Gas Detector Head

GD-84D-EX Series (Ethernet models)

GD-84D-EX-ET-EC
GD-84D-EX-ET
GD-84D-EX-EA-EC
GD-84D-EX-EA

Communication Functions Operating Manual

RIKEN KEIKI Co.,Ltd.

2-7-6 Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan
Website: https://www.rikenkeiki.co.jp/

Contents

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About this document

1-1 Introduction

Thank you for purchasing this GD-84D-EX series Gas Detector (Ethernet models) ("product" hereinafter).
This operating manual describes product operating procedures and specifications for GD-84D-EX series (Ethernet models) Ethernet functions.
Make sure you have read and fully understood the contents of this manual before use.
Note that the GD-84D-EX series (Ethernet models) are intended to be used as part of a network.
Additionally, be sure to read the 'GD-84D-EX Series Gas Detector Head Operating Manual'.
Keep this operating manual on hand to allow ready reference during use.

The contents of this manual are subject to change without notice to allow product improvements. Any duplication or reproduction of this manual without permission is prohibited, whether in whole or in part.
Riken Keiki accepts no liability for accidents or damage resulting from use of programs of devices communicating with the product, whether within or outside the warranty period.
Review the warranty policy indicated on the warranty.

<Models covered by this operating manual>
・ GD-84D-EX-ET-EC
・ GD-84D-EX-ET
・ GD-84D-EX-EA-EC
・ GD-84D-EX-EA

<About the notations used in this document>
<Notations used for numbers>
Decimal: Numbers only indicated
Example: 1, 100, 1000, etc.
Hexadecimal: Values are prefixed with "0x".
Example: 0x00, 0x64, 0x3EB, etc.

<Sensor positioning indications>
In this document, the positions [A1], [A2], [B1], and [B2] at which the sensors are fitted in this product are indicated as slot 1, slot 2, slot 3, and slot 4.

1-2 DANGER, WARNING, and NOTE

This operating manual uses the following categories to indicate potential damage/hazards if the user disregards the information provided and uses the product incorrectly:

⚠ DANGER	This indicates situations in which improper handling may result in fatal or serious injury or significant property damage.
⚠ WARNING	This indicates situations in which improper handling may result in serious injury or significant property damage.
⚠ CAUTION	This indicates situations in which improper handling may result in minor injury or minor property damage.

Additionally, usage recommendations are indicated as follows:

NOTE	This indicates items that will be helpful to know when using the product.

2

Device connection

2-1 Connecting the product and a PC

Connect the product and the PC as shown below.

When using a switching hub (PoE+)>

GD-84D-EX (Ethernet model)

<When using a switching hub (non PoE+)>
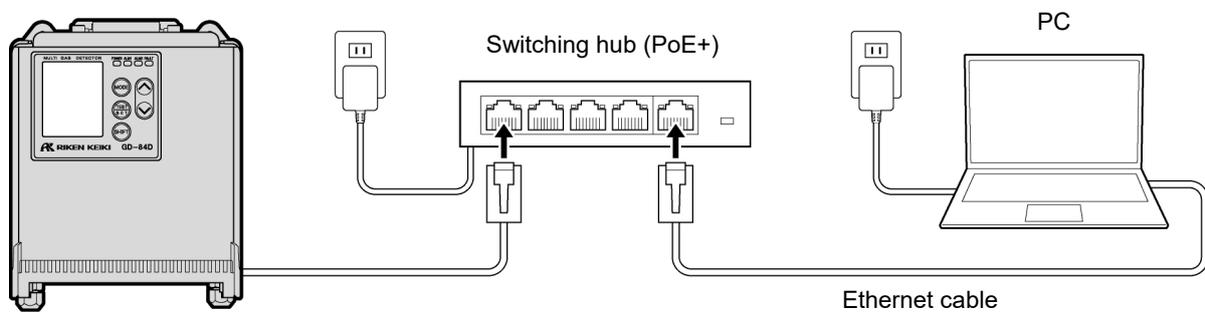
Connect the product to a 24 V DC power supply.

A switching hub (non PoE+) can be used with EA models (GD-84D-EX-EA-EC, GD-84D-EX-EA).

GD-84D-EX (EA model)
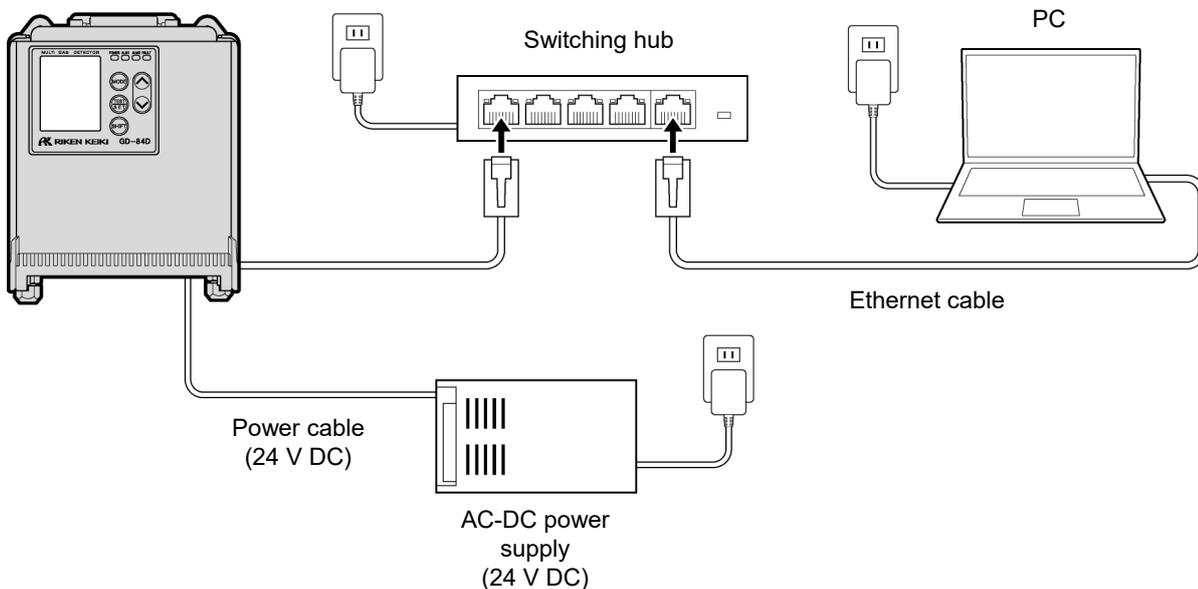
2-2 Setting IP addresses

2-2-1 Setting the IP address for this product

Set the following IP address in this product.
Refer to '7-10-18 ETHERNET settings (ETHERNET)' in the 'GD-84D-EX Series Gas Detector Head Operating Manual' for setting instructions.
IP address: 192.168.1.1
Subnet mask: 255.255.255.0

NOTE
▶ It takes about 10 seconds to write the IP address.

2-2-2 Setting the IP address for the PC

Set the following IP address in Internet Protocol (TCP/IP) Properties.
IP address: 192.168.1.2
Subnet mask: 255.255.255.0

* The above assumes the user is running Windows 10.

⚠️ **CAUTION**

- If the IP address of the device following replacement is identical to the one before replacement, it may not be possible to communicate from the PC to the connected device for a certain period (usually 10 minutes) after replacement.
  To enable communication as quickly as possible, disable the network connection, then enable once again.

2-2-3 Performing communication tests

1   Launch the Windows Command Prompt.

2   Enter "ping 192.168.1.1" and press the <Enter> key.

If the communication test is successful, icons (TX for transmission, RX for reception) will appear on the product LCD as data is transmitted and received.
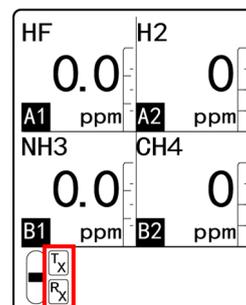
NOTE

▶ If the communication test fails, recheck the connections with the product, the IP address, and other settings.

