PAPERLESS RECORDER
Model: VR4896E-G2

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 × 2 pcs.+ watertight packing)....(1)

■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: VR4896E-G2), refer to 4.3.7.9 Information.
- For instructions on confirming the version of the Configurator Software (model: VR4896CFG), 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
VR4896E-G2	1.0.x
VR4896CFG	1.0.x
TRViewer	1.6.21 or later

1.3 Precautions

■CONFORMITY WITH EU DIRECTIVES

- 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.
- In order to enable the operator to turn off the power input immediately, install a switch or a circuit breaker according to the relevant requirements in IEC 60947-2 and properly indicate it.

■POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC ±10%, ≤ 2.4W, ≤ 100mA (at 24V DC)
- 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.

■GENERAL PRECAUTIONS

- Before you remove the device or mount it, turn off the power supply and I/O signals 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.
- 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.

■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.

■MINIMIZING NOISE INTERFERENCE TO ANALOG SIGNAL CABLES

- 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 (high frequency line, etc.).
- Do not bind the analog input cables together with those in which noises are present. Do not install them in the same duct.

■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 month

■AND ....

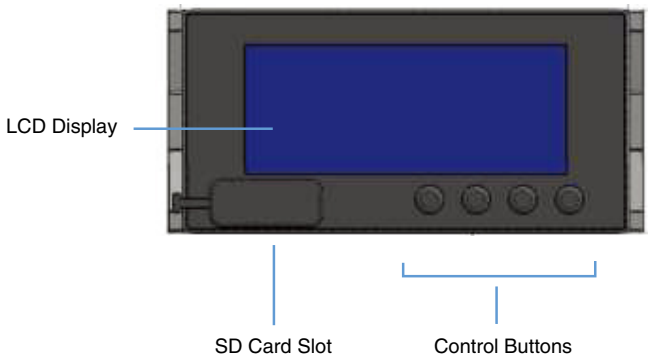
- We recommend use of an UPS to supply power backups.
- The device is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

1.4 Explanation about the terms

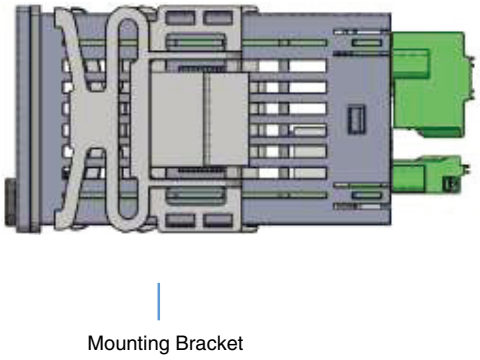
Term	Explanation
Channel CH	2 types of input channels and 1 type of output channel are defined in a device. The I/O signals are in the form of fully encoded digital data. AI : Analog input (16 bit signed integer, unsigned integer) DI : Discrete input (1 bit) OI : Operational input (32 bit floating point) DO : Discrete output (1 bit)
Pen	Pen is used in trend graph and 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 I/O values at the point of each timing for the respective channels assigned to pens. - The history of events in channels where the trend 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.
Sampling rate	The time cycles used for acquiring I/O values for logging by the VR4896E-G2; 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.

1.5 Component identification

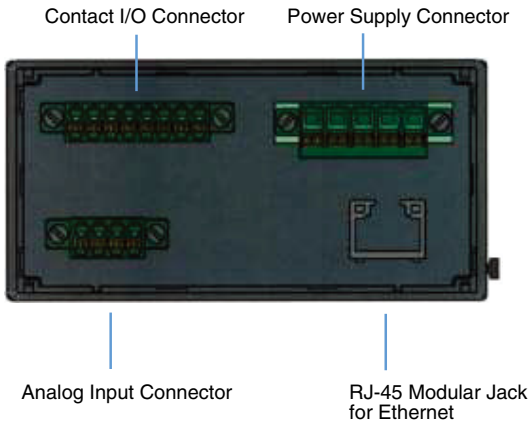
■ FRONT VIEW



■ SIDE VIEW



■ REAR VIEW



■LCD DISPLAY

TFT color display showing multiple display screens.

■CONTROL BUTTONS

Used to perform various settings.

■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-7061-A) attached to the VR4896E-G2.

1.6 Main functions of the VR4896E-G2

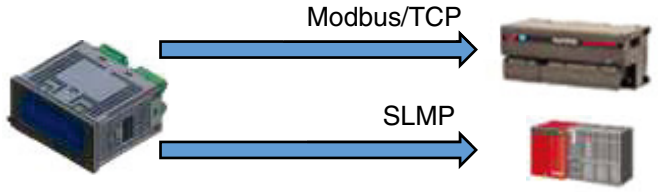
The VR4896E-G2 is a paperless recorder featuring a color LCD display.
The VR4896E-G2 has the following main functions.

■BUILT-IN I/O

The VR4896E-G2 has built-in I/Os of 2-point AI, 1-point DI, and 1-point DO, for direct input and output.

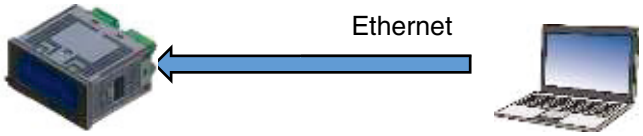
■MODBUS/TCP & SLMP CLIENT

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.



■COLOR LCD DISPLAY

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

■TREND DATA STORING

The trend data, event data and comment data 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 and deleting files 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: VR4896E-G2).

- PC
- LAN cable
- SD card (Refer to 7.2.6 SD card for recommended SD card.)
- VR4896E-G2 Configurator Software (Model: VR4896CFG) *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: VR4896E-G2).
For details, refer to the Instruction Manual (EM-7061-A) attached to the VR4896E-G2.

2.3 Preparing the configurator software

Install the Configurator Software (model: VR4896CFG) on the PC in order to configure the setting for the VR4896E-G2.

2.3.1 Installation

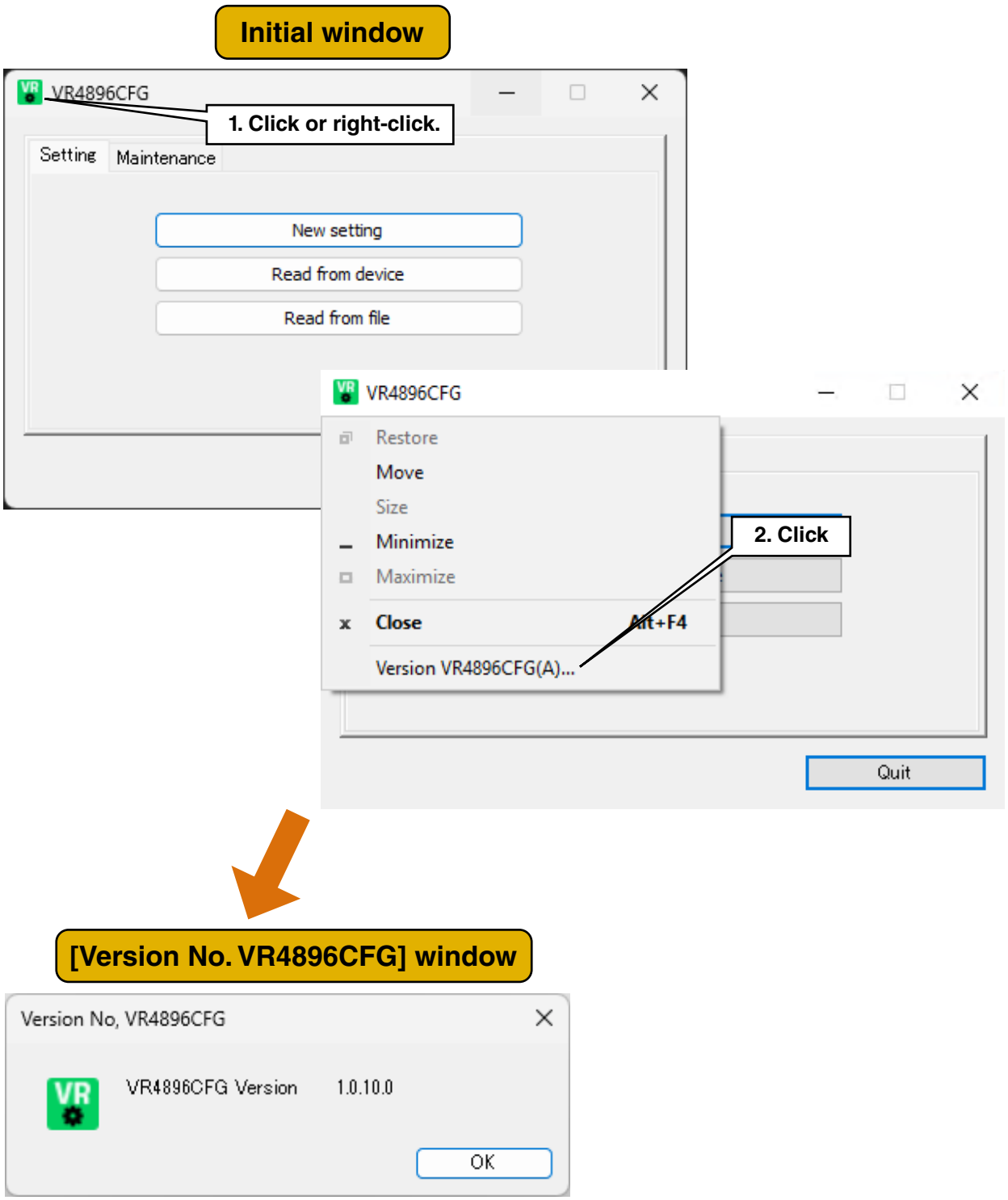
Download VR4896CFG from our website, and complete the installation simply by extracting it into any folder.
Create a shortcut to VR4896CFG.exe on the desktop if necessary.

2.3.2 Startup

Connect the RJ-45 modular jack for Ethernet to the PC using LAN cable.
Start up VR4896CFG, and then perform settings and maintenance of the VR4896E-G2.
For details on VR4896CFG, refer to 3. Setting.

2.3.3 Confirming the version

For confirming the version of VR4896CFG, refer to the following procedure.

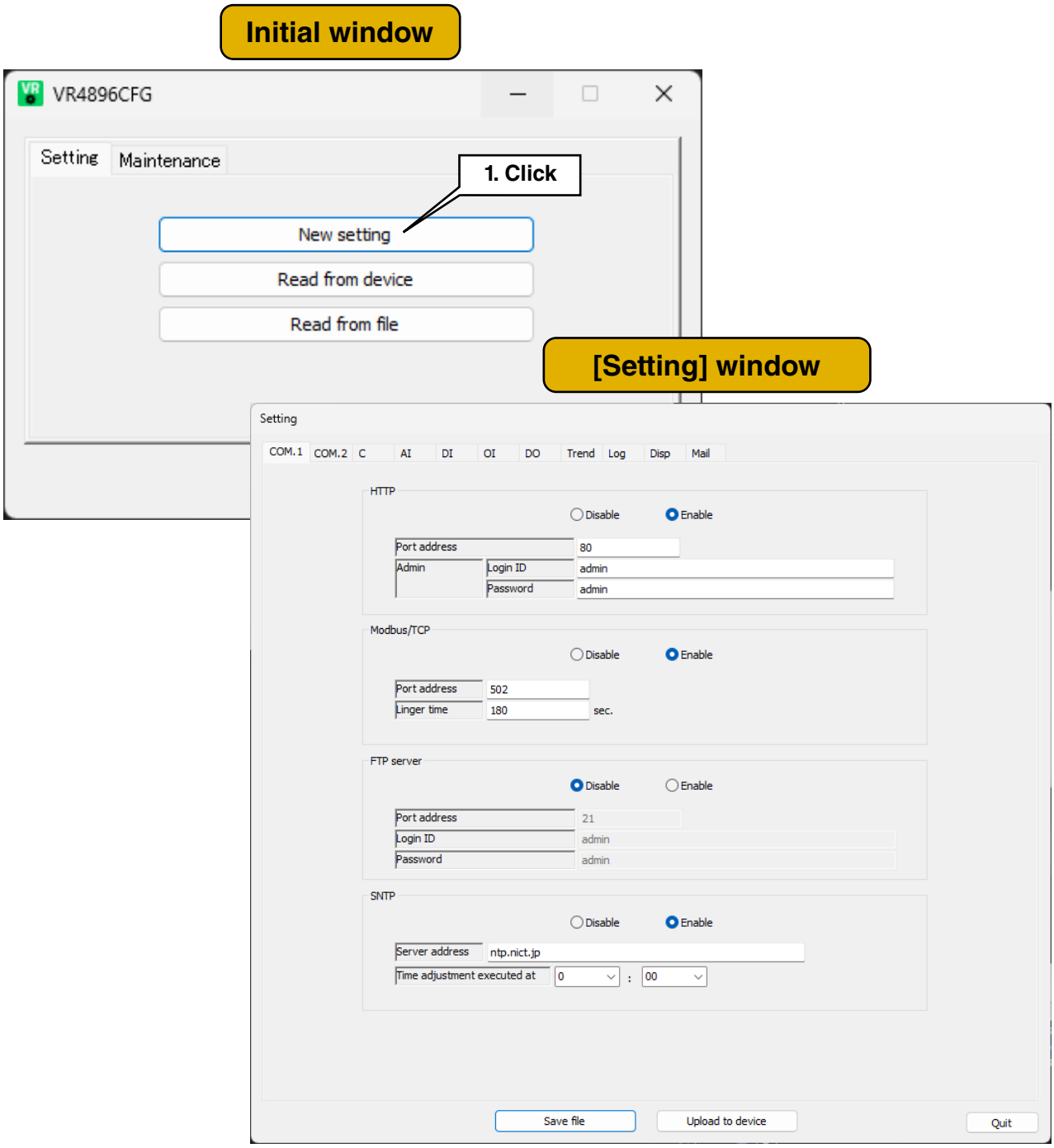


2.3.4 VR4896E-G2 setting

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

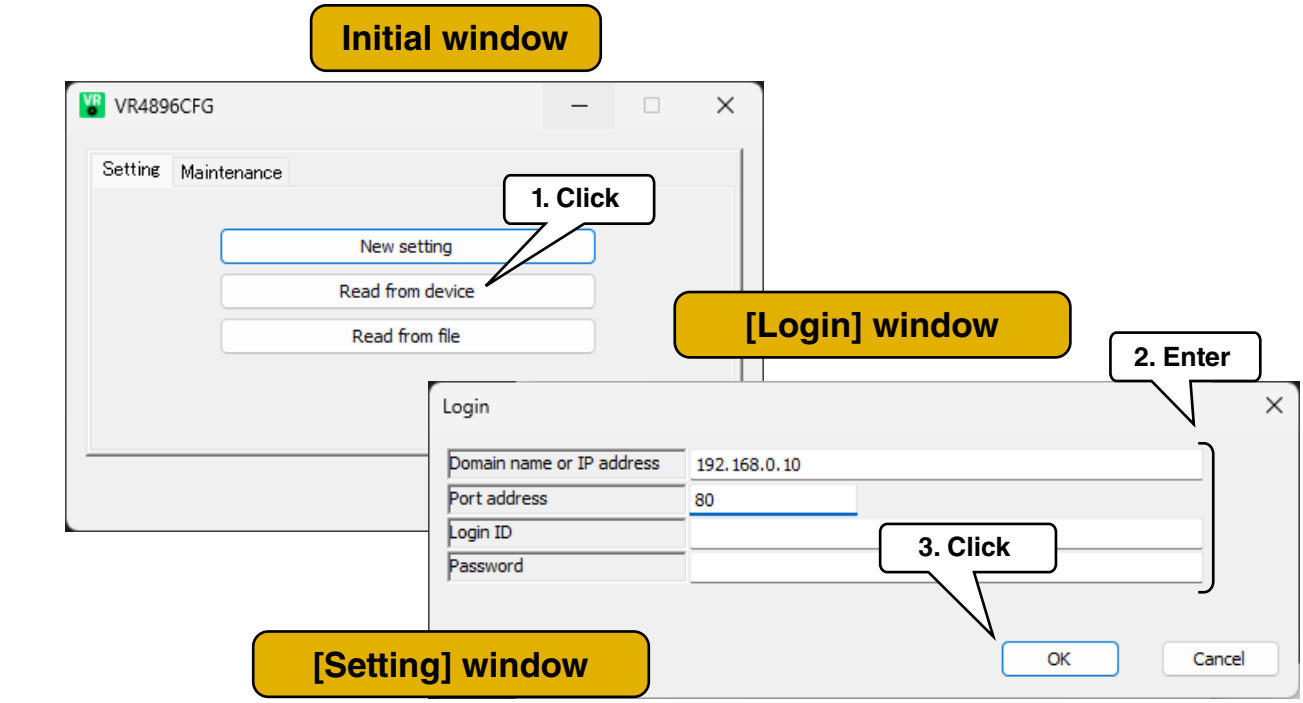
2.3.4.1 New setting

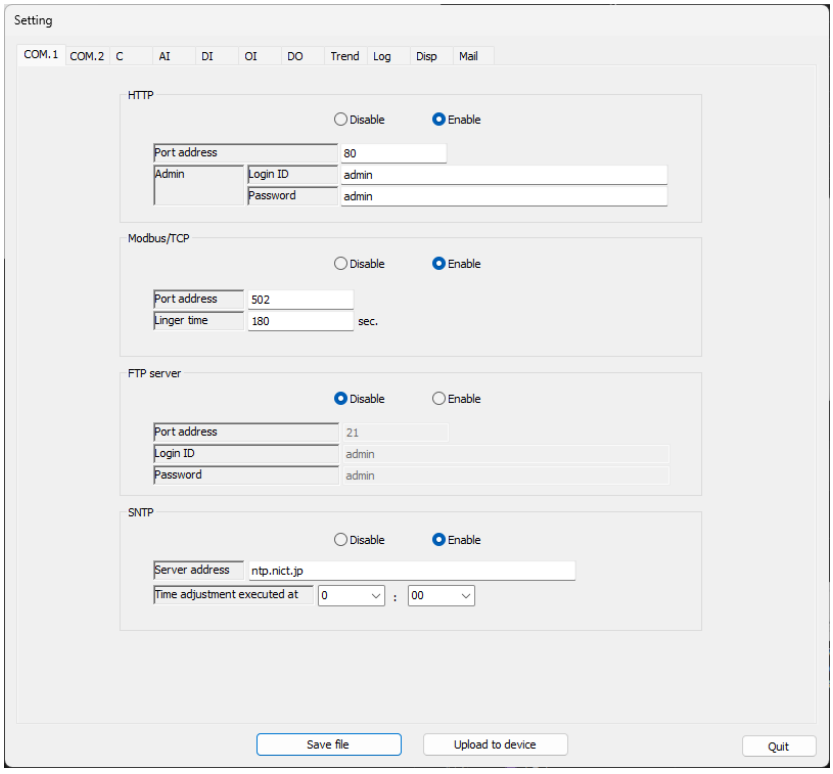
Click [New setting] button to configure a new setting for the VR4896E-G2.
The new setting values are displayed on [Setting] window. Various settings can be performed on [Setting] window.



2.3.4.2 Reading from device

Click [Read from device] button to read and change the values set in the VR4896E-G2.
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.



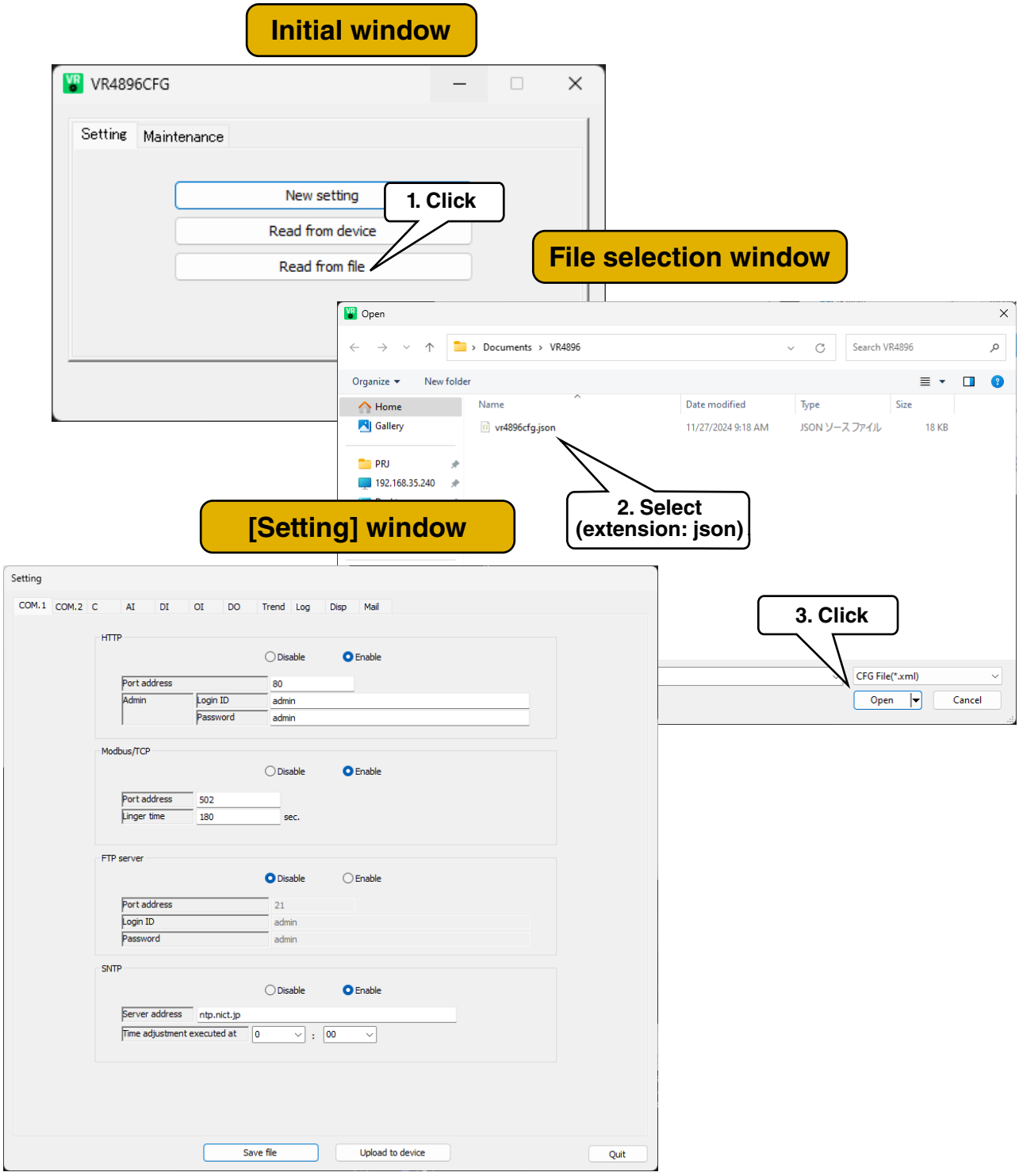


Default value on [Login] window

Parameter	Default
Domain name or IP address	192.168.0.10 ➔ Changeable in 4.3.7.7 Network setting.
Port address	80 ➔ Changeable in 3.2.1 HTTP.
Login ID	admin ➔ Changeable in 3.2.1 HTTP.
Password	admin ➔ Changeable in 3.2.1 HTTP.

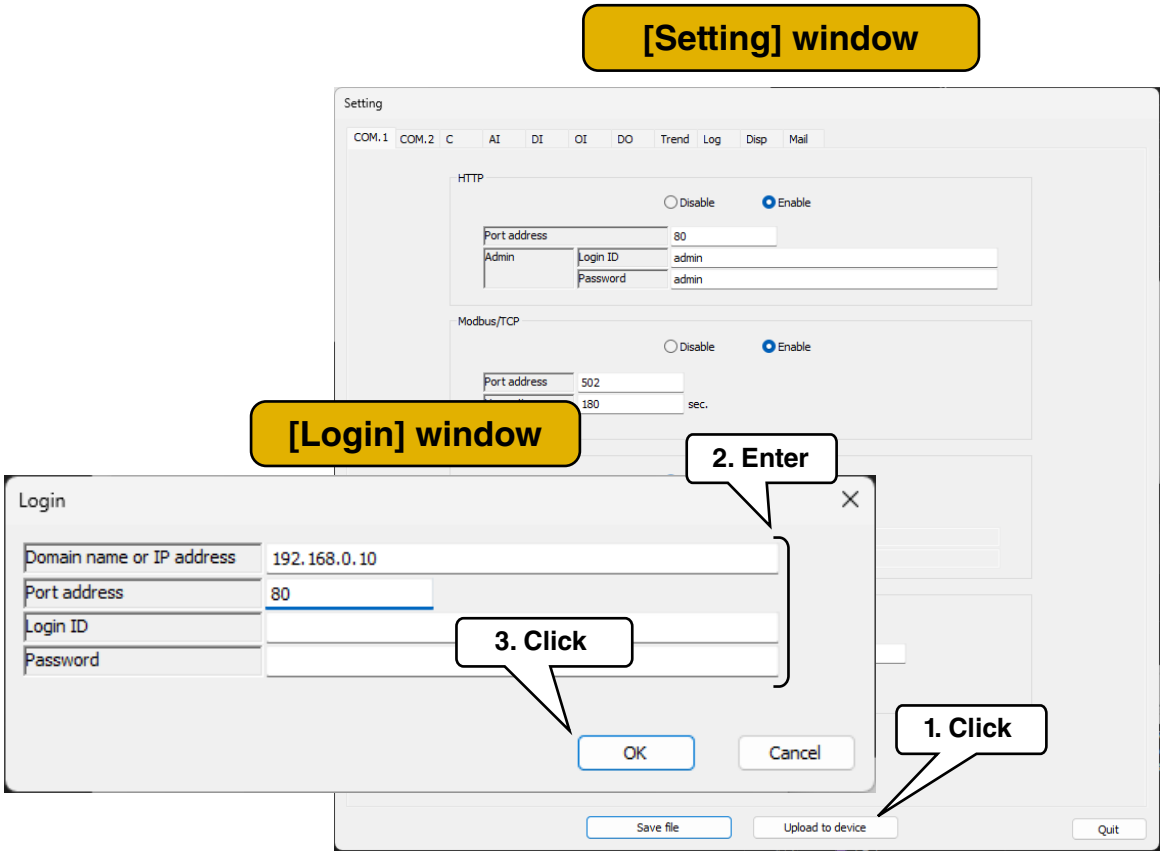
2.3.4.3 Reading from file

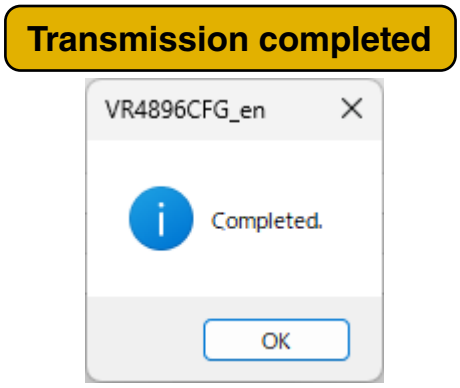
Click [Read from file] button to read out any setting file for the VR4896E-G2 saved in the PC.
File selection window appears. Select the file to be read (extension: json).
The imported setting values are reflected on [Setting] window. Various settings and changes can be performed on [Setting] window.



2.3.5 Transmitting the setting to the device

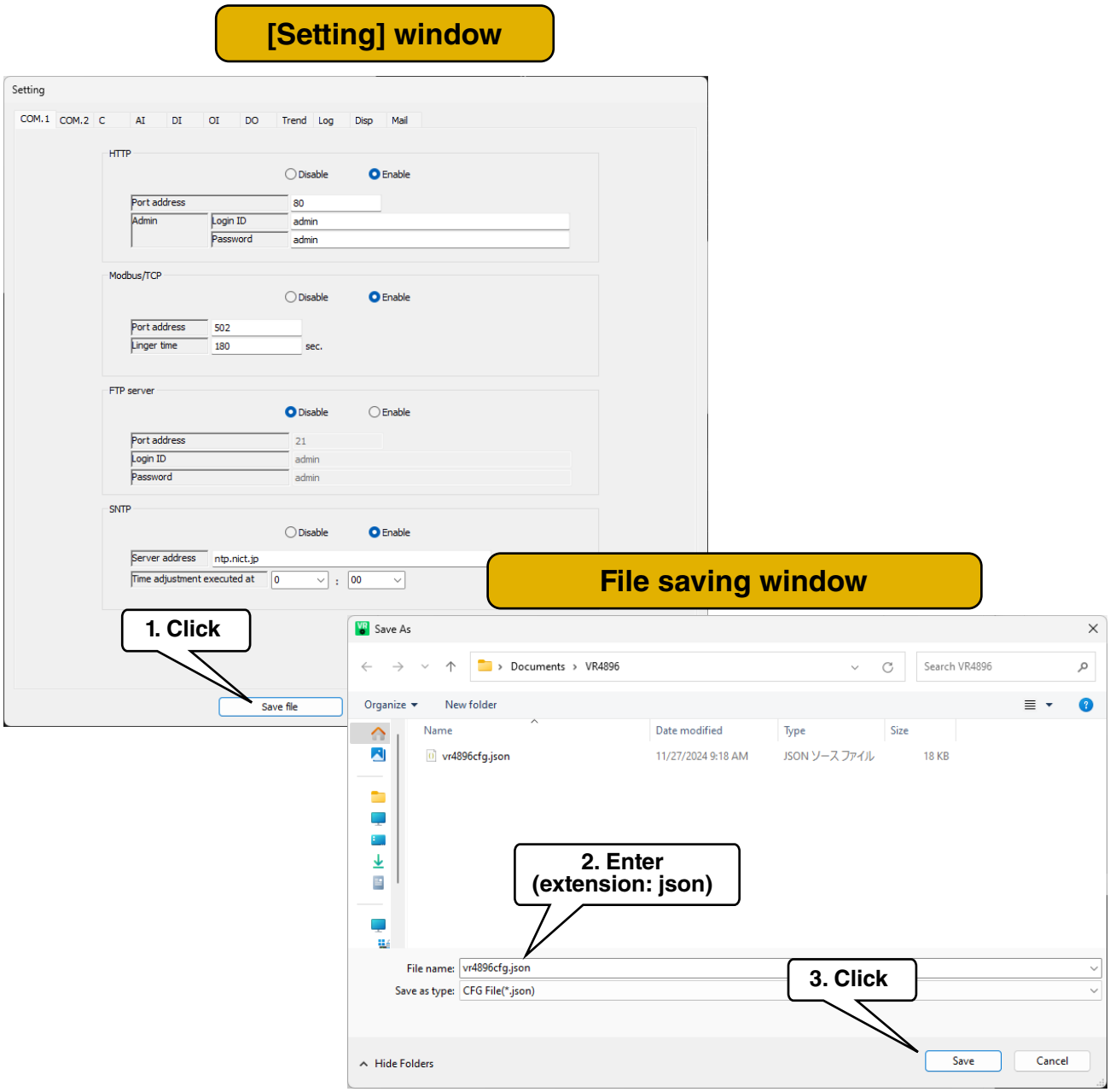
After completing the settings, click [Upload to device] button to transmit the settings to the device.
On completing transmission, [Completed] message appears.
(For [Login] window, refer to 2.3.4.2 Reading from device.)





2.3.6 Saving the setting to file

After completing the settings, click [Save file] button to save the settings to the PC.



3. Setting

3.1 Setting flow

Before starting recording or reporting with the VR4896E-G2, configure the settings according to the following procedure using the dedicated Configurator Software (model: VR4896CFG).

After turning on the device,
connecting to the Configurator Software. ➔ 2.3.4 VR4896E-G2 setting

▼

Communication setting ➔ 3.2 Communication setting

▼

Connection setting ➔ 3.3 Connection setting

▼

I/O setting ➔ 3.4 I/O setting

▼

Trend/log setting ➔ 3.5 Trend setting, 3.6 Log setting

▼

Display setting ➔ 3.7 Display setting

▼

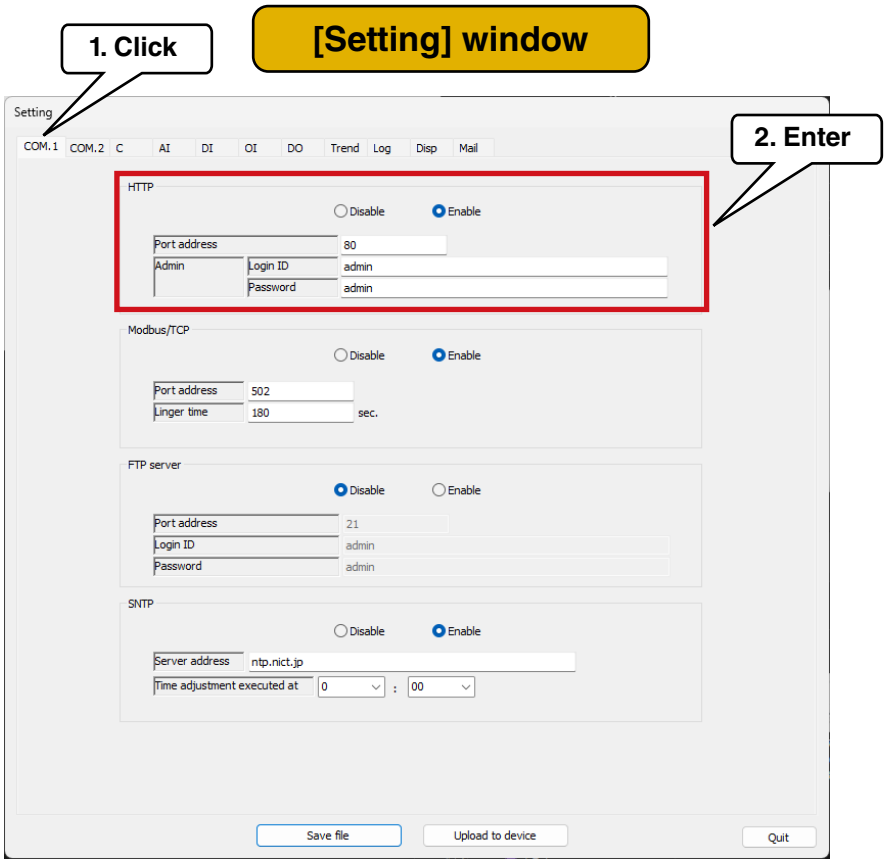
E-mail reporting setting ➔ 3.8 E-mail reporting setting

3.2 Communication setting

Configure various communication settings with the VR4896E-G2.

3.2.1 HTTP

Configure the HTTP server settings for the VR4896E-G2.
Click [COM.1] tab and set parameters according to the table below.



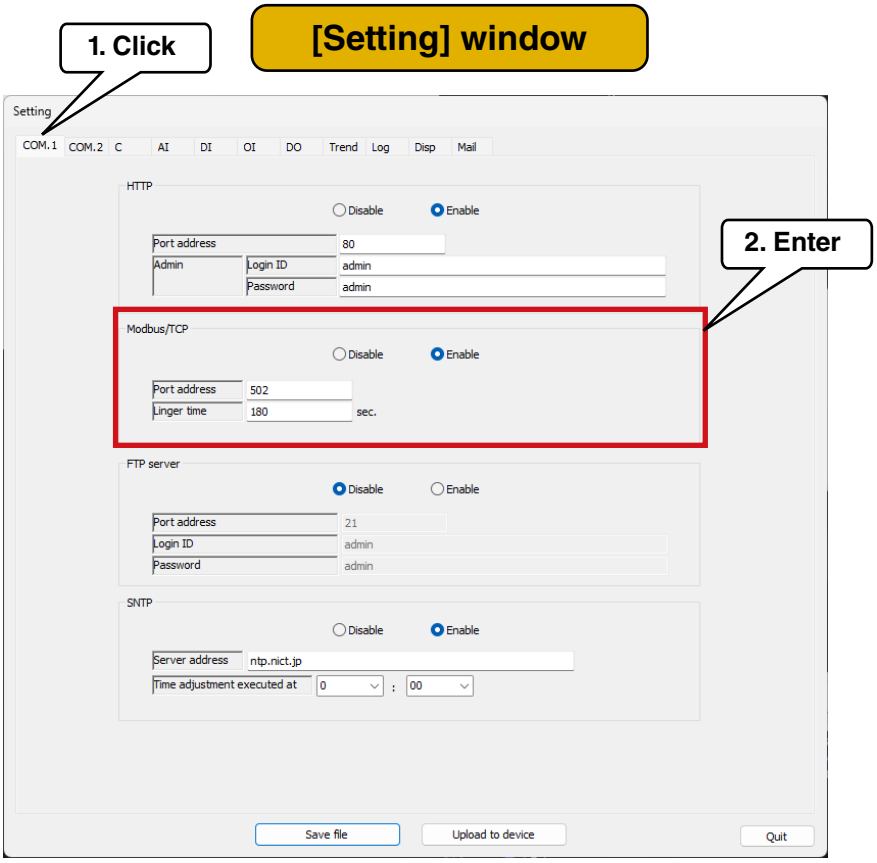
Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using HTTP server function.
Port address	Set the port address within 1 to 65535.
Admin Login ID	Set login ID within 32 characters. (alphanumeric characters and "_")
Admin Password	Set password within 32 characters.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

CAUTION

Disabling HTTP will disable communication between the VR4896CFG and the VR4896E-G2.

3.2.2 Modbus/TCP (server)

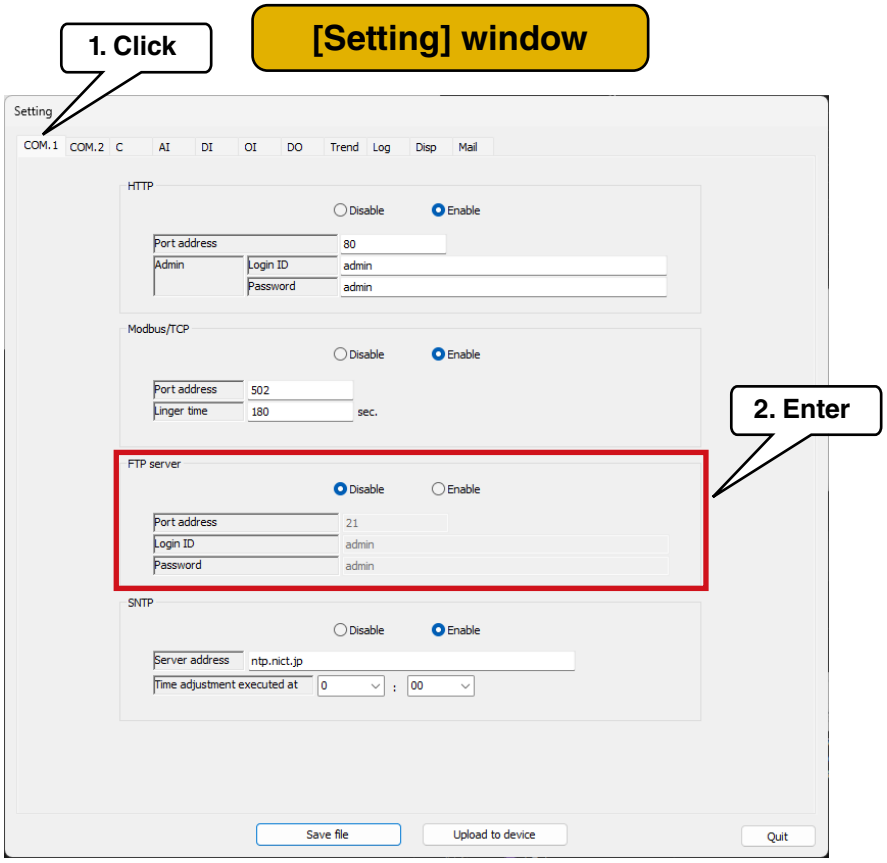
Configure the Modbus/TCP server settings for the VR4896E-G2.
Click [COM.1] tab and set parameters according to the table below.



Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using 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 VR4896E-G2.
Click [COM.1] tab and set parameters according to the table below.



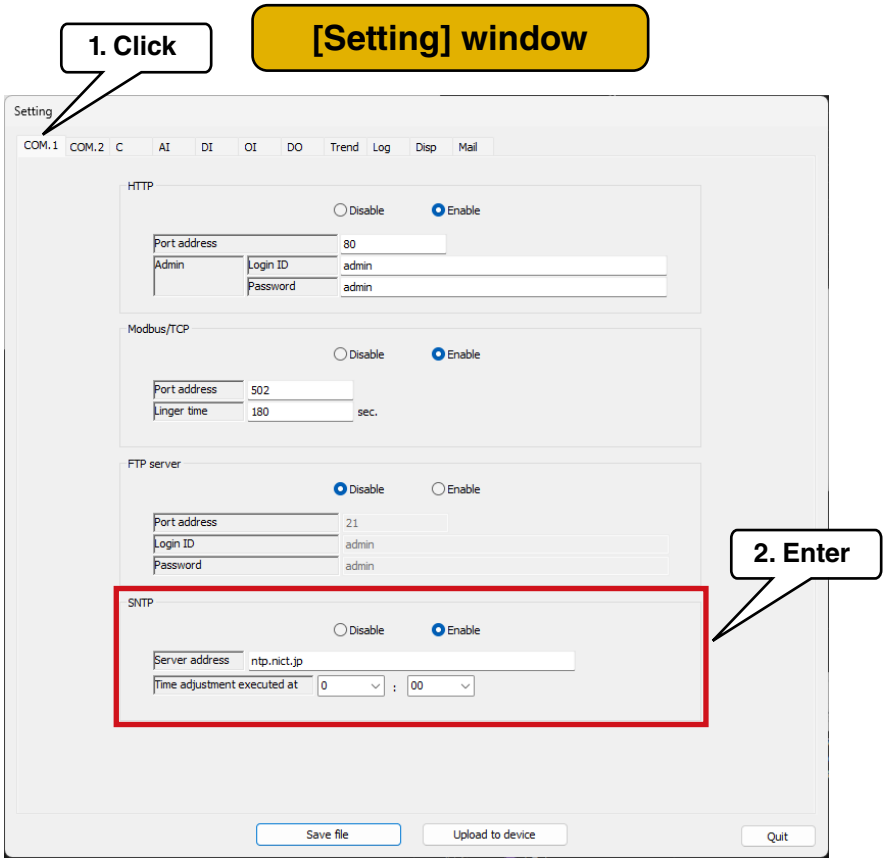
Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using FTP server function.
Port address	Set the port address of FTP server within 1 to 65535.
Login ID	Set the login ID within 32 characters. (alphanumeric characters and "_")
Password	Set the password within 32 characters.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

NOTE

Port address 45967 to 45970 are used for PASV.

3.2.4 SNTP

Configure the SNTP server settings for the VR4896E-G2.
Click [COM.1] tab and set parameters according to the table below.

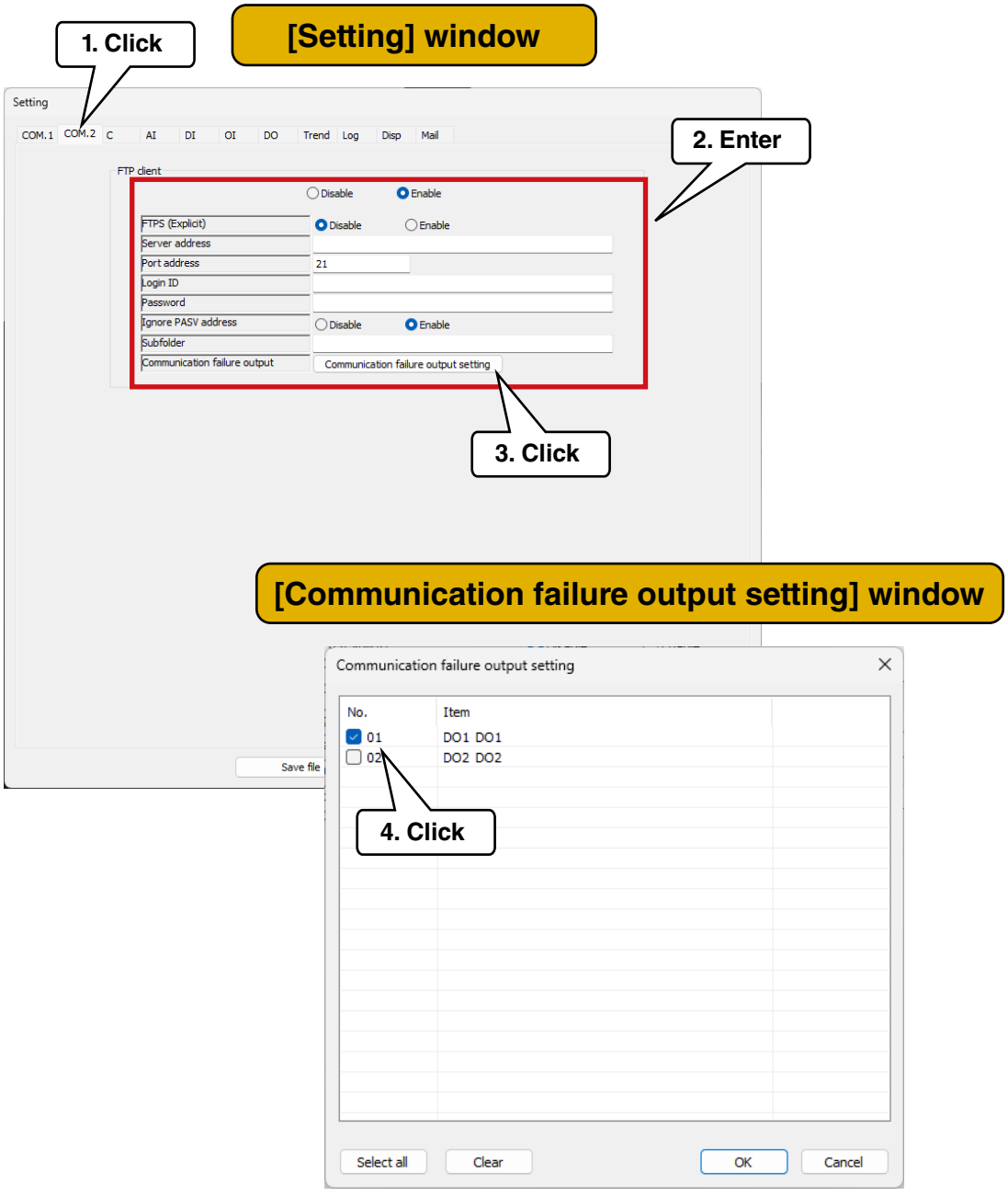


Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of using SNTP client function.
Server address	Set the SNTP server address within 32 characters
Time adjustment executed at	Set the time when time adjustment will be performed. (0:00 to 23:59)

3.2.5 FTP client

Configure the FTP client settings for the VR4896E-G2.

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 VR4896E-G2 and remote I/O or SLMP-compatible devices.
Two connections can be set. (C1 and C2)

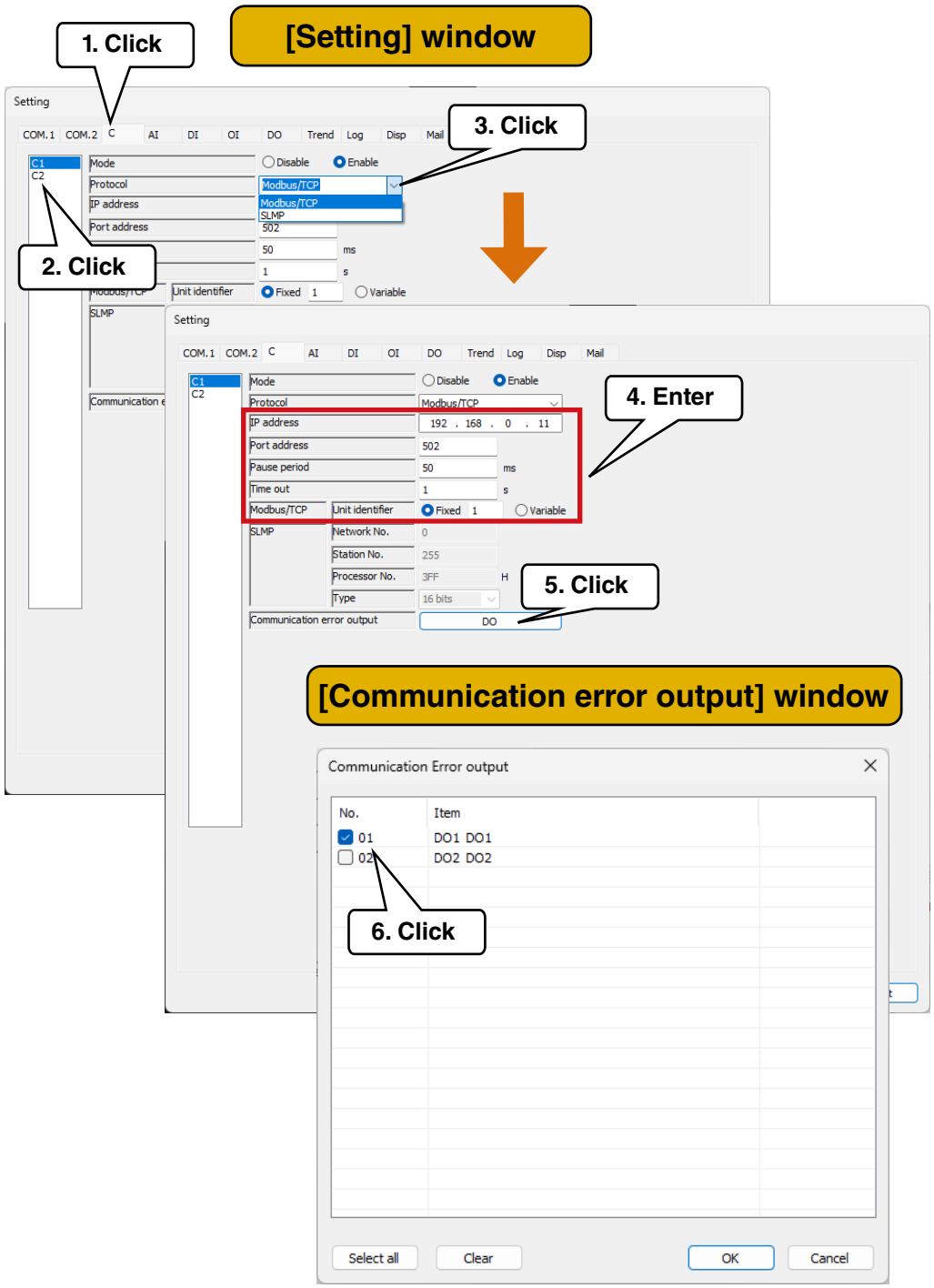
3.3.1 Connection setting

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 the connection to be set to display the current settings.
2. Click the protocol drop-down list and select [Modbus/TCP].
3. Set parameters according to the table on the next page.
4. 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.

