

PAPERLESS RECORDER

Model: VR288E-G64

USERS MANUAL

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1. Introduction

Thank you for choosing us.
Before use, check the following information.

1.1 Before use...

This product is for use in general industrial environments, therefore may not be suitable for applications which require higher level of safety (e.g. safety or accident prevention systems) or of reliability (e.g. vehicle control or combustion control systems).

For safety, installation and maintenance of this product must be conducted by qualified personnel.

■PACKAGE INCLUDES:

Paperless recorder (body + mounting bracket × 8 pcs.*1)....(1)

When power input is MR2 or BR2:

- AC adapter.....(1)
- AC code.....(1)
- Ferrite core (ZCAT 2132-1130 TDK).....(1)
- Ferrite core (ZCAT 1325-0530A TDK).....(1)

*1: Not included for desktop type.

■MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■SD CARD

To store the data, prepare an SD card. (For the specified SD card, refer to 7.2.6 SD card.)

1.2 Corresponding versions

This Users Manual corresponds to the following versions of our products.

■DEVICE VERSION

This User Manual corresponds to the versions in the following table.

- For instructions on confirming the version of the Paperless Recorder (model: VR288E-G64), refer to 4.3.11.14 Information.
- For instructions on confirming the version of the Configurator Software (model: VR288CFG), refer to 2.3.3 Confirming the version.
- For instructions on confirming the version of the TR30 Viewer Software (model: TRViewer), refer to the TRViewer Users Manual (EM-8633).

MODEL	VERSION
VR288E-G64	1.0.x
VR288CFG	1.0.x
TRViewer	1.6.21 or later

1.3 Precautions

■ CONFORMITY WITH EU DIRECTIVES

- The included AC adapter is suitable for Pollution Degree 2 and Installation Category II (transient voltage 2500V). Use the included AC adapter for safety.
- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel. (excluding desktop type)
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this device 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.
* For example, installation of noise filters and clamp filters for the power source, input and output connected to the device, etc.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
100V AC rating: 100V $\pm$ 10%, Approx. 30 VA
100 – 240V AC rating: 85 – 264V, 47 – 66Hz,
Approx. 30 VA at 100 V
Approx. 41 VA at 200 V
Approx. 43 VA at 240 V
24V DC rating: 24V $\pm$ 10%, $\leq$ 600 mA
- Supplying any level of power other than specified above can damage the device or the power source.
- Power supply start-up characteristics must reach within 5 seconds to the operational voltage range of the device.
- Power cables and signal I/O cables for the device must be located separately.
- Power cables, signal I/O cables and communication cables for the device should not be bundled together.
- To increase noise resistance of the power input wires, twist the strands before connecting.

■ AC ADAPTER

- The use of AC adapter other than the included one may cause malfunctions.

■ GENERAL PRECAUTIONS

- Before you remove the device or mount it, turn off the power supply and I/O signals for safety.
- Before you remove the terminal block or mount it, turn off the power supply and input signal for safety.
- Do not disassemble or modify the device in any way. Doing so may result in a fire or an electrical shock.
- Do not block the device's ventilation openings or use it in areas where heat accumulates.
- Additionally, do not store or use it under high-temperature conditions.
- Do not use this device in an environment where flammable/corrosive gases are present.
- Do not store or use this device in locations subject to direct sunlight, or where excessive dust, dirt or metal particles are present.
- This device is a precision instrument. Do not store or use it where large shocks or excessive vibration can occur.
- Do not store or use this device in environments subject to chemical evaporation (such as that of organic solvents), or where there are chemicals and/or acids present in the environment.
- Do not use paint thinner or organic solvents to clean this device.
- Observe the environmental conditions when using this device.
- Wait at least 15 seconds before turning on the power supply after it was turned off.

■ENVIRONMENT

- Indoor use.
- This device is designed to be mounted on a vertical panel. It is not suitable for a slanted or a horizontal panel surface.
- When heavy dust or metal particles are present in the air, install the device inside proper housing with sufficient ventilation.
- Do not install the device where it is subjected to continuous vibration. Do not subject the device to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 10 to 90% RH in order to ensure adequate life span and operation.

■GROUNDING

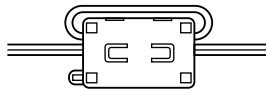
- Be sure to determine in advance the most stable grounding point in the environment and earth the device's FE terminal and that of connected devices to it in order to protect the devices from dielectric breakdown.
- Grounding is also effective to eliminate noise that could cause errors in the device's operation.

■WIRING

- Wrong connection may damage the device.
- Do not connect cables to moving parts or pull them tightly.
- Noise entering through the analog signal cables may cause irregular measurement values, degradation of overall accuracy, and malfunction of the product. We recommend that you would conduct wiring to the device with the following points of caution.
- 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.

■FERRITE CORE

- Twist the power cables 1 turn around the ferrite core at near the device as shown below.



■SD CARD

- Do not turn off the power supply to the device or reset it during data recording or history recording. The SD card may be destroyed.
- Observe the described procedure when you need to replace the SD card during recording.
- Confirm the sides and the connector position of the SD card when inserting one to the card slot.
- Do not touch the metal terminal with your hands or metallic tools.
- SD cards have a life span. Back up your important data.

■LCD PANEL

- The LCD panel's liquid contains an irritant. If the panel is damaged and the liquid contacts your skin, rinse immediately the contact area with running water for at least 15 minutes. If the liquid gets in your eyes, rinse immediately your eyes with running water for at least 15 minutes and consult a doctor.
- The following phenomena are LCD characteristics, and NOT a product defect:
 - LCD screen may show uneven brightness depending upon displayed images or contrast settings.
 - The LCD screen pixels may contain minute black-and-white-colored spots.
 - The color displayed on the LCD screen may appear different when seen from outside the specified viewing angle.
 - When the same image is displayed on the screen for a long time period, an afterimage may appear when the image is changed. If this happens, turn off the device and wait for a while before restarting it.
- To prevent an afterimage:
 - Set the screensaver when you plan to display the same image for a long time period.
 - Plan to change the screen image periodically so that the same image does not remain for the long time period.
- The LCD surface is covered with a protective film at the factory shipment. Remove it once the device is installed.

■DO NOT APPLY OVERRANGE INPUT

- Do not apply voltages beyond the maximum input range to prevent failure.

■INTERNAL CLOCK

- The internal clock data is stored in memory powered by a backup battery while the device is without external power supply.
- The data will be reset to its default status when the battery is used up while the device is left without power supply for a long time period. The clock adjustment will be necessary once the power is restored.
- Once the power is restored, the device starts recharging the battery. It will be full in approximately in 36 to 48 hours.
- Battery backup: approx. 2 months

■AND

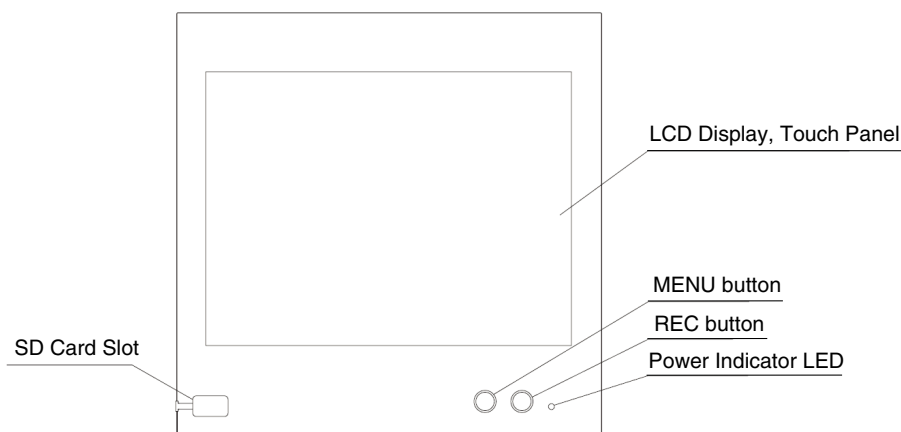
- We recommend use of an UPS to supply power backups.
- The device is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

1.4 Explanation about the terms

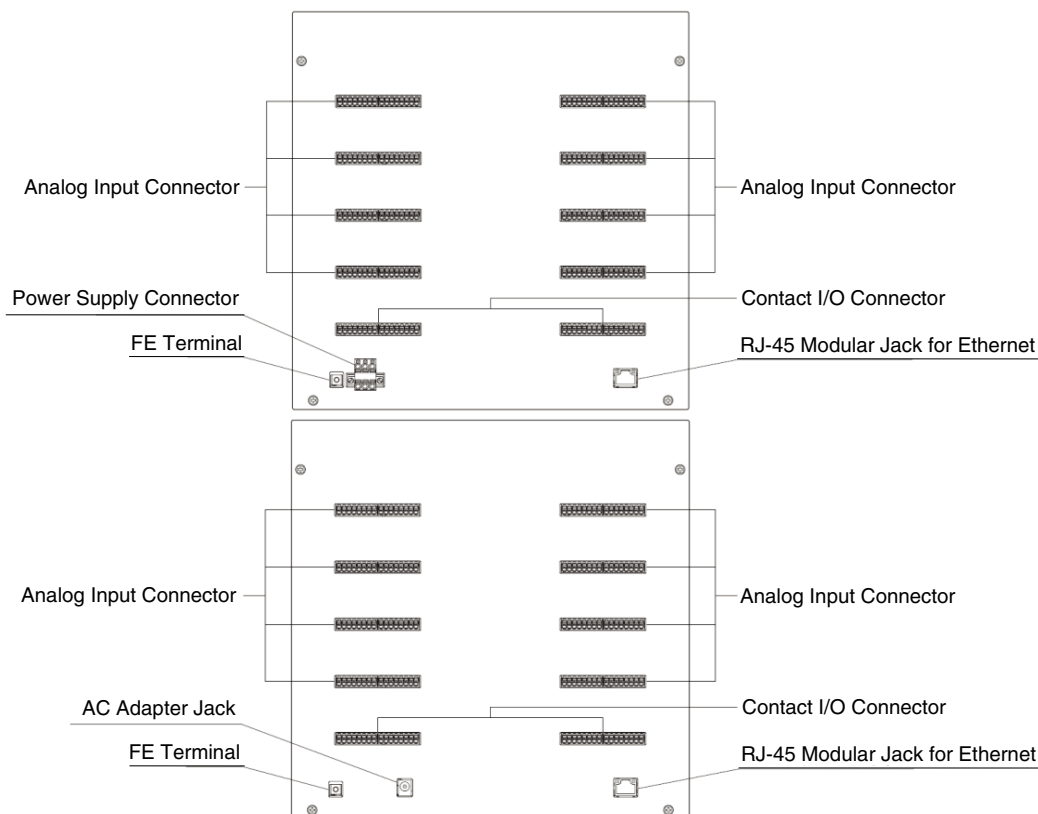
Term	Explanation
Channel CH / ch	2 types of input channels and 1 type of output channel are defined in a device. The I/O signals are in the form of fully encoded digital data. AI : Analog input (16 bit signed integer, unsigned integer) DI : Discrete input (1 bit) OI : Operational input (32 bit floating point) DO : Discrete output (1 bit)
Pen	Pen is used in trend data. To record waveform of I/O value or to record the trend data to a file, the channels need to be assigned to pens.
Zone transition	In case of AI and OI, the total zone in which input values can be obtained can be divided into maximum of 5 zones. The change of the zone caused by a change of the input value is called zone transition. In case of DI and DO, this can only be ON/OFF, and hence a change of the input signal is equivalent to the zone transition.
Event	Event indicates the information that [There has been a zone transition].
Trend data	Trend data includes the following. - The history of trend graph at the point of each timing for the respective channels assigned to pens. - The history of events in channels where the trend graph recording is enabled. - The history of comments.
Event log data	Event log 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.
Historical trend	Historical trend indicates the past trend data saved in an SD card.
Sampling rate	The time cycles used for acquiring I/O values for logging by the VR288E-G64; fixed at 100 msec.
Storing rate	The time cycles used for recording I/O values for logging data. Data acquired at the sampling rate are operated and stored at 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.
Tap	Tapping means the action of selecting an item. Touch lightly and release an item with a finger on the LCD display which functions as a touch panel.
Internal memory	Internal memory indicates the area where trend data and event log data are written. It is composed of 64 divided blocks per recording data file unit and functions as a ring buffer. A ring buffer means that, after writing data to the last block, it returns to the first block to continue writing data.
Memory block	A memory block is a division of internal memory into 64 parts per file. Recorded data is written to a memory block, and when it reaches a specified time or number of samples, the writing operation transitions to the next memory block. Simultaneously, the recorded data in the memory block is transferred to an SD card and saved as a file.

1.5 Component identification

■FRONT VIEW



■REAR VIEW



■LCD DISPLAY, TOUCH PANEL

The color display showing multiple display screens. Various settings are configured by touching the screen.

■CONTROL BUTTONS

MENU operation and REC operation (displaying the dialogs) are possible.

■SD CARD SLOT

Remove the watertight cap and insert an SD card.
Be sure to firmly attach the cap after replacing the card.

■CONNECTORS

For details, refer to the Instruction Manual (EM-7062-A) attached to the VR288E-G64.

1.6 Main functions of the VR288E-G64

The VR288E-G64 is a paperless recorder featuring a color LCD display.

The VR288E-G64 has the following main functions.

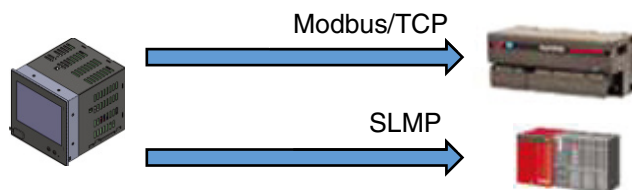
■BUILT-IN I/O

The VR288E-G64 has built-in I/Os of 64-point AI, 8-point DI, and 8-point DO, for direct input and output.

■MODBUS/TCP & SLMP CLIENT

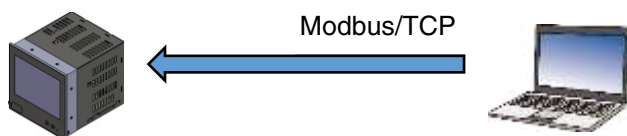
It is possible to expand I/O by connecting with remote I/O of MG Co., Ltd. that is compatible with Modbus/TCP. It is also possible to expand I/O by connecting with the SLMP-compatible CPU unit of Mitsubishi programmable-controller MELSEC.

Moreover, the recorder can handle data from measuring points in multiple locations.



■MODBUS/TCP SERVER

I/O data can be monitored by remote SCADA.



■GRAPHIC PANEL

Four views can be created by the user.

■COLOR LCD DISPLAY, TOUCH PANEL

Specified content can be displayed and operated such as trend data, event logs data, etc.

■TREND DATA STORING

The trend graph, event and comment can be stored to an SD card at the specified time intervals.

The data stored in the SD card can be displayed on TR30 Viewer Software (model: TRViewer).

■LOGGING

The event logs, system logs and communication logs can be stored to an SD card.

■E-MAIL REPORTING

E-mail reporting function is available at event occurrence or at the specified time.

■FTP CLIENT/SERVER

Trend data or log data stored in the SD card can be uploaded to an FTP server.

Also, reading/deleting trend data or log data in the SD card by an FTP client is available.

2. Installation

2.1 Preparations

Prepare the following items other than the paperless recorder (model: VR288E-G64).

- PC
- LAN cable
- SD card (Refer to 7.2.6 SD card for recommended SD card.)
- VR288E-G64 Configurator Software (Model: VR288CFG) *¹
- Viewer Software (Model: TRViewer) *¹
- Remote I/O and/or SLMP-compatible PLC *²

Note 1) The software program can be downloaded from our website.

Note 2) Prepare in case of connecting via Modbus/TCP or SLMP.

2.2 Wiring

Connect the cables corresponding to the power supply connector, analog input connector and contact I/O connector of the paperless recorder (model: VR288E-G64).

For details, refer to the Instruction Manual (EM-7062-A) attached to the VR288E-G64.

2.3 Preparing the configurator software

Install the Configurator Software (model: VR288CFG) on the PC in order to configure the setting for the VR288E-G64.

2.3.1 Installation

Download VR288CFG from our website, and complete the installation simply by extracting it into any folder. Create a shortcut to VR288CFG.exe on the desktop if necessary.

2.3.2 Startup

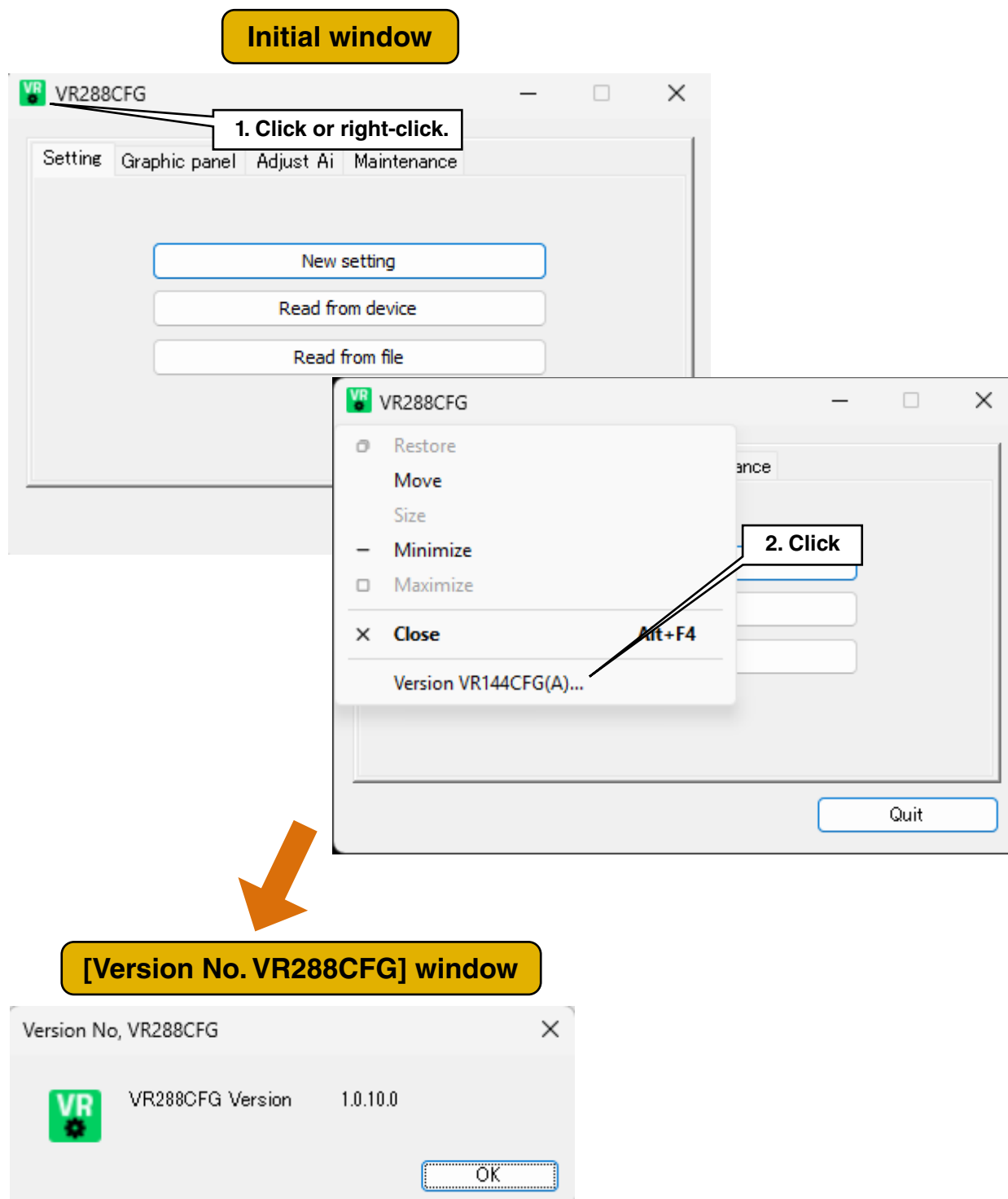
Connect the RJ-45 modular jack for Ethernet to the PC using LAN cable.

Start up VR288CFG, and then perform settings and maintenance of the VR288E-G64.

For details on VR288CFG, refer to 3. Setting.

2.3.3 Confirming the version

For confirming the version of VR288CFG, refer to the following procedure.



2.3.4 VR288E-G64 setting

There are multiple ways to configure the recorder as explained in the following sections.
For details, refer to the 3. Setting.

2.3.4.1 New setting

Click [New setting] button to configure a new setting for the VR288E-G64.

The new setting values are displayed on [Setting] window. Various settings can be performed on [Setting] window.

Initial window

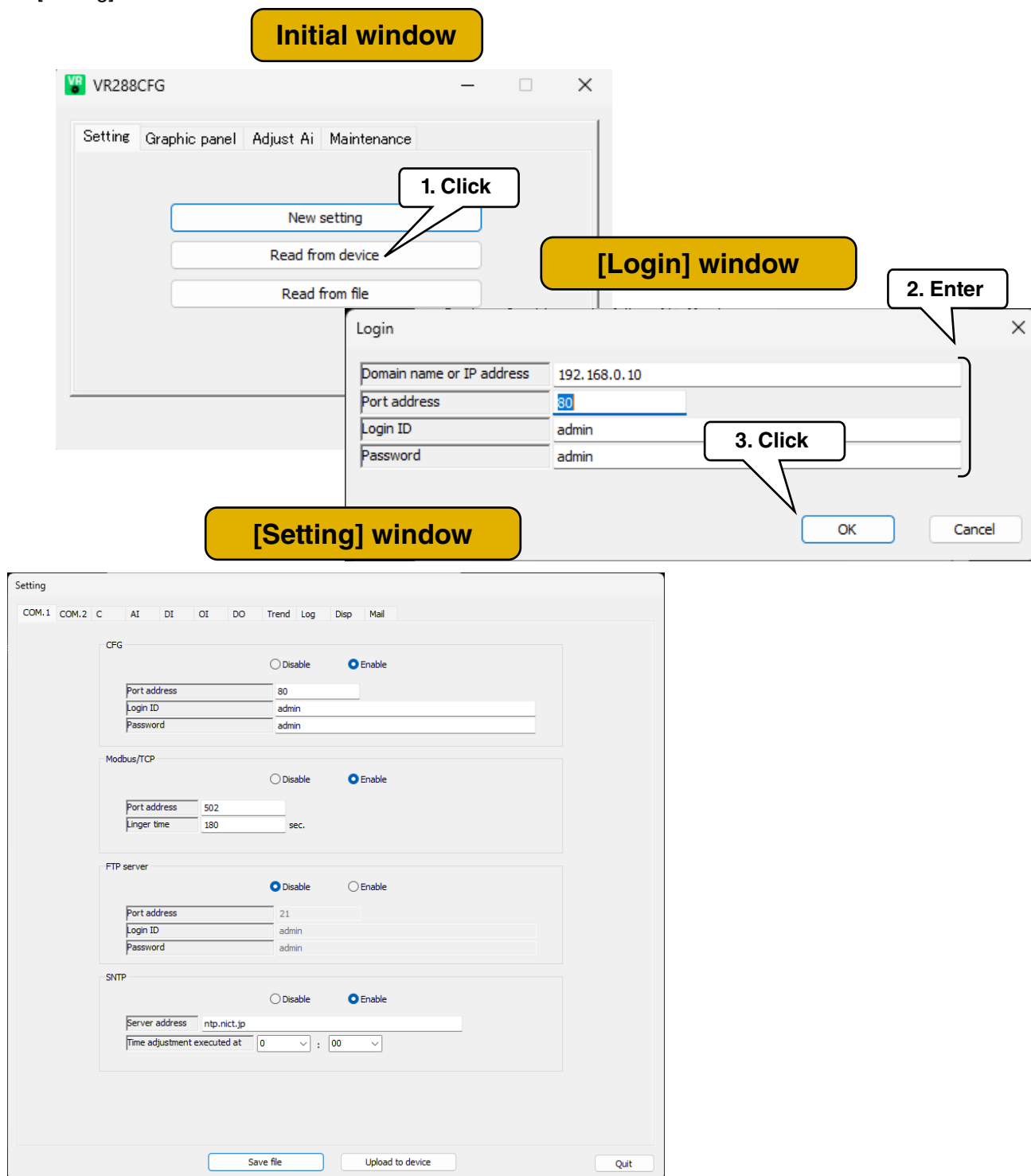
The image shows two overlapping windows from the VR288CFG software. The background window is the 'Initial window', which has a title bar 'VR288CFG' and a menu bar with 'Setting', 'Graphic panel', 'Adjust Ai', and 'Maintenance'. It contains three buttons: 'New setting', 'Read from device', and 'Read from file'. A callout box labeled '1. Click' points to the 'New setting' button. The foreground window is the '[Setting] window', titled 'Setting'. It has a tabbed interface with tabs for 'COM.1', 'COM.2', 'C', 'AI', 'DI', 'OI', 'DO', 'Trend', 'Log', 'Disp', and 'Mail'. The 'COM.1' tab is selected, showing configuration sections for 'CFG', 'Modbus/TCP', 'FTP server', and 'SNTP'. Each section has 'Disable' and 'Enable' radio buttons. The 'CFG' section has fields for 'Port address' (80), 'Login ID' (admin), and 'Password' (admin). The 'Modbus/TCP' section has 'Port address' (502) and 'Linger time' (180 sec). The 'FTP server' section has 'Port address' (21), 'Login ID' (admin), and 'Password' (admin). The 'SNTP' section has 'Server address' (ntp.nict.jp) and 'Time adjustment executed at' (0 : 00). At the bottom of the [Setting] window are buttons for 'Save file', 'Upload to device', and 'Quit'.

2.3.4.2 Reading from device

Click [Read from device] button to read and change the values set in the VR288E-G64.

Refer to the following table for the default values of [Login] window.

The imported setting values are reflected on [Setting] window. Various settings and changes can be performed on [Setting] window.



Default value on [Login] window

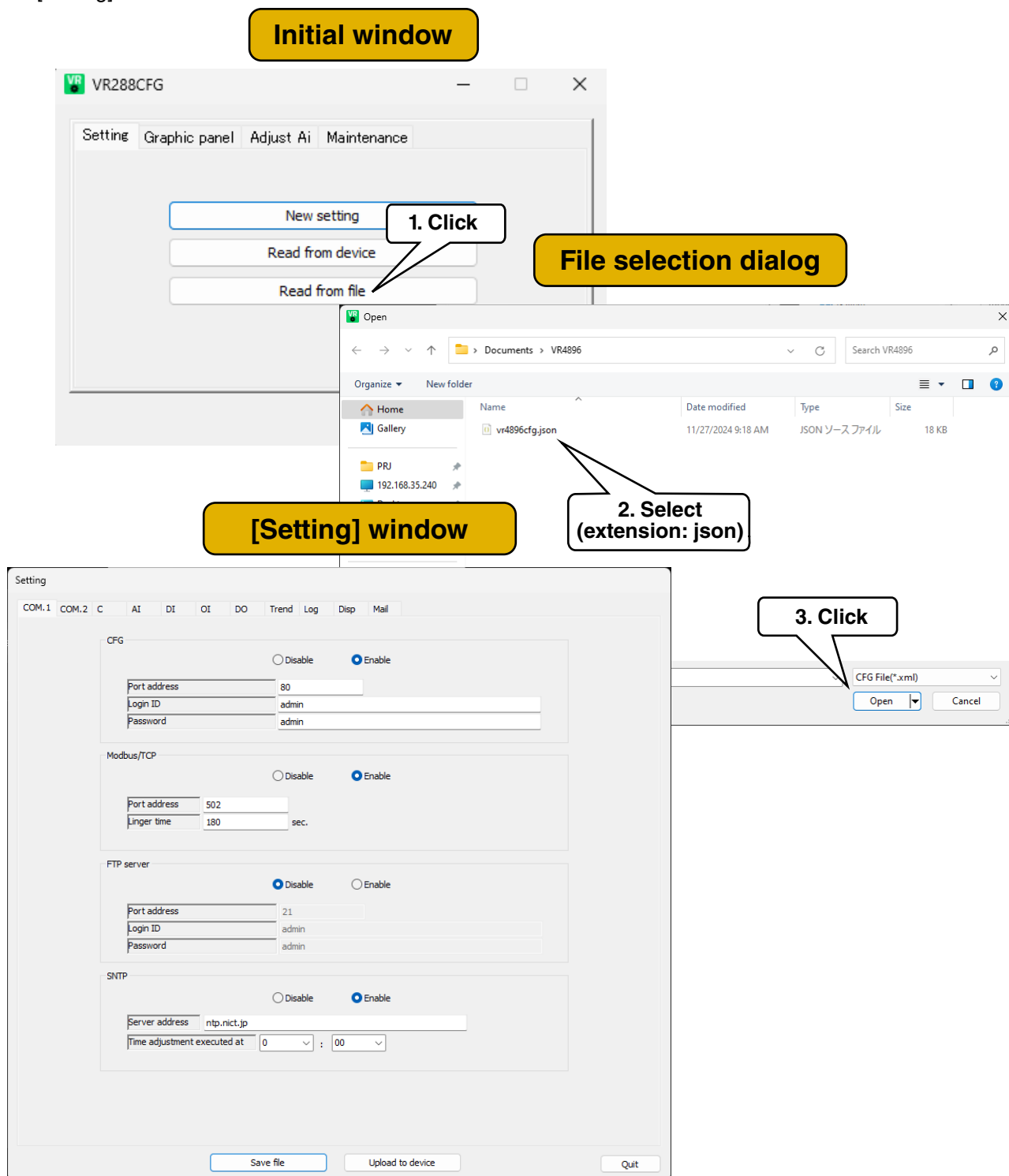
Parameter	Default
Domain name or IP address	192.168.0.10 → Changeable in 4.3.11.6 Network setting.
Port address	80 → Changeable in 3.2 Communication setting.
Login ID	admin → Changeable in 3.2 Communication setting.
Password	admin → Changeable in 3.2 Communication setting.

2.3.4.3 Reading from file

Click [Read from file] button to read out any setting file for the VR288E-G64 saved in the PC.

File selection dialog appears. Select the file to be read (extension: json).

The imported setting values are reflected on [Setting] window. Various settings and changes can be performed on [Setting] window.



2.3.5 Transmitting the setting to the device

After completing the settings, click [Upload to device] button to transmit the settings to the device.
On completing transmission, [Completed] message appears.
(For [Login] window, refer to 2.3.4.2 Reading from device.)

[Setting] window

Setting

COM.1 COM.2 C AI DI OI DO Trend Log Disp Mail

CFG

☐ Disable ☒ Enable

Port address 80

Login ID admin

Password admin

Modbus/TCP

☐ Disable ☒ Enable

Port address 502

180 sec.

Save file Upload to device Quit

Login

Domain name or IP address 192.168.0.10

Port address 80

Login ID

Password

OK Cancel

2. Enter

3. Click

1. Click

Transmission completed

VR288CFG_en

Completed.

OK

2.3.6 Saving the setting to file

After completing the settings, the setting values are saved to a file.

Click [Save file] button to display the file saving dialog.

Specify the file name (extension: json) and location and click [Save] button.

[Setting] window

The Setting window displays several configuration sections:

- CFG**: ☐ Disable, ☒ Enable. Fields: Port address (80), Login ID (admin), Password (admin).
- Modbus/TCP**: ☐ Disable, ☒ Enable. Fields: Port address (502), Linger time (180 sec).
- FTP server**: ☒ Disable, ☐ Enable. Fields: Port address (21), Login ID (admin), Password (admin).
- SNTP**: ☐ Disable, ☒ Enable. Fields: Server address (ntp.nict.jp), Time adjustment executed at (0 : 00).

A yellow callout box labeled "1. Click" points to the "Save file" button at the bottom right of the window.

File saving dialog

The File saving dialog (Save As) window shows the following details:

- Location: Documents > VR4896
- File list: vr4896cfg.json (11/27/2024 9:18 AM, JSON ソースファイル, 18 KB)
- File name: vr4896cfg.json
- Save as type: CFG File(*.json)

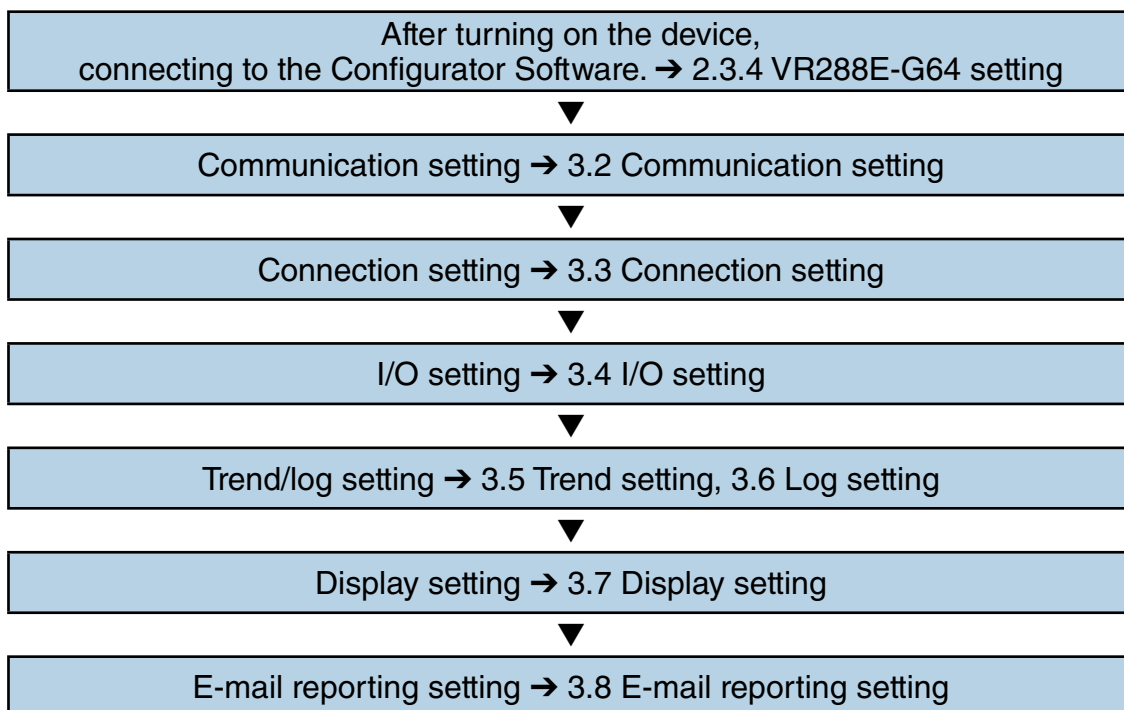
Yellow callout boxes provide instructions:

- "2. Enter (extension: json)" points to the file name field.
- "3. Click" points to the "Save" button at the bottom right.

3. Setting

3.1 Setting flow

Before starting recording or reporting with the VR288E-G64, configure the settings according to the following procedure using the Configurator Software (model: VR288CFG).



3.2 Communication setting

Configure various communication settings with the VR288E-G64.

3.2.1 CFG

Configure the connection settings between the VR288E-G64 and VR288CFG.

Click [COM.1] tab and set parameters according to the table below.

1. Click

[Setting] window

2. Enter

Setting

COM.1 COM.2 C AI DI OI DO Trend Log Disp Mail

CFG

☐ Disable ☒ Enable

Port address 80

Login ID admin

Password admin

Modbus/TCP

☐ Disable ☒ Enable

Port address 502

Linger time 180 sec.

FTP server

☒ Disable ☐ Enable

Port address 21

Login ID admin

Password admin

SNTP

☐ Disable ☒ Enable

Server address ntp.nict.jp

Time adjustment executed at 0 : 00

Save file Upload to device Quit

Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using CFG function.
Port address	Set the port address within 1 to 65535.
Login ID	Set login ID within 32 characters. (alphanumeric characters and "_")
Password	Set password within 32 characters. (alphanumeric characters and "_")

CAUTION

Disabling CFG will disable communication between the VR288CFG and the VR288E-G64.

3.2.2 Modbus/TCP (server)

Configure the Modbus/TCP server settings for the VR288E-G64.
Click [COM.1] tab and set parameters according to the table below.

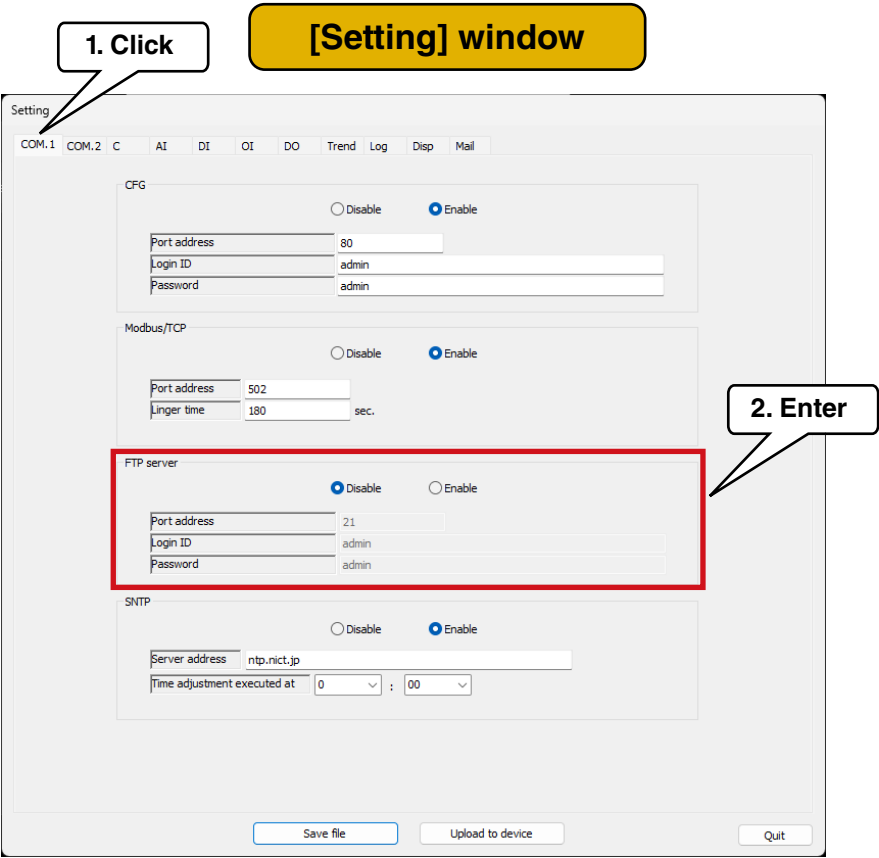
The screenshot shows the [Setting] window with the following configuration:

- COM.1 Tab:** Selected.
- CFG Section:**
 - Disable/Enable: ☒ Enable
 - Port address: 80
 - Login ID: admin
 - Password: admin
- Modbus/TCP Section (highlighted with a red box):**
 - Disable/Enable: ☒ Enable
 - Port address: 502
 - Linger time: 180 sec.
- FTP server Section:**
 - Disable/Enable: ☒ Disable
 - Port address: 21
 - Login ID: admin
 - Password: admin
- SNTP Section:**
 - Disable/Enable: ☒ Enable
 - Server address: ntp.nict.jp
 - Time adjustment executed at: 0 : 00
- Buttons:** Save file, Upload to device, Quit

Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using Modbus/TCP server function.
Port address	Set the port address of Modbus/TCP within 1 to 65535.
Linger time	Set the time until communication timeout within 1 to 600 (sec.)

3.2.3 FTP server

Configure the FTP server settings for the VR288E-G64.
Click [COM.1] tab and set parameters according to the table below.



Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using FTP server function.
Port address	Set the port address of FTP server within 1 to 65535.
Login ID	Set the login ID within 32 characters. (alphanumeric characters and "_")
Password	Set the password within 32 characters. (alphanumeric characters and "_")

NOTE

Port address 45967 to 45970 are used for PASV.

3.2.4 SNTP

Configure the SNTP server settings for the VR288E-G64.
Click [COM.1] tab and set parameters according to the table below.

1. Click

[Setting] window

Setting

COM.1COM.2CAltDIOTrendLogDispMail

CFG

DisableEnable

Port address80

Login IDadmin

Passwordadmin

Modbus/TCP

DisableEnable

Port address502

Linger time180sec.

FTP server

DisableEnable

Port address21

Login IDadmin

Passwordadmin

SNTP

DisableEnable

Server addressntp.nict.jp

Time adjustment executed at0:00

Save file

Upload to device

Quit

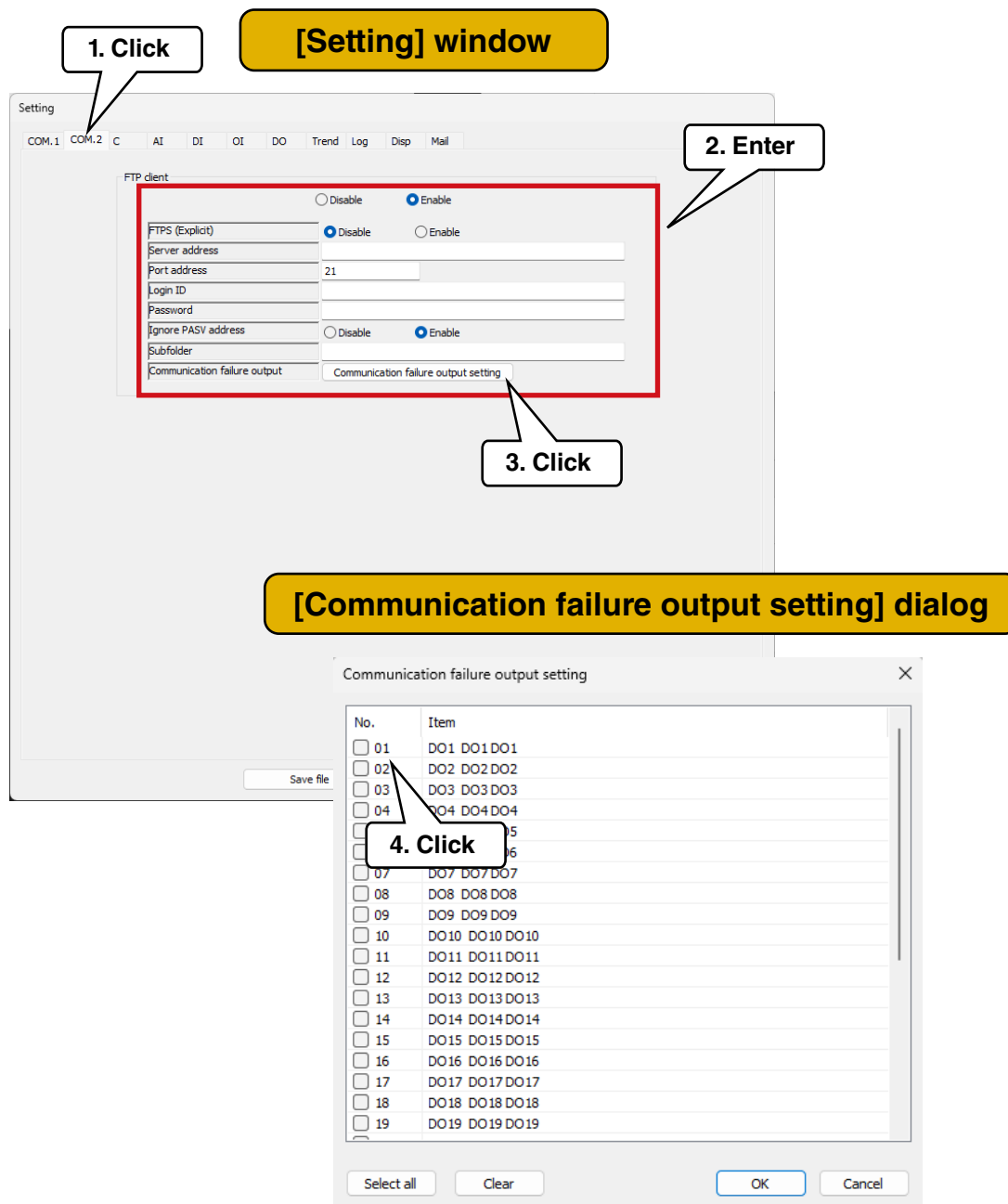
2. Enter

Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using SNTP client function.
Server address	Set the SNTP server address within 32 characters
Time adjustment executed at	Set the time when time adjustment will be performed. (0:00 to 23:59)

3.2.5 FTP client

Configure the FTP client settings for the VR288E-G64.

1. Click [COM.2] tab and enter the parameters according to the table below.
2. Click [Communication failure output setting] button to configure DO processing setting in case of communication failure. Click [Select all] or [Clear] button to enable batch setting.
When selecting the checkbox, DO is output in case of communication failure.



Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using FTP client function.
FTPS (Explicit)	Set [Disable] or [Enable]. Set [Enable] in case of connecting in Explicit mode.
Server address	Set the FTP server address. (within 64 characters)
Port address	Set the port address of the FTP server within 1 to 65535.
Login ID	Set the login ID. (within 32 characters)
Password	Set the password. (within 32 characters)
Ignore PASV address	Set [Disable] or [Enable]. Set [Enable] in case of ignoring the IP address returned by the PASV command.
Subfolder	Set the subfolder. (within 64 characters)

3.3 Connection setting

Configure connection settings between the VR288E-G64 and remote I/O or SLMP-compatible devices. Twelve connections can be set. (C1 to C12)

3.3.1 Connection setting

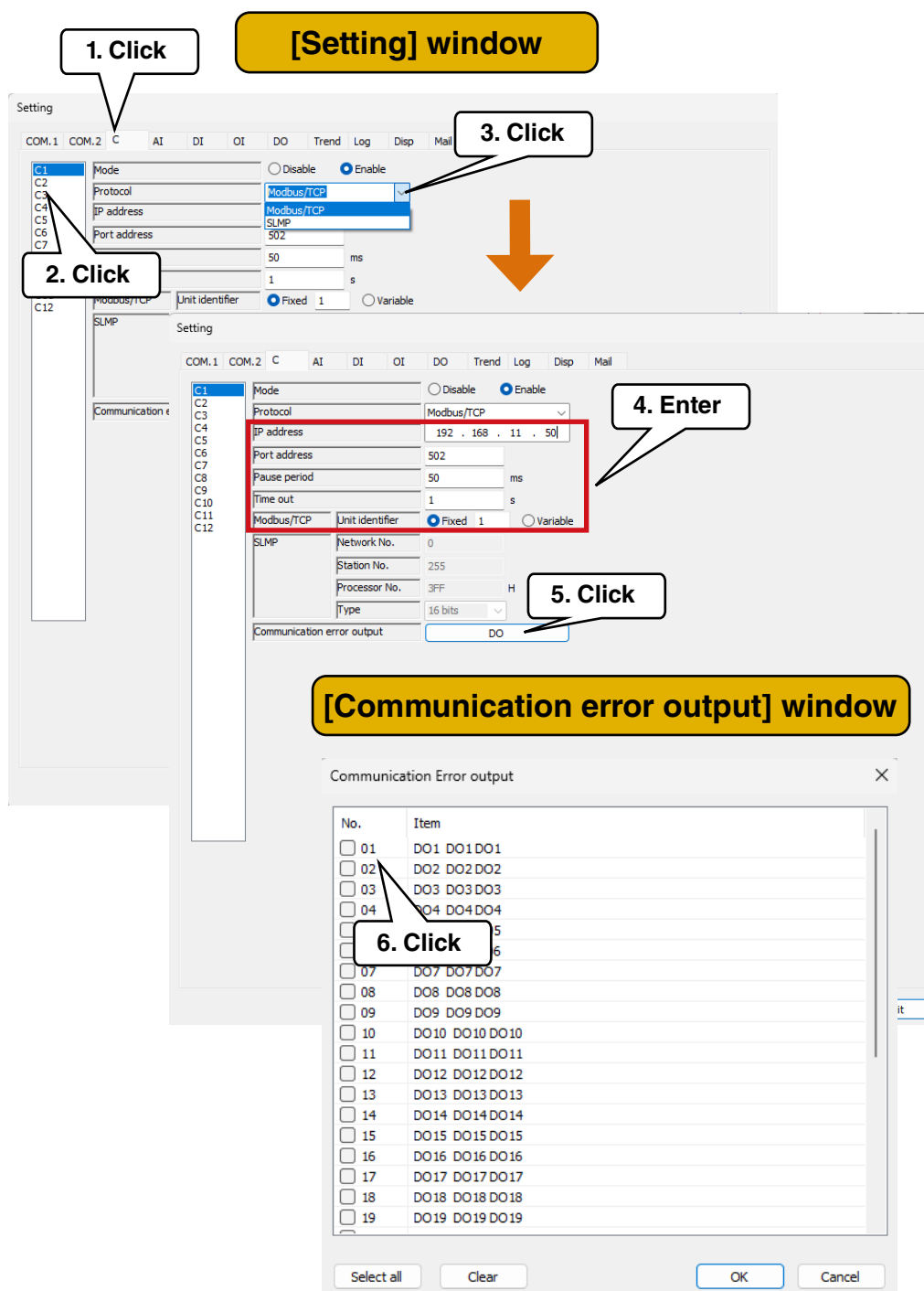
When communicating with remote I/O or SLMP-compatible device, set the IP address of each device per connection.

3.3.1.1 Modbus/TCP connection

Configure the Modbus/TCP connection (client) setting.

1. Click [C] tab.
2. Click the connection to be set to display the current settings.
3. Click the protocol drop-down list and select [Modbus/TCP].
4. Set parameters according to the table on the next page.
5. Click [DO] button to configure DO processing setting in case of communication failure. Click [Select all] or [Clear] button to enable batch setting.

When the checkbox is selected, DO is output in case of communication failure.



Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of communicating with remote I/O or SLMP-compatible device.
Protocol	Select [Modbus/TCP] or [SLMP].
IP address	Set the IP address of the connection destination. (0.0.0.0 to 255.255.255.255)
Port address	Set the port address within 1 to 65535.
Pause period	Set the communication interval with the connection destination by the millisecond. (50 to 30000)
Time out	Set the time until communication timeout with the connection destination by the millisecond. (1 to 60)
Modbus/TCP Unit identifier	Select [Fixed] or [Variable]. Select [Variable] when multiple nodes are used in 1 connection. In case of [Fixed], set in the range of 0 to 255.

3.3.1.2 SLMP connection

Configure the SLMP connection (client) setting.

1. Click [C] tab.
2. Click the connection to be set to display the current settings.
3. Click the protocol drop-down list and select [SLMP].
4. Set parameters according to the table below.
5. Click [DO] button to configure DO processing setting in case of communication failure. Click [Select all] or [Clear] button to enable batch setting.

When selecting the checkbox, DO is output in case of communication failure.

[Setting] window

1. Click

2. Click

3. Click

4. Enter

5. Click

[Communication error output] window

6. Click

The [Setting] window shows the configuration for connection C1. The 'C' tab is selected. The 'Protocol' dropdown is set to 'SLMP'. The 'IP address' is '192.168.11.50', 'Port address' is '502', 'Pause period' is '50 ms', and 'Time out' is '1 s'. The 'Modbus/TCP' section shows 'Unit identifier' as 'Fixed 1'. The 'SLMP' section shows 'Network No.' as '0', 'Station No.' as '255', 'Processor No.' as '3FF', and 'Type' as '16 bits'. The 'Communication error output' is set to 'DO'.

The [Communication error output] window shows a list of 19 items, each with a checkbox and a label (e.g., '01 DO1 DO1 DO1'). The 'Select all' button is highlighted.

Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of communicating with remote I/O or SLMP-compatible device.
Protocol	Select [Modbus/TCP] or [SLMP].
IP address	Set the IP address of the connection destination. (0.0.0.0 to 255.255.255.255)
Port address	Set the port address within 1 to 65535.
Pause period	Set the communication interval with the connection destination by the millisecond. (50 to 30000)
Time out	Set the time until communication timeout with the connection destination by the millisecond. (1 to 60)
SLMP Network No.	Set the SLMP Network No. within 0 to 255.
SLMP Station No.	Set the SLMP Station No. within 1 to 255.
SLMP Processor No.	Set the SLMP Processor No. within 0x0000 to 0xFFFF.
SLMP Type	Select [16 bits] or [32 bits].

3.3.2 Copying the connection setting

It is possible to copy the connection settings configured on [Setting] window and to modify only the necessary parameters.

[Setting] window

1. Click

2. Right-click and click [Copy]

3. Click

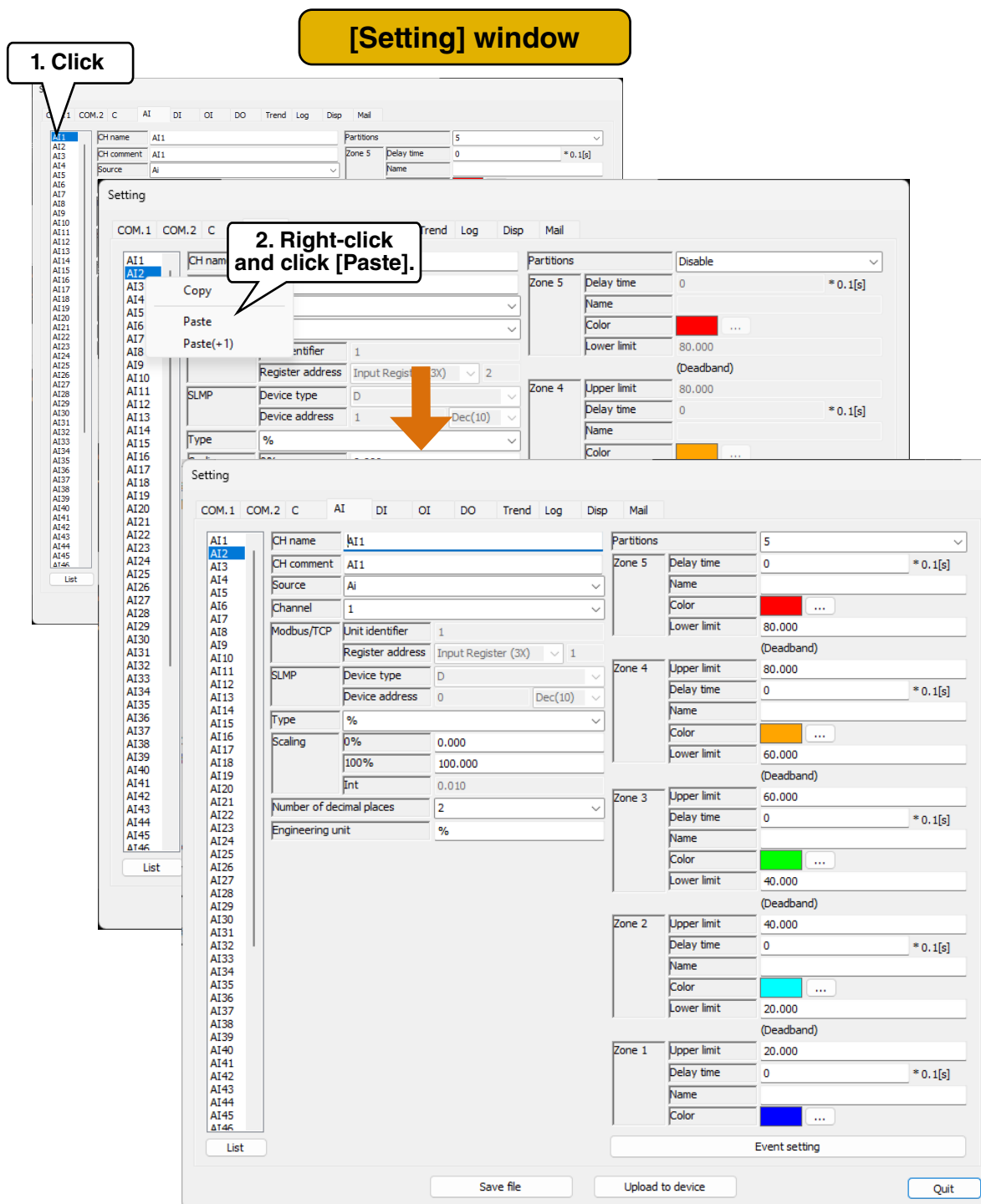
4. Right-click and click [Paste]

The [Setting] window displays connection settings for COM.1, COM.2, and C. The settings include Mode (Disable/Enable), Protocol (SLMP), IP address (192.168.11.50), Port address (502), Pause period (50 ms), Time out (1 s), Modbus/TCP Unit identifier (Fixed 1), SLMP Network No. (0), Station No. (255), Processor No. (3FF H), Type (16 bits), and Communication error output (DO).

Save file Upload to device Quit

3.3.2.1 Pasting

Copied I/O settings can be pasted. The procedure is common to each I/O setting window. Pasting is possible only in the same I/O tab.



3.3.3 SLMP-compatible device

Up to twelve SLMP-compatible devices can be connected to one VR288E-G64.

Assign separate IP addresses to SLMP-compatible devices (C1 to C12) that are different from the VR288E-G64.

■SLMP-COMPATIBLE DEVICES THAT CAN BE CONNECTED

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

(Tested and verified)

- R04CPU
- FX5U-32M
- Q03UDECPU

■CONNECTING WITH SLMP-COMPATIBLE DEVICE

The VR288E-G64 can be connected to SLMP-compatible devices via TCP/IP over Ethernet.

Register the SLMP device on the Ethernet device setting window and set as follows:

- Communication data code: Binary
- Communication method: SLMP
- Protocol: TCP
- IP address: IP address specified in the connection setting of the VR288E-G64
- Port address: Port address specified in the connection setting of the VR288E-G64

NOTE

Refer to the Users Manual of each product for the setting of the SLMP-compatible device.

3.4 I/O setting

Configure I/O signal settings with the VR288E-G64.

It is possible to assign remote I/O and SLMP-compatible device in addition to the built-in I/O.

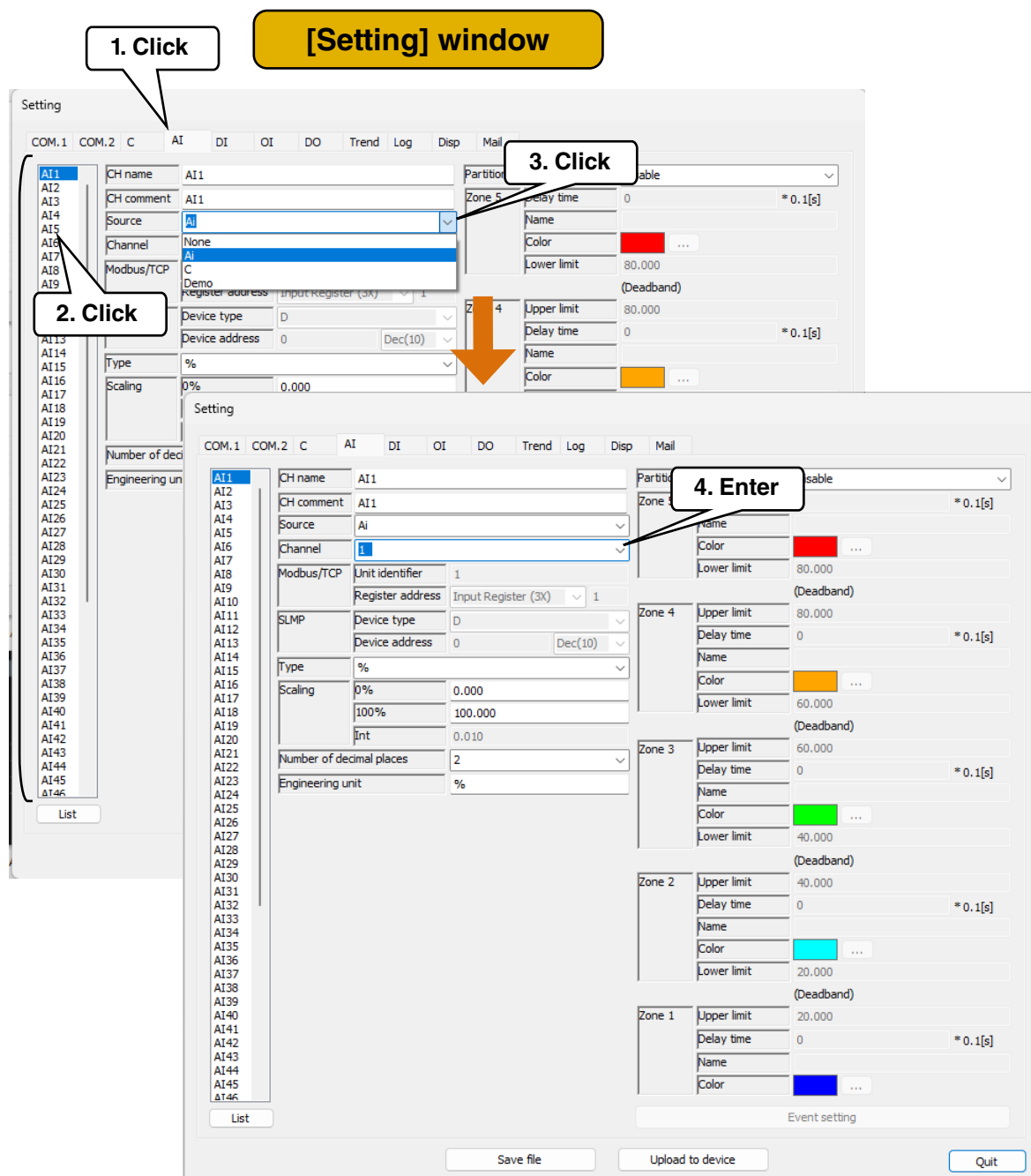
3.4.1 Analog input (AI)

Analog input signals can be monitored for maximum of 96 points (AI1 to AI96) using the VR288E-G64.

Assign the analog input from built-in I/O, remote I/O or SLMP-compatible device to the VR288E-G64 according to the following procedure.

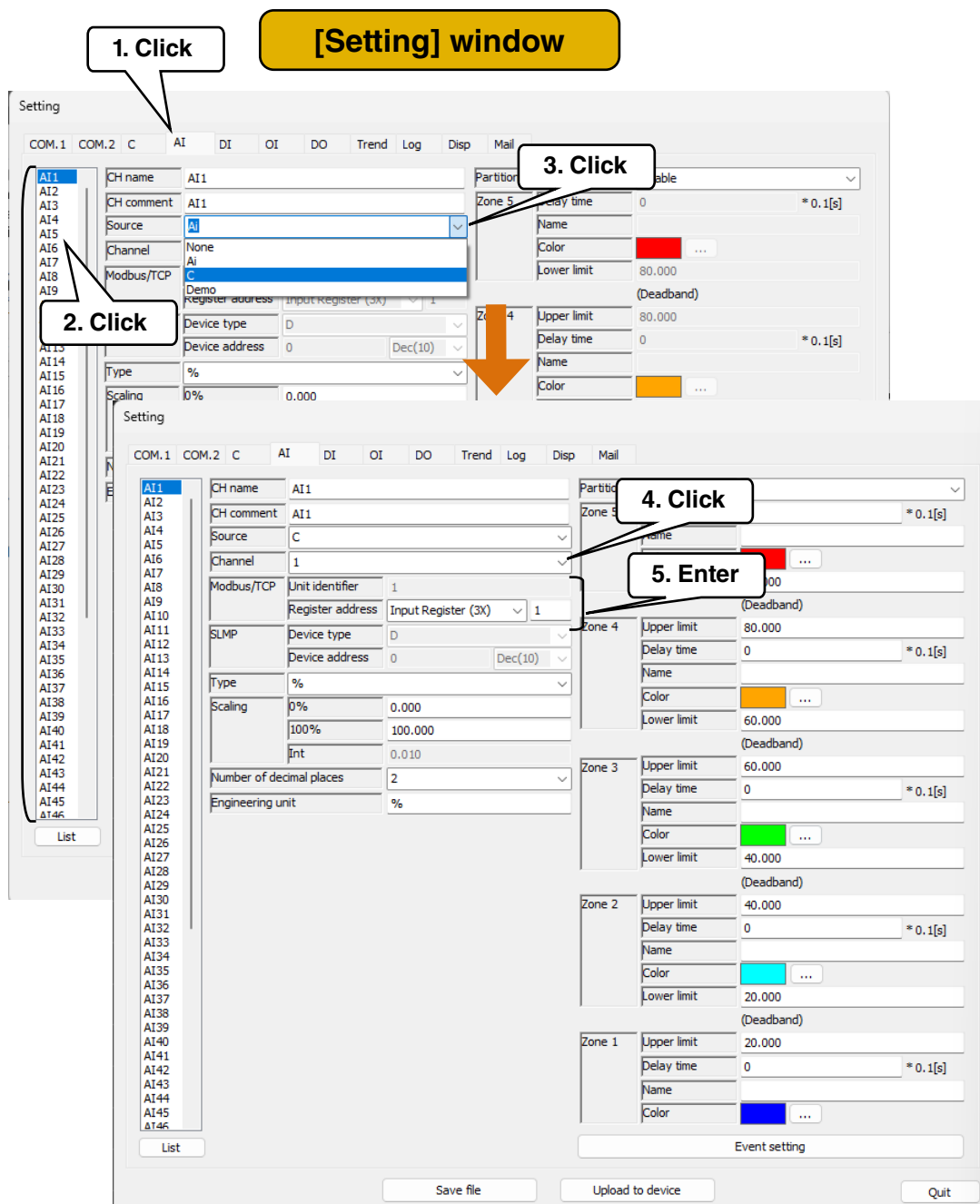
3.4.1.1 Assignment analog input to built-in I/O

1. Click [AI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [Ai].
4. Set the channel of built-in Ai.



3.4.1.2 Assignment analog input to remote I/O

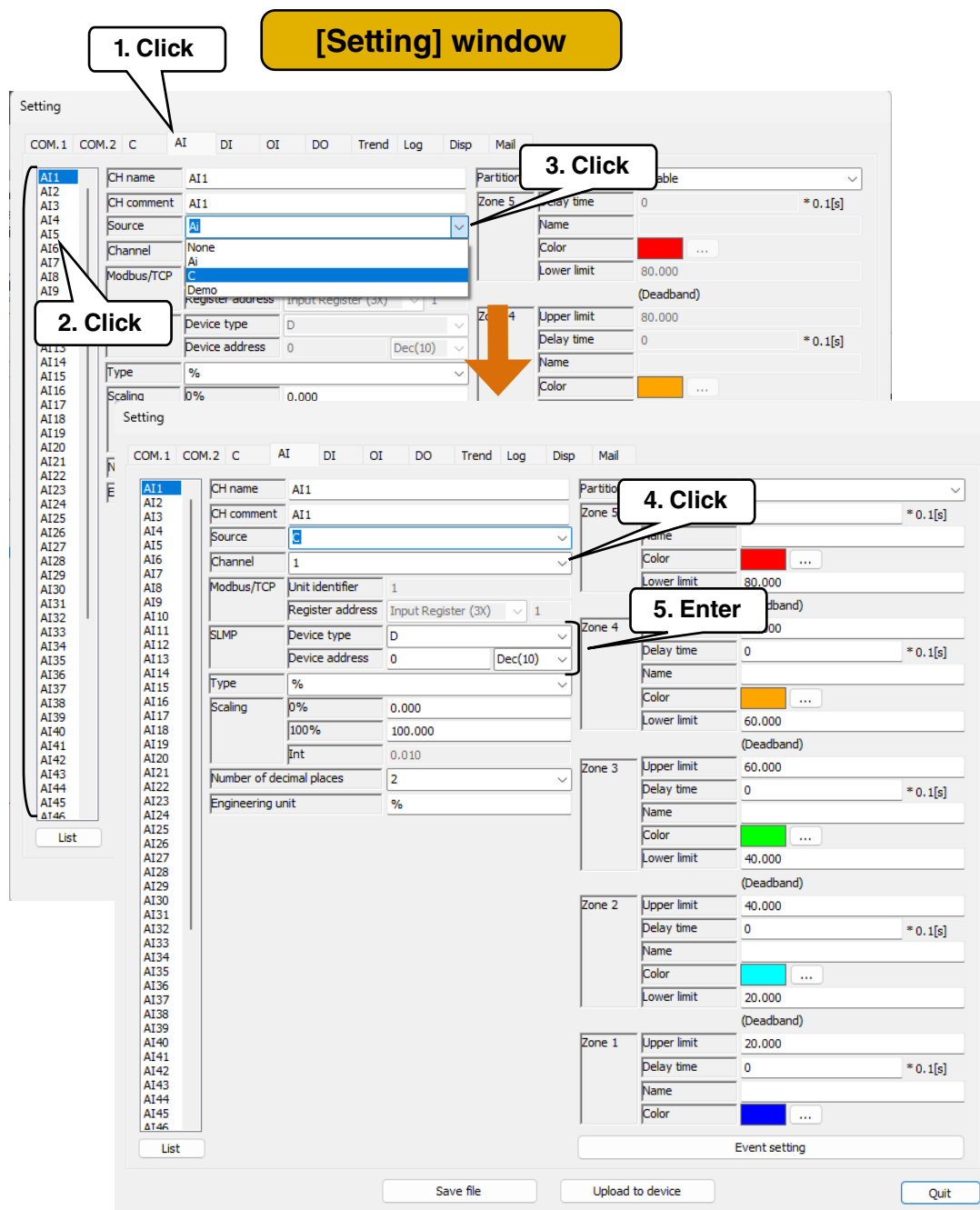
1. Click [AI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. → 3.3.1.1 Modbus/TCP connection
5. Set parameters according to the table below.



Parameter	Description
Modbus/TCP Unit identifier	In case that the unit identifier of the selected channel is [Variable], set the unit identifier number in the range of 0 to 255. → 3.3.1.1 Modbus/TCP connection
Modbus/TCP Register address	Select [Input Register (3X)] or [Holding Register (4X)]. Set the register address in the range of 0 to 65536.

3.4.1.3 Assignment analog input to SLMP-compatible device

1. Click [AI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. → 3.3.1.2 SLMP connection
5. Set parameters according to the table below.



Parameter	Description
Device type	Select the device type of the SLMP-compatible device to be connected.
Device address	Enter the address of the SLMP-compatible device to be connected. (Dec(10): 0 to 4294967295, Hex(16): 0x00000000 to 0xFFFFFFFF, Oct(8): 0 to 037777777777)

3.4.1.4 Basic setting (AI)

After completing the assignment, configure the following basic setting.