3

Setting GAS DETECTOR MANAGER

3-1 Overview of GAS DETECTOR MANAGER

3-1-1 About GAS DETECTOR MANAGER

GAS DETECTOR MANAGER is a Web application that connects the product to a PC, allowing real-time monitoring of the status of this product and changes in network and alarm setpoint settings from a Web browser. GAS DETECTOR MANAGER also displays an event history (alarm history) and calibration history and can be used to run calibrations and alarm tests.
GAS DETECTOR MANAGER has a user mode and an administrator mode; each mode has different functions.

<User mode>
Displays basic product information, such as the gas names and alarm setpoints, as well as event history (alarm history) and communication history.

\<Administrator mode\>

Displays basic product information and event history (alarm history), communication history, calibration history, alarm trends, etc.

You can also change settings for alarm setpoints or the network, run calibrations, alarm tests and fault alarm tests, reset alarms, and set INHIBIT.

NOTE

▶ For more information on GAS DETECTOR MANAGER, refer to '5-1 List of GAS DETECTOR MANAGER functions'.

3-1-2 Supported browsers

GAS DETECTOR MANAGER is designed to run in Microsoft Edge.
GAS DETECTOR MANAGER may not be fully compatible with other browsers.

3-2 Launching GAS DETECTOR MANAGER

3-2-1 Network environment settings

\<Proxy server settings (Windows 10)\>

 This feature cannot be used via a proxy server.
 If you are using a proxy server, turn the proxy server settings off.

1   In Windows, select [Settings] → [Network & Internet] → [Proxy].

2   Confirm that [Use a proxy server] is switched to [Off].
       If [Use a proxy server] is switched to [On], switch to [Off].

<When using a local address (Windows 10)>

⚠️ **CAUTION**
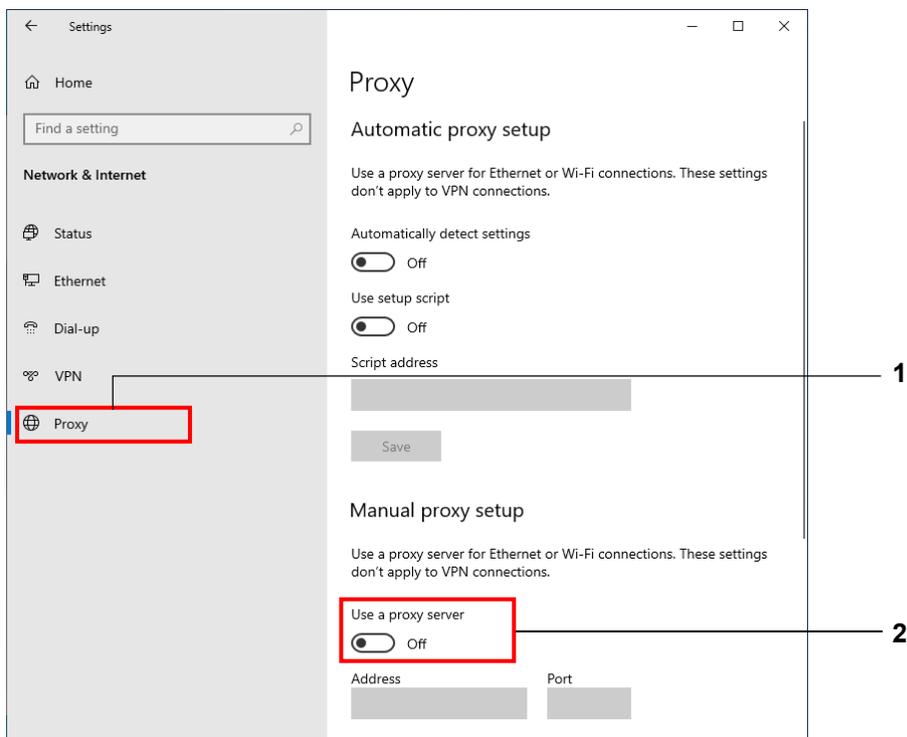
- The following operations are for the settings to use a local address for this product. GAS DETECTOR MANAGER cannot be used via a proxy server.

1   In Windows, select [Settings] → [Network & Internet] → [Proxy].

2   Select the [Don't use the proxy server for local (intranet) addresses] check box.

3   In the [Use the proxy server except for addresses that start with the following entries. Use semicolons (;) to separate entries.] field, enter the IP address for this product.

4.   Click the [Save] button.
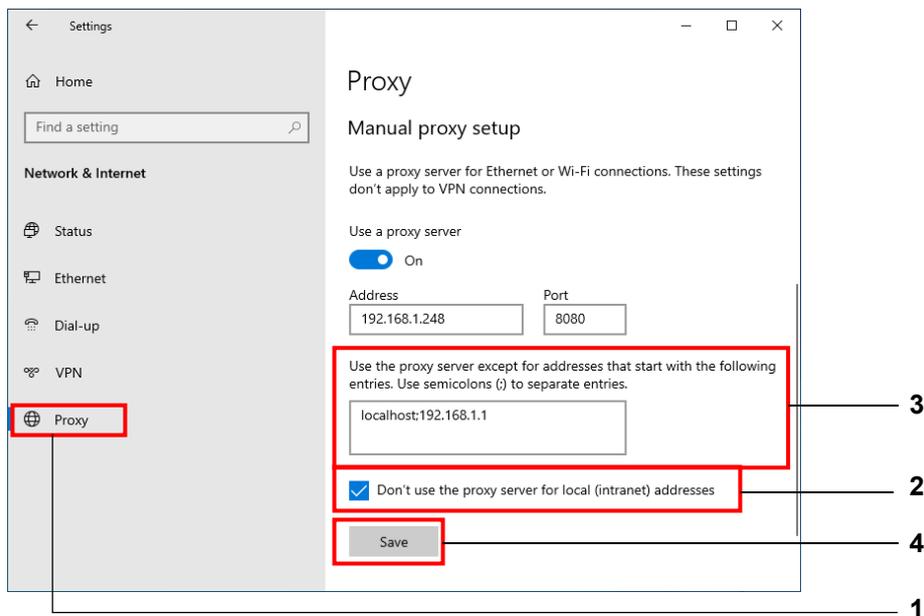
NOTE

▶ If product settings are modified, the message [Data is updated.] will appear when you exit maintenance mode, and the screen is shown again.

▶ Login details are recorded on this product when you log on in administrator mode. These login details are deleted when the product is turned OFF. For this reason, the PC will display an error if you turn the product ON while GAS DETECTOR MANAGER runs on the PC. Before turning the product OFF, close GAS DETECTOR MANAGER. After starting the product, log into GAS DETECTOR MANAGER once again.

▶ Do not change the settings on GAS DETECTOR MANAGER and this product at the same time.

3-2-2 Logging on in user mode

1 Launch Microsoft Edge.

2 In the [Search or enter web address] field, enter "http://192.168.1.1" and press the <Enter> key.
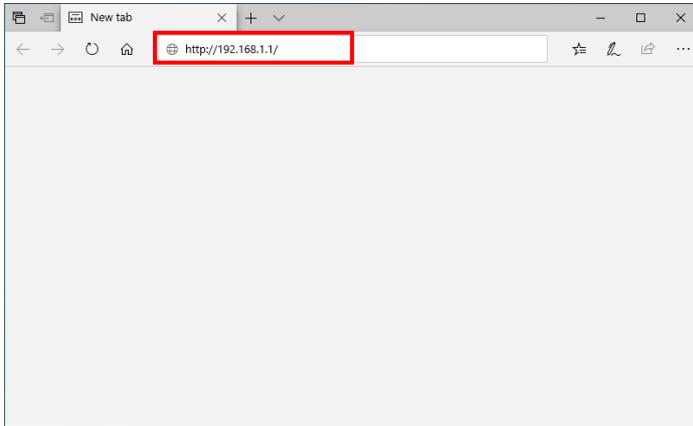
Displays the user mode screen for GAS DETECTOR MANAGER.