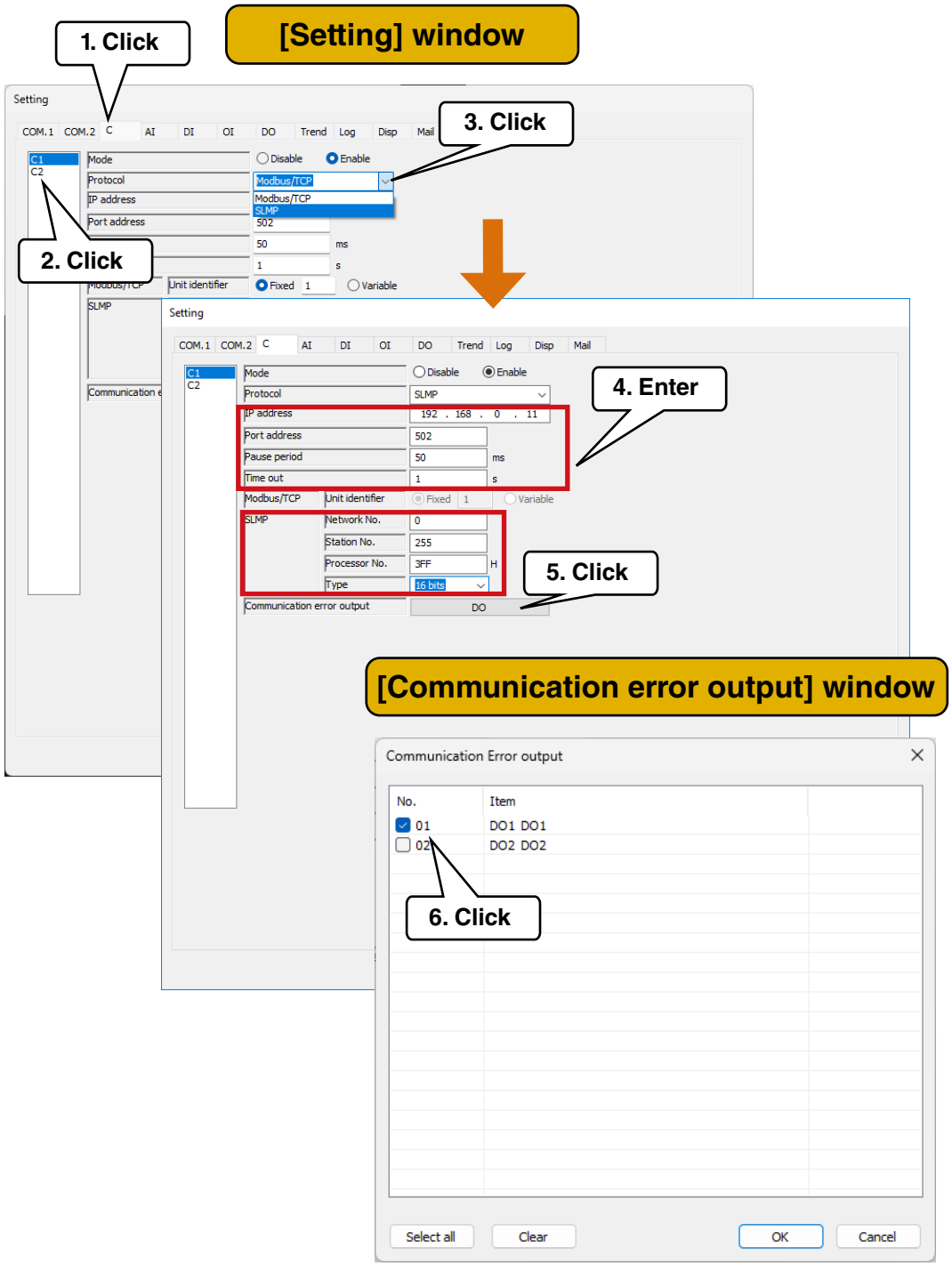


Parameter	Description
Disable/Enable	Set [Disable] or [Enable]. Set [Enable] in case of communicating with remote I/O or SLMP-compatible device.
Protocol	Select [Modbus/TCP] or [SLMP].
IP address	Set the IP address of the connection destination. (0.0.0.0 to 255.255.255.255)
Port address	Set the port 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]. In case of [Fixed], set in the range of 0 to 255.

3.3.1.2 SLMP connection

Configure the SLMP connection (client) setting.

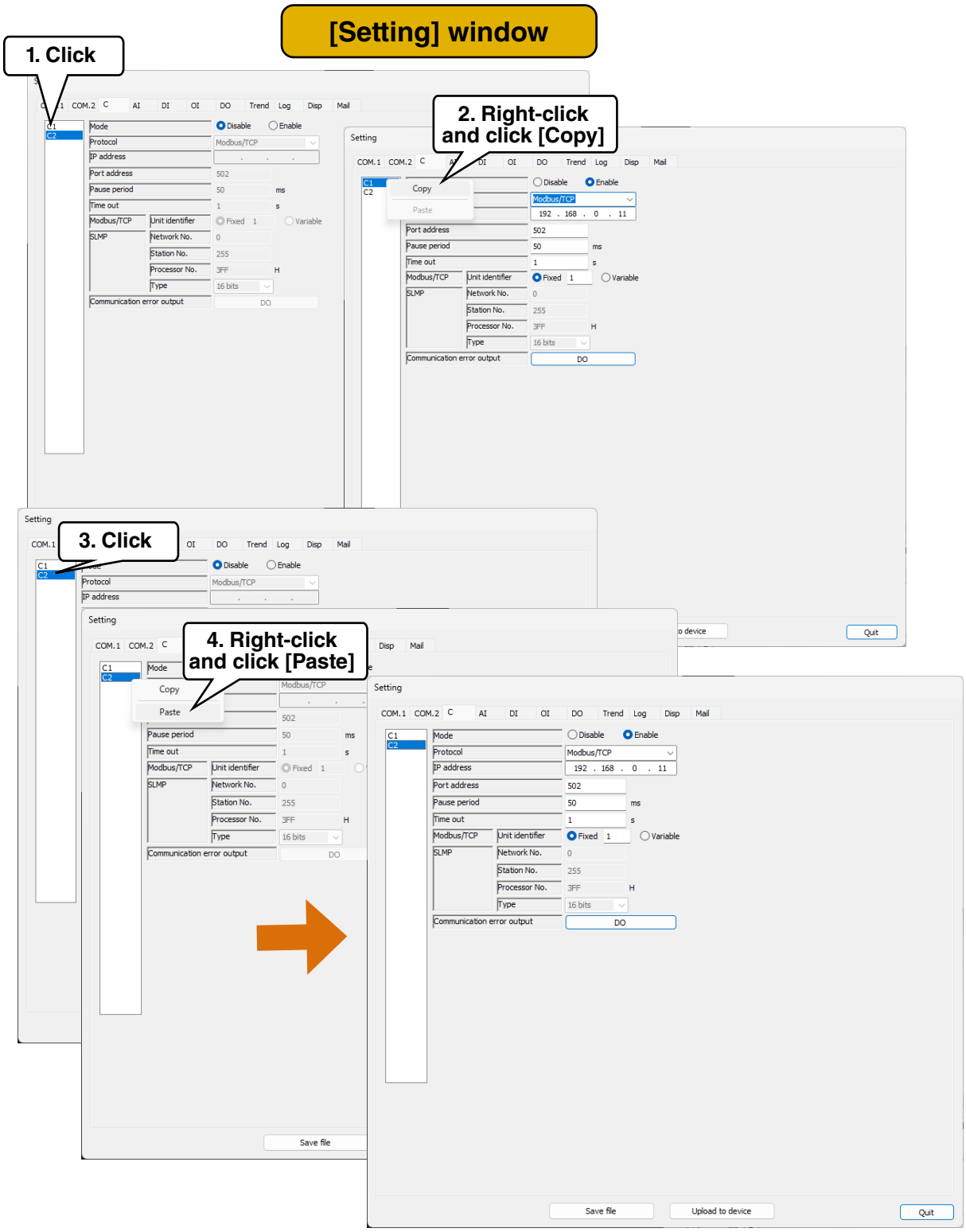
1. Click the connection to be set to display the current settings.
2. Click the protocol drop-down list and select [SLMP].
3. Set parameters according to the table below.
4. Click [DO] button to configure DO processing setting in case of communication failure. Click [Select all] or [Clear] button to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



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].

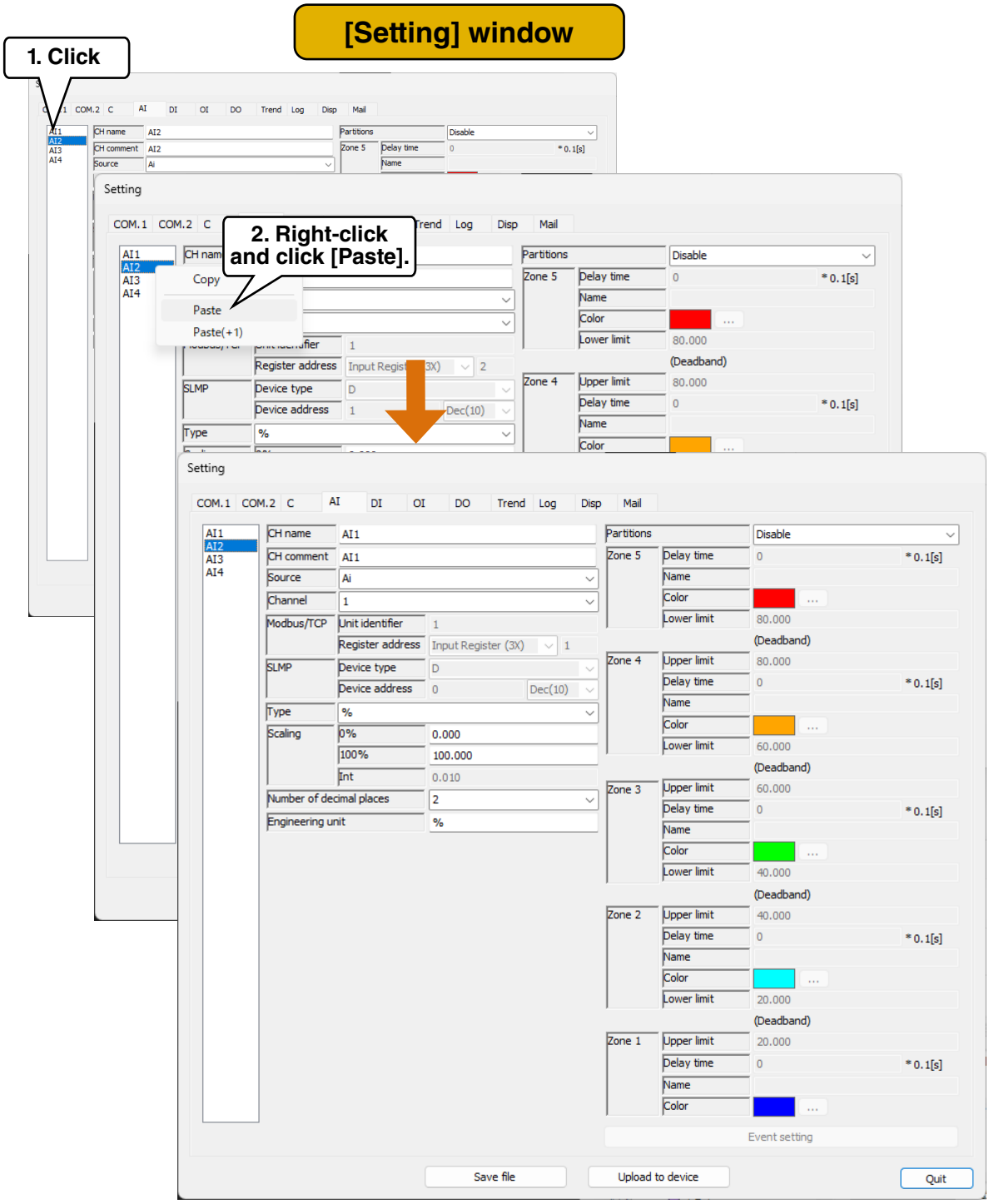
3.3.2 Copying the connection setting

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



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 two SLMP-compatible devices can be connected to one VR4896E-G2.
Assign separate IP addresses to SLMP-compatible devices (C1, C2) that are different from the VR4896E-G2.

■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 VR4896E-G2 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 VR4896E-G2
- Port address: Port address specified in the connection setting of the VR4896E-G2

NOTE

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

3.4 I/O setting

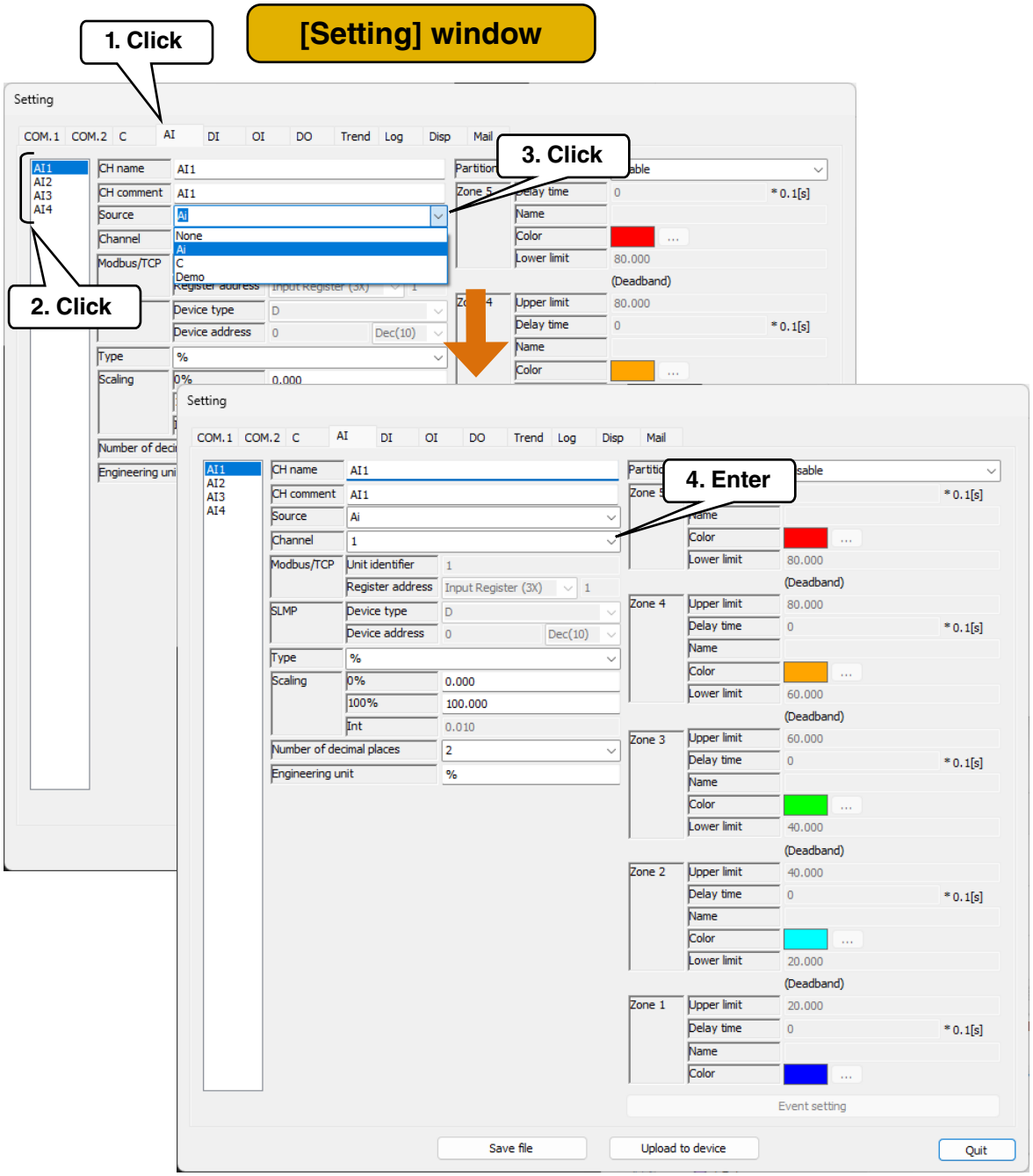
Configure I/O signal settings with the VR4896E-G2.
It is possible to assign remote I/O and SLMP-compatible device in addition to the built-in I/O.

3.4.1 Analog input (AI)

Analog input signals can be monitored for maximum of 4 points (AI1 to AI4) using the VR4896E-G2.
Assign the analog input from built-in I/O, remote I/O or SLMP-compatible device to the VR4896E-G2 according to the following procedure.

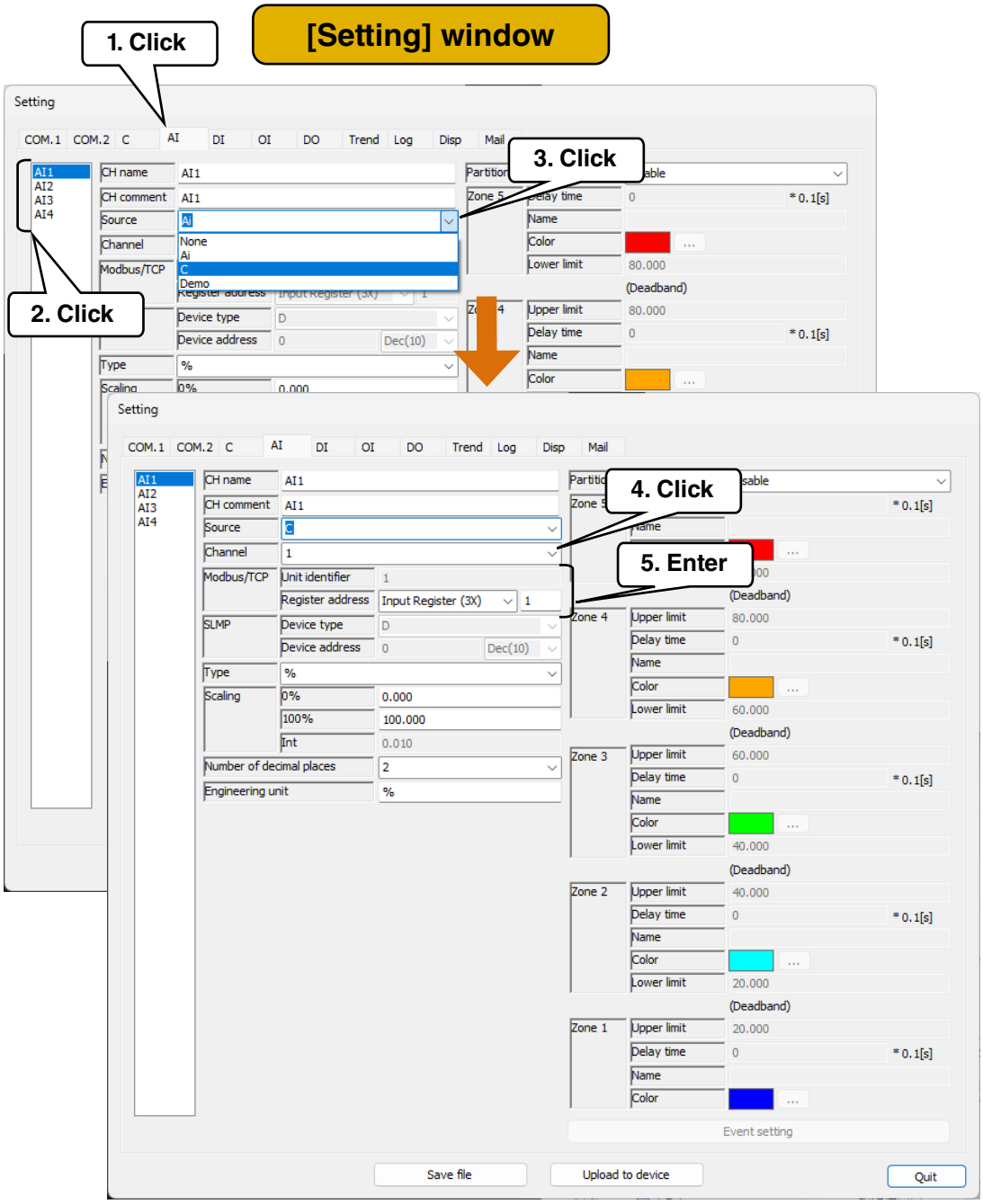
3.4.1.1 Assignment analog input to built-in I/O

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



3.4.1.2 Assignment analog input to remote I/O

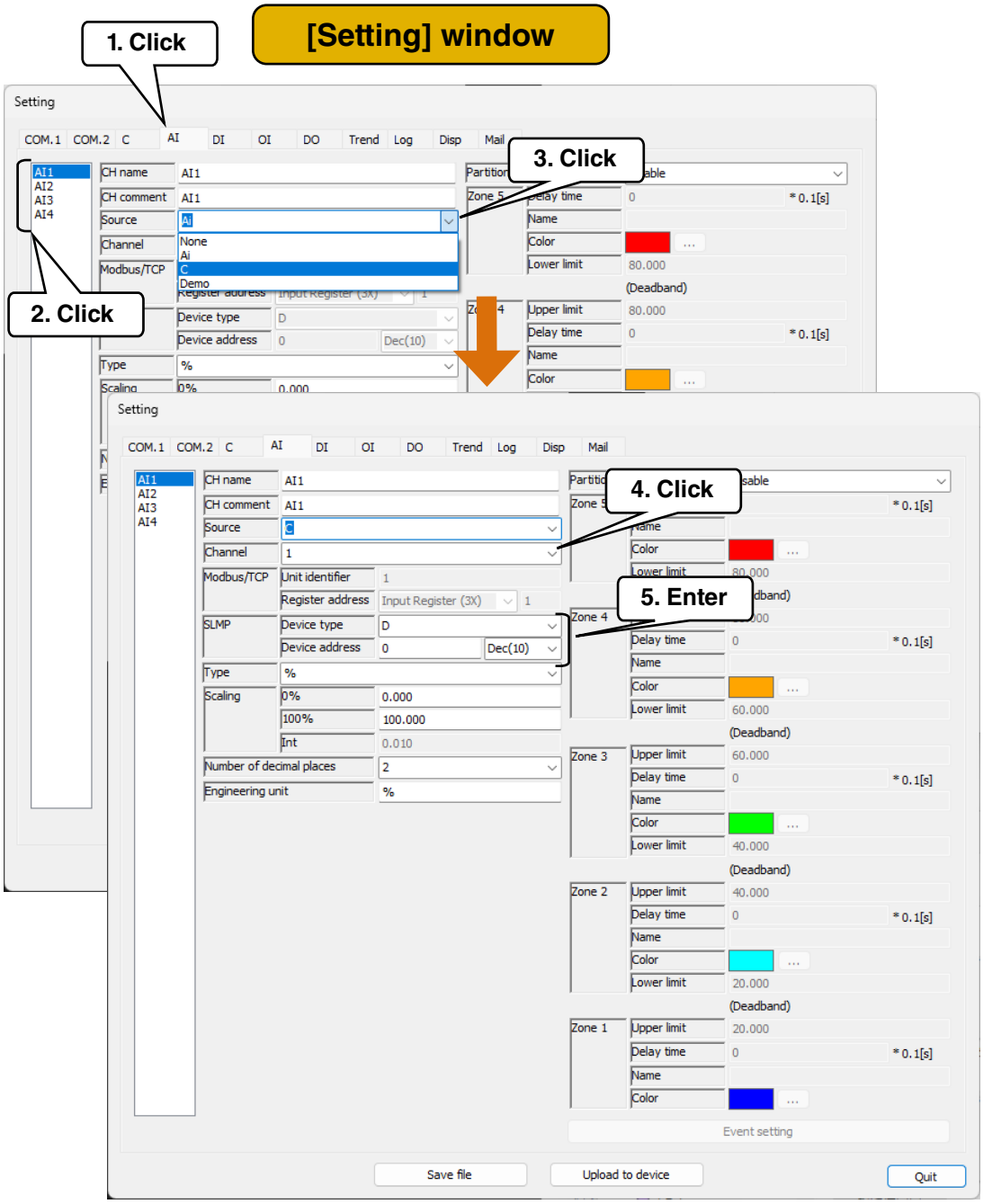
1. Click the channel to be set to display the current settings.
2. Click the source drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. ➔ 3.3.1.1 Modbus/TCP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

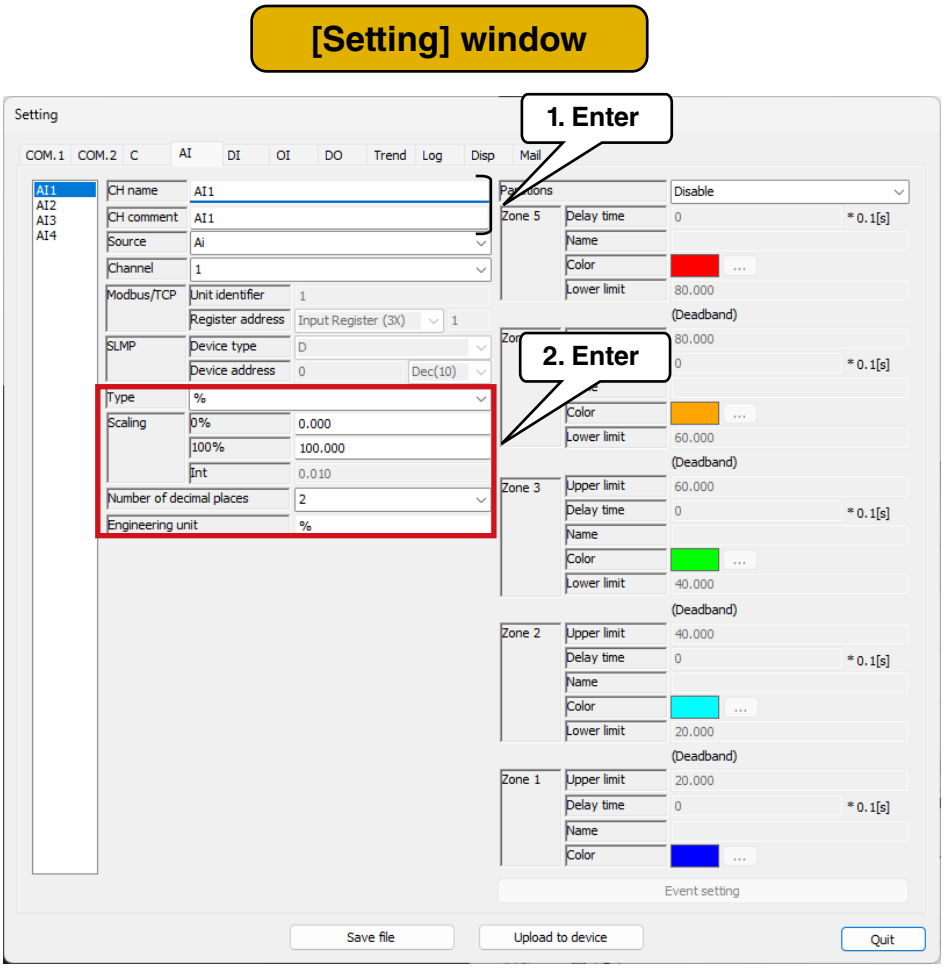
1. Click the channel to be set to display the current settings.
2. Click the source drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. ➔ 3.3.1.2 SLMP connection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

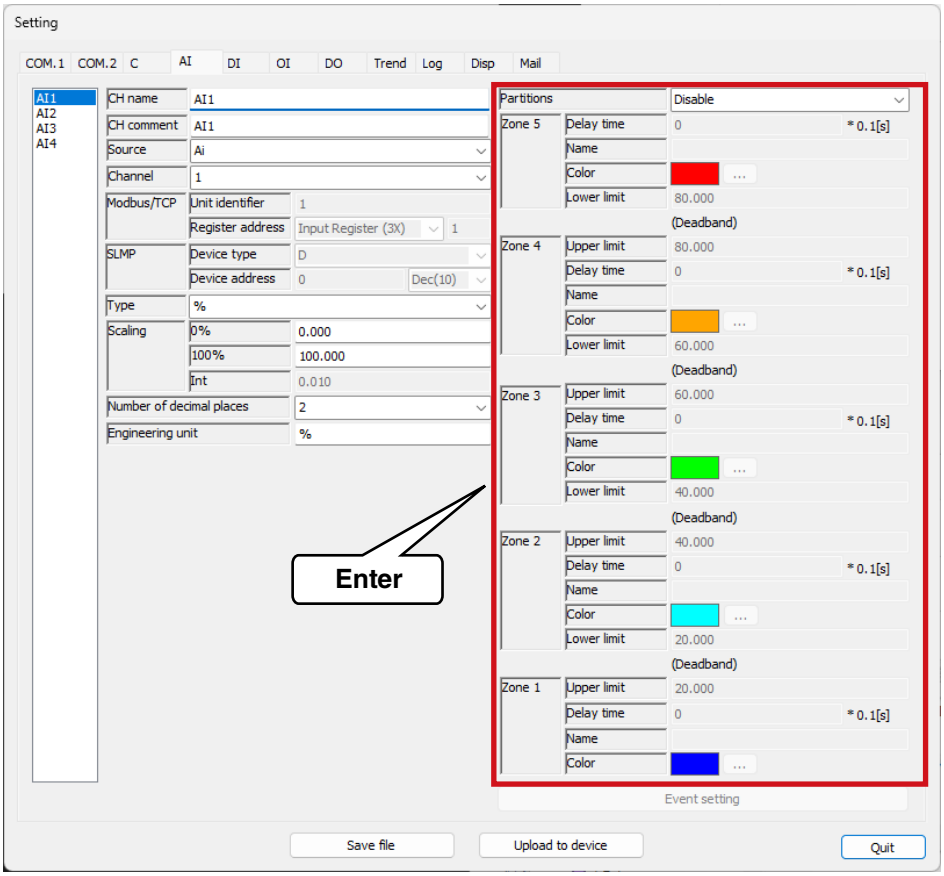


Parameter	Description
CH name	Set the channel name within 16 characters.
CH comment	Set the comment for the channel within 16 characters such as the tag name, etc.
Type	Select the data type from the following 3 types. • % %×100 format data (-500 to 10500) (equivalent to the voltage/current data of remote 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.

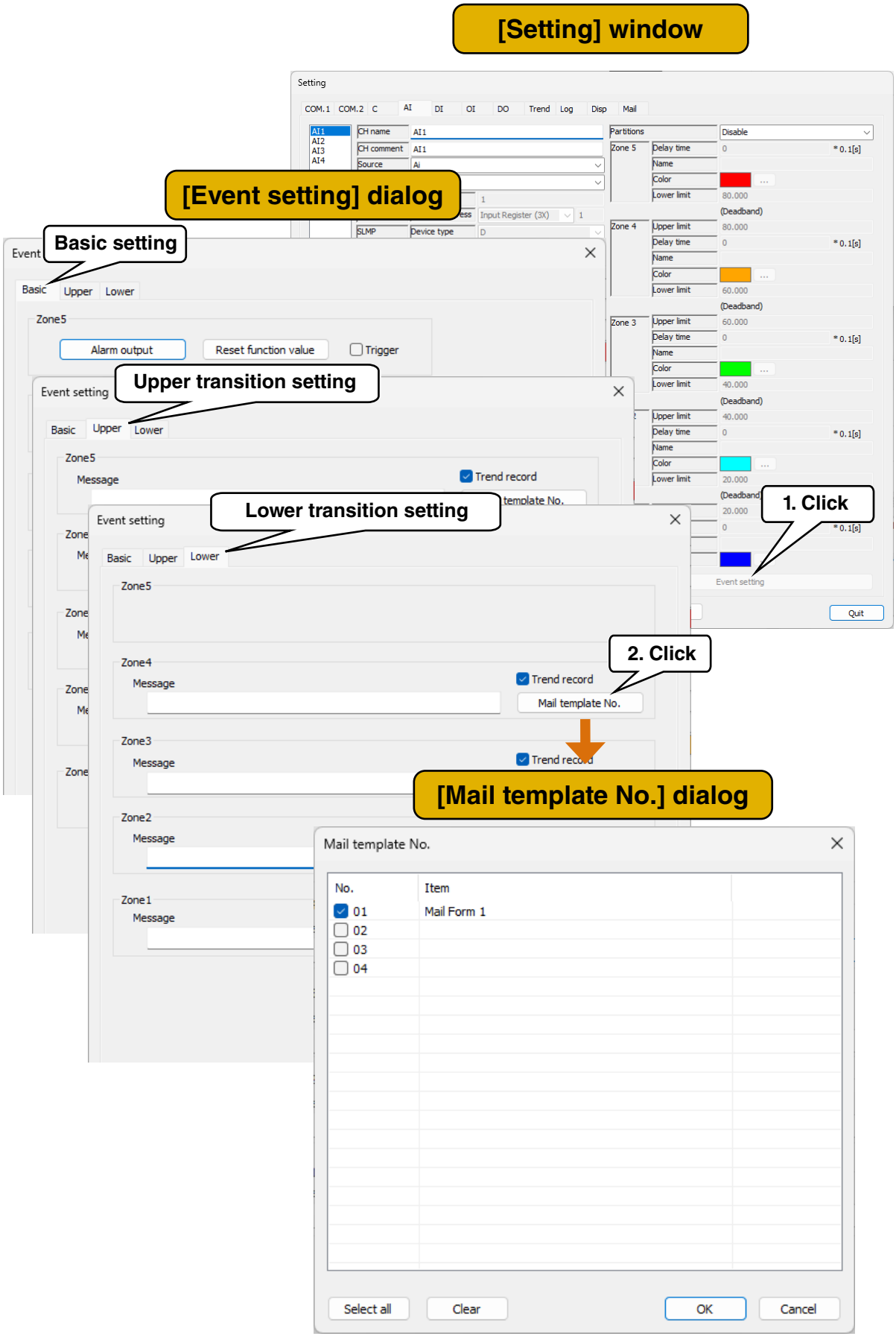
[Setting] window



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. 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.

3.4.1.6 Event setting (AI)

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



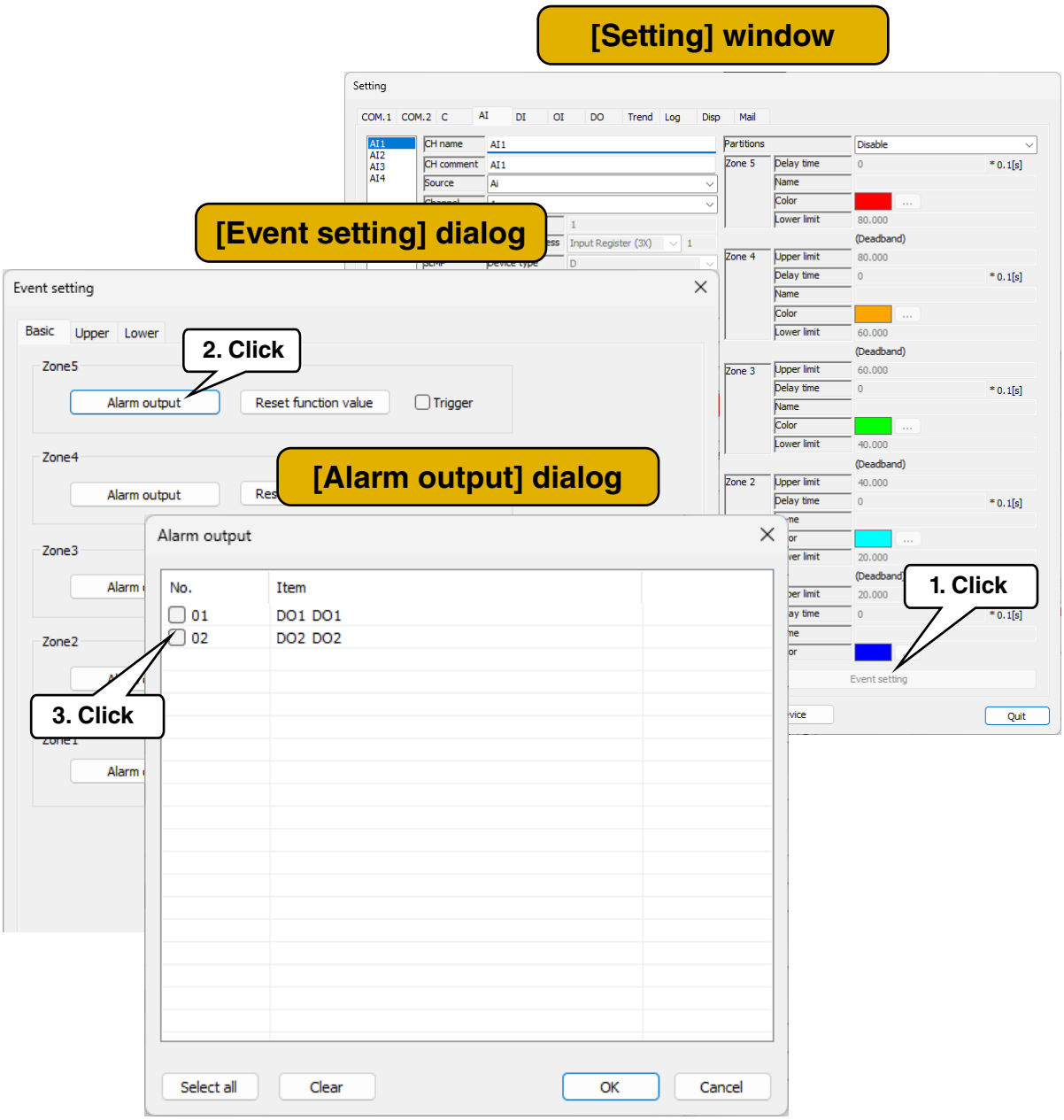
1. Click [Event setting] button on [Setting] window (AI) to display [Event setting] dialog. In case that the partitions is [Disable], [Event setting] button is disabled.
2. Set parameters according to the table below. Click [OK] button to go back to [Setting] window.
3. Click [Mail template No.] button 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
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.

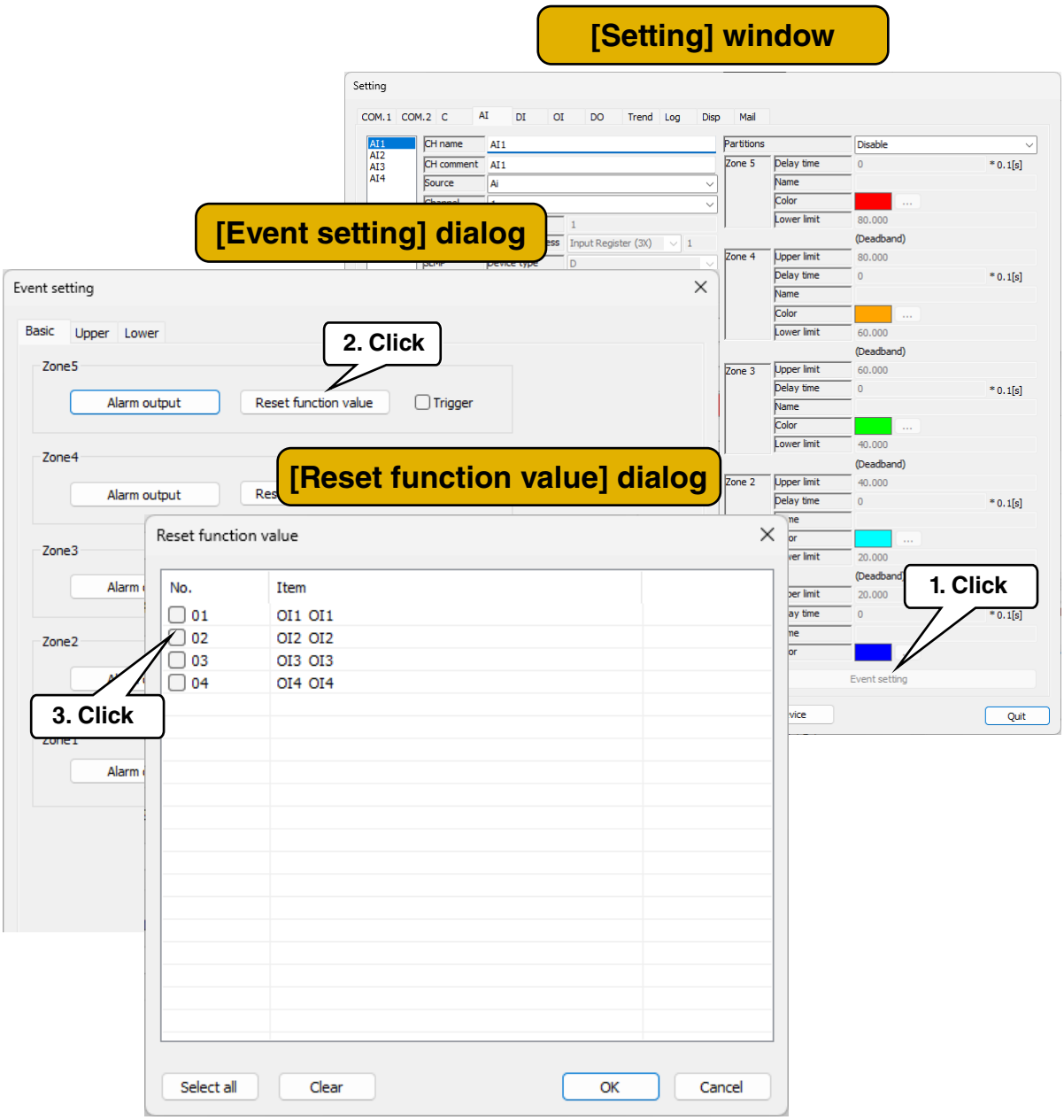
1. Click [Event setting] button on [Setting] window (AI) to display [Event setting] dialog. Click [Alarm output] button of the specified zone to display [Alarm output] dialog.
2. Select the checkbox of the DO channel to be set and click [OK].



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].



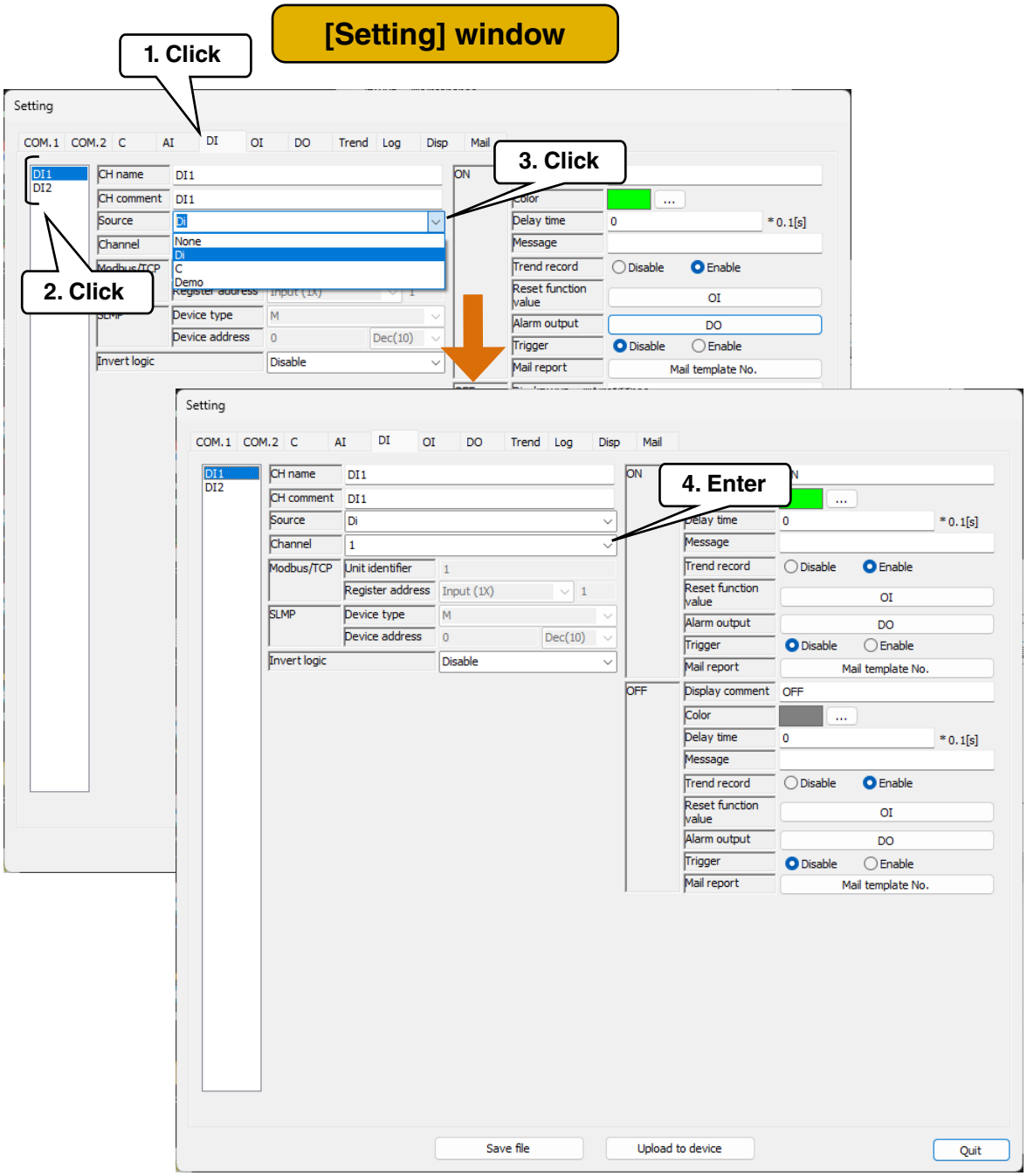
Follow the above procedure to set all the channels.
The channel setting configured on [Analog input (AI)] window can also be copied to other channels and only the required parameters can be modified.
➔ 3.4.5 Copying the I/O setting

3.4.2 Discrete input (DI)

Discrete input signals can be monitored for maximum of 2 points (DI1 to DI2) using the VR4896E-G2. Assign the discrete input from built-in I/O, remote I/O or SLMP-compatible device to the VR4896E-G2 according to the following procedure.

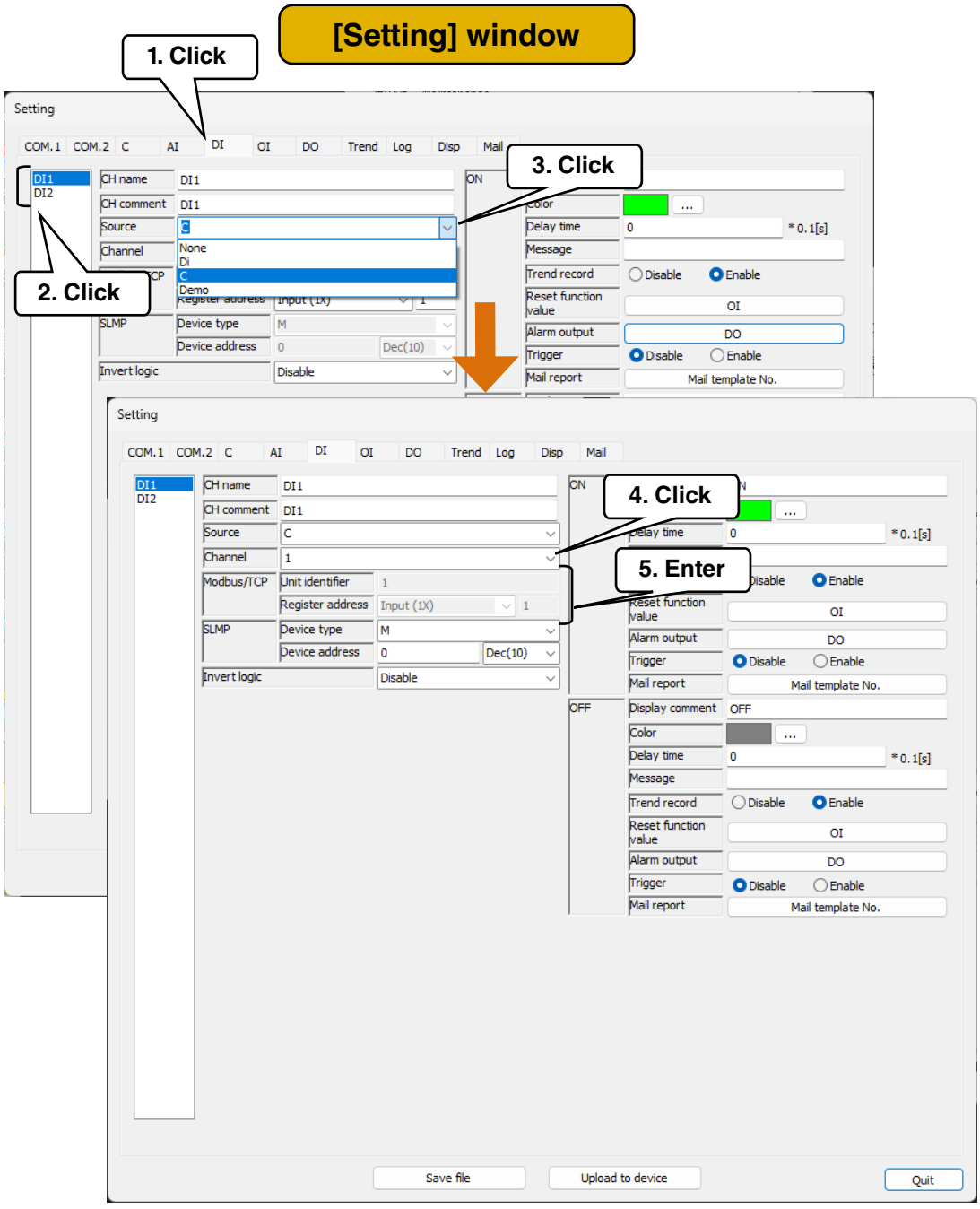
3.4.2.1 Assignment discrete input to built-in I/O

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



3.4.2.2 Assignment discrete input to remote I/O

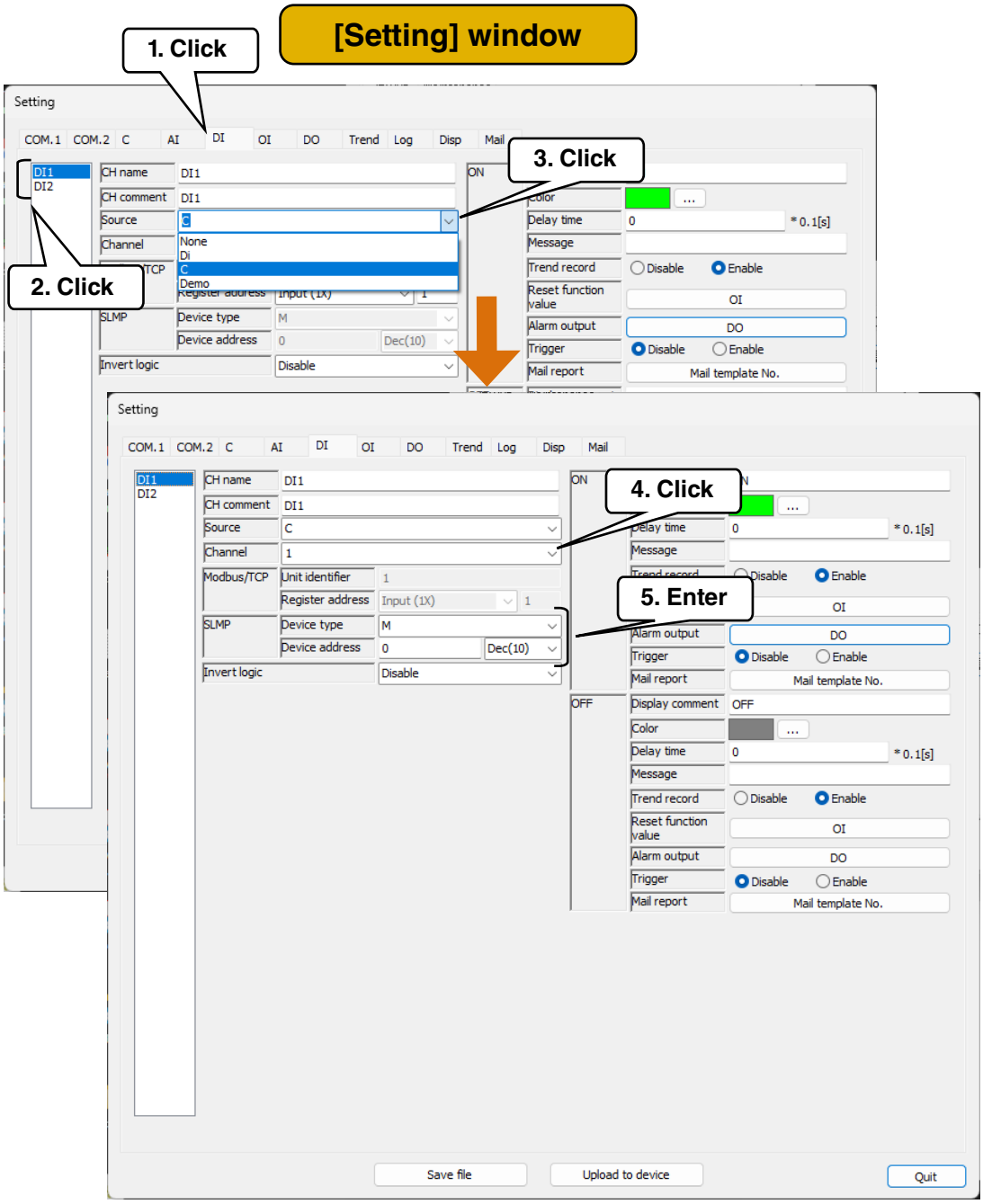
1. Click the channel to be set to display the current settings.
2. Click the source drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. ➔ 3.3.1.1 Modbus/TCP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

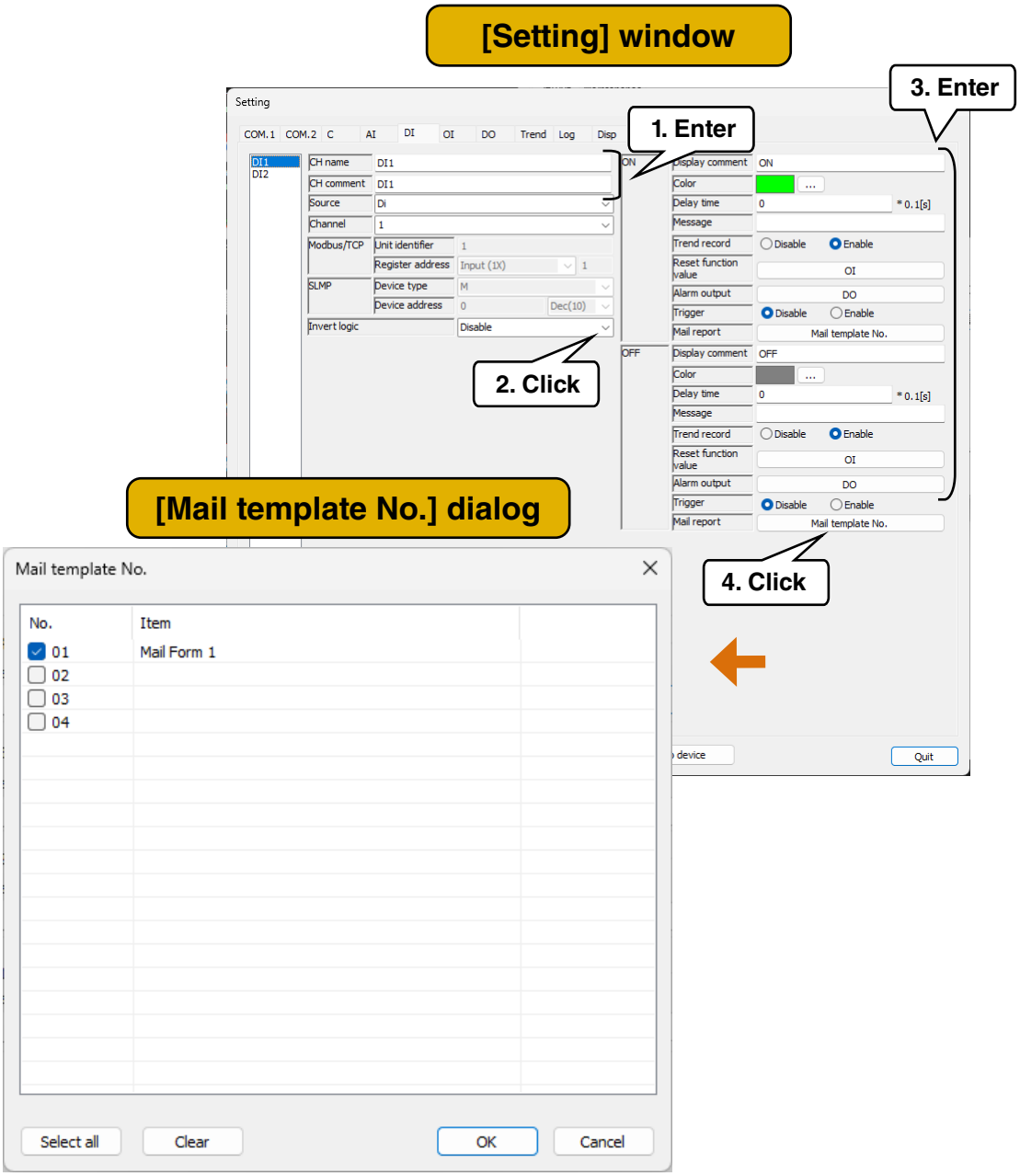
1. Click the channel to be set to display the current settings.
2. Click the source drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. ➔ 3.3.1.2 SLMP connection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

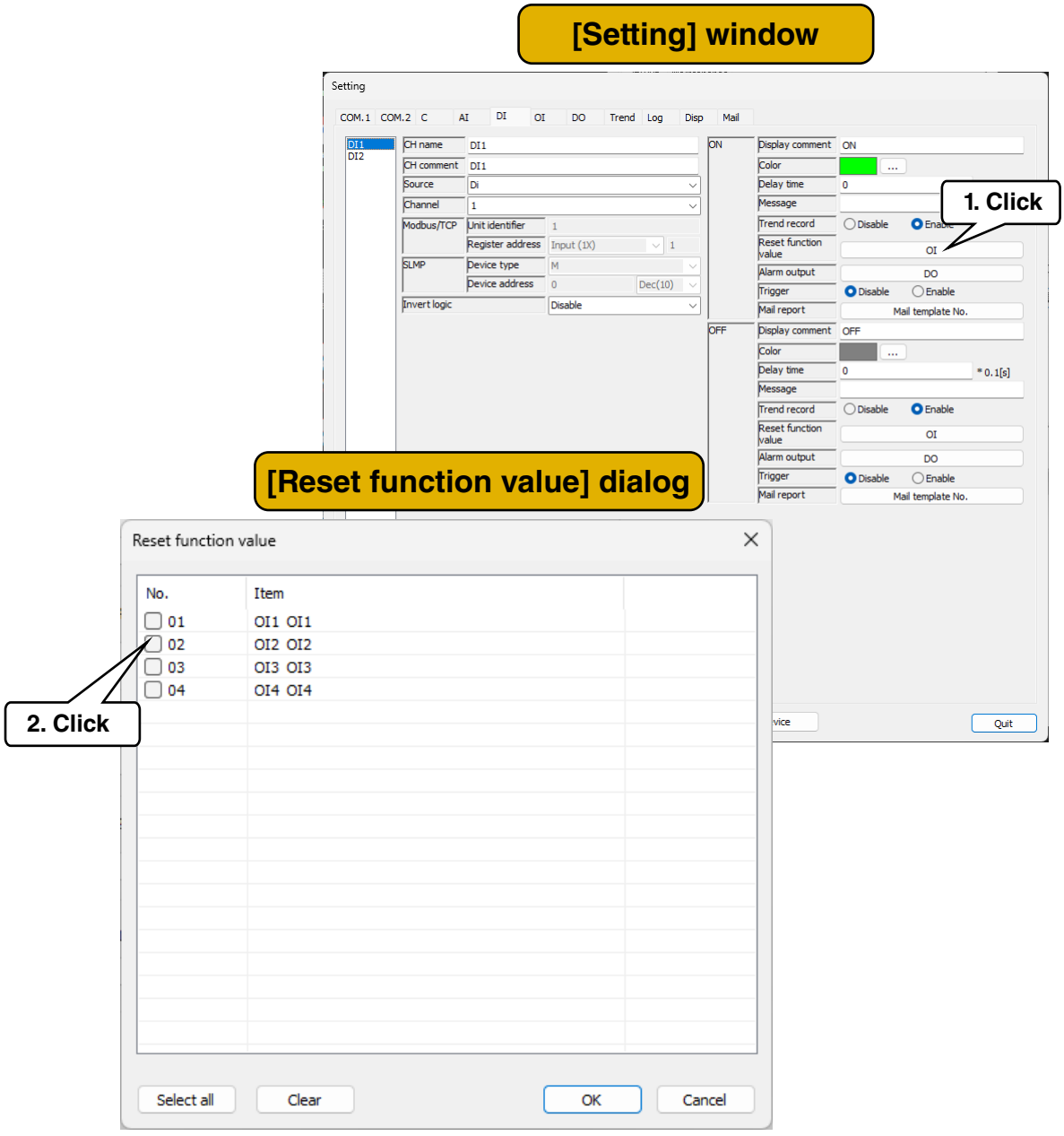
Parameter	Description
Display comment	Set the comment corresponding to ON and OFF respectively within 8 characters.
Color	Set the color which represents the status displayed on the trend data for ON and OFF respectively.
Delay time	Set the delay time for ON and OFF respectively within the range of 0.0 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

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.