[Setting] window

Parameter	Description
CH name	Set the channel name within 16 characters.
CH comment	Set the comment for the channel within 16 characters such as the tag name, etc.
Type	Select the data type from the following 3 types. • % %×100 format data (-500 to 10500) (equivalent to the voltage/current data of remote I/O) • Int Signed 16 bit integer format data (-32768 to 32767) (equivalent to the temperature data of remote I/O) • Uint Unsigned 16 bit integer format data (0 to 65535)
Scaling	• If the data type is [%] Set the actual corresponding values at 0% and 100% respectively as numeric values. • If the data type is [Int] or [Uint] Set the multiplication factor in order to convert the data to its actual value. For example, if the temperature data is the actual value × 10, enter [0.1].
Number of decimal places	Set the number of digits after the decimal point for the values displayed on the trend data, etc. Set from 0, 1, 2 and 3.
Engineering unit	Set the engineering unit corresponding to the actual value set in the [Scaling]. Set within 8 characters.

3.4.1.5 Zone setting (AI)

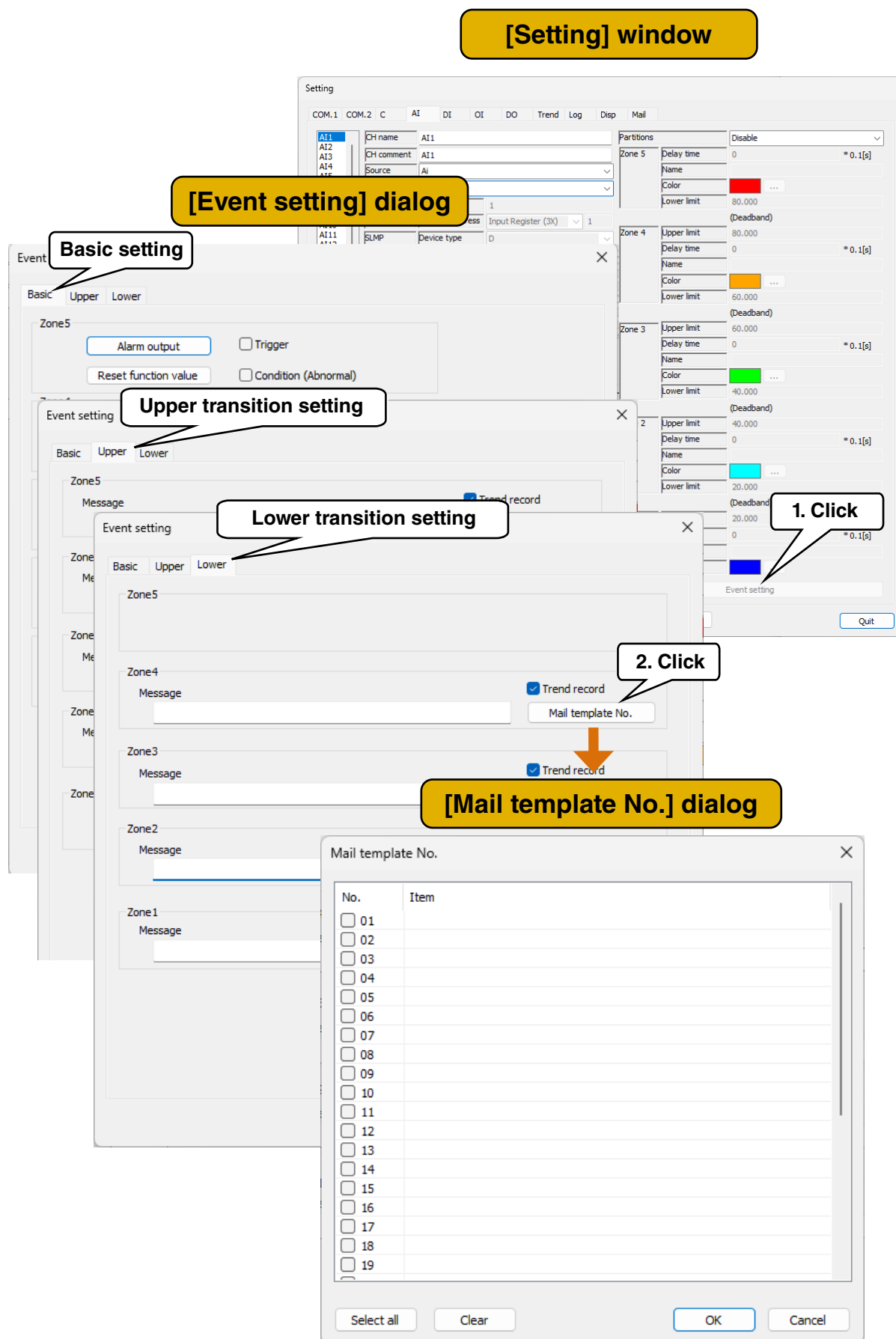
Configure zone setting corresponding to the input values. Up to 5 zones can be set, and deadbands can also be set between zones.

[Setting] window

Parameter	Description
Partitions	Set the number of zones to be used. Select from Disable / 2 / 3 / 4 / 5.
Name	Set the name for each zone within 16 characters.
Color	Set the color to represent each zone which will be displayed on the trend data.
Delay time	Set the time required for the transition from another zones to the corresponding zone to be confirmed in the range of 0.0 to 99.9 (sec.). When zone 1 is set to five seconds: The transition to zone 1 is confirmed five seconds after the input value changes in the state of zone 2 and becomes less than or equal to the upper limit of zone 1. It remains in zone 2 until five seconds have elapsed.
Upper limit : : : Lower limit	Set the upper and lower limit value for zones with actual values. Set as the upper limit > lower limit. - When the deadband is set When the deadband is set between zone 1 and zone 2, set the values so that the deadband is between the upper limit of zone 1 and the lower limit of zone 2. The zone transitions when the value is above the lower limit of zone 2 or below the upper limit of zone 1. 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 of zone 1 and the lower limit of zone 2. The zone transitions when the value exceeds the upper limit of zone 1 or reaches the lower limit of zone 2. Set similarly for the other zones as well.

3.4.1.6 Event setting (AI)

An event occurs when transiting to the zone which has been set in the zone setting.



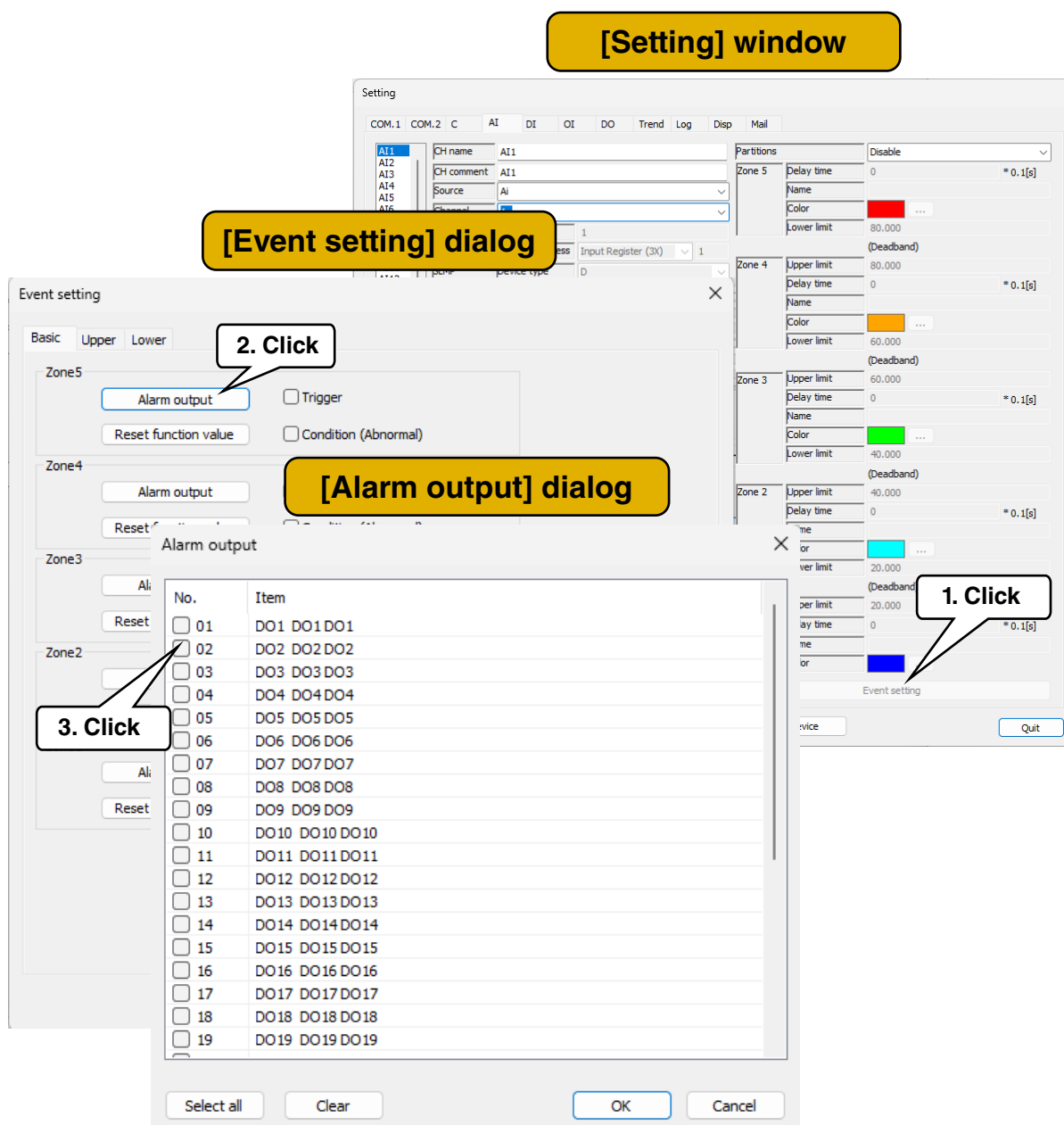
1. Click [Event setting] button on [Setting] window (AI) to display [Event setting] dialog. In case that the partitions is [Disable], [Event setting] button is disabled.
2. Set parameters according to the table below. Click [OK] button to go back to [Setting] window.
3. Click [Mail template No.] button to display [Mail template No.] dialog. An e-mail is sent according to the selected template when the input value changes and enters the corresponding zone.

Parameter	Description
Trigger	Set whether or not to perform trigger recording when the input value changes and enters the corresponding zone. Select the checkbox when performing the trigger recording. → 3.5.1.3 Trigger recording
Condition (Abnormal)	Set whether or not to return from the screen saver when an event occurs.
Message	Set the message when an event occurs within 32 characters.
Trend record	Set whether or not to record a message to the trend when an event occurs. Select the checkbox when recording the message.

3.4.1.7 Alarm output setting (AI)

A specified DO can be turned ON for each zone.

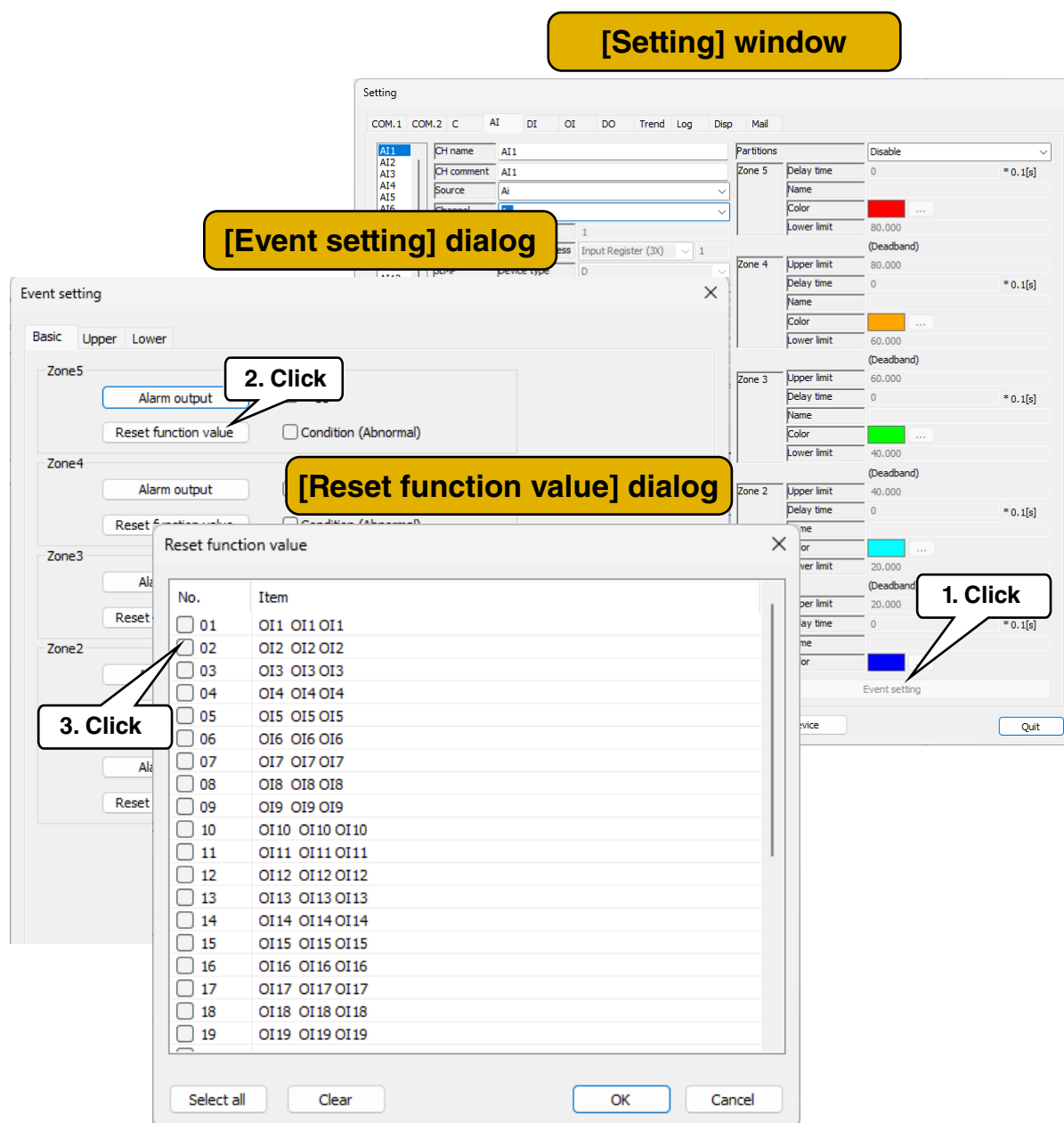
1. Click [Event setting] button on [Setting] window (AI) to display [Event setting] dialog. Click [Alarm output] button of the specified zone to display [Alarm output] dialog.
2. Select the checkbox of the DO channel to be set and click [OK].



3.4.1.8 Reset function value setting (AI)

The function value of the specified OI can be reset when zone transition occurs.

1. Click [Event setting] button on [Setting] window (AI) to display [Event setting] dialog. Click [Reset function value] button of the specified zone to display [Reset function value] dialog.
2. Select the checkbox of the OI channel to be set and click [OK].



Follow the above procedure to set all the channels.

The channel setting configured on [Analog input (AI)] window can also be copied to other channels and only the required parameters can be modified.

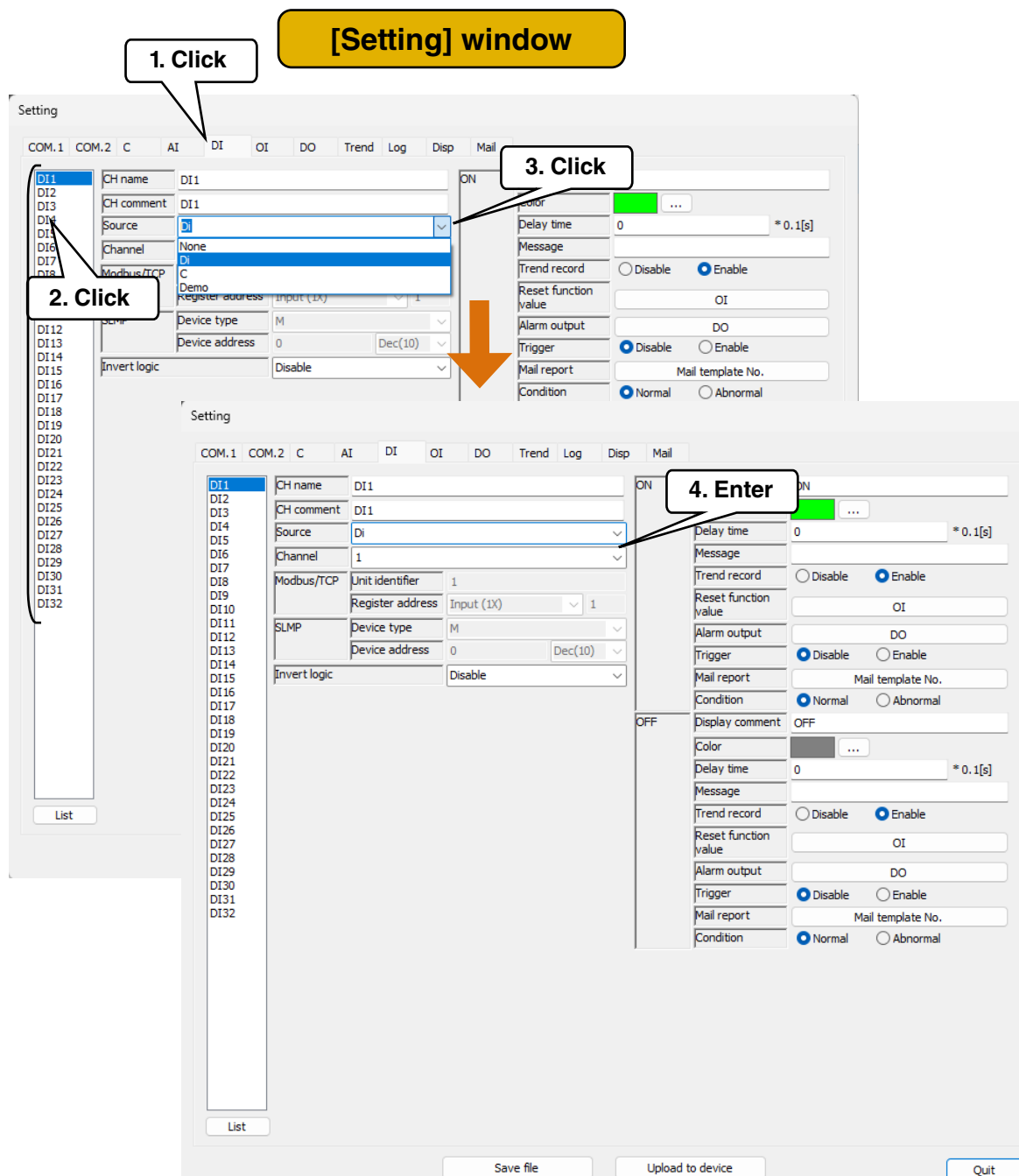
→ 3.4.5 Copying the I/O setting

3.4.2 Discrete input (DI)

Discrete input signals can be monitored for maximum of 32 points (DI1 to DI32) using the VR288E-G64. Assign the discrete input from built-in I/O, remote I/O or SLMP-compatible device to the VR288E-G64 according to the following procedure.

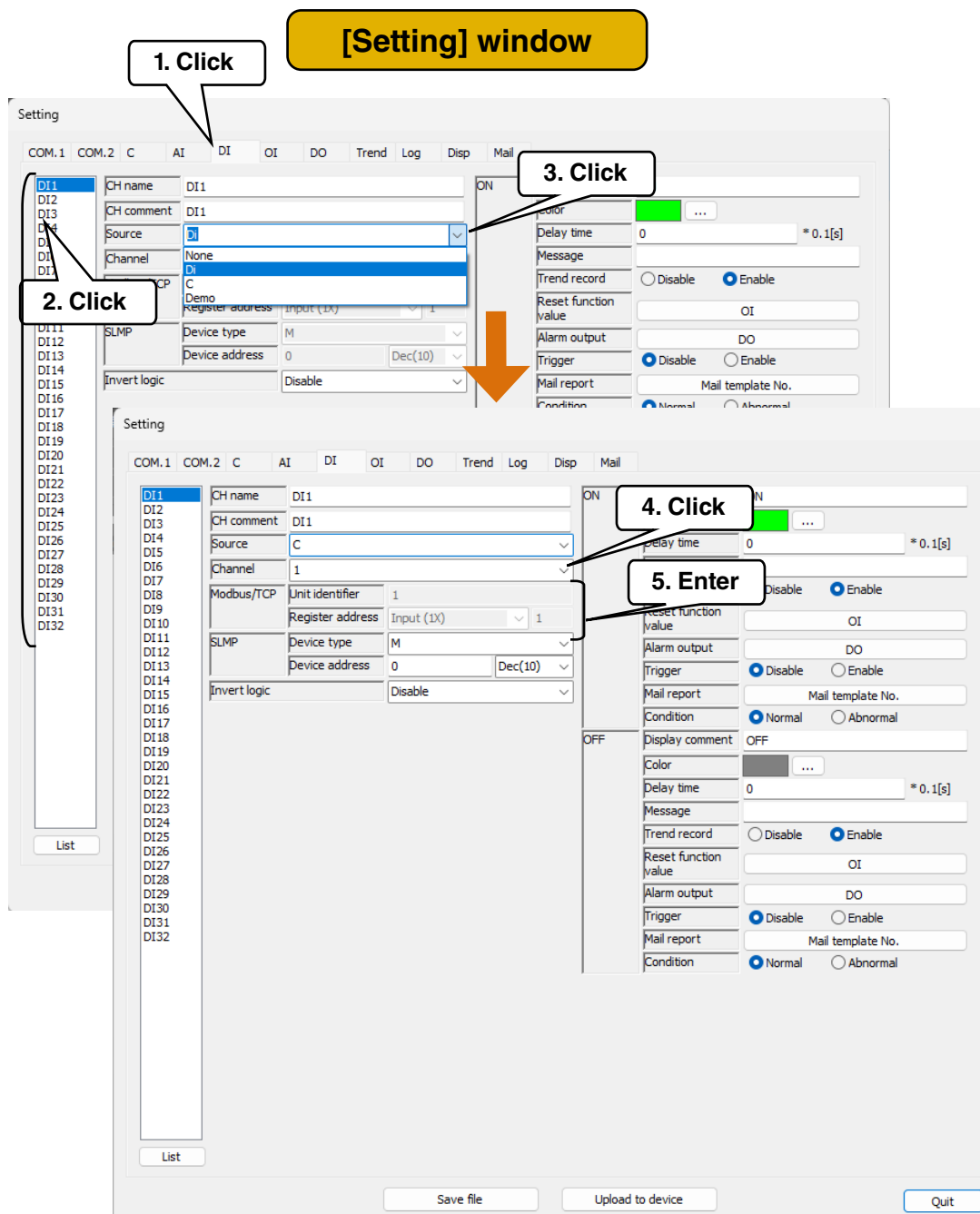
3.4.2.1 Assignment discrete input to built-in I/O

1. Click [DI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [Di].
4. Set the channel of built-in Di.



3.4.2.2 Assignment discrete input to remote I/O

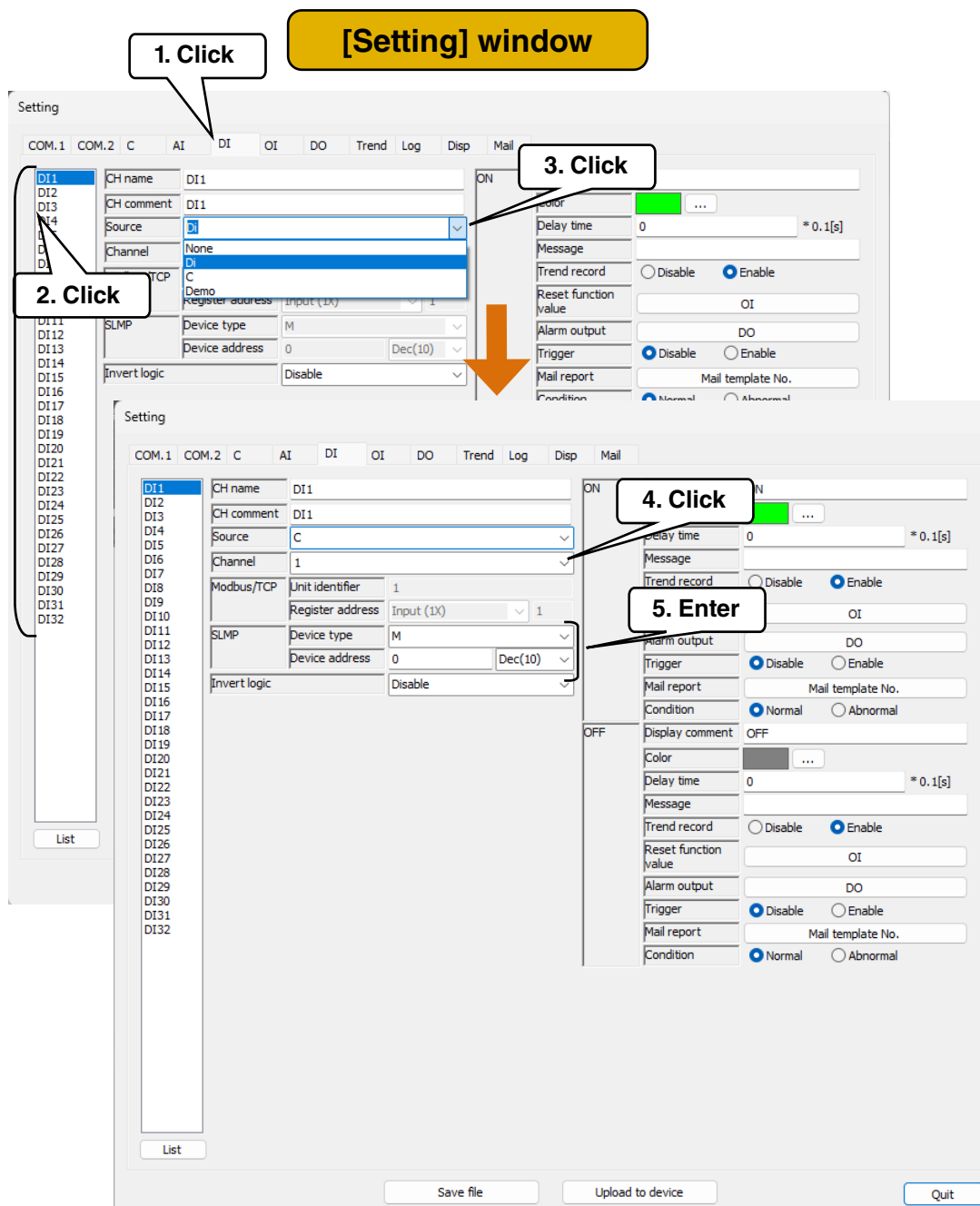
1. Click [DI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. → 3.3.1.1 Modbus/TCP connection
5. Set parameters according to the table below.



Parameter	Description
Modbus/TCP Unit identifier	In case that the unit identifier of the selected channel is variable, set the unit identifier number in the range of 0 to 255. → 3.3.1.1 Modbus/TCP connection
Modbus/TCP Register address	Select [Input (1X)] or [Coil (0X)]. Set the register address in the range of 1 to 65536.

3.4.2.3 Assignment discrete input to SLMP-compatible device

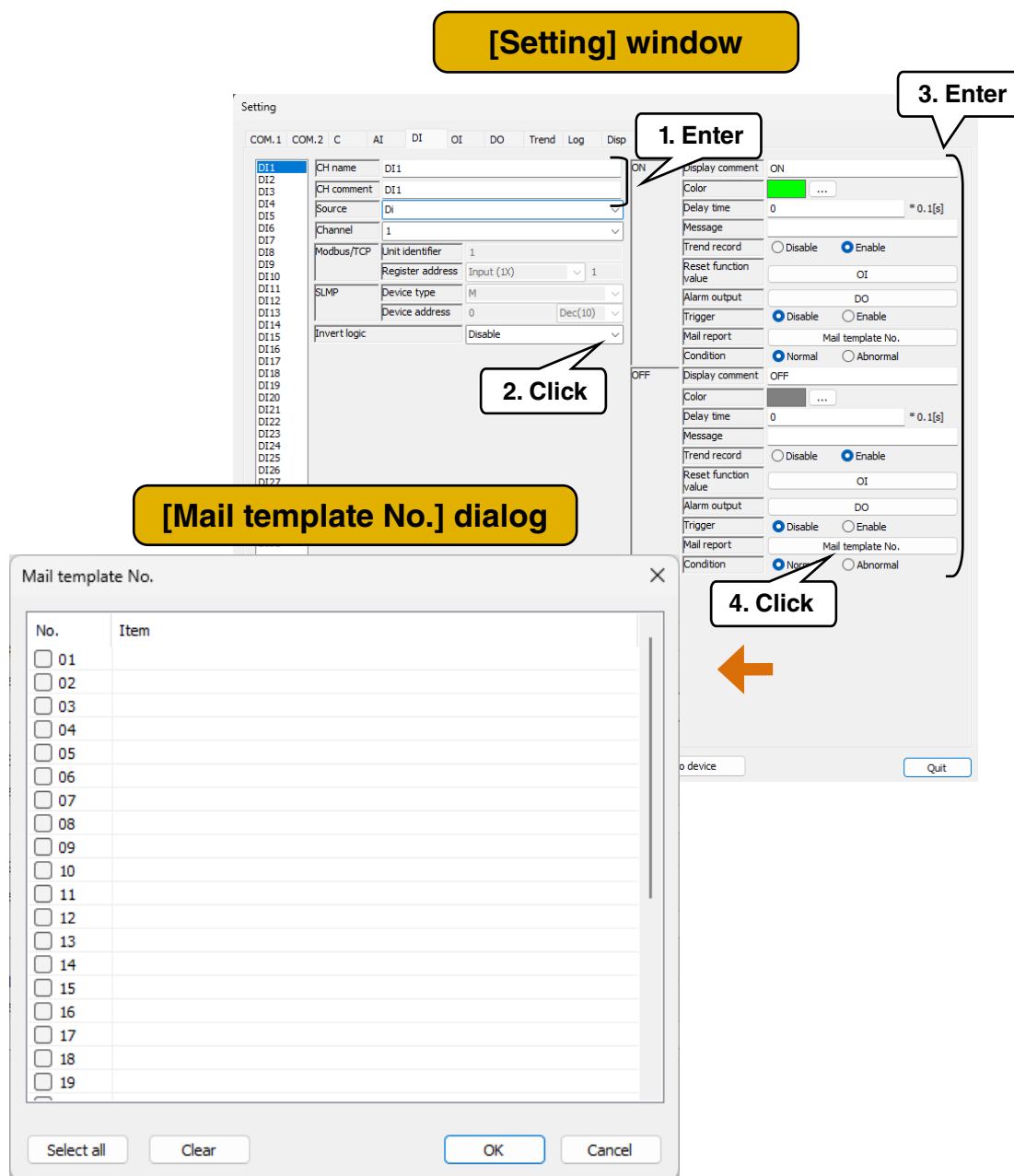
1. Click [DI] tab.
2. Click the channel to be set to display the current settings.
3. Click the source drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. → 3.3.1.2 SLMP connection
5. Set parameters according to the table below.



Parameter	Description
Device type	Select the device type of the SLMP-compatible device to be connected.
Device address	Enter the address of the SLMP-compatible device to be connected. (Dec(10): 0 to 4294967295, Hex(16): 0x00000000 to 0xFFFFFFFF, Oct(8): 0 to 037777777777)

3.4.2.4 Basic setting (DI)

After completing the assignment, configure the following basic setting.



1. Configure the basic setting.

Parameter	Description
CH name	Set the channel name within 16 characters.
CH comment	Set the comment for the channel within 16 characters such as the tag name, etc.
Invert logic	If the ON/OFF of the input signal and the ON/OFF of the application signal are the reverse of each other, select [Enable].

2. Set ON and OFF respectively.

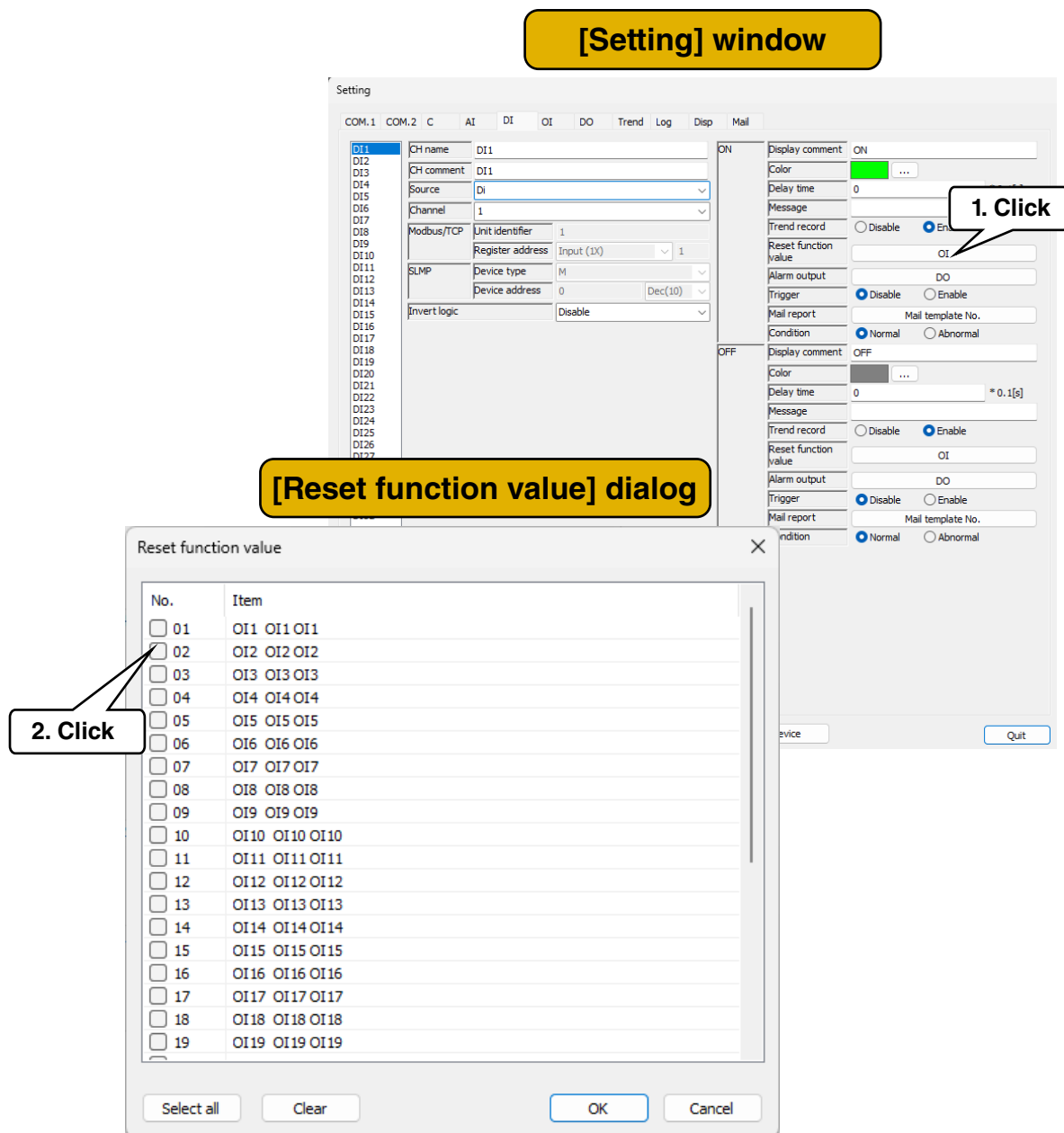
Parameter	Description
Display comment	Set the comment corresponding to ON and OFF respectively within 8 characters.
Color	Set the color which represents the status displayed on the trend data for ON and OFF respectively.
Delay time	Set the delay time for ON and OFF respectively within the range of 0.0 to 99.9 seconds.
Message	Set the message to be displayed when an event occurs within 32 characters.
Trend record	Set whether or not to record a message in trend when an event occurs. Select the checkbox when recording the message.
Trigger	Set whether or not to perform trigger recording when the input value changes and enters the corresponding zone. Select the checkbox when performing the trigger recording. → 3.5.1.3 Trigger recording
Condition	Set whether or not to return from the screen saver when an event occurs. Select [Abnormal] in order to return from the screen saver.

3. Click [Mail template No.] button to display [Mail template No.] dialog. A mail is sent according to the selected template when the input value changes and enters the corresponding zone.

3.4.2.5 Reset function value setting (DI)

The function of the specified OI can be reset by turning DI ON → OFF and OFF → ON.

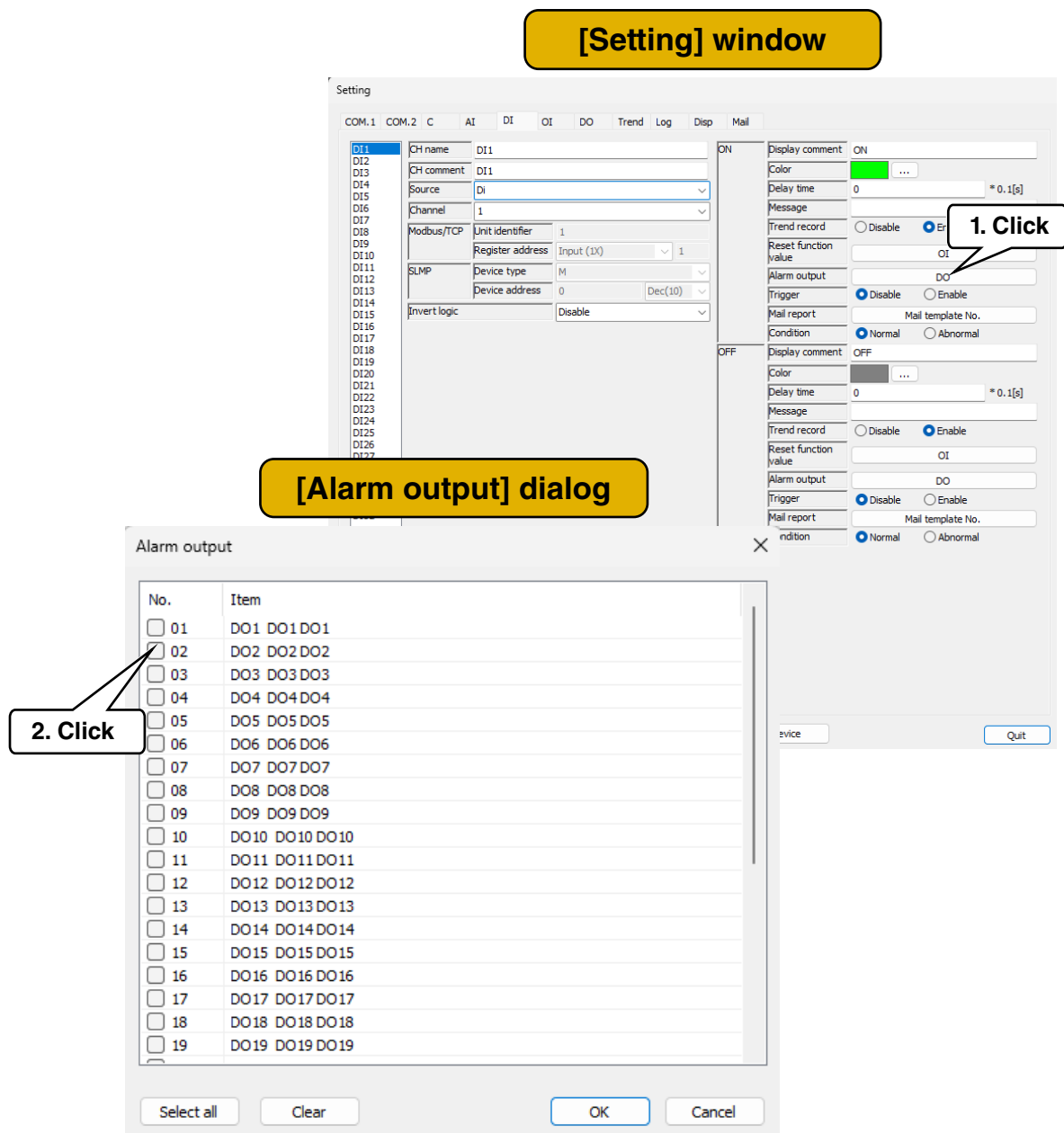
1. Click [OI] button to display [Reset function value] dialog.
2. Select the checkbox of the OI channel to be set and click [OK].



3.4.2.6 Alarm output setting (DI)

A specified DO can be turned ON by turning DI ON → OFF and OFF → ON.

1. Click [DO] button to display [Alarm output] dialog.
2. Select the checkbox of the DO channel to be set and click [OK].



Follow the above procedure to set all the channels.

The channel setting configured on [Discrete input (DI)] window can also be copied to other channels and only the required parameters can be modified.

→ 3.4.5 Copying the I/O setting

3.4.3 Operational input (OI)

Configure the operational input (OI) setting. There are 32 operational input channels (OI1 to OI32). The operation is performed starting from OI1.

3.4.3.1 Basic setting (OI)

1. Click [OI] tab.
2. Click the channel to be set to display the current setting.
3. Configure the basic setting. Set the parameters according to the table below, .

[Setting] window

Setting

COM.1 COM.2 C AI DI **OI** DO Trend Log Disp Mail

1. Click

2. Click

3. Enter

CH name OI1

CH comment OI1

Number of decimal places 2

Engineering unit %

Function type Addition/Subtraction

$K1 \cdot X1 + K2 \cdot X2 + K3 \cdot X3 + A0$

K1 Const 1 0.000

X1 AI 1 0.000

K2 Const 1 0.000

X2 AI 1 0.000

K3 Const 1 0.000

X3 AI 1 0.000

A0 Const 1 0.000

Partitions

Zone 5

Delay time 0 * 0.1[s]

Name

Color

Lower limit 80.000

(Deadband)

Zone 4

Delay time 0 * 0.1[s]

Name

Color

Lower limit 60.000

(Deadband)

Zone 3

Upper limit 60.000

Delay time 0 * 0.1[s]

Name

Color

Lower limit 40.000

(Deadband)

Zone 2

Upper limit 40.000

Delay time 0 * 0.1[s]

Name

Color

Lower limit 20.000

(Deadband)

Zone 1

Upper limit 20.000

Delay time 0 * 0.1[s]

Name

Color

Event setting

List

Save file Upload to device Quit

Parameter	Description
CH name	Set the channel name within 16 characters.
CH comment	Set the comment for the channel within 16 characters such as the tag name, etc.
Number of decimal places	Set the number of digits after the decimal point for the data displayed on the trend data, etc. Set in the range of 0 to 3.
Engineering unit	Set the engineering unit within 8 characters.
Function type	Select from the following: Unused / Addition/Subtraction / Multiplication / Division / Extraction of square root / Moving average / First order lag / exp / Common logarithm / Natural logarithm / Peak hold (maximum) / Peak hold (minimum) / Power / Analog integration / F-value operation / antilogarithm / Scaling / Time.

Operation specifications

Parameter	Expression	Parameter
Addition/ Subtraction	$K1X1+K2X2+K3X3+A0$	K1, K2, K3, A0, X1, X2, X3: *1
Multiplication	$(K1X1+A1)(K2X2+A2)+A0$	K1, K2, A0, A1, A2, X1, X2: *1
Division	$(K1X1+A1)/(K2X2+A2)+A0$	K1, K2, A0, A1, A2, X1, X2: *1
Extraction of square root	$10K1 \sqrt{X1}$	K1, X1: *1
Moving average	$\frac{\sum_{n=0}^{N-1} x_n}{N}$	X1: *1 N: Moving average value (4/8/16/32/64) RST: Initialization
First order lag	$G(s) = \frac{K}{1 + Ts}$	G: *1 T: Time constant (0 to 100 seconds) K: Gain (Constant) RST: Reset
exp	e^{xI_n}	X1: *1
Common logarithm	$\log X1$	X1: *1
Natural logarithm	$\ln X1$	X1: *1
Peak hold (Maximum)	$MAX(X1)$	X1: *1 RST: Initialization (MAX=X1) Note: The value before the power removed is held in case of power failure.
Peak hold (Minimum)	$MIN(X1)$	X1: *1 RST: Initialization (MAX=X1) Note: The value before the power removed is held in case of power failure.
Analog integration	$\sum_{n=0}^N x_n$	X1: *2 K1: Integration rate K2: Unit (M/H/D) K3: Dropout (0.000 to 120.000%) RST: Initialization Note: The value before the power removed is held in case of power failure.
Power	$X1^{K1}$	X1, K1: *1
F-value operation	$\sum 10^{\frac{X1-K1}{K2}}$	X1: *1 K1: Reference temperature (°C) *1 K2: Z-value (Positive real number) *1 RST: Initialization
Antilogarithm	10^{X1}	X1: *1
Scaling	$K3+(K4-K3)*(X1-K1)/(K2-K1)$	X1: *1 K1: Zero (Input) *1, 3 K2: Span (Input) *1, 3 K3: Zero (Output) *1, 3 K4: Span (Output) *1, 3
Time	MM/DD hh:mm:ss	K1: 0: month, 1: day, 2: hour, 3: minute, 4: second, 5: day of week Day of week: 0: Sunday, 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday

Note 1) Constants (Const), AI, AI zone, DI or OI can be set.

DI: ON → 1.0, OFF → 0.0

AI zone: Specified AI current value is operated as numeric value to determine which zone it is in.

Current value zone 1 to 5 can be operated as 1.0 to 5.0. If the partitions is set to [Disable], operation is performed with 0. → 3.4.1.5 Zone setting (AI)

Note 2) AI, AI zone, DI or OI can be set. The value is same as note 1.

Note 3) The same value cannot be set for zero and span.

E.g.: Analog integration

This is an example of capturing flow rate using voltage.

Assume 1V corresponds to 0 m³/h and 5V corresponds to 30 m³/h.

When performing analog integration, input should be in the range of 0 to 100.

In advance, scale 1 to 5V to 0 to 100% in AI or perform scaling with operation.

Since the unit is m³/h, set the time unit to "hour."

If the integration rate is set to 30, the integrated value becomes 15 when 50% continues for 1 hour, and the integrated value becomes 30 when 100% continues for 1 hour.

3.4.3.2 Zone setting (OI)

Configure zone setting corresponding to the input values. Up to 5 zones can be set, and deadbands can also be set between zones.

[Setting] window

Setting

COM.1 COM.2 C AI DI OI DO Trend Log Disp Mail

CH name OI1
CH comment OI1
Number of decimal places 2
Engineering unit %
Function type Addition/Subtraction

$K1 \cdot X1 + K2 \cdot X2 + K3 \cdot X3 + A0$

Parameter	Value	Unit
K1	Const	1
X1	AI	1
K2	Const	1
X2	AI	1
K3	Const	1
X3	AI	1
A0	Const	1

Partitions: 5

Zone 5: Delay time 0 * 0.1[s], Name, Color, Lower limit 80.000 (Deadband)

Zone 4: Upper limit 80.000, Delay time 0 * 0.1[s], Name, Color, Lower limit 60.000 (Deadband)

Zone 3: Upper limit 60.000, Delay time 0 * 0.1[s], Name, Color, Lower limit 40.000 (Deadband)

Zone 2: Upper limit 40.000, Delay time 0 * 0.1[s], Name, Color, Lower limit 20.000 (Deadband)

Zone 1: Upper limit 20.000, Delay time 0 * 0.1[s], Name, Color, Lower limit 0.000 (Deadband)

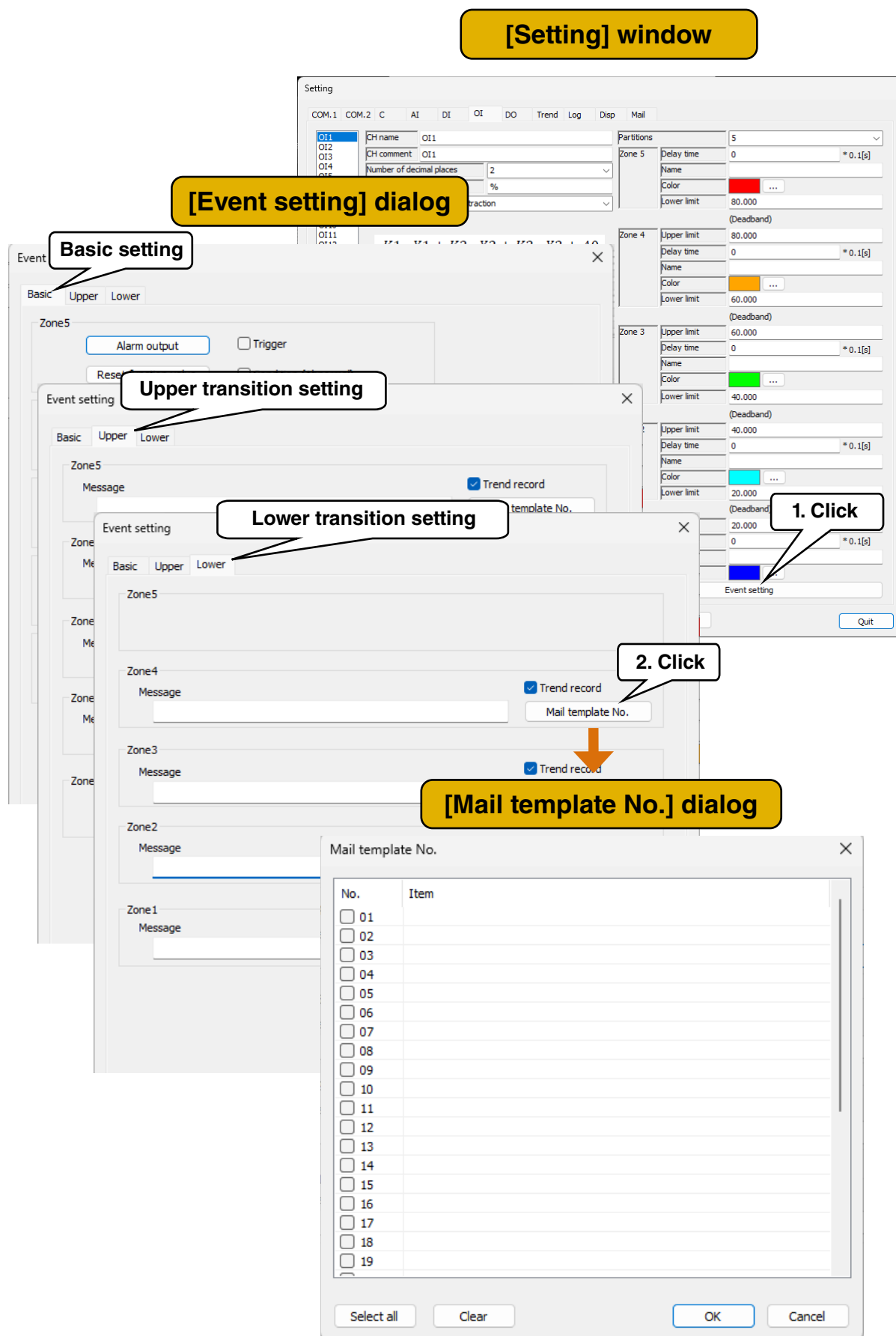
Event setting

Save file Upload to device Quit

Parameter	Description
Partitions	Set the number of zones to be used. Select from Disable / 2 / 3 / 4 / 5.
Name	Set the name within 16 characters for each zone.
Color	Set the color to represents each zone which will be displayed on the trend data.
Delay time	Set the time required for the transition from another zones to the corresponding zone to be confirmed in the range of 0.0 to 99.9 (sec.). When zone 1 is set to five seconds: The transition to zone 1 is confirmed five seconds after the input value changes in the state of zone 2 and becomes less than or equal to the upper limit of zone 1. It remains in zone 2 until five seconds have elapsed.
Upper limit : : : Lower limit	Set the upper and lower limit value for zones with actual values. Set as the upper limit > lower limit. • When the deadband is set When the deadband is set between zone 1 and zone 2, set the values so that the deadband is between the upper limit of zone 1 and the lower limit of 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 of zone 1 and the lower limit of zone 2. Set similarly for the other zones as well.

3.4.3.3 Event setting (OI)

An event occurs when transitting to the zone set in the zone setting.



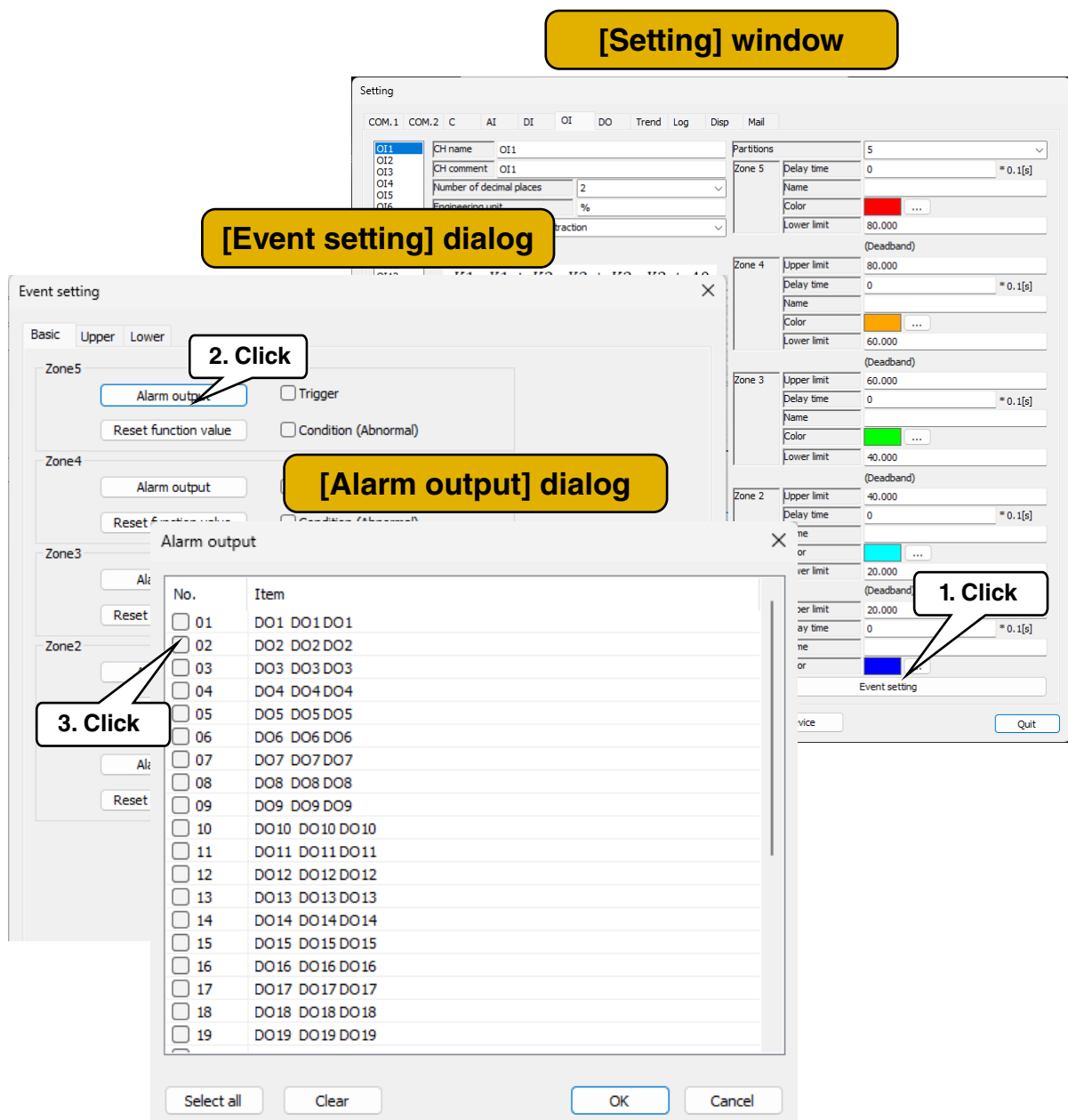
1. Click [Event setting] button on [Setting] window (OI) to display [Event setting] dialog. In case that the partitions is [Disable], [Event setting] button is disabled.
2. Set parameters according to the table below. Click [OK] button to go back to [Setting] window.
3. Click [Mail template No.] button to display [Mail template No.] dialog. A mail is sent according to the selected template when the input value changes and enters the corresponding zone.

Parameter	Description
Trigger	Set whether or not to perform trigger recording when the input value changes and enters the corresponding zone. Select the checkbox when performing the trigger recording. → 3.5.1.3 Trigger recording
Condition (Abnormal)	Set whether or not to return from the screen saver when an event occurs.
Message	Set the message when an event occurs within 32 characters.
Trend record	Set whether or not to record a message in trend when an event occurs. Select the checkbox when recording the message.

3.4.3.4 Alarm output setting (OI)

A specified DO can be turned ON for each zone.

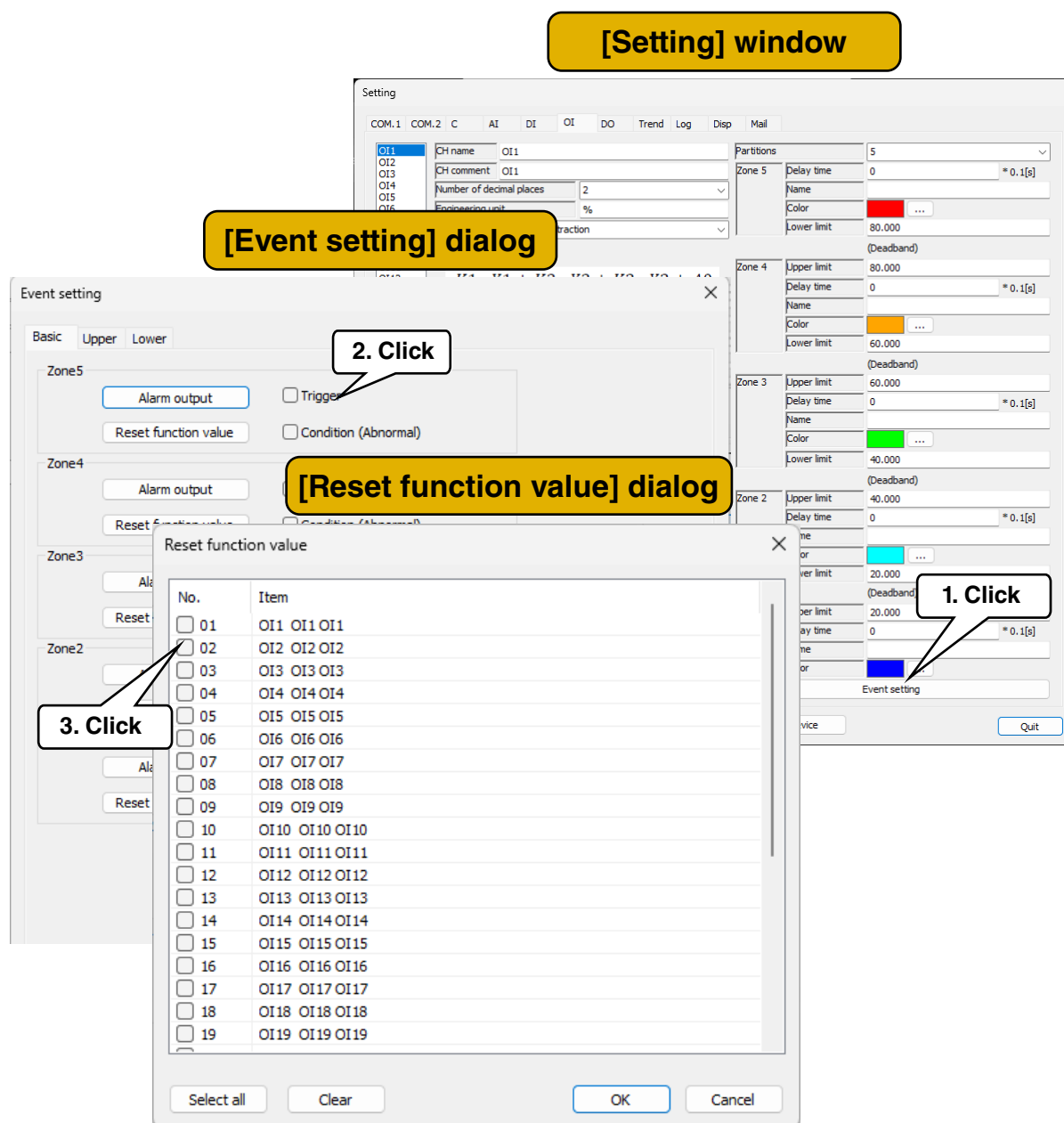
1. Click [Event setting] button on [Setting] window (OI) to display [Event setting] dialog. Click [Alarm output] button of the specified zone to display [Alarm output] dialog.
2. Select the checkbox of the DO channel to be set and click [OK].



3.4.3.5 Reset function value setting (OI)

A specified OI can be reset when zone transition occurs.

1. Click [Event setting] button on [Setting] window (OI) to display [Event setting] dialog. Click [Reset function value] button of the specified zone to display [Reset function value] dialog.
2. Select the checkbox of the OI channel to be set and click [OK].



Follow the above procedure to set all the channels.

The channel setting configured on [Operational input (OI)] window can also be copied to other channels and only the required parameters can be modified.

→ 3.4.5 Copying the I/O setting

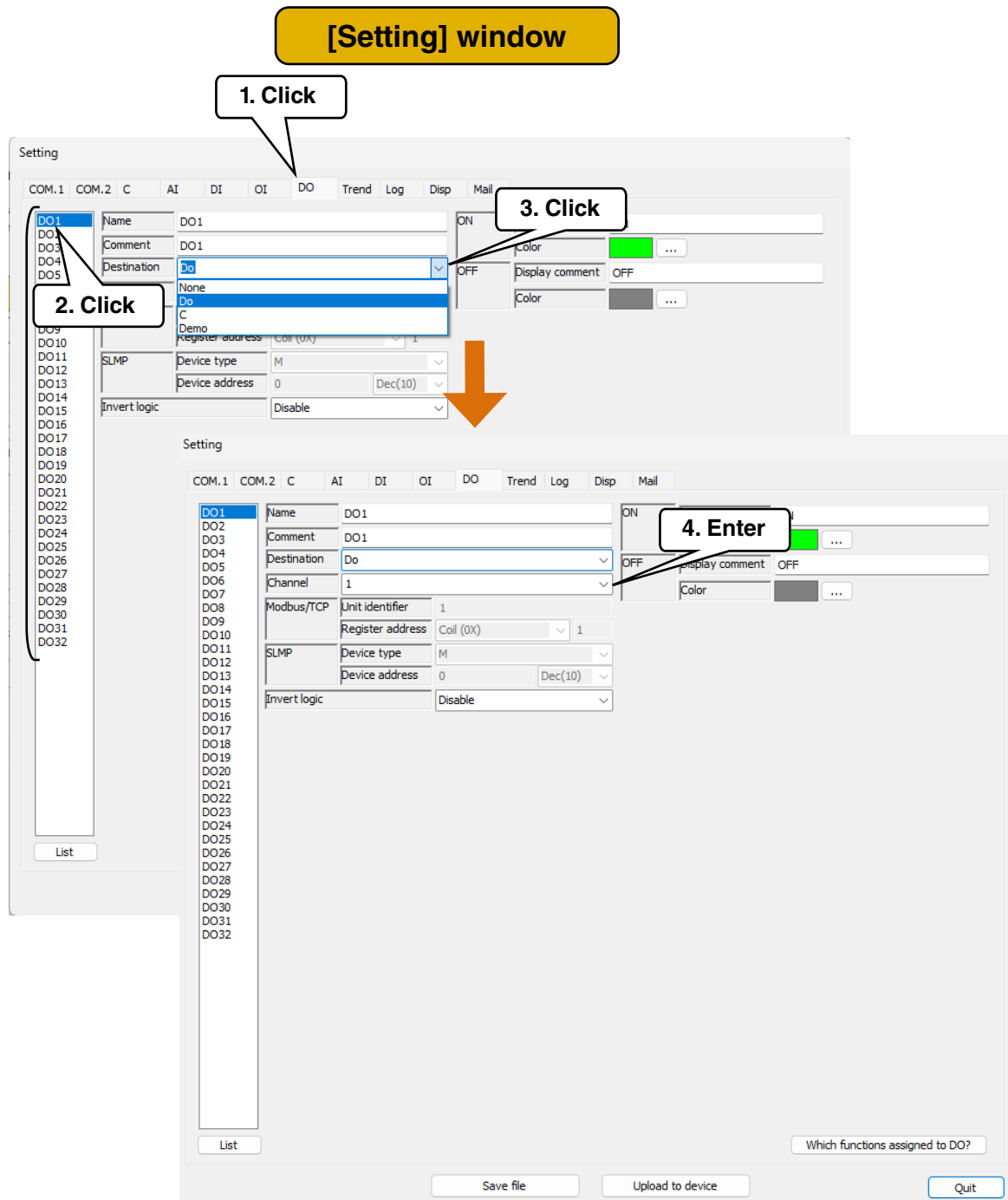
3.4.4 Discrete output (DO)

Discrete output signals can be monitored for maximum of 32 points (DO1 and DO32).

Assign the discrete output from built-in I/O, remote I/O or SLMP-compatible device to the VR288E-G64 according to the following procedure.

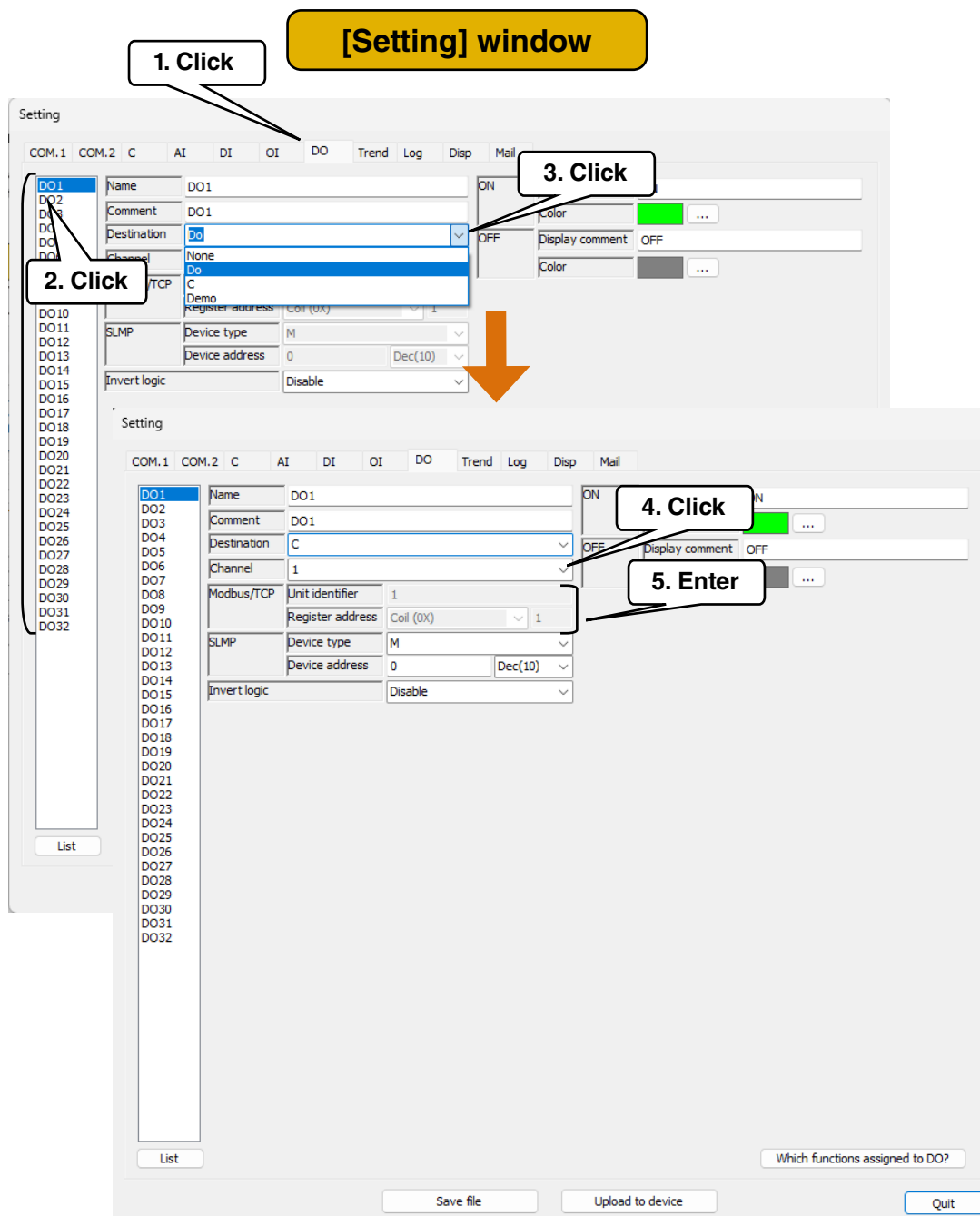
3.4.4.1 Assignment discrete output to built-in I/O

1. Click [DO] tab.
2. Click the channel to be set to display the current settings.
3. Click the destination drop-down list and select [Do].
4. Set the channel of built-in Do.