NOTE
▶ Depending on the version and settings of the browser, the actual display may differ.

3-2-3 Logging on in administrator mode

1   **Launch Microsoft Edge.**

2   **In the [Search or enter web address] field, enter "http://192.168.1.1/login.html" and press the <Enter> key.**

3   **Enter the password and click the [Login] button.**
The default password is "GD-84D".
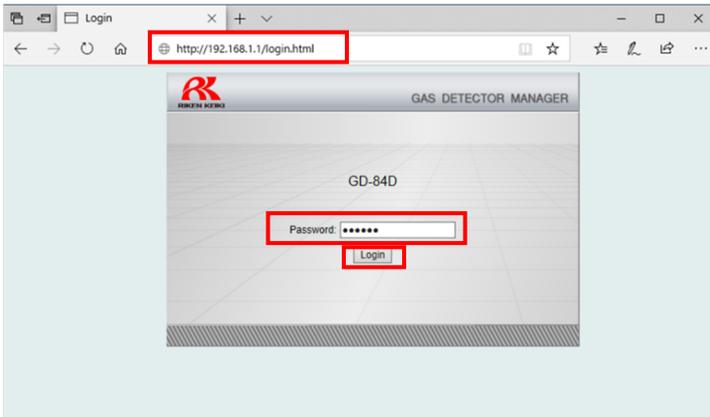
Displays the administrator mode screen for GAS DETECTOR MANAGER.
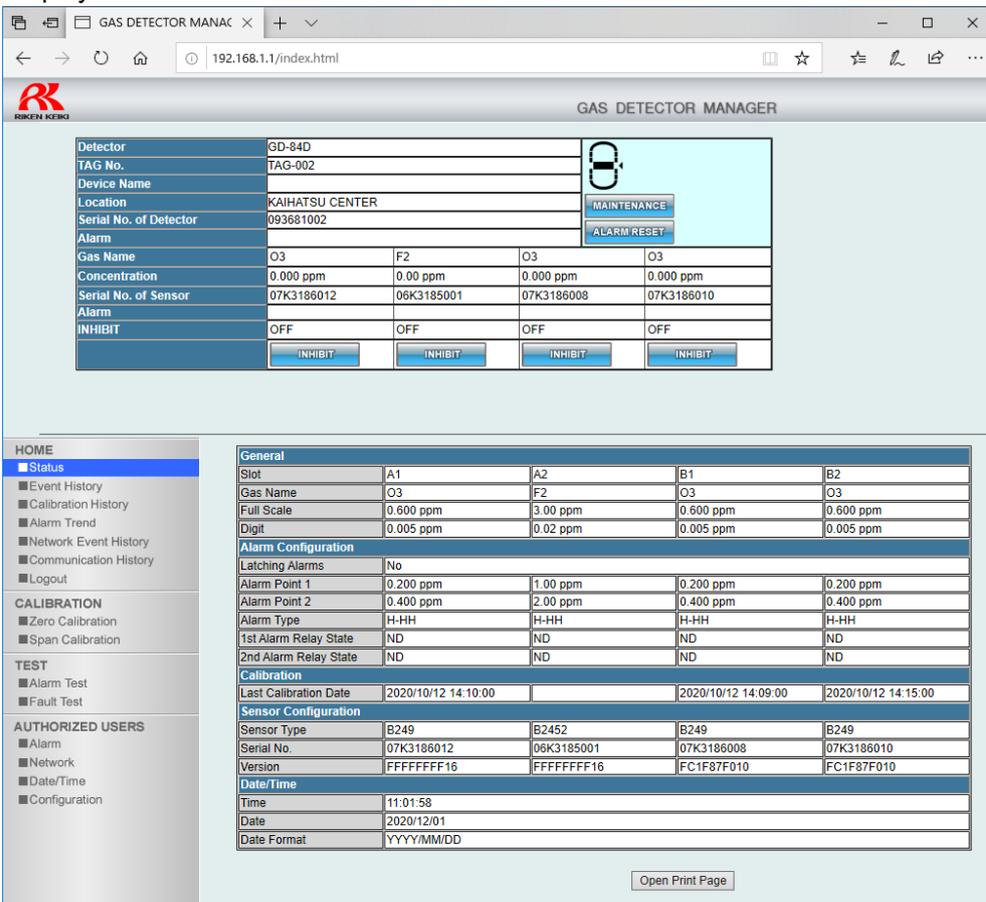
NOTE

▶ Depending on the version and settings of the browser, the actual display may differ.

\<Logging out of administrator mode\>

Click [Logout] in [HOME].

HOME
- ■Status
- ■Event History
- ■Calibration History
- ■Alarm Trend
- ■Network Event History
- ■Communication History
- ■Logout

CALIBRATION
- ■Zero Calibration
- ■Span Calibration

TEST
- ■Alarm Test
- ■Fault Test

AUTHORIZED USERS
- ■Alarm
- ■Network
- ■Date/Time
- ■Configuration

General

Slot	A1	A2	B1	B2
Gas Name	O3	F2	O3	O3
Full Scale	0.600 ppm	3.00 ppm	0.600 ppm	0.600 ppm
Digit	0.005 ppm	0.02 ppm	0.005 ppm	0.005 ppm

Alarm Configuration

Latching Alarms	No			
Alarm Point 1	0.200 ppm	1.00 ppm	0.200 ppm	0.200 ppm
Alarm Point 2	0.400 ppm	2.00 ppm	0.400 ppm	0.400 ppm
Alarm Type	H-HH	H-HH	H-HH	H-HH
1st Alarm Relay State	ND	ND	ND	ND
2nd Alarm Relay State	ND	ND	ND	ND

Calibration

Last Calibration Date	2020/10/12 14:10:00		2020/10/12 14:09:00	2020/10/12 14:15:00

Sensor Configuration

Sensor Type	B249	B2452	B249	B249
Serial No.	07K3186012	06K3185001	07K3186008	07K3186010
Version	FFFFFFFF16	FFFFFFFF16	FC1F87F010	FC1F87F010

Date/Time

Time	11:01:58
Date	2020/12/01
Date Format	YYYY/MM/DD

Open Print Page

4

PLC communication settings

This is a simple setup that allows easy connection to OMRON PLCs (CJ/CS series) and Mitsubishi Electric PLCs (Q series) by setting the PLC mode and PLC area.

> PLC mode: Select the PLC model to be connected and the communication data size.
> PLC area: Select the data area to be used for writing/reading detectors in the destination PLC.

*When setting up using PLC mode or PLC area, the IP address of the PLC to be connected will be fixed at xxx.xxx.xxx.251.

4-1-1 PLC communication settings (OMRON CJ/CS series)

There are two ways to set PLC communications.

<Setting with GAS DETECTOR MANAGER>

Log in at the administrator mode screen for GAS DETECTOR MANAGER. Make the settings in Network screen.
Detailed PLC communication settings can be made in GAS DETECTOR MANAGER.
For instructions on making or modifying settings, refer to '4-1-3 Setting PLC communication (OMRON CJ/CS series) with GAS DETECTOR MANAGER'.

NOTE
> ▶ Detailed settings for PLC communication can be made when the [PLC Mode] is [1].

<Setting in product maintenance mode>

Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode ([SET-18 ETHERNET] in [2-10 SETTING2]).
In each of the [PLC Mode] and [PLC Area] modes, the setting values for the PLC communication settings are set automatically for each area.
For instructions on making or modifying settings, refer to '4-1-4 Setting PLC communication (OMRON CJ/CS series) with the product'.