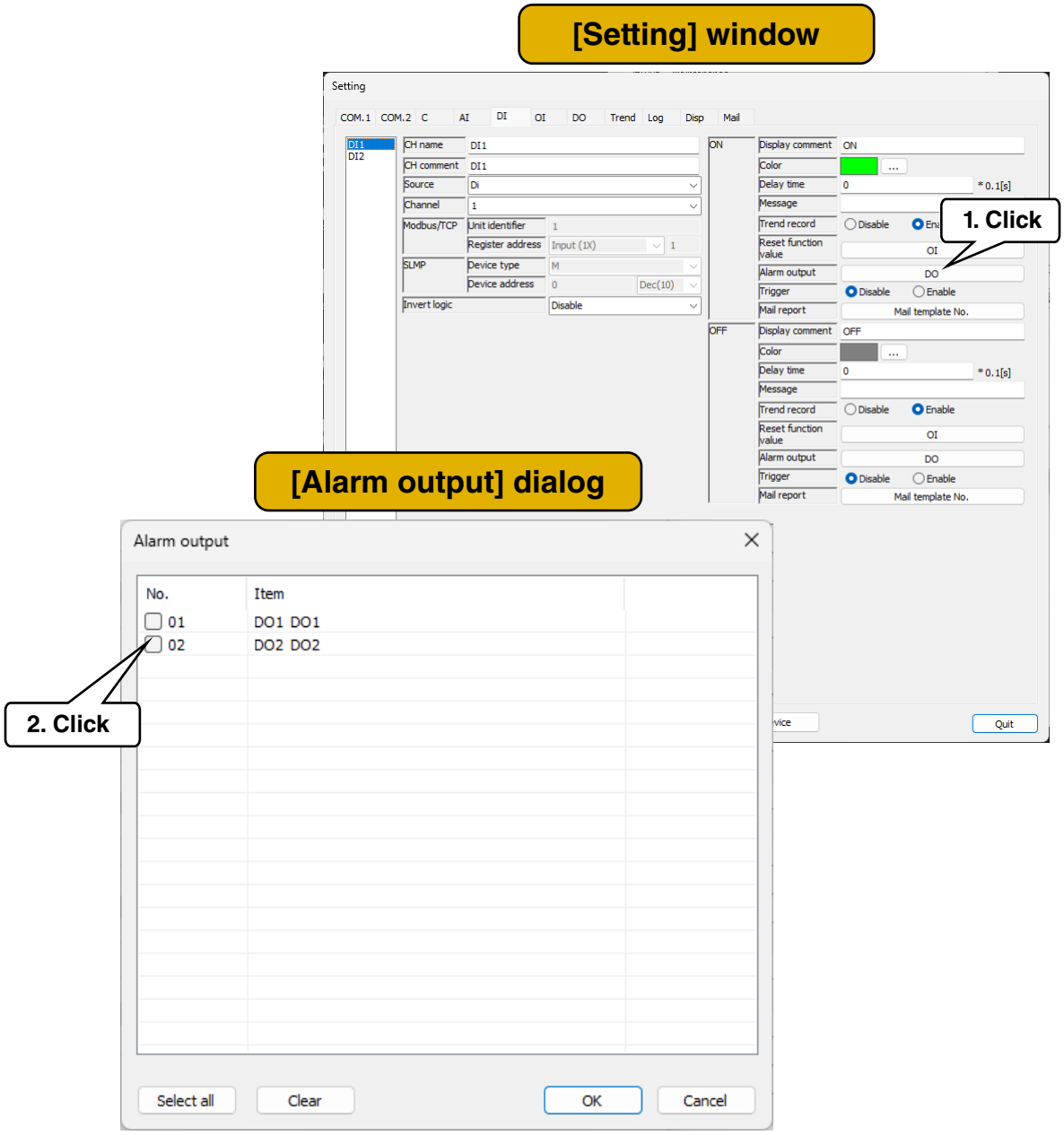
1. Click [OI] button to display [Reset function value] dialog.
2. Select the checkbox of the OI channel to be set and click [OK].



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].



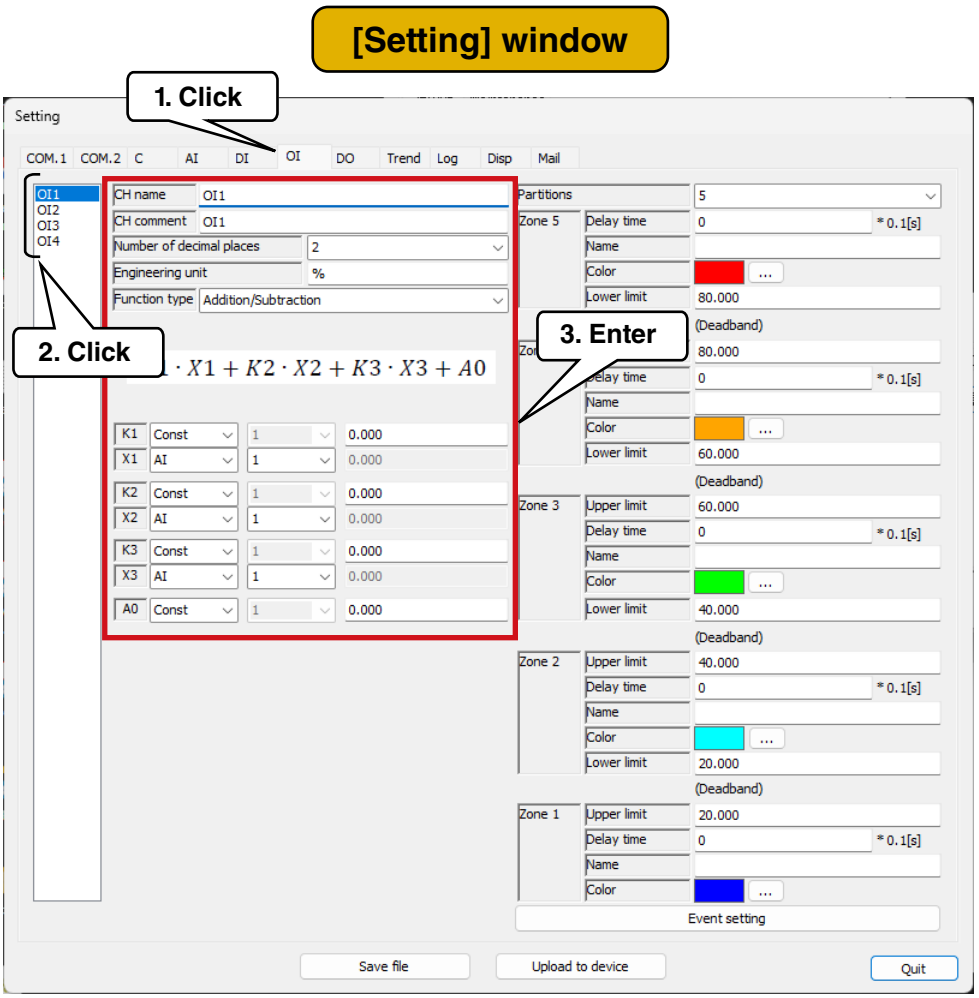
Follow the above procedure to set all the channels.
The channel setting configured on [Discrete input (DI)] window can also be copied to other channels and only the required parameters can be modified.
➔ 3.4.5 Copying the I/O setting

3.4.3 Operational input (OI)

Configure the operational input (OI) setting. There are 4 operational input channels (OI1 to OI4).

3.4.3.1 Basic setting (OI)

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



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 values 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

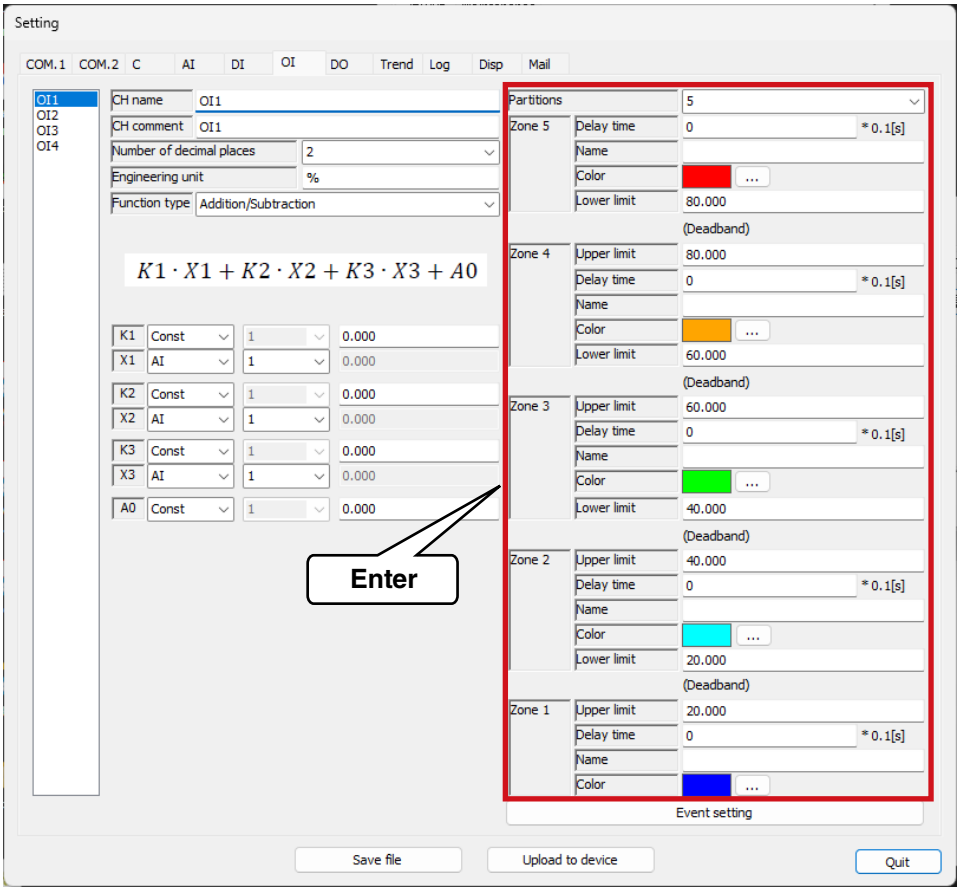
Parameter	Expression	Parameter
Addition/ Subtraction	K1X1+K2X2+ K3X3+A0	K1, K2, K3, A0, X1, X2, X3: *1
Multiplication	(K1X1+A1)(K2X2+A2)+A0	K1, K2, A0, A1, A2, X1, X2: *1
Division	(K1X1+A1)/(K2X2+A2)+A0	K1, K2, A0, A1, A2, X1, X2: *1
Extraction of square root	$10K1\sqrt{X1}$	K1, X1: *1
Moving average	$\frac{\sum_{n=0}^{N-1} x_n}{N}$	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^{x1_n}	X1: *1
Common logarithm	logX1	X1: *1
Natural logarithm	lnX1	X1: *1
Peak hold (Maximum)	MAX(X1)	X1: *1 RST: Initialization (MAX=X1)
Peak hold (Minimum)	MIN(X1)	X1: *1 RST: Initialization (MAX=X1)
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: Integrated value is reset in case of power failure or similar stoppage.
Power	$X1^{K1}$	X1, K1: *1
F-value operation	$\sum 10^{\frac{X1-K1}{K2}}$	X1: *1 K1: Reference temperature (°C) K2: Z-value (Positive real number) RST: Initialization
Antilogarithm	10^{X1}	X1: *1
Scaling	K3+(K4-K3)*(X1-K1)/(K2-K1)	X1: *1 K1: Zero (Input) *3 K2: Span (Input) *3 K3: Zero (Output) *3 K4: Span (Output) *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), AI1 to AI4, AI zone (AI_Zone1 to 4), DI1 and DI2, OI1 to OI4 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) AI1 to AI4, AI zone (AI_Zone1 to 4), DI1 and DI2, OI1 to OI4 can be set. The value is same as note 1.
Note 3) The same value cannot be set for zero and span.

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.

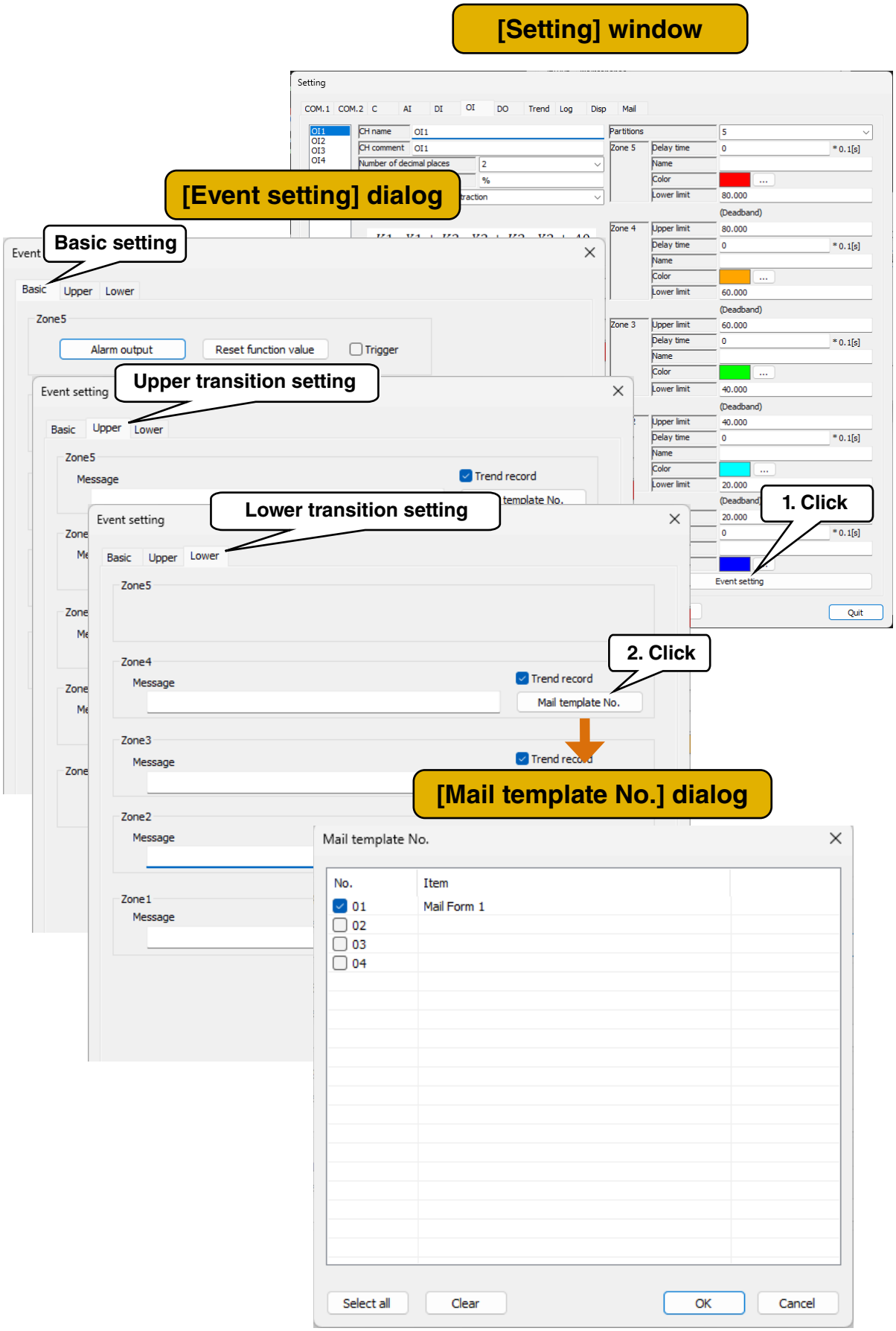
[Setting] window



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.



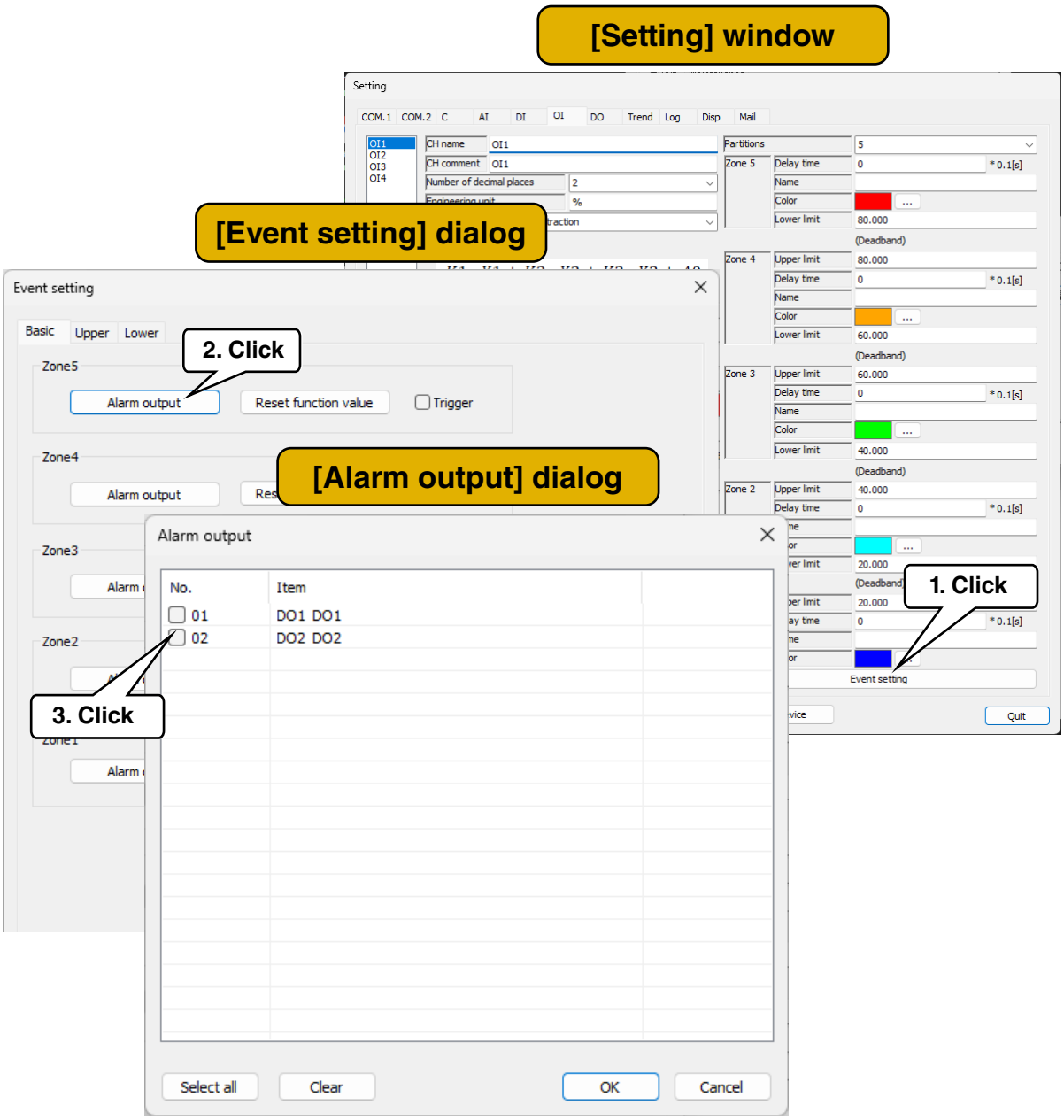
1. Click [Event setting] button on [Setting] window (OI) to display [Event setting] dialog. In case that the partitions is [Disable], [Event setting] button is disabled.
2. Set parameters according to the table below. Click [OK] button to go back to [Setting] window.
3. Click [Mail template No.] button 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
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.

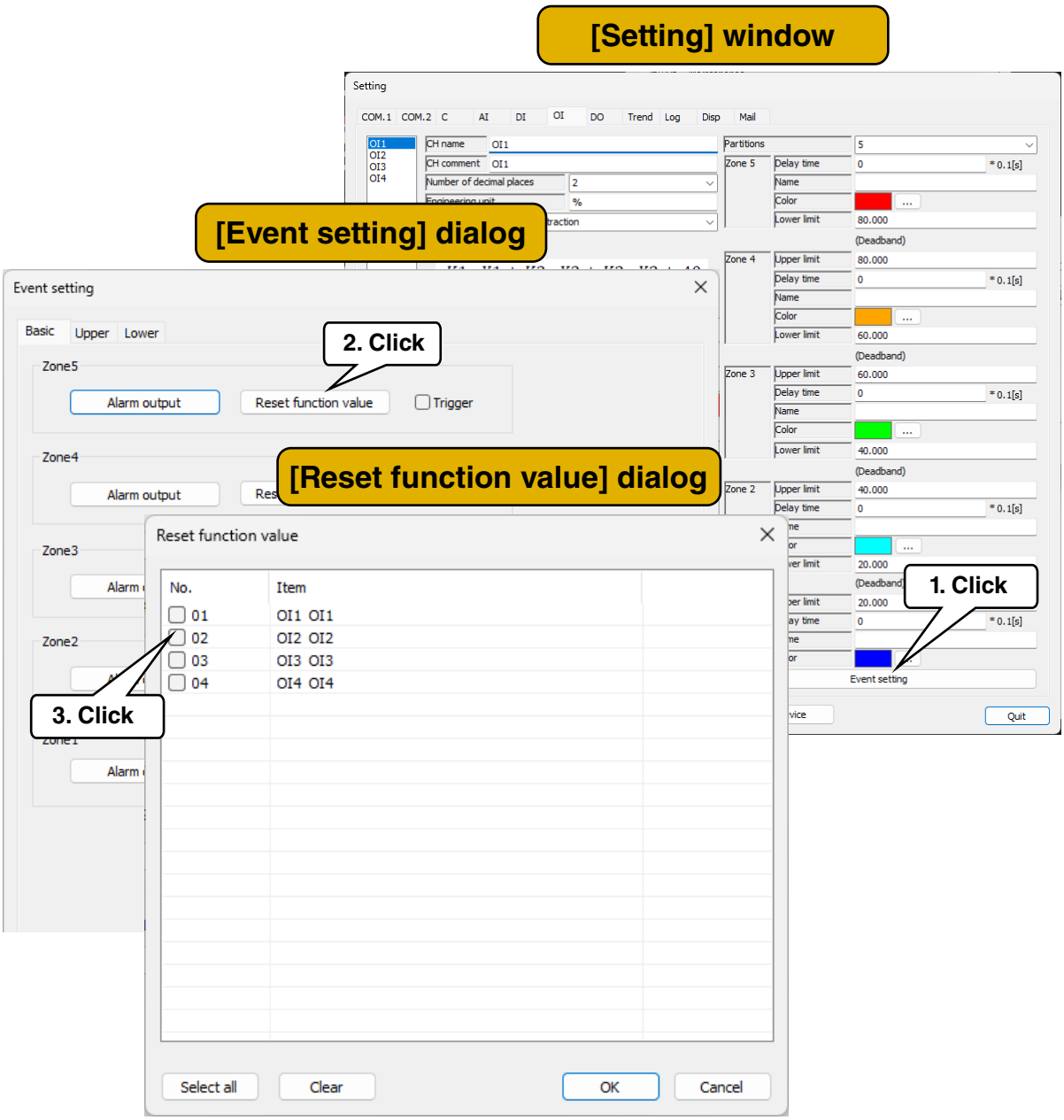
1. Click [Event setting] button on [Setting] window (OI) to display [Event setting] dialog. Click [Alarm output] button of the specified zone to display [Alarm output] dialog.
2. Select the checkbox of the DO channel to be set and click [OK].



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].



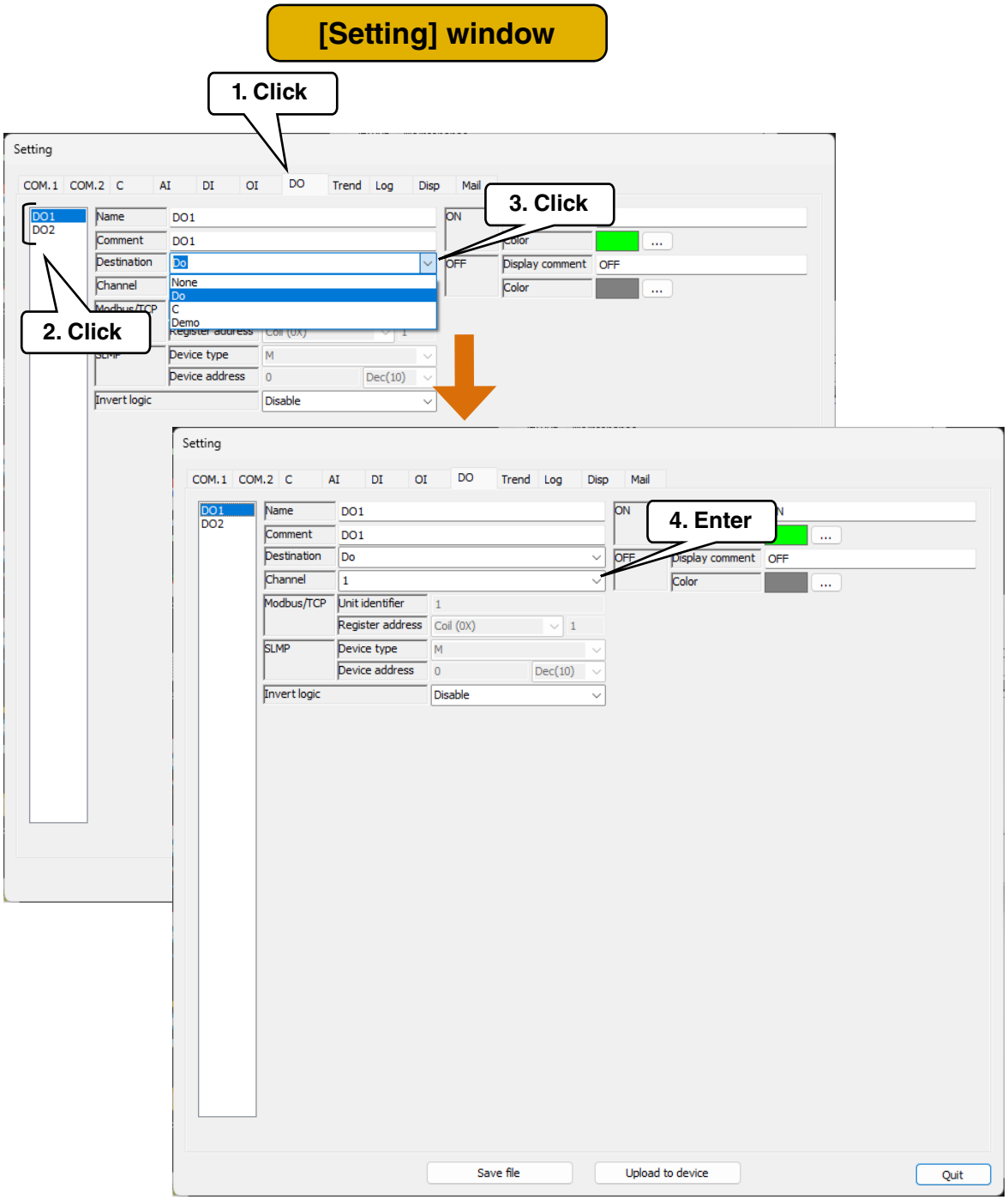
Follow the above procedure to set all the channels.
The channel setting configured on [Operational input (OI)] window can also be copied to other channels and only the required parameters can be modified.
➔ 3.4.5 Copying the I/O setting

3.4.4 Discrete output (DO)

Discrete output signals can be monitored for maximum of 2 points (DO1 and DO2).
Assign the discrete output from built-in I/O, remote I/O or SLMP-compatible device to the VR4896E-G2 according to the following procedure.

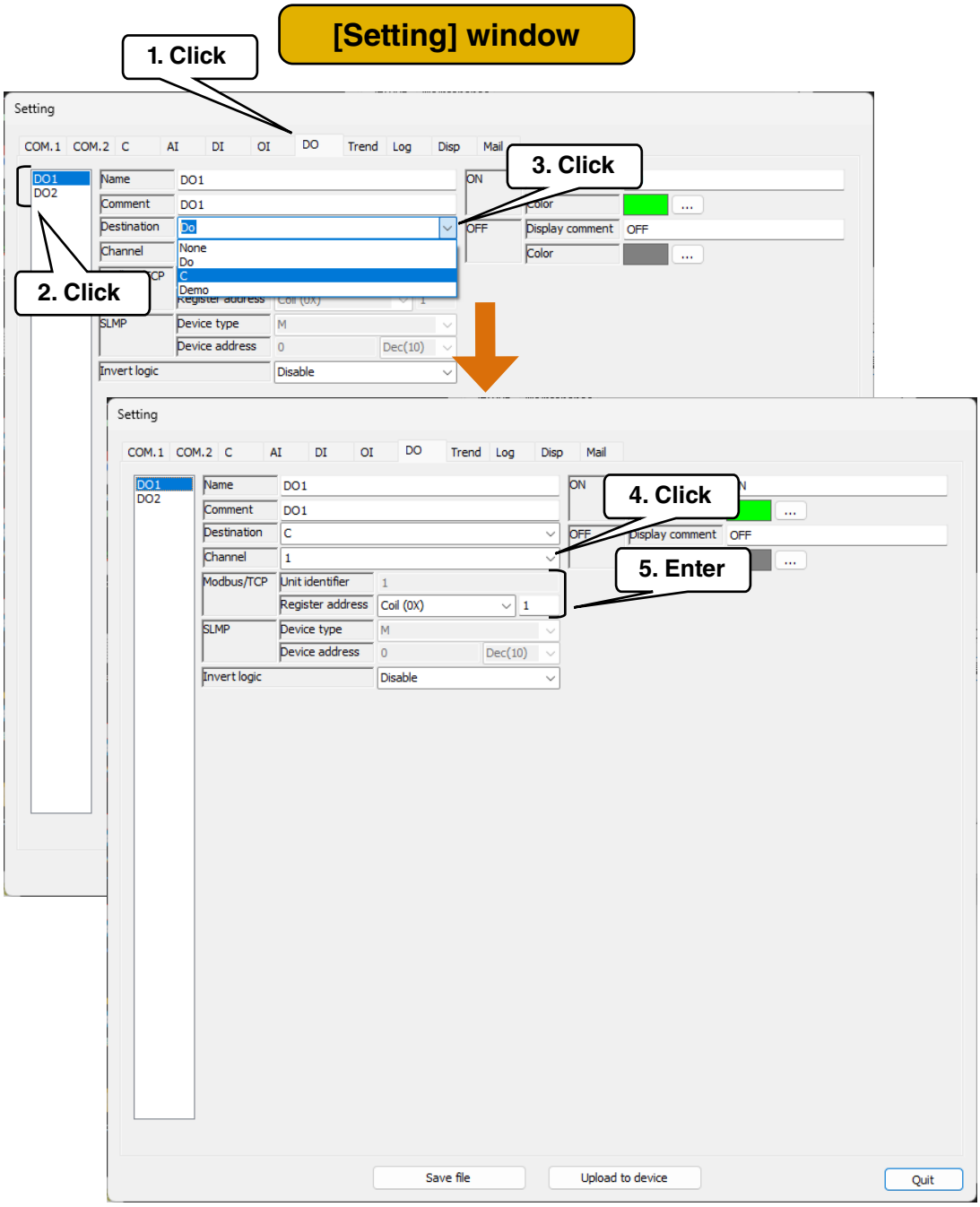
3.4.4.1 Assignment discrete output to built-in I/O

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



3.4.4.2 Assignment discrete output to remote I/O

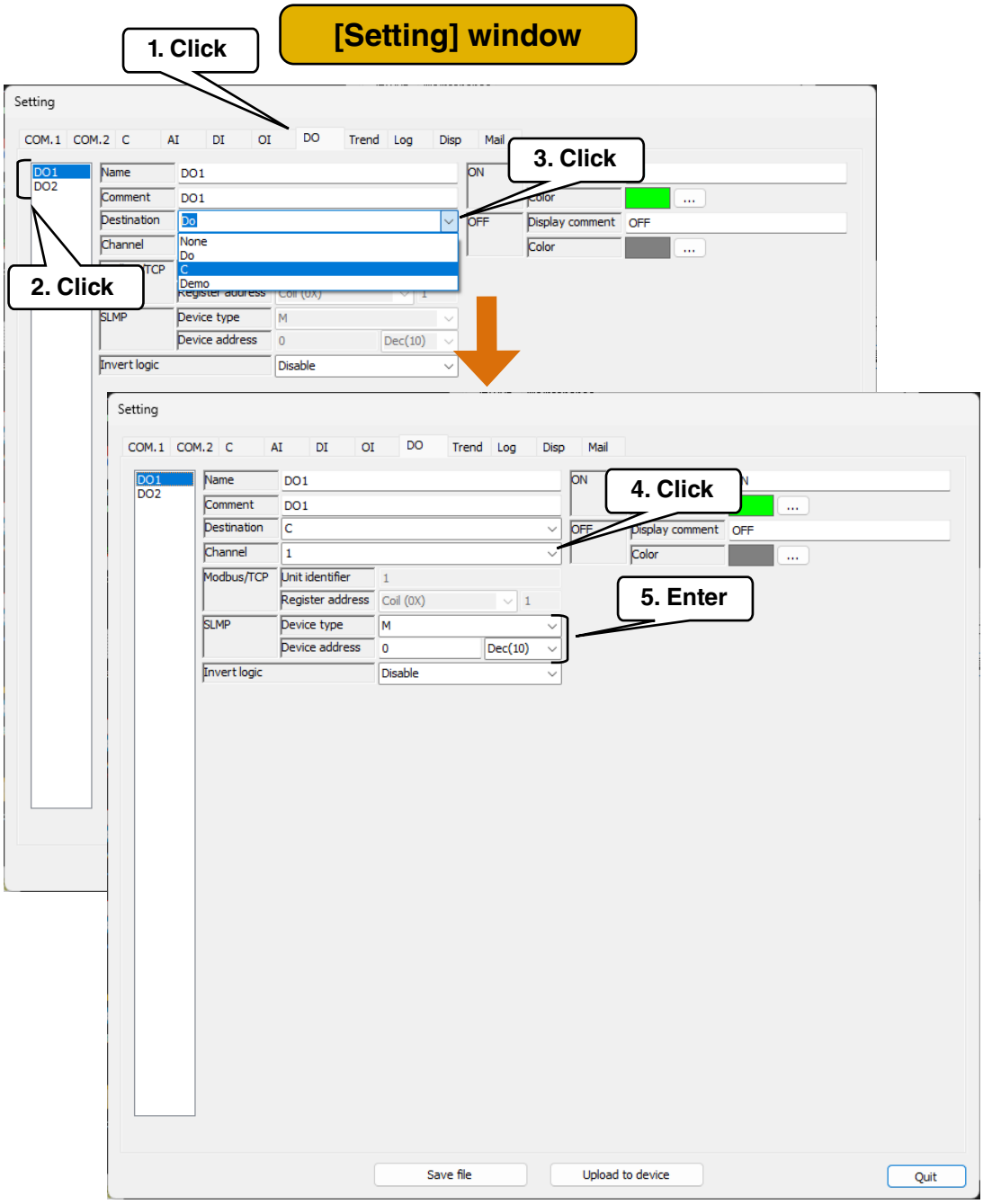
1. Click the channel to be set to display the current settings.
2. Click the destination drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is Modbus/TCP, the following window appears and assigning remote I/O becomes possible. ➔ 3.3.1.1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

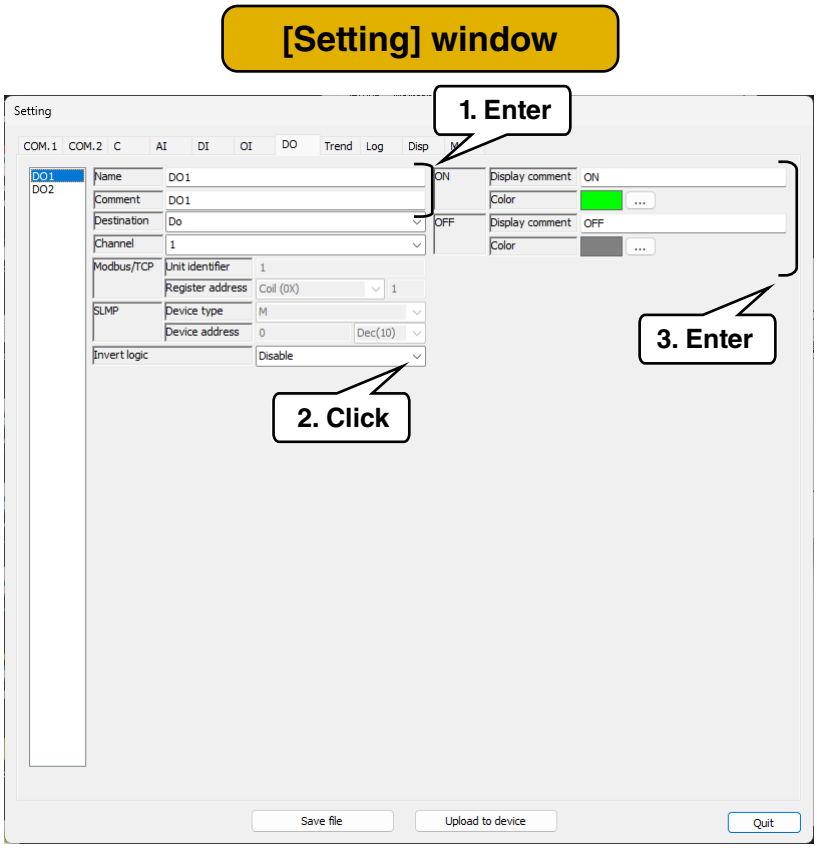
1. Click the channel to be set to display the current settings.
2. Click the destination drop-down list and select [C].
3. Set the channel for connection setting. In case that the selected connection channel is SLMP, the following window appears and assigning SLMP becomes possible. ➔ 3.3.1.2 SLMP connection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



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.

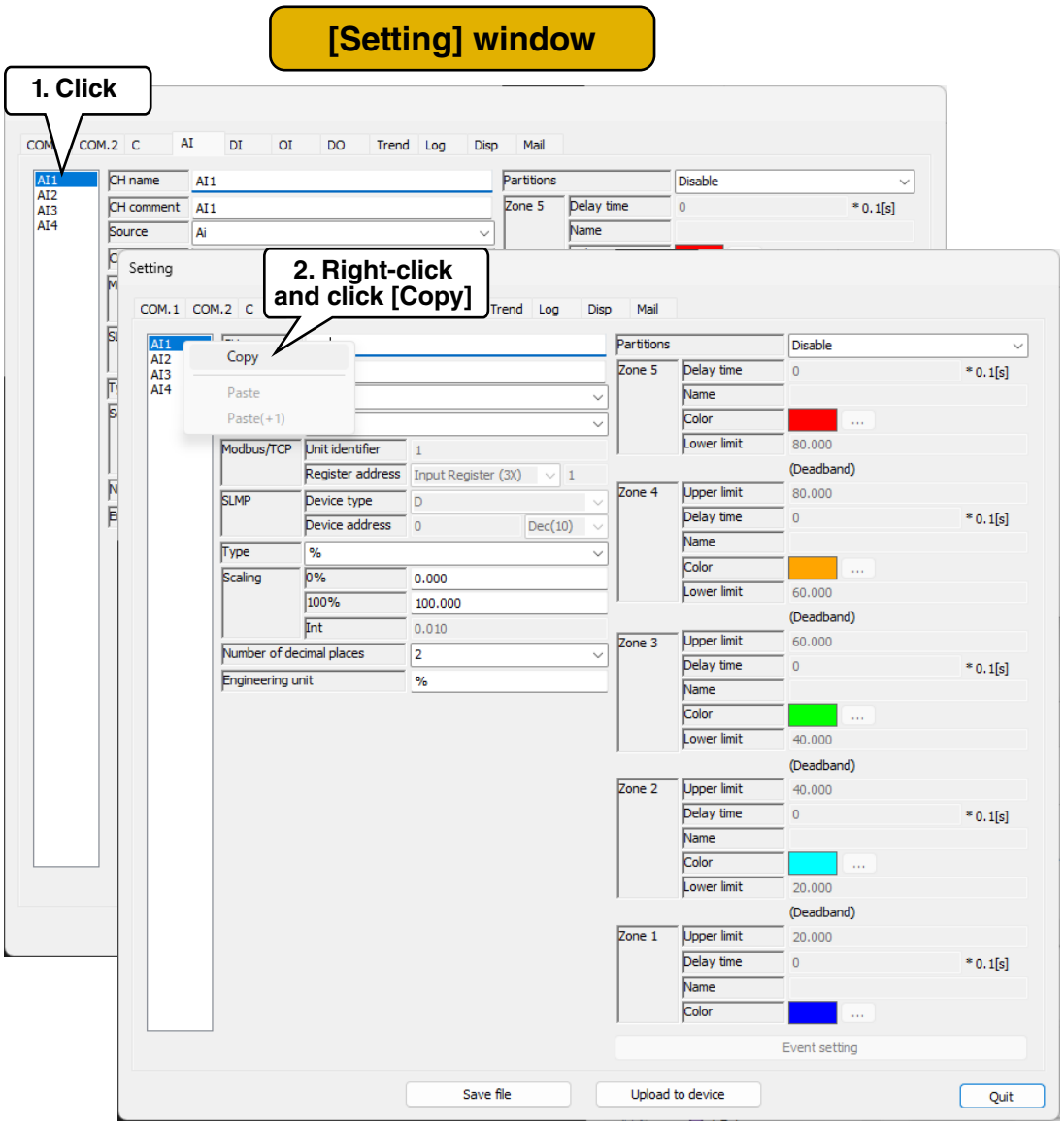
Follow the above procedure to set all the channels.
The channel setting configured on [Discrete Output (DO)] window can also be copied to other channels and only the required parameters can be modified. ➔ 3.4.5 Copying the I/O setting

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.

