stored. Offsets (minutes and seconds) can be applied to each hour setting. NOTE) Data for one day is saved in a file when the logging cycle is set in seconds or minutes, while data for one month is saved in a file when the logging cycle is set in hours. See [8.2.5 Data file configurations] > [File names] for details. • Dateline (hour) Specify at which time a day starts. • Day of week Uncheck the days of the week when logging is not required. For example, uncheck [Sun] to cancel the logging on Sundays.
SD card record character set	Choose the character set for the data stored in the SD card between S-JIS and UTF-8.

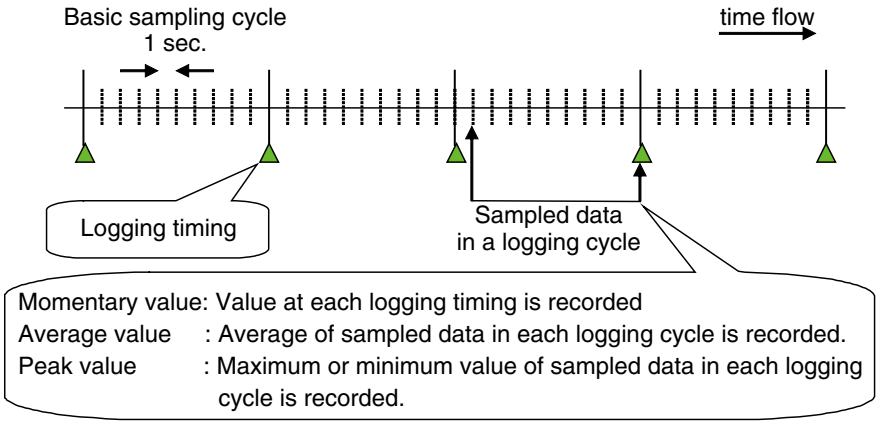
(2) Click [Pen information] button to display the [Pen information] window.
Double-click a row of the PEN to be set to display the [Pen information setting].



Set relevant parameters by referring to the table below.

Parameter	Description
Type	Choose the signal type among: None / AI / DI / PI / MA / MD / AO / DO / GDO.
CH	Choose the channel number.
Sampling method	Choose the data sampling method among: Momentary value / Average value / Peak value (max.) / Peak value (min.). *1
Data range	• Mode — Choose [Enable] when a specific valid data range is set. • Upper limit — Specify the upper limit of the data. • Lower limit — Specify the lower limit of the data.
Error mode	• Mode — A pre-defined value can be applied in the Report form when the DL30-G is unable to acquire data or when the data is out of the specified range. Choose among: Previous value / Fixed value / Fixed characters. • Fixed value — Specify a numeric value for the [Fixed value] mode. • Fixed characters — Specify characters for the [Fixed characters] mode. (max. 8 characters)

*1. Sampling method

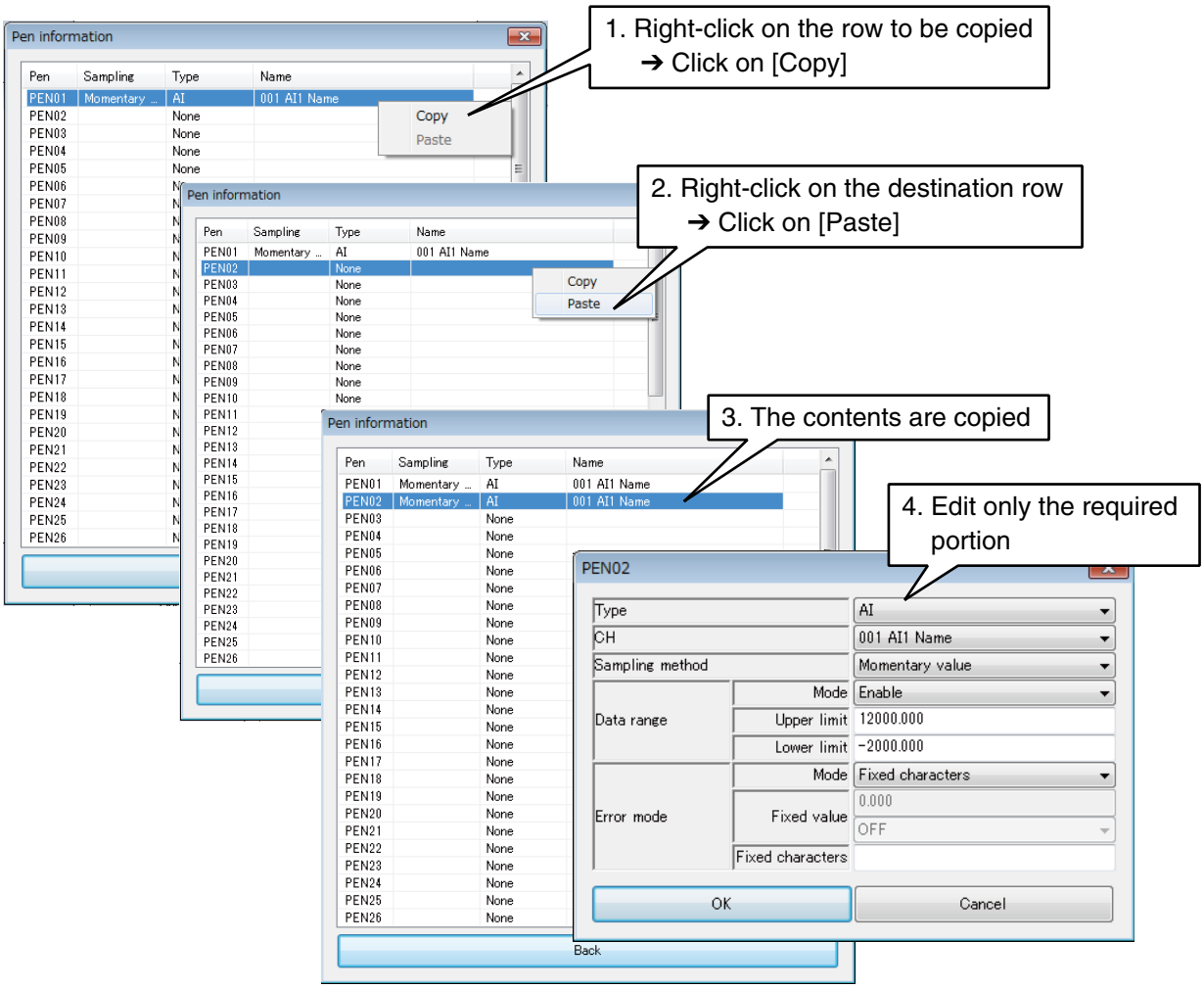


NOTES

When the [Sampling method] other than the [Momentary value] is selected, the [Fixed] characters] specified for the [Error mode] is applied only all data sampled within the time interval specified as [Storing rate] are in error. The DL30-G performs the operation specified for the [Sampling method] if one or more data samples are acquired within the cycle.

(3) Click [OK] to temporarily store the setting.

(4) Go through the same procedure for as many pens as needed.
One pen's setting can be copied to another, so that only the differences should be edited.



(5) Once the setting is complete, click [OK] to go back to the [Logging] window.

NOTES

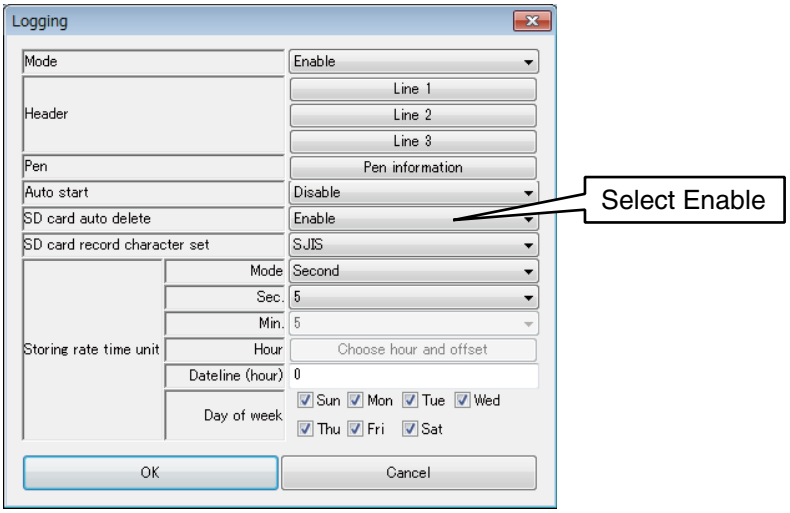
In a CSV file, blank data rows for unassigned pens are moved over so that the data is saved without blank cells.

Starting logging automatically

Set [Auto start] as [Enable] to start data logging automatically once the power supply to the device is turned ON.

Automatically deleting logging data in SD card

Old files/folders can be automatically deleted when the remaining space in the SD card reaches a certain limit. Set [SD card auto delete] as [Enable] to automatically delete the data.



For more explanations on the target files and the timing of deletion, refer to [8.2.4 SD card] > [Automatic file deleting function].

NOTES

If [SD card auto delete] is set as [Disable], data cannot be transferred to the SD card from the internal memory once there is no more space on the SD card.
Data continues to be recorded in the memory blocks, but after the last memory block, the first memory block is overwritten.

3.8.2 Event log

Event data format

Data stored as CSV file are arranged as shown in the table below. Texts in blue color are fixed.

■ Event log

Column	1	2	3	4	5	6	7	8
Row 1	Date and time	CH	CH name	CH comment	Event No.	Message	Zone color / Status message	Status color
Row 2	(data)	(data)	(data)	(data)	(data)	(data)	(data)	(data)
:	:	:	:	:	:	:	:	:

■ System log

Column	1	2
Row 1	Date and time	Message
Row 2	(data)	(data)
:	:	:

■ Communication log

Column	1	2	3	4	5	6
Row 1	Date and time	Protocol	Result	Form No. / File name	Transmission times	Message
Row 2	(data)	(data)	(data)	(data)	(data)	(data)
:	:	:	:	:	:	:

Column 4, 5, and 6 are blank for SNTP error.

■ Schedule log

Column	1	2	3	4	5	6	7
Row 1	Date and time	Type	CH	CH name	CH comnent	Operation	Output type
Row 2 (Schedule output)	Date and time of Schedule output	Log type (OUTPUT)	CH No.	CH name	CH comment	Operation (ON/OFF)	blank
Row 3 (Schedule output type change)	Date and time of change	Log type (MAINTE)	CH No.	CH name	CH comment	blank	Schedule output type (SCH / ON / OFF)
Row 4 (One-time schedule)	Assigned date and time	Log type (TEMP)	blank	blank	blank	blank	blank
Row 5 (Permanent schedule)	Assigned date and time	Log type (PER)	blank	blank	blank	blank	blank
:	:	:	:	:	:	:	:

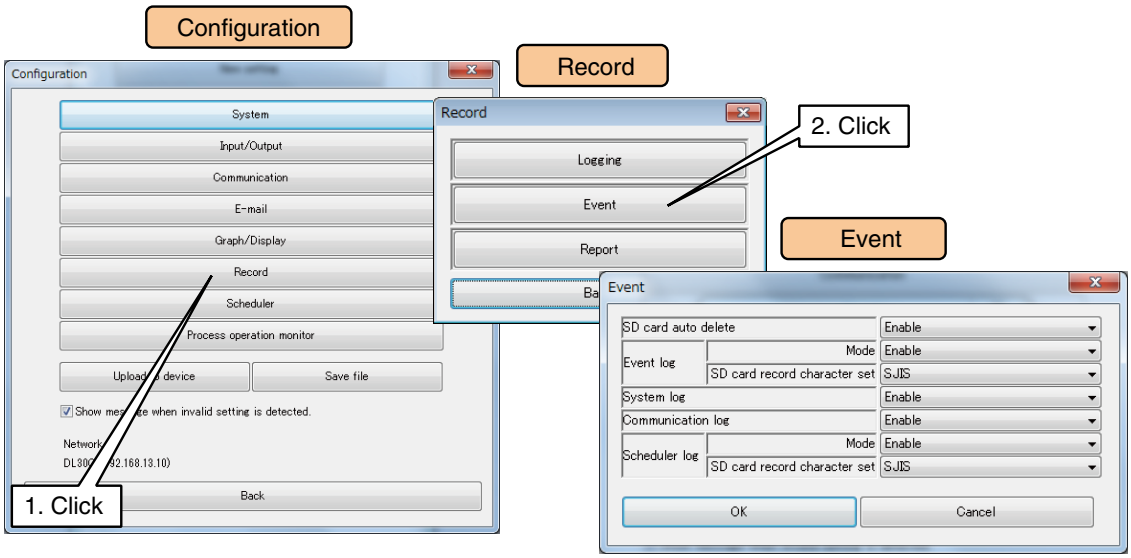
Column	8	9	10	11	12	13	14
Row 1	Schedule unit	Schedule unit name	Reg. No.	Date	PAT	PAT name	Operation ID
Row 2 (Schedule output)	blank	blank	blank	blank	blank	blank	blank
Row 3 (Schedule output type change)	blank	blank	blank	blank	blank	blank	Operation ID (*1)
Row 4 (One-time schedule)	Schedule unit No.	Schedule unit name	blank	Date	Pattern No.	Pattern name	Operation ID (*1)
Row 5 (Permanent schedule)	Schedule unit No.	Schedule unit name	Reg. No.	Date	Pattern No.	Pattern name	Operation ID (*1)
:	:	:	:	:	:	:	:

*1. CFG1 to 8: DL30GCFG authentication ID, WEB1 to 32: Web authentication ID, USB: USB connection

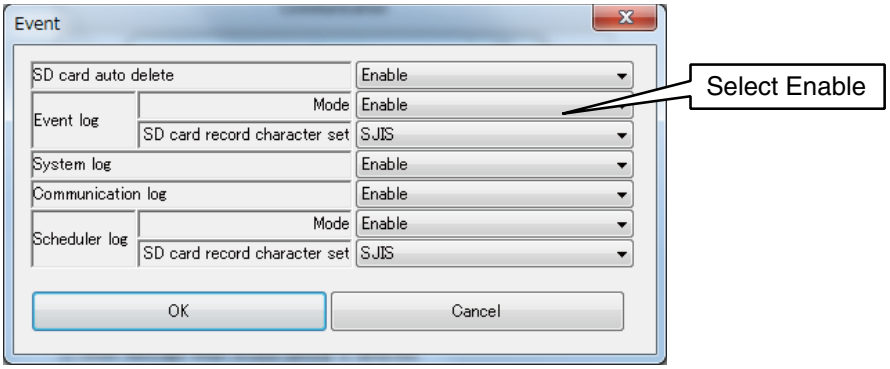
Event log setting

Events are recorded in Event logs.

(1) Click [Record] button in the [Configuration] window to display the [Record] window.
Click [Event] button to display the [Event] window.



(2) First, be sure to set [Event log] > [Mode] as [Enable], otherwise no data is recorded.



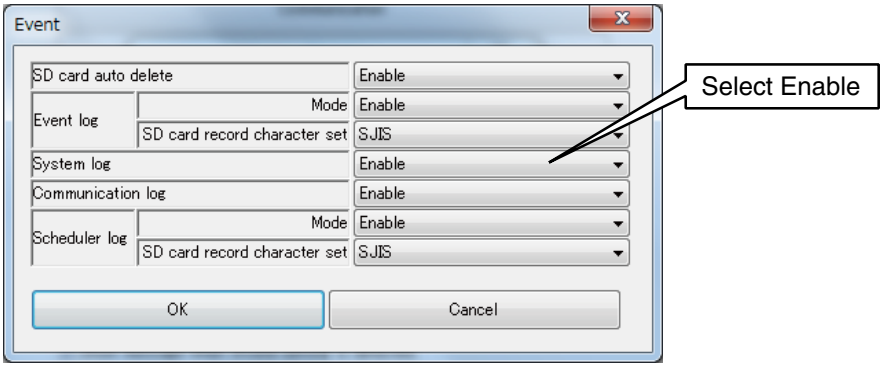
(3) Set the parameter by referring to the table below.

Parameter	Description
SD card record character set	Choose the character set for the data stored in the SD card between S-JIS and UTF-8.

System log setting

(1) Display the [Event] window following the same procedure as for the Event log.

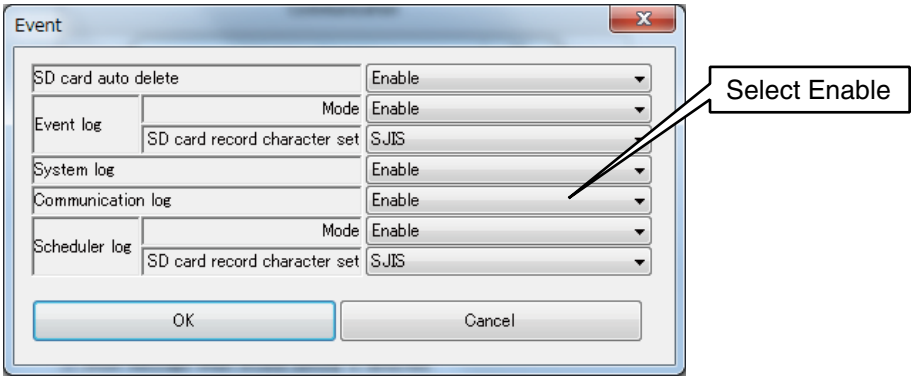
(2) Set [System log] as [Enable], otherwise no data is recorded.



Communication log setting

(1) Display the [Event] window following the same procedure as for the Event log.

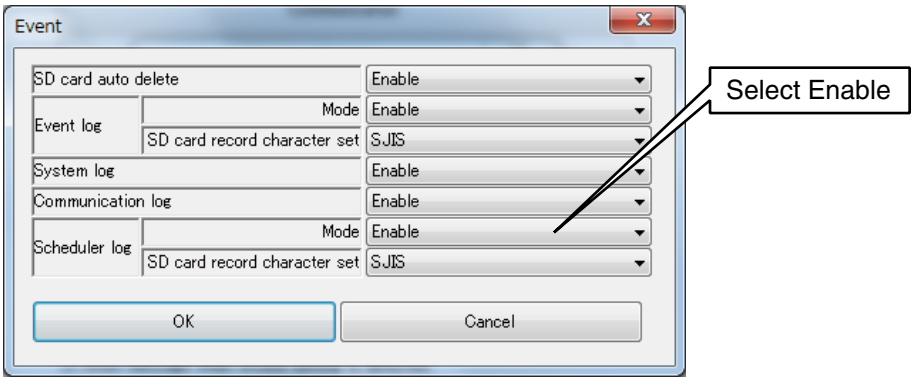
(2) Set [Communication log] as [Enable], otherwise no data is recorded.



Schedule log setting

(1) Display the [Event] window following the same procedure as for the Event log.

(2) Set [Schedule log] > [Mode] as [Enable], otherwise no data is recorded.

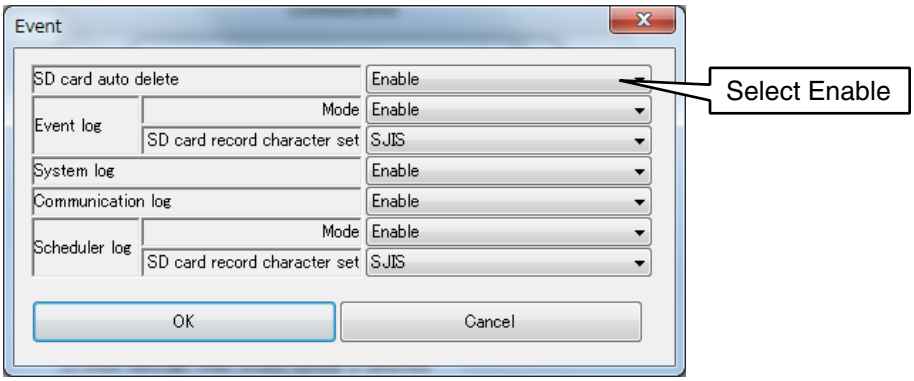


(3) Set the parameter by referring to the table below.

Parameter	Description
SD card record character set	Choose the character set for the data stored in the SD card between S-JIS and UTF-8.

Automatically deleting event data in SD card

Old files/folders can be automatically deleted when the remaining space in the SD card reaches certain limit. Set [SD card auto delete] as [Enable] to automatically delete the data.



For more explanations on the target files and the timing of deletion, refer to [8.2.4 SD card] > [Automatic file deleting function].

3.9 Report form setting

Daily, monthly, and yearly reports can be automatically generated in a predefined format.
A maximum of 128 channels of AI, PI, and/or MA data can be recorded.
[Momentary], [Average], [Peak value (max.)], or [Peak value (min.)] values are sampled from each hourly data to create a daily report.
A monthly report is generated from Daily reports, and a yearly report is from Monthly reports.

3.9.1 Report format

Report form data is stored in the internal memory and then saved as CSV file in the SD card.
Data stored in a CSV file are arranged as shown in the table below. (Example of 128 channels)
Texts in blue color are fixed.

Daily report

	Column 1	Column 2	Column 3	...	Column 129
Row 1	Page title				
Row 2	Device name	CH1 name	CH2 name	...	CH128 name
Row 3	yyyy/mm/dd	CH1 comment	CH2 comment	...	CH128 comment
Row 4	HOUR	CH1 eng. unit	CH2 eng. unit	...	CH128 eng. unit
Row 5	1	CH1 data	CH2 data	...	CH128 data
Row 6	2	CH1 data	CH2 data	...	CH128 data
:	:	:	:	:	:
Row 28	24	CH1 data	CH2 data	...	CH128 data
Row 29	Sum	CH1 total	CH2 total	...	CH128 total
Row 30	Average	CH1 average	CH2 average	...	CH128 average
Row 31	Maximum	CH1 max.	CH2 max.	...	CH128 max.
Row 32	Minimum	CH1 min.	CH2 min.	...	CH128 min.

Monthly report

	Column 1	Column 2	Column 3	...	Column 129
Row 1	Page title				
Row 2	Device name	CH1 name	CH2 name	...	CH128 name
Row 3	yyyy/mm	CH1 comment	CH2 comment	...	CH128 comment
Row 4	DATE	CH1 eng. unit	CH2 eng. unit	...	CH128 eng. unit
Row 5	1	CH1 data	CH2 data	...	CH128 data
Row 6	2	CH1 data	CH2 data	...	CH128 data
:	:	:	:	:	:
Row 35	31	CH1 data	CH2 data	...	CH128 data
Row 36	Sum	CH1 total	CH2 total	...	CH128 total
Row 37	Average	CH1 average	CH2 average	...	CH128 average
Row 38	Maximum	CH1 max.	CH2 max.	...	CH128 max.
Row 39	Minimum	CH1 min.	CH2 min.	...	CH128 min.

Yearly report

	Column 1	Column 2	Column 3	...	Column 129
Row 1	Page title				
Row 2	Device name	CH1 name	CH2 name	...	CH128 name
Row 3	yyyy	CH1 comment	CH2 comment	...	CH128 comment
Row 4	MONTH	CH1 eng. unit	CH2 eng. unit	...	CH128 eng. unit
Row 5	1	CH1 data	CH2 data	...	CH128 data
Row 6	2	CH1 data	CH2 data	...	CH128 data
:	:	:	:	:	:
Row 16	12	CH1 data	CH2 data	...	CH128 data
Row 17	Sum	CH1 total	CH2 total	...	CH128 total
Row 18	Average	CH1 average	CH2 average	...	CH128 average
Row 19	Maximum	CH1 max.	CH2 max.	...	CH128 max.
Row 20	Minimum	CH1 min.	CH2 min.	...	CH128 min.

NOTES

- [------] is saved in a cell if there is no data recorded.
- Report forms are divided by 8 channels on the web browser view.
- The last four rows of total, average, max., and min. appear in the CSV file only after the end of the report period, and do not appear in the CSV file during the report period.
  That is, when the report period ends at 00.00 midnight, the daily report CSV file of the day before includes the final four rows while the CSV file of the day does not include these rows yet. However, the final four rows always show on the Web browser view.

Web Browser View

Back

Page1

Daily report

DL30	AI1	AI1	AI1	AI1	PI1	PI1	PI1	PI1
2018/11/18	AI1 comment	AI1 comment	AI1 comment	AI1 comment	PI1 comment	PI1 comment	PI1 comment	PI1 comment
HOUR	mA	mA	mA	mA	count	count	count	count
1	4.04	12.00	20.00	4.00	5830	4690	10010	10
2	4.04	12.00	20.00	4.00	1790	5144	10010	10
[illegible]	[illegible]	[illegible]	[illegible]	4.00	7760	4971	10010	10
22	4.04	12.00	20.00	[illegible]	[illegible]	5224	10010	10
23	4.04	12.00	20.00	4.00	7040	[illegible]	[illegible]	[illegible]
24	4.04	12.00	20.00	4.00	3000	5008	10010	10
Sum	96.96	288.00	480.00	96.00	125980	119956	240240	240
Average	4.04	12.00	20.00	4.00	5249	4998	10010	10
Maximum	4.04	12.00	20.00	4.00	9690	5291	10010	10
Minimum	4.04	12.00	20.00	4.00	1070	4690	10010	10

8 channels

Page2

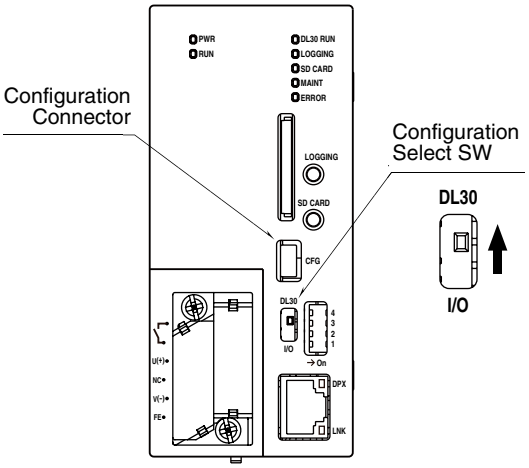
Daily report

DL30	PI2	PI3	PI4
2018/11/18	PI2 comment	PI3 comment	PI4 comment
HOUR	count	count	count
1	1000.5	1000.50	1001
2	1000.5	1000.50	1001
3	1000.5	1000.50	1001
4	1000.5	1000.50	1001

3.9.2 Report form setting

Channels assigned to PEN01 ... PEN128 can be exported to report forms.

(1) Turn [Configuration Select SW] to the [DL30] side.

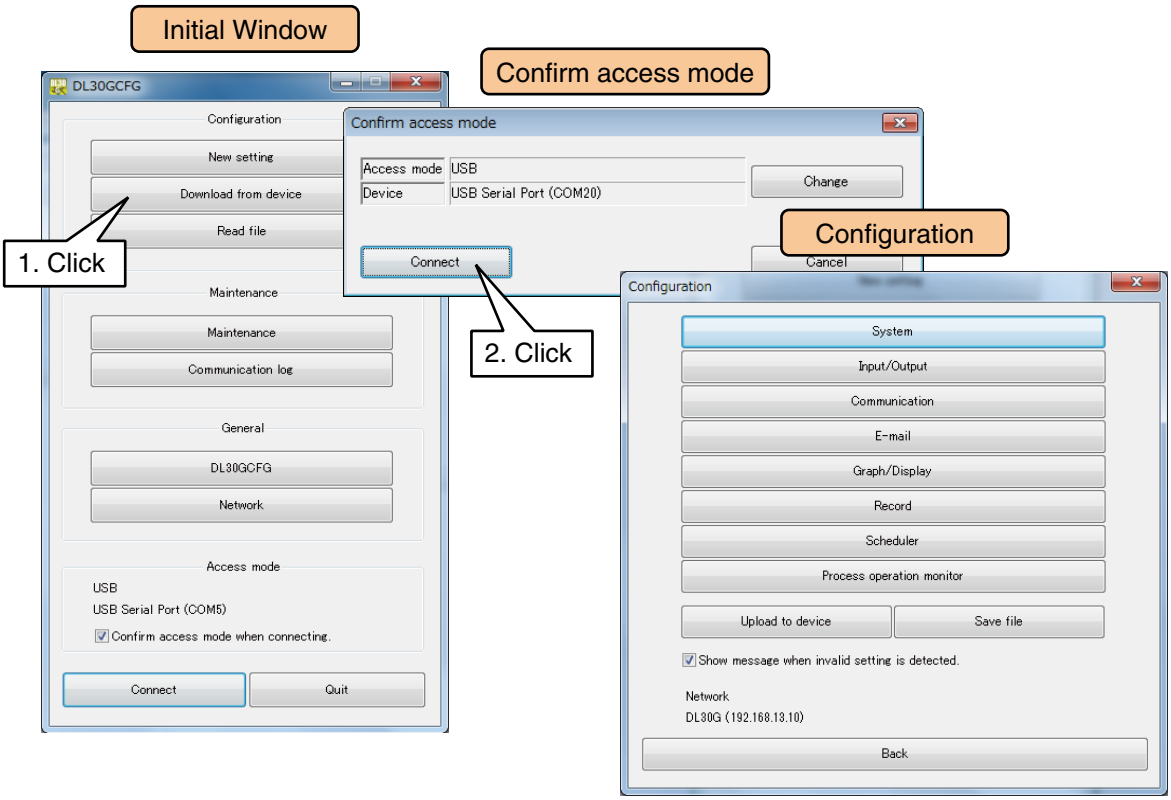


(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

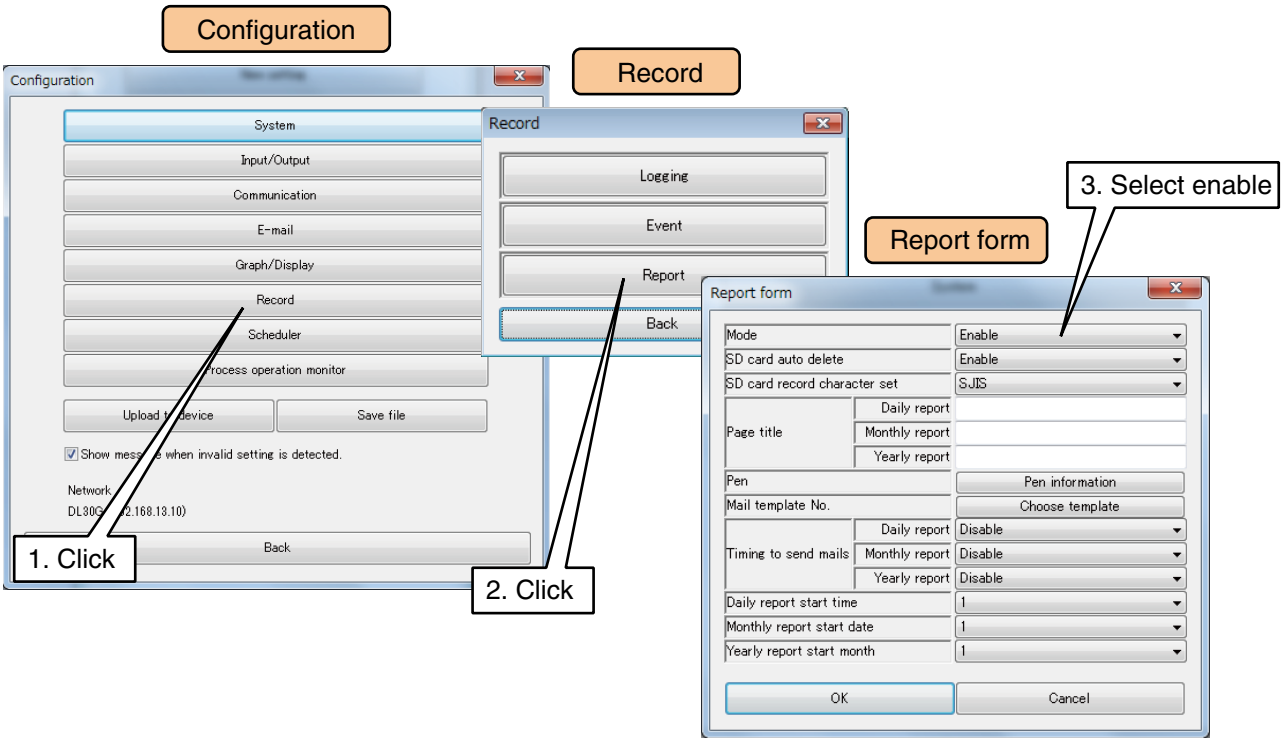
(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.



(6) Click [Record] button in the [Configuration] window.
Click [Report] button to display the [Report form] window.
First, set [Mode] as [Enable], otherwise no report data is created.

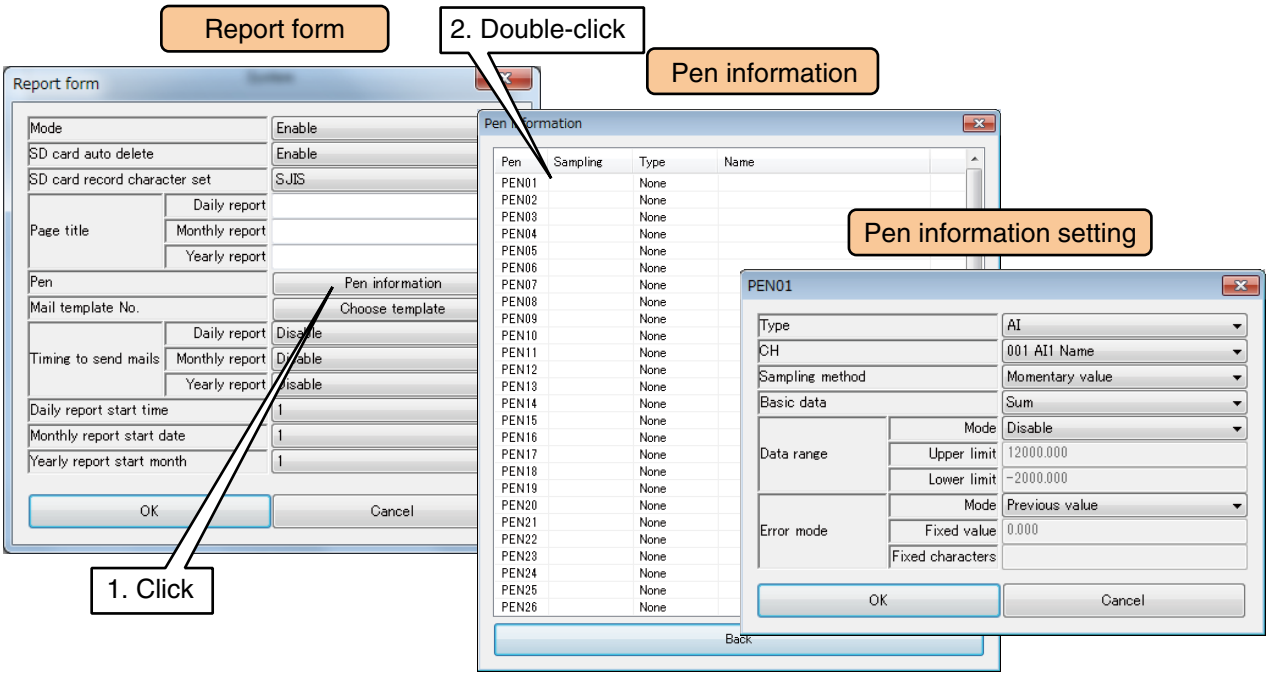


Set the parameters by referring to the table below.

Parameter	Description
SD card record character set	Choose the character set for the data stored in the SD card between S-JIS and UTF-8.
Page title	Specify a page title for each of Daily, Monthly, and Yearly report (max. 32 characters)

Report form contents setting

(1) Click [Pen information] button to display the [Pen information] window.
Double-click a row of the PEN to be set to display the [Pen information setting] window.



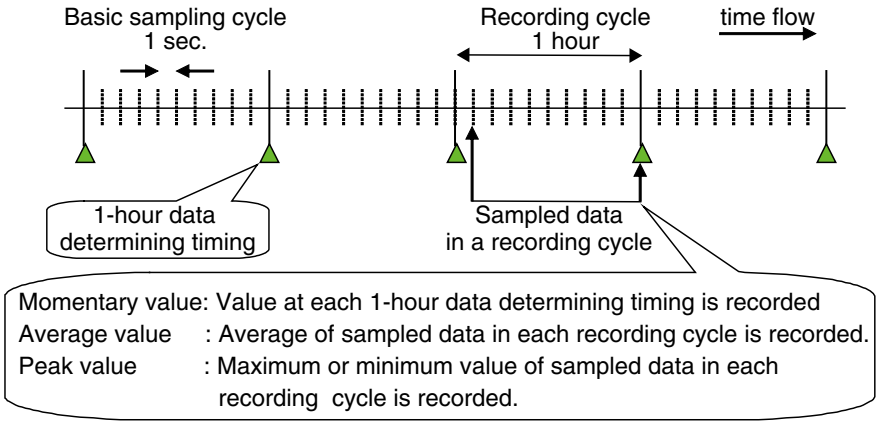
Set relevant parameters by referring to the table below.

Parameter	Description
Type	Choose the signal type among: None / AI / PI / MA.
CH	Choose the channel number.
Sampling method	Choose the data sampling method for hourly data among: Momentary value / Average value / Peak value (max.) / Peak value (min.). *1
Basic data	Choose the operating function for obtaining 'daily data' to be recorded in a Monthly report from the Daily report data and 'monthly data' to be recorded in a Yearly report from the Monthly report data among: Sum / Average / Maximum / Minimum.
Data range	• Mode: Choose [Enable] when a specific valid data range is set. • Upper limit: Specify the upper limit of the data. • Lower limit: Specify the lower limit of the data.
Error mode	• Mode: A pre-defined value can be applied in the Report form when the DL30-G is unable to acquire data or when the data is out of the specified range. Choose among: Previous value / Fixed value / Fixed characters. • Fixed value: Specify a numeric value for the [Fixed value] mode. • Fixed characters: Specify characters for the [Fixed characters] mode. (max. 8 characters)

NOTES

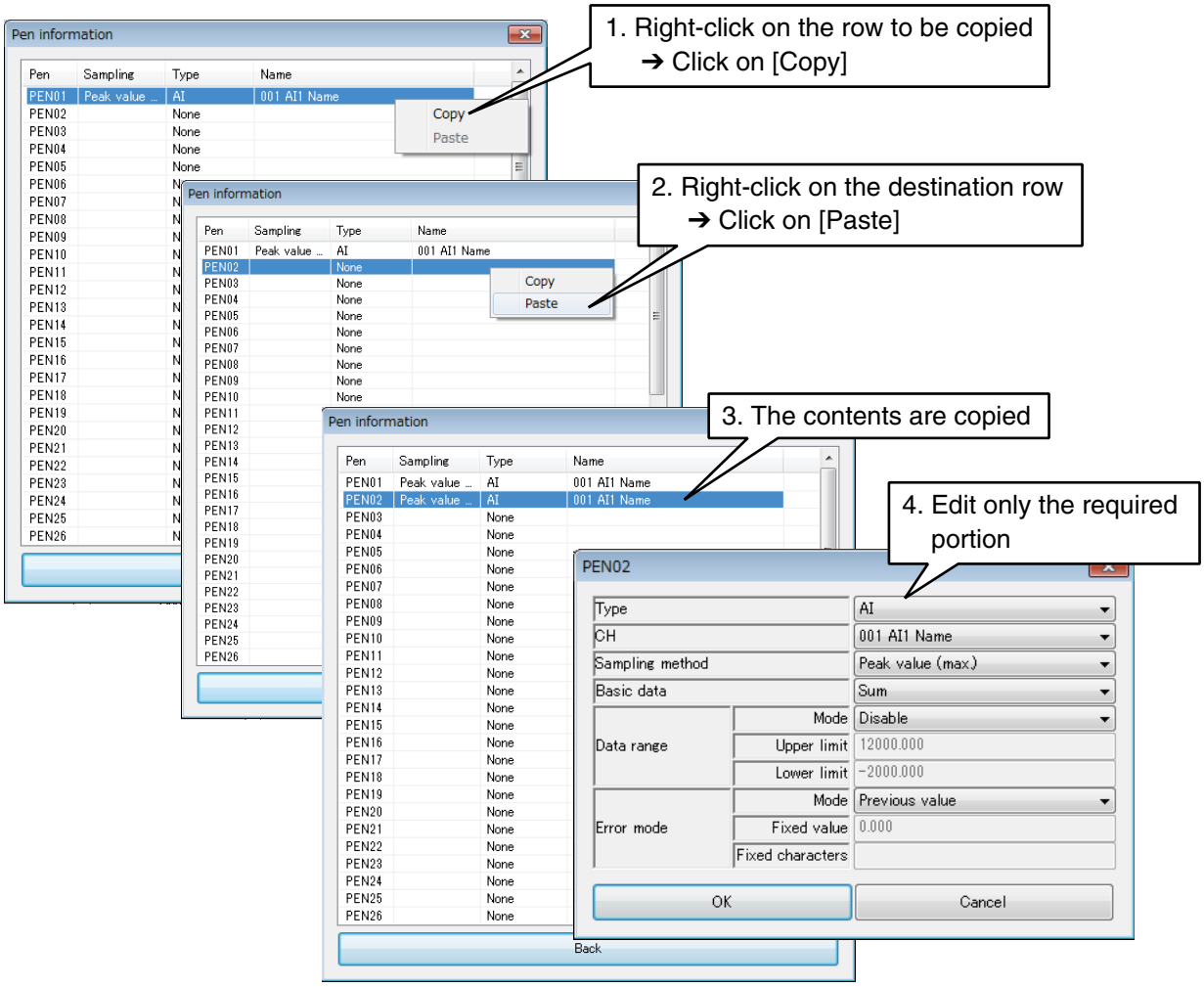
- When the [Momentary value] is selected for [Sampling method], data sampled at 0 minute, 0 second of every hour is recorded.
- When the [Sampling method] other than the [Momentary value] is selected, the [Fixed] characters] specified for the [Error mode] in Daily reports is applied only all data sampled within one hour are in error.
  The DL30-G performs the operation specified for the [Sampling method] if one or more data samples are acquired within the hour.

*1. Sampling method



(2) Click [OK] to temporarily store the setting.

(3) Go through the same procedure for as many pens as needed.
One pen's setting can be copied to another, so that only the differences should be edited.



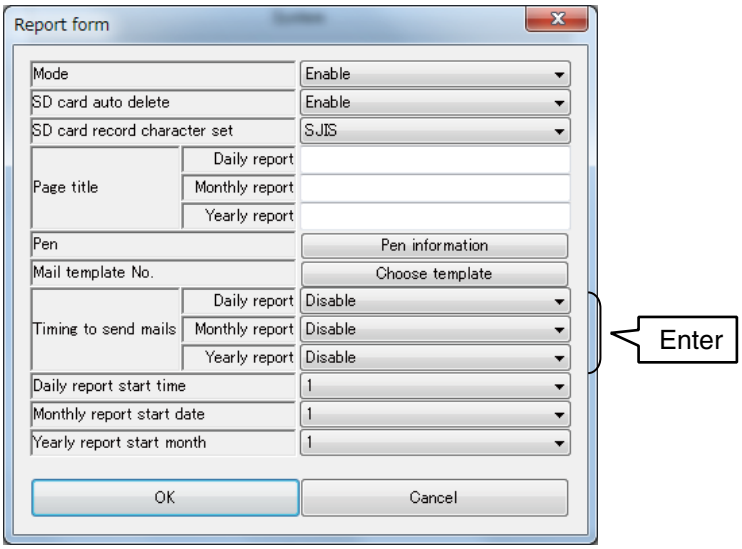
(4) Once the setting is complete, click [OK] to go back to the [Report form] window.

NOTES

- In a CSV file, blank data rows for unassigned pens are moved over so that the data is saved without blank cells.
- In order to report in the Daily reports the difference per hour for a PI channel, specify an AI channel with [Time] input so that the data is reset every hour.
  Choose [Momentary value] for the sampling method.

E-mailing report forms

In addition to regular e-mailing, report forms can be e-mailed at the timing of file update.
Specify mail template number(s) and the timing to send mails, referring to the table below.



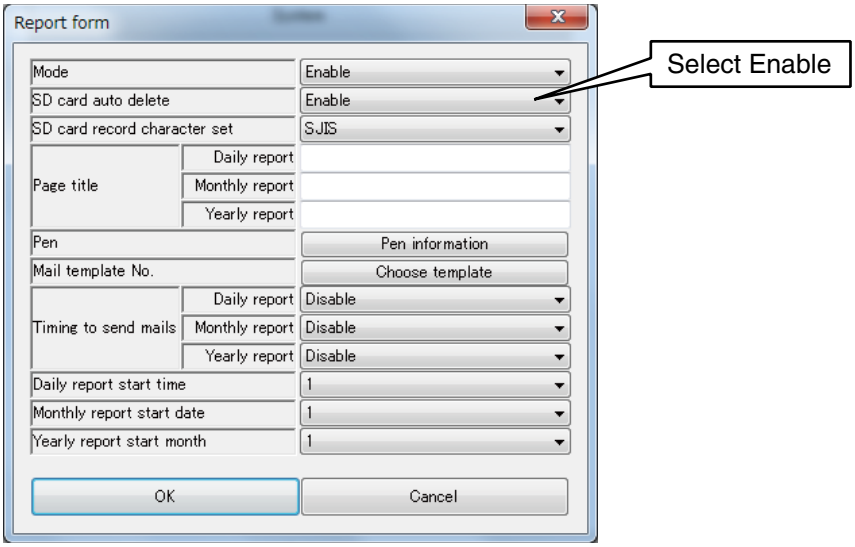
Parameter	Description
Mail template No.	Choose one or more mail template No. in which the relevant report form is specified as attached file. For example, choose a mail template in which the Daily report is specified as attachment to send Daily reports at the timing of update. ➔ 3.10.2 Mail template setting
Timing to send mails	Choose among: Disable / Upon updating of file / Upon saving of file.

CAUTION

- E-mails are not sent if the specified e-mail template does not contain a report form as attachment.
- Report form files are generated in the SD card. No file is saved if an SD card is not inserted in the slot.

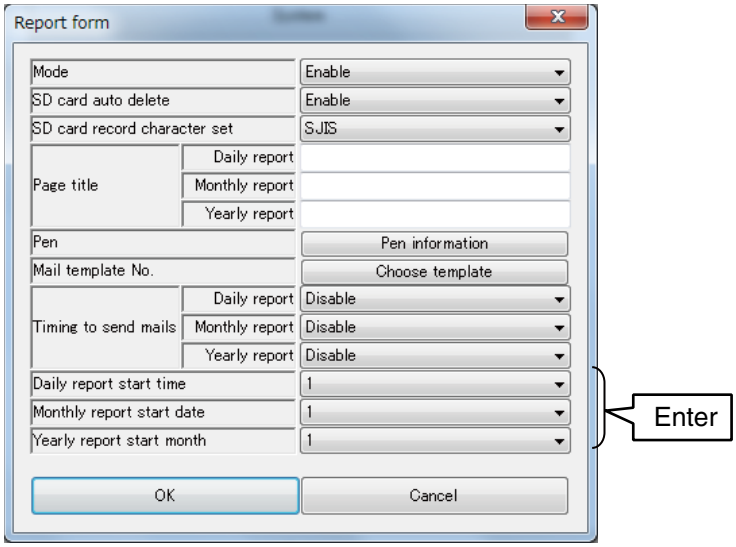
Automatically deleting report forms in SD card

Old files/folders can be automatically deleted when the remaining space in the SD card reaches certain limit. Set [SD card auto delete] as [Enable] to automatically delete the data.



Report data sampling start time

Set the time, date, and month to start data sampling for the daily, monthly, and yearly reports, respectively. The set time, date, and month becomes the beginning of each report.



Parameter	Description
Time to start Daily report	Set the time to start daily report. Setting range: 1 to 24 (hour)
Date to start Monthly report	Set the date to start monthly report. Setting range: 1 to 28 (date)
Month to start Yearly report	Set the month to start yearly report. Setting range: 1 to 12 (month)

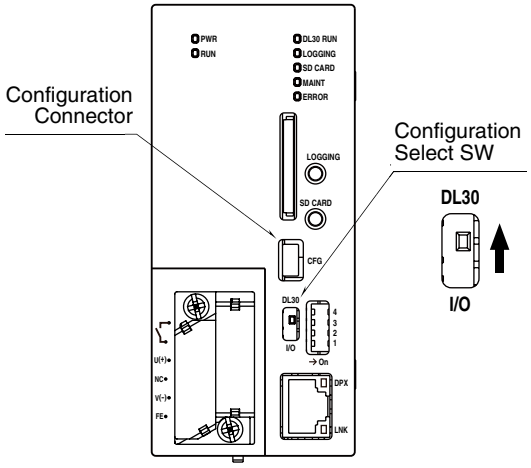
3.10 Mail reporting setting

The DL30-G is equipped with the Mail reporting function for sending emails.

NOTES

The DL30-G cannot receive an e-mail.

(1) Turn [Configuration Select SW] to the [DL30] side.

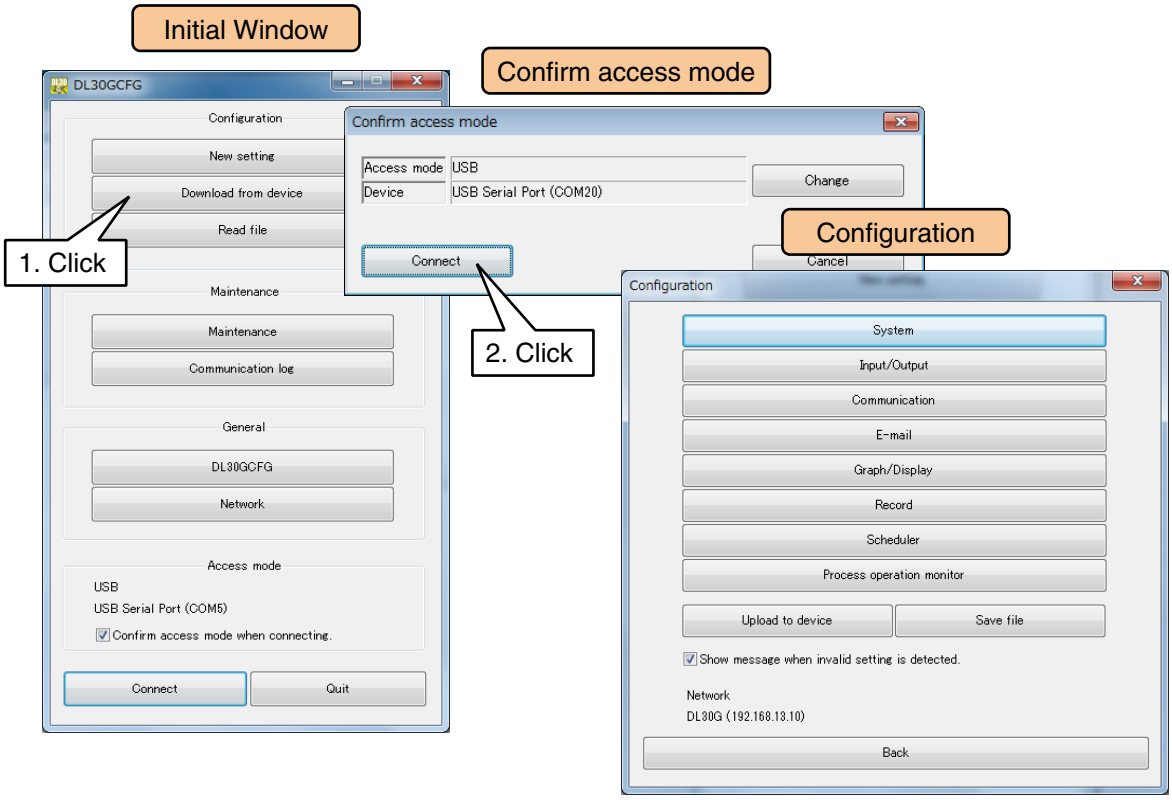


(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

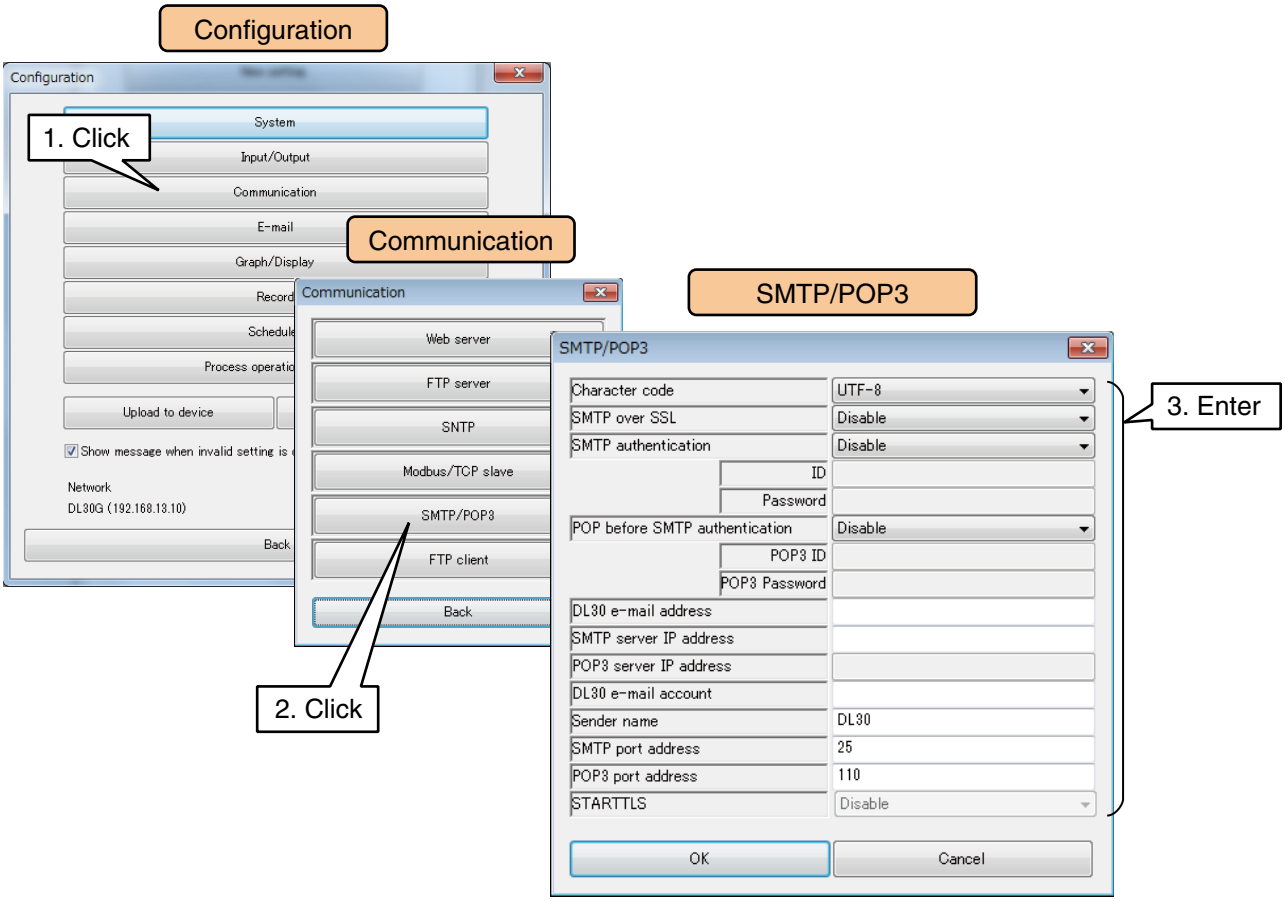
(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.



3.10.1 Mail server setting

(1) Click [Communication] button in the [Configuration] window.
Click [SMTP/POP3] button to display the [SMTP/POP3] window.



Set relevant parameters by referring to the table below.

Parameter	Description	Default value
Character code	Set the character code for the mail. UTF-8 ISO-2022-JP	UTF-8
SMTP over SSL	Configure encrypted communication setting. To use, set as [Enable].	Disable
SMTP authentication	Configure SMTP authentication setting. Disable: Do not perform SMTP authentication. Automatic: Automatically decide on the authentication algorithm. CRAM-MD5: Perform CRAM-MD5 authentication. LOGIN: Perform LOGIN authentication. PLAIN: Perform PLAIN authentication.	Disable
ID	Set the ID to be used for the SMTP server.	No entry (Blank)
Password	Set the password to be used for the SMTP server.	No entry (Blank)
POP before SMTP authentication	Set as [Enable] to use the POP before SMTP authentication function.	Disable
POP3 ID	Set the POP3 ID.	No entry (Blank)
POP3 password	Set the POP3 password.	No entry (Blank)
DL30-G e-mail address	Set the DL30-G mail address.	No entry (Blank)
SMTP server IP address	Set the domain name or IP address of the SMTP server.	No entry (Blank)
POP3 server IP address	Set the domain name or IP address of the POP3 server.	No entry (Blank)
DL30-G e-mail account	Set the DL30-G mail account name. Set it as the string before @ in the mail address.	No entry (Blank)
Sender name	Set the name to be displayed as the sender.	DL30
SMTP port address	Set the SMTP port address.	25
POP3 port address	Set the POP3 port address.	110
STARTTLS	When SMTP over SSL is enabled, configure the STARTTLS setting.	Disable

(2) Once the setting is complete, click [OK] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.

The table below shows setting examples for majior free e-mail services (As of July 2016).

Parameter	Yahoo mail (Yahoo Japan)	Gmail (Google)	
SMTP over SSL	Disable	Enable	
SMTP authentication	Automatic	Automatic	
ID	Before @ in the mail address Example: dl30	Mail address Example: dl30@gmail.com	
Password	Registered password Example: abcde	Registered password Example: abcde	
DL30-G e-mail address	Mail address Example: dl30@yahoo.co.jp	Mail address Example: dl30@gmail.com	
SMTP server	smtp.mail.yahoo.co.jp	smtp.gmail.com	
DL30-G e-mail account	Before @ in the mail address Example: dl30	Before @ in the mail address Example: dl30	
SMTP port address	465	465	587
STARTTLS	Disable	Disable	Enable

CAUTION

- POP3 is incorporated for POP before SMTP authentication.
  DL30-G cannot receive e-mails.
- SMTP over SSL authentication of the DL30-G is intended only for encryption.
  Therefore the certification issued by the mail server is not verified.
- Many mail servers are equipped with antispam tactic.
  Consult your email hosting provider for details.
- It is not guaranteed that this function can connect to all mail servers.
- For mail service, there are many kind of restrictions varying by each company.
  Also change of function or authentication method may be carry out.
  Therefore according to these changes of restriction or function, check the mail communication on a regular basis and perform adequate operational administrative.

3.10.2 Mail template setting

Register e-mail recipients and templates used for regular and event reporting.
First, create a list of e-mail recipients.
Then create e-mail templates and specify recipients for each template.

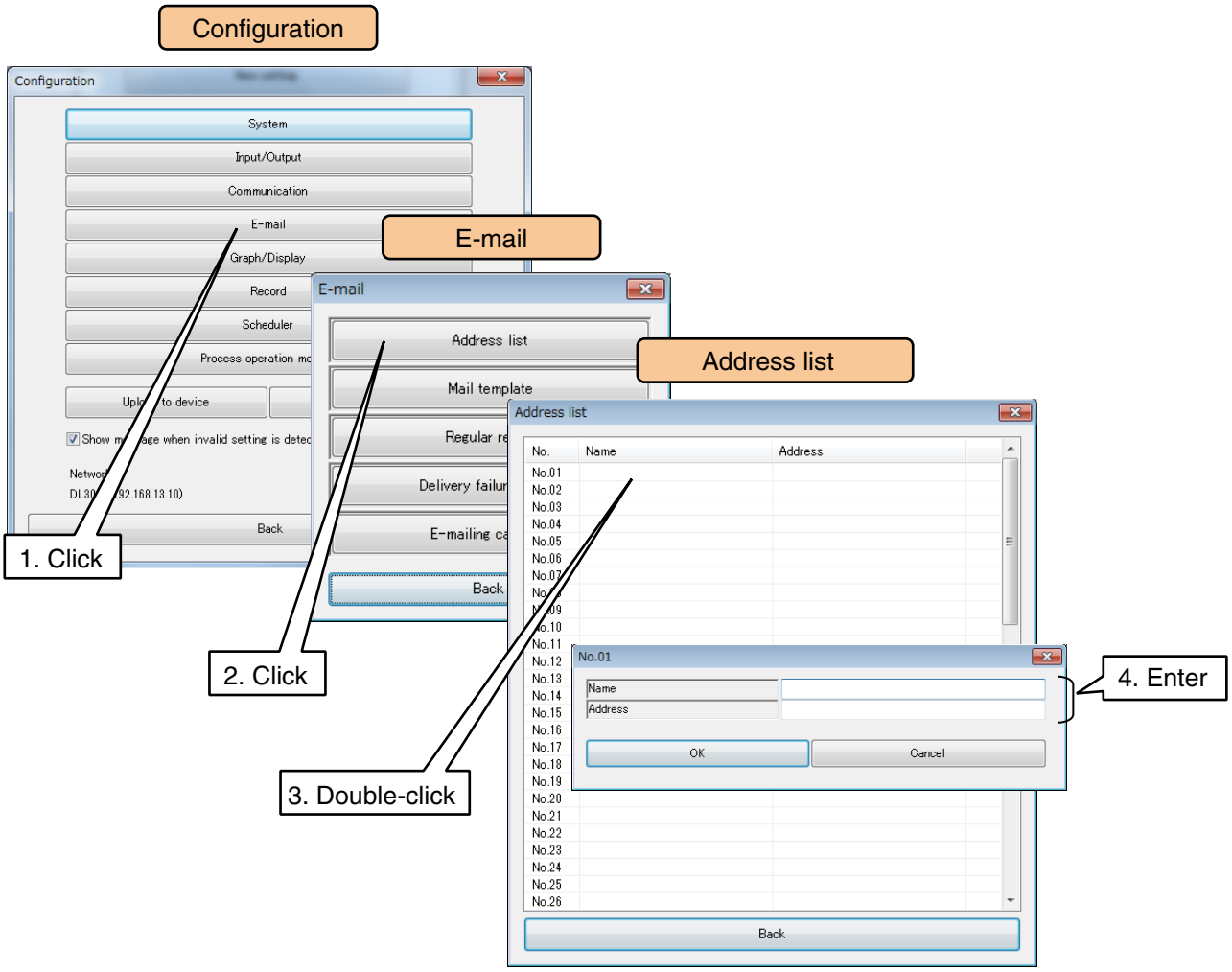
Registering address list

Create a list of e-mail recipients.

(1) Click [E-mail] button in the [Configuration] window to open the [E-mail] window.

(2) Click [Address list] button to display the [Address list].

(3) Double-click a row in the list and register the Name and Address (e-mail address).
Up to 64 e-mail recipients can be registered.



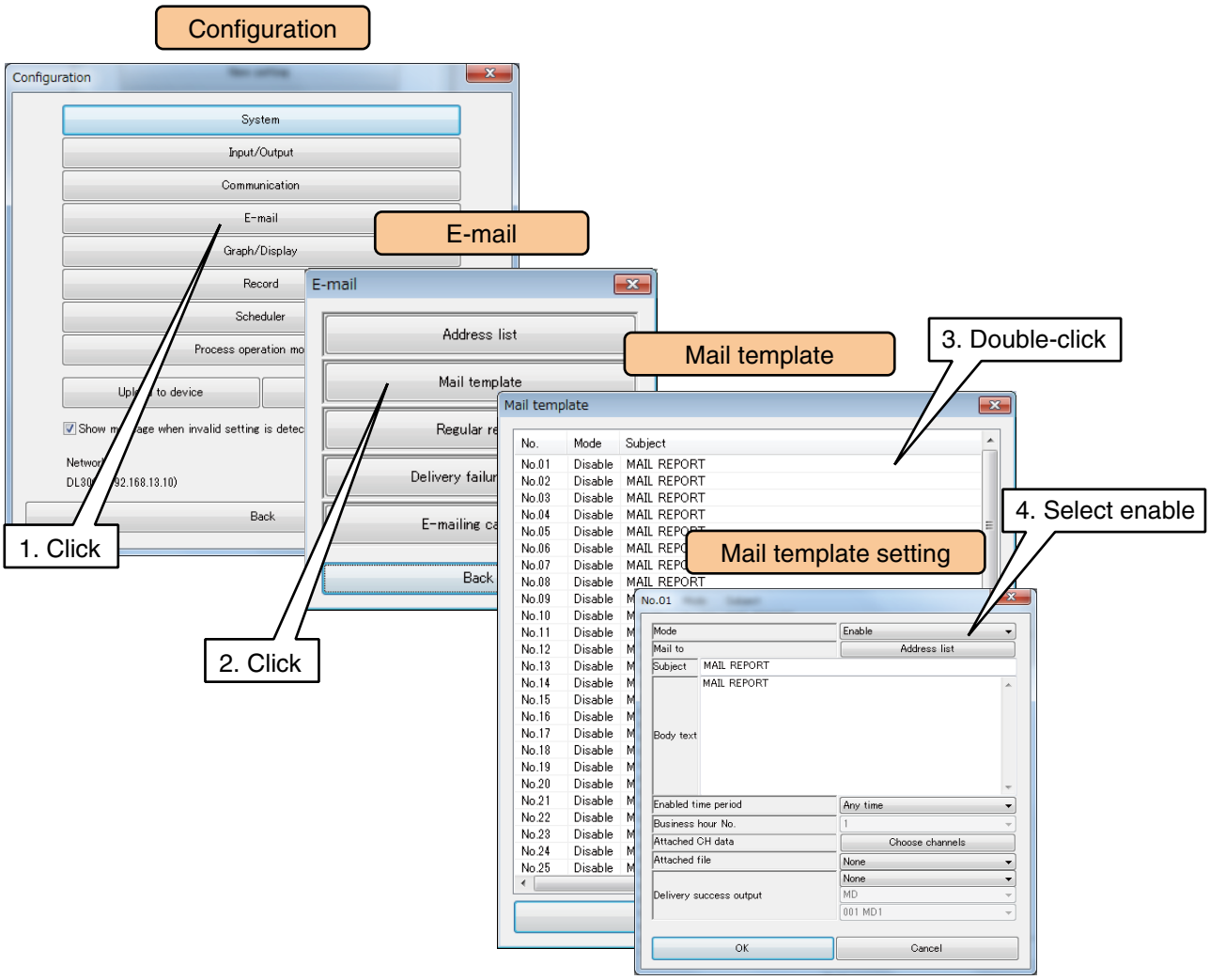
Creating mail templates

Create e-mail templates specifying Subject, Body text, e-mail recipients, and other parameter items.

(1) Click [E-mail] button in the [Configuration] window to display the [E-mail] window.
Then, click [Mail template] button to open the [Mail template] window.

(2) Double-click a row with the mail template number to be registered, to open the [Mail template setting] window.

(3) First, set the [Mode] as [Enable], otherwise no e-mail is sent.



CAUTION

- When the [Mode] is disabled, the relevant event and regular report settings are also changed accordingly.
  For temporarily disabling a particular mailing function while maintaining the setting itself, set [Enabled time period] as [Pause].
- When the [Mode] is disabled, the test mailing function is also disabled.

(4) Set relevant parameters by referring to the table below.

Parameter	Description
Subject	Specify the mail subject within 32 characters.
Body text	Specify the main text of the mail within 256 characters. Specific variables can be contained in the message by describing them using the original html tags. The maximum limit of 256 characters is applicable to the texts and the values after conversion.
Enabled time period	E-mail reporting is enabled or disabled during specific days or hours. Specify when the mail sending is permitted among the following selections: All times / Business day / Non-business day / Within business hours / Out of business hours / Non-business hours / Pause. ➔ 3.10.5 E-mailing calendar
Business hour setting	Select from 1 to 6. 'Business hours' are set in the Emailing calendar once 'Within business hours' and 'Out of business hours' are set in the [Enabled time period] setting. ➔ 3.10.5 E-mailing calendar
Attached file	The latest report form data file can be attached. Choose among: None / Daily report / Monthly report / Yearly report.