4-1-2 Connecting the PLC (OMRON CJ/CS series)

Connect the product and the PLC (OMRON CJ/CS series).
The following shows an example of making a connection when using a PoE+ compliant switching hub.
Set the following IP address in the PLC:
・ IP address: 192.168.1.251
・ FINS/UDP port: 9600

GD-84D-EX (Ethernet model)
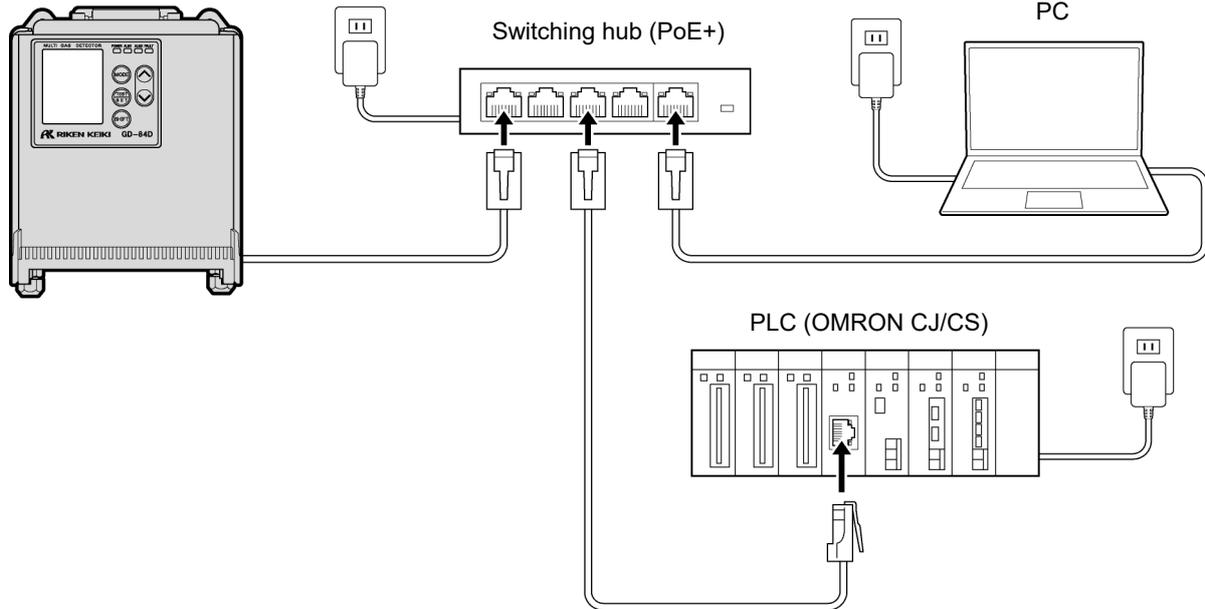
NOTE
▶ The PLC IP address is set to xxx.xxx.xxx.251, with the NODE fixed at 251. (xxx is the product IP address.)

4-1-3 Setting PLC communication (OMRON CJ/CS series) with GAS DETECTOR MANAGER

Log in at the administrator mode screen for GAS DETECTOR MANAGER and click [■Network] to display the Network screen.
The [PLC Mode] must be set to [1] to make detailed settings for PLC communications.
The following screen shows an example of writing Basic Data:Small in the 0 address of the D memory of the PLC.
In this example, note that the PLC IP address is: 192.168.1.251; the NODE: 251; and the FINS/UDP port: 9600.

Make the [PLC Mode] [1] ———

Items that can be set ———

PLC	
PLC Mode	1 ∨
PLC Area	0 ∨
PLC Type	○ Not Use ● FINS ○ MC
Type of Basic Data	● Small ○ Large ○ Very Small
Use Optional Data	○ Yes ● No

Interval	Min	1000	msec
	Max	3000	msec
Timeout		10	sec

FINS			
IP Address		192 . 168 . 1 . 251	
Port		9600	

Detector	Network Address	0	
	Node Address	0	
	Unit Number	0	
PLC	Network Address	0	
	Node Address	251	
	Unit Number	0	
Detector Write	Memory Address	0	
	Area Type	DM ∨	130
Detector Read	Memory Address	10000	
	Area Type	DM ∨	130

HOME
■Status
■Event History
■Calibration History
■Alarm Trend
■Network Event History
■Communication History
■Logout

CALIBRATION
■Zero Calibration
■Span Calibration

TEST
■Alarm Test
■Fault Test

AUTHORIZED USERS
■Alarm
■Network
■Date/Time
■Configuration

NOTE
▶ For more information on settings for PLC communication, refer to '7. PLC communication'.
▶ For information on PLC settings and tools, refer to the PLC operating manual.

⚠ CAUTION

- Any errors in data written to the PLC memory may result in unexpected PLC behavior. Check the data for errors before finalizing the settings.

4-1-4 Setting PLC communication (OMRON CJ/CS series) with the product

Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode
([SET-18 ETHERNET] in [2-10 SETTING2]). (Refer to '7-10-18 ETHERNET settings (ETHERNET)' in the
'GD-84D-EX Series Gas Detector Head Operating Manual')

If you set the [PLC Mode] to [2] and the [PLC Area] to [2] with this unit, the PLC communication settings
will be as follows.
In this example, note that the PLC IP address is: 192.168.1.251; the NODE: 251; and the FINS/UDP port:
9600.

PLC Mode = 2		
	PLC Type	FINS
	Type of Basic Data	Small
	Memory Address	
		Detector write	0*
		Detector read	-
PLC Area = 2		
	Area Type (FINS)	E2

* When the product IP address is 192.168.1.1

NOTE

▶ The PLC IP address is set to xxx.xxx.xxx.251, with the NODE fixed at 251. (xxx is the product IP
address.)
▶ For more information on settings for PLC communication, refer to '7. PLC communication'.
▶ For more information on [PLC Mode], the various [PLC Area] modes, and the PLC communication
settings corresponding to each area, refer to '7-6 PLC communication setting specifications using
this product'.
▶ For information on PLC settings and tools, refer to the PLC operating manual.

⚠️ **CAUTION**

- Any errors in data written to the PLC memory may result in unexpected PLC behavior. Check the
data for errors before finalizing the settings.

4-2 MELSEC Q series

4-2-1 PLC communication settings (MELSEC Q series)

There are two ways to set PLC communications.

<Setting with GAS DETECTOR MANAGER>

Log in at the administrator mode screen for GAS DETECTOR MANAGER. Make the settings in Network screen.

Detailed communication settings can be made in GAS DETECTOR MANAGER.

For instructions on making or modifying settings, refer to '4-4-3 Setting PLC communication (MELSEC Q series) with GAS DETECTOR MANAGER'.

NOTE

▶ Detailed settings for PLC communication can be made when the [PLC Mode] is [1].

<Setting in product maintenance mode>

Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode ([SET-18 ETHERNET] in [2-10 SETTING2]).

In each of the [PLC Mode] and [PLC Area] modes, the setting values for the PLC communication settings are set automatically for each area.

For instructions on making or modifying settings, refer to '4-2-4 Setting PLC communication (MELSEC Q series) with the product'.

4-2-2 Connecting the PLC (MELSEC Q series)

Connect the product and the PLC (MELSEC Q series).
The following shows an example of making a connection when using a PoE+ compliant switching hub.
Set the following IP address in the PLC:
・ IP address: 192.168.1.251
・ UDP local port number: 2000