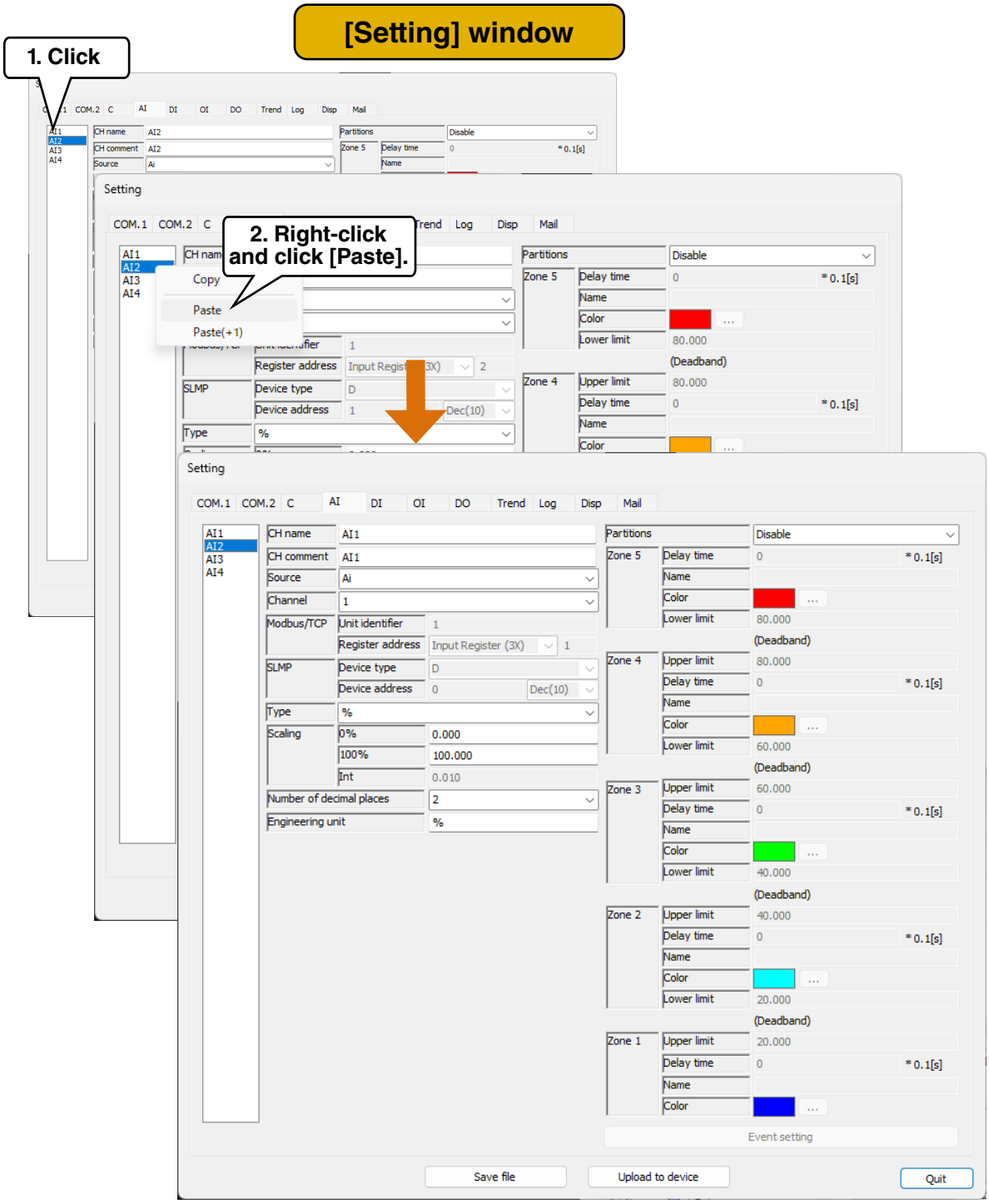
3.4.5.1 Copying

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)

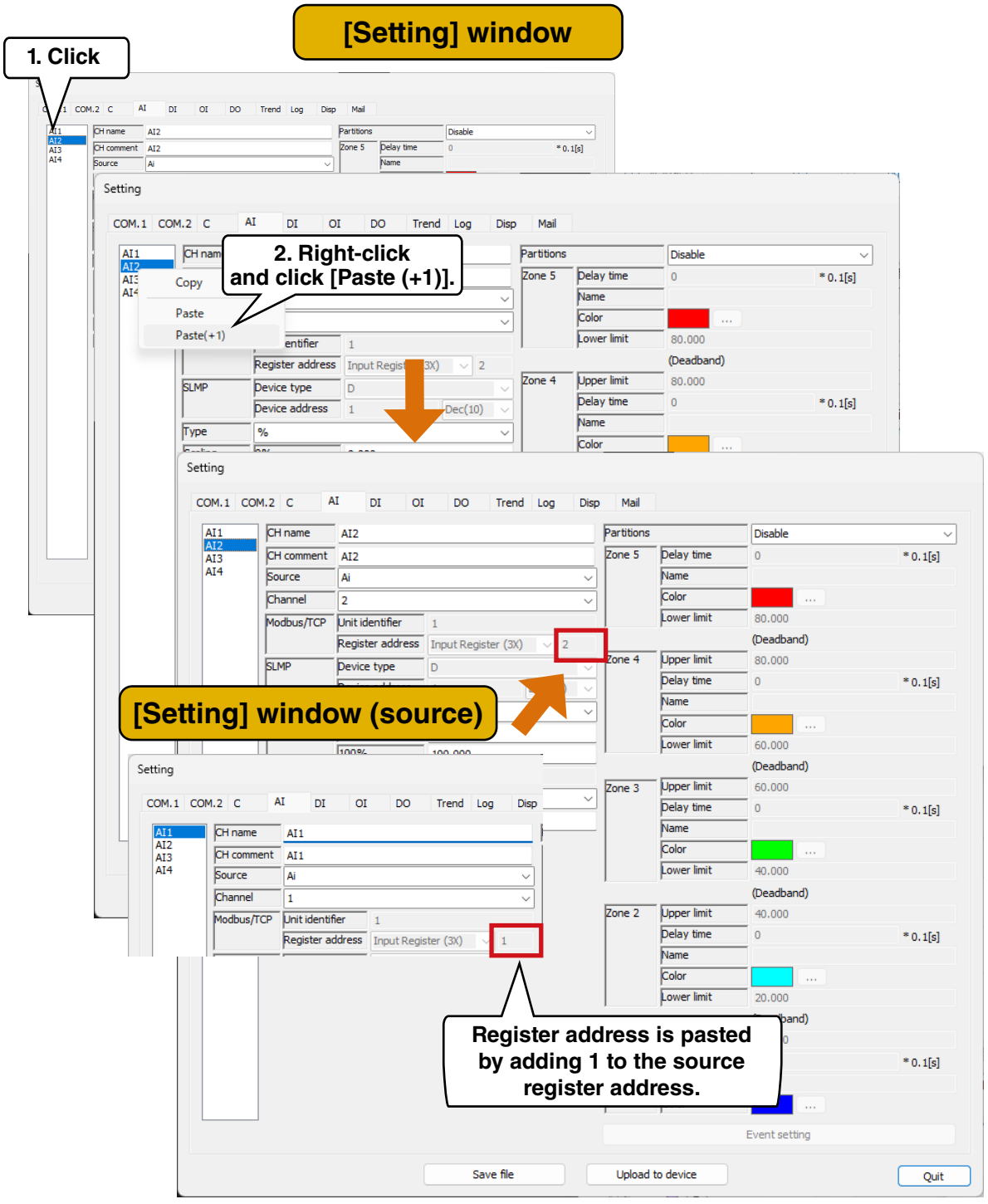
Copied I/O settings can be pasted.

[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.

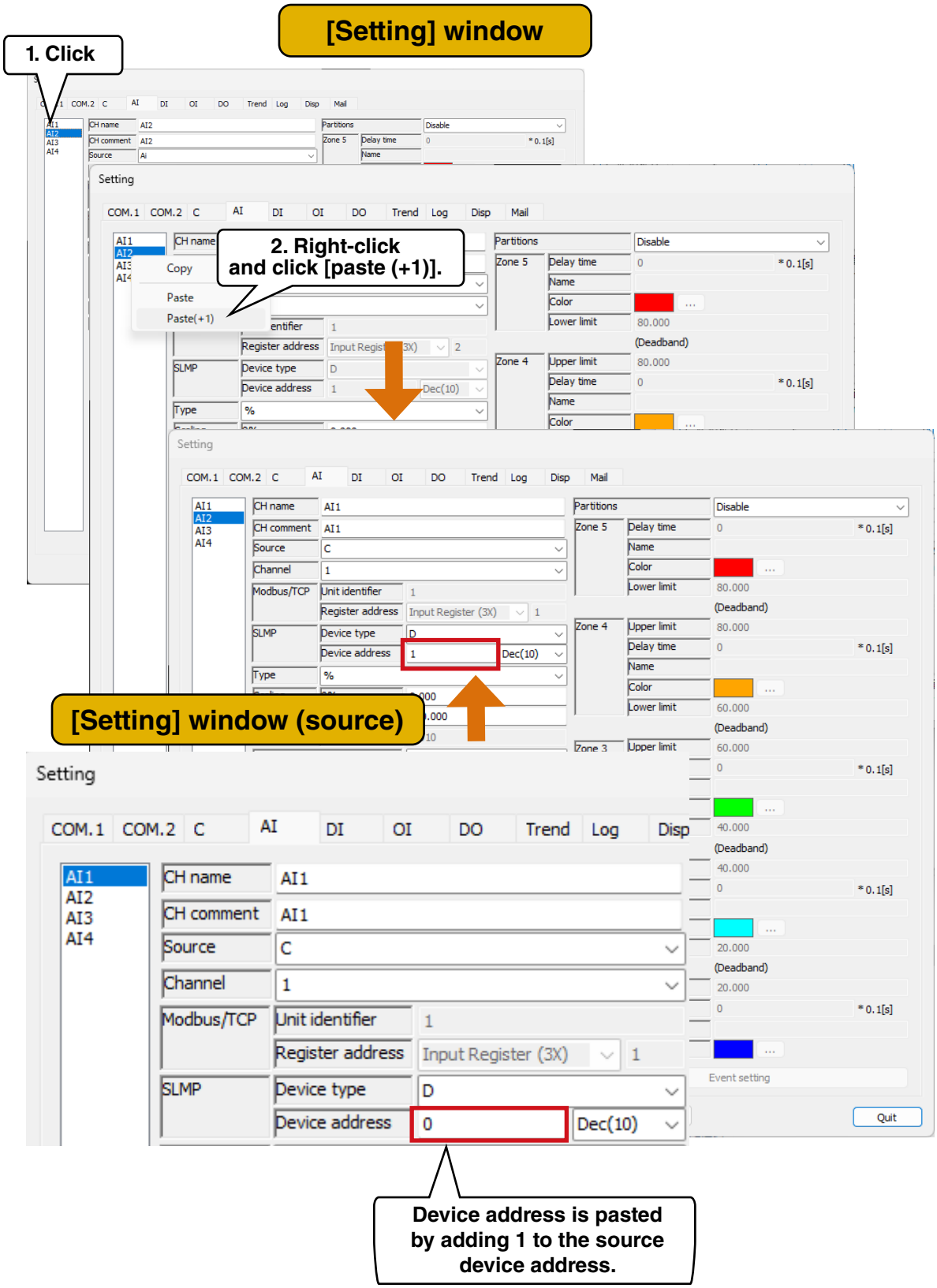
(1) Remote I/O

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



(2) SLMP

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



3.5 Trend setting

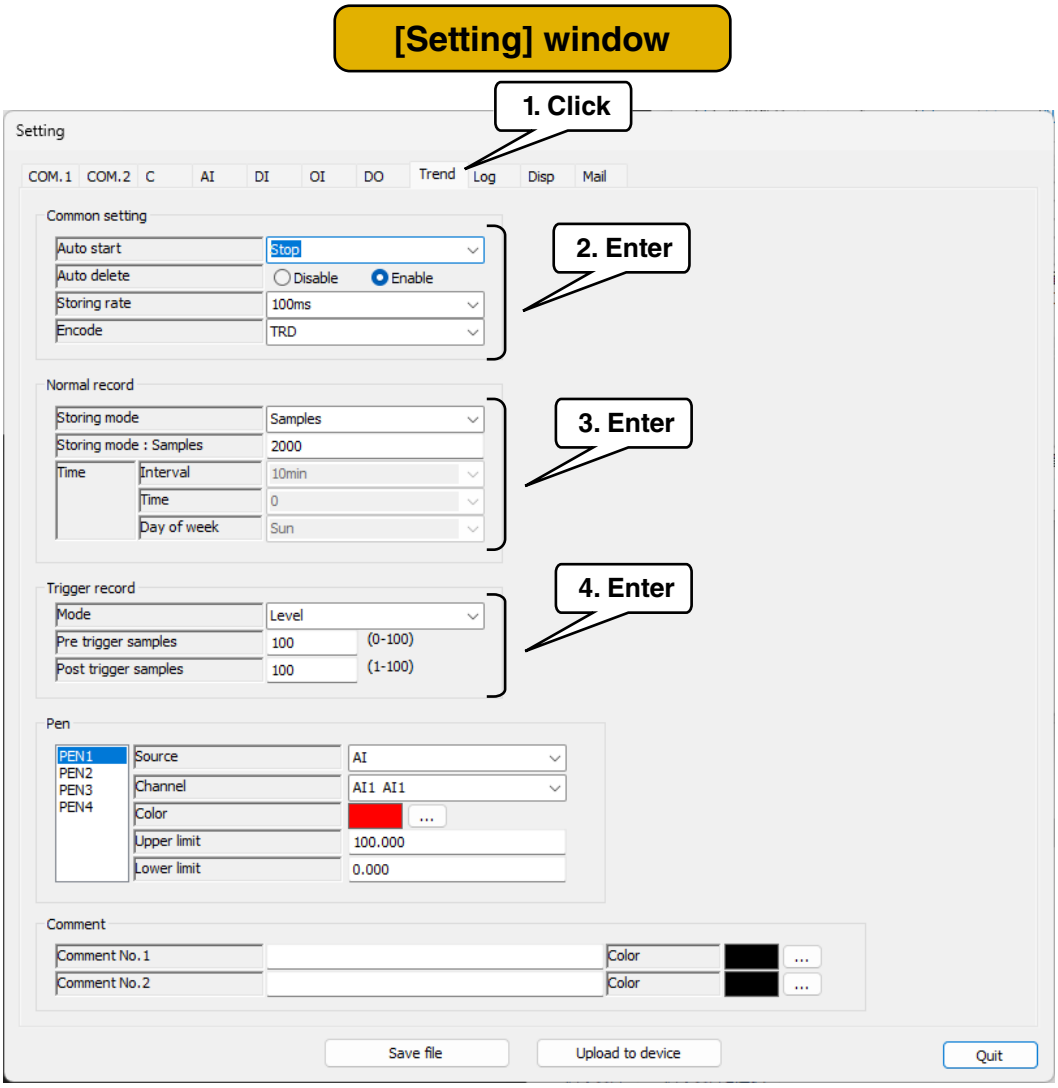
Assign any channel set in I/O (AI, DI, OI, DO) to pen and set the pen's waveform to be recorded and displayed on the VR4896E-G2 screen.

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 recorded 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 interval / Storing rate	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

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 100.
Post trigger samples	Set in the range of 1 to 100.

3.5.1.2 Normal recording

When the normal recording is set in [Auto start], trend recording starts upon VR4896E-G2 startup.

(1) Storing mode: Samples
When samples is set in [Storing mode], the recorded data are stored to the trend files by the specified number of samples.

(2) Storing mode: Time
When time is set in [Storing mode], the recorded data are stored to the trend file at the specified timing. For storing timing, refer to the table below.

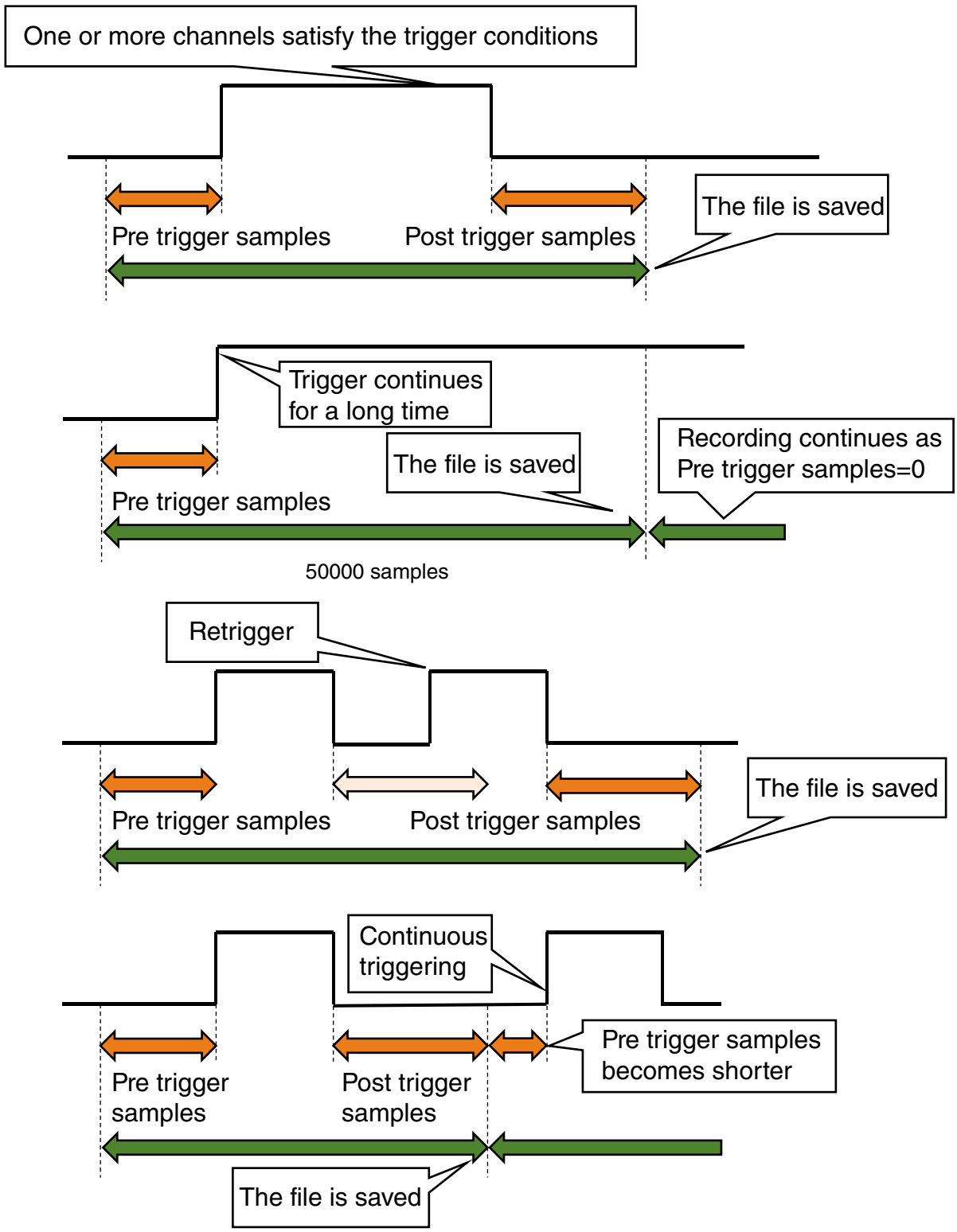
Storing interval	Storing timing
10 min.	0, 10, 20, 30, 40, 50 minutes and 0 second every hour
30 min.	0, 30 minutes and 0 second every hour
1 hour	0 minute and 0 second every hour
6 hours	0, 6, 12, 18 hours, 0 minute and 0 second
12 hours	0, 12 hours, 0 minute and 0 second
1 day	0 minute and 0 second 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], the trend is recorded according to the trigger conditions set for each channel of AI, DI, and OI.

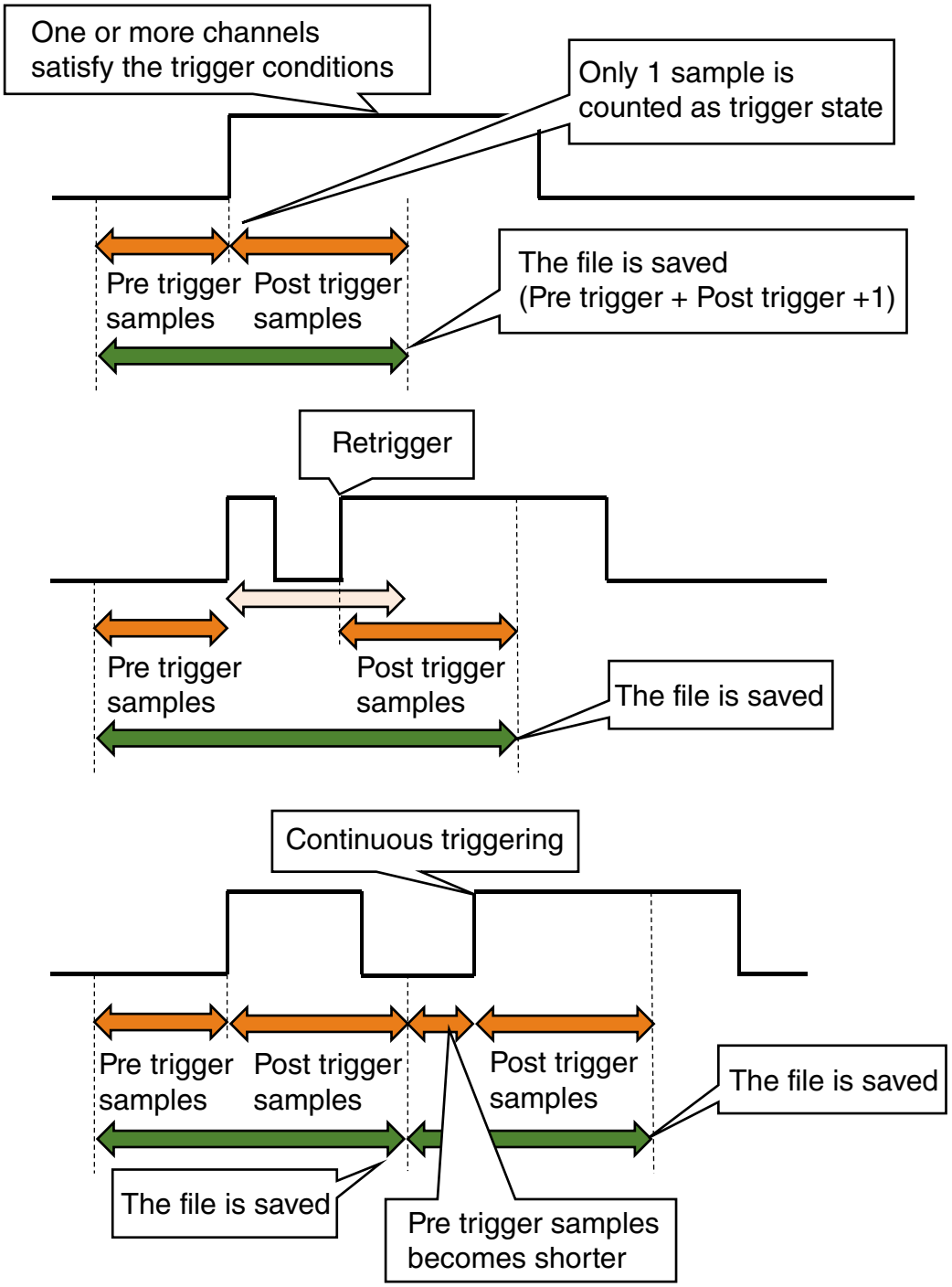
(1) Mode: Level

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 stored in the trend file 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

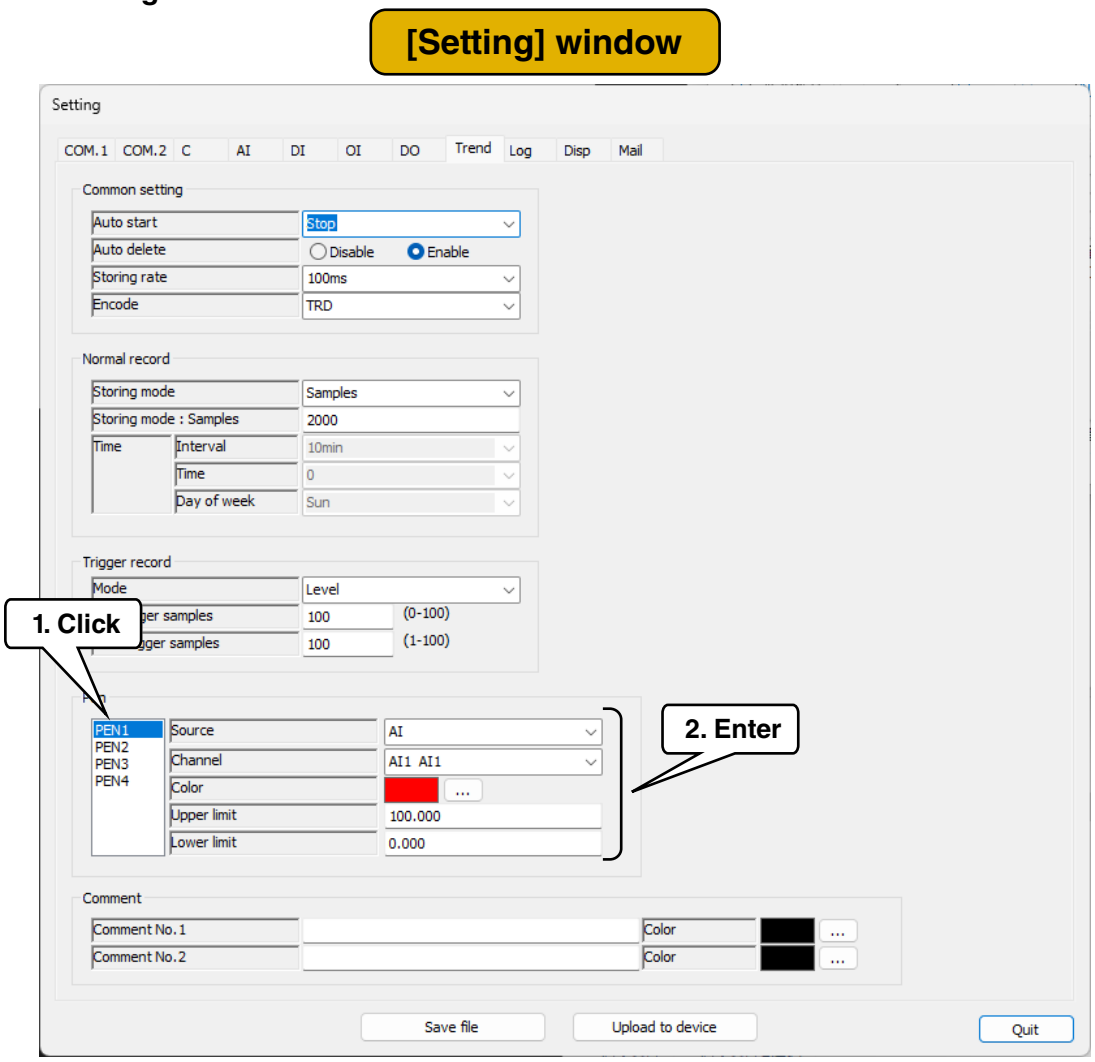
When the edge is set in [Mode] of the trigger recording, trend are recorded with reference to the change point where one or more channels satisfy the trigger conditions from the non-trigger state of all channels among AI, DI, and OI channels configured trigger setting. The number of samples to be stored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

Perform assigning 4 pens to record to trend files and to display on the trend graph.

3.5.2.1 Pen setting



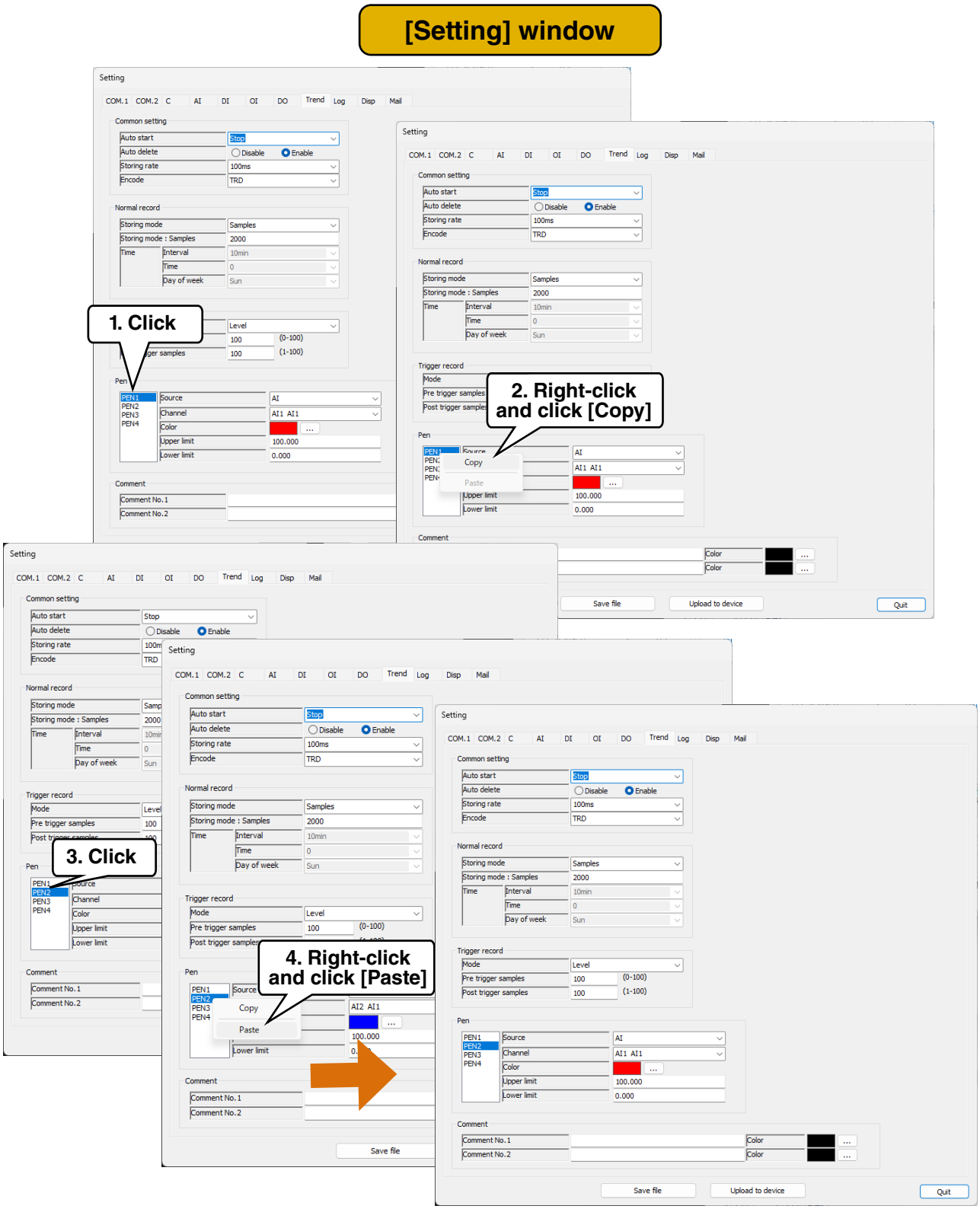
1. Select the pen to be set to display the current settings of the selected pen.
2. Assign the pen. Set the pen according to the table below.

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.

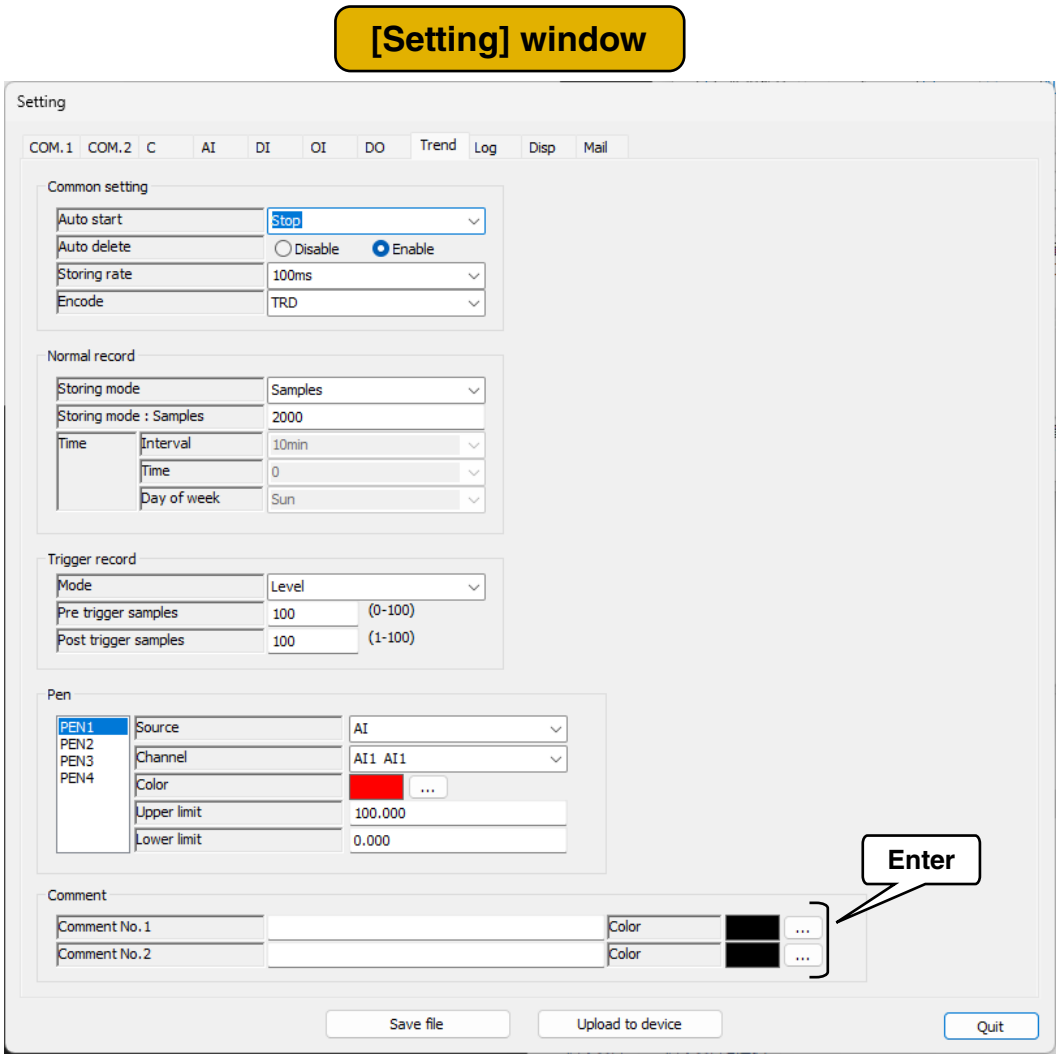
3.5.2.2 Copying pen setting

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



3.5.3 Comment setting

Configure the comment setting registered to the trend graph.

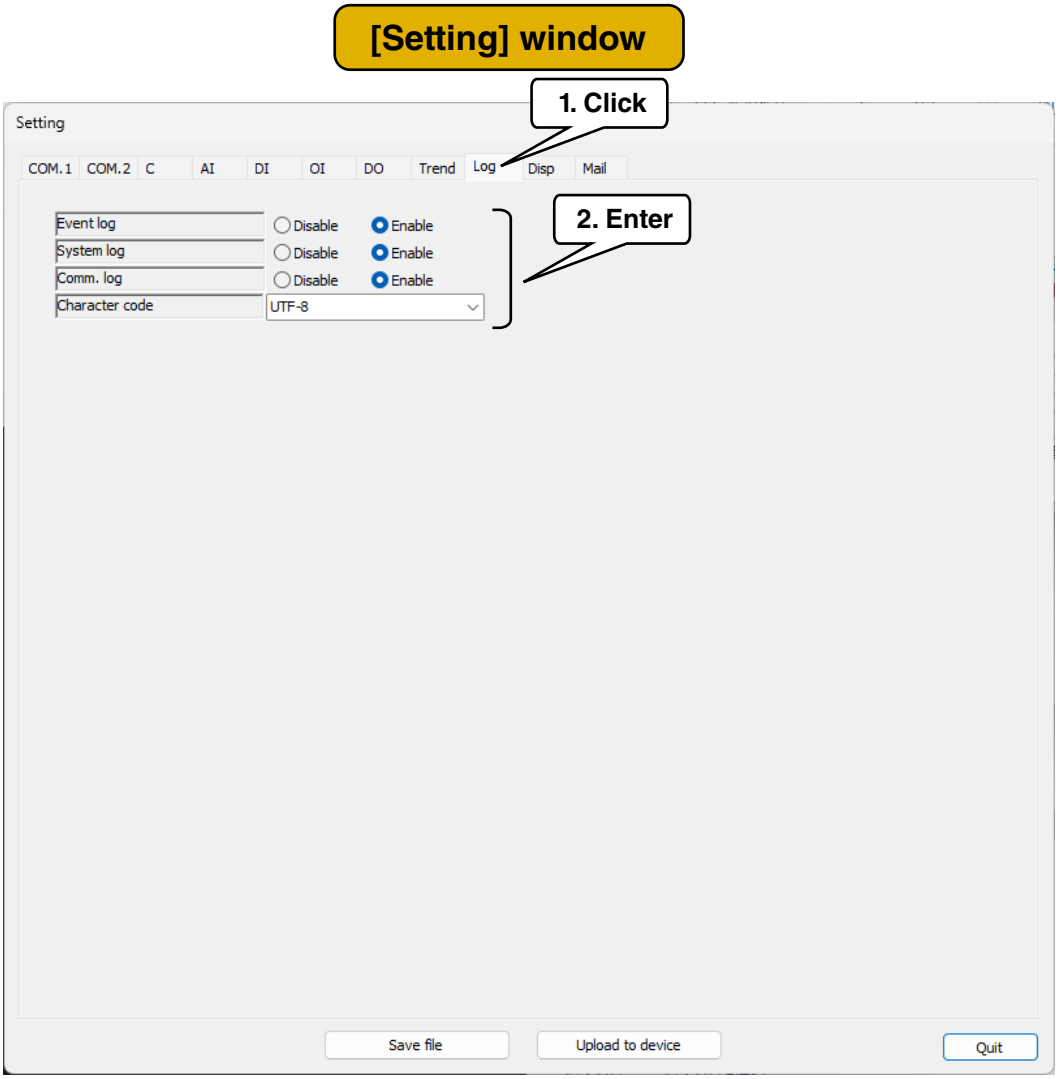


Set parameters according to the table below.

Parameter	Description
Comment No. 1, 2	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

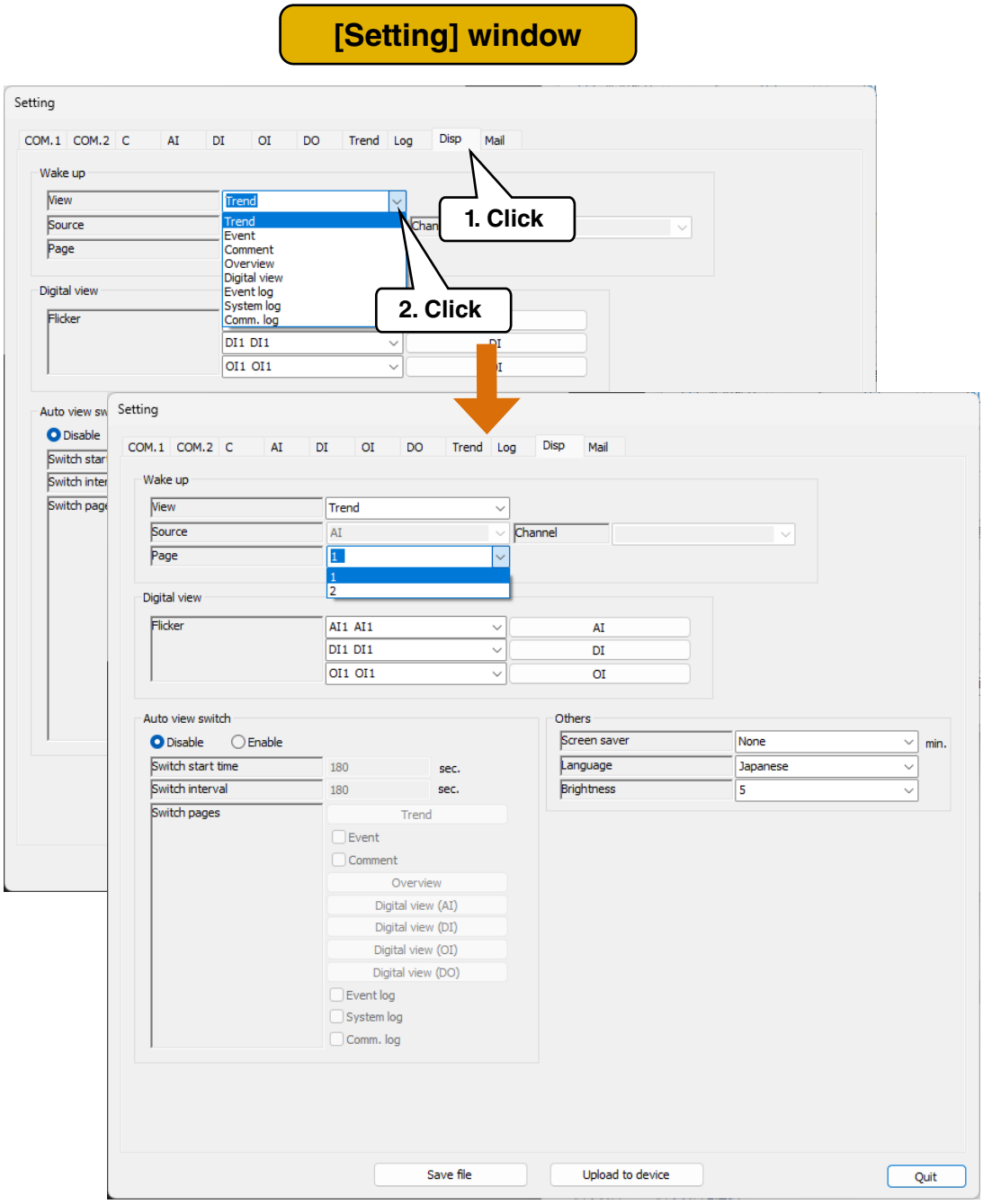
Configure the display setting of VR4896E-G2.

3.7.1 Wake up screen setting

Configure the display setting when the VR4896E-G2 is turned on.

3.7.1.1 Setting the trend screen to the wake up screen

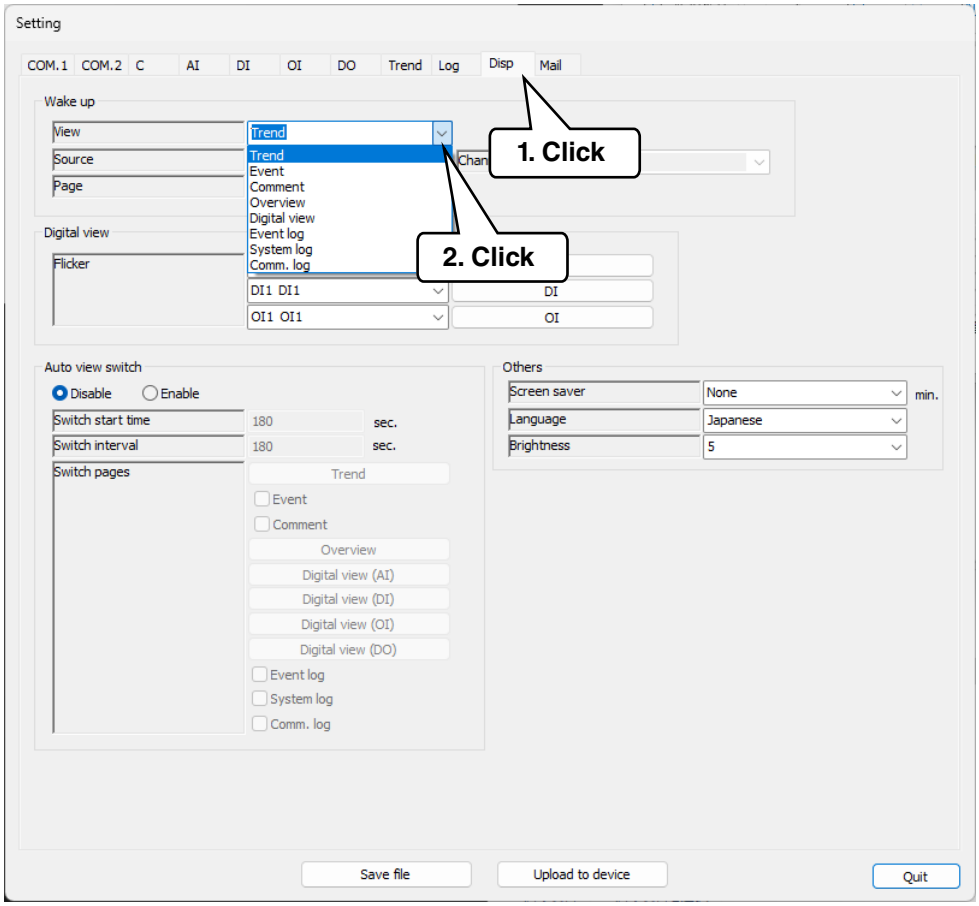
1. Click view drop-down list and select [Trend].
2. Click page drop-down list and select [1] or [2].
3. When selecting page [1], [PEN 1] and [PEN 2] set in pen setting are displayed on the wake up screen.
   When selecting page [2], [PEN 3] and [PEN 4] set in pen setting are displayed on the wake up screen.
   ➔ 3.5.2.1 Pen setting



3.7.1.2 Setting the event screen to the wake up screen

1. Click view drop-down list and select [Event].
2. The summary of the latest 32 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)

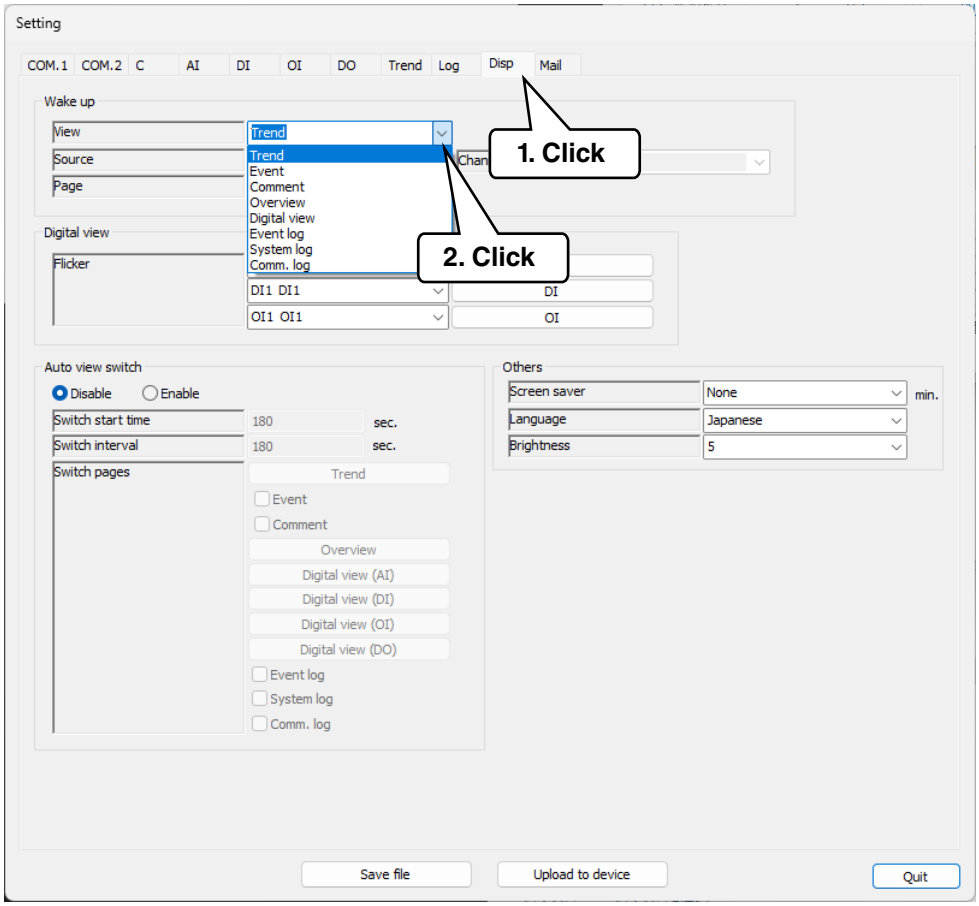
[Setting] window



3.7.1.3 Setting the comment screen to the wake up screen

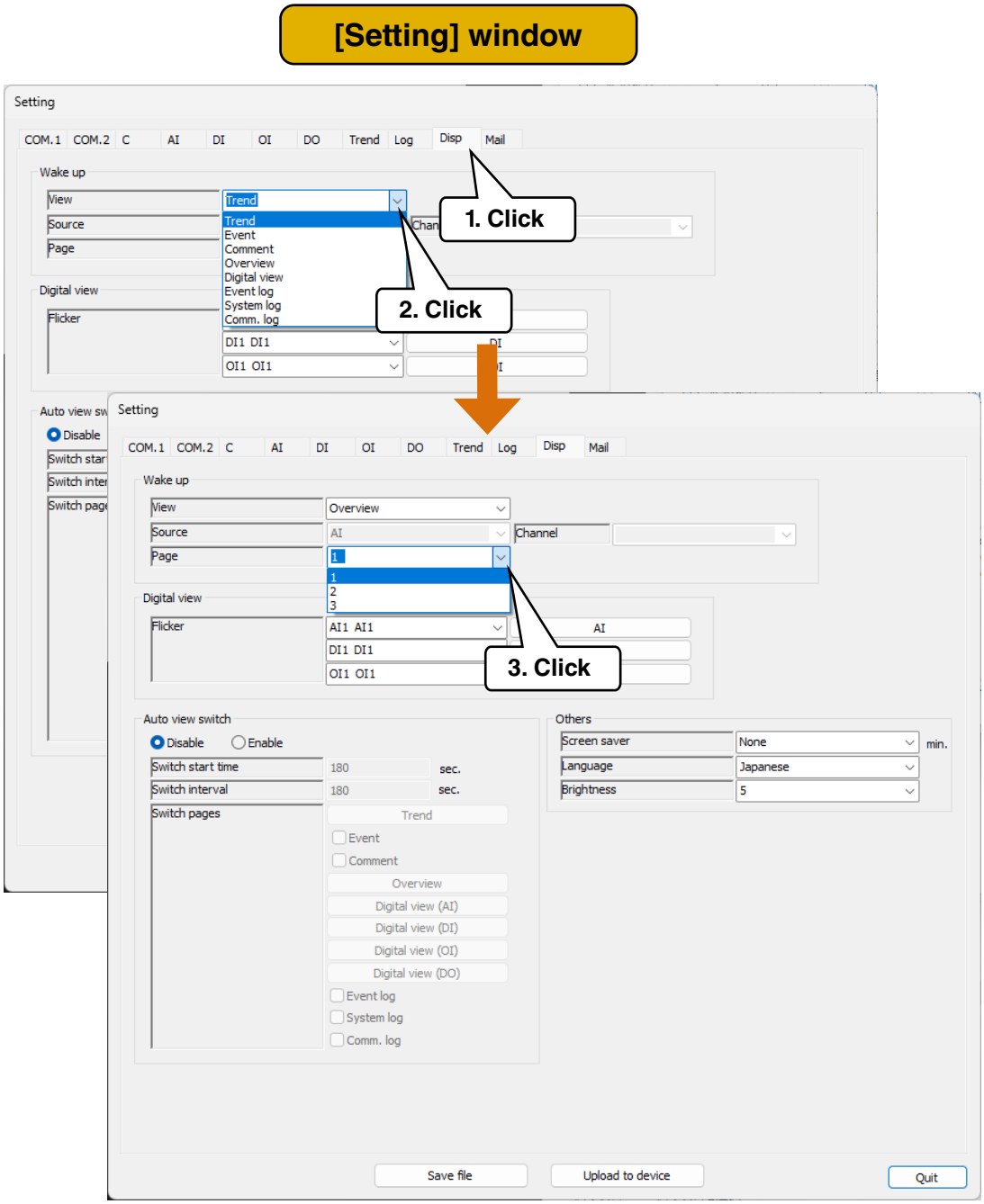
1. Click view drop-down list and select [Comment].
2. The summary of the latest 32 comments is displayed on the wake up screen.

[Setting] window



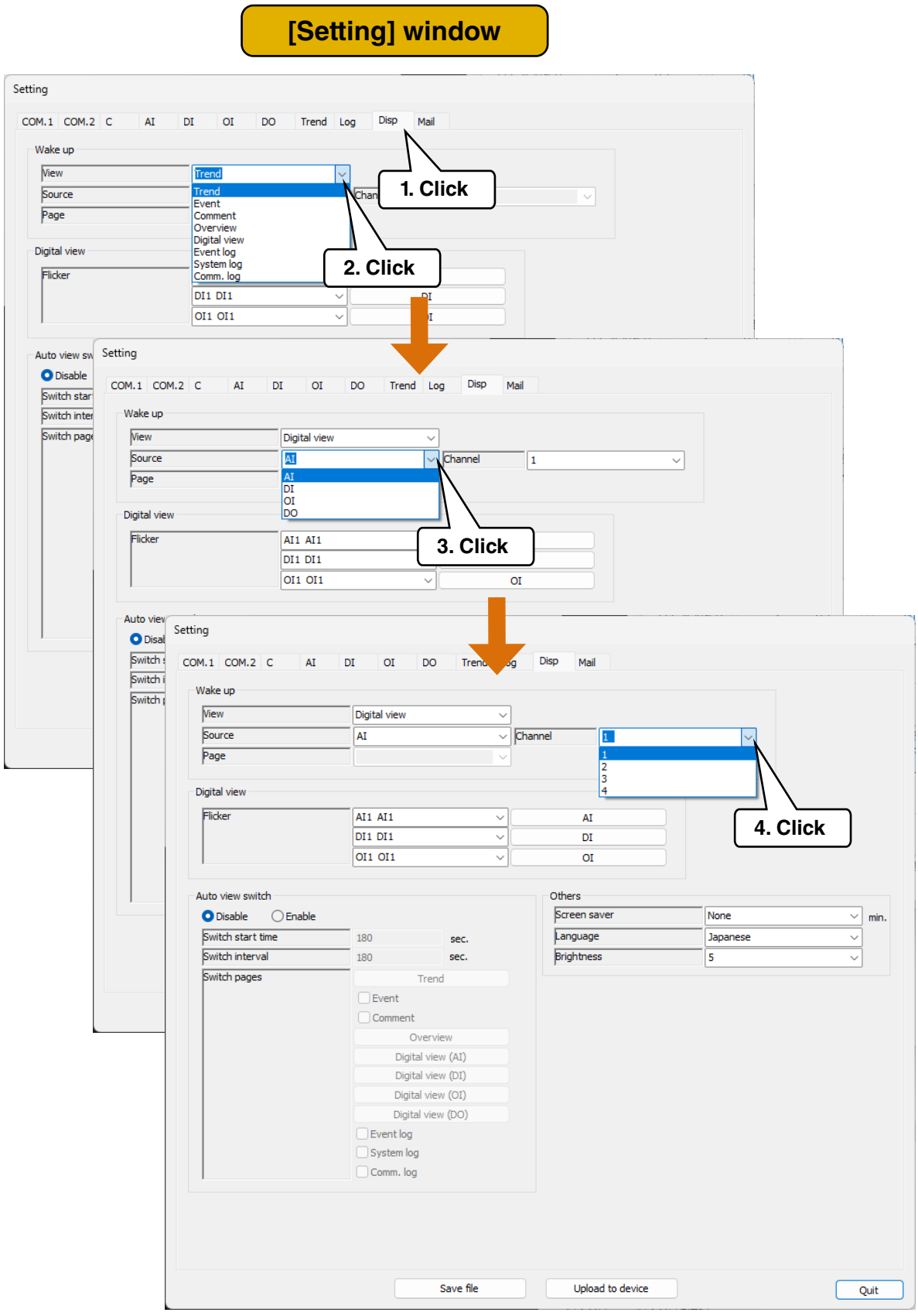
3.7.1.4 Setting the overview screen to the wake up screen

1. Click view drop-down list and select [Overview].
2. Click page drop-down list and select [1], [2] or [3].
3. When selecting page [1], AI1 to AI4 are displayed on the wake up screen.
   When selecting page [2], DI1, DI2, OI1 and OI2 are displayed on the wake up screen.
   When selecting page [3], OI3, OI4, DO1 and DO2 are displayed on the wake up screen.