3.4.4.2 Assignment discrete output to remote I/O

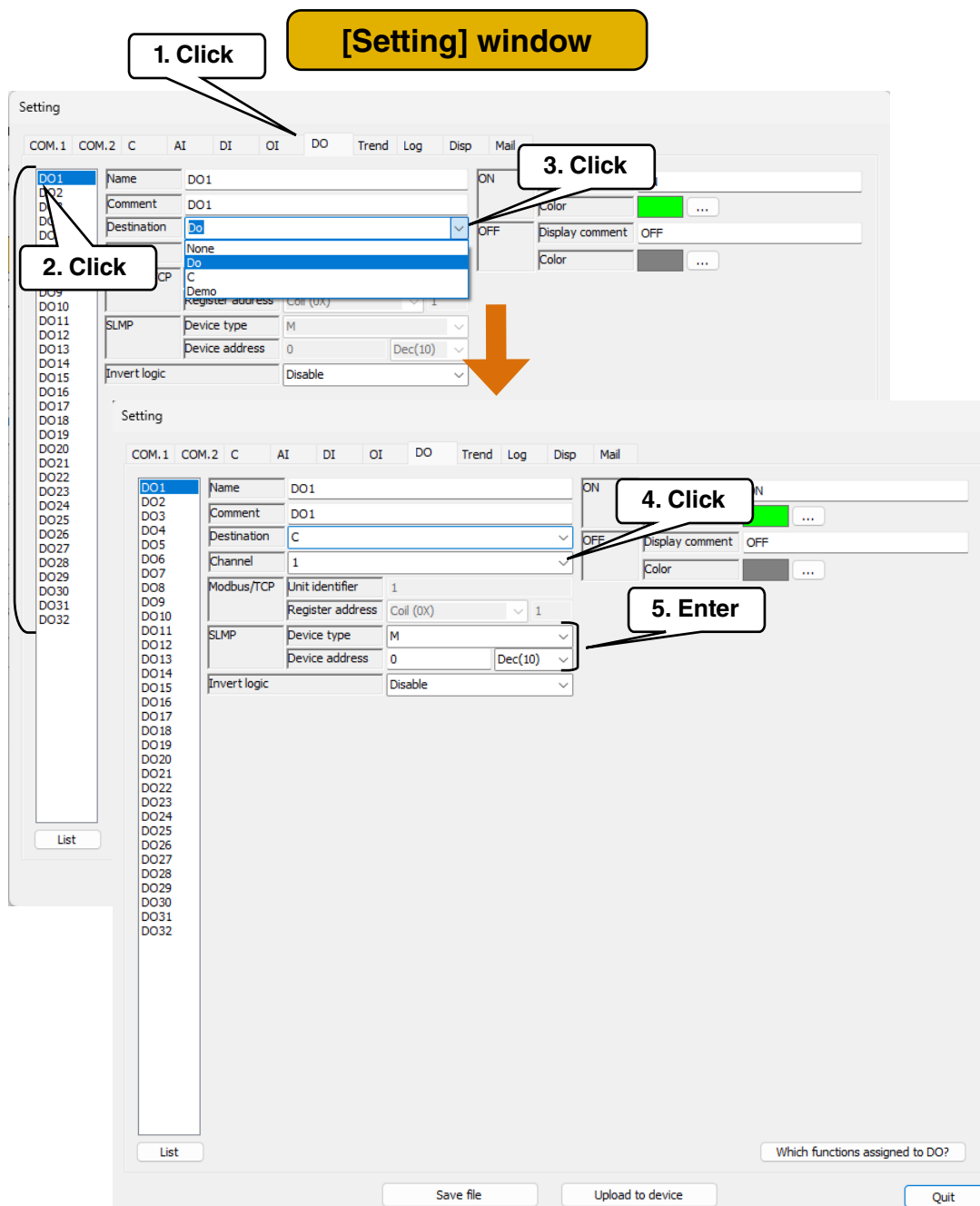
1. Click [DO] tab.
2. Click the channel to be set to display the current settings.
3. Click the destination drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. → 3.3.1.1 Modbus/TCP connection
5. Set parameters according to the table below.



Parameter	Description
Modbus/TCP Unit identifier	In case that the unit identifier of the selected channel is variable, set in the range of 0 to 255. → 3.3.1.1 Modbus/TCP connection
Modbus/TCP Register address	Select [Coil (0X)]. Set the register address in the range of 1 to 65536.

3.4.4.3 Assignment discrete output to SLMP-compatible device

1. Click [DO] tab.
2. Click the channel to be set to display the current settings.
3. Click the destination drop-down list and select [C].
4. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. → 3.3.1.2 SLMP connection
5. Set parameters according to the table below.



Parameter	Description
Device type	Select the device type of the SLMP-compatible device to be connected.
Device address	Enter the address of the SLMP-compatible device to be connected. (Dec(10): 0 to 4294967295, Hex(16): 0x00000000 to 0xFFFFFFFF, Oct(8): 0 to 037777777777)

3.4.4.4 Basic setting (DO)

After completing the assignment, configure the following basic setting.

[Setting] window

1. Configure the basic setting.

Parameter	Description
Name	Set the channel name within 16 characters.
Comment	Set the comment for the channel within 16 characters such as 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, select [Enable].

2. Set ON and OFF respectively.

Parameter	Description
Display comment	Set the comment corresponding to ON and OFF respectively within 8 characters.
Color	Set the color which represents the status displayed on the trend data for ON and OFF respectively.

Follow the above procedure to set all the channels.

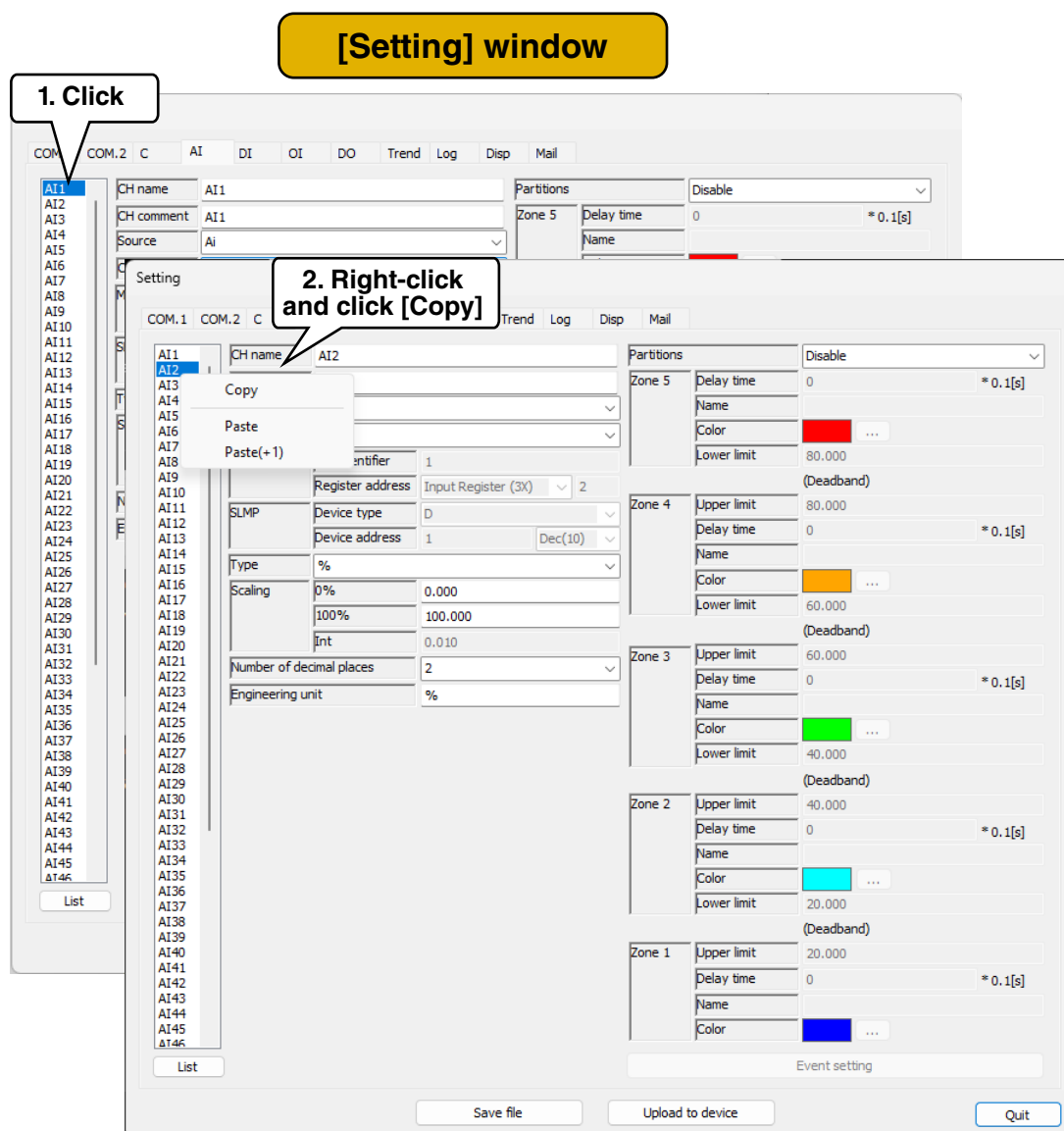
The channel setting configured on [Discrete Output (DO)] window can also be copied to other channels and only the required parameters can be modified. → 3.4.5 Copying the I/O setting

3.4.5 Copying the I/O setting

The channel setting configured on each I/O setting window can also be copied to other channels and only the required parameters can be modified.

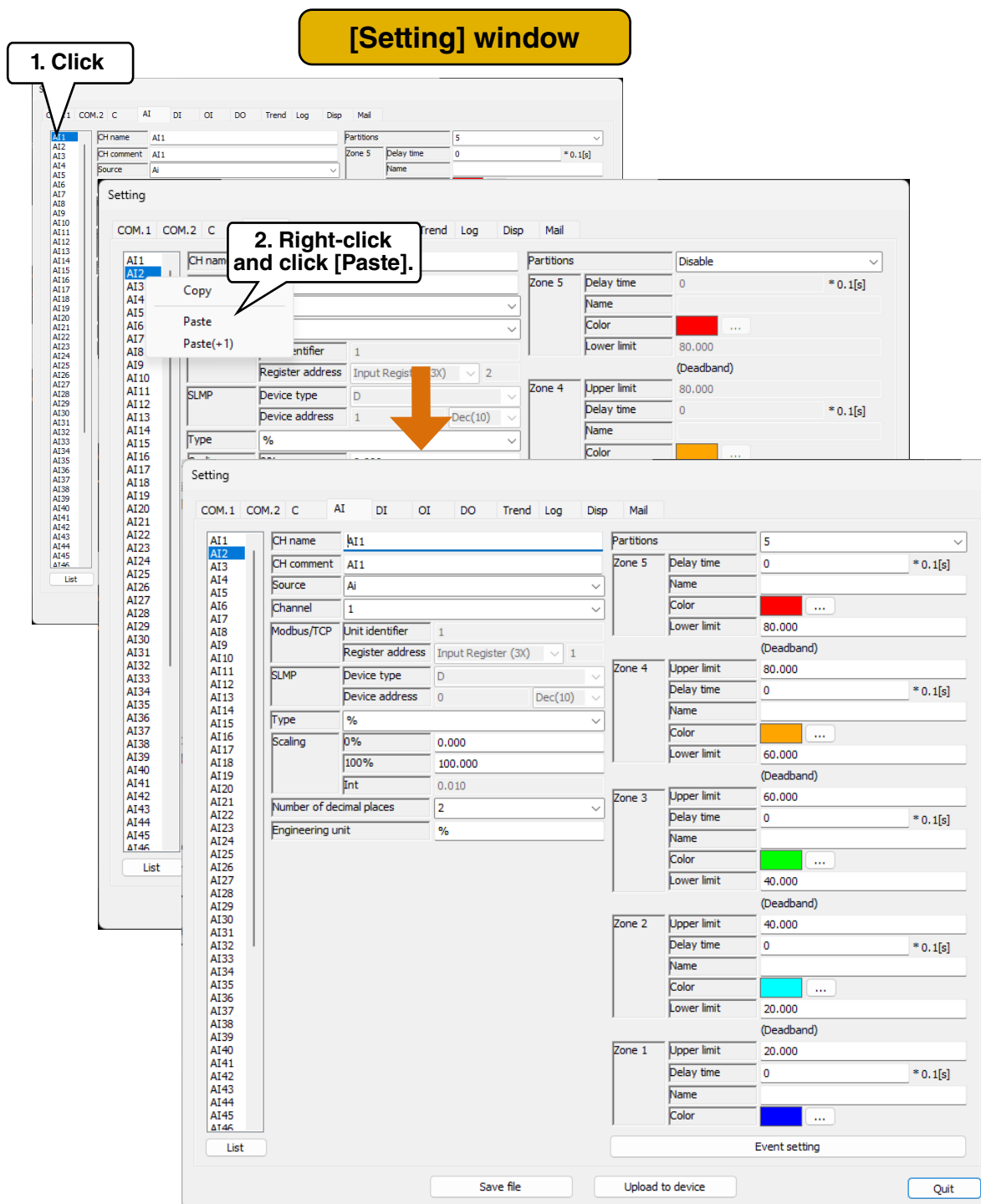
3.4.5.1 Copying

The procedure is common to each I/O setting window.



3.4.5.2 Pasting

Copied I/O settings can be pasted. The pasting procedure is common to each I/O setting window. Pasting is possible only in the same I/O tab.



3.4.5.3 Pasting (+1)

Copied I/O settings can be pasted.

[Paste (+1)] is useful when copying and pasting the channels assigned from remote I/O or SLMP-compatible device.

In case that the channel is assigned from built-in I/O, the procedure is same as normal pasting.

(1) Remote I/O

Register address is pasted by adding 1 to the source register.

The image shows a sequence of three overlapping screenshots of a software interface titled "[Setting] window".

- Top Screenshot:** A yellow callout box labeled "1. Click" points to the "CH name" field in the "Setting" window. A yellow box labeled "[Setting] window" is at the top.
- Middle Screenshot:** A yellow callout box labeled "2. Right-click and click [Paste (+1)]." points to the "Paste (+1)" option in a context menu. An orange arrow points from this menu to the "Register address" field in the "Setting" window.
- Bottom Screenshot:** A yellow callout box labeled "[Setting] window (source)" points to the "Register address" field in the "Setting" window, which now contains the value "1". A yellow box labeled "Register address is pasted by adding 1 to the source register address." points to the "1" in the "Register address" field.

The "Setting" window displays various tabs (COM.1, COM.2, C, AI, DI, OI, DO, Trend, Log, Disp, Mail) and fields for channel configuration, including CH name, CH comment, Source, Channel, Modbus/TCP Unit identifier, Register address, and SLMP Device type. The "Register address" field is highlighted with a red box in the bottom screenshot.

(2) SLMP

Device address is pasted by adding 1 to the source device address.

[Setting] window

1. Click

2. Right-click and click [paste (+1)].

[Setting] window (source)

Device address is pasted by adding 1 to the source device address.

The screenshots illustrate the process of setting an SLMP device address. The first screenshot shows the 'Setting' window for AI1. The second screenshot shows the 'Setting' window for AI2, where the 'Device address' field is highlighted with a red box and the value '1' is entered. The third screenshot shows the 'Setting' window for AI1, where the 'Device address' field is highlighted with a red box and the value '0' is entered. The text 'Device address is pasted by adding 1 to the source device address.' explains the relationship between the source device address (0) and the target device address (1).

3.5 Trend setting

Assign any channel set in I/O (AI, DI, OI, DO) to pen and set the pen's waveform to be recorded and displayed.

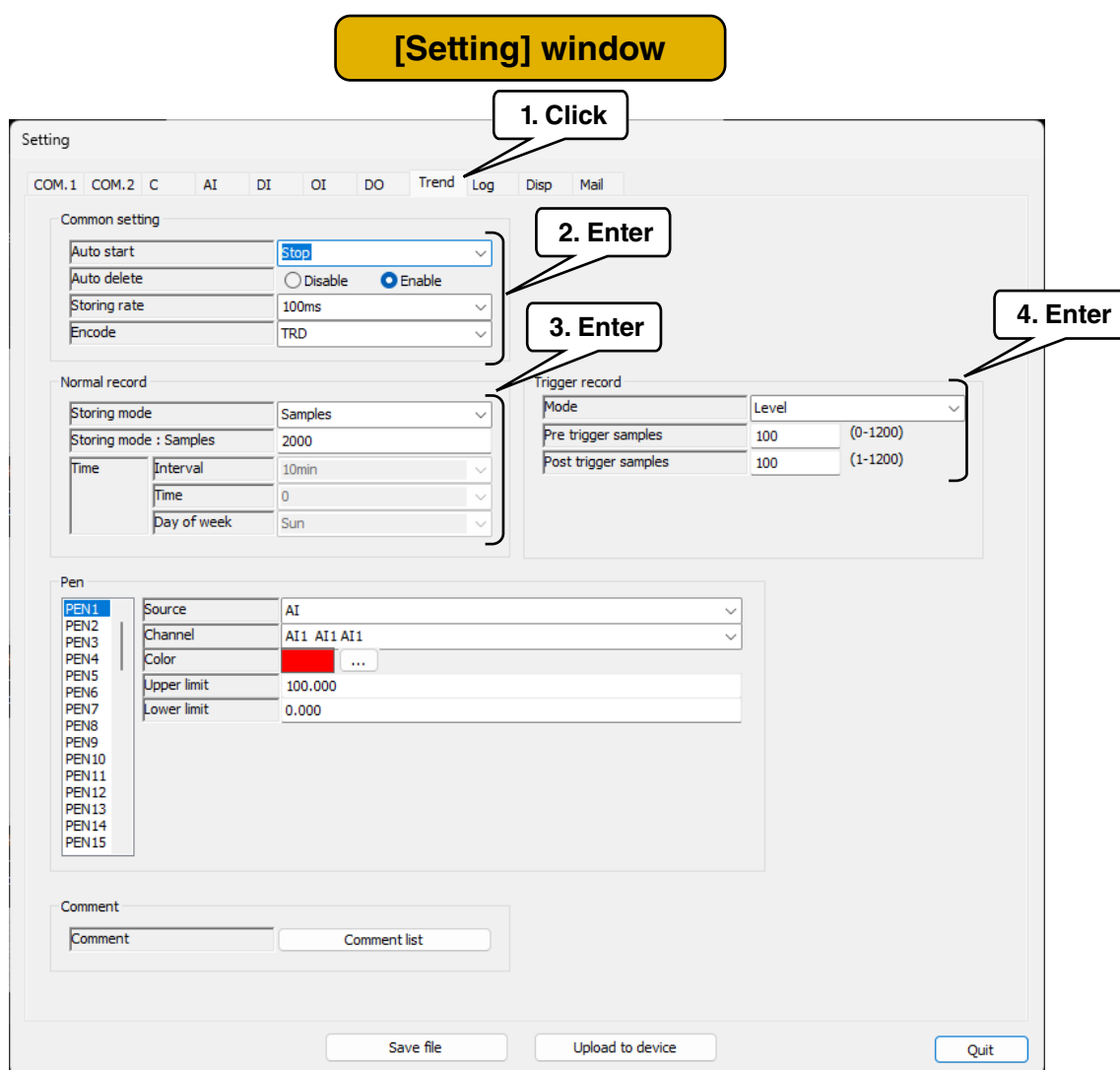
3.5.1 Basic setting

Configure the setting to record pen's waveform to a trend file.

When recording pen's waveform, event data and comment data occurred during the recording period are saved to the same file.

3.5.1.1 Recording setting

Set the recording conditions of the trend.



1. Configure the common setting. Set parameters according to the table below.

Parameter	Description
Auto start	Select from Stop / Normal recording / Trigger recording.
Auto delete	Select [Enable] to delete trend files automatically when the free space on the SD card falls below 100 MB.
Storing rate	Select from 100 ms / 500 ms / 1 sec. / 2 sec. / 5 sec. / 10 sec. / 1 min. / 2 min. / 5 min. / 10 min. / 30 min. / 1 hour.
Encode	Select the file saving format from TRD / CSV (UTF-8) / CSV (Shift-JIS).

2. Configure the settings for normal recording. Set parameters according to the table below.

Parameter	Description
Storing mode	Select from Samples / Time.
Storing mode: Samples	When [Samples] is selected in the storing mode, the number of samples can be set. Set in the range of 1000 to 50000.
Time	When [Time] is selected in the storing mode, the storing interval can be set. The selectable storing interval depends on the storing rate. Refer to the table below. - When [1 day] is selected for the storing interval, set [Time] from 0 to 23 (hour). - When [1 week] is selected for the storing interval, set [Time] and [Day of week]. Select from 0 to 23 (hour) and Sun / Mon / Tue / Wed / Thu / Fri / Sat. - When [1 month] is selected for the storing interval, set [Time] from 0 to 23 (hour).

Correspondence table of storing rate and storing interval (X: selectable)

Storing rate \ Storing interval	10 min.	30 min.	1 hour	6 hours	12 hours	1 day	1 week	1 month
100 ms	X	X	X	—	—	—	—	—
500 ms	—	X	X	X	—	—	—	—
1 sec.	—	—	X	X	X	—	—	—
2 sec.	—	—	X	X	X	X	—	—
5 sec.	—	—	—	X	X	X	—	—
10 sec.	—	—	—	X	X	X	—	—
1 min.	—	—	—	—	—	X	X	—
2 min.	—	—	—	—	—	X	X	—
5 min.	—	—	—	—	—	X	X	X
10 min.	—	—	—	—	—	X	X	X
30 min.	—	—	—	—	—	X	X	X
1 hour	—	—	—	—	—	X	X	X

3. Configure the settings for trigger recording. Set parameters according to the table below.

Parameter	Description
Mode	Select from Level / Edge.
Pre trigger samples	Set in the range of 0 to 1200.
Post trigger samples	Set in the range of 1 to 1200.

3.5.1.2 Normal recording

When the normal recording is set in [Auto start], trend recording starts upon VR288E-G64 startup.

(1) Storing mode: Samples

When samples is set in [Storing mode], the memory block transitions to the next block after reaching a specified number of samples.

Simultaneously, the recorded data in the memory block is transferred to an SD card and saved as a file.

(2) Storing mode: Time

The memory block transitions to the next block at a specified time.

However, if the number of recorded data samples reaches 50 000 per channel before the specified time, the memory block will transition.

Simultaneously, the recorded data in the memory block is transferred to an SD card and saved as a file.

For storing timing, refer to the table below.

Storing interval	Storing timing
10 min.	0, 10, 20, 30, 40, 50 minutes and 0 second every hour
30 min.	0, 30 minutes and 0 second every hour
1 hour	0 minute and 0 second every hour
6 hours	0, 6, 12, 18 hours, 0 minute and 0 second
12 hours	0, 12 hours, 0 minute and 0 second
1 day	0 minute and 0 second of the hour set in [Time]
1 week	0 minute and 0 second of the hour set in [Time] on the day of the week set in [Day of week]
1 month	0 minute and 0 second of the hour set in [Time] on the first day of every month.

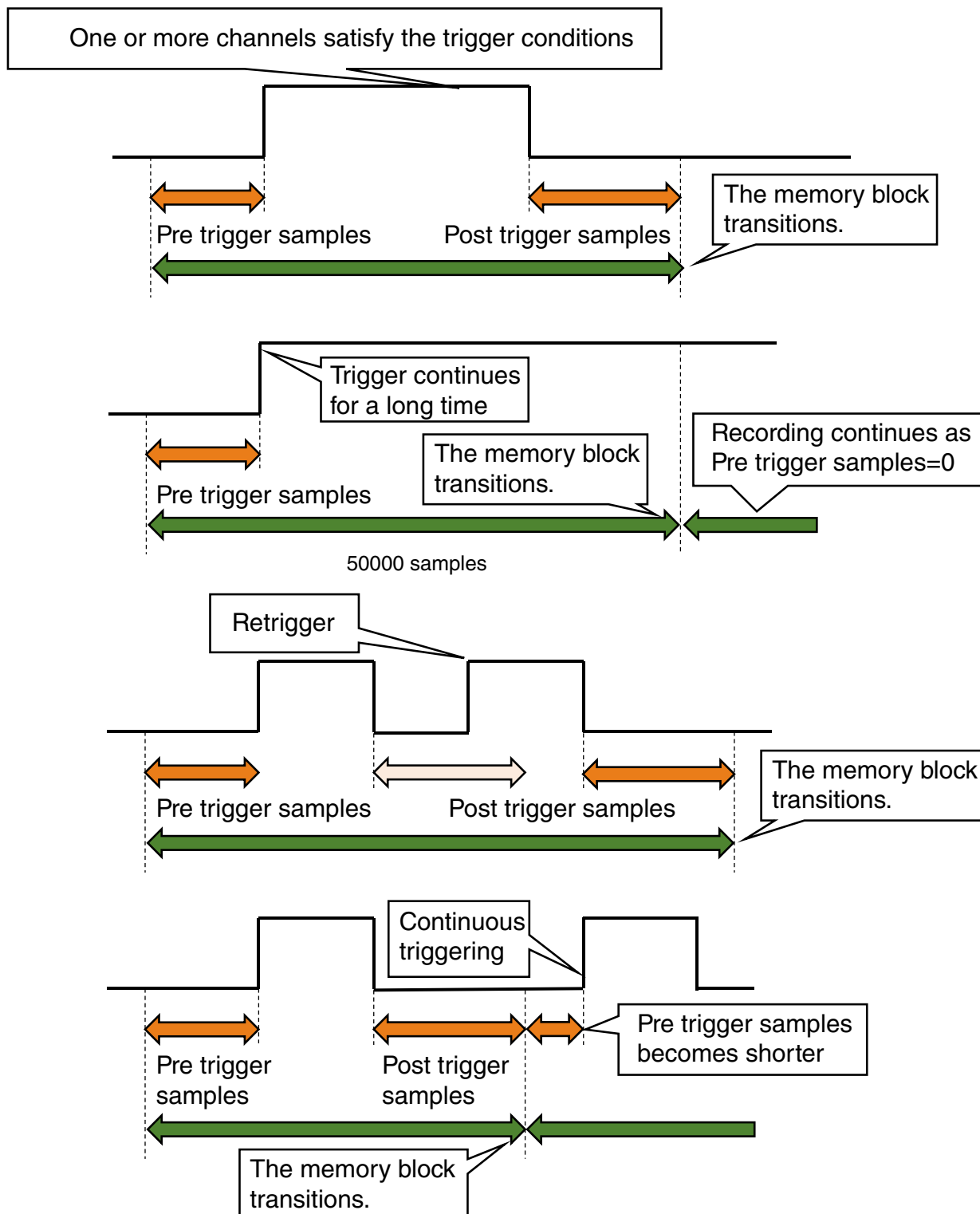
3.5.1.3 Trigger recording

When trigger recording is set in [Auto Start], trigger conditions are set for each channel of AI, DI, and OI. The memory block transitions handling the number of samples including [Pre trigger samples] and [Post trigger samples] as a single data.

Simultaneously, the recorded data in the memory block is transferred to an SD card and saved as a file.

(1) Mode: Level

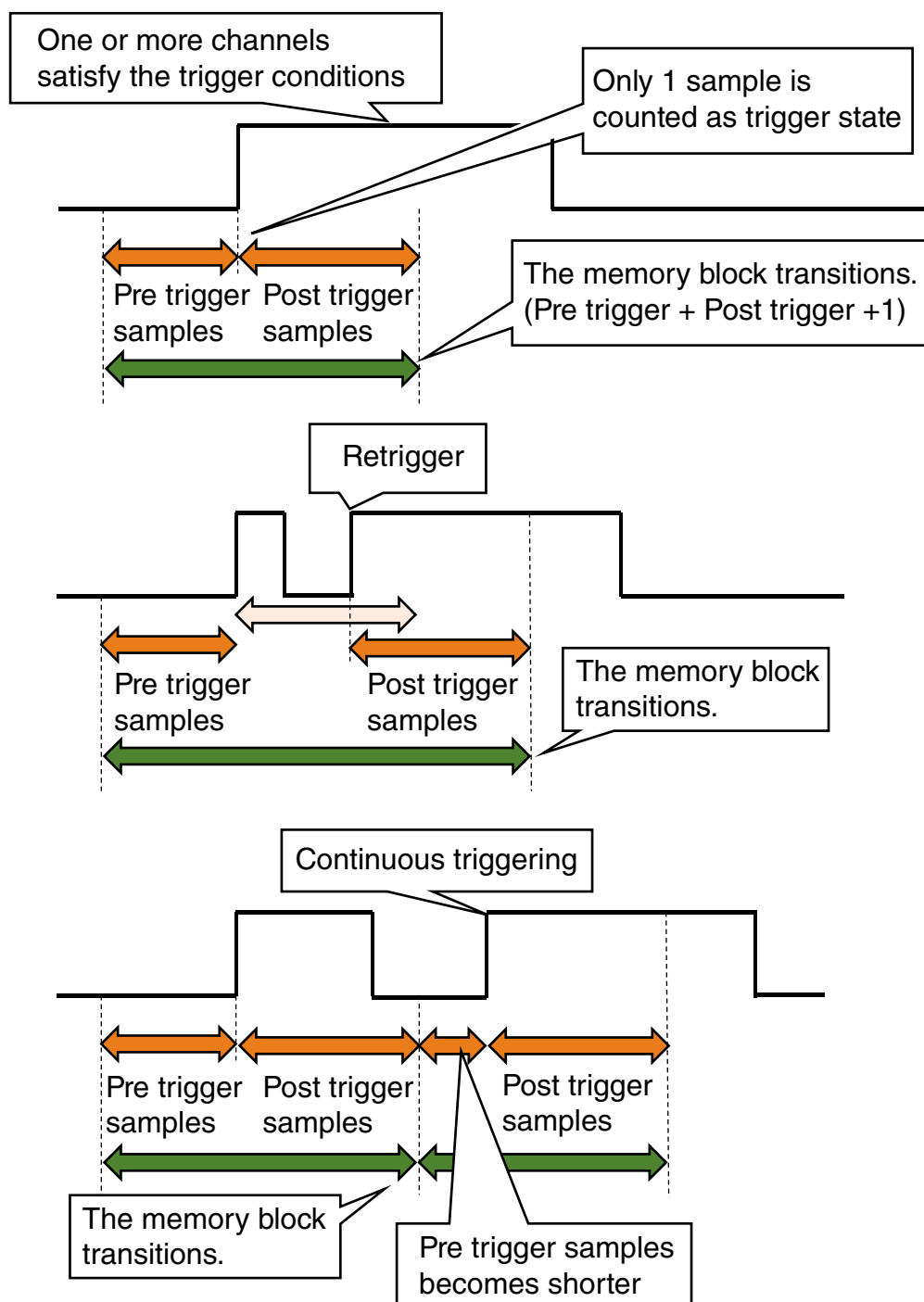
When the level is set in [Mode] of the trigger recording, the trend is recorded as long as one or more of the AI, DI, or OI channels with trigger settings satisfy the trigger conditions. The number of samples to be recorded in the memory block should be set in [Pre trigger samples] and [Post trigger samples]. The data sample interval depends on the storing rate in [Common]. For details, refer to the following.



(2) Mode: Edge

When the edge is set in [Mode] of the trigger recording, trend are recorded with reference to the change point where one or more channels satisfy the trigger conditions from the non-trigger state (inverting trigger state) of all channels among AI, DI, and OI channels configured trigger setting.

"One or more channels satisfy the trigger conditions" means that the triggers are set to zones corresponding to any of the input values among AI1 to 96, DI1 to 32, or OI1 to 32. The number of samples to be recorded in the memory block should be set in [Pre trigger samples] and [Post trigger samples]. The data sample interval depends on the storing rate in [Common]. For details, refer to the following.



3.5.2 Pen setting

Assign pens to record to trend files and to display on the trend graph.

3.5.2.1 Pen setting

[Setting] window

1. Select the pen to be set to display the current settings of the selected pen.
2. Assign the pen. Set the pen according to the table below.

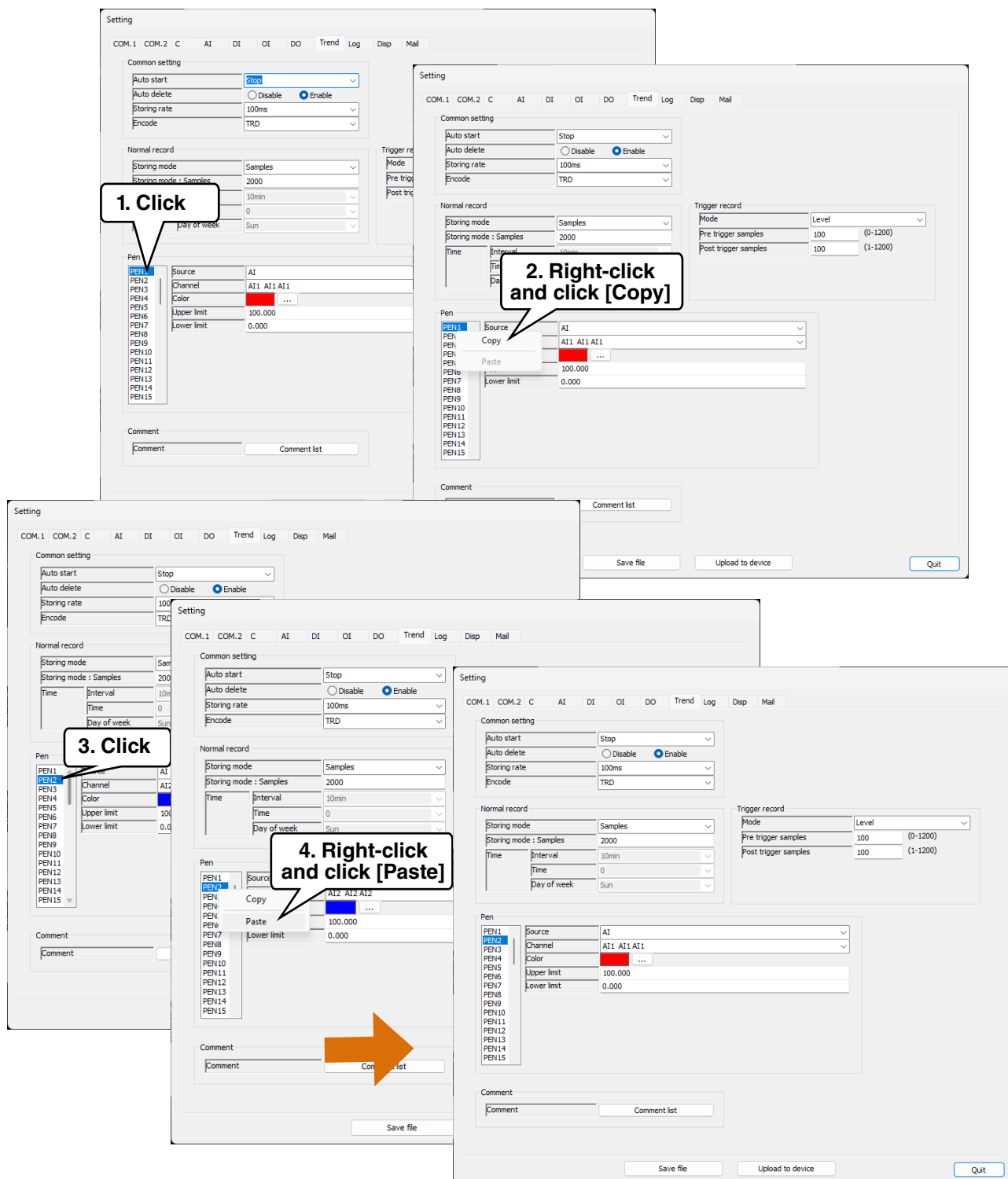
Parameter	Description
Source	Select the source to be assigned. Select from None / AI / DI / OI / DO.
Channel	Set the channel to be assigned. Select from the list of I/O channel selected in the source.
Color	Set the pen color.
Upper limit	Set the scaling value of 100% in the trend graph.
Lower limit	Set the scaling value of 0% in the trend graph.

3. Follow the above procedure to set all the pens. The pen setting already configured can also be copied to other pens and only the required parameters can be modified.

3.5.2.2 Copying pen setting

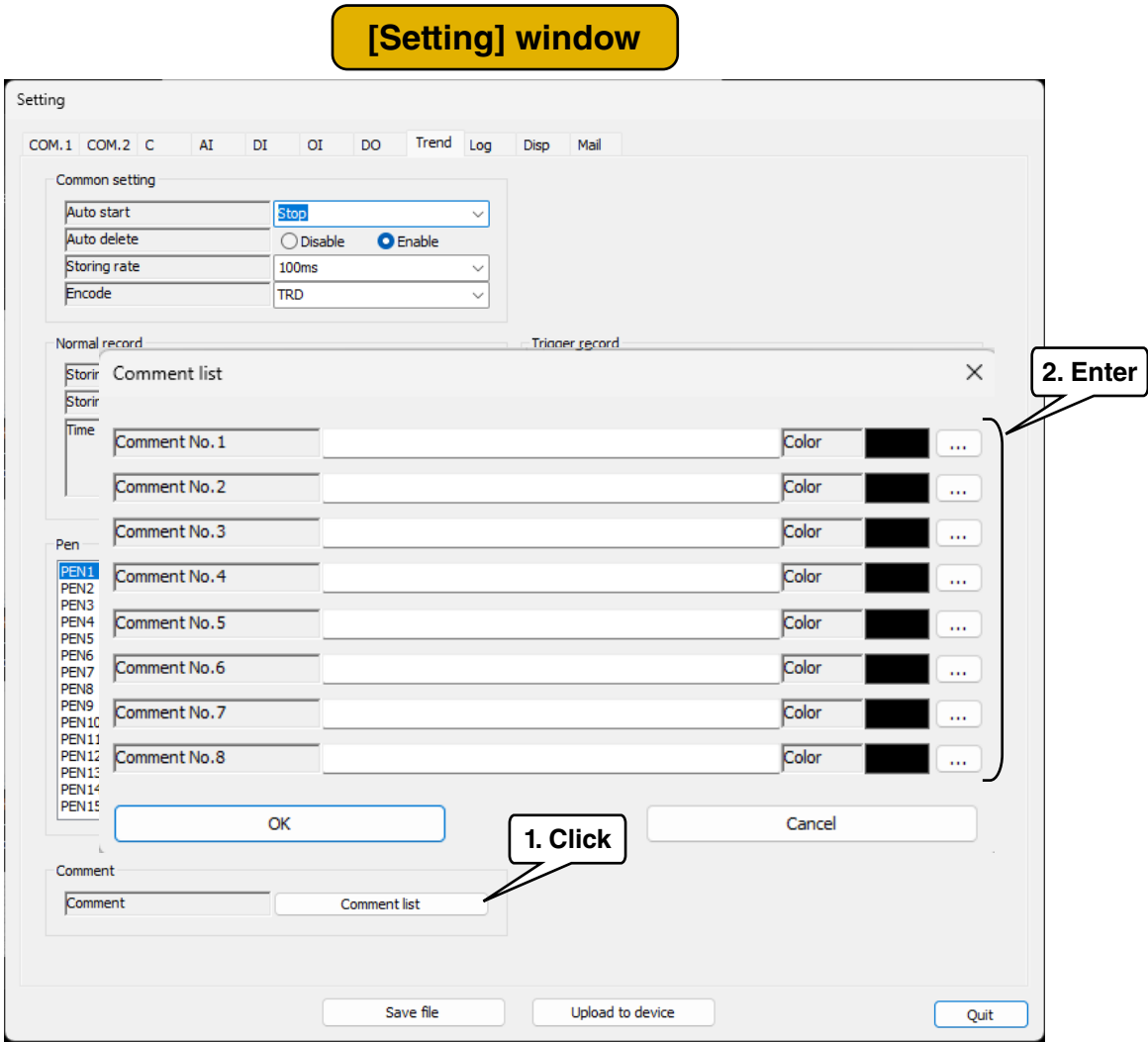
The pen setting configured on [Trend setting] window can also be copied to other pens and only the required parameters can be modified.

[Setting] window



3.5.3 Comment setting

Configure the comment setting registered to the trend graph.

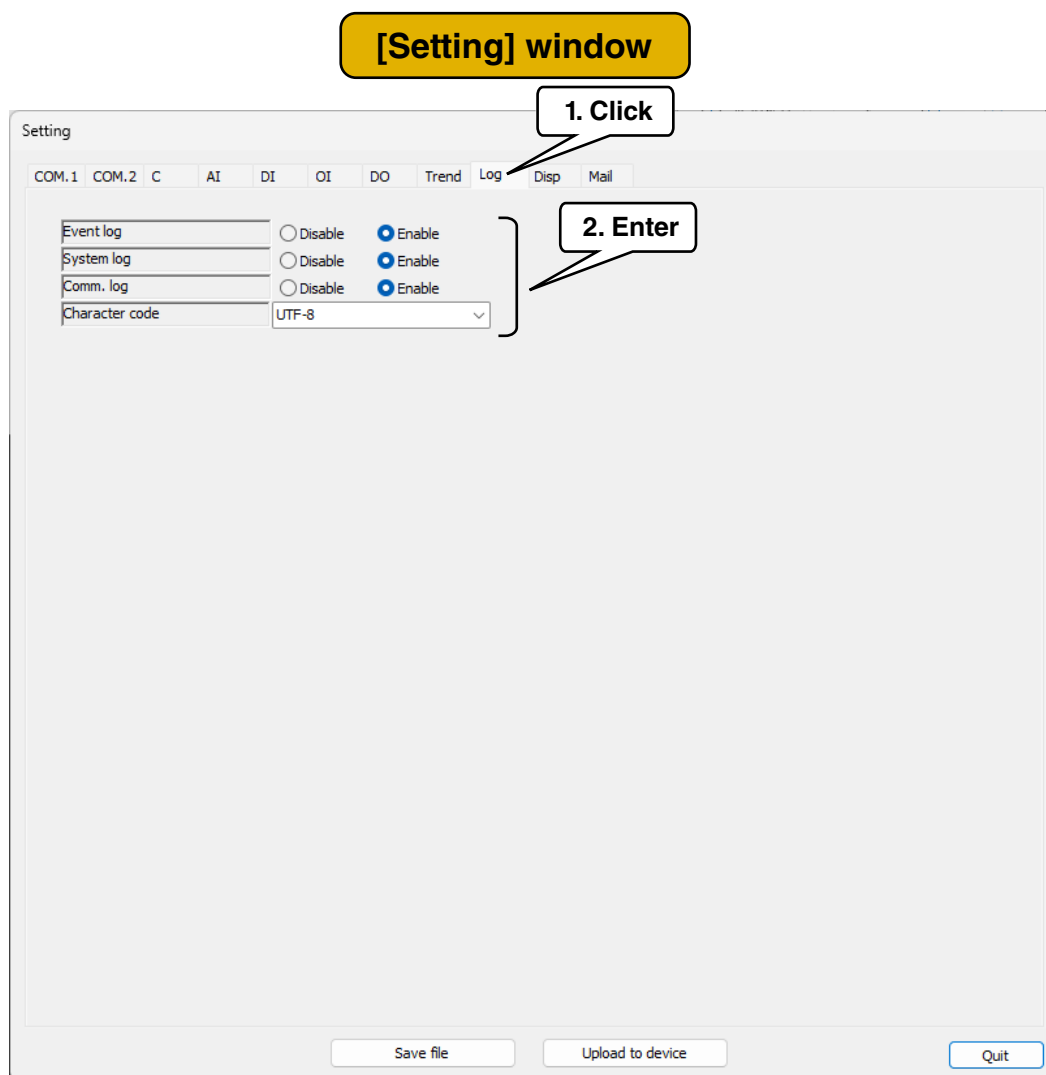


Set parameters according to the table below.

Parameter	Description
Comment No. 1 to 8	Set the comments within 32 characters.
Color	Set the comment color.

3.6 Log setting

Configure log file setting stored to an SD card.



Set parameters according to the table below.

Parameter	Description
Event log	Select [Disable] in case of not storing event log files to the SD card.
System log	Select [Disable] in case of not storing system log files to the SD card.
Comm. log	Select [Disable] in case of not storing communication log files to the SD card.
Character code	Choose either UTF-8 or Shift-JIS character code used to save log files.

3.7 Display setting

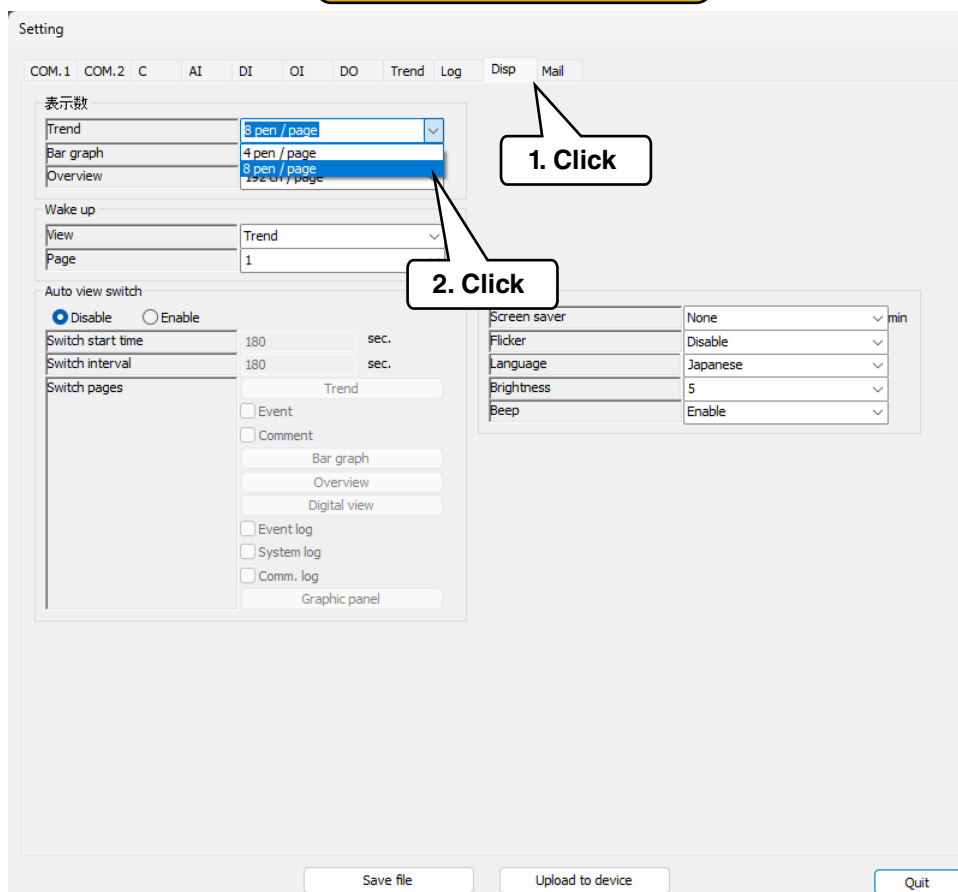
Configure the display setting of VR288E-G64.

3.7.1 Setting for the number of display

Configure the number of pen / channel to be displayed per page of each window.

Total page number of each window depends on the setting.

[Setting] window



1. Click [Disp] tab.
2. Click [Trend] drop-down list and select the number of pen per page. Set [Bar graph] and [Overview] in the same way.
3. For the relation between the number of pens/channels and the total page number, refer to the following table.

Parameter	Number of pens/channels	Total page number	Description
Trend	8 pen	12	8 pens are displayed per page starting from trend PEN1.
	4 pen	24	4 pens are displayed per page starting from trend PEN1.
Bar graph	8 pen	12	8 pens are displayed per page starting from trend PEN1.
	4 pen	24	4 pens are displayed per page starting from trend PEN1.
Overview	32 ch	6	32 channels are displayed per page in the order of AI1 to 96, DI1 to 32, OI1 to 32 and DO1 to 32.
	64 ch	3	64 channels are displayed per page in the order of AI1 to 96, DI1 to 32, OI1 to 32 and DO1 to 32.
	96 ch	2	96 channels are displayed per page in the order of AI1 to 96, DI1 to 32, OI1 to 32 and DO1 to 32.
	192 ch	1	192 channels are displayed per page in the order of AI1 to 96, DI1 to 32, OI1 to 32 and DO1 to 32.

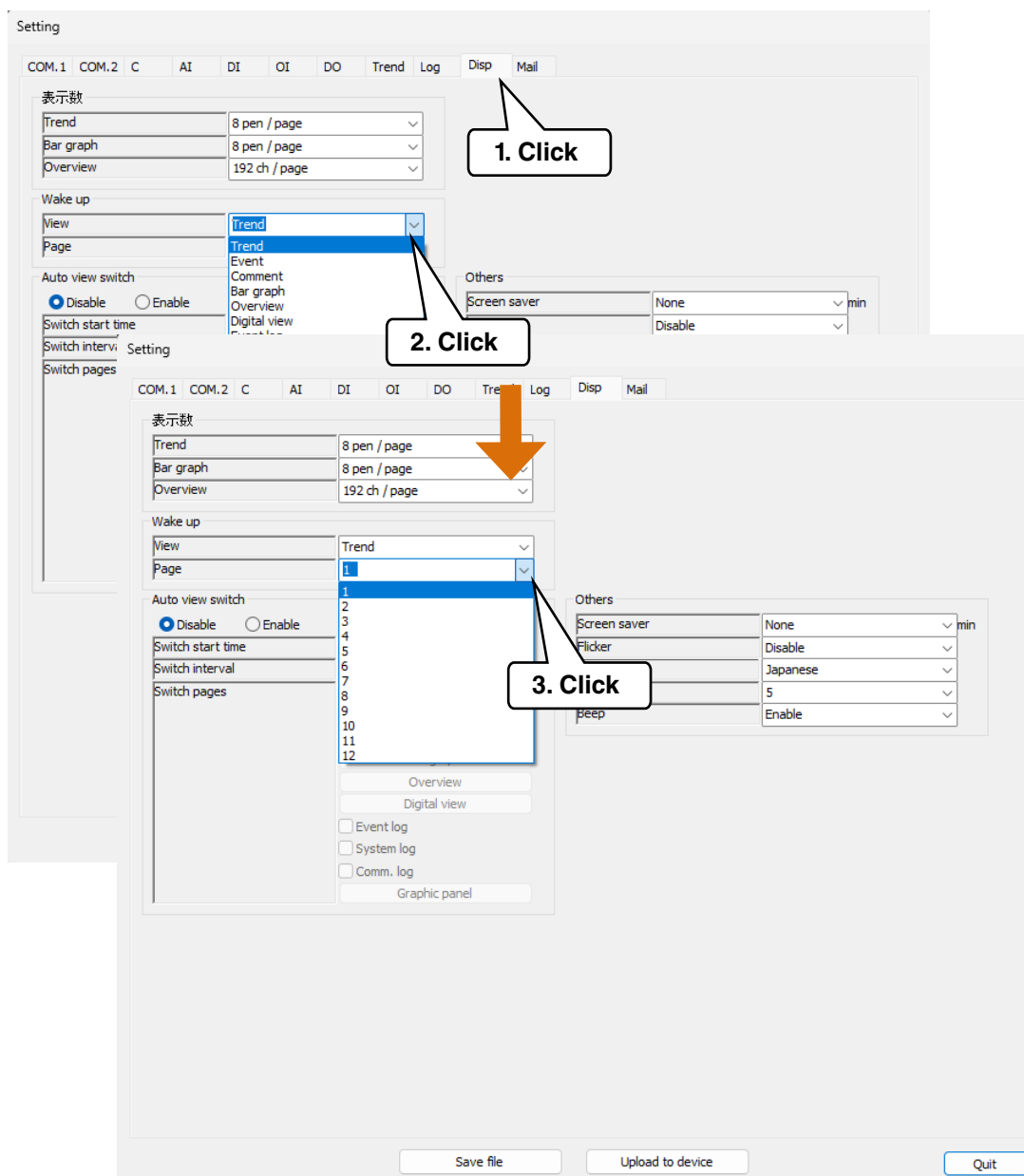
3.7.2 Wake up screen setting

Configure the display setting when the VR288E-G64 is turned on.

3.7.2.1 Setting the trend screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Trend].
3. Click page drop-down list and select a page. → 3.7.1 Setting for the number of display

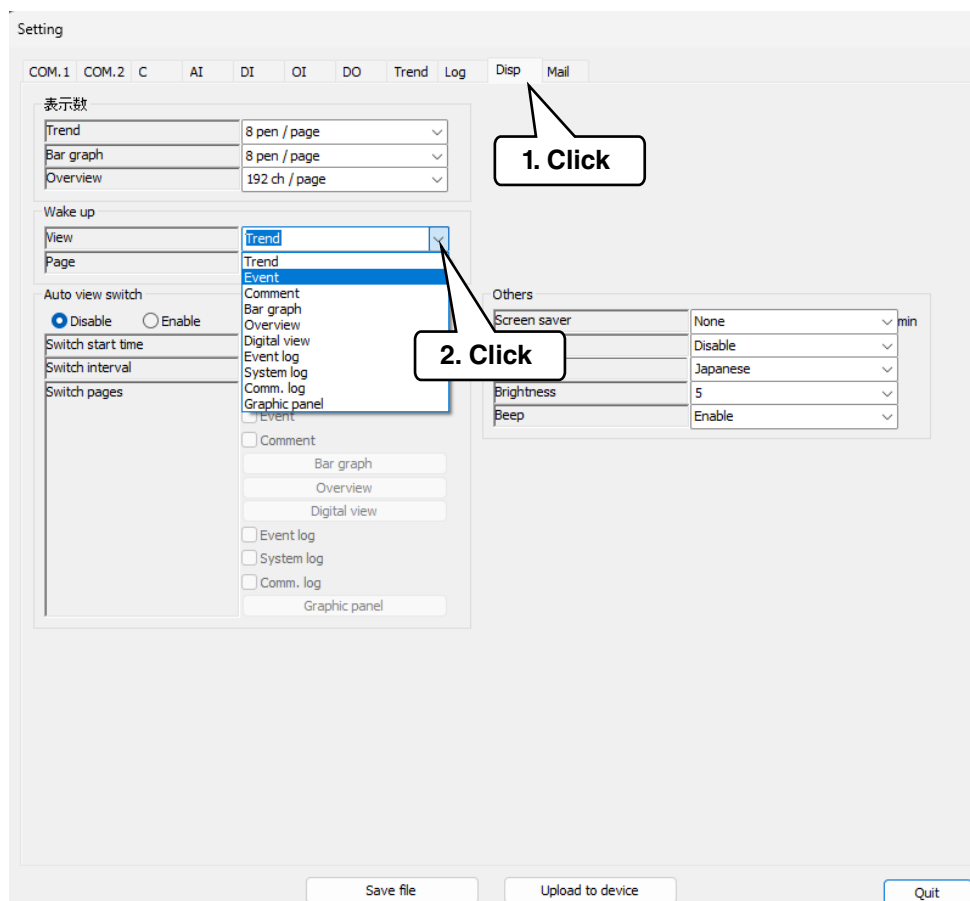
[Setting] window



3.7.2.2 Setting the event screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Event].
3. The summary of the latest 48 events for which checkboxes of [trend record] are selected or for which trend record is set to [Enable] is displayed.
→ 3.4.1.6 Event setting (AI), 3.4.1.4 Basic setting (AI), 3.4.3.3 Event setting (OI)

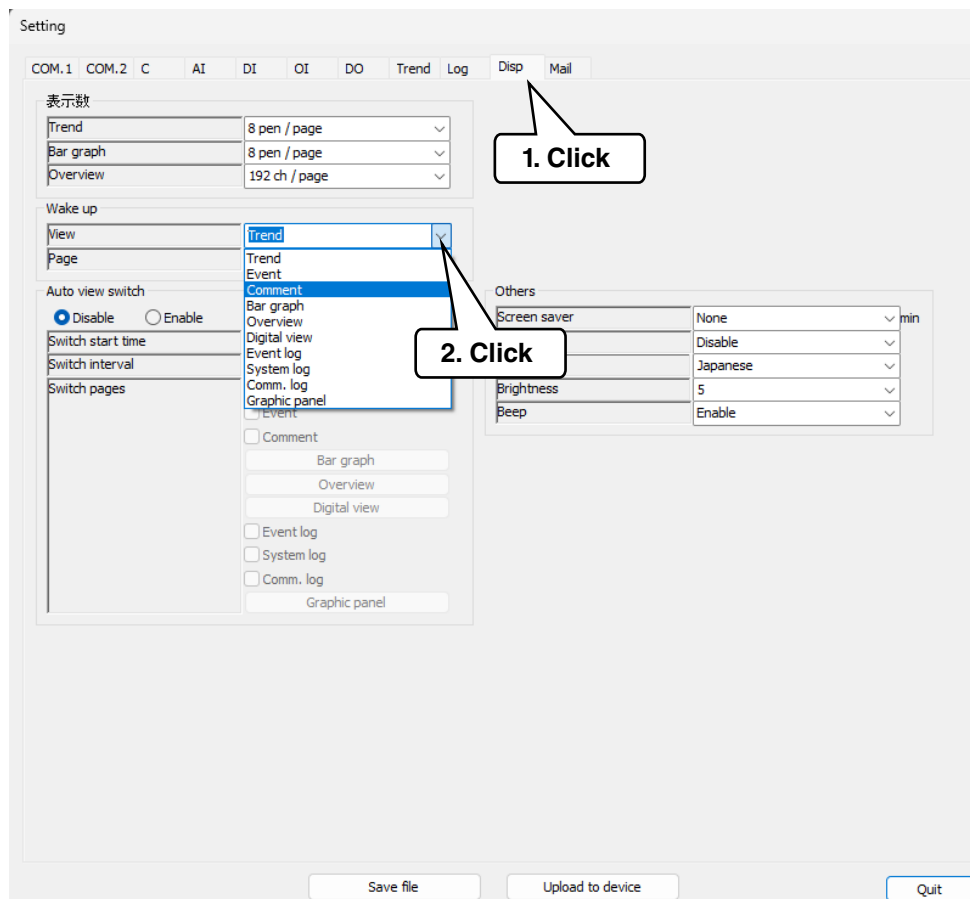
[Setting] window



3.7.2.3 Setting the comment screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Comment].
3. The summary of the latest 48 comments is displayed on the wake up screen.

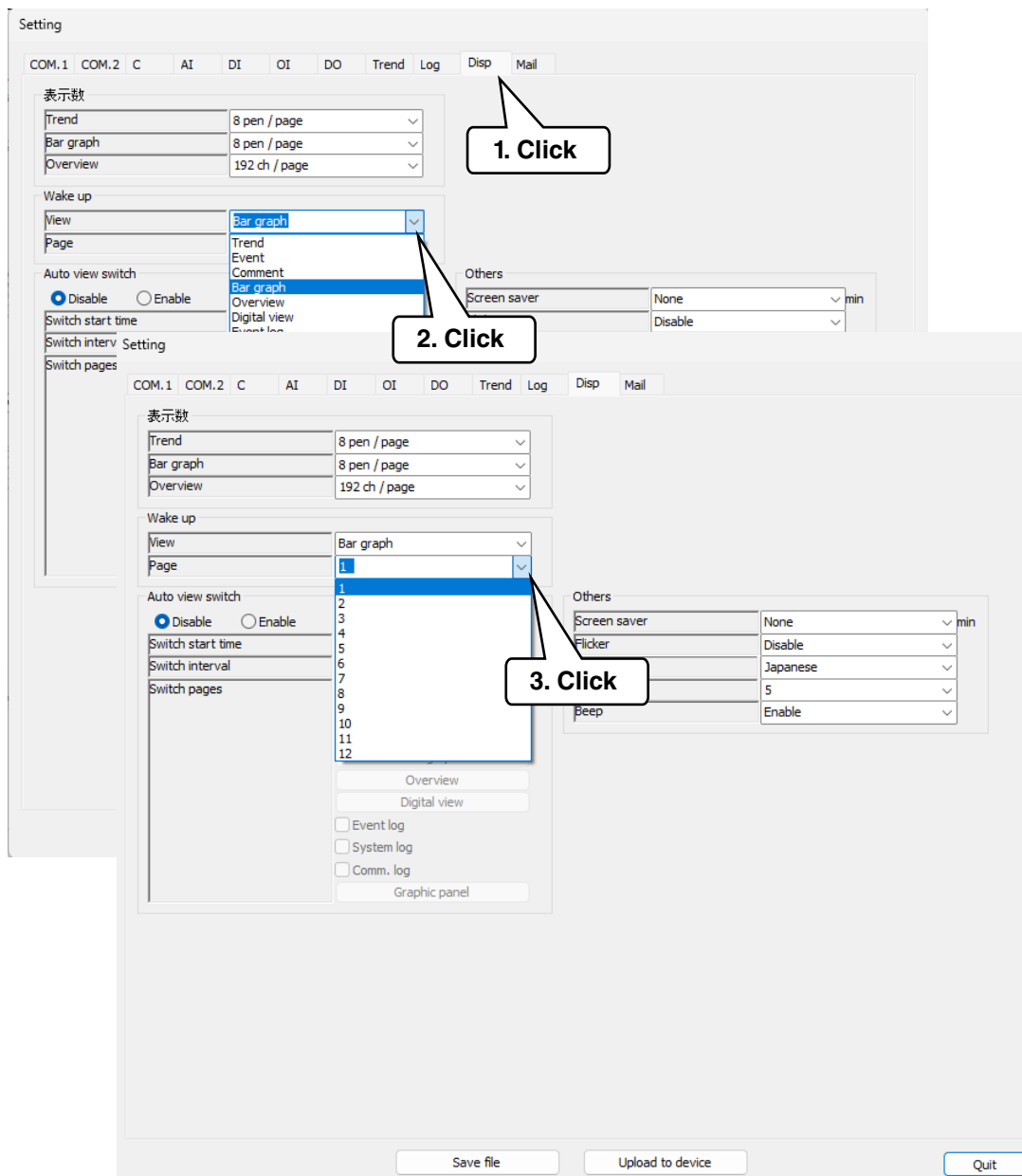
[Setting] window



3.7.2.4 Setting the Bar graph screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Bar graph].
3. Click page drop-down list and select a page. → 3.7.1 Setting for the number of display

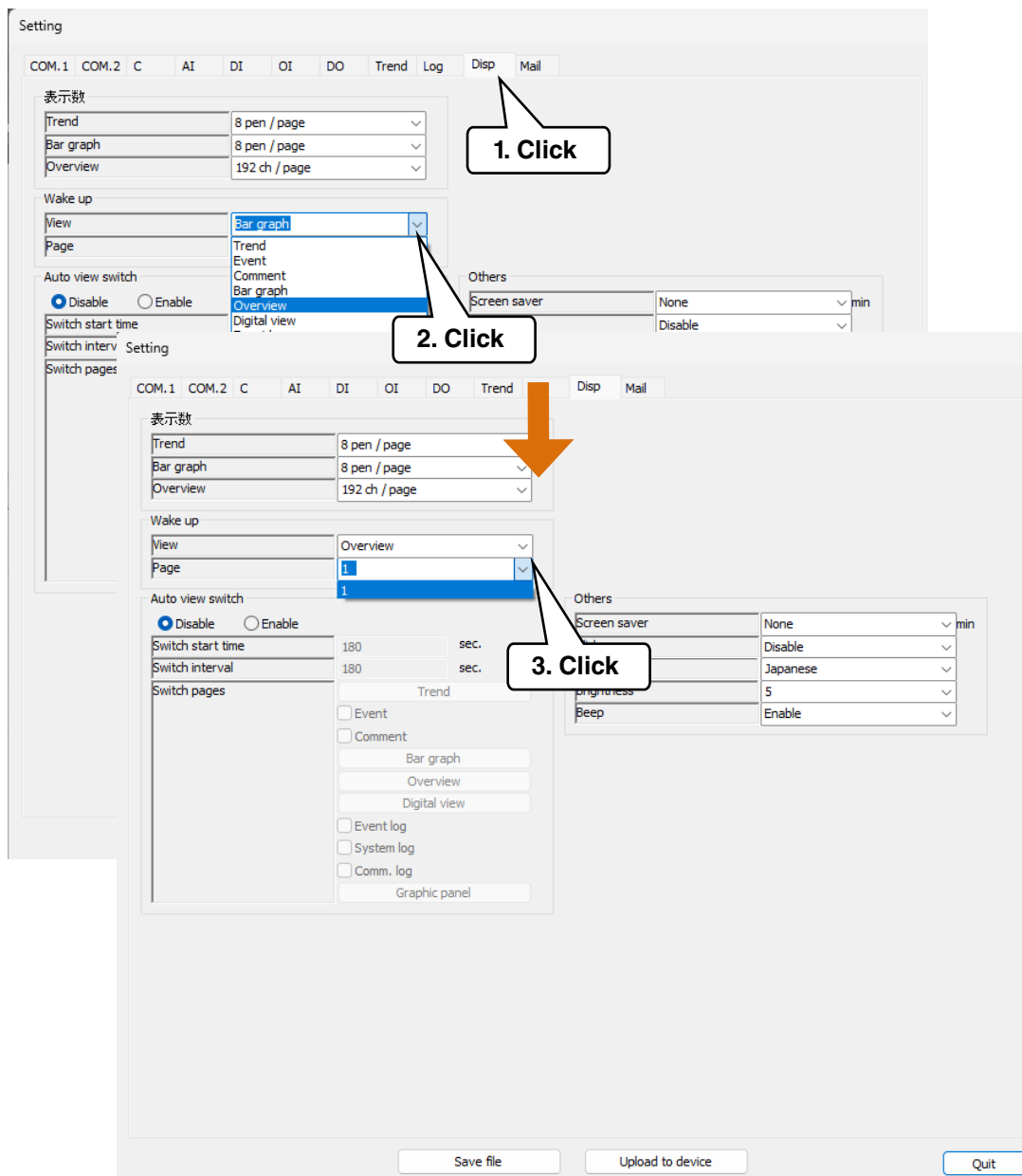
[Setting] window



3.7.2.5 Setting the overview screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Overview].
3. Click page drop-down list and select a page. → 3.7.1 Setting for the number of display

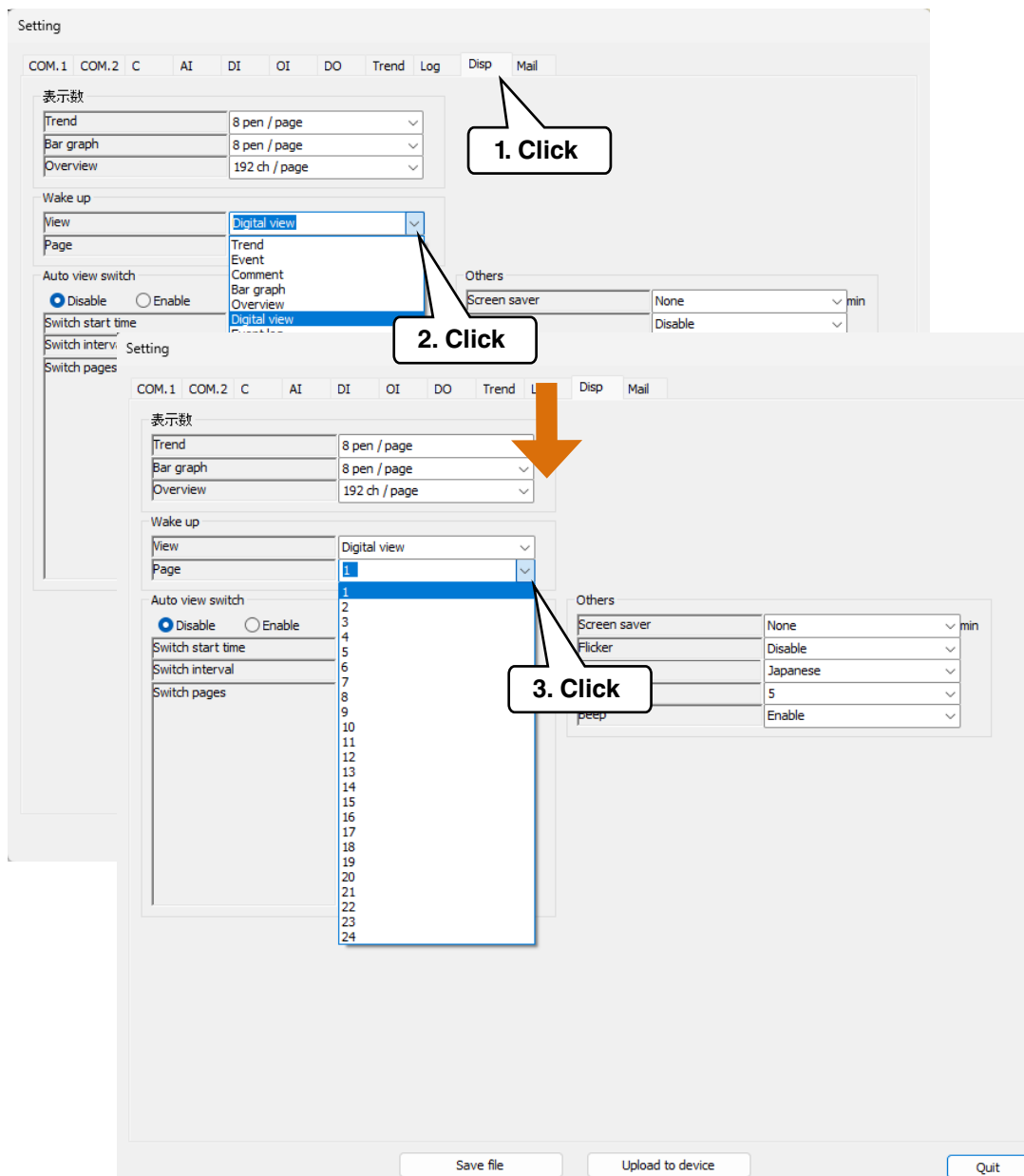
[Setting] window



3.7.2.6 Setting the digital view screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Digital view].
3. Click page drop-down list and select from 1 to 24.

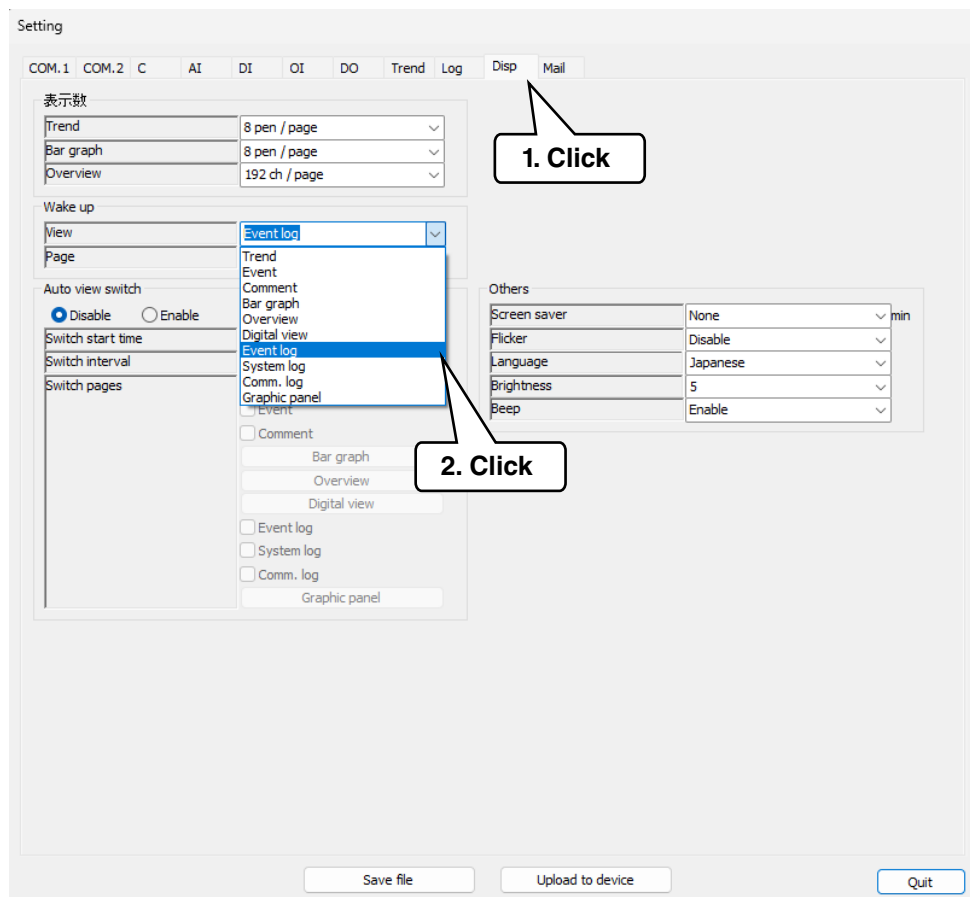
[Setting] window



3.7.2.7 Setting the event log screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Event log].
3. The latest 48 event logs are displayed.