GD-84D-EX (Ethernet model)
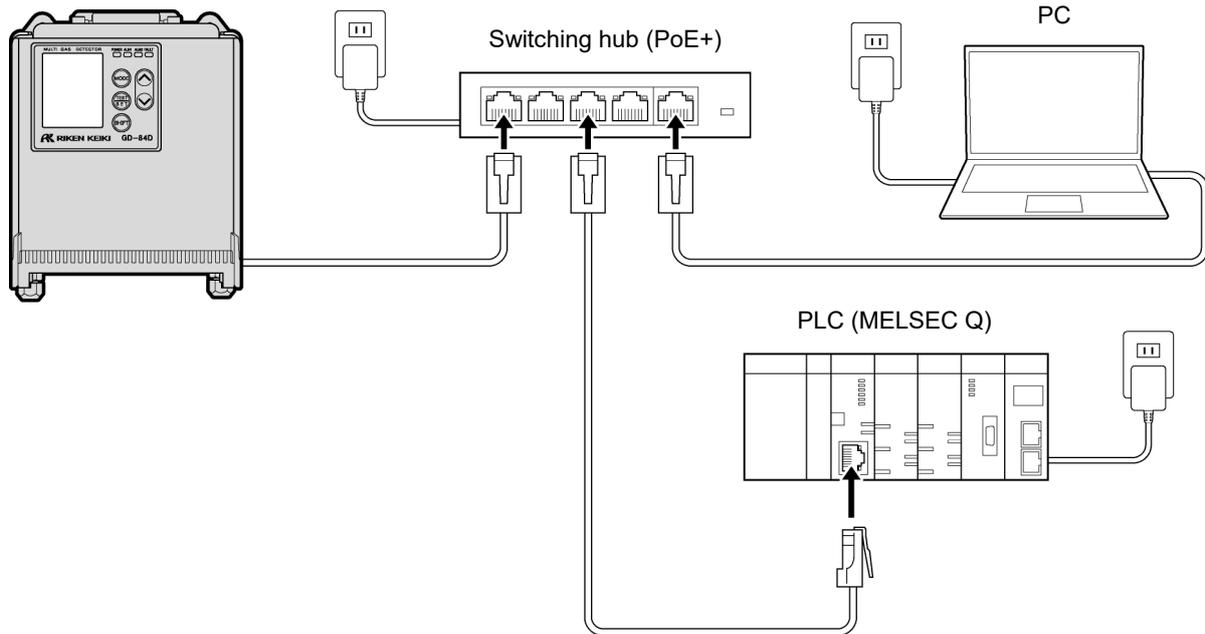
NOTE
▶ The PLC IP address is set to xxx.xxx.xxx.251. (xxx is the same as the product IP address)

4-2-3 Setting PLC communication (MELSEC Q series) with GAS DETECTOR MANAGER

Log in at the administrator mode screen for GAS DETECTOR MANAGER and click [■Network] to display the Network screen.

The [PLC Mode] must be set to [1] to make detailed settings for PLC communications.

The following screen shows an example of writing Basic Data:Small in the 0 address of the D memory of the PLC.

In this example, note that the PLC IP address is: 192.168.1.251, and the UDP local port number: 2000.

NOTE

▶ For more information on settings for PLC communication, refer to '7. PLC communication'.
▶ For information on PLC settings and tools, refer to the PLC operating manual.

⚠ **CAUTION**

- Any errors in data written to the PLC memory may result in unexpected PLC behavior. Check the data for errors before finalizing the settings.

4-2-4 Setting PLC communication (MELSEC Q series) with the product

Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode
([SET-18 ETHERNET] in [2-10 SETTING2]). (Refer to '7-10-18 ETHERNET settings (ETHERNET)' in the
'GD-84D-EX Series Gas Detector Head Operating Manual'.)

If you set the [PLC Mode] to [4] and the [PLC Area] to [2] with this unit, the PLC communication settings
will be as follows.
In this example, note that the PLC IP address is: 192.168.1.251, and the UDP local port number: 2000.

PLC Mode = 4			
	PLC Type		MC
	Type of Basic Data		Small
	Memory Address		
		Detector write	0*
		Detector read	-
PLC Area = 2			
	Area Type (MC)		ZR (65536)

*   When the product IP address is 192.168.1.1

NOTE

▶ The PLC IP address is set to xxx.xxx.xxx.251. (xxx is the same as the product IP address)
▶ For more information on settings for PLC communication, refer to '7. PLC communication'.
▶ For more information on [PLC Mode], the various [PLC Area] modes, and the PLC communication
   settings corresponding to each area, refer to '7-6 PLC communication setting specifications using
   this product'.
▶ For information on PLC settings and tools, refer to the PLC operating manual.

⚠ **CAUTION**

- Any errors in data written to the PLC memory may result in unexpected PLC behavior. Check the
  data for errors before finalizing the settings.

4-3 PLC memory-saving setting function

This function allows a slot that is not equipped with an F-sensor but has a dummy sensor connected to it to be optionally omitted from the data sent to the PLC. The setting of this function can be specified for each slot and is to be selected from enable/disable. The standard settings are all enabled (when disabled, the target sensor is omitted from the transmitted data).

As shown in the figure below, the slot to which the dummy sensor is connected can be set to the disabled setting to save area in the PLC used by one product.

When all are enable

GD-84D

Slot	Sensor Type	PLC memory saving setting
A1	F sensor	ON
A2	Dummy Sensor	ON
B1	F sensor	ON
B2	Dummy sensor	ON

PLC

Memory
1
2
3
4
Data ⋮

When partially disabled

GD-84D

Slot	Sensor Type	PLC memory saving setting
A1	F sensor	ON
A2	Dummy Sensor	OFF
B1	F sensor	ON
B2	Dummy sensor	OFF

PLC
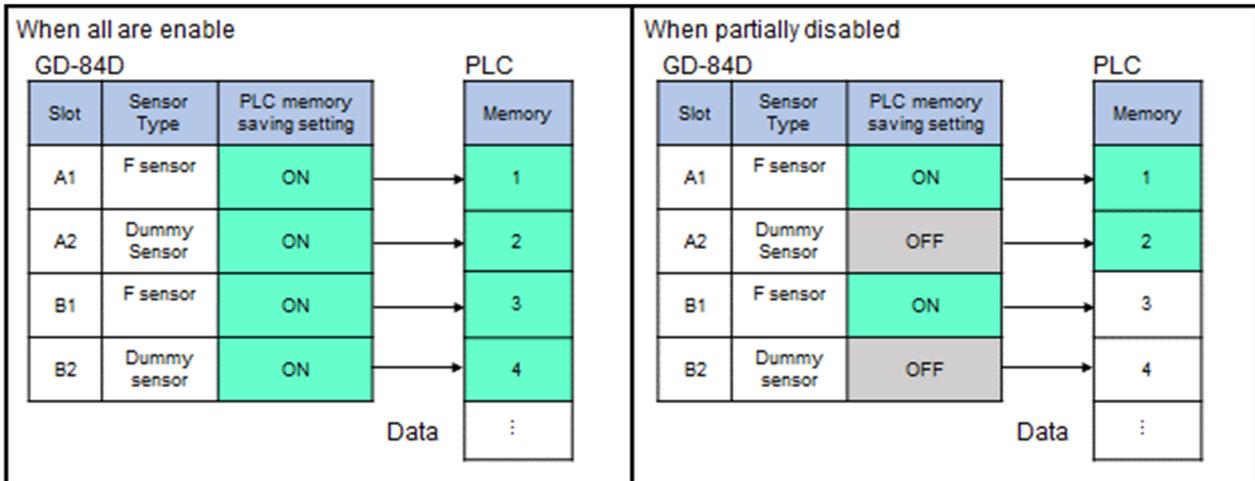
Memory
1
2
3
4
Data ⋮

⚠️ **CAUTION**

- If a sensor other than a dummy sensor is connected, the target slot cannot turn off the PLC memory-saving setting.

- Sensors other than dummy sensors cannot be replaced in slots where the PLC memory saving setting is OFF. (By turning the setting ON before replacement work, it is possible to replace the sensor with one other than a dummy sensor.) Therefore, when changing the configuration of the F sensor and dummy sensor, turn on all PLC memory-saving settings once before replacing the sensor, and then replace the sensor and make the settings again.

- If the address setting of the PLC is wrong regardless of this setting, data in a certain area of the PLC will be duplicated as shown in the figure below. In this case, the same area will be rewritten for each other, resulting in unstable operation.

- When using this function, the size of the area occupied by each PLC is variable depending on the setting, whereas it was fixed at a multiple of 4.