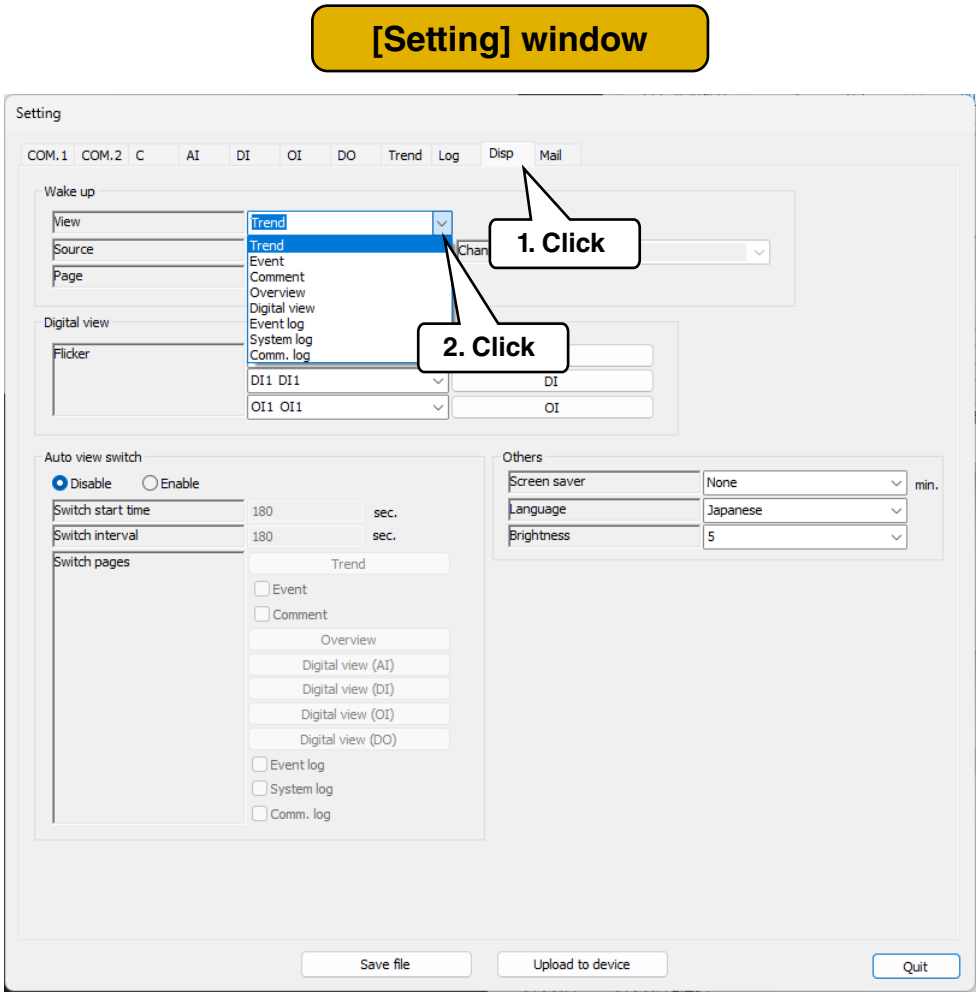
3.7.1.5 Setting the digital view screen to the wake up screen

1. Click view drop-down list and select [Digital view].
2. Click source drop-down list and select [AI], [DI], [OI] or [DO].
3. Click channel drop-down list and select the channel that corresponds to I/O selected in the source.
   The current value of the selected channel is displayed on the wake up screen.



3.7.1.6 Setting the event log screen to the wake up screen

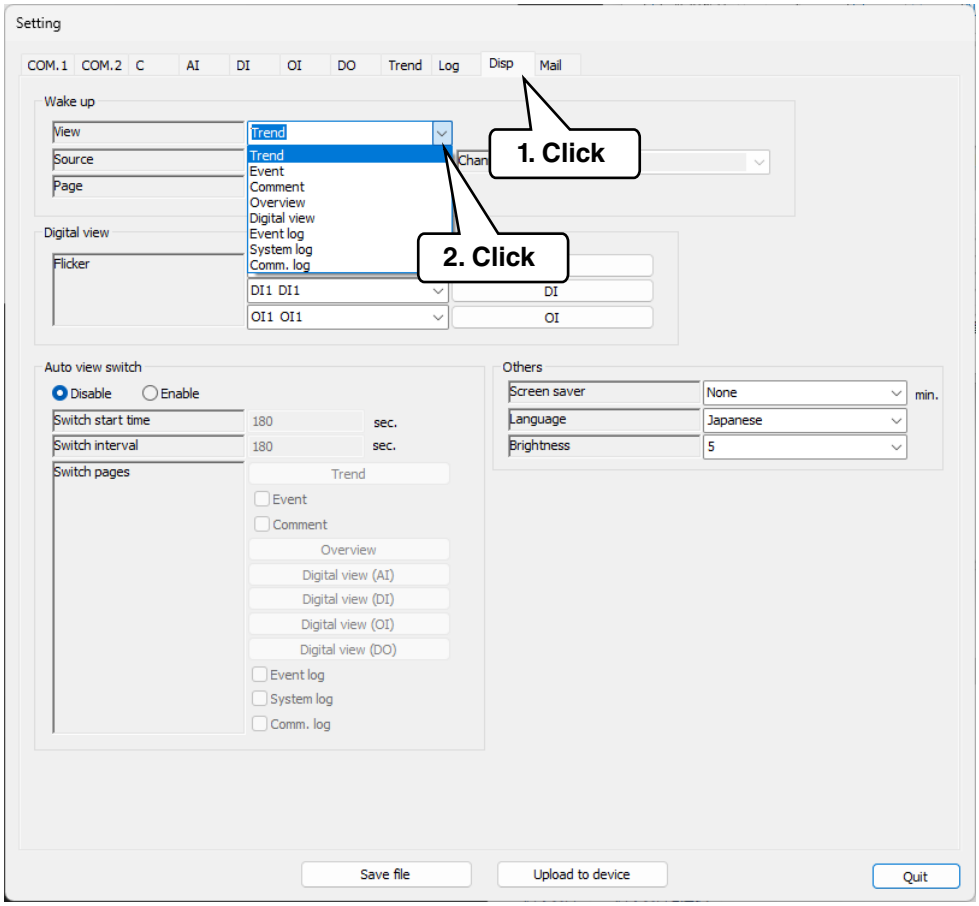
1. Click view drop-down list and select [Event log].
2. The latest 32 event logs are displayed on the wake up screen.



3.7.1.7 Setting the system log screen to the wake up screen

1. Click view drop-down list and select [System log].
2. The latest 32 system logs are displayed on the wake up screen.

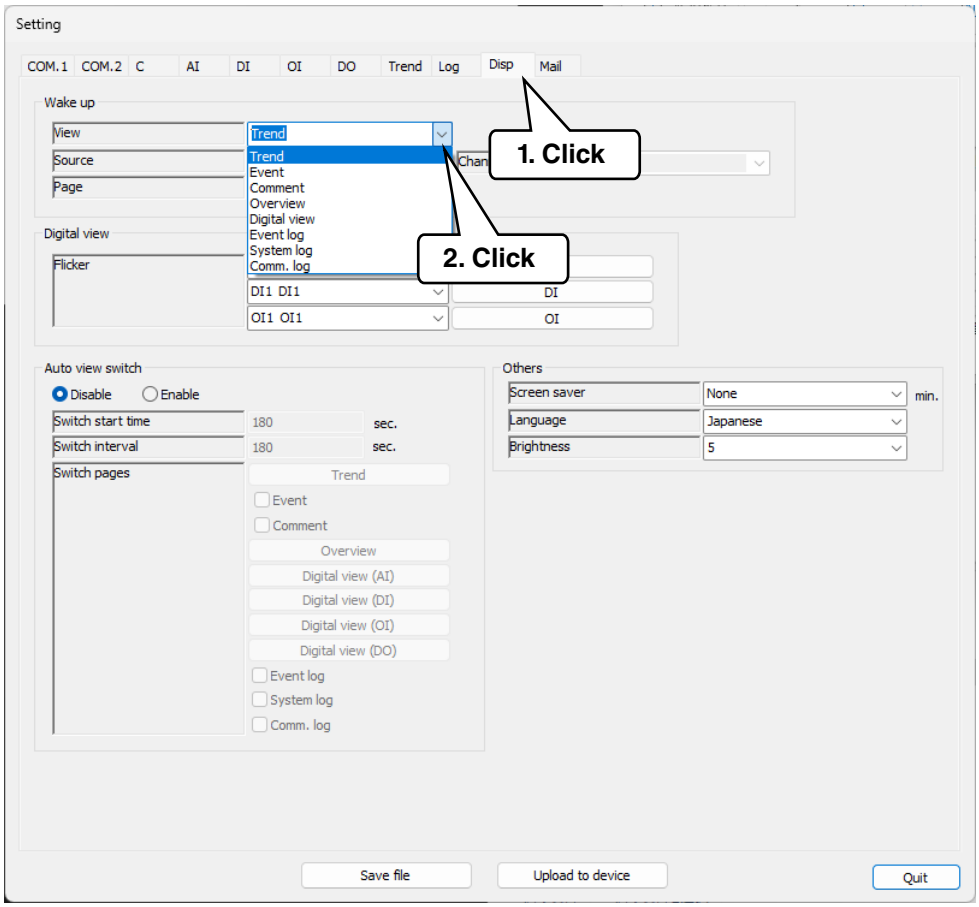
[Setting] window



3.7.1.8 Setting the communication log screen to the wake up screen

1. Click view drop-down list and select [Comm. log].
2. The latest 32 communication logs are displayed on the wake up screen.

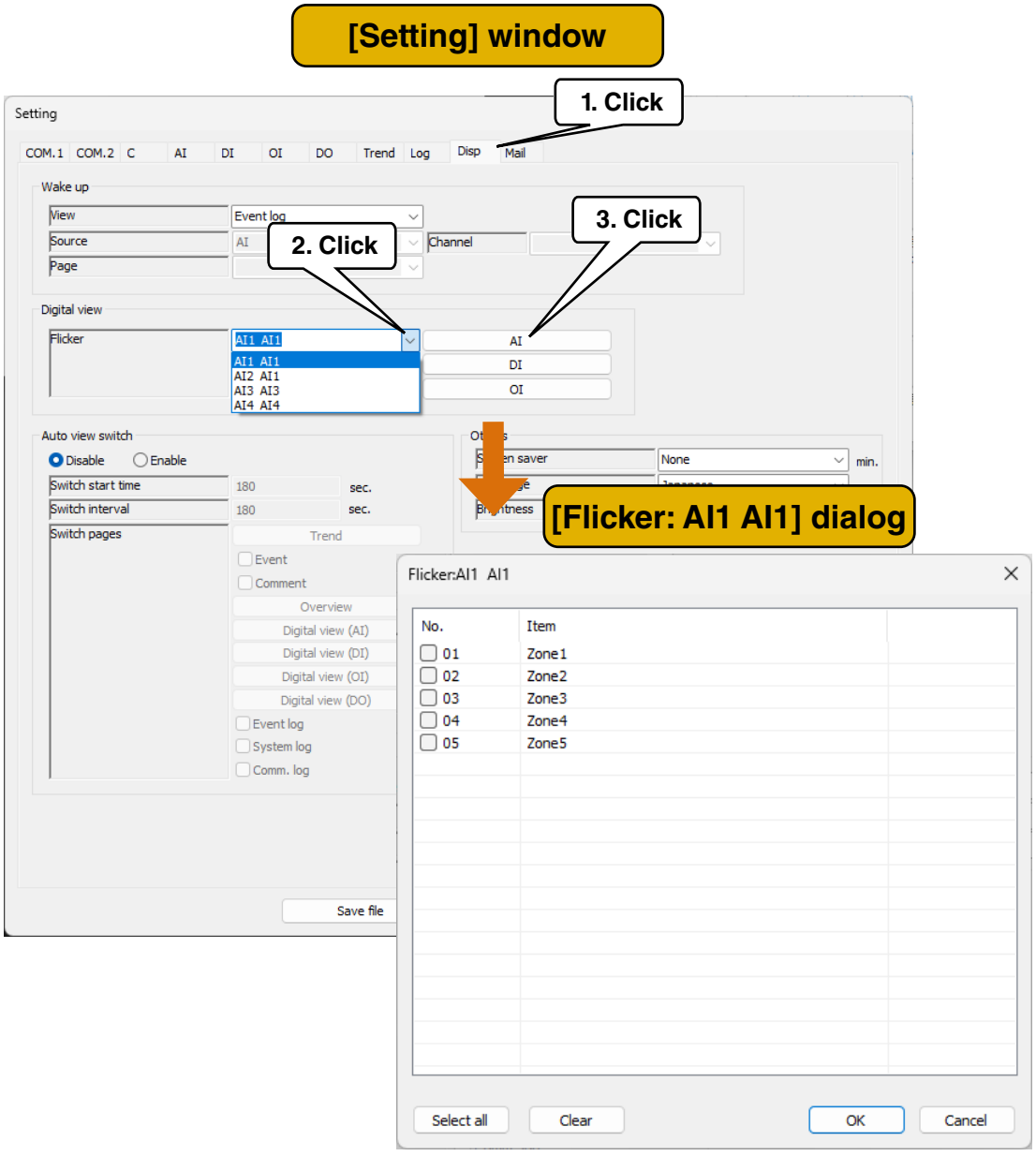
[Setting] window



3.7.2 Digital view setting

Set the parameters to be displayed in flicker mode when the VR4896E-G2 screen is in digital view.
For analog input (AI), follow the procedure below.

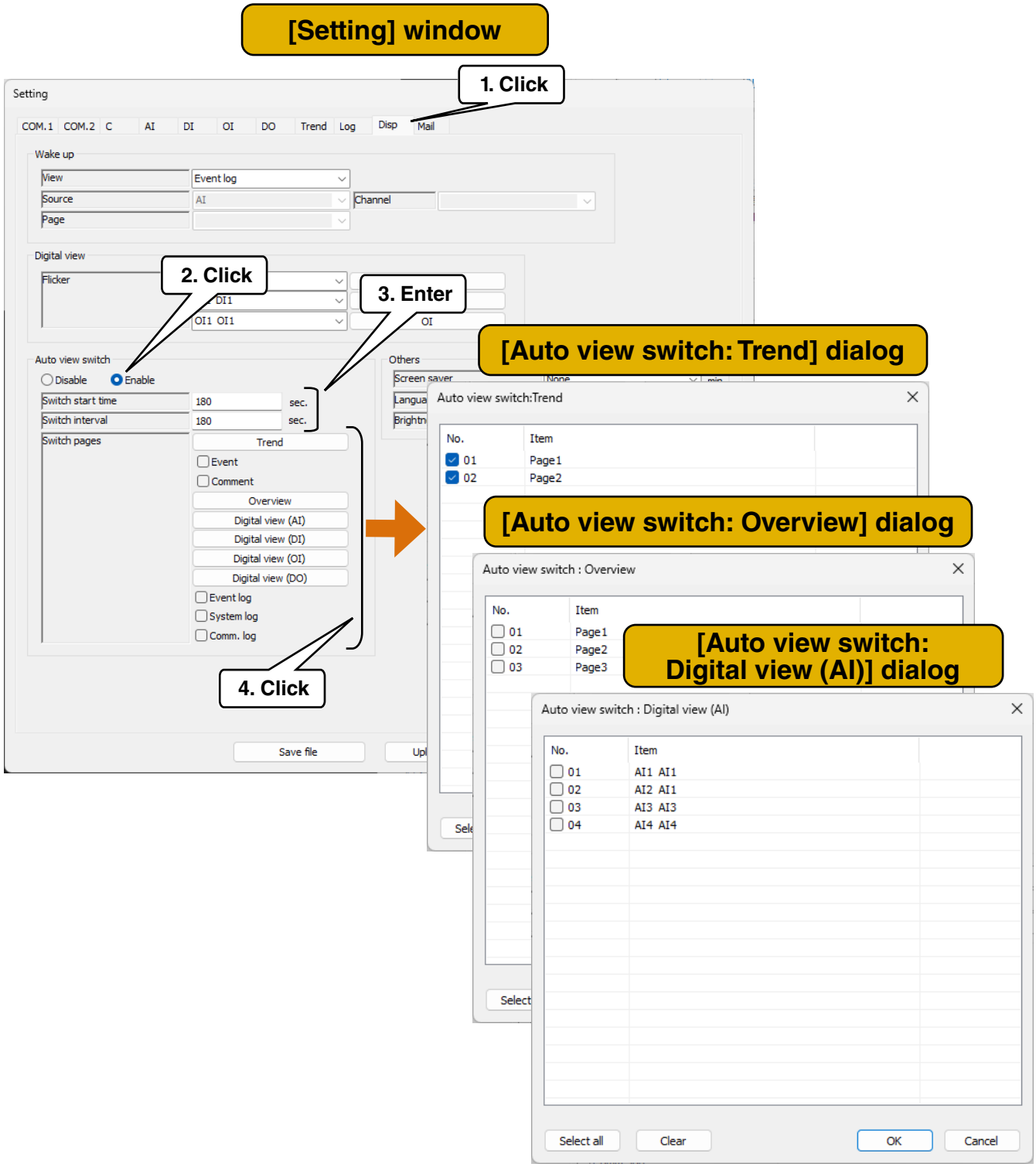
1. Click the flicker drop-down list and select the channel to be set.
2. Click [AI] button to display [Flicker: AI1 AI1] dialog *1.
   When the analog input value is within the selected zone, the display will be in flicker mode. When it goes out of the zone, the display returns to normal mode.
   Note 1) The dialog name is [Ain name]. (n: channel number configured in each channel setting.)
3. Follow the same procedure for discrete input (DI) and operational input (OI).



3.7.3 Auto view switch setting

Configure the auto view switch setting for the VR4896E-G2.

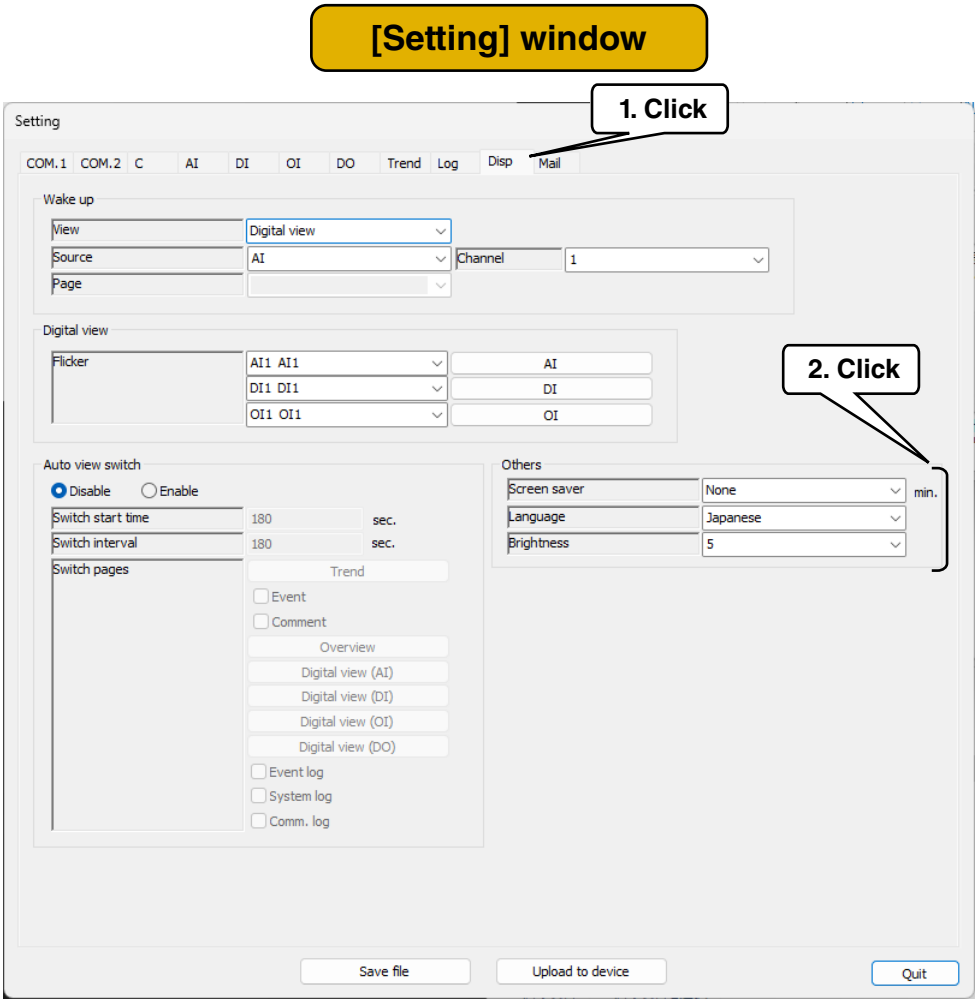
1. When enabling auto view switch, click [Enable] in [Auto view switch].
2. Set parameters according to the table on the next page.
3. Configure the settings for the screen to be targeted for auto view switch.
   Select checkboxes of the parameter to be targeted for auto view switch.
   Click [Trend], [Overview], [Digital view (AI)], [Digital view (DI)], [Digital view (OI)] or [Digital view (DO)] to display the corresponding dialog.



Parameter	Description
Switch start time	Set the switch start time. If the VR4896E-G2 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.).

3.7.4 Other settings

Configure the screen, screen saver, language and brightness of the VR4896E-G2.
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 VR4896E-G2 is not operated for the set time. Set it disable or within 1 to 10 minutes.
Language	Set the language displayed on the VR4896E-G2 Select English or Japanese.
Brightness	Set the brightness of the LCD panel of VR4896E-G2. Set within 1 (dark) to 5 (bright).

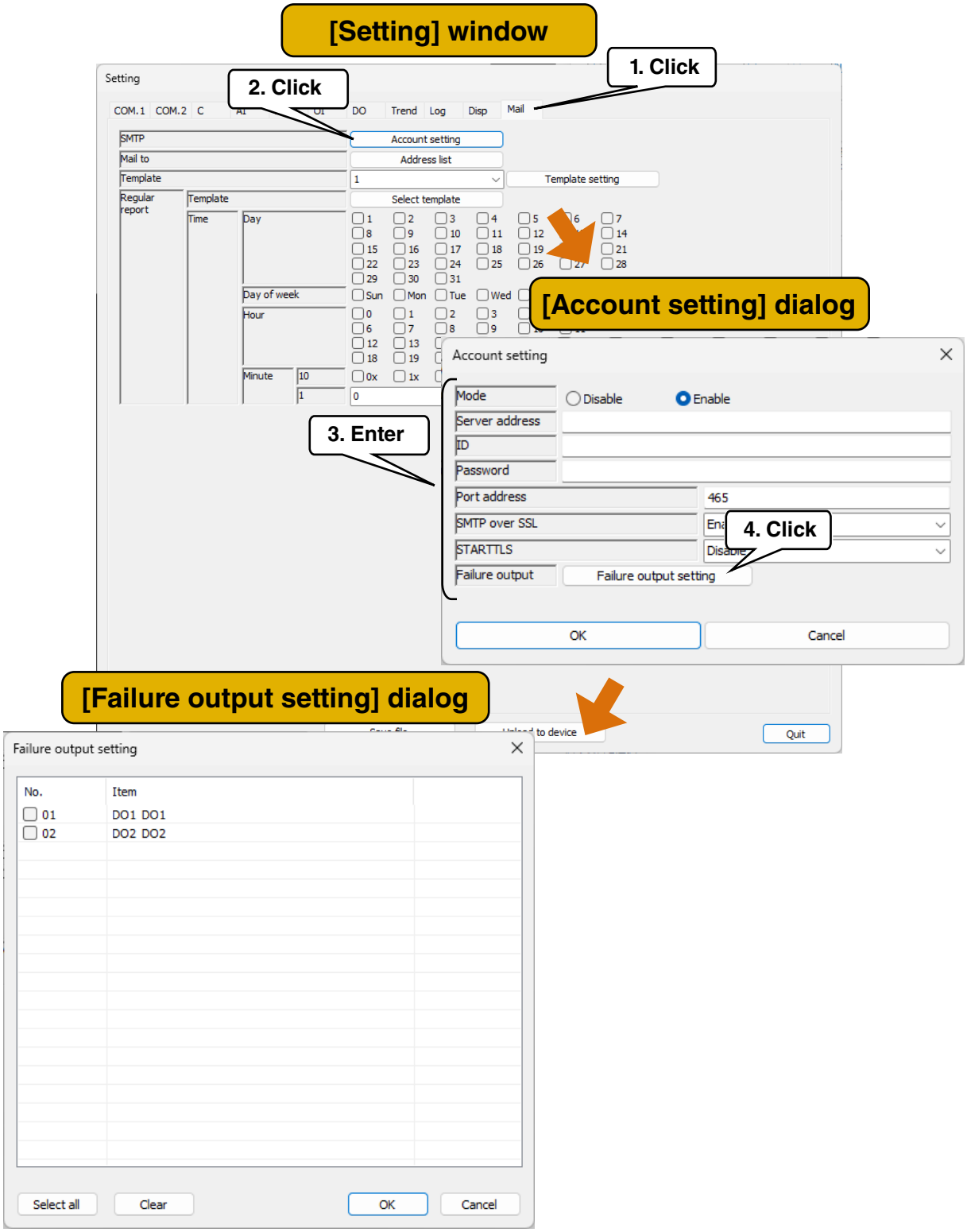
3.8 E-mail reporting setting

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.



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].

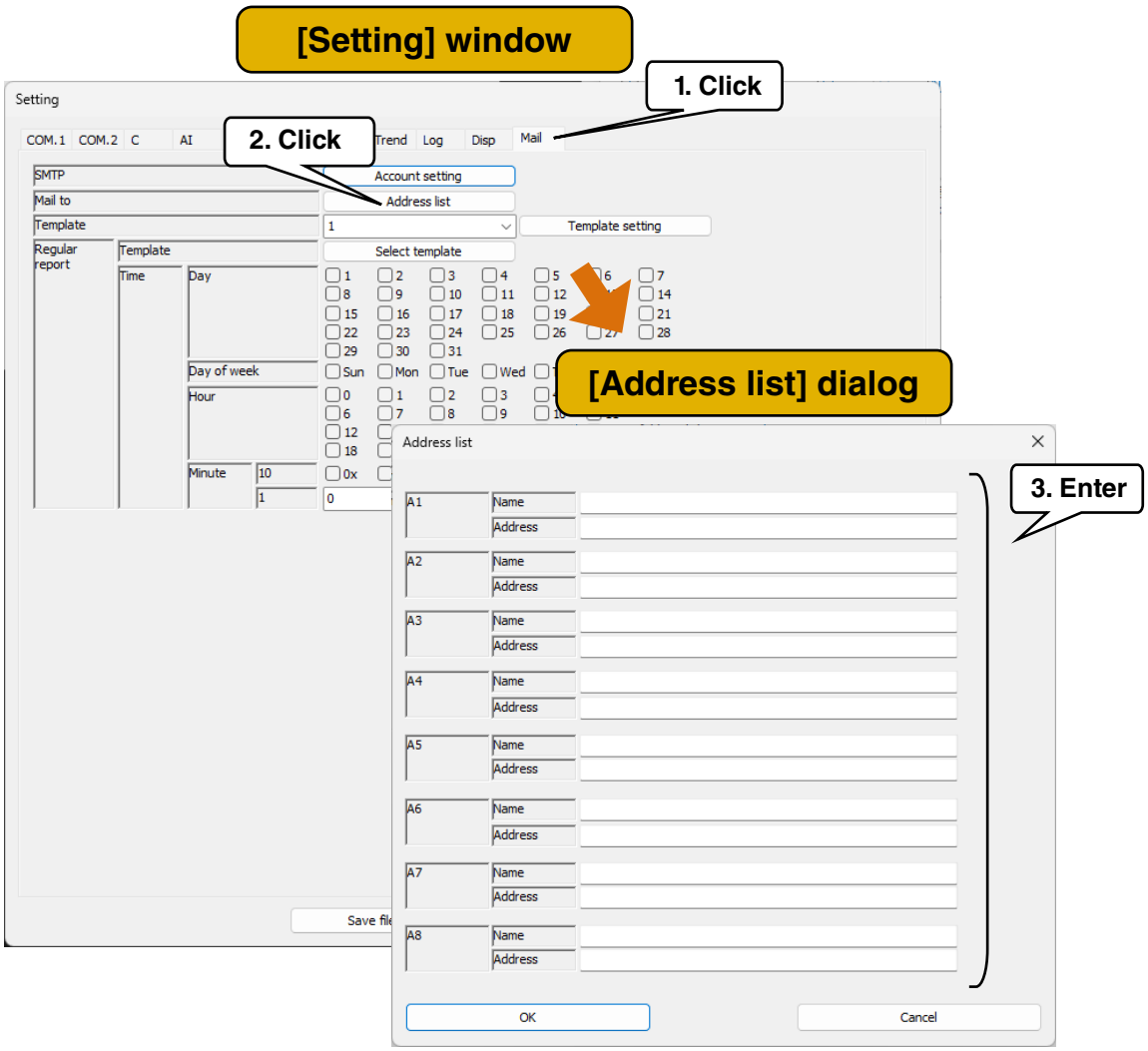
CAUTION

- Mail receiving is not available for VR4896E-G2.
- 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.

3.8.2 Recipient address setting

Configure the e-mail recipient address. Up to 8 addresses A1 to A8 can be set.

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

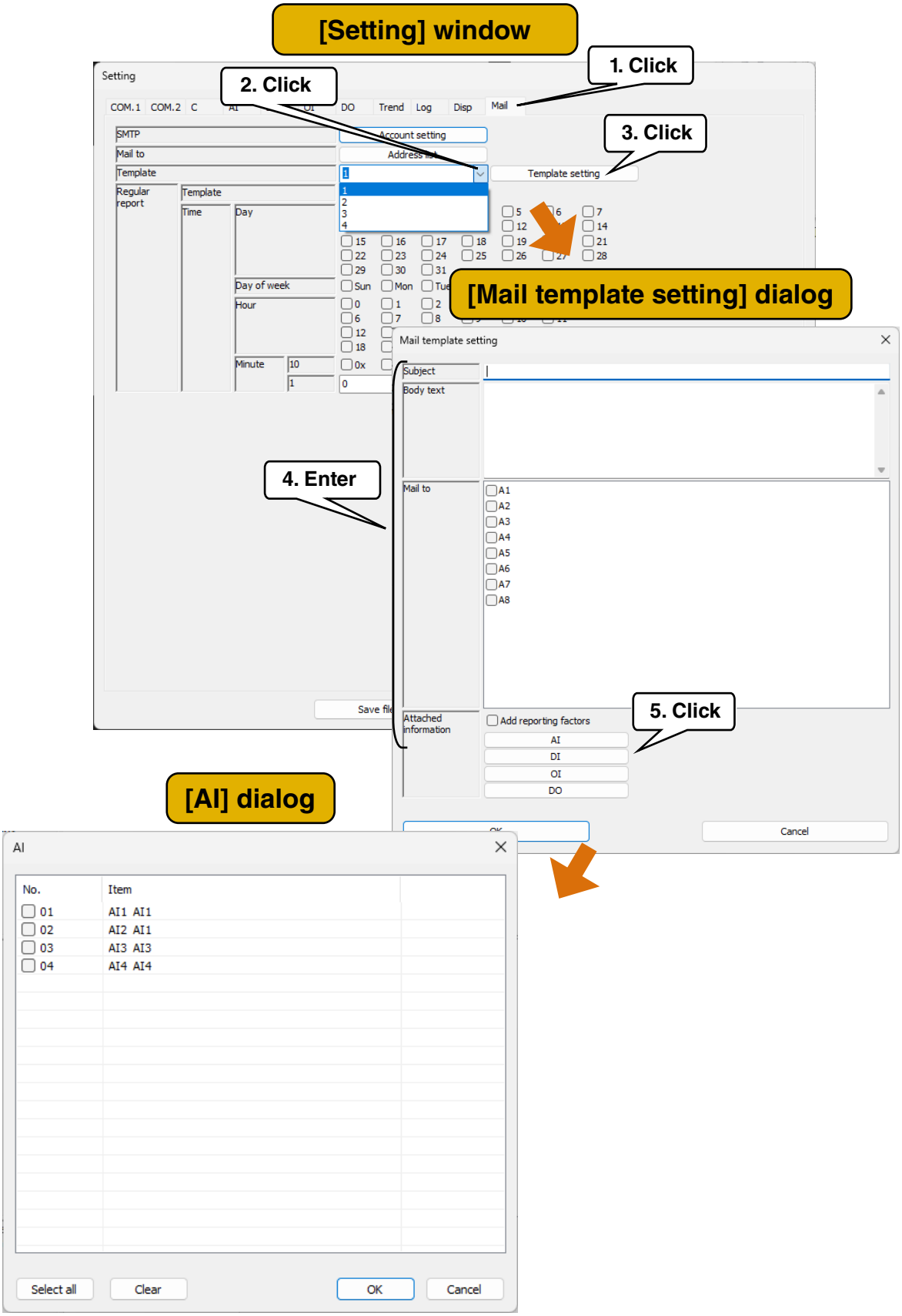


Parameter	Description
Name	Set within 16 characters.
Address	Set the e-mail recipient address within 64 characters.

3.8.3 Template setting

Configure the mail template setting. Up to 4 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.

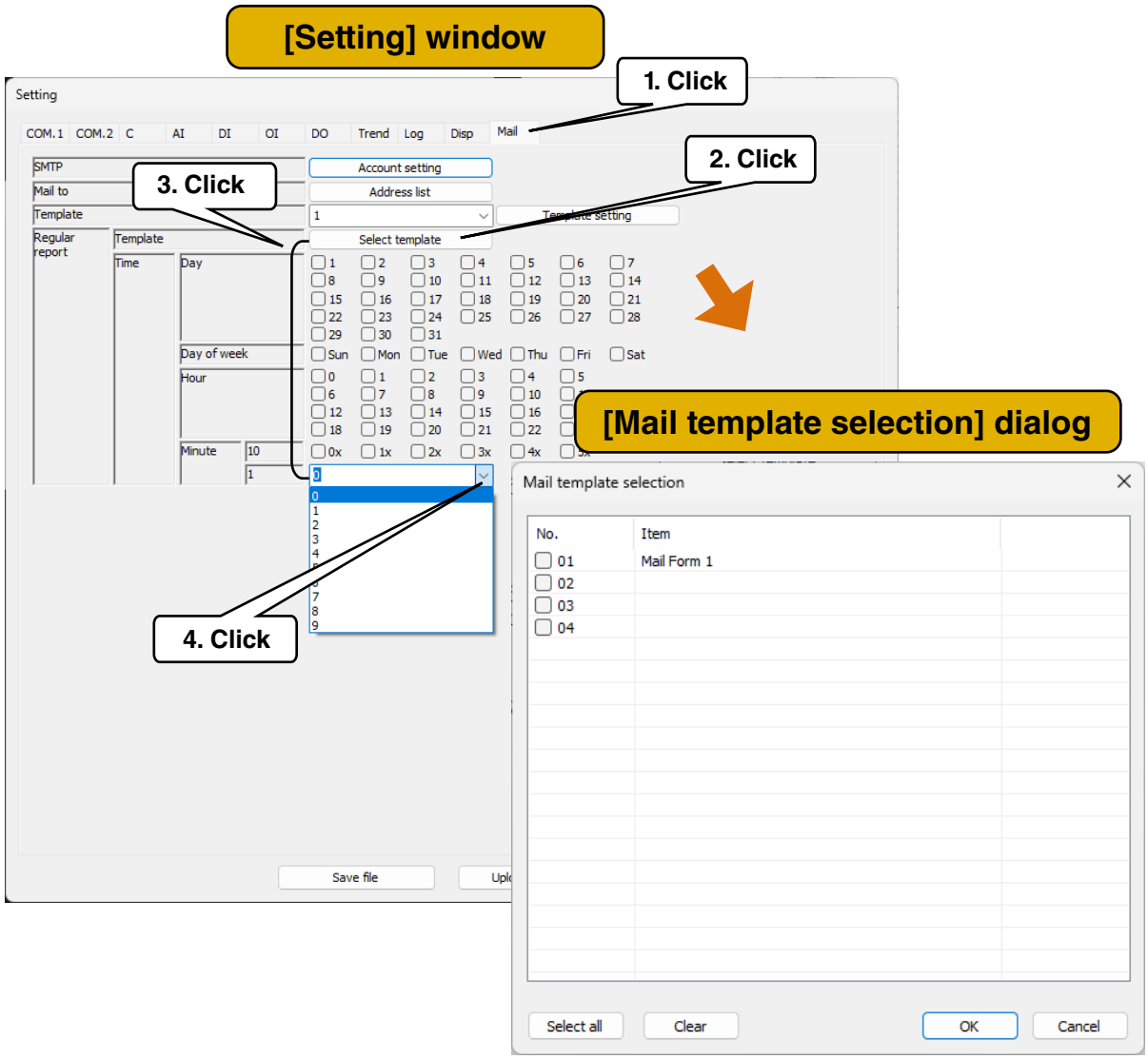
Parameter	Description
Subject	Set the subject of e-mail within 32 characters.
Body text	Set the body text of e-mail within 128 characters.
Mail to	Select the checkbox of the addresses specified for e-mail recipient.
Attached information Add reporting factors	Select the checkbox when adding reporting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


[Setting] window
1. Click
2. Click
3. Click
4. Enter
5. Click
[Mail template setting] dialog
[AI] dialog
Setting
COM.1
COM.2
DO
Trend
Log
Disp
Mail
SMTP
Account setting
Mail to
Template
Template setting
Regular report
Time
Day
Day of week
Hour
Minute
Mail template setting
Subject
Body text
Mail to
A1
A2
A3
A4
A5
A6
A7
A8
Attached information
Add reporting factors
AI
DI
OI
DO
Cancel
AI
No.
Item
01
AI1 AI1
02
AI2 AI1
03
AI3 AI3
04
AI4 AI4
Select all
Clear
OK
Cancel

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.

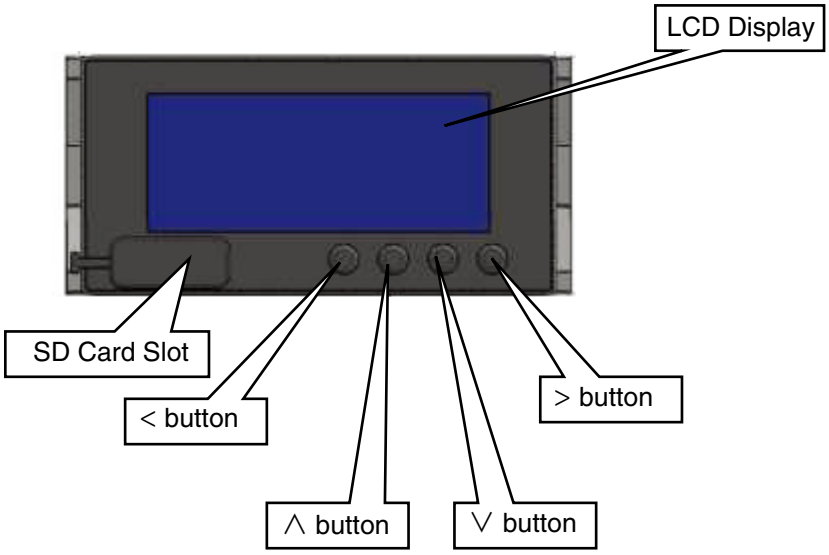


4. VR4896E-G2 operation

This chapter describes the details of the VR4896E-G2 screen and how to operate it.

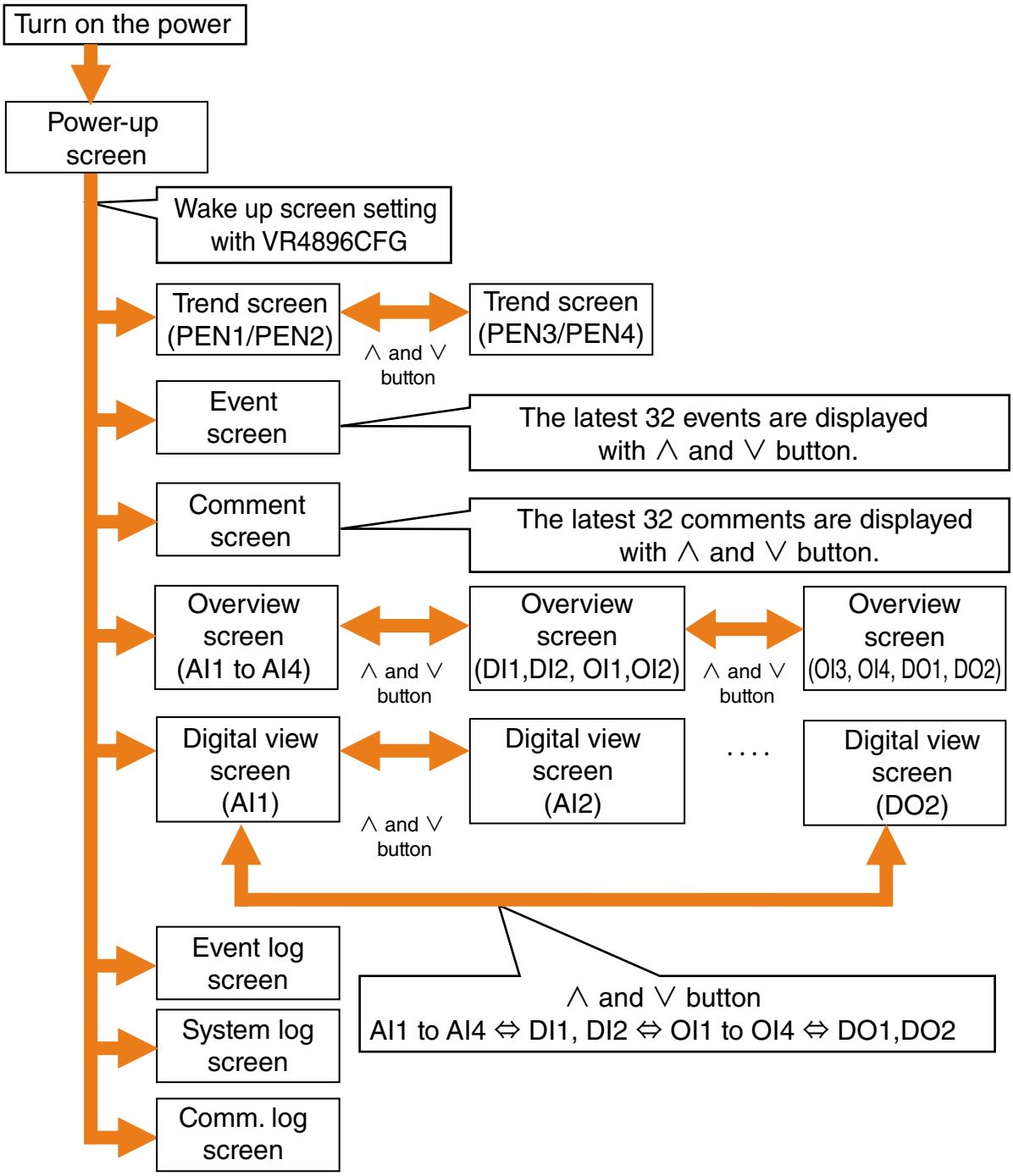
4.1 Component identification

The following illustration shows the component identification of the VR4896E-G2.
Press the arrow buttons to operate the screen.



4.2 Wake up screen

After turning on the power of VR4896E-G2, one of the following is displayed:
Trend screen, event screen, comment screen, overview screen, digital view screen, event log screen, system log screen, or comm. log screen.
The screen to be displayed can be set with the Configurator Software (Model: VR4896CFG).
➔ 3.7.1 Wake up screen setting, 4.3.7.5 Setting



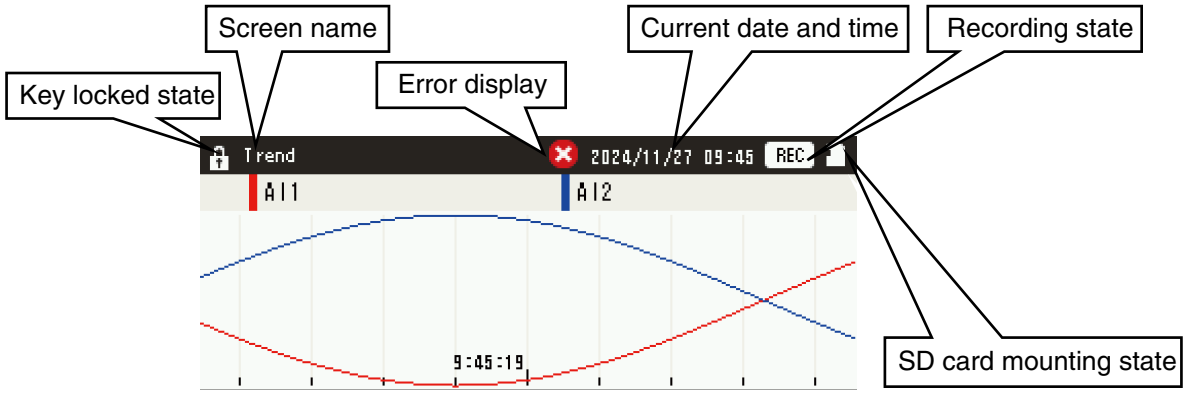
4.2.1 Power-up screen

For the period from turning on the device until the configured wake up screen (3.7.1 Wake up screen setting, 4.3.7.5 Setting) 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 (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

4.2.2 Common area for each screen

The common area for each screen is as follows.



4.2.2.1 Key lock

The icon is displayed when the button operation is disabled.

4.2.2.2 Screen name

The name of the currently displayed screen is displayed.

4.2.2.3 Error display

The icon is displayed when the following errors occur.

- Built-in I/O abnormality
- Modbus/TCP or SLMP communication error
- Recording abnormality
- Log abnormality
- SD card abnormality

4.2.2.4 Current date and time

The date and time recognized by the VR4896E-G2 are displayed.
Refer to 4.3.7.8 Maintenance, 5.1.1 Date/Time for the setting.

4.2.2.5 Recording state

When the normal trend recording starts, the icon REC turns on.
When the trigger recording starts, the icon T-REC turns on.
For the recording display, refer to the table below.

Item	Description	Display
Stop recording	Recording stops.	REC OFF
Normal recording	Recording is in progress.	REC ON
	SD card mounting is released.	REC Blinking
Trigger recording	The device is waiting for trigger.	T-REC OFF
	Recording is in progress.	T-REC ON
	SD card mounting is released.	T-REC Blinking

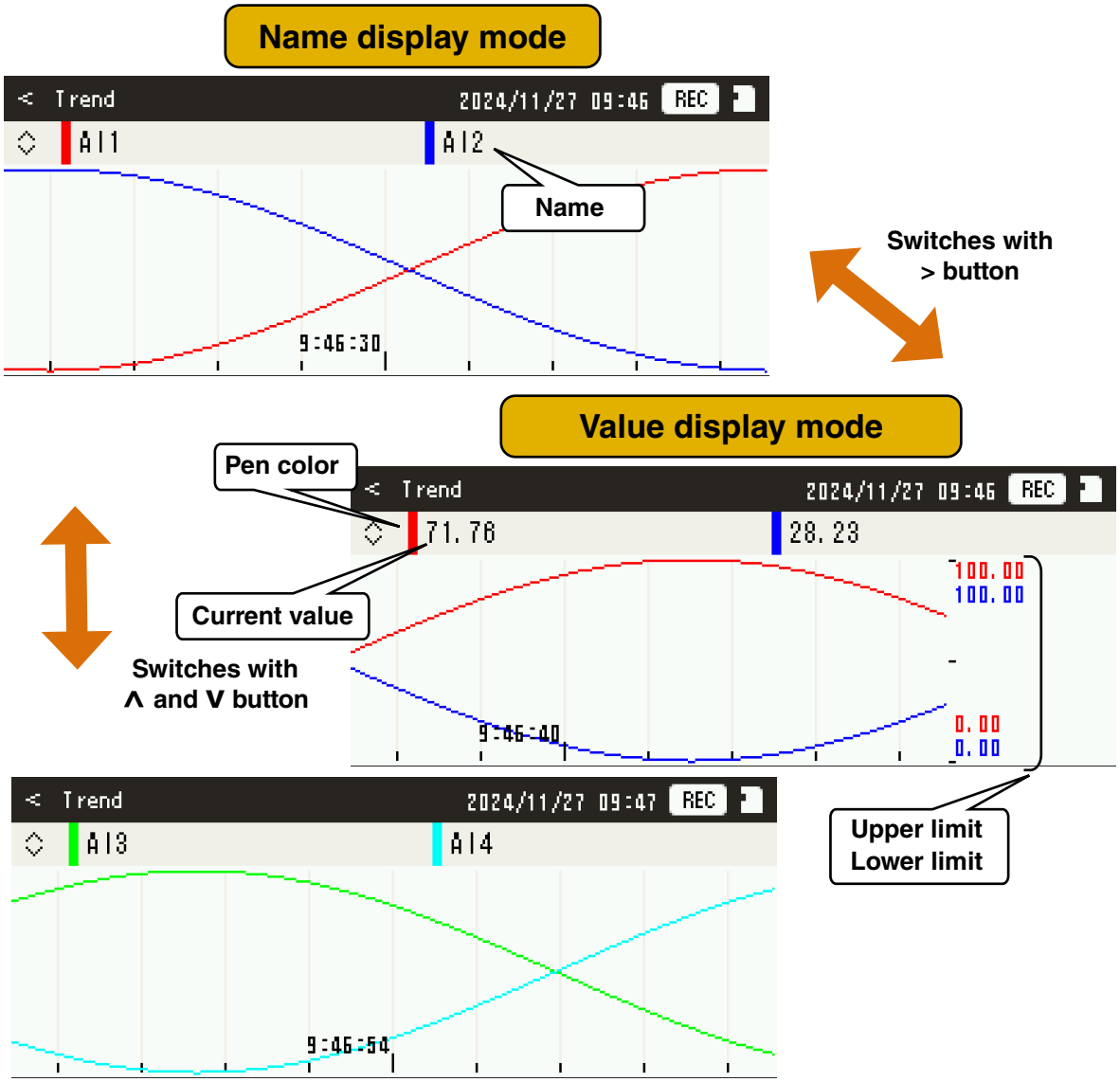
4.2.2.6 SD card mounting state

When the SD card is mounted, the icon turns on.

4.2.3 Trend screen

Follow the procedure below in order to display the trend graph of PEN1 to PEN4 configured in the pen settings.