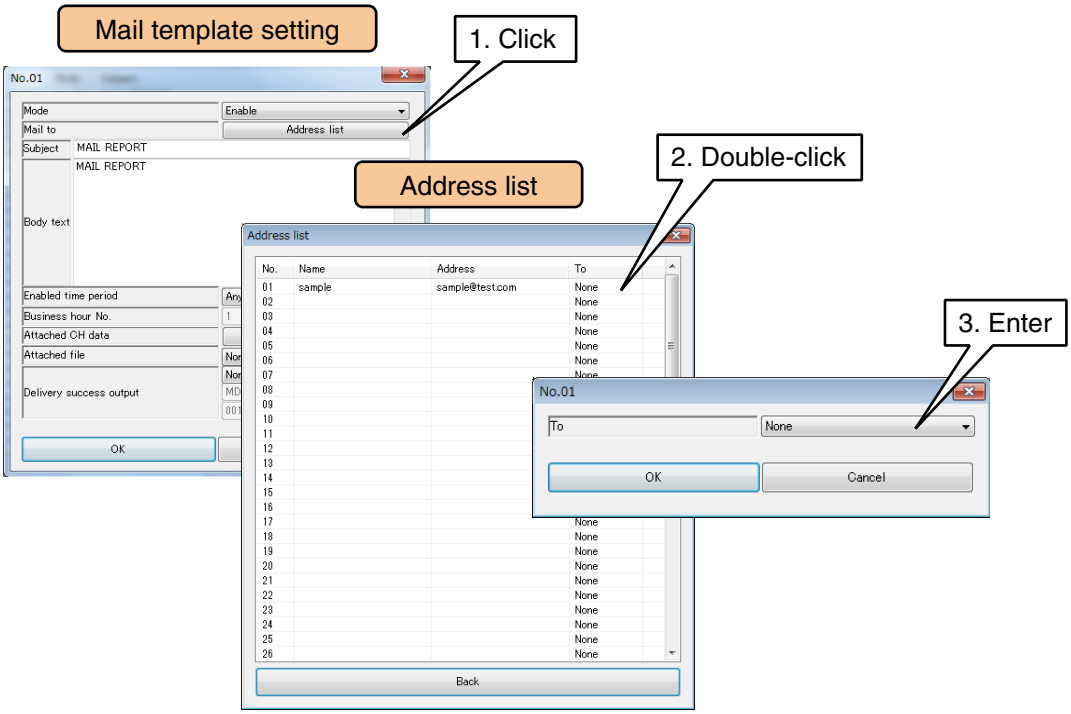
CAUTION

No mail for the event report or regular report is sent out of the days/hours specified by [Enabled time period] and [Business hour] settings.

NOTES

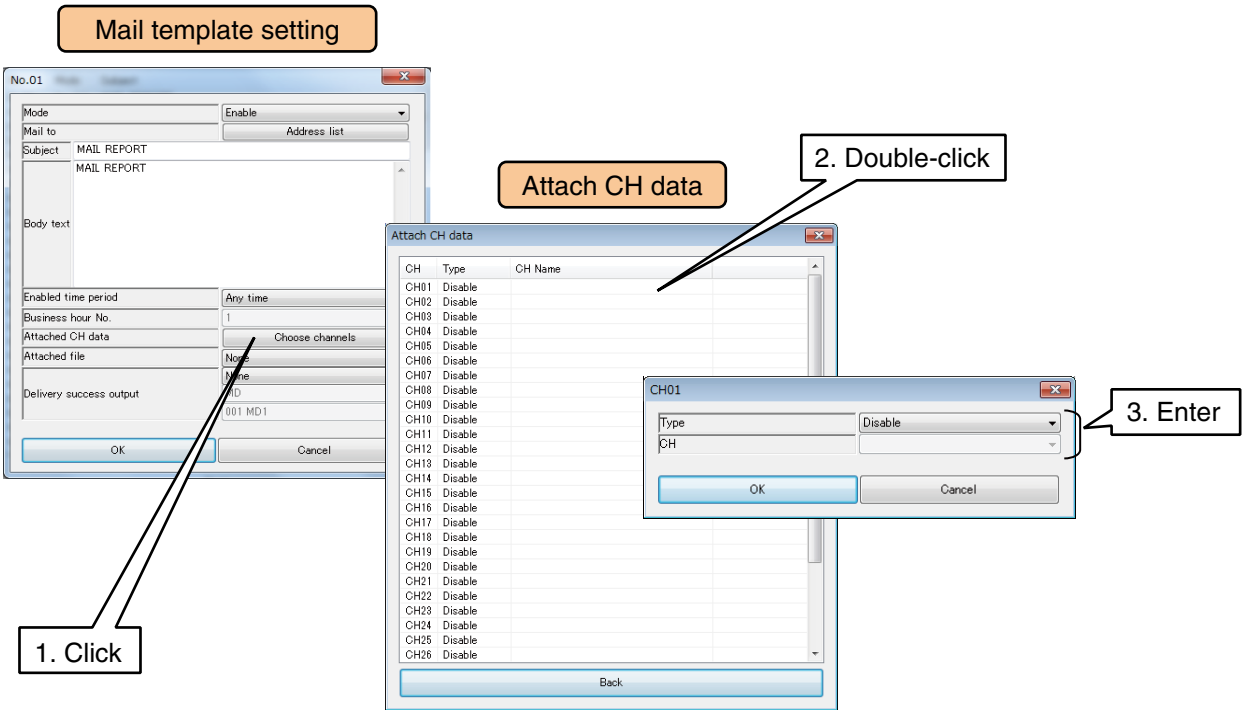
- Test mail function is usable even when the [Enabled time period] is set to [Pause].
- [Out of business hours] means “the out of business hours in a business day”.
  Choose [Non-business hours] for applying the filter to “the out of business hours in a non-business days.

(5) Click [Address list] to display the [Address list].
Double-click a row of the recipient name and choose [To].



(6) Configure the setting related to the most recent input value report to be appended at the end of the mail document.

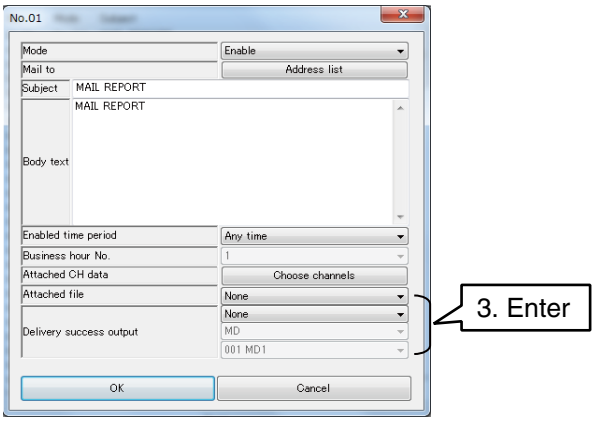
Click [Choose channels] button to open the [Attach CH data] window.
A maximum of 32 CH can be registered.
Double-click a row of the relevant CH, and specify the type and CH No. of the data to add to an e-mail.



CAUTION

Maximum capacity per one mail when CH data is attached to body text is approx. 4 KB.
If many CH data is attached, the last part of the mail may be lost by capacity limit.

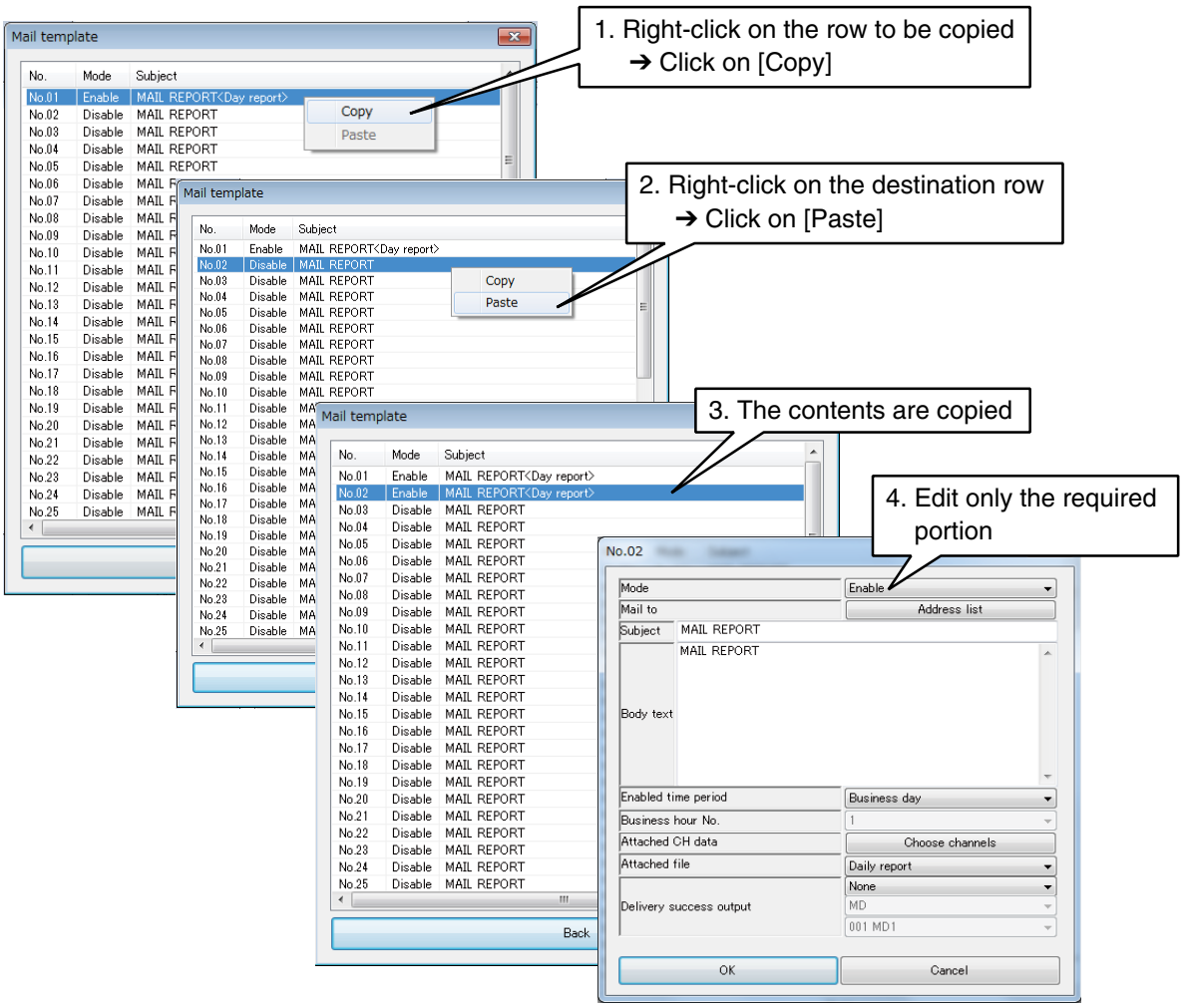
(7) An alarm output can be turned ON/OFF when the mail reporting is successful.



Parameter	Description
Mode	Choose among: None / ON / OFF.
Type	Choose an output type among: MD / DO / GDO.
CH	Choose a channel No.

(8) Once the setting is complete, click [OK] to temporarily store the setting.

(9) Go through the same procedure for all the required mail templates.
One template's setting can be copied to another, so that only the differences should be edited.



(10) Once the setting is complete, click [OK] and/or [Back] to temporarily store the setting.

Original html tag

Certain variables can be contained in a mail body text using the original html tags.

Original tag	Description
[_ _TIM_ _]	The time when a mail transmission is confirmed.
[_ _NAM_ _]	CH name (valid only for an event report)
[_ _COM_ _]	CH comment (valid only for an event report)
[_ _MSG_ _]	Event message (valid only for an event report)

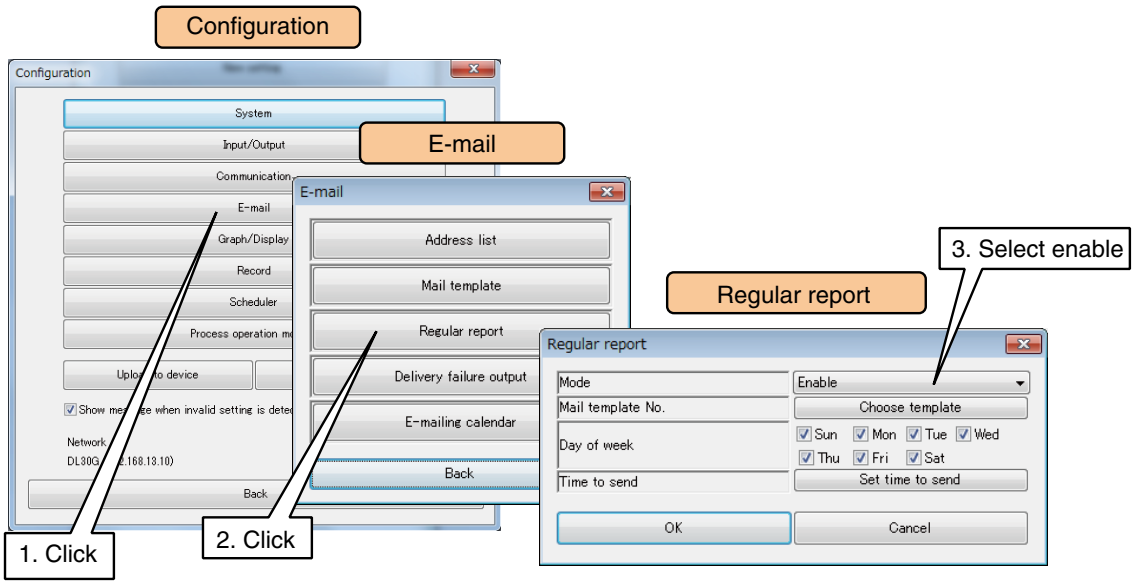
NOTES

The original tags for an event report is not converted but appear as they are in a mail body text if such tags are used for other than an event report.

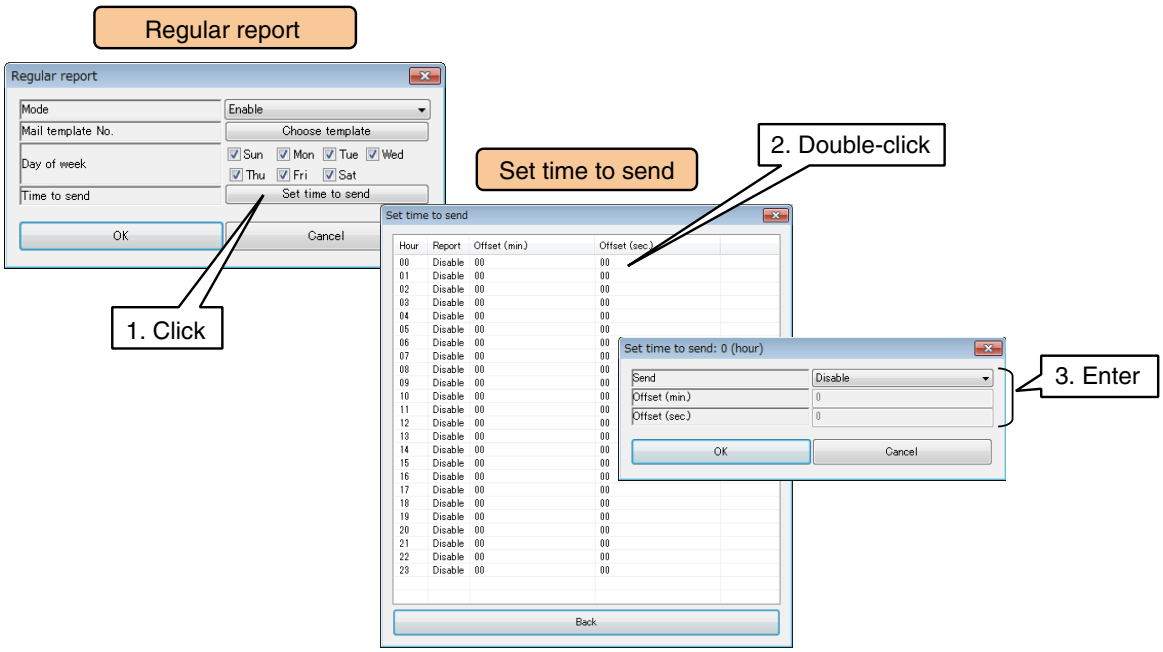
3.10.3 Regular reporting

E-mail reports are sent on a scheduled time.
The contents of regular mails are determined according to the predefined mail templates.
Multiple templates can be selected.
Set time to allow or limit mail sending for each template in the [Enabled time period].
➔ 3.10.2 Mail template setting > Creating mail templates

(1) Click [E-mail] button in the [Configuration] window to display the [E-mail] window.
(2) Click [Regular report] button to display the [Regular report] window.
(3) First, set [Mode] as [Enable].



(4) Choose a mail template No. and check the days of the week for sending e-mails.
(5) The time(s) of the day to send regular mails can be also specified.
Click [Set time to send] button to open the [Set time to send] window.
Double-click one or more [Hour] rows and set [Send] as [Enable].
Specify time offsets (minutes and seconds). To report on the hour, set both values to 0.



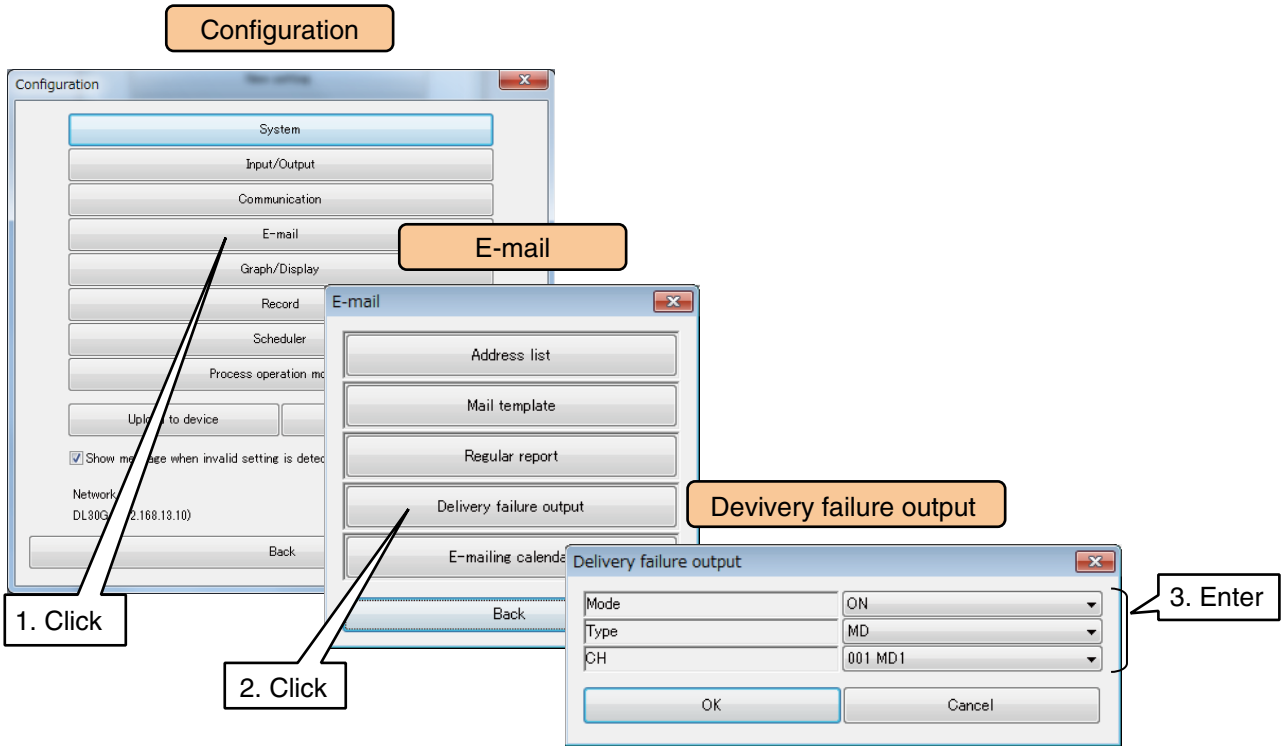
3.10.4 Report failure output

A mail reporting failure can be notified by setting the report failure output.

(1) Click [E-mail] button in the [Configuration] window to display the [E-mail] window.

(2) Click [Delivery failure output] button to display the [Delivery failure output] window.

(3) Set the details referring to the table below.



Parameter	Description
Mode	Choose among: None / ON / OFF.
Type	Choose an output type among: MD / DO / GDO.
CH	Choose a channel No.

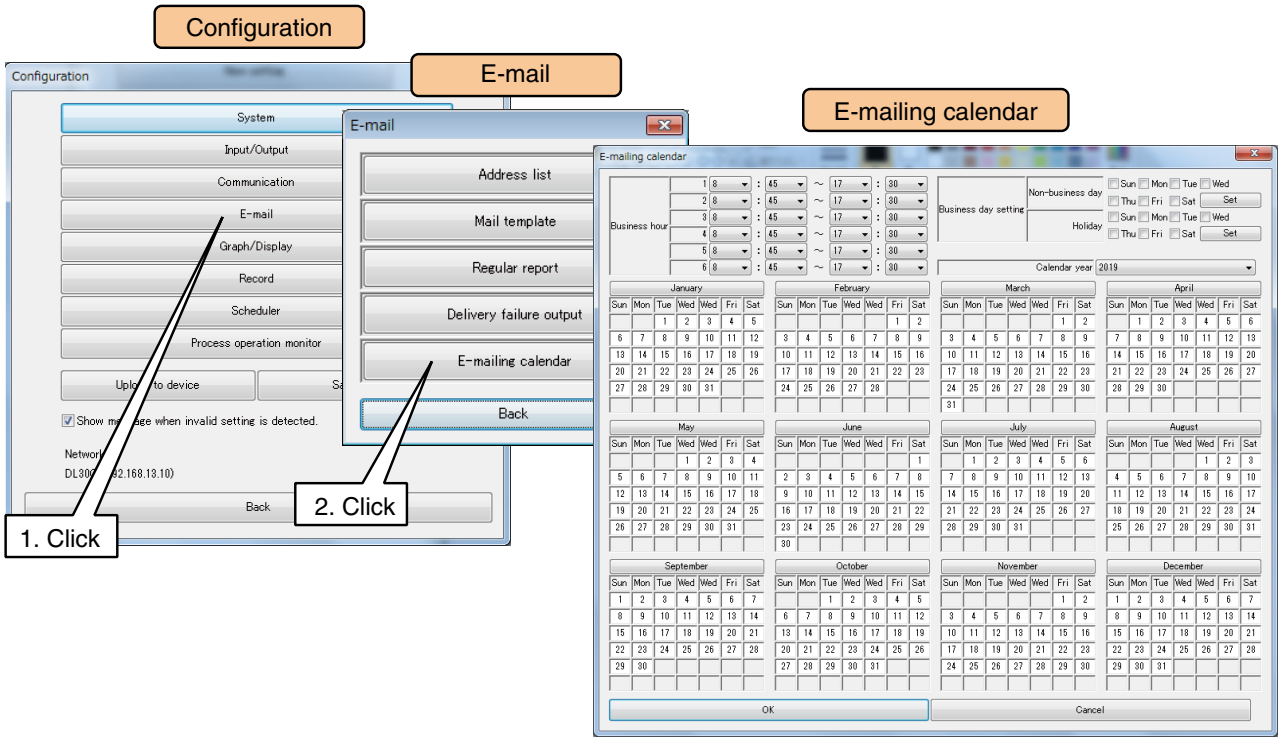
(4) Once the setting is complete, click [OK] and [Back] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.

3.10.5 E-mailing calendar

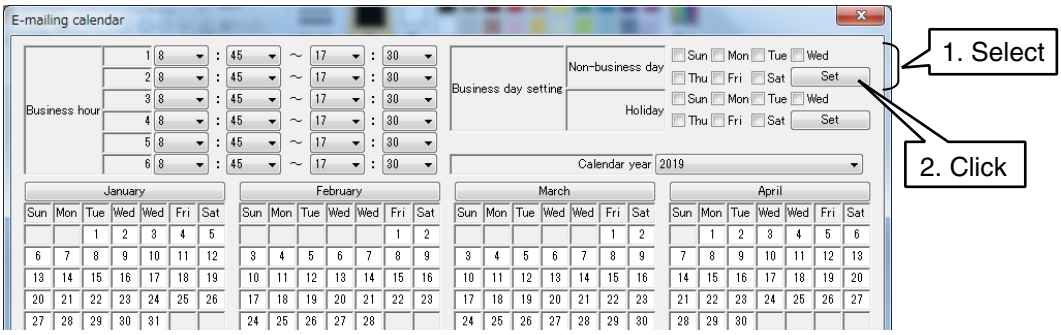
The E-mailing calendar is used to specify the business days/hours and holidays to define when a mail is allowed to be sent.

(1) Click [E-mail] button in the [Configuration] window to display the [E-mail] window.

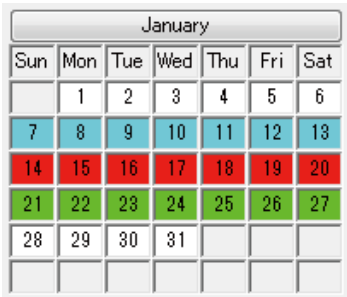
(2) Click [E-mailing calendar] button.
The calendar of the present year is displayed in a plain background (with no highlight) at default.



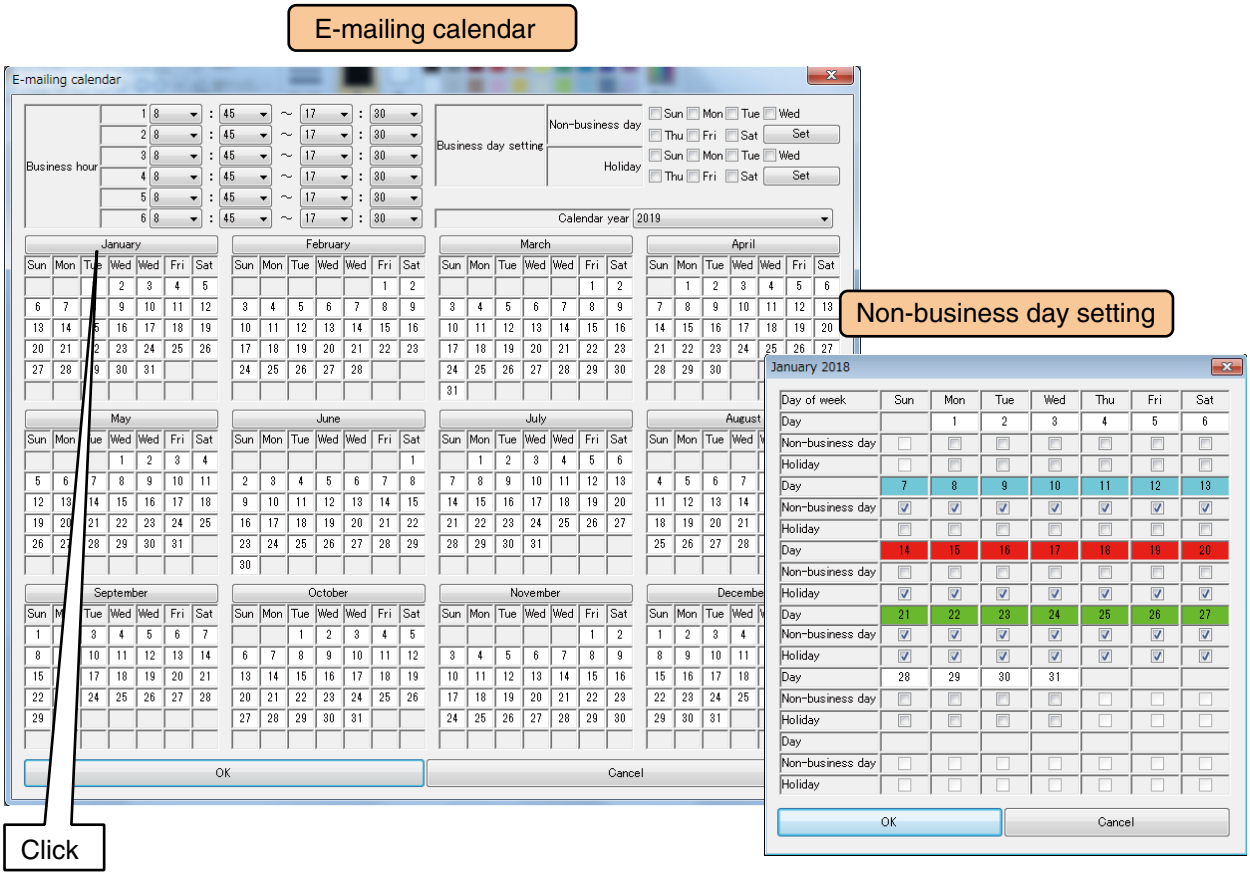
(3) Check days of the week for common Holidays and Non-business days applicable to all weeks.



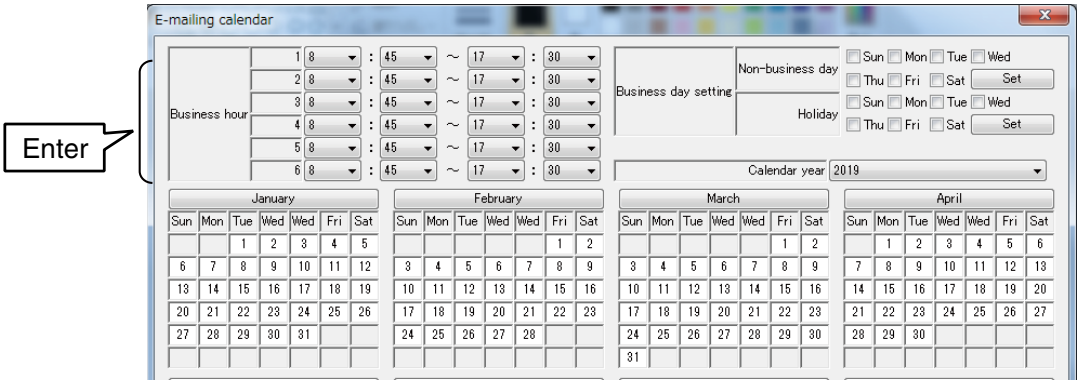
[Holiday] cells are indicated in red color.
[Holiday + Non-business day] cells are in light green.
[Weekday (except the Holidays) + Non-business day] cells are in light blue.



(4) To designate specific days of the year as non-business days, click the applicable month button and check days for the Non-business days and/or the Holidays.



(5) Specify the regular business hours for up to 6 patterns.
Set the start and the end hours for each pattern.



(6) Once the setting is complete, click [OK] to temporarily store the setting.

3.10.6 Test mail

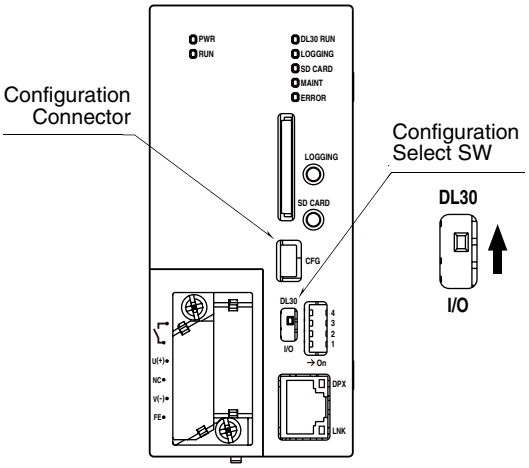
Event reporting and regular mailing can be tested on the DL30GCFG.

➔ 6.1.2 Maintenance menu (DL30GCFG) > Test mail

3.11 Web server setting

User can set the page name, pen colors, etc. displayed on the Web page.

1) Turn [Configuration Select SW] to the [DL30] side.

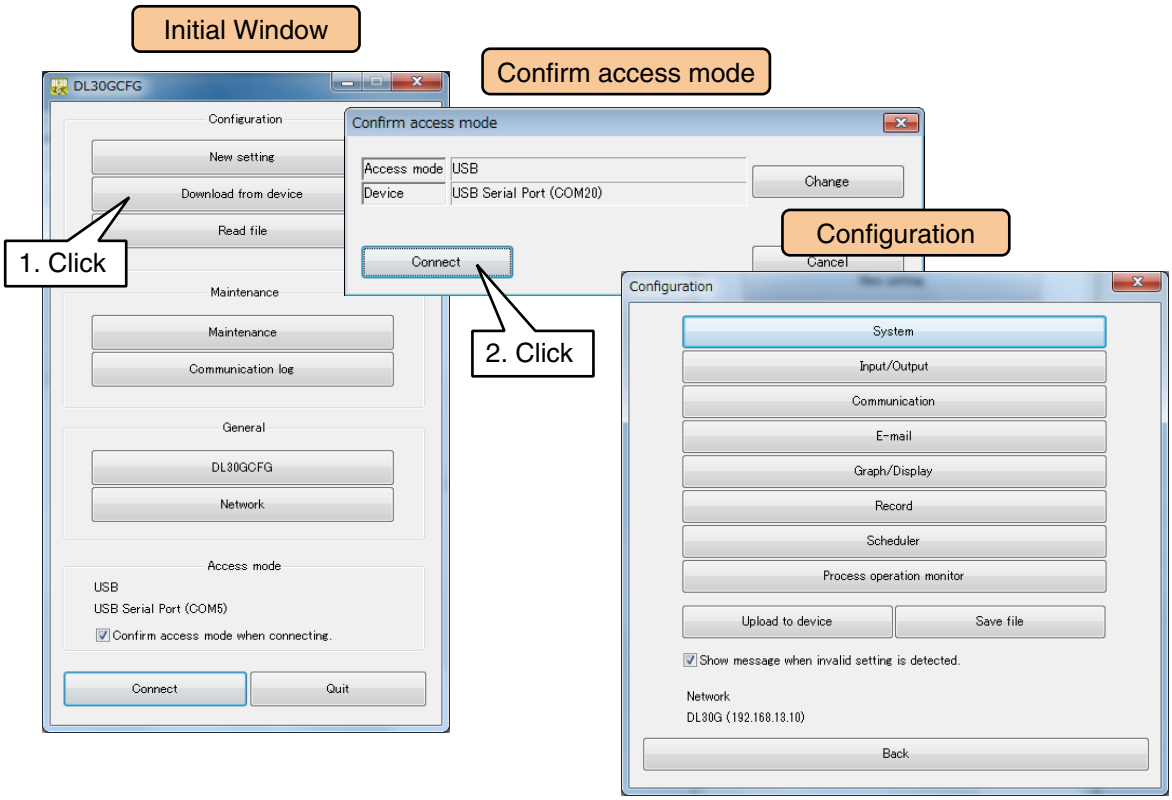


(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

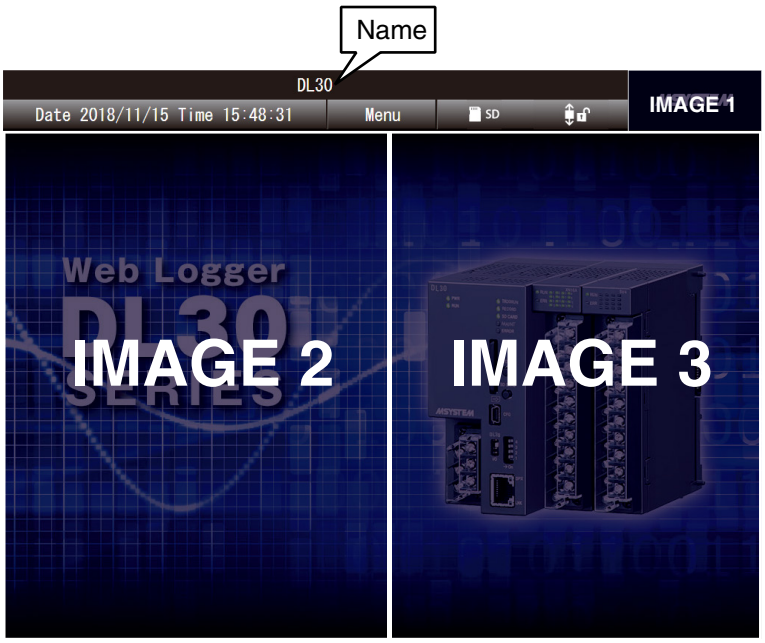
(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.



3.11.1 Top screen header name and image setting

The page header name and the images on the top screen can be changed.



Name

The DL30-G system name can be specified and indicated at the header of the web page.
Set Name by referring to [3.4 System setting].

Images 1, 2, and 3

User's own image files can be placed on the top screen.
The image sizes are fixed.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Importing user defined imagery data

NOTES

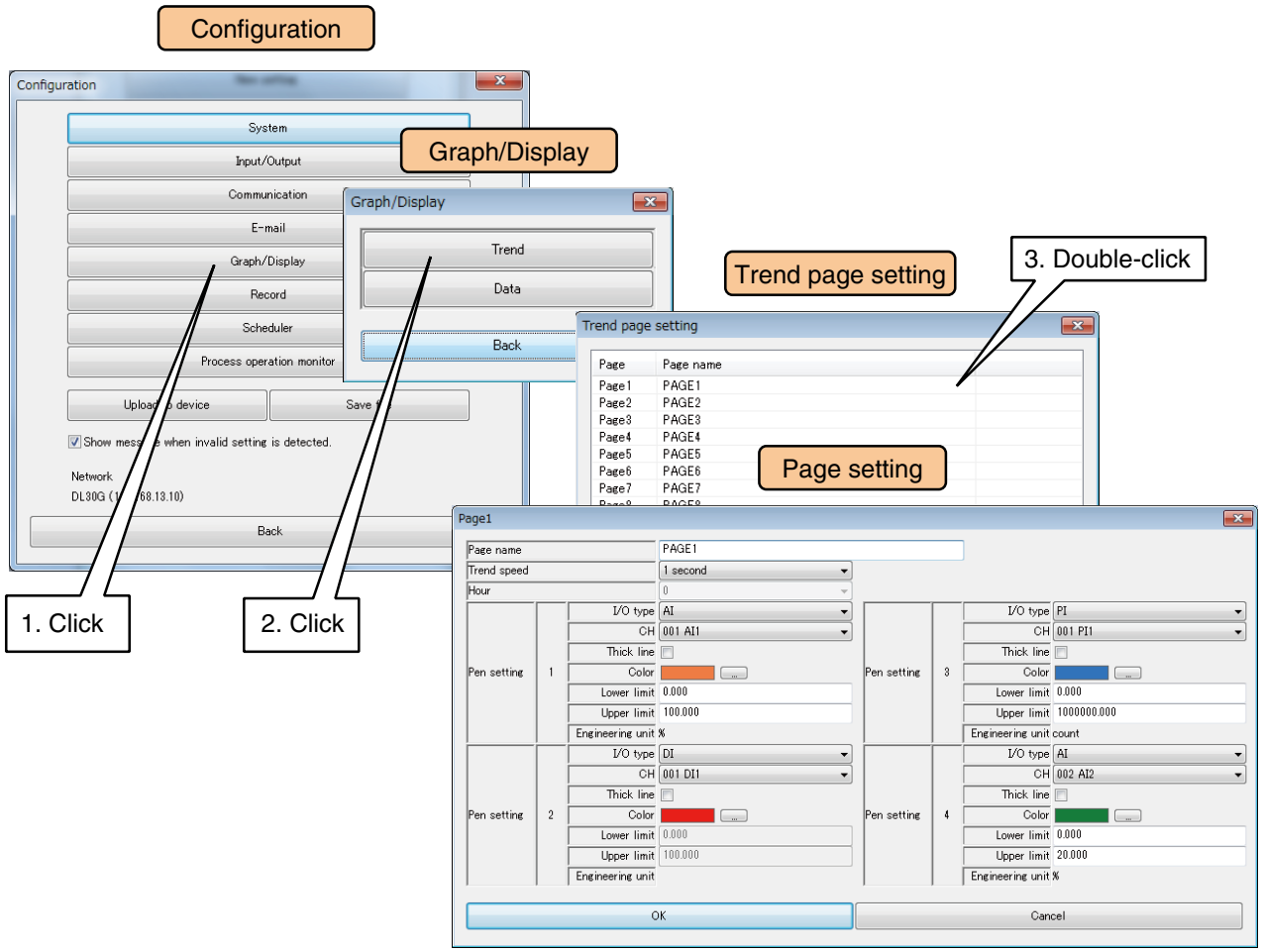
The Image 1 is common to all display pages.

3.11.2 Trend graph setting

Pen setting

Set the pen assignment, color, and other setting for the trend displayed on the web page.
The DL30-G can display a maximum of 64 pens on a total of 16 pages.
Pens 1 to 4, Pens 5 to 8, ... are assigned to Page 1, Page 2,..., respectively.

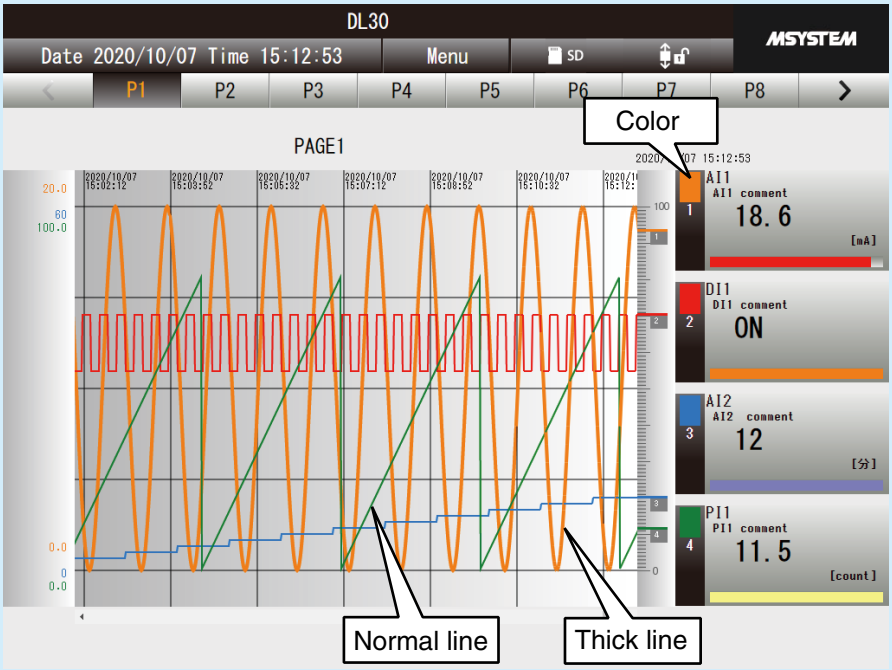
(1) Click [Graph/Display] button in the [Configuration] to display the [Graph/Display] window.
(2) Click [Trend] button to display the [Trend page setting] window.
(3) Double-click a row to open the [Page setting] window.



Configure each pen setting by referring to the table below.

Parameter	Description
I/O type	Select the I/O type of the channel to be assigned. Select from: None / AI / DI / PI / MA / MD / AO / DO / GDO.
CH	Set the channel to be assigned. Select from the channel list for the I/O type.
Thick line	Check the box to draw a thick line.
Color	Set the pen color.
Lower limit	Set the 0% scaling value for the trend graph.
Upper limit	Set the 100% scaling value for the trend graph.
Engineering unit	The unit specified in the I/O setting is indicated. Cannot be edited.

Web Browser View



(4) Once the setting is complete, click [OK] to temporarily store the setting.

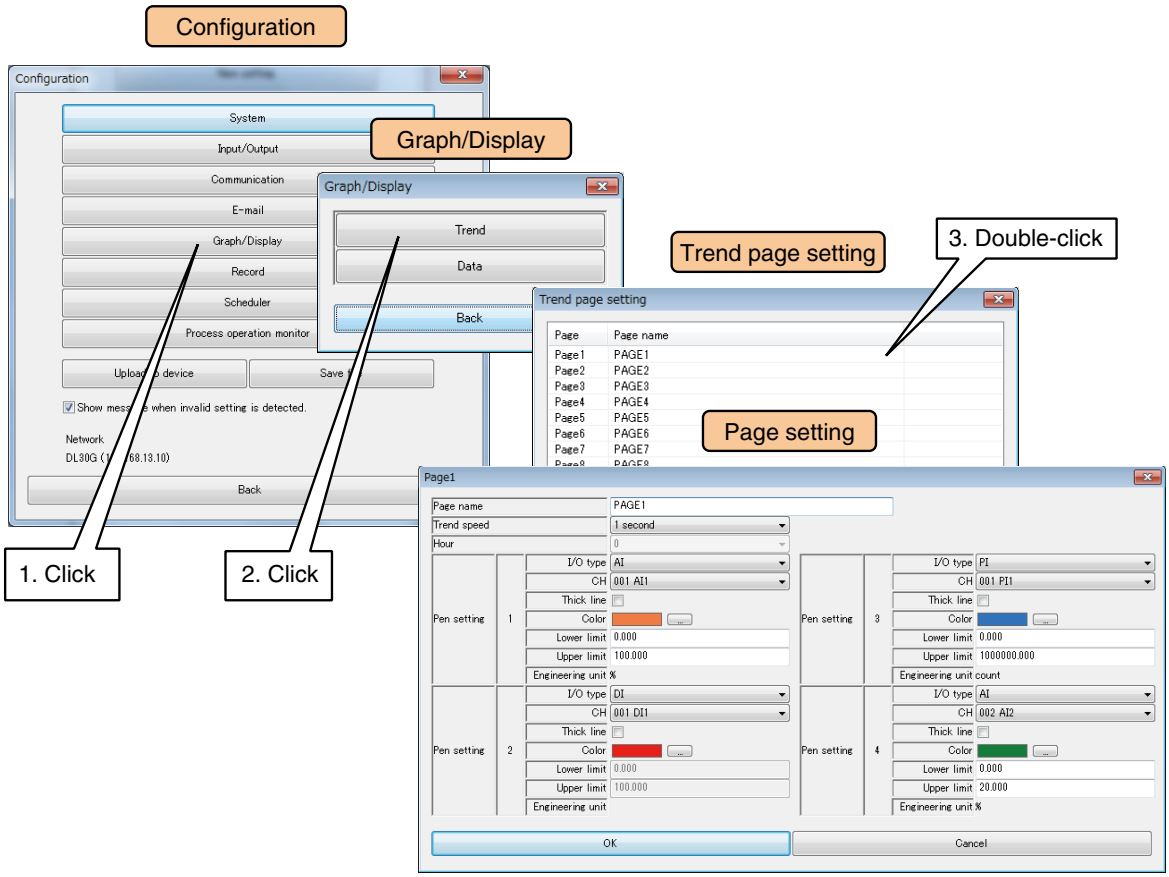
(5) To activate the setting, return to the [Configuration] and click [Upload to device] button.

Page setting

(1) Click [Graph/Display] button in the [Configuration] to display the [Graph/Display] window.

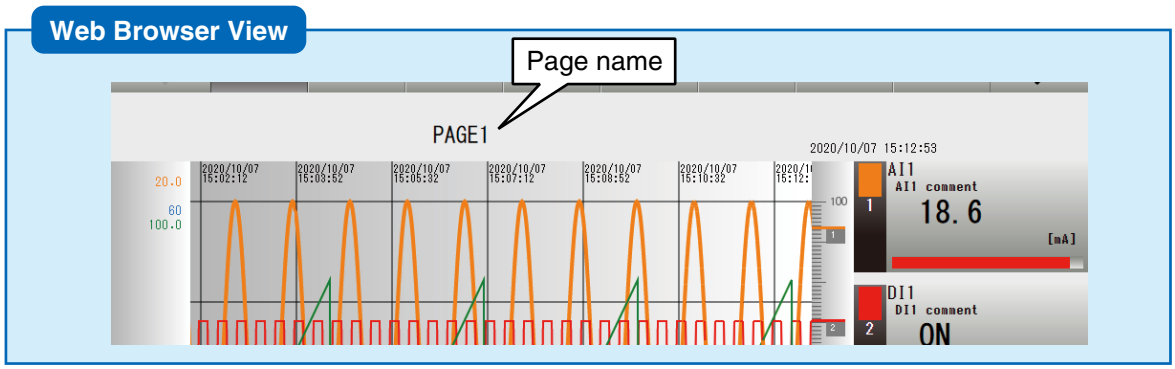
(2) Click [Trend] button to display the [Trend page setting] window.

(3) Double-click a row to open the [Page setting] window.



Configure each page setting by referring to the table below.

Parameter	Description
Page name	Specify Page name within 64 characters.
Trend speed	Choose the speed of plotting trend graphs.
Hour	For the trend speed of [1 day], specify at which hour of the day momentary values are plotted. (0 - 23)



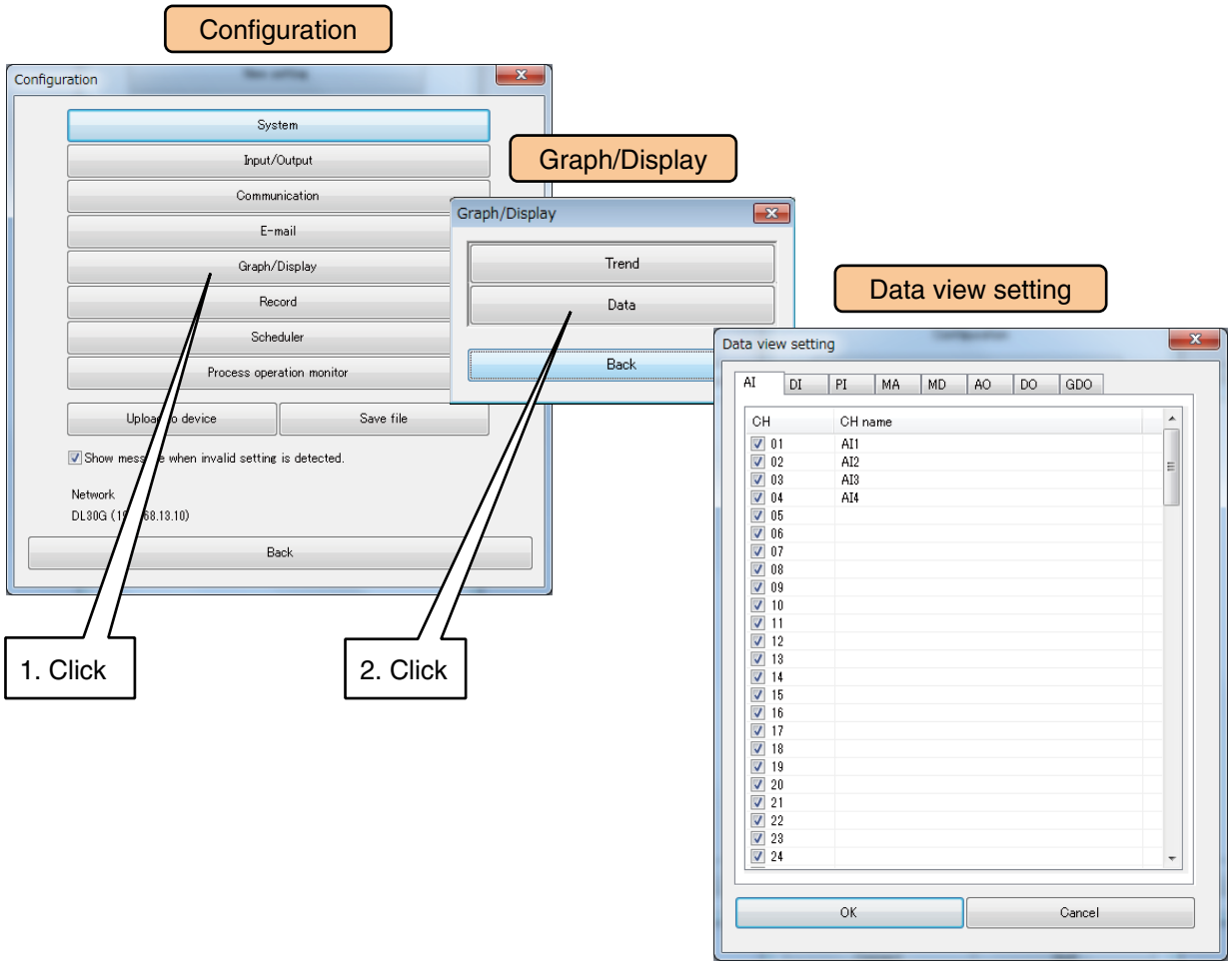
(4) Once the setting is complete, click [OK] to temporarily store the setting.

(5) To activate the setting, return to the [Configuration] and click [Upload to device] button.

3.11.3 Data display setting

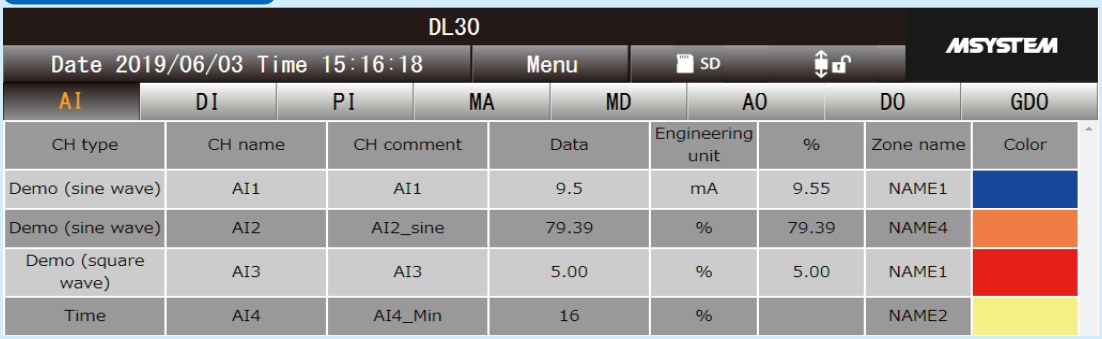
Select channels to be displayed on the [Data view] window.

(1) Click [Graph/Display] button in the [Configuration] to open the [Graph/Display] window.
Click [Data] button to display the [Data view setting] window.



(2) Check the channels to show on the Data view.

Web Browser View



CH type	CH name	CH comment	Data	Engineering unit	%	Zone name	Color
Demo (sine wave)	AI1	AI1	9.5	mA	9.55	NAME1	
Demo (sine wave)	AI2	AI2_sine	79.39	%	79.39	NAME4	
Demo (square wave)	AI3	AI3	5.00	%	5.00	NAME1	
Time	AI4	AI4_Min	16	%		NAME2	

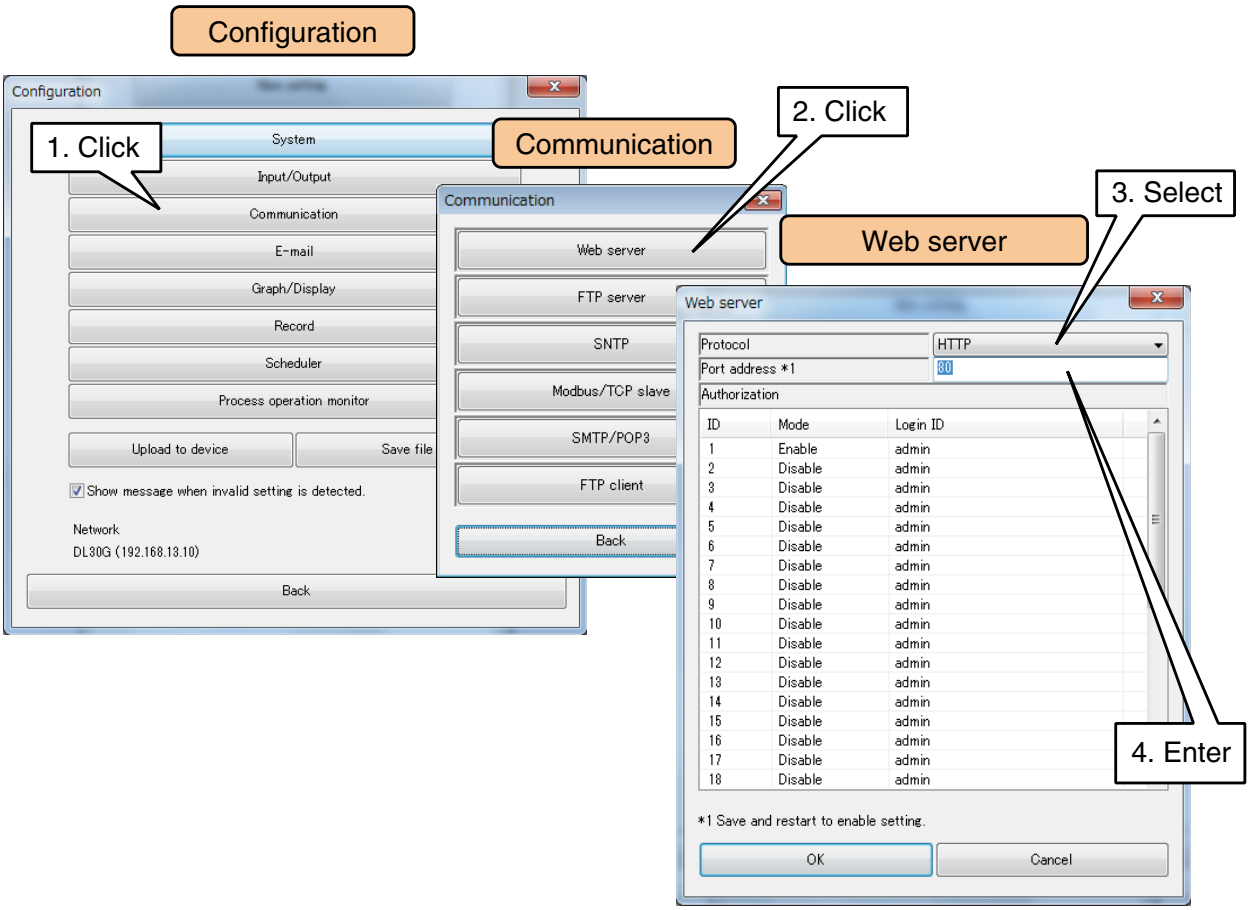
NOTES

Right-click on the CH list in the [Data view setting] window to check/ uncheck all CH.

3.11.4 Login ID / password / port address setting (web browser access)

Web browsing can be password locked.
User can also select the web server protocol and change the port address.

(1) Click [Communication] button in the [Configuration] window.
Click [Web server] button to open the [Web server] window.



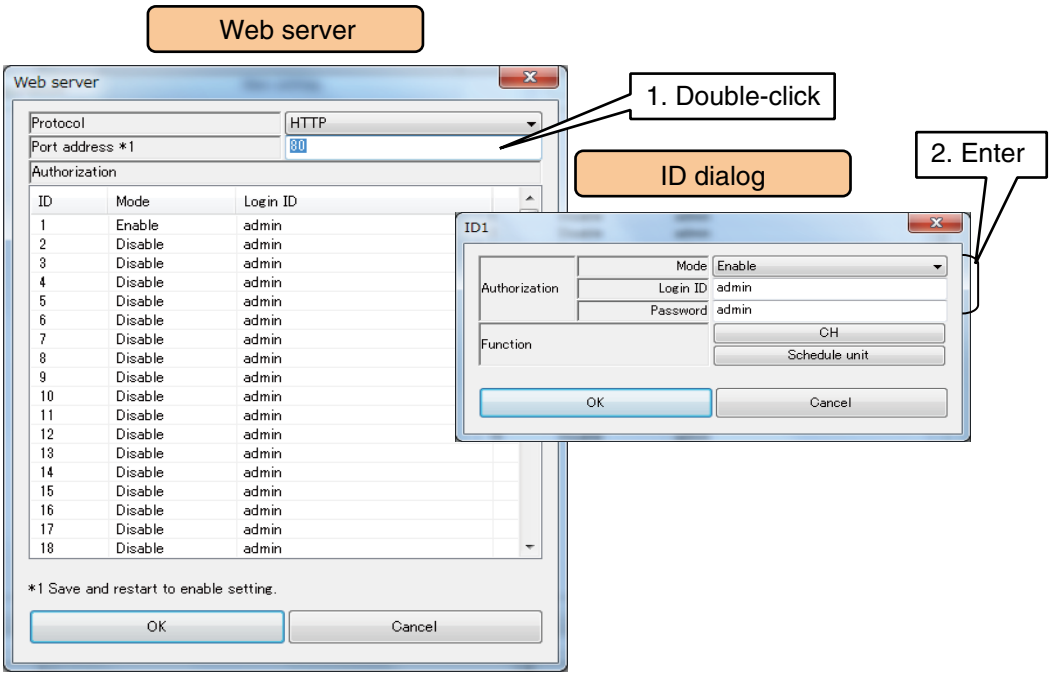
Set relevant parameters by referring to the table below.

Parameter	Description	Default value
Protocol	Set the web server protocol. Select between 'HTTP" and 'HTTPS'.	HTTP
Port address	Set the port address. After uploading the setting to the device, turn the power supply OFF and ON to activate it. Setting '0' disables the web server function and no web browser view will be displayed.	80

NOTES

- To use HTTPS protocol, it is required to install a web server certificate on the DL30-G and a local certificate authority on a terminal such as a PC which connects to the DL30-G.
  Refer to the users manual of Local certification authority creator (model: LCA-DL30) for details.
- The software program of Local certification authority creator can be downloaded from the M-System web site (http://www.m-system.co.jp/).
- When 'HTTPS' is selected as Protocol, do not set the Port address to '80'.

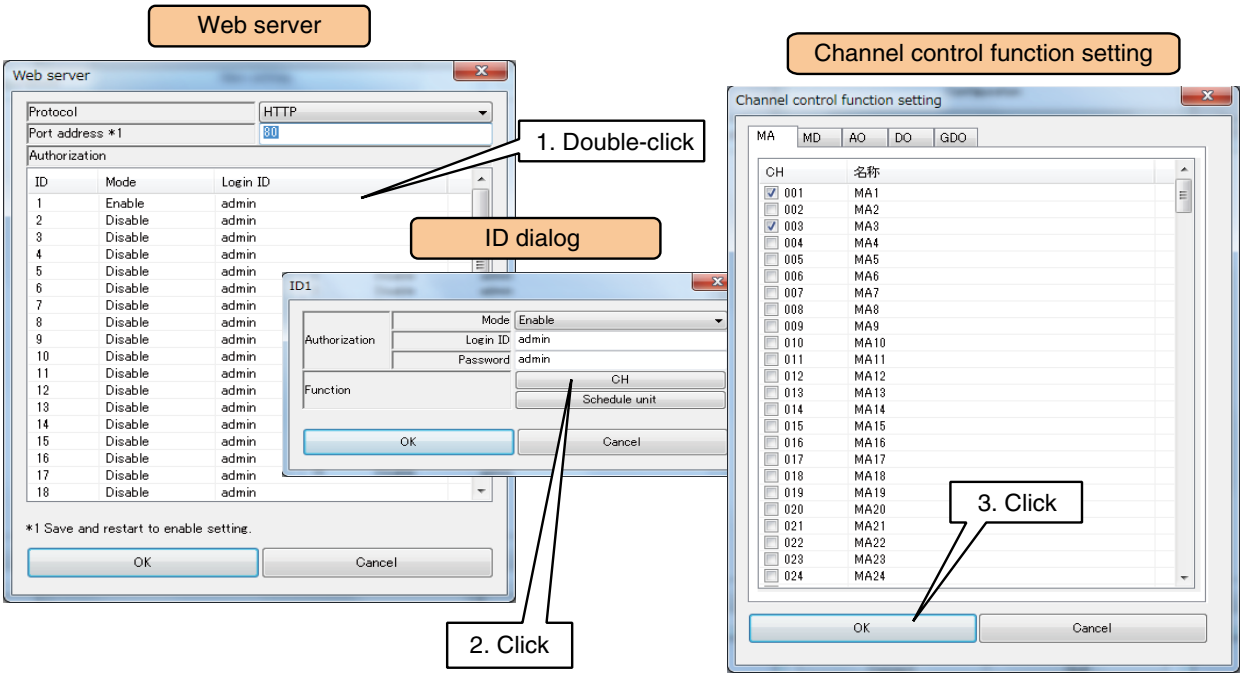
(2) Double-click a row in the Web server ID list to display the ID dialog.



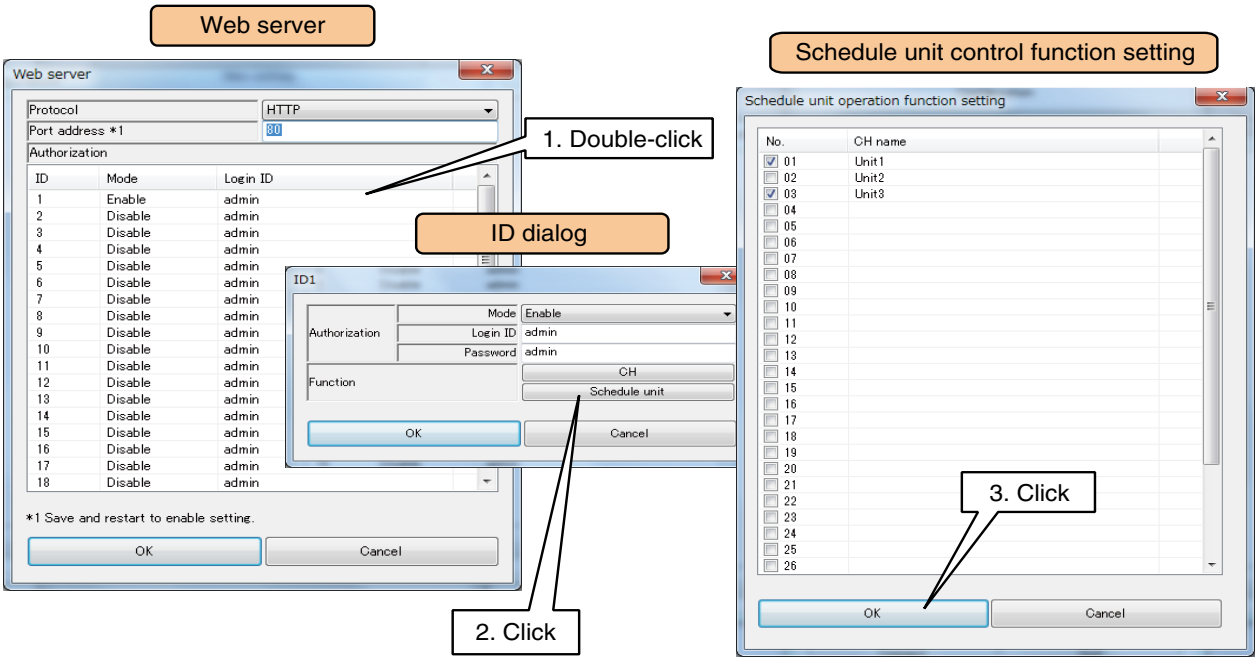
Set relevant parameters by referring to the table below.

Parameter	Description	Default value
Mode	To enable Web browsing, set at least 1 ID as [Enable].	ID1: Enable Other IDs: Disable
Login ID	Set the login ID for the Web server using up to 16 single byte alphanumeric characters.	admin
Password	Set the password to login to the Web server using up to 16 single byte alphanumeric characters.	admin

(3) Click [CH] in the ID dialog to display the [Channel control function setting] window.
Select channel(s) to allow the ID to control.
Click [OK] to return to the ID dialog.



(4) Click [Schedule unit] in the ID dialog to display the [Schedule unit control function setting] window.
Select schedule unit(s) to allow the ID to control.
Click [OK] to return to the ID dialog.



(5) Once the setting is complete, click [OK] to temporarily store the setting.
To validate the setting, return to the [Configuration] and click [Upload to device] button.
When the port No. has been changed, be sure to turn off and on the power supply to the device.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Restarting DL30-G

NOTES

- When the user has logged in using the login ID and password for remote access authorization, the user is allowed to control all the channels and schedule units as well as web browsing. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
- When there is any ID with its login ID and password set to blank, the user automatically logs in the web server using such ID.
  The same applies when there is any ID with its login ID and password for remote access authorization set to blank.
  The login ID and password for remote access authorization takes priority over the Web server login ID and password.
- Even when a GDO is selected in the [Channel control function setting], the user is not allowed to control individual MD and DO channels grouped in the GDO.

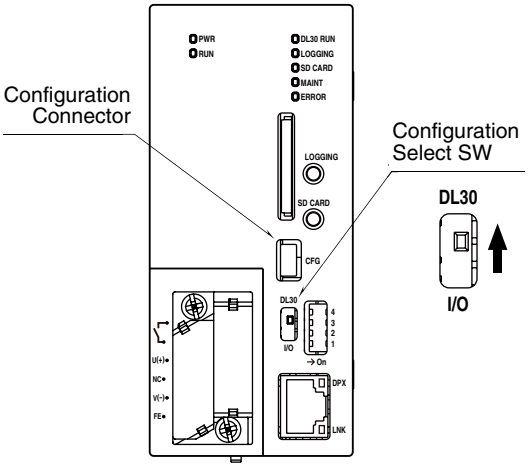
CAUTION

- The login ID and password for the Web server of the device are simple functions.
  They do not guarantee complete security.
- After changing the login ID and password, use the Update button of the browser to update the cache.
- Be sure to change the default ID and password.
- It is highly recommended to change the password regularly.

3.12 Communication function setting

The DL30-G supports various communication functions including the remote operation of the DL30-G, data downloading from the SD card, and time correction using the SNTP server.

(1) Turn [Configuration Select SW] to the [DL30] side.