PLC

Memory

1

(1)

2

3

4

5

(2)

6

・

●

（In the left figure, memory 3 is duplicated in products (1) and (2)）
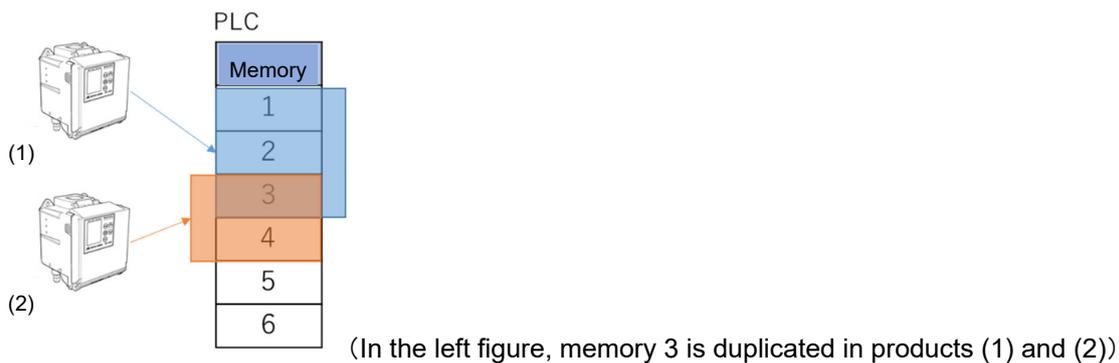
4-3-1　Setting PLC memory saving

Step (1)

Operate the button on the GD-84D series main unit to enter the maintenance mode from the detection mode. For details on GD-84D series button operation, please refer to the instruction manual of the main unit.

1 In detection mode, hold down the MODE key (about three seconds).

HF   H2

0.0   0

A1   ppm A2 ppm

NH3   CH4

0.0   0

B1   ppm B2 ppm
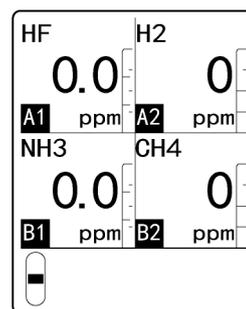
Switches to user mode

1− 1

AIR

MAINTE

2 Press the ▲ key or ▼ key to select [1- 8 M MODE], then press the TEST/SET key.

1− 8

M MODE
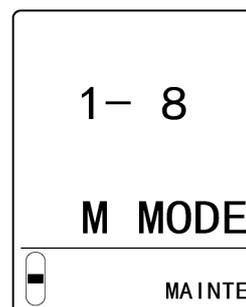
MAINTE

3   Hold down the TEST/SET key for about three seconds.

```
┌─────────────────────┐
│                     │
│                     │
│      ────           │
│                     │
│                     │
│                     │
│  ┌─┐        M  MODE  │
│  │█│        MA INTE  │
│  └─┘                 │
└─────────────────────┘
```
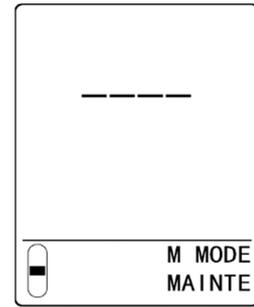
Switches to maintenance mode.

After switching to maintenance mode, proceed to step (2).

```
┌─────────────────────┐
│                     │
│                     │
│      2─ 0           │
│                     │
│  GAS  TEST          │
│  ┌─┐                │
│  │█│        MA INTE  │
│  └─┘                 │
└─────────────────────┘
```
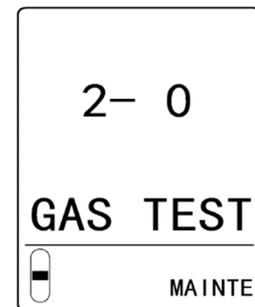
Step(2)

1   In maintenance mode, press the ▲ key or ▼ key to select [2-10 SETTING2], then press the TEST/SET key.

```
┌─────────────────────┐
│                     │
│      2─10           │
│                     │
│  SETT I NG2         │
│  ┌─┐                │
│  │█│        MA INTE  │
│  └─┘                 │
└─────────────────────┘
```
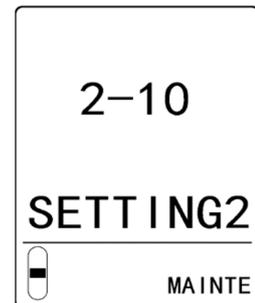
2   Press the ▲ key or ▼ key to select〔SET-18 ETHERNET〕, then press the TEST/SET key.

```
┌─────────────────────┐
│                     │
│      SET─18         │
│                     │
│  ETHERNET           │
│  ┌─┐                │
│  │█│        MA INTE  │
│  └─┘                 │
└─────────────────────┘
```
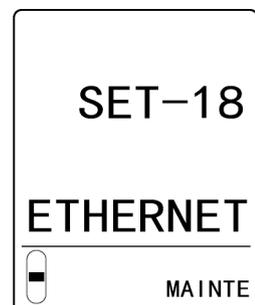
3   **PLC Data Select on the third page of the maintenance mode "2-10 SETTING2" - "SET-18 ETHERNET". Select PLC data saving settings in the menu from the top to the bottom.**

The display screen will look like this

```
┌──────────────────────────┐
│ PLC Data Select          │
│                          │
│   A1:    ON (＊HOLD)      │
│   A2:  ▐ON (＊HOLD)▌      │
│   B1:    ON               │
│   B2:  OFF                │
│   ─────────────────────  │
│  ⬭         ETHERNET      │
│  ▬         MAINTE        │
└──────────────────────────┘
```
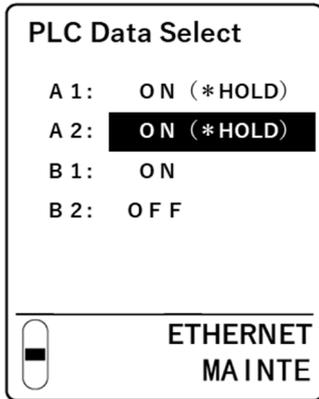
Display	Setting	Additional information
ON	Enable	Can be changed only when a dummy sensor is mounted
OFF	Disabled	
ON(*HOLD)	Enable	When a sensor other than a dummy sensor is mounted, the setting cannot be changed.

*The ON/OFF setting can be changed for the dummy sensor.

For F sensor, the setting is fixed at ON (*HOLD).

Step (3).

The settings are reflected at the time you exit the "SET-18 ETHERNET" menu.

5

Operating GAS DETECTOR MANAGER

5-1 List of GAS DETECTOR MANAGER functions

NOTE

► If product settings are modified, the message [Data is updated.] will appear when you exit maintenance mode, and the screen is shown again.

► Login details are recorded on this product when you log on in administrator mode. These login details are deleted when the product is turned OFF. For this reason, the PC will display an error if you turn the product ON while GAS DETECTOR MANAGER runs on the PC. Before turning the product OFF, close GAS DETECTOR MANAGER. After starting the product, log into GAS DETECTOR MANAGER once again.

► Do not change the settings on GAS DETECTOR MANAGER and this product at the same time.

○: Can be displayed   ×: Cannot be displayed

Menu items		User mode	Administrator mode	Function details
HOME	Status	○	○	Displays information about the various settings for the product.
	Event History	○	○	Displays event history (alarm history). A trend graph can also be displayed.
	Calibration History	×	○	Displays the calibration history for each slot.
	Alarm Trend	×	○	Displays a list of alarm trends.
	Network Event History	○	○	Displays the network event history in list format.
	Communication History	○	○	Displays the communication history in list format.
	Logout	×	○	Logs out of administrator mode.
CALIBRATION	Zero Calibration	×	○	Performs zero calibration.
	Span Calibration	×	○	Performs span adjustment.
TEST	Alarm Test	×	○	Performs alarm tests.
	Fault Test	×	○	Performs fault alarm tests.
AUTHORIZED USERS	Alarm	×	○	View and set alarm settings.
	Network	×	○	View and make settings for communications, email, and networks.
	Date/Time	×	○	View and set date and time.
	Configuration	×	○	View and set detailed information for the product and the details of sensor information related settings.
[MAINTENANCE] button		×	○	Switches to maintenance mode.
[INHIBIT] button		×	○	Set ON/OFF for INHIBIT.
[ALARM RESET] button		×	○	Resets the alarms.