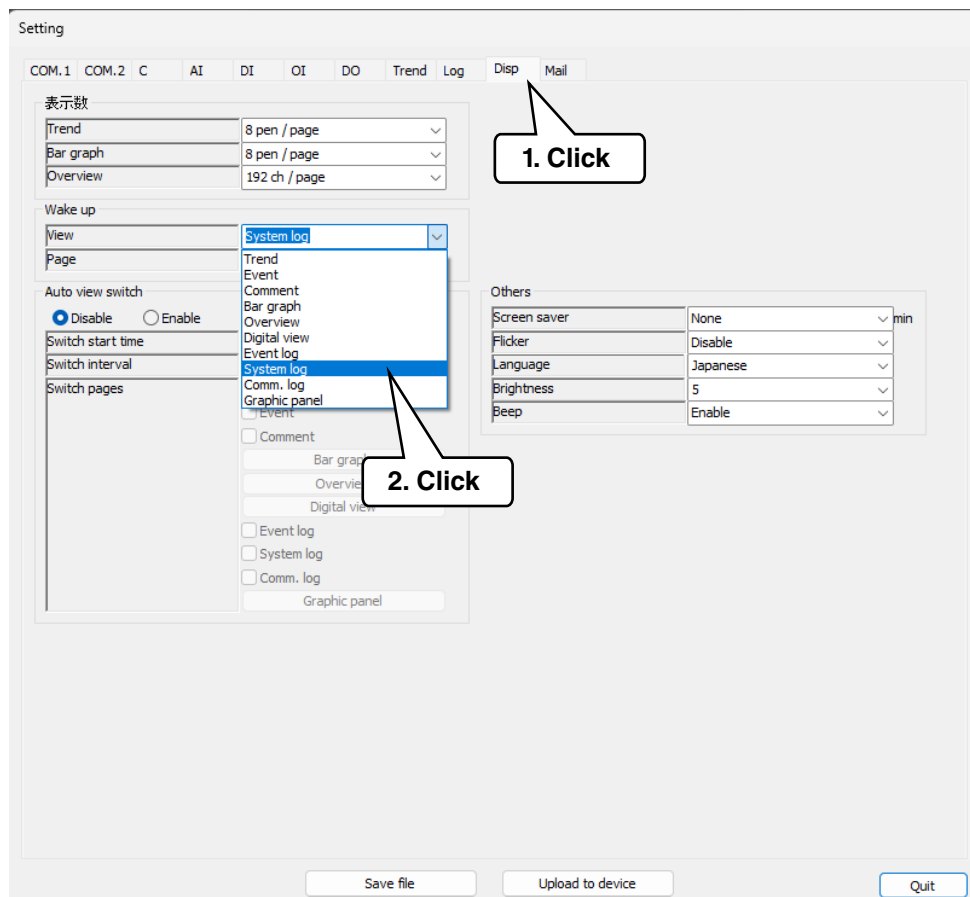
[Setting] window



3.7.2.8 Setting the system log screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [System log].
3. The latest 48 system logs are displayed.

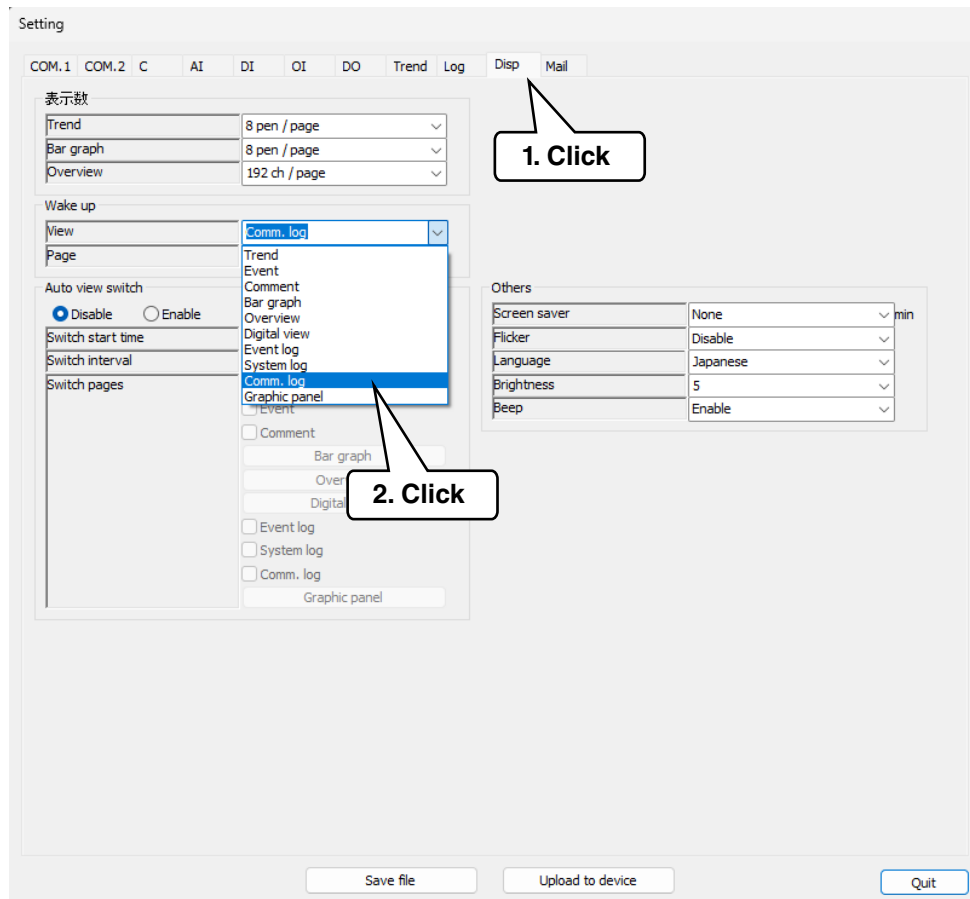
[Setting] window



3.7.2.9 Setting the communication log screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Comm. log].
3. The latest 48 communication logs are displayed.

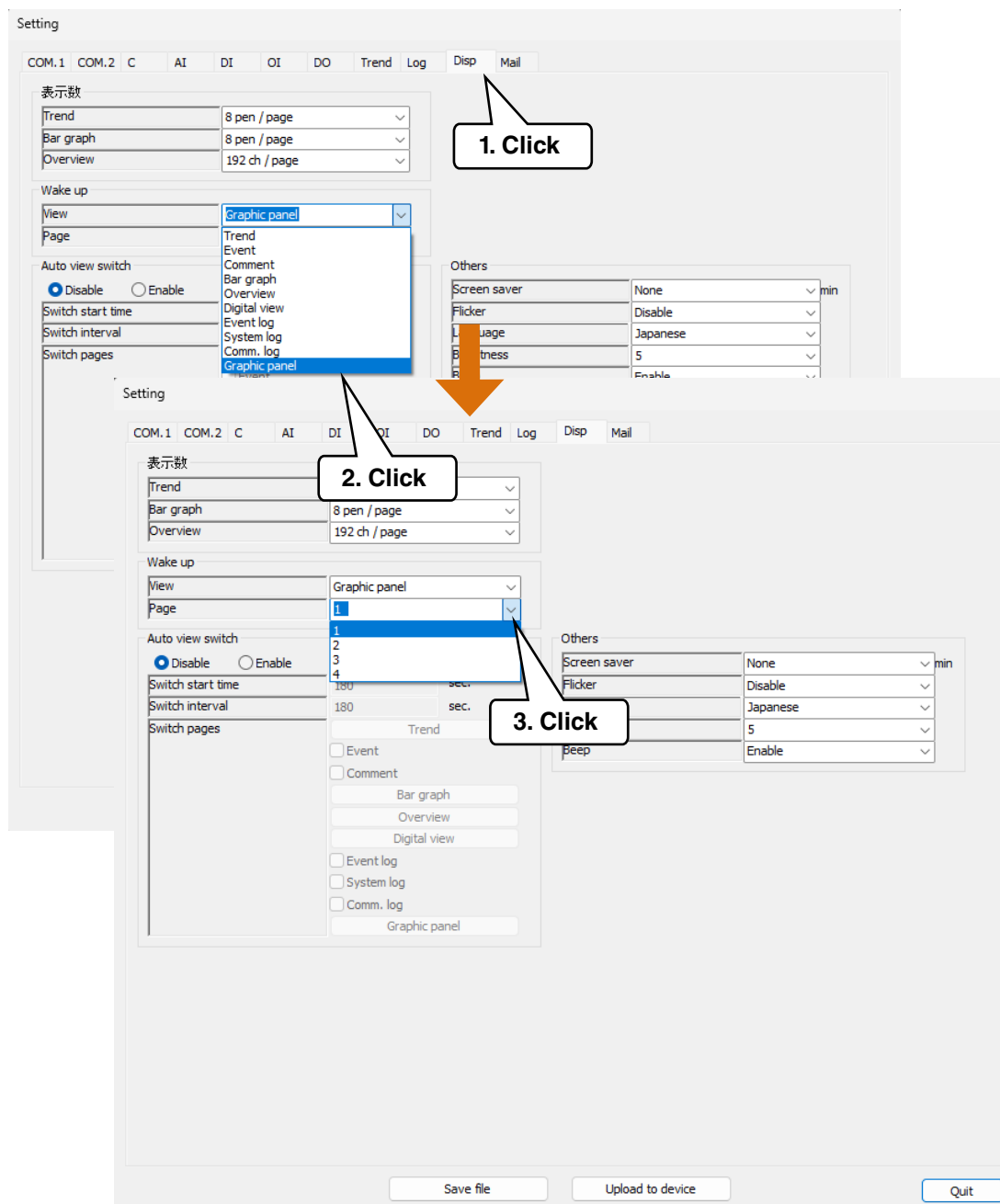
[Setting] window



3.7.2.10 Setting the graphic panel screen to the wake up screen

1. Click [Disp] tab.
2. Click view drop-down list and select [Graphic panel].
3. Click page drop-down list and select from [1] to [4].
4. The selected graphic panel is displayed.

[Setting] window

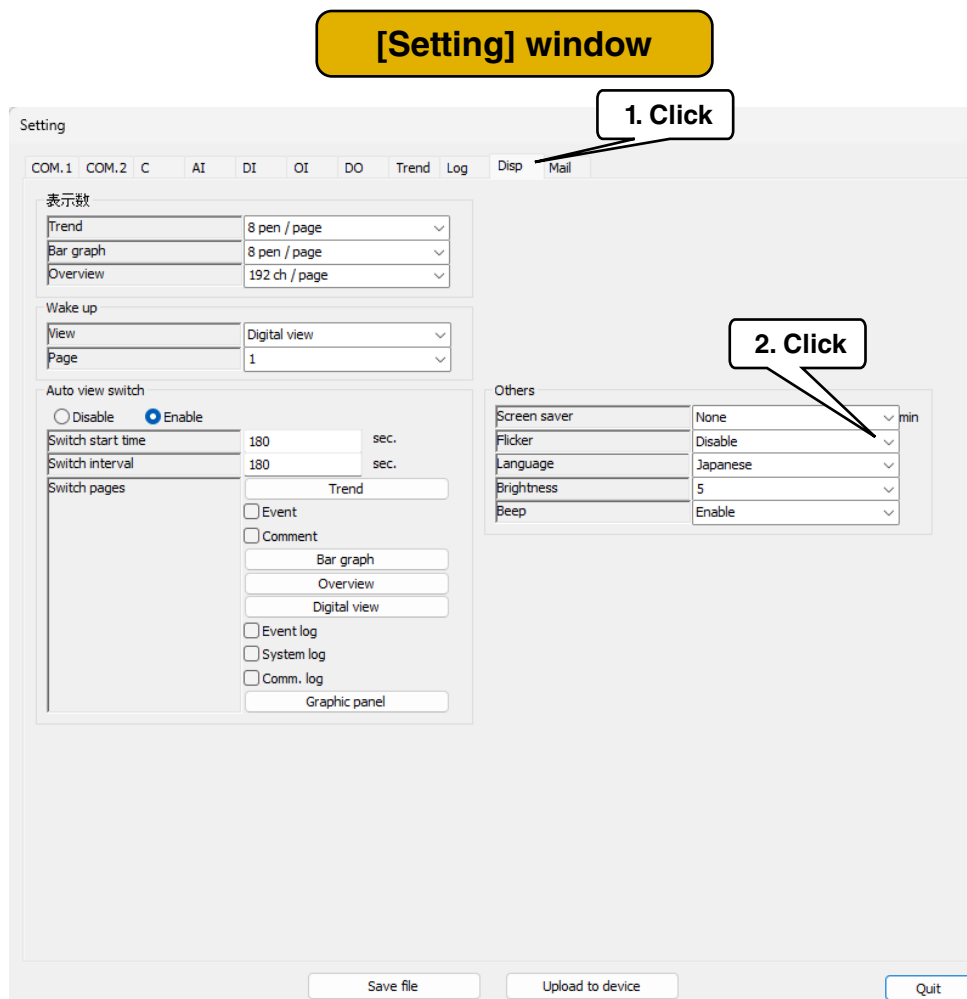


3.7.3 Digital view setting

Set the parameters to enable/disable flicker mode when the VR288E-G64 screen is in digital view or in over-view.

When the current value is within a zone where [Condition (abnormal)] is selected in the event settings (3.4.1.6 Event setting (AI), 3.4.3.3 Event setting (OI)) of AI or OI, or when the ON/OFF status of DI is [Abnormal] (3.4.2.4 Basic setting (DI)), the display will be in flicker mode. When it goes out of the zone, the display returns to normal mode.

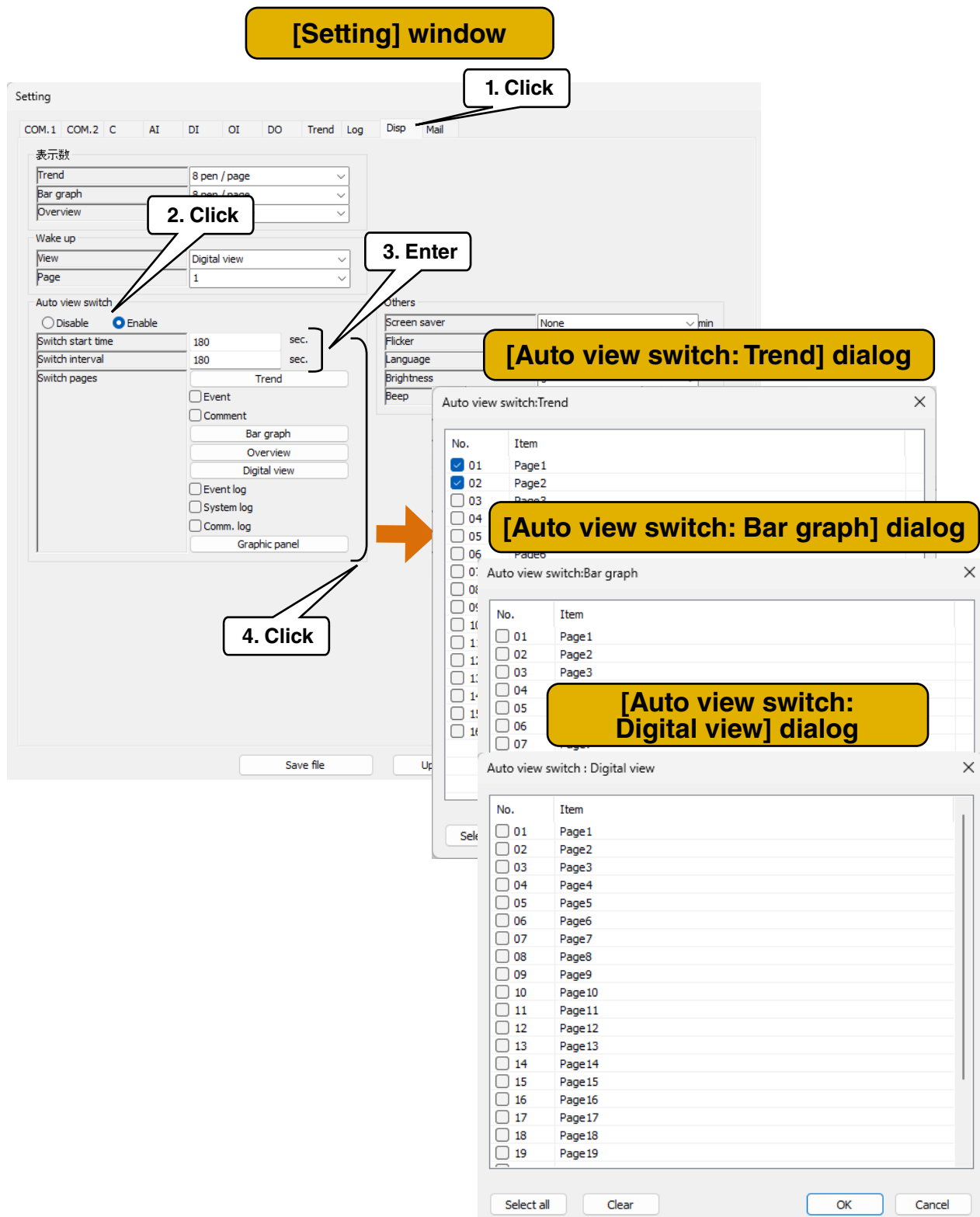
1. Click [Disp] tab.
2. Click the flicker drop-down list and select [Enable].



3.7.4 Auto view switch setting

Configure the auto view switch setting for the VR288E-G64.

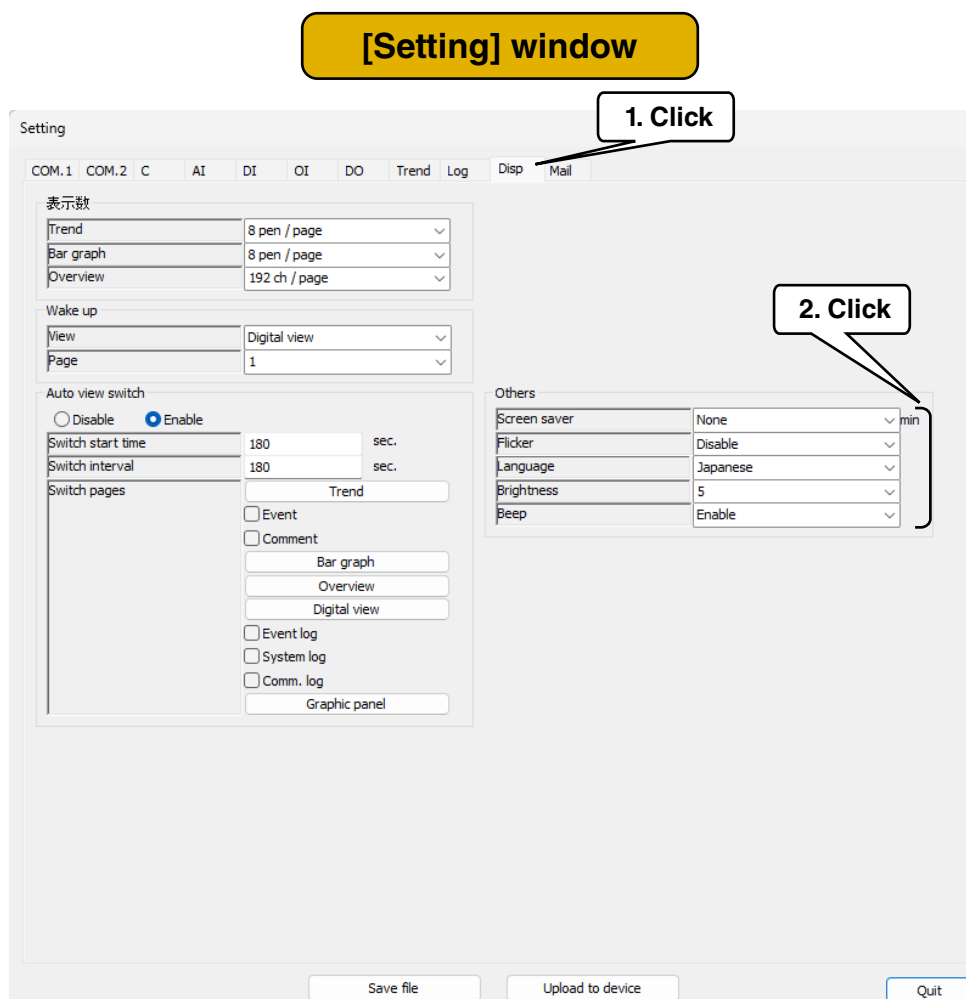
1. When enabling auto view switch, select [Enable] in [Auto view switch].
2. Set parameters according to the table on the next page.
3. Configure the settings for the screen to be targeted for auto view switch.
Select checkboxes of the parameter to be targeted for auto view switch.
4. Regarding [Trend], [Bar graph], [Overview], [Digital view] and [Graphic panel], select a corresponding page.



Parameter	Description
Switch start time	Set the switch start time. If the VR288E-G64 is not operated for a period exceeding the switch start time, the view switches automatically. Set in the range of 10 to 180 (sec.).
Switch interval	Set the interval for auto view switch. After the switch interval time elapses, transition to the screen set as the target for auto view switch is performed automatically. Set in the range of 3 to 180 (sec.).

3.7.5 Other settings

Configure the screen, screen saver, flicker, language and brightness of the VR288E-G64.
Set parameters according to the table below.



Parameter	Description
Screen saver	Set the time until the screen saver activates. The screen saver activates if the VR288E-G64 is not operated for the set time. Set it disable or within 1 to 10 minutes.
Flicker	Refer to 3.7.3 Digital view setting.
Language	Set the language displayed on the VR288E-G64 Select English or Japanese.
Brightness	Set the brightness of the LCD panel of VR288E-G64. Set within 1 (dark) to 5 (bright).
Beep	Set whether or not to emit a sound when the touch panel is tapped. Select [Enable] or [Disable].

3.8 E-mail reporting setting

Configure e-mail reporting setting with the SMTP authentication.

3.8.1 Account setting

Configure the account for sending e-mails.

1. Click [Account setting] button to display [Account setting] dialog.
2. Set parameters according to the table below.
3. Click [Failure output setting] button to display [Failure output setting] dialog.
Select the checkbox in case of outputting DO when sending an e-mail fails.

The image shows a sequence of three windows from a software application, illustrating the steps to configure email reporting settings.

[Setting] window: The top window shows the 'Mail' tab selected. The 'Account setting' button is highlighted with a callout '1. Click'. Below it, the 'Address list' button is highlighted with a callout '2. Click'. The 'Template' section shows a grid of checkboxes for selecting a template, with an orange arrow pointing to the '16' checkbox.

[Account setting] dialog: The middle window shows the 'Account setting' dialog. The 'Mode' is set to 'Enable'. The 'Server address' field is empty. The 'ID' field is empty. The 'Password' field is empty. The 'Port address' is set to '465'. The 'SMTP over SSL' dropdown is set to 'Enable'. The 'STARTTLS' dropdown is set to 'Disable'. The 'Failure output' button is highlighted with a callout '4. Click'. The 'OK' and 'Cancel' buttons are at the bottom.

[Failure output setting] dialog: The bottom window shows the 'Failure output setting' dialog. It contains a table with 19 rows, each with a checkbox and an item name. The 'to device' button is highlighted with an orange arrow. The 'Quit' button is at the bottom right.

No.	Item
☐ 01	DO1 DO1 DO1
☐ 02	DO2 DO2 DO2
☐ 03	DO3 DO3 DO3
☐ 04	DO4 DO4 DO4
☐ 05	DO5 DO5 DO5
☐ 06	DO6 DO6 DO6
☐ 07	DO7 DO7 DO7
☐ 08	DO8 DO8 DO8
☐ 09	DO9 DO9 DO9
☐ 10	DO10 DO10 DO10
☐ 11	DO11 DO11 DO11
☐ 12	DO12 DO12 DO12
☐ 13	DO13 DO13 DO13
☐ 14	DO14 DO14 DO14
☐ 15	DO15 DO15 DO15
☐ 16	DO16 DO16 DO16
☐ 17	DO17 DO17 DO17
☐ 18	DO18 DO18 DO18
☐ 19	DO19 DO19 DO19

Parameter	Description
Mode	Select [Disable] or [Enable].
Server address	Set the mail server address within 64 characters.
ID	Set the ID (e-mail account name) within 64 characters.
Password	Set the password within 64 characters.
Port address	Set the port address of the server.
SMTP over SSL	Set the encrypted communication. Select [Enable] to use it.
STARTTLS	Select [Disable] or [Enable] only when SMTP over SSL is [Enable].

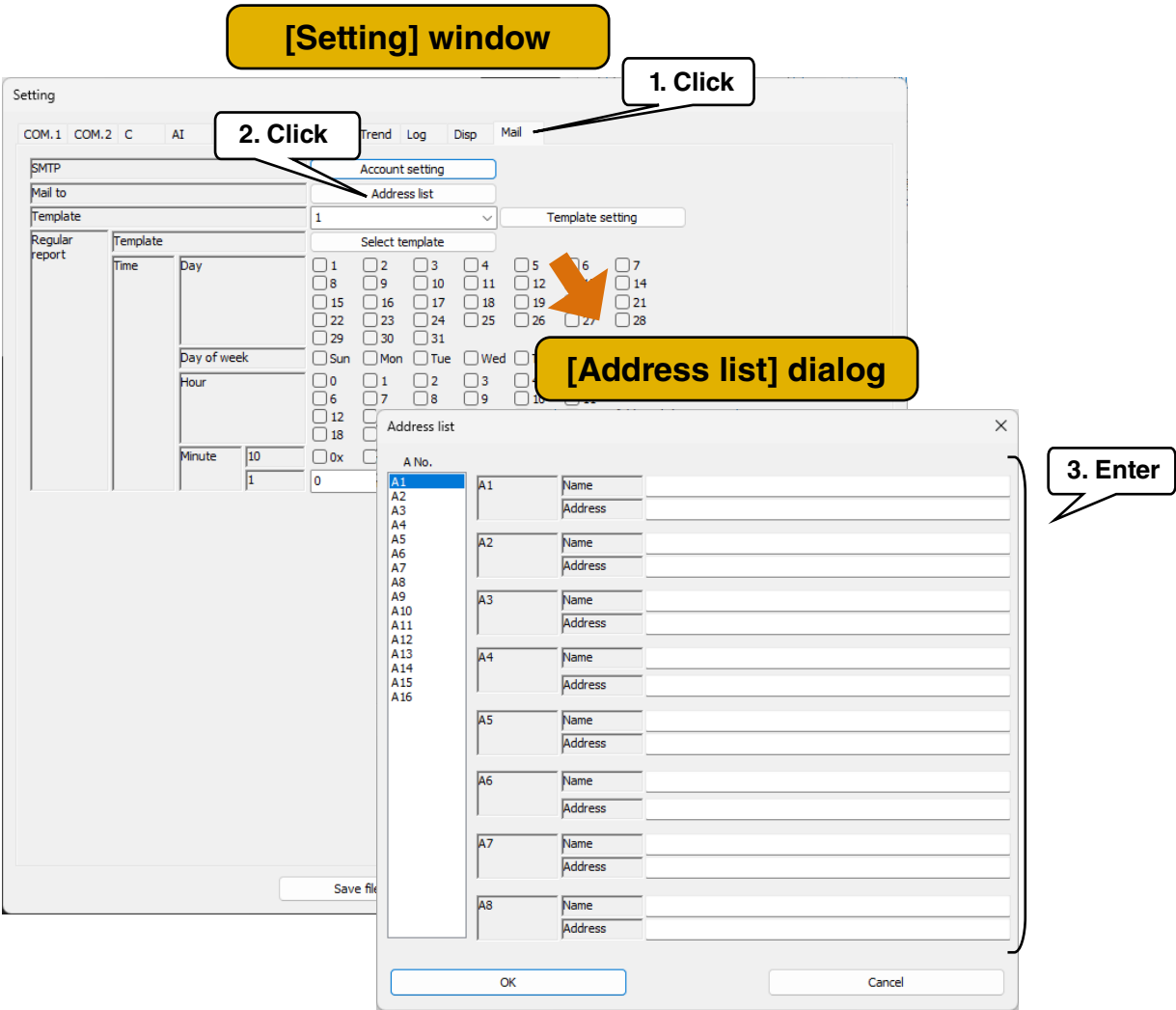
CAUTION

- Mail receiving is not available for VR288E-G64.
- SMTP over SSL authentication is intended only for encryption. Therefore the certification issued by mail server is not verified.
- 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 may be carried out. Therefore according to these changes of restriction or function, check the mail communication on a regular basis and perform adequate operational administrative.
- The following cipher suites are supported.
 TLS_RSA_WITH_AES_256_CBC_SHA
 TLS_RSA_WITH_AES_128_CBC_SHA
 TLS_RSA_WITH_RC4_128_SHA
 TLS_RSA_WITH_RC4_128_MD5
 TLS_RSA_WITH_3DES_EDE_CBC_SHA
 TLS_RSA_WITH_DES_CBC_SHA

3.8.2 Recipient address setting

Configure the e-mail recipient address. Up to 16 addresses A1 to A16 can be set.

- 1. Click [Mail] tab.
- 2. Click [Address list] button to display [Address list] dialog.
- 3. Set parameters according to the table below.



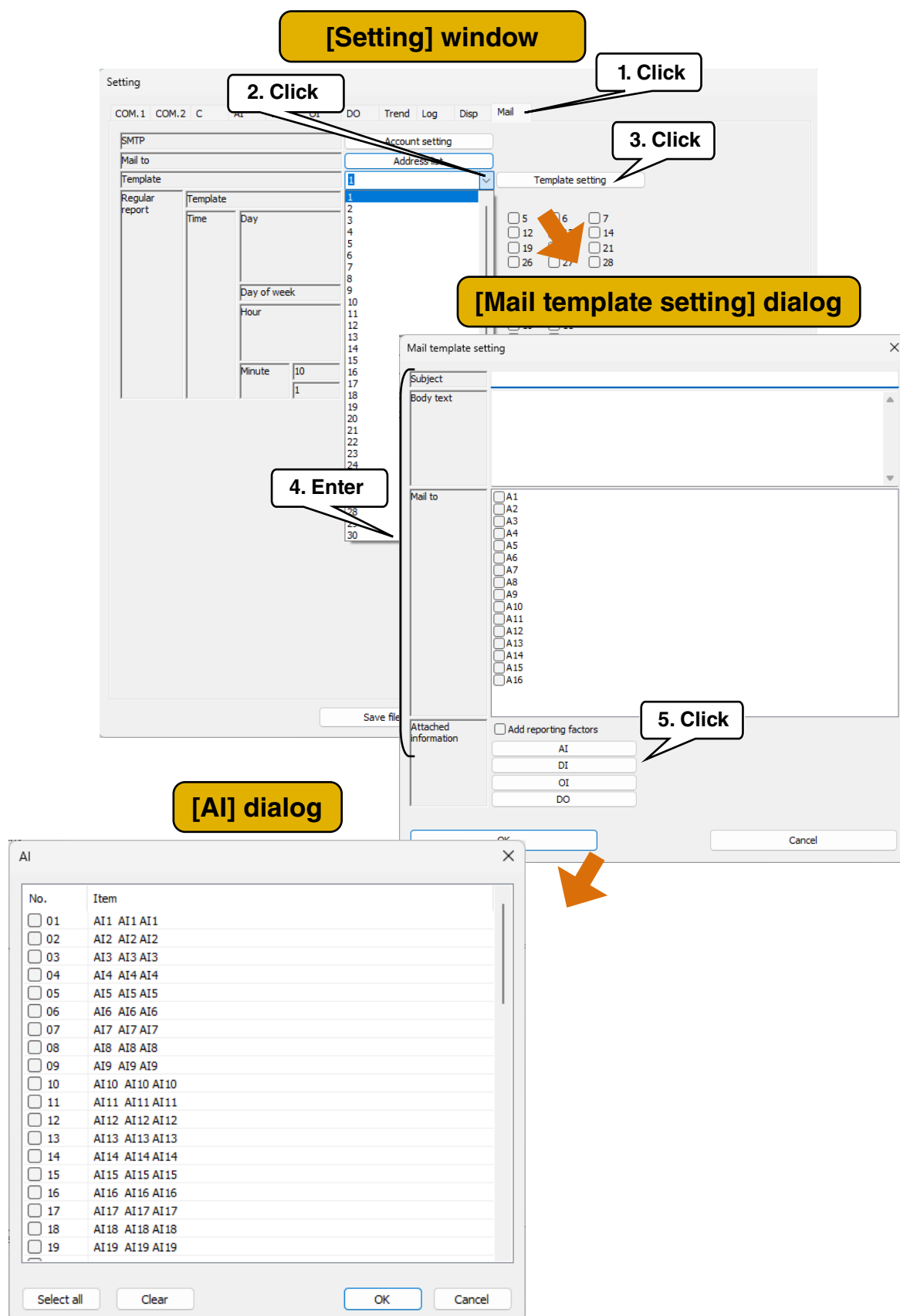
Parameter	Description
Name	Set within 16 characters.
Address	Set the e-mail recipient address within 64 characters.

3.8.3 Template setting

Configure the mail template setting. Up to 32 templates can be set.

1. Click template drop-down list and select a template to be set.
2. Click [Template setting] button to display [Mail template setting] dialog.
3. Click [AI], [DI], [OI] or [DO] button to set the I/O information attached to the body text.
4. Set parameters according to the table below.

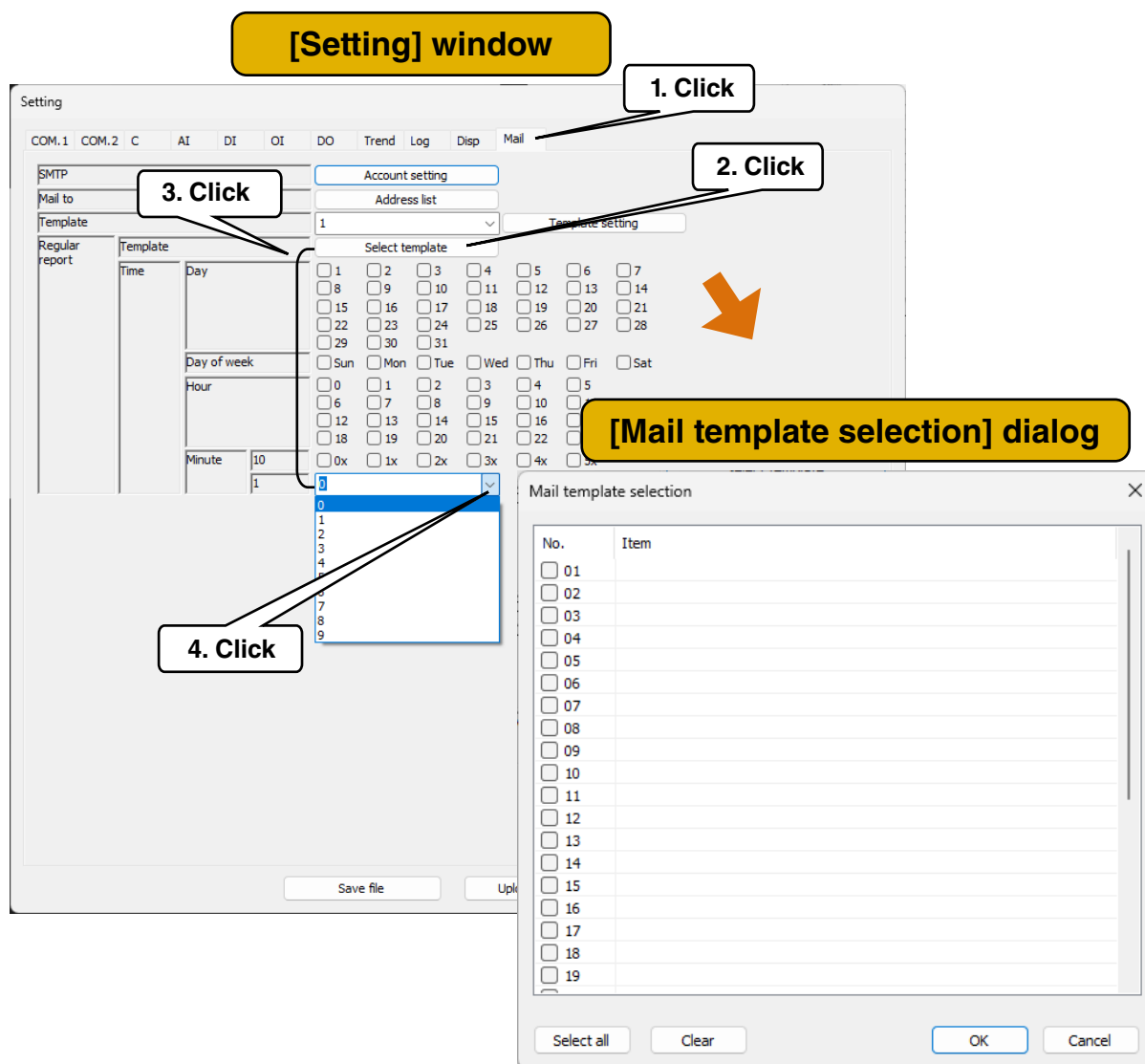
Parameter	Description
Subject	Set the subject of e-mail within 32 characters.
Body text	Set the body text of e-mail within 128 characters.
Mail to	Select the checkbox of the addresses specified for e-mail recipient.
Attached information Add reporting factors	Select the checkbox when adding reporting factors at the end of the body text.



3.8.4 Regular reporting setting

Configure the regular reporting setting.

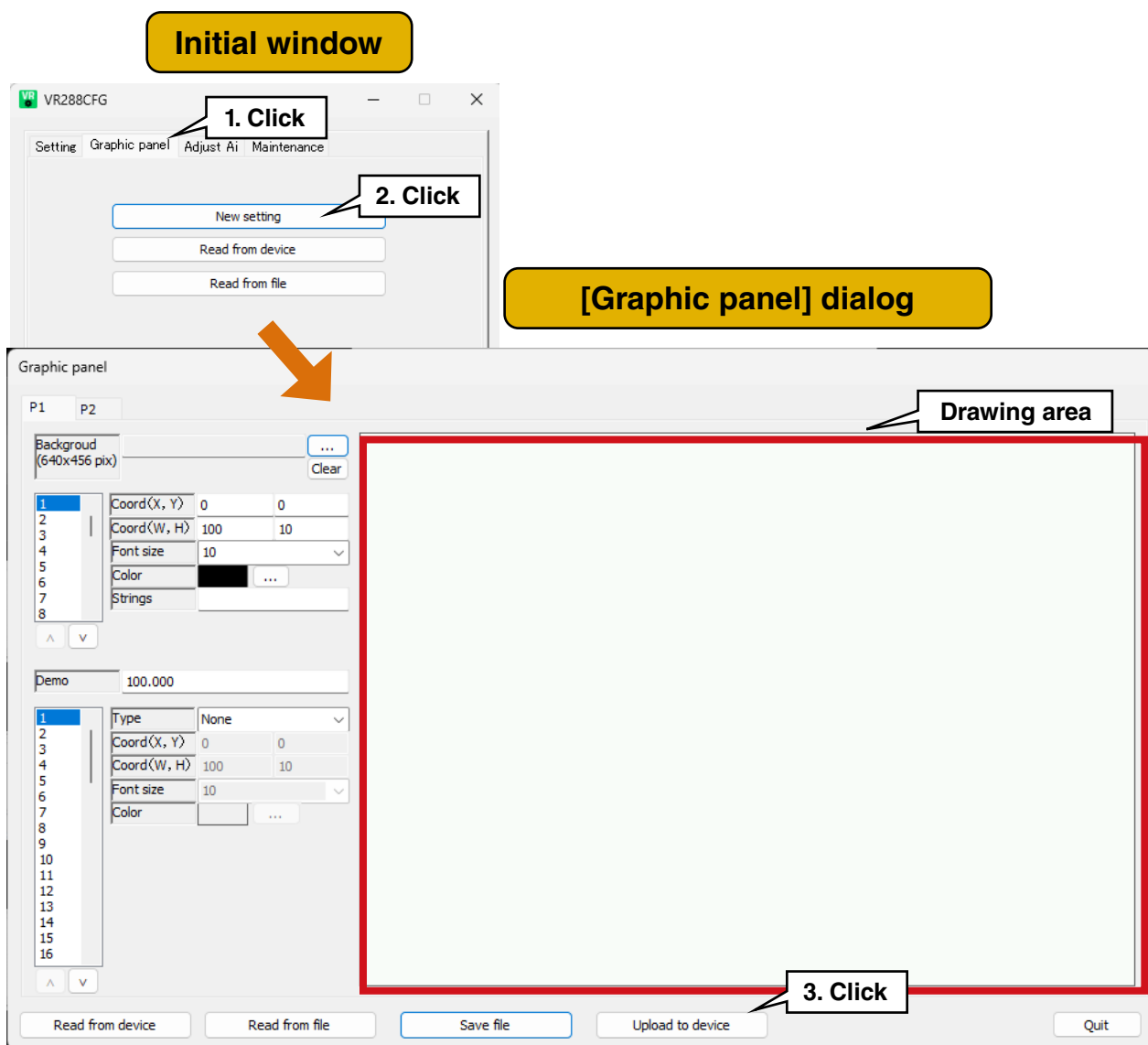
1. Click [Select template] button to display [Mail template selection] dialog.
Select the template to be used for regular reporting.
2. Enter the day and time for regular reporting. Multiple items can be selected for each parameter.
An e-mail will be sent on the selected day and time of the week.



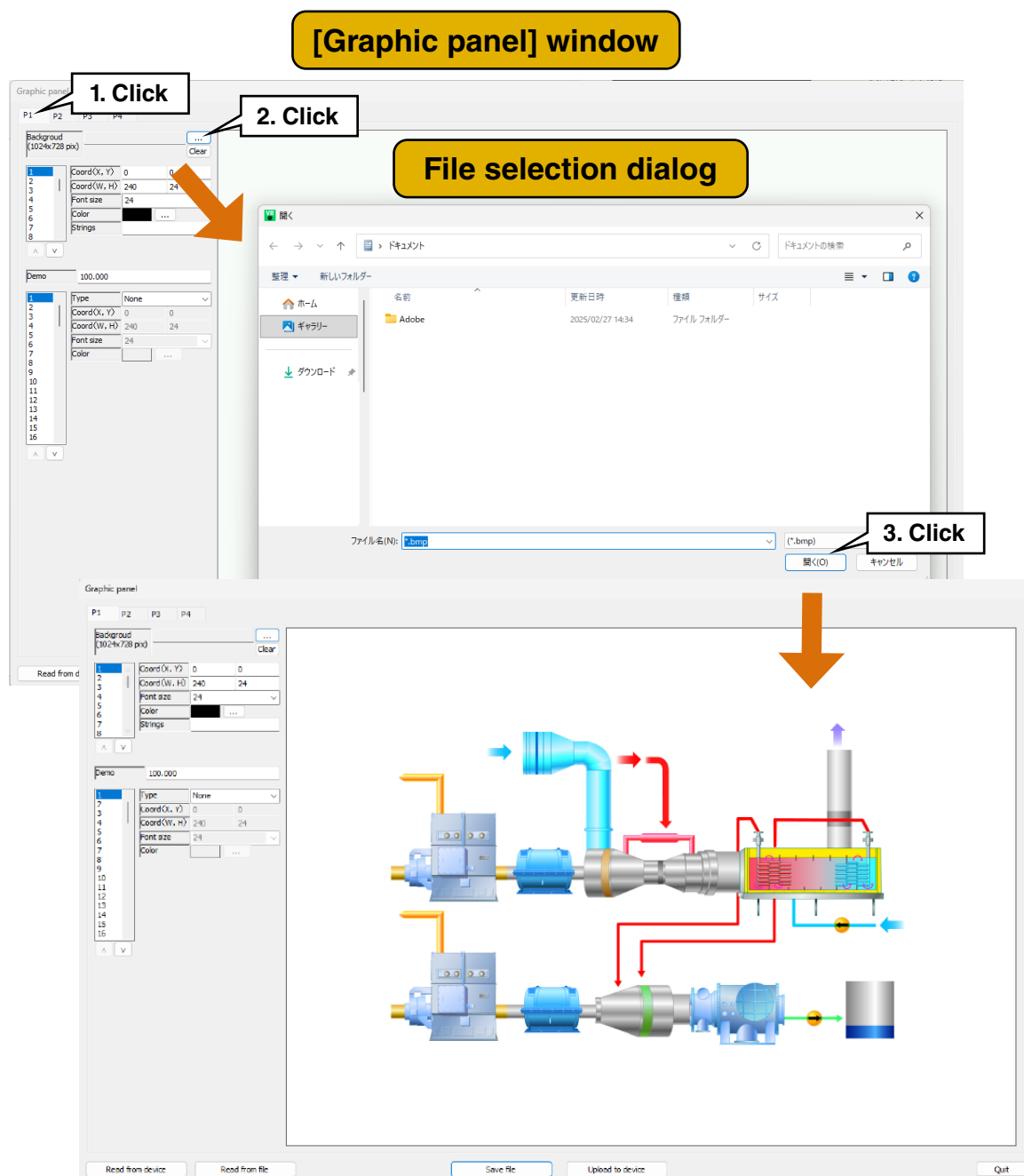
3.9 Graphic panel

The views can be freely created within the area excluding the header by specifying a background and parts. 4 views (P1 to P4) can be created. The specified background and parts are displayed in the drawing area.

1. Click [Graphic panel] tab.
2. Click [New setting] button to configure a new graphic panel setting.
Click [Read from device] button to read a graphic panel set in the device and change it.
(same as 2.3.4.2 Reading from device)
Click [Read from file] button to read a graphic panel saved in the PC.
(same as 2.3.4.3 Reading from file)
3. Click [Upload to device] to transmit the graphic panel setting to the device.
Refer to 2.3.5 Transmitting the setting to the device for details.
4. Click [Save file] to save the graphic panel setting to a file. The file extension is "rom".
Refer to 2.3.6 Saving the setting to file for details.
5. Click [Read from device] button to read the setting from the device. (same as 2.3.4.2 Reading from device)
6. Click [Read from file] button to save the settings read from the PC to a file.
(same as 2.3.6 Saving the setting to file)



3.9.1 Setting background image



1. Click [P1] to [P4] tab to be set.
2. Click [...] to open the file selection dialog.
3. Select a background image and click [Open] button.
4. The selected background image is displayed in the drawing area.
 - 1 background image is displayed per page.
5. Specify a file in bmp format with a maximum size of 1024 pix × 728 pix.
 - If larger, it is trimmed from the top left.
6. Click [Clear] to clear the background image. After clearing, the background will be white.

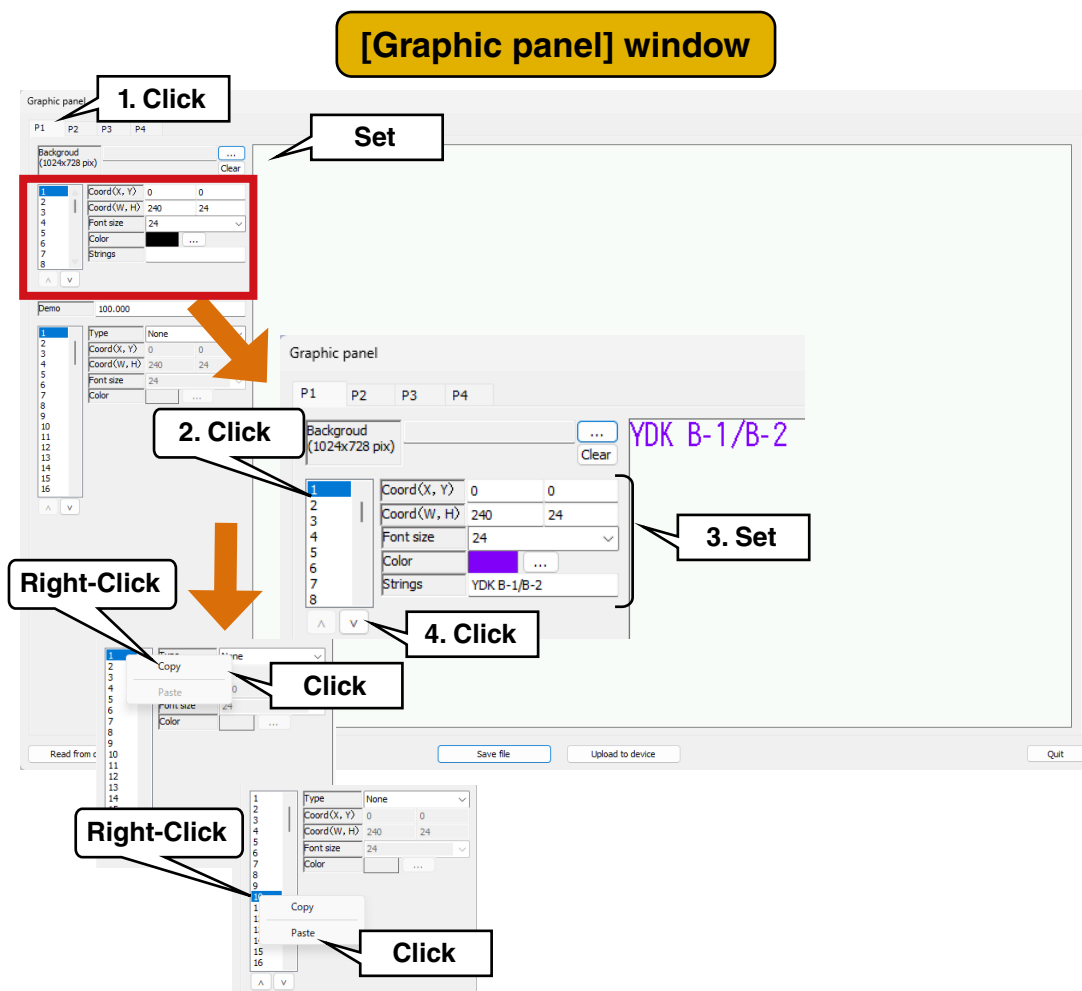
3.9.2 Setting text strings

Configure text strings displayed on the graphic panel. Up to 32 strings can be set.

1. Click [P1] to [P4] tab to be set.
2. Select a text string number and set by referring to the following table.

Part name	Detail
Coord (X, Y)	Set the coordinates of the top left corner of the part, with the top left corner of the window as the origin (0, 0).
Coord (W, H)	Specify the width and height.
Font size	Select 12, 16, 24, 32 or 46.
Color	Specify the text color.
Strings	Specify within 16 characters.

3. Text strings are drawn in order from 1, with 32 on the frontmost and 1 on the backmost (in front of the background image).
4. Click [^] or [v] button to switch the order of parts.
5. If the width of the text string is longer than the drawing area (Coord (W, H)), it will wrap.
If the height is longer, the text outside the range will be cut off.
6. Copying and pasting are possible by right-clicking a part number.



3.9.3 Setting parts

Set parts displayed on the graphic panel. Up to 96 parts can be set.
Select a part type and set. For part type, refer to the following table.

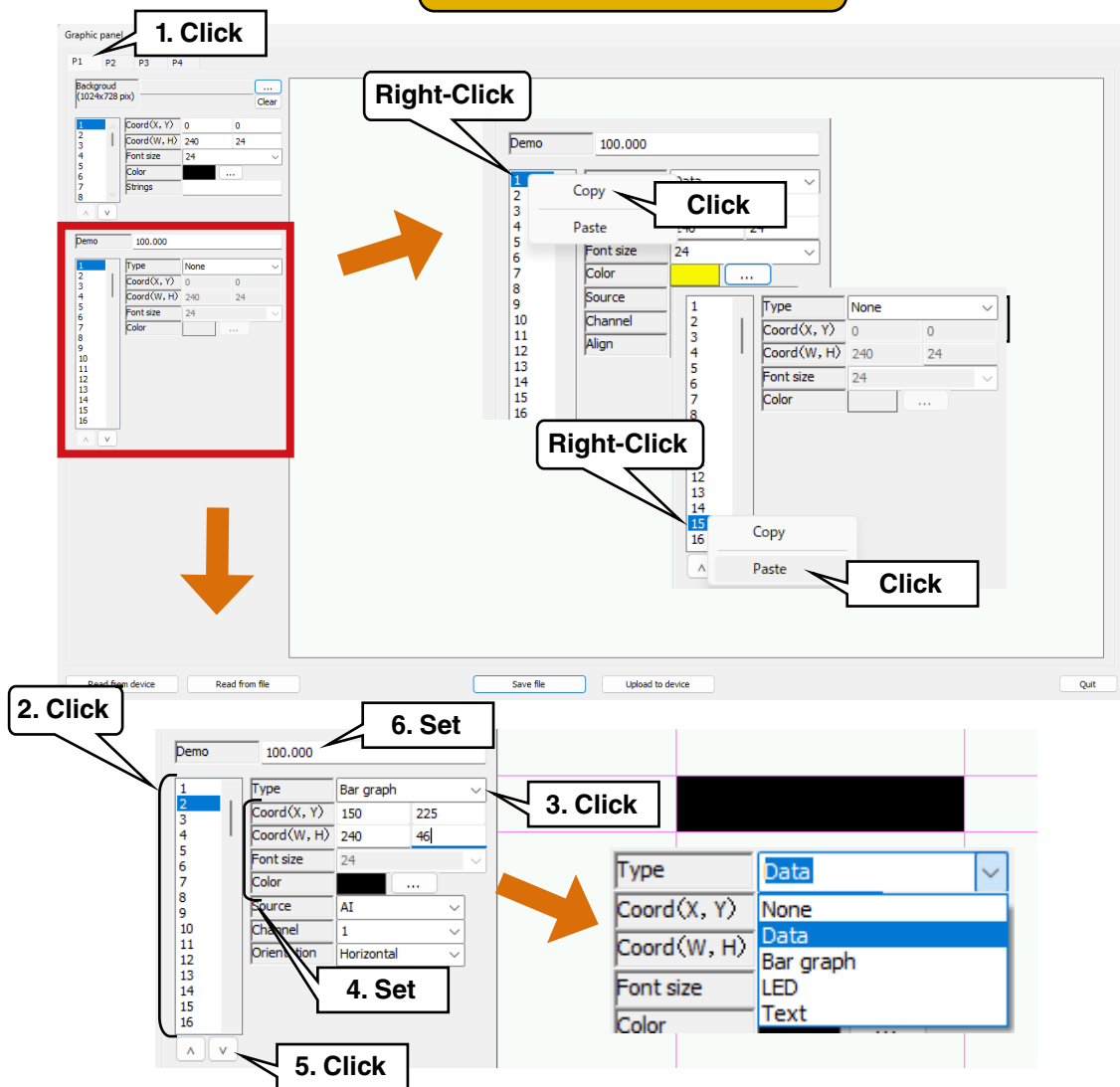
Part name	Detail
None	No part
Data	I/O values of the set channel are displayed.
Bar graph	Input values of the AI channel are displayed in the bar graph.
LED	The zone color corresponding to I/O values of the set channel is displayed.
Text	The value specified in the set channel is displayed.

■COMMON TO PARTS

1. Click [P1] to [P4] tab to be set.
2. Select a part number to be set.
3. Select a part type.
4. Configure the common setting by referring to the following table.
5. Parts are drawn in the order from 1, with 96 on the frontmost and 1 on the backmost.
6. Click [^] or [v] buttons to switch the order of parts.
7. If the width of the text string is longer than the drawing area (Coord (W, H)), it will wrap.
If the height is longer, the text outside the range will be cut off.
8. Copying and pasting are possible by right-clicking a part number.
9. Enter a value in [Simulation input]. The value is reflected to all parts.

Item	Detail
Coord (X, Y)	Set the coordinates of the top left corner of the part, with the top left corner of the window as the origin (0, 0).
Coord (W, H)	Specify the width and height.
Font size	Select 12, 16, 24, 32 or 46. It is disabled when [Part type] is [Bar graph] or [LED].
Color	Specify the color. It is default value when [Part type] is [Bar graph] or [LED].
Simulation input	Enter an actual value. - The source is AI and OI: The entered value is displayed. The zone is determined based on the entered value. - The source is DI and DO: The value is determined as 0 or otherwise.

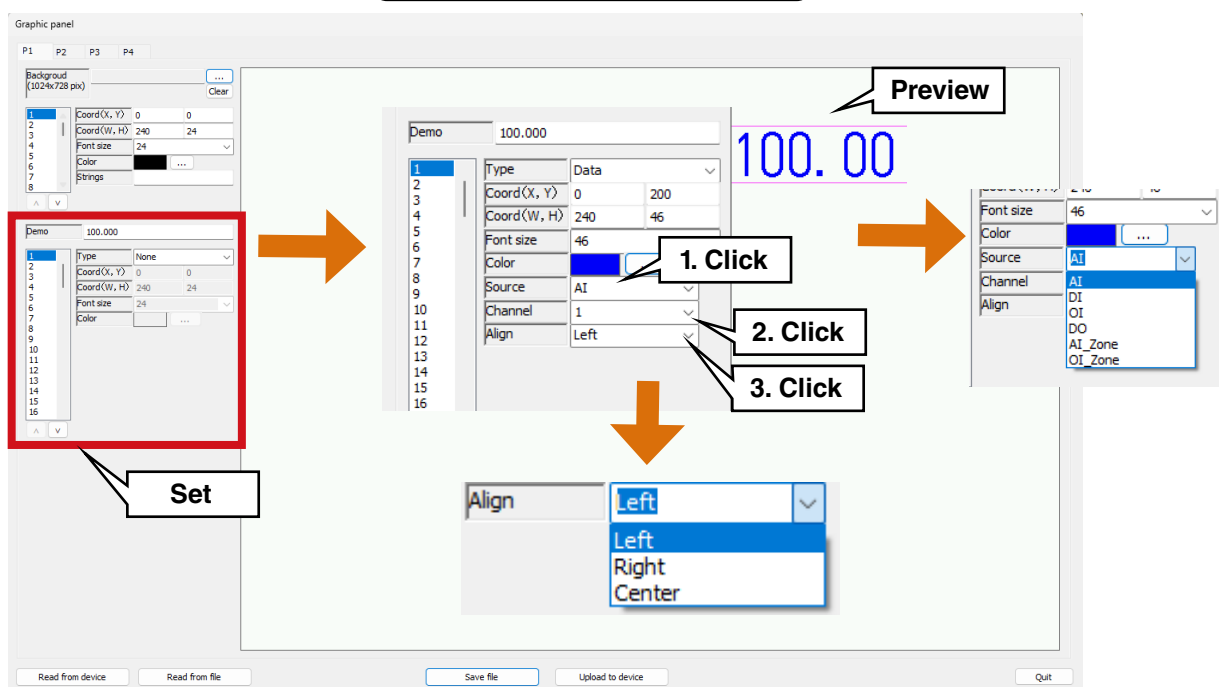
[Graphic panel] window



■ DATA DISPLAY

1. Select a part number to be set and set part type to [Data].
2. Set the source, channel and align by referring to the following table.

[Graphic panel] window

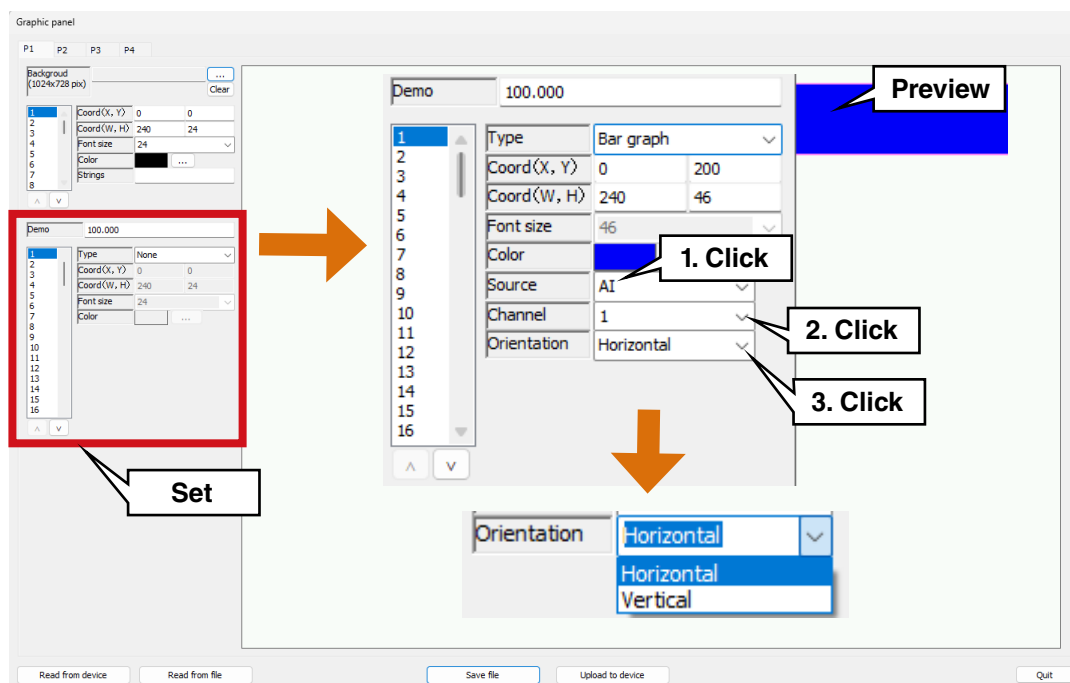


Item	Detail	Note
Source	- AI: The input value of AI channel is displayed. - DI: The input value of DI channel is displayed as corresponding display strings. - OI: The input value of OI channel is displayed. - DO: The output value of DO channel is displayed as corresponding display strings. - AI_Zone: The zone name of AI channel is displayed. - OI_Zone: The zone name of OI channel is displayed.	AI, DI, DO: The data is displayed when the setting source of I/O is not None. → 3.4.1 Analog input (AI), 3.4.2 Discrete input (DI), 3.4.4 Discrete output (DO) OI: The data is displayed regardless of the setting. AI_Zone: The data is displayed when the setting source of AI is not None and when [Partitions] is [1] to [5]. → 3.4.1 Analog input (AI), 3.4.1.5 Zone setting (AI) OI_Zone: The data is displayed when [Partitions] is [1] to [5]. → 3.4.3.2 Zone setting (OI)
Channel	Set the channel number of I/O type specified in [Source].	
Align	Set the display position in the specified coordinate. - Left: left-aligned - Right: right-aligned - Center: center-aligned	

■ BAR GRAPH DISPLAY

1. Select a part number to be set and set part type to [Bar graph].
2. Set the source, channel and orientation by referring to the following table.
3. When [Partitions] is [Disable], the bar graph is displayed with the set color.
→ 3.4.1.5 Zone setting (AI)

[Graphic panel] window

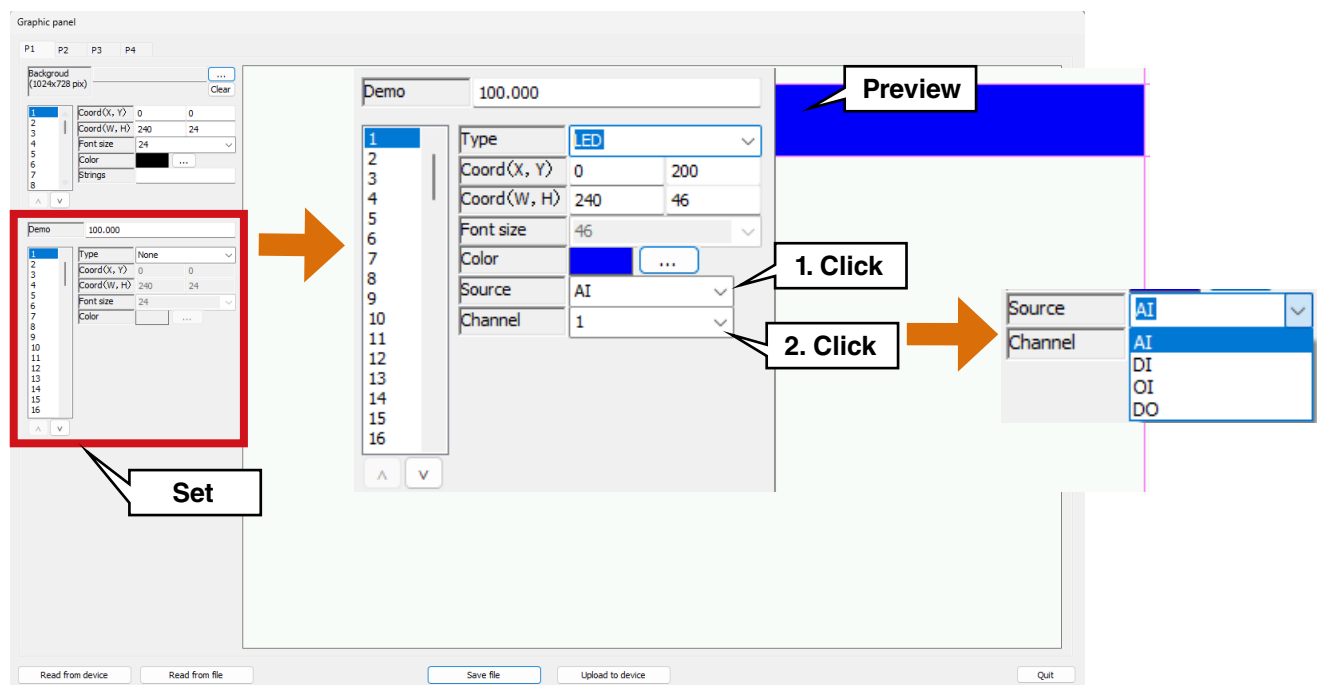


Item	Detail	Note
Source	Only AI can be selected.	The data is displayed when the setting source of AI is not None. Data type is [%]: 0 to 100 % is displayed. Data type is [Int] and [Uint]: Int and Uint is displayed as 100 %. → 3.4.1 Analog input (AI), 3.4.1.4 Basic setting (AI)
Channel	Set the channel number of I/O type specified in [Source].	
Orientation	Set the increase direction of the bar graph. - Horizontal: Left to right - Vertical: bottom to top	

■LED DISPLAY

1. Select a part number to be set and set part type to [LED].
2. Set the source and channel by referring to the following table.
3. When source is AI or OI and when [Partitions] is [Disable], the LED is displayed with the set color.
→ 3.4.1.5 Zone setting (AI), 3.4.3.2 Zone setting (OI)

[Graphic panel] window



Item	Detail	Note
Source	Set AI, DI, OI or DO. AI, OI: The zone color of the channel is displayed. DI, DO: The display color of the channel is displayed.	AI, DI, DO: The data is displayed when the setting source of I/O is not None. → 3.4.1 Analog input (AI), 3.4.2 Discrete input (DI), 3.4.4 Discrete output (DO) OI: The data is displayed regardless of the setting. Flicker setting is applied when flicker setting is enabled. → 3.7.3 Digital view setting Zone color: 3.4.1.5 Zone setting (AI), 3.4.3.2 Zone setting (OI) Display color: 3.4.2.4 Basic setting (DI), 3.4.4.4 Basic setting (DO)
Channel	Set the channel number of I/O type specified in [Source].	

1. Select a part number to be set and set part type to [Text].
2. Set [Source], [Channel], [Type], [Zone number] and [Align] by referring to the following table.
3. [Zone number] depends on the settings of [Source] and [Type].

The image illustrates the steps to set up a demo in the AI1 software. It shows a 'Graphic panel' window with a 'Demo' section, a 'Preview' window, and several dropdown menus for configuration. Arrows indicate the flow of the setup process.