1. [PEN1] and [PEN2], [PEN3] and [PEN4] configured in the pen settings are displayed. ➔ 3.5.2 Pen setting
2. Press ∧ or ∨ button to switch from the screen of [PEN1] and [PEN2] to the screen of [PEN3] and [PEN4].
   The same is applied in value display mode.
3. Press > button to switch the screen to value display mode.



4. Refer to the table below for each displayed item.

Item	Description	Reference
Name	Displays the name set in the I/O setting.	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)
Pen color	Draws the trend graph 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)
Upper limit Lower limit	Displays the upper and lower limits set in the trend setting and pen setting. Trend graphs are plotted within the range.	3.5.2 Pen setting

4. Refer to the table below for button operation.

Button	Description	Reference
∧, ∨	Switches the display between [PEN1], [PEN2] and [PEN3], [PEN4].	3.5.2 Pen setting
>	Switches between name display mode and value display mode.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	

4.2.4 Event screen

The summary of the latest 32 events configured in the trend recording is displayed.
The latest ones appear on the top.

1. Refer to the table below for each displayed item.

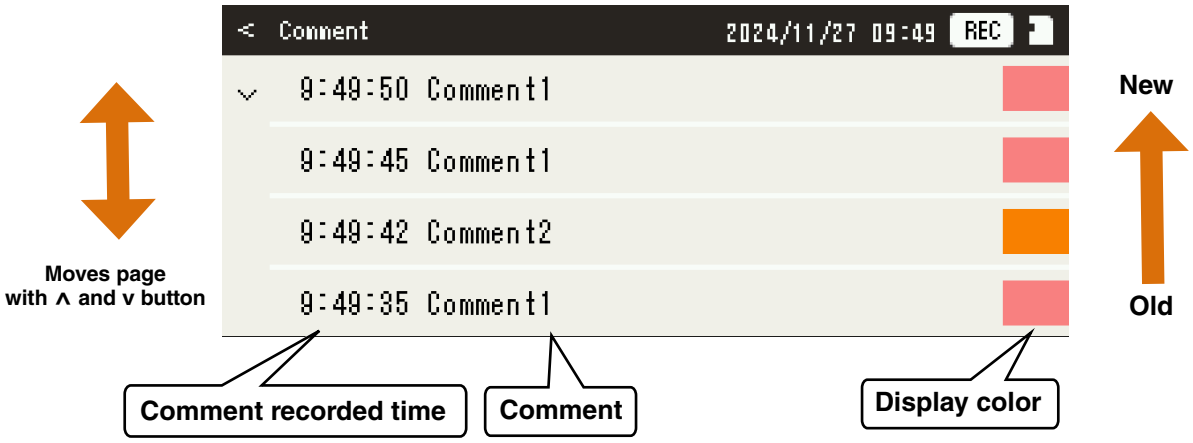
Item	Description	Reference
Event occurrence time	Displays the time when the events occurred.	
Message	Analog Input (AI): Displays the message set in the event setting. Discrete Input (DI): Displays the message set in ON and OFF respectively. Operational input (OI): Displays the message set in the event setting. Discrete Output (DO): Displays the message set in ON and OFF respectively.	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): Displays the color set in zone setting 1 to 5. Discrete Input (DI): Displays the color set in ON and OFF. Operational input (OI): Displays the color set in zone setting 1 to 5. Discrete Output (DO): Displays the color set in ON and OFF.	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)

2. Refer to the table below for button operation.

Button	Description	Reference
∧	Displays new trends.	
v	Displays old trends.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	

4.2.5 Comment screen

The summary of the latest 32 comments recorded in the trend graph is displayed.
The latest ones appear on the top.



1. Refer to the table below for each displayed item.

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

2. Refer to the table below for button operation.

Button	Description	Reference
∧	Displays new comments.	
v	Displays old comments.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	

3. Refer to 4.3.2 Trend selection screen for how to record the comment.

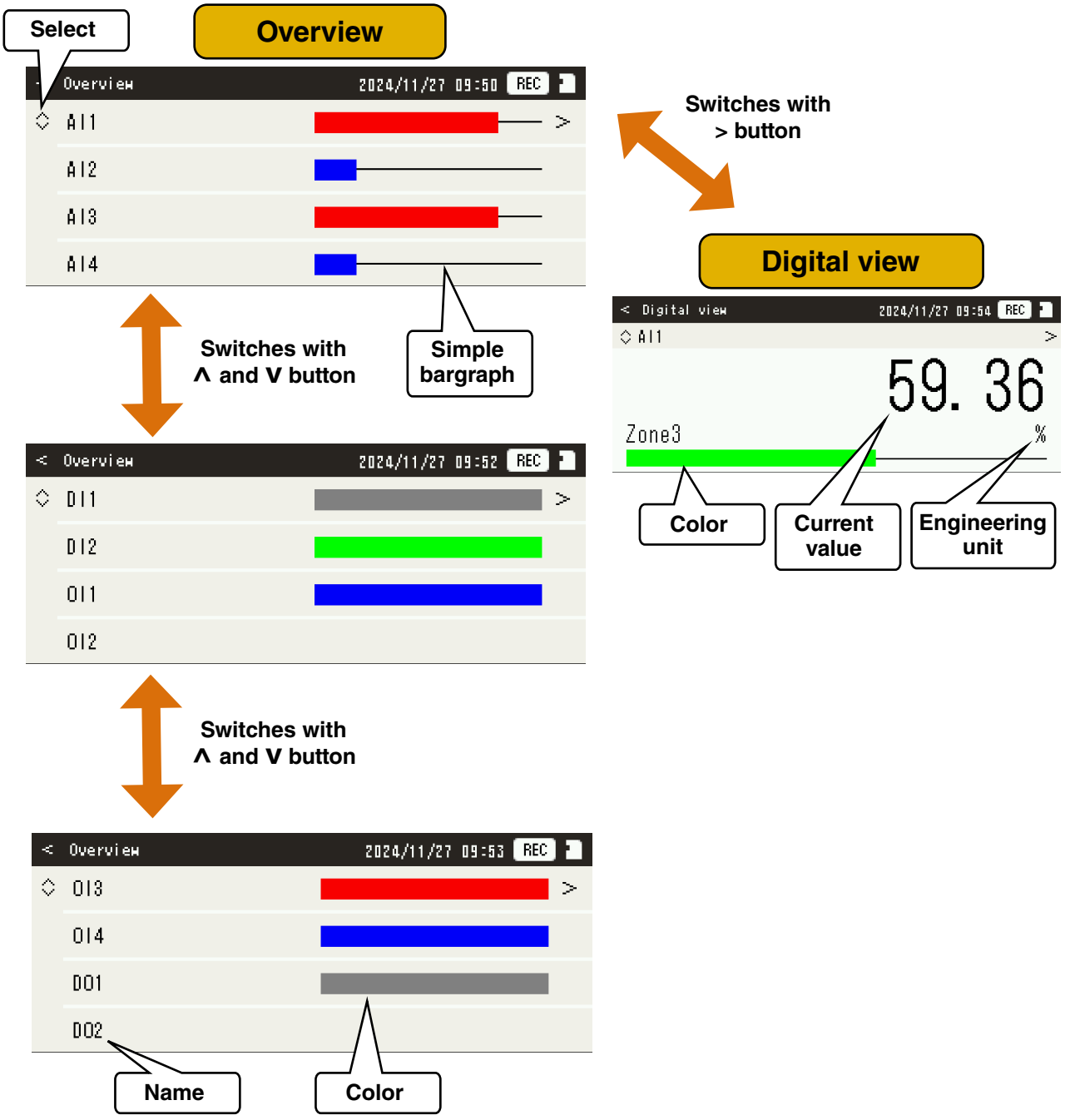
4.2.6 Overview screen

Follow the procedure below in order to display the latest I/O values. 4 channels are displayed per screen.
1. Switch pages with ∧ and V buttons. Each set of 4 channels ("AI1 to AI4", "DI1, DI2, OI1, OI2", and "OI3, OI4, DO1, DO2") is displayed on 1 screen.
2. Refer to the table below for each displayed item.

Item	Description	Reference
Name	Displays the name set in I/O setting. (If the name exceeds 10 characters, it is abbreviated.)	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)
Simple bargraph	Displays the latest I/O values in a simple bargraph.	
Color	The color of simple bargraph is as follows. Analog Input (AI): Displays the color set in zone setting 1 to 5. Discrete Input (DI): Displays the color set in ON and OFF. Operational input (OI): Displays the color set in zone setting 1 to 5. Discrete Output (DO): Displays the color set in ON and OFF.	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)

3. Refer to the table below for button operation.

Button	Description	Reference
^, v	Switches the page.	
>	Switches the selected channel to digital view.	4.2.7 Digital view screen
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	



4.2.7 Digital view screen

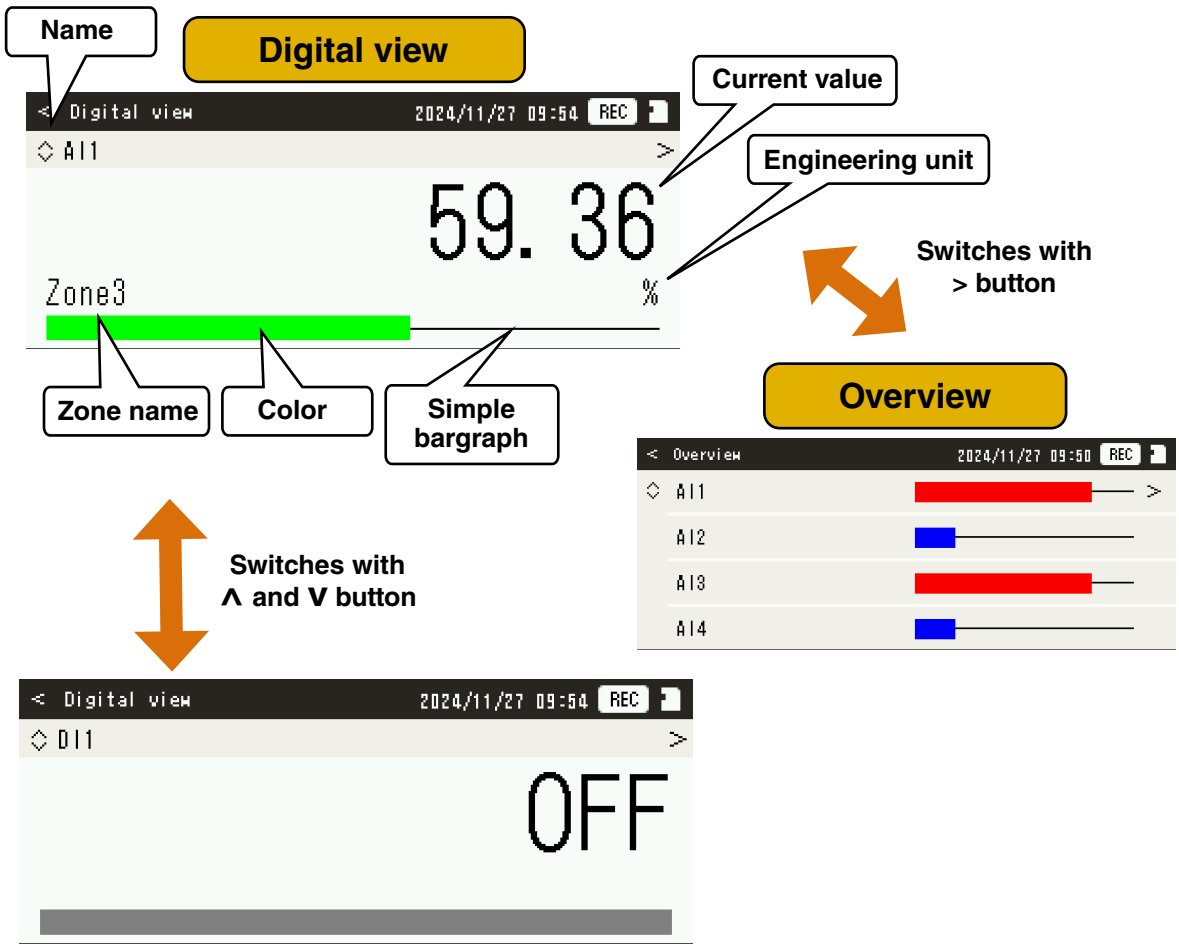
Follow the procedure below in order to display the latest I/O values. 1 channel is displayed per screen.

1. Switch channels one by one with ^ and V buttons.
   The channels switch in the order of AI, DI, OI, DO from the smaller number.
2. Refer to the table below for each displayed item.

Displayed item	Description	Reference
Name	Displays the name set in I/O setting.	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	Displays the engineering unit set in I/O setting (AI, OI).	AI: 3.4.1.4 Basic setting (AI) OI: 3.4.3.1 Basic setting (OI)
Simple bargraph	Displays the latest I/O values in a simple bargraph.	
Zone name	Analog Input (AI): Displays the name set in zone setting 1 to 5. Operational input (OI): Displays the name set in zone setting 1 to 5.	AI: 3.4.1.5 Zone setting (AI) OI: 3.4.3.2 Zone setting (OI)
Color	The color of simple bargraph is as follows. Analog Input (AI): Displays the color set in zone setting 1 to 5. Discrete Input (DI): Displays the color set in ON and OFF. Operational input (OI): Displays the color set in zone setting 1 to 5. Discrete Output (DO): Displays the color set in ON and OFF.	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)

3. Refer to the table below for button operation.

Button	Description	Reference
^, v	Switches the channel.	
>	Switches the selected channel to overview.	4.2.6 Overview screen
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording.)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	



4.2.8 Event log screen

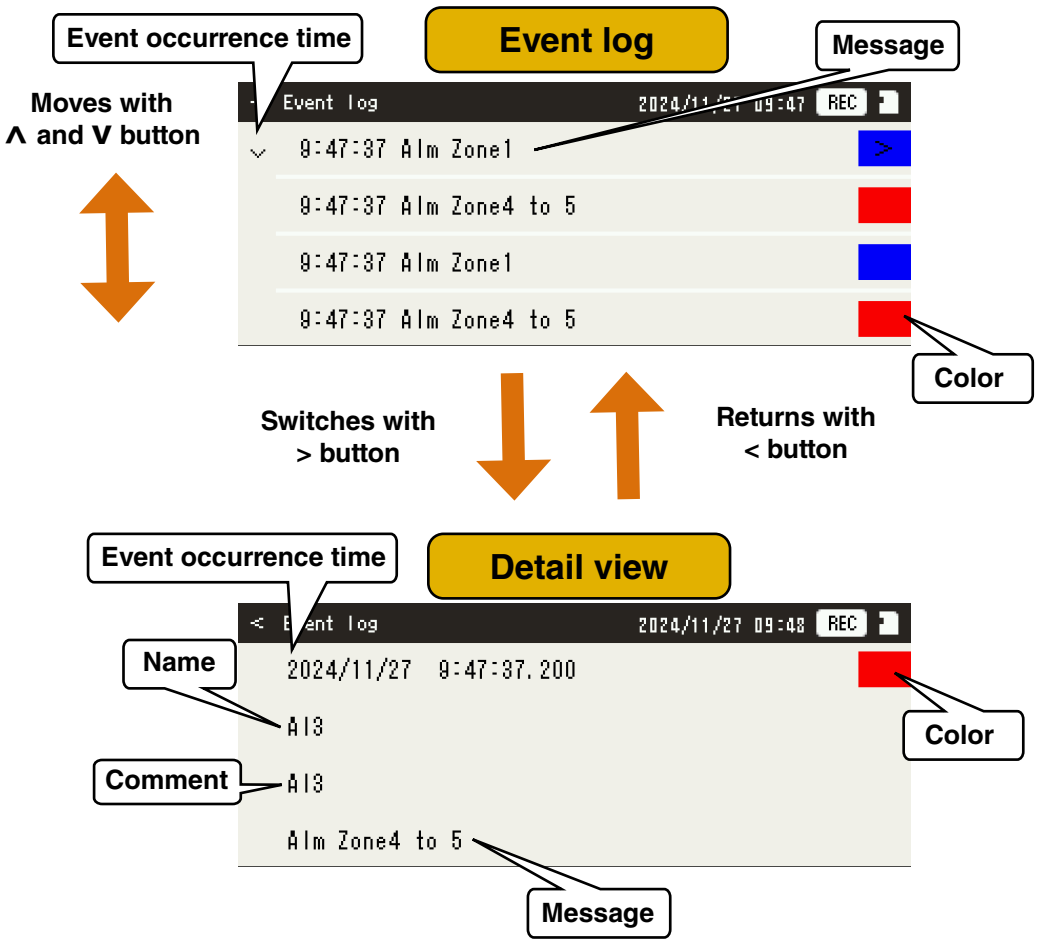
Regardless of whether event log recording is enabled or disabled, the latest 32 event logs are displayed.

1. Press ∧ and ∨ buttons to move the selection. Press > button to display the details of the selected row.
   Press < button to return to the previous screen.
2. Refer to the table below for each displayed item.

Displayed item	Description	Reference
Name Comment	Displays the name and the comment set in I/O setting.	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): Displays the message set in the event setting. Discrete Input (DI): Displays the message set in ON and OFF Operational input (OI): Displays the message set in the event setting. Discrete Output (DO): Displays the message set in ON and OFF.	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): Displays the color set in zone setting 1 to 5. Discrete Input (DI): Displays the color set in ON and OFF. Operational input (OI): Displays the color set in zone setting 1 to 5. Discrete Output (DO): Displays the color set in ON and OFF.	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)

3. Refer to the table below for button operation.

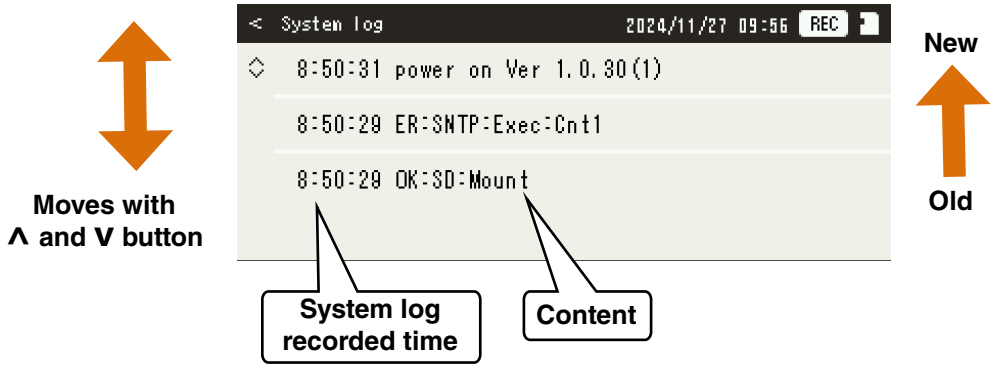
Button	Description	Reference
^	Moves to a new event log.	
v	Moves to an old event log.	
>	Displays the details of the selected event log.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording.)	3.5.1.1 Recording setting
<	Detail view: Returns to the event log display. Event log view: Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	



4.2.9 System log screen

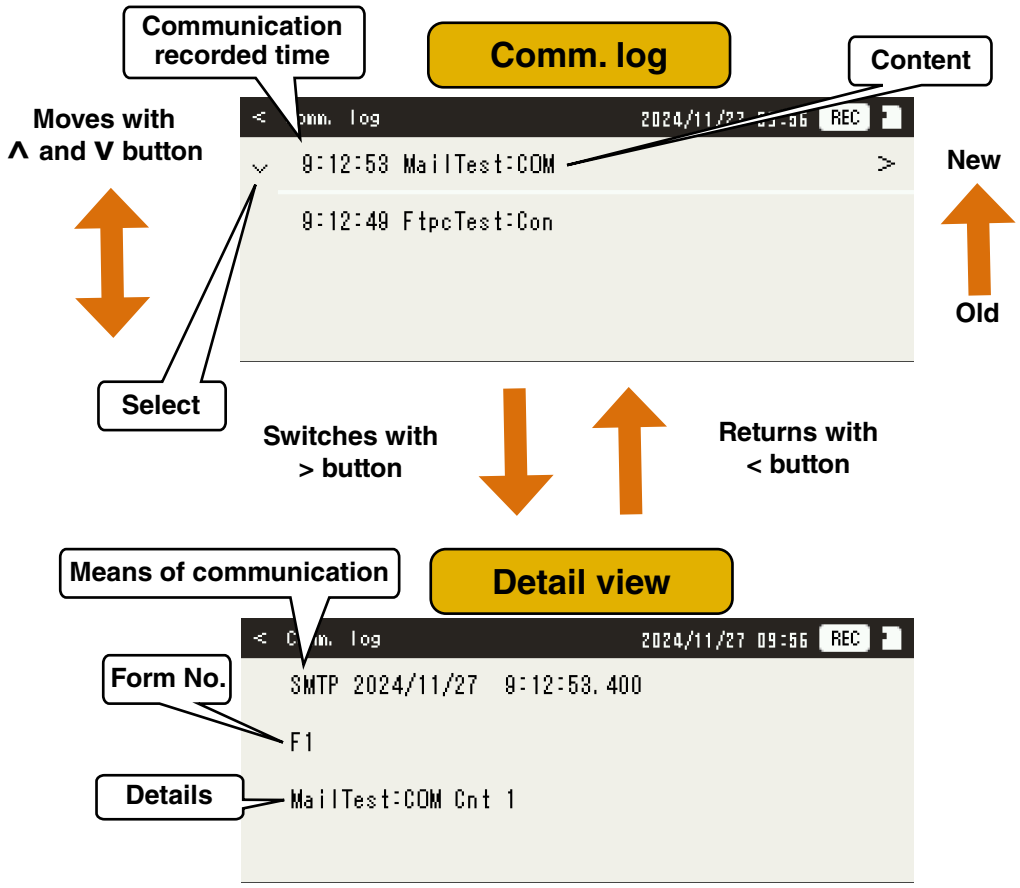
Regardless of whether system log recording is enabled or disabled, the latest 32 system logs are displayed. The latest ones appear on the top. For the log details, refer to 5.1.3 System log.
Refer to the table below for button operation.

Button	Description	Reference
^	Moves to a new system log.	
v	Moves to an old system log.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording.)	3.5.1.1 Recording setting
<	Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	



4.2.10 Communication log screen

Regardless of whether communication log recording is enabled or disabled, the latest 32 logs about SNTP, e-mail reporting, success or failure of FTP client are displayed.
For the log details, refer to 5.1.4 Communication log.

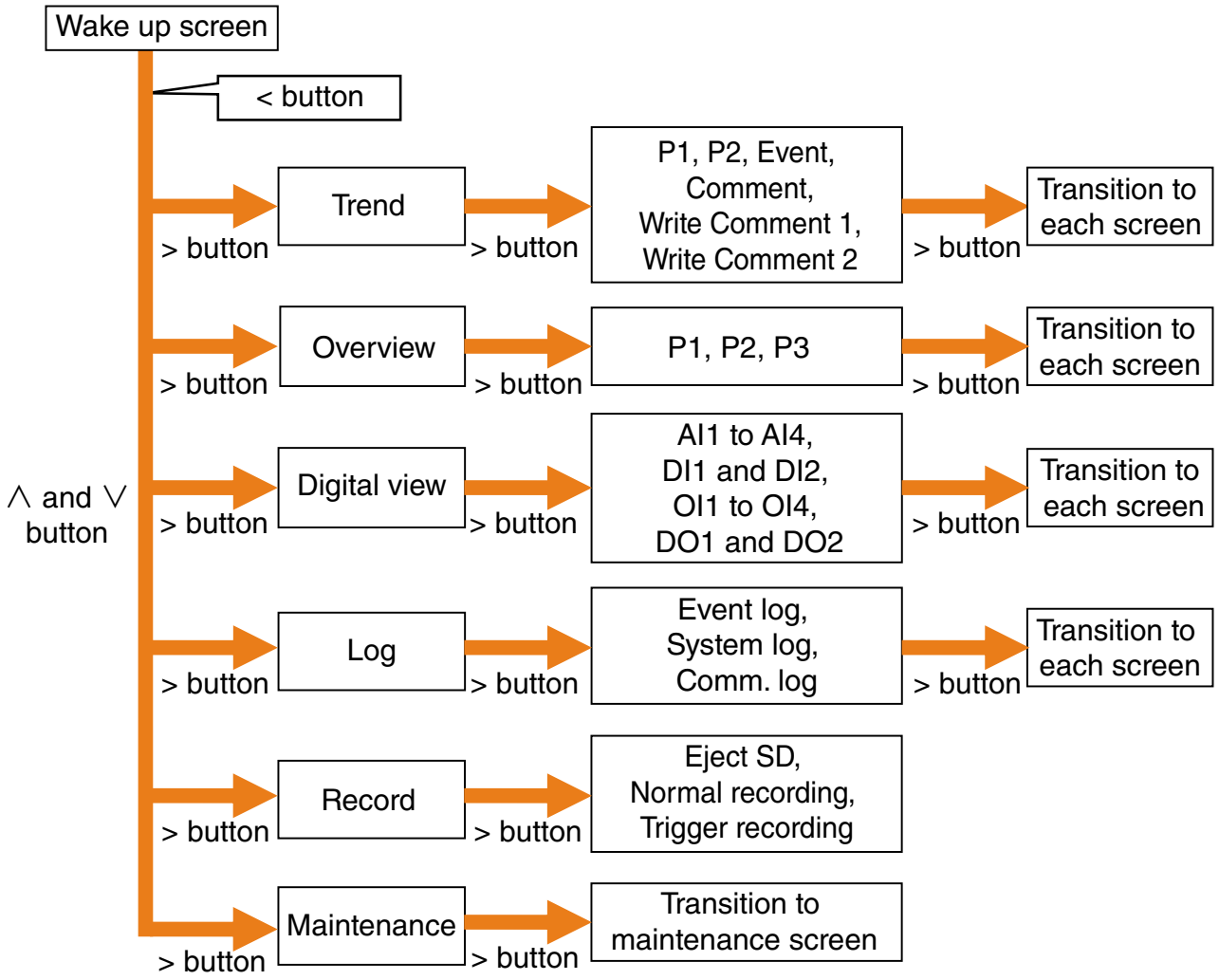


3. Refer to the table below for button operation.

Button	Description	Reference
^	Moves to a new communication log.	
v	Moves to an old communication log.	
>	Displays the details of the selected communication log.	
Hold down >	Starts or stops "normal recording". (If trigger recording is in progress, it switches to normal recording.)	3.5.1.1 Recording setting
<	Detail view: Returns to the communication log view. Communication log view: Displays the menu.	4.3 Configuration of the menu screen
Hold down <	Sets or releases the key lock.	

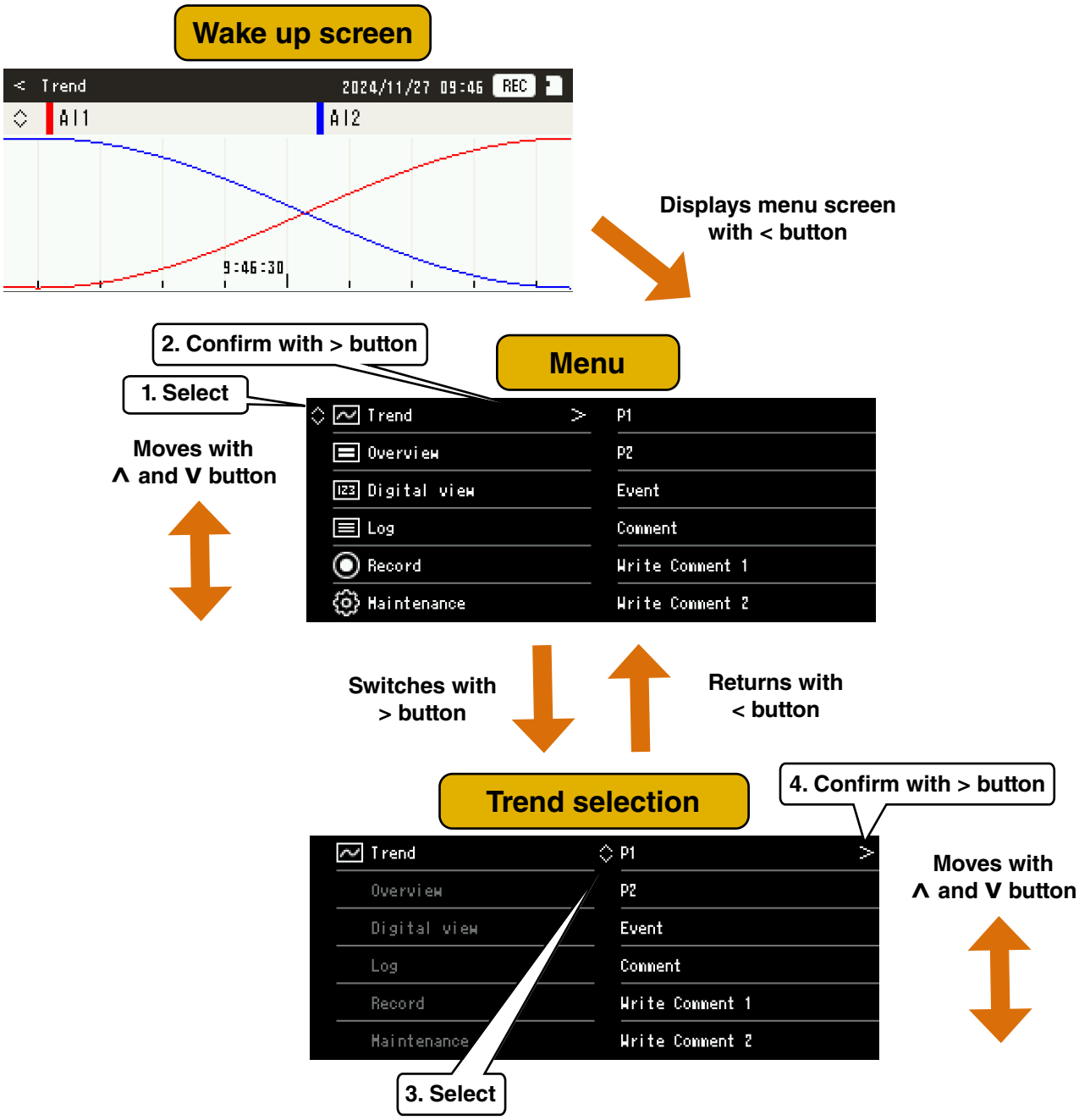
4.3 Configuration of the menu screen

Press < button to shift from the wake up screen to the menu screen.



4.3.1 Common area for each screen

The common area for each screen is as follows.



4.3.1.1 Select

The icon ◇ moves with ∧ and v button. The row with icon ◇ is being selected.

4.3.1.2 Confirm

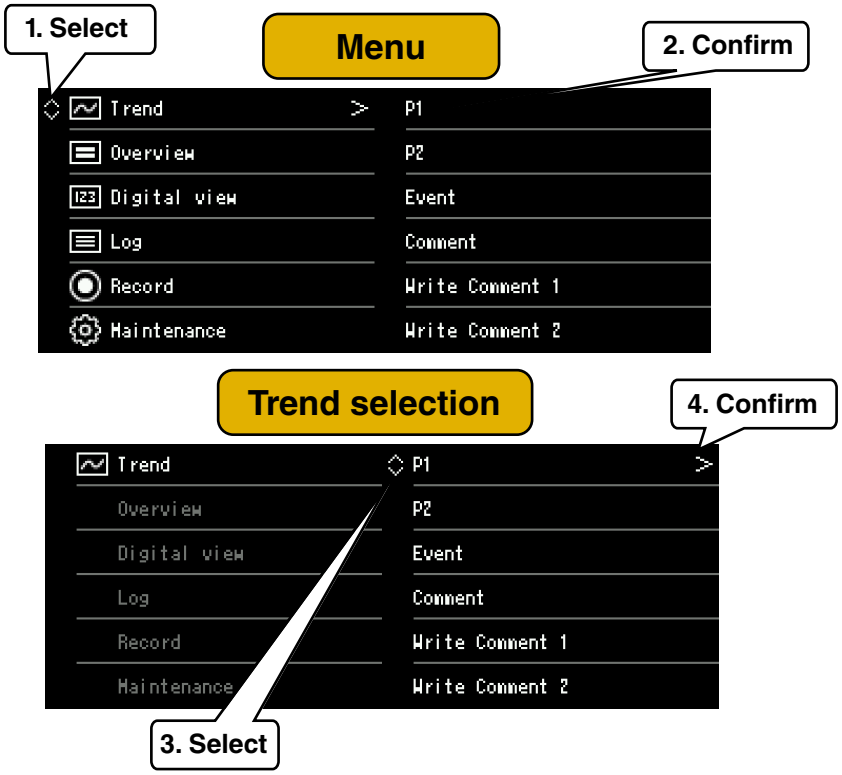
The row with icon ▷ is confirmed.

4.3.1.3 Cancel

Pressing < button returns to the previous screen.

4.3.2 Trend selection screen

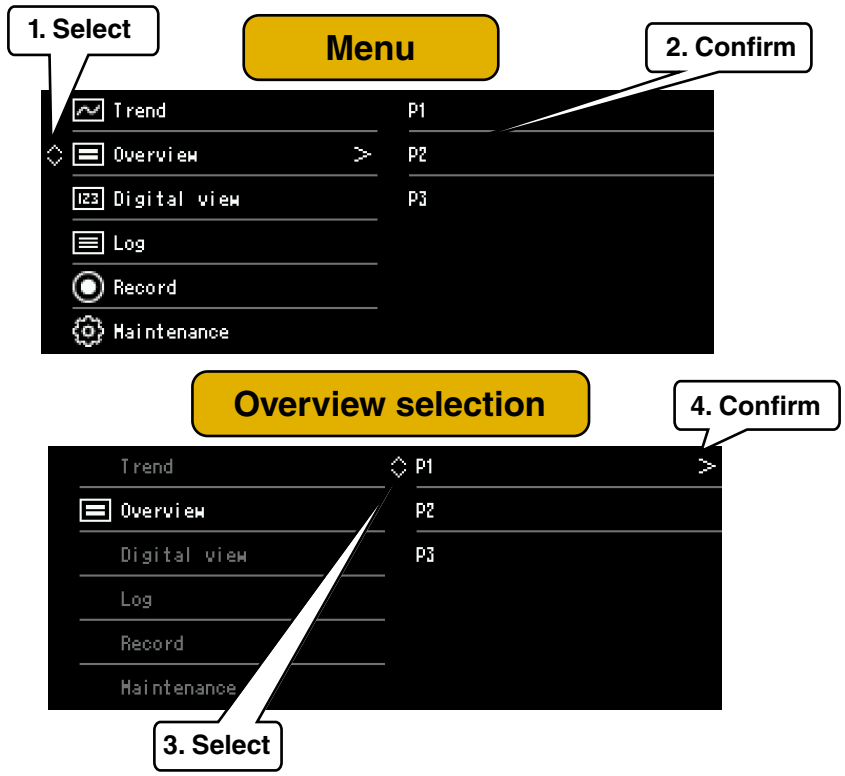
Select the trend screen. The selected trend screen is displayed.
It is also possible to write comments.



1. Select [Trend] on the menu screen.
2. Select the trend screen to be displayed on the trend selection screen to transit to the selected screen.
   ➔ 4.2.3 Trend screen, 4.2.4 Event screen, 4.2.5 Comment screen
3. When writing comments, select [Write Comment 1] or [Write Comment 2].
   Comments are written in the trend at the moment confirmed with the > button. ➔ 3.5.3 Comment setting

4.3.3 Overview selection screen

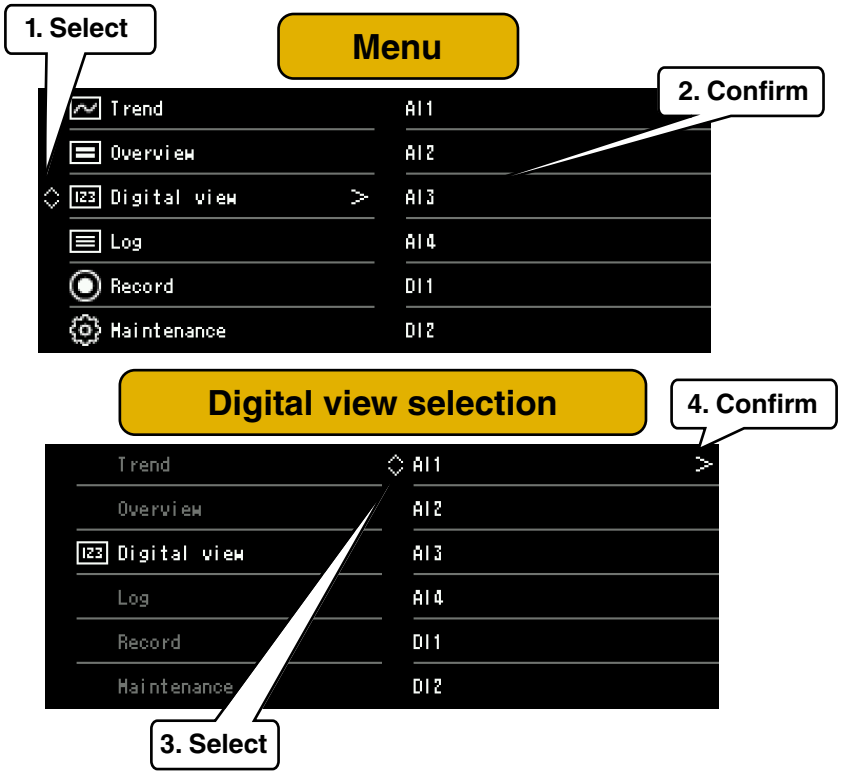
Select the overview screen. The selected overview screen is displayed.



1. Select [Overview] on the menu screen.
2. Select the overview screen to be displayed on the overview selection screen to transit to the selected screen.
   ➔ 4.2.6 Overview screen

4.3.4 Digital view selection screen

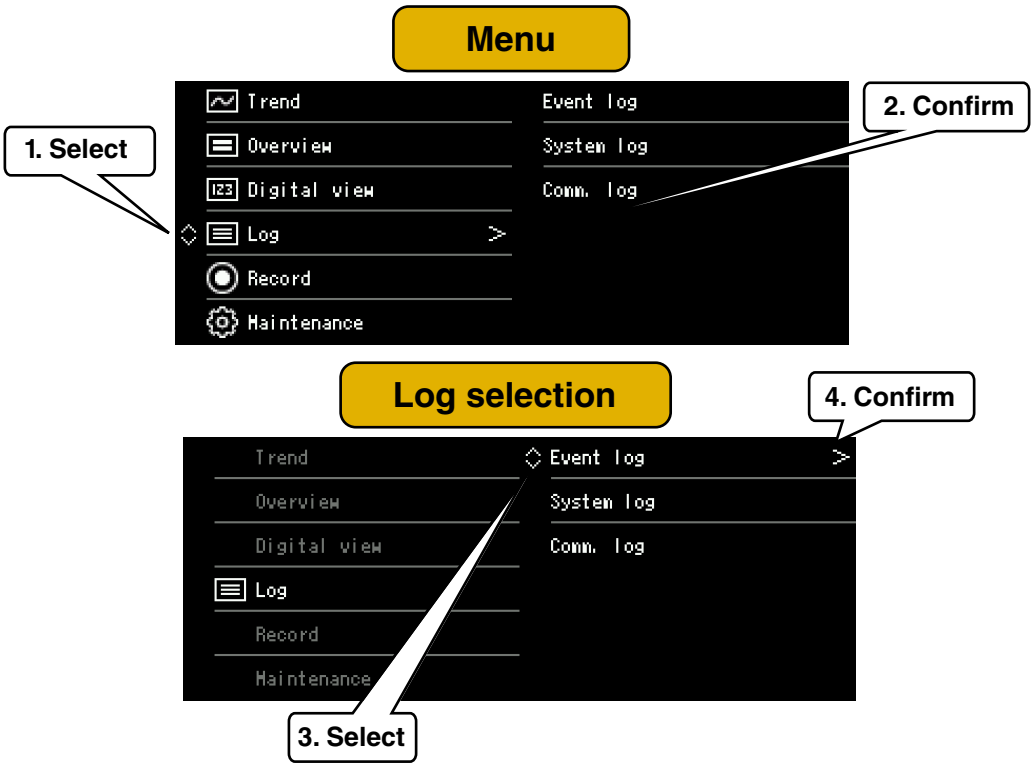
Select the digital view screen.
The latest I/O value of the selected channel is displayed in digital view.



1. Select [Digital view] on the menu screen.
2. Select the channel to be displayed on the digital view selection screen to transit to the digital view screen of the selected channel. ➔ 4.2.7 Digital view screen

4.3.5 Log selection screen

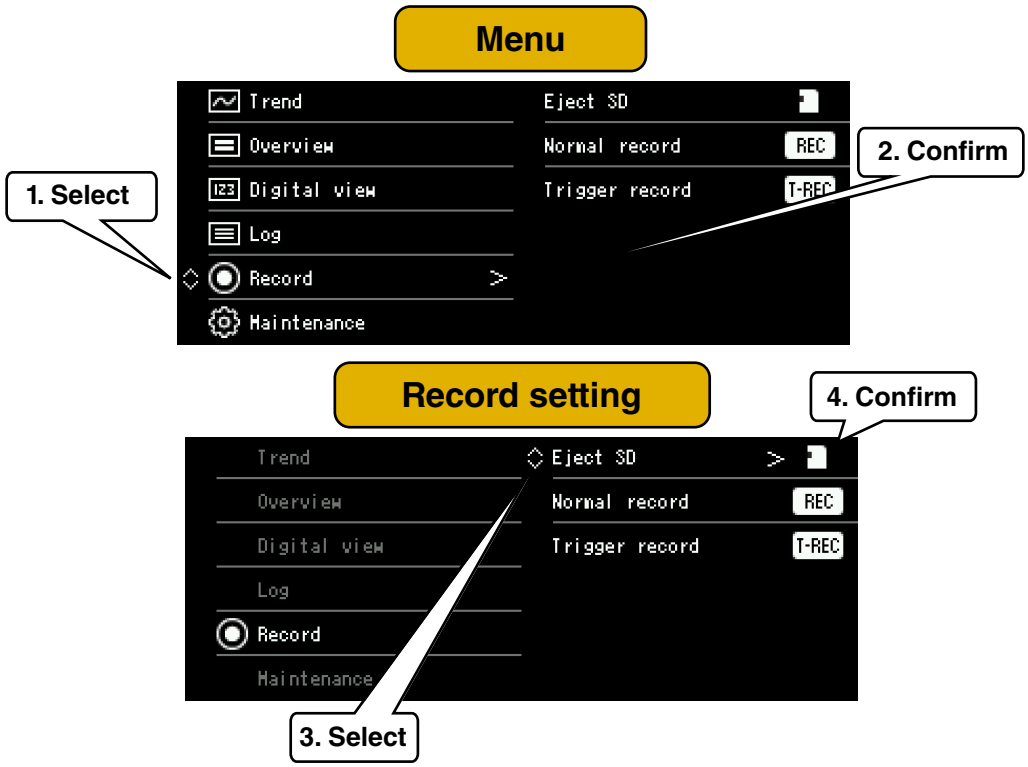
Select the log screen. The list of the selected log is displayed.



1. Select [Log] on the menu screen.
2. Select the log to be displayed on the log selection screen to transit to the list of the selected log.
   ➔ 4.2.8 Event log screen, 4.2.9 System log screen, 4.2.10 Communication log screen

4.3.6 Record setting screen

Configure the record setting.



1. Select [Record] on the menu screen.
2. Before inserting or removing an SD card from the VR4896E-G2, select [Eject SD].
   Insert or remove the SD card after changing to icon which means to release mounting.

3. When selecting [Normal record], normal recording of the trend starts. When recording starts, REC 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

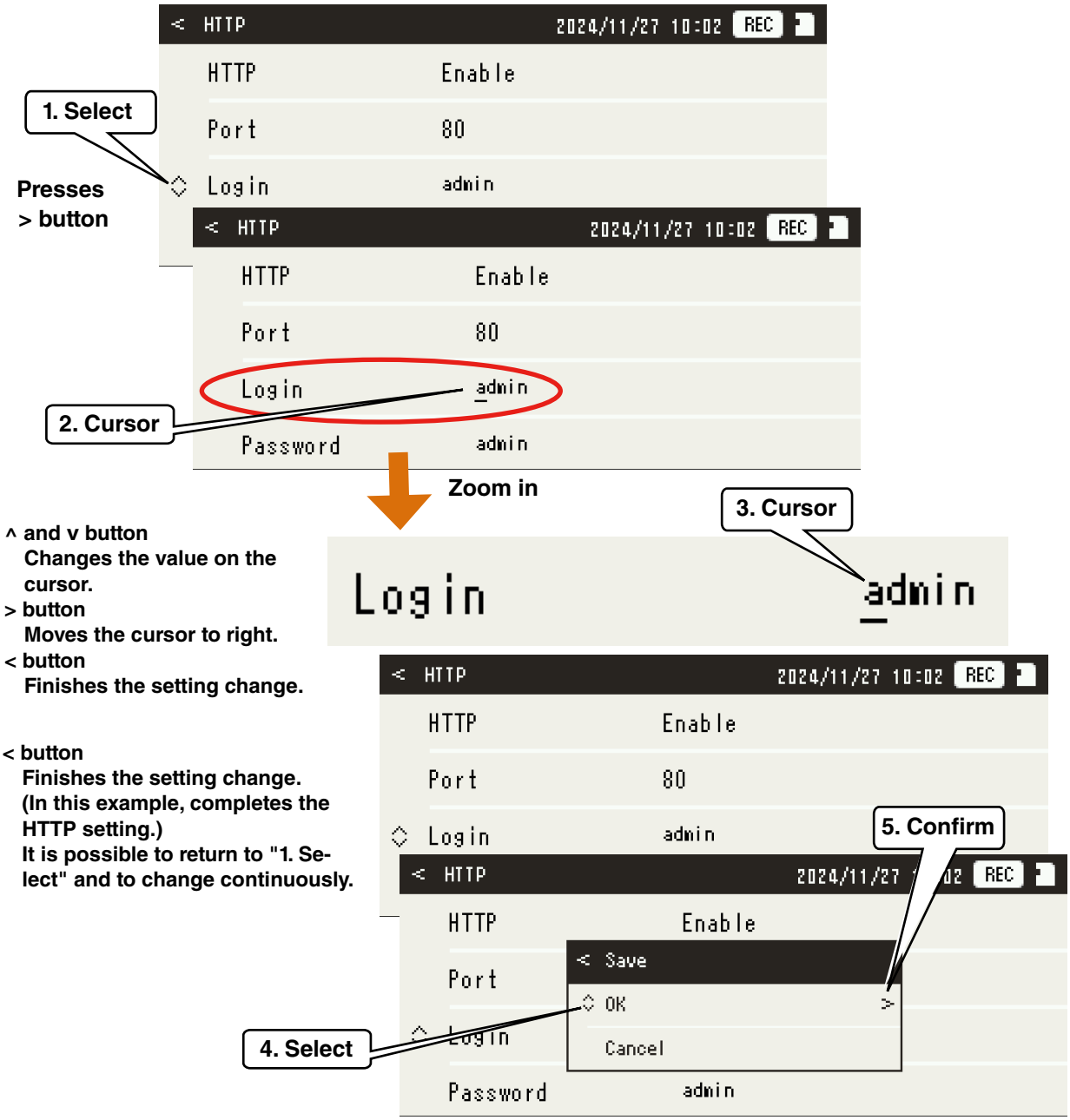
4. When selecting [Trigger record], trigger recording of the trend starts. When recording starts, T-REC icon turns on. The recorded content is based on the settings in the configurator software.
   ➔ 3.5.1 Basic setting, 3.5.2 Pen setting

4.3.7 Maintenance screen

This section describes how to display each maintenance screen.

4.3.7.1 Common

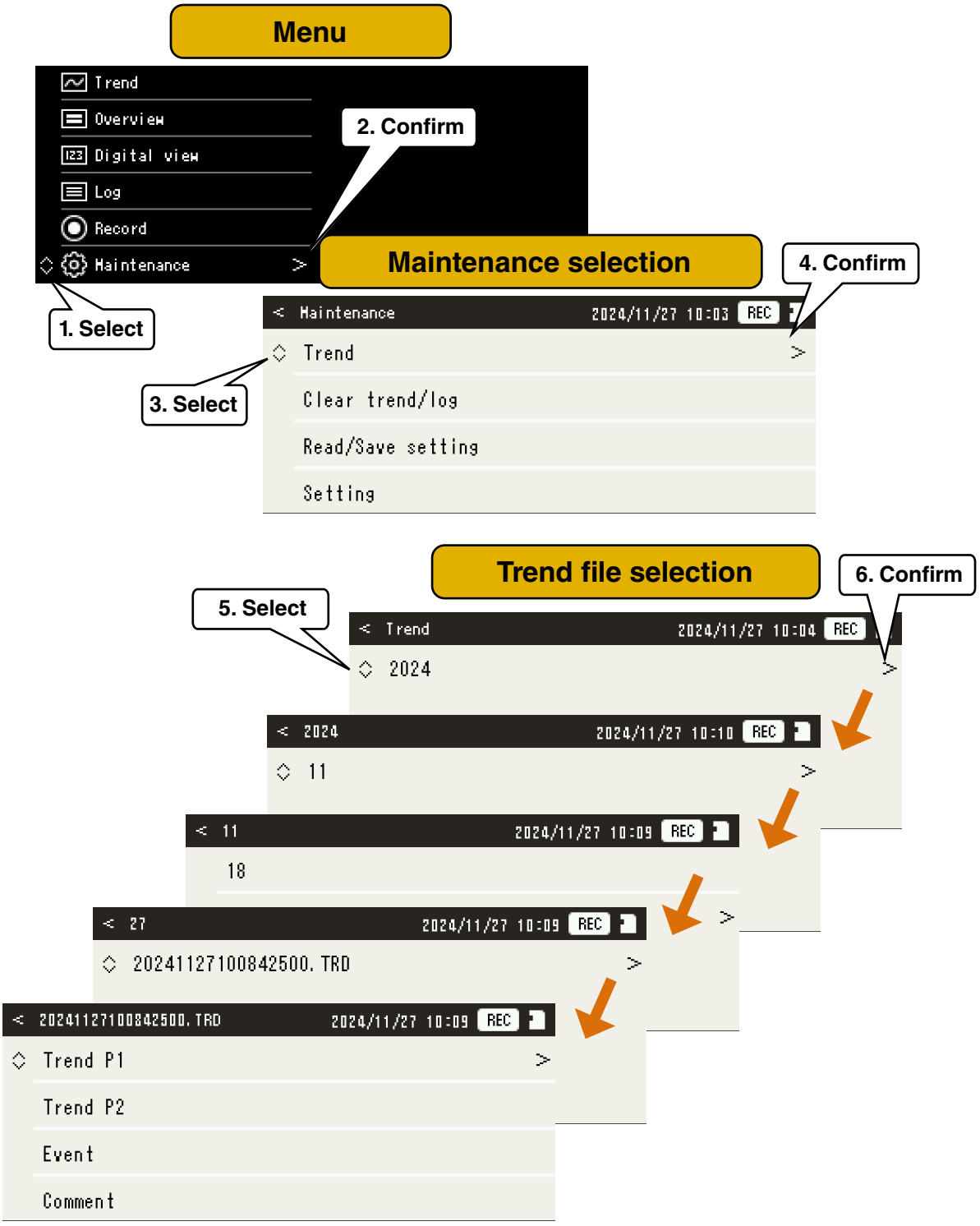
In the maintenance screen, some settings of the VR4896E-G2 can be modified.
Setting changes can be performed with the button operations in the procedure below.