5-2 Checking the current status of the product

The upper part of the screen of GAS DETECTOR MANAGER displays flow and gas concentration for the product in real-time.

<User mode screen>

<Administrator mode screen>
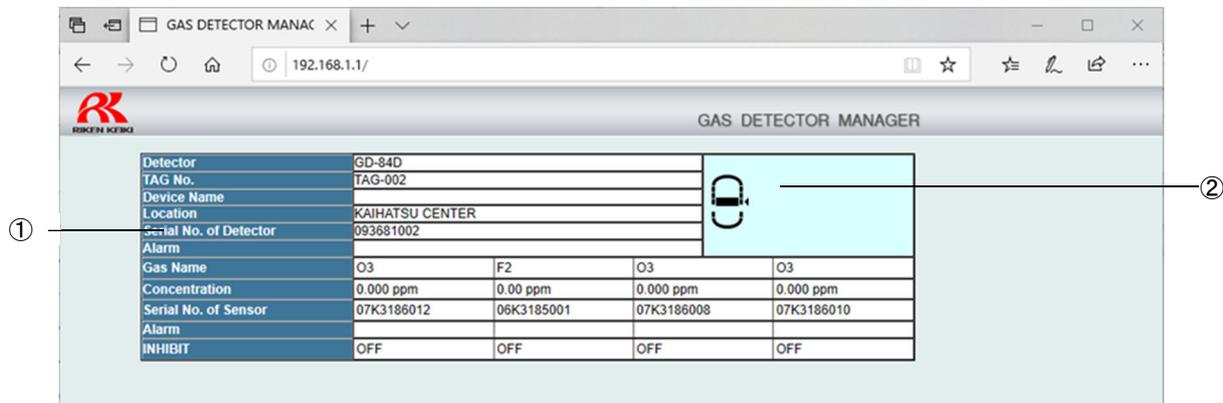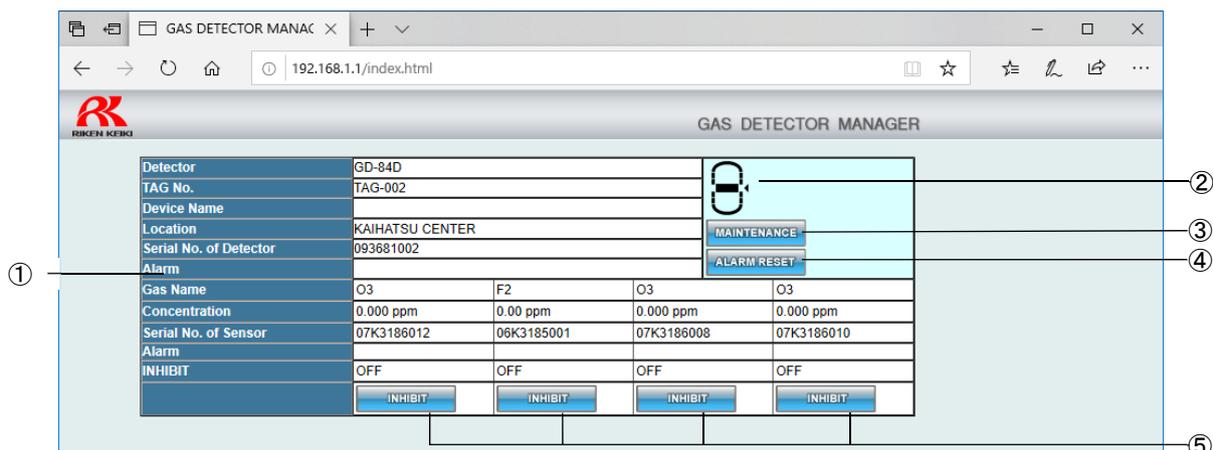
Number	Item	Description
①	Status of this product	Displays the model, TAG number, device name, installation location, serial number, and alarms of the product, along with the gas names, gas concentration, serial numbers, and INHIBIT settings of the sensors fitted.
②	Flow display	Displays the current flow of the product.
③	[MAINTENANCE] button*	Click to switch to the maintenance mode of the product.
④	[ALARM RESET] button*	Click to reset the alarm state of the product.
⑤	[INHIBIT] button*	Click to switch the sensor INHIBIT setting ON/OFF. If the button is light blue, the INHIBIT setting is ON. If the button is gray, the INHIBIT setting is OFF.

* This can be set only in administrator mode.

NOTE

▶ When the first alarm and second alarm are triggered, the following displays will appear on the screen of GAS DETECTOR MANAGER.

<User mode screen>

<Administrator mode screen>
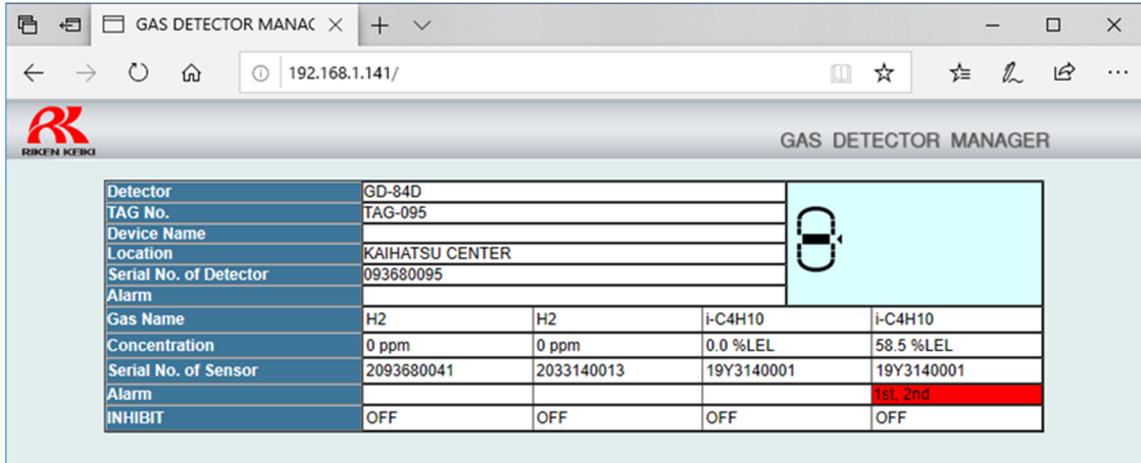
If you logged in as an administrator, you can cancel the alarm state on the product by clicking the [ALARM RESET] button.
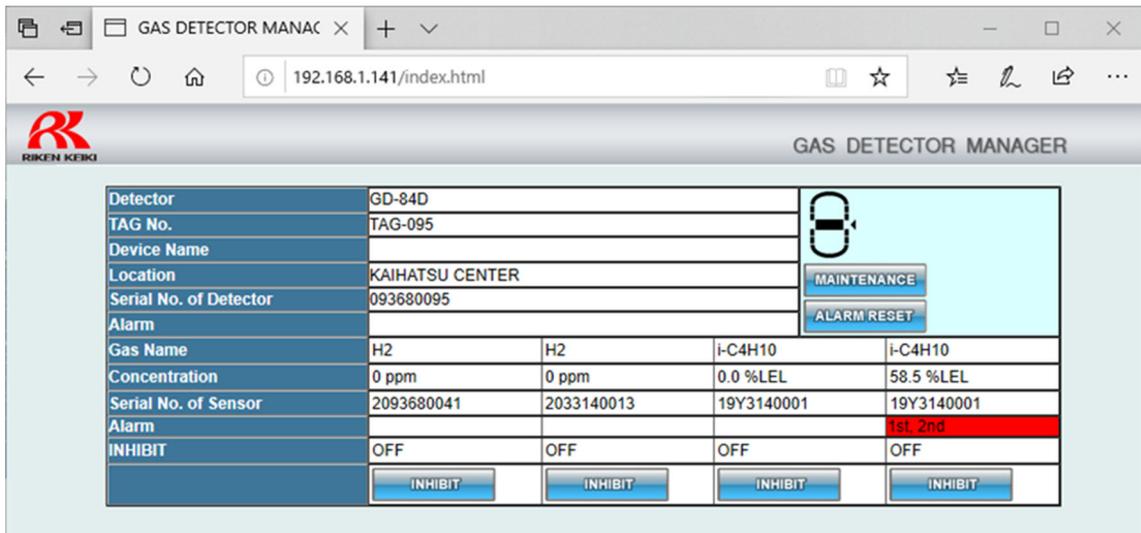
5-3 Displaying the setting information for the product (Status)

Click [■Status] in GAS DETECTOR MANAGER to view product settings.