Graphic panel Demo section:

- Type: Text
- Coord(X, Y): 0, 200
- Coord(W, H): 240, 46
- Font size: 46
- Color: [Blue]
- Source: AI
- Channel: 1
- Type: CH
- Zone number: 1
- Align: Left

Preview window:

AI1

Configuration steps:

- Click: [Blue] color dropdown
- Click: AI source dropdown
- Click: CH type dropdown
- Click: Left align dropdown

Source AI, OI:

- Type: CH
- Zone number: CH
- Align: CH name, CH comment, Engineering unit, Zone name, Zone upper limit, Zone lower limit

Source DI, DO:

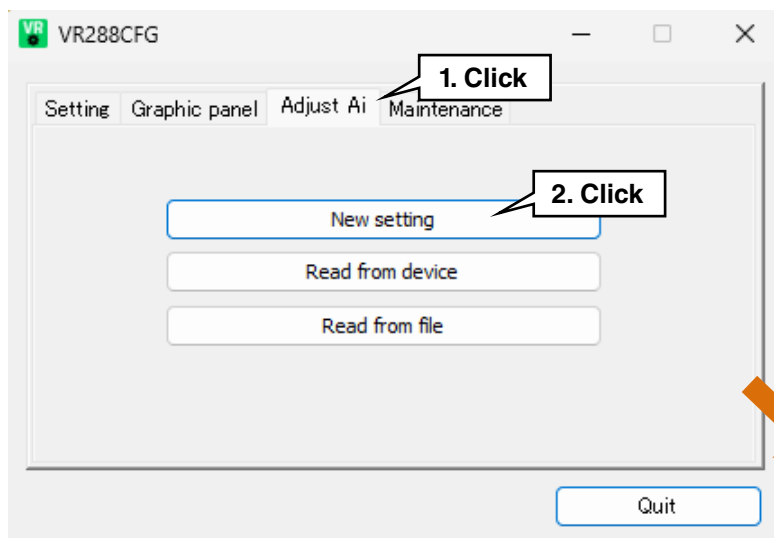
- Type: Display comment
- Zone number: OFF
- Align: OFF, ON

Part type	Parameter	Description
Source	Set AI, DI, OI or DO.	
Channel	Set the channel number of I/O type specified in [Source].	
Type	The setting parameters are different depending on the I/O type specified in [Source]. Common: - CH: Channel - CH name: Channel name is displayed. - CH comment: Channel comment is displayed. AI, OI: - Engineering unit - Zone name: Zone name specified in [Zone number] is displayed. - Zone upper limit: The upper limit of the zone specified in [Zone number] is displayed. - Zone lower limit: The lower limit of the zone specified in [Zone number] is displayed. DI, DO: - Display comment: The comment specified in ON and OFF is displayed.	CH, CH name, CH comment, Engineering unit: → 3.4.1.4 Basic setting (AI), 3.4.2.4 Basic setting (DI), 3.4.3.1 Basic setting (OI), 3.4.4.4 Basic setting (DO) The engineering unit is not displayed when the setting source of AI is None. → 3.4.1.4 Basic setting (AI) Zone name, Zone upper/lower limit: → 3.4.1.5 Zone setting (AI), 3.4.3.2 Zone setting (OI)
Zone number	Set the following range when [Type] is set to [Zone name], [Zone upper limit] or [Zone lower limit]. - Zone name: 1 to 5 - Zone upper limit: 1 to 4 - Zone lower limit: 2 to 5 DI, DO: Set ON or OFF when [Type] is set to [Display comment].	AI: It is displayed when the setting source of AI is not None and when [Partitions] is [1] to [5]. It is not displayed when an invalid zone is set. → 3.4.1 Analog input (AI), 3.4.1.5 Zone setting (AI) OI: It is displayed when [Partitions] is [1] to [5]. It is not displayed when an invalid zone is set. → 3.4.3.2 Zone setting (OI) DI, DO: It is not displayed when the setting source of I/O is None. → 3.4.2.4 Basic setting (DI), 3.4.4.4 Basic setting (DO)
Align	Set the display position in the specified coordinate. - Left: left-aligned - Right: right-aligned - Center: center-aligned	

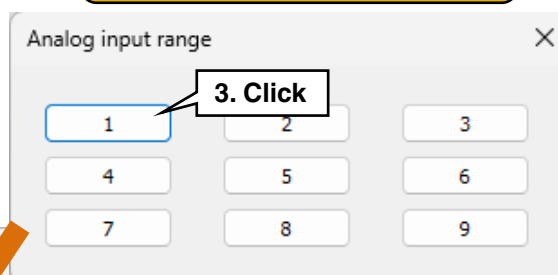
3.10 Adjusting Ai

Follow the procedure below in order to adjust Ai value.

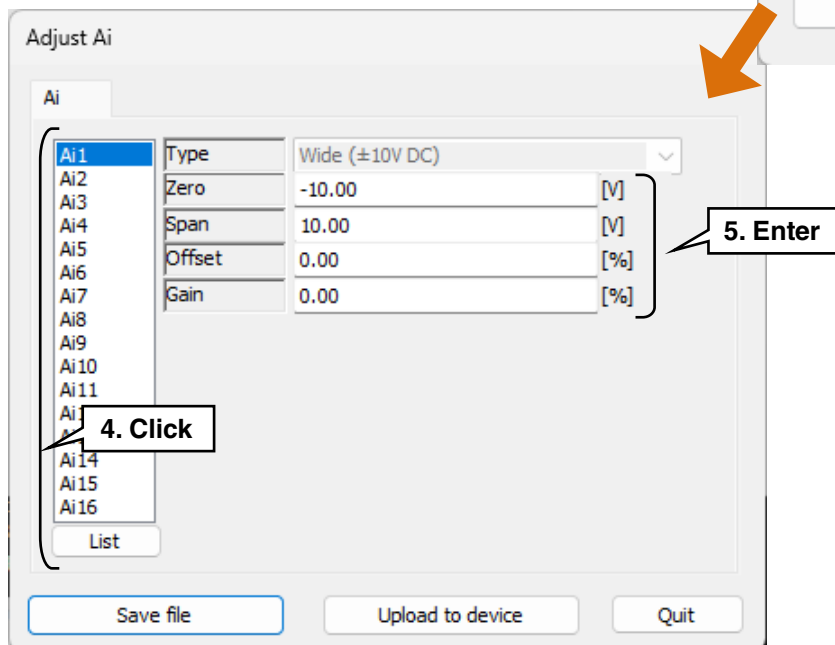
Initial window



Range selecting window



[Adjust Ai] window



1. Click [Adjust AI] tab.
2. Click [New setting] button to configure a new Ai adjustment setting.
 Click [Read from device] button to read the Ai adjusted values set in the device and change the values.
 (same as 2.3.4.2 Reading from device)
 Click [Read from file] button to read the Ai adjusted values saved in the PC.
 (same as 2.3.4.3 Reading from file)
3. Select the analog input range by referring to the option code of the device.
 The range selecting window appears only when [New setting] button is clicked.
4. Adjust the Ai values. Click an Ai channel to display the current values.
5. Set the values by referring to the following table.
6. Click [Save file] to save the adjusted values to a file.
 Refer to 2.3.6 Saving the setting to file for details.
7. Click [Upload to device] to transmit the adjusted values to the device.
 Refer to 2.3.5 Transmitting the setting to the device for details.

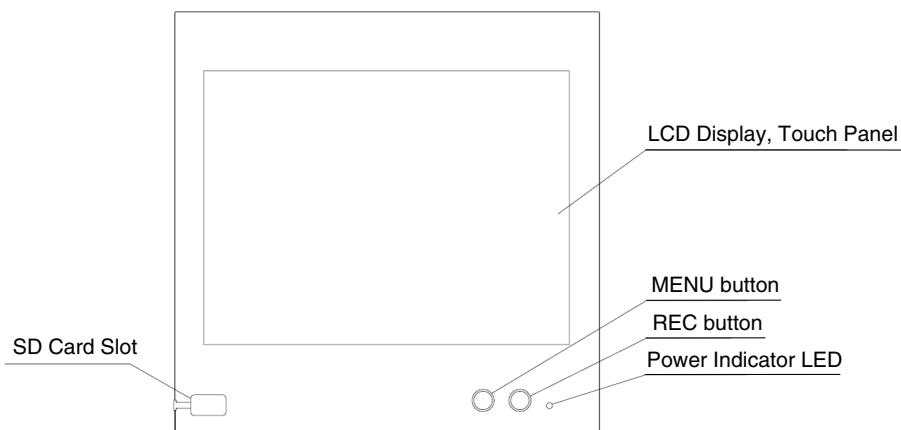
Parameter	Detail
Type	The range corresponding to the Ai channel is displayed.
Zero / Span	Depends on the analog input specification. • Type [Wide (± 10 V DC)]: -10.00 to +10.00 V (minimum range 1.6 V) • Type [Middle (± 0.8 V DC)]: -800 to +800 mV (minimum range 160 mV) • Type [Narrow (± 80 mV DC)]: -80 to +80 mV (minimum range 20 mV)
Offset	Set within -5.00 to +5.00 (%)
Gain	

4. VR288E-G64 operation

This chapter describes the details of the VR288E-G64 screen and how to operate it.

4.1 Component identification

The following illustration shows the component identification of the VR288E-G64.



Refer to the following table regarding the button operation.

Button	Operation	Reference
REC	[Record] dialog appears. [Eject SD], [Normal record], [Trigger record] or [Stop record] is selectable.	
Hold down REC	Normal recording is started or stopped. (If trigger recording is in progress, it switches to normal recording.)	3.5.1.1 Recording setting
MENU	Menu is displayed.	
Hold down MENU	Key lock is set or released.	

4.2 Wake up screen

After the power is turned on, the wake up screen is displayed until the initialization process is complete.

After the initialization process is complete, the configured wake up screen is displayed.

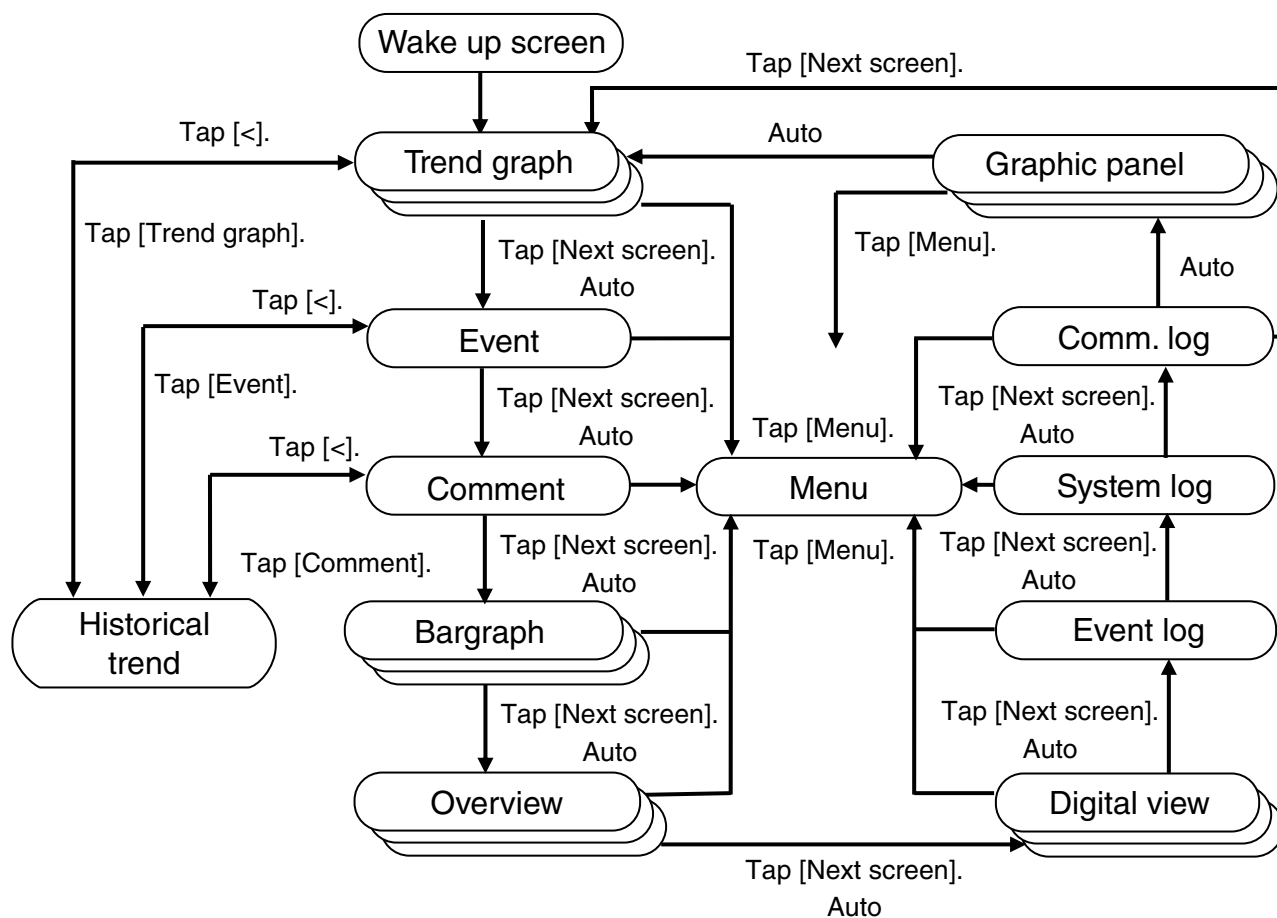
Select the wake up screen from trend, event, comment, bar graph, overview, digital display, event log, system log, communication log or graphic panel. (The figure below shows the case when the trend graph is set.)

If automatic switching is enabled, the screen switches at the specified timing.

Configure the wake up screen and automatic switching using the configurator software (model: VR288CFG) or user setting.

→ 3.7.2 Wake up screen setting, 3.7.4 Auto view switch setting, 4.3.11.5 User setting

For details on each screen, refer to the sections for each screen on the following pages.



4.2.1 Power-up screen

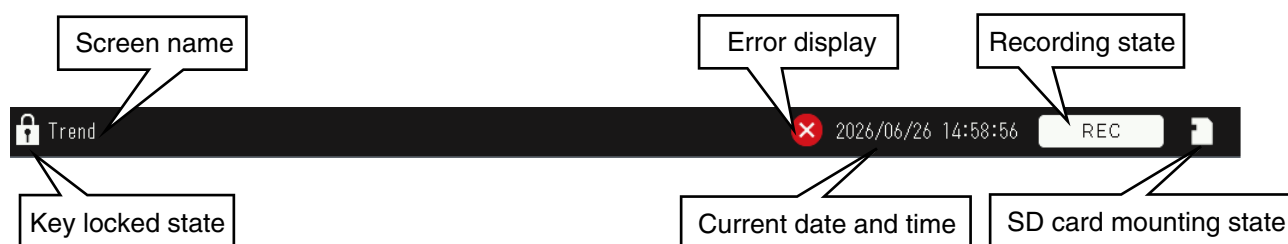
For the period from turning on the device until the configured wake up screen is displayed, the following message appears at the lower right corner of the screen. The message is deleted when the waiting state is released, and then the wake up screen appears.

Message	Description
progress (DHCP / IP address)	Waiting for obtaining DHCP IP
progress (SNTP)	Waiting for initial SNTP processing
progress (I/O)	Waiting for initial I/O communication processing
progress (SD)	Waiting for recognizing SD card
progress (REC)	Waiting for starting the recording process

4.2.2 Common area for each screen

4.2.2.1 Header

Header is the common area for all screens.



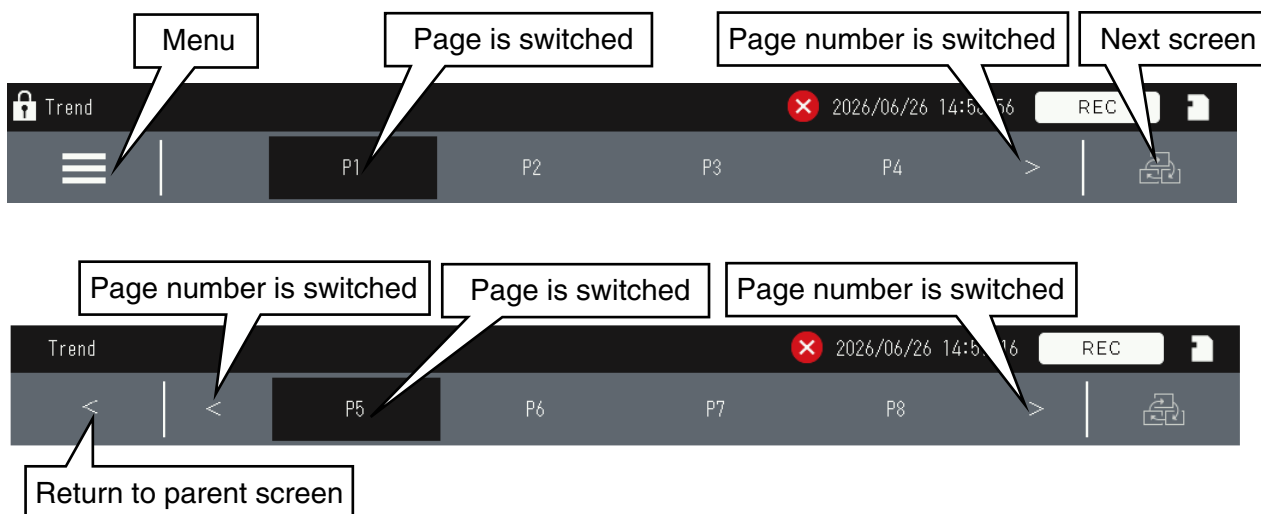
Item	Description
Key lock	The icon  indicates key lock state.
Screen name	The name of the currently displayed screen is displayed.
Error display	The icon  indicates that the following errors occur. - Built-in I/O abnormality - Modbus/TCP or SLMP communication error - Recording abnormality - Log abnormality - SD card abnormality
Current date and time	The date and time are displayed. Refer to 5.1.1 Date/Time for the setting.
Recording state	The icons indicate recording state. Refer to the table below.
SD card mounting state	The icon  indicates SD card mounting state.

Recording state

Item	Description	Display
Stop recording	Recording stops.	REC OFF (white)
Normal recording	Recording is in progress.	REC ON (green)
Trigger recording	The device is waiting for trigger. (Pre trigger is in progress.)	Trigger REC Blinking
	Recording is in progress. (Trigger or post trigger is in progress.)	Trigger REC ON (green)

4.2.2.2 Sub header (page)

Sub header (page) is displayed on the screen that requires page switching, such as trend screen, event screen, comment screen, bar graph, overview screen, digital view, event log, system log and communication log.



Item	Description
≡ / <	≡: Menu is displayed. <: The display returns to the main screen.
Switching page	Tap a page number to switch to the corresponding page. < and > buttons on the side switch the page number in the sub header.
To next screen	The display transits to the next screen. The transition order is as follows: trend → event → comment → bar graph → overview → digital view → event log → system log → comm. log

4.2.2.3 Sub header (transition)

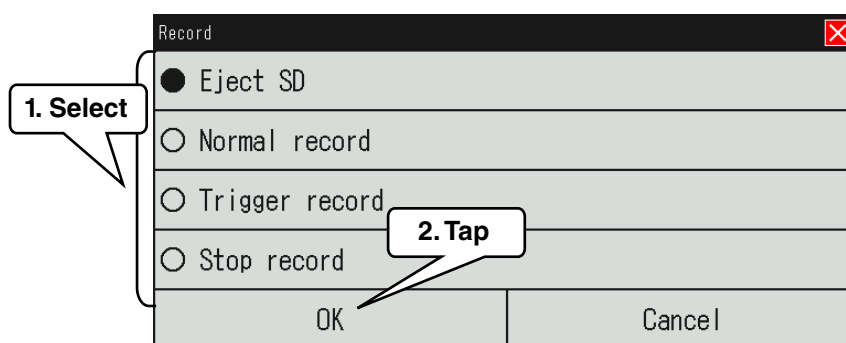
Sub header (transition) is displayed when the number of pages is not fixed, such as internal memory, event log and comment log of SD.



Item	Description
≡ / <	≡: Menu is displayed. <: The display returns to the main screen.
Switching page	< and > buttons on the side switch pages.

4.2.2.4 [Record] dialog

Press REC button or tap REC icon to display [Record] dialog.



1. Press REC button (4.1 Component identification) or tap REC icon to display [Record] dialog.
2. The selected parameter is displayed with a black circle. Tap a parameter and [OK].
Tap [Cancel] or  to cancel the selection and close the dialog.
3. Before inserting or removing an SD card from the VR288E-G64, select [Eject SD].
Insert or remove the SD card after changing to  icon which means to release mounting.
4. When [Normal record] is selected, normal recording of the trend starts. When recording starts,  icon turns on. The recorded content is based on the settings in the configurator software.
→ 3.5.1 Basic setting, 3.5.2 Pen setting
5. When [Trigger record] is selected, trigger recording of the trend starts. When recording starts,  icon turns on. The recorded content is based on the settings in the configurator software.
→ 3.5.1 Basic setting, 3.5.2 Pen setting
6. Select [Stop record] and tap [OK] to stop normal recording / trigger recording.

4.2.2.5 Auto view switching

The display switches automatically to the specified screen if there is no operation for a certain period of time.

Item	Description	Reference
Time	Start switching time: 10 to 180 sec. / OFF Switching interval: 3 to 180 sec.	3.7.4 Auto view switch setting
Conditions for stopping	- When there is tapping or button operation (even if the screen is locked) - When the screen saver is active - During displaying the menu or maintenance screen.	3.7.5 Other settings

4.2.2.6 Screen saver

Back light is turned off if there is no operation for a certain period of time.

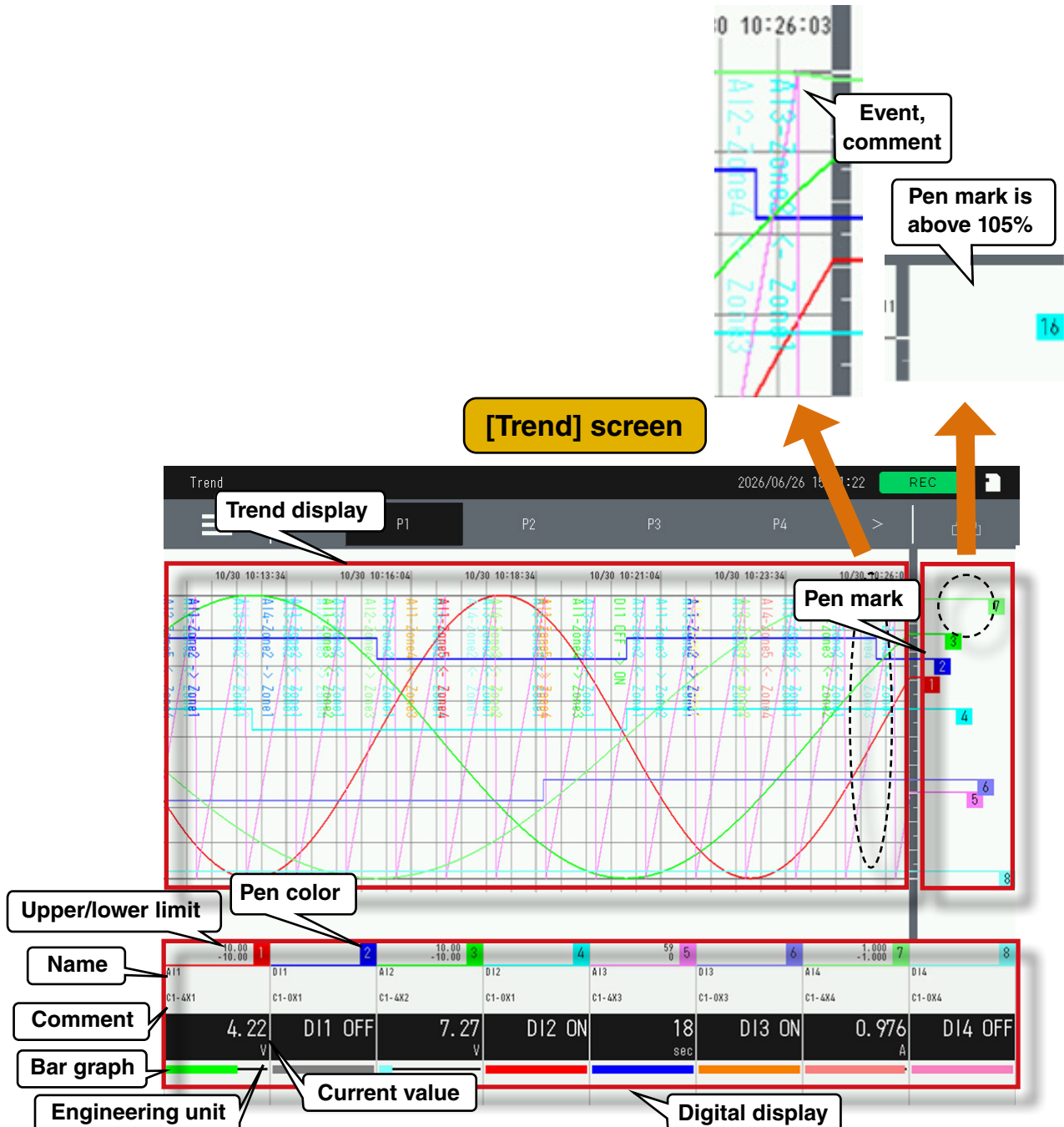
Item	Description	Reference
Screen saver standby time	1 to 10 min. / OFF	3.7.5 Other settings
Conditions for returning from screen saver	- When there is tapping or button operation (even if the screen is locked) - When input is in the area specified as abnormal or when it passes through the area. - When the error icon is displayed - When settings are written from VR288CFG	

4.2.3 Trend screen

4.2.3.1 Trend graph

The latest trend graphs configured in the display settings are displayed per pen/page.

→ 3.7.1 Setting for the number of display



1. [PEN1] to [PEN96] configured in the pen settings are displayed. → 3.5.2 Pen setting
2. Tap page switching button (from [P1]) to switch pages.
3. When the graphs are tapped during recording, triggering or post triggering, the screen switches to historical trend starting from the latest value at the time of tapping.
4. Event/comment data recorded during recording, triggering or post-triggering is displayed on the trend graph.
5. Refer to the table below for each displayed item.

Item	Description	Reference
Name	The name set in the I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI)
Comment	The comment set in the I/O setting is displayed.	OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Pen color	The trend graph is drawn using the color set in the trend setting and pen setting.	3.5.2 Pen setting
Current value	Analog Input (AI): Displays with actual values. Discrete Input (DI): Displays the current state with display comment (ON) and display comment (OFF). Operational Input (OI): Displays the operation result. Discrete Output (DO): Displays the current state with display comment (ON) and display comment (OFF).	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Engineering unit	The engineering unit set in the I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) OI: 3.4.3.1 Basic setting (OI)
Upper limit Lower limit	The upper/lower limit is displayed when the source in the trend setting and pen setting is AI or OI. Trend graphs are plotted within the range.	3.5.2 Pen setting
Bar graph	Analog Input (AI): The current value is displayed in the bar graph. The zone color set in the zone setting 1 to 5 is displayed when zone setting is enabled. Pen color is displayed when [Partitions] is disabled. Operational Input (OI): The current zone is displayed. The zone color set in the zone setting 1 to 5 is displayed when zone setting is enabled. Pen color is displayed when [Partitions] is disabled. Discrete Input (DI), Discrete Output (DO): The current status is displayed with ON/OFF colors.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Trend display	Trend graph: The data of the latest 896 samplings is displayed. Event: The latest 48 events are displayed. Comment: The latest 48 comments are displayed.	
Pen mark	When the current value is out of -5 to +105%, the value is displayed without the bar graph. The DI/DO are displayed at equally divided positions in the trend display area.	

[Trend] screen



Analog adjustment dialog

PEN1

☒ % value

☐ Hide graph

☐ Change upper limit

☐ Change lower limit

☐ Clear limit

☐ Reset calibration

OK Cancel

Digital adjustment dialog

PEN2

☒ Hide graph

☐ Reset calibration

OK Cancel

6. Tap the digital display area at the bottom of the trend screen to display the adjustment dialog corresponding to each pen.

The display content differs depending on analog input (AI), operation input (OI) or digital input/output (DI/DO) data.

7. Tap [x] button to close the adjustment dialog.

8. For adjustment items, refer to the following table.

Item	Description	Pen setting source
% value	The display is switched between % value and actual value. This is displayed only when the data type is %. (3.4.1.4 Basic setting (AI))	AI
Hide graph	The trend graph is hidden.	AI, DI, OI, DO
Change upper/lower limit	The upper/lower limit in plotting the trend graph is set.	AI, OI
Clear limit	The upper/lower limit setting is initialized.	AI, OI
Reset calibration	The adjusted values of all pens are initialized.	AI, DI, OI, DO

Item	Description
Cursor	The cursor jumps to the tapped position. The sampling time (hour:minute:second) at the cursor position is displayed. The sampling value is displayed in the digital display area.
Cursor moves to left	The cursor position moves 1 sampling (older) to the left.
Cursor initial position	The cursor position moves to the initial position (the position of the latest data).
Cursor moves to right	The cursor position moves 1 sampling (newer) to the right.
Zoom out / zoom in	The zoom factor is changed. ($\times 1$, $\times 1/2$, $\times 1/5$, $\times 1/10$)
Scroll bar	The display jumps to the tapped position. Touch [<] or [>] button to move the display by 224 samplings.
Digital display	Same as the trend screen. 4.2.3.1 Trend graph
Analog / digital adjustment dialog	
Back	Used to return to the previous screen.

Item	Description	Reference
Event occurrence time	The time when the events occurred is displayed.	
Message	Analog Input (AI): The message set in the event setting is displayed. Discrete Input (DI): The message set in ON and OFF respectively is displayed. Operational input (OI): The message set in the event setting is displayed. Discrete Output (DO): The message set in ON and OFF respectively is displayed.	AI: 3.4.1.6 Event setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.3 Event setting (OI) DO: 3.4.4.4 Basic setting (DO)
Display color	Analog Input (AI): The color set in zone setting 1 to 5 is displayed. Discrete Input (DI): The color set in ON and OFF is displayed. Operational input (OI): The color set in zone setting 1 to 5 is displayed. Discrete Output (DO): The color set in ON and OFF is displayed.	AI: 3.4.1.5 Zone setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) DO: 3.4.4.4 Basic setting (DO)

4.2.5 Comment screen

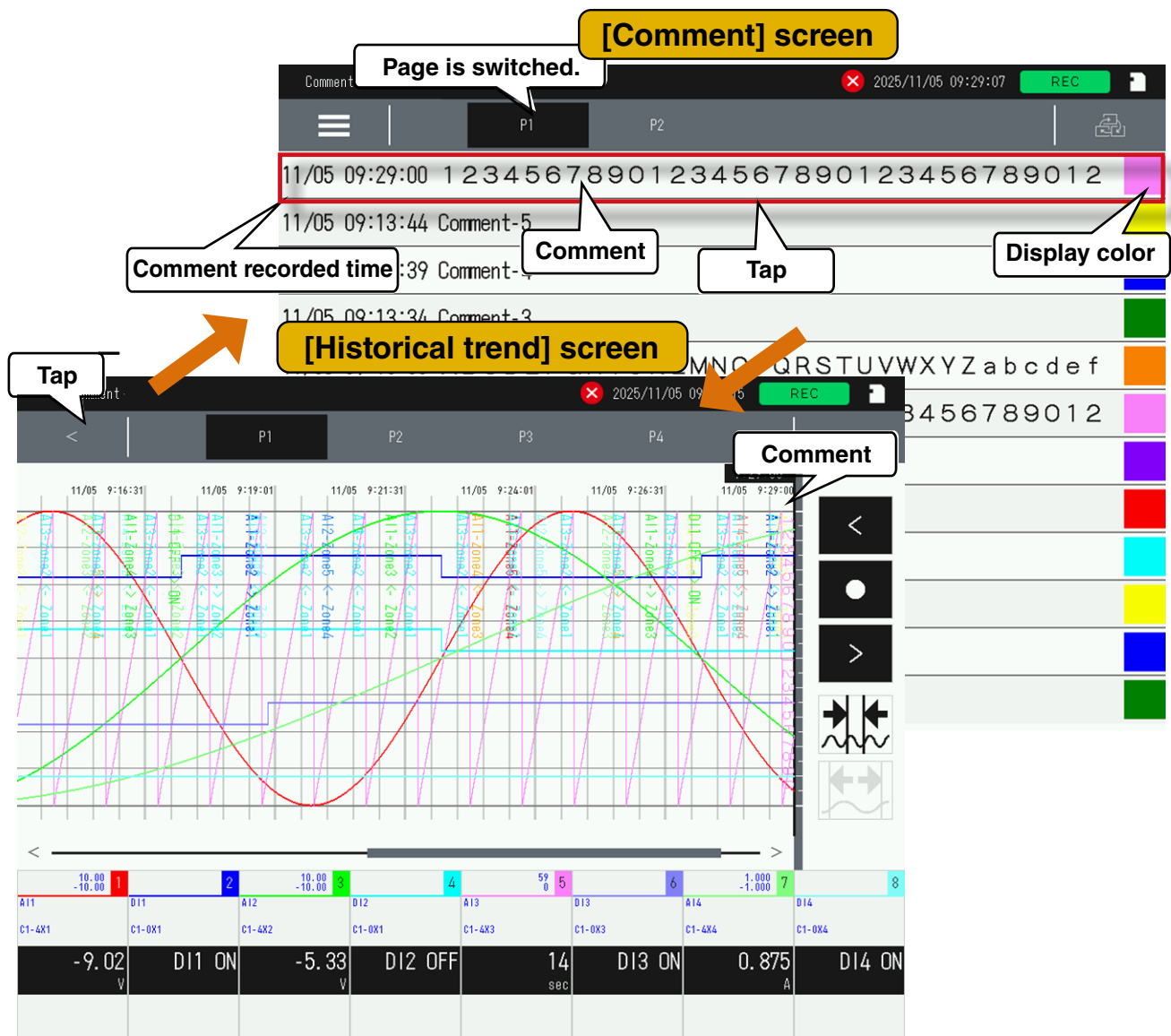
The latest 48 comment data registered in the trend graph is displayed.

The latest comments appear on the top.

When the number of comment data exceeds 48, older data will be deleted.

When a memory block switches to new one, the data in the new memory block is displayed.

→ 6. Recorded data



1. Tap page switching buttons ([P1] to [P4]) to switch pages.
2. When the comments are tapped during recording, triggering or post triggering, historical trend is shown with the tapped comment on the rightmost position of the graph.
3. Tap < button to return to the comment screen.
4. Refer to the table below for displayed items.

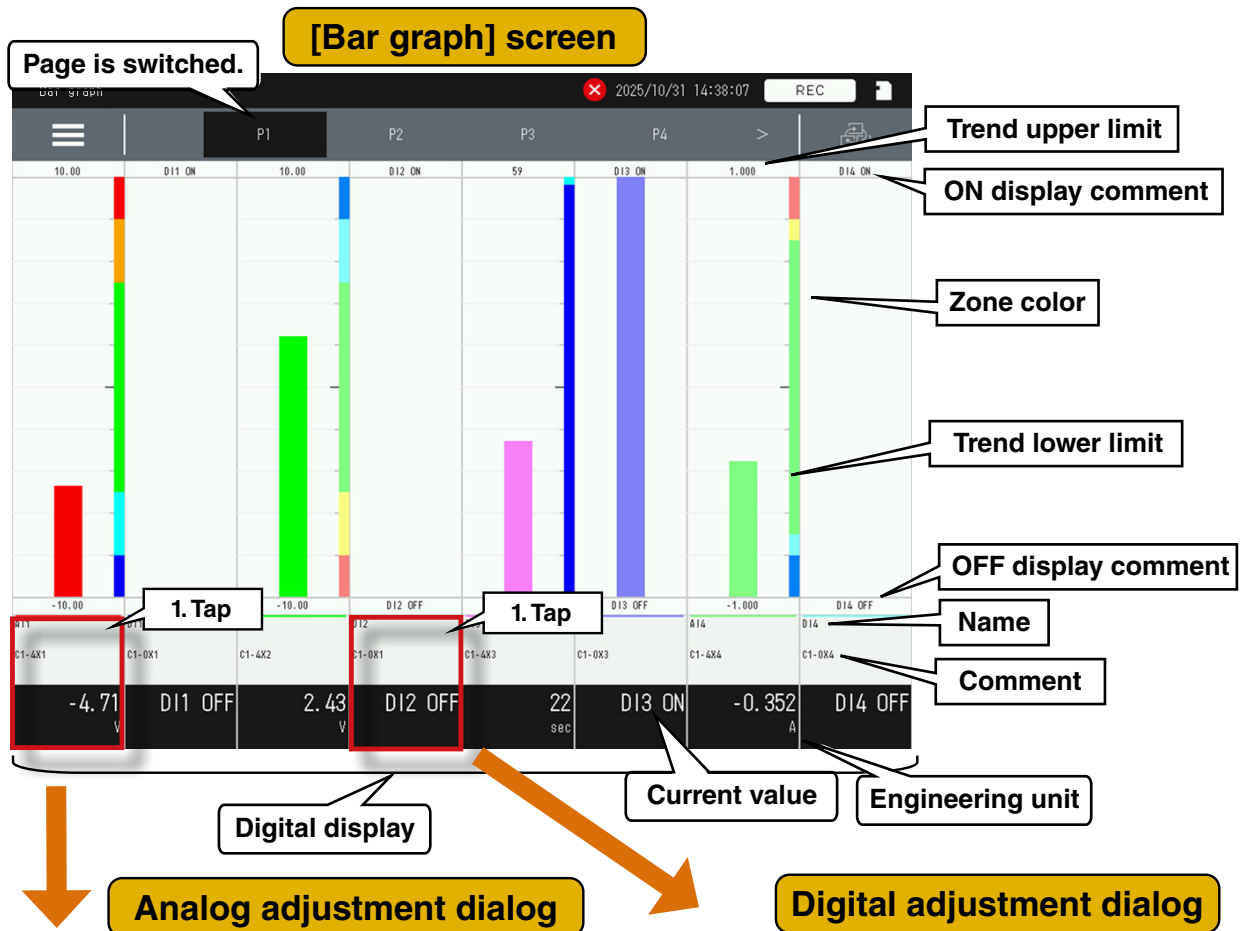
Item	Description	Reference
Comment recorded time	The time when the comments were recorded is displayed.	3.5.3 Comment setting
Comment	The comment set in the trend setting is displayed.	
Display color	The color set in the trend setting is displayed.	

5. Refer to 4.3.3 Trend selection screen for how to record the comment.

4.2.6 Bar graph screen

The latest I/O values are displayed for each pen/page set in the display number setting.

→ 3.7.1 Setting for the number of display



PEN1

- ☒ % value
- ☐ Hide graph
- ☐ Change upper limit
- ☐ Change lower limit
- ☐ Clear limit
- ☐ Reset calibration
- OK **3. Tap**
- Cancel

PEN2

- ☒ Hide graph
- ☐ Reset calibration
- OK **3. Tap**
- Cancel

2. Tap

1. The current values of the number of displayed pens set in the display setting (4 pens/page or 8 pens/page) are displayed in the bar graph.
2. Tap page switching buttons ([P1] etc.) to switch pages.
3. Refer to the table below for displayed items.

Item	Description	Reference
Name	The name set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Current value	The latest I/O values are displayed as numerical value for analog data (AI, OI) and as comment for discrete data (DI, DO).	DI: 3.4.2.4 Basic setting (DI) DO: 3.4.4.4 Basic setting (DO)
Engineering unit	The engineering unit set in I/O setting (AI, OI) is displayed.	AI: 3.4.1.4 Basic setting (AI) OI: 3.4.3.2 Zone setting (OI)
Zone color	The zone color set in I/O setting (AI, OI) is displayed. When [Partitions] is disabled, the zone color is hidden.	
Display color	The bar graph is plotted in the colors set in the pen setting.	3.5.2 Pen setting
Upper/lower limit	When the source for the pen setting is AI or OI, the configured upper/lower limit values are displayed. The trend graph is plotted within the range.	
ON/OFF display comment	When the source for the pen setting is DI or DO, the character strings set in the I/O setting (DI, DO) are displayed.	DI: 3.4.2.4 Basic setting (DI) DO: 3.4.4.4 Basic setting (DO)

4. Tap the digital display area at the bottom of the bar graph screen to display the adjustment dialog corresponding to each pen.

The display content differs depending on analog input (AI), operation input (OI) or digital input/output (DI/DO) data.

5. Tap [×] button to close the adjustment dialog.
6. For adjustment items, refer to the following table.

Item	Description	Pen setting source
% value	The display is switched between % value and actual value. This is displayed only when the data type is %. (Ai: 3.4.1.4 Basic setting (AI))	AI
Hide graph	The bar graph is hidden.	AI, DI, OI, DO
Change upper/lower limit	The upper/lower limit in plotting the bar graph is set.	AI, OI
Clear limit	The upper/lower limit setting is initialized.	AI, OI
Reset calibration	The adjusted values of all pens are initialized.	AI, DI, OI, DO

4.2.7 Overview screen

The latest data is displayed for each channel/page set in the display number setting.

→ 3.7.1 Setting for the number of display

[Overview] screen

Page is switched.

Tap

Display color

Name

Comment

Analog detail popup

Channel No.

Name

Comment

Current value (actual value)

Engineering unit

Current value (%)

Simple bar graph

Zone name

Digital detail popup

Channel No.

Name

Comment

Display comment

Simple bar graph

P1		P2	
A11 C1-4X1 ABCDEF GHIJ KLMNOP 1234567890123456	A12 C1-4X2 あいうえおかきくけ アイウエオカキクケ	A13 C1-4X3	A14 C1-4X4
A117 C1-4X17	A118 C1-4X18	A119 C1-4X19	A120 C1-4X20
A121 C1-4X21	A122 C1-4X22	A123 C1-4X23	A124 C1-4X24
A125 C1-4X25	A126 C1-4X26	A127 C1-4X27	A128 C1-4X28
A129 C1-4X29	A130 C1-4X30	A131 C1-4X31	A132 C1-4X32
A133 C1-4X33	A134 C1-4X34	A135 C1-4X35	A136 C1-4X36
A137 C1-4X37	A138 C1-4X38	A139 C1-4X39	A140 C1-4X40
A141 C1-4X41	A142 C1-4X42	A143 C1-4X43	A144 C1-4X44
A145 C1-4X45	A146 C1-4X46	A147 C1-4X47	A148 C1-4X48
A149 C1-4X49	A150 C1-4X50	A151 C1-4X51	A152 C1-4X52
A153 C1-4X53	A154 C1-4X54	A155 C1-4X55	A156 C1-4X56
A157 C1-4X57	A158 C1-4X58	A159 C1-4X59	A160 C1-4X60
A161 C1-4X61	A162 C1-4X62	A163 C1-4X63	A164 C1-4X64
A165 C1-4X65	A166 C1-4X66	A167 C1-4X67	A168 C1-4X68
A169 C1-4X69	A170 C1-4X70	A171 C1-4X71	A172 C1-4X72
A173 C1-4X73	A174 C1-4X74	A175 C1-4X75	A176 C1-4X76
A177 C1-4X77	A178 C1-4X78	A179 C1-4X79	A180 C1-4X80
A181 C1-4X81	A182 C1-4X82	A183 C1-4X83	A184 C1-4X84
A185 C1-4X85	A186 C1-4X86	A187 C1-4X87	A188 C1-4X88
A189 C1-4X89	A190 C1-4X90	A191 C1-4X91	A192 C1-4X92

Analog detail popup

Channel No. A12

Name C1-4X2

Comment

Current value (actual value) 3.81 V

Engineering unit

Current value (%) 30.94%

Simple bar graph

Zone name A12-Zone3

Digital detail popup

Channel No. D12

Name D12

Comment C1-0X1

Display comment D12 OFF

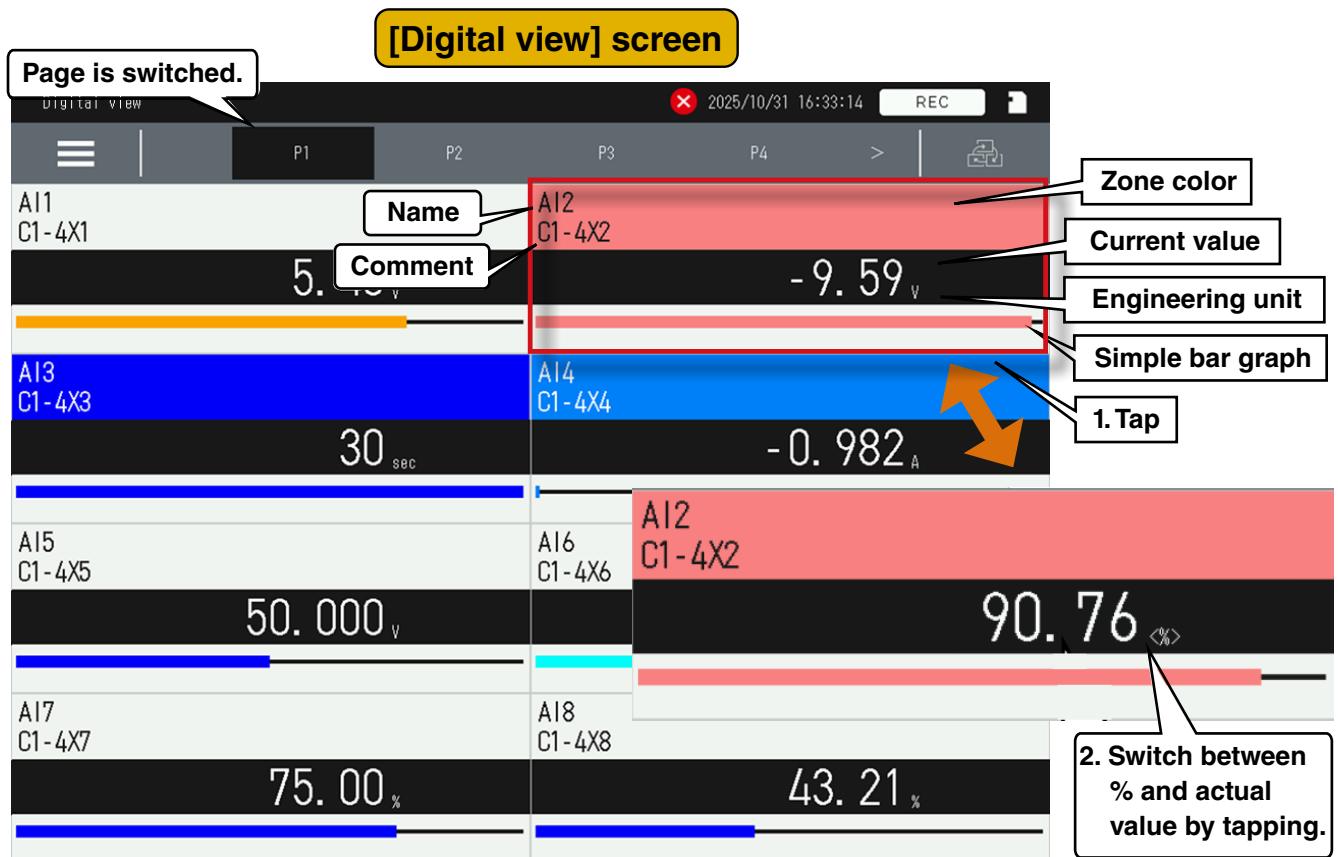
Simple bar graph

1. Tap page switching buttons ([P1] etc.) to switch pages.
2. Tap a channel to open a detail popup.
3. Tap [X] button to close the detail popup.
4. Refer to the table below for displayed items.
5. When [Flicker] is enabled and the zone is specified as abnormal, the display will be in flicker mode with the zone color. → 3.7.3 Digital view setting

Item	Description	Reference
Name	The name set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Comment	The comment set in I/O setting is displayed.	
Current value	Analog Input (AI): The actual value is displayed. Only when the data type is %, the % value is displayed. Discrete Input (DI): The current status is displayed by ON or OFF. Operational Input (OI): The operation result is displayed. Discrete Output (DO): The current status is displayed by ON or OFF.	
Engineering unit	The engineering unit set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) OI: 3.4.3.1 Basic setting (OI)
Zone name	The zone name set in the zone setting 1 to 5 is displayed when AI or OI zone setting is enabled.	AI: 3.4.1.5 Zone setting (AI) OI: 3.4.3.2 Zone setting (OI)
Simple bar graph	Input values and ON/OFF status are displayed in a simple bar graph. The color of simple bar graph is displayed according to the following settings. Analog Input (AI): When the zone setting is enabled, the color set in zone settings 1 to 5 is displayed. When the data type is % and [Partitions] is disabled, the bar graph is displayed in blue. Discrete Input (DI): The color set in ON and OFF is displayed. Operational Input (OI): When the zone setting is enabled, the color set in zone settings 1 to 5 is displayed. Discrete Output (DO): The color set in ON and OFF is displayed.	AI: 3.4.1.5 Zone setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) DO: 3.4.4.4 Basic setting (DO)
Color	Analog Input (AI): The color set in zone setting 1 to 5 is displayed. When [Partitions] is disabled, the color does not change. Discrete Input (DI): The color set in ON and OFF is displayed. Operational Input (OI): The color set in zone setting 1 to 5 is displayed. When [Partitions] is disabled, the color does not change. Discrete Output (DO): The color set in ON and OFF is displayed.	

4.2.8 Digital view screen

The latest data of channels are displayed per 8 channels.

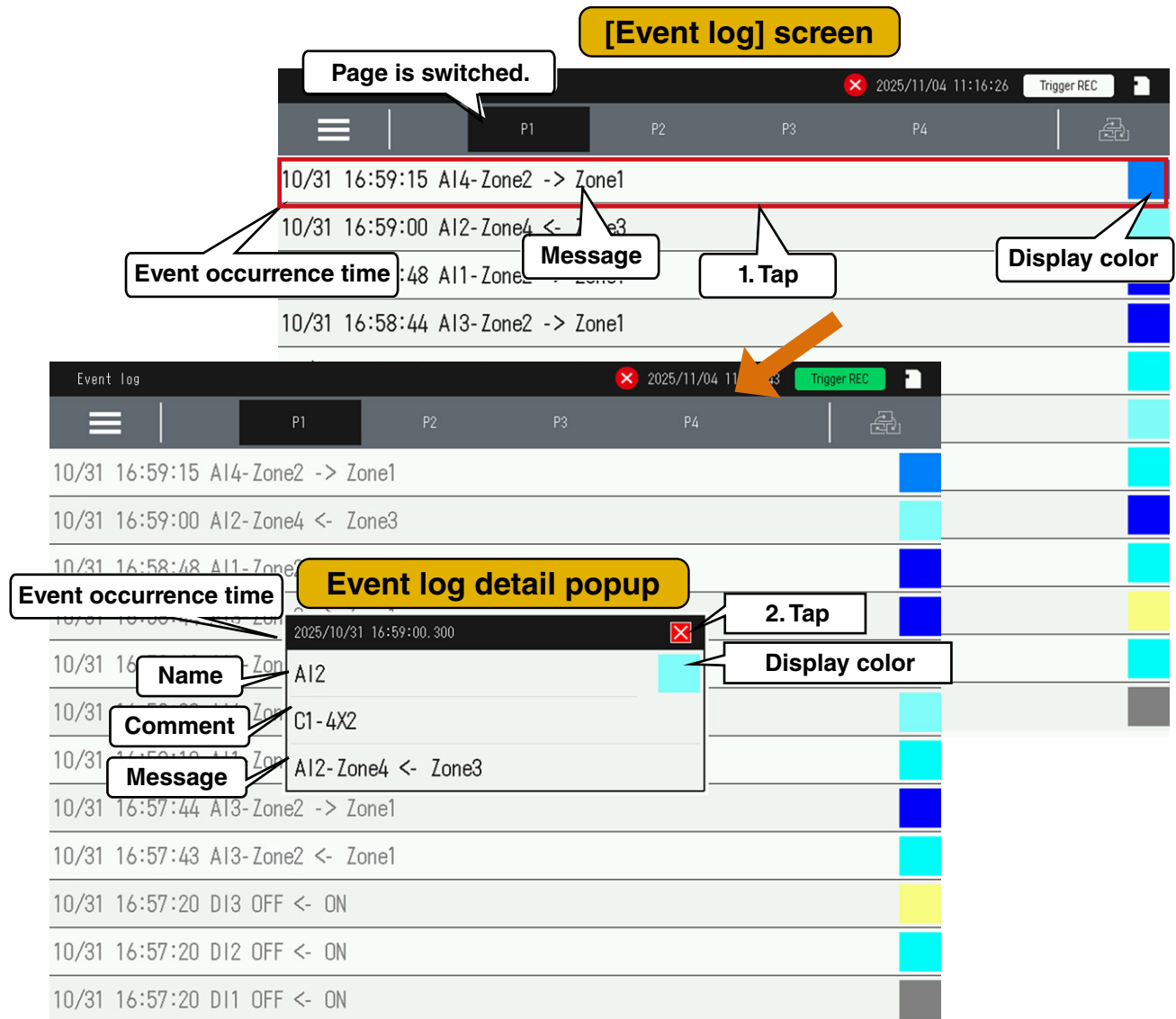


1. Tap page switching buttons ([P1] to [P24]) to switch pages.
The channels switch in the order of AI, DI, OI, DO from the smaller number.
2. Tap an AI channel area to switch between % and actual value.
3. When [Flicker] is enabled and the zone is specified as abnormal, the display will be in flicker mode with the zone color. → 3.7.3 Digital view setting
4. Refer to the table below for displayed items.

Item	Description	Reference
Name	The name set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Comment	The comment set in I/O setting is displayed.	
Current value	Analog Input (AI): The actual value is displayed. Only when the data type is %, % value and actual value are switched by tapping. Discrete Input (DI): The current status is displayed by ON or OFF. Operational input (OI): The operation result is displayed. Discrete Output (DO): The current status is displayed by ON or OFF.	
Engineering unit	The engineering unit set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) OI: 3.4.3.1 Basic setting (OI)
Simple bar graph	Input values and ON/OFF status are displayed in a simple bar graph. The color of simple bar graph is displayed according to the following settings. Analog Input (AI): When the zone setting is enabled, the color set in zone settings 1 to 5 is displayed. When the data type is % and [Partitions] is disabled, the bar graph is displayed in blue. Discrete Input (DI): The color set in ON and OFF is displayed. Operational Input (OI): When the zone setting is enabled, the color set in zone settings 1 to 5 is displayed. Discrete Output (DO): The color set in ON and OFF is displayed.	AI: 3.4.1.5 Zone setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) DO: 3.4.4.4 Basic setting (DO)
Zone color	The flicker color is displayed by the following settings. Analog Input (AI): The color set in zone setting 1 to 5 is displayed. When [Partitions] is disabled, the color does not change. Discrete Input (DI): The color set in ON and OFF is displayed. Operational input (OI): The color set in zone setting 1 to 5 is displayed. When [Partitions] is disabled, the color does not change. Discrete Output (DO): The color set in ON and OFF is displayed.	Flicker: 3.7.3 Digital view setting AI: 3.4.1.5 Zone setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) DO: 3.4.4.4 Basic setting (DO)

4.2.9 Event log screen

Regardless of whether event log recording is enabled or disabled, the latest 48 event logs are displayed. When the number of event logs exceeds 48, older data will be deleted.



1. Tap page switching buttons ([P1] to [P4]) to switch pages.
2. Tap an event to display the details of the selected event.
Tap [x] button to close the detail popup.
3. Refer to the table below for displayed items.

Displayed item	Description	Reference
Name Comment	The name and comment set in I/O setting is displayed.	AI: 3.4.1.4 Basic setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.1 Basic setting (OI) DO: 3.4.4.4 Basic setting (DO)
Message	Analog Input (AI): The message set in the event setting is displayed. Discrete Input (DI): The message set in ON and OFF is displayed. Operational input (OI): The message set in the event setting is displayed. Discrete Output (DO): The message set in ON and OFF is displayed.	AI: 3.4.1.6 Event setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.3 Event setting (OI) DO: 3.4.4.4 Basic setting (DO)
Color	Analog Input (AI): The color set in zone setting 1 to 5 is displayed. Discrete Input (DI): The color set in ON and OFF is displayed. Operational input (OI): The color set in zone setting 1 to 5 is displayed. Discrete Output (DO): The color set in ON and OFF is displayed.	AI: 3.4.1.5 Zone setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) DO: 3.4.4.4 Basic setting (DO)

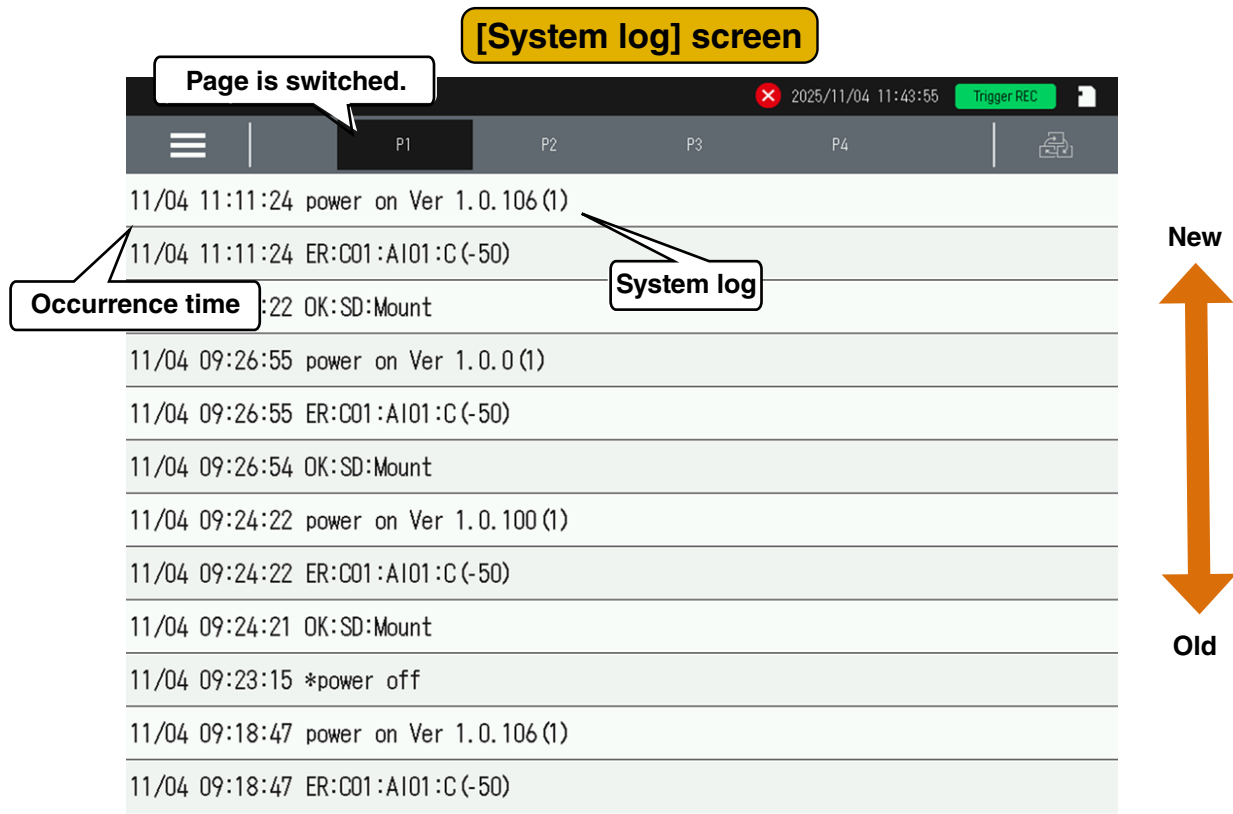
4.2.10 System log screen

Regardless of whether system log recording is enabled or disabled, the latest 48 system logs are displayed. The latest ones appear on the top.

When the number of system logs exceeds 48, older data will be deleted.

For the log details, refer to 5.1.3 System log.

Tap page switching buttons ([P1] to [P4]) to switch pages.



4.2.11 Communication log screen

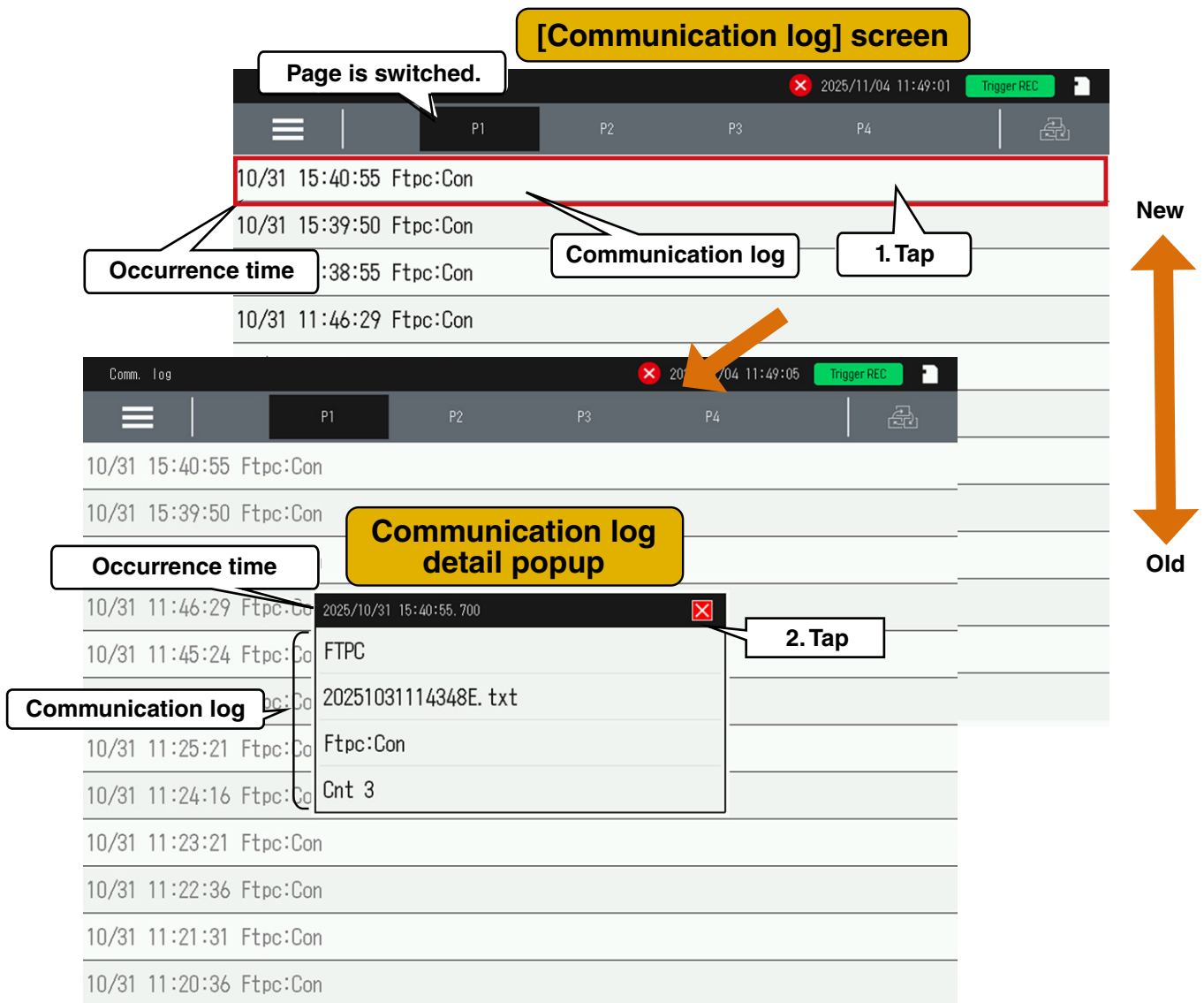
Regardless of whether communication log recording is enabled or disabled, the latest 48 logs about SNMP, e-mail reporting, success/failure of FTP client are displayed.

When the number of communication logs exceeds 48, older data will be deleted.

Tap a log to display the details of the selected communication log. Tap [×] button to close the detail popup.

For the log details, refer to 5.1.4 Communication log.

Tap page switching buttons ([P1] to [P4]) to switch pages.



4.2.12 Graphic panel

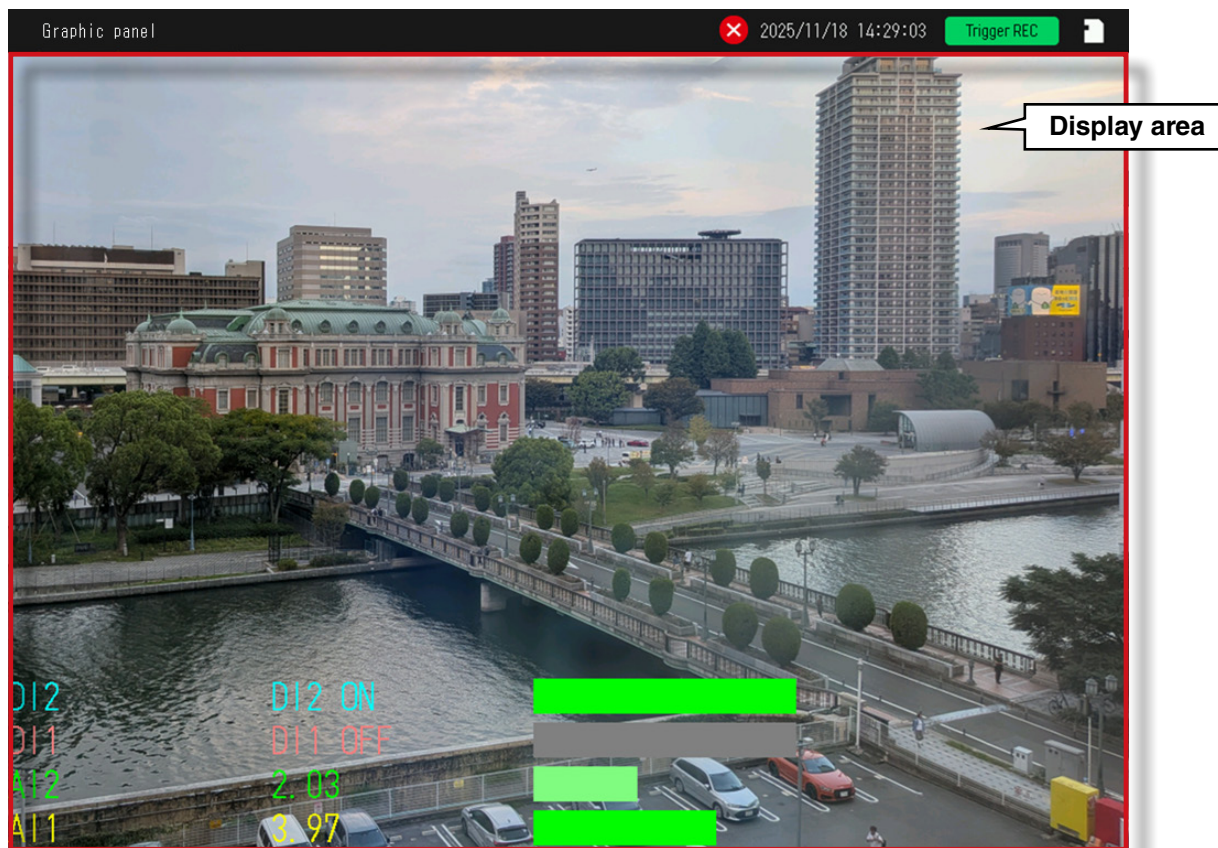
The screen configured in the graphic panel of VR288CFG is displayed.

The configured screen is displayed in the following area.

Click MENU button to transition from the graphic panel to another screen. → 4.1 Component identification

For screen display settings, refer to 3.9 Graphic panel.

[Graphic panel]



4.3 Configuration of the menu screen

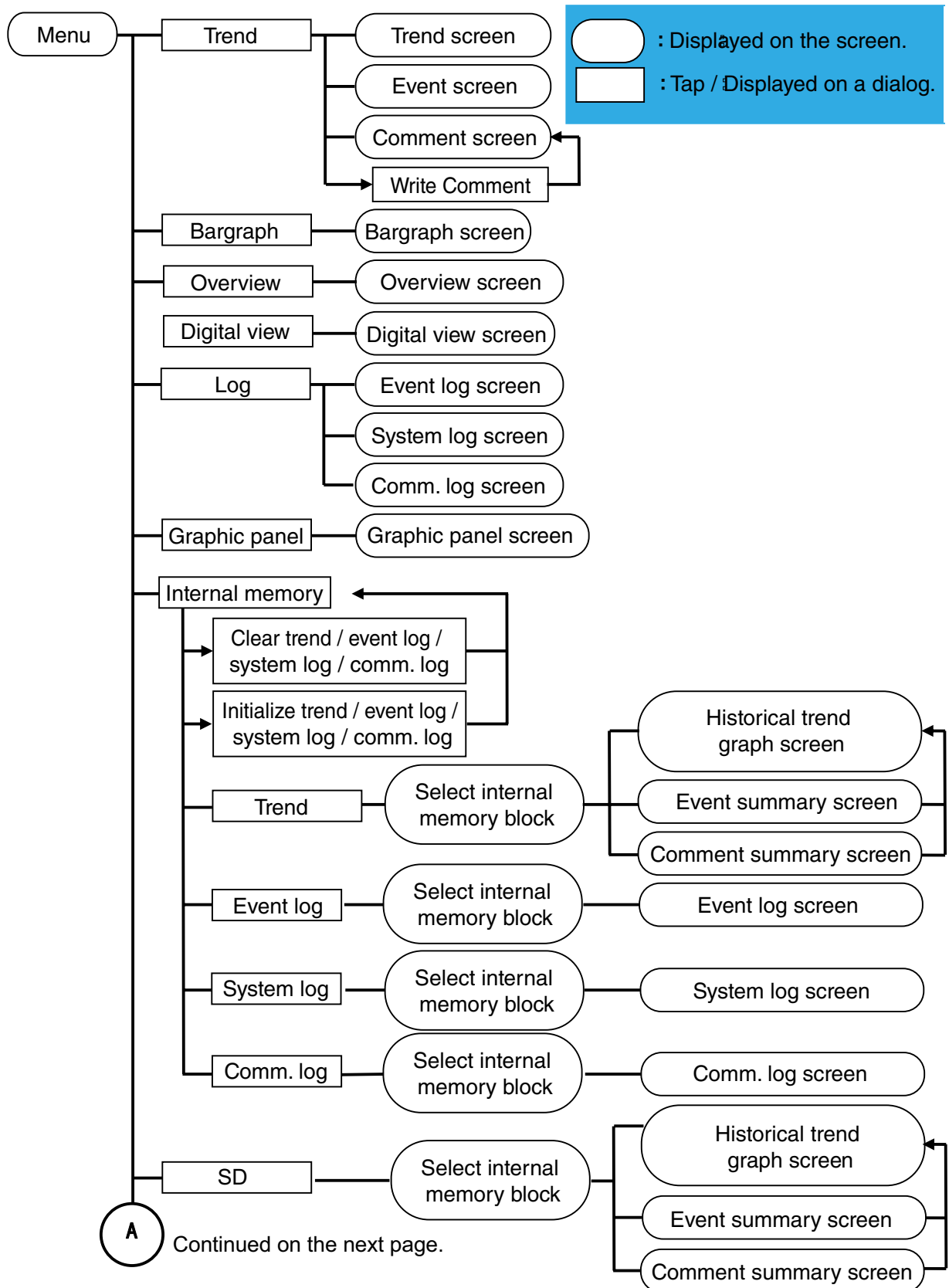
Tap [≡] button at the top left of the screen to open the menu.



4.3.1 Menu configuration and structure

Tap a primary item to display secondary / tertiary items.

Refer to the following diagram and table for the menu configuration and structure.