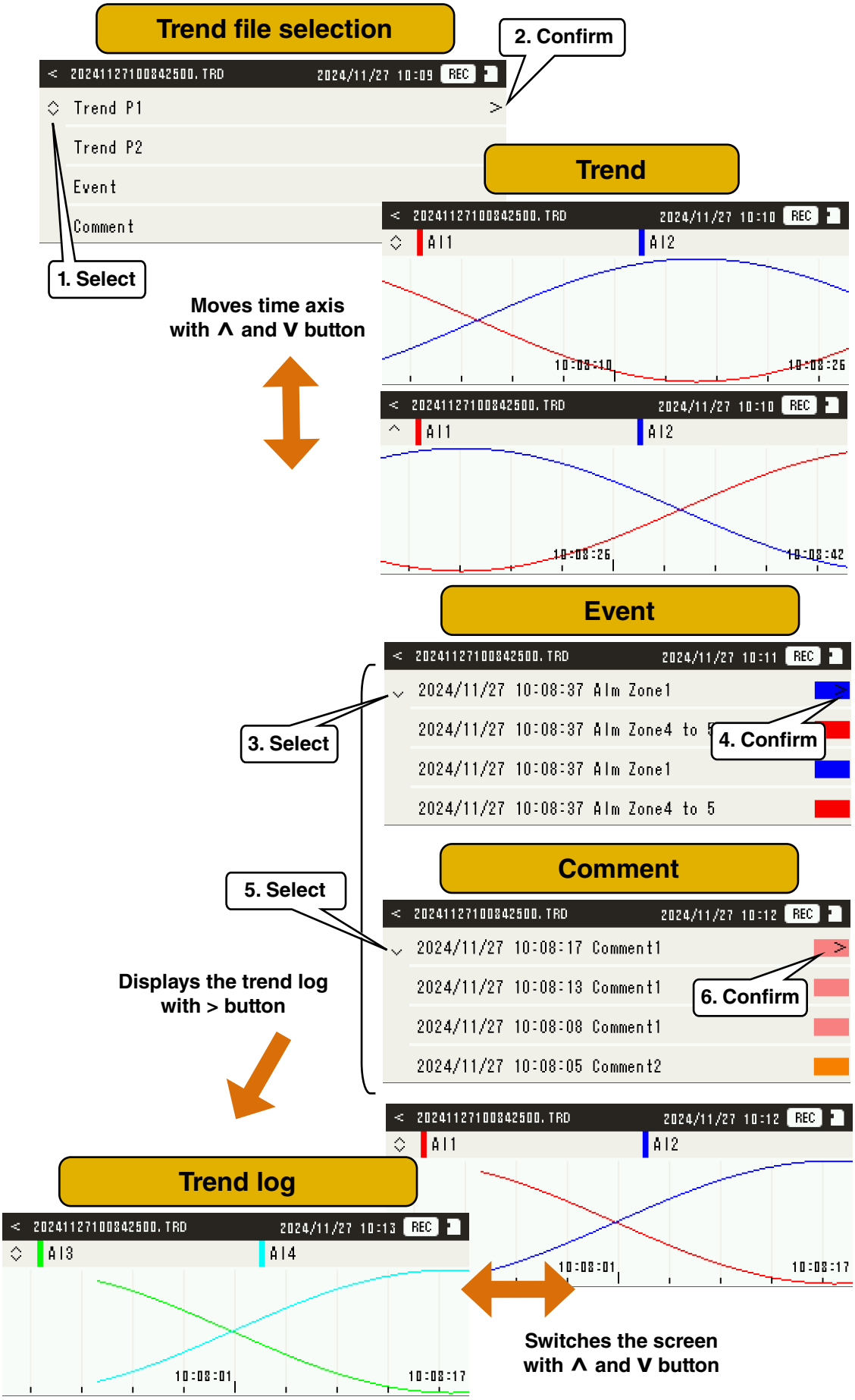


1. Select the parameter to perform the setting change with Λ and V buttons. Then, press > button.
2. The cursor appears at the position where the change is performed.
3. Change the value on the cursor with Λ and V buttons.
4. Press > button to move the cursor one position to the right.
   When the cursor moves to the end, it returns to the beginning.
5. Press < button to finish the setting change.
6. After performing the setting, press < button to complete the setting change.
7. [Save] dialog appears. Select [OK] to make the setting change effective.

4.3.7.2 Trend

Select the trend file stored in the SD card. Then, the recorded content is displayed.

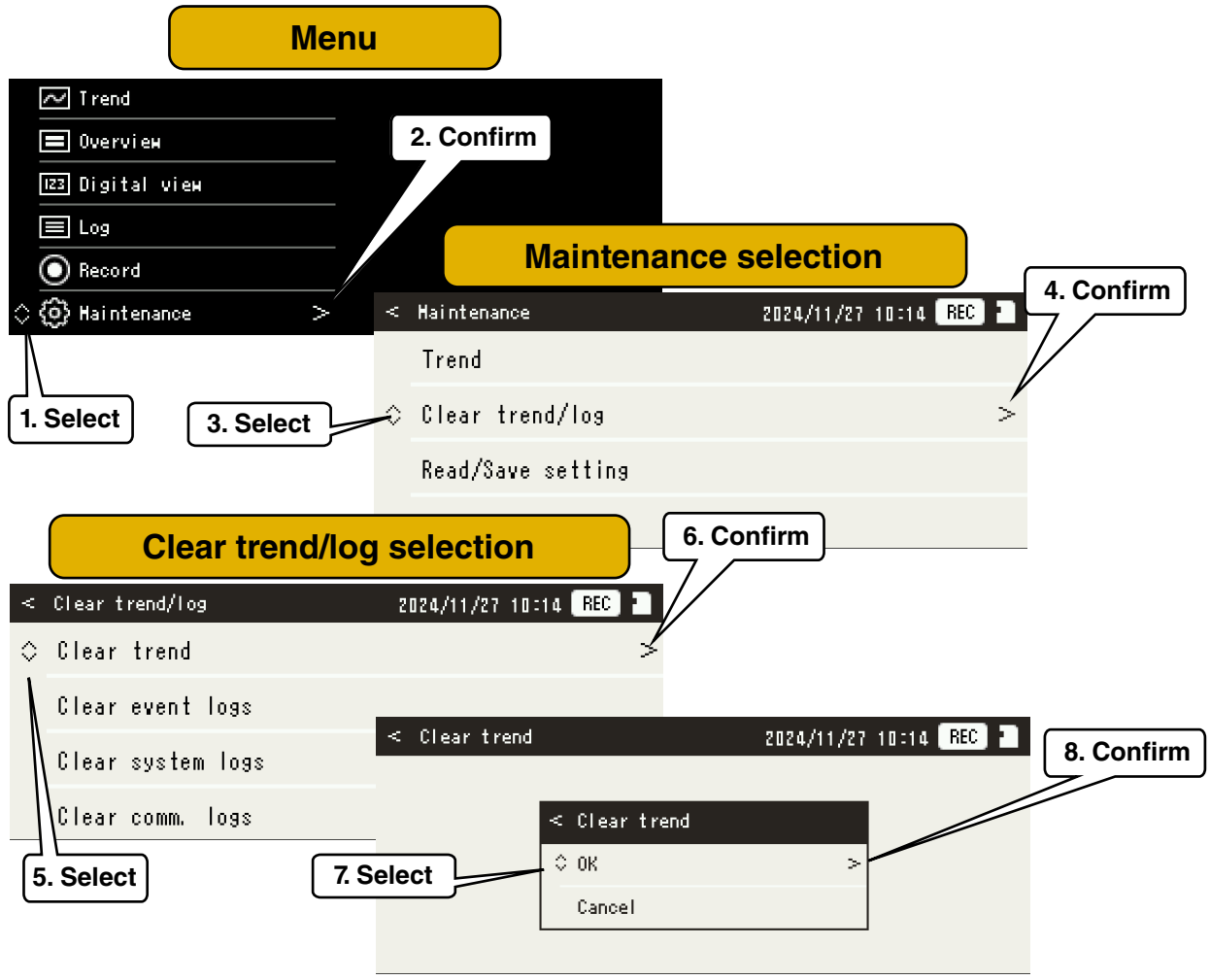



Trend file selection
2. Confirm
< 20241127100842500.TRD 2024/11/27 10:09 REC
Trend P1
Trend P2
Event
Comment
1. Select
Trend
< 20241127100842500.TRD 2024/11/27 10:10 REC
AI1
AI2
10:08:10
10:08:26
Moves time axis
with ∧ and ∨ button
< 20241127100842500.TRD 2024/11/27 10:10 REC
AI1
AI2
10:08:26
10:08:42
Event
< 20241127100842500.TRD 2024/11/27 10:11 REC
2024/11/27 10:08:37 Alm Zone1
2024/11/27 10:08:37 Alm Zone4 to 5
2024/11/27 10:08:37 Alm Zone1
2024/11/27 10:08:37 Alm Zone4 to 5
3. Select
4. Confirm
Comment
5. Select
< 20241127100842500.TRD 2024/11/27 10:12 REC
2024/11/27 10:08:17 Comment1
2024/11/27 10:08:13 Comment1
2024/11/27 10:08:08 Comment1
2024/11/27 10:08:05 Comment2
6. Confirm
Displays the trend log
with > button
Trend log
< 20241127100842500.TRD 2024/11/27 10:13 REC
AI3
AI4
10:08:01
10:08:17
< 20241127100842500.TRD 2024/11/27 10:12 REC
AI1
AI2
10:08:01
10:08:17
Switches the screen
with ∧ and ∨ button

1. Select [Maintenance] on the menu screen.
2. Select [Trend] on the maintenance selection screen.
3. Select the trend file on the trend file selection screen.
   Trend files are saved in a hierarchy of year, month, and day. ➔ 6.6 Folder structure
4. When selecting an item recorded in the trend file, the recorded content is displayed.
5. When selecting the content to be displayed, transitions to the corresponding screen is performed.
6. Select [Trend P1] or [Trend P2] to display the trend graph.
   The time axis of the trend data is moved with ∧ and V button.
7. Select [Event] to display the event log.
   Press > button to display the trend log at the time of event recording.
   During displaying the trend log, press the ∧ and V buttons to switch between trend P1 and P2.
8. Select [Comment] to display the comment log.
   Press the > button to display the trend log at the time of comment recording.
   During displaying the trend log, press the ∧ and V buttons to switch between trend P1 and P2.

4.3.7.3 Clearing trend/log

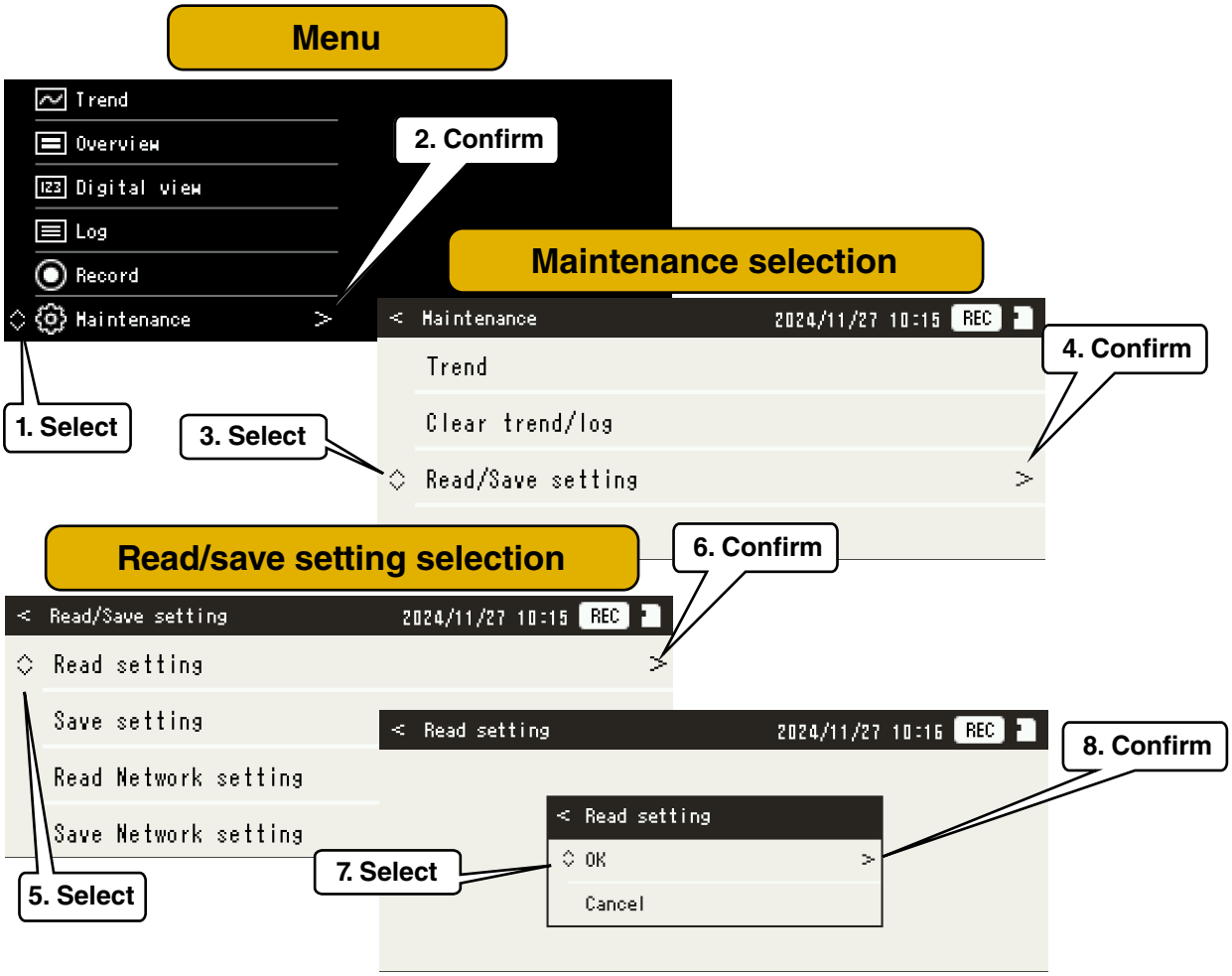
Follow the procedure below in order to delete trend files or log files stored in the VR4896E-G2 and in an SD card.



1. Select [Maintenance] on the menu screen.
2. Select [Clear trend/log] on the maintenance selection screen.
3. Select the file type to be deleted.
4. Select [OK] to delete the files.

4.3.7.4 Reading/saving setting

Follow the procedure below in order to read or save the setting or the network setting of the VR4896E-G2 stored in an SD card.



1. Select [Maintenance] on the menu screen.
2. Select [Read/Save setting] on the maintenance selection screen.
3. Select the parameter to be read or saved.
4. For the file name and the saving destination, refer to the table below. ➔ 6.6 Folder structure

Button	File name	Saving destination
Read setting	vr4896cfg.json	The setting file in the base folder is exported to the device. The contents are reflected to the device.
Save setting	vr4896cfg.json	The setting file is saved to the base folder.
Read Network setting	vr4896net.json	The setting file in the base folder is exported to the device. The contents are reflected to the device.
Save Network setting	vr4896net.json	The setting file is saved to the base folder.

"vr4896cfg.json" is the same format as the settings saved to the file with the configurator software.
➔ 2.3.6 Saving the setting to file
"vr4896net.json" is the same content as the device information set with the configurator software.

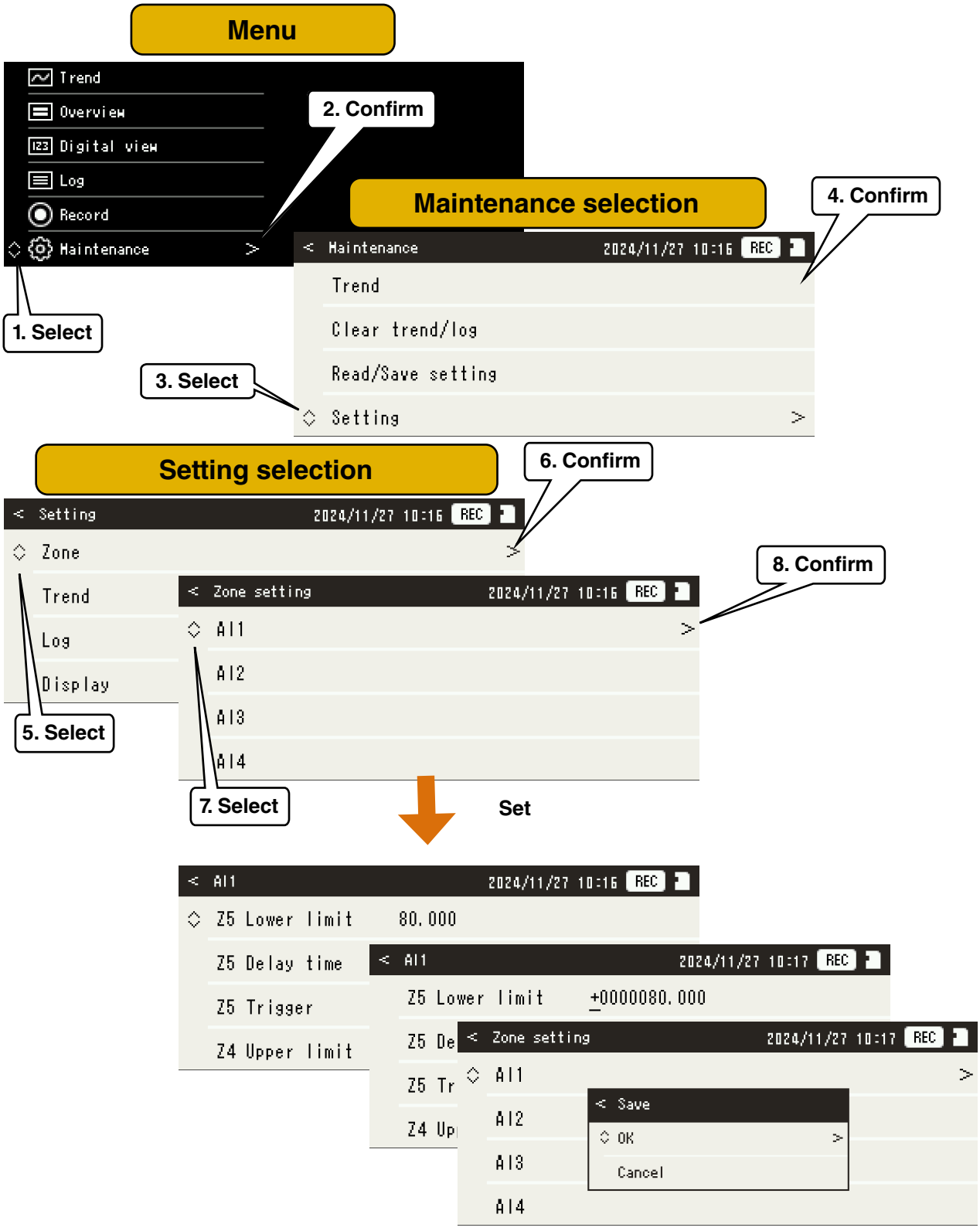
5. Select [OK] to perform reading or writing the setting.
6. If the reading operation is performed but the corresponding file does not exist, or if the writing operation is performed but is failed in writing to the corresponding file, an error message appears.

CAUTION

Do not edit "vr4896cfg.json" or "vr4896net.json" with a text editor or similar tools.

4.3.7.5 Setting

Configure the zone setting, trend setting, log setting and display setting.



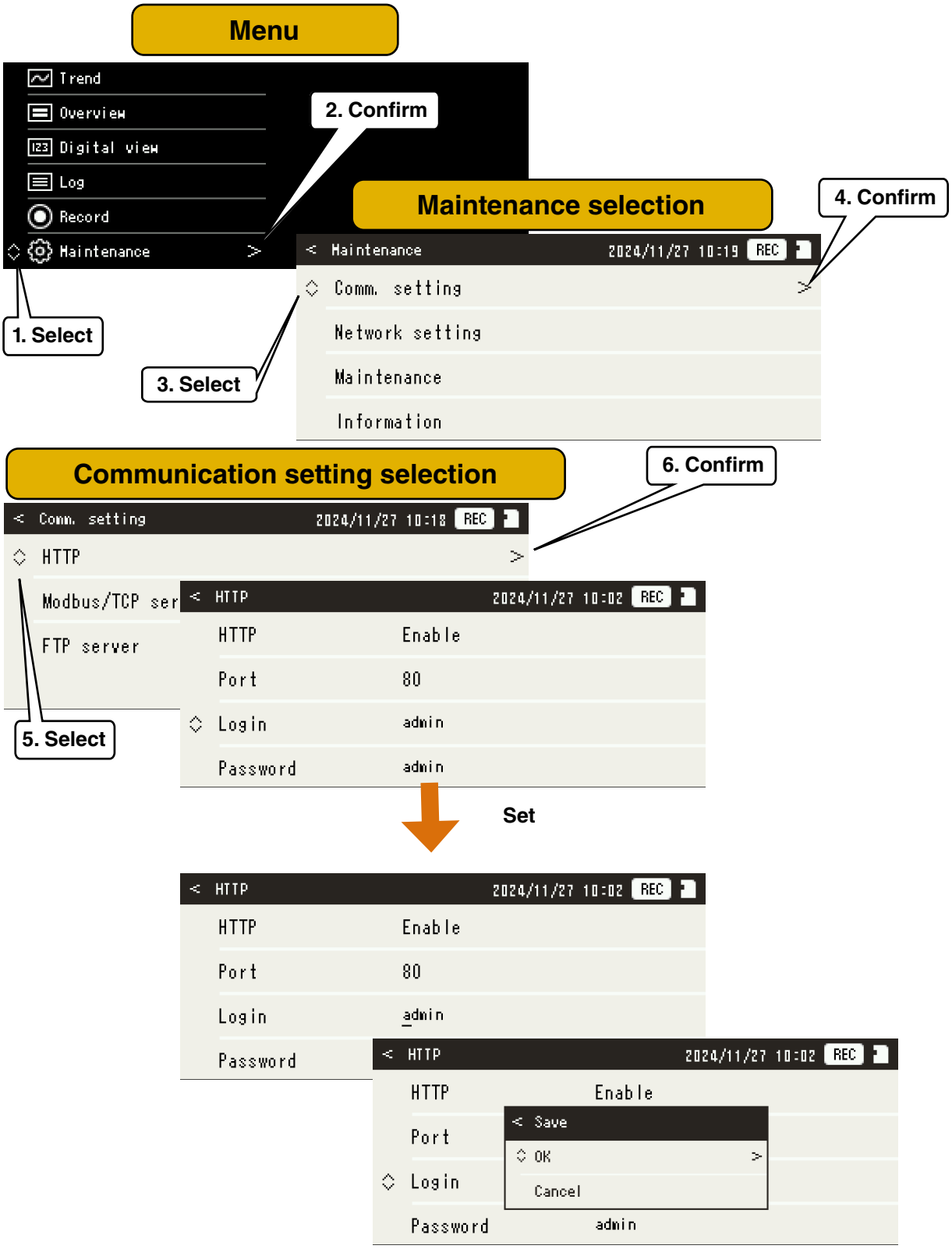
1. Select [Maintenance] on the menu screen.
2. Select [Setting] on the maintenance screen.
3. Select the parameter to be set on the setting selection screen.
4. For the parameter and the selectable item, refer to the table below.

Parameter	Selectable item	Reference
Zone	AI, OI: Z(Zone) 1 to 5 Lower limit, Upper limit, Delay time, Trigger DI: ON Delay time, OFF Delay time, ON Trigger, OFF Trigger	Set after selecting channel. 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	Basic: Auto start, Storing rate, Auto delete, Encode, Storing mode, Interval, Samples, Trigger mode, Pre trigger, Post trigger PEN: Upper limit, Lower limit	Set after selecting PEN1 to 4. The detail is same as the following. Basic: 3.5.1 Basic setting PEN: 3.5.2 Pen setting
Log	Event log, System log, Comm. log	The detail is same as the following. 3.6 Log setting
Display	Wake up, Screen saver, Flicker, Brightness	The detail is same as the following. Wake up: 3.7.1 Wake up screen setting Flicker: 3.7.2 Digital view setting Screen saver, Brightness: 3.7.4 Other settings

5. Setting change can be performed with the button operation. Refer to 4.3.7.1 Common for the button operation.

4.3.7.6 Communication setting

Configure the setting of HTTP server, Modbus/TCP server and FTP server.



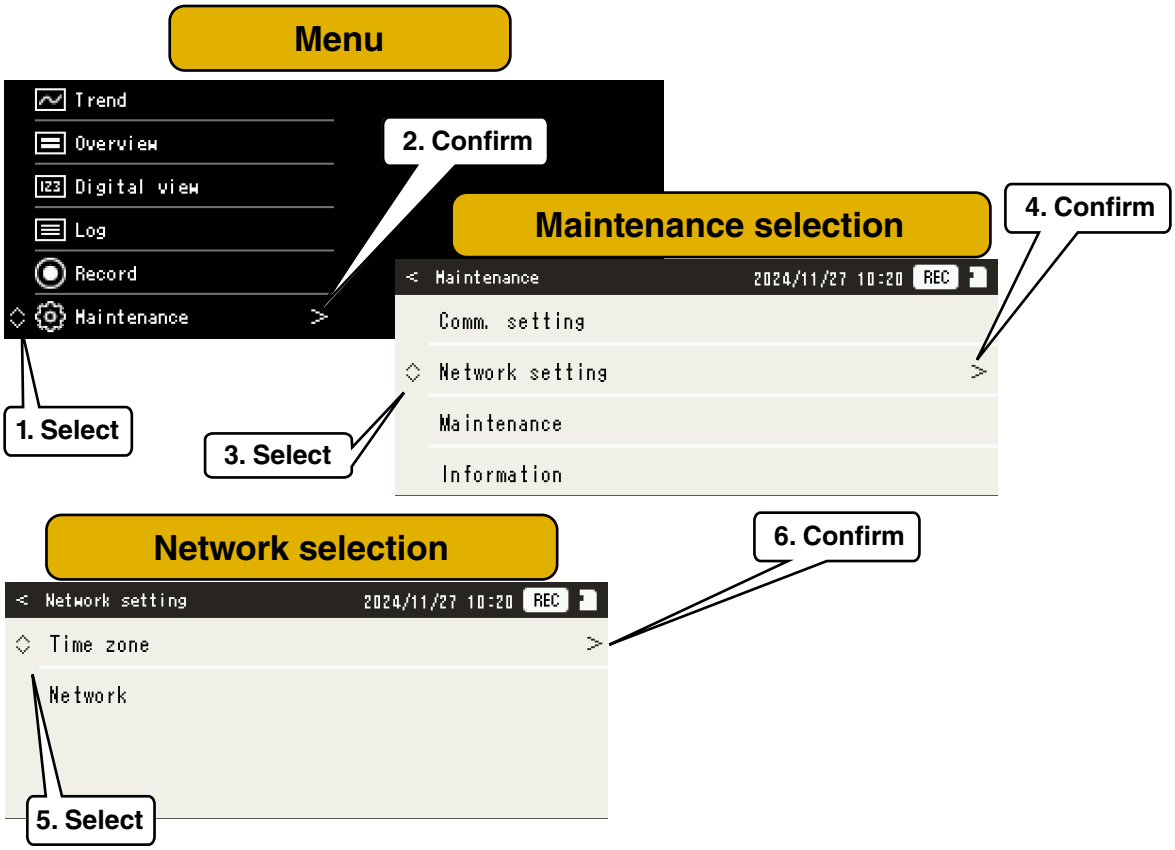
1. Select [Maintenance] on the menu screen.
2. Select [Comm. setting] on the maintenance screen.
3. Select the parameter to be set on the communication setting selection screen.
4. For the parameter and the selectable item, refer to the table below.

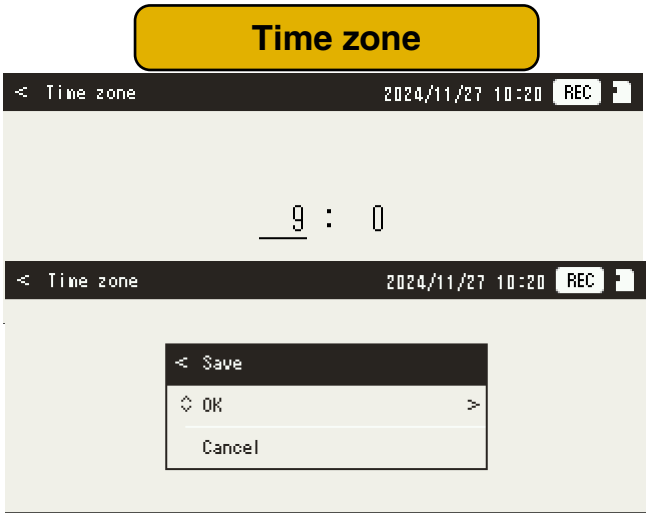
Parameter	Selectable item	Reference
HTTP	Disable/Enable, Port No., Login name, Password	The detail is same as the following. 3.2.1 HTTP
Modbus/TCP server	Disable/Enable, Port No., Linger timer	The detail is same as the following. 3.2.2 Modbus/TCP (server)
FTP server	Disable/Enable, Port No., Login name, Password	The detail is same as the following. 3.2.3 FTP server

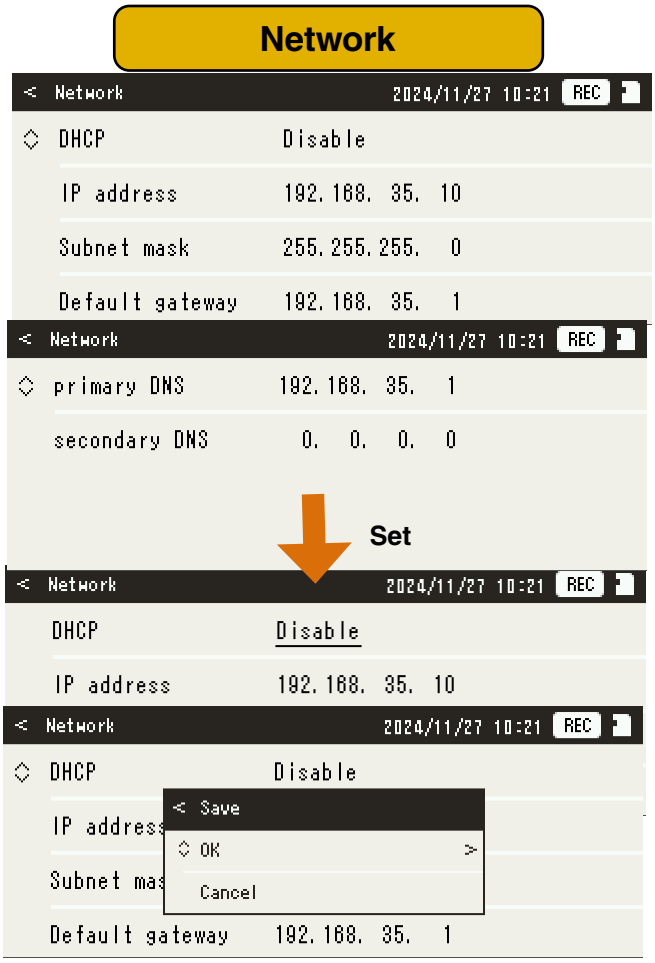
5. Setting change can be performed with the button operation. Refer to 4.3.7.1 Common for the button operation.

4.3.7.7 Network setting

Configure the network setting of the device.







1. Select [Maintenance] on the menu screen.
2. Select [Network setting] on the maintenance screen.
3. Select the parameter to be set on the network selection screen.
4. For the parameter and the selectable item, refer to the table below.

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

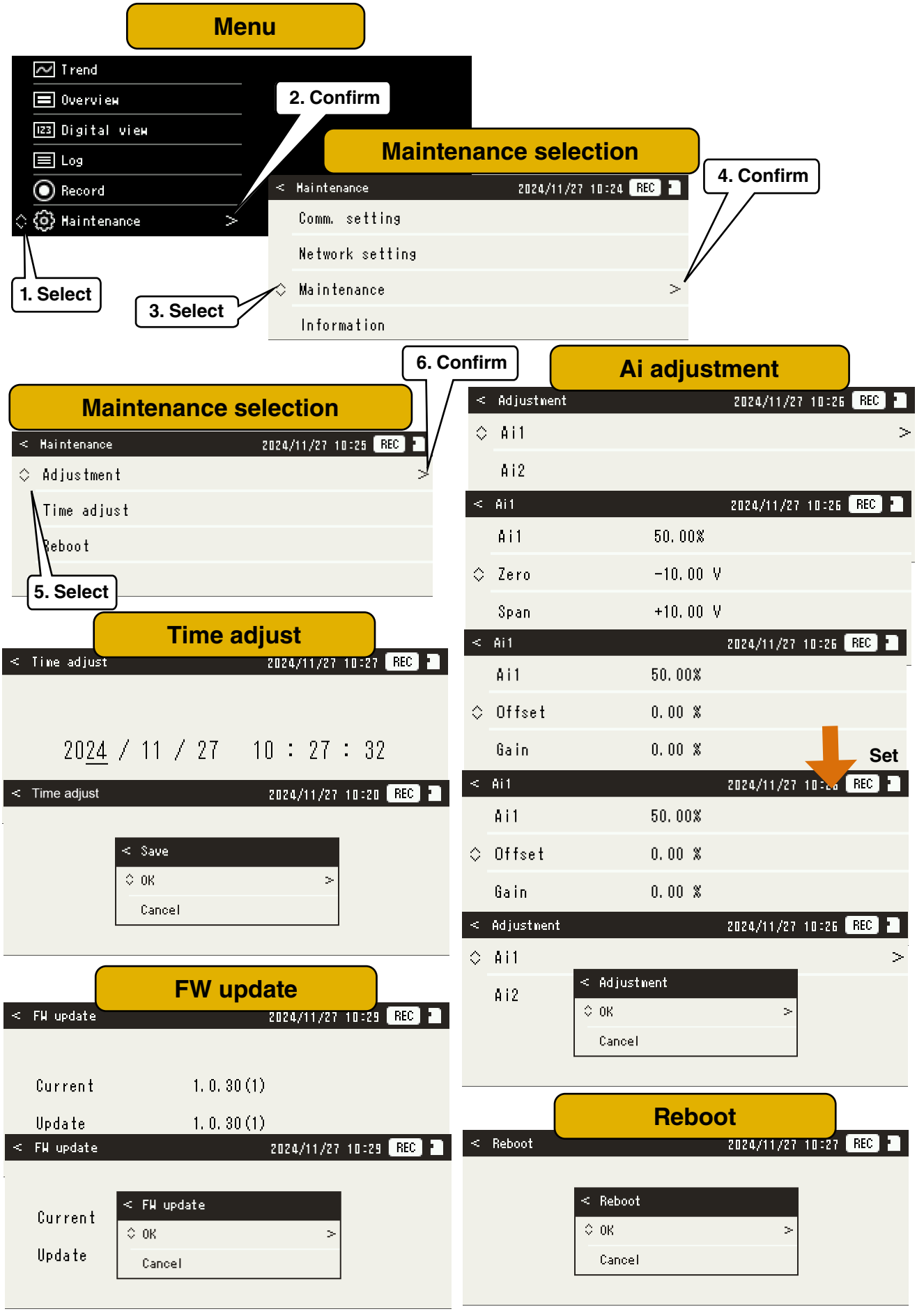
5. Setting change can be performed with the button operation. Refer to 4.3.7.1 Common for the button operation.

CAUTION

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

4.3.7.8 Maintenance

Configure the settings, such as time adjustment or Ai input adjustment.



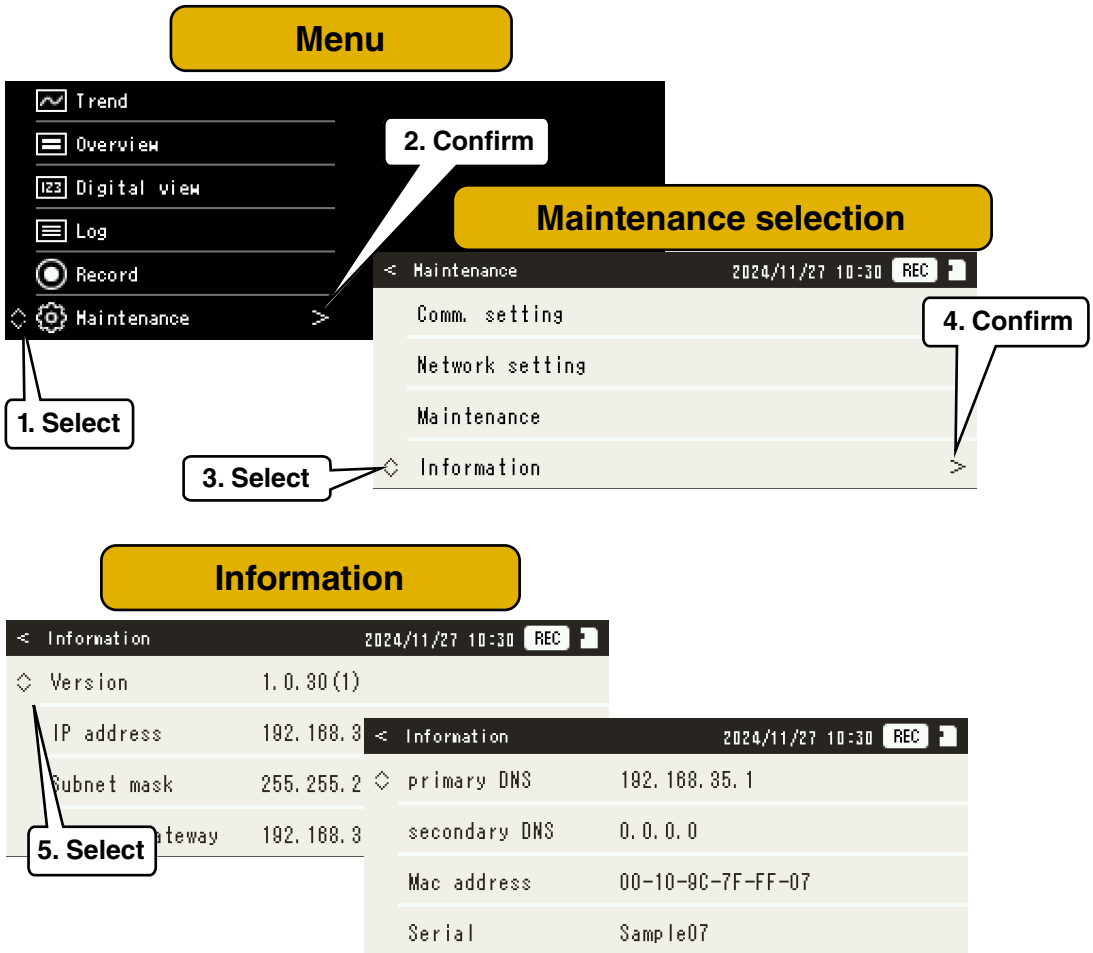
1. Select [Maintenance] on the menu screen.
2. Select [Maintenance] on the maintenance selection screen.
3. Select the parameter to be set on the maintenance selection screen.
4. For the parameter and the selectable item, refer to the table below.

Parameter	Selectable item	Reference
Adjustment	Displays the current input value. Zero, span, offset and gain can be set.	Adjustable range Zero: Depends on the analog input specification Span: Depends on the analog input specification Offset: -5.00 to 5.00 (%) Gain: -5.00 to 5.00 (%)
Time adjust	Sets the local time to be used for trend recording or system log.	
Reboot	Reboots the VR4896E-G2.	
FW update	Displays new and old firmware versions.	For update procedure, refer to our website.

5. Setting change can be performed with the button operation. Refer to 4.3.7.1 Common for the button operation.

4.3.7.9 Information

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

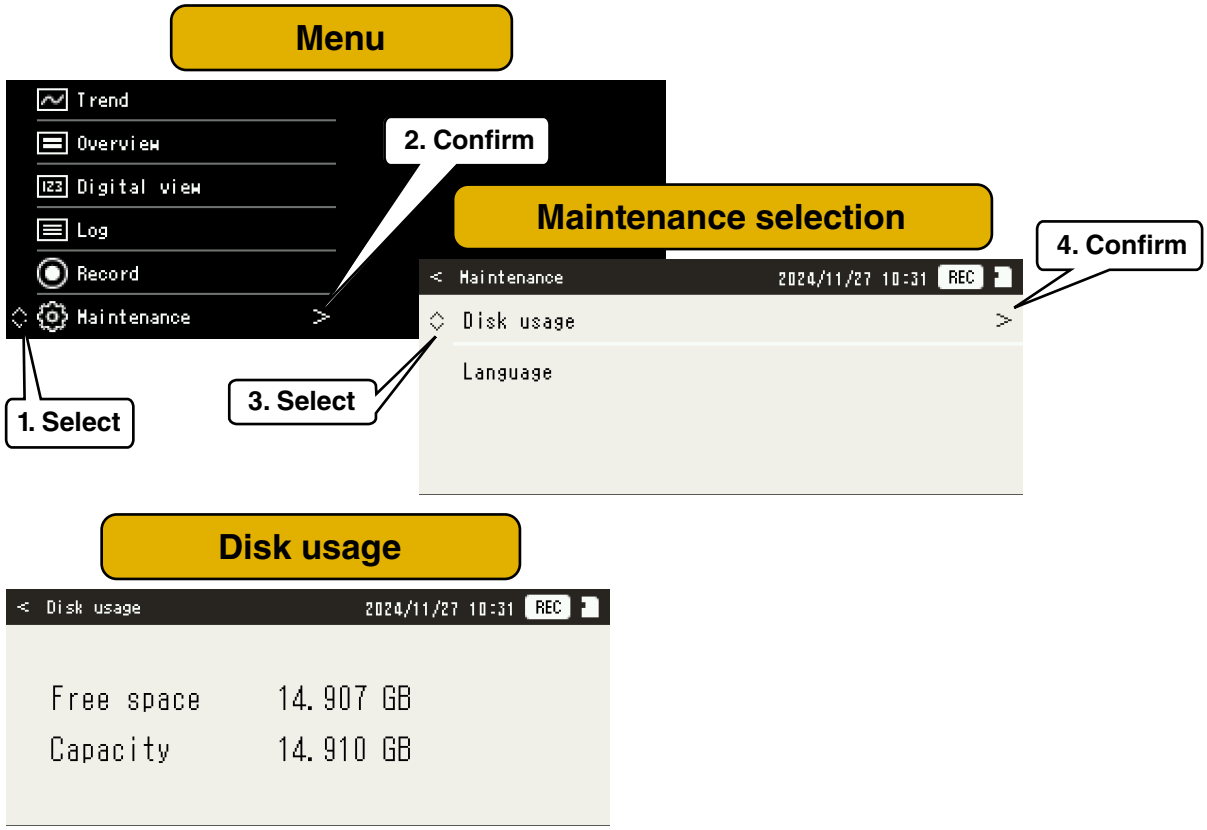


1. Select [Maintenance] on the menu screen.
2. Select [Information] on the maintenance selection screen.
3. The current device information is displayed on the information screen.
   For the displayed item, refer to the table below.

Displayed item	Description	Reference
Version	Displays the currently operating firmware version in the VR4896E-G2.	
IP address, Subnet mask, Default Gateway, primary DNS, secondary DNS	Displays IP address, Subnet mask, Default Gateway, primary DNS and secondary DNS.	Changeable in 4.3.7.7 Network setting.
Mac address	Displays Mac address.	
Serial	Displays the number to be managed by MG CO., LTD.	

4.3.7.10 Disk usage

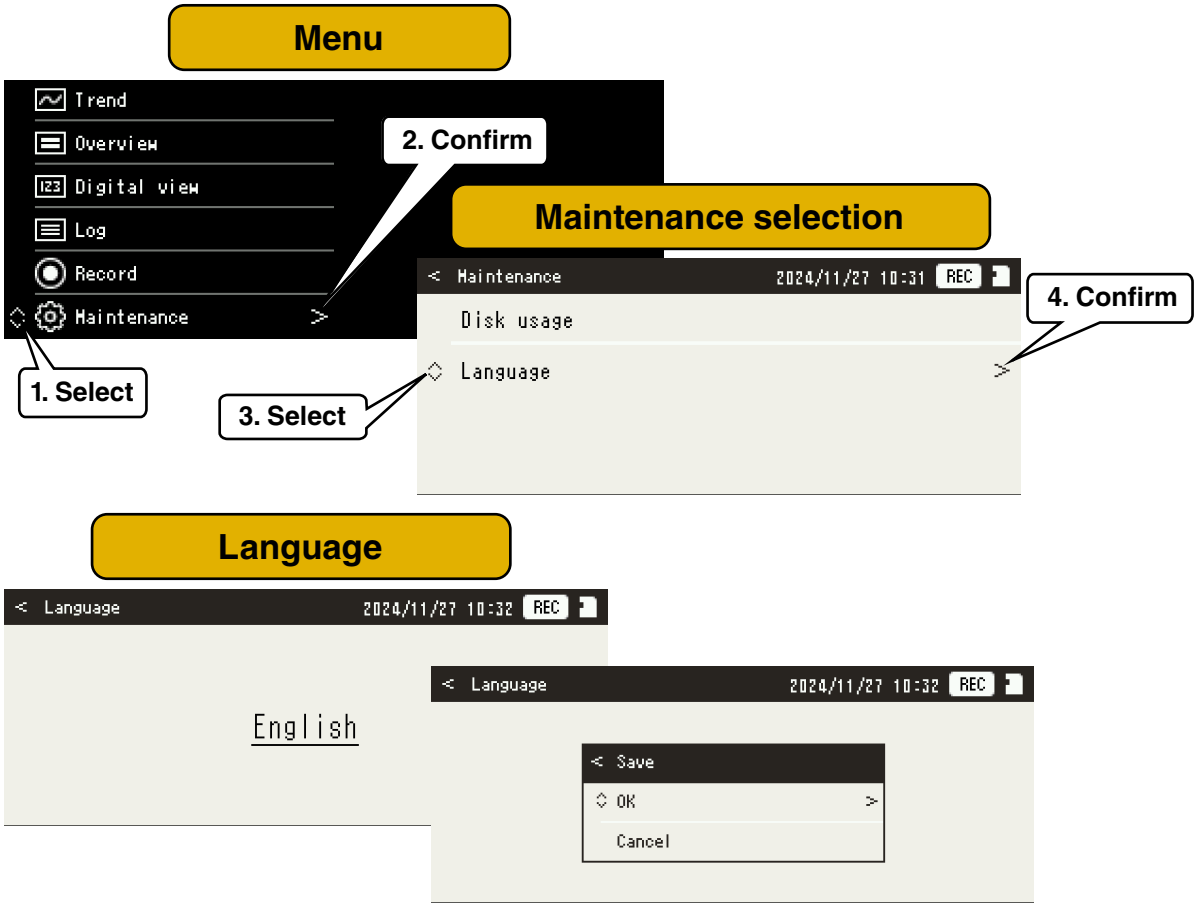
Follow the procedure below in order to display the usage state of the SD card placed in the device.



1. Select [Maintenance] on the menu screen.
2. Select [Disk usage] on the maintenance selection screen.

4.3.7.11 Language

Configure the language setting displayed on the device.

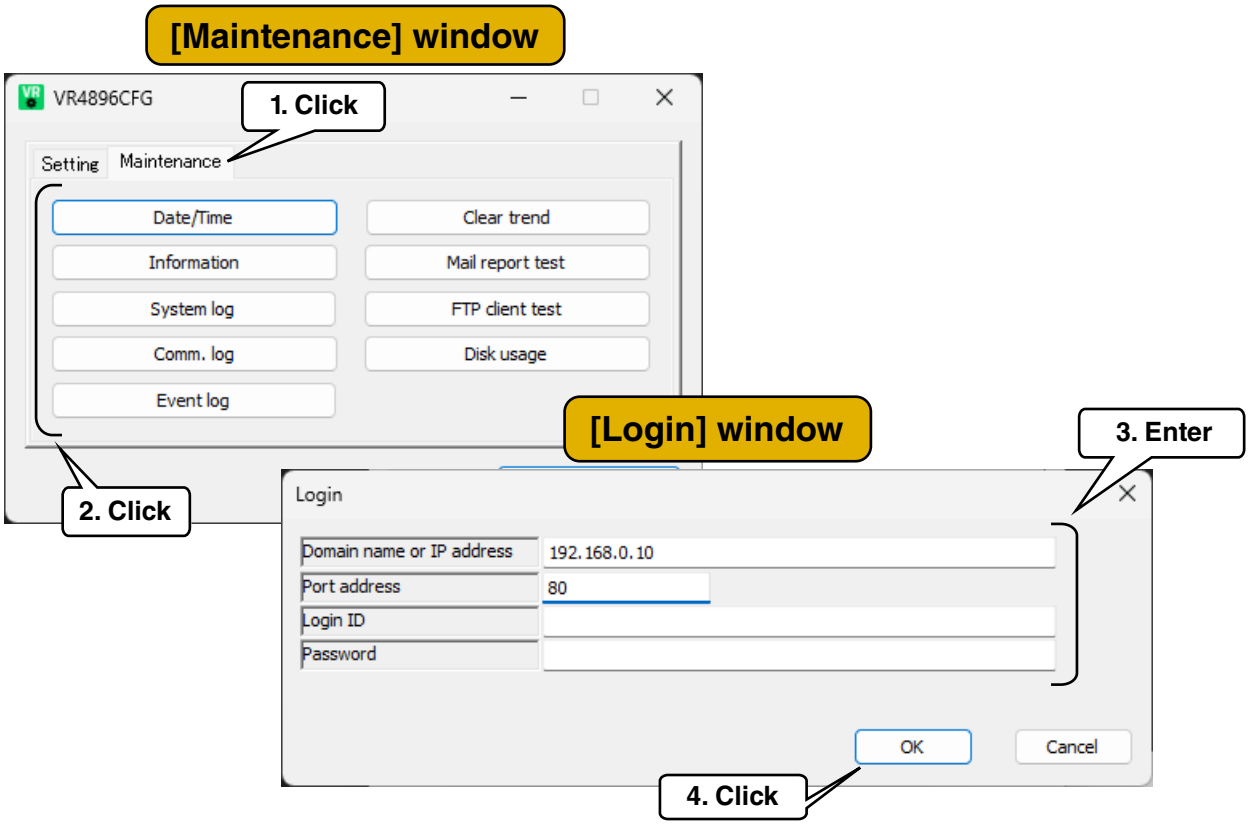


1. Select [Maintenance] on the menu screen.
2. Select [Language] on the maintenance selection screen.
3. Select the language to be displayed on the language screen.
4. Setting change can be performed with the button operation. Refer to 4.3.7.1 Common for the button operation.