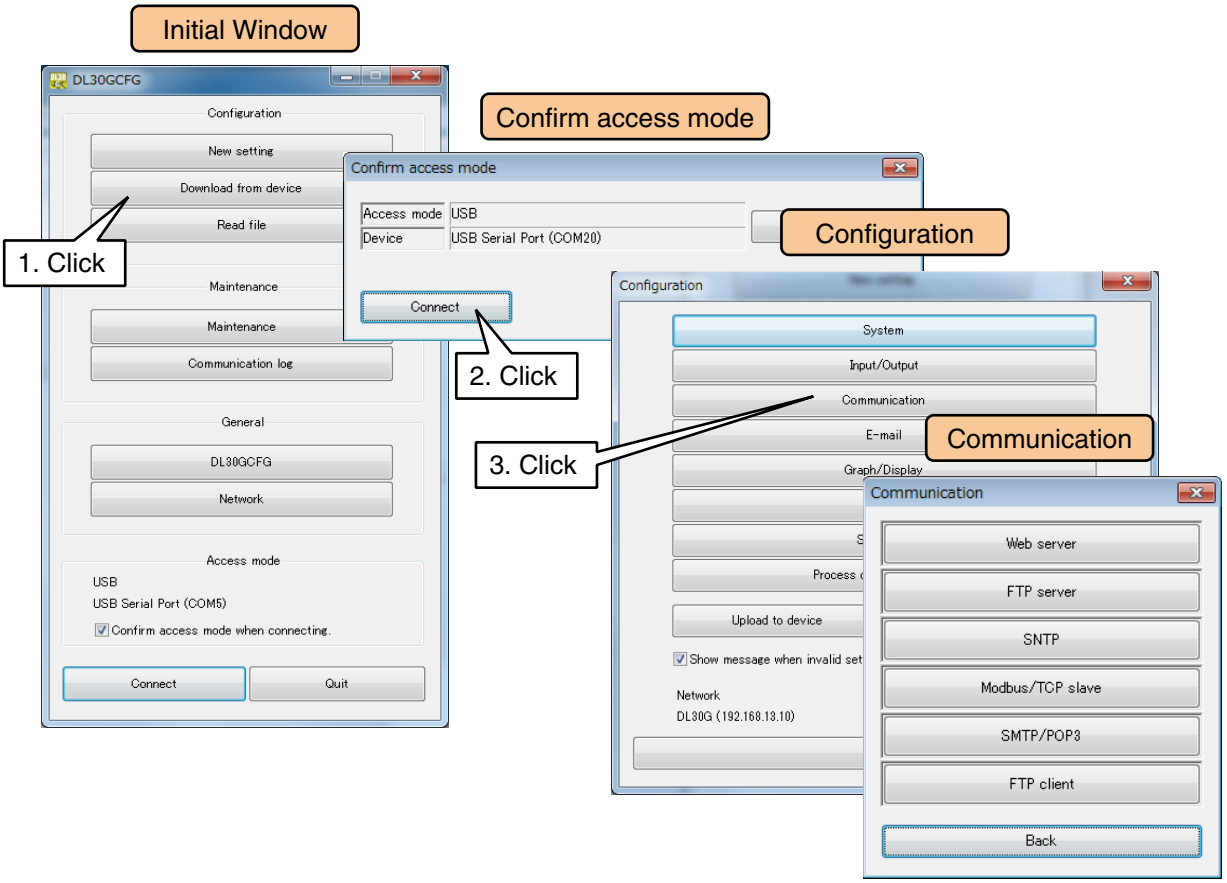
(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.

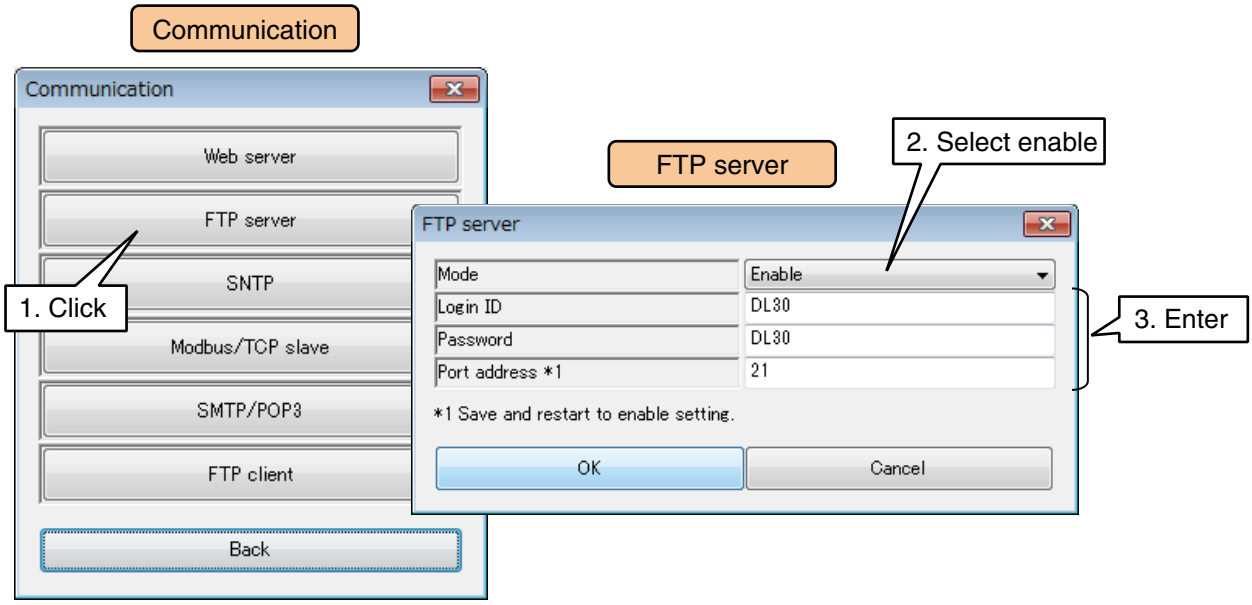
(6) Click [Communication] button to display the [Communication] window.



3.12.1 FTP server

Files in the SD card placed in the device can be transferred or deleted remotely by the FTP server function.

(1) Click [FTP server] button in the [Communication] window to display the [FTP server] window.
First, be sure to set [Mode] as [Enable].



(2) Set the parameters by referring to the table below.

Parameter	Description	Default value
Mode	To use the FTP server function, set as [Enable].	Disable
Login ID	Set the FTP server login name using up to 16 single byte alphanumeric characters.	DL30G
Password	Set the FTP server password using up to 16 single byte alphanumeric characters.	DL30G
Port address	Set the port address of the FTP server. (0 – 65535)	21

(3) Once the setting is complete, click [OK] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.
After changing the setting, turn off and on the power supply to the device.

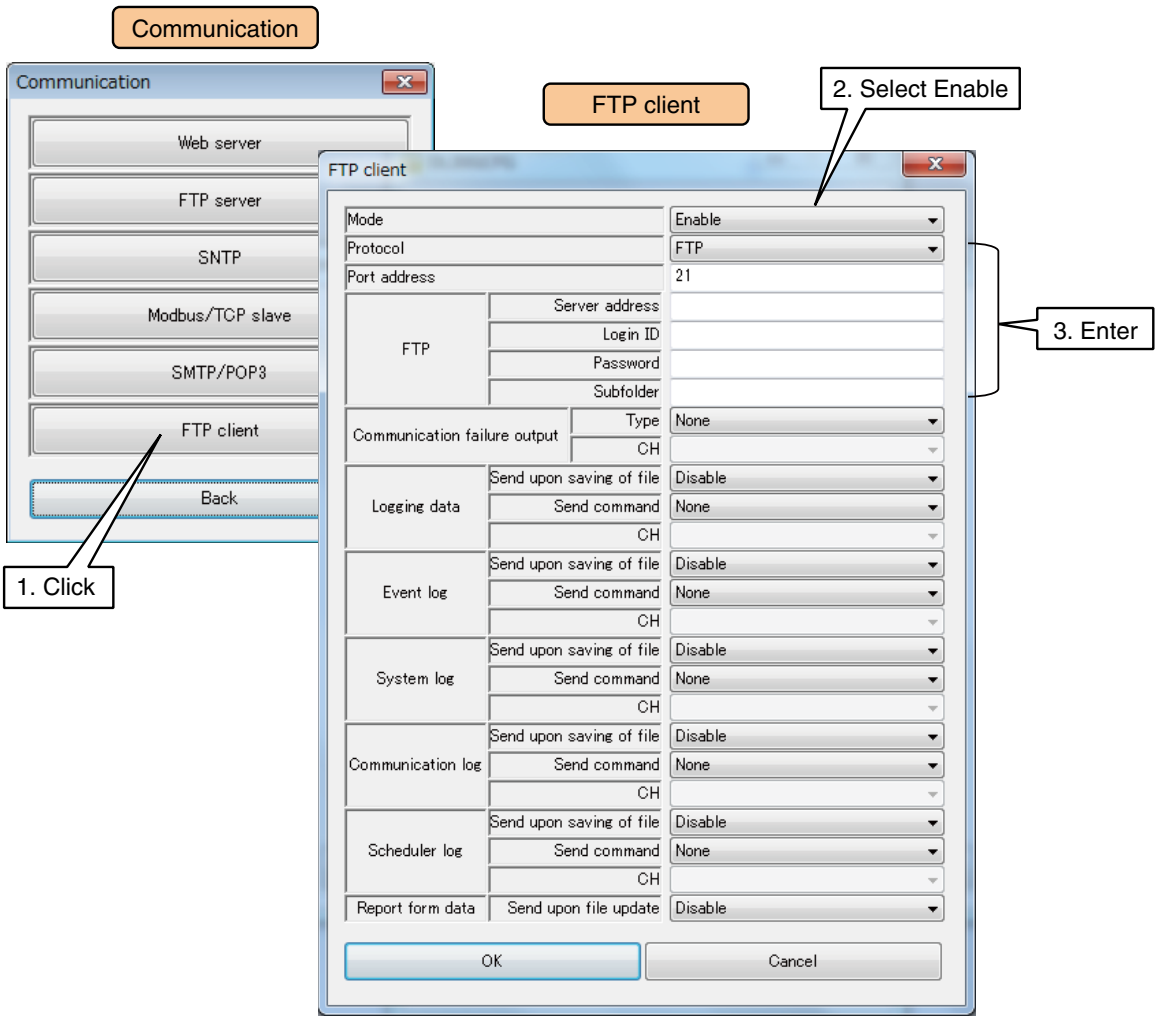
NOTES

- See [8.2.8 FTP server] for details of the operating systems / applications supported by the FTP server function, points to note, etc.
- Be sure to change the default ID and password.
- It is highly recommended to change the password regularly.

3.12.2 FTP client

Files in the SD card placed in the device can be transferred to a FTP server by the FTP client function.

(1) Click [FTP client] button in the [Communication] window to open the [FTP client] window.



(2) Set the parameters by referring to the table below.

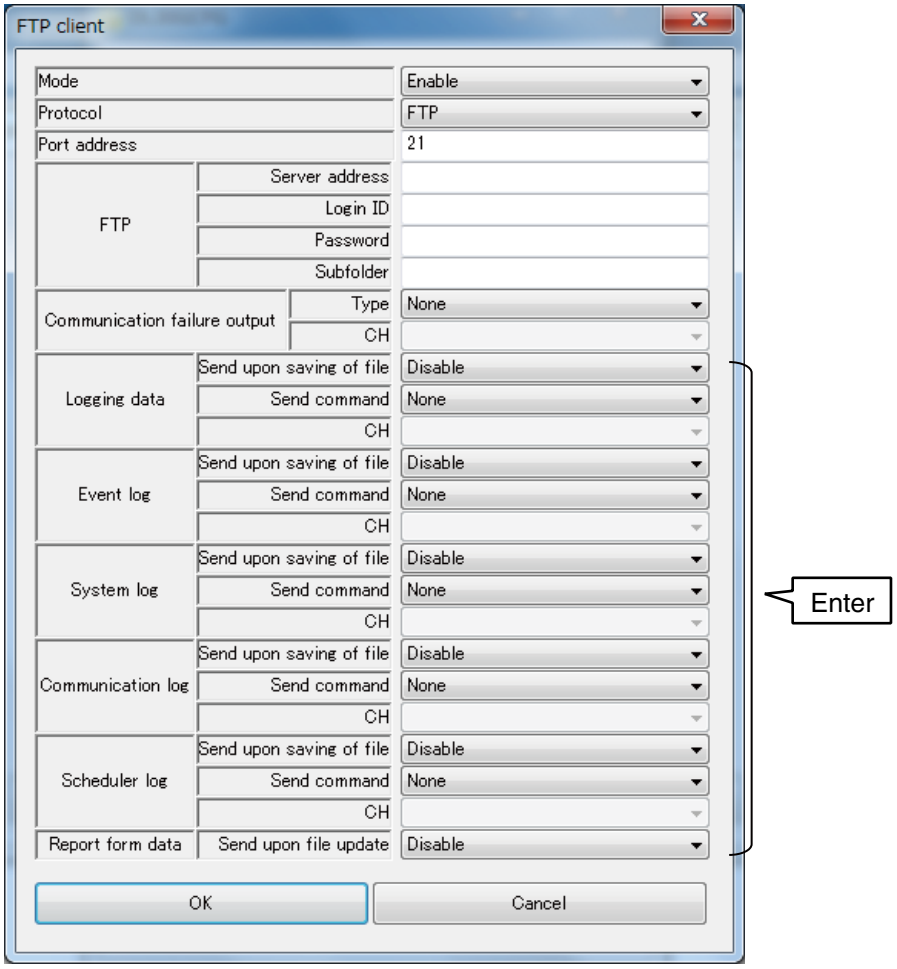
Parameter	Description	Default value
Mode	To use the FTP client function, set as [Enable].	Disable
Protocol	Select the FTP server protocol between 'FTP' and 'FTPS'.	FTP
Port address	Set the port address of the FTP server. (0 – 65535)	21
Server address	Set the FTP server address.	No (Blank)
Login ID	Set the FTP server login name using up to 16 single byte alphanumeric characters.	No (Blank)
Password	Set the FTP server password using up to 16 single byte alphanumeric characters.	No (Blank)
Subfolder	Set subfolder(s) in the FTP server. If it is left blank, files are transferred to the root directory.	No (Blank)

NOTES

- To use FTPS protocol, external connection must be permitted for port numbers 45967 to 45970.
- FTPS is used in explicit mode.

FTP data setting

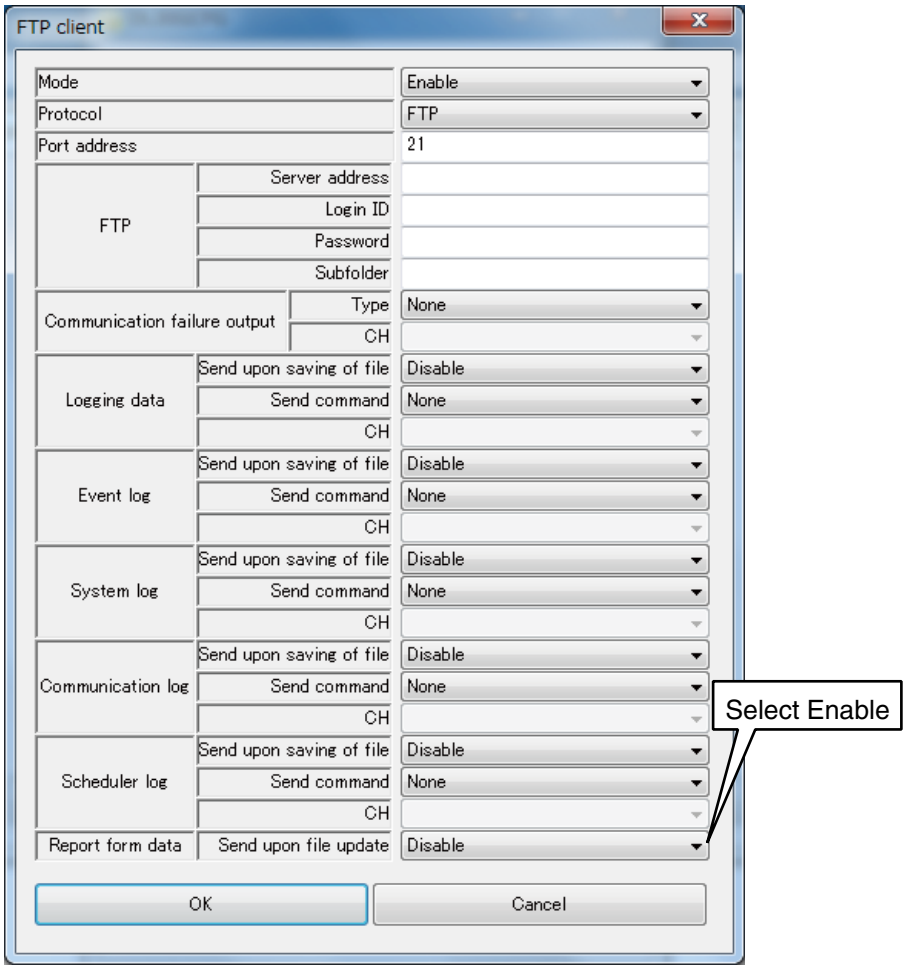
Specify data and log types and the timing of data transfer for each data/log.



(1) Specify the following parameters for each of Logging data, Event log, System log, Communication log, and Scheduler log.

Parameter	Description
Send upon saving of file	Set as [Enable] to send out a file at the timing of saving.
Send command	FTP file transfer can be initiated by a command of specific MD (rising edge). Choose either [None] or [MD].
CH	Specify CH used as Send command.

(2) For Report form data, set [Report form data] as [Enable] to send out a file at the timing of updating.



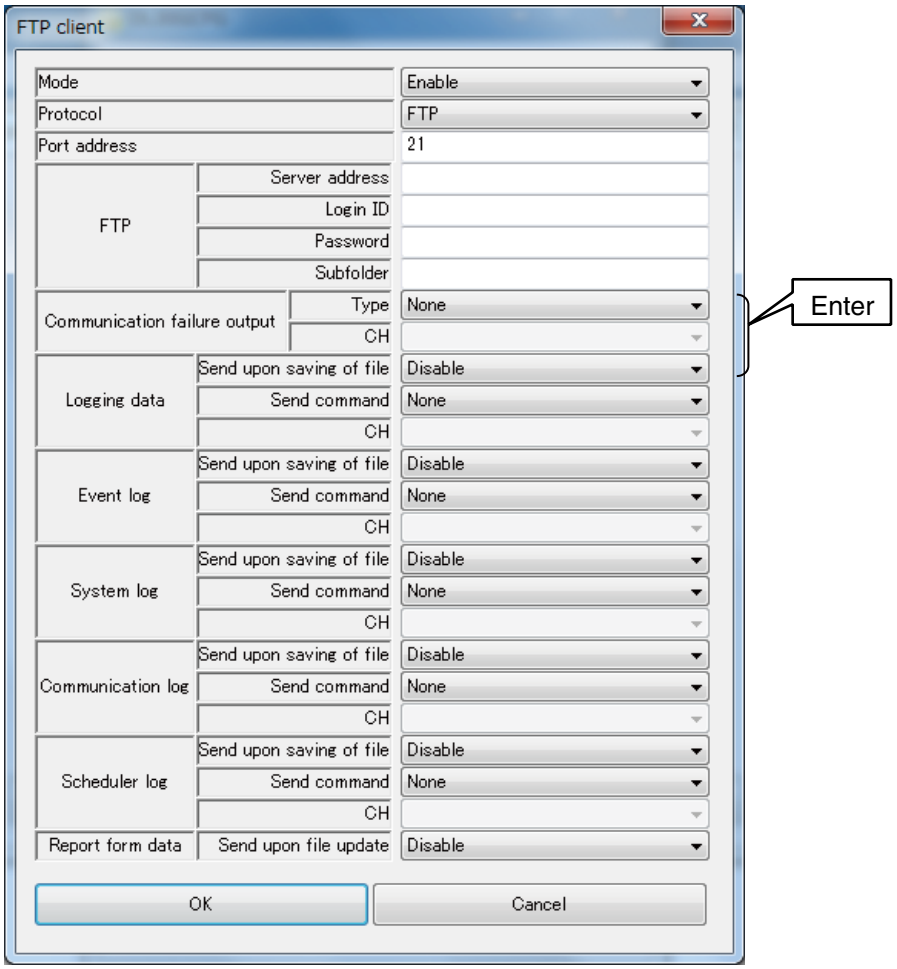
NOTES

FTP transfer can be executed on the hour by using MD signal's rising edge as Send command.

[Example] Sending a file every hour on the hour
Assign [Time] (minute) to an AI channel. (CH setting: Time, Time unit: Minute)
Go to [Alarm zone setting] and set [Partitions] to 2.
Set '10' for both the upper limit of Zone 1 and the lower limit of Zone 2.
Specify an MD channel to [Alarm output (MD)] for Zone 1.
The AI transits from Zone 1 to Zone 2 at 0 minute and the MD output turns on.

Communication failure output

An alarm output can be turned on if retries fail.
The alarm output turns off when the error is cancelled.



Parameter	Description
Type	Choose an output type among: None / MD / DO / GDO.
CH	Choose a channel No.

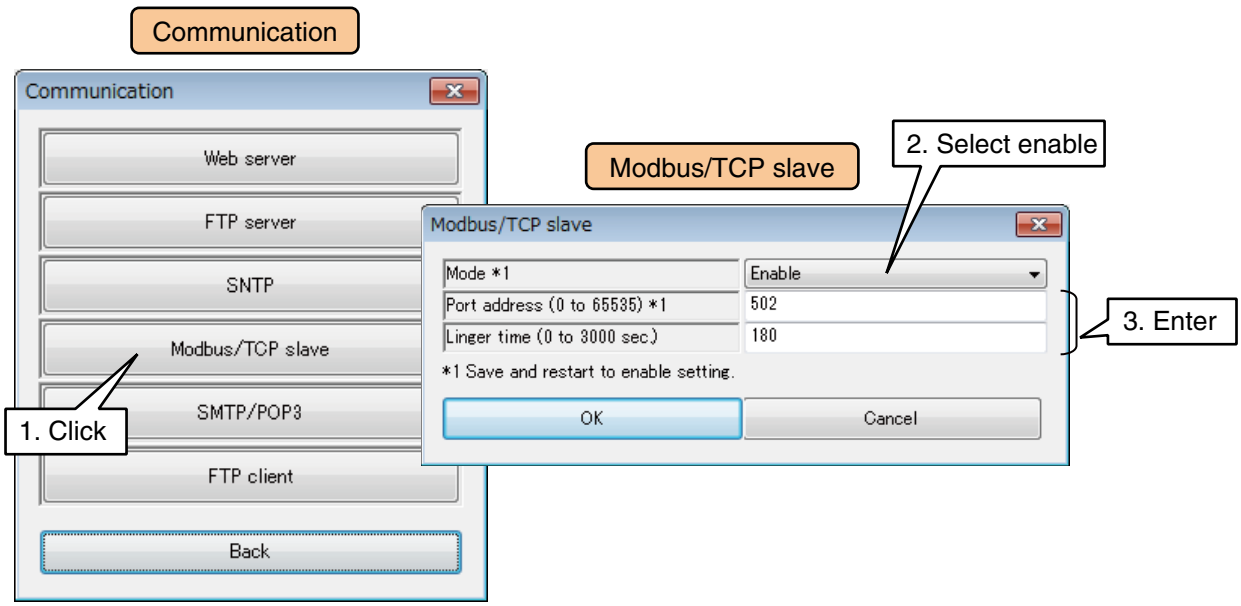
Once the setting is complete, click [OK] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.

3.12.3 Modbus/TCP slave

The DL30-G supports the Modbus/TCP slave function which allows an external Modbus master device to monitor the DL30-G I/O signals and to perform other operations.

(1) Click [Communication] button in the [Configuration] to display the [Communication] window.

(2) Click [Modbus/TCP slave] button to open the [Modbus/TCP slave] window.



Set the parameters by referring to the table below.

Parameter	Description	Default value
Mode	To use the Modbus/TCP slave function, set as [Enable].	Disable
Port address	Set the port address for Modbus/TCP. (0 to 65535)	502
Linger time	Set the communication timeout duration. (0 to 3000 seconds)	180

(3) Once the setting is complete, click [OK] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.
After changing the setting, turn off and on the power supply to the device.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Restarting DL30-G

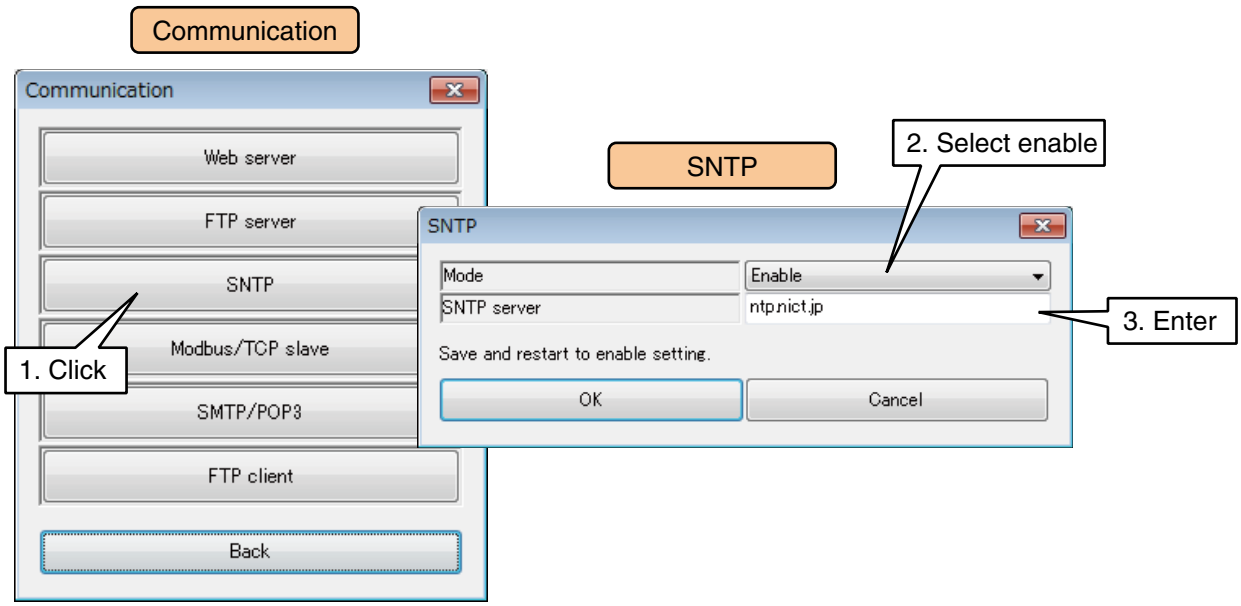
NOTES

- See [8.2.6 Modbus/TCP slave] for the register map, internal registers, and available commands.
- Maximum connection is 4 stations at once.

3.12.4 SNTP (automatic time correction)

The DL30-G supports the SNTP client function which is used to automatically correct the time clock in the DL30-G.
Automatic time correction is executed when the power supply to the DL30-G is turned on, and at 00:00, 06:00, 12:00, and 18:00 hours.

(1) Click [Communication] button in the [Configuration] to open the [Communication] window.
(2) Click [SNTP] button to open the [SNTP] window.



Set the parameters by referring to the table below.

Parameter	Description	Default value
Mode	To use the SNTP client function, Set as [Enable].	Disable
SNTP server	Set the SNTP server.	ntp.nict.jp

(3) Once the setting is complete, click [OK] to temporarily store the setting.
To activate the setting, return to the [Configuration] and click [Upload to device] button.
After changing the setting, turn off and on the power supply to the device.
➔ 6.1.2 Maintenance menu (DL30GCFG) > Restarting DL30-G

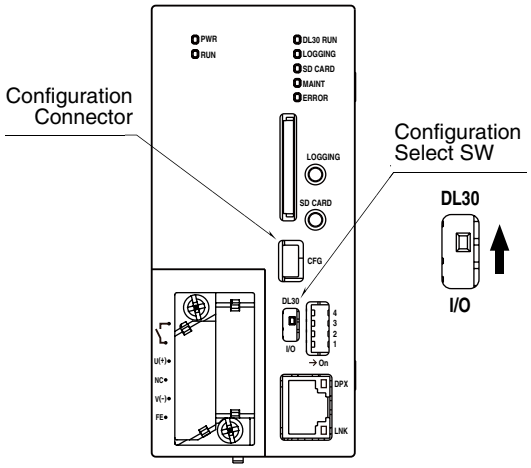
CAUTION

- When using the SNTP client function, be sure to set [Sampling adjustment at time correction] as [Enable].
  ➔ 3.4 System setting > Sampling adjustment at time correction

3.13 Scheduling function setting

The DL30-G is equipped with the scheduling function for manipulating channels of discrete output (DO), digital function register (MD), and grouped digital output (GDO) according to the preset schedule.

(1) Turn [Configuration Select SW] to the [DL30] side.



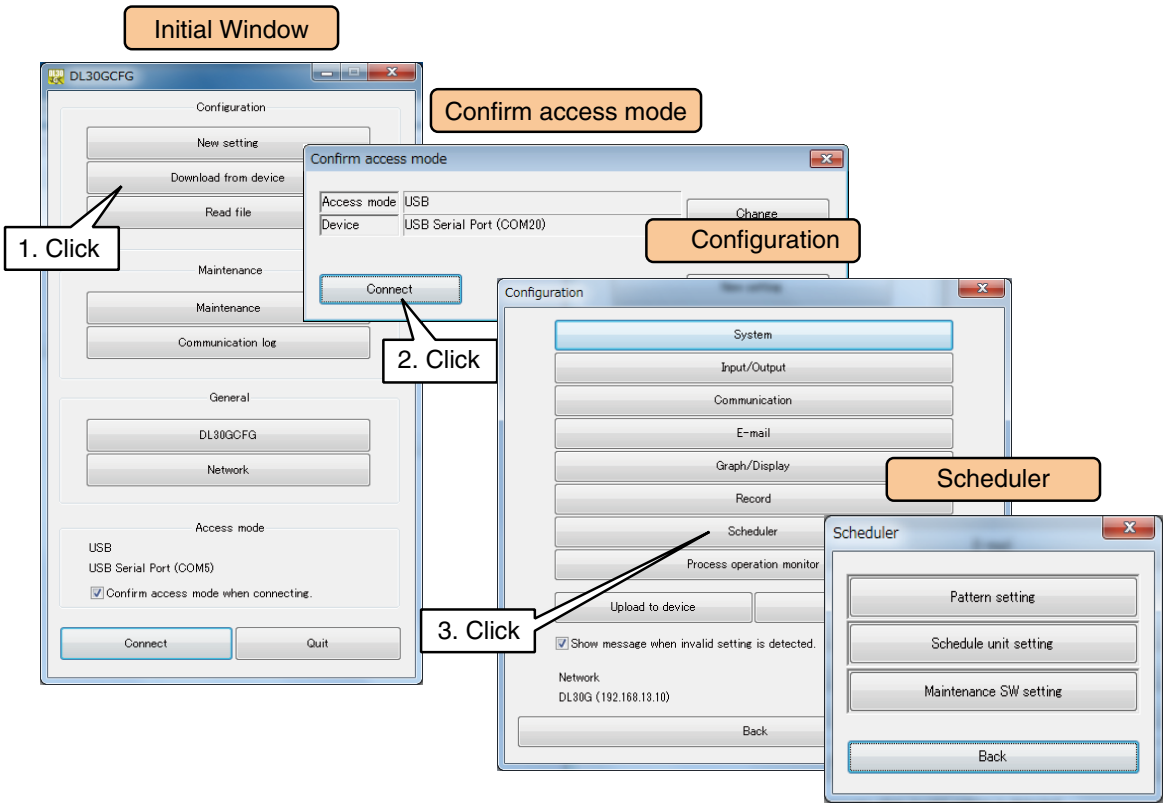
(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.

(6) Click [Scheduler] button to display the [Scheduler] window.



NOTES

See [8.2.11 Schedule] for specifications of the scheduling function.

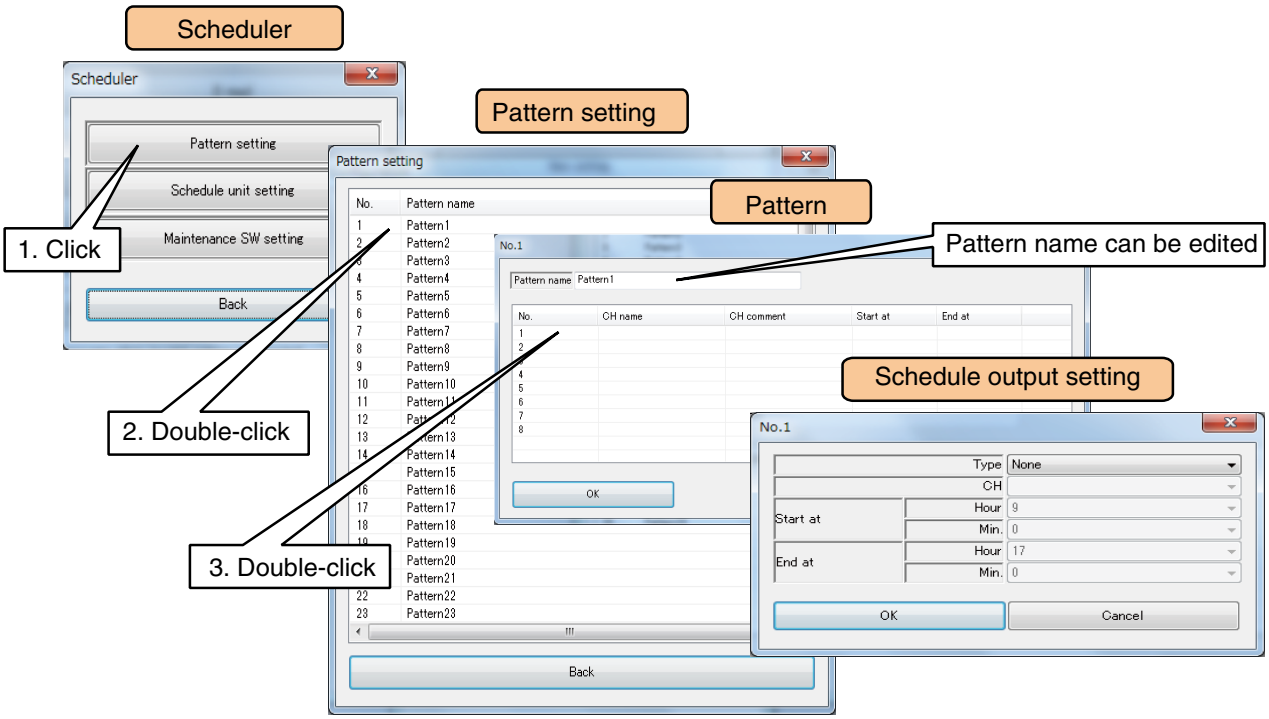
3.13.1 Pattern setting

A pattern is a set of schedule outputs to be assigned to a day.
A channel to manipulate for each schedule is set in the [Schedule output setting] window.
A pattern consists of up to 8 sets of schedule outputs and up to 64 patterns can be created.
By assigning these patterns to the respective days of the week, ON/OFF operations are performed depending on the days of the week.

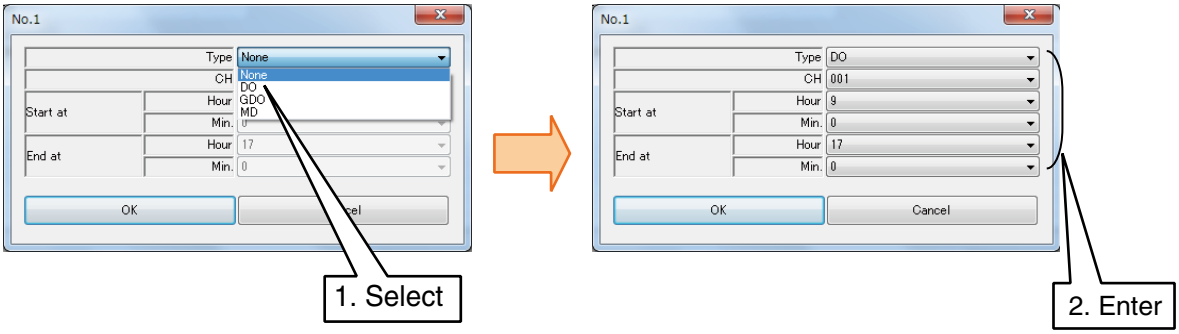
(1) Click [Pattern setting] button in the [Scheduler] window to display the [Pattern setting] window.

(2) Double-click the pattern to set in the [Pattern setting] window to display the [Pattern] window.
The pattern name can be edited using up to 32 characters.

(3) Double-click the schedule No. to set in the [Pattern] window to display the [Schedule output setting] window.



(4) Select DO, MD, or GDO to enable pull-down menus below.
Select the channel number, start time, and end time to output schedule.
Click [OK] to temporarily store the setting and return to the [Pattern] window.
Click [OK] in the [Pattern] window to store the setting and return to the [Pattern setting] window.



Set the parameters by referring to the table below.

Parameter	Description
Type	Select the signal type among: DO / MD / GDO.
CH	Select the channel number.
Start at	Set the time to start ON operation. The selected channel turns ON from the set start time until the end time.
End at	Set the time to end the ON operation.

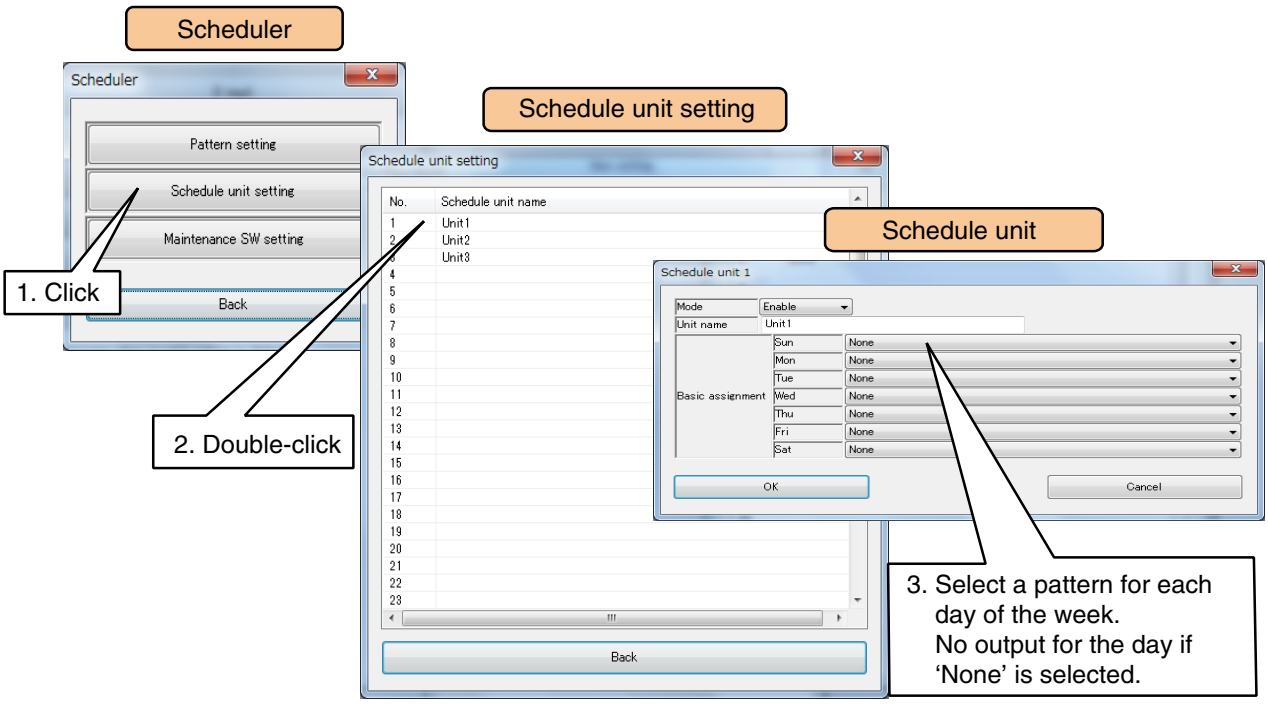
3.13.2 Schedule unit setting

A schedule unit is a set of patterns to be assigned to a week.
Assign patterns set in 3.13.1 Pattern setting to the respective days of the week to create a schedule unit.
Up to 32 units can be created.

(1) Click [Schedule unit setting] button in the [scheduler] to display the [Schedule unit setting] window.

(2) Double-click the unit to set in the [Schedule unit setting] to display the [Schedule unit] window.
The pattern name can be edited using up to 32 characters.

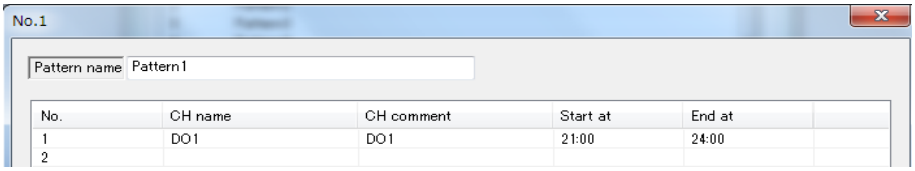
(3) Select the pattern from a pull-down menu for each day of the week.
Select 'None' to disable schedule output for the day of the week.

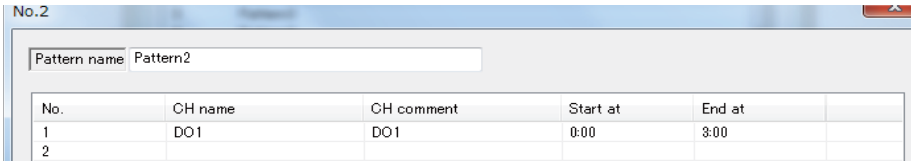


(4) Click [OK] to store the setting and return to the [Schedule unit setting] window.
To validate the settings, return to the [Configuration] and click [Upload to device] button.

NOTES

- In order to schedule an output across two days, create two patterns.
  Set the end time of the first pattern at 24:00 and set the start time of the second pattern at 0:00.
  For example, to schedule an output from 21:00 on Sunday to 3:00 on Monday, create two patterns named Pattern1 and Pattern2 as shown below and assign them to Sunday and Monday, respectively.



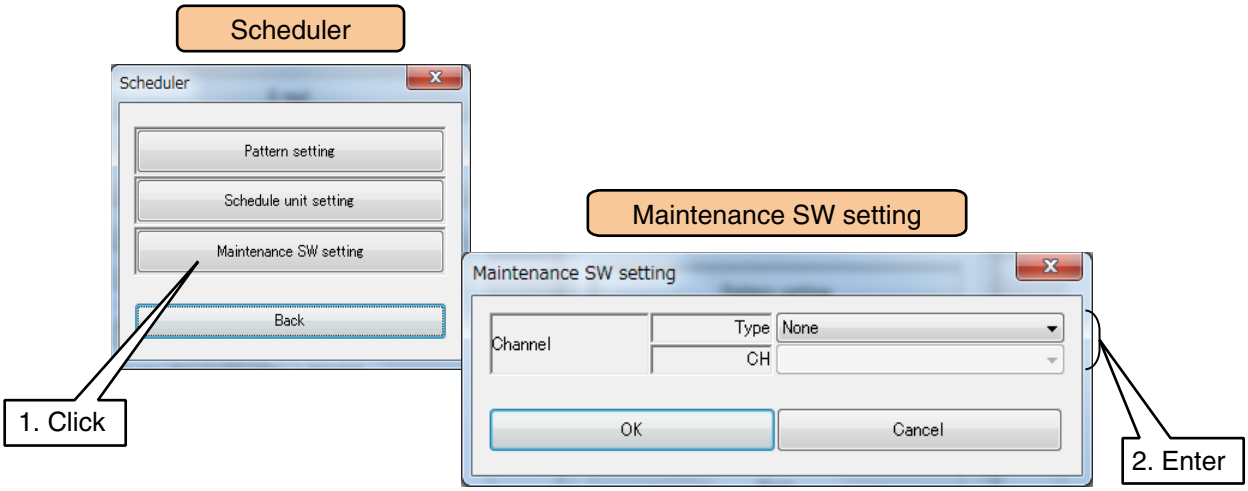


3.13.3 Maintenance SW setting

By specifying the DI or MD channel in the [Maintenance SW setting], all the schedule outputs set to the channel can be disabled while the channel is ON.

(1) Click [Maintenance SW setting] button in the [Scheduler] to display the [Maintenance SW setting] window.

(2) Select the signal type and channel number.



Set the parameters by referring to the table below.

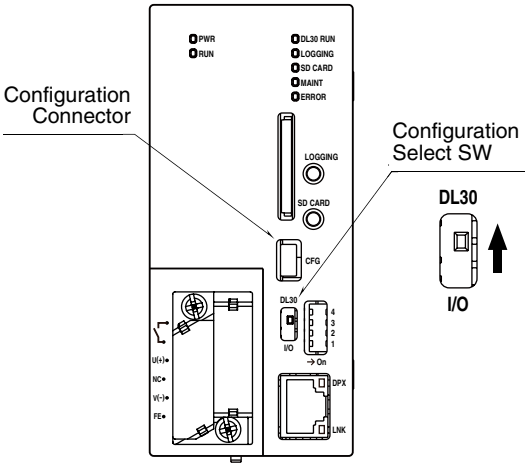
Parameter	Description
Type	Select the signal type from: None / DI / MD.
CH	Select the channel number.

(3) Click [OK] to store the setting and return to the [Scheduler].

3.14 Process operation monitor function setting

The DL30-G is equipeed with the process operation monitor function, which allows to monitor process operation of channels selected from among Analog input (AI), Pulse input (PI), Analog function register (MA), Discrete input (DI), and Digital function register (MD).

(1) Turn [Configuration Select SW] to the [DL30] side.



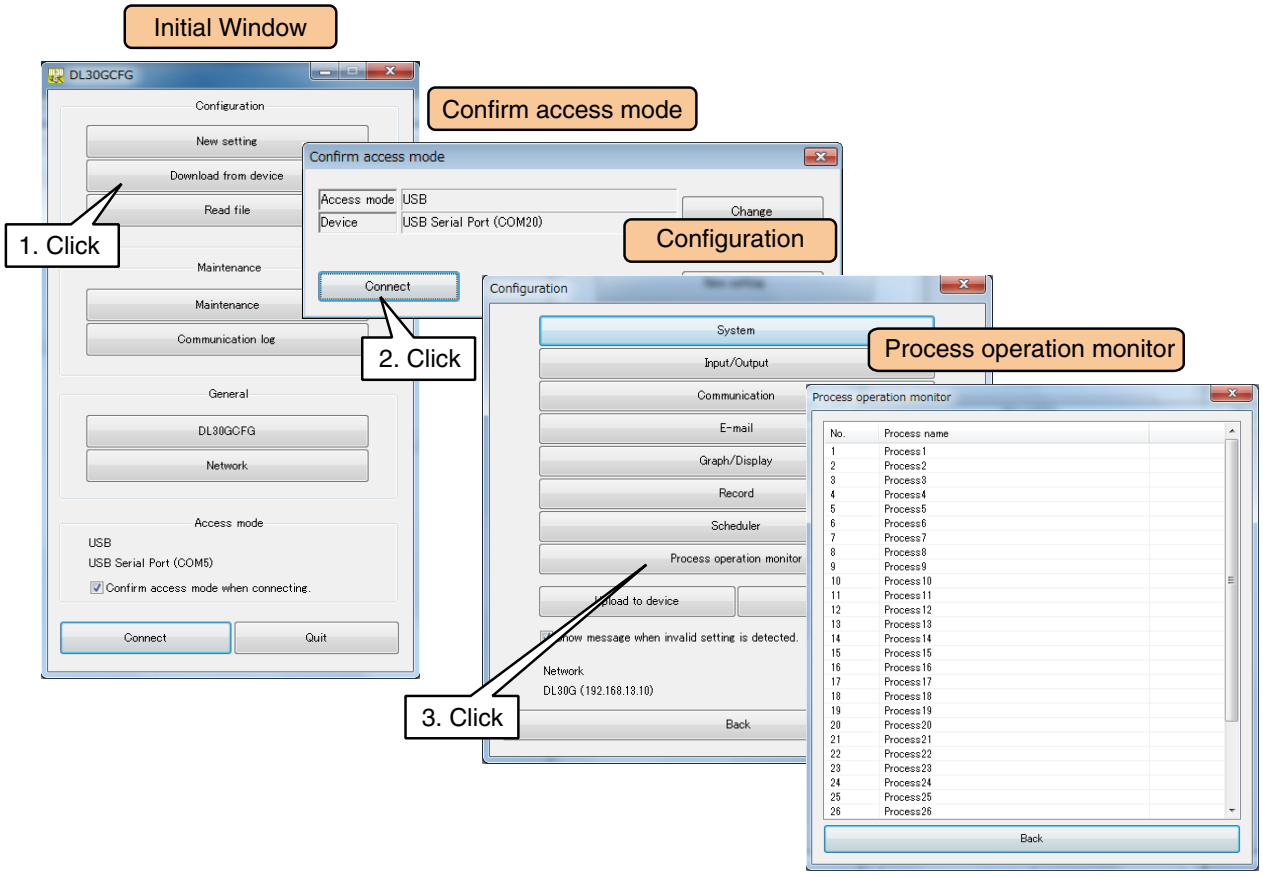
(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

(3) Click [Download from device] button in the initial window to display [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.

(5) Once the setting information has been loaded from the device, the [Configuration] is displayed.

(6) Click [Process operation monitor] button to display the [Process operation monitor] window.



3.14.1 Process operation monitor setting

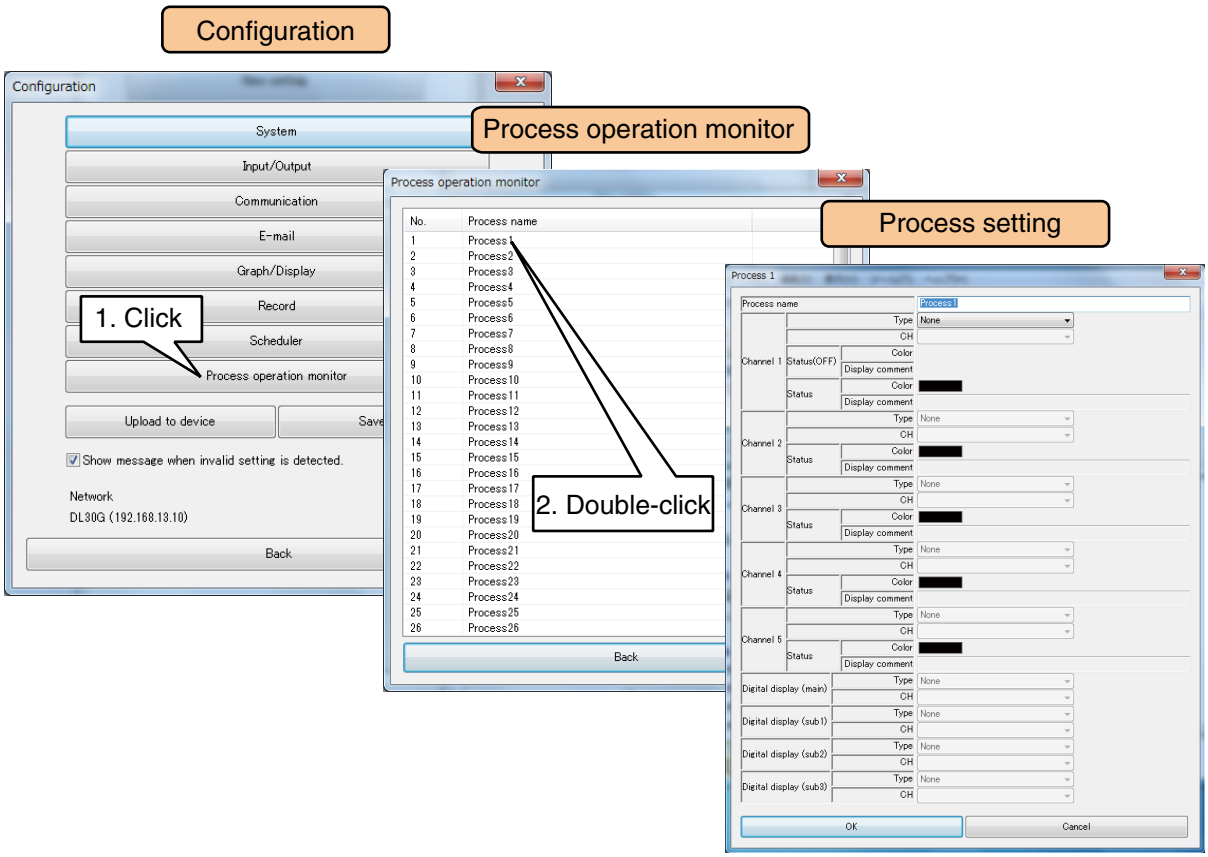
Configure process operation monitor setting.
Up to 32 processes to monitor can be set.

(1) Click [Process operation monitor] button in the [Configuration] to open the [Process operation monitor] window.

(2) Double-click the process number to set in the [Process operation monitor] window to display the [Process setting] window.

(3) Edit parameters in the [Process setting] window as needed.

➔ 3.14.2 Setting analog data to process
➔ 3.14.3 Setting digital data to process



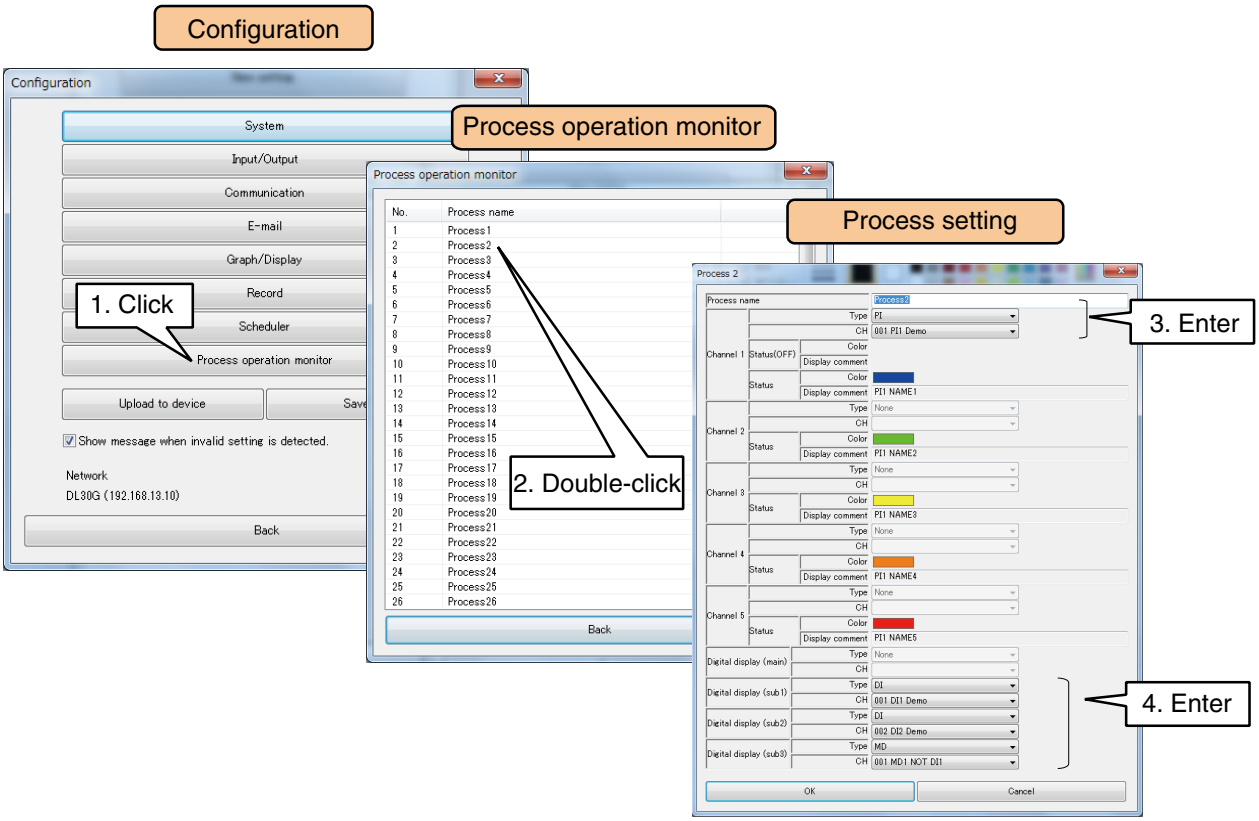
3.14.2 Setting analog data to process

Configure process operation monitor setting for Analog input (AI), Pulse input (PI), and Analog function register (MA).

(1) Double-click the process number to set in the [Process operation monitor] window to display the [Process setting] window.

(2) Select the signal type and channel to monitor for 'Channel 1'.

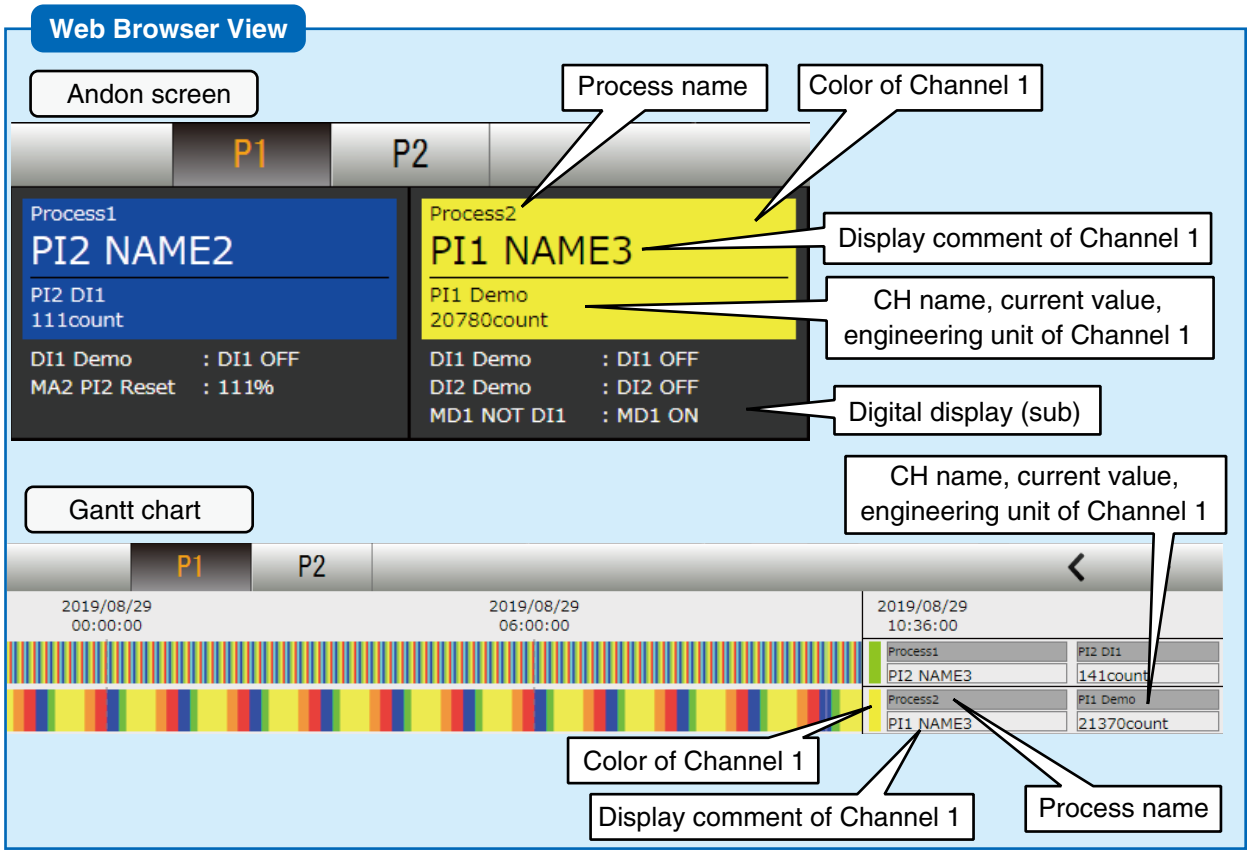
(3) Select the signal type and channel to display data value for each of 'Digital display (sub1) to 'Digital display (sub3)'.



(4) Set the parameters by referring to the table below.

Parameter	Description
Process name	Set a name of the process using up to 32 characters
Channel 1 Type	For setting analog data, select the signal type from AI, PI, and MA. When AI, PI, or MA is selected for Channel 1: - 'None' is automatically selected for 'Type' and 'Display comment' of Channels 2 to 5. - The 'Color' and 'Name' fields of the alarm zones of the channel selected for Channel 1 are automatically uploaded to the 'Color' and 'Display comment' fields of Channels 1 to 5, respectively. ➔ 3.6.2 Analog input (AI) > Alarm zone setting (AI) ➔ 3.6.4 Pulse input (PI) > Alarm zone setting (PI) ➔ 3.6.5 Analog function register (MA) > Alarm zone setting (MA)
Channel 1 CH	Select the channel to monitor.
Digital display (main)	'None' is automatically selected when AI, PI, or MA is selected for Channel 1.
Digital display (sub1) Type	Select from None, AI, PI, MA, DI, and MD.
Digital display (sub1) CH	Select the channel to display data value.

(5) The status of data set for Channel 1 is recorded every minute (00 seconds of DL30-G clock data) for 48 hours and represents the data in a Gantt chart. ➔ 4.8.1 Display contents > Gantt chart



CAUTION

- Gantt chart will be cleared when the type, channel, display comment, or engineering unit of Channel 1 has been changed.
- Gantt chart can also be cleared on DL30GCFG.
  ➔ 6.1.2 Maintenance menu (DL30GCFG) > Initializing internal memory

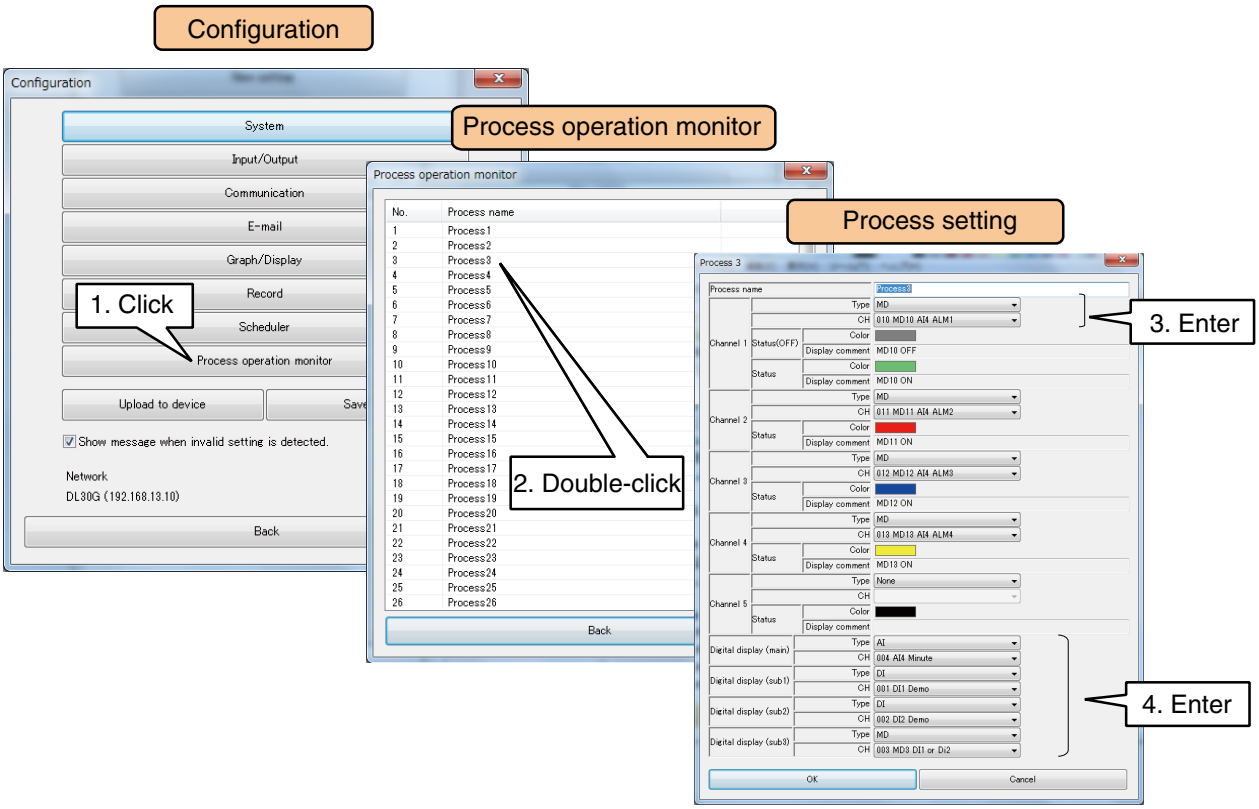
3.14.3 Setting digital data to process

Configure process operation monitor setting for Discrete input (DI) and Digital function register (MD).

(1) Double-click the process number to set in the [Process operation monitor] window to display the [Process setting] window.

(2) Select the signal type and channel to monitor for each of 'Channel 1' to 'Channel 5'.

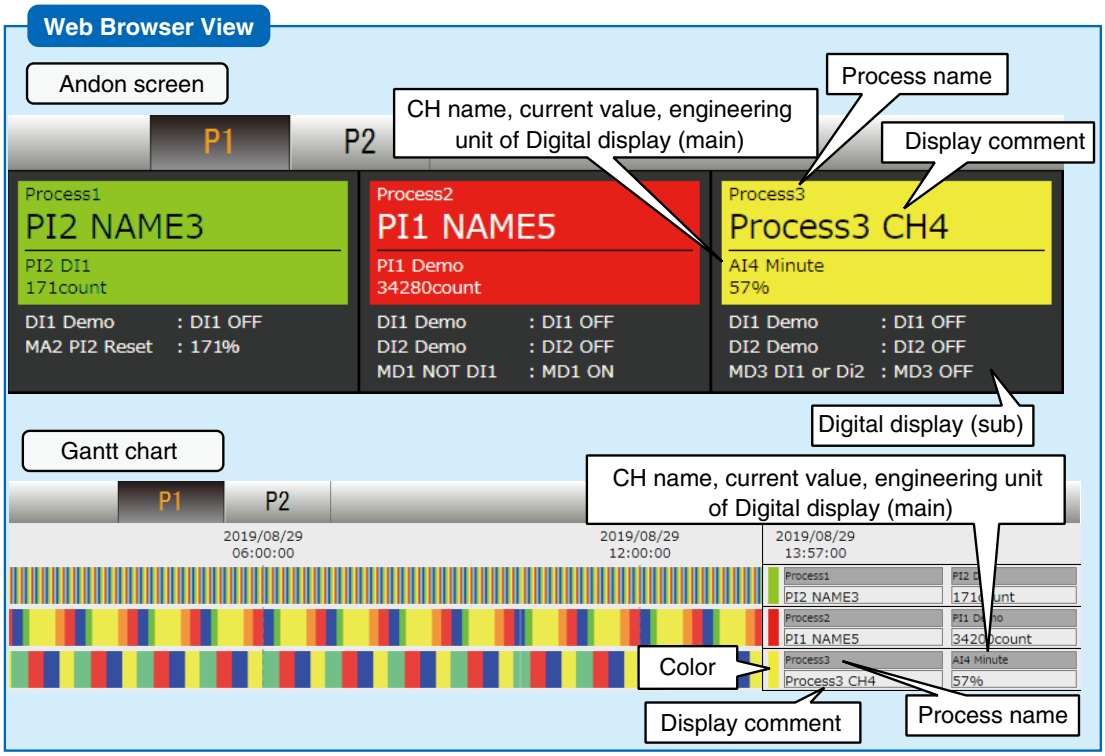
(3) Select the signal type and channel to display data value for each of 'Digital display (main)' and 'Digital display (sub1)' to 'Digital display (sub3)'.



(4) Set the parameters by referring to the table below.

Parameter	Description
Process name	Set a name of the process using up to 32 characters
Channels 1 to 5 Type	When setting digital data, select the signal type as follows. Channel 1: DI or MD Channels 2 to 5: None / DI / MD In the 'Color' and 'Display comment' fields of OFF state for Channel 1, those of the channel set for Channel 1 are automatically displayed. In the 'Color' and 'Display comment' fields of ON state for each of Channels 1 to 5, those of the channel set for each of Channels 1 to 5 are automatically displayed. ➔ 3.6.3 Discrete input (DI) > Basic setting (DI) ➔ 3.6.6 Digital function register (MD) > Basic setting (MD) When all the channels are OFF, 'Color' and 'Display comment' of OFF state of Channel 1 are displayed on the browser view.
Channels 1 to 5	Select the channel to monitor.
Digital display (main) Type	Select from None, AI, PI, and MA. Configurable when DI or MD is selected for Channel 1.
Digital display (main) CH	Select the channel to display data value.
Digital display (sub1) Type	Select from None, AI, PI, MA, DI, and MD.
Digital display (sub1) CH	Select the channel to display data value.