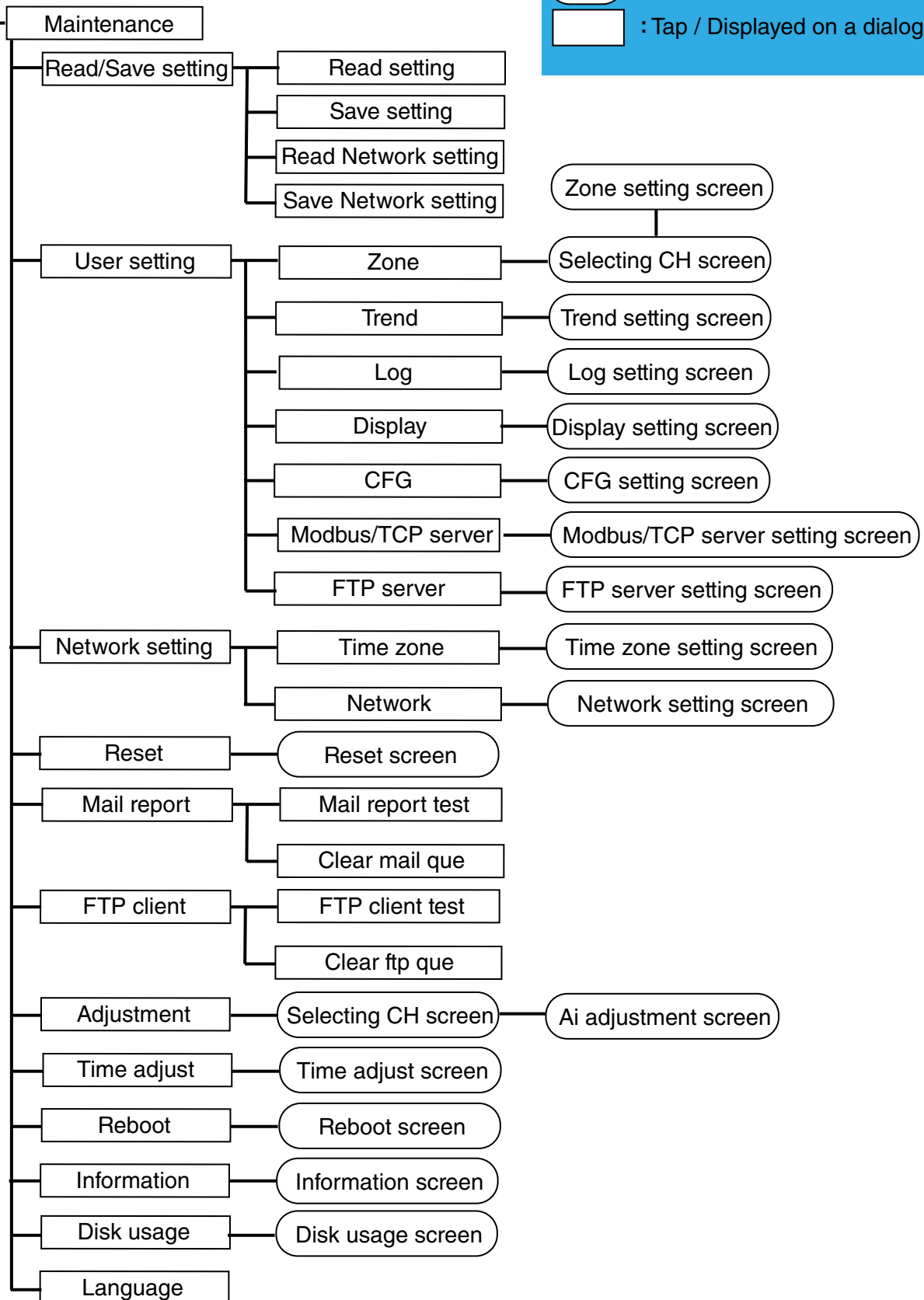
A

Continued on the next page.

A

Continued from the previous page.

 : Displayed on the screen.
 : Tap / Displayed on a dialog.

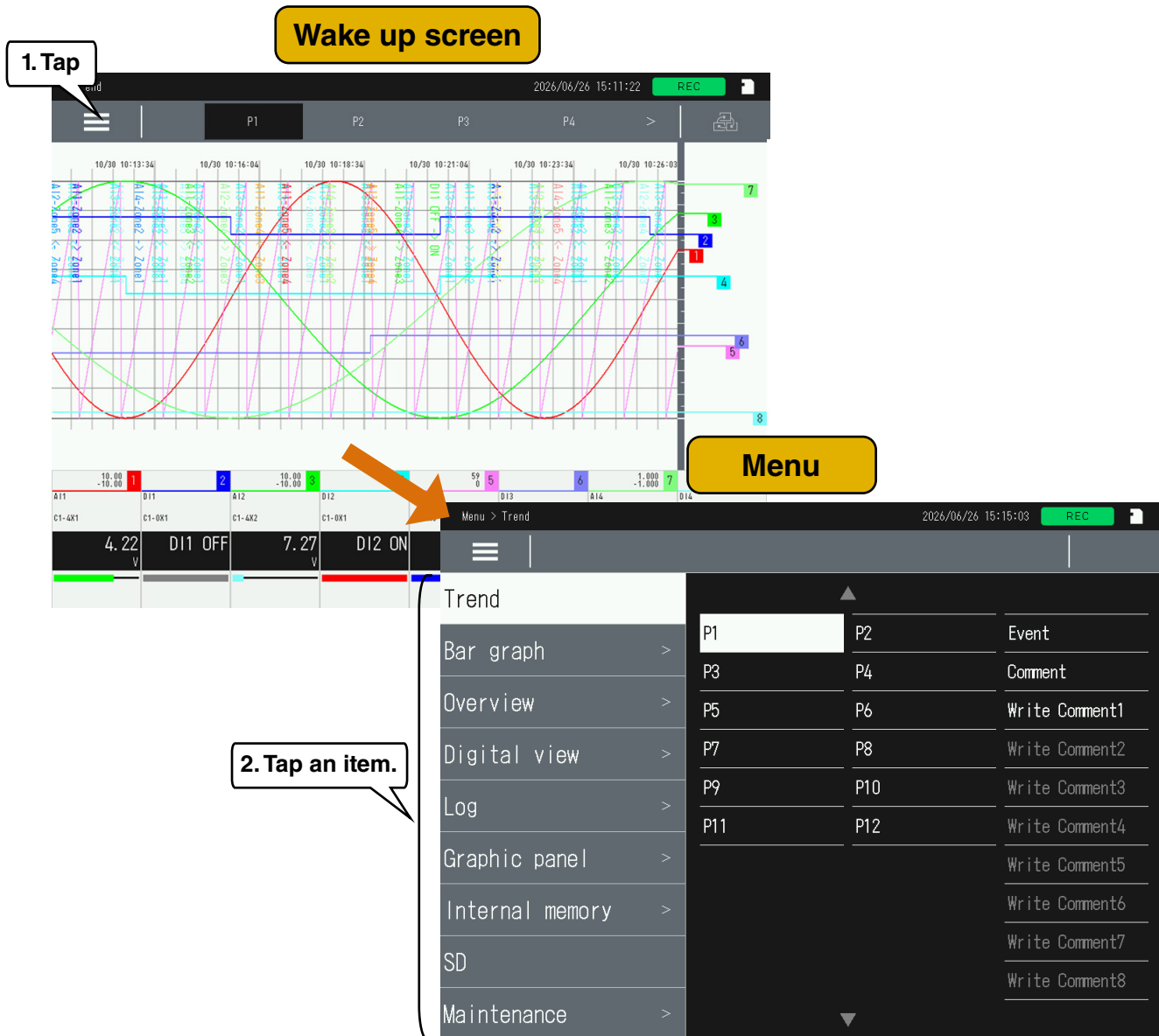


Item	Sub item	Explanation	Reference
Trend	P1 to P12, P24	The screen moves to trend graph screen.	4.3.3 Trend selection screen
	Event	The screen moves to event screen.	
	Comment	The screen moves to comment screen.	
	Write Comment 1 to 8	The screen moves to comment screen after registering comments.	
Bar graph	P1 to P12, P24	The screen moves to bar graph screen.	4.3.4 Bar graph selection screen
Overview	P1 to P6, P1 to P3 P1 to P2, P1	The screen moves to overview screen.	4.3.5 Overview selection screen
Digital view	P1 to P24	The screen moves to digital view screen.	4.3.6 Digital view selection screen
Log	Event log	The screen moves to event log screen. (The latest 48 logs are displayed.)	4.3.7 Log selection screen
	System log	The screen moves to system log screen. (The latest 48 logs are displayed.)	
	Comm. log	The screen moves to comm. log screen. (The latest 48 logs are displayed.)	
Graphic panel	P1, P2, P3, P4	The screen moves to graphic panel.	4.3.8 Graphic panel
Internal memory	Trend	Trend in the internal memory is displayed.	4.3.9 Internal memory
	Event log	Event logs in the internal memory are displayed.	
	System log	System logs in the internal memory are displayed.	
	Comm. log	Comm. logs in the internal memory are displayed.	
	Clear trend	Memory block transfers to new memory block.	
	Initialize trend	Memory block is initialized. (Data in the memory block is deleted.)	
	Clear event logs	Memory block transfers to new memory block.	
	Initialize event logs	Memory block is initialized. (Data in the memory block is deleted.)	
	Clear system logs	Memory block transfers to new memory block.	
	Initialize system logs	Memory block is initialized. (Data in the memory block is deleted.)	
	Clear comm. logs	Memory block transfers to new memory block.	
	Initialize comm. logs	Memory block is initialized. (Data in the memory block is deleted.)	
SD	—	The screen moves to SD card file selection screen.	4.3.10 SD card

Primary item	Secondary item	Tertiary item	Explanation	Reference
Maintenance	Read/Save setting	Read setting Save setting Read Network setting Save Network setting	User setting and network setting in the SD card are read/saved.	4.3.11.4 Reading/saving setting
	User setting	Zone Trend, Log, Display CFG Modbus/TCP server FTP server	Each setting is configured.	4.3.11.5 User setting
	Network setting	Time zone Network	Time zone, DHCP, IP address, subnet mask, default gateway and DNS can be set.	4.3.11.6 Network setting
	Reset	—	Operational input (OI) is reset.	4.3.11.7 Reset
	Mail report	Mail report Clear mail que	E-mail reporting test and clearing e-mail queue are performed.	4.3.11.8 E-mail report
	FTP client	FTP client test Clear ftp que	FTP client test and clearing FTP queue are performed.	4.3.11.9 FTP client
	Adjustment	—	The screen moves to adjustment screen for analog input.	4.3.11.10 Ai adjustment
	Time adjust	—	The screen moves to time adjustment screen.	4.3.11.11 Time adjust
	Reboot	—	The screen moves to reboot screen.	4.3.11.12 Reboot
	FW update	—	The screen moves to firmware updating screen.	4.3.11.13 FW update
	Information	—	The screen moves to device information screen.	4.3.11.14 Information
	Disk usage	—	The screen moves to the screen showing the usage state of the SD card.	4.3.11.15 Disk usage
	Language	—	Language can be selected from Japanese or English.	4.3.11.16 Language

4.3.2 Common area for each screen

The common area for each screen is as follows.



4.3.2.1 Move

Tap [≡] button at the top left of the screen to open the menu.

4.3.2.2 Select

Tap an item on the menu. Tap [>] button to display secondary / tertiary items.

Tap ▲ and ▼ buttons to move upward or downward.

4.3.2.3 Confirm

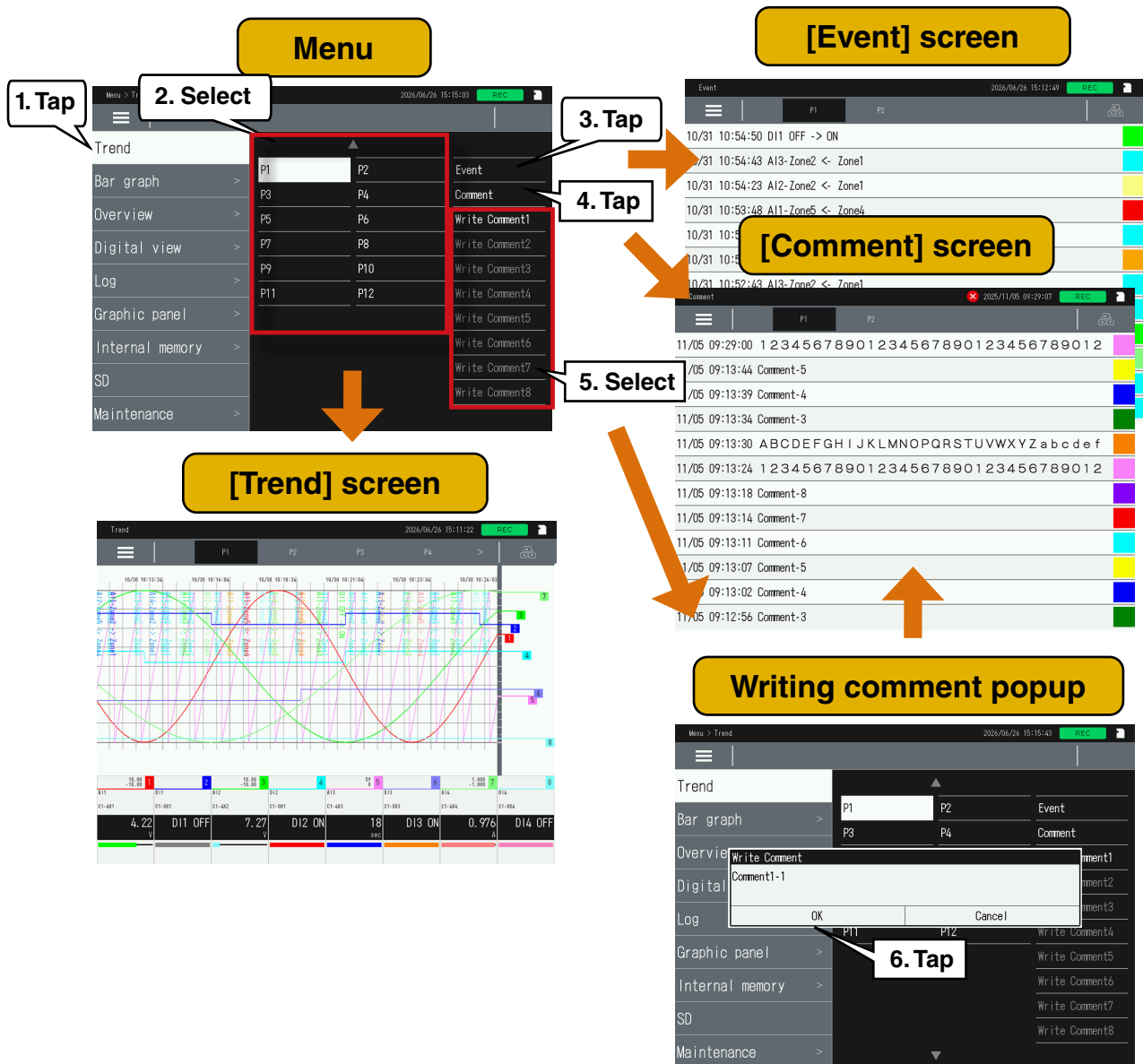
Select a tertiary item or secondary item.

4.3.2.4 Cancel

Tap [≡] button at the top left of the screen to return to the previous screen.

4.3.3 Trend selection screen

Select the trend screen. The selected trend screen is displayed.
It is also possible to write comments.



1. Tap [Trend] on the menu screen.
2. Tap the screen to be displayed. ([P1] to [P12], [P24] Event or Comment)
The selected screen appears.
→ 4.2.3 Trend screen, 4.2.4 Event screen, 4.2.5 Comment screen
3. When writing comments, select from [Write Comment 1] to [Write Comment 8].
The writing comment popup appears.
4. Comments are written in the trend at the moment of tapping [OK] button on the popup.
The comment screen appears. → 3.5.3 Comment setting
5. When the graphs are tapped during recording, triggering or post triggering, the screen switches to historical trend starting from the latest value at the time of tapping. → 4.2.3.2 Historical trend

4.3.4 Bar graph selection screen

Select the bar graph screen. The selected bar graph screen is displayed.



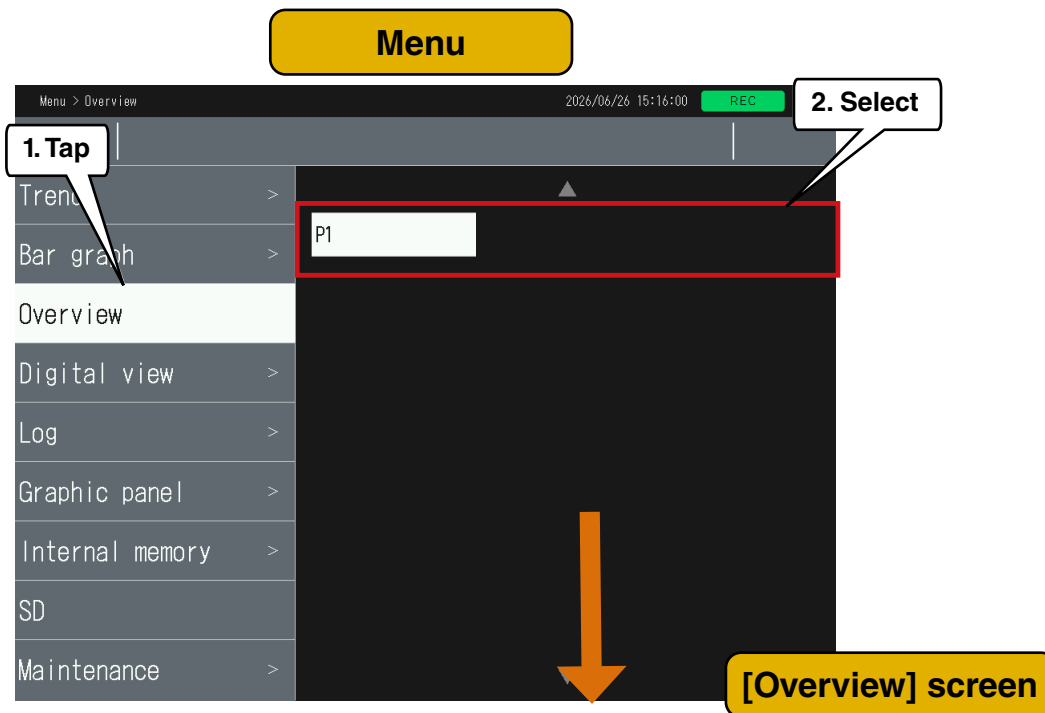
1. Tap [Bar graph] on the menu screen.
2. Tap the screen to be displayed. ([P1] to [P12], [P24]) The selected screen appears.
→ 4.2.6 Bar graph screen

4.3.5 Overview selection screen

The latest data of channels are displayed.

The number of displayed channels per screen can be selected from 32, 64, 96 or 128.

→ 3.7.1 Setting for the number of display



Overview							
2025/10/31 11:36:00 REC							
P1		P2					
A11 C1-4X1	A12 C1-4X2	A13 C1-4X3	A14 C1-4X4	A15 C1-4X5	A16 C1-4X6	A17 C1-4X7	A18 C1-4X8
ABCDEFGHIJKLMNO PQRSTUVWXYZ	あいうえおかきくけ こアイウエオカキクケ クアイウエオカキクケ	A111 C1-4X11	A112 C1-4X12	A113 C1-4X13	A114 C1-4X14	A115 C1-4X15	A116 C1-4X16
A117 C1-4X17	A118 C1-4X18	A119 C1-4X19	A120 C1-4X20	A121 C1-4X21	A122 C1-4X22	A123 C1-4X23	A124 C1-4X24
A125 C1-4X25	A126 C1-4X26	A127 C1-4X27	A128 C1-4X28	A129 C1-4X29	A130 C1-4X30	A131 C1-4X31	A132 C1-4X32
A133 C1-4X33	A134 C1-4X34	A135 C1-4X35	A136 C1-4X36	A137 C1-4X37	A138 C1-4X38	A139 C1-4X39	A140 C1-4X40
A141 C1-4X41	A142 C1-4X42	A143 C1-4X43	A144 C1-4X44	A145 C1-4X45	A146 C1-4X46	A147 C1-4X47	A148 C1-4X48
A149 C1-4X49	A150 C1-4X50	A151 C1-4X51	A152 C1-4X52	A153 C1-4X53	A154 C1-4X54	A155 C1-4X55	A156 C1-4X56
A157 C1-4X57	A158 C1-4X58	A159 C1-4X59	A160 C1-4X60	A161 C1-4X61	A162 C1-4X62	A163 C1-4X63	A164 C1-4X64
A165 C1-4X65	A166 C1-4X66	A167 C1-4X67	A168 C1-4X68	A169 C1-4X69	A170 C1-4X70	A171 C1-4X71	A172 C1-4X72
A173 C1-4X73	A174 C1-4X74	A175 C1-4X75	A176 C1-4X76	A177 C1-4X77	A178 C1-4X78	A179 C1-4X79	A180 C1-4X80
A181 C1-4X81	A182 C1-4X82	A183 C1-4X83	A184 C1-4X84	A185 C1-4X85	A186 C1-4X86	A187 C1-4X87	A188 C1-4X88
A189 C1-4X89	A190 C1-4X90	A191 C1-4X91	A192 C1-4X92	A193 C1-4X93	A194 C1-4X94	A195 C1-4X95	A196 C1-4X96

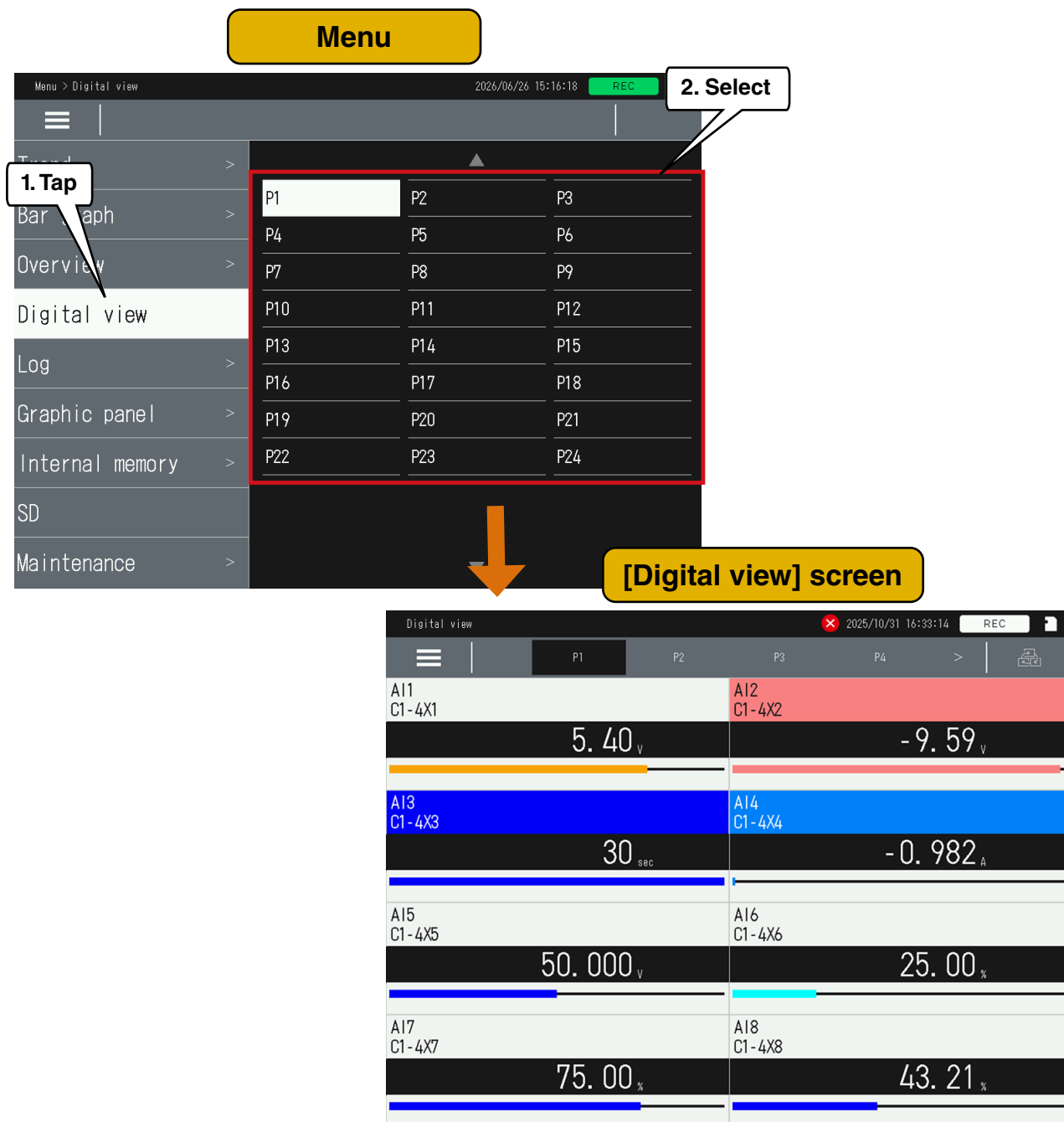
1. Tap [Overview] on the menu screen.

2. Tap the screen to be displayed ([P1] to [P6], [P3], [P2], [P1]). The selected screen appears.

→ 4.2.7 Overview screen

4.3.6 Digital view selection screen

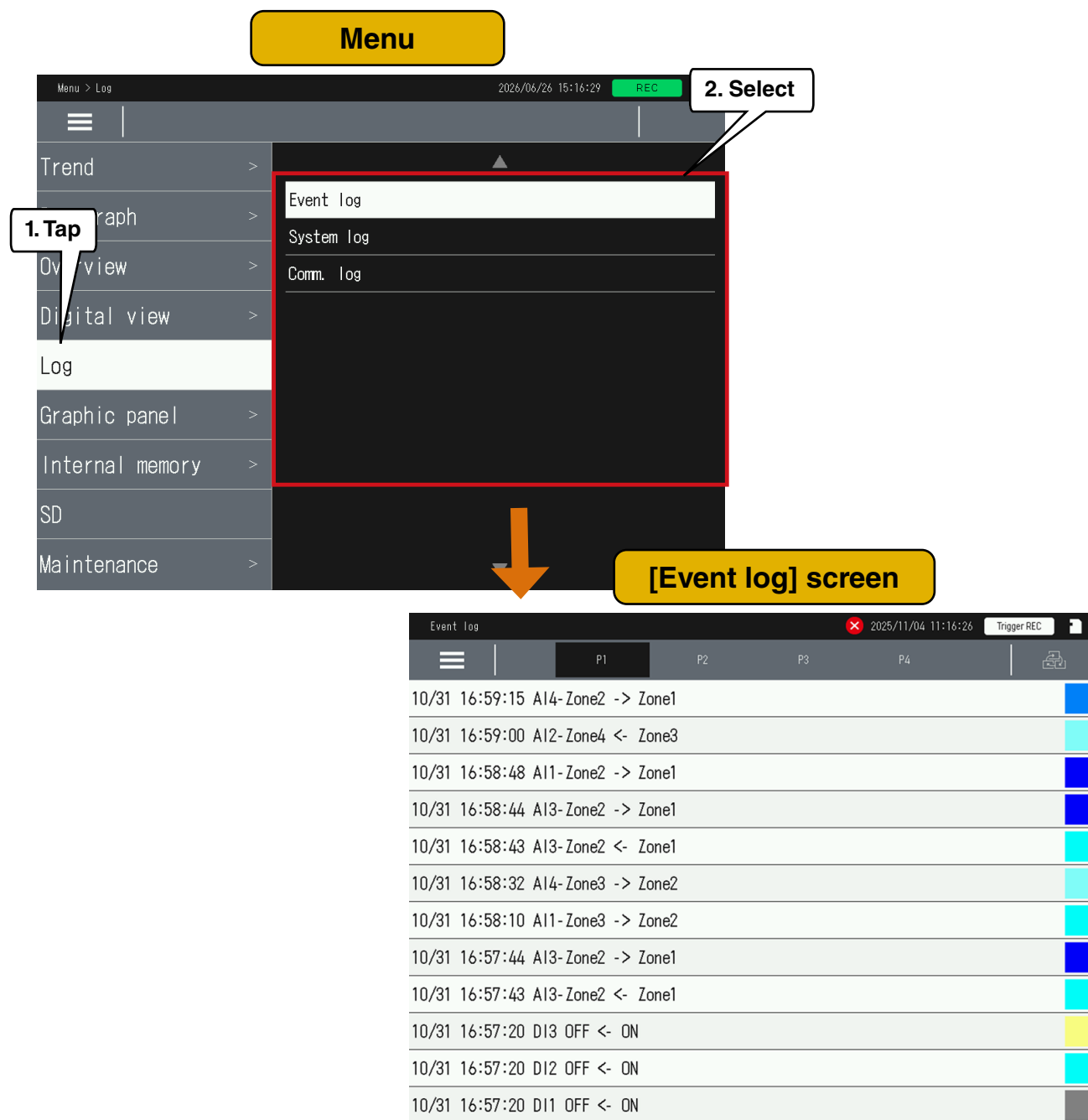
The latest data of channels are displayed.



1. Tap [Digital view] on the menu screen.
2. Tap a page from [P1] to [P24]. The digital view screen of the selected channel appears.
→ 4.2.8 Digital view screen

4.3.7 Log selection screen

Regardless of whether event log recording is enabled or disabled, the latest 48 logs are displayed.
When the number of logs exceeds 48, older data will be deleted.



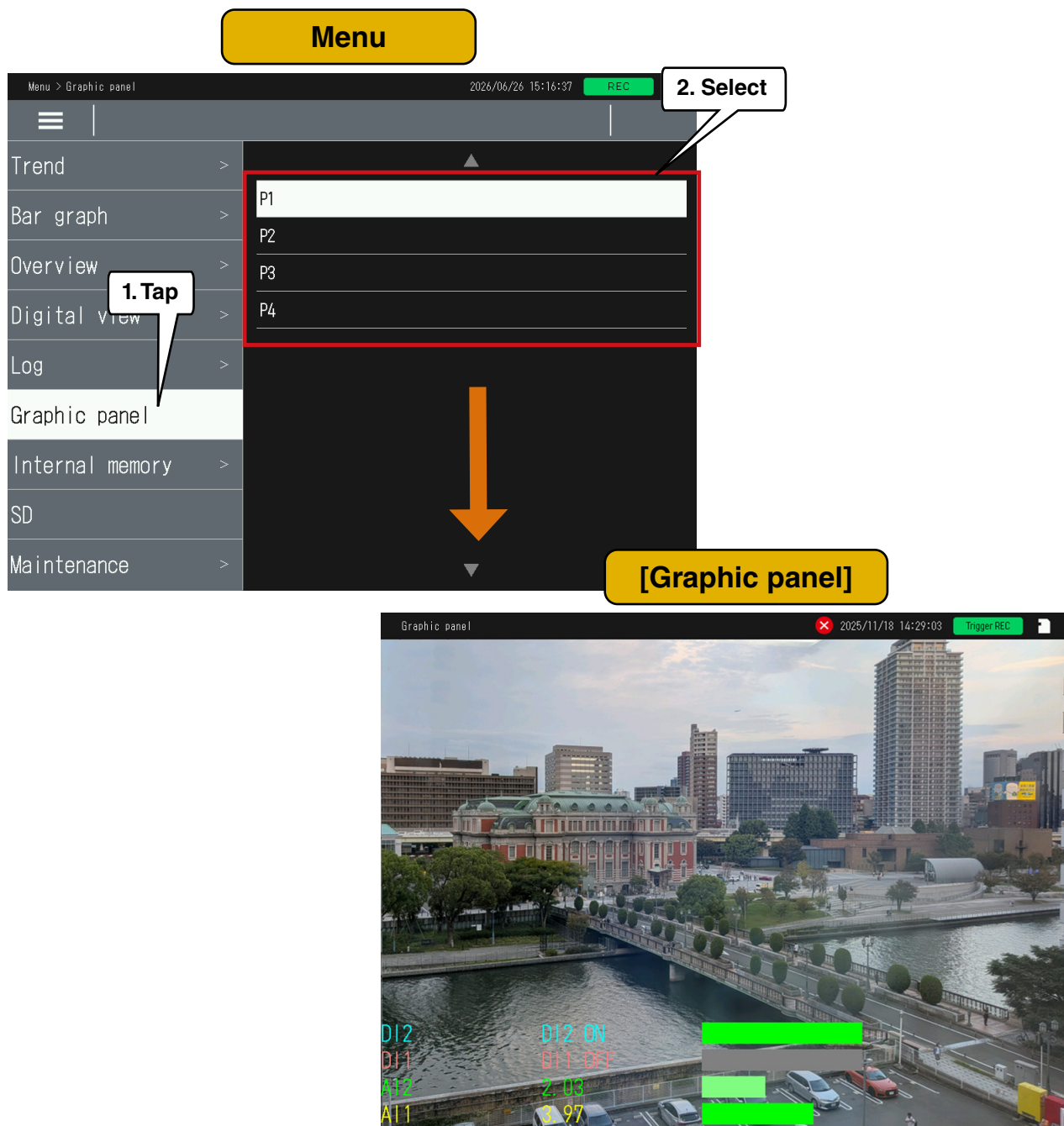
1. Tap [Log] on the menu screen.

2. Tap a log to be viewed ([Event log], [System log] or [Comm. log]).

→ 4.2.9 Event log screen, 4.2.10 System log screen, 4.2.11 Communication log screen

4.3.8 Graphic panel

A screen created by combining a background and parts is displayed.



1. Tap [Graphic panel] on the menu screen.
2. Tap from [P1] to [P4] to display the graphic panel. → 4.2.12 Graphic panel
3. Press [MENU] button to return to the menu screen. → 4.1 Component identification

4.3.9 Internal memory

The following operations are possible by the memory block recorded in internal memory:

Displaying/deleting trend data and log data, transferring the data to SD card, transferring memory block to new one, clearing trend data and log data, initializing trend data and log data.

4.3.9.1 Trend

Follow the procedure below in order to display the trend data in the internal memory.

1. Tap [Internal memory] on the menu screen. Tap [Trend].

2. The list of the internal memory is displayed. Select [Memory block].

Move upward and downward by tapping ▲ and ▼ buttons.

After the memory block number, the date and time when trend data recording to internal memory started (month/day hour:minute:second) and the number of recordings (trend sampling/event summary/comment summary) are displayed.

Example: "11/20 15:00 1000/20/5" means that recording started on November 20 at 15:00, with 1000 trend records, 20 event records, and 5 comment records.

3. Select an internal memory block. The selected memory block is highlighted in blue and a dialog appears.

In the dialog, select from [Open data], [Delete data], [Transfer to SD], or [New memory block].

Refer to the table below for details.

4. Select [Open data] to display the data display selection screen.

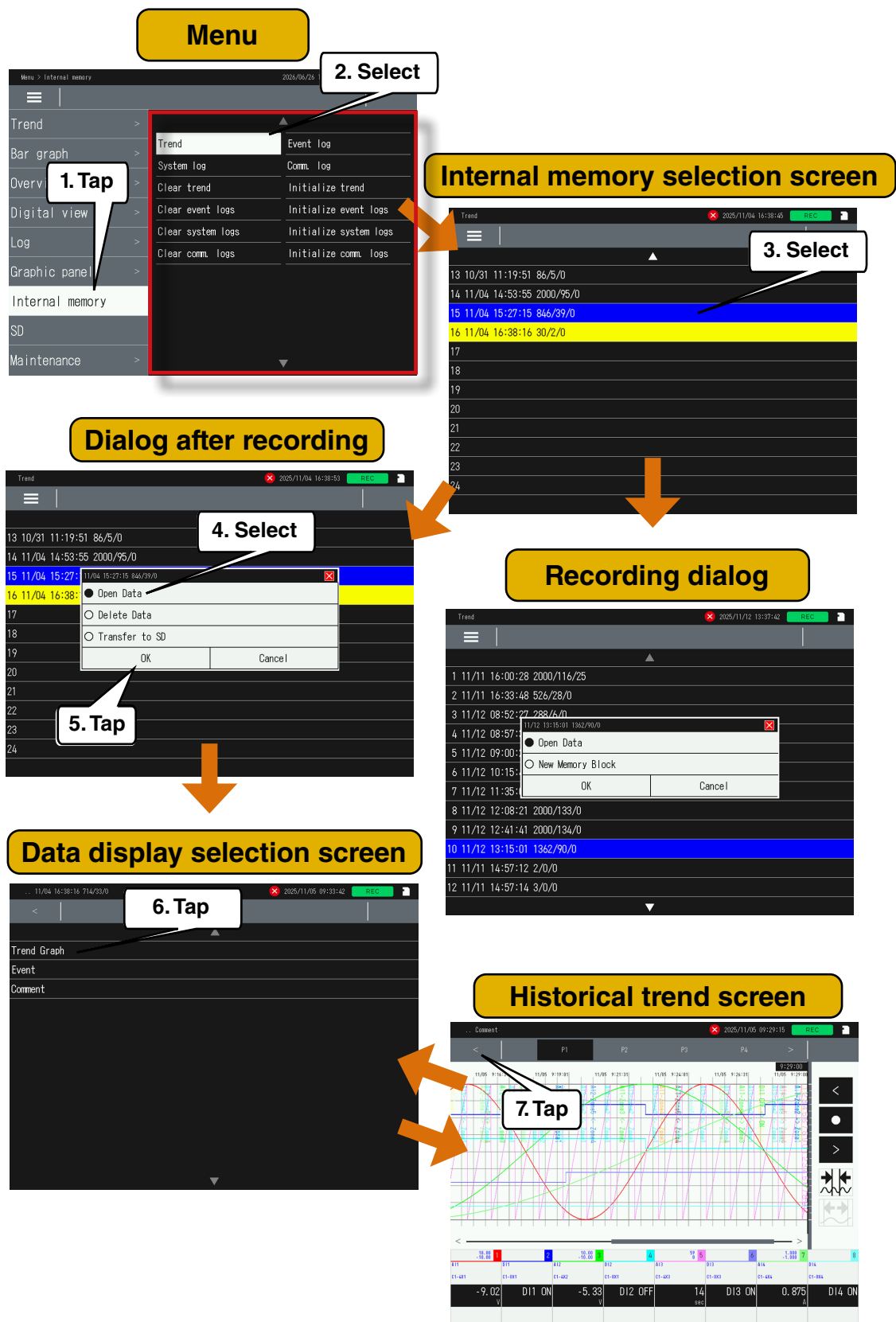
Select [Trend graph] to display the historical trend. → 4.2.3.2 Historical trend

Select [Event] to display the event summary. Tap an event to be viewed to display the historical trend at the time of recording the event. → EVENT SUMMARY

Select [Comment] to display the comment summary. Tap a comment to be viewed to display the historical trend at the time of recording the comment. → COMMENT SUMMARY

5. Tap < button to return to the data display selection screen.

State	Parameter	Description
The data has been recorded.	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	Delete Data	The data in the selected memory block is deleted.
	Transfer to SD	The data in the selected memory block is transferred to an SD card and stored.
The data is being recorded. (yellow background)	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	New memory block	The selected memory block transfers to a new memory block. An error occurs if recording is not in progress.



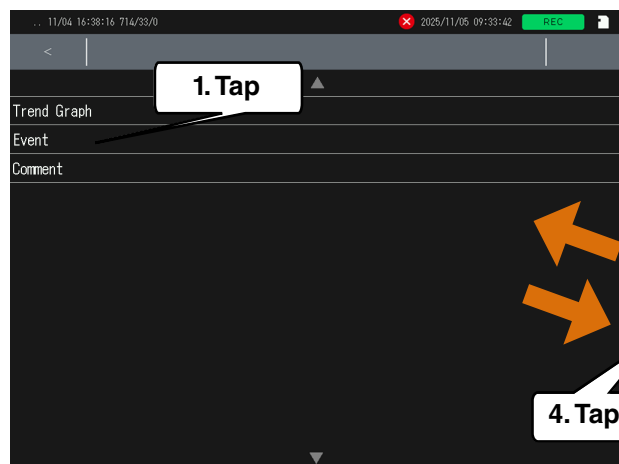
■EVENT SUMMARY

The latest event summaries registered in the trend data of internal memory are displayed.

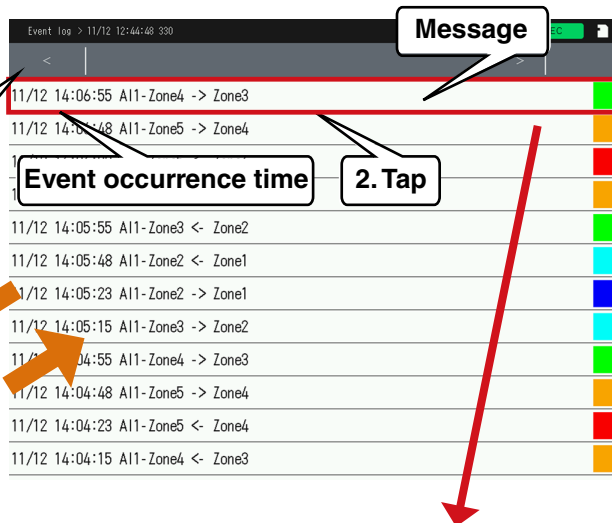
The latest event summary appears on the top.

The same is applied to event summary registered in the trend data of SD card.

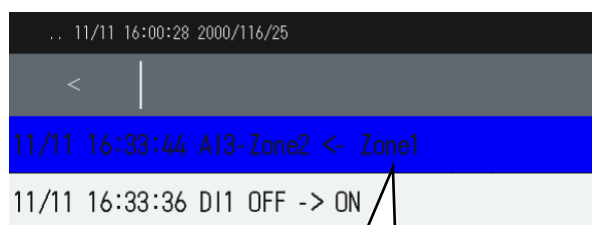
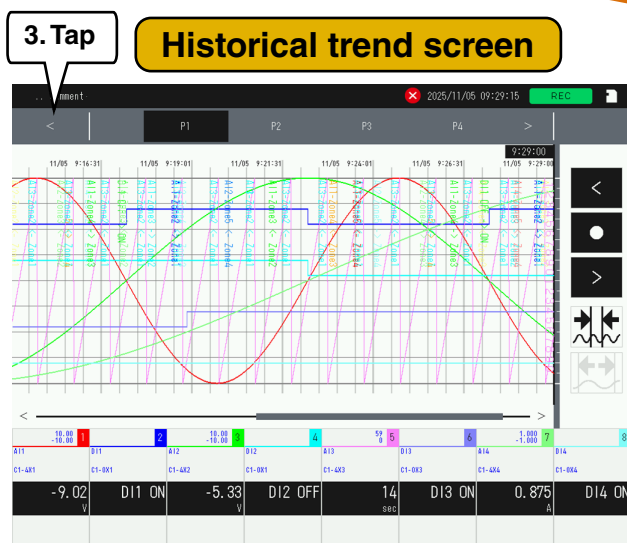
Data display selection screen



Event summary screen



Historical trend screen



Historical trend screen
↓
Event summary screen

1. Tap < or > button to switch the page.
2. Tap an event summary to display the historical trend with the selected event on the rightmost position of the graph.
The event summary selected in step 2 is displayed in blue.
3. Tap < button on the historical trend screen to return to the event summary screen.
4. Tap < button on the event summary screen to return to the data display selection screen.
5. For displayed items, refer to 4.2.4 Event screen.

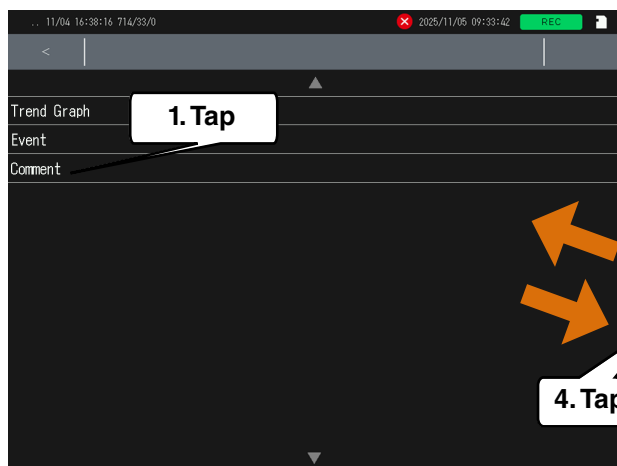
■COMMENT SUMMARY

The latest comment summaries registered in the trend data of internal memory are displayed.

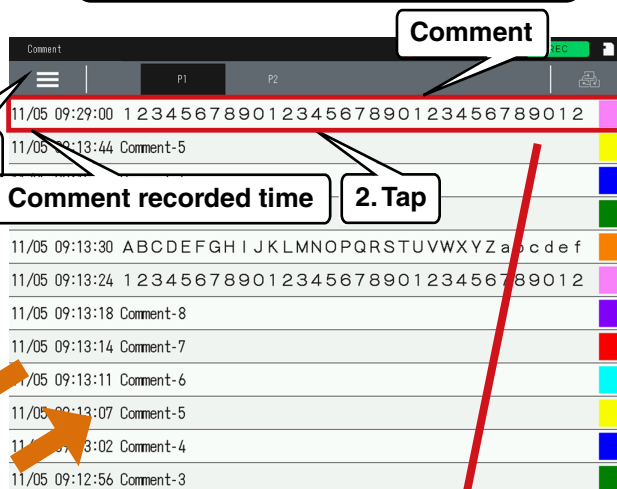
The latest comment appears on the top.

The same is applied to comment summary registered in the trend data of SD card.

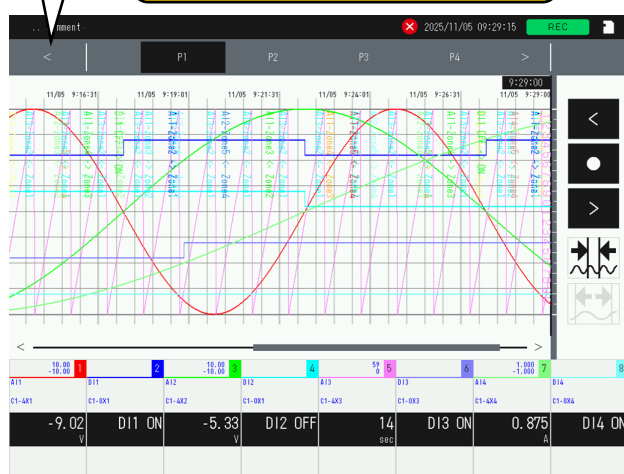
Data display selection screen



Comment summary screen



Historical trend screen



Historical trend screen

↓
Comment summary screen

1. Tap < or > button to switch the page.
2. Tap an comment summary to display the historical trend with the selected comment on the rightmost position of the graph.
3. Tap < button on the historical trend screen to return to the comment summary screen.
The comment summary selected in step 2 is displayed in blue.
4. Tap < button on the comment summary screen to return to the data display selection screen.
5. For displayed items, refer to 4.2.5 Comment screen.

4.3.9.2 Event log

1. Tap [Internal memory] on the menu screen. Tap [Event log].
2. Select a memory block.

Move upward and downward by tapping ▲ and ▼ buttons.

After the memory block number, the date and time when event log recording to internal memory started (month/day hour:minute:second) and the number of recordings are displayed.

Example: "11/20 15:00 1000" means that recording started on November 20 at 15:00, with 1000 event log records.

3. Select an internal memory block. The selected memory block is highlighted in blue and a dialog appears. In the dialog, select from [Open data], [Delete data], [Transfer to SD], or [New memory block].

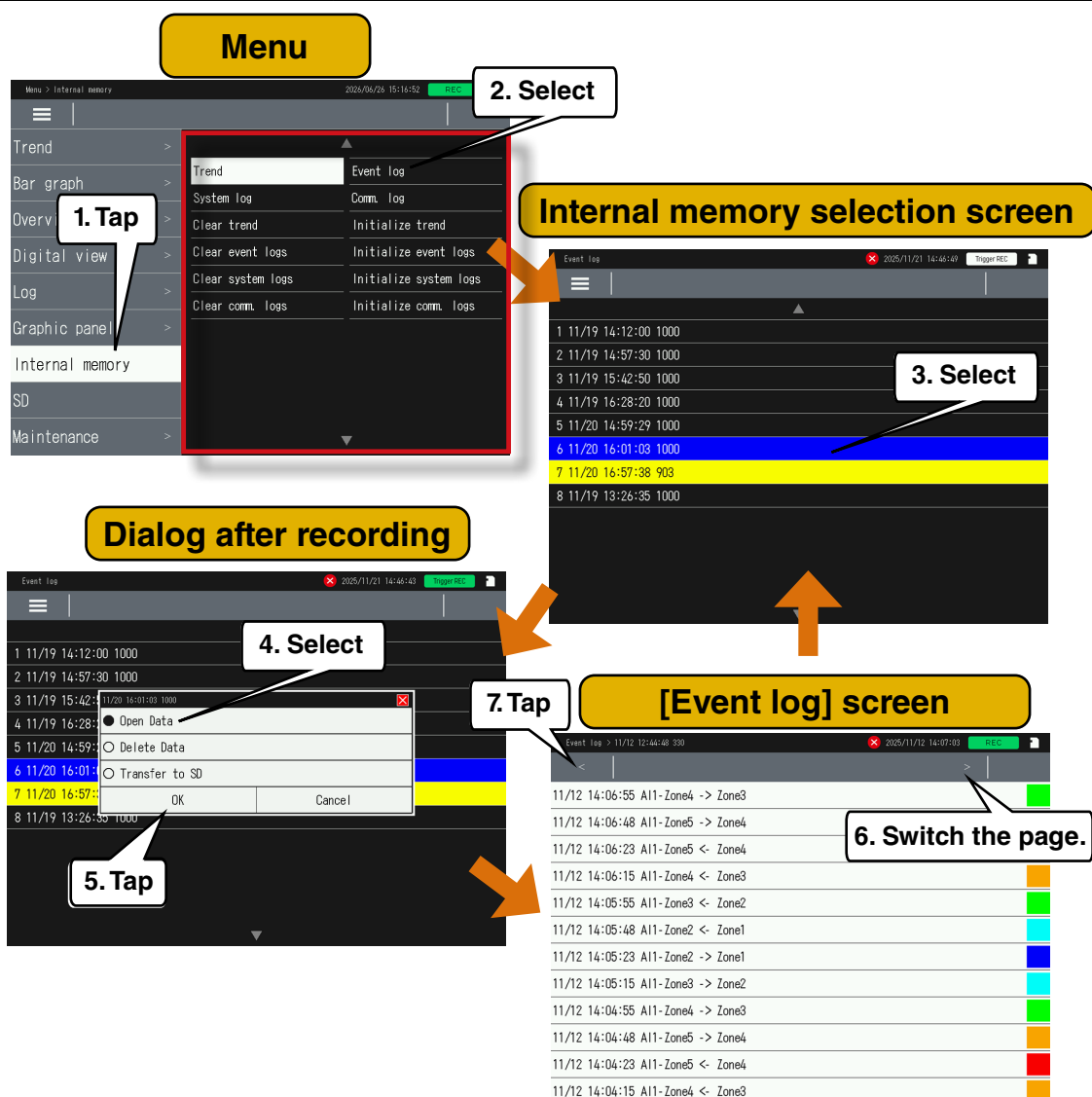
Refer to the table below for details.

4. Select [Open data] to display the event logs. → 4.2.9 Event log screen

Tap < or > button to switch the page.

5. Tap < button to return to the internal memory selection screen.

State	Parameter	Description
The data has been recorded.	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	Delete Data	The data in the selected memory block is deleted.
	Transfer to SD	The data in the selected memory block is transferred to an SD card and stored.
The data is being recorded. (yellow background)	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	New memory block	The selected memory block transfers to a new memory block. An error occurs if recording is not in progress.



4.3.9.3 System log

1. Tap [Internal memory] on the menu screen. Tap [System log].

2. Select a memory block.

Move upward and downward by tapping ▲ and ▼ buttons.

After the memory block number, the date and time when system log recording to internal memory started (month/day hour:minute:second) and the number of recordings are displayed.

Example: "11/20 15:00 10" means that recording started on November 20 at 15:00, with 10 system log records.

3. Select an internal memory block. The selected memory block is highlighted in blue and a dialog appears.

In the dialog, select from [Open data], [Delete data], [Transfer to SD], or [New memory block].

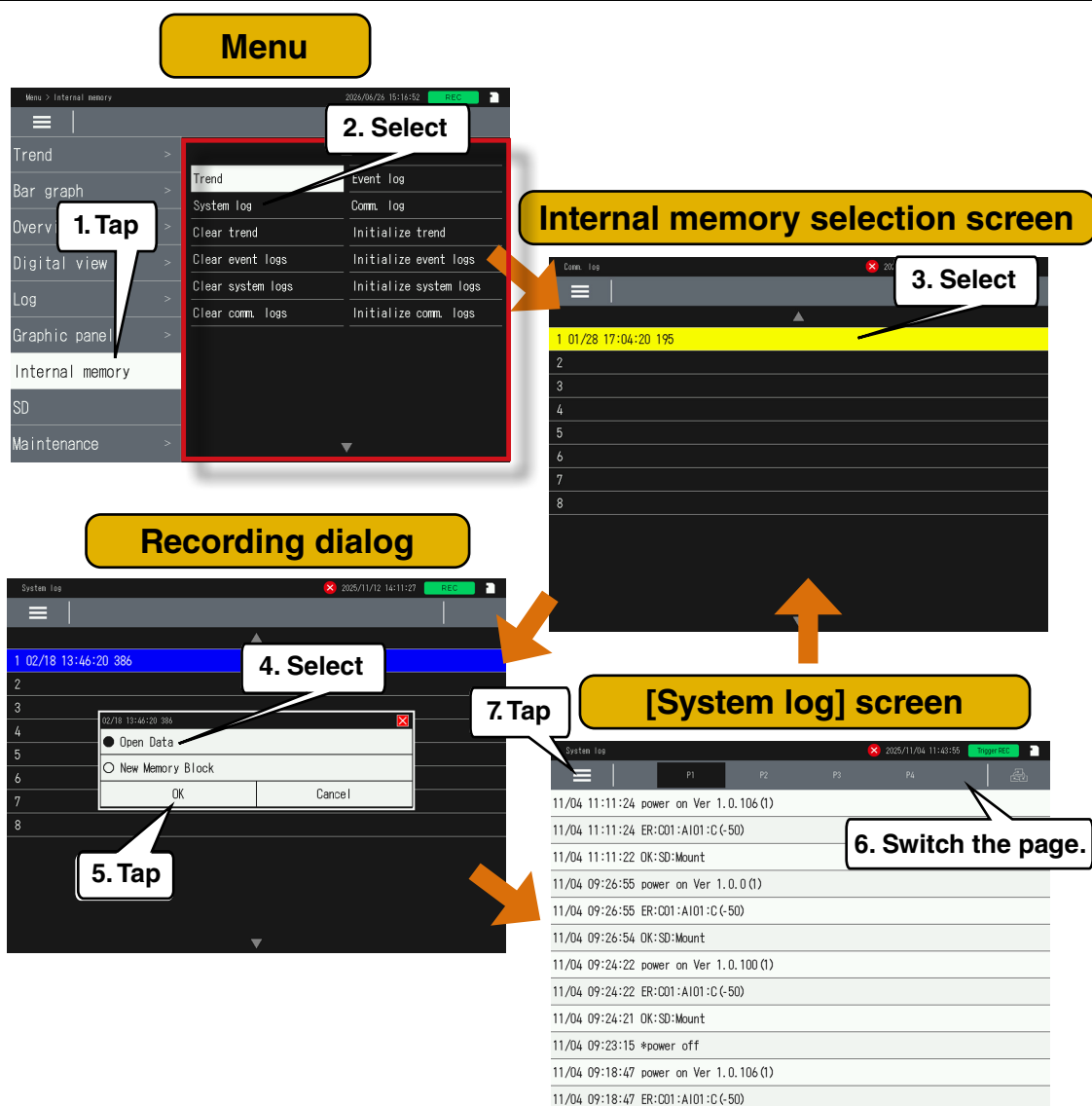
Refer to the table below for details.

4. Select [Open data] to display the system logs. → 4.2.10 System log screen

Tap < or > button to switch the page.

5. Tap < button to return to the internal memory selection screen.

State	Parameter	Description
The data has been recorded.	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	Delete Data	The data in the selected memory block is deleted.
	Transfer to SD	The data in the selected memory block is transferred to an SD card and stored.
The data is being recorded. (yellow background)	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	New memory block	The selected memory block transfers to a new memory block. An error occurs if recording is not in progress.



4.3.9.4 Communication log

1. Tap [Internal memory] on the menu screen. Tap [Comm. log].

2. Select a memory block.

Move upward and downward by tapping ▲ and ▼ buttons.

After the memory block number, the date and time when communication log recording to internal memory started (month/day hour:minute:second) and the number of recordings are displayed.

Example: "11/20 15:00 100" means that recording started on November 20 at 15:00, with 100 communication log records.

3. Select an internal memory block. The selected memory block is highlighted in blue and a dialog appears.

In the dialog, select from [Open data], [Delete data], [Transfer to SD], or [New memory block].

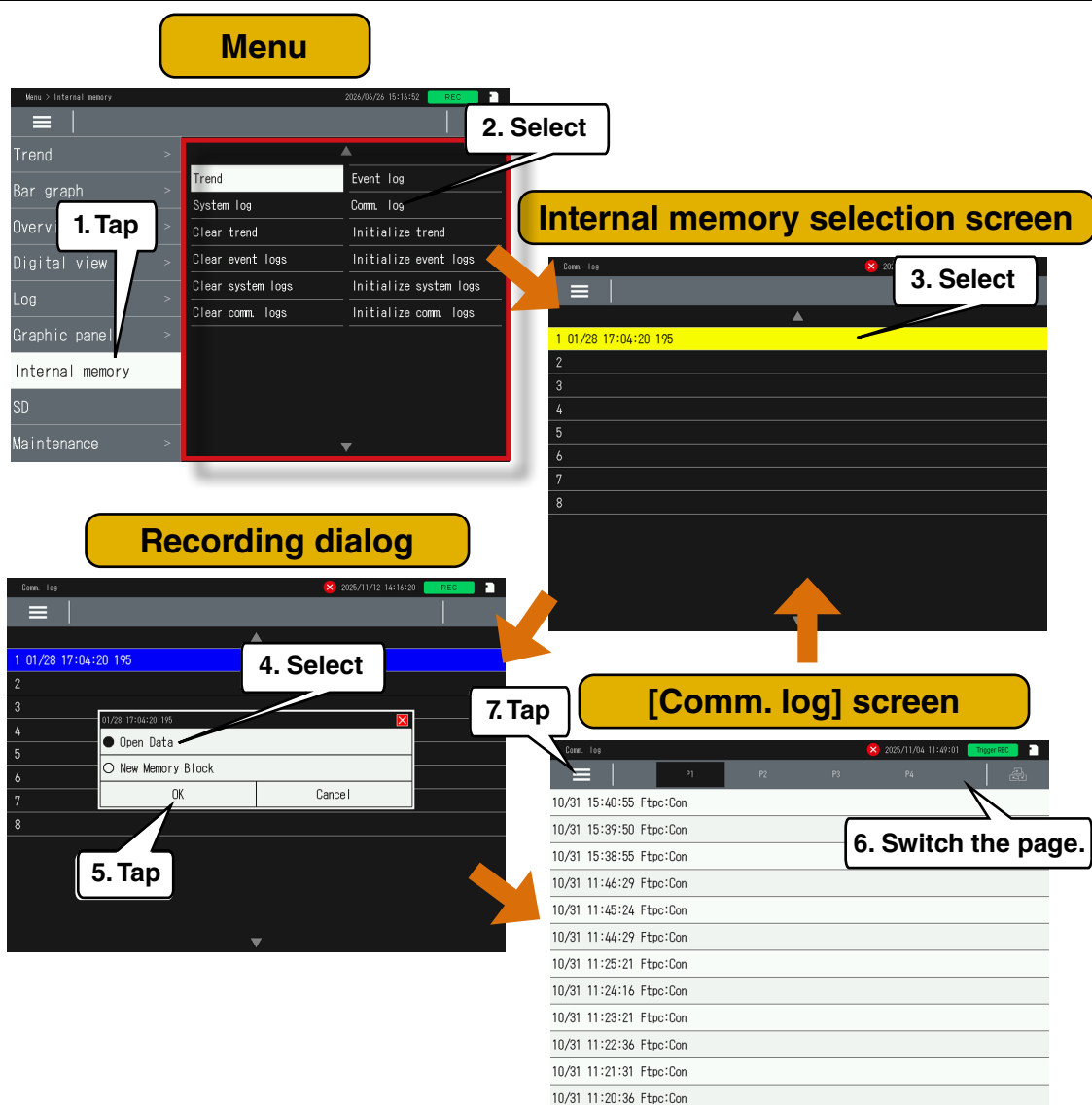
Refer to the table below for details.

4. Select [Open data] to display the communication logs. → 4.2.11 Communication log screen

Tap < or > button to switch the page.

5. Tap < button to return to the internal memory selection screen.

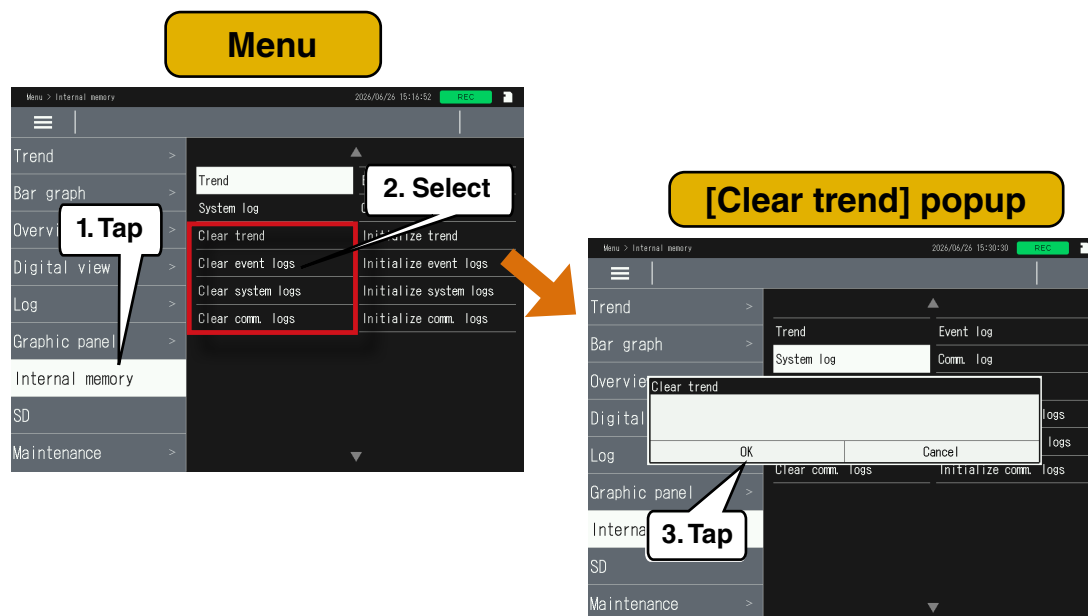
State	Parameter	Description
The data has been recorded.	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	Delete Data	The data in the selected memory block is deleted.
	Transfer to SD	The data in the selected memory block is transferred to an SD card and stored.
The data is being recorded. (yellow background)	Open Data	The data in the selected memory block is displayed. The detailed screen appears.
	New memory block	The selected memory block transfers to a new memory block. An error occurs if recording is not in progress.



4.3.9.5 Clear

Follow the procedure below in order to clear the data in the internal memory.

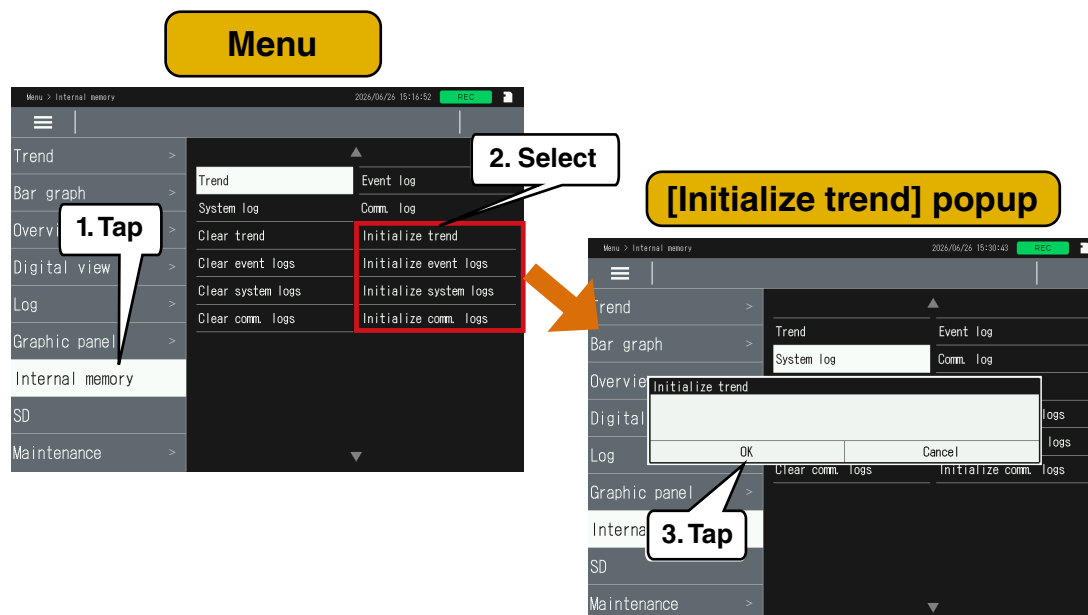
1. Tap [Internal memory] on the menu screen.
2. Select from [Clear trend], [Clear event logs], [Clear system logs] or [Clear comm. logs].
3. A popup appears. Tap [OK] to transition from the current internal memory block to the next block. When the current internal memory block is the last block, the recording in the first block is discarded and transitions to the first block.



4.3.9.6 Initialization

Follow the procedure below in order to initialize the data in the internal memory.

1. Tap [Internal memory] on the menu screen.
2. Select from [Initialize trend], [Initialize event logs], [Initialize system logs] or [Initialize comm. logs].
3. A popup appears. Tap [OK] to initialize all corresponding memory blocks.



4.3.10 SD card

Trend graph, event logs and comment logs are displayed by selecting a trend data file (extension: TRD) in the specified directory of SD card.

Menu

1. Tap

2. Tap

3. Tap

4. Tap

SD file selection screen

5. Select

Folder structure

Data display selection screen

SD file selection screen

Data display selection screen

6. Select
Each screen appears.

7. Tap

Historical trend screen

8. Tap

1. Tap [SD] on the menu screen.
Tap a trend data file on the SD file selection screen.
Trend data files are saved in a hierarchy of year, month, and day. → 6.6 Folder structure
Tap ▲ button to display previous twelve files. Tap ▼ button to display next twelve files.
2. After selecting a trend data file, select [Trend Graph], [Event] or [Comment].
3. Select [Trend Graph] to display historical trend. → 4.2.3.2 Historical trend
4. Select [Event] to display the event summary.
Tap an event to display historical trend at the moment of recording the event.
→ EVENT SUMMARY in 4.3.9.1 Trend
5. Select [Comment] to display the comment summary.
Tap a comment to display historical trend at the moment of recording the comment.
→ COMMENT SUMMARY in 4.3.9.1 Trend
6. Tap [<] to return to the data display selection screen.
7. Tap [<] on the data display selection screen to return to the SD file selection screen.
The trend data file selected in step 2 is displayed in blue.

4.3.11 Maintenance screen

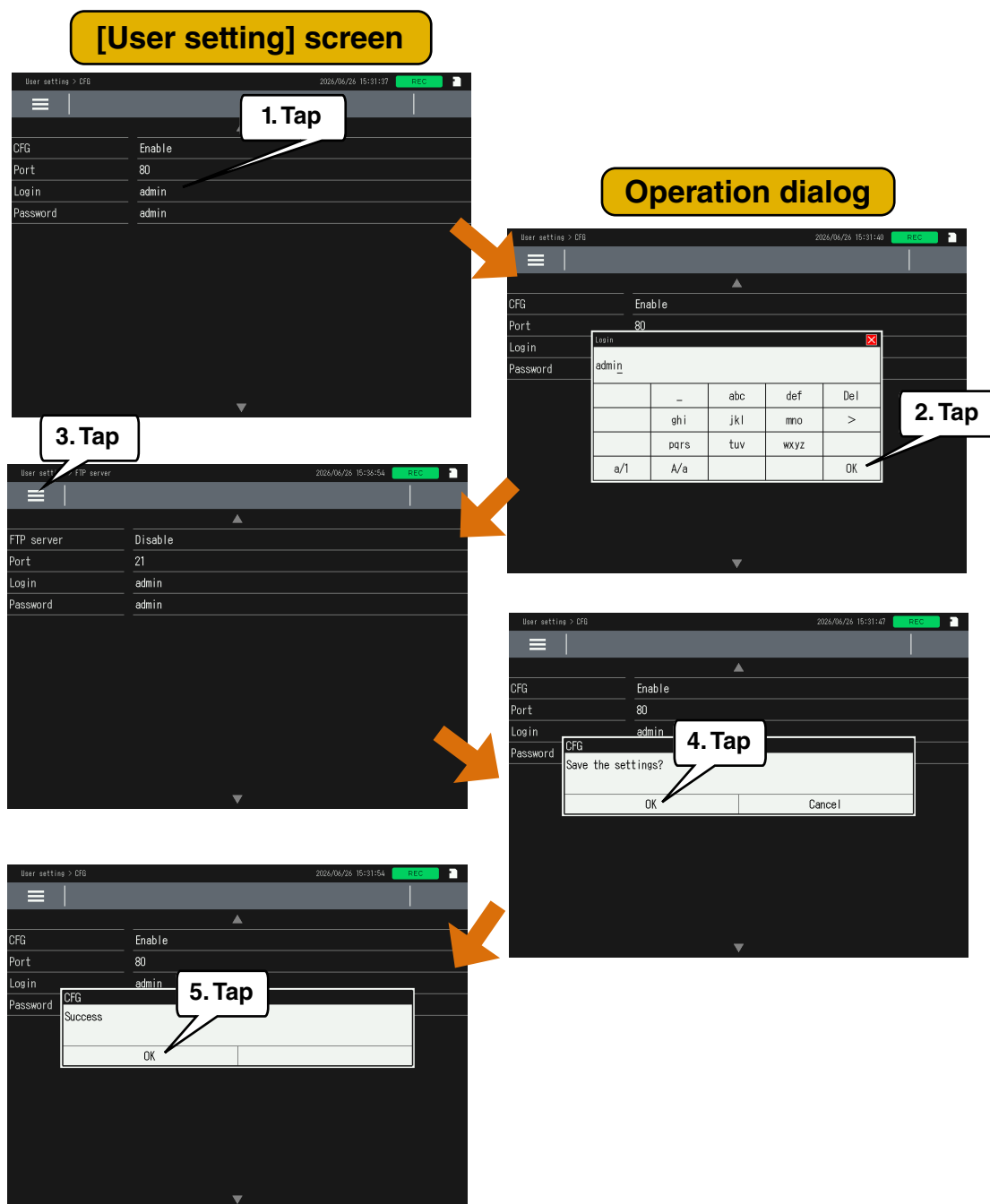
This section describes how to operate on the maintenance screen.