5. Maintenance

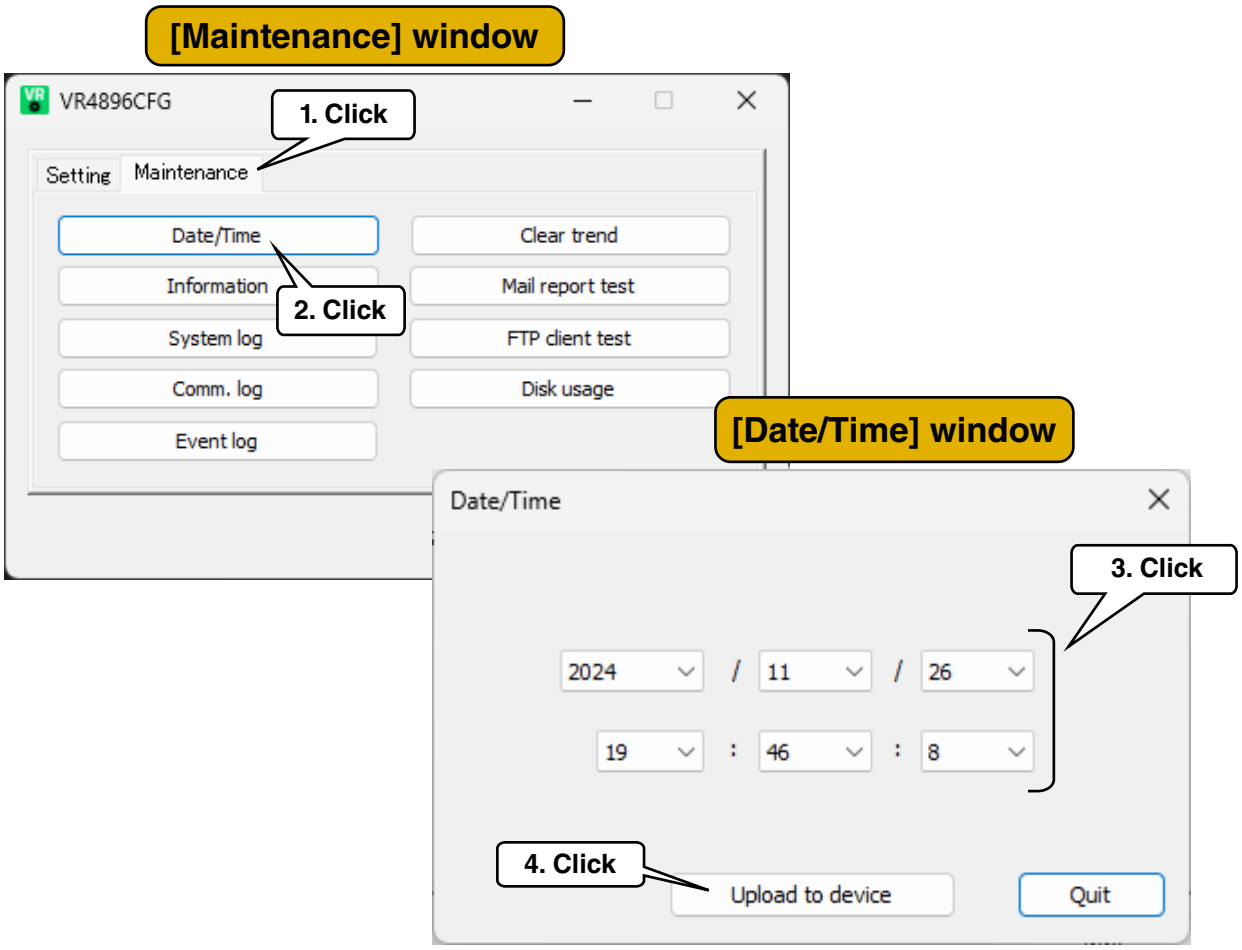
5.1 Maintenance from VR4896CFG

From [Maintenance] window, maintenance on the VR4896E-G2 can be performed.
1. After starting up VR4896CFG, 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

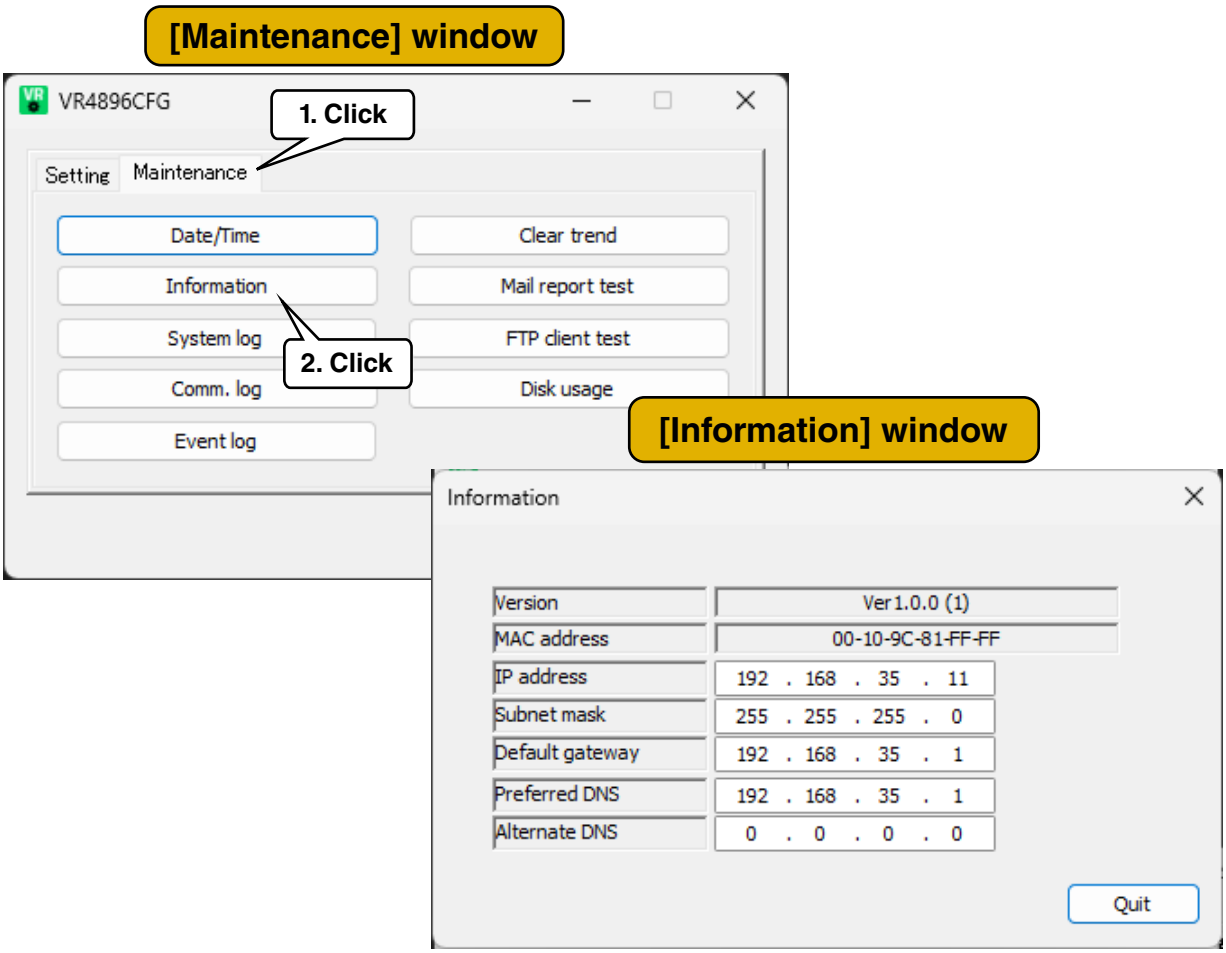
Set the local time used to the trend recording and the system logs.



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

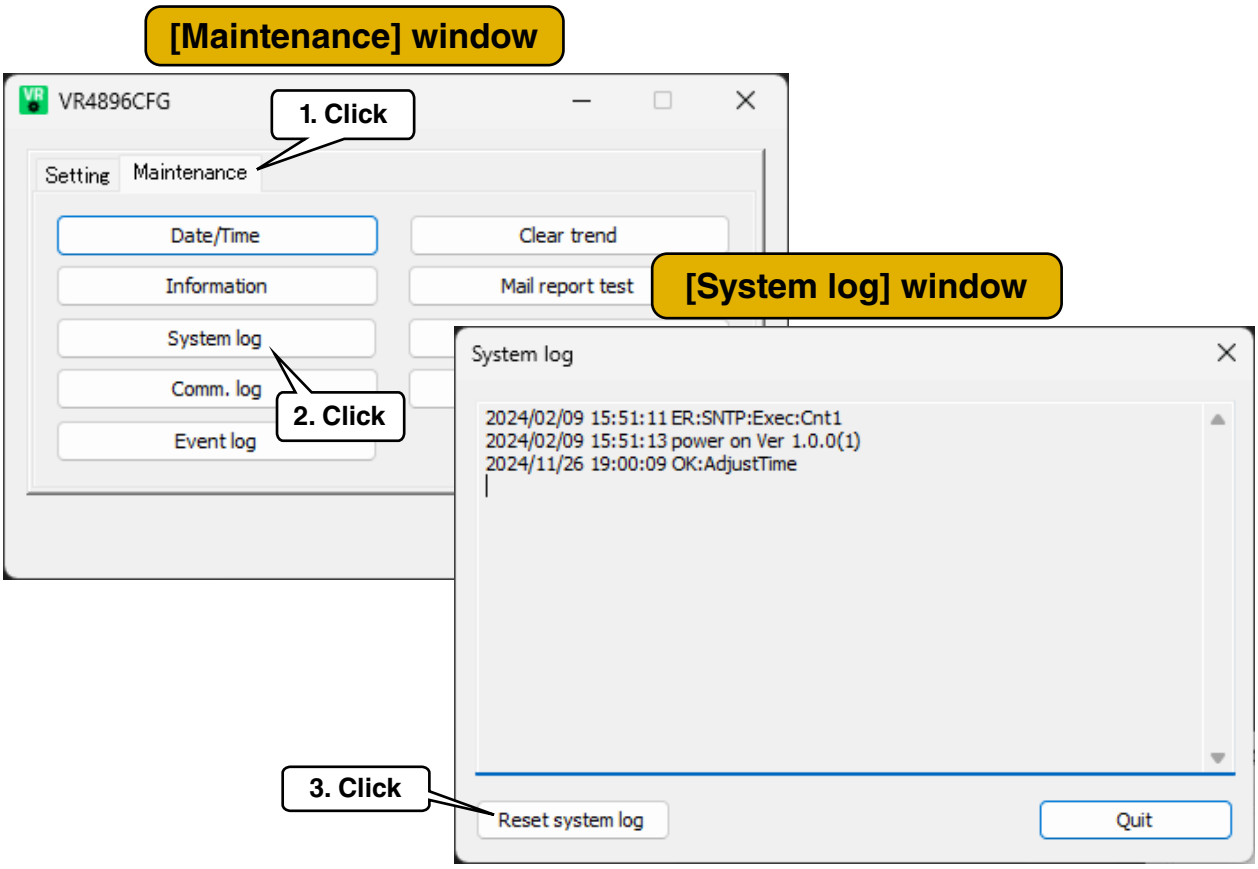
Follow the procedure below in order to display the device information.



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 system log] button to clear the system logs.
4. For system log messages, refer to the table below. (Partial list)

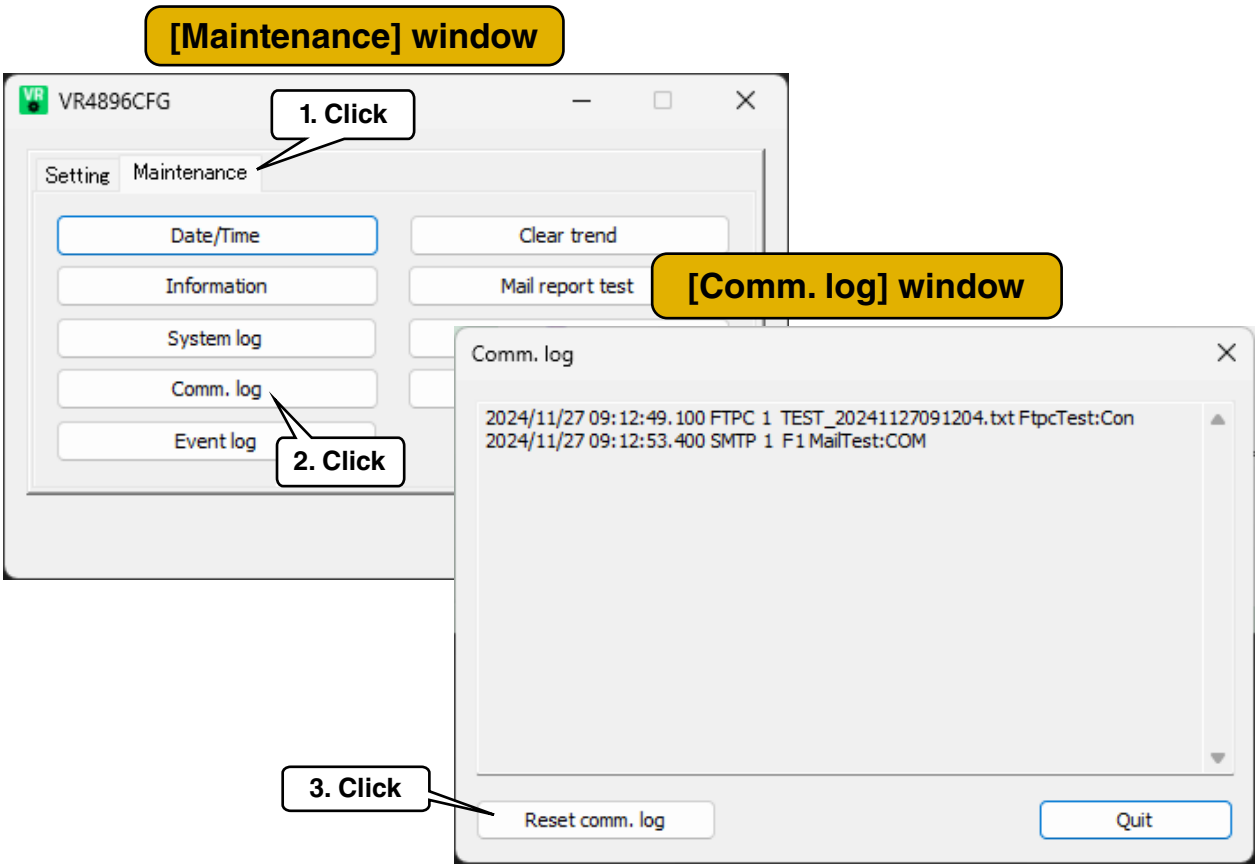
Message	Meaning
power on Verxx	Power supply ON (xxx: version)
OK:SNTP	Succeeded in time synchronization of SNTP.
OK:AdjustTime	Time is adjusted.
OK:Save Config	Setting is updated.
OK:Save Net	Network setting is updated (Rebooting is required).

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.
4. For communication log messages, refer to the table below. (Partial list)

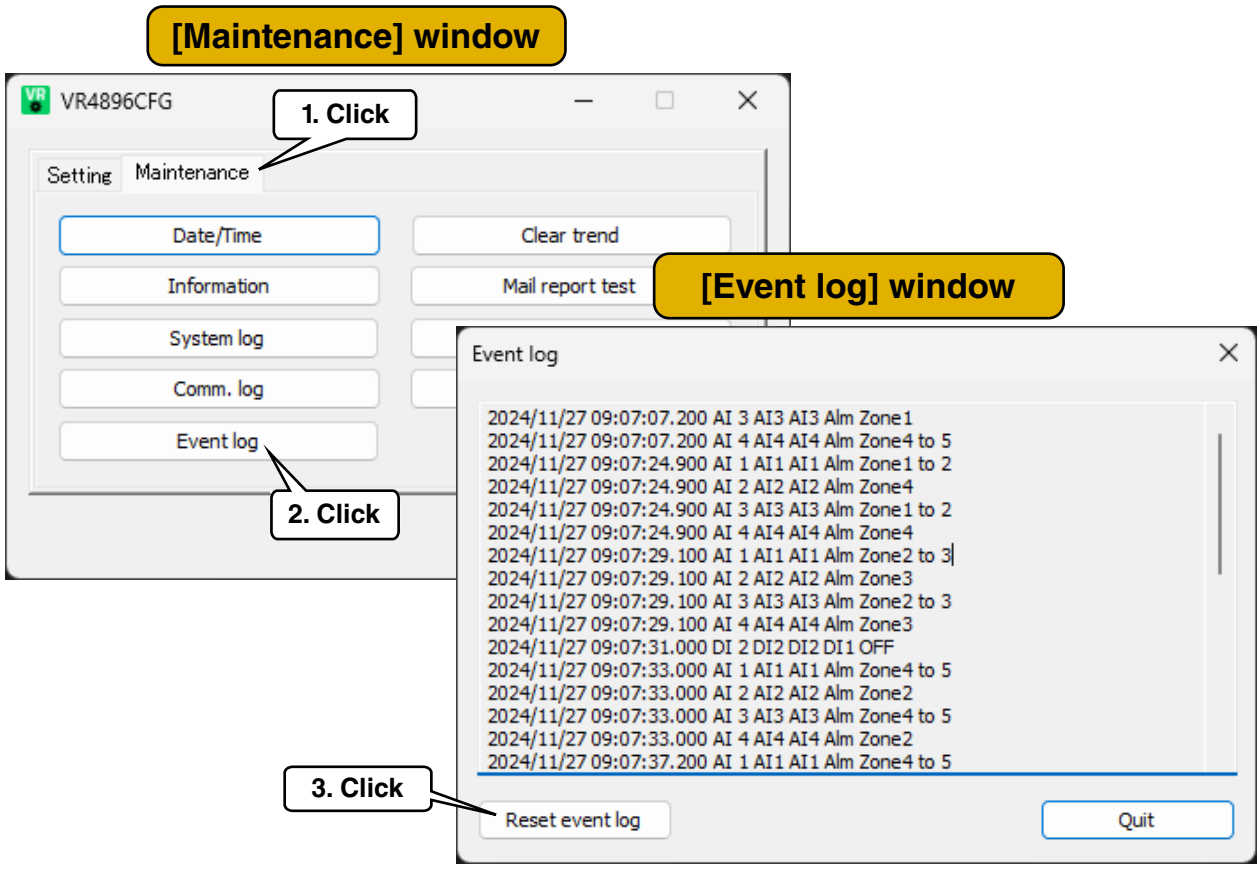
Message	Meaning
FTPC,1,CLOG.txt,Success	Succeeded in the transfer of CLOG.txt.
SMTP,1,F1,Regular	Succeeded in the regular reporting of Form1.

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

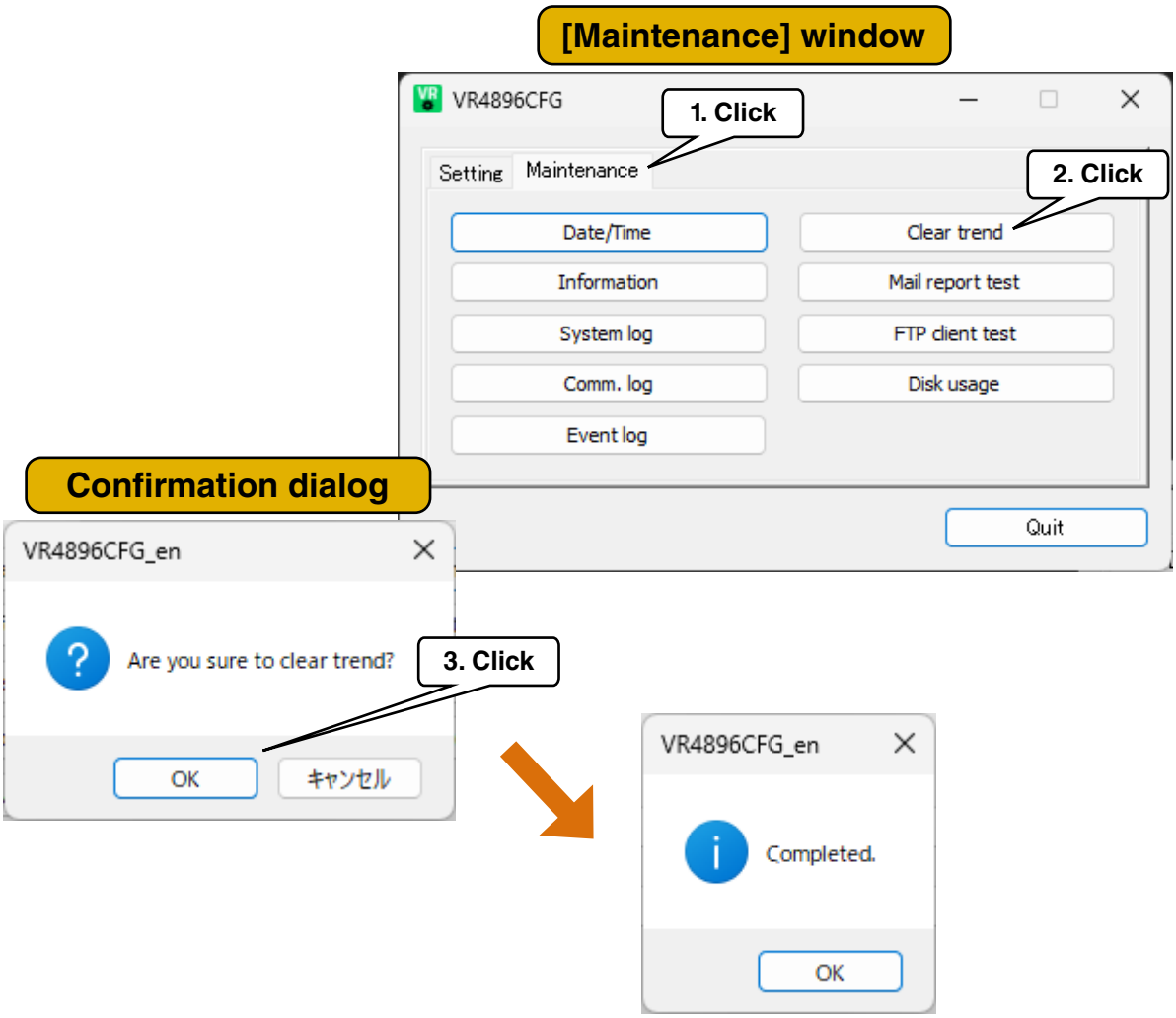
Follow the procedure below in order to display the list of event logs.



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

5.1.6 Clear trend

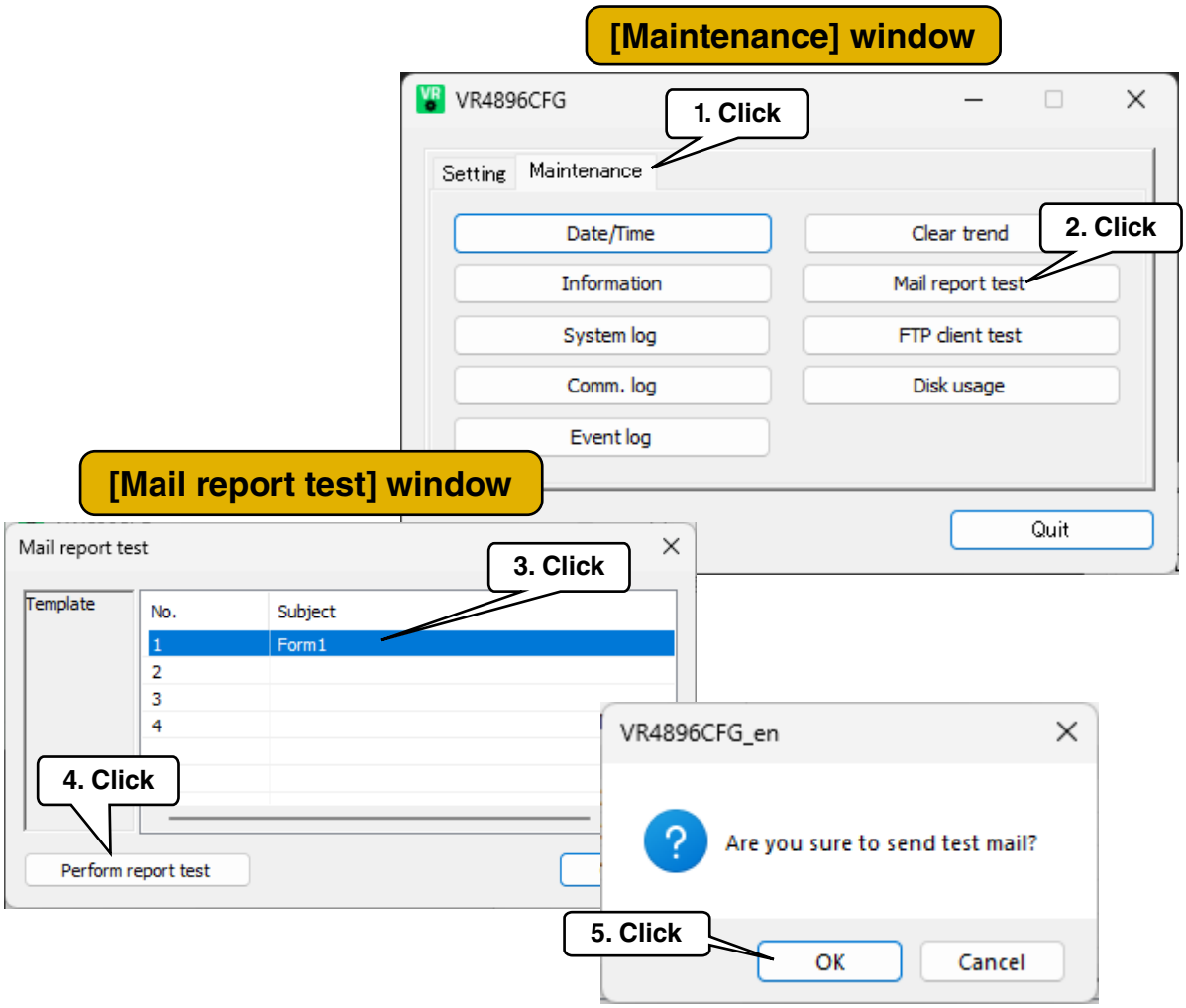
Follow the procedure below in order to clear the trend.



1. Click [Maintenance] tab.
2. Click [Clear trend] button. The confirmation dialog appears.
3. Click [OK] button. The result of performing clearing trend appears in the dialog.

5.1.7 E-mail reporting test

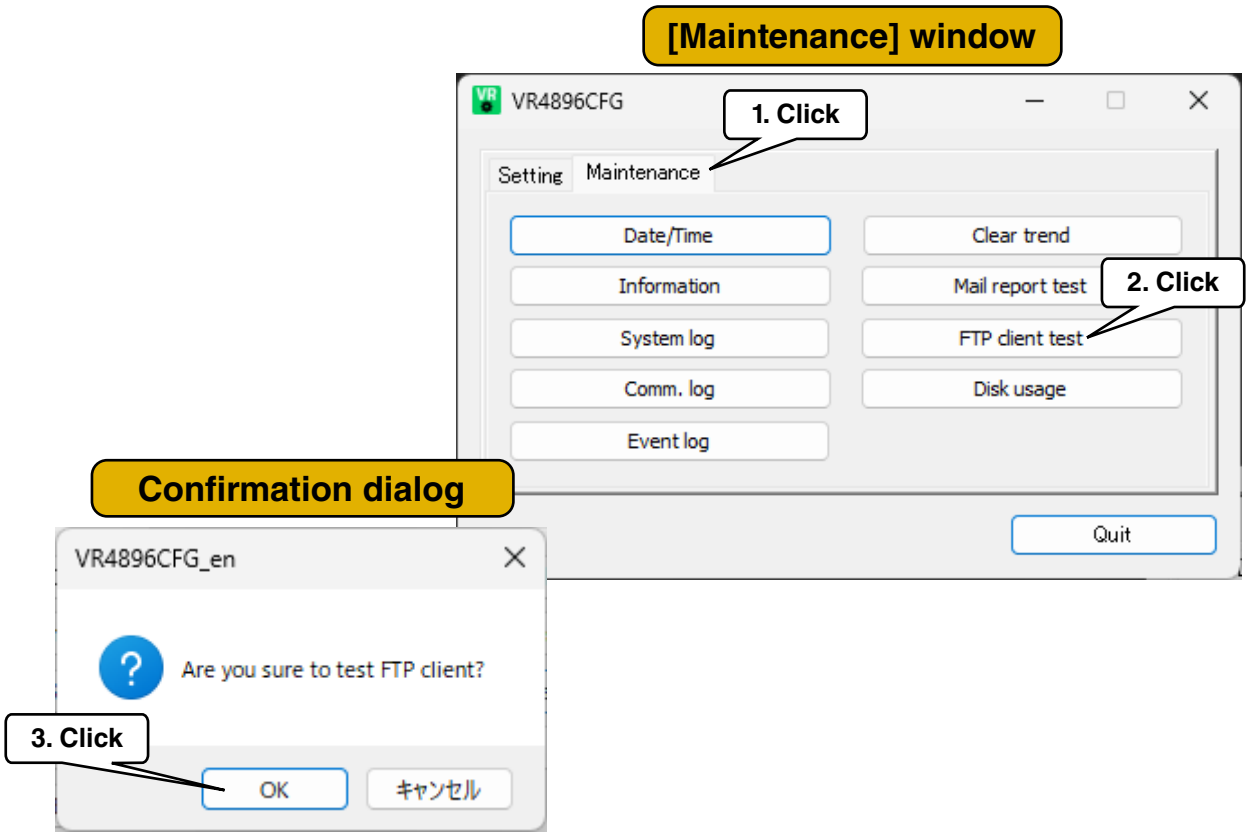
Perform e-mail reporting test.



1. Click [Maintenance] tab.
2. Click [Mail report test] button. After logging in, [Mail report test] window appears.
3. Click the template to perform the e-mail reporting test. ➔ 3.8.3 Template setting
4. Click [Perform report test] button. Then, the confirmation dialog appears.
5. Click [OK] button to perform the e-mail reporting test.

5.1.8 FTP client test

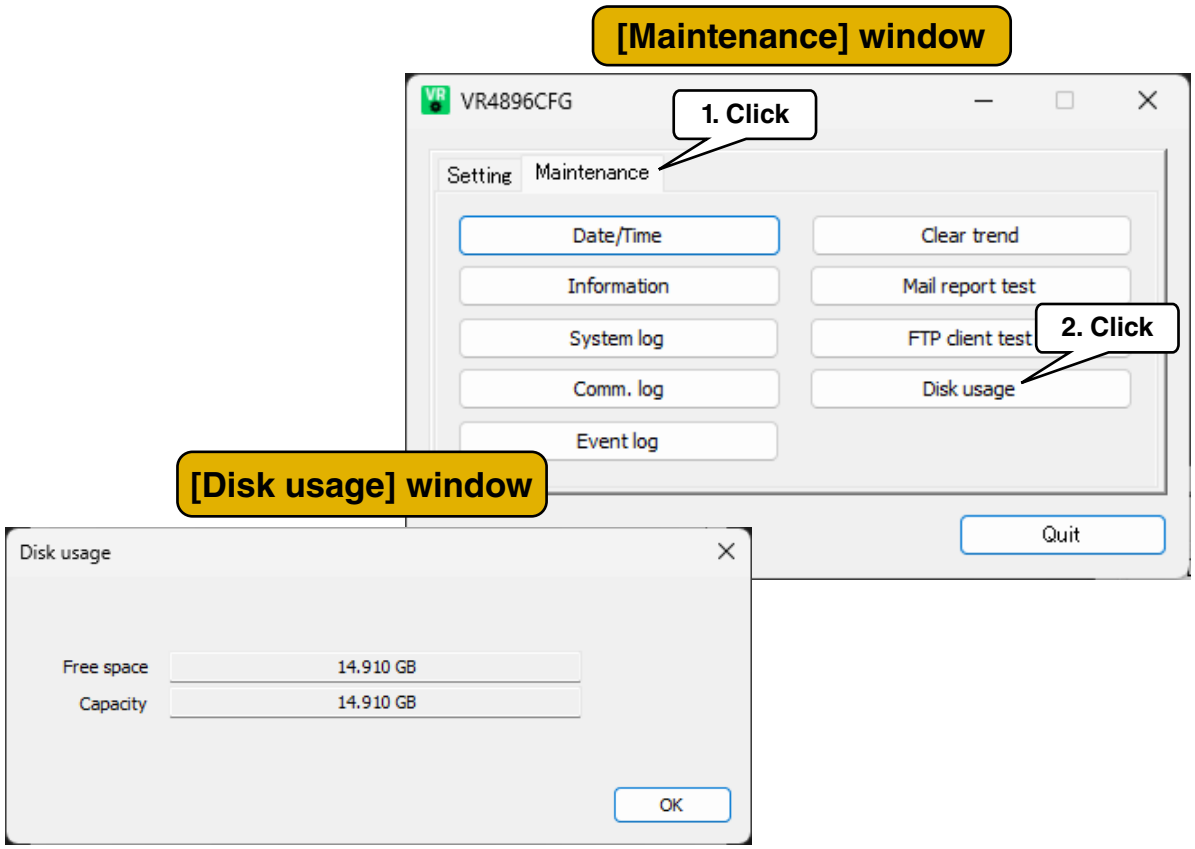
Perform FTP client test.



1. Click [Maintenance] tab.
2. Click [FTP client test] button. Then, the confirmation dialog appears.
3. Click [OK] button. After logging in, the FTP client test is performed.

5.1.9 Disk usage

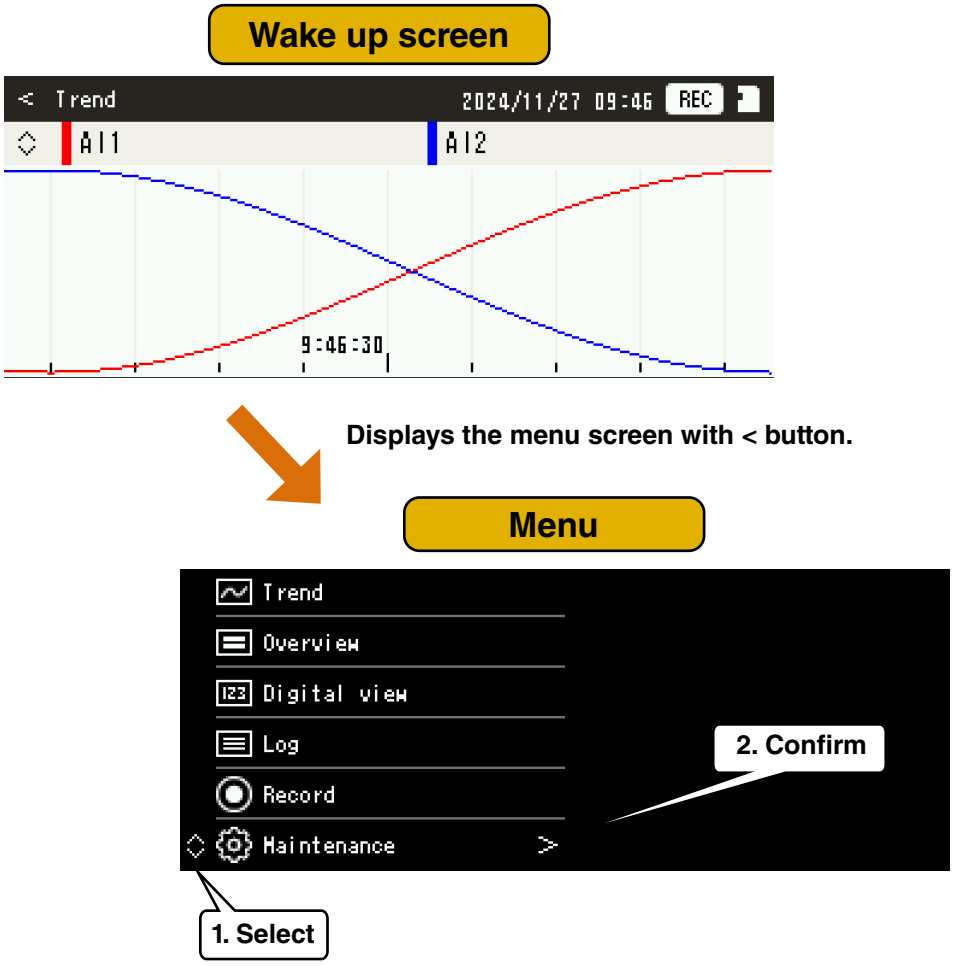
Follow the procedure below in order to display the disk usage.



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

5.2 Maintenance from VR4896E-G2

Maintenance can be performed on the device screen.



For details, refer to 4.3.7 Maintenance screen.

6. Recorded data

Depending on the settings, trend data, system logs, event logs and communication logs are stored in the SD card in the specified file format.

6.1 General specification

The working directory is directly under the SD card. The pre-confirmation data (intermediate data of each recorded data) is saved there.
The updating cycle of the pre-confirmation data is as follows.

Item	Description
Trend data	Depends on the storing rate. 100 ms: 5 sec. 500 ms: 10 sec. 1 s, 2 s, 5 s, 10 s: the timing of 00 sec. 1 m, 2 m, 5 m, 10 m, 30 m, 1 h: at the storing timing
System log	Updated sequentially.
Event log	
Communication log	

The conditions for finalizing the pre-confirmation data are as shown in the table below.
Finalized files are registered in the FTP client's queue. ➔ 3.2.3 FTP server
It is also possible to download 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, 4.3.7.5 Setting At the time of the device startup. When the SD card is inserted. When the setting is changed.
System log	When the pre-confirmation data size exceeds 128KBytes. At the time of the device startup.
Event log	
Communication log	

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	No SD card: Not saved. SD card removal process: Recording stops. When inserting SD card: Same operation as at the time of power startup. 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	None
At the time of power startup	The pre-confirmation data before power startup is finalized and saved in the designated folders. The designated folder and file name are determined by the date information when the recorded data is finalized.

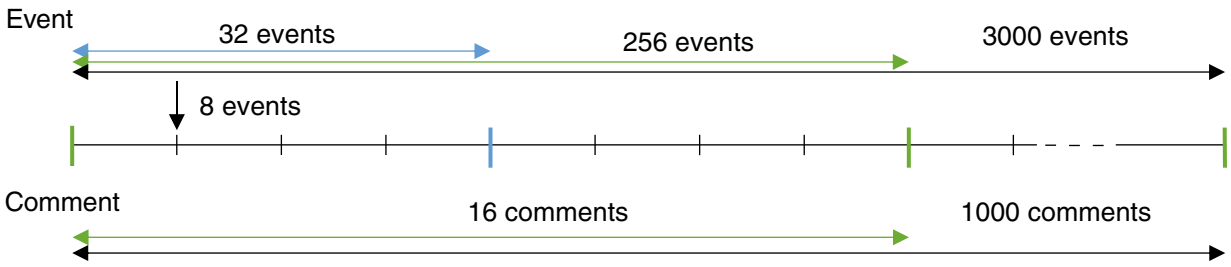
6.2 Trend data

The trend data is recorded according to the settings in the configurator software or in the device.
➔ 3.5 Trend setting, 4.3.7.5 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, event data, comment data - CSV file: Trend data, event data, comment data
Data size (per file)	Max. 50,000 samples × the number of pens (per file)
Data size (total)	Depending on the capacity of the SD card
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 256 events can be recorded every file updating timing. Up to 32 events can be recorded per sample. Up to 8 events can be recorded per 100ms. If the maximum number is exceeded, new events will not be recorded and will be discarded. Example: 500 ms: 8 events are recorded every 100ms, 32 events are recorded every 500ms, Up to 256 events are recorded every 10 seconds of file updating.
Number of comments	Up to 16 comments can be recorded every file updating timing. If the maximum number is exceeded, new comments will not be recorded and will be discarded. Example: 500 ms: Up to 16 comments are recorded every 10 seconds of file updating.



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.

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 confirmed time of the recorded data. Saved in the "TREND\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2024 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
File name	Files are named with the confirmed year, month, day, hour, minute, second, and millisecond of the recorded data (YYYYMMDDhhmmss///) and saved to the SD card. (Example: For August 20, 2024, at 10:30:10.500, the file would be named 20240820103010500.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) ➔ 4.3.7.2 Trend - 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 confirmed time of the recorded data. Saved in the "TREND\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2024 MM: 2-digit month, e.g., 08 DD: 2-digit day, e.g., 20
File name	Files are named with the confirmed year, month, day, hour, minute, second_file type of the recorded data and saved to the SD card. Trend: YYYYMMDDhhmmss_T.CSV Event: YYYYMMDDhhmmss_E.CSV Comment: YYYYMMDDhhmmss_C.CSV (Example: For August 20, 2024, at 10:30:10.500, the file would be named 20240820103010_T.CSV, 20240820103010_E.CSV, 20240820103010_C.CSV)
Data view	Trend data being recorded can be viewed on the device screen. ➔ 4.2.3 Trend screen

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	Number of pens	4											
Row 3	Storing rate	100ms											
Row 4		PEN	Display color	I/O type	CH	CH name	Displayed comment (ON)	Displayed comment (OFF)	Scaling (0%)	Scaling (100%)	Scaling	Number of decimal places	Engineering unit
Row 5		1	0xFF0000	AI	1	AI1			-10	10		2	V
Row 6		2	0x0000FF	AI	2	AI2			4	20		2	mA
Row 7		3	0x00FF00	DI	1	DI1	OFF	ON					
Row 8		4	0x00FFFF	DI	2	Contact 2	OFF	ON					
Row 9													
Row 10		Date	Time	Milisecond	AI1	AI2	DI1	Contact 2					
Row 11					AI1	AI2	DI1	Auxiliary power					
Row 12		2024/8/21	16:02:20	500	6.45	6.84	OFF	OFF					
Row 13		2024/8/21	16:02:20	600	6.53	6.77	OFF	OFF					
Row 14		2024/8/21	16:02:20	700	6.61	6.71	OFF	OFF					
Row 15		2024/8/21	16:02:20	800	6.69	6.65	OFF	OFF					
•••	…	…	…	…	…	…	…	…	…	…	…	…	…

(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	Message	Event no.	Status
Row 7		2024/8/21	16:02:22	700	AI1	AI1	Zone 1	0	0,0xFF0000
Row 8		2024/8/21	16:02:43	900	Contact 2	Auxiliary power	OFF	0	0,0xFF00FF
Row 9		2024/8/21	16:02:52	700	AI1	AI1	Zone 5	0	0,0x0000FF
Row 10		2024/8/21	16:03:13	800	Contact 2	Auxiliary power	ON	0	0,0xFF0000
Row 11		2024/8/21	16:03:22	700	AI1	Ai2	Zone 3	0	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	Display color
Row 7		2024/9/2	13:27:31	0	Comment 1	0xFF00FF
Row 8		2024/9/2	13:27:41	0	Comment 2	0xFF8000
Row 9		2024/9/2	13:27:47	0	Comment 2	0xFF8000
Row 10		2024/9/2	13:27:52	0	Comment 2	0xFF8000
Row 11		2024/9/2	13:27:56	0	Comment 1	0xFF00FF
…	…	…	…	…	…	…

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, 4.3.7.5 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 "LOG\YYYY\MM\DD" folder. YYYY: 4-digit year, e.g., 2024 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 confirmed year, month, day, hour, minute, second, and S of the recorded data (YYYYMMDDhhmmssS.txt) and stored to the SD card. (Example: For August 20, 2024, at 10:30:10, the file would be named 20240820103010S.txt.)
Data view	Regardless of whether system logs are recorded or not, the latest 32 system logs can be viewed on the device.

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, 4.3.7.5 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., 2024 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 the I/O setting Comment: The comment set in the I/O setting (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 set in the I/O 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))
File name	Files are named with the confirmed year, month, day, hour, minute, second, and E of the recorded data (YYYYMMDDhhmmssE.txt) and stored to the SD card. (Example: For August 20, 2024, at 10:30:10, the file would be named 20240820103010E.txt.)
Data view	Regardless of whether event logs are recorded or not, the latest 32 event logs can be viewed on the device.

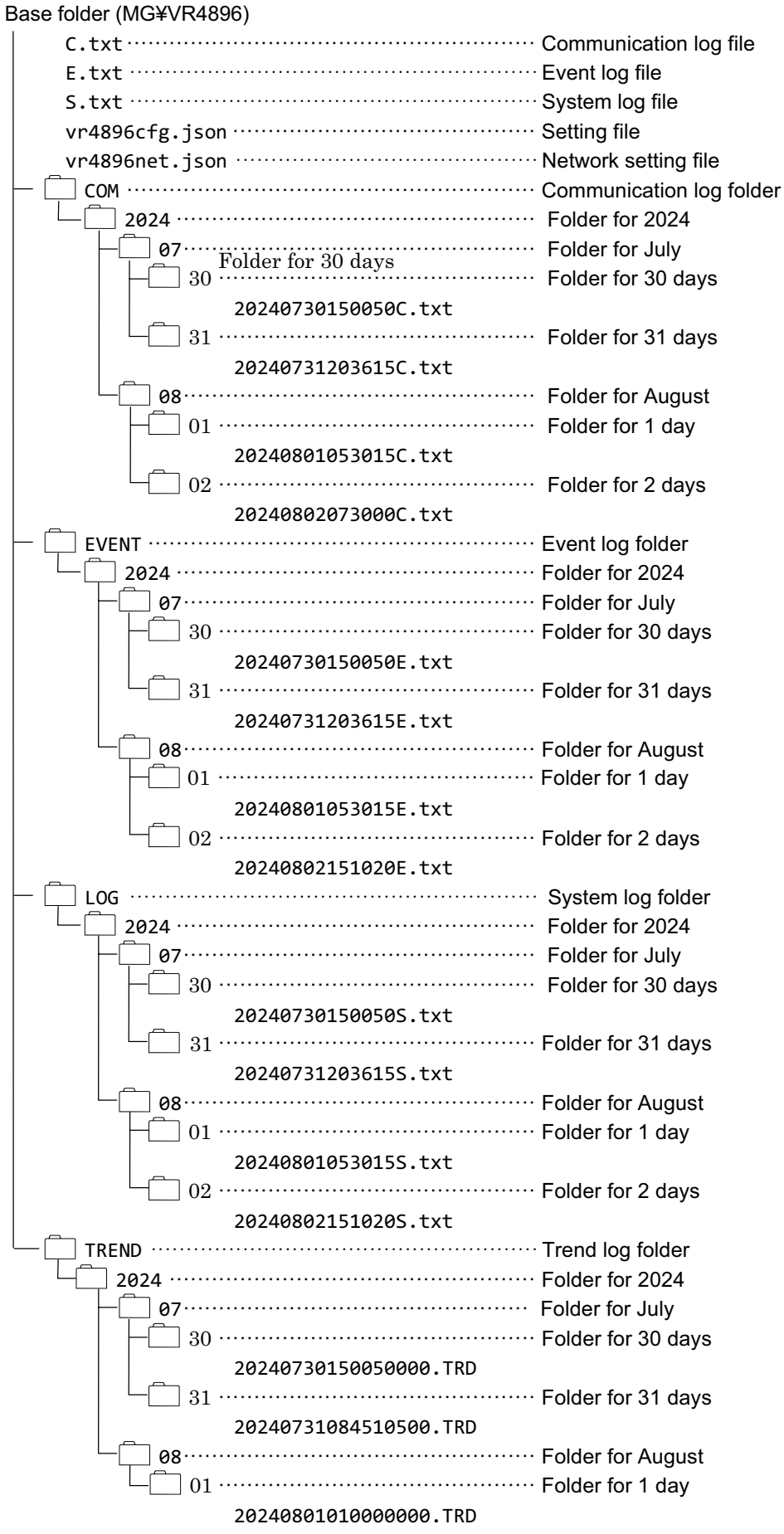
6.5 Communication log

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, 4.3.7.5 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., 2024 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,Reguluar ➔ Succeeded in regular reporting of Form1
File name	Files are named with the confirmed year, month, day, hour, minute, second, and C of the recorded data (YYYYMMDDhhmmssC.txt) and stored to the SD card. (Example: For August 20, 2024, at 10:30:10, the file would be named 20240820103010C.txt.)
Data view	Regardless of whether communication logs are recorded or not, the latest 32 communication logs can be viewed on the device.

6.6 Folder structure

Each file is stored in the base folder "MG¥VR4896" 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¥VR4896)
C.txt ····· Communication log file
E.txt ····· Event log file
S.txt ····· System log file
vr4896cfg.json ····· Setting file
vr4896net.json ····· Network setting file
COM ····· Communication log folder
2024 ····· Folder for 2024
07 ····· Folder for July
Folder for 30 days
30 ····· Folder for 30 days
20240730150050C.txt
31 ····· Folder for 31 days
20240731203615C.txt
08 ····· Folder for August
01 ····· Folder for 1 day
20240801053015C.txt
02 ····· Folder for 2 days
20240802073000C.txt
EVENT ····· Event log folder
2024 ····· Folder for 2024
07 ····· Folder for July
30 ····· Folder for 30 days
20240730150050E.txt
31 ····· Folder for 31 days
20240731203615E.txt
08 ····· Folder for August
01 ····· Folder for 1 day
20240801053015E.txt
02 ····· Folder for 2 days
20240802151020E.txt
LOG ····· System log folder
2024 ····· Folder for 2024
07 ····· Folder for July
30 ····· Folder for 30 days
20240730150050S.txt
31 ····· Folder for 31 days
20240731203615S.txt
08 ····· Folder for August
01 ····· Folder for 1 day
20240801053015S.txt
02 ····· Folder for 2 days
20240802151020S.txt
TREND ····· Trend log folder
2024 ····· Folder for 2024
07 ····· Folder for July
30 ····· Folder for 30 days
20240730150050000.TRD
31 ····· Folder for 31 days
20240731084510500.TRD
08 ····· Folder for August
01 ····· Folder for 1 day
20240801010000000.TRD

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	Hold down > button 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. ➔ 4.3.7.10 Disk usage, 5.1.9 Disk usage

7.1.2 VR4896CFG

Problem faced	Checks to be done	Method of handling
Unable to communicate between VR4896E-G2 and VR4896CFG.	Is the IP address correct?	Check the IP address on the screen of the VR4896E-G2. ➔ 4.3.7.7 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 VR4896E-G2 and in the PC?	Check the IP address. Issue the ping command from the PC and check whether there is a response. [Example] VR4896E-G2 : 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 VR4896E-G2. ➔ 4.3.7.6 Communication setting

7.1.3 E-mail reporting

Problem faced	Checks to be done	Method of handling
Unable to send e-mails from the VR4896E-G2.	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 VR4896E-G2 been correctly set?	Check the settings of the IP address and default gateway of the VR4896E-G2. ➔ 4.3.7.7 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 VR4896E-G2.	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 VR4896E-G2 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 VR4896E-G2.	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 VR4896E-G2 correct?	Check the IP address. ➔ 4.3.7.7 Network setting
	Has the same network address been specified in the VR4896E-G2 and in Modbus server device?	Check the network address. [Example] VR4896E-G2: 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 VR4896CFG?	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 VR4896E-G2.	Have the setting of the FTP server function for the VR4896E-G2 been enabled?	Set the mode in the FTP server setting in VR4896CFG as [Enable]. ➔ 3.2.3 FTP server, 4.3.7.6 Communication setting
	Are the IP address, Login ID and the password for the VR4896E-G2 correct?	Check the IP address.
		Check the Login ID and password set in VR4896CFG. ➔ 3.2.3 FTP server
	Is it possible to login to the VR4896E-G2 from an FTP client such as a PC?	Check whether a DOS command can be used to login to the VR4896E-G2.
Unable to perform maintenance of files in the VR4896E-G2 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 VR4896E-G2 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 VR4896E-G2.	Are the FTP server address, login, password, and destination folder name correct?	Check the login name and password for the FTP server. ➔ 3.2.3 FTP server
	Is the subfolder to transfer specfied?	Check the subfolder name on the FTP server. ➔ 3.2.3 FTP server
	Does VR4896E-G2 regularly transmit to the FTP server?	Check the transmission status. ➔ 4.2.10 Communication log screen, 5.1.4 Communication log

7.2 Reference documents

7.2.1 FTP server

Item	Description
FTP client	OS: Windows 10, 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
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

File transfer by FTP client function is performed as follows.

- Files corresponding to the confirmed saving format on the SD card are registered in a transmission queue. They are sent to the FTP server in order of registering in the queue.
- Maximum 8 sets of data are stored in the queue.
  The data exceeded the max. limit is not registered. They are discarded and registered in system log.
- If file transmission fails, it will be resent 3 times, including the initial attempt. The first retry will continue 10 seconds later, and the second retry will continue 20 seconds later.
- 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.
- The "transmission queue" is reset with a power reset.

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

Parameter	Description
Header	Automatically added
Subheader	Fixed at 0x5000
Request destination station network number	Network No. specified in the VR4896CFG I/O connection setting
Request destination station number	Station No. specified in the VR4896CFG I/O connection setting
Request destination unit I/O number	Processor No. specified in the VR4896CFG I/O connection setting
Request destination multidrop station number	Fixed at 0
Request data length	Automatically added
Monitoring timer	SLMP Timeout specified in the VR4896CFG connection setting
Request data	Automatically generated by the device specified by the VR4896CFG
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

7.2.4.2 Register map

0X

Register	Channel
1	DO1
2	DO2

1X

Register	Channel
1	DI1
2	DI2

3X

Register	Channel
0001	AI1
0002	AI2
0003	AI3
0004	AI4
1001	OI1 (low)
1002	OI1 (high)
1003	OI2 (low)
1004	OI2 (high)
1005	OI3 (low)
1006	OI3 (high)
1007	OI4 (low)
1008	OI4 (high)

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 VR4896E-G2 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.

- A maximum of 8 reports are stored in the reporting queue. The reports exceeding the limit are not registered. They are discarded and registered in the system log.
- If file transmission fails, it will be resent 3 times, including the initial attempt. The first retry will continue 10 seconds later, and the second retry will continue 20 seconds later.
- When transmission fails, the transmission failure output is turned ON. When transmission is successful or when e-mail reporting-related settings or account-related settings are changed, the transmission failure output is turned OFF. The same applies during test transmissions.
- The "reporting queue" is reset with a power reset.
- The encryption method supports "TLS1.2".

7.2.6 SD card

7.2.6.1 SD card basic specifications

Item	Description
Type	SDHC
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

Old files in the SD card can be automatically deleted by enabling the auto deleting function.
The oldest files can be automatically deleted when the remaining space of the SD card is less than 100 MB.
(Except for system logs, event logs and communication logs) ➔ 3.5.1 Basic setting, 4.3.7.5 Setting
The conditions for deletion are as follows.

- The data older than 2 years are deleted.
- Up to 30 files are deleted at a time. 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 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.

8. License

Below are the licenses for the functions used in VR4896E-G2 and VR4896CFG.

8.1 License

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