(5) The status of data set for Channel 1 is recorded every minute (00 seconds of DL30-G clock data) for 48 hours and represents the data in a Gantt chart. ➔ 4.8.1 Display contents > Gantt chart



CAUTION

- Gantt chart will be cleared when the type, channel, display comment, or engineering unit of any of Channels 1 to 5 has been changed.
- Gantt chart can also be cleared on DL30GCFG.
  ➔ 6.1.2 Maintenance menu (DL30GCFG) > Initializing internal memory

3.15 Other settings

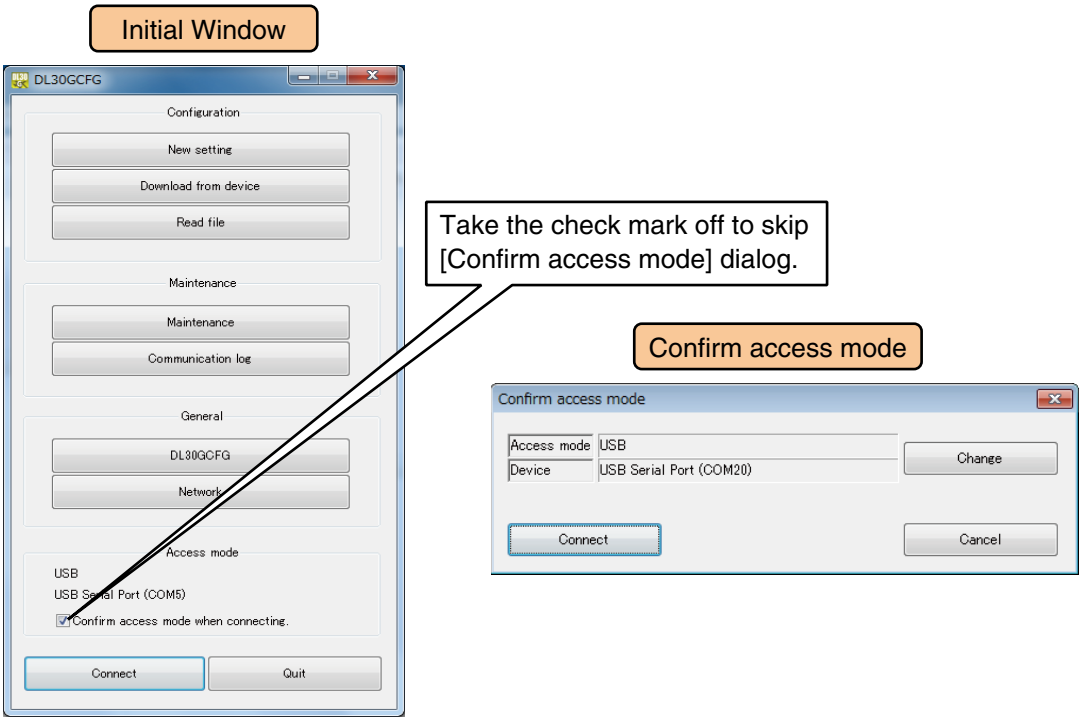
3.15.1 Skipping access mode confirmation in DL30GCFG

The dialog box to prompt the user to confirm the access mode when connecting to the DL30-G can be suppressed by setting as follows:

(1) Start up DL30GCFG.

(2) Uncheck the box next to the option [Confirm access mode when connecting.] in the initial window.
The [Confirm access mode] dialog is suppressed.

(3) To show the dialog again, check the box.



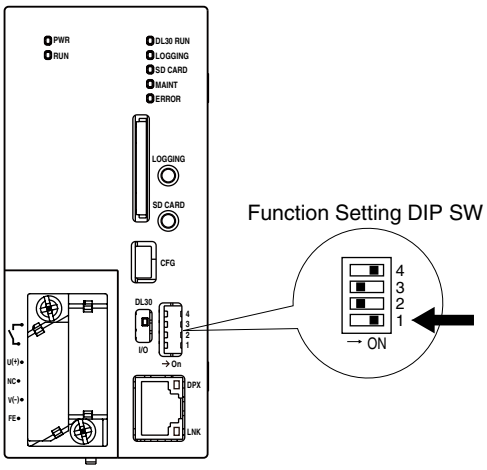
3.15.2 Status monitoring

The status of data uploading by FTP can be confirmed during the setting procedure via DL30GCFG or the terminal software program.

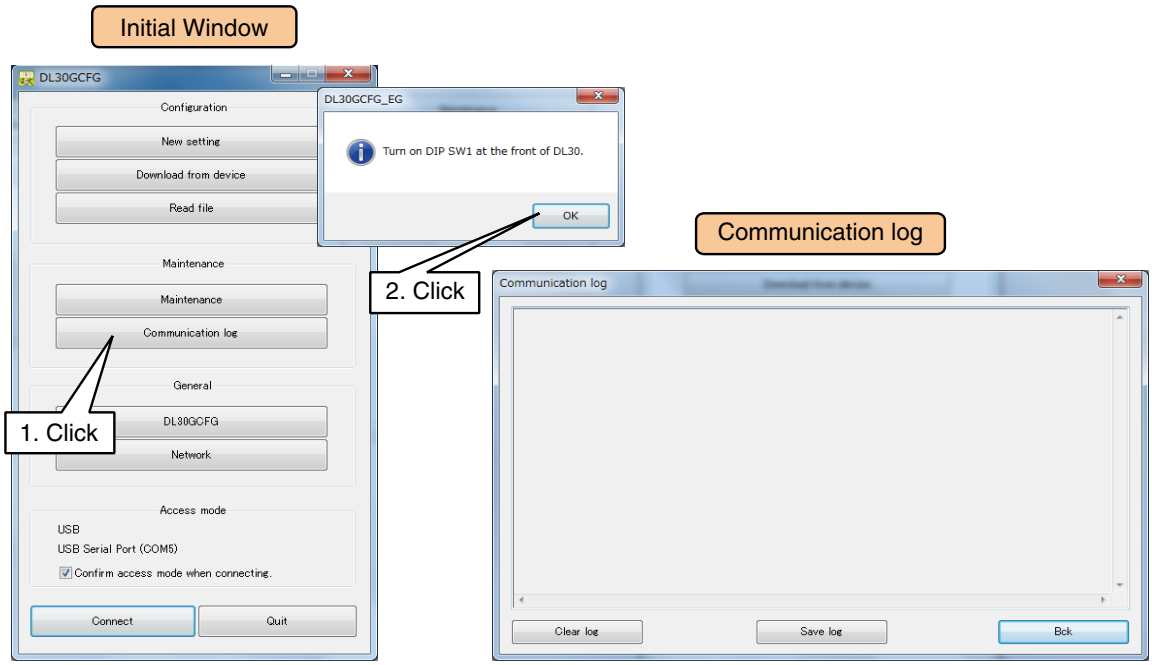
Status monitoring via DL30GCFG

(1) Connect the DL30-G to a PC with an USB cable.

(2) Turn ON the function setting DIP SW1.



(3) Start up DL30GCFG.
Click [Communication log] button in the initial window to display the [Communication log] window.



Function	Description
Clear log	Clear all logs displayed in the [Communication log] window.
Save log	Save logs displayed in the [Communication log] window as a CSV file.
Back	Close the [Communication log] window and return to the initial window.

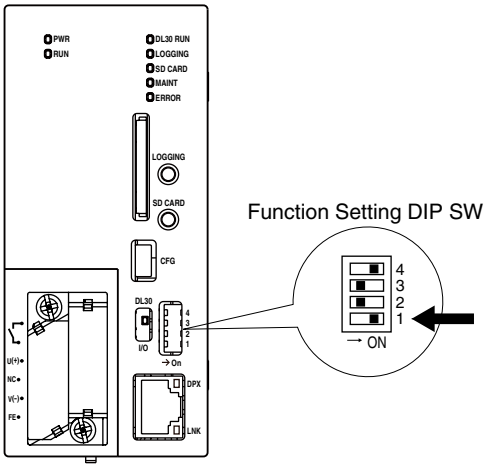
(4) When an FTP transfer starts, confirm communication logs on the [Communication log] window.
Confirm the FTP and other settings until the transfer is completed normally.

(5) After confirmation, click [Back] to close the [Communication log] window, and turn OFF the DIP SW1.

Status monitoring via Terminal software program

(1) Connect the DL30-G to a PC with an USB cable.

(2) Turn ON the function setting DIP SW1.



(3) Start up the terminal software program and set as follows:

Transmission speed: 38400 bps
Data bit: 8
Start bit: 1
Stop bit: 1
Parity bit: None

(4) When an FTP transfer starts, user can confirm its terminal log on the program.
Confirm the FTP and other settings until the transfer is completed normally.

(5) After confirmation, turn OFF the DIP SW1.

NOTES

The above methods are also useful to monitor mail delivery status.

4. How to use the Web server

Enter the domain name or IP address in the URL entry field of the browser to open the top page of the DL30-G web server.

Descriptions in this section are based on the operations on a PC.

NOTES

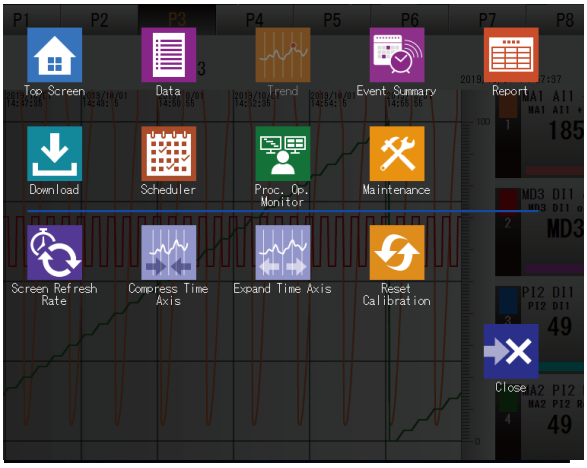
- See [8.2.1 Compatible terminals and browsers] for information on compatible terminals.
- To go back to the top page from any DL30-G web page, click [Menu button Menu] and select [Top].

4.1 Common menu bar

A common menu bar is displayed in all web pages generated by the DL30-G.

Menu button

Click Menu button  to display the menu dialog.



View Selector

A grayed out icon indicates that the relevant view is currently on the screen.

Sub-menu

A list of icons for the functions available for the selected view.

SD card indicator

When an SD card is in place, the  mark is displayed.

Error indicator

If an error is detected (e.g. discrepancy in I/O module type and/or position), the  mark is displayed.

Screen lock indicator

The display screen is free for scrolling when  (icon with an open lock) is displayed.

The icon  means the screen is locked. Click on the indicator to lock/unlock.

NOTES

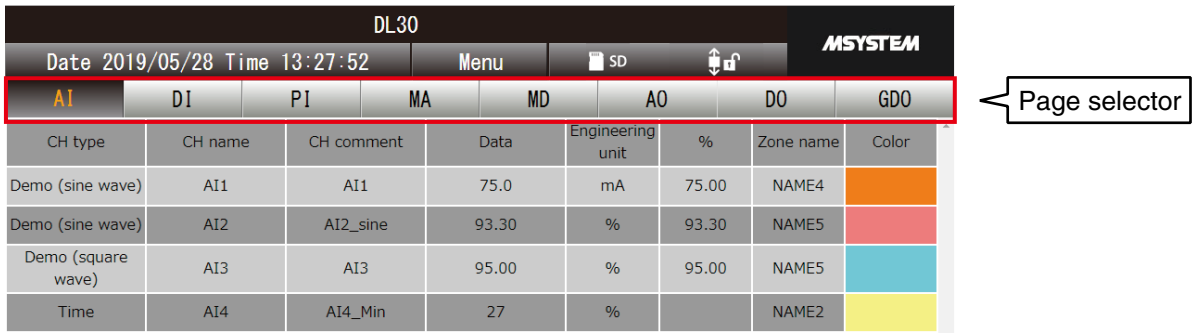
The screen lock function is available in “Data”, “Trend”, and “Event” views.

4.2 Data display

Click [Menu button Menu] and select [Data] to switch to the data display view.

4.2.1 Data display page contents

The current status of the channels assigned to the window is displayed in the table format.
The parameter items appearing on the window differ depending on the signal types.



CH type	CH name	CH comment	Data	Engineering unit	%	Zone name	Color
Demo (sine wave)	AI1	AI1	75.0	mA	75.00	NAME4	
Demo (sine wave)	AI2	AI2_sine	93.30	%	93.30	NAME5	
Demo (square wave)	AI3	AI3	95.00	%	95.00	NAME5	
Time	AI4	AI4_Min	27	%		NAME2	

4.2.2 Data display operation

Switching pages

Click [Page selector] to switch pages for displaying data of the selected signal type.

Manipulating output signals

User can control values of the selected MA, MD, AO, DO, and/or GDO channels for which the [Control on browser] option is enabled in the MA, MD, AO, DO, and/or GDO setting window.

NOTES

- When the user has logged in the web server using the login ID and password for web browsing, the user is only allowed to control channels selected in the [Channel control function setting].
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)
- The login ID and password for accessing via network with DL30GCFG allows the user to manipulate outputs of all the channels.
  ➔ 3.3.4 Enabling configuration via network (remote access authorization)

CAUTION

- If the web browsing is not locked by password, a login authorization dialog will not appear and the user automatically logs in the web server in the web browsing mode.
  When the user intends to access the device with DL30GCFG via network using the login ID and password for remote access, be sure to set the login ID and password for web browsing as well.
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

Changing screen refresh rate

The refresh rate for the data display pages can be specified between 0 and 999 seconds.
The screen is not updated when the value is set to 0.

(1) Click [Menu button Menu].

(2) Click [Screen Refresh Rate] in the sub-menu.

(3) Enter the auto refresh rate and click [OK].
The refresh rate of the data display pages is changed.

NOTES

The I/O channels appearing on the Data display are specified in the DL30GCFG.

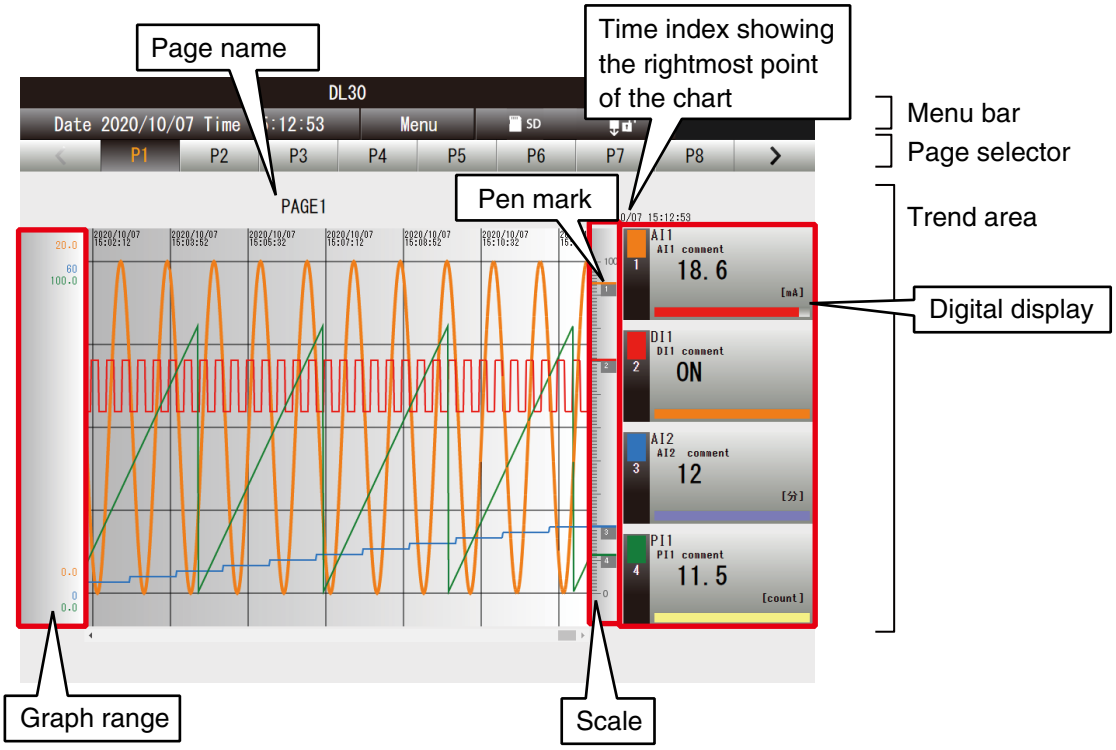
➔ 3.11.3 Data display setting

4.3 Trend graph

Click [Menu button Menu] and select [Trend] to switch to the trend graph view.

4.3.1 Trend graph page contents

The [Trend] view consists of [Menu bar], [Page selector], and [Trend area].



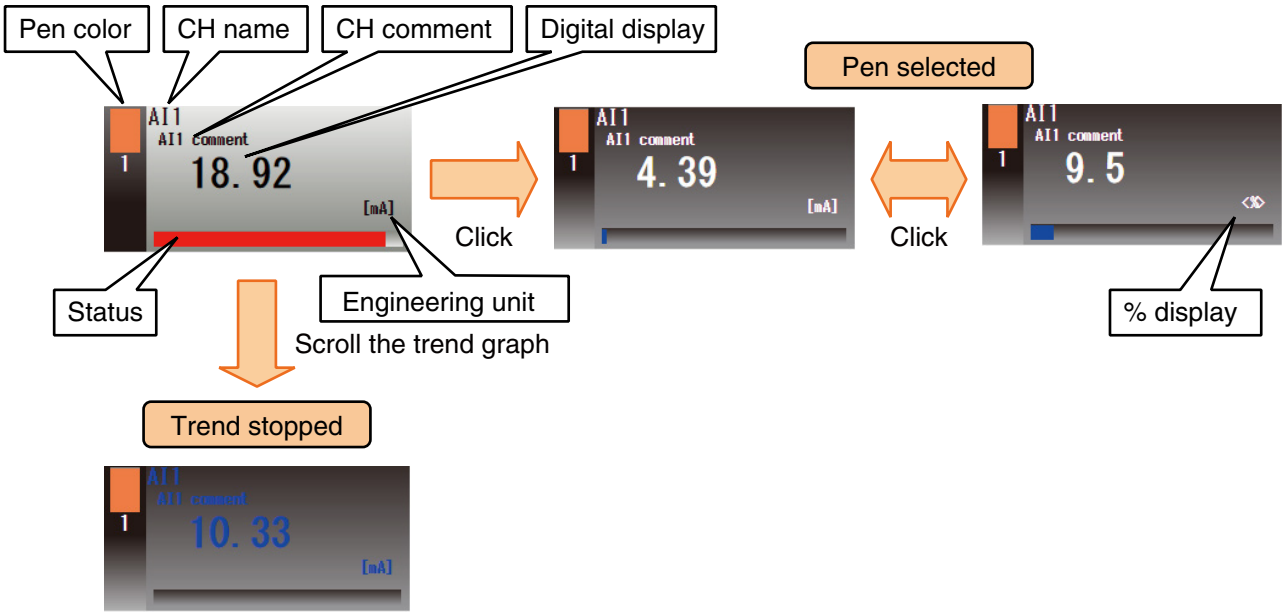
Page name

The preset page name is displayed. ➔ 3.11.2 Trend graph setting

Digital display

The digital display in black characters means that the current values are being displayed.
When the graph chart is scrolled, the digital displays show the values of the most advanced time point (the rightmost position) of the chart in blue characters.

To select a pen, click on the digital display field which turns to black color.
To unselect the pen, click on the graph scale.



Item		Display content
Digital display	AI	When data type is%: % value or engineering unit value When data type is integer: engineering unit value
	DI DO MD GDO	Character strings corresponding to ON/OFF
	PI MA AO	Engineering unit value
Status	AI PI MA	Shown in the color of the current alarm zone when alarm zones are set. Shown in the pen color when no zone is set. Shown as a bargraph for AI when the data type is %.
Engineering unit	AI OI MA AO	Shown as designated.
	DI DO MD GDO	Blank

4.3.2 Trend graph operation

Switching pages

Click [Page selector] to switch pages. There are 16 pages.

Changing maximum/minimum scale values

The maximum and minimum values of the scale range can be changed.

(1) Lock the screen.

(2) To change the maximum (minimum) value, click the area showing the maximum (minimum) value of the scale. The [upper (lower) limit value setting] dialog is displayed.

(3) Enter a new value and click [OK] to apply the new value on the graph.

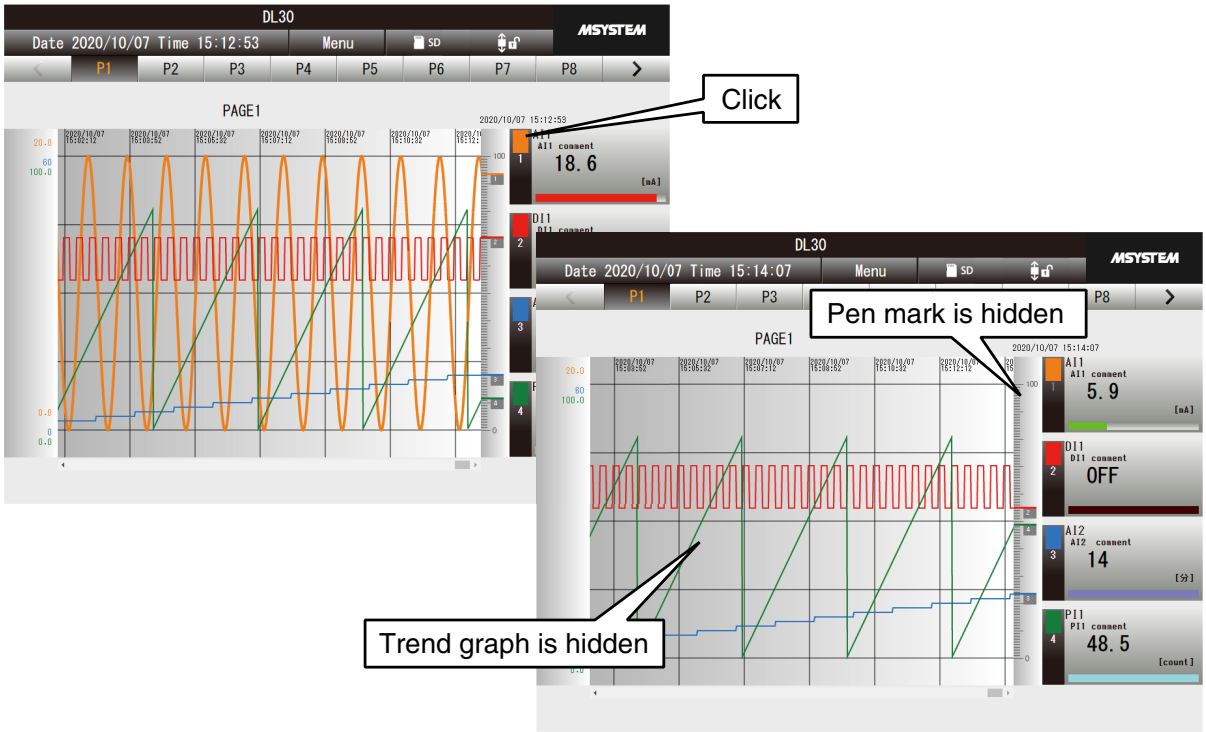
NOTES

- The modified scale values are valid only while the [Trend] view is displayed.
- The modifications can be cleared by [Reset calibration] command.
  ➔ 4.3.2 Trend graph operation > Resetting local calibration

Hiding pens

Trend graphs for selected pens can be temporarily removed from the screen.

(1) Click [Pen color] of the pen to hide in the digital display.
(2) The number of the selected pen is grayed out, and the relevant trend graph is removed.
(3) To show the hidden graph, click [Pen color] once again.



NOTES

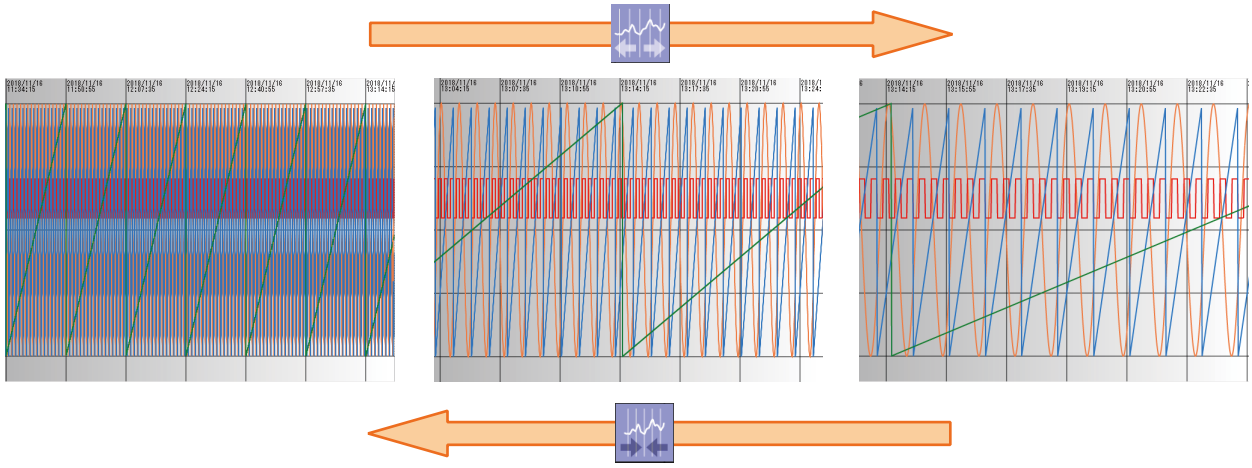
- The modified status (shown/hidden) is valid until the trend data is cleared.
- The status (shown/hidden) cannot be switched while the screen is locked.

Expanding/compressing time axis

Time axis of the trend graphs can be expanded or compressed.
The same expansion/compression ratio is applied to all pages.

(1) Click [Menu button Menu] to display the [Menu].

(2) Click [Compress time axis], or [Expand time axis] in the sub-menu.
Each click on the icon compresses/expands the time axis on the trend graph.



NOTES

- The axis can be selected from 4 levels: 100% (same size), 50%, 20%, 10%.
- In case of a touch panel such as an iPad, it is possible to Pinch in to compress, and Pinch out to expand.
  Pinching-in/-out with a pen being selected expands/shrinks the browser window size.

CAUTION

Values applied by [Reset calibration] are not cleared by expanding/compressing the time axis.

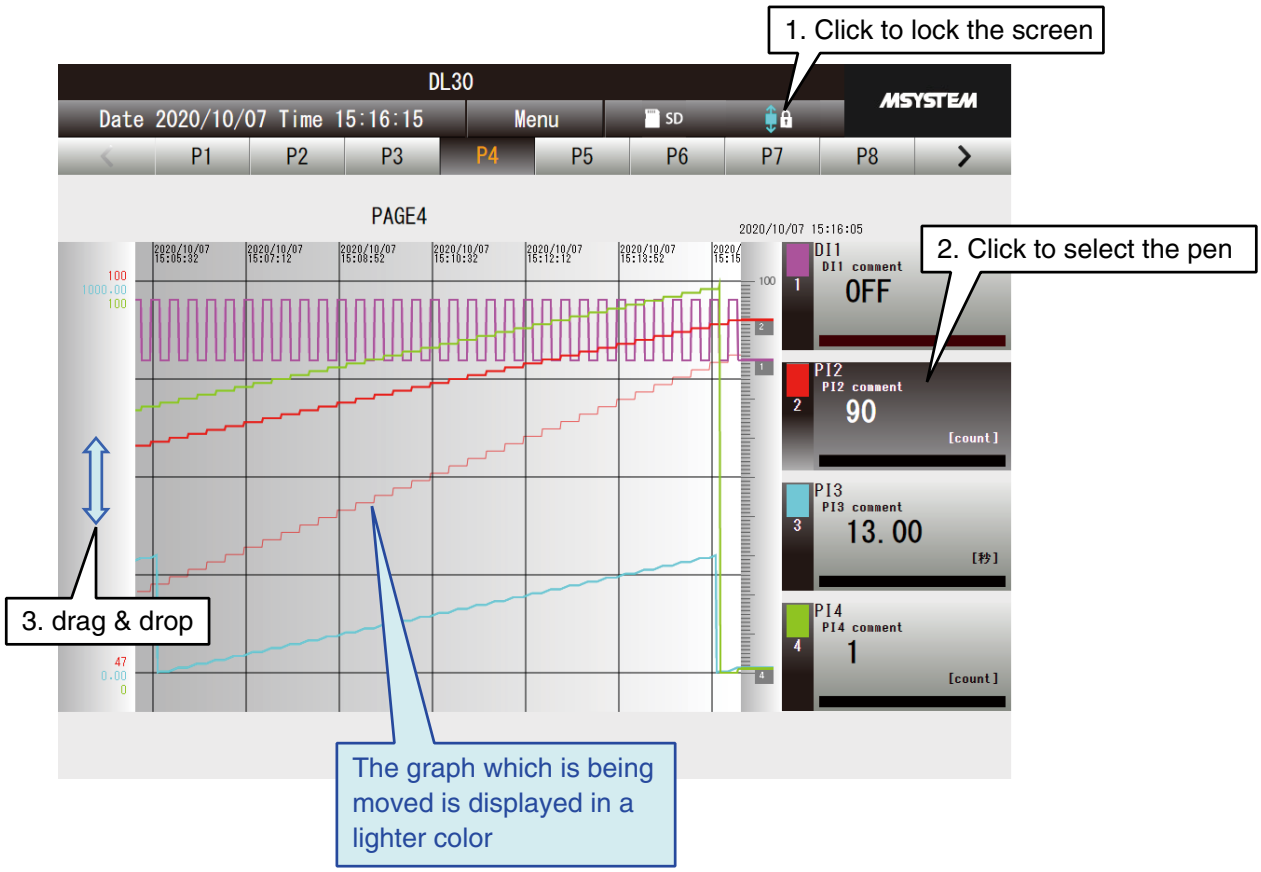
Comparing graphs (shifting graph along scale)

Trend graphs for selected pens can be shifted vertically along the scale.

(1) Click [Screen lock indicator] to lock the screen.

(2) Click on the digital display of a desired pen and confirm that the pen is being selected.

(3) Drag and drop over the graph range area in the desired direction.



(4) To unselect the pen, click over the scale area.
The graph remains shifted even after the pen is unselected.
Select another pen to shift its graph as needed.

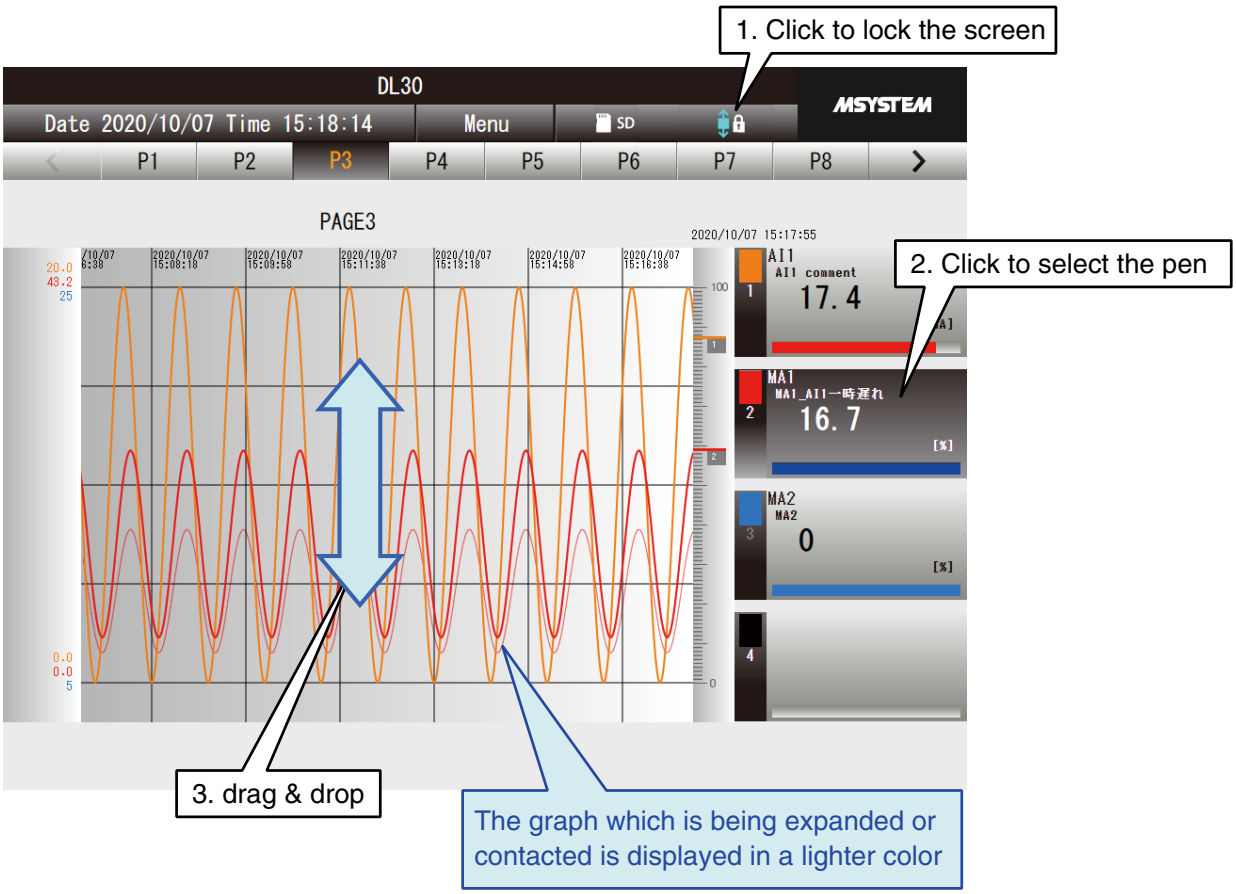
NOTES

- In case of a touch panel such as an iPad, swipe over the trend graph area in the desired direction.
- The modifications can be cleared by [Reset calibration] command.
  ➔ 4.3.2 Trend graph operation > Resetting local calibration

Comparing graphs (expanding/contracting scale)

Scale range of the trend graph of the selected pen can be expanded and contracted.

(1) Click [Screen lock indicator] to lock the screen.
(2) Click on the digital display of a desired pen and confirm that the pen is being selected.
(3) Drag and drop over the trend chart area in the desired direction.



(4) To unselect the pen, click over the scale area.
The new graph scale remains even after the pen is unselected.
Select another pen to expand/contract its graph as needed.

NOTES

- In case of a touch panel such as an iPad, pinch in or pinch out over the trend graph area.
- The modifications can be cleared by [Reset calibration] command.
  ➔ 4.3.2 Trend graph operation > Resetting local calibration

Changing screen refresh rate

The refresh rate for the trend graph pages can be specified between 1 and 999 seconds.
The screen is not updated when the value is set to 0.

(1) Click [Menu button Menu].

(2) Click [Screen refresh rate] in the sub-menu.

(3) Enter the auto refresh rate and click [OK]. The refresh rate of the trend graph pages is changed.

Resetting local calibration

User can reset the modification applied locally on the trend graphs, such as the upper/lower range values for each pen.

(1) Click the [Menu button Menu].

(2) Click [Reset calibration] in the sub-menu.

(3) The calibration confirmation dialog will appear. Click [OK].

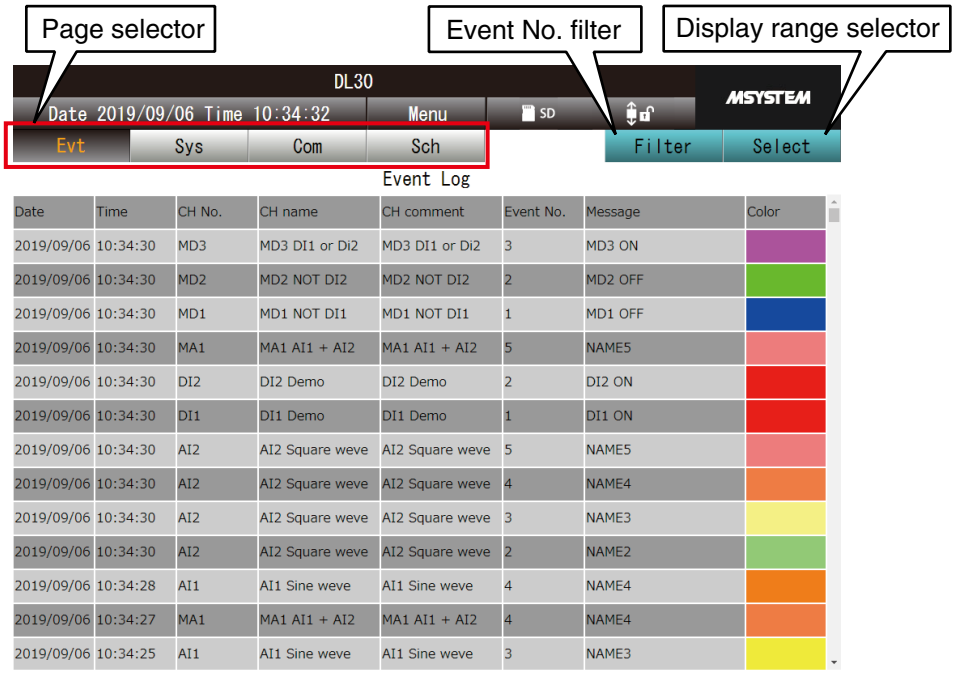
(4) Local calibration values are reset and the trend graphs return to their initial state.

4.4 Event summary

Click [Menu button Menu] and select [Event summary] to switch to the event summary view.

4.4.1 Event summary page contents

Up to 2000 events stored in the internal memory are displayed.



Date	Time	CH No.	CH name	CH comment	Event No.	Message	Color
2019/09/06	10:34:30	MD3	MD3 DI1 or Di2	MD3 DI1 or Di2	3	MD3 ON	
2019/09/06	10:34:30	MD2	MD2 NOT DI2	MD2 NOT DI2	2	MD2 OFF	
2019/09/06	10:34:30	MD1	MD1 NOT DI1	MD1 NOT DI1	1	MD1 OFF	
2019/09/06	10:34:30	MA1	MA1 AI1 + AI2	MA1 AI1 + AI2	5	NAME5	
2019/09/06	10:34:30	DI2	DI2 Demo	DI2 Demo	2	DI2 ON	
2019/09/06	10:34:30	DI1	DI1 Demo	DI1 Demo	1	DI1 ON	
2019/09/06	10:34:30	AI2	AI2 Square weve	AI2 Square weve	5	NAME5	
2019/09/06	10:34:30	AI2	AI2 Square weve	AI2 Square weve	4	NAME4	
2019/09/06	10:34:30	AI2	AI2 Square weve	AI2 Square weve	3	NAME3	
2019/09/06	10:34:30	AI2	AI2 Square weve	AI2 Square weve	2	NAME2	
2019/09/06	10:34:28	AI1	AI1 Sine weve	AI1 Sine weve	4	NAME4	
2019/09/06	10:34:27	MA1	MA1 AI1 + AI2	MA1 AI1 + AI2	4	NAME4	
2019/09/06	10:34:25	AI1	AI1 Sine weve	AI1 Sine weve	3	NAME3	

NOTES

The log type which was previously selected is displayed when Cookie is enabled.

4.4.2 Event summary operation

Switching pages

Click on one of the page selector buttons.

Evt	Event log
Sys	System log
Com	Communication log
Sch	Schedule log

Changing log history range

User can switch time span of the events displayed on the screen.

Click [Select Select] button to choose among [All events], [Today], and [Previous day].

Changing screen refresh rate

The refresh rate for the event summary pages can be specified between 0 and 999 seconds.
The screen is not updated when the value is set to 0.

(1) Click [Menu button Menu].

(2) Click [Screen refresh rate ] in the sub-menu.

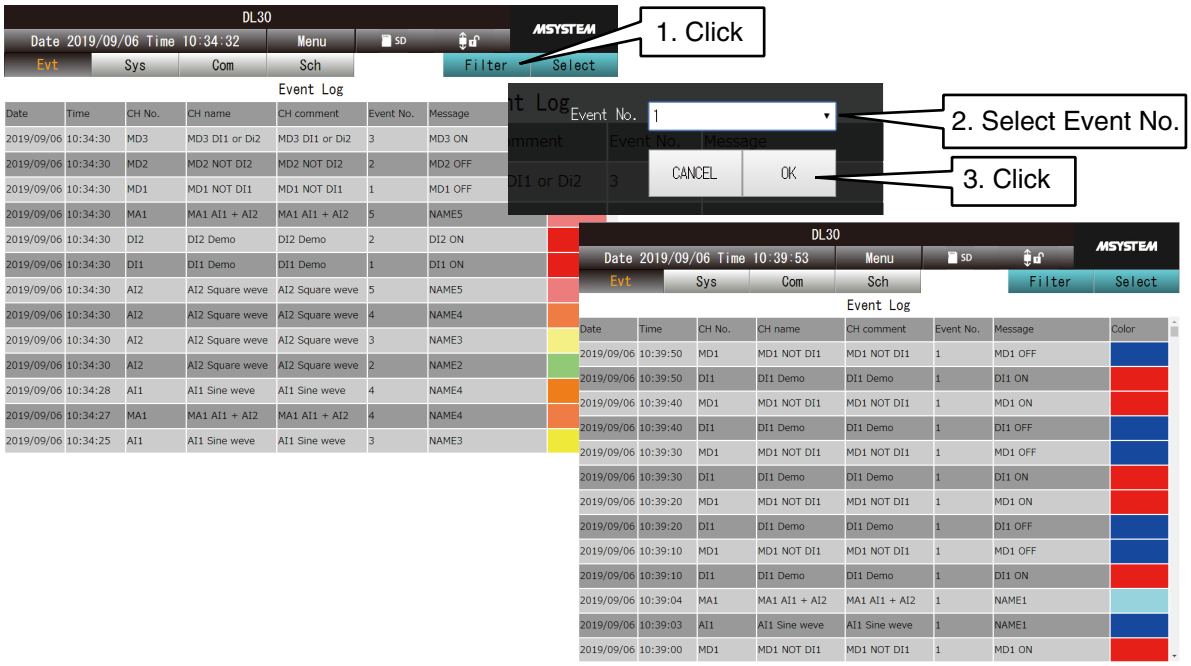
(3) Enter the auto refresh rate and click [OK].
The refresh rate of the event summary pages is changed.

Event No. filter

Event log data can be filtered by Event No.

(1) Click [Select Filter] button to display the [Event No. setting] dialog.

(2) Select Event No. and click [OK].

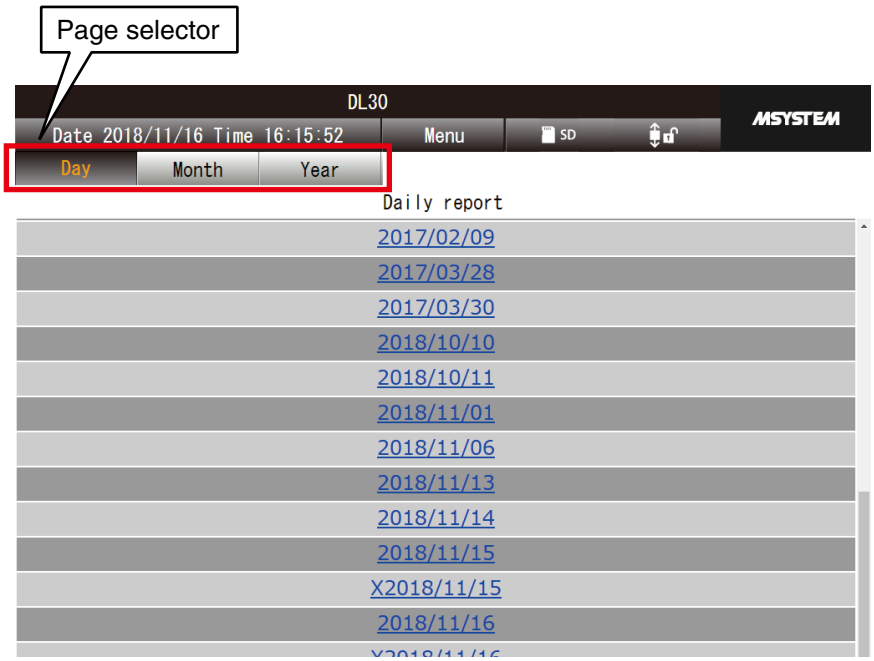


4.5 Report form

Click [Menu button Menu] and select [Report] to switch to the report form view.

4.5.1 Report form page contents

Report form data files stored in the internal memory are listed.



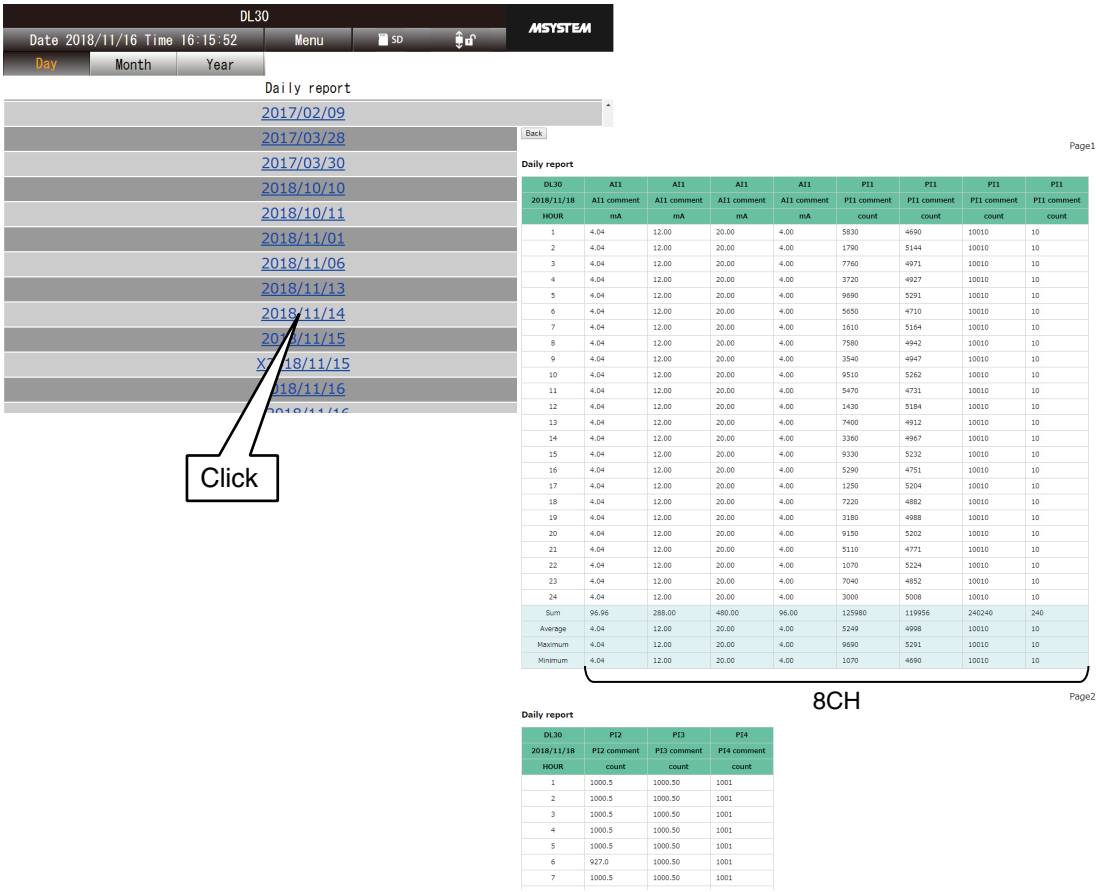
4.5.2 Report form operation

Switching pages

Click one of the page selector buttons: [Day] for the daily report; [Month] for the monthly report; and [Year] for the yearly report.

Opening a report form

Click on a desired date (year/month/date) in the list to open the report form data in a table form.
A maximum of 8 channels are displayed in one table (page) and the following channels are on the next pages.



NOTES

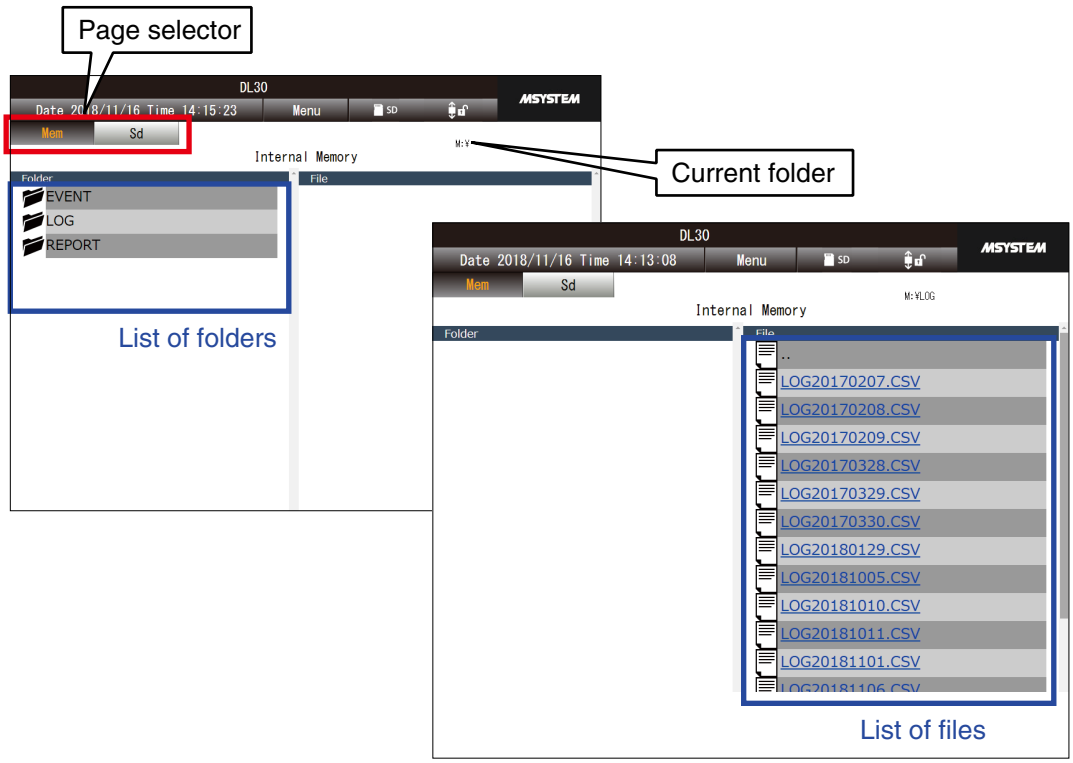
- If the report form setting is modified while a report file is still active, the file is saved and a new file is created for the new setting, named with “X” at the beginning of the data name.
- If the time index of sampling data is no longer continuous due to time adjustment, a new file is created and named with “X” at the beginning of the data name.

4.6 Data file download

Click [Menu button Menu] and select [Download] to switch to the [Download] window.

4.6.1 Download page contents

Data files stored in the internal memory and the SD card are listed.
Folders are listed in the left half of the window, and files are listed in the right half of the window.



NOTES

Refer to [8.2.5 Data file configurations] for more information about file names and folder structures.

4.6.2 Download operation

Switching pages

Click one of the page selector buttons: [Mem] for the internal memory; and [Sd] for the SD card.

Choosing/downloading files

Switch the folders to locate a file to download.

To show the content (files) of a folder under the current directory:

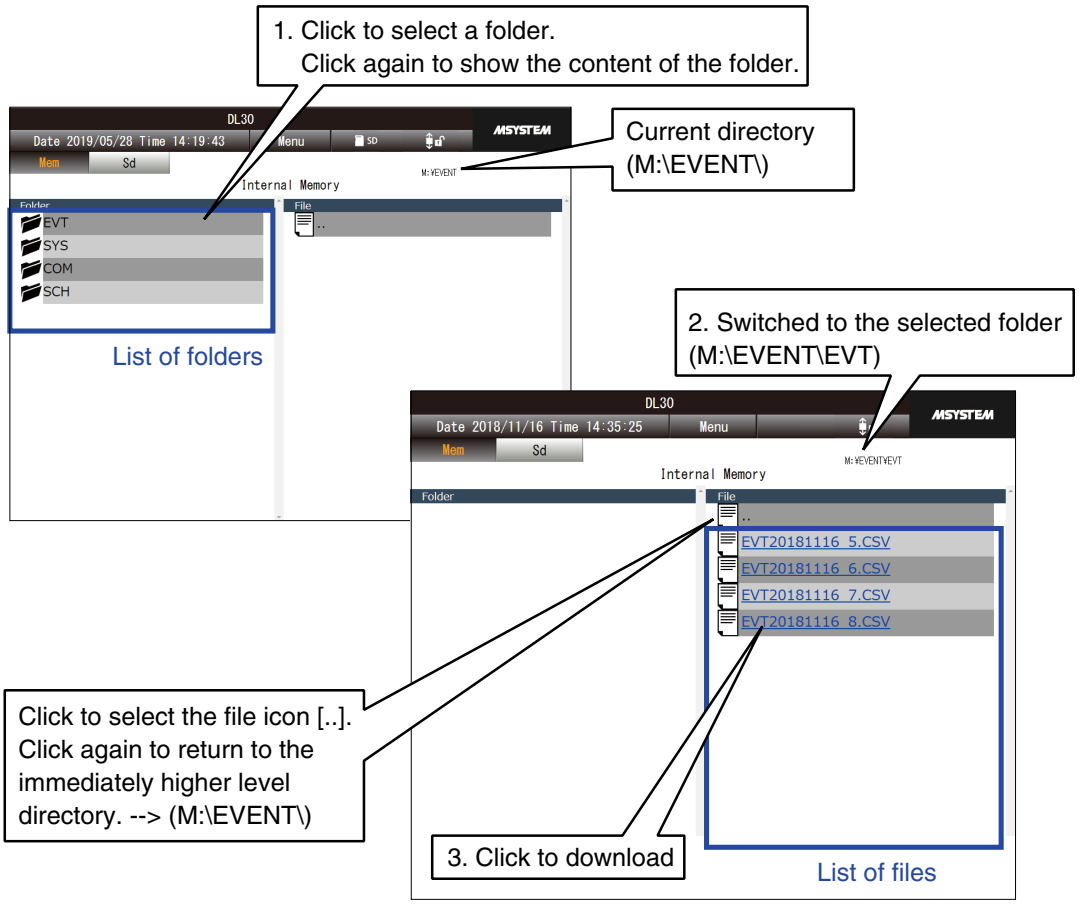
Click to select a desired folder from the folder list in the left window area.
Click the folder again to show a list of files in the folder in the right window area.

To show the content (folders and files) at an upper level of the current directory:

Click the file icon [..] at the top of the right window area.
Click the icon again to move to a higher level directory.

To download a file:

Once the file for downloading is located, click the file name to start downloading.



NOTES

If you click a blank space in a file name row, the target file is selected but not downloaded.

Deleting files

Data can be deleted from the [Maintenance] menu.
Data in the internal memory cannot be deleted.

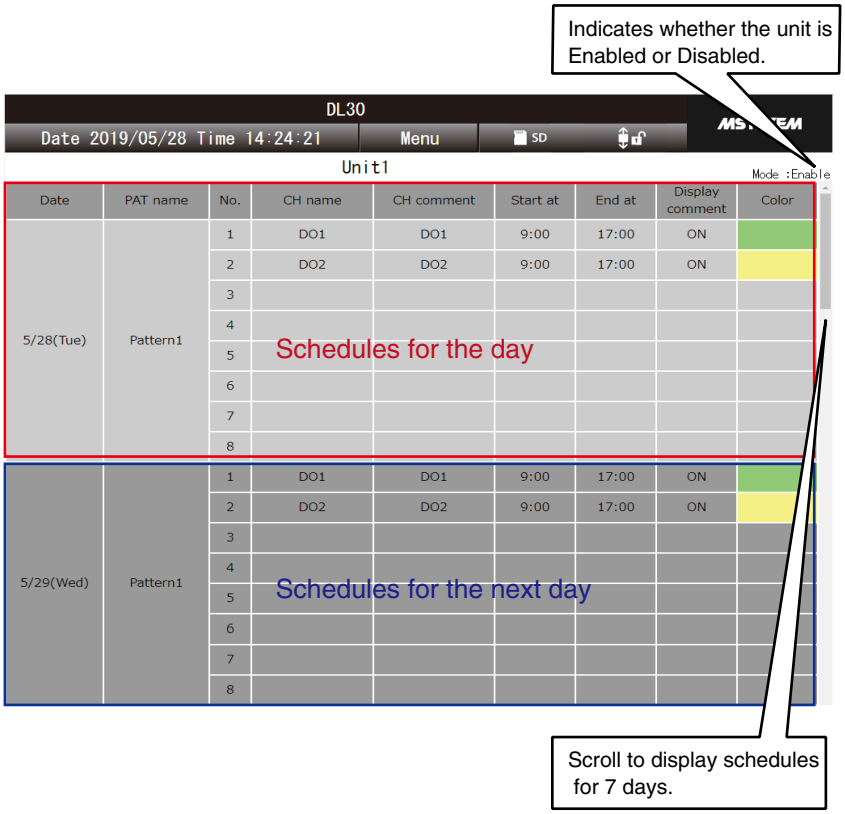
➔ 6.2.2 Maintenance menu (Web) > Downloading/deleting SD card files

4.7 Schedule

Click [Menu button Menu] and select [Schedule] to display the [Schedule] menu.

4.7.1 Display contents

Schedules for 7 days including the current day are displayed.
Schedules of the current day are always listed on the top, followed by those of the 2nd day, 3rd day....7th day in order.

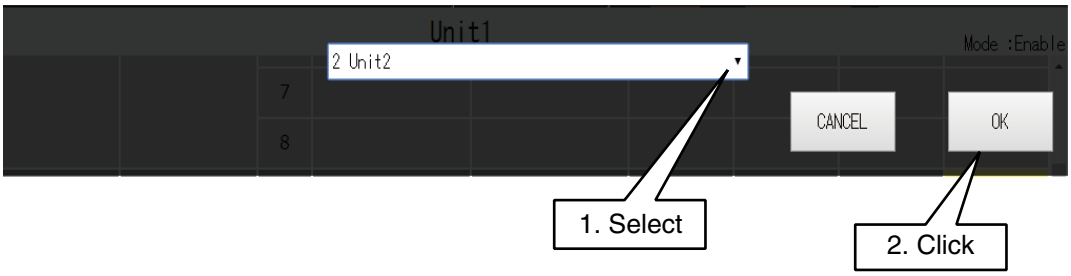


NOTES

- 'Display comment' and 'Color' indicated on this screen reflect results of OR operation of schedule output, operation output, and alarm output at the current time.
  ➔ 3.6.6 Digital function register (MD) > Control on Web browser (MD)
  ➔ 3.6.8 Discrete output (DO) > Control on browser (DO)
  ➔ 3.6.9 Grouped digital output (GDO) > Control on browser (GDO)
- The patterns displayed on the [Schedule] view can be changed from the web browser (➔ 4.7.3 One-time schedule, ➔ 4.7.4 Permanent schedule) or from DL30GCFG
  ➔ 6.1 Maintenance on DL30GCFG > One-time schedule assignment,
  ➔ 6.1 Maintenance on DL30GCFG > Permanent schedule assignment).
- Channels to operate and start/end time can be changed from the web maintenance menu (➔ 4.9.4 Pattern setting) or DL30GCFG (➔ 3.13 Scheduling function setting).
- For details of specifications of the scheduling function, see [8.2.11 Schedule].

4.7.2 Selecting units

Menu] on the [Schedule] menu, and select [Select unit] to display the [Select unit] dialog. Select the unit to operate, and click [OK].



4.7.3 One-time schedule

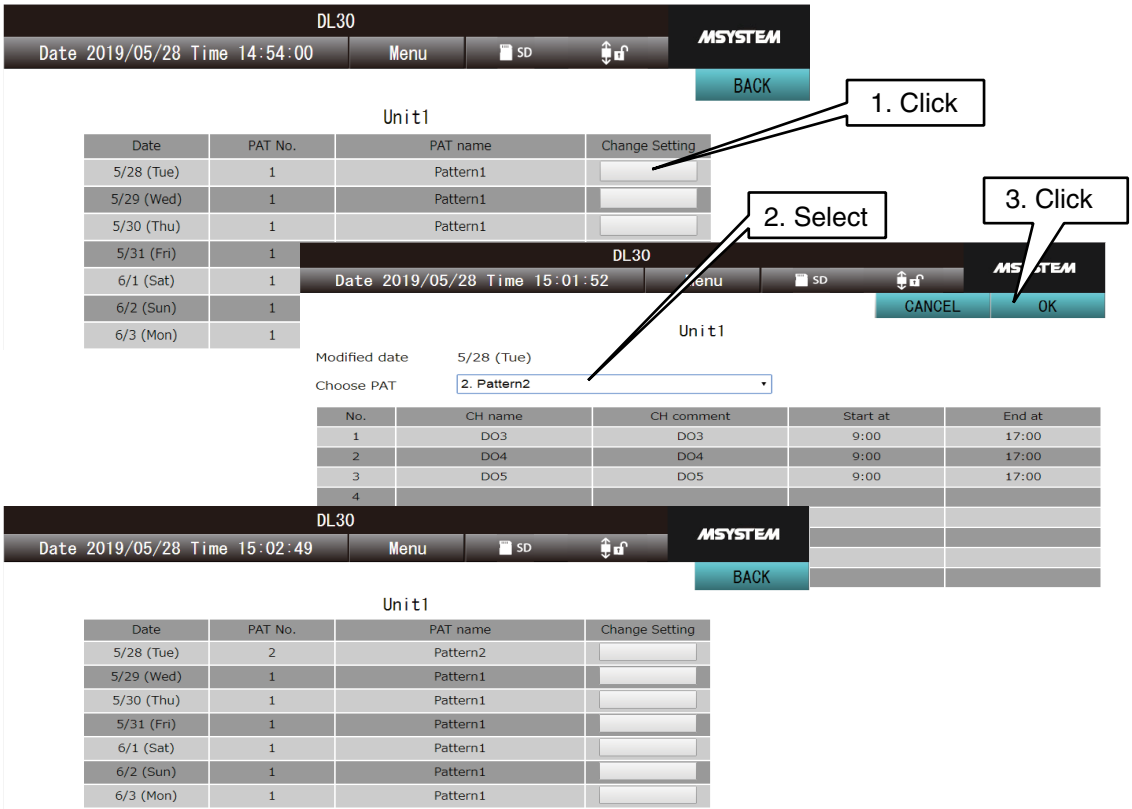
Schedule patterns of the currently displayed schedule unit for one week from the current day can be changed. The change is applied only once.

(1) Click [Menu button Menu] on the [Schedule] menu and select [One-time schedule] to display the [One-time schedule setting] screen.

(2) Click [Change Setting] button of the pattern of the day to change, to display the [Select pattern] screen.

(3) Select a pattern to which to change.

(4) Click [OK].



NOTES

- For details of the specifications of the scheduling function, see [8.2.11 Schedule].
- The user cannot use the one-time schedule function if the corresponding schedule unit is not selected in the [Schedule unit control function setting] window for the ID currently logged in the web server.
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)

4.7.4 Permanent schedule

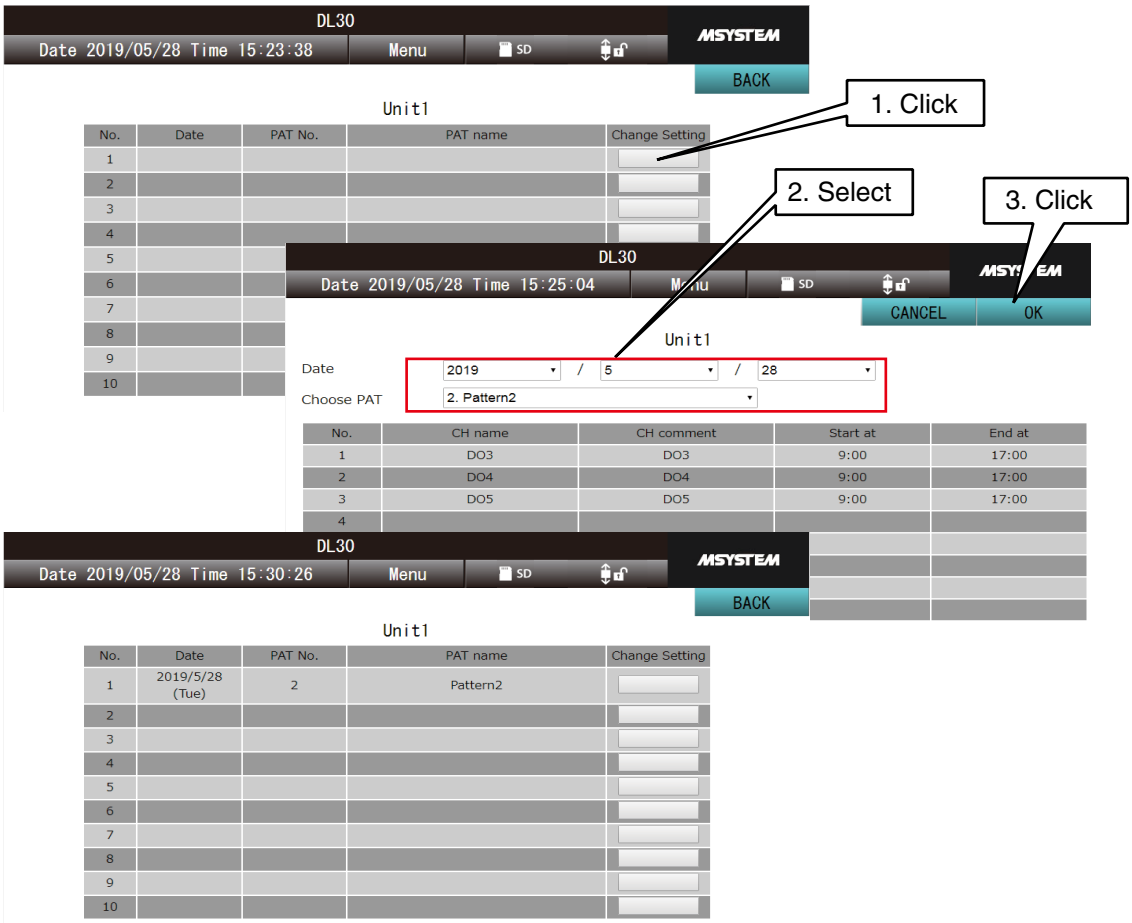
Schedule patterns which are valid only for specific dates can be set for the currently displayed schedule unit. Specify year, month, date, and a pattern to register up to 10 patterns.

(1) Click [Menu button Menu] on the [Schedule] menu and select [Permanent schedule] to display the [Permanent schedule setting] screen.

(2) Click [Change Setting] button of the pattern No. to change to display the [Select pattern] screen.

(3) Specify year, month, and date, and select a pattern to which to change.

(4) Click [OK].



NOTES

- To delete the registered pattern, select 'None' and register.
- For details of the specifications of the scheduling function, see [8.2.11 Schedule].
- Schedules in the past date are also displayed, and available for reuse by changing the pattern and/or date on the [Select pattern] screen.
- The user cannot use the permanent schedule function if the corresponding schedule unit is not selected in the [Schedule unit control function setting] window for the ID currently logged in the web server. ➔ 3.11.4 Login ID / password / port address setting (web browser access)

4.7.5 Output type maintenance

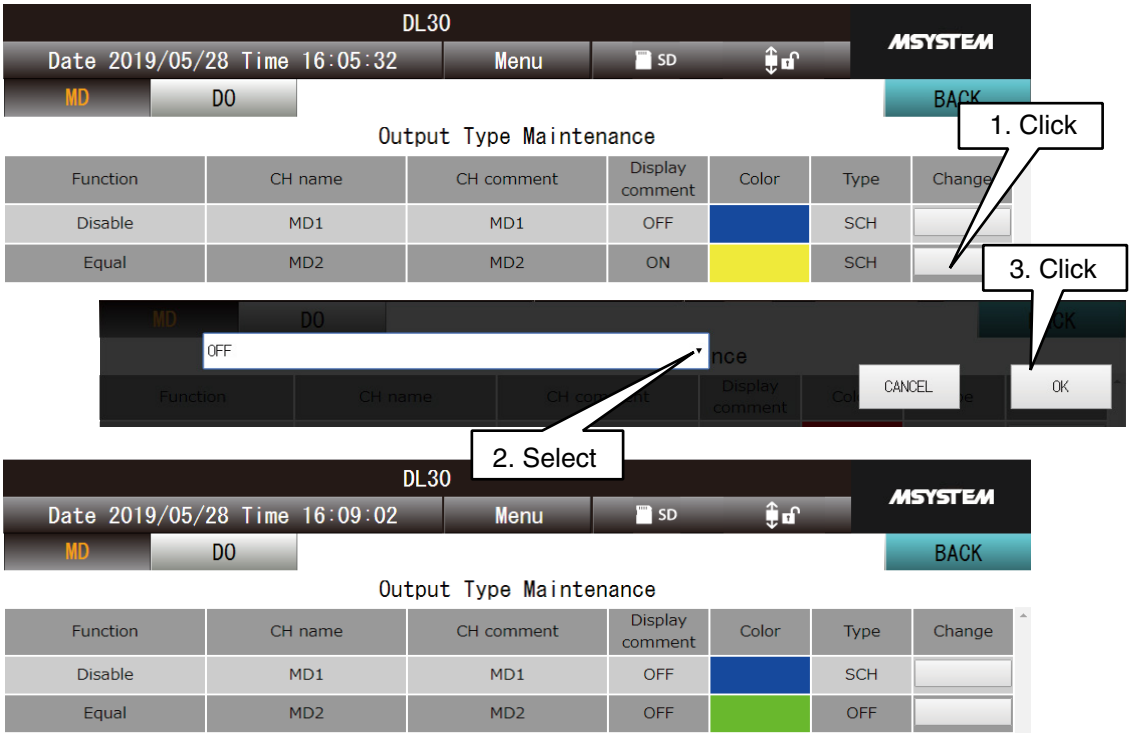
ON/OFF of the DO or MD channel selected for schedule output can be manually changed.