4.3.11.1 Common

Some settings of the VR288E-G64 can be modified on the maintenance screen.

Setting changes can be performed in the procedure below.

1. Tap a parameter to be changed.
2. An operation dialog appears. After entering setting values, tap [OK] to finish entering keys.
→ 4.3.11.2 Operation dialog
3. After completing the settings, tap [≡] to open a popup. Tap [OK] to save the setting change.



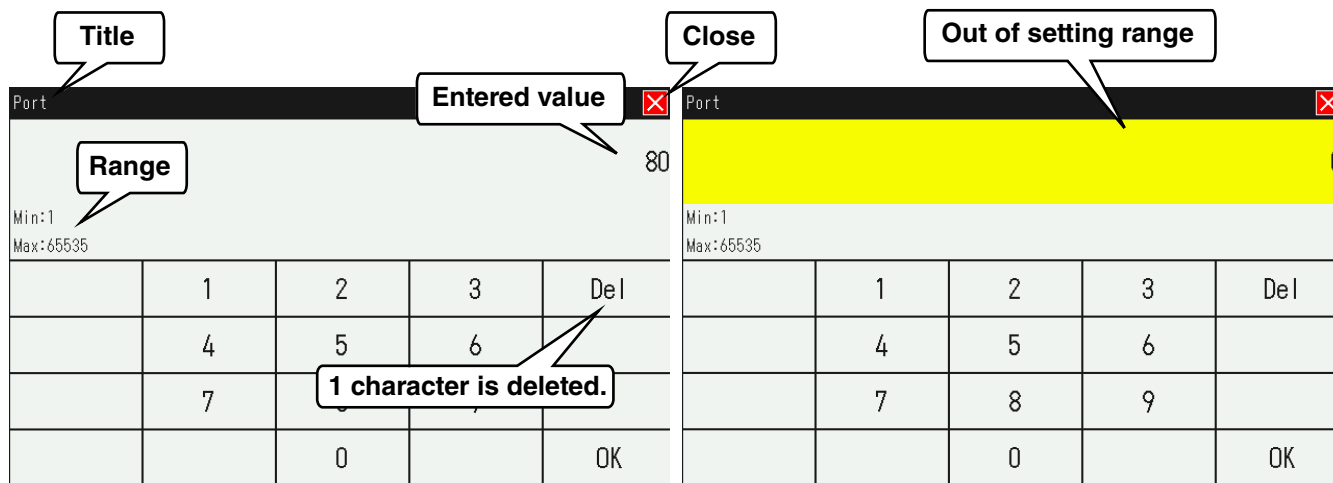
4.3.11.2 Operation dialog

This section describes about the dialog displayed when changing setting values on the maintenance screen.

■ENTERING VALUE DIALOG (INTEGER)

This dialog is displayed when setting integer values.

If the entered value is out of the setting range, the background turns yellow.

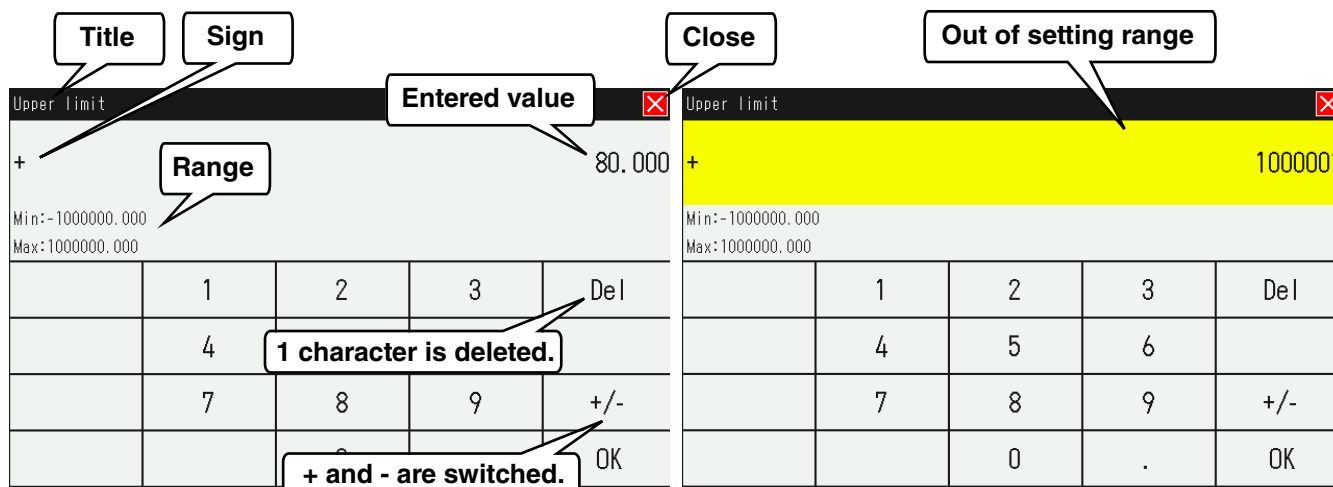


Parameter	Description
Title	The name of the parameter to be changed is displayed.
Entered value	The current value is displayed. The background turns yellow when the value is out of the setting range.
Range	The valid range is displayed.
Key	✖ : The setting is cancelled and the dialog is closed. Del : The last digit is deleted. OK : The entered value is confirmed. The button is disabled when an error occurs.

■ NUMERIC INPUT DIALOG (DECIMAL)

This dialog is displayed when setting a numeric value including decimal places.

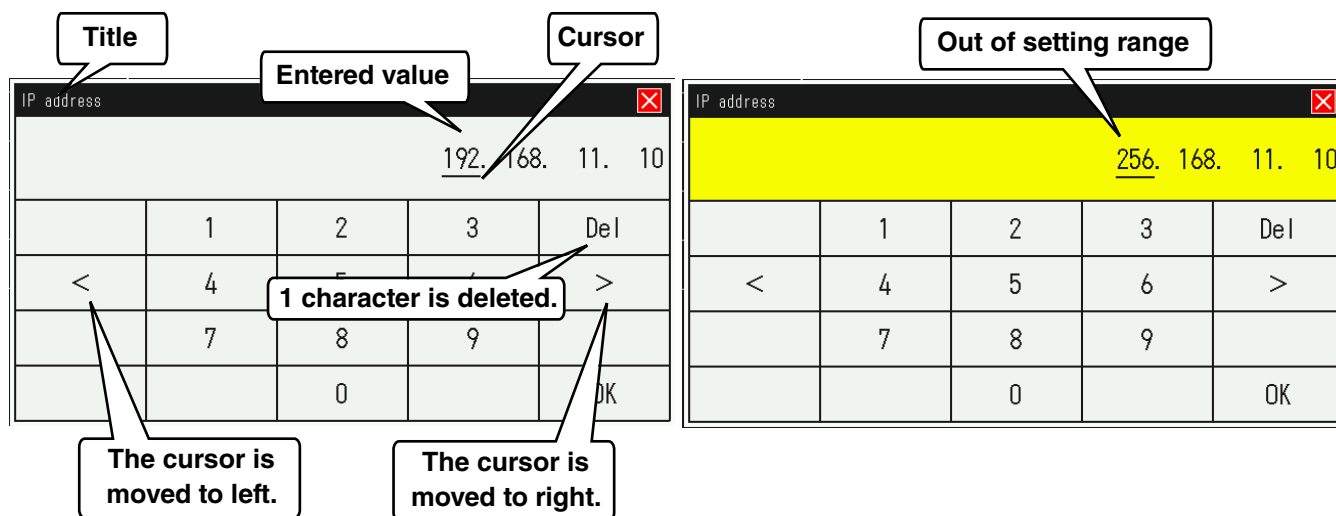
If the entered value is out of the setting range, the background turns yellow.



Parameter	Description
Title	The name of the parameter to be changed is displayed.
Entered value	The current value is displayed. The background turns yellow when the value is out of the setting range.
Range	The valid range is displayed.
Key	✖ : The setting is cancelled and the dialog is closed. Del : The last digit is deleted. +/- : The plus value and minus value are switched. OK : The entered value is confirmed. The button is disabled when an error occurs.

■IP DIALOG

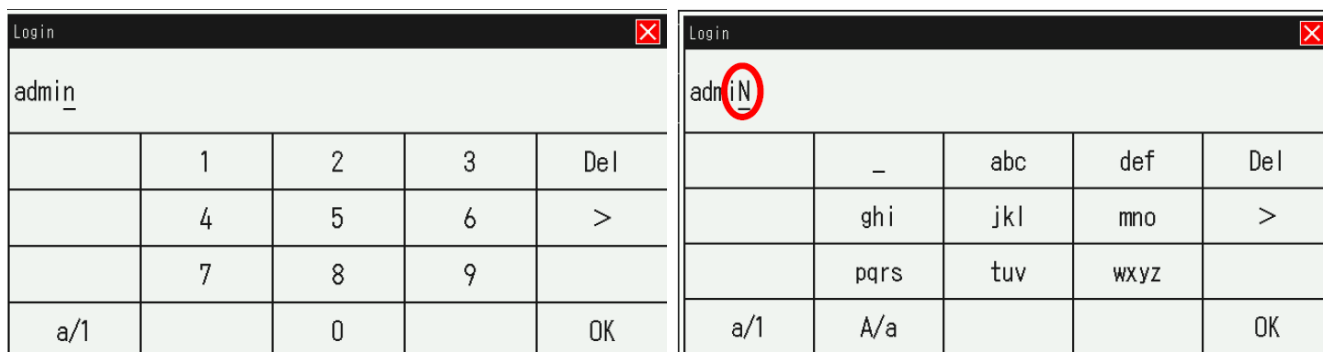
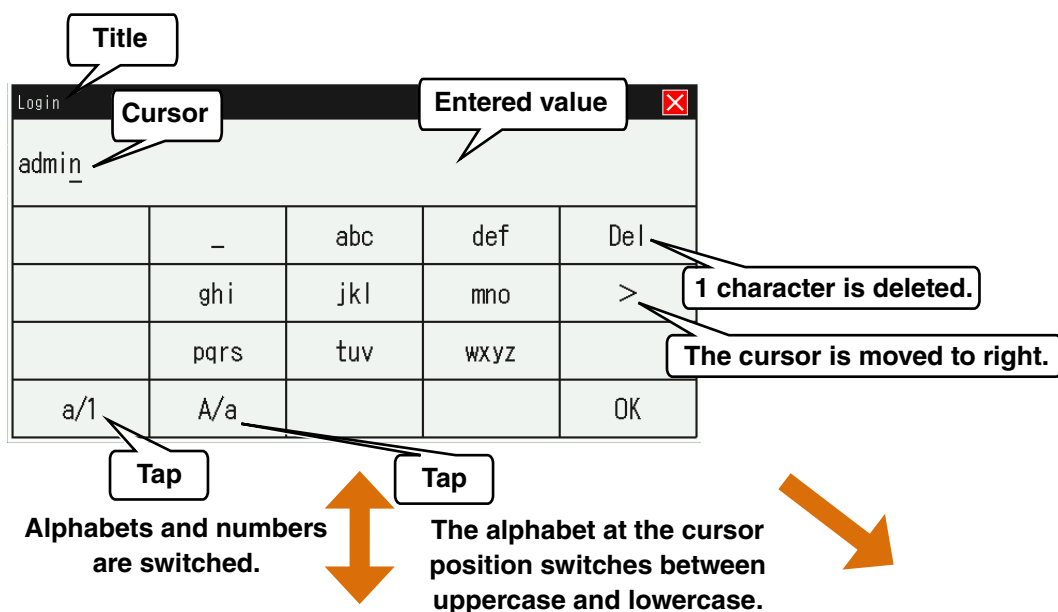
This dialog is displayed when setting IP address, Subnet mask, etc.
If the entered value is invalid, the background turns yellow.



Parameter	Description
Title	The name of the parameter to be changed is displayed.
Entered value	The current value is displayed. The background turns yellow when the value is invalid.
Key	✖ : The setting is cancelled and the dialog is closed. Del : The last digit is deleted. <, > : The cursor position is moved. OK : The entered value is confirmed. The button is disabled when an error occurs.

■ ENTERING ID DIALOG

This dialog is displayed when setting the login ID, password, etc.

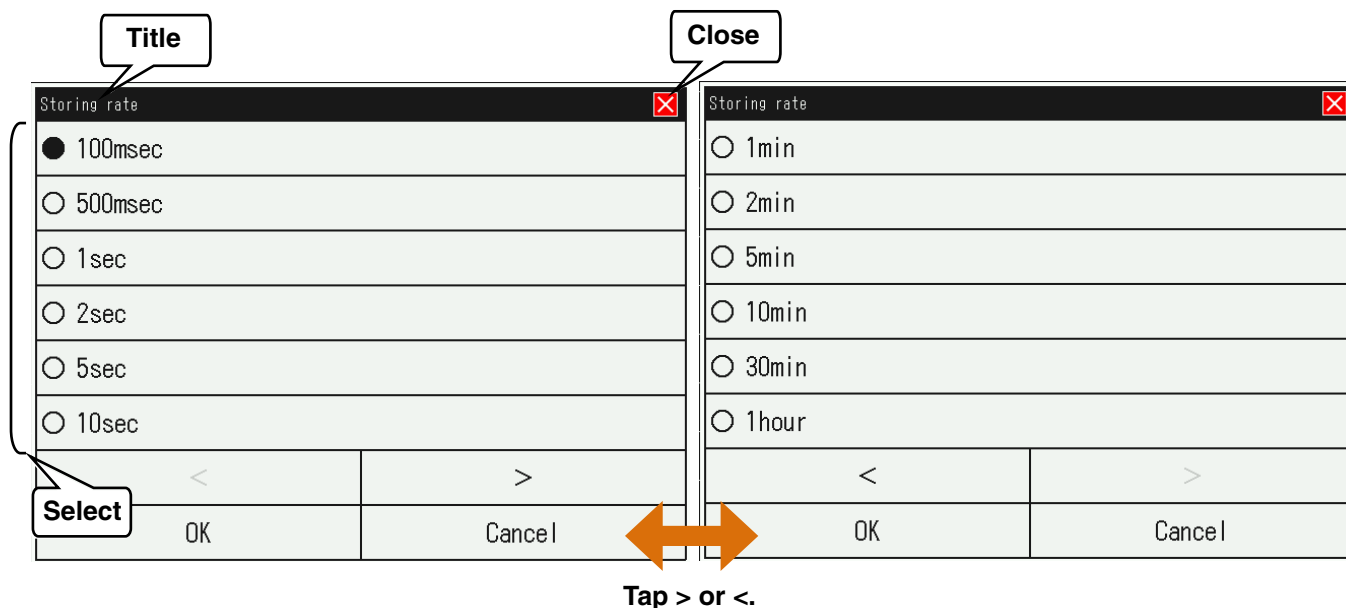


Parameter	Description
Title	The name of the parameter to be changed is displayed.
Entered value	The current value is displayed. The background turns yellow when the value is invalid.
Key	✖ : The setting is cancelled and the dialog is closed. Del : The last digit is deleted. > : The cursor position is moved to right. When the cursor position is blank, the button is disabled. a/1: The alphabets and numbers are switched. A/a: The alphabet at the cursor position is switched between uppercase and lowercase. OK : The entered value is confirmed. The button is disabled when an error occurs.

■SELECTING LIST DIALOG

This dialog is displayed when selecting from multiple options.

After tapping a parameter, the white circle changes to the black circle.



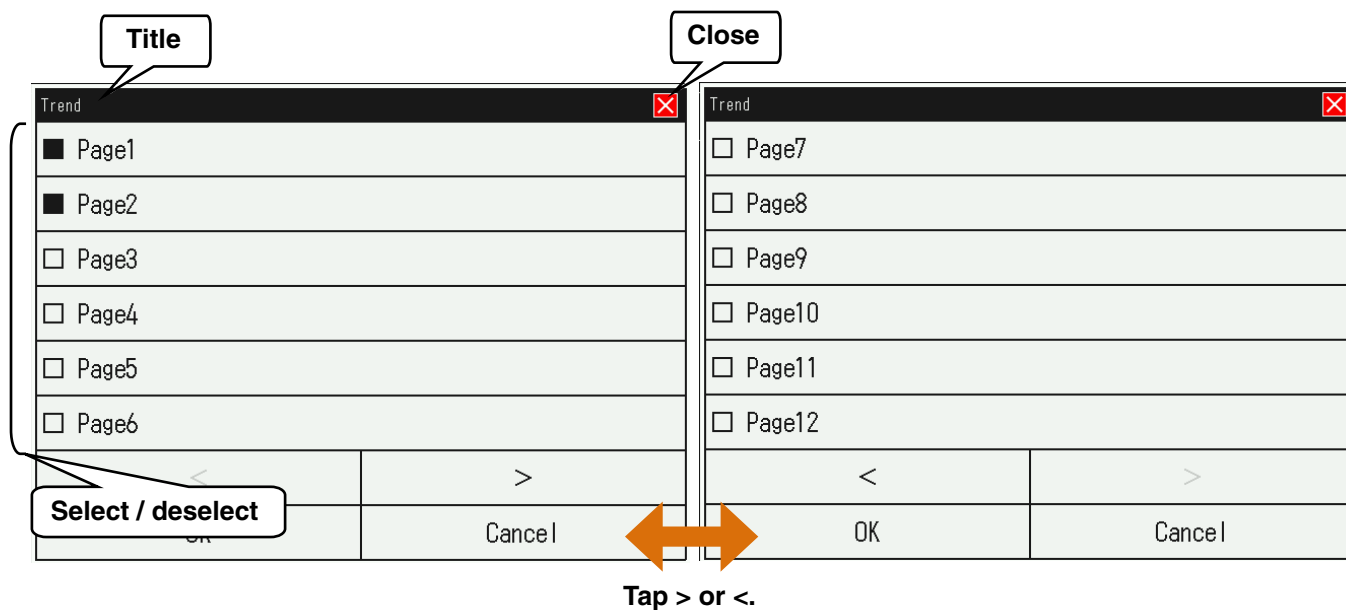
Parameter	Description
Title	The name of the parameter to be changed is displayed.
Select	The current value is displayed with black circle.
Key	✖ : The setting is cancelled and the dialog is closed. > , <: Tap > or < to move to next options when there are 8 or more options. OK : The entered value is confirmed. The button is disabled when an error occurs.

■CHECK BOX DIALOG

This dialog is displayed when selecting multiple items from multiple options.

After tapping a parameter, the white square changes to black.

Tap an item with the black square to return to the white square and deselect it.



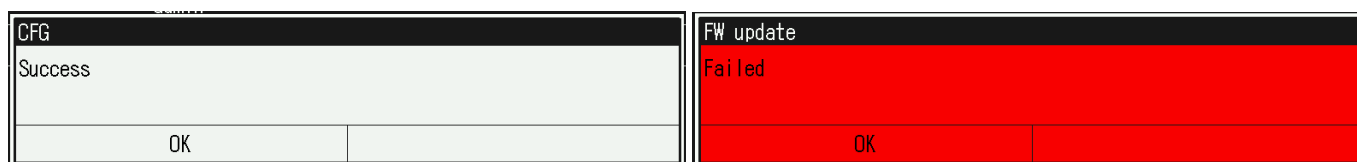
Parameter	Description
Title	The name of the parameter to be changed is displayed.
Select	The currently selected item is displayed with a black square.
Key	✖ : The setting is cancelled and the dialog is closed. > , < : Tap > or < to move to next options when there are 8 or more options. OK : The entered value is confirmed. The button is disabled when an error occurs.

4.3.11.3 Popup

The popup appears when an error occurs or some operation such as setting change is recommended.

The background turns red when an error occurs.

Tapping other buttons is disabled until the popup is closed.



Confirm with [OK] button to close the popup.

4.3.11.4 Reading/saving setting

Follow the procedure below in order to read or save the device settings or the network setting stored in an SD card.



1. Tap [Maintenance] on the menu screen.

2. Tap [Read/Save setting].

3. Select a parameter to be read or saved.

For the file name and the saving destination, refer to the table below. → 6.6 Folder structure

The contents of "VR288cfg.json" is the settings saved to the file with the configurator software.

→ 2.3.6 Saving the setting to file

The contents of "vr288net.json" is the settings saved to the file with the configurator software.

4. Tap [OK] to perform reading or writing the setting.

5. If the reading operation is performed but the corresponding file does not exist, or if the writing operation is performed but is failed in writing to the corresponding file, an error message appears.

If the operation finishes correctly, the completion message is displayed.

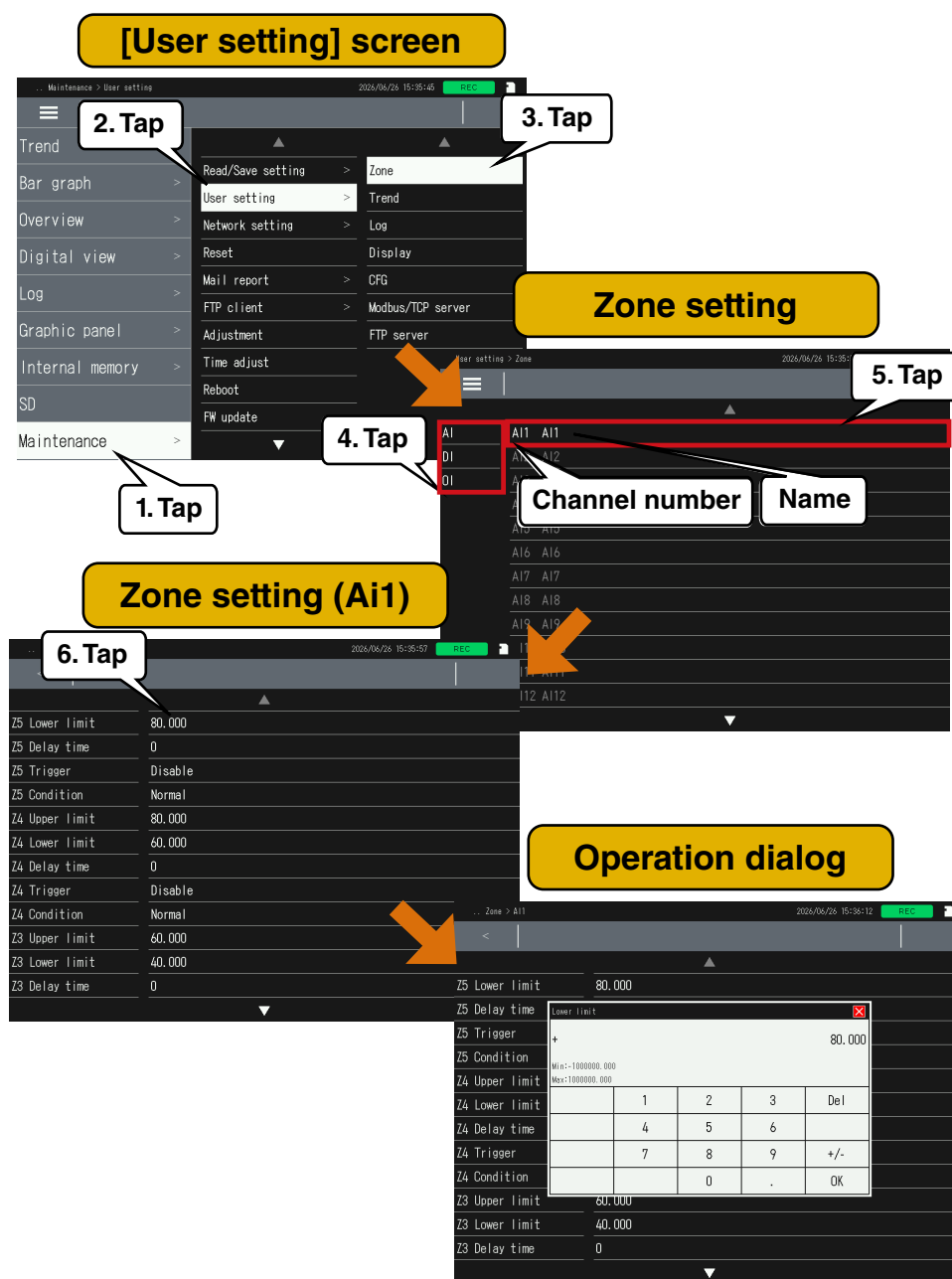
Button	File name	Saving destination
Read setting	VR288cfg.json	The setting file in the base folder is exported to the device. The contents are reflected to the device.
Save setting	VR288cfg.json	The setting file is saved to the base folder.
Read Network setting	vr288net.json	The setting file in the base folder is exported to the device. The contents are reflected to the device.
Save Network setting	vr288net.json	The setting file is saved to the base folder.

CAUTION

Do not edit "VR288cfg.json" or "vr288net.json" with a text editor or similar tools.

4.3.11.5 User setting

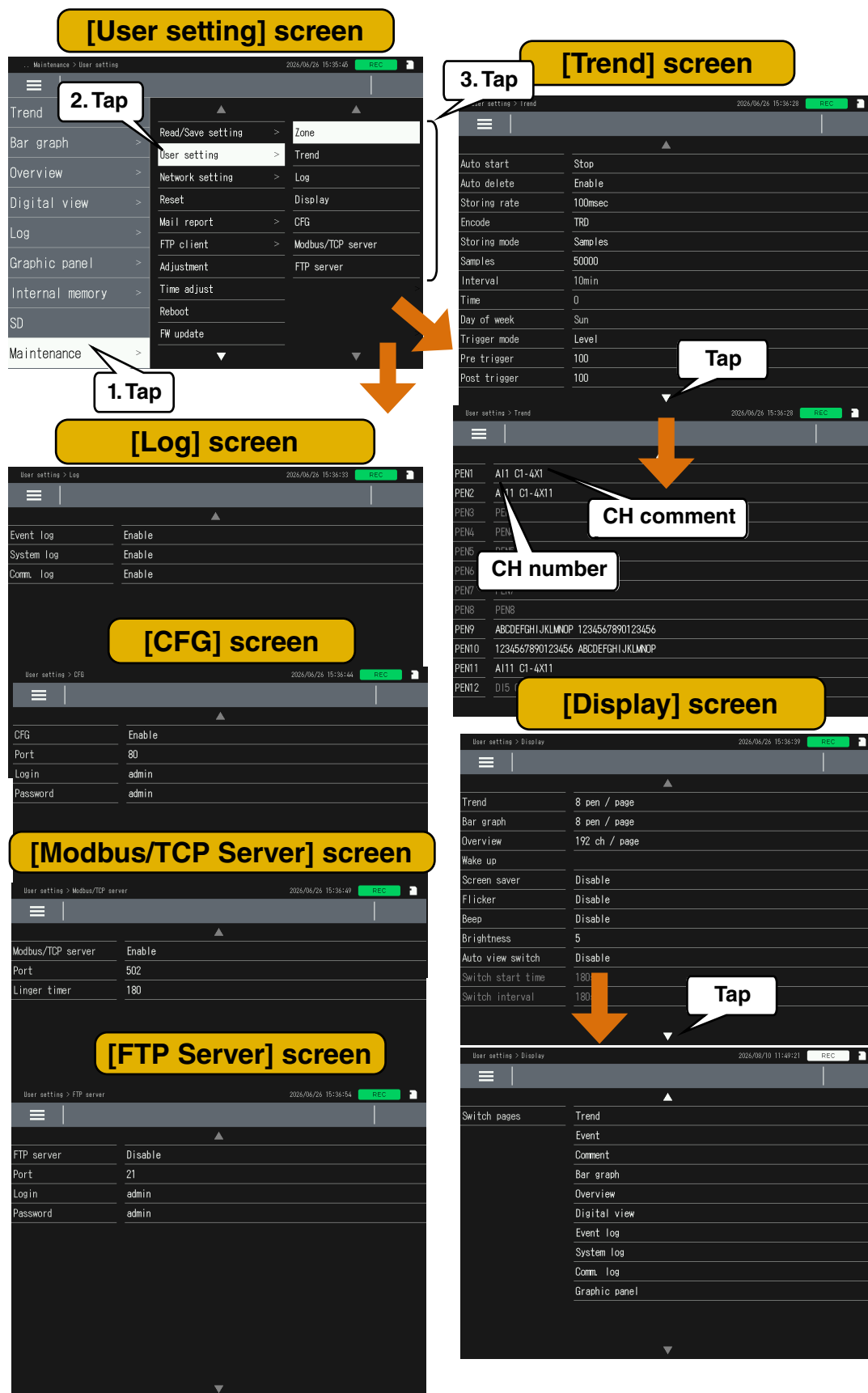
Follow the procedure below in order to configure the settings of zone, trend, log, display, CFG, Modbus/TCP server, and FTP server.



Follow the procedure below in order to set [Zone].

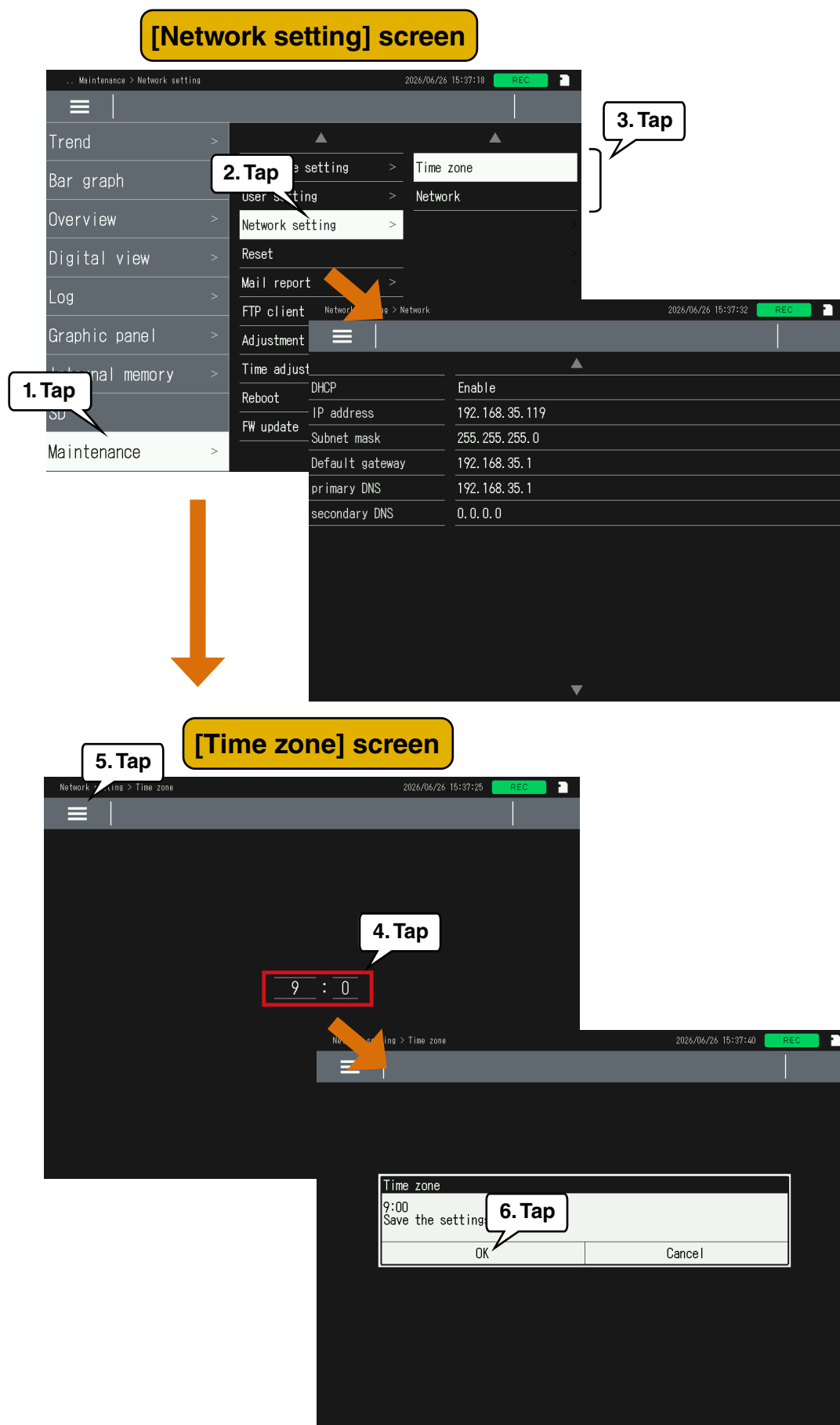
1. Tap [Maintenance] on the menu screen.
2. Tap [User setting] > [Zone].
3. [Zone setting] screen appears. Tap an I/O type to be set (AI, DI, OI).
The list of channel numbers (e.g.: [Ain name] (n: channel number)) and channel names (CH number when the AI/DI source is None or the OI function type is unused) is displayed.
4. Tap a channel to be set.
5. Select an item and change the setting.
Refer to 4.3.11.2 Operation dialog for setting change.
6. Set other parameters same as [Zone].
For the parameters and the selectable options, refer to the table on the next page.

Parameter	Selectable option	Reference
Zone	AI, OI: Delay time, Upper limit, Lower limit, Trigger, Condition DI: Delay time, Trigger, Condition	The detail is same as the following. AI: 3.4.1.5 Zone setting (AI) 3.4.1.6 Event setting (AI) DI: 3.4.2.4 Basic setting (DI) OI: 3.4.3.2 Zone setting (OI) 3.4.3.3 Event setting (OI)
Trend	Common setting: Auto start, Auto delete, Storing rate, Encode Normal recording: Storing mode, Storing mode: Samples, Storing interval, Time, Day of week Trigger recording: Trigger mode, Pre trigger, Post trigger PEN1 to 96 setting: Upper limit, Lower limit	The detail is same as the following. Common setting, Normal recording, Trigger recording: 3.5.1 Basic setting PEN setting: 3.5.2 Pen setting
Log	Enable or disable event log, system log or comm. log.	The detail is same as the following. 3.6 Log setting
Display	Number of displayed items (trend, bar graph, overview) Wake up (wake up screen and page), Screen saver, Flicker, Beep, Brightness, Auto view switch (Switch start time, Switch interval, Switch pages)	The detail is same as the following. Wake up: 3.7.1 Setting for the number of display 3.7.2 Wake up screen setting Flicker: 3.7.3 Digital view setting Screen saver, Brightness: 3.7.5 Other settings Auto view switch: 3.7.4 Auto view switch setting
CFG	Enable/Disable, Port No., Login name, Password	The detail is same as the following. 3.2.1 CFG
Modbus/ TCP server	Enable/Disable, Port No., Linger timer	The detail is same as the following. 3.2.2 Modbus/TCP (server)
FTP server	Enable/Disable, Port No., Login name, Password	The detail is same as the following. 3.2.3 FTP server



4.3.11.6 Network setting

Follow the procedure below in order to configure the settings of time zone and network for the device.



1. Tap [Maintenance] on the menu screen.
2. Tap [Network setting].
3. Select an parameter to be set.
4. For the parameters and the selectable items, refer to the table below.

Parameter	Selectable item	Reference
Time zone	± hh:mm	
Network	DHCP, IP address, Subnet mask, Default gateway, primary DNS, secondary DNS	DHCP: Enable/Disable Setting range (0.0.0.0 to 255.255.255.255)

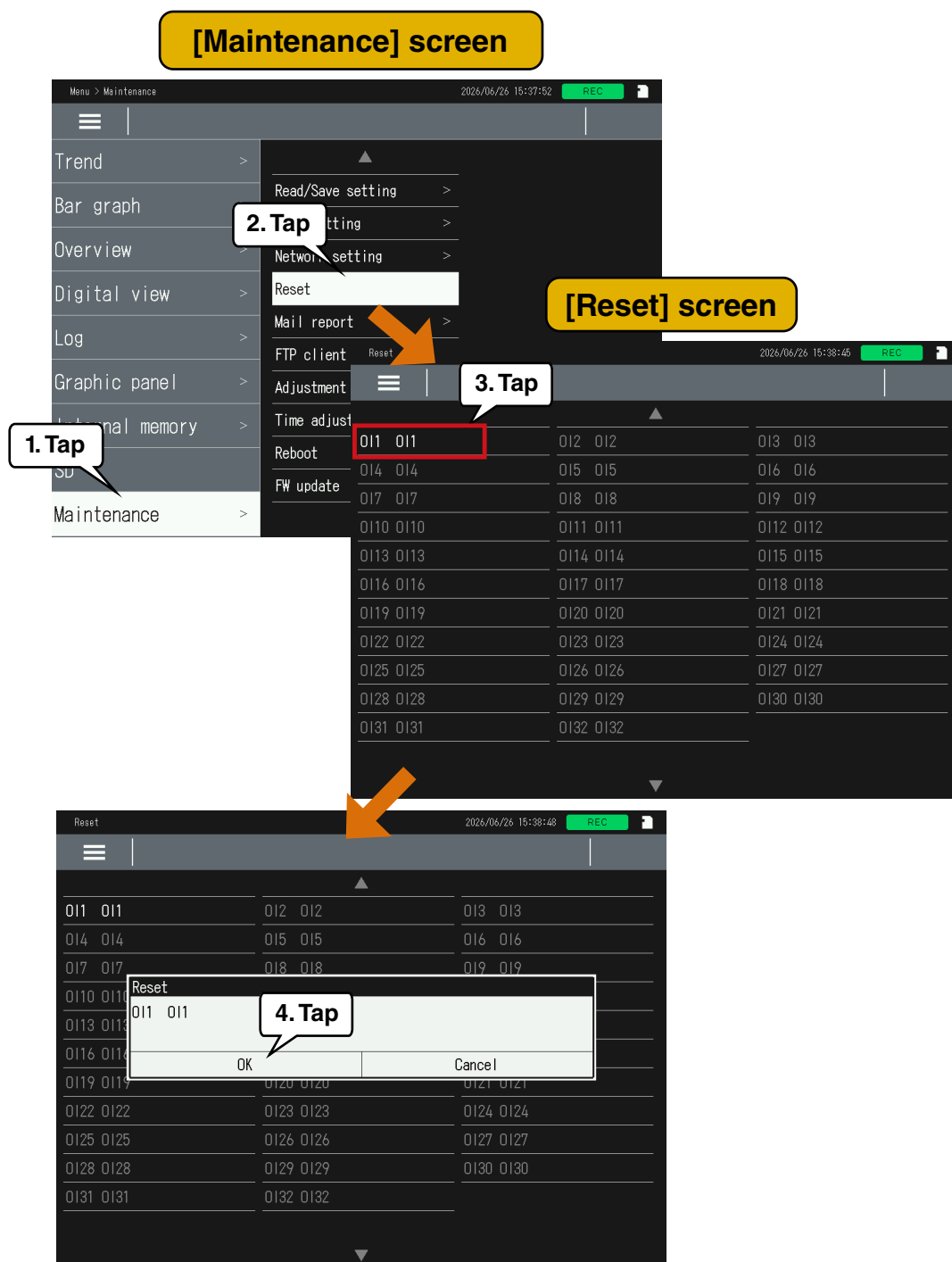
5. Keypad appears when entering a value. Refer to 4.3.11.2 Operation dialog for setting change.

CAUTION

To enable the settings, it is necessary to turn off and then turn on the device or to reboot it.

4.3.11.7 Reset

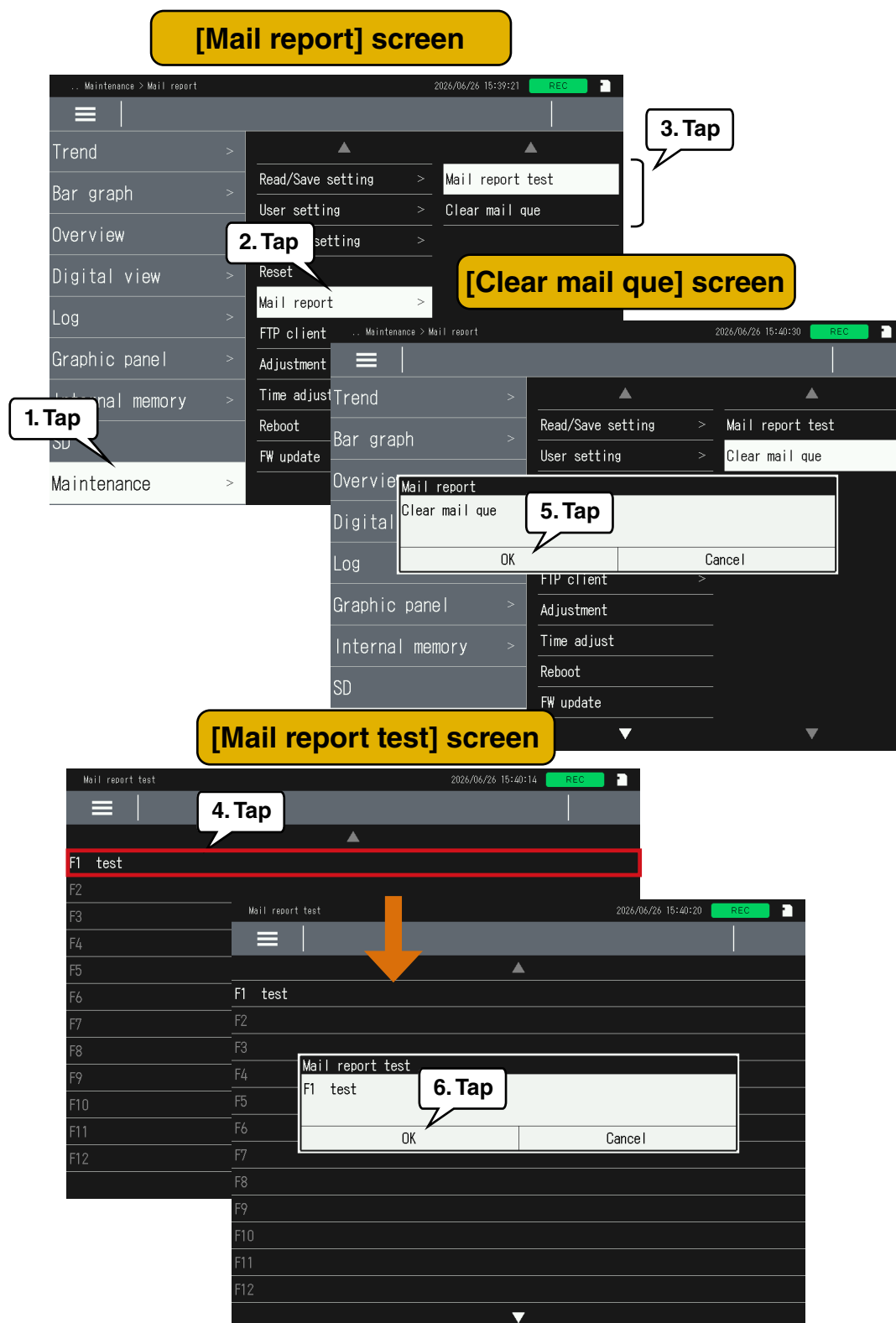
Follow the procedure below in order to reset operational input (OI) for analog accumulation.



1. Tap [Maintenance] on the menu screen.
2. Tap [Reset].
3. Select an OI to be reset.
4. When a popup appears, tap [OK] to execute.

4.3.11.8 E-mail report

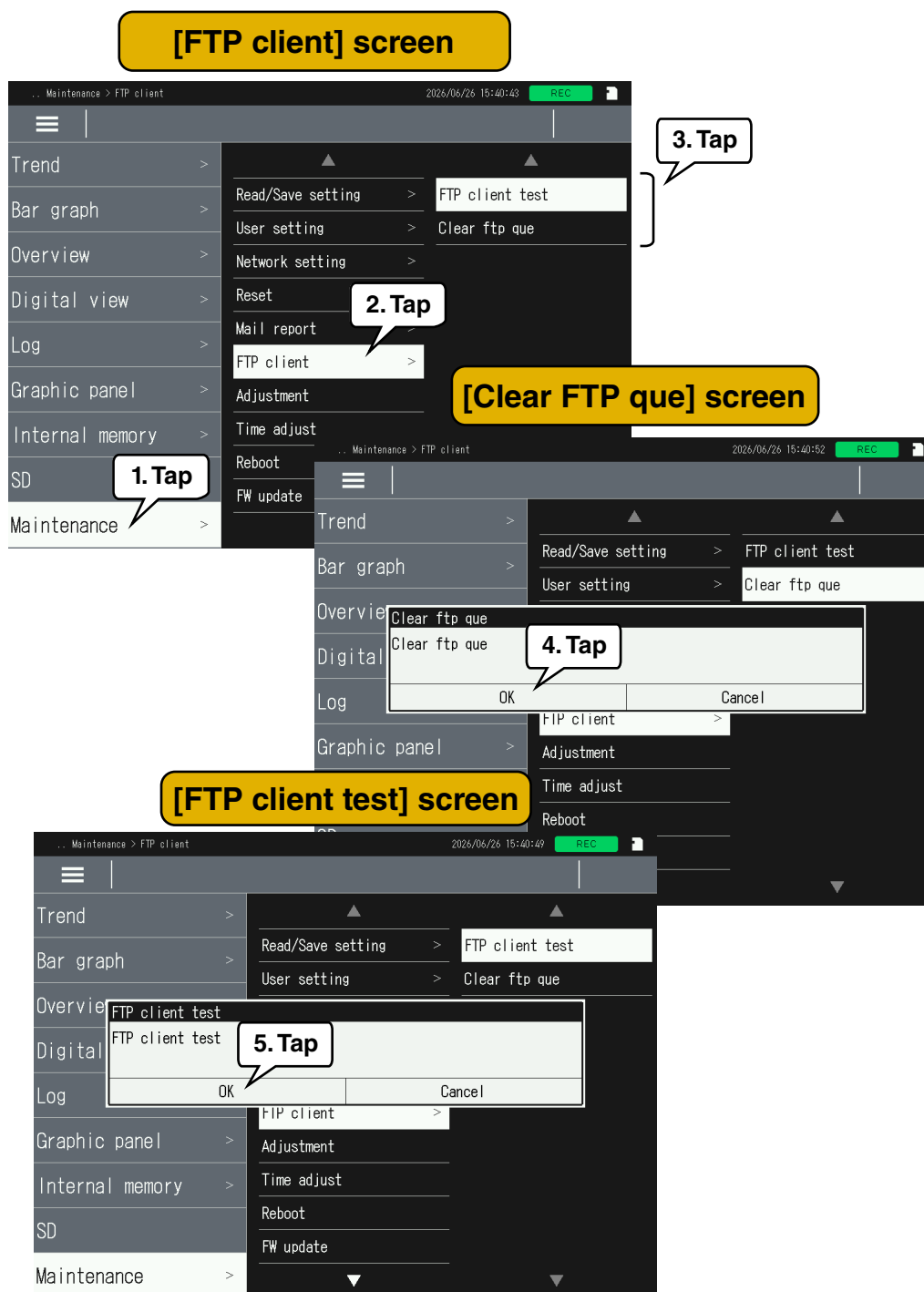
Follow the procedure below in order to perform e-mail reporting test.



1. Tap [Maintenance] on the menu screen.
2. Tap [Mail report].
3. When performing an e-mail reporting test, tap [Mail report test].
4. Select a template with ▲ and ▼ buttons. → 3.8.3 Template setting
5. Select [Clear mail que] when deleting the transmission queue.
6. When a popup appears, tap [OK] to execute.

4.3.11.9 FTP client

Follow the procedure below in order to perform FTP client test.



1. Tap [Maintenance] on the menu screen.
2. Tap [FTP client].
3. When performing an FTP client test, tap [FTP client test].
4. Select [Clear ftp que] when clearing the transmission queue.
5. When a popup appears, tap [OK] to execute.

4.3.11.10 Ai adjustment

Follow the procedure below in order to adjust analog input (Ai).

[Maintenance] screen

1. Tap Maintenance

2. Tap Adjustment

3. Tap Ai1

Selecting Ai channel screen

4. Tap Zero

5. Tap Adjustment

6. Tap Ai1

7. Tap OK

Ai adjustment screen

Current value

Ai1 50.47 %

Zero -10.00 V

Span 10.00 V

Offset 0.00 %

Gain 0.00 %

Adjustment

Save the settings?

OK Cancel

Ai1	Ai2	Ai3	Ai4	Ai5	Ai6
Ai7	Ai8	Ai9	Ai10	Ai11	Ai12
Ai13	Ai14	Ai15	Ai16	Ai17	Ai18
Ai19	Ai20	Ai21	Ai22	Ai23	Ai24
Ai25	Ai26	Ai27	Ai28	Ai29	Ai30
Ai31	Ai32	Ai33	Ai34	Ai35	Ai36
Ai37	Ai38	Ai39	Ai40	Ai41	Ai42
Ai43	Ai44	Ai45	Ai46	Ai47	Ai48
Ai49	Ai50	Ai51	Ai52	Ai53	Ai54
Ai55	Ai56	Ai57	Ai58	Ai59	Ai60
Ai61	Ai62	Ai63	Ai64		

1. Tap [Maintenance] on the menu screen.
2. Tap [Adjustment].
3. Select a channel to be adjusted.
4. The current input value (%) and the current setting value are displayed.
Refer to the table below for the parameters.
5. Tap [<] button to go back to [Adjustment] screen. Tap [=] to display a popup. When [OK] is tapped, the setting change is saved.

Parameter	Reference
Zero / Span	Depends on the analog input specification. Refer to the code number for the analog input specification. • ± 10 V DC: -10.00 to +10.00 V (minimum range 1.6 V) • ± 0.8 V DC: -800 to +800 mV (minimum range 160 mV) • ± 80 mV DC: -80 to +80 mV (minimum range 20 mV)
Offset	Set within the range of -5.00 to +5.00 (%)
Gain	

4.3.11.11 Time adjust

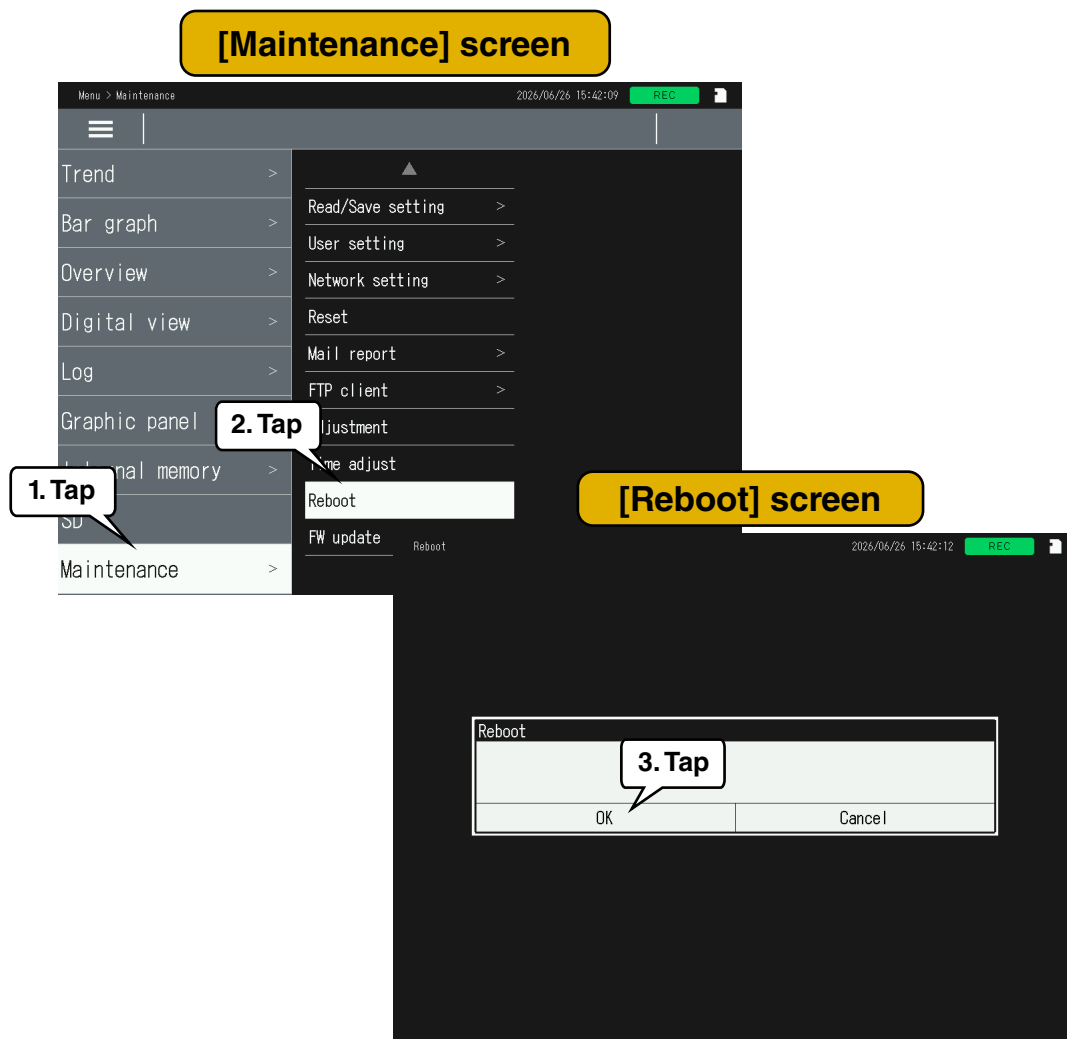
Follow the procedure below in order to set the local time used for trend recording or system logs.



1. Tap [Maintenance] on the menu screen.
2. Tap [Time adjust].
3. Change the time on [Time adjust] screen.
4. When a popup appears, tap [OK] to save the setting change.

4.3.11.12 Reboot

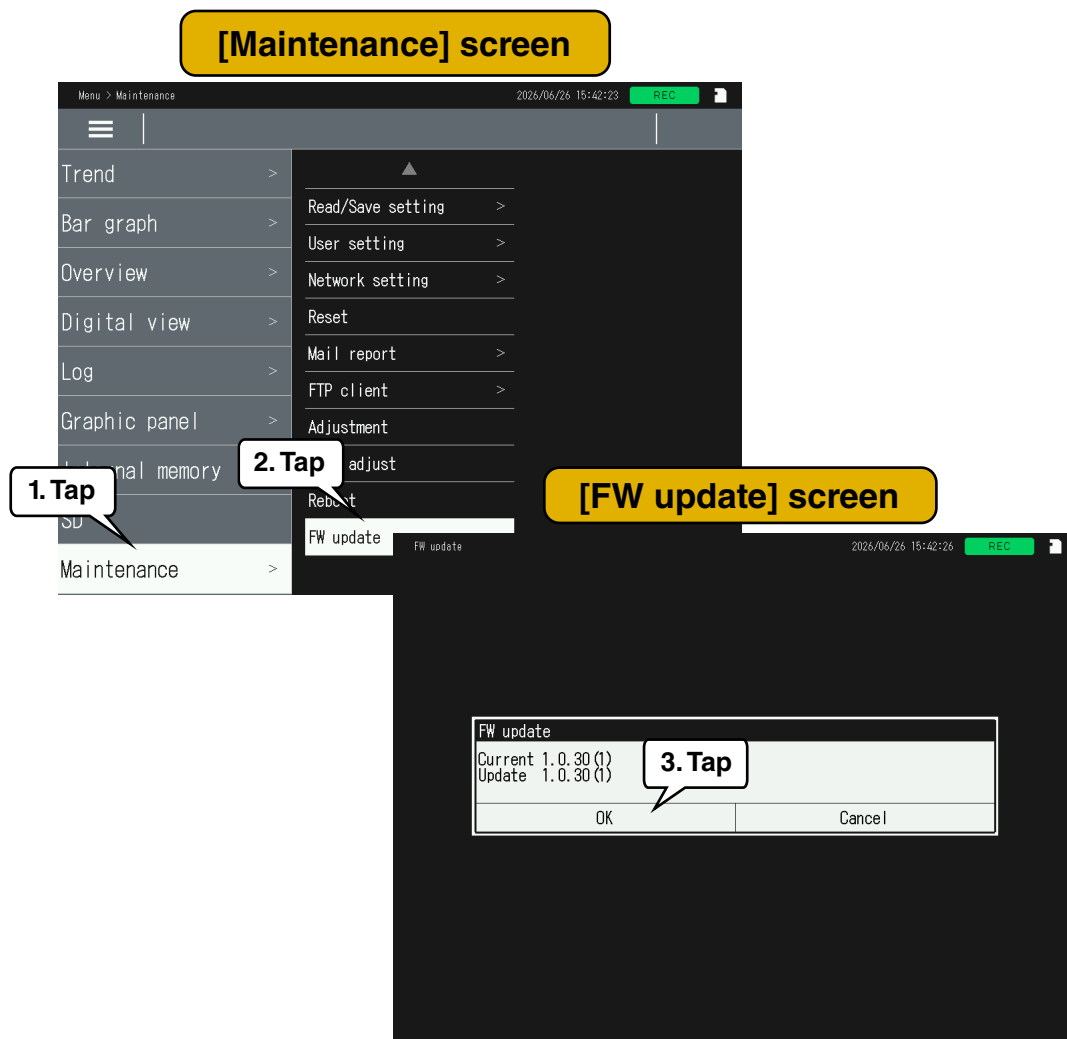
Follow the procedure below in order to reboot the device.



1. Tap [Maintenance] on the menu screen.
2. Tap [Reboot].
3. When a popup appears, tap [OK] to reboot the device.

4.3.11.13 FW update

The firmware version is displayed. Refer to our website regarding how to update the firmware.



1. Tap [Maintenance] on the menu screen.
2. Tap [FW update].
3. Check the version information on the popup. Tap [OK] to start updating.

4.3.11.14 Information

Follow the procedure below in order to display the device information.



1. Tap [Maintenance] on the menu screen.

2. Tap [Information].

3. The device information is displayed.

For the displayed items, refer to the table below.

Displayed item	Description	Reference
Version	The firmware version in the VR288E-G64 is displayed.	
IP address Subnet mask Default Gateway primary DNS secondary DNS	IP address, Subnet mask, Default Gateway, primary DNS and secondary DNS are displayed.	Changeable in 4.3.11.6 Network setting.
Mac address	Mac address is displayed.	
Serial	The number to be managed by MG CO., LTD. is displayed.	

4.3.11.15 Disk usage

Follow the procedure below in order to display the usage state of the SD card placed in the device.



1. Tap [Maintenance] on the menu screen.
2. Tap [Disk usage].

4.3.11.16 Language

Follow the procedure below in order to configure the language setting displayed on the device.



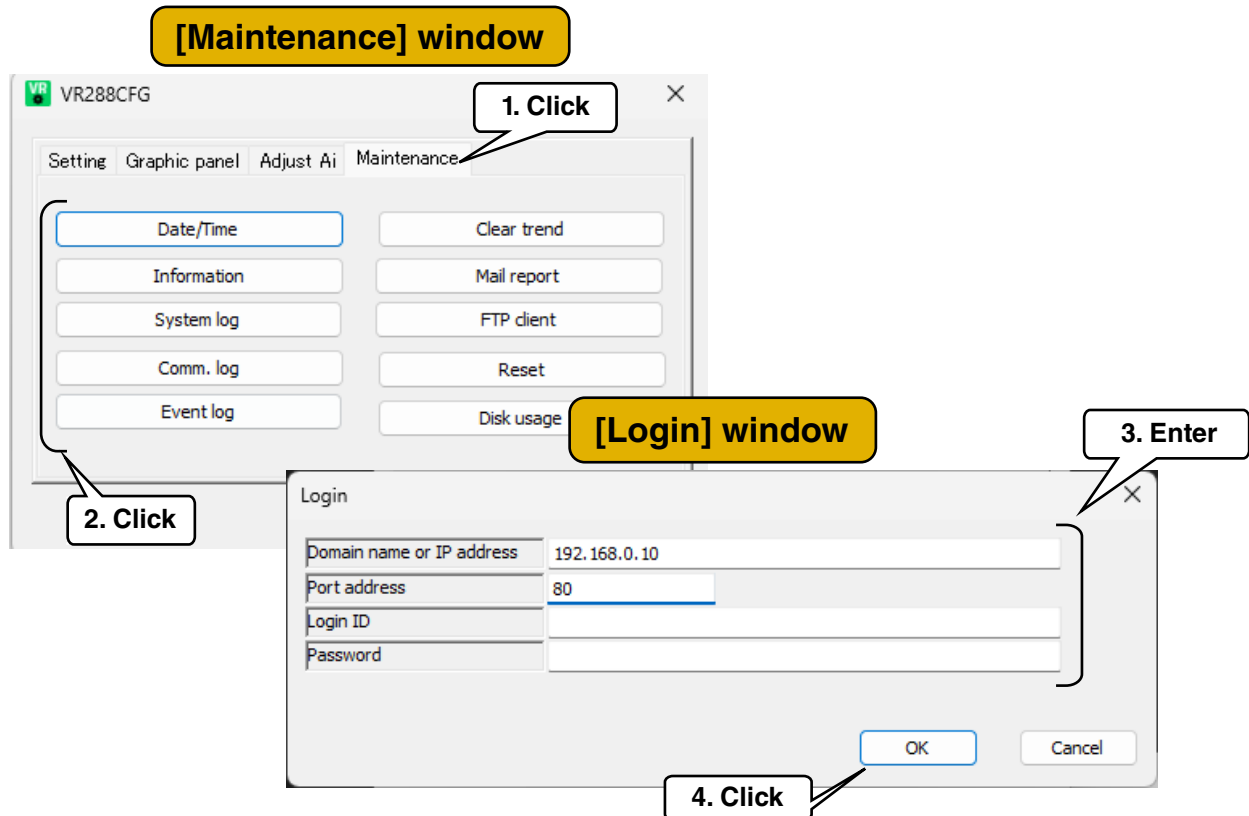
1. Tap [Maintenance] on the menu screen.
2. Tap [Language].
3. Select the language to be displayed.
4. Tap [OK] to save the setting change.

5. Maintenance

5.1 Maintenance from VR288CFG

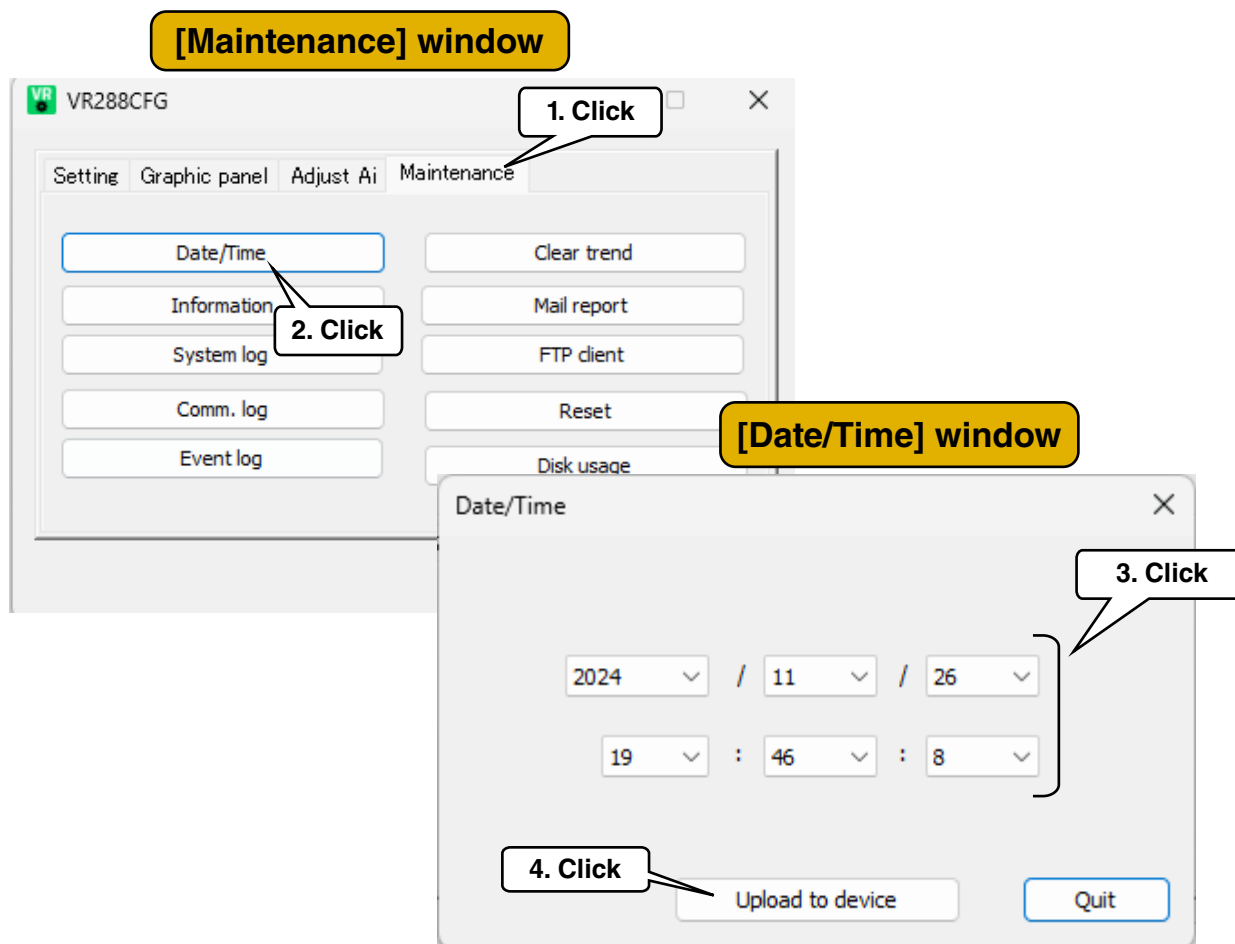
From [Maintenance] window, maintenance on the VR288E-G64 can be performed.

1. After starting up VR288CFG, click [Maintenance] tab to display [Maintenance] window.
2. Click the parameter to be performed to display [Login] window.
3. Enter the login information and click [OK]. The window for the maintenance to be performed appears.



5.1.1 Date/Time

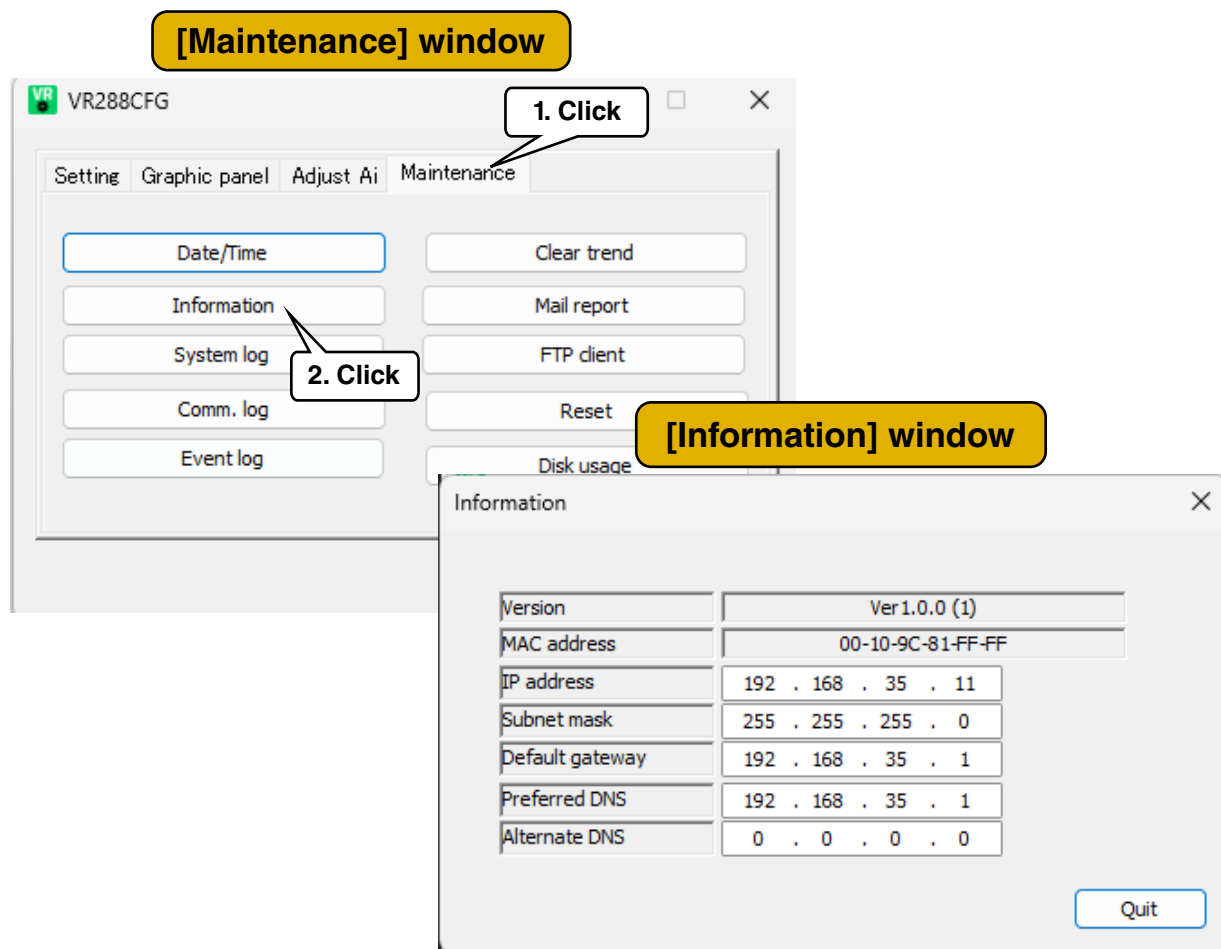
Set the local time used to the trend recording and the system logs.



1. Click [Maintenance] tab.
2. Click [Date/Time] button. After logging in, [Date/Time] window appears.
3. Click the date and time drop-down list to select the date and time, and click [Upload to device] button to apply the settings.