(1) Click [Menu button Menu] on the [Schedule] menu and select [Output type maintenance] to display the [Output type maintenance] screen.

(2) Click [Change] button of the channel to change to display the [Output change] dialog.

(3) Select the output type from SCH (schedule output), ON, and OFF.

(4) Click [OK].



NOTES

- The user cannot operate the output type if the corresponding channel is not selected in the [Channel control function setting] window.
  ➔ 3.11.4 Login ID / password / port address setting (web browser access)
- The login ID and password for accessing via network with DL30GCFG allows the user to manipulate outputs of all the channels.
  ➔ 3.3.4 Enabling configuration via network (remote access authorization)
- Even when the output type is set to OFF, the channel is turned ON when the control output or alarm output of the corresponding channel is set to ON.

4.8 Process operation monitor

4.8.1 Display contents

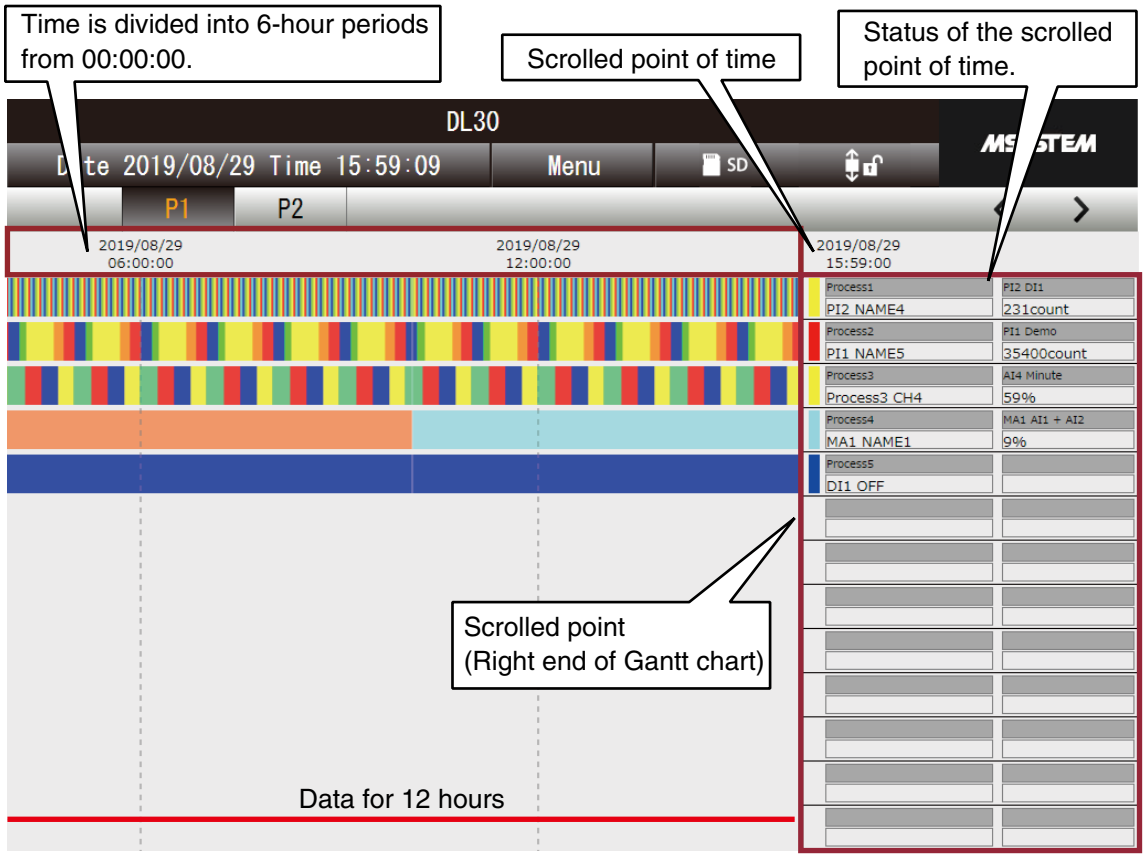
Click [Menu button Menu] and select [Proc. Op. Monitor] to display Gantt chart or Andon screen.

Click [Menu button Menu] on the [Process Operation Monitor] and select [Gantt chart] or [Andon screen] to switch between Gantt chart and Andon screen.

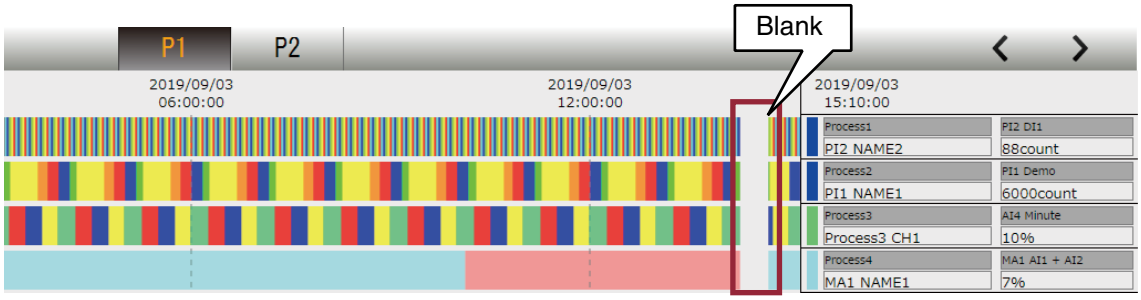
When the screen returns to the [Process Operation Monitor] from another menu, Gantt chart or Andon screen, whichever was displayed last, will be displayed.

Gantt chart

The status history of channels set for operation process can be monitored with Gantt chart and digital display.
➔ 3.14.1 Process operation monitor setting
A maximum of 16 processes are displayed per page, and no chart will be displayed if no process is set.
The chart is read from left to right, showing the oldest data at the left end and the latest data at the right end.
Data for 12 hours are displayed per page and data for 48 hours are available to be displayed by scrolling.



When a part of data is missing due to power failure or time adjustment, the corresponding part of the Gantt chart will be blank.



NOTES

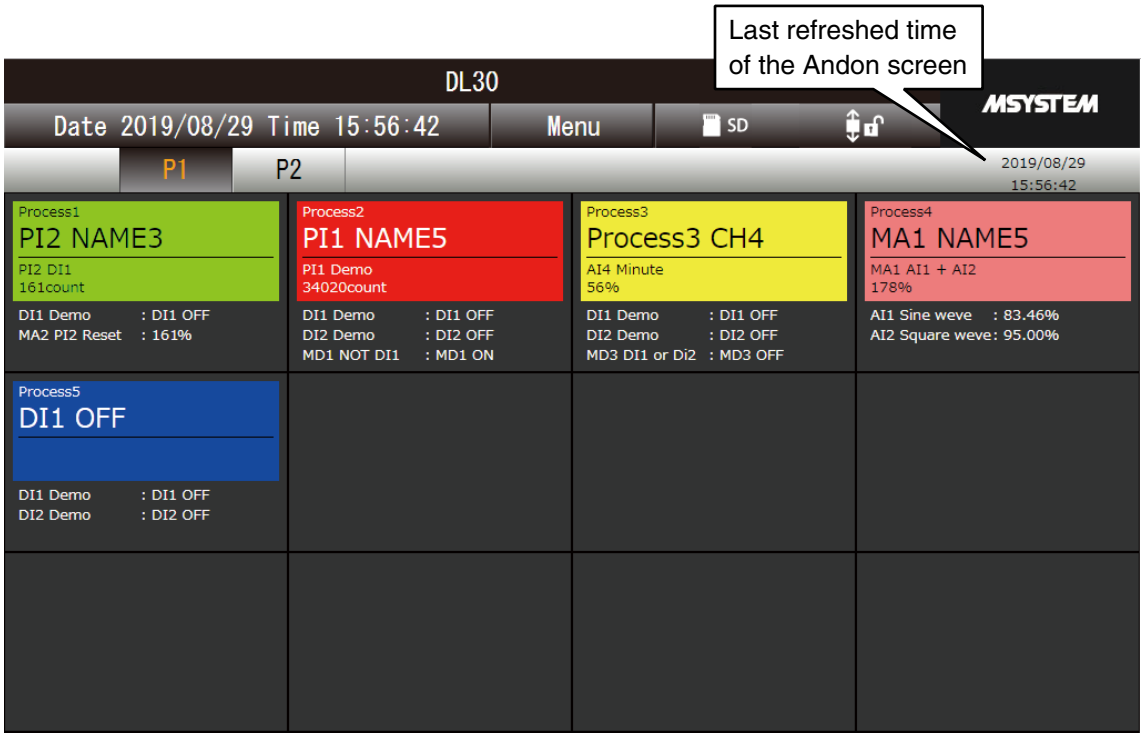
- Process operation data is sampled every minute when the clock data of the DL30-G is 00 seconds while the Gantt chart screen is refreshed every 10 seconds.
  Thus, timing of update of the process operation data may be shifted from the current time shown at the menu bar of the DL30-G web page.

Andon screen

Andon screen shows the current status of channels set for operation process, respectively with colors and digital display. The status is updated every second.

➔ 3.14.1 Process operation monitor setting

A maximum of 16 processes are displayed per page, and sections with no processes assigned will be blank.



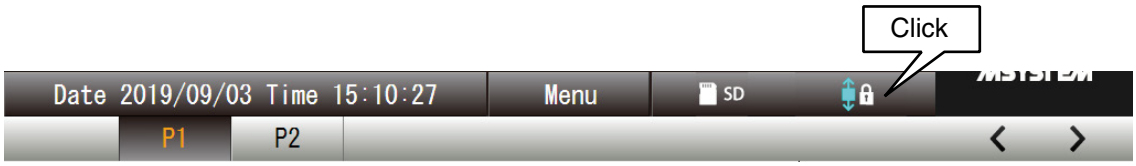
4.8.2 Operations

Switching pages

Each of Gantt chart and Andon screen consists of 2 pages.
Click one of the page selector buttons (P1, P2) to switch between pages.

Locking the screen

Click the Screen lock indicator to lock the screen such that the screen will not be refreshed.

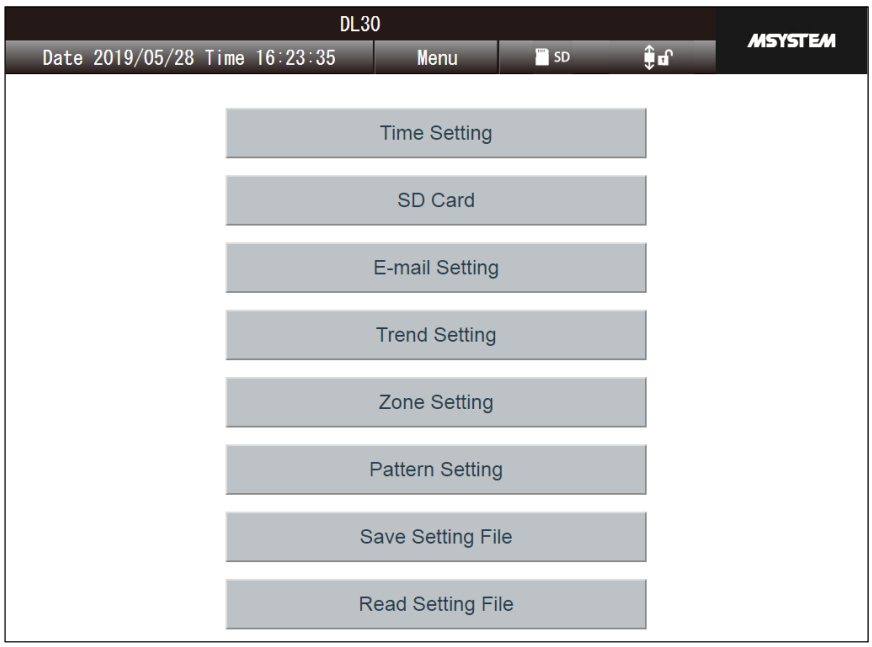


Gantt chart history

Click the [<] or [>] button to scroll the Gantt chart history by 1 minute.

4.9 Setting change on browser

Click [Menu button Menu] and select [Maintenance] to display the [Maintenance] menu.
Some of the parameters can be changed using the menu.



NOTES

The login ID and password authorizing access to the device via network by DL30GCFG are required to change setting on the browser.
➔ 3.3.4 Enabling configuration via network (remote access authorization)

CAUTION

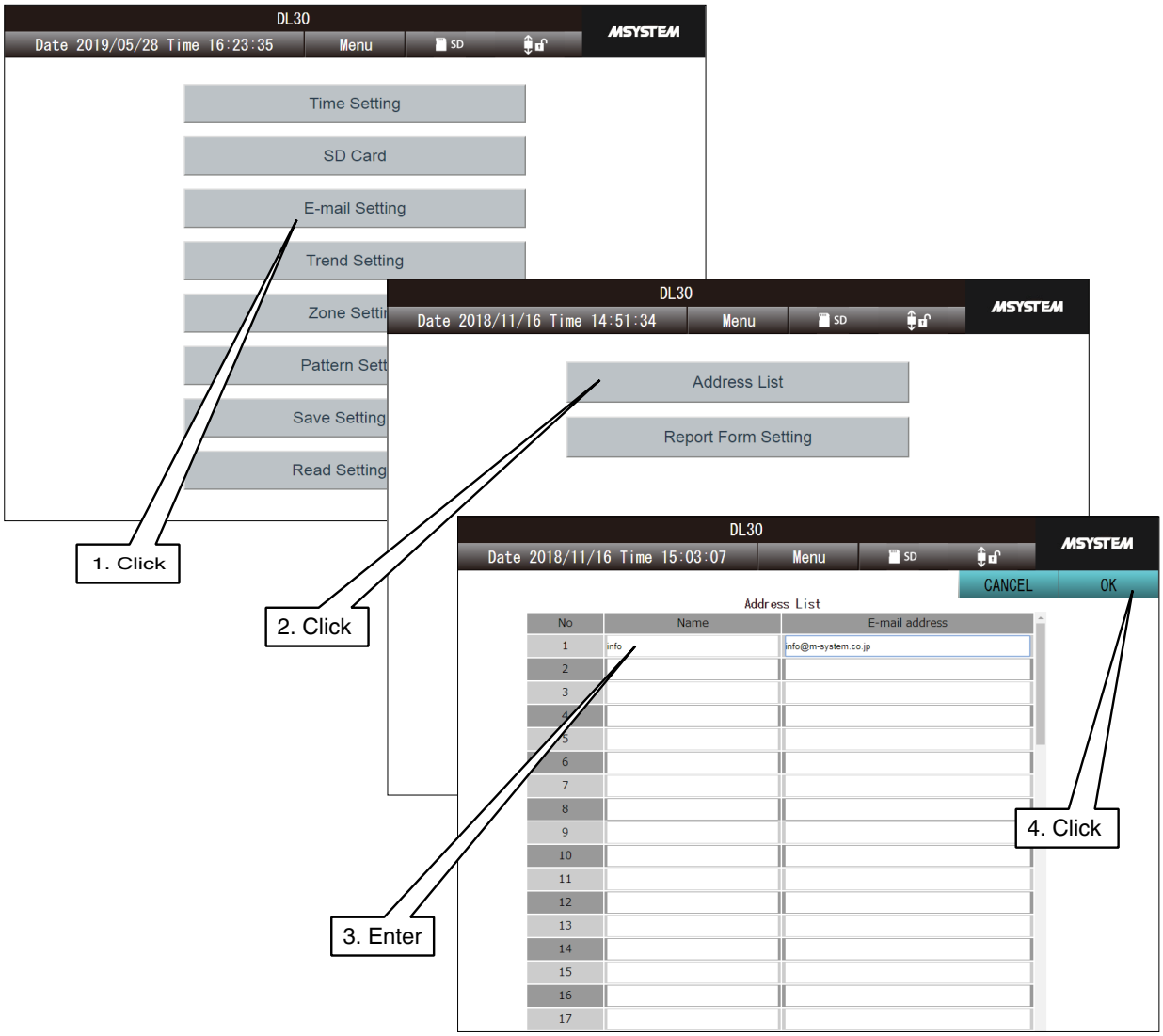
Some browsers such as Google Chrome and Firefox may display check boxes such as [Do not generate any more dialog boxes], or [Suppress additional dialog display], but DO NOT select these options. If it is selected, subsequent dialogs are not displayed, and this also prevents the operation which requires display of the confirmation dialog.
➔ 8.1.10 Web server

4.9.1 E-mail setting

The address list and the mail templates for mail reporting can be edited on the browser.

Address list setting

(1) Click [E-mail setting] button in the [Maintenance] menu to open the [E-mail setting] window.
(2) Click [Address list] button to open the address list.
(3) Enter the [Name] and [E-mail address].
(4) Once all the changes are complete, click [OK].



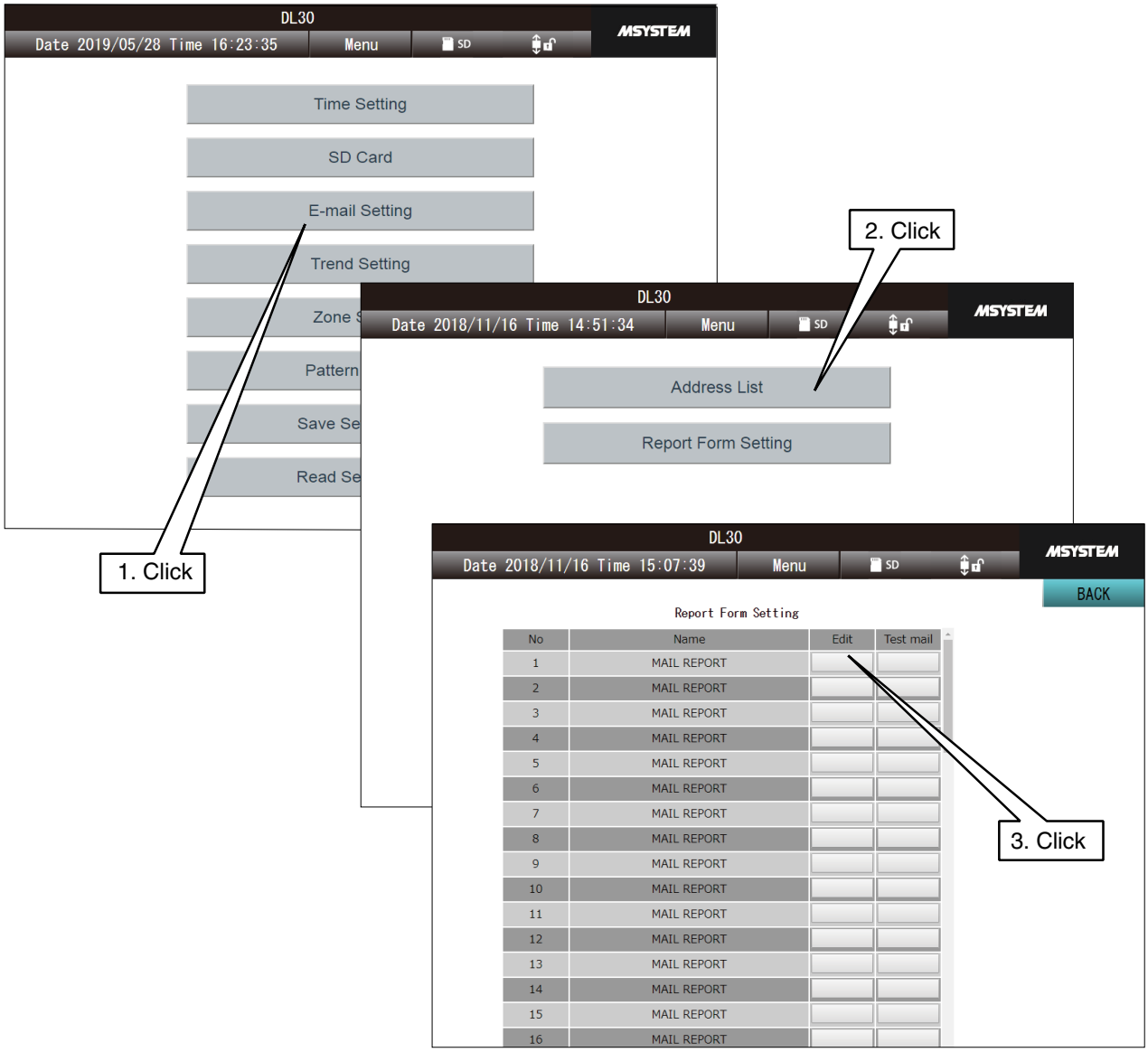
(5) Click [OK] when a message dialog "Are you sure to save the list?" appears on the window.
(6) After the setting has been successfully applied, a message dialog [Completed] appears.
Click [OK] to return to the [E-mail setting] window.

Mail template setting

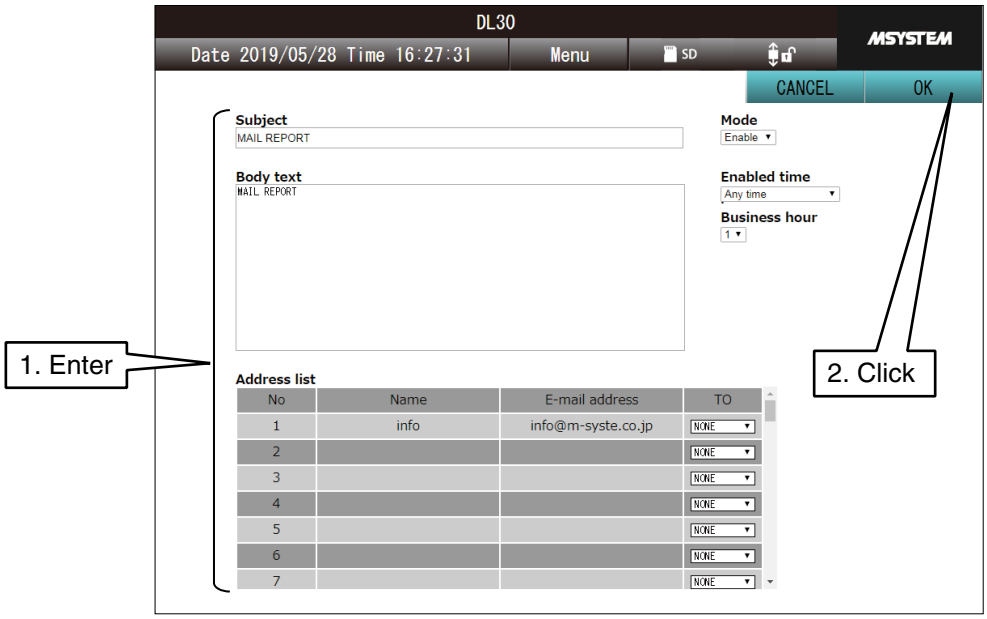
(1) Click [E-mail Setting] button in the [Maintenance] menu to open the [E-mail setting] window.

(2) Click [Report Form setting] (= Mail template setting in DL30GCFG) button to display the [Report Form Setting] window.

(3) Click [Edit] button to the right of the template to be modified.



(4) Mail template is displayed.
Set the [Subject, Body text, Mode, Enabled time, and Address list].



Parameter	Description
Subject	Specify the mail subject within 32 characters.
Body text	Specify the main text of the mail within 256 characters. Specific variables can be contained in the message using the original html tags. Note that the text containing the original html tags and the text after conversion must be within 256 characters. ➔ 3.10.2 Mail template setting > Original html tag
Address list	The predefined recipients are listed. Select [To] to send the mail.
Mode	The mail is not sent if the mode is set as [Disable].
Enabled time period	E-mail reporting is enabled or disabled during specific days or hours. Specify when the mail sending is permitted among the following selections: All times / Business day / Non-business day / Within business hours / Out of business hours / Non-business hours / Pause. The definition of each filter is set by the [E-mailing calendar]. ➔ 3.10.5 E-mailing calendar
Business hour	Select Business hour No. 'Business hours' can be set once 'Within business hours' and 'Out of business hours' are set in the [Enabled time period] setting. ➔ 3.10.5 E-mailing calendar

(5) Once all the changes are complete, click [OK].
Click [OK] when a message dialog to confirm the setting appears on the window.

(6) After the setting are reflected, a message dialog [Completed] is displayed.
Click [OK] to return to the [Report Form setting] window.

CAUTION

- When the [Mode] is disabled, the relevant event and regular report settings are also changed accordingly. For temporarily disabling a particular mailing function while maintaining the setting itself, set [Enabled time period] as [Pause].
- When the [Mode] is disabled, the test mailing function is also disabled.

Test mail

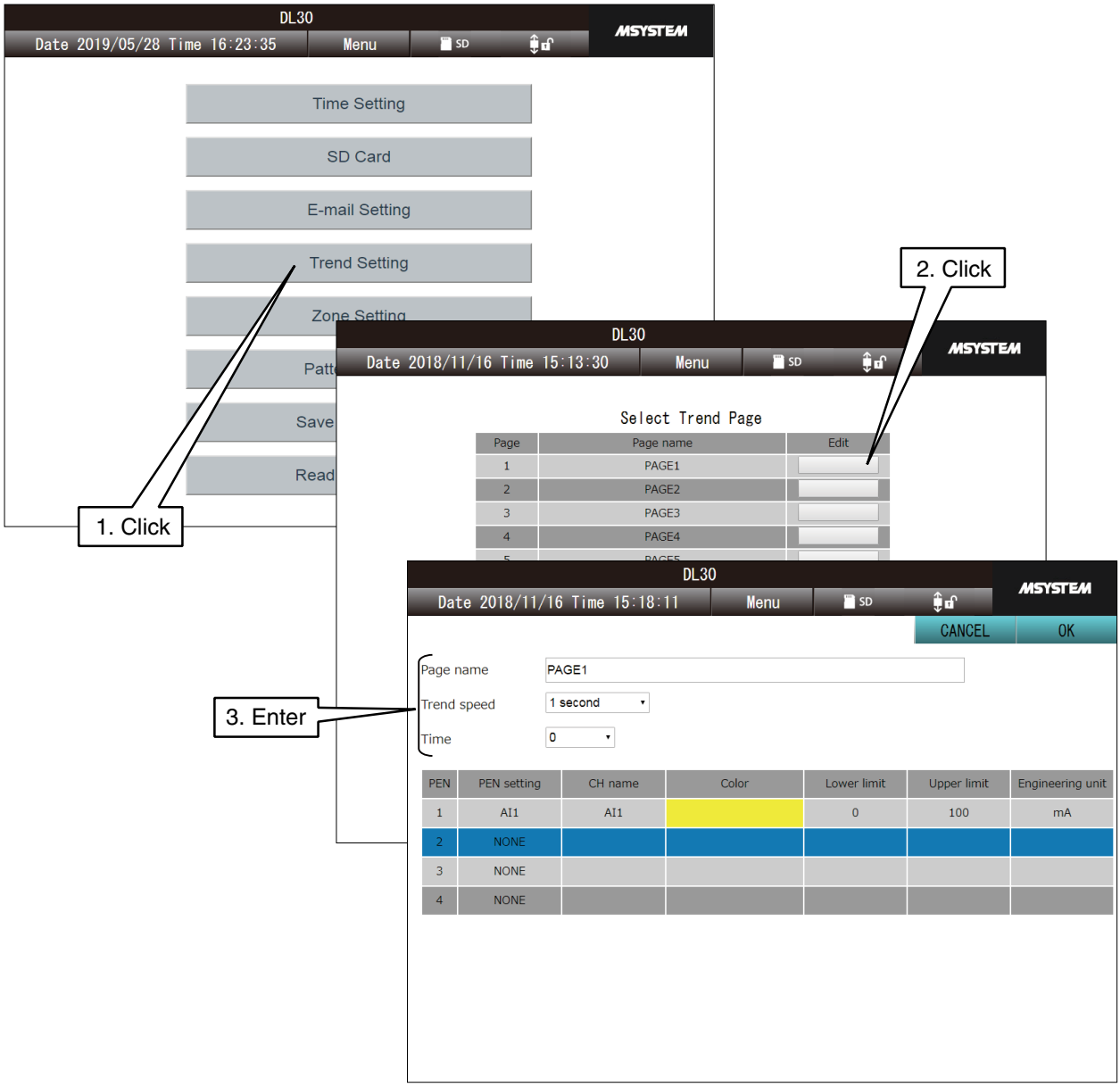
A test mail can be sent from the [Report Form setting] window.
Click [Test mail] button of the mail template for testing.
➔ 6.2.2 Maintenance menu (Web) > Test mail

4.9.2 Trend page setting

(1) Click [Trend Setting] button in the [Maintenance] menu to display the [Select Trend Page] window.

(2) Click [Edit] button to the right of the page to be modified to display the [Trend Page setting] window.

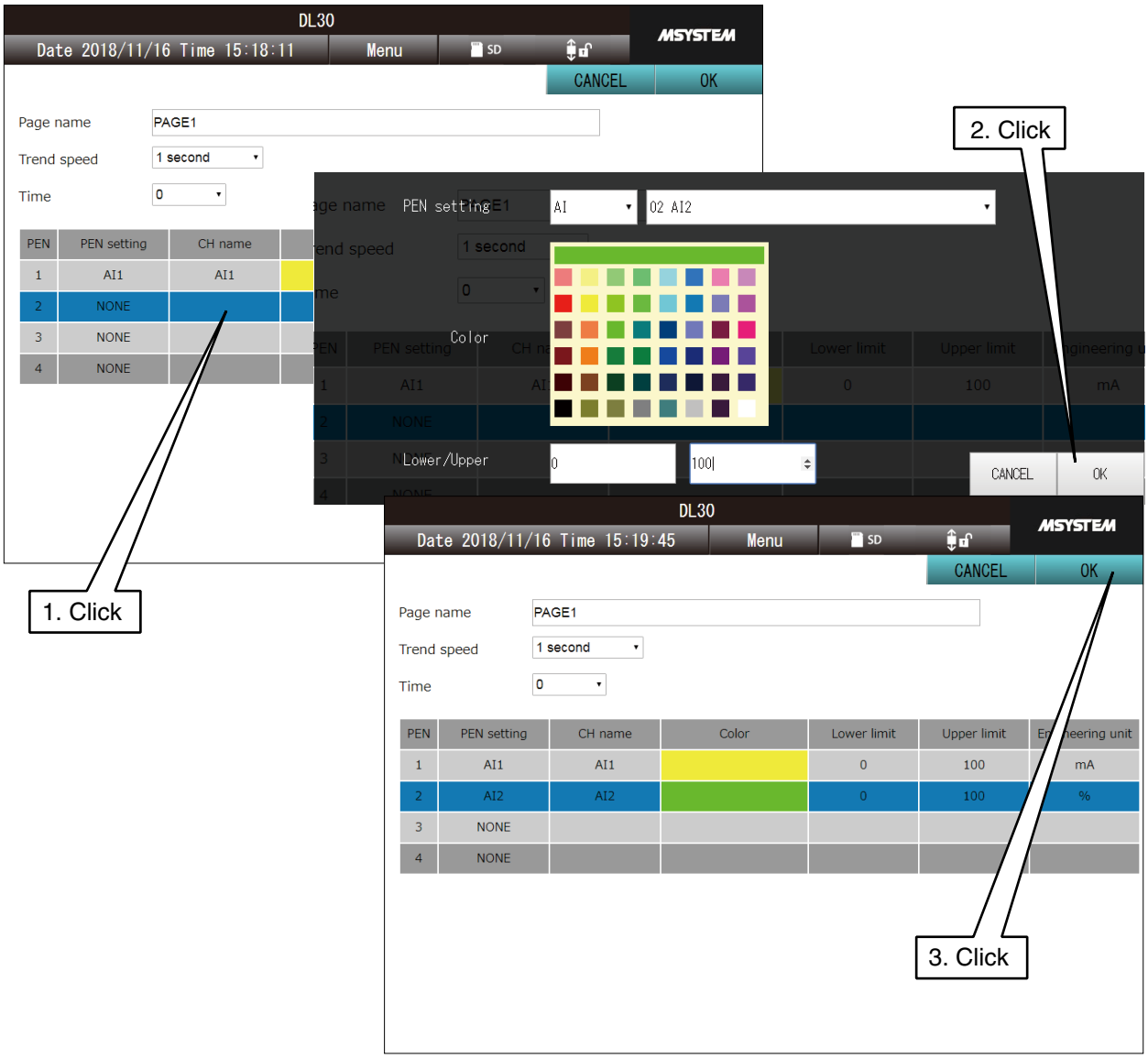
(3) Enter the [Page name] and other settings.



(4) To change PEN setting, click PEN No. in the list.
The selected row is indicated in blue color.

(5) Click the selected PEN No. again to display the [PEN setting] dialog.
Apply necessary changes to the pen assignment, color, and other settings.
Click [OK] and return to the [Trend Page setting] window.

(6) Click [OK] and a message dialog “Saving setting?” appears on the window.
Click [OK].



(7) After the setting has been successfully applied, a message dialog [Completed] appears.
Click [OK].

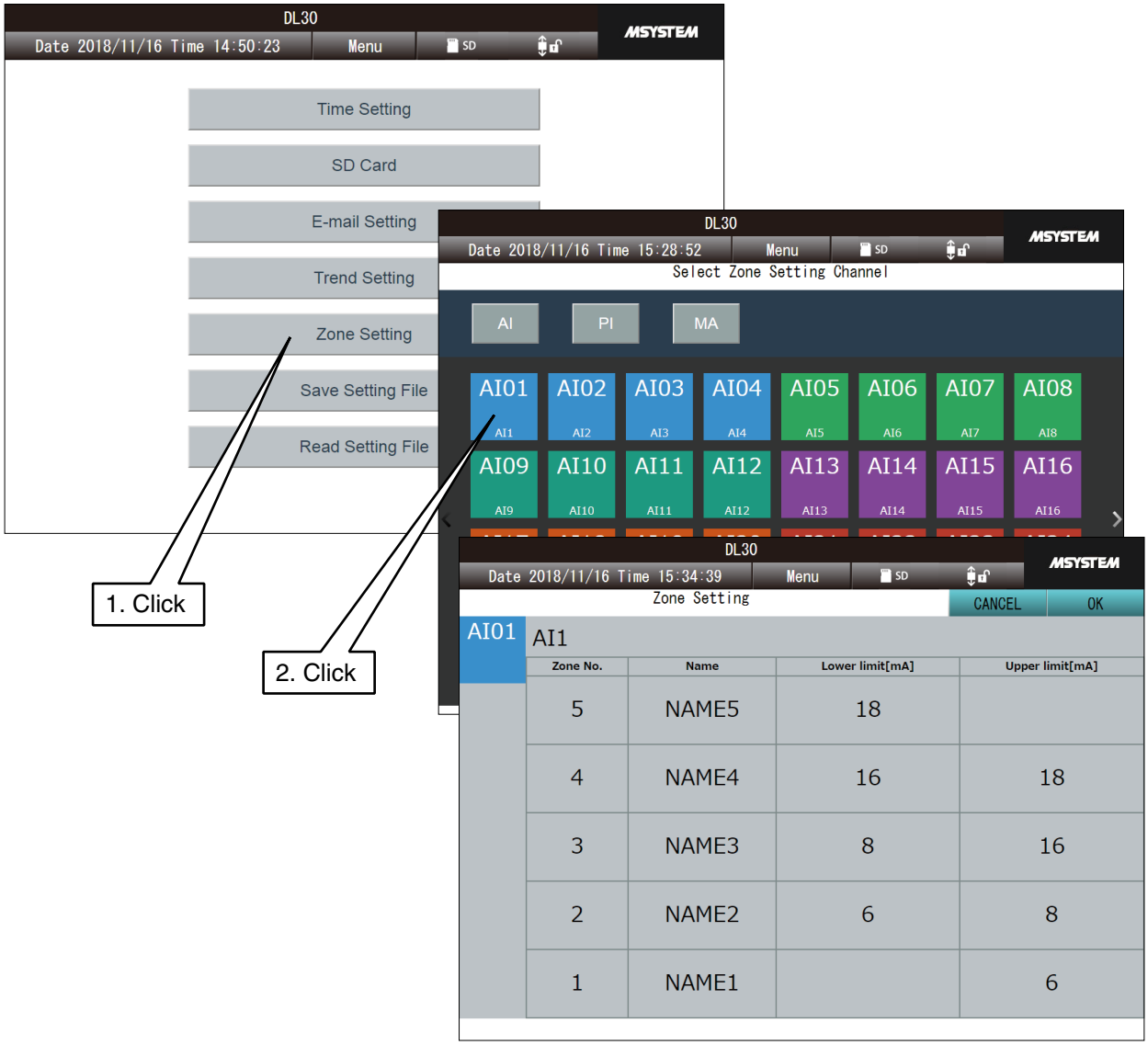
(8) Click [CANCEL] button to return to the [Trend page setting] window.

4.9.3 Alarm zone setting

(1) Click [Zone setting] button in the [Maintenance] menu to display the [Select Zone Setting Channel] window.

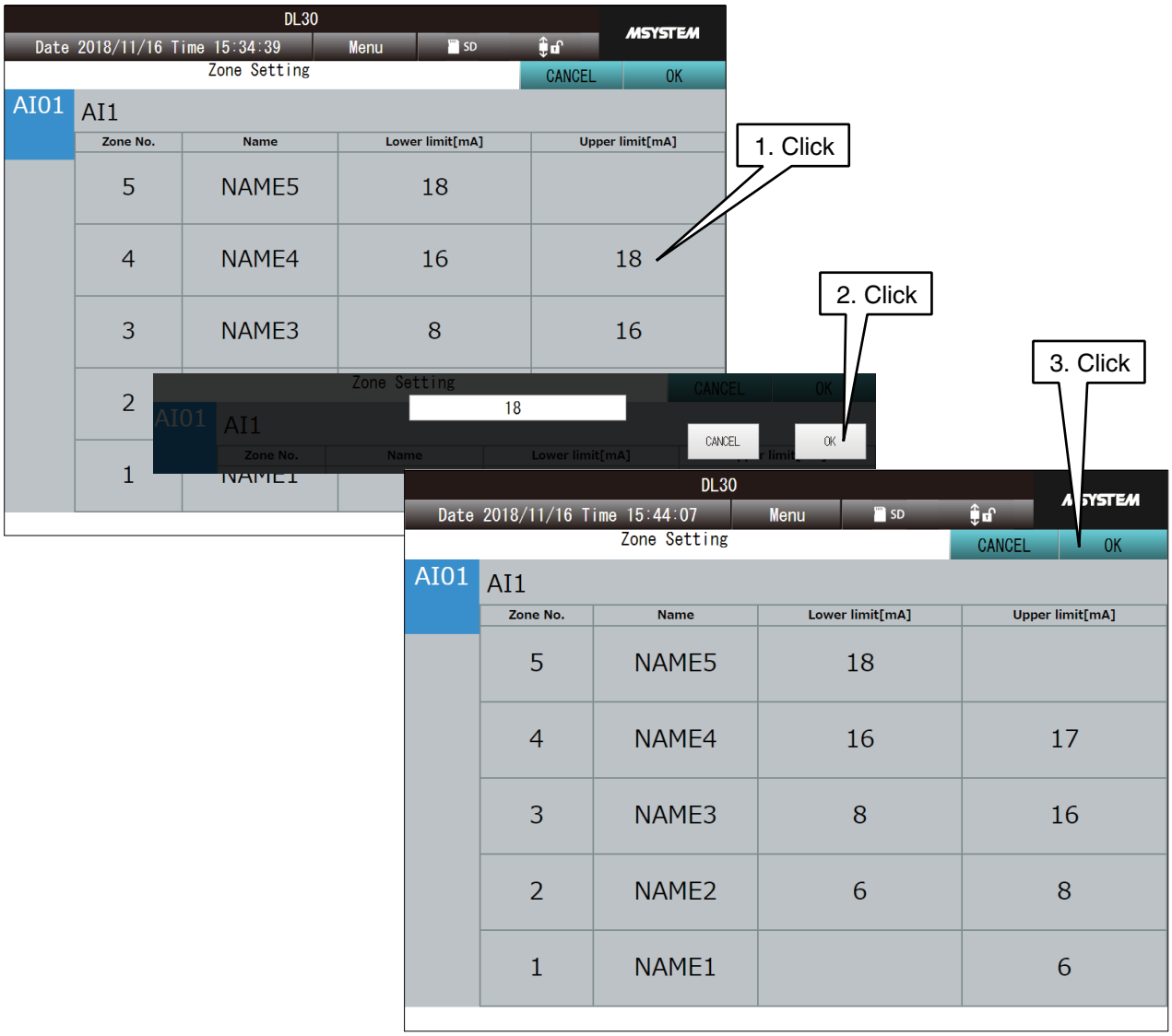
(2) Switch the signal type, if necessary, by clicking the signal type button at the top left of the window. Choose a channel.

(3) The [Zone Setting] window is displayed.



(4) Click a cell for the Lower limit or Upper limit to be changed to display the setting change dialog.
Enter a new value in engineering unit and click [OK].

(5) Once all relevant cells are changed, click [OK] and a message dialog “Saving setting?” appears on the window.
Click [OK].



(6) After the setting has been successfully applied, a message dialog [Completed] appears.
Click [OK].

CAUTION

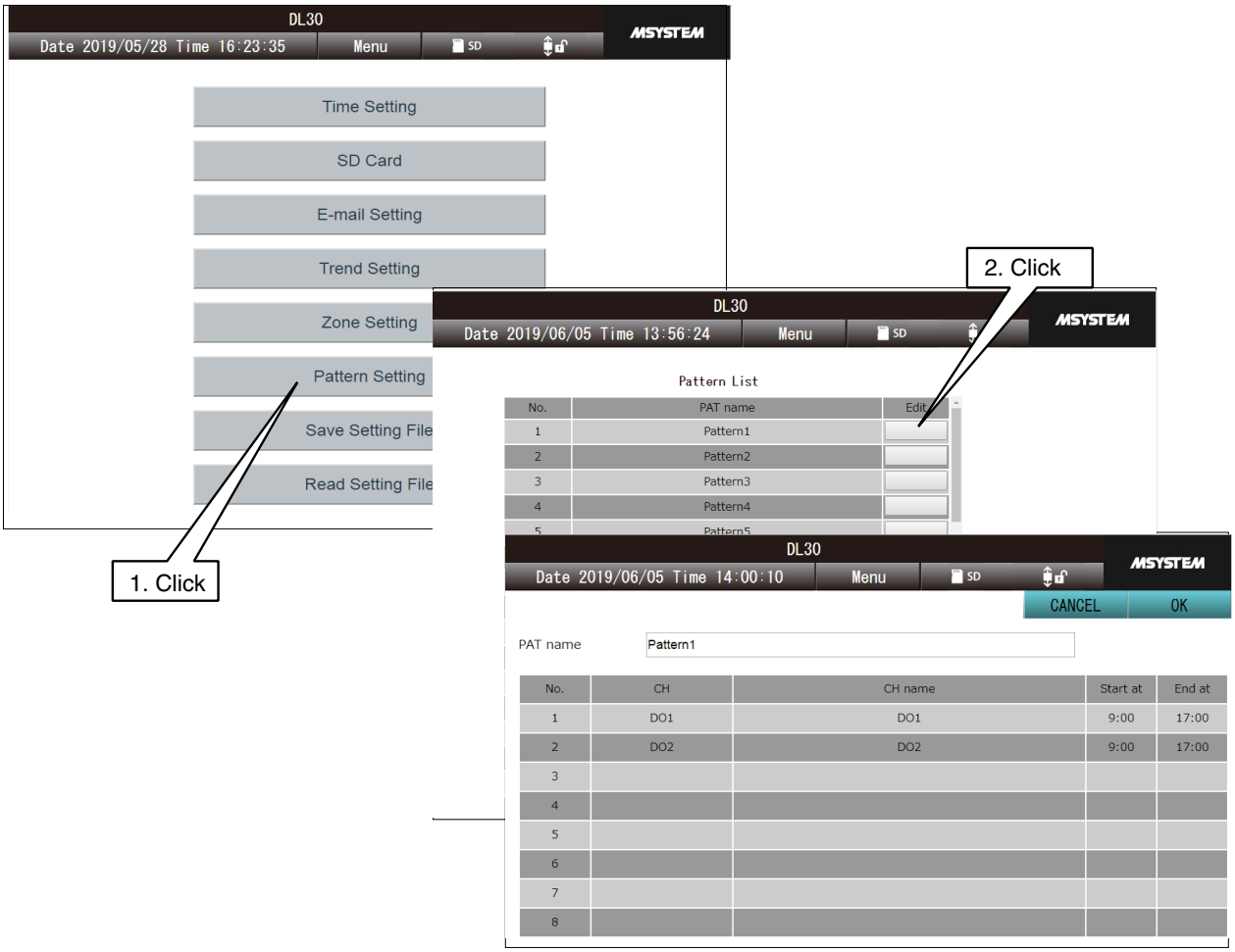
Zone names cannot be changed on the web browser. Use the DL30GCFG.

4.9.4 Pattern setting

Schedule patterns displayed on the [Schedule] menu can be changed. ➔ 4.7 Schedule

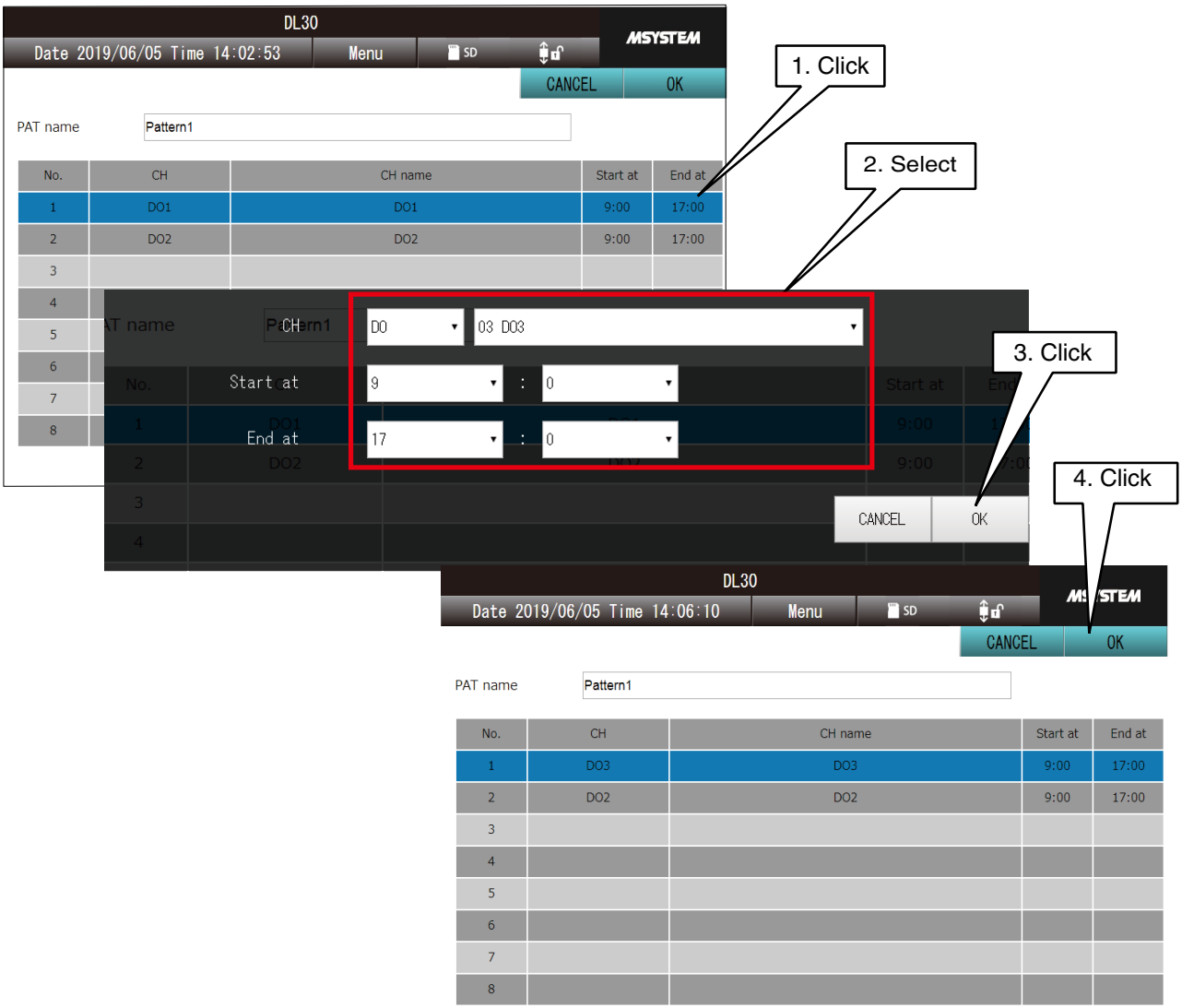
(1) Click [Pattern Setting] button in the [Maintenance] menu to display the [Pattern List].

(2) Click [Edit] button of the pattern to change to display the [Pattern] screen.



(3) Click the row of the channel to change to display the [Schedule Output setting] dialog. Select each parameter and click [OK].

(4) Click [OK] on the [Pattern] screen to apply the change.

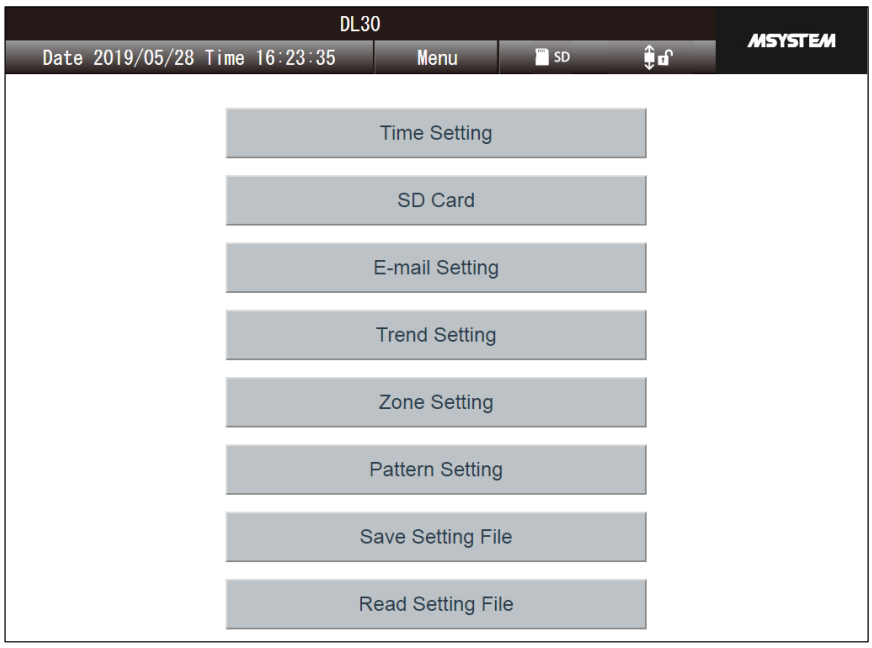


NOTES

- For details of the specifications of the scheduling function, see [8.2.11 Schedule].

4.10 Maintenance

Click the [Menu button Menu] and select [Maintenance] to display the [Maintenance] menu.



For details, see [6.2 Maintenance on Web browser].

4.11 User defined web browser view

User is allowed to freely create Web screens Using HTML or JavaScript.

Access [http://<DL30G-IP address>/user/<content file name>] from the browser to show the user defined windows.

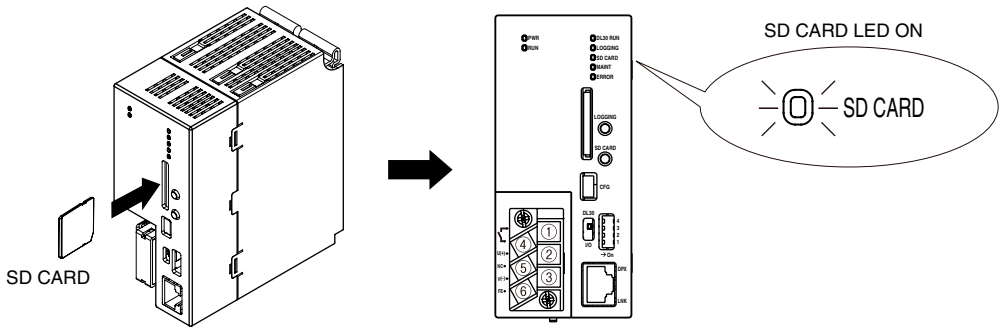
See [7. User defined browser view] for detailed information.

5. Unit operation

5.1 SD card

Inserting SD card

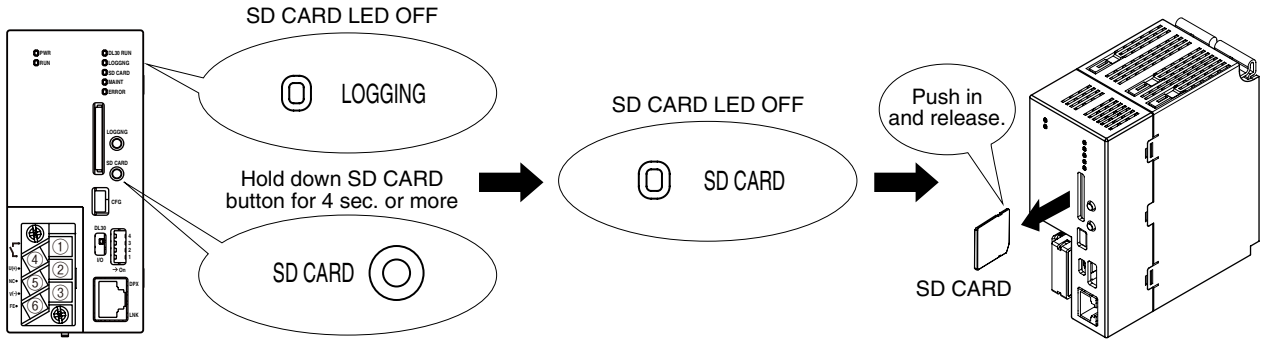
With the terminal surface of the SD card on the left, slowly push the SD card into the bottom of the slot and then release it. As soon as it is correctly recognized, the [SD CARD] lamp comes ON.



Removing SD card

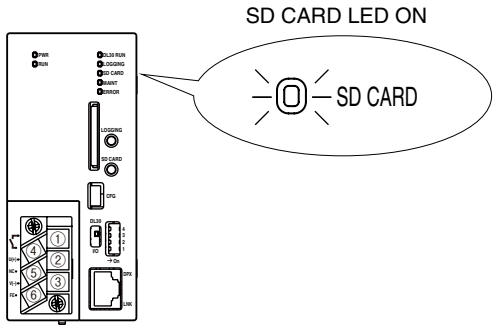
Check that the logging has been stopped (the LOGGING lamp is OFF).
If logging is in progress, stop logging.

Hold down the [SD CARD] button for at least 4 seconds to turn the [SD CARD] lamp OFF.
Push the SD card into the bottom of the slot and then release it.
The card is unlatched and can be removed. Slowly pull it out.



SD CARD lamp

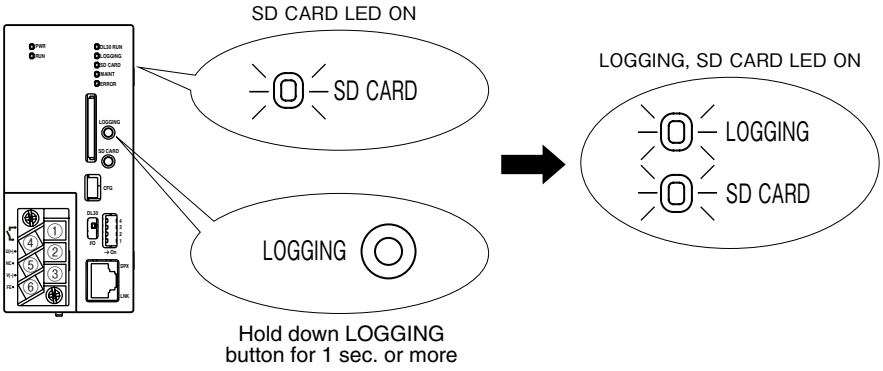
The SD card lamp remains ON as long as the SD card is being recognized, and blinks while the SD card is being accessed.



5.2 Data logging

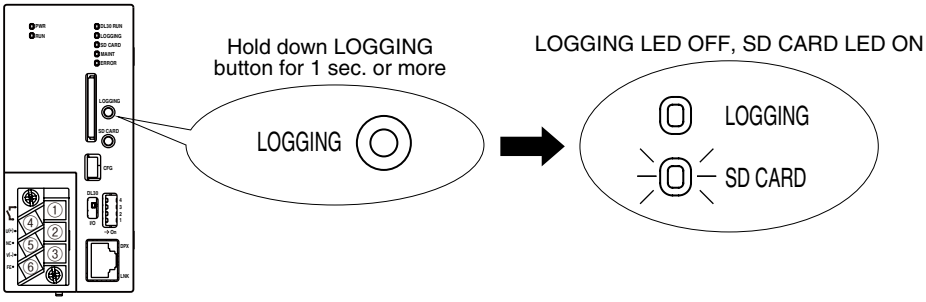
Starting data logging

Check that the SD card is being recognized.
Hold down the [LOGGING] button for at least 1 second to start logging.



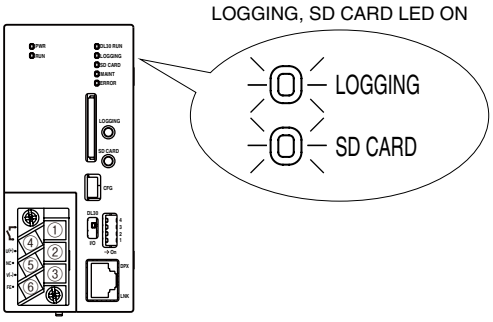
Stopping data logging

While logging is in progress, hold down the [LOGGING] button for at least 1 second to stop logging.



LOGGING lamp

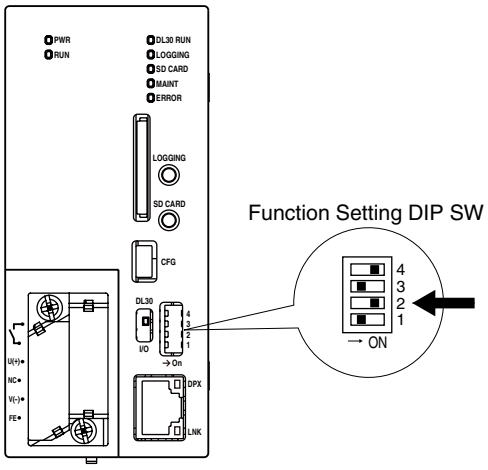
The LOGGING lamp is always ON while logging is in progress.



5.3 Function setting DIP switch

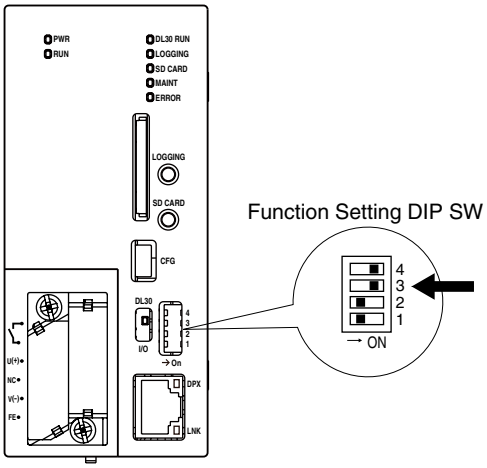
Halting e-mail reporting

Turn DIP SW2 ON to disable the e-mail reporting function.



Switching to maintenance mode

Turn DIP SW3 ON to enable the maintenance mode.
Logging is stopped, e-mail reporting, FTP client file transfer, and schedule outputs are disabled.



5.4 Stopping the unit

Stop logging, remove the SD card, and then turn off the power supply.

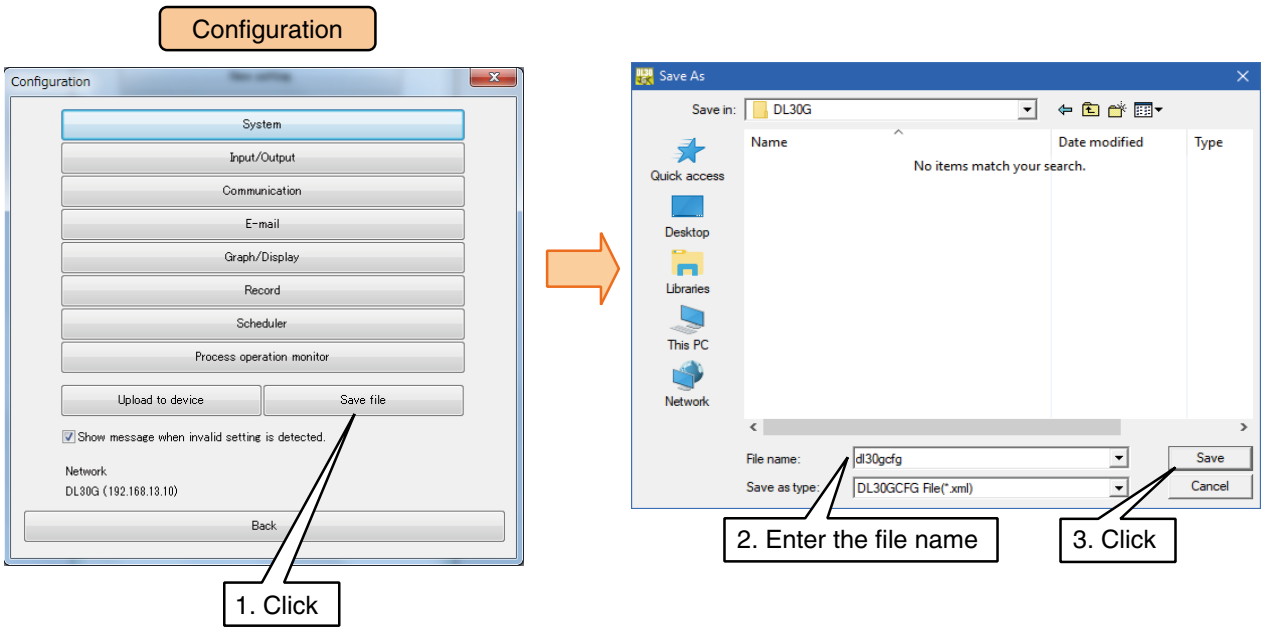
6. Maintenance

6.1 Maintenance on DL30GCFG

6.1.1 Saving/reading setting values (DL30GCFG)

Saving setting file

DL30GCFG can be used to store the setting information in a file.
Click [Save file] button in the [Configuration] and specify the file path.



NOTES

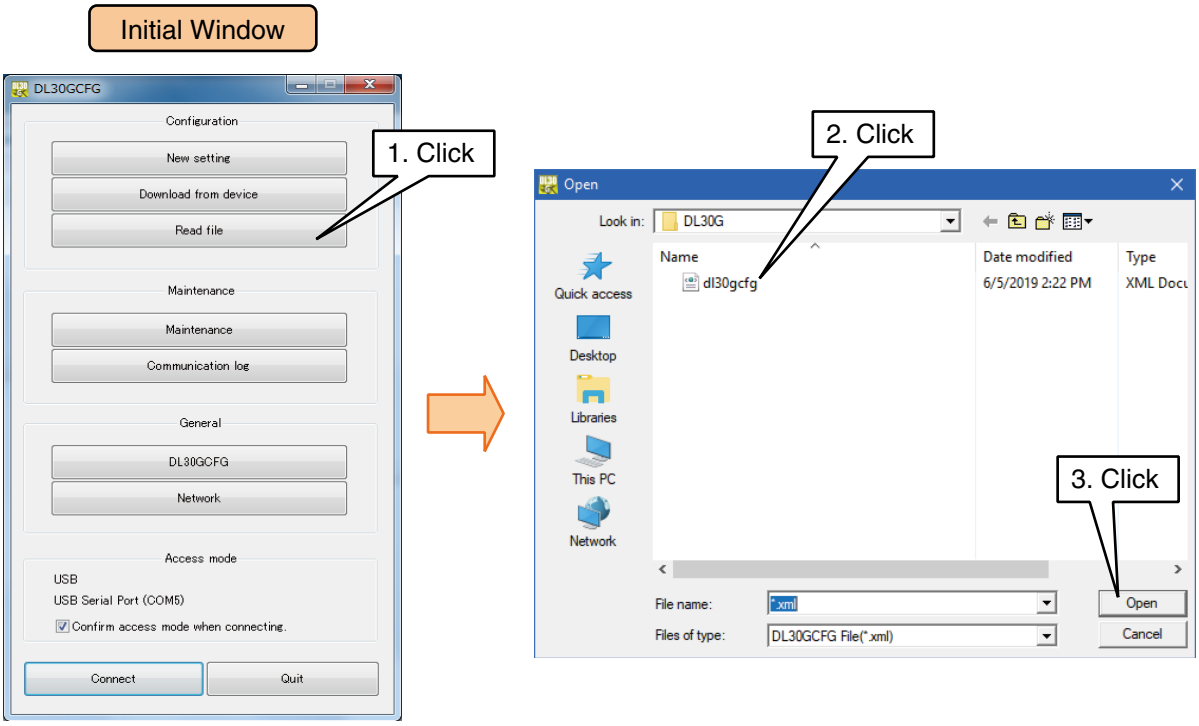
The setting file which is stored in the root folder of the SD card can be retrieved from the Web browser. To do so, specify the file name using single byte alphanumeric characters.

Reading setting file

The setting information stored in the file can be retrieved using DL30GCFG.

(1) Click [Read file] button in the DL30GCFG initial window.

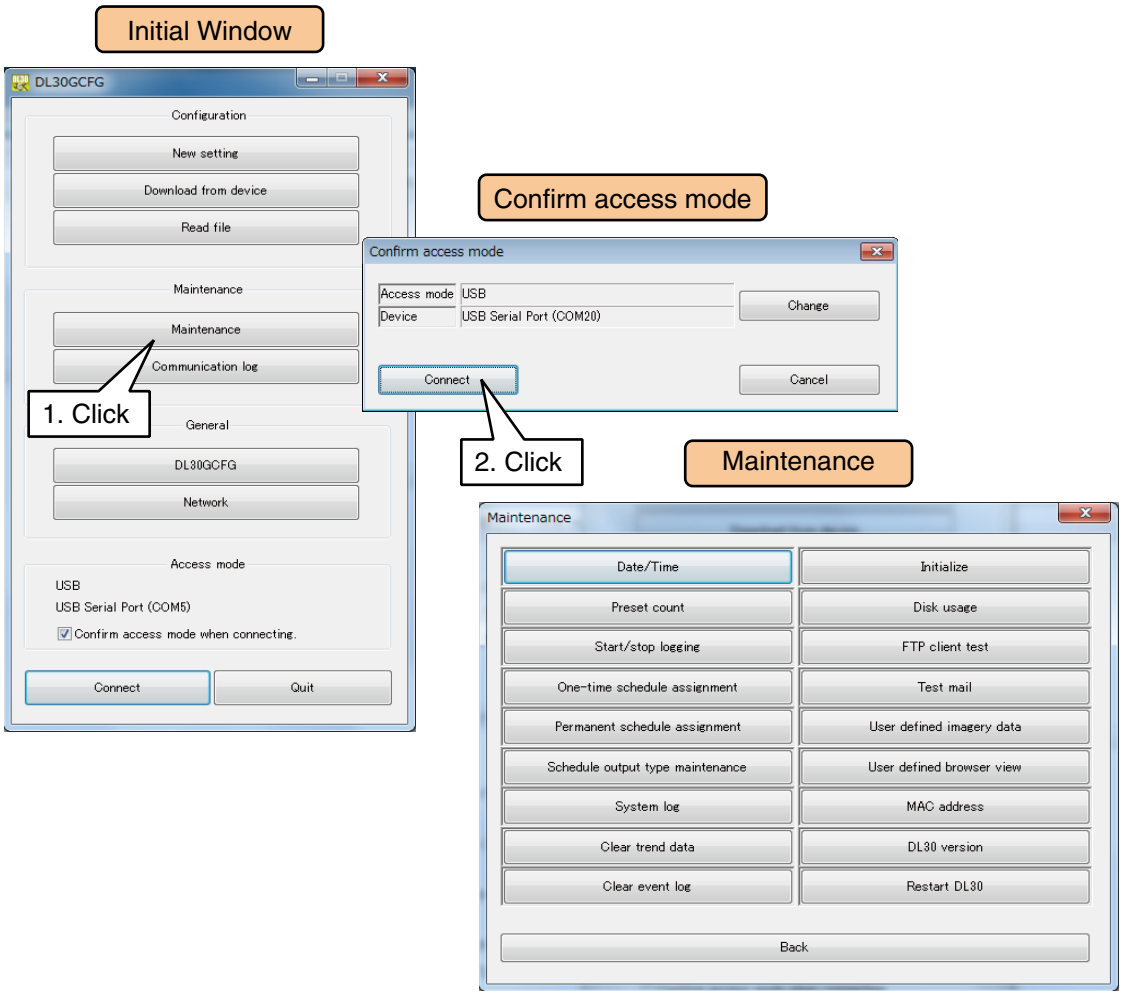
(2) Select the file and click [Open] to retrieve the setting values.



6.1.2 Maintenance menu (DL30GCFG)

Maintenance of the DL30-G can be performed from the [Maintenance] window.

(1) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.
(2) Click [Maintenance] button in the initial window to display [Confirm access mode] window.
(3) Check that the device is correct, and click [Connect] button to display the [Maintenance] window.

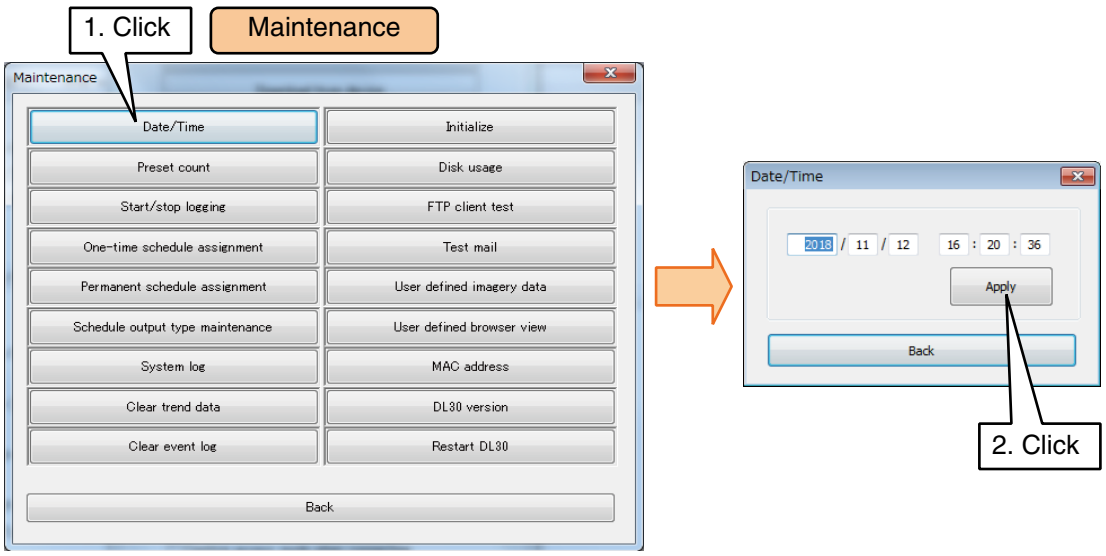


Time correction

The calendar clock in the DL30-G can be manually adjusted.

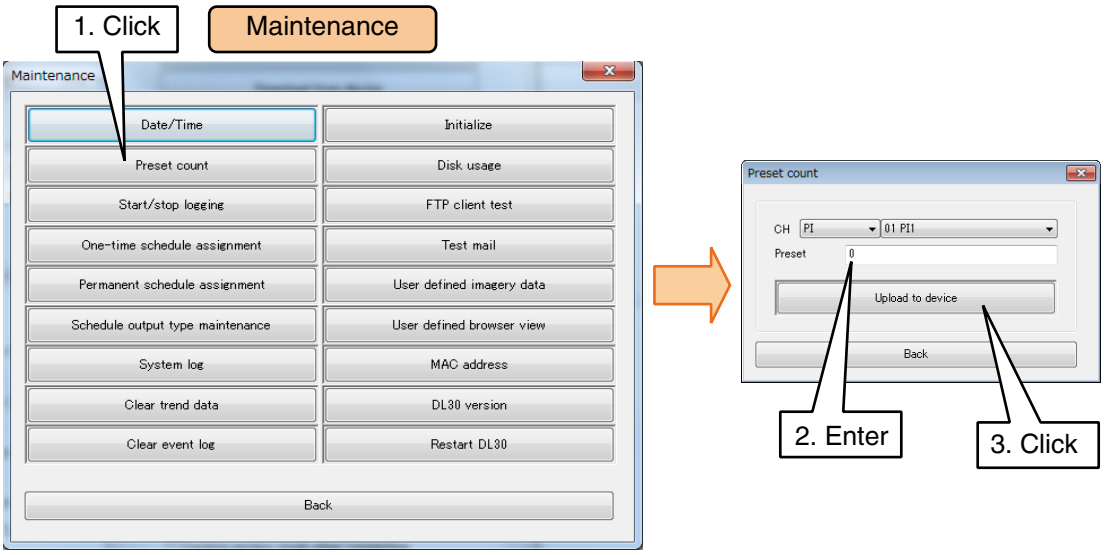
Click [Date/Time] button in the [Maintenance] window to open the [Date/Time] dialog.
The current system time of the PC is initially displayed.

Enter the time to be set and click [Apply] button to reflect the set time in the internal RTC (Real Time Clock) of the device.



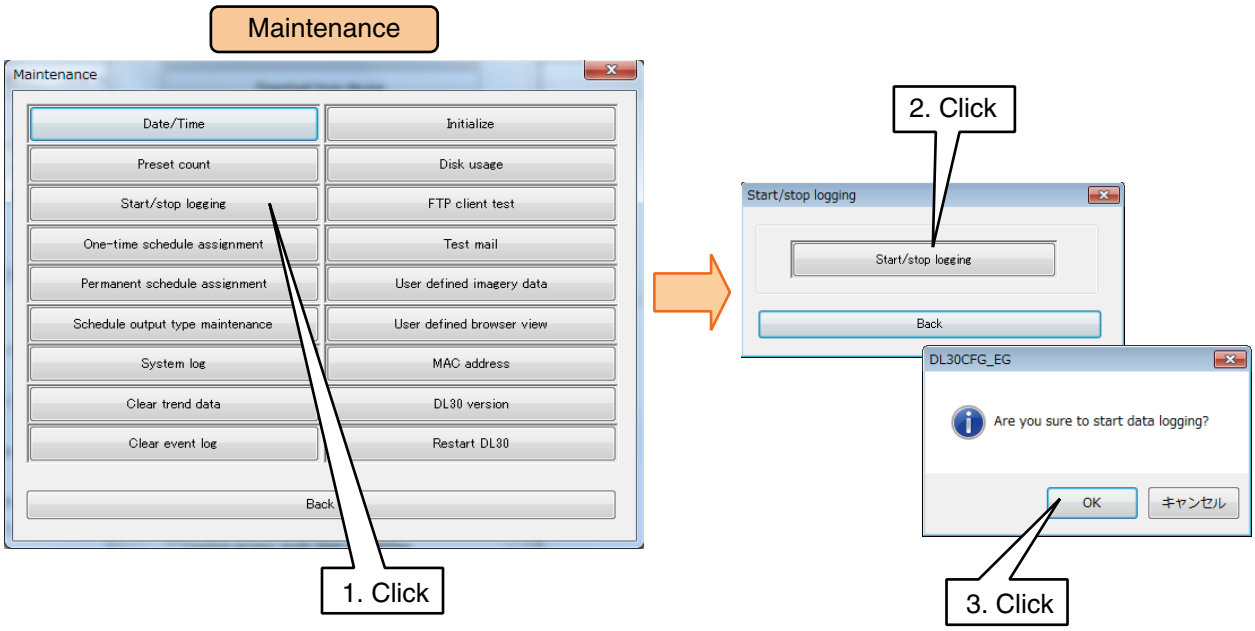
Applying preset count for PI

A specific count value can be preset for the PI data.
Click [Preset count] button in the [Maintenance] window to open the [Preset count] dialog.
Select a relevant channel, enter a preset value, and then click [Upload to device] button.



Starting/stopping data logging

The logging operation can be manually started/stopped.
Click [Start/stop logging] button in the [Maintenance] window to open the [Start/stop logging] dialog.
Click [Start/stop logging] button and a dialog for confirmation appears.
Click [OK] to start the logging operation or stops the logging operation in progress.



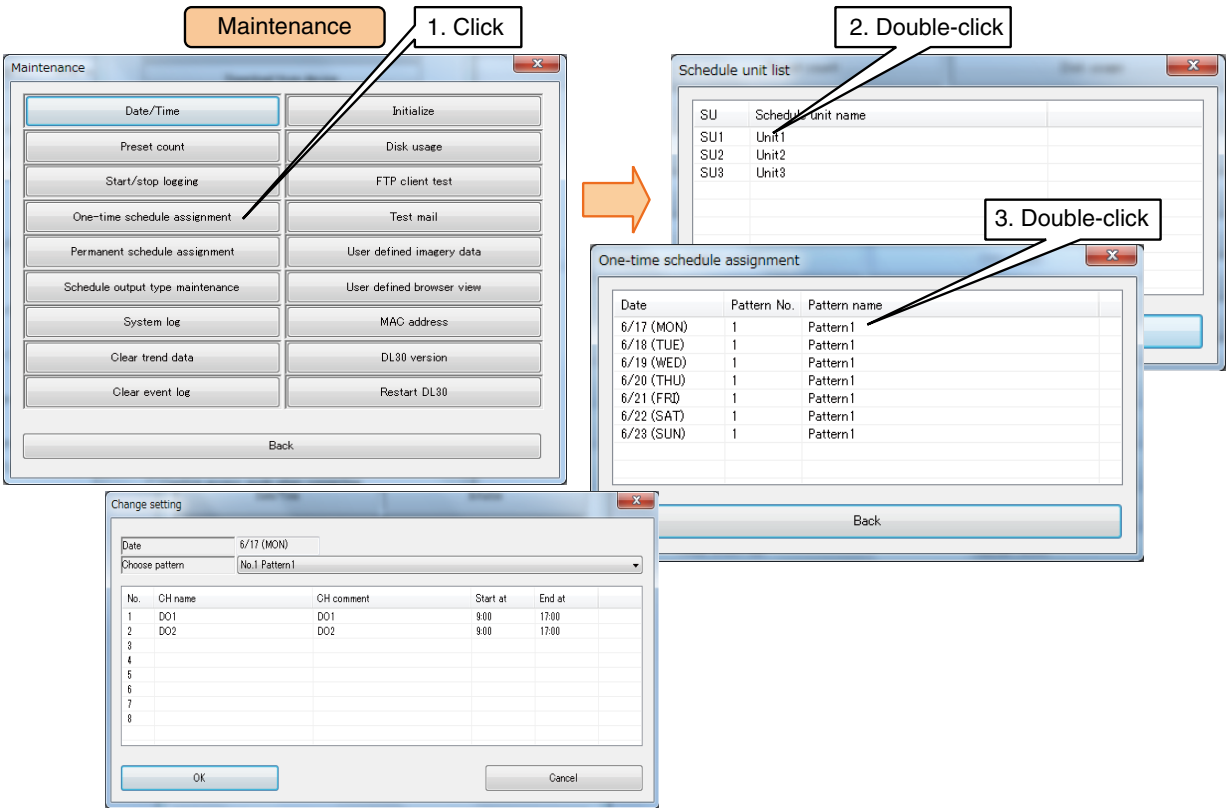
One-time schedule assignment

Schedule patterns of the selected unit for one week from the current day can be changed.
➔ 3.13 Scheduling function setting
The change is applied only once.

(1) Click [One-time schedule assignment] button in the [Maintenance] window to display [Schedule unit list].

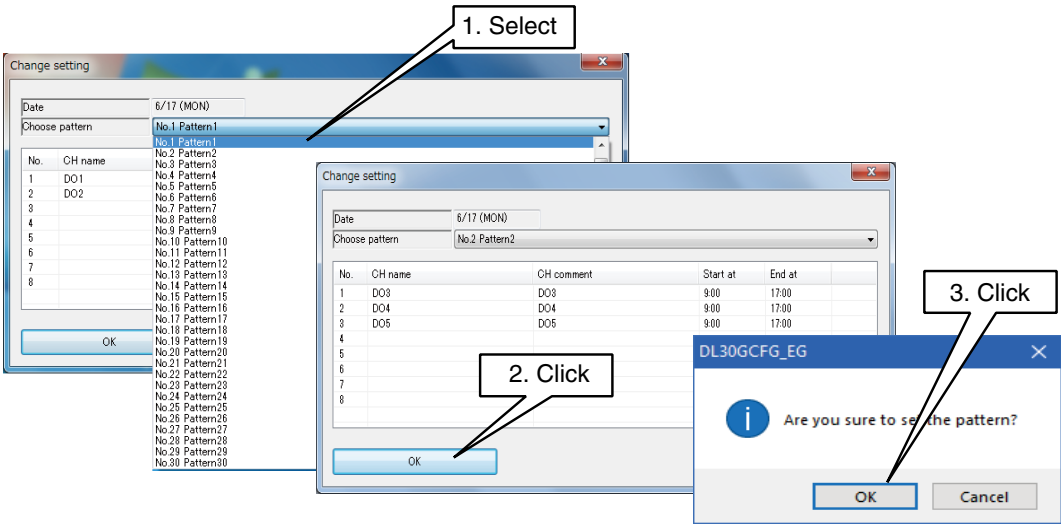
(2) Double-click the unit to change in the list to display the [One-time schedule assignment] window.

(3) Double-click the pattern to change to display the [Change setting] window.



(4) Select the pattern to which to change and click [OK] to display the [Change setting confirmation] dialog.

(5) Click [OK].



NOTES

- For details of the specifications of the scheduling function, see [8.2.11 Schedule].

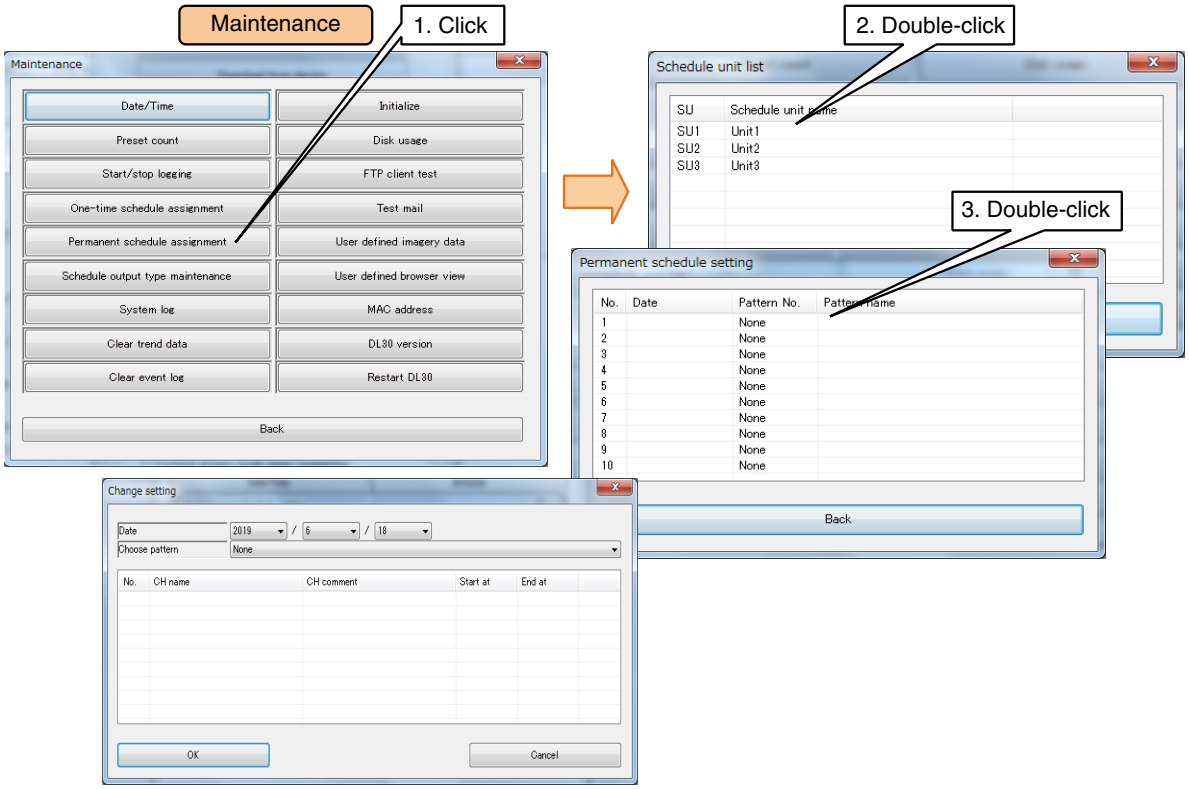
Permanent schedule assignment

Schedule patterns which are valid only for specific dates can be set for the currently selected schedule unit by specifying year, month, and date. ➔ 3.13 Scheduling function setting

(1) Click [Permanent schedule assignment] button in the [Maintenance] window to display the [Schedule unit list].

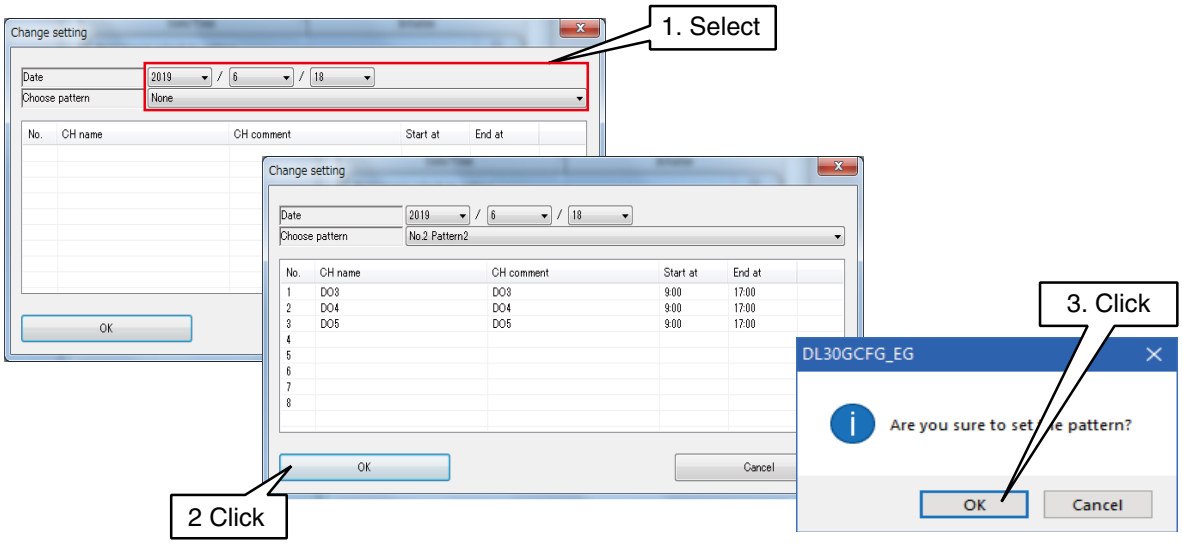
(2) Double-click the unit to change in the list to display the [Permanent schedule setting] window.

(3) Double-click the pattern to change to display the [Change setting] window.



(4) Select the pattern and date to which to change and click [OK] to display the [Change setting confirmation] dialog.

(5) Click [OK].



NOTES

- For details of the specifications of the scheduling function, see [8.2.11 Schedule].

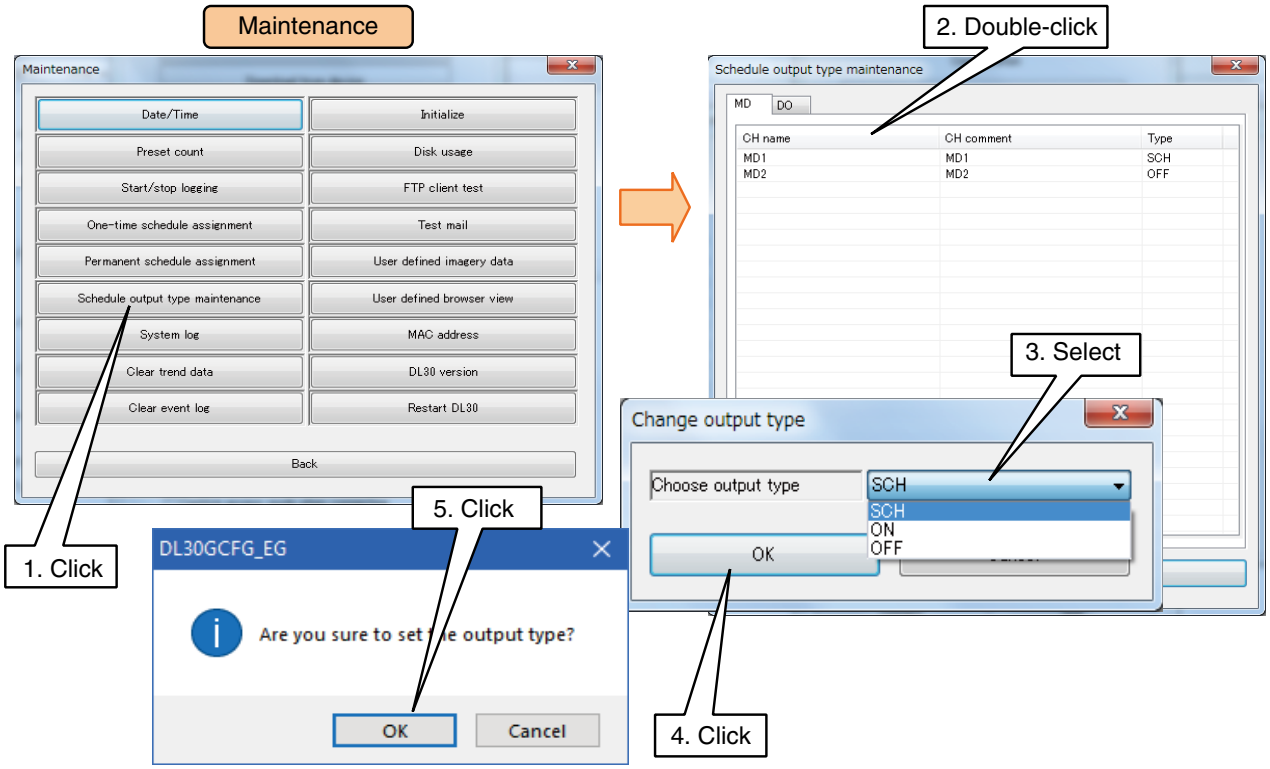
Schedule output type maintenance

ON/OFF of the DO or MD channel selected for schedule output can be manually changed.

(1) Click [Schedule output type maintenance] button in the [Maintenance] window to display the [Schedule output type maintenance] window.

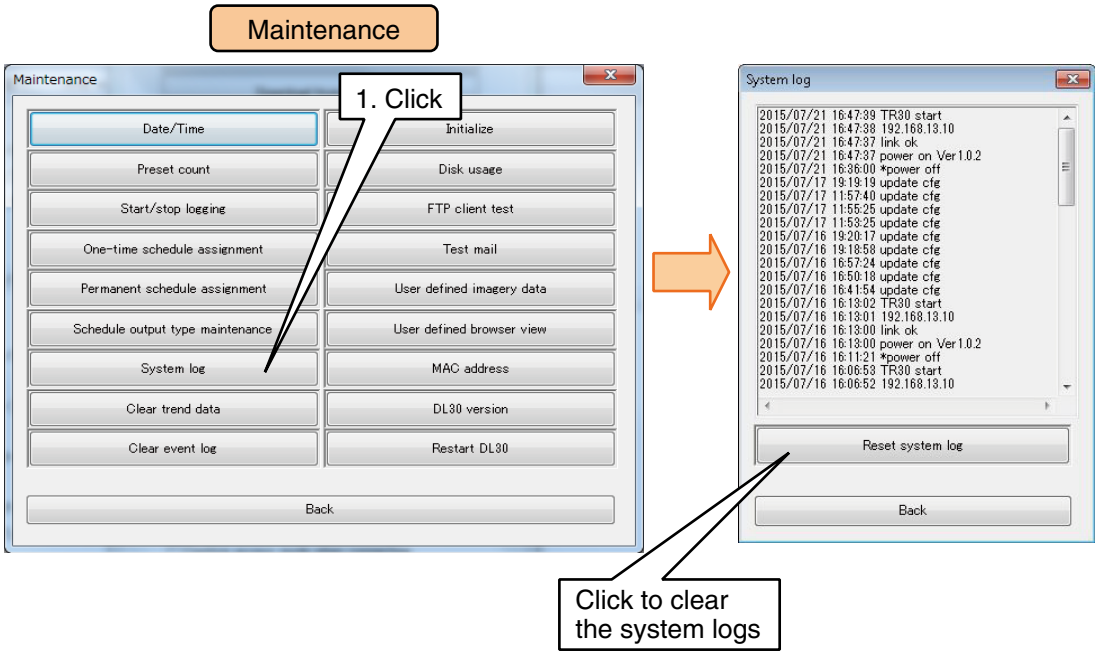
(2) Select the output type from SCH (schedule), ON, and OFF and click [OK] to display the [Change output type confirmation] dialog.

(3) Click [OK].



Checking system log

64 most recent event logs are stored in nonvolatile memory.
Click [System log] button in the [Maintenance] window to display the system log.
Click [Reset system log] button to clear the logs.



■ System log message list (Partial list)

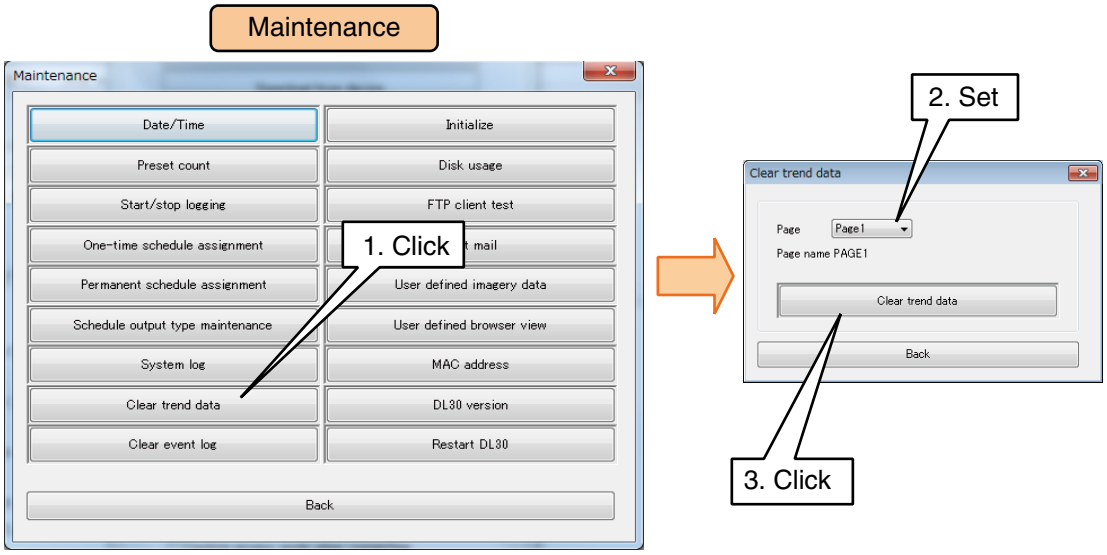
Message	Description
power on VerX.X.X	Power supply ON firmware version
*power off	Power supply OFF
link ok	Ethernet LINK OK
link error	Ethernet LINK error

CAUTION

- M-System may use the system logs for troubleshooting.
- Details of system log messages are not described in this manual as the contents of these messages are related to the internal processing original to M-System.

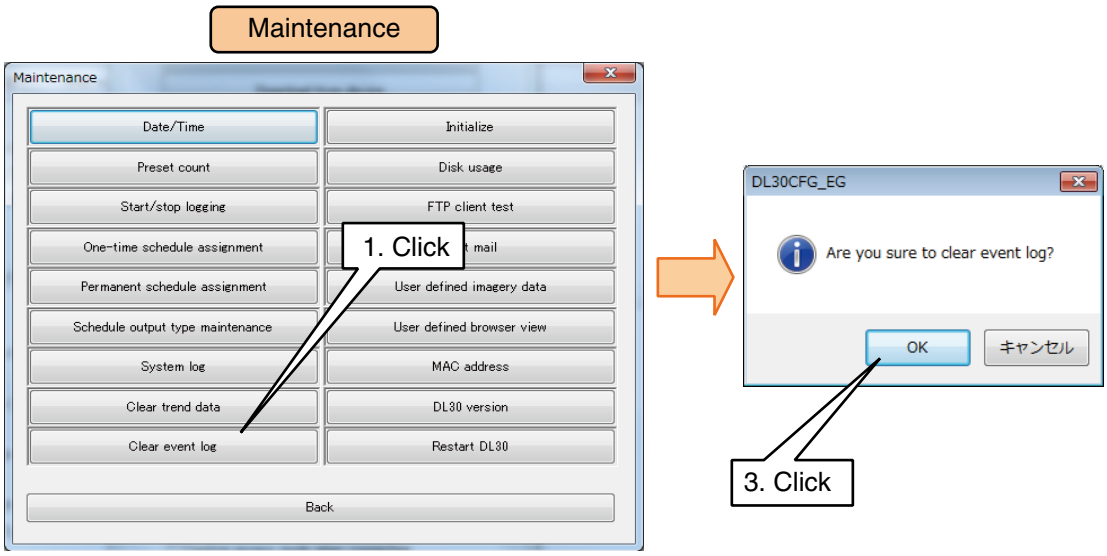
Clearing trend data

The trend data in the internal memory can be deleted all at once or by pages.
Click [Clear trend data] button in the [Maintenance] window to display the [Clear trend data] dialog.
Choose a page number and click [Clear trend data] button.
A dialog for confirmation appears. Click [OK].



Clearing event logs

Event log data in the internal memory can be manually deleted.
Click [Clear event log] button in the [Maintenance] window.
A dialog for confirmation appears. Click [OK].

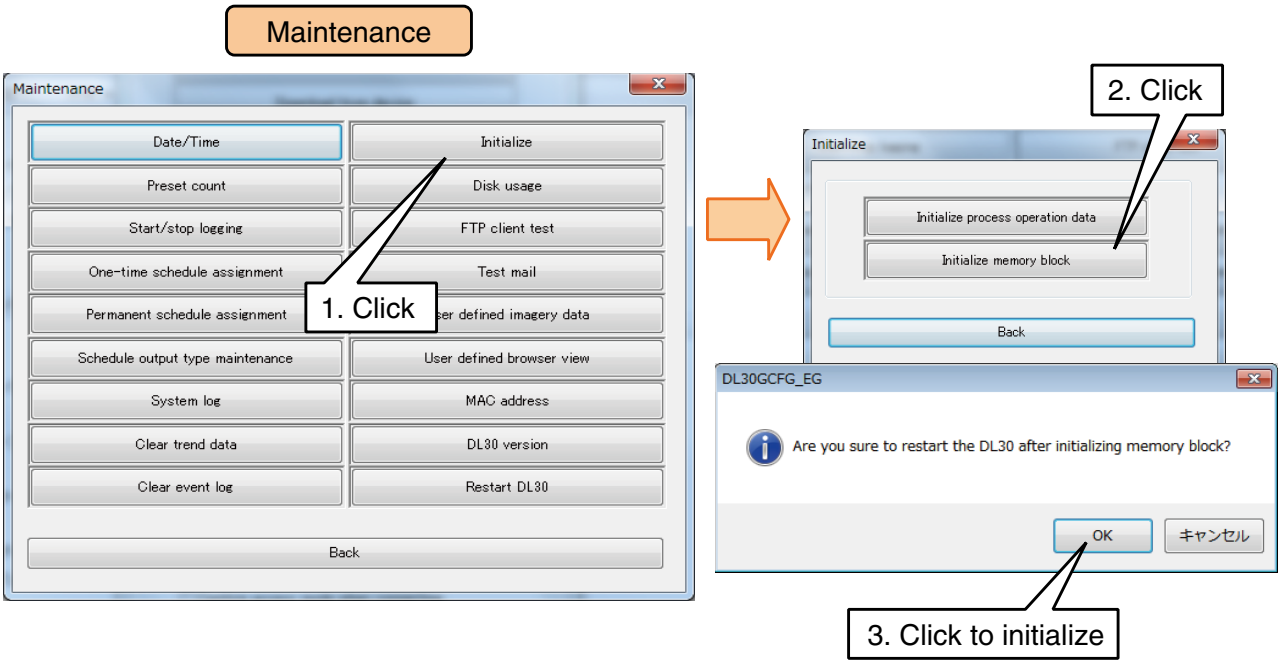


CAUTION

Event log data in the SD card is not deleted by this operation.
If a new file with the same as a file existing in the SD card is created in the internal memory after that, the new file will overwrite the existing one in the SD card.

Initializing internal memory

Memory blocks can be initialized using the [Initialize] button in the [Maintenance] window.
Click [Initialize] button to display the [Initialize] window.
Click [Initialize memory block] button and a dialog for confirmation appears. Click [OK].
To initialize process operation data only, click [Initialize process operation data] instead.

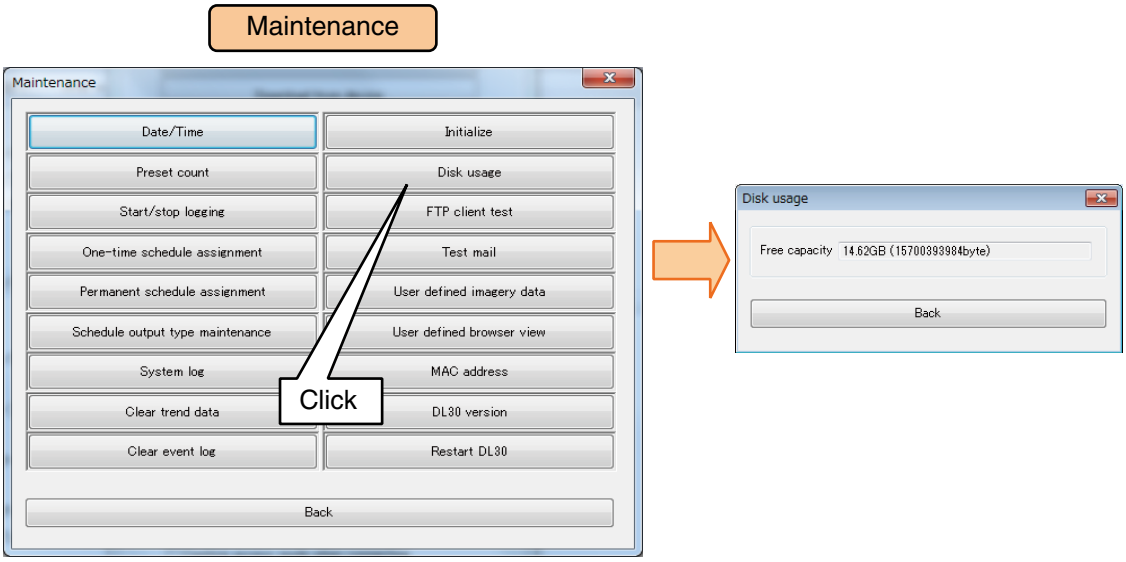


CAUTION

- Note that [Initialize memory block] will erase every piece of record data in the internal memory.
- Data in the SD card is not deleted by this operation.
  If a new file with the same as a file existing in the SD card is created in the internal memory after that, the new file will overwrite the existing one in the SD card.

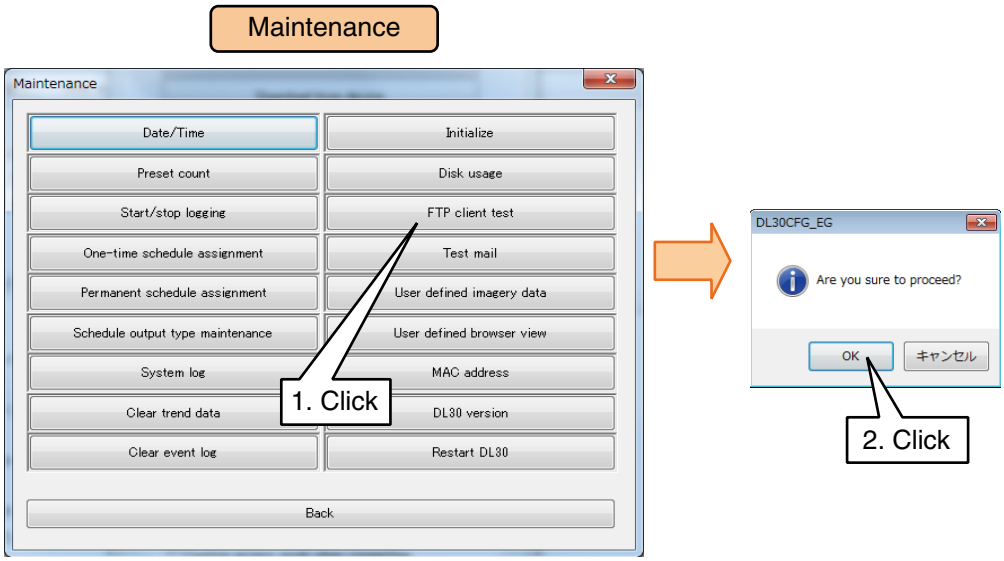
Confirming disk usage status

Free memory area in the SD card inserted in the DL30-G can be confirmed.
Click [Disk usage] button in the [Maintenance] window to open the [Disk usage] dialog.
Confirm the free capacity and click [Back] to close the window.



FTP client test

FTP client function can be confirmed by testing.
Click [FTP client test] button in the [Maintenance] window and a dialog for confirmation appears.
Click [OK] to execute the testing.

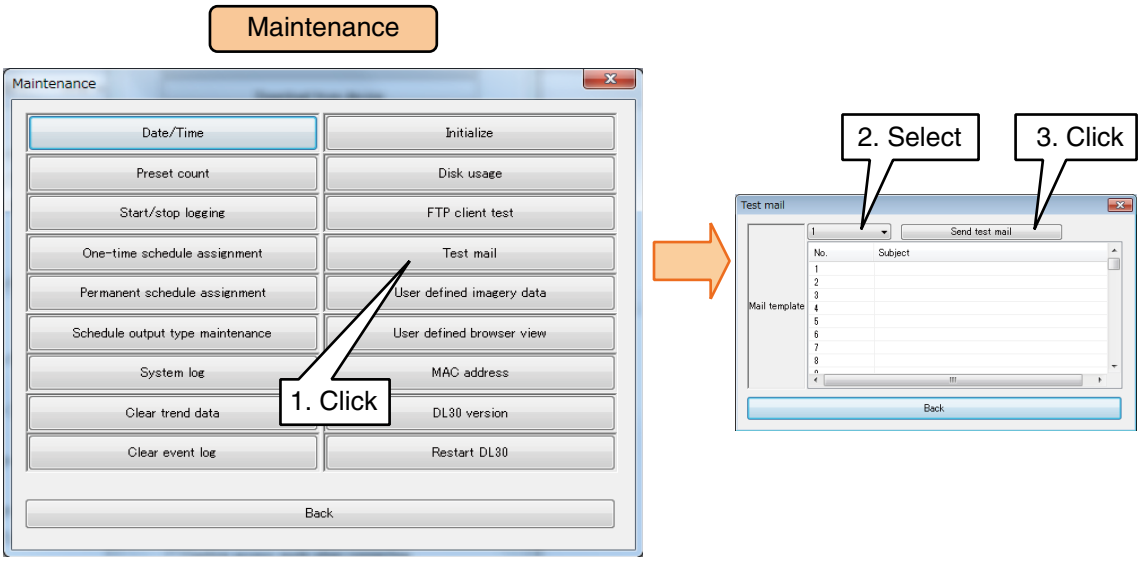


Test mail

A test mail can be sent to confirm the adequate setting of e-mail reporting function.

Click [Test mail] button in the [Maintenance] window to open the [Test mail] dialog.
Choose a mail template No. and click [Send test mail] button.

Test results are recorded in the communication log.



NOTES

The mail template No.s containing no subject are not shown in the Mail template list.

Importing user defined imagery data

The images on the Top screen (See the image below) can be replaced.

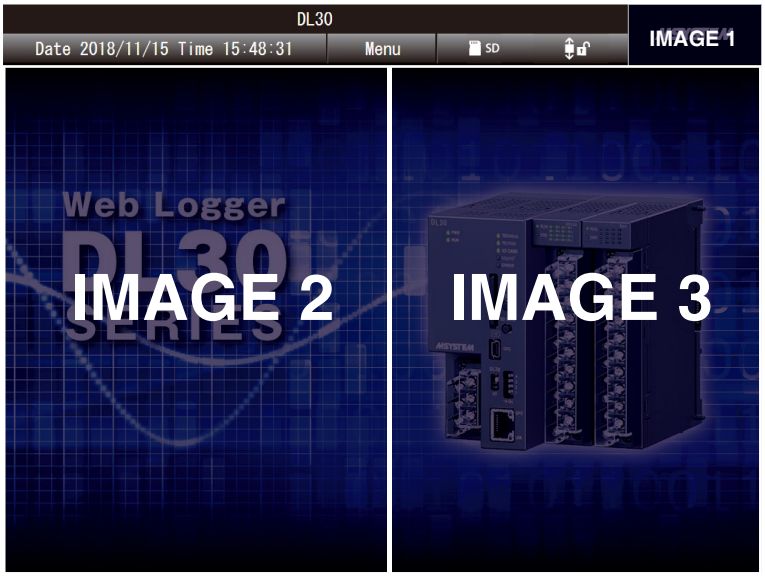
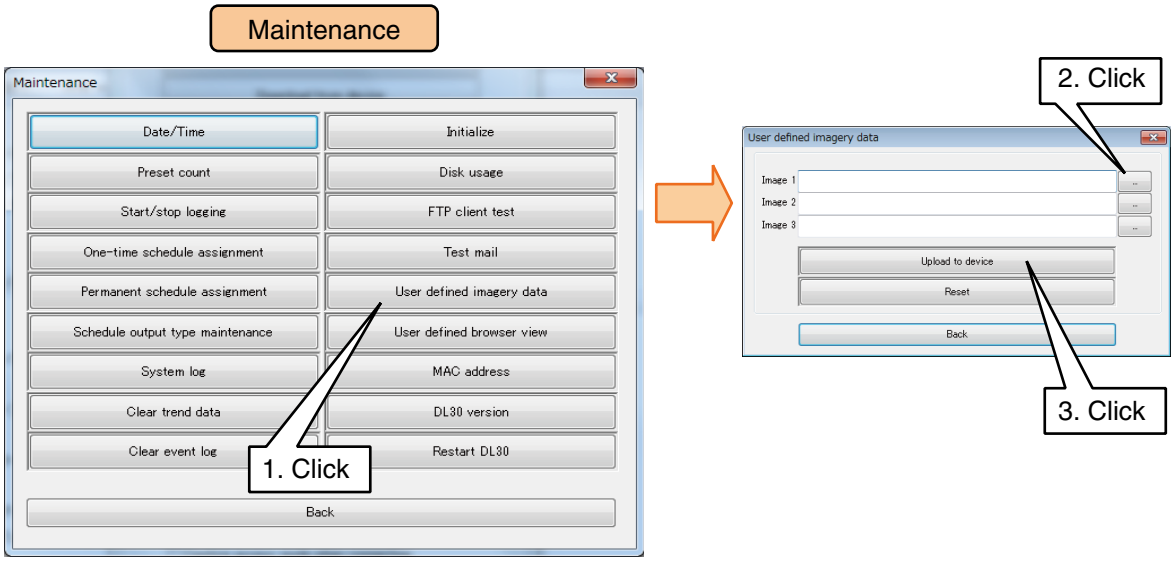


Image	Size	File format
IMAGE 1	180 x 80 pixels	JPG
IMAGE 2	512 x 688 pixels	
IMAGE 3	512 x 688 pixels	

Click [User defined imagery data] button in the [Maintenance] window to display the [User defined imagery data] window.
Specify the files and click [Upload to device] button to transfer the data to the device.



NOTES

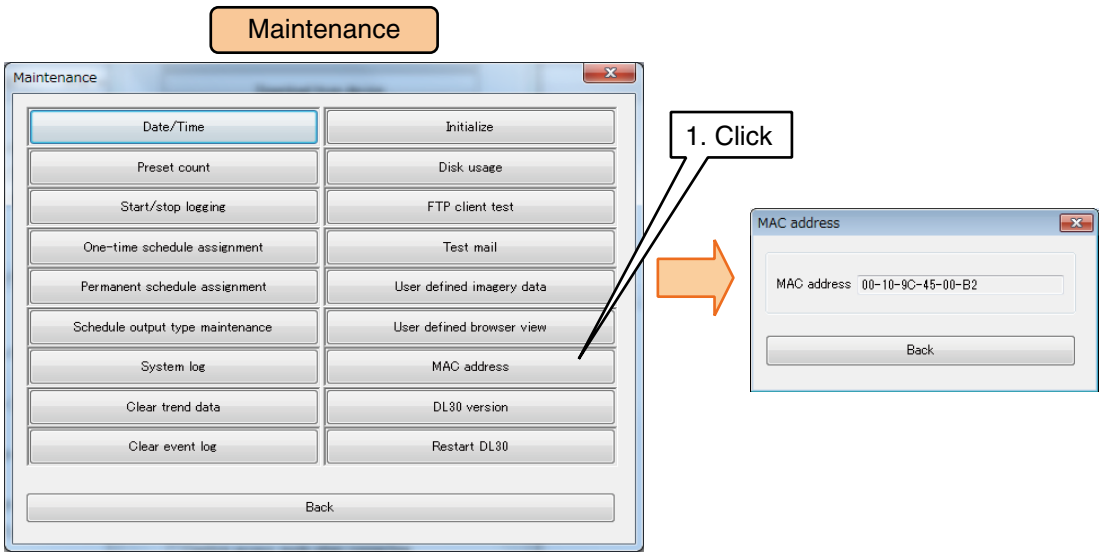
- The factory default images are placed in the positions where no new image files are specified.
- If the new images do not appear on the window after uploading, clear the browser cache and reload.

Importing user defined browser view

Web browser views in various formats such as html, js and css, can be imported to the DL30-G.
See [7. User defined browser view] > [Step 3: Upload to the DL30-G] for detailed information.

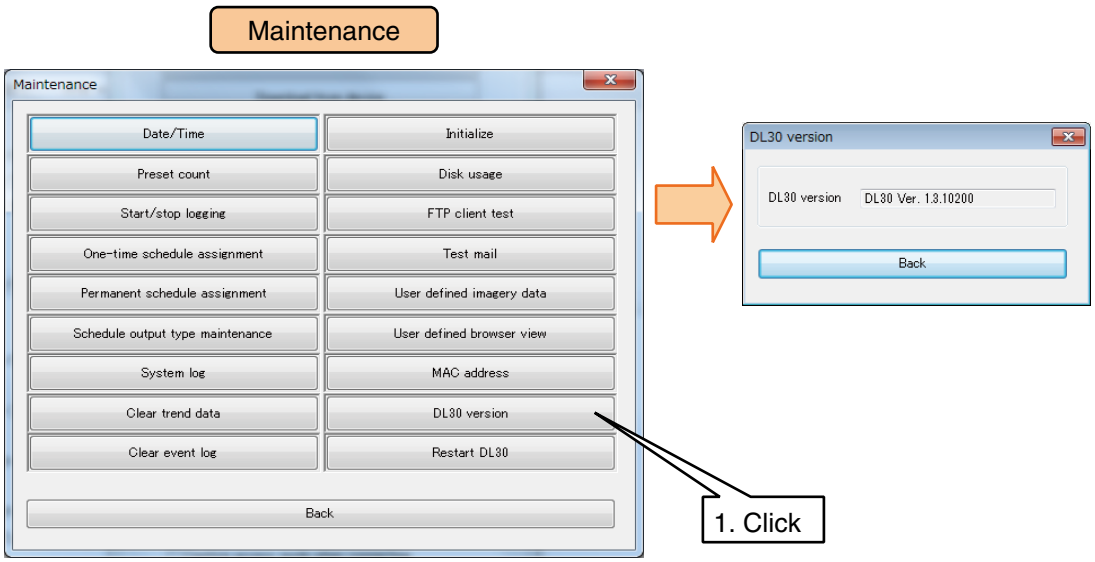
Confirming MAC address

Click [MAC address] button in the [Maintenance] window to display the MAC address of the unit.
Confirm the MAC address and click [Back] to close the window.



Confirming unit version

Click [DL30 version] button in the [Maintenance] window to display the firmware version of the unit.
Confirm the version and click [Back] to close the window.

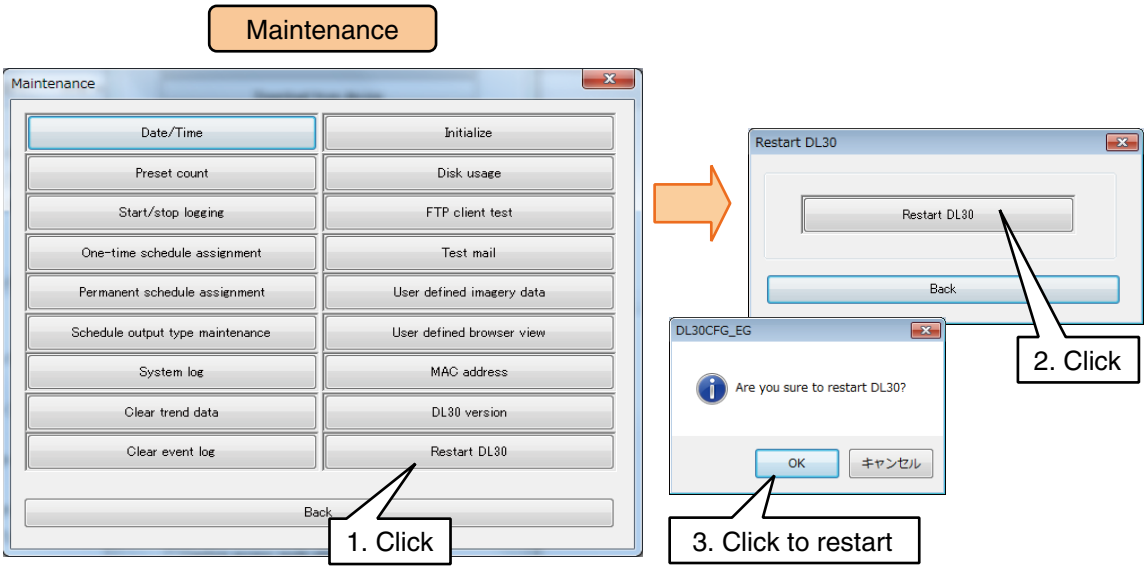


NOTES

To confirm the versions of I/O modules, use R30CFG configurator software.

Restarting DL30-G

The DL30-G can be restarted without turning off and on the power supply.
Click [Restart DL30] button in the [Maintenance] window, and a dialog for confirmation appears.
Click [OK].



6.2 Maintenance on Web browser

Some parameters can be changed on the Web browser.

6.2.1 Saving/reading setting values (Web)

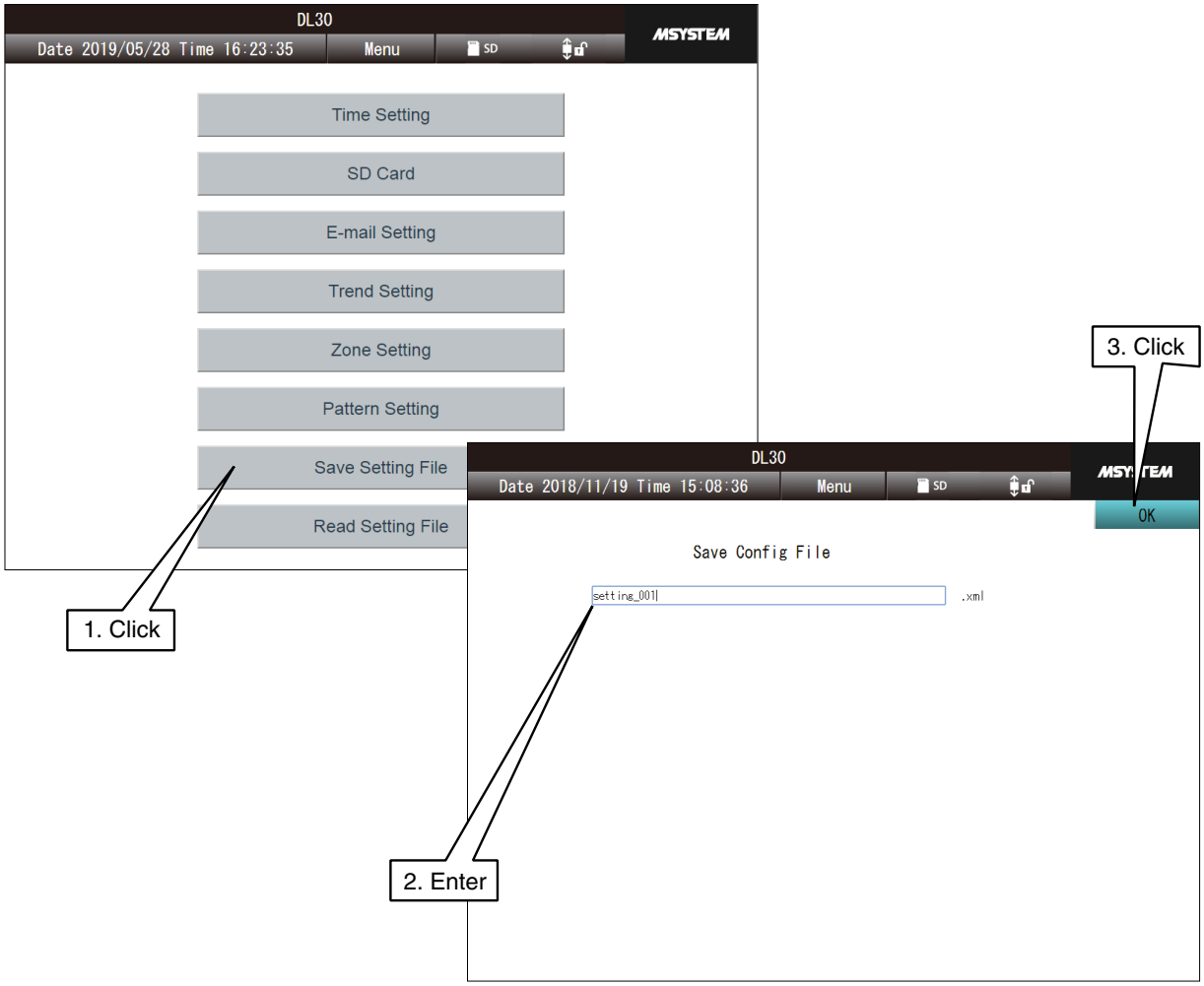
Saving setting file in SD card

(1) Click [Menu button Menu] to display the menu screen.

(2) Click [Maintenance] button to display the [Maintenance] menu.

(3) Choose [Save Setting File] to display the [Save Config File] window.

(4) Click on the input field and enter a file name using single byte alphanumeric characters.



(5) Click [OK] and a confirmation dialog [Do you want to save the setting?] will appear. Click [OK].

(6) After the setting file has been successfully saved, a message dialog [Completed] appears. Click [OK]. The file is saved in the root folder of the SD card.

NOTES

The login ID and password authorizing access to the device via network by DL30GCFG are also required to change setting on the browser. ➔ 3.3.4 Enabling configuration via network (remote access authorization).

CAUTION

- Files cannot be saved if characters other than single byte alphanumeric characters are contained in the file names.
- Some browsers such as Google Chrome and Firefox may display a checkbox saying [Don't let this page create more messages] or [Prevent this page from creating additional dialogs]. DO NOT check such an option. Once it is checked, subsequent dialogs are not displayed, and thus the dialogs to confirm operations performed on the web browser will not be displayed. ➔ 8.1.10 Web server

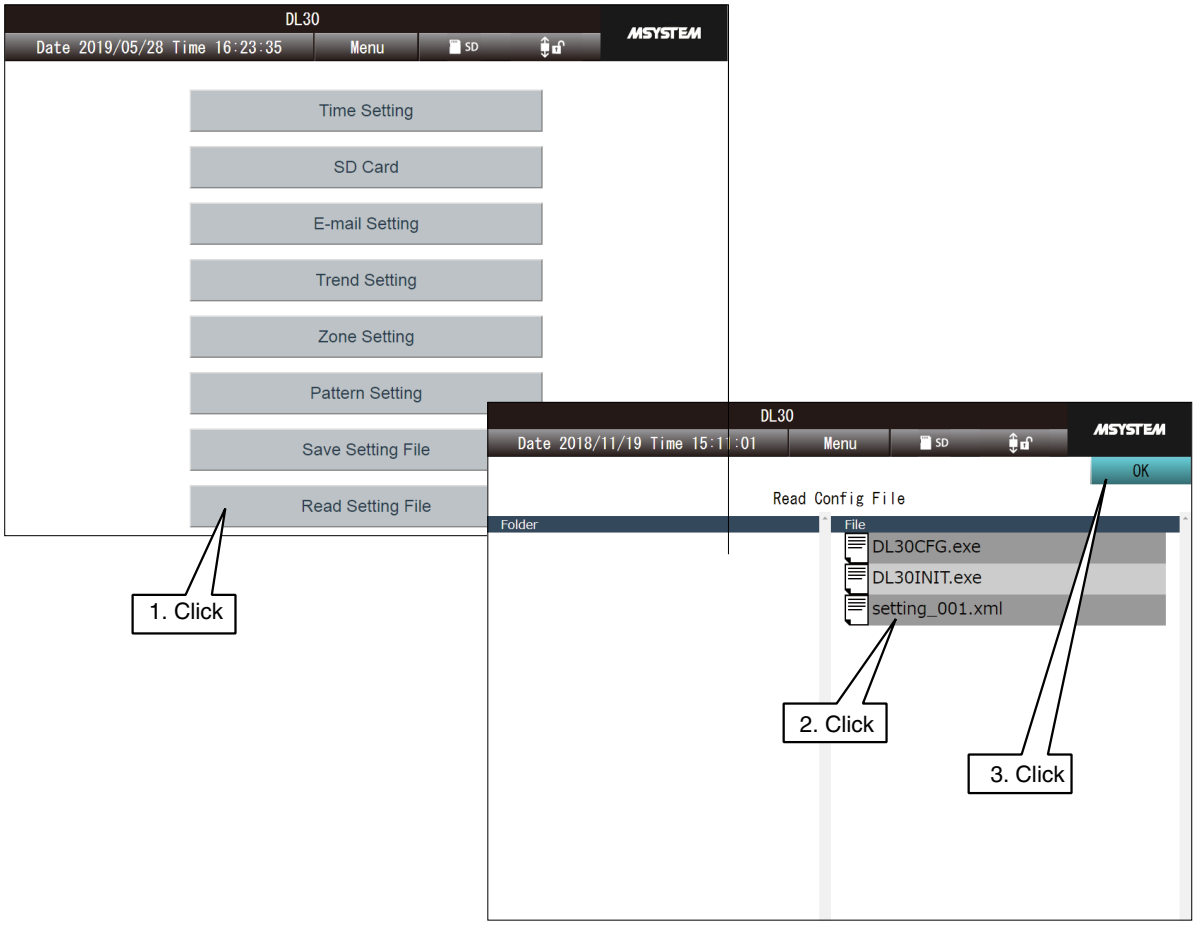
Reading setting file from SD card

(1) Click [Menu button Menu] to display the menu screen.

(2) Click [Maintenance] to display the [Maintenance] menu.

(3) Choose [Read Setting File] to display the [Read Config File] window.

(4) Choose an xml file and click [OK].



(5) A confirmation dialog [Do you want to read setting file?] is displayed. Click [OK].

(6) After the setting file has been successfully loaded, a message dialog [Completed] appears. Click [OK].

NOTES

- The file name of a setting file is [*****.xml].
- User can also retrieve setting files saved in the DL30GCFG.

CAUTION

- Use single byte alphanumeric characters for the file name.
  We cannot guarantee that the files can be properly saved/read if characters other than single byte alphanumeric characters are contained in the file names.
- Some browsers such as Google Chrome and Firefox may display a checkbox saying [Don't let this page create more messages] or [Prevent this page from creating additional dialogs]. DO NOT check such an option. Once it is checked, subsequent dialogs are not displayed, and thus the dialogs to confirm operations performed on the web browser will not be displayed. ➔ 8.1.10 Web server

6.2.2 Maintenance menu (Web)

Time correction

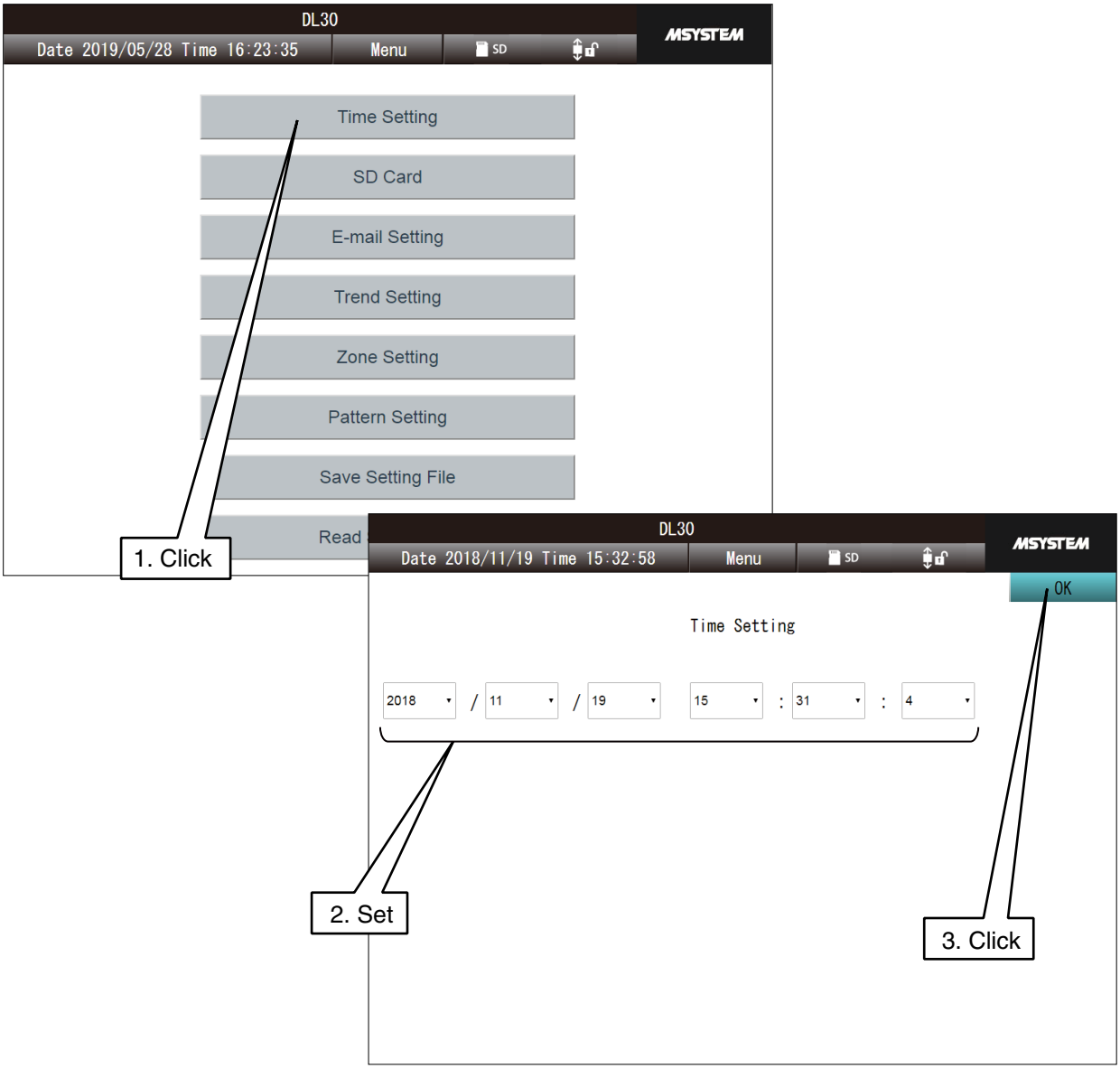
(1) Click [Menu button Menu] to display the menu screen.

(2) Click [Maintenance] button to display the [Maintenance] menu.

(3) Choose [Time Setting] to display the [Time Setting] window.
The current system time of the terminal being used is initially displayed.

(4) Set the date and time and click [OK].

(5) After the time has been successfully set, a message dialog [Completed] appears. Click [OK].



Downloading/deleting SD card files

(1) Click [Menu button Menu] to display the menu screen.

(2) Click [Maintenance] button to open the [Maintenance] menu.

(3) Choose [SD Card] to display the [SD card] window.

(4) Switch the folders to locate a file to be downloaded or deleted.

To show the content (files) of a folder under the current directory:

Click to select a desired folder from the folder list in the left window area.
Click the folder again to show a list of files in the folder in the right window area.

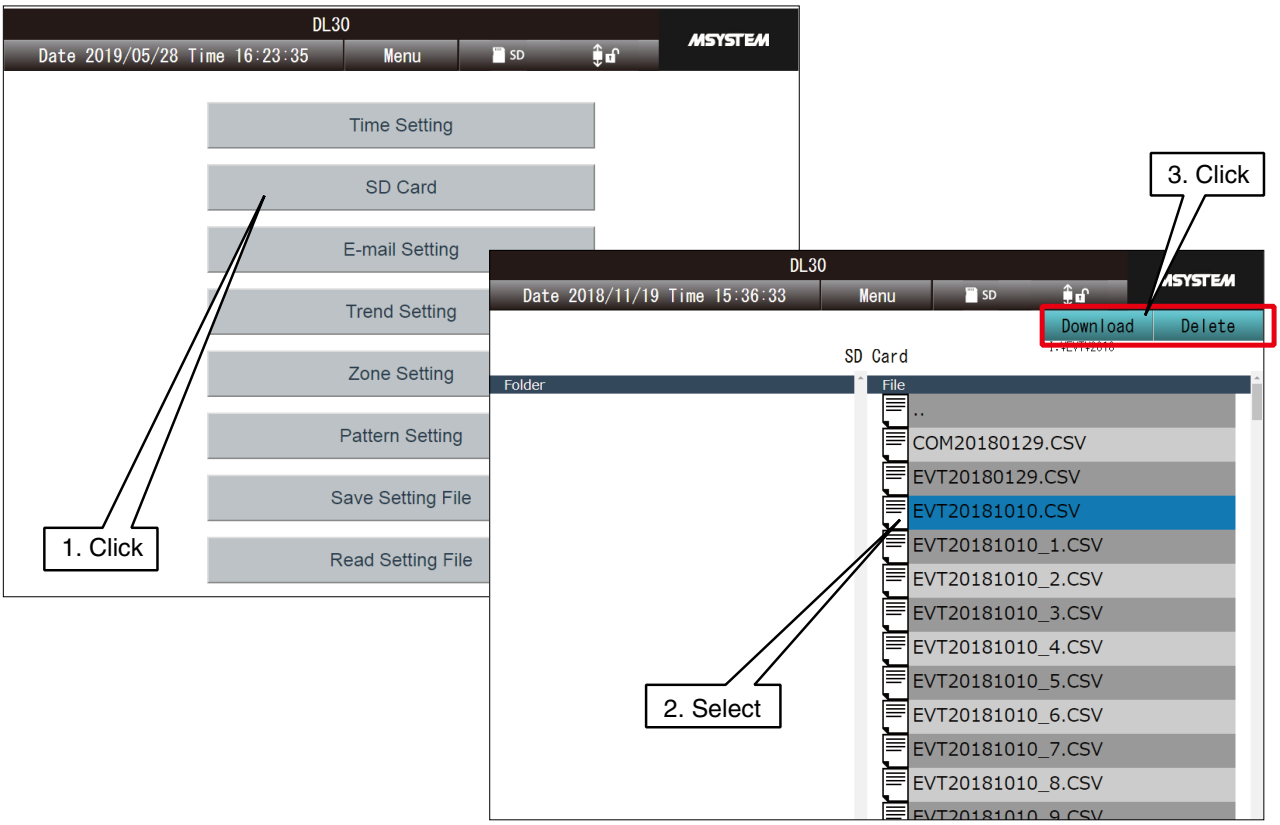
To show the content (folders and files) at an upper level of the current directory:

Click the file icon [..] at the top of the right window area.
Click the icon again to move to a higher level directory.

To select a file

Once the file to be downloaded/deleted is located, click on the file name.

(5) Click [Download] or [Delete] button.