5.1.2 Information

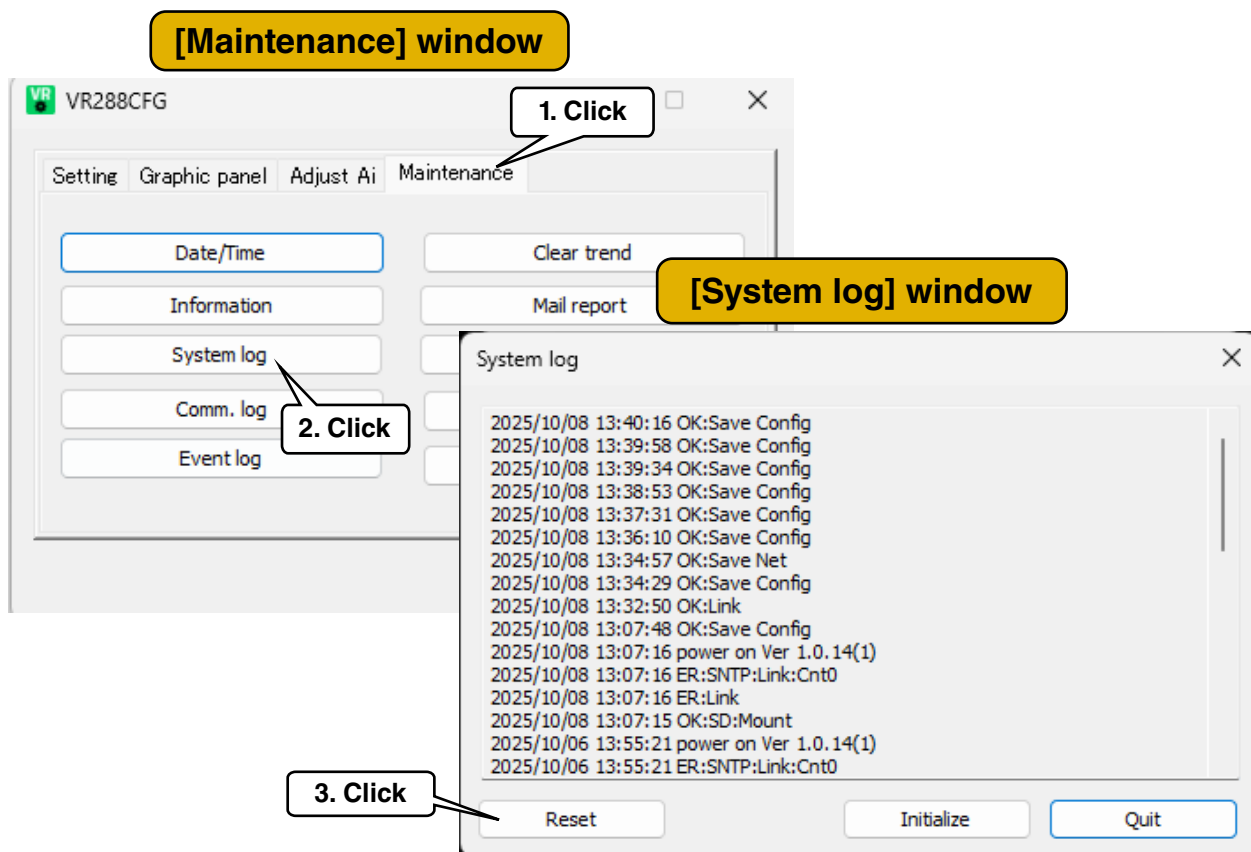
Follow the procedure below in order to display the device information.



1. Click [Maintenance] tab.
2. Click [Information] button. After logging in, [Information] window appears.

5.1.3 System log

Follow the procedure below in order to display the list of system logs.



1. Click [Maintenance] tab.
2. Click [System log] button. After logging in, [System log] window appears.
3. Click [Reset] button to clear the system logs.
Click [Initialize] button to initialize the system logs.
4. For system log messages, refer to the table below. (Partial list)

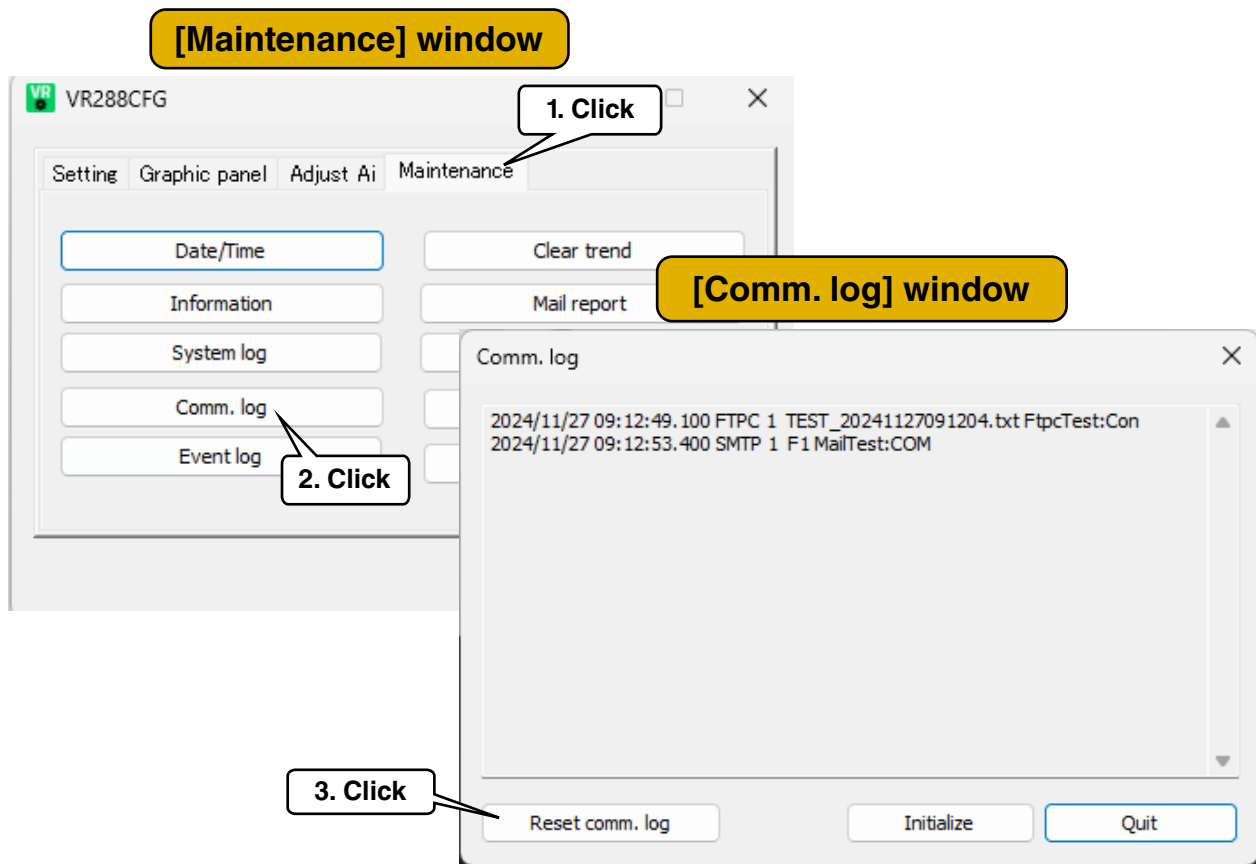
Message	Meaning
power on Verxx	Power supply ON (xxx: version)
OK:SNTP	Succeeded in time synchronization of SNTP.
OK:AdjustTime	Time is adjusted.
OK:Save Config	Setting is updated.
OK:Save Net	Network setting is updated (Rebooting is required).

CAUTION

- In case of trouble, our service personnel may review the system log contents for analysis.
- The system log messages contain many proprietary internal processes, so individual log details are not provided.

5.1.4 Communication log

Follow the procedure below in order to display the list of communication logs.



1. Click [Maintenance] tab.
2. Click [Comm. log] button. After logging in, [Comm. log] window appears.
3. Click [Reset comm. log] button to clear the communication logs.
Click [Initialize] button to initialize the communication logs.
4. For communication log messages, refer to the table below. (Partial list)

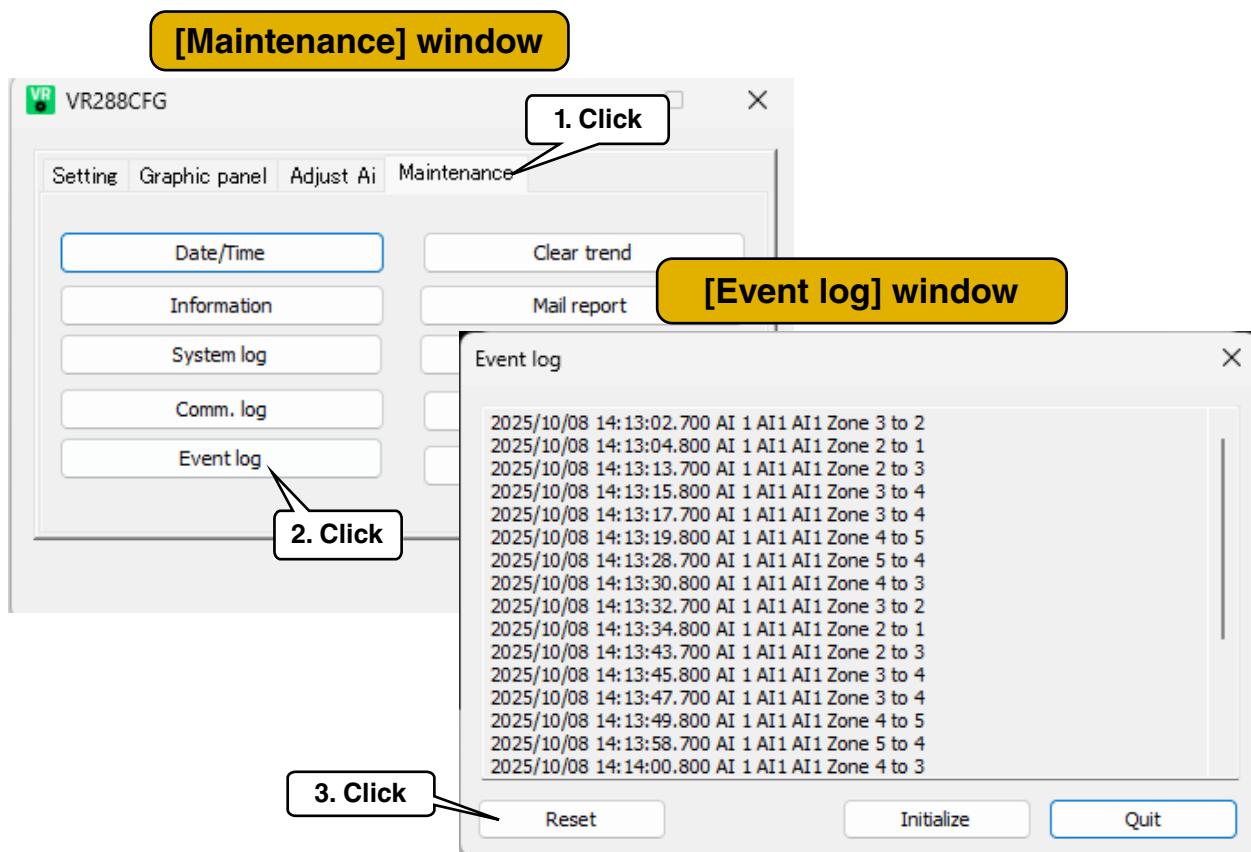
Message	Meaning
FTPC,1,CLOG.txt,Success	Succeeded in the transfer of CLOG.txt.
SMTP,1,F1,Regular	Succeeded in the regular reporting of Form1.

CAUTION

- The communication log contains proprietary content related to internal processing and various messages from different companies providing mail services, so individual log details are not provided.

5.1.5 Event log

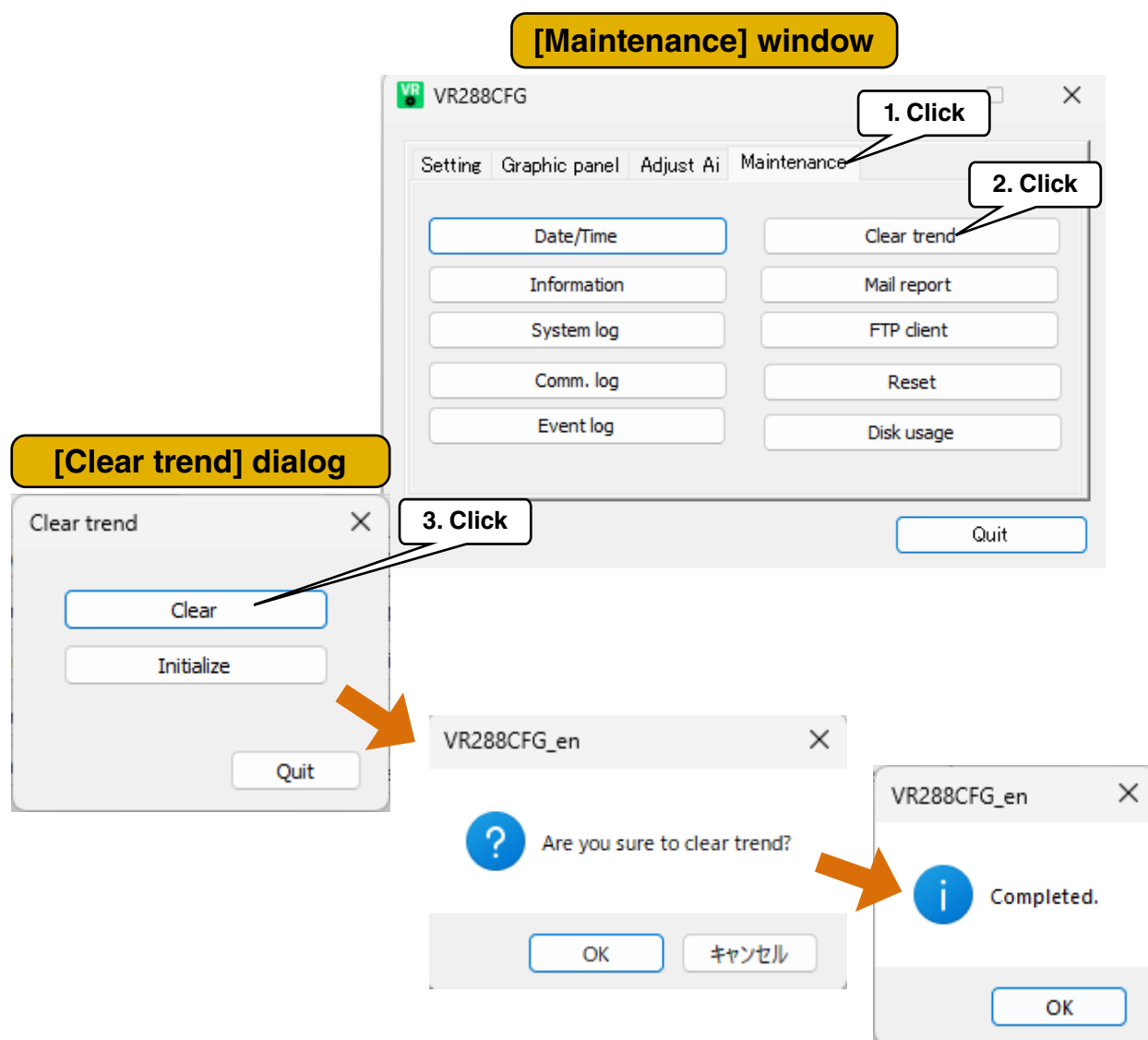
Follow the procedure below in order to display the list of event logs.



1. Click [Maintenance] tab.
2. Click [Event. log] button. After logging in, [Event log] window appears.
3. Click [Reset] button to clear the event logs.
Click [Initialize] button to initialize the event logs.

5.1.6 Clear trend

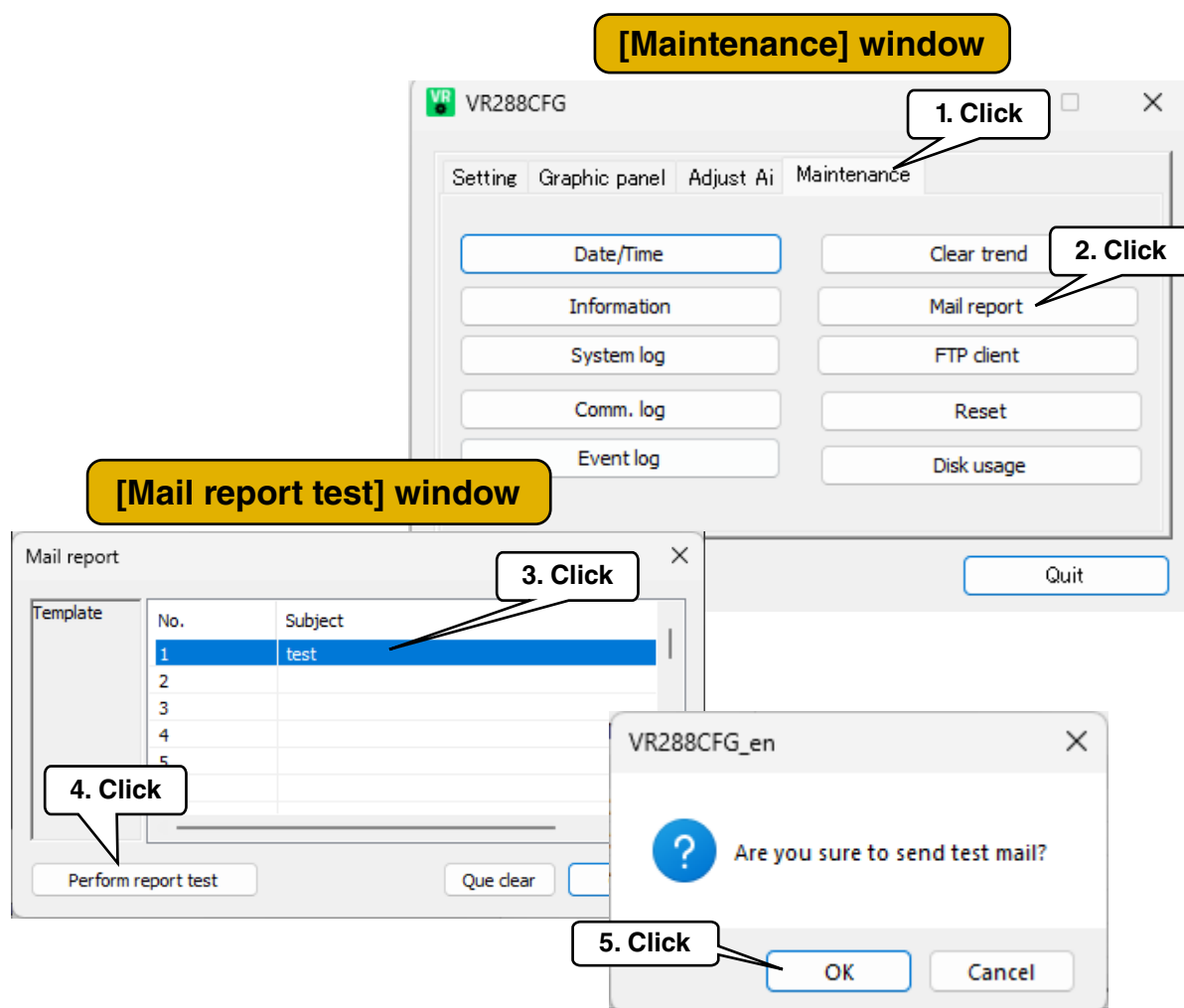
Follow the procedure below in order to clear the trend.



1. Click [Maintenance] tab.
2. Click [Clear trend] button. [Clear trend] dialog appears.
3. Click [Clear] button to clear the trend. Click [Initialize] button to initialize the trend.
4. After clicking [Clear] or [Initialize] button, the confirmation dialog appears.
5. Click [OK] button. After logging in, the result of clearing/initializing trend appears.

5.1.7 E-mail reporting test

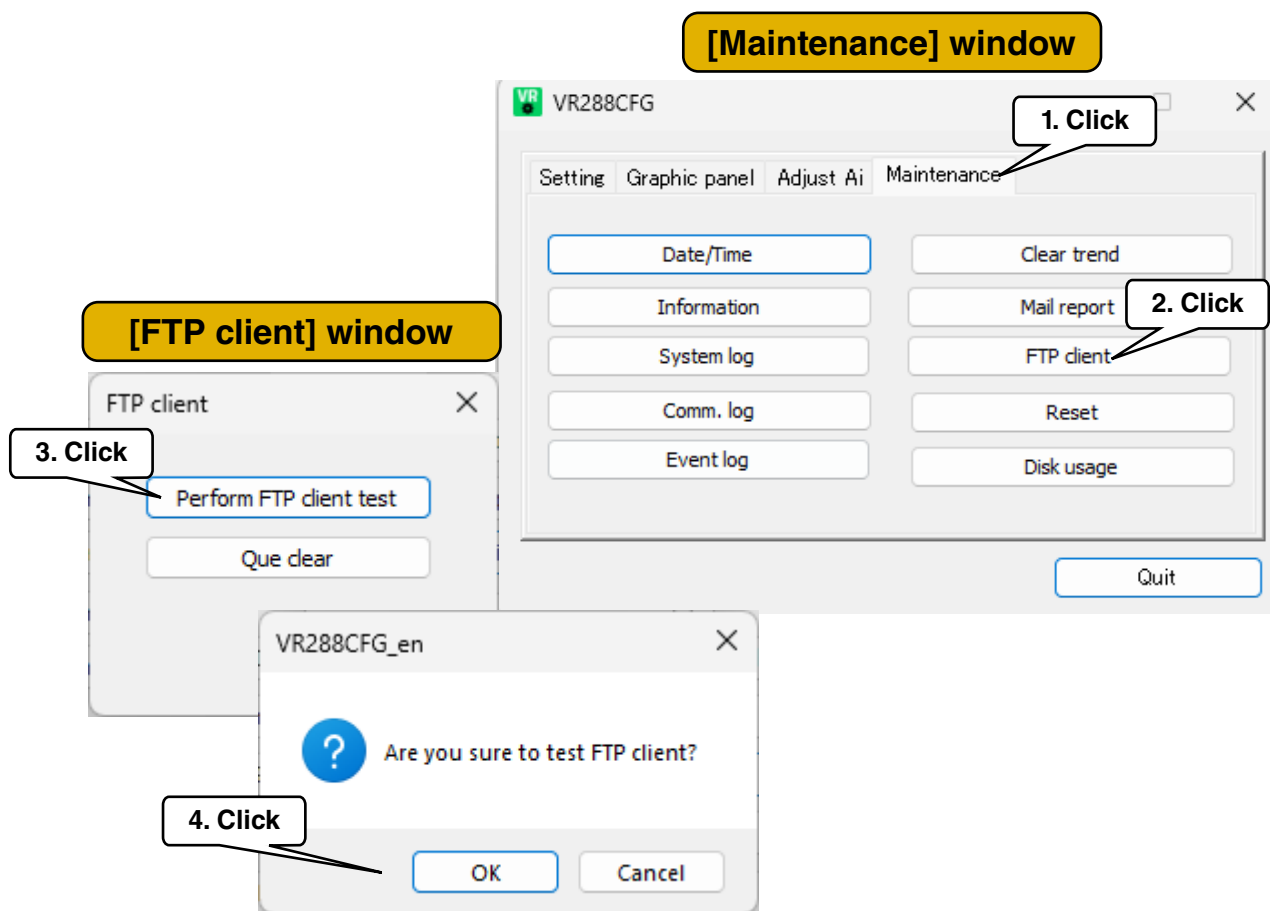
Perform e-mail reporting test.



1. Click [Maintenance] tab.
2. Click [Mail report] button. After logging in, [Mail report] window appears.
3. Click [Perform report test] button to perform a report test.
Click [Que clear] button to clear the transmission queue.
4. Click the template to perform the e-mail reporting test. → 3.8.3 Template setting
5. Click [Perform report test] button. Then, the confirmation popup appears.
6. Click [OK] button to perform the e-mail reporting test.

5.1.8 FTP client test

Perform FTP client test.

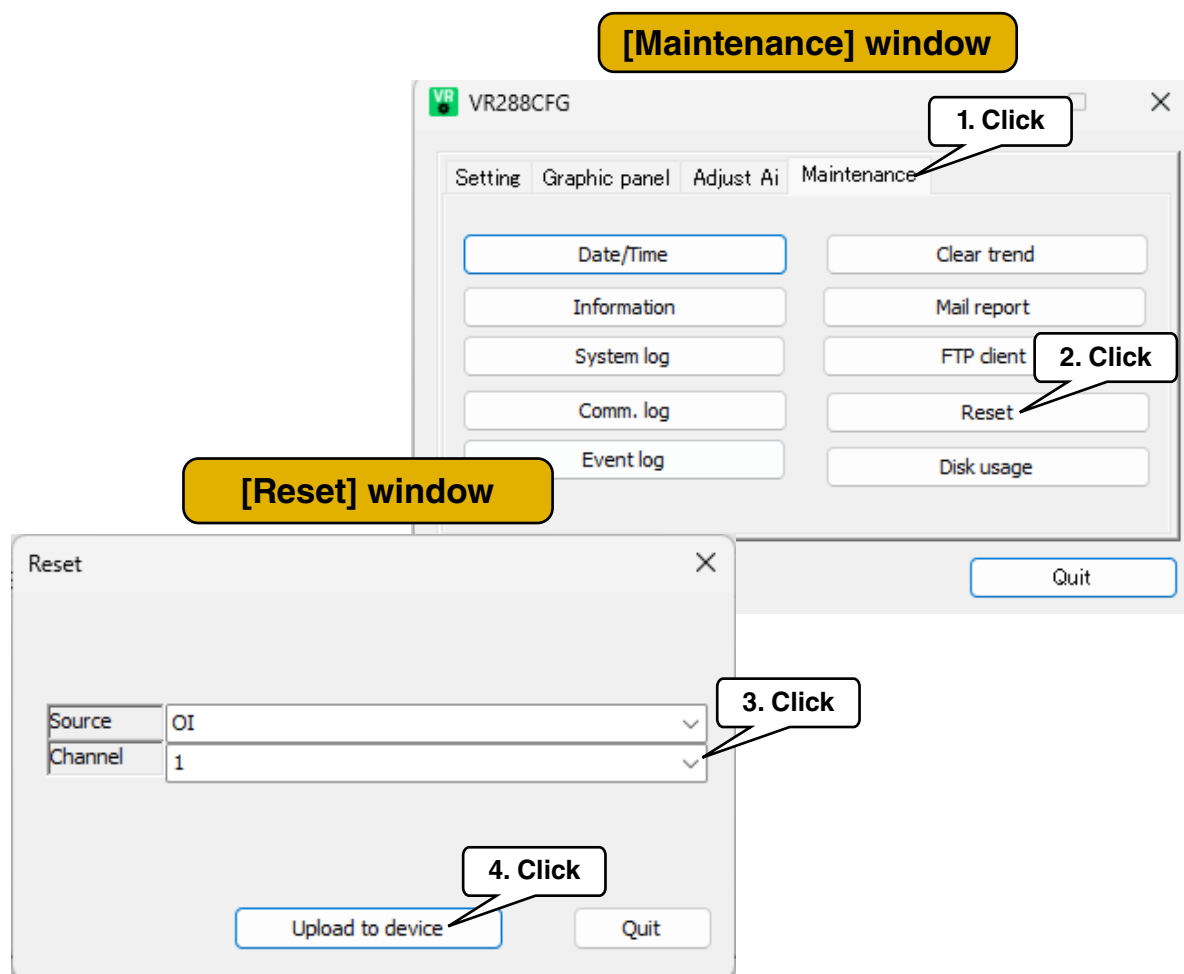


1. Click [Maintenance] tab.
2. Click [FTP client] button. After logging in, the [FTP client] window appears.
3. Click [Perform FTP client test] button to perform a FTP client test.
Click [Que clear] button to clear the transmission queue.
4. When [Perform FTP client test] button is clicked, the confirmation popup appears.
5. Click [OK] button. The FTP client test is performed.

5.1.9 Reset

Follow the procedure below in order to reset the OI values.

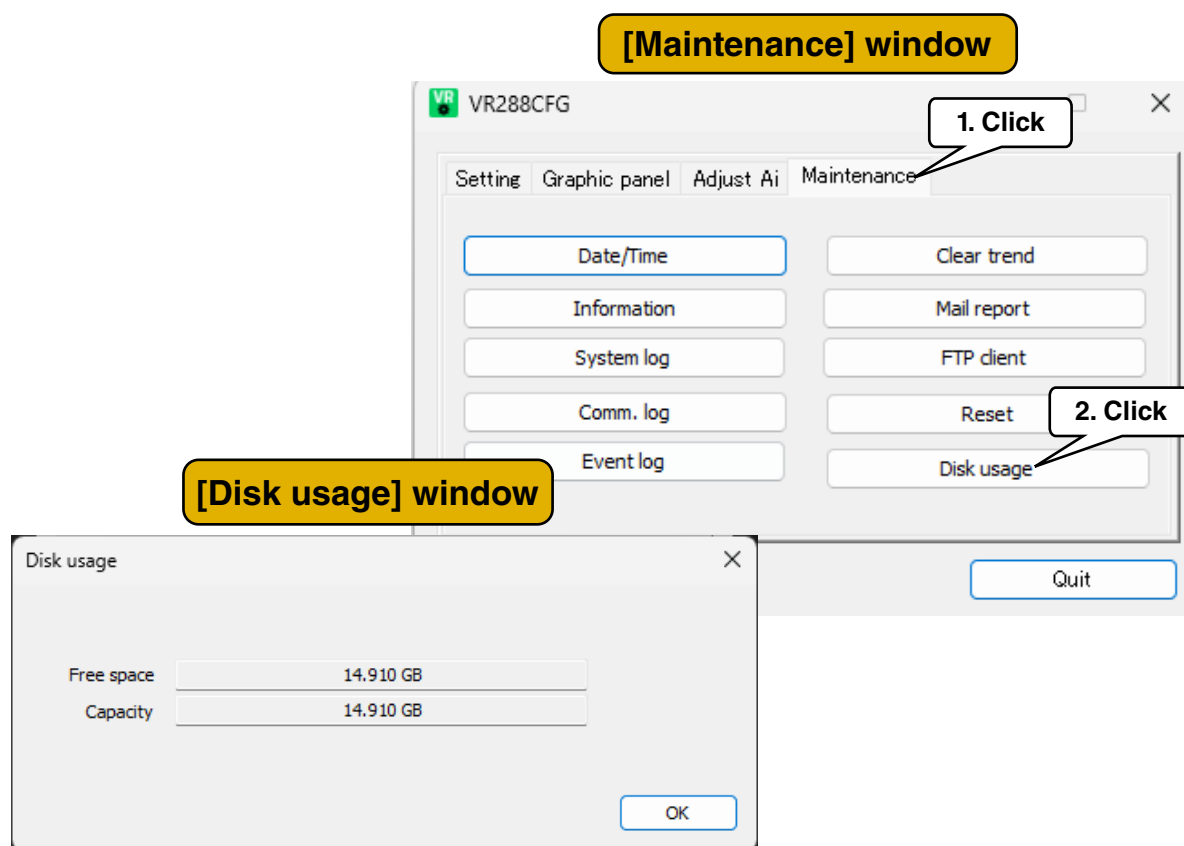
Refer to 3.4.3 Operational input (OI) regarding OI type that can be reset.



1. Click [Maintenance] tab.
2. Click [Reset] button.
3. Select a channel from 1 to 32.
4. Click [Upload to device] button. After logging in, resetting operation is performed.

5.1.10 Disk usage

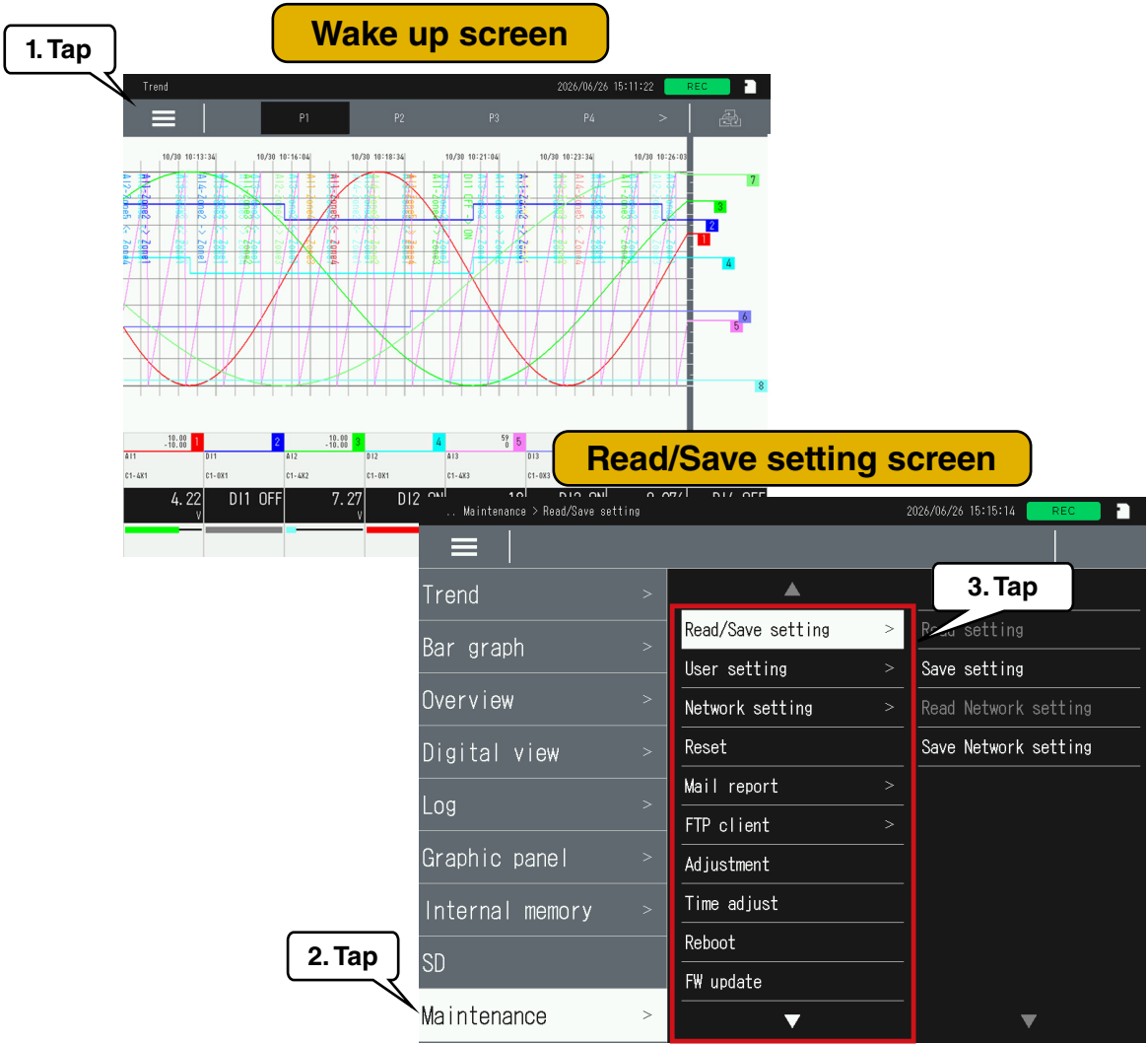
Follow the procedure below in order to display the disk usage.



1. Click [Maintenance] tab.
2. Click [Disk usage] button. After logging in, [Disk usage] window appears.

5.2 Maintenance from VR288E-G64

Maintenance can be performed on the device screen.



For details, refer to 4.3.11 Maintenance screen.

6. Recorded data

The trend data and event log data are written to the internal memory of the device.

The internal memory is composed of divided memory blocks and functions as a ring buffer.

Recorded data is written to a memory block, and when it reaches a specified time or number of samplings, the writing operation transitions to the next memory block.

Simultaneously, the recorded data in the memory block is transferred to an SD card and saved as a file.

6.1 General specification

The working directory is "MG\VR288" under the SD card. The recording data transferred from a memory block is saved as a file. The data size of a memory block is as follows.

Item	Description
Trend data	Data size: max. 50 000 samples, the number of memory blocks: 64
System log	Data size: 1 000 logs The number of memory blocks: 8
Event log	
Communication log	

The conditions for transferring the recording data are as shown in the table below.

The recorded data files are registered in the transmission queue. → 3.2.5 FTP client

It is also possible to download the recorded data files from the FTP server. → 3.2.3 FTP server

Item	Description
Trend data	When the conditions set in the normal recording or the trigger recording are met. → 3.5.1 Basic setting At the time of the device startup. When the SD card is inserted. When the setting is changed.
System log	When the data size exceeds 1000 logs.
Event log	When the year is changed.
Communication log	When the recording state is changed. When the encode is changed.

Refer to the following for operations during inserting or removing SD card, during power failure retention and during power startup.

Item	Description
Inserting or removing SD card	When removing SD card: When a memory block transitions, the recorded data in the memory block is transferred to an SD card and saved as a file. When inserting SD card: When a memory block transitions, the recorded data in the memory block is transferred to an SD card and saved as a file. In case of storing failure due to removing SD card: Storing failure is registered in the system log. Trend recording stops. In case of storing failure during inserting SD card: Storing failure is registered in the system log. Trend recording stops.
Power failure retention	The recording data is written to the internal memory.
At the time of power startup	In case that recording was in progress before the power is removed, the recorded data is transferred to an SD card and saved as a file simultaneously with the memory block transition.

6.2 Trend data

The trend data is recorded according to the settings in the configurator software or in the device.

→ 3.5 Trend setting

Either binary format (extension: TRD) or CSV file can be selected for the recording file format of the trend data.

Refer to the table below for the specifications of the trend data recording file.

Item	Description
Recorded content	- Binary format (extension: TRD): Setting information, trend data - CSV file: Trend data, event data, comment data
Storing rate	100 msec, 500 msec, 1 sec., 2 sec., 5 sec., 10 sec., 1 min., 2 min., 5 min., 10 min., 30 min., 1 hour
Memory block	64
Data size (per file)	Max. 50,000 samples (per memory block)
Data size (total)	Depending on the capacity of the SD card
Timing of finalizing data	The data is finalized when the trend is finalized or when the power is turned on. When recording was in progress before the power is removed, the memory block is finalized and transitions to the next block. Simultaneously, the data in the memory block is transferred to an SD card and saved as a file.
Data error	The previous value (initial value: 0) is recorded. Data errors occur in the following cases: - When a communication error occurs with I/O - When I/O is out of the input range - During I/O communication errors
Recording capacity (per file)	- Trend data: 50,000 samples × the number of pens - Event data: 3,000 events - Comment data: 1,000 comments

When recording trends, note the following limitations.

Item	Description
Number of events	Up to 64 events can be recorded per sample. Up to 16 events can be recorded per 100 msec. If the maximum number of the internal memory is exceeded, a new event is written starting from the beginning.
Number of comments	Up to 4 comments can be recorded per sample. If the maximum number of the internal memory is exceeded, a new comment is written starting from the beginning.

If the time is corrected during trend data recording, the time is corrected at regular intervals for a fixed period of time to ensure time continuity. If file names are duplicate due to changes of time or regional settings, the later file is effective.

Corrected range	Process
Within 0 to -10 sec.	The storing rate is extended until the corrected current time catches up with the time in the process of trend data recording. After catching up, the storing rate is restored.
Within 0 to 10 sec.	The data for missing storing rate is complemented. In addition, the storing rate is shortened until the time in the process of trend data recording catches up with the corrected current time. After catching up, the storing rate is restored.
Other than those above	The time change is applied immediately and is not equalized.

6.2.1 Trend data (TRD)

Refer to the table below for the detail of the trend file. Refer to 6.6 Folder structure for the folder structure.

Item	Description
Data format	TRD Binary Format (Extension: TRD)
Encode	UTF-8
Recording folder	Determined by the time of initial sampling after the recording (normal recording / trigger ON) started. Saved in the "TREND\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2025 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
File name	Files are named with the year, month, day, hour, minute, second, and millisecond (YYYYMMDDhhmmss//) of the initial sampling after the recording (normal recording / trigger ON) started. When the sampling number is reached, the file is transferred to an SD card and saved as a file. (Example: For August 20, 2025, at 10:30:10.500, the file would be named 20250820103010500.TRD.)
Data view	- The trend data being recorded can be viewed on the device screen. → 4.2.3 Trend screen - Any data in the recording folder can be selected and displayed on the device screen. It is possible to jump to the target trend position from the event summary screen or comment summary screen. (If there are no events, only the latest will be displayed) → 4.3.10 SD card - Any data in the recording folder can be downloaded from FTP server. - Data can be viewed with the waveform viewer software for TR30 (model: TRViewer). TRViewer can be downloaded from our website.

6.2.2 Trend data (CSV)

Refer to the table below for the detail of the trend file.

6.2.2.1 Saving format

Refer to 6.6 Folder structure for the folder structure.

Item	Description
Data format	CSV Format (Extension: CSV)
Encode	Shift-JIS / UTF-8
Recording folder	Determined by the time of initial sampling after the recording (normal recording / trigger ON) started. Saved in the "TREND\YYYYMMDD" folder. YYYY: 4-digit year, e.g., 2025 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
File name	Files are named with the year, month, day, hour, minute, second_file type of the initial sampling after the recording (normal recording / trigger ON) started. When the sampling number is reached, the data is transferred to an SD card and saved as a file. Trend: YYYYMMDDhhmmss_T.CSV Event: YYYYMMDDhhmmss_E.CSV Comment: YYYYMMDDhhmmss_C.CSV (Example: For August 20, 2025, at 10:30:10.500, the file would be named 20250820103010_T.CSV, 20250820103010_E.CSV, 20250820103010_C.CSV)
Data view	- Trend data being recorded can be viewed on the device screen. → 4.2.3 Trend screen - Any data in the recording folder can be selected and displayed on the device screen. - Any data in the recording folder can be downloaded from FTP server.

6.2.2.2 Recording format

(1) Trend data

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13
Row 1													
Row 2													
Row 3													
Row 4	Number of pens	4											
Row 5	Storing rate	100ms											
Row 6													
Row 7													
Row 8		PEN	Display color	I/O type	CH	CH name	Displayed comment (ON)	Displayed comment (OFF)	Scaling (0%)	Scaling (100%)	Scal- ing	Num- ber of decimal places	Engi- neering unit
Row 9		1	0xFF0000	AI	1	AI1			0.000	100.000		3	kW
Row 10		2	0x0000FF	AI	2	AI2					0.010	2	mA
Row 11		5	0x00FF00	DI	1	DI1	ON	OFF					
Row 12		9	0x00FFFF	PI	1	PI01					1.000	1	kW/h
Row 13													
Row 14		Date	Time	Mili- sec- ond	AI01	AI02	DI01	PI01	OI01	DO01			
Row 15					AI01	AI02	DI01	PI01	OI01	DO01			
Row 16		2025/8/20	13:00:00	0	9.920	15.30	ON	20.1	4500.00	OFF			
Row 17		2025/8/20	13:00:00	100	10.020	15.50	ON	21.5	4600.00	OFF			
Row 18		2025/8/20	13:00:00	200	10.800	15.45	ON	22.3	4630.00	OFF			
:		:	:	:	:	:	:	:	:	:	:	:	:
...		2025/8/20	13:09:59	900	12.000	15.05	STOP	36.2	5330.00	ON			
...	...	...	...	...	...	...	...	...	...	...	...	...	...

(2) Event data

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Row 1									
Row 2									
Row 3									
Row 4									
Row 5									
Row 6		Date	Time	Milisecond	CH name	CH comment	Event	Event no.	Status
Row 7		2025/8/20	13:01:00	200	AI01	AI01	AI1 AREA2	0	0xFF0000
:	:	:	:	:	:	:	:	:	:
...		2025/8/20	13:08:10	500	AI01	AI01	AI1 AREA3	0	0x00FF00
...	...	...	...	...	...	...	...	...	...

(3) Comment data

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Row 1						
Row 2						
Row 3						
Row 4						
Row 5						
Row 6		Date	Time	Milisecond	Message	Text color
Row 7		2025/8/20	13:04:00	700	COMMENT 1	0x0000FF
Row 8		2025/8/20	13:08:10	500	COMMENT 2	0x00FF00
...	...	...	...	...	...	...

6.3 System log

Refer to the table below for the specifications of the system log recording files.

When system log recording is disabled, system logs are not saved. → 3.6 Log setting

Item	Description
Data format	Text format (Extension: txt)
Encode	ASCII
Recording folder	Determined by the time when an initial system log file is registered. Saved in the "LOG\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2025 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
Recorded content	Each row is recorded as "YYYY/MM/DD hh:mm:ss Message". Refer to 5.1.3 System log for the details on the messages.
File name	Files are named with the year, month, day, hour, minute, second, and S (YYYYMMDDhhmmssS.txt) of the initial registering for each memory block and stored to the SD card. (Example: For August 20, 2025, at 10:30:10, the file would be named 20250820103010S.txt.)
Data size	1000 logs
Memory block	8
Finalizing data	- When the data size exceeds 1000 logs. - When the year is changed. - When the recording state is changed. - When the encode is changed.
Data view	- Regardless of whether system logs are recorded or not, the latest 48 system logs can be viewed on the device. - Any log data in the recording folder can be selected and displayed on the device screen. - Any data in the recording folder can be downloaded from FTP server.

6.4 Event log

Refer to the table below for the specifications of the event log recording files.

When event log recording is disabled, event logs are not saved. → 3.6 Log setting

Item	Description
Data format	Text format (Extension: txt)
Encode	UTF-8 / Shift-JIS
Recording folder	Determined by the confirmed time of the recorded data. Saved in the "EVENT\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2025 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
Recorded content	Each row is recorded as "YYYY/MM/DD hh:mm:ss CH,Name,Comment,Msg". CH: Channel information (AI1-AI4, DI1, DI2, OI1-OI4, DO1, DI2) Name: The name set in channel Comment: The comment set in channel (AI: 3.4.1.4 Basic setting (AI), DI: 3.4.2.4 Basic setting (DI), OI: 3.4.3.1 Basic setting (OI), DO: 3.4.4.4 Basic setting (DO)) Message: The message at zone transition (AI: 3.4.1.5 Zone setting (AI), DI: 3.4.2.4 Basic setting (DI), OI: 3.4.3.2 Zone setting (OI), DO: 3.4.4.4 Basic setting (DO))
File name	Files are named with the first registration year, month, day, hour, minute, second, and E per memory block (YYYYMMDDhhmmssE.txt) and stored to the SD card. (Example: For August 20, 2025, at 10:30:10, the file would be named 20250820103010E.txt.)
Data size	1000 logs
Memory block	8
Finalizing data	- When the data size exceeds 1000 logs. - When the year is changed. - When the recording state is changed. - When the encode is changed.
Data view	- Regardless of whether event logs are recorded or not, the latest 48 event logs can be viewed on the device. - Any log data in the recording folder can be selected and displayed on the device screen. - Any data in the recording folder can be downloaded from FTP server.

6.5 Communication log

Refer to the table below for the specifications of the communication log recording files.

When communication log recording is disabled, communication logs are not saved.

→ 3.6 Log setting

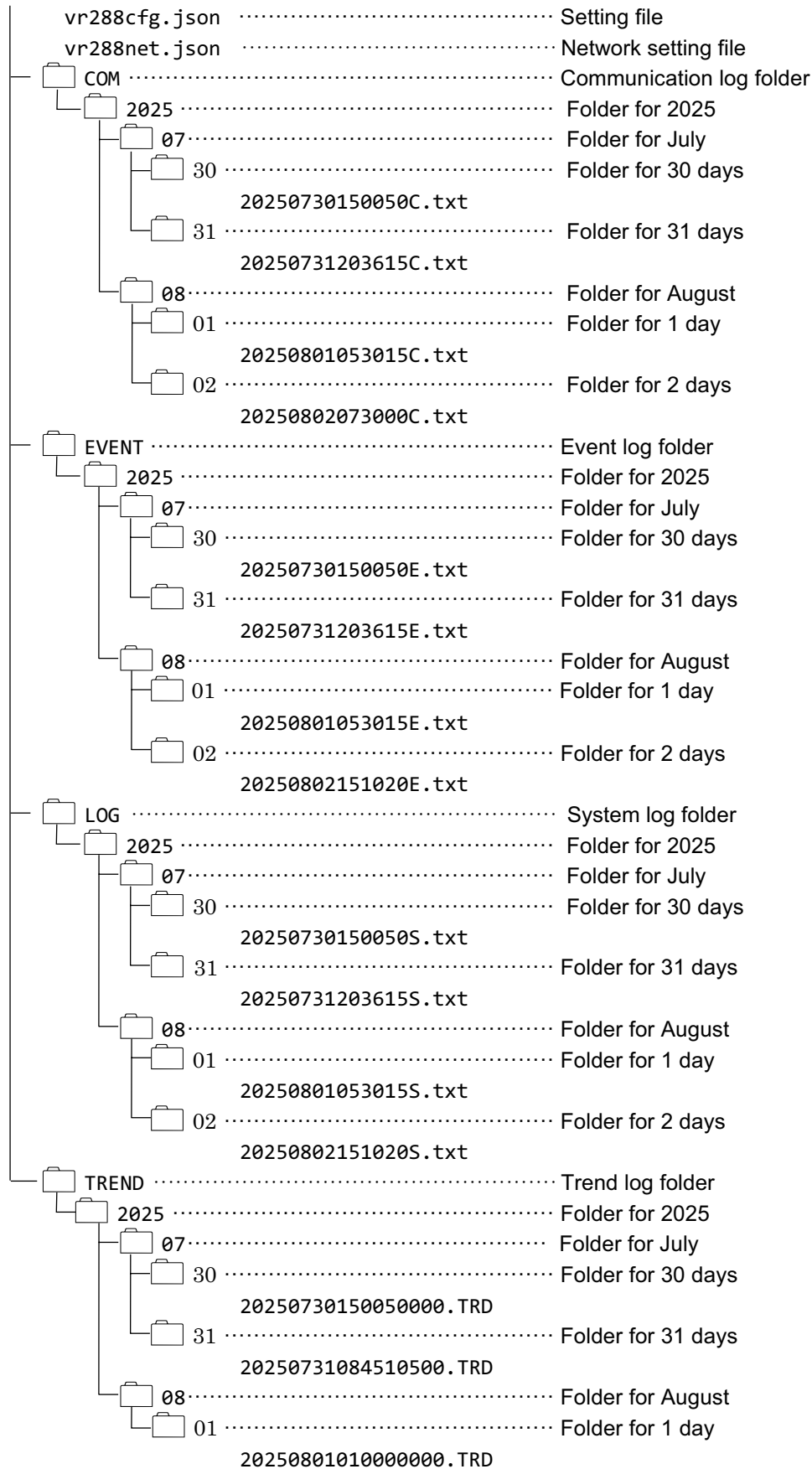
Item	Description
Data format	Text format (Extension: txt)
Encode	ASCII
Recording folder	Determined by the confirmed time of the recorded data. Saved in the "COM\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2025 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
Recorded content	Each row is recorded as "YYYY/MM/DD hh:mm:ss Type, Count,Form/File,Msg". Type: SMTP/FTPC Count: Number of transmission trials 1 to 3 Form/File: Forms or files to be sent Msg: Success or failure factors Example: FTPC,1,CLOG.txt,Success → Succeeded in transferring CLOG.txt SMTP,1,F1,Regular → Succeeded in regular reporting of Form1
File name	Files are named with the first registration year, month, day, hour, minute, second, and C per memory block (YYYYMMDDhhmmssC.txt) and stored to the SD card. (Example: For August 20, 2025, at 10:30:10, the file would be named 20250820103010C.txt.)
Data size	1000 logs
Memory block	8
Finalizing data	- When the data size exceeds 1000 logs. - When the year is changed. - When the recording state is changed. - When the encode is changed.
Data view	- Regardless of whether communication logs are recorded or not, the latest 48 communication logs can be viewed on the device. - Any log data in the recording folder can be selected and displayed on the device screen. - Any data in the recording folder can be downloaded from FTP server.

6.6 Folder structure

Each file is stored in the base folder "MG¥VR288" in the SD card.

The folder structure is as shown on the next page. Year, month, and day folders are automatically created as the number of saved files increases.

Base folder (MG¥VR288)



7. Appendix

7.1 Troubleshooting

Also refer to the “Frequently Asked Questions (FAQ)” from our website.

7.1.1 SD card

Problem faced	Checks to be done	Method of handling
Unable to record log data in the SD card.	Has the SD card been inserted? (Is the SD card mounted?) → 4.2.2 Common area for each screen	Insert an SD card specified by us. → 7.2.6 SD card
	Is the RECORD lamp ON? → 4.2.2 Common area for each screen	Tap [REC] or [REC Trigger] on the device.
	Is there space available for storage on the SD card?	Check for space availability, and delete unnecessary data in the SD card. → 4.3.11.15 Disk usage, 5.1.10 Disk usage

7.1.2 VR288CFG

Problem faced	Checks to be done	Method of handling
Unable to communicate between VR288E-G64 and VR288CFG.	Is the IP address correct?	Check the IP address on the screen of the VR288E-G64. → 4.3.11.6 Network 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 VR288E-G64 and in the PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] VR288E-G64 : 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.
	Is there a problem in the terminal or PC being used?	Use a different terminal or PC.
	Is the login name and the password correct?	Check the login name and password on the screen of the VR288E-G64. → 4.3.11.5 User setting

7.1.3 E-mail reporting

Problem faced	Checks to be done	Method of handling
Unable to send e-mails from the VR288E-G64.	Have you connected to the Internet?	Check that it is possible to connect to the Internet from the PC.
	Have the IP address and default gateway of the VR288E-G64 been correctly set?	Check the settings of the IP address and default gateway of the VR288E-G64. → 4.3.11.6 Network setting
	Is the recipient's e-mail address correct?	Check the recipient's e-mail address. Pay attention to differences such as between "_" and "-".
	Are the mail-related settings correct? - E-mail account - SMTP server IP address or domain name - POP3 server IP address or domain name - E-mail password	Check the mail-related settings sent by the provider. Also, confirm that it is possible to send e-mails to the recipient's address from e-mail software of your PC.
	Is the e-mail address correctly registered in the template?	Check the template settings.
	Does the e-mail server of the provider require authentication when sending e-mails? (e.g., SMTP authentication, SSL)	Verify the authentication method required by the provider and configure the e-mail settings accordingly. → 3.8 E-mail reporting setting
	If case of POP before SMTP authentication, have you opened the specified router port number?	Manually set the number specified in the router's NAT settings. (refer to the instruction manual of the router)
	Does the provider's e-mail service have a spam prevention function?	Are the mail-related settings correct? - E-mail account - SMTP server IP address or domain name - POP3 server IP address or domain name - E-mail password

7.1.4 Modbus/TCP (client)

Problem faced	Checks to be done	Method of handling
Unable to connect from the Modbus client to the VR288E-G64.	Has the Modbus/TCP server function enabled?	Enable the Modbus/TCP server function. → 3.2.2 Modbus/TCP (server)
Unable to read the data.	Are the channel register type and address correct?	Check the register type and address. → 7.2.4 Modbus/TCP server
Unable to connect via the router.	Has the port number 502 used by Modbus/TCP on the router opened?	Manually set the IP address and port number 502 of the VR288E-G64 in the router's NAT settings. (refer to the instruction manual of the router)

7.1.5 Modbus/TCP (server)

Problem faced	Checks to be done	Method of handling
Unable to connect to the Modbus server device from the VR288E-G64.	Is the LAN cable disconnected or has it come out from the HUB?	Connect the LAN cable securely. Check the connection lamp on the HUB.
	Is the IP address of the VR288E-G64 correct?	Check the IP address. → 4.3.11.6 Network setting, 4.3.11.5 User setting
	Has the same network address been specified in the VR288E-G64 and in Modbus server device?	Check the network address. [Example] VR288E-G64: 192.168.0.1 Slave: 192.168.0.2 Subnet mask: 255.255.255.0
	Is the IP address of the server device same as the one registered in VR288CFG?	Check the IP address. → 3.3.1 Connection setting
	Has the IP address been set for the server device?	Set the IP address for the server device. And, when using a remote I/O provided by us, disconnect and restart the power supply after setting the IP address. (refer to Users Manual of the respective remote I/O for how to set the IP address)
	Is the server function enabled on the SLMP-compatible device?	Enable the server function on the SLMP-compatible device.

7.1.6 FTP server

Problem faced	Checks to be done	Method of handling
Unable to make an FTP connection to the VR288E-G64.	Have the setting of the FTP server function for the VR288E-G64 been enabled?	Set the mode in the FTP server setting in VR288CFG as [Enable]. → 3.2.3 FTP server,
	Are the IP address, Login ID and the password for the VR288E-G64 correct?	Check the IP address.
		Check the Login ID and password set in VR288CFG. → 3.2.3 FTP server
	Is it possible to login to the VR288E-G64 from an FTP client such as a PC?	Check whether a DOS command can be used to login to the VR288E-G64.
Unable to perform maintenance of files in the VR288E-G64 from the FTP client.	Is the FTP client software being used specified in this User Manual?	Use an FTP client whose working has been confirmed. → 7.2.1 FTP server

7.1.7 FTP client

Problem faced	Checks to be done	Method of handling
Unable to connect to the FTP server.	Are the FTP server settings correct?	Check the settings on the FTP server.
	Is it possible to login to the FTP server set to the VR288E-G64 as transfer destination from FTP client such as a PC?	Verify if it is possible to log in to the FTP server using DOS commands, etc.
Unable to transfer trend data and each log files from the VR288E-G64.	Are the FTP server address, login, password, and destination folder name correct?	Check the login name and password for the FTP server. → 3.2.5 FTP client
	Is the subfolder to transfer specified?	Check the subfolder name on the FTP server. → 3.2.5 FTP client
	Does VR288E-G64 regularly transmit to the FTP server?	Check the transmission status. → 4.2.11 Communication log screen, 5.1.4 Communication log

7.2 Reference documents

7.2.1 FTP server

FTP server function is performed as follows.

Item	Description
FTP client	OS: Windows 11 Application (Verified operation environment): FFFTP
Maximum number of connections	1
Port address	For FTP connection: can be changed (initial value: 21) For passive: 45967 to 45970
Connection	PASV only (port mode is not available)
Access limitation	Login ID and password only
Operation	- Display of the list of directories and files - File download (only 1 file) - File download (Multiple files) - File deletion (1 file/multiple files) - Directory deletion (Including the files stored in the directory)

7.2.2 FTP client

FTP client function is performed as follows.

Item	Description
Port address	Variable (default: 21)
Connection	PASV only (port mode is not available)
Target	Finalized files (trend, logs)
File name	Same as the files saved in an SD card
Sub folder	Sub folder can be set.
Queuing	Up to 16 files Files are recorded in system logs when the queue is full.
PASV	PASV port: 45967 to 45970 It is possible to set whether the address returned by the PASV command is ignored or not. (mandatory if a port number other than 21 is specified).
Power failure retention	None
Retransmission	3 times (including the initial attempt) The first retry will continue 10 seconds later, and the second retry will continue 20 seconds later.
Test transmission	A test file is created in the working directory and transmitted. It is deleted after the test transmission. Test transmission is not a target of retransmission.
Transmission failure	When transmission fails, the transmission failure output is turned ON. When transmission is successful or when FTP client-related settings are changed, the transmission failure output is turned OFF. The same applies during test transmissions.
Time stamp	Local time
Log	Recorded in the communication log including retransmissions.

7.2.3 SLMP client

7.2.3.1 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 data length	Monitoring timer	Request data	Footer
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Parameter	Description
Header	Automatically added
Subheader	Fixed at 0x5000
Request destination station network number	Network No. specified in the VR288CFG I/O connection setting
Request destination station number	Station No. specified in the VR288CFG I/O connection setting
Request destination unit I/O number	Processor No. specified in the VR288CFG I/O connection setting
Request destination multidrop station number	Fixed at 0
Request data length	Automatically added
Monitoring timer	SLMP Timeout specified in the VR288CFG connection setting
Request data	Automatically generated by the device specified by the VR288CFG
Footer	Automatically added

7.2.3.2 SLMP command list

The commands and subcommands used to read the data from an SLMP device are as follows.

AI

Type	Device	Device code	Command	Subcommand
16bits	Data register (D)	00A8H	0403H	0000H
	Special register (SD)	00A9H	0403H	0000H
	File register (R) -- Block switching method	00AFH	0403H	0000H
	File register (ZR) -- Serial number access methos	00B0H	0403H	0000H
	Link register (W)	00B4H	0403H	0000H
	Link special register (SW)	00B5H	0403H	0000H
	Timer, Current value (TN)	00C2H	0403H	0000H
	Counter, Current value (CN)	00C5H	0403H	0000H
	Retentive timer, Current value (STN)	00C8H	0403H	0000H
	Index register (Z)	00CCH	0403H	0000H
	Module refresh register (RD)	002CH	0403H	0000H
32bits	Data register (D)	00A8H	0403H	0002H
	Special register (SD)	00A9H	0403H	0002H
	File register (R) -- Block switching method	00AFH	0403H	0002H
	File register (ZR) -- Serial number access methos	00B0H	0403H	0002H
	Link register (W)	00B4H	0403H	0002H
	Link special register (SW)	00B5H	0403H	0002H
	Timer, Current value (TN)	00C2H	0403H	0002H
	Counter, Current value (CN)	00C5H	0403H	0002H
	Retentive timer, Current value (STN)	00C8H	0403H	0002H
	Index register (Z)	00CCH	0403H	0002H
	Module refresh register (RD)	002CH	0403H	0002H

DI (1/2)

Type	Device	Device code	Command	Subcommand
16bits	Internal relay (M)	0090H	0403H	0000H
	Special relay (SM)	0091H	0403H	0000H
	Latch relay (L)	0092H	0403H	0000H
	Annunciator (F)	0093H	0403H	0000H
	Edge relay (V)	0094H	0403H	0000H
	Step relay (S)	0098H	0403H	0000H
	Input (X)	009CH	0403H	0000H
	Output (Y)	009DH	0403H	0000H
	Link relay (B)	00A0H	0403H	0000H
	Link special relay (SB)	00A1H	0403H	0000H
	Timer, Coil (TC)	00C0H	0401H	0001H
	Timer, Contact (TS)	00C1H	0401H	0001H
	Counter, Coil (CC)	00C3H	0401H	0001H
	Counter, Contact (CS)	00C4H	0401H	0001H
	Retentive timer, Coil (STC)	00C6H	0401H	0001H
	Retentive timer, Contact (STS)	00C7H	0401H	0001H
	Long timer, Coil (LTC)	0050H	0403H	0000H
	Long timer, Contact (LTS)	0051H	0403H	0000H
	Long counter, Coil (LCC)	0054H	0403H	0000H
	Long counter, Contact (LCS)	0055H	0403H	0000H
	Long retentive timer, Coil (LSTC)	0058H	0403H	0000H
	Long retentive timer, Contact (LSTS)	0059H	0403H	0000H

DI (2/2)

Type	Device	Device code	Command	Subcommand
32bits	Internal relay (M)	0090H	0403H	0002H
	Special relay (SM)	0091H	0403H	0002H
	Latch relay (L)	0092H	0403H	0002H
	Annunciator (F)	0093H	0403H	0002H
	Edge relay (V)	0094H	0403H	0002H
	Step relay (S)	0098H	0403H	0002H
	Input (X)	009CH	0403H	0002H
	Output (Y)	009DH	0403H	0002H
	Link relay (B)	00A0H	0403H	0002H
	Link special relay (SB)	00A1H	0403H	0002H
	Timer, Coil (TC)	00C0H	0401H	0003H
	Timer, Contact (TS)	00C1H	0401H	0003H
	Counter, Coil (CC)	00C3H	0401H	0003H
	Counter, Contact (CS)	00C4H	0401H	0003H
	Retentive timer, Coil (STC)	00C6H	0401H	0003H
	Retentive timer, Contact (STS)	00C7H	0401H	0003H
	Long timer, Coil (LTC)	0050H	0401H	0002H
	Long timer, Contact (LTS)	0051H	0401H	0002H
	Long counter, Coil (LCC)	0054H	0401H	0003H
	Long counter, Contact (LCS)	0055H	0401H	0003H
	Long retentive timer, Coil (LSTC)	0058H	0401H	0002H
	Long retentive timer, Contact (LSTS)	0059H	0401H	0002H

DO (1/2)

Type	Device	Device code	Command	Subcommand
16bits	Internal relay (M)	0090H	1402H	0001H
	Special relay (SM)	0091H	1402H	0001H
	Latch relay (L)	0092H	1402H	0001H
	Annunciator (F)	0093H	1402H	0001H
	Edge relay (V)	0094H	1402H	0001H
	Step relay (S)	0098H	1402H	0001H
	Input (X)	009CH	1402H	0001H
	Output (Y)	009DH	1402H	0001H
	Link relay (B)	00A0H	1402H	0001H
	Link special relay (SB)	00A1H	1402H	0001H
	Timer, Coil (TC)	00C0H	1402H	0001H
	Timer, Contact (TS)	00C1H	1402H	0001H
	Counter, Coil (CC)	00C3H	1402H	0001H
	Counter, Contact (CS)	00C4H	1402H	0001H
	Retentive timer, Coil (STC)	00C6H	1402H	0001H
	Retentive timer, Contact (STS)	00C7H	1402H	0001H
	Long timer, Coil (LTC)	0050H	1402H	0001H
	Long timer, Contact (LTS)	0051H	1402H	0001H
	Long counter, Coil (LCC)	0054H	1402H	0001H
	Long counter, Contact (LCS)	0055H	1402H	0001H
	Long retentive timer, Coil (LSTC)	0058H	1402H	0001H
	Long retentive timer, Contact (LSTS)	0059H	1402H	0001H

DO (2/2)

Type	Device	Device code	Command	Subcommand
16bits	Internal relay (M)	0090H	1402H	0003H
	Special relay (SM)	0091H	1402H	0003H
	Latch relay (L)	0092H	1402H	0003H
	Annunciator (F)	0093H	1402H	0003H
	Edge relay (V)	0094H	1402H	0003H
	Step relay (S)	0098H	1402H	0003H
	Input (X)	009CH	1402H	0003H
	Output (Y)	009DH	1402H	0003H
	Link relay (B)	00A0H	1402H	0003H
	Link special relay (SB)	00A1H	1402H	0003H
	Timer, Coil (TC)	00C0H	1402H	0003H
	Timer, Contact (TS)	00C1H	1402H	0003H
	Counter, Coil (CC)	00C3H	1402H	0003H
	Counter, Contact (CS)	00C4H	1402H	0003H
	Retentive timer, Coil (STC)	00C6H	1402H	0003H
	Retentive timer, Contact (STS)	00C7H	1402H	0003H
	Long timer, Coil (LTC)	0050H	1402H	0003H
	Long timer, Contact (LTS)	0051H	1402H	0003H
	Long counter, Coil (LCC)	0054H	1402H	0003H
	Long counter, Contact (LCS)	0055H	1402H	0003H
	Long retentive timer, Coil (LSTC)	0058H	1402H	0003H
	Long retentive timer, Contact (LSTS)	0059H	1402H	0003H

7.2.4 Modbus/TCP server

7.2.4.1 General specification

Item	Description
Protocol	Modbus/TCP
Port address	Variable (Initial value: 502)
Number of simultaneous connections	Up to 2
Connectable device	SCADALINXpro / DL30 series / TR30 series / DL8 series / JC-IO / VR series / GM30 / RGP30

7.2.4.2 Register map

0X

Register	Channel
1 to 32	DO1 to 32

1X

Register	Channel
1 to 32	DI1 to 32

3X

Register	Channel
0001 to 0096	AI1 to 96
1001 to 1064	OI1 to 32 Addresses with smaller numbers are low.

7.2.4.3 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		General purpose register within the slave
04	Read Input Registers	Yes	Collected data from the field by the slave
05	Force Single Coil		Digital output from the slave
06	Preset Single Register		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		Digital output from the slave
16	Preset Multiple Registers		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		

7.2.4.4 Data range

When the VR288E-G64 is used as a Modbus/TCP slave, the data range that respond to the Modbus master and data written from the Modbus master is as follows.

Item	Description
AI	- When the data type is [%] (0 to 10000; voltage/current data of remote I/O): -500 to 10500 - 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)
DI	0: OFF, 1: ON
OI	32 bit single precision floating point
DO	0: OFF, 1: ON

7.2.5 E-mail reporting

Event reporting and regular reporting are sent as follows.

Item	Description
Port address	Variable (default: 465)
Reported contents	- Subject: up to 32 characters - Body text: up to 128 characters - Reporting source: attached at the end of the body text Abnormality reporting: [Report Factor: message] Regular reporting: [Report Factor: Regular] Test reporting: [Report Factor: Test] - Channel information: attached at the end of the body text AI, DI, OI or DO can be selected. (abnormality reporting and regular reporting only)
Address	16 (only "To:")
Template	32
Encryption communication	TLS1.2
Queuing	Up to 32 files Files are recorded in system logs when the queue is full.
Power failure retention	None
Retransmission	3 times (including the initial attempt) The first retry will continue 10 seconds later, and the second retry will continue 20 seconds later.
Test transmission	Test transmission is not a target of retransmission.
Transmission failure	When transmission fails, the transmission failure output is turned ON. When transmission is successful or when SMTP-related settings are changed, the transmission failure output is turned OFF. The same applies during test transmissions.

7.2.6 SD card

7.2.6.1 SD card basic specifications

Item	Description
Type	microSD
Format	FAT32

7.2.6.2 Specified SD card type

Manufacturer	Model	Capacity
Hagiwara Solutions	MSDB-016GS(V01SLS	16 GB

Available for purchase from us. Consult us.

7.2.6.3 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 formatter other than the one provided by the SD Association for the SD card.

7.2.6.4 Auto deleting function

The oldest files can be automatically deleted by enabling the auto deleting function when the remaining space of the SD card is less than 100 MB. → 3.5.1 Basic setting

The conditions for deletion are as follows.

- The data older than 2 days are deleted.
- An SD card error is triggered if the files cannot be deleted.
- The oldest files are deleted when the remaining space of the SD card is less than 100 MB.
The oldest day, month, year folder(s) are deleted until the SD 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 deletion.
The SD card recovers from error when the free space exceeds 100 MB after deleting the files.
Regarding system log, event log and communication log, the oldest files are deleted when the files are exported after memory blocks are finalized.

7.3 Version history

7.3.1 VR288E-G64

7.3.1.1 Ver1.0

- Initial issue

8. License

Below are the licenses for the functions used in VR288E-G64 and VR288CFG.

8.1 License

Software	Function	License
zlib	Compressing and decompressing data	zlib/libpng
Jansson	JSON parser	MIT License

This software incorporates Jansson (<https://github.com/akheron/jansson>).
This Jansson is distributed under the MIT License.

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