NOTES

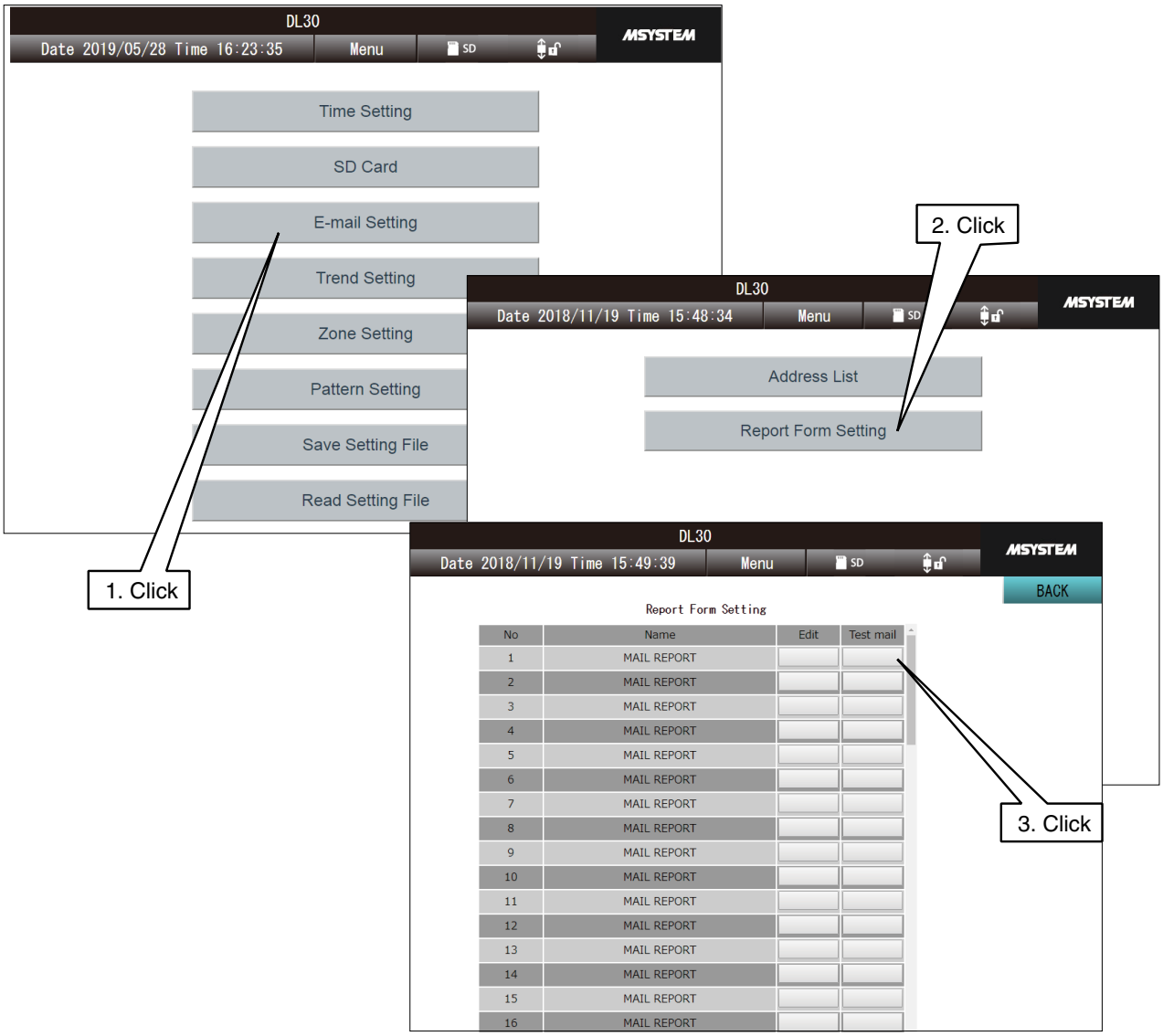
Clicking on the [Delete] button while a folder is selected deletes the folder and all the files in the folder.

Test mail

(1) Click [Menu button Menu] to display the menu screen.

(2) Click [Maintenance] button to display the [Maintenance] menu.
Choose [E-mail Setting] > [Report Form Setting] to display the [Report Form Setting] window.

(3) Click [Test mail] button to the right of the mail template to send a test mail.



(4) A dialog "Are you sure to send test mail?" appears and click [OK].

(5) After the mail sending command has been executed, a message dialog [Completed] appears. Click [OK].

CAUTION

No specific message is given when the mail transmission fails.
Confirm the mail transmission on the Communication log.

7. User defined browser view

User can freely design Web pages using HTML, JavaScript, etc.
Or, use M-System's web page designing software (model: DL30 Web Designer) which allows User to easily create web pages and transfer them to the DL-30G.

The software program can be downloaded from the M-System web site:
➔ http://www.m-system.co.jp/
See Users Manual of DL30 Web Designer for details.

User can retrieve the current data measured using the device as JavaScript data files.
See [8.2.15 Data files for user defined web browser view].

The DL30-G is only capable of basic web server function for file I/O handling, and NOT capable of running programs such as CGI or Script, provided from the server side.

Access [http://<DL30-IP address>/user/<content file name>] from the browser.

CAUTION

This function is intended for users who have knowledge about the Web in terms of HTML, Javascript, etc.
Note that we will be unable to entertain queries about the Web.

NOTES

The Top screen images can be replaced using the procedures explained in [6.1.2 Maintenance menu (DL30GCFG)] > [Importing user defined imagery data].

Step 1: Create a working folder

First, create a working folder in a PC.
Only the files directly under this folder are transferred to the DL30-G device but not subfolders and files in them.

NOTES

- The maximum number of files that can be stored in a working folder is 1024.
- The maximum total size of files in a working folder is 4 MB.

Step 2: Create HTML files

Describe user's original browser view data in the working folder using HTML, Javascript, CSS and other languages/formats. Refer to tutorial documents for them.

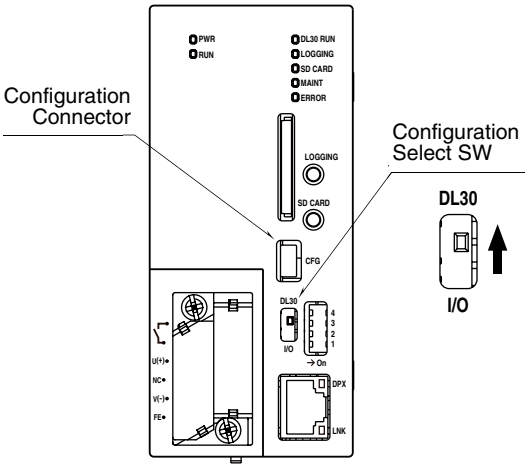
NOTES

- Set a file name which is 24 single byte alphanumeric characters or less, including the extension.
- The maximum size of 1 file is 1 MB.

Step 3: Upload to the DL30-G

Transfer the files created in Step 2 to the DL30-G using the DL30GCFG.

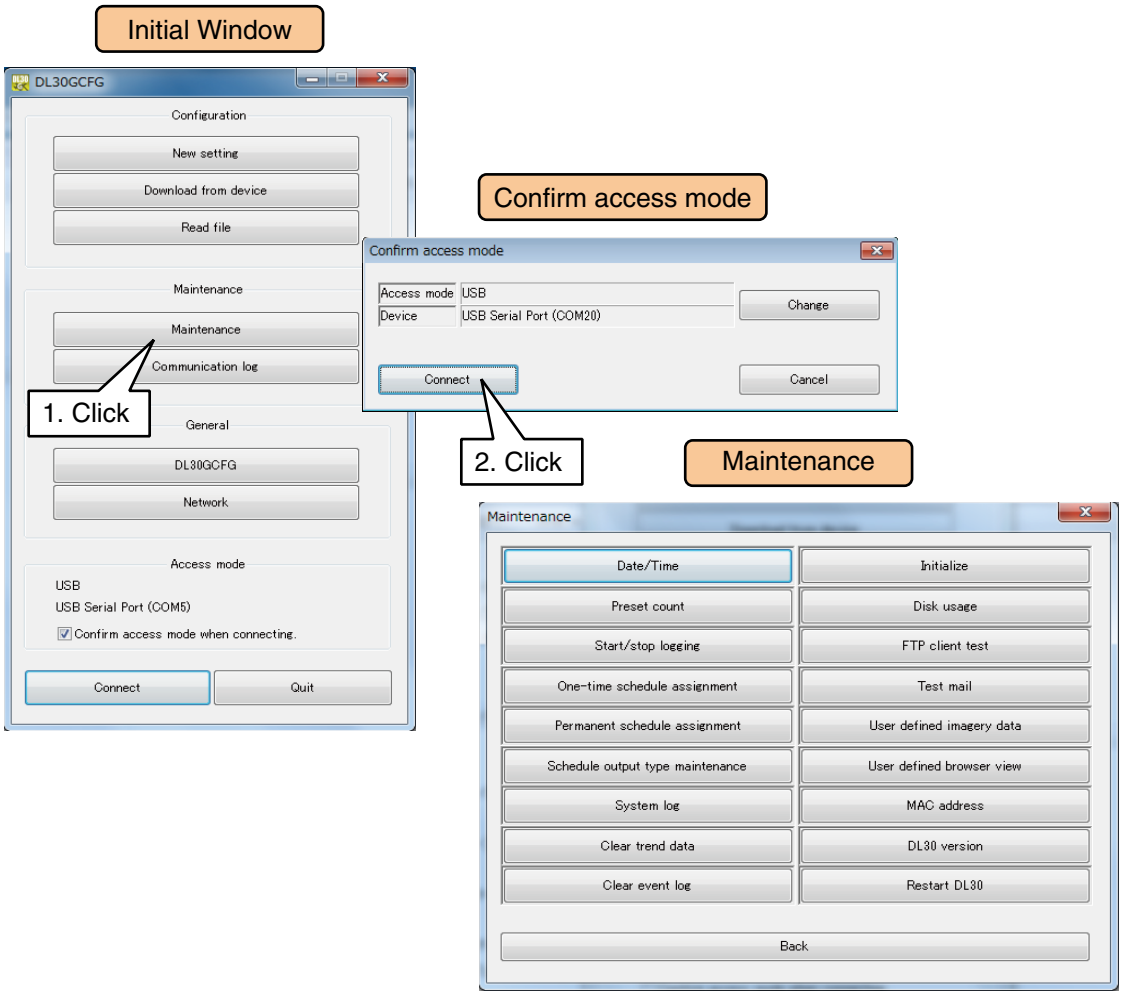
(1) Turn [Configuration Select SW] to the [DL30] side.



(2) Connect the device to a PC in which DL30GCFG is installed, and start up DL30GCFG.

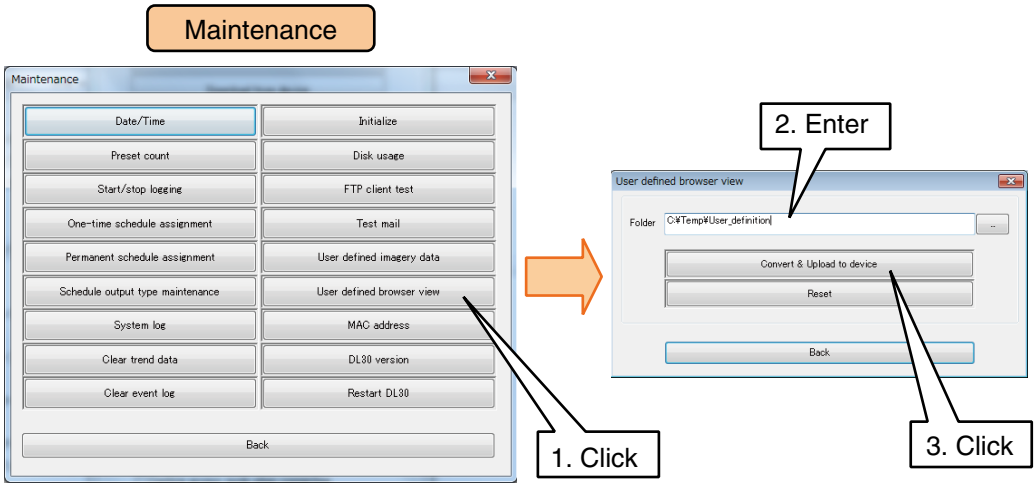
(3) Click [Maintenance] button in the initial window to display the [Confirm access mode] window.

(4) Check that the device is correct, and click [Connect] button.



(5) Click [User defined browser view] button to display the [User defined browser view] window.

(6) Specify the working folder and click [Convert & Upload to device] button to import the contents.



Step 4: Confirm on the web browser

Access the address: http://<DL30-IP address>/user/<Contents file name>.

[Example]
Contents file name: sample.html
DL30 IP address: 192.168.0.1
Default top window: http://192.168.0.1/index.html
User defined browser view: http://192.168.0.1/user/sample.html

NOTES

Reload the browser if the user file is not displayed.
Clear the cache if the display does not change after reloading.

8. Appendix

8.1 Troubleshooting

Refer to the FAQ on M-System web site.
➔ http://www.m-system.co.jp/

8.1.1 Status indicator LED lamps

Problem faced	Checks to be done	Method of handling
The PWR LED does not come on.	Is the DL30-G powered ON?	Check the power supply.
The RUN LED does not come on.	Perform the same checks as in [8.1.2 Error indicator on browser].	----
The DL30 RUN LED does not come on.	Is the DL30-G powered ON?	Check the power supply.
The ERROR LED is blinking.	Perform the same checks as in [8.1.2 Error indicator on browser].	

8.1.2 Error indicator on browser

Problem faced	Checks to be done	Method of handling
The error indicator is displayed on the menu bar.	Has an R30 I/O module been installed?	If “module” has been specified in the CH setting for the DL30GCFG [Input/Output] - [Analog input (AI)], [Discrete input (DI)], [pulse input (PI)], [Analog output (AO)] and [Discrete output (DO)], check if an I/O module is mounted on the specified slot.
	Can the SD card be accessed from the Web browser view?	Check if the SD card can be accessed. ➔ 4.6 Data file download If it cannot be accessed, the SD card may be corrupted. Prepare a new SD card for replacement.
	Can the internal memory be accessed from the Web browser view?	Check if the internal memory can be accessed. ➔ 4.6 Data file download If it cannot be accessed, the internal memory may be corrupted. Return the DL30-G to M-System so that it can be repaired.

8.1.3 RUN contact

Problem faced	Checks to be done	Method of handling
Run contact is off.	Has an R30 I/O module been installed?	If “module” has been specified in the CH setting for the DL30GCFG [Input/Output] - [Analog input (AI)], [Discrete input (DI)], [Pulse input (PI)], [Analog output (AO)] and [Discrete output (DO)], check if an I/O module is mounted on the specified slot.
	Can the SD card be accessed from the Web browser view?	Check if it can be accessed. ➔ 4.6 Data file download If it cannot be accessed, the SD card may be corrupted. Arrange for a new SD card and replace it.
	Can the internal memory be accessed from the Web browser view?	Check if it can be accessed. ➔ 4.6 Data file download If it cannot be accessed, the internal memory may be corrupted. Return the DL30-G so that it can be repaired.

8.1.4 SD card

Problem faced	Checks to be done	Method of handling
Unable to record in the SD card.	Has the SD card been inserted? (Is the SD CARD lamp ON?)	Insert an SD card specified by us. ➔ 8.2.4 SD card
	Is the RECORD lamp ON?	Keep the [RECORD] button in the DL30-G clicked for at least 1 second. ➔ 5.2 Data logging [Starting data logging]
	If there space available for storage on the SD card?	Check for space availability, and delete unnecessary data from the SD card. ➔ 6.1.2 Maintenance menu (DL30GCFG) [Confirming disk usage status]
The sum values are not recorded in the CSV report file.	Are you not looking into the current (today, this month, this year) file?	The sum values are recorded only when the current (today, this month, this year) file is closed and saved. Files in the internal memory contains the sum values before they are finalized. ➔ 4.6 Data file download

8.1.5 R30 I/O module

Problem faced	Checks to be done	Method of handling
The RUN LED does not come on.	Have the I/O modules been properly installed?	Refer to the instruction manuals for the R30 Series and confirm the installation conditions.
	Are the module addresses not duplicate?	Review the address of each module.
	DL30GCFG I/O setting	The RUN LED does not turn on if the I/O modules are not assigned to the I/O channels on the DL30GCFG program.
	Is the PWR LED on?	Check the power supply to the DL30-G.
Analog input value is not correct.	Hardware range setting	Refer to the instruction manuals for the R30 Series and confirm the range setting.
	Is the input voltage/current correctly supplied?	Check the actual input value using the loop test function on the R30CFG. Refer to the User Manual for the R30CFG.

8.1.6 DL30GCFG

Problem faced	Checks to be done	Method of handling
Unable to connect to the DL30-G. (When using a USB cable to connect)	Is the COM port correct?	Check the COM port. It should be the same as the COM number in the [USB Serial Port]. ➔ 2.3.1 Configurator software for DL30-G: DL30GCFG
	Is the Configuration Select Switch set as [DL30]?	Set the Configuration Select Switch as [DL30]. ➔ 1.3 Component identification
Unable to connect to the DL30-G. (When connecting via the LAN)	Has [Connection via network] been enabled?	Connect using a USB cable, and set [Connection via network] as [Enable]. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
	Is the IP address correct?	Connect using a USB cable, and check the IP address. ➔ 3.3.3 IP address setting
	Has the LAN cable come out of the HUB?	Connect the LAN cable securely.
	Has the same network address been specified in the IP address of the DL30-G and PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] Paperless recorder : 192.168.0.1 PC : 192.168.0.2 Subnet mask : 255.255.255.0
	Is the password correct?	Connect using a USB cable, and check the password set in the [DL30GCFG] window. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
Unable to connect to the DL30-G. (When connecting via the Internet)	Has [Connection via network] been enabled?	Connect using a USB cable, and set [Connection via network] as [Enable]. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
	Is the IP address correct?	Connect using a USB cable, and check the IP address. ➔ 3.3.3 IP address setting
	Has the LAN cable come out of the HUB?	Connect the LAN cable securely.
	Is the password correct?	Connect using a USB cable, and check the password set in the [DL30GCFG] window. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
	Is the port address on the router used by DL30GCFG (Initial setting: 30341) open?	Set the IP address and port address of the DL30-G manually in the NAT setting of the router. (See the User Manual for the router.)

8.1.7 LAN connection

Problem faced	Checks to be done	Method of handling
Unable to display the Web browser view via the LAN.	Is the IP address correct?	Connect using a USB cable, and check the IP address. ➔ 3.3.3 IP address setting
	Has the LAN cable come out of the HUB?	Connect the LAN cable securely.
	Is the IP address overlapping with another device?	Check the IP address.
	Has the same network address been specified in the IP address of the DL30-G and PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] Paperless recorder : 192.168.0.1 PC : 192.168.0.2 Subnet mask: 255.255.255.0
	Have firewall or proxy server setting been configured on the PC?	Check the contents of the firewall and proxy server setting with the network administrator.
	Are you using a compatible terminal and compatible browser?	Check the version of the terminal/browser software. ➔ 8.2.1 Compatible terminals and browsers
	Is there a problem with the terminal or PC being used?	Use a different terminal/PC.

8.1.8 Wi-Fi connection

Problem faced	Checks to be done	Method of handling
Unable to connect to the access point from a terminal/PC.	Is the password to the access point correct?	Check the password to the access point. (See the User Manual for the access point)
	Has an IP address been assigned to the terminal/PC?	Check that the access point has a DHCP server function. If not, enter the IP address manually. (See the User Manual for the access point)

8.1.9 Internet

Problem faced	Checks to be done	Method of handling
Unable to connect to the Internet (provider).	Does the information used to connect to the provider match the setting in the router (User name, password, etc.)?	Check the setting of the router related to the provider. (See the provider information and the User Manual of the router)
	If a mobile router is being used, is the signal weak?	Check the signal strength.
	Have the IP address and default gateway of the DL30-G been correctly set?	Check the IP address and default gateway setting for the DL30-G. ➔ 3.3.3 IP address setting
Unable to display the Web browser view via the Internet.	Is the URL correct?	Check the fixed IP address or domain name of the WAN as per the agreement with the provider. (See the contents of the agreement with the provider)
	If the IP address of the DL30-G is manually set, is the port open?	Set the IP address and port address of the DL30-G (Initial setting: 80) manually in the NAT setting of the router. (See the User Manual of the router)
	If the IP address of the DL30-G is set as [Automatic setting (DHCP)], has the IP address been assigned by the router?	Obtain the IP address from the router and set the IP address and port address (Initial setting: 80) from the NAT setting manually. (See the User Manual of the router)

8.1.10 Web server

Problem faced	Checks to be done	Method of handling
Unable to manipulate MA, MD, AO, DO, and/or GDO on the Data display view.	Is the relevant channel selected in the [Channel control function setting]?	Select the relevant channel in the [Channel control function setting] from the Web server setting. ➔ 3.11.4 Login ID / password / port address setting (web browser access)
	Have you not logged in to the web server in the browsing mode?	Log in to the web server using the DL30GCFG remote access authorization login ID and password. ➔ 3.3.4 Enabling configuration via network (remote access authorization)
	Is the [Control on browser] for the relevant channel not set to [Disable]?	Enable the [Control on browser] setting for the relevant output channel.
	Is the relevant channel not specified for I/O mapping function?	Channels used for I/O mapping cannot be manipulated. Remove the setting.

8.1.11 E-mail reporting

Problem faced	Checks to be done	Method of handling
DL30-G is unable to send an e-mail.	Is the PC connecting to the Internet?	Make sure that the PC connects to the Internet.
	Are the IP addresses of DL30-G including the default gateway set correctly?	Check the settings of the IP addresses of DL30-G including the default gateway. ➔ 3.3.3 IP address setting
	Is the recipient e-mail address correct?	Check the attention e-mail address. Be careful of the difference between "_" (low line) and "-" (hyphen-minus) for instance.
	Settings on e-mailing · Mail account · IP address or domain name of SMTP server · IP address or domain name of POP3 server · Mail password Are the above settings correct?	Check the settings on e-mailing the provider supplies. Make sure that an e-mail can be sent to the recipient address with mail software of the PC.
	Doesn't the mail server of the provider need authentication (SMTP, POP before SMTP, etc.) in sending an e-mail?	Confirm the authentication the provider requires and configure the e-mail settings. ➔ 3.10.1 Mail server setting
	With POP before SMTP, is the specified port address of the router open?	Manually set the No. specified in the NAT setting of the router. (Refer to the instruction manual of the router.)
	Doesn't the mail service of the provider have a nuisance e-mail reception prevention function?	Check a response from the mail server with terminal software. ➔ 3.15.2 Status monitoring
Unable to open the web browser view for e-mail setting.	Are the login ID and password correct?	Confirm the login ID and password. ➔ 3.3.4 Enabling configuration via network (remote access authorization)

8.1.12 Modbus/TCP slave

Problem faced	Checks to be done	Method of handling
Unable to connect with DL30-G from the Modbus master side.	Is the Modbus/TCP slave function enabled?	Enable the Modbus/TCP slave function. ➔ 3.12.3 Modbus/TCP slave
Unable to read data.	Are the register type and the address of the channel correct?	Check the register type and the address. ➔ 8.2.6 Modbus/TCP slave
Unable to connect via the router.	Is the port address 502 of the router used for Modbus/TCP open?	Set the IP address and the port address 502 of DL30-G manually in the NAT setting of the router. (Refer to the instruction manual of the router.)

8.1.13 Modbus/TCP master

Problem faced	Checks to be done	Method of handling
Unable to connect to the Modbus slave device from the DL30-G.	Is the LAN cable disconnected or has it come out from the HUB?	Connect the LAN cable securely. Check the connected lamp on the HUB.
	Has the IP address of the DL30-G been manually set?	Set the IP address manually. ➔ 3.3.3 IP address setting
	Has the same network address been specified in the DL30-G and Modbus slave device?	Check the network address. [Example] Paperless recorder: 192.168.0.1 Slave: 192.168.0.2 Subnet mask: 255.255.255.0
	Does the IP address of the slave device coincide with the one registered on DL30GCFG?	Check the IP address. ➔ 3.6.1 I/O slave setting
	Has the IP address been set for the slave device?	Set the IP address for the slave device. For M-System remote I/O, disconnect and restart the power supply after setting the IP address. (See the respective remote I/O User Manuals for information on the method of setting the IP address)
	Have you replaced the network module?	When the Modbus/TCP network module in the remote I/O is replaced, it may take time to connect. In order to connect immediately, disconnect and restart the power supply to the DL30-G.

8.1.14 FTP server

Problem faced	Checks to be done	Method of handling
Unable to make an FTP connection to the DL30-G via the LAN.	Have the setting of the FTP server function for the DL30-G been enabled?	Set the mode in the FTP server setting in DL-30GCFG as [Enable]. ➔ 3.12.1 FTP server
	Are the IP address, login ID and the password for the DL30-G correct?	Check the IP address.
		Check the login ID and password set in DL-30GCFG. ➔ 3.12.1 FTP server
	Are you able to login to the DL30-G from an FTP client such as a PC?	Check whether a DOS command can be used to login to the DL30-G.
Unable to make an FTP connection to the DL30-G via the Internet.	Is the DL30-G able to connect to the Internet?	Check whether you can connect to the Internet from the PC.
	Is the URL correct?	Check the fixed IP address or domain name of the WAN as per the agreement with the provider. (See the contents of the agreement with the provider)
	Is port 21 open on the router used by the FTP for the DL30=G?	Set port address 21 on the NAT setting for the router manually. (See the User Manual of the router)
	Is security software or a firewall blocking the connection?	Disable the security software and the firewall, and try again.
Unable to carry out maintenance of files in the DL30-G using the FTP client.	Is the FTP client software specified in this User Manual being used?	Use an FTP client whose working has been checked. ➔ 8.2.8 FTP server

8.1.15 FTP client

Problem faced	Checks to be done	Method of handling
Unable to connect to the FTP server on the LAN.	Are the FTP server settings correct?	Check the settings in the FTP server side.
	Is login to the FTP server set to DL30-G as transfer destination from FTP client such as a PC possible?	Make sure that login to the FTP server is possible using DOS commands, for example.
Unable to connect to the FTP server via the Internet.	Is the PC connecting to the Internet?	Make sure that the PC connects to the Internet.
	Is the port address 21, used for the FTP, of the router in the FTP server side open?	Set the port address 21 manually in the NAT setting of the router. (Refer to the instruction manual of the router.)
	Is security software or a firewall blocking the connection?	Disable the security software and the firewall, and try again.
DL30-G is unable to transfer a CSV file.	Are the address, login, password, and the folder name to store the file of the FTP server correct?	Review the login and the password of the FTP server comparing with the settings of DL-30GCFG. ➔ 3.12.2 FTP client
	Is the subfolder to transfer specified?	Review the subfolder name of the FTP server comparing with the settings of DLGCFG. ➔ 3.12.2 FTP client
	Does DL30-G regularly transmit to the FTP server?	Check the transmission status. ➔ 3.15.2 Status monitoring

8.2 Reference documents

8.2.1 Compatible terminals and browsers

The following environments are verified operation.

Terminal	Compatible browser
iPad (iPadOS 13.5.1)	Safari
Android tablet (Android 9)	Chrome 83.0.4103.101
Windows (7, 8, 10)	Microsoft Edge 81.0.478.56, Internet Explorer 11, Firefox 75.0, Chrome 83.0.4103.116

OS	Browser	Mouse operation	Touch operation	HTTPS
iPadOS 13.2.3	Safari	No	Yes	Yes
Android 9	Chrome	Yes	Yes	Yes
Windows 7	Internet Explorer	Yes	No	No
	Firefox	Yes	No	No
	Chrome	Yes	No	No
Windows 8 (*2)	Internet Explorer	Yes	Yes (*1)	No
	Firefox	Yes	Yes (*1)	No
	Chrome	Yes	Yes	No
Windows 10 (*2)	Edge	Yes	Yes (*1)	Yes
	Internet Explorer	Yes	Yes (*1)	No
	Firefox	Yes	Yes (*1)	Yes
	Chrome	Yes	Yes	Yes

(*1) 2 point touch operation is not supported. And, the operation specifications depend on the mouse.
(*2) The automatic window size adjustment function is disabled.

8.2.2 Web server

The following environments are supported.

Terminal	Compatible browser
Port address	Variable (Initial value: 80)
Number of simultaneous connections	Up to 4
Character code	UTF-8
Number of pixels in the horizontal width	1024 (Automatic window size adjustment function for scaling according to the window width (viewport))
Screen refresh rate	0 to 999 seconds
Browser setting conditions	Enable JavaScript. Enable Cookies. Disable Internet Explorer Compatibility View Settings.

8.2.3 Internal memory

Internal memory basic specifications

Item	Description
Total space	4 GB (Uses around 3.0 GB)

Memory block

The internal memory is divided into several memory blocks.
Switching the storage area from one block to another is called “internal memory transition”.
A data file in a currently running block is saved before the data logging starts in a new block.
When the last memory block is used up, the DL30-G goes back to the first block and overwrite it.
One file per block is downloadable.

Data		Number of memory blocks	Timing of internal memory transition
Logging data		16	· Storing rate in seconds: 1 day · Storing rate in minutes: 1 day · Storing rate in hours: 1 month · When the time index is modified by clock adjustment. · When the logging setting is changed.
Event data	Event log	4	· When the year is changed. · When the accumulated data reaches 2000 entries.
	System log	4	
	Communication log	4	
	Schedule log	4	
Report form	Daily report	32	· Daily report: When the date is changed. · Monthly report: When the month is changed. · Yearly report: When the year is changed. · When the time index is modified by clock adjustment. · When the report form setting is changed.
	Monthly report	16	
	Yearly report	4	

8.2.4 SD card

SD card basic specifications

Item	Description
Type	SDHC
Format	FAT32

Specified SD card type

Hagiwara Solutions: NSD6-004GH(B21SEI
NSD6-016GH(B20SEI
(NSD6-004GH(A00SDI ... discontinued)

SD card formatter

When formatting SD card, use a dedicated software “SD Card Formatter”.

“SD Card Formatter” is downloadable at SD Association’s web site.
https://www.sdcard.org

CAUTION

Do not use a format other than the one provided by the SD Association for the SD card.

Automatic file deleting function

Old files in the SD card can be automatically deleted by enabling [SD card auto delete] function.

■ Logging data

- The oldest files are deleted when the remaining space of the SD card is less than 100 MB.
  The DL30-G deletes the oldest year folder(s) until the card recovers more than 100 MB of free space.
  An SD card error is triggered if the free space is still less than 100 MB after all the year folders other than the current year are deleted.

■ Event data

- The folders older than 3 years are deleted at the timing of a new calendar year.
  (Data for the past 3 years + the current year is saved.)
- The oldest files are deleted when the remaining space of the SD card is less than 100 MB.
  The DL30-G deletes the oldest year folder(s) until the card recovers more than 100 MB of free space.
  An SD card error is triggered if the free space is still less than 100 MB after all the year folders other than the current year are deleted.

■ Report form data

- The folders older than 3 years are deleted at the timing of a new calendar year.
  (Data for the past 3 years + the current year is saved.)

Approximate file size

The following tables show approximate memory size occupied by each CSV file.

■ Logging data file

[Assumptions]

- 3 lines of headers using the maximum text length (1024 x 3)
- Each data entry taking 15 single byte characters including commas
- Data for the last 24 hours is saved in a file when the storing rates are 1 second to 30 minutes, while data for one month is saved in a file when the storing rate is 1 hour.

Storing rate	16 pens (MB)	32 pens (MB)	64 pens (MB)	128 pens (MB)
1 second	21.43	41.21	80.76	159.69
2 seconds	10.72	20.60	40.38	79.85
5 seconds	4.24	8.25	16.16	31.94
10 seconds	2.15	4.13	8.08	15.97
20 seconds	1.06	2.03	3.96	7.99
30 seconds	0.72	1.38	2.70	5.33
1 minute	0.37	0.69	1.35	2.67
2 minutes	0.19	0.35	0.68	1.34
5 minutes	0.08	0.15	0.28	0.54
10 minutes	0.04	0.08	0.14	0.27
15 minutes	0.03	0.05	0.10	0.18
20 minutes	0.03	0.04	0.08	0.14
30 minutes	0.02	0.03	0.05	0.09
1 hour	0.19	0.36	0.70	1.38

■ Report form data file

[Assumptions]

- The maximum text length used for Page title (32 x 3), Device name (32 x 3), CH name (8 x 3), CH comment (8 x 3), and Engineering unit (8 x 3)
- Each data entry taking 15 single byte characters including commas

Report form type	16 pens (MB)	32 pens (MB)	64 pens (MB)	128 pens (KB)
Daily report	8.14	15.92	31.49	62.24
Monthly report	9.93	19.46	38.53	75.40
Yearly report	5.07	9.85	19.41	39.67

■ Event data file

[Assumptions]

- Each data entry occupying the maximum size

Event data type	1 line (BYTE)	1 file (KB)
Event log	373	728.5
System log	50	97.66
Communication log	99	193.36
Schedule log	250	488.42

8.2.5 Data file configurations

All data is saved first in the internal memory and then transferred to the SD card in the specific timings.

Data transfer to SD card

Data is not stored in the SD card unless each function is enabled.

Function	Data transfer timing	Transferred data description
Logging data	SD card recognized *	All contents in the currently active internal memory block. All previous memory blocks that were not transferred.
	Every minute	Added data is sent when the storing rate set to Second or Minute.
	At the storing timing	Added data is sent when the storing rate set to Hour.
Event data (Event log, System log, Communication log, and Schedule log)	SD card recognized *	All contents in the currently active internal memory block. All previous memory blocks that were not transferred.
	Every minute	Added data is sent every minute.
Report form (Daily report, Monthly report, and Yearly report)	SD card recognized *	All contents in the currently active internal memory block. All previous memory blocks that were not transferred.
	On the hour	Generated report data is sent.

* Applicable also to the following cases:
  When the power supply to the DL30-G is turned on while the SD card is inserted in the slot.
  When an SD card is inserted to the slot (including when it is removed and then inserted again).

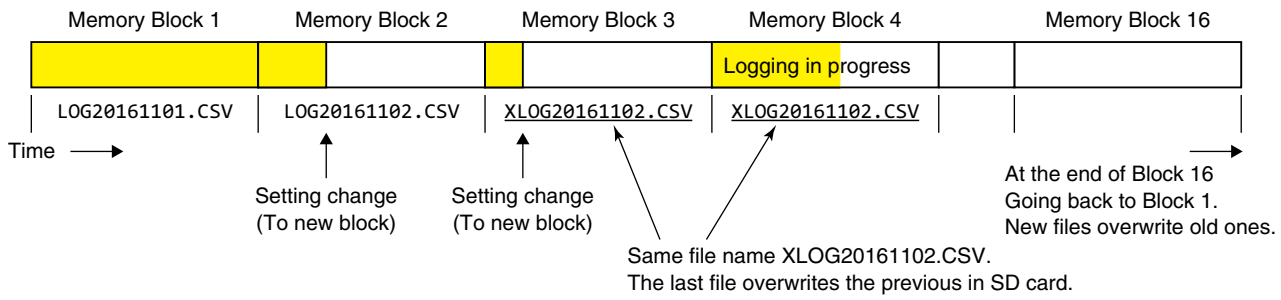
File names

■ Logging data file

A file is named with the date (yyyymmdd) of the first data entry.
If data storage is switched to a new memory block when some setting changes and/or disruptions of time index occurs (if the [Sampling adjustment at time correction] is enabled, when the difference between before and after time correction is greater than 10 seconds), the currently logging data file is determined and a new file is created and prefixed with "X".

Function	File name	Example
Logging data	LOGyyyymmdd	LOG20161101.CSV, XLOG20161101.CSV

[Example]



CAUTION

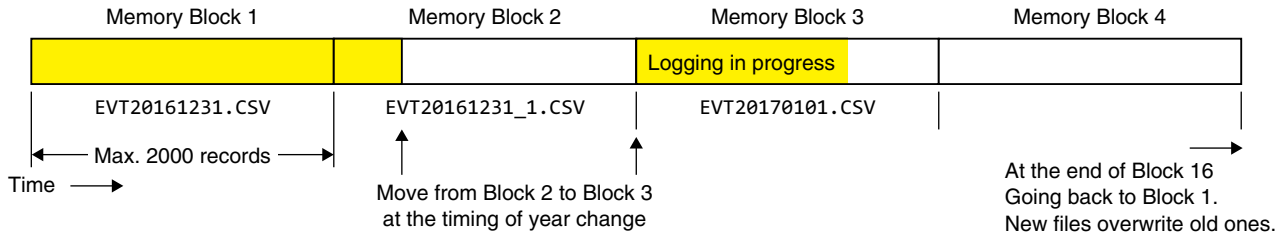
In the internal memory, if the memory block is switched again on the same day due to setting changes and/or disruptions of time index, a new file with the same name (i.e. XLOGyyyymmdd.csv) is created and two files with the identical name coexist.
However, the former file is overwritten by the latter file when data is transferred to the SD card and data in the former file will be missing in the SD card.
Download the missing data, if necessary, from the internal memory.

■ Event data file

A file is named the date (yyyymmdd) of the first data entry.
If data storage is switched to a new memory block, a new file is created with the name added with serial numbers (_1, _2, ...).

Function		File name	Example
Event data	Event log	EVTyyyymmdd	EVT20161101.CSV, EVT20161101_1.CSV
	System log	SYSyyyymmdd	SYS20161101.CSV, SYS20161101_1.CSV
	Communication log	COMyyyymmdd	COM20161101.CSV, COM20161101_1.CSV
	Schedule log	SCHyyyymmdd	SCH20161101.CSV, SCH20161101_1.CSV

[Example]



■ Report form file

A file is named with the date (yyyymmdd) of the first data entry.
If data storage is switched to a new memory block when some setting changes and/or disruptions of time index occurs (if the [Sampling adjustment at time correction] is enabled, when the difference between before and after time correction is greater than 10 seconds), the current report form file is determined and a new file is created and prefixed with “X”.

Function		File name	Example
Report form	Daily report	RPTyyyymmdd	RPT20161101.CSV, XRPT20161101.CSV
	Monthly report	RPTyyyymm	RPT2016110CSV, XRPT201611.CSV
	Yearly report	RPTyyyy	RPT2016.CSV, XRPT2016.CSV

CAUTION

In the internal memory, if the memory block is switched again on the same day due to setting changes and/or disruptions of time index, a new file with the same name (e.g. XRPTyyyym-mdd.csv) is created and two files with the identical name coexist.
However, the former file is overwritten by the latter file when data is transferred to the SD card and data in the former file will be missing in the SD card.
Download the missing data, if necessary, from the internal memory.

Folder structure in internal memory

```
LOG ..................................... Logging data
    LOG20161126.CSV

EVENT ................................... Event data
  EVT ................................... Event log
      EVT20161126.CSV
  SYS ................................... System log
      SYS20161126.CSV
  COM ................................... Communication log
      COM20161126.CSV
  SCH ................................... Schedule log
      SCH20161126.CSV

REPORT .................................. Report forms
  DAY ................................... Daily report
      RPT20161126.CSV
  MONTH ................................. Monthly report
      RPT201611.CSV
      RPT201612.CSV
  YEAR .................................. Yearly report
      RPT2016.CSV
```

Folder structure in SD card

```
LOG ..................................... Logging data
  2016
    11
      LOG20161126.CSV

EVT ..................................... Event data
  2016
    EVT20161126.CSV ..................... Event log
    SYS20161126.CSV ..................... System log
    COM20161126.CSV ..................... Communication log
    SCH20161126.CSV ..................... Schedule log

RPT ..................................... Report forms
  2016
    RPT2016.CSV ......................... Yearly report
    11
      RPT20161126.CSV ................... Daily report
      RPT201611.CSV ..................... Monthly report
    12
      RPT20161201.CSV
      RPT201612.CSV
```

8.2.6 Modbus/TCP slave

Modbus register map

0X

Register	Channel	Register	Channel	Register	Channel	Register	Channel
00001	DO1	00033	DO33	00065	DO65	00097	DO97
00002	DO2	00034	DO34	00066	DO66	00098	DO98
00003	DO3	00035	DO35	00067	DO67	00099	DO99
00004	DO4	00036	DO36	00068	DO68	00100	DO100
00005	DO5	00037	DO37	00069	DO69	00101	DO101
00006	DO6	00038	DO38	00070	DO70	00102	DO102
00007	DO7	00039	DO39	00071	DO71	00103	DO103
00008	DO8	00040	DO40	00072	DO72	00104	DO104
00009	DO9	00041	DO41	00073	DO73	00105	DO105
00010	DO10	00042	DO42	00074	DO74	00106	DO106
00011	DO11	00043	DO43	00075	DO75	00107	DO107
00012	DO12	00044	DO44	00076	DO76	00108	DO108
00013	DO13	00045	DO45	00077	DO77	00109	DO109
00014	DO14	00046	DO46	00078	DO78	00110	DO110
00015	DO15	00047	DO47	00079	DO79	00111	DO111
00016	DO16	00048	DO48	00080	DO80	00112	DO112
00017	DO17	00049	DO49	00081	DO81	00113	DO113
00018	DO18	00050	DO50	00082	DO82	00114	DO114
00019	DO19	00051	DO51	00083	DO83	00115	DO115
00020	DO20	00052	DO52	00084	DO84	00116	DO116
00021	DO21	00053	DO53	00085	DO85	00117	DO117
00022	DO22	00054	DO54	00086	DO86	00118	DO118
00023	DO23	00055	DO55	00087	DO87	00119	DO119
00024	DO24	00056	DO56	00088	DO88	00120	DO120
00025	DO25	00057	DO57	00089	DO89	00121	DO121
00026	DO26	00058	DO58	00090	DO90	00122	DO122
00027	DO27	00059	DO59	00091	DO91	00123	DO123
00028	DO28	00060	DO60	00092	DO92	00124	DO124
00029	DO29	00061	DO61	00093	DO93	00125	DO125
00030	DO30	00062	DO62	00094	DO94	00126	DO126
00031	DO31	00063	DO63	00095	DO95	00127	DO127
00032	DO32	00064	DO64	00096	DO96	00128	DO128

0X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
01001	MD1	01033	MD33	01065	MD65	01097	MD97
01002	MD2	01034	MD34	01066	MD66	01098	MD98
01003	MD3	01035	MD35	01067	MD67	01099	MD99
01004	MD4	01036	MD36	01068	MD68	01100	MD100
01005	MD5	01037	MD37	01069	MD69	01101	MD011
01006	MD6	01038	MD38	01070	MD70	01102	MD102
01007	MD7	01039	MD39	01071	MD71	01103	MD103
01008	MD8	01040	MD40	01072	MD72	01104	MD104
01009	MD9	01041	MD41	01073	MD73	01105	MD105
01010	MD10	01042	MD42	01074	MD74	01106	MD106
01011	MD11	01043	MD43	01075	MD75	01107	MD107
01012	MD12	01044	MD44	01076	MD76	01108	MD108
01013	MD13	01045	MD45	01077	MD77	01109	MD109
01014	MD14	01046	MD46	01078	MD78	01110	MD110
01015	MD15	01047	MD47	01079	MD79	01111	MD111
01016	MD16	01048	MD48	01080	MD80	01112	MD112
01017	MD17	01049	MD49	01081	MD81	01113	MD113
01018	MD18	01050	MD50	01082	MD82	01114	MD114
01019	MD19	01051	MD51	01083	MD83	01115	MD115
01020	MD20	01052	MD52	01084	MD84	01116	MD116
01021	MD21	01053	MD53	01085	MD85	01117	MD117
01022	MD22	01054	MD54	01086	MD86	01118	MD118
01023	MD23	01055	MD55	01087	MD87	01119	MD119
01024	MD24	01056	MD56	01088	MD88	01120	MD120
01025	MD25	01057	MD57	01089	MD89	01121	MD121
01026	MD26	01058	MD58	01090	MD90	01122	MD122
01027	MD27	01059	MD59	01091	MD91	01123	MD123
01028	MD28	01060	MD60	01092	MD92	01124	MD124
01029	MD29	01061	MD61	01093	MD93	01125	MD125
01030	MD30	01062	MD62	01094	MD94	01126	MD126
01031	MD31	01063	MD63	01095	MD95	01127	MD127
01032	MD32	01064	MD64	01096	MD96	01128	MD128

0X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
01129	MD129	01161	MD161	01193	MD193	01225	MD225
01130	MD130	01162	MD162	01194	MD194	01226	MD226
01131	MD131	01163	MD163	01195	MD195	01227	MD227
01132	MD132	01164	MD164	01196	MD196	01228	MD228
01133	MD133	01165	MD165	01197	MD197	01229	MD229
01134	MD134	01166	MD166	01198	MD198	01230	MD230
01135	MD135	01167	MD167	01199	MD199	01231	MD231
01136	MD136	01168	MD168	01200	MD200	01232	MD232
01137	MD137	01169	MD169	01201	MD201	01233	MD233
01138	MD138	01170	MD170	01202	MD202	01234	MD234
01139	MD139	01171	MD171	01203	MD203	01235	MD235
01140	MD140	01172	MD172	01204	MD204	01236	MD236
01141	MD141	01173	MD173	01205	MD205	01237	MD237
01142	MD142	01174	MD174	01206	MD206	01238	MD238
01143	MD143	01175	MD175	01207	MD207	01239	MD239
01144	MD144	01176	MD176	01208	MD208	01240	MD240
01145	MD145	01177	MD177	01209	MD209	01241	MD241
01146	MD146	01178	MD178	01210	MD210	01242	MD242
01147	MD147	01179	MD179	01211	MD211	01243	MD243
01148	MD148	01180	MD180	01212	MD212	01244	MD244
01149	MD149	01181	MD181	01213	MD213	01245	MD245
01150	MD150	01182	MD182	01214	MD214	01246	MD246
01151	MD151	01183	MD183	01215	MD215	01247	MD247
01152	MD152	01184	MD184	01216	MD216	01248	MD248
01153	MD153	01185	MD185	01217	MD217	01249	MD249
01154	MD154	01186	MD186	01218	MD218	01250	MD250
01155	MD155	01187	MD187	01219	MD219	01251	MD251
01156	MD156	01188	MD188	01220	MD220	01252	MD252
01157	MD157	01189	MD189	01221	MD221	01253	MD253
01158	MD158	01190	MD190	01222	MD222	01254	MD254
01159	MD159	01191	MD191	01223	MD223	01255	MD255
01160	MD160	01192	MD192	01224	MD224	01256	MD256

0X (continued)

Register	Channel
02001	GDO1
02002	GDO2
02003	GDO3
02004	GDO4
02005	GDO5
02006	GDO6
02007	GDO7
02008	GDO8
02009	GDO9
02010	GDO10
02011	GDO11
02012	GDO12
02013	GDO13
02014	GDO14
02015	GDO15
02016	GDO16
02017	GDO17
02018	GDO18
02019	GDO19
02020	GDO20
02021	GDO21
02022	GDO22
02023	GDO23
02024	GDO24
02025	GDO25
02026	GDO26
02027	GDO27
02028	GDO28
02029	GDO29
02030	GDO30
02031	GDO31
02032	GDO32

1X

Register	Channel	Register	Channel	Register	Channel	Register	Channel
10001	DI1	10033	DI33	10065	DI65	10097	DI97
10002	DI2	10034	DI34	10066	DI66	10098	DI98
10003	DI3	10035	DI35	10067	DI67	10099	DI99
10004	DI4	10036	DI36	10068	DI68	10100	DI100
10005	DI5	10037	DI37	10069	DI69	10101	DI101
10006	DI6	10038	DI38	10070	DI70	10102	DI102
10007	DI7	10039	DI39	10071	DI71	10103	DI103
10008	DI8	10040	DI40	10072	DI72	10104	DI104
10009	DI9	10041	DI41	10073	DI73	10105	DI105
10010	DI10	10042	DI42	10074	DI74	10106	DI106
10011	DI11	10043	DI43	10075	DI75	10107	DI107
10012	DI12	10044	DI44	10076	DI76	10108	DI108
10013	DI13	10045	DI45	10077	DI77	10109	DI109
10014	DI14	10046	DI46	10078	DI78	10110	DI110
10015	DI15	10047	DI47	10079	DI79	10111	DI111
10016	DI16	10048	DI48	10080	DI80	10112	DI112
10017	DI17	10049	DI49	10081	DI81	10113	DI113
10018	DI18	10050	DI50	10082	DI82	10114	DI114
10019	DI19	10051	DI51	10083	DI83	10115	DI115
10020	DI20	10052	DI52	10084	DI84	10116	DI116
10021	DI21	10053	DI53	10085	DI85	10117	DI117
10022	DI22	10054	DI54	10086	DI86	10118	DI118
10023	DI23	10055	DI55	10087	DI87	10119	DI119
10024	DI24	10056	DI56	10088	DI88	10120	DI120
10025	DI25	10057	DI57	10089	DI89	10121	DI121
10026	DI26	10058	DI58	10090	DI90	10122	DI122
10027	DI27	10059	DI59	10091	DI91	10123	DI123
10028	DI28	10060	DI60	10092	DI92	10124	DI124
10029	DI29	10061	DI61	10093	DI93	10125	DI125
10030	DI30	10062	DI62	10094	DI94	10126	DI126
10031	DI31	10063	DI63	10095	DI95	10127	DI127
10032	DI32	10064	DI64	10096	DI96	10128	DI128

1X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
10129	DI129	10161	DI161	10193	DI193	10225	DI225
10130	DI130	10162	DI162	10194	DI194	10226	DI226
10131	DI131	10163	DI163	10195	DI195	10227	DI227
10132	DI132	10164	DI164	10196	DI196	10228	DI228
10133	DI133	10165	DI165	10197	DI197	10229	DI229
10134	DI134	10166	DI166	10198	DI198	10230	DI230
10135	DI135	10167	DI167	10199	DI199	10231	DI231
10136	DI136	10168	DI168	10200	DI200	10232	DI232
10137	DI137	10169	DI169	10201	DI201	10233	DI233
10138	DI138	10170	DI170	10202	DI202	10234	DI234
10139	DI139	10171	DI171	10203	DI203	10235	DI235
10140	DI140	10172	DI172	10204	DI204	10236	DI236
10141	DI141	10173	DI173	10205	DI205	10237	DI237
10142	DI142	10174	DI174	10206	DI206	10238	DI238
10143	DI143	10175	DI175	10207	DI207	10239	DI239
10144	DI144	10176	DI176	10208	DI208	10240	DI240
10145	DI145	10177	DI177	10209	DI209	10241	DI241
10146	DI146	10178	DI178	10210	DI210	10242	DI242
10147	DI147	10179	DI179	10211	DI211	10243	DI243
10148	DI148	10180	DI180	10212	DI212	10244	DI244
10149	DI149	10181	DI181	10213	DI213	10245	DI245
10150	DI150	10182	DI182	10214	DI214	10246	DI246
10151	DI151	10183	DI183	10215	DI215	10247	DI247
10152	DI152	10184	DI184	10216	DI216	10248	DI248
10153	DI153	10185	DI185	10217	DI217	10249	DI249
10154	DI154	10186	DI186	10218	DI218	10250	DI250
10155	DI155	10187	DI187	10219	DI219	10251	DI251
10156	DI156	10188	DI188	10220	DI220	10252	DI252
10157	DI157	10189	DI189	10221	DI221	10253	DI253
10158	DI158	10190	DI190	10222	DI222	10254	DI254
10159	DI159	10191	DI191	10223	DI223	10255	DI255
10160	DI160	10192	DI192	10224	DI224	10256	DI256

3X

Register	Channel	Register	Channel	Register	Channel	Register	Channel
30001	AI1	30033	AI33	30065	AI65	30097	AI97
30002	AI2	30034	AI34	30066	AI66	30098	AI98
30003	AI3	30035	AI35	30067	AI67	30099	AI99
30004	AI4	30036	AI36	30068	AI68	30100	AI100
30005	AI5	30037	AI37	30069	AI69	30101	AI101
30006	AI6	30038	AI38	30070	AI70	30102	AI102
30007	AI7	30039	AI39	30071	AI71	30103	AI103
30008	AI8	30040	AI40	30072	AI72	30104	AI104
30009	AI9	30041	AI41	30073	AI73	30105	AI105
30010	AI10	30042	AI42	30074	AI74	30106	AI106
30011	AI11	30043	AI43	30075	AI75	30107	AI107
30012	AI12	30044	AI44	30076	AI76	30108	AI108
30013	AI13	30045	AI45	30077	AI77	30109	AI109
30014	AI14	30046	AI46	30078	AI78	30110	AI110
30015	AI15	30047	AI47	30079	AI79	30111	AI111
30016	AI16	30048	AI48	30080	AI80	30112	AI112
30017	AI17	30049	AI49	30081	AI81	30113	AI113
30018	AI18	30050	AI50	30082	AI82	30114	AI114
30019	AI19	30051	AI51	30083	AI83	30115	AI115
30020	AI20	30052	AI52	30084	AI84	30116	AI116
30021	AI21	30053	AI53	30085	AI85	30117	AI117
30022	AI22	30054	AI54	30086	AI86	30118	AI118
30023	AI23	30055	AI55	30087	AI87	30119	AI119
30024	AI24	30056	AI56	30088	AI88	30120	AI120
30025	AI25	30057	AI57	30089	AI89	30121	AI121
30026	AI26	30058	AI58	30090	AI90	30122	AI122
30027	AI27	30059	AI59	30091	AI91	30123	AI123
30028	AI28	30060	AI60	30092	AI92	30124	AI124
30029	AI29	30061	AI61	30093	AI93	30125	AI125
30030	AI30	30062	AI62	30094	AI94	30126	AI126
30031	AI31	30063	AI63	30095	AI95	30127	AI127
30032	AI32	30064	AI64	30096	AI96	30128	AI128

3X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
31001	PI1 (low)	31033	PI17 (low)	31065	PI33 (low)	31097	PI49 (low)
31002	PI1 (high)	31034	PI17 (high)	31066	PI33 (high)	31098	PI49 (high)
31003	PI2 (low)	31035	PI18 (low)	31067	PI34 (low)	31099	PI50 (low)
31004	PI2 (high)	31036	PI18 (high)	31068	PI34 (high)	31100	PI50 (high)
31005	PI3 (low)	31037	PI19 (low)	31069	PI35 (low)	31101	PI51 (low)
31006	PI3 (high)	31038	PI19 (high)	31070	PI35 (high)	31102	PI51 (high)
31007	PI4 (low)	31039	PI20 (low)	31071	PI36 (low)	31103	PI52 (low)
31008	PI4 (high)	31040	PI20 (high)	31072	PI36 (high)	31104	PI52 (high)
31009	PI5 (low)	31041	PI21 (low)	31073	PI37 (low)	31105	PI53 (low)
31010	PI5 (high)	31042	PI21 (high)	31074	PI37 (high)	31106	PI53 (high)
31011	PI6 (low)	31043	PI22 (low)	31075	PI38 (low)	31107	PI54 (low)
31012	PI6 (high)	31044	PI22 (high)	31076	PI38 (high)	31108	PI54 (high)
31013	PI7 (low)	31045	PI23 (low)	31077	PI39 (low)	31109	PI55 (low)
31014	PI7 (high)	31046	PI23 (high)	31078	PI39 (high)	31110	PI55 (high)
31015	PI8 (low)	31047	PI24 (low)	31079	PI40 (low)	31111	PI56 (low)
31016	PI8 (high)	31048	PI24 (high)	31080	PI40 (high)	31112	PI56 (high)
31017	PI9 (low)	31049	PI25 (low)	31081	PI41 (low)	31113	PI57 (low)
31018	PI9 (high)	31050	PI25 (high)	31082	PI41 (high)	31114	PI57 (high)
31019	PI10 (low)	31051	PI26 (low)	31083	PI42 (low)	31115	PI58 (low)
31020	PI10 (high)	31052	PI26 (high)	31084	PI42 (high)	31116	PI58 (high)
31021	PI11 (low)	31053	PI27 (low)	31085	PI43 (low)	31117	PI59 (low)
31022	PI11 (high)	31054	PI27 (high)	31086	PI43 (high)	31118	PI59 (high)
31023	PI12 (low)	31055	PI28 (low)	31087	PI44 (low)	31119	PI60 (low)
31024	PI12 (high)	31056	PI28 (high)	31088	PI44 (high)	31120	PI60 (high)
31025	PI13 (low)	31057	PI29 (low)	31089	PI45 (low)	31121	PI61 (low)
31026	PI13 (high)	31058	PI29 (high)	31090	PI45 (high)	31122	PI61 (high)
31027	PI14 (low)	31059	PI30 (low)	31091	PI46 (low)	31123	PI62 (low)
31028	PI14 (high)	31060	PI30 (high)	31092	PI46 (high)	31124	PI62 (high)
31029	PI15 (low)	31061	PI31 (low)	31093	PI47 (low)	31125	PI63 (low)
31030	PI15 (high)	31062	PI31 (high)	31094	PI47 (high)	31126	PI63 (high)
31031	PI16 (low)	31063	PI32 (low)	31095	PI48 (low)	31127	PI64 (low)
31032	PI16 (high)	31064	PI32 (high)	31096	PI48 (high)	31128	PI64 (high)

3X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
31129	PI65 (low)	31161	PI81 (low)	31193	PI97 (low)	31225	PI113 (low)
31130	PI65 (high)	31162	PI81 (high)	31194	PI97 (high)	31226	PI113 (high)
31131	PI66 (low)	31163	PI82 (low)	31195	PI98 (low)	31227	PI114 (low)
31132	PI66 (high)	31164	PI82 (high)	31196	PI98 (high)	31228	PI114 (high)
31133	PI67 (low)	31165	PI83 (low)	31197	PI99 (low)	31229	PI115 (low)
31134	PI67 (high)	31166	PI83 (high)	31198	PI99 (high)	31230	PI115 (high)
31135	PI68 (low)	31167	PI84 (low)	31199	PI100 (low)	31231	PI116 (low)
31136	PI68 (high)	31168	PI84 (high)	31200	PI100 (high)	31232	PI116 (high)
31137	PI69 (low)	31169	PI85 (low)	31201	PI101 (low)	31233	PI117 (low)
31138	PI69 (high)	31170	PI85 (high)	31202	PI101 (high)	31234	PI117 (high)
31139	PI70 (low)	31171	PI86 (low)	31203	PI102 (low)	31235	PI118 (low)
31140	PI70 (high)	31172	PI86 (high)	31204	PI102 (high)	31236	PI118 (high)
31141	PI71 (low)	31173	PI87 (low)	31205	PI103 (low)	31237	PI119 (low)
31142	PI71 (high)	31174	PI87 (high)	31206	PI103 (high)	31238	PI119 (high)
31143	PI72 (low)	31175	PI88 (low)	31207	PI104 (low)	31239	PI120 (low)
31144	PI72 (high)	31176	PI88 (high)	31208	PI104 (high)	31240	PI120 (high)
31145	PI73 (low)	31177	PI89 (low)	31209	PI105 (low)	31241	PI121 (low)
31146	PI73 (high)	31178	PI89 (high)	31210	PI105 (high)	31242	PI121 (high)
31147	PI74 (low)	31179	PI90 (low)	31211	PI106 (low)	31243	PI122 (low)
31148	PI74 (high)	31180	PI90 (high)	31212	PI106 (high)	31244	PI122 (high)
31149	PI75 (low)	31181	PI91 (low)	31213	PI107 (low)	31245	PI123 (low)
31150	PI75 (high)	31182	PI91 (high)	31214	PI107 (high)	31246	PI123 (high)
31151	PI76 (low)	31183	PI92 (low)	31215	PI108 (low)	31247	PI124 (low)
31152	PI76 (high)	31184	PI92 (high)	31216	PI108 (high)	31248	PI124 (high)
31153	PI77 (low)	31185	PI93 (low)	31217	PI109 (low)	31249	PI125 (low)
31154	PI77 (high)	31186	PI93 (high)	31218	PI109 (high)	31250	PI125 (high)
31155	PI78 (low)	31187	PI94 (low)	31219	PI110 (low)	31251	PI126 (low)
31156	PI78 (high)	31188	PI94 (high)	31220	PI110 (high)	31252	PI126 (high)
31157	PI79 (low)	31189	PI95 (low)	31221	PI111 (low)	31253	PI127 (low)
31158	PI79 (high)	31190	PI95 (high)	31222	PI111 (high)	31254	PI127 (high)
31159	PI80 (low)	31191	PI96 (low)	31223	PI112 (low)	31255	PI128 (low)
31160	PI80 (high)	31192	PI96 (high)	31224	PI112 (high)	31256	PI128 (high)

CAUTION

Access to a PI (32-bit data) must be executed using a single query.
A set of low-/high-order bytes is read out in a response as far as the query specifies both registers together.

4X

Register	Channel	Register	Channel
40001	AO1	40033	AO33
40002	AO2	40034	AO34
40003	AO3	40035	AO35
40004	AO4	40036	AO36
40005	AO5	40037	AO37
40006	AO6	40038	AO38
40007	AO7	40039	AO39
40008	AO8	40040	AO40
40009	AO9	40041	AO41
40010	AO10	40042	AO42
40011	AO11	40043	AO43
40012	AO12	40044	AO44
40013	AO13	40045	AO45
40014	AO14	40046	AO46
40015	AO15	40047	AO47
40016	AO16	40048	AO48
40017	AO17	40049	AO49
40018	AO18	40050	AO50
40019	AO19	40051	AO51
40020	AO20	40052	AO52
40021	AO21	40053	AO53
40022	AO22	40054	AO54
40023	AO23	40055	AO55
40024	AO24	40056	AO56
40025	AO25	40057	AO57
40026	AO26	40058	AO58
40027	AO27	40059	AO59
40028	AO28	40060	AO60
40029	AO29	40061	AO61
40030	AO30	40062	AO62
40031	AO31	40063	AO63
40032	AO32	40064	AO64

4X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
41001	MA1 (low)	41033	MA17 (low)	41065	MA33 (low)	41097	MA49 (low)
41002	MA1 (high)	41034	MA17 (high)	41066	MA33 (high)	41098	MA49 (high)
41003	MA2 (low)	41035	MA18 (low)	41067	MA34 (low)	41099	MA50 (low)
41004	MA2 (high)	41036	MA18 (high)	41068	MA34 (high)	41100	MA50 (high)
41005	MA3 (low)	41037	MA19 (low)	41069	MA35 (low)	41101	MA51 (low)
41006	MA3 (high)	41038	MA19 (high)	41070	MA35 (high)	41102	MA51 (high)
41007	MA4 (low)	41039	MA20 (low)	41071	MA36 (low)	41103	MA52 (low)
41008	MA4 (high)	41040	MA20 (high)	41072	MA36 (high)	41104	MA52 (high)
41009	MA5 (low)	41041	MA21 (low)	41073	MA37 (low)	41105	MA53 (low)
41010	MA5 (high)	41042	MA21 (high)	41074	MA37 (high)	41106	MA53 (high)
41011	MA6 (low)	41043	MA22 (low)	41075	MA38 (low)	41107	MA54 (low)
41012	MA6 (high)	41044	MA22 (high)	41076	MA38 (high)	41108	MA54 (high)
41013	MA7 (low)	41045	MA23 (low)	41077	MA39 (low)	41109	MA55 (low)
41014	MA7 (high)	41046	MA23 (high)	41078	MA39 (high)	41110	MA55 (high)
41015	MA8 (low)	41047	MA24 (low)	41079	MA40 (low)	41111	MA56 (low)
41016	MA8 (high)	41048	MA24 (high)	41080	MA40 (high)	41112	MA56 (high)
41017	MA9 (low)	41049	MA25 (low)	41081	MA41 (low)	41113	MA57 (low)
41018	MA9 (high)	41050	MA25 (high)	41082	MA41 (high)	41114	MA57 (high)
41019	MA10 (low)	41051	MA26 (low)	41083	MA42 (low)	41115	MA58 (low)
41020	MA10 (high)	41052	MA26 (high)	41084	MA42 (high)	41116	MA58 (high)
41021	MA11 (low)	41053	MA27 (low)	41085	MA43 (low)	41117	MA59 (low)
41022	MA11 (high)	41054	MA27 (high)	41086	MA43 (high)	41118	MA59 (high)
41023	MA12 (low)	41055	MA28 (low)	41087	MA44 (low)	41119	MA60 (low)
41024	MA12 (high)	41056	MA28 (high)	41088	MA44 (high)	41120	MA60 (high)
41025	MA13 (low)	41057	MA29 (low)	41089	MA45 (low)	41121	MA61 (low)
41026	MA13 (high)	41058	MA29 (high)	41090	MA45 (high)	41122	MA61 (high)
41027	MA14 (low)	41059	MA30 (low)	41091	MA46 (low)	41123	MA62 (low)
41028	MA14 (high)	41060	MA30 (high)	41092	MA46 (high)	41124	MA62 (high)
41029	MA15 (low)	41061	MA31 (low)	41093	MA47 (low)	41125	MA63 (low)
41030	MA15 (high)	41062	MA31 (high)	41094	MA47 (high)	41126	MA63 (high)
41031	MA16 (low)	41063	MA32 (low)	41095	MA48 (low)	41127	MA64 (low)
41032	MA16 (high)	41064	MA32 (high)	41096	MA48 (high)	41128	MA64 (high)

4X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
41129	MA65 (low)	41161	MA81 (low)	41193	MA97 (low)	41225	MA113 (low)
41130	MA65 (high)	41162	MA81 (high)	41194	MA97 (high)	41226	MA113 (high)
41131	MA66 (low)	41163	MA82 (low)	41195	MA98 (low)	41227	MA114 (low)
41132	MA66 (high)	41164	MA82 (high)	41196	MA98 (high)	41228	MA114 (high)
41133	MA67 (low)	41165	MA83 (low)	41197	MA99 (low)	41229	MA115 (low)
41134	MA67 (high)	41166	MA83 (high)	41198	MA99 (high)	41230	MA115 (high)
41135	MA68 (low)	41167	MA84 (low)	41199	MA100 (low)	41231	MA116 (low)
41136	MA68 (high)	41168	MA84 (high)	41200	MA100 (high)	41232	MA116 (high)
41137	MA69 (low)	41169	MA85 (low)	41201	MA101 (low)	41233	MA117 (low)
41138	MA69 (high)	41170	MA85 (high)	41202	MA101 (high)	41234	MA117 (high)
41139	MA70 (low)	41171	MA86 (low)	41203	MA102 (low)	41235	MA118 (low)
41140	MA70 (high)	41172	MA86 (high)	41204	MA102 (high)	41236	MA118 (high)
41141	MA71 (low)	41173	MA87 (low)	41205	MA103 (low)	41237	MA119 (low)
41142	MA71 (high)	41174	MA87 (high)	41206	MA103 (high)	41238	MA119 (high)
41143	MA72 (low)	41175	MA88 (low)	41207	MA104 (low)	41239	MA120 (low)
41144	MA72 (high)	41176	MA88 (high)	41208	MA104 (high)	41240	MA120 (high)
41145	MA73 (low)	41177	MA89 (low)	41209	MA105 (low)	41241	MA121 (low)
41146	MA73 (high)	41178	MA89 (high)	41210	MA105 (high)	41242	MA121 (high)
41147	MA74 (low)	41179	MA90 (low)	41211	MA106 (low)	41243	MA122 (low)
41148	MA74 (high)	41180	MA90 (high)	41212	MA106 (high)	41244	MA122 (high)
41149	MA75 (low)	41181	MA91 (low)	41213	MA107 (low)	41245	MA123 (low)
41150	MA75 (high)	41182	MA91 (high)	41214	MA107 (high)	41246	MA123 (high)
41151	MA76 (low)	41183	MA92 (low)	41215	MA108 (low)	41247	MA124 (low)
41152	MA76 (high)	41184	MA92 (high)	41216	MA108 (high)	41248	MA124 (high)
41153	MA77 (low)	41185	MA93 (low)	41217	MA109 (low)	41249	MA125 (low)
41154	MA77 (high)	41186	MA93 (high)	41218	MA109 (high)	41250	MA125 (high)
41155	MA78 (low)	41187	MA94 (low)	41219	MA110 (low)	41251	MA126 (low)
41156	MA78 (high)	41188	MA94 (high)	41220	MA110 (high)	41252	MA126 (high)
41157	MA79 (low)	41189	MA95 (low)	41221	MA111 (low)	41253	MA127 (low)
41158	MA79 (high)	41190	MA95 (high)	41222	MA111 (high)	41254	MA127 (high)
41159	MA80 (low)	41191	MA96 (low)	41223	MA112 (low)	41255	MA128 (low)
41160	MA80 (high)	41192	MA96 (high)	41224	MA112 (high)	41256	MA128 (high)

4X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
41257	MA129 (low)	41289	MA145 (low)	41321	MA161 (low)	41353	MA177 (low)
41258	MA129 (high)	41290	MA145 (high)	41322	MA161 (high)	41354	MA177 (high)
41259	MA130 (low)	41291	MA146 (low)	41323	MA162 (low)	41355	MA178 (low)
41260	MA130 (high)	41292	MA146 (high)	41324	MA162 (high)	41356	MA178 (high)
41261	MA131 (low)	41293	MA147 (low)	41325	MA163 (low)	41357	MA179 (low)
41262	MA131 (high)	41294	MA147 (high)	41326	MA163 (high)	41358	MA179 (high)
41263	MA132 (low)	41295	MA148 (low)	41327	MA164 (low)	41359	MA180 (low)
41264	MA132 (high)	41296	MA148 (high)	41328	MA164 (high)	41360	MA180 (high)
41265	MA133 (low)	41297	MA149 (low)	41329	MA165 (low)	41361	MA181 (low)
41266	MA133 (high)	41298	MA149 (high)	41330	MA165 (high)	41362	MA181 (high)
41267	MA134 (low)	41299	MA150 (low)	41331	MA166 (low)	41363	MA182 (low)
41268	MA134 (high)	41300	MA150 (high)	41332	MA166 (high)	41364	MA182 (high)
41269	MA135 (low)	41301	MA151 (low)	41333	MA167 (low)	41365	MA183 (low)
41270	MA135 (high)	41302	MA151 (high)	41334	MA167 (high)	41366	MA183 (high)
41271	MA136 (low)	41303	MA152 (low)	41335	MA168 (low)	41367	MA184 (low)
41272	MA136 (high)	41304	MA152 (high)	41336	MA168 (high)	41368	MA184 (high)
41273	MA137 (low)	41305	MA153 (low)	41337	MA169 (low)	41369	MA185 (low)
41274	MA137 (high)	41306	MA153 (high)	41338	MA169 (high)	41370	MA185 (high)
41275	MA138 (low)	41307	MA154 (low)	41339	MA170 (low)	41371	MA186 (low)
41276	MA138 (high)	41308	MA154 (high)	41340	MA170 (high)	41372	MA186 (high)
41277	MA139 (low)	41309	MA155 (low)	41341	MA171 (low)	41373	MA187 (low)
41278	MA139 (high)	41310	MA155 (high)	41342	MA171 (high)	41374	MA187 (high)
41279	MA140 (low)	41311	MA156 (low)	41343	MA172 (low)	41375	MA188 (low)
41280	MA140 (high)	41312	MA156 (high)	41344	MA172 (high)	41376	MA188 (high)
41281	MA141 (low)	41313	MA157 (low)	41345	MA173 (low)	41377	MA189 (low)
41282	MA141 (high)	41314	MA157 (high)	41346	MA173 (high)	41378	MA189 (high)
41283	MA142 (low)	41315	MA158 (low)	41347	MA174 (low)	41379	MA190 (low)
41284	MA142 (high)	41316	MA158 (high)	41348	MA174 (high)	41380	MA190 (high)
41285	MA143 (low)	41317	MA159 (low)	41349	MA175 (low)	41381	MA191 (low)
41286	MA143 (high)	41318	MA159 (high)	41350	MA175 (high)	41382	MA191 (high)
41287	MA144 (low)	41319	MA160 (low)	41351	MA176 (low)	41383	MA192 (low)
41288	MA144 (high)	41320	MA160 (high)	41352	MA176 (high)	41384	MA192 (high)

4X (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
41385	MA193 (low)	41417	MA209 (low)	41449	MA225 (low)	41481	MA241 (low)
41386	MA193 (high)	41418	MA209 (high)	41450	MA225 (high)	41482	MA241 (high)
41387	MA194 (low)	41419	MA210 (low)	41451	MA226 (low)	41483	MA242 (low)
41388	MA194 (high)	41420	MA210 (high)	41452	MA226 (high)	41484	MA242 (high)
41389	MA195 (low)	41421	MA211 (low)	41453	MA227 (low)	41485	MA243 (low)
41390	MA195 (high)	41422	MA211 (high)	41454	MA227 (high)	41486	MA243 (high)
41391	MA196 (low)	41423	MA212 (low)	41455	MA228 (low)	41487	MA244 (low)
41392	MA196 (high)	41424	MA212 (high)	41456	MA228 (high)	41488	MA244 (high)
41393	MA197 (low)	41425	MA213 (low)	41457	MA229 (low)	41489	MA245 (low)
41394	MA197 (high)	41426	MA213 (high)	41458	MA229 (high)	41490	MA245 (high)
41395	MA198 (low)	41427	MA214 (low)	41459	MA230 (low)	41491	MA246 (low)
41396	MA198 (high)	41428	MA214 (high)	41460	MA230 (high)	41492	MA246 (high)
41397	MA199 (low)	41429	MA215 (low)	41461	MA231 (low)	41493	MA247 (low)
41398	MA199 (high)	41430	MA215 (high)	41462	MA231 (high)	41494	MA247 (high)
41399	MA200 (low)	41431	MA216 (low)	41463	MA232 (low)	41495	MA248 (low)
41400	MA200 (high)	41432	MA216 (high)	41464	MA232 (high)	41496	MA248 (high)
41401	MA201 (low)	41433	MA217 (low)	41465	MA233 (low)	41497	MA249 (low)
41402	MA201 (high)	41434	MA217 (high)	41466	MA233 (high)	41498	MA249 (high)
41403	MA202 (low)	41435	MA218 (low)	41467	MA234 (low)	41499	MA250 (low)
41404	MA202 (high)	41436	MA218 (high)	41468	MA234 (high)	41500	MA250 (high)
41405	MA203 (low)	41437	MA219 (low)	41469	MA235 (low)	41501	MA251 (low)
41406	MA203 (high)	41438	MA219 (high)	41470	MA235 (high)	41502	MA251 (high)
41407	MA204 (low)	41439	MA220 (low)	41471	MA236 (low)	41503	MA252 (low)
41408	MA204 (high)	41440	MA220 (high)	41472	MA236 (high)	41504	MA252 (high)
41409	MA205 (low)	41441	MA221 (low)	41473	MA237 (low)	41505	MA253 (low)
41410	MA205 (high)	41442	MA221 (high)	41474	MA237 (high)	41506	MA253 (high)
41411	MA206 (low)	41443	MA222 (low)	41475	MA238 (low)	41507	MA254 (low)
41412	MA206 (high)	41444	MA222 (high)	41476	MA238 (high)	41508	MA254 (high)
41413	MA207 (low)	41445	MA223 (low)	41477	MA239 (low)	41509	MA255 (low)
41414	MA207 (high)	41446	MA223 (high)	41478	MA239 (high)	41510	MA255 (high)
41415	MA208 (low)	41447	MA224 (low)	41479	MA240 (low)	41511	MA256 (low)
41416	MA208 (high)	41448	MA224 (high)	41480	MA240 (high)	41512	MA256 (high)

CAUTION

- Access to a MA (32-bit data) must be executed using a single query.
  A set of low-/high-order bytes is read out in a response as far as the query specifies both registers together.
- MA is represented as single precision floating point format.

Internal registers

Control input (AI)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
44001	AI1	44033	AI33	44065	AI65	44097	AI97
44002	AI2	44034	AI34	44066	AI66	44098	AI98
44003	AI3	44035	AI35	44067	AI67	44099	AI99
44004	AI4	44036	AI36	44068	AI68	44100	AI100
44005	AI5	44037	AI37	44069	AI69	44101	AI101
44006	AI6	44038	AI38	44070	AI70	44102	AI102
44007	AI7	44039	AI39	44071	AI71	44103	AI103
44008	AI8	44040	AI40	44072	AI72	44104	AI104
44009	AI9	44041	AI41	44073	AI73	44105	AI105
44010	AI10	44042	AI42	44074	AI74	44106	AI106
44011	AI11	44043	AI43	44075	AI75	44107	AI107
44012	AI12	44044	AI44	44076	AI76	44108	AI108
44013	AI13	44045	AI45	44077	AI77	44109	AI109
44014	AI14	44046	AI46	44078	AI78	44110	AI110
44015	AI15	44047	AI47	44079	AI79	44111	AI111
44016	AI16	44048	AI48	44080	AI80	44112	AI112
44017	AI17	44049	AI49	44081	AI81	44113	AI113
44018	AI18	44050	AI50	44082	AI82	44114	AI114
44019	AI19	44051	AI51	44083	AI83	44115	AI115
44020	AI20	44052	AI52	44084	AI84	44116	AI116
44021	AI21	44053	AI53	44085	AI85	44117	AI117
44022	AI22	44054	AI54	44086	AI86	44118	AI118
44023	AI23	44055	AI55	44087	AI87	44119	AI119
44024	AI24	44056	AI56	44088	AI88	44120	AI120
44025	AI25	44057	AI57	44089	AI89	44121	AI121
44026	AI26	44058	AI58	44090	AI90	44122	AI122
44027	AI27	44059	AI59	44091	AI91	44123	AI123
44028	AI28	44060	AI60	44092	AI92	44124	AI124
44029	AI29	44061	AI61	44093	AI93	44125	AI125
44030	AI30	44062	AI62	44094	AI94	44126	AI126
44031	AI31	44063	AI63	44095	AI95	44127	AI127
44032	AI32	44064	AI64	44096	AI96	44128	AI128

Control input (DI)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
04001	DI1	04033	DI33	04065	DI65	04097	DI97
04002	DI2	04034	DI34	04066	DI66	04098	DI98
04003	DI3	04035	DI35	04067	DI67	04099	DI99
04004	DI4	04036	DI36	04068	DI68	04100	DI100
04005	DI5	04037	DI37	04069	DI69	04101	DI101
04006	DI6	04038	DI38	04070	DI70	04102	DI102
04007	DI7	04039	DI39	04071	DI71	04103	DI103
04008	DI8	04040	DI40	04072	DI72	04104	DI104
04009	DI9	04041	DI41	04073	DI73	04105	DI105
04010	DI10	04042	DI42	04074	DI74	04106	DI106
04011	DI11	04043	DI43	04075	DI75	04107	DI107
04012	DI12	04044	DI44	04076	DI76	04108	DI108
04013	DI13	04045	DI45	04077	DI77	04109	DI109
04014	DI14	04046	DI46	04078	DI78	04110	DI110
04015	DI15	04047	DI47	04079	DI79	04111	DI111
04016	DI16	04048	DI48	04080	DI80	04112	DI112
04017	DI17	04049	DI49	04081	DI81	04113	DI113
04018	DI18	04050	DI50	04082	DI82	04114	DI114
04019	DI19	04051	DI51	04083	DI83	04115	DI115
04020	DI20	04052	DI52	04084	DI84	04116	DI116
04021	DI21	04053	DI53	04085	DI85	04117	DI117
04022	DI22	04054	DI54	04086	DI86	04118	DI118
04023	DI23	04055	DI55	04087	DI87	04119	DI119
04024	DI24	04056	DI56	04088	DI88	04120	DI120
04025	DI25	04057	DI57	04089	DI89	04121	DI121
04026	DI26	04058	DI58	04090	DI90	04122	DI122
04027	DI27	04059	DI59	04091	DI91	04123	DI123
04028	DI28	04060	DI60	04092	DI92	04124	DI124
04029	DI29	04061	DI61	04093	DI93	04125	DI125
04030	DI30	04062	DI62	04094	DI94	04126	DI126
04031	DI31	04063	DI63	04095	DI95	04127	DI127
04032	DI32	04064	DI64	04096	DI96	04128	DI128

Control input (DI) (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
04129	DI129	04161	DI161	04193	DI193	04225	DI225
04130	DI130	04162	DI162	04194	DI194	04226	DI226
04131	DI131	04163	DI163	04195	DI195	04227	DI227
04132	DI132	04164	DI164	04196	DI196	04228	DI228
04133	DI133	04165	DI165	04197	DI197	04229	DI229
04134	DI134	04166	DI166	04198	DI198	04230	DI230
04135	DI135	04167	DI167	04199	DI199	04231	DI231
04136	DI136	04168	DI168	04200	DI200	04232	DI232
04137	DI137	04169	DI169	04201	DI201	04233	DI233
04138	DI138	04170	DI170	04202	DI202	04234	DI234
04139	DI139	04171	DI171	04203	DI203	04235	DI235
04140	DI140	04172	DI172	04204	DI204	04236	DI236
04141	DI141	04173	DI173	04205	DI205	04237	DI237
04142	DI142	04174	DI174	04206	DI206	04238	DI238
04143	DI143	04175	DI175	04207	DI207	04239	DI239
04144	DI144	04176	DI176	04208	DI208	04240	DI240
04145	DI145	04177	DI177	04209	DI209	04241	DI241
04146	DI146	04178	DI178	04210	DI210	04242	DI242
04147	DI147	04179	DI179	04211	DI211	04243	DI243
04148	DI148	04180	DI180	04212	DI212	04244	DI244
04149	DI149	04181	DI181	04213	DI213	04245	DI245
04150	DI150	04182	DI182	04214	DI214	04246	DI246
04151	DI151	04183	DI183	04215	DI215	04247	DI247
04152	DI152	04184	DI184	04216	DI216	04248	DI248
04153	DI153	04185	DI185	04217	DI217	04249	DI249
04154	DI154	04186	DI186	04218	DI218	04250	DI250
04155	DI155	04187	DI187	04219	DI219	04251	DI251
04156	DI156	04188	DI188	04220	DI220	04252	DI252
04157	DI157	04189	DI189	04221	DI221	04253	DI253
04158	DI158	04190	DI190	04222	DI222	04254	DI254
04159	DI159	04191	DI191	04223	DI223	04255	DI255
04160	DI160	04192	DI192	04224	DI224	04256	DI256

Control input (PI)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
45001	PI1 (low)	45033	PI17 (low)	45065	PI33 (low)	45097	PI49 (low)
45002	PI1 (high)	45034	PI17 (high)	45066	PI33 (high)	45098	PI49 (high)
45003	PI2 (low)	45035	PI18 (low)	45067	PI34 (low)	45099	PI50 (low)
45004	PI2 (high)	45036	PI18 (high)	45068	PI34 (high)	45100	PI50 (high)
45005	PI3 (low)	45037	PI19 (low)	45069	PI35 (low)	45101	PI51 (low)
45006	PI3 (high)	45038	PI19 (high)	45070	PI35 (high)	45102	PI51 (high)
45007	PI4 (low)	45039	PI20 (low)	45071	PI36 (low)	45103	PI52 (low)
45008	PI4 (high)	45040	PI20 (high)	45072	PI36 (high)	45104	PI52 (high)
45009	PI5 (low)	45041	PI21 (low)	45073	PI37 (low)	45105	PI53 (low)
45010	PI5 (high)	45042	PI21 (high)	45074	PI37 (high)	45106	PI53 (high)
45011	PI6 (low)	45043	PI22 (low)	45075	PI38 (low)	45107	PI54 (low)
45012	PI6 (high)	45044	PI22 (high)	45076	PI38 (high)	45108	PI54 (high)
45013	PI7 (low)	45045	PI23 (low)	45077	PI39 (low)	45109	PI55 (low)
45014	PI7 (high)	45046	PI23 (high)	45078	PI39 (high)	45110	PI55 (high)
45015	PI8 (low)	45047	PI24 (low)	45079	PI40 (low)	45111	PI56 (low)
45016	PI8 (high)	45048	PI24 (high)	45080	PI40 (high)	45112	PI56 (high)
45017	PI9 (low)	45049	PI25 (low)	45081	PI41 (low)	45113	PI57 (low)
45018	PI9 (high)	45050	PI25 (high)	45082	PI41 (high)	45114	PI57 (high)
45019	PI10 (low)	45051	PI26 (low)	45083	PI42 (low)	45115	PI58 (low)
45020	PI10 (high)	45052	PI26 (high)	45084	PI42 (high)	45116	PI58 (high)
45021	PI11 (low)	45053	PI27 (low)	45085	PI43 (low)	45117	PI59 (low)
45022	PI11 (high)	45054	PI27 (high)	45086	PI43 (high)	45118	PI59 (high)
45023	PI12 (low)	45055	PI28 (low)	45087	PI44 (low)	45119	PI60 (low)
45024	PI12 (high)	45056	PI28 (high)	45088	PI44 (high)	45120	PI60 (high)
45025	PI13 (low)	45057	PI29 (low)	45089	PI45 (low)	45121	PI61 (low)
45026	PI13 (high)	45058	PI29 (high)	45090	PI45 (high)	45122	PI61 (high)
45027	PI14 (low)	45059	PI30 (low)	45091	PI46 (low)	45123	PI62 (low)
45028	PI14 (high)	45060	PI30 (high)	45092	PI46 (high)	45124	PI62 (high)
45029	PI15 (low)	45061	PI31 (low)	45093	PI47 (low)	45125	PI63 (low)
45030	PI15 (high)	45062	PI31 (high)	45094	PI47 (high)	45126	PI63 (high)
45031	PI16 (low)	45063	PI32 (low)	45095	PI48 (low)	45127	PI64 (low)
45032	PI16 (high)	45064	PI32 (high)	45096	PI48 (high)	45128	PI64 (high)

Control input (PI) (continued)

Register	Channel	Register	Channel	Register	Channel	Register	Channel
45129	PI65 (low)	45161	PI81 (low)	45193	PI97 (low)	45225	PI113 (low)
45130	PI65 (high)	45162	PI81 (high)	45194	PI97 (high)	45226	PI113 (high)
45131	PI66 (low)	45163	PI82 (low)	45195	PI98 (low)	45227	PI114 (low)
45132	PI66 (high)	45164	PI82 (high)	45196	PI98 (high)	45228	PI114 (high)
45133	PI67 (low)	45165	PI83 (low)	45197	PI99 (low)	45229	PI115 (low)
45134	PI67 (high)	45166	PI83 (high)	45198	PI99 (high)	45230	PI115 (high)
45135	PI68 (low)	45167	PI84 (low)	45199	PI100 (low)	45231	PI116 (low)
45136	PI68 (high)	45168	PI84 (high)	45200	PI100 (high)	45232	PI116 (high)
45137	PI69 (low)	45169	PI85 (low)	45201	PI101 (low)	45233	PI117 (low)
45138	PI69 (high)	45170	PI85 (high)	45202	PI101 (high)	45234	PI117 (high)
45139	PI70 (low)	45171	PI86 (low)	45203	PI102 (low)	45235	PI118 (low)
45140	PI70 (high)	45172	PI86 (high)	45204	PI102 (high)	45236	PI118 (high)
45141	PI71 (low)	45173	PI87 (low)	45205	PI103 (low)	45237	PI119 (low)
45142	PI71 (high)	45174	PI87 (high)	45206	PI103 (high)	45238	PI119 (high)
45143	PI72 (low)	45175	PI88 (low)	45207	PI104 (low)	45239	PI120 (low)
45144	PI72 (high)	45176	PI88 (high)	45208	PI104 (high)	45240	PI120 (high)
45145	PI73 (low)	45177	PI89 (low)	45209	PI105 (low)	45241	PI121 (low)
45146	PI73 (high)	45178	PI89 (high)	45210	PI105 (high)	45242	PI121 (high)
45147	PI74 (low)	45179	PI90 (low)	45211	PI106 (low)	45243	PI122 (low)
45148	PI74 (high)	45180	PI90 (high)	45212	PI106 (high)	45244	PI122 (high)
45149	PI75 (low)	45181	PI91 (low)	45213	PI107 (low)	45245	PI123 (low)
45150	PI75 (high)	45182	PI91 (high)	45214	PI107 (high)	45246	PI123 (high)
45151	PI76 (low)	45183	PI92 (low)	45215	PI108 (low)	45247	PI124 (low)
45152	PI76 (high)	45184	PI92 (high)	45216	PI108 (high)	45248	PI124 (high)
45153	PI77 (low)	45185	PI93 (low)	45217	PI109 (low)	45249	PI125 (low)
45154	PI77 (high)	45186	PI93 (high)	45218	PI109 (high)	45250	PI125 (high)
45155	PI78 (low)	45187	PI94 (low)	45219	PI110 (low)	45251	PI126 (low)
45156	PI78 (high)	45188	PI94 (high)	45220	PI110 (high)	45252	PI126 (high)
45157	PI79 (low)	45189	PI95 (low)	45221	PI111 (low)	45253	PI127 (low)
45158	PI79 (high)	45190	PI95 (high)	45222	PI111 (high)	45254	PI127 (high)
45159	PI80 (low)	45191	PI96 (low)	45223	PI112 (low)	45255	PI128 (low)
45160	PI80 (high)	45192	PI96 (high)	45224	PI112 (high)	45256	PI128 (high)

CAUTION

Access to a PI (32-bit data) must be executed using a single query.
A set of low-/high-order bytes is read out in a response as far as the query specifies both registers together.

Modbus commands

■ Data and control functions

CODE	NAME		
01	Read Coil Status	Yes	Digital output from the slave
02	Read Input Status	Yes	Status of digital Inputs to the slave
03	Read Holding Registers	Yes	General purpose register within the slave
04	Read Input Registers	Yes	Collected data from the field by the slave
05	Force Single Coil	Yes	Digital output from the slave
06	Preset Single Register	Yes	General purpose register within the slave
07	Read Exception Status		
08	Diagnostics		
09	Program 484		
10	Poll 484		
11	Fetch Comm. Event Counter		
12	Fetch Comm. Event Log		
13	Program Controller		
14	Poll Controller		
15	Force Multiple Coils	Yes	Digital output from the slave
16	Preset Multiple Registers	Yes	General purpose register within the slave
17	Report Slave ID		
18	Program 884/M84		
19	Reset Comm. Link		
20	Read General Reference		
21	Write General Reference		
22	Mask Write 4X Register		
23	Read/Write 4X Registers		
24	Read FIFO Queue		

■ Exception code

CODE	NAME		
01	Illegal Function	Yes	Function code is not allowable for the slave
02	Illegal Data Address	Yes	Address is not available within the slave
03	Illegal Value		
04	Slave Device Failure		
05	Acknowledge		
06	Slave Device Busy		
07	Negative Acknowledge		
08	Memory Parity Error		

■ Diagnostic subfunctions

CODE	NAME		
00	Return Query Data		
01	Restart Comm. Option		
02	Return Diagnostic Register		
03	Change Input Delimiter Character		
04	Force Slave to Listen Only Mode		

Data range

When the DL30-G device is used as a Modbus/TCP slave, the range of data returned from the slave to the Modbus master and data written by the master is as shown in the table below.

Item	Description
AI	• When the data type is [%] (0 to 10000; voltage/current data of R30 I/O modules or remote I/O devices): -2000 to 12000 • When the data type is [Int] (signed integer): Signed 16 bit integer (-32768 to 32767) • When the data type is [Uint]: Unsigned 16 bit integer (0 to 65535)
PI	• When the data type is [Accumulation] in Measurement mode: Unsigned 32 bit integer • When the data type is [Actual value] in Measurement mode: Signed 32 bit integer • When the data type is [Float] in Measurement mode: 32 bit single precision floating point
MA	32 bit single precision floating point
AO	Signed 16 bit integer (-32768 to 32767)

8.2.7 SLMP Client

Request Message

Header	Subheader	Request destination station network number	Request destination station number	Request destination unit I/O number	Request destination multidrop station number	Request destination multidrop station number	Monitoring timer	Request data	Footer

Parameter	Description
Header	Automatically added
Subheader	Fixed at 0x5000
Request destination station network number	Network No. specified in the DL30GCFG I/O slave setting
Request destination station number	Station No. specified in the DL30GCFG I/O slave setting
Request destination unit I/O number	Processor No. specified in the DL30GCFG I/O slave setting
Request destination multidrop station number	Fixed at 0
Request data length	Automatically added
Monitoring timer	SLMP Timeout specified in the DL30GCFG Communication setting
Request data	Automatically generated by the device specified by the DL30GCFG
Footer	Automatically added

SLMP command list

The following table lists the commands and subcommands used to read in data from an SLMP device.

Device	Device code	Command	Subcommand
Special register (SD)	00A9H	0403H	0002H
Data register (D)	00A8H	0403H	0002H
Link register (W)	00B4H	0403H	0002H
Timer, Current value (TN)	00C2H	0403H	0002H
Retentive timer, Current value (STN)	00C8H	0403H	0002H
Counter, Current value (CN)	00C5H	0403H	0002H
Link special register (SW)	00B5H	0403H	0002H
Index register (Z)	00CCH	0403H	0002H
File register (R) -- Block switching method	00AFH	0403H	0002H
File register (ZR) -- Serial number access methos	00B0H	0403H	0002H
Module refresh register (RD)	002CH	0403H	0002H
Special register (SD)	A9H	0403H	0000H
Data register (D)	A8H	0403H	0000H
Link register (W)	B4H	0403H	0000H
Timer, Current value (TN)	C2H	0403H	0000H
Retentive timer, Current value (STN)	C8H	0403H	0000H
Counter, Current value (CN)	C5H	0403H	0000H
Link special register (SW)	B5H	0403H	0000H
Index register (Z)	CCH	0403H	0000H
File register (R) -- Block switching method	AFH	0403H	0000H
File register (ZR) -- Serial number access method	B0H	0403H	0000H
Special relay (SM)	0091H	0403H	0002H
Input (X)	009CH	0403H	0002H
Output (Y)	009DH	0403H	0002H
Internal relay (M)	0090H	0403H	0002H
Latch relay (L)	0092H	0403H	0002H
Annunciator (F)	0093H	0403H	0002H
Edge relay (V)	0094H	0403H	0002H
Link relay (B)	00A0H	0403H	0002H
Timer, Contact (TS)	00C1H	0401H	0003H
Timer, Coil (TC)	00C0H	0401H	0003H
Long timer, Contact (LTS)	0052H	0401H	0002H
Long timer, Coil (LTC)	0052H	0401H	0002H
Retentive timer, Contact (STS)	00C7H	0401H	0003H
Retentive timer, Coil (STC)	00C6H	0401H	0003H
Long retentive timer, Contact (LSTS)	005AH	0401H	0002H
Long retentive timer, Coil (LSTC)	005AH	0401H	0002H
Counter, Contact (CS)	00C4H	0401H	0003H
Counter, Coil (CC)	00C3H	0401H	0003H
Long counter, Contact (LCS)	0055H	0401H	0003H
Long counter, Coil (LCC)	0054H	0401H	0003H
Link special relay (SB)	00A1H	0403H	0002H

SLMP command list (continued)

The following table lists the commands and subcommands used to read in data from an SLMP device.

Device	Device code	Command	Subcommand
Special relay (SM)	91H	0403H	0000H
Input (X)	9CH	0403H	0000H
Output (Y)	9DH	0403H	0000H
Internal relay (M)	90H	0403H	0000H
Latch relay (L)	92H	0403H	0000H
Annunciator (F)	93H	0403H	0000H
Edge relay (V)	94H	0403H	0000H
Link relay (B)	A0H	0403H	0000H
Step relay (S)	98H	0403H	0000H
Timer, Contact (TS)	C1H	0401H	0001H
Timer, Coil (TC)	C0H	0401H	0001H
Retentive timer, Contact (STS)	C7H	0401H	0001H
Retentive timer, Coil (STC)	C6H	0401H	0001H
Counter, Contact (CS)	C4H	0401H	0001H
Counter, Coil (CC)	C3H	0401H	0001H
Link special relay (SB)	A1H	0403H	0000H
Long counter, Contact (LCS)	55H	0403H	0000H
Long counter, Coil (LCC)	54H	0403H	0000H
Long timer, Current value (LTN)	0052H	0403H	0002H
Long retentive timer, Current value (LSTN)	005AH	0403H	0002H
Long counter, Current value (LCN)	0056H	0403H	0002H
Long index register (LZ)	0062H	0403H	0002H
Long counter, Current value (LCN)	56H	0403H	0000H
Long index register (LZ)	62H	0403H	0000H

SLMP command list (continued)

The following table lists the commands and the subcommands used to write data to an SLMP device.

Device	Device code	Command	Subcommand
Special register (SD)	00A9H	1402H	0002H
Data register (D)	00A8H	1402H	0002H
Link register (W)	00B4H	1402H	0002H
Timer, Current value (TN)	00C2H	1402H	0002H
Retentive timer, Current value (STN)	00C8H	1402H	0002H
Counter, Current value (CN)	00C5H	1402H	0002H
Link special register (SW)	00B5H	1402H	0002H
Index register (Z)	00CCH	1402H	0002H
File register (R) -- Block switching method	00AFH	1402H	0002H
File register (ZR) -- Serial number access methos	00B0H	1402H	0002H
Module refresh register (RD)	002CH	1402H	0002H
Special register (SD)	A9H	1402H	0000H
Data register (D)	A8H	1402H	0000H
Link register (W)	B4H	1402H	0000H
Timer, Current value (TN)	C2H	1402H	0000H
Retentive timer, Current value (STN)	C8H	1402H	0000H
Counter, Current value (CN)	C5H	1402H	0000H
Link special register (SW)	B5H	1402H	0000H
Index register (Z)	CCH	1402H	0000H
File register (R) -- Block switching method	AFH	1402H	0000H
File register (ZR) -- Serial number access method	B0H	1402H	0000H
Special relay (SM)	0091H	1402H	0003H
Input (X)	009CH	1402H	0003H
Output (Y)	009DH	1402H	0003H
Internal relay (M)	0090H	1402H	0003H
Latch relay (L)	0092H	1402H	0003H
Annunciator (F)	0093H	1402H	0003H
Edge relay (V)	0094H	1402H	0003H
Link relay (B)	00A0H	1402H	0003H
Timer, Contact (TS)	00C1H	1402H	0003H
Timer, Coil (TC)	00C0H	1402H	0003H
Long timer, Contact (LTS)	0052H	1402H	0003H
Long timer, Coil (LTC)	0052H	1402H	0003H
Retentive timer, Contact (STS)	00C7H	1402H	0003H
Retentive timer, Coil (STC)	00C6H	1402H	0003H
Long retentive timer, Contact (LSTS)	005AH	1402H	0003H
Long retentive timer, Coil (LSTC)	005AH	1402H	0003H
Counter, Contact (CS)	00C4H	1402H	0003H
Counter, Coil (CC)	00C3H	1402H	0003H
Long counter, Contact (LCS)	0055H	1402H	0003H
Long counter, Coil (LCC)	0054H	1402H	0003H
Link special relay (SB)	00A1H	1402H	0003H

SLMP command list (continued)

The following table lists the commands and the subcommands used to write data to an SLMP device.

Device	Device code	Command	Subcommand
Special relay (SM)	91H	1402H	0001H
Input (X)	9CH	1402H	0001H
Output (Y)	9DH	1402H	0001H
Internal relay (M)	90H	1402H	0001H
Latch relay (L)	92H	1402H	0001H
Annunciator (F)	93H	1402H	0001H
Edge relay (V)	94H	1402H	0001H
Link relay (B)	A0H	1402H	0001H
Step relay (S)	98H	1402H	0001H
Timer, Contact (TS)	C1H	1402H	0001H
Timer, Coil (TC)	C0H	1402H	0001H
Retentive timer, Contact (STS)	C7H	1402H	0001H
Retentive timer, Coil (STC)	C6H	1402H	0001H
Counter, Contact (CS)	C4H	1402H	0001H
Counter, Coil (CC)	C3H	1402H	0001H
Link special relay (SB)	A1H	1402H	0001H
Long counter, Contact (LCS)	55H	1402H	0001H
Long counter, Coil (LCC)	54H	1402H	0001H

8.2.8 FTP server

Item	Description			
FTP client	OS	Windows 7, 8, 10		
	Application (Verified operation environment)	Browser Internet Explorer 11, Chrome 78.0.3904.108 Explorer FFFTP (4.3)		
Maximum number of connections	4			
Port address	For FTP connection: can be changed (initial value: 21) For passive: 45967 to 45970			
Function	Function	Browser	Explorer	FFFTP
	Display of the list of folders and files	Yes	Yes	Yes
	File download (1 file only)	Yes	Yes	Yes
	File download (Multiple files)	No	Yes	Yes
	File deletion (1 file/multiple files)	No	Yes	Yes
	Folder download (Including the files stored in the folder)	No	Yes	Yes
	Folder deletion (Including the files stored in the folder)	No	Yes	Yes

NOTES

- FTPS is used in explicit mode.
- To use FTPS protocol to perform encrypted communication, it is required to install a web server certificate on the DL30-G. (When using FTPS protocol, it is not necessary to install a local certificate authority on a terminal such as a PC which connects to the DL30-G.) Refer to the users manual of Local certification authority creator (model: LCA-DL30) for how to install a web server certificate.
- The software program of Local certification authority creator can be downloaded from the M-System web site (http://www.m-system.co.jp/).
- When using FTPS protocol with the FTP client function, be sure that the FTP client software allows FTPS connection.
- When using FFFTP for FTPS connection, enable:
  'Ignore addresses returned with PASV mode'; and
  'Connect with FTPS (Explicit)'
  in the Host Setting.

CAUTION

When connecting with DL30-G using FTPS protocol, a security warning message may appear depending on the FTP client software. However, encryption communication is performed normally.

8.2.9 FTP client

File transfer by FTP client function is executed as follows.

- Logging data, event logs, and report forms are registered in a transmission queue.
  They are sent to the FTP server in order of registering in the queue.
- Maximum 16 sets of data are stored in the queue.
  The data exceeded the max. limit is not registered and discarded.
- When a transfer is failed, it is resent after 2 minutes.
  Failed file transfers are retried up to 3 times.
  Data is discarded after the 3 times of unsuccessful retries.
- The transmission queue is reset when the DL30-G is switched to the maintenance mode.

8.2.10 Mail reporting

Event reports, regular reports and report forms are sent as follows.

- Occurred event reports, regular reports and report forms are registered in a report queue.
  Mail is sent in order of registering in the report queue.
- A maximum of 128 reports are stored in the report queue.
  The reports exceeding the limit is not registered and discarded.
- When a mail reporting failure is detected, the mail is resent in 30 seconds after the detection.
  Retransmission is repeated up to 3 times, and the report is discarded if a reporting failure is detected for the fourth time.
- The report queue is reset when the DL30-G is switched to the maintenance mode, or by cancelling the mail report function.

8.2.11 Schedule

Terminology

Item	Description
Schedule output	Controlled using the scheduling function to be output from the DO, MD, or GDO channel.
Pattern	A set of schedule outputs assigned to a day. A pattern consists of 8 schedule outputs and up to 64 patterns can be created. ➔ 3.13.1 Pattern setting
Schedule unit	A set of patterns to be assigned to a week. Up to 32 units can be created. Assign patterns to the days of the week, respectively to realize ON/OFF operations according to the days of the week. ➔ 3.13.2 Schedule unit setting
One-time schedule assignment	Patterns displayed on the Schedule menu (➔ 4.7 Schedule) can be changed to different patterns only once. ➔ 4.7.3 One-time schedule
Permanent schedule assignment	Patterns can be changed to different patterns on the specified dates. This function is useful when a pattern needs to be changed on a specific date due to a national holiday, etc. The registered pattern remains until it is deleted. ➔ 4.7.4 Permanent schedule

CAUTION

In a case where different patterns are set for the same day, the setting is applied in the following priority order: (high) Permanent schedule assignment > One-time schedule assignment > Schedule unit setting (low).

Schedule output

- Schedule output is independent of control output and alarm output.
  The channel which is ON for schedule output cannot be turned OFF by control output.
  When schedule output, control output, and alarm output are set in the same channel, ON outputs are operated based on the OR logic among the schedule, control, and alarm outputs.
  ➔ 3.6.6 Digital function register (MD) > Control on Web browser (MA),
  ➔ 3.6.8 Discrete output (DO) > Control on browser (DO),
  ➔ 3.6.9 Grouped digital output (GDO) > Control on browser (GDO)
- Schedule outputs are operated based on the OR logic among ON schedule outputs of the current time and date (yyyymmddhhmm).
  Be aware when changing the time and/or date of the system, or the schedule settings.
- When the output type of the DO or MD channel set for schedule output is set to ON or OFF on the [Output type maintenance] menu, the schedule output is disabled. ➔ 4.7.5 Output type maintenance

CAUTION

When automatic time correction of the SNTP client function is enabled (➔ 3.12.4 SNTP (automatic time correction)), be sure to set [Sampling adjustment at time correction] as [Enable] so that schedule output will not be interrupted due to discontinuous time.
➔ 3.4 System setting > Sampling adjustment at time correction

Disabling schedule output

Schedule outputs can be forcibly disabled by any of the following methods.

- Specify the DI or MD channel on the [Maintenance SW setting] of DL30GCFG.
  Schedule outputs of the specified channel are disabled while the channel is ON.
  ➔ 3.13.3 Maintenance SW setting
- Set the function setting DIP switch to the maintenance mode.
  ➔ 5.3 Function setting DIP switch

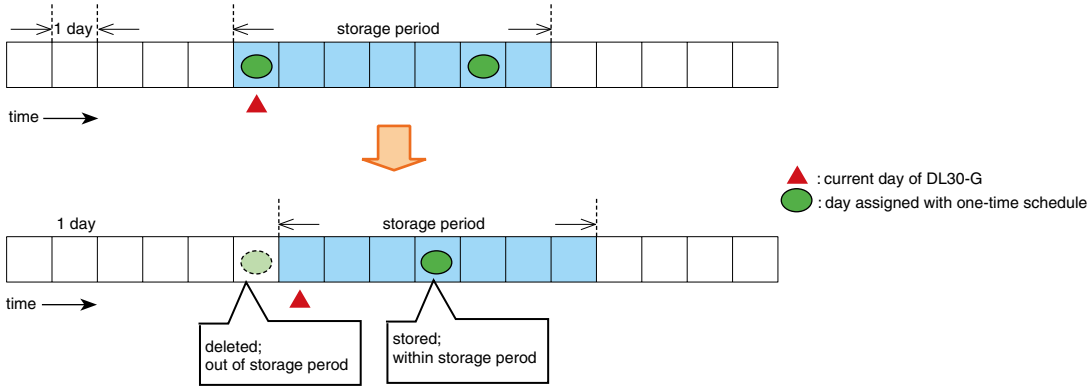
CAUTION

- Schedule outputs are turned ON as soon as the 'Enabled' state is cancelled.
- Schedule outputs are turned ON when the channel is turned ON by control outputs or alarm outputs even if the schedule outputs are disabled by the above methods.

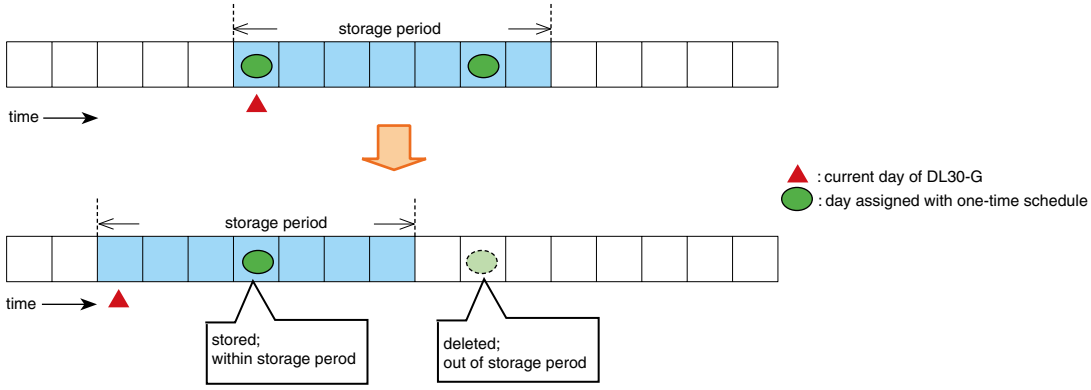
One-time schedule pattern storage period

The schedule pattern assigned for one-time schedule (➔ 4.7.3 One-time schedule, ➔ 6.1.2 Maintenance menu (DL30GCFG) > One-time schedule assignment) is displayed on the [Schedule] menu if the assigned day is within the 7 days from the current day.
The pattern is automatically deleted if the assigned day deviates from the storage period.

Example) When 1 day has passed from the storage period



Example) When the date is set back three days

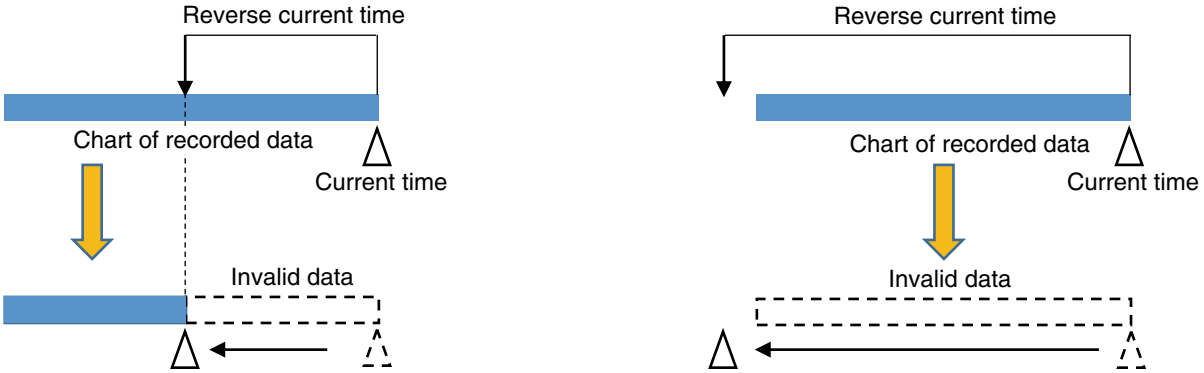


NOTES

- If the assigned one-time schedule pattern is deleted as it has deviated from the storage period, assign it again when the date to assign enters the storage period and is displayed on the [Schedule] menu.
- All the assigned one-time schedule patterns are out of the storage period and thus are deleted if the DL30-G is stopped for eight days or longer, or the system date is set back 8 days or more from the current day.

8.2.12 Process operation monitor function

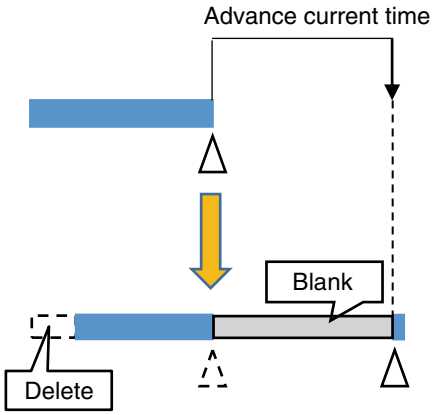
Process operation data will be deleted when the calendar clock of the DL30-G has been advanced or reversed by 24 hours or more due to time correction/adjustment, etc., or when the DL30-G has stopped for 24 hours or more due to power failure.
In case of time correction or power failure within 24 hours, the chart will be affected as shown below.



When the current time has been reversed by less than 24 hours, data recorded for reversed time period becomes invalid. DL30-G records data again from the new current time.
When the new current time is ahead of the beginning of the chart, the whole chart becomes invalid.

NOTES

- When the calendar clock has been reversed by less than 24 hours, the DL30-G records data for the overlapped time period twice. Therefore, the chart represents data for less than 48 hours until next 48 hours has passed.



When the current time has been advanced by less than 24 hours or when time has passed less than 24 hours during power failure, the data for the advanced/passed time is left blank (missing data) and DL30-G records data from the new current time.
If a part of data deviates from the chart range because of the advanced current time, the part of data is deleted from the oldest.

8.2.13 Maximum number of characters used in DL30GCFG

The description in this manual is based on the assumption that double-byte and single-byte characters are mixed in the settings of the DL30GCFG.
User can use twice as many number of characters if they are all single-byte ASCII codes.

8.2.14 Number of characters that can be displayed on browser

The approximate number of characters that can be displayed on a Web window is shown below.
The number of characters that can actually be displayed may vary depending on the character size setting in the browser.

Item			iPadOS	Android	Windows			
			Safari	Chrome	Edge	IE	Chrome	Firefox
Header	Name		32	32	32	32	32	32
Data display	AI	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Unit	8	8	8	8	8	8
		Zone name	32	32	32	32	32	32
	DI, MD	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Message	8	8	8	8	8	8
	PI, MA	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Unit	8	8	8	8	8	8
		Zone name	32	32	32	32	32	32
	AO	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Unit	8	8	8	8	8	8
	DO	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Message	8	8	8	8	8	8
	GDO	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Message	8	8	8	8	8	8
Trend	Page name		31	30	30	30	30	30
	CH name		11	11	11	11	11	11
	CH comment		15	15	15	15	15	13
	Digital display		6	6	5	5	5	5
	Unit		8	8	8	8	8	8
Event	Event log	CH name	16	16	16	16	16	16
		CH comment	16	16	16	16	16	16
		Message	32	32	32	32	32	32
Schedule	Pattern name		32	32	32	32	32	32
	CH name		16	16	16	16	16	16
	CH comment		16	16	16	16	16	16
	Display comment		8	8	8	8	8	8
Gantt chart	Process name		15	15	15	20	15	15
	Display comment		11	11	11	16	11	11
	CH name		12	12	12	14	12	12
	Digital display		9	8	9	9	7	8
Andon screen	Process name		18	18	17	20	17	17
	Display comment		9	9	9	14	9	9
	CH name		16	16	16	16	16	16
	Digital display		16	16	16	16	16	16
	Digital display (sub)	CH name	8	8	8	8	8	8
		digital display	8	8	8	8	8	8

The numbers in the table represent the number of characters in double-byte format.

8.2.15 Data files for user defined web browser view

Character code: UTF-8

Header

File name: header_u.js

Variable	Description	Variable definition format
h_year	Year	var h_year=2016;
h_mon	Month	var h_mon=8;
h_day	Day	var h_day=12;
h_hour	Hour	var h_day=17;
h_min	Minute	var h_min=46;
h_sec	Second	var h_sec=8;
h_date	Current date YYYYMMDD	var h_date="2016/08/12";
h_time	Current time HHMMSS	var h_time="17:46:08";
h_name	Name	var h_name="M-System";
h_error	Error status (0: OK 1: error)	var h_error=1;
h_sd	SD card status (0: not recognized 1: recognized)	var h_sd=1;
h_mac	Unit MAC address	var h_mac="00:10:9C:3F:00:01";

Authorization level

File name: auth_level.js

Variable	Description	Variable definition format
auth_level	Authorization level 0: not authorized 1: Web browser viewing / control (items to control are set for individual IDs) 2: Web browser viewing and control/remote setting	var auth_level=0;

AI data

File name: data_ai_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_ai	Number of channels except unused ones	var chs_ai=16;
ch_ai_type[chs_ai]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: Control input, 5: Time, 6; Demo (sine wave), 7: Demo (square wave))	var ch_ai_type=[1,…,7];
ch_ai_no[chs_ai]	CH No.	var ch_ai_no=[1,...,128];
ch_ai_name[chs_ai]	CH name	var ch_ai_name=["AI1",…,"AI128"];
ch_ai_comm[chs_ai]	CH comment	var ch_ai_comm=["AI-01",…,"AI-128"];
ch_ai_data_type[chs_ai] *1	Data type (0: %, 1: Int, 2: Uint)	var ch_ai_type=[0,...,1];
ch_ai_real[chs_ai]	Data (engineering unit value)	var ch_ai_real=[-50.32,...,10.05];
ch_ai_point[chs_ai]	Decimal point position (for engineering unit value display)	var ch_ai_point=[2,...,0];
ch_ai_unit[chs_ai]	Engineering unit	var ch_ai_unit=["kW",...,"m3"];
ch_ai_per[chs_ai]	Data (%)	var ch_ai_per=[23.45,...,100.00];
ch_ai_area[chs_ai]	Alarm zone name	var ch_ai_area=["HH",...,"LL"];
ch_ai_color[chs_ai]	Alarm zone color	var ch_ai_color =["#00FF00",...,"#000000"];
ch_ai_area_num[chs_ai]	Alarm zone partitions	var ch_ai_area_num=[5,...0]

*1. Only the values in % data type are present in the relevant positions in % data sequence (ch_per).

File name: data_ai_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_ai	Number of channels except unused ones	"chs_ai":16,
ch_ai_type[chs_ai]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: Control input, 5: Time, 6, Demo (sine wave), 7: Demo (square wave))	"ch_type":[1,…,7],
ch_ai_no[chs_ai]	CH No.	"ch_ai_no":[1,...,128],
ch_ai_name[chs_ai]	CH name	"ch_ai_name":["AI1",…,"AI128"],
ch_ai_comm[chs_ai]	CH comment	"ch_ai_comm":["AI-01",…,"AI-128"],
ch_ai_data_type[chs_ai] *1	Data type (0: %, 1: Int, 2: Uint)	"ch_ai_type":[0,...,1],
ch_ai_real[chs_ai]	Data (engineering unit value)	"ch_ai_real":[-50.32,...,10.05],
ch_ai_point[chs_ai]	Decimal point position (for engineering unit value display)	"ch_ai_point":[2,...,0],
ch_ai_unit[chs_ai]	Engineering unit	"ch_ai_unit":["kW",...,"m3"],
ch_ai_per[chs_ai]	Data (%)	"ch_ai_per":[23.45,...,100.00],
ch_ai_area[chs_ai]	Alarm zone name	"ch_ai_area":["HH",...,"LL"],
ch_ai_color[chs_ai]	Alarm zone color	"ch_ai_color ":["#00FF00",...,"#000000"],
ch_ai_area_num[chs_ai]	Alarm zone partitions	"ch_ai_area_num":[5,...0]

DI data

File name: data_di_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_di	Number of channels except unused ones	var chs_di=16;
ch_di_type[chs_di]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: AI, 5: Control input, 6; Demo)	var ch_di_type=[1,…,7];
ch_di_no[chs_di]	CH No.	var ch_di_no=[1,...,256];
ch_di_name[chs_di]	CH name	var ch_di_name=["DI1",…,"DI256"];
ch_di_comm[chs_di]	CH comment	var ch_di_comm=["DI-01",…,"DI-256"];
ch_di_status[chs_di]	Display comment	var ch_di_status=["ON",...,"OFF"];
ch_di_color[chs_di]	Color	var ch_di_color =["#00FF00",...,"#000000"];
ch_di_data[chs_di]	Data (0: OFF 1: ON)	var ch_di_data=[1,...,0];

File name: data_di_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_di	Number of channels except unused ones	"chs_di":16,
ch_di_type[chs_di]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: AI, 5: Control input, 6; Demo)	"ch_type":[1,…,6],
ch_di_no[chs_di]	CH No.	"ch_di_no":[1,...,256],
ch_di_name[chs_di]	CH name	"ch_di_name":["DI1",…,"DI256"],
ch_di_comm[chs_di]	CH comment	"ch_di_comm":["DI-01",…,"DI-256"],
ch_di_status[chs_di]	Display comment	"ch_di_status":["ON",...,"OFF"],
ch_di_color[chs_di]	Color	"ch_di_color ":["#00FF00",...,"#000000"],
ch_di_data[chs_di]	Data (0: OFF, 1: ON)	"ch_di_data":[1,...,0],

PI data

File name: data_pi_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_pi	Number of channels except unused ones	var chs_pi=16;
ch_pi_type[chs_pi]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: DI, 5: Control input, 6; Analog accumulation, 7: Binary accumulation, 8: Demo)	var ch_pi_type=[1,…,8];
ch_pi_no[chs_pi]	CH No.	var ch_pi_no=[1,...,128];
ch_pi_name[chs_pi]	CH name	var ch_pi_name=["PI1",…,"PI128"];
ch_pi_comm[chs_pi]	CH comment	var ch_pi_comm=["PI-01",…,"PI-128"];
ch_pi_real[chs_pi]	Data (engineering unit value)	var ch_pi_real=[-50.32,...,10.05];
ch_pi_point[chs_pi]	Decimal point position (for engineering unit value display)	var ch_pi_point=[2,...,0];
ch_pi_unit[chs_pi]	Engineering unit	var ch_pi_unit=["kW",...,"m3"];
ch_pi_area[chs_pi]	Alarm zone name	var ch_pi_area=["HH",...,"LL"];
ch_pi_color[chs_pi]	Alarm zone color	var ch_pi_color =["#00FF00",...,"#000000"];
ch_pi_area_num[chs_pi]	Alarm zone partitions	var ch_pi_area_num=[5,...0]

File name: data_pi_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_pi	Number of channels except unused ones	"chs_pi":16,
ch_pi_type[chs_pi]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP, 4: DI, 5: Control input, 6; Analog accumulation, 7: Binary accumulation, 8: Demo)	"ch_type":[1,…,8],
ch_pi_no[chs_pi]	CH No.	"ch_pi_no":[1,...,128],
ch_pi_name[chs_pi]	CH name	"ch_pi_name":["PI1",…,"PI128"],
ch_pi_comm[chs_pi]	CH comment	"ch_pi_comm":["PI-01",…,"PI-128"],
ch_pi_real[chs_pi]	Data (engineering unit value)	"ch_pi_real":[-50.32,...,10.05],
ch_pi_point[chs_pi]	Decimal point position (for engineering unit value display)	"ch_pi_point":[2,...,0],
ch_pi_unit[chs_pi]	Engineering unit	"ch_pi_unit":["kW",...,"m3"],
ch_pi_area[chs_pi]	Alarm zone name	"ch_pi_area":["HH",...,"LL"],
ch_pi_color[chs_pi]	Alarm zone color	"ch_pi_color ":["#00FF00",...,"#000000"],
ch_pi_area_num[chs_pi]	Alarm zone partitions	"ch_pi_area_num":[5,...0]

MA data

File name: data_ma_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_ma	Number of channels except unused ones	var chs_ma=16;
ch_ma_type[chs_ma]	Function (0: Disable, 1: Addition/Subtraction, 2: Multiplication, 3: Division, 4: Square root, 5: Moving average, 6: Delay buffer, 7: Peak hold (max), 8: Valley hold (min), 9: exp, 10: Common logarithm, 11: Natural logarithm, 12: Analog accumulation, 13: Power, 14: F value calculation, 15: Scaling, 16: Upper/ lower signal limiter)	var ch_ma_type=[1,…,16];
ch_ma_no[chs_ma]	CH No.	var ch_ma_no=[1,...,256];
ch_ma_name[chs_ma]	CH name	var ch_ma_name=["MA1",…,"MA256"];
ch_ma_comm[chs_ma]	CH comment	var ch_ma_comm=["MA-01",…,"MA-256"];
ch_ma_real[chs_ma]	Data (engineering unit value)	var ch_ma_real=[-50.32,...,10.05];
ch_ma_point[chs_ma]	Decimal point position (for engineering unit value display)	var ch_ma_point=[2,...,0];
ch_ma_unit[chs_ma]	Engineering unit	var ch_ma_unit=["kW",...,"m3"];
ch_ma_area[chs_ma]	Alarm zone name	var ch_ma_area=["HH",...,"LL"];
ch_ma_color[chs_ma]	Alarm zone color	var ch_ma_color =["#00FF00",...,"#000000"];
ch_ma_area_num[chs_ma]	Alarm zone partitions	var ch_ma_area_num=[5,...0]
ch_ma_enable[chs_ma]	Control on browser (0: Disable 1: Enable) *1	var ch_ma _enable = [1,…0];
ch_ma_lower[chs_ma]	Operation range on browser, lower limit	var ch_ma_lower = [0,…0];
ch_ma_upper[chs_ma]	Operation range on browser, upper limit	var ch_ma_upper = [100,…1000];

*1. Authorization condition (AND logic between): CH setting=None; CH control set for Web browsing ID=Yes

File name: data_ma_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_ma	Number of channels except unused ones	"chs_ma":16,
ch_ma_type[chs_ma]	Function (0: Disable, 1: Addition/Subtraction, 2: Multiplication, 3: Division, 4: Square root, 5: Moving average, 6: Delay buffer, 7: Peak hold (max), 8: Valley hold (min), 9: exp, 10: Common logarithm, 11: Natural logarithm, 12: Analog accumulation, 13: Power, 14: F value calculation, 15: Scaling, 16: Upper/ lower signal limiter)	"ch_type":[1,…,16],
ch_ma_no[chs_ma]	CH No.	"ch_ma_no":[1,...,256],
ch_ma_name[chs_ma]	CH name	"ch_ma_name":["MA1",…,"MA256"],
ch_ma_comm[chs_ma]	CH comment	"ch_ma_comm":["MA-01",…,"MA-256"],
ch_ma_real[chs_ma]	Data (engineering unit value)	"ch_ma_real":[-50.32,...,10.05],
ch_ma_point[chs_ma]	Decimal point position (for engineering unit value display)	"ch_ma_point":[2,...,0],
ch_ma_unit[chs_ma]	Engineering unit	"ch_ma_unit":["kW",...,"m3"],
ch_ma_area[chs_ma]	Alarm zone name	"ch_ma_area":["HH",...,"LL"],
ch_ma_color[chs_ma]	Alarm zone color	"ch_ma_color ":["#00FF00",...,"#000000"],
ch_ma_area_num[chs_ma]	Alarm zone partitions	"ch_ma_area_num":[5,...0]
ch_ma_enable[chs_ao]	Control on browser (0: Disable 1: Enable)	“ch_ma_enable”:[1,…0],
ch_ma_lower[chs_ao]	Operation range on browser, lower limit	“ch_ma_lower”:[0,…0],
ch_ma_upper[chs_ao]	Operation range on browser, upper limit	“ch_ma_upper”:[100,…1000],

MD data

File name: data_md_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_md	Number of channels except unused ones	var chs_md=256;
ch_md_type[chs_md]	Function (1: None, 1: Equal, 2: AND, 3: OR, 4: XOR, 5: NOT, 6: RUN)	var ch_md_type=[1,…,6];
ch_md_no[chs_md]	CH No.	var ch_md_no=[1,...,256];
ch_md_name[chs_md]	CH name	var ch_md_name=["MD1",…,"MD256"];
ch_md_comm[chs_md]	CH comment	var ch_md_comm=["MD-01",…,"MD-256"];
ch_md_status[chs_md]	Display comment	var ch_md_status=["ON",...,"OFF"];
ch_md_color[chs_md]	Color	var ch_md_color =["#00FF00",...,"#000000"];
ch_md_data[chs_md]	Data (0: OFF 1: ON)	var ch_md_data=[1,...,0];
ch_md_enable[chs]	Control on browser (0: Disable 1: Enable) *1	var ch_md_enable = [1,…0];

*1. Authorization condition (AND logic between): CH setting=None; CH control set for Web browsing ID=Yes

File name: data_md_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_md	Number of channels except unused ones	"chs_md":256,
ch_md_type[chs_md]	Function (1: None, 1: Equal, 2: AND, 3: OR, 4: XOR, 5: NOT, 6: RUN)	"ch_type":[1,…,6],
ch_md_no[chs_md]	CH No.	"ch_md_no":[1,...,256],
ch_md_name[chs_md]	CH name	"ch_md_name":["MD1",…,"MD256"],
ch_md_comm[chs_md]	CH comment	"ch_md_comm":["MD-01",…,"MD-256"],
ch_md_status[chs_md]	Display comment	"ch_md_status":["ON",...,"OFF"],
ch_md_color[chs_md]	Color	"ch_md_color ":["#00FF00",...,"#000000"],
ch_md_data[chs_md]	Data (0: OFF, 1: ON)	"ch_md_data":[1,...,0],
ch_md_enable[chs]	Control on browser (0: Disable 1: Enable)	“ch_md_enable”:[1,…0],

AO data

File name: data_ao_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_ao	Number of channels except unused ones	var chs_ao=16;
ch_ao_type[chs_ao]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP)	var ch_ao_type=[1,…,3];
ch_ao_no[chs_ao]	CH No.	var ch_ao_no=[1,...,64];
ch_ao_name[chs_ao]	CH name	var ch_ao_name=["AO1",…,"AO64"];
ch_ao_comm[chs_ao]	CH comment	var ch_ao_comm=["AO-01",…,"AO-64"];
ch_ao_real[chs_ao]	Data (engineering unit value)	var ch_ao_real=[-50.32,...,10.05];
ch_ao_point[chs_ao]	Decimal point position (for engineering unit value display)	var ch_ao_point=[2,...,0];
ch_ao_unit[chs_ao]	Engineering unit	var ch_ao_unit=["kW",...,"m3"];
ch_ao_enable[chs_ao]	Control on browser (0: Disable 1: Enable) *1	var ch_ao_enable=[1,...,0];
ch_ao_lower[chs_ao]	Operation range on browser, lower limit	var ch_ao_lower=[0,...,0];
ch_ao_upper[chs_ao]	Operation range on browser, upper limit	var ch_ao_upper=[100,...,1000];

*1. Authorization condition (AND logic between): I/O mapping=None; CH control set for Web browsing ID=Yes

File name: data_ao_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_ao	Number of channels except unused ones	"chs_ao":16,
ch_ao_type[chs_ao]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP)	"ch_type":[1,…,3],
ch_ao_no[chs_ao]	CH No.	"ch_ao_no":[1,...,64],
ch_ao_name[chs_ao]	CH name	"ch_ao_name":["AO1",…,"AO64"],
ch_ao_comm[chs_ao]	CH comment	"ch_ao_comm":["AO-01",…,"AO-64"],
ch_ao_real[chs_ao]	Data (engineering unit value)	"ch_ao_real":[-50.32,...,10.05],
ch_ao_point[chs_ao]	Decimal point position (for engineering unit value display)	"ch_ao_point":[2,...,0],
ch_ao_unit[chs_ao]	Engineering unit	"ch_ao_unit":["kW",...,"m3"],
ch_ao_enable[chs_ao]	Control on browser (0: Disable 1: Enable)	"ch_ao_enable":[1,...,0],
ch_ao_lower[chs_ao]	Operation range on browser, lower limit	"ch_ao_lower":[0,...,0],
ch_ao_upper[chs_ao]	Operation range on browser, upper limit	"ch_ao_upper":[100,...,1000],

DO data

File name: data_do_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_do	Number of channels except unused ones	var chs_do=16;
ch_do_type[chs_do]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP)	var ch_do_type=[1,…,3];
ch_do_no[chs_do]	CH No.	var ch_do_no=[1,...,128];
ch_do_name[chs_do]	CH name	var ch_do_name=["DO1",…,"DO128"];
ch_do_comm[chs_do]	CH comment	var ch_do_comm=["DO-01",…,"DO-128"];
ch_do_status[chs_do]	Display comment	var ch_do_status=["ON",...,"OFF"];
ch_do_color[chs_do]	Color	var ch_do_color =["#00FF00",...,"#000000"];
ch_do_enable[chs_do]	Control on browser (0: Disable 1: Enable) *1	var ch_do_enable=[1,...,0];
ch_do_data[chs_do]	Data (0: OFF 1: ON)	var ch_do_data=[1,...,0];

*1. Authorization condition (AND logic between): I/O mapping=None; CH control set for Web browsing ID=Yes

File name: data_do_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_day":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date":"2016/08/12",
h_time	Current time HHMMSS	"h_time":"17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_do	Number of channels except unused ones	"chs_do":16,
ch_do_type[chs_do]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP)	"ch_type":[1,…,3],
ch_do_no[chs_do]	CH No.	"ch_do_no":[1,...,128],
ch_do_name[chs_do]	CH name	"ch_do_name":["DO1",…,"DO128"],
ch_do_comm[chs_do]	CH comment	"ch_do_comm":["DO-01",…,"DO-128"],
ch_do_status[chs_do]	Display comment	"ch_do_status":["ON",...,"OFF"],
ch_do_color[chs_do]	Color	"ch_do_color ":["#00FF00",...,"#000000"],
ch_do_enable[chs_do]	Control on browser (0: Disable 1: Enable)	"ch_do_enable":[1,...,0],
ch_do_data[chs_do]	Data (0: OFF, 1: ON)	"ch_do_data":[1,...,0],

GDO data

File name: data_gdo_u.js (JavaScript format)

Variable	Description	Variable definition format
chs_gdo	Number of channels except unused ones	var chs_gdo = 16;
ch_gdo_mode [chs]	CH type (1: I/O module, 2: Modbus/TCP, 3: SLMP)	var ch_gdo_mode = [1,…,0];
ch_gdo_no[chs]	CH No.	var ch_gdo_no = [1,…,32];
ch_gdo_name[chs]	CH name	var ch_gdo_name = ["GDO1",…,"GDO32"];
ch_gdo_comm[chs]	CH comment	var ch_gdo_comm = ["GDO-01",..,"GDO-32"];
ch_gdo_status[chs]	Display comment	var ch_gdo_status = ["ON",…,"OFF"];
ch_gdo_color[chs]	Color	var ch_gdo_color = ["#000000",.., "#0000FF"];
ch_gdo_enable[chs]	Control on browser (0: Disable 1: Enable) *1	var ch_gdo_enable = [1,…0];
ch_gdo_data[chs]	Data (0: OFF 1: ON)	var ch_gdo_data = [1,…,0];

*1. Authorization condition (AND logic between): I/O mapping=None; CH control set for Web browsing ID=Yes

File name: data_gdo_u.json (JSON format)

Variable	Description	Variable definition format
h_year	Year	"h_year":2016,
h_mon	Month	"h_mon":8,
h_day	Day	"h_day":12,
h_hour	Hour	"h_hour":17,
h_min	Minute	"h_min":46,
h_sec	Second	"h_sec":8,
h_date	Current date YYMMDD	"h_date ":"2013/08/12",
h_time	Current time HHMMSS	"h_time": "17:46:08",
h_name	Name	"h_name":"3F Research Lab",
h_error	Error status (0: OK 1: error)	"h_error":1,
h_sd	SD card status (0: not recognized 1: recognized)	"h_sd":1,
h_mac	Unit MAC address	"h_mac":"00:10:9C:3F:00:01",
chs_gdo	Number of channels except unused ones	"chs":16,
ch_gdo_mode[chs]	Mode (0: Disable 1: Enable)	"ch_gdo_mode":[1,…,0],
ch_gdo_no[chs]	CH No.	"ch_gdo_no":[1,…,32],
ch_gdo_name[chs]	CH name	"ch_gdo_name":["GDO1",…,"GDO32"],
ch_gdo_comm[chs]	CH comment	"ch_gdo_comm":["GDO-01",..,"GDO-32"],
ch_gdo_status[chs]	Display comment	"ch_gdo_status":["ON",…,"OFF"],
ch_gdo_color[chs]	Color	"ch_gdo_color":["#000000",.., "#0000FF"],
ch_gdo_enable[chs]	Control on browser (0: Disable 1: Enable)	"ch_gdo_enable":[1,…0],
ch_gdo_data[chs]	Data (0: OFF, 1: ON)	"ch_gdo_data":[1,…,0],

XML format data

File name: command.xml

Tag 1	Tag 2	Tag 3 (open)	Value	Description	Tag 3 (close)	Notes
<OUTPUT>						
	<AO>					
		<CHxx>	(Engineering unit value)	Setting AOxx ouptut value	</CHxx>	xx: 1 to 64
	</AO>					
	<DO>					
		<CHxx>	ON OFF	Turning ON DOxx Turning OFF DOxx	</CHxx>	xx: 1 to 128
	</DO>					
	<MA>					
		<CHxx>	(Engineering unit value)	Setting MAxx ouptut value	</CHxx>	xx: 1 to 256
	</MA>					
	<MD>					
		<CHxx>	ON OFF	Turning ON MDxx Turning OFF MDxx	</CHxx>	xx: 1 to 256
	</MD>					
	<GDO>					
		<CHxx>	ON OFF	Turning ON GDOxx Turning OFF GDOxx	</CHxx>	xx: 1 to 32
	</GDO>					
</OUTPUT>						

8.2.16 Operation on touch panel

The primary method of operation of the touch panel used in this User Manual is explained below.

■ **Tap**

Lightly tap any point on the window with your finger and immediately remove your finger. (a light rap)
Use to select an item such as an icon or menu. Equivalent to the click operation in relation to the mouse.

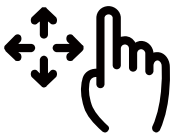
■ **Pinch in**

Touch the window with 2 fingers, and close the gap between the fingers. Use to shrink the display.

■ **Pinch out**

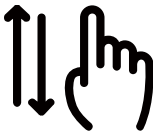
Touch the window with 2 fingers, and increase the gap between the fingers. Use to enlarge the display.

■ **Flick**



Touch a point or specific position on the window, and move your finger without taking it off from the window.
Similar to the drag and drop operation in relation to the mouse.

■ **Swipe**



Rather than touching a particular point as when flicking, move (slide) a wide area of the window.
Similar to the wheel scroll operation in relation to the mouse.

8.2.17 System log display items

The table below shows major system logs.

Variable	Description
ftpc:ftp upload error	Transmission failure from FTP client (previously successful)
CUnet error slot=x	Indicates Slot No. (x) of DL30 where module error is detected.
Modbus/TCP Connect ERR slave=x	Indicates Slave No. (x) at the time of Modbus/TCP connection error
Modbus/TCP Connect OK slave=x	Indicates Slave No. (x) at the time of Modbus/TCP connection success (previously failed)
SLMP Connect ERR slave=x	Indicates Slave No. (x) at the time of SLMP connection failure
SLMP Connect OK slave=x	Indicates Slave No. (x) at the time of SLMP connection success (previously failed)
SLMP AO ERR slave=x	Indicates Slave No. (x) at the time of SLMP AO scan
Modbus/TCP ERR slave=x code=x	Indicates Salve No. (x) and Error code (50: reception timeout) at the time of Modbus/TCP data reception error
mail report error	Mail transmission failure (previously successful)
mail report open error	SMTP server connection failure (previously successful)
link error	LAN link error

8.3 Version history

8.3.1 DL30-G version 2.1 revision history

- Improved mouse operability and touch operability on Web screens.
- Improved the processing of SNTP time correction.
- Fixed the problem that digital data setting configured for each process is not always reflected correctly on the Andon screen.

8.3.2 DL30-G version 2.2 revision history

- The problem that sometimes the PI cumulative count is not correctly reset to the preset value by using the [Preset count] function on DL30GCFG under the condition that [Scaling] of the PI channel is set to a decimal value and “Preset value” of [Preset count] is set to a decimal value, is solved.

8.3.3 DL30-G version 2.3 revision history

- Added Pen mark to Trend graph.
- Fixed the problem that files in an SD card cannot be accessed when using the FTPS client or FTPS server function.

8.4 Licenses

exPat is built into DL30-G and DL30GCFG.

DL30-G and DL30GCFG contain software to which the following Camellia licence is applicable.

camellia.c ver 1.2.0

DL30-G incorporates MD5.