<User mode screen>

<Administrator mode screen>

Number	Item	Description
①	General information (General)	Displays the gas names, full scale values, and setting units for the sensors in each of the slots.
②	Alarm setpoint (Alarm Configuration)	Displays the alarm pattern, first and second alarm setpoints for the sensors in each slot, the alarm type, and the energized/de-energized setting (first alarm contact, second alarm contact).
③	Calibration	Displays the date on which calibration was last performed for the sensors in each slot.
④	Sensor information (Sensor Configuration)	Displays the model, serial number, and version for each sensor in each slot.
⑤	Date and time (Date/Time)	Displays the date and time on the product as well as the date format.
⑥	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.

5-4 Displaying histories

5-4-1 Displaying the event history (Event History)

Click [■Event History] in GAS DETECTOR MANAGER to view 10 event history (alarm history) items in a single screen. You can display a maximum of 272 history items.

\<User mode screen\>

\<Administrator mode screen\>

Number	Item	Description
①	Displayed page number	Displays the page number being displayed.
②	Event history (alarm history)	Displays the date and time events occur and the descriptions of events (alarms). When there is graph data, the [Graph] button is displayed, and when you click it, it displays the trend graph showing the three minutes before and after the alarm was triggered. (Refer to \<Displaying the trend graph\> on this page)
③	Select page number to display	Select the page number to display and click the [GO] button to view the selected page. Press the [>>] button or [<<] button to view the next page or the previous page.

Number	Item	Description
④	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.
⑤	[Open Print All] button	Click to view the screen for printing all pages, including pages not currently displayed. To print, press the [Print] button in the printing screen.

<Displaying the trend graph>
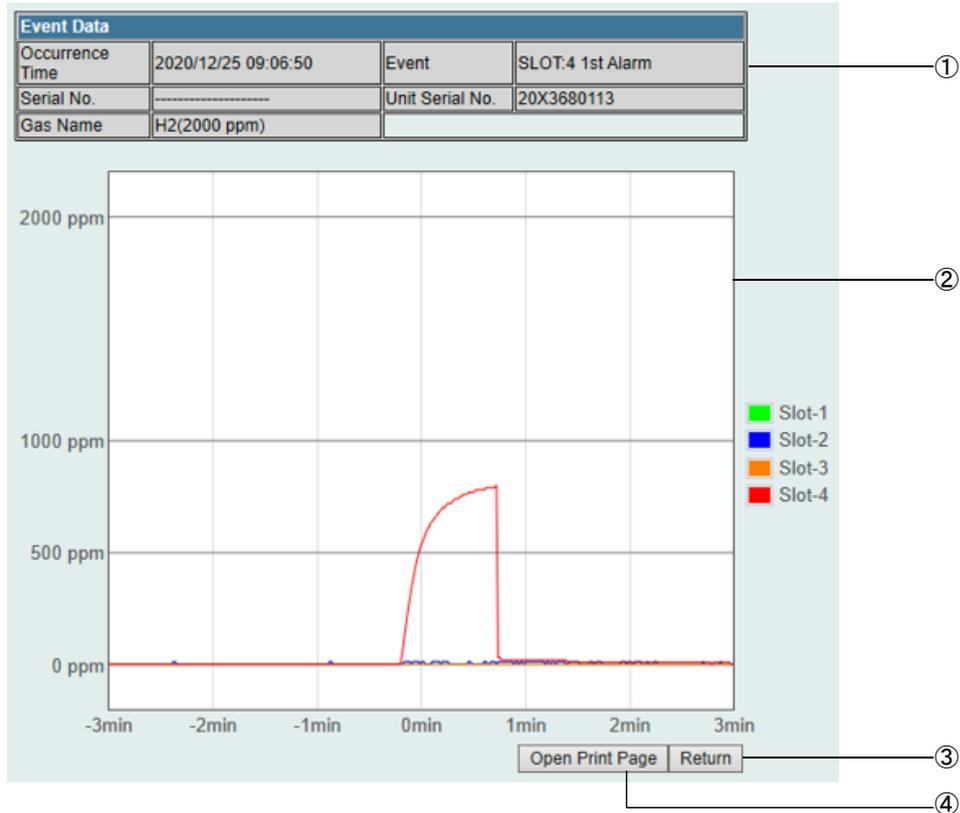
Number	Item	Description
①	Event information	Displays for the event for which the graph is displayed the date and time the event occurred, the description of the event (alarm), the serial number of the product, the serial number of the sensor, and the gas name.
②	Graph	Displays the trend graph showing the three minutes before and after the alarm was triggered for each slot.
③	[Return] button	Click to return to the event history screen.
④	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.

5-4-2 Displaying the calibration history (Calibration History)

Click [■Calibration History] in GAS DETECTOR MANAGER to view 10 calibration history events in a single screen. You can display a maximum of 64 sensor calibration history items for each slot.
You must log in as an administrator.

<Administrator mode screen>
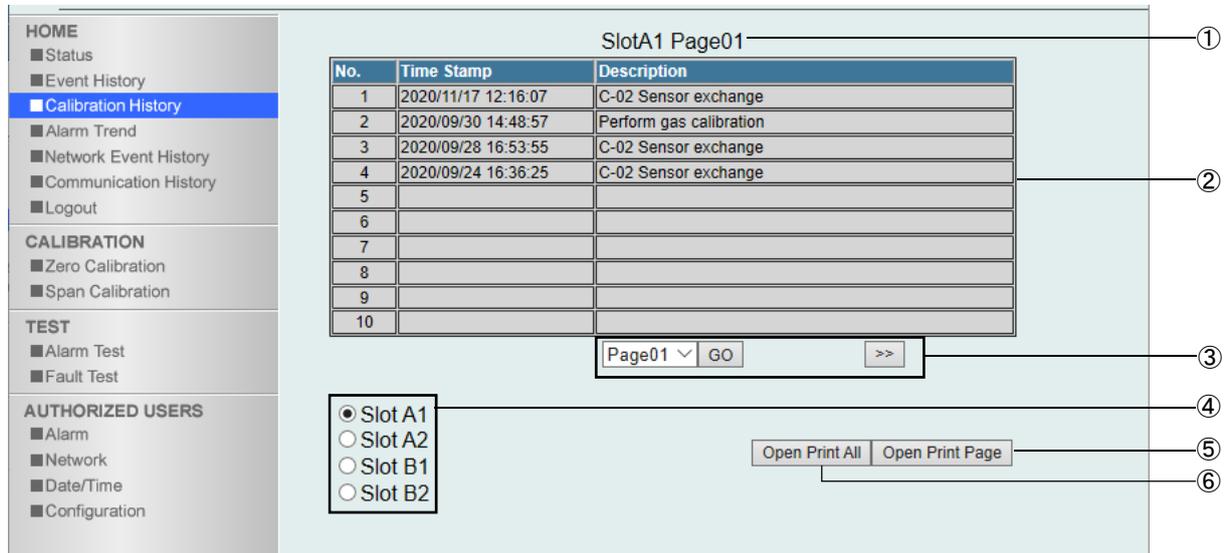
Number	Item	Description
①	Displayed slot number and page number	Displays the slot number and page number being displayed.
②	Calibration History	Displays the date of calibration and calibration details for the sensor fitted in the slot being displayed.
③	Select page number to display	Select the page number to display and click the [GO] button to view the selected page. Press the [>>] button or [<<] button to view the next page or the previous page.
④	Slot selection	Select the slot number to display. [Slot A1], [Slot A2], [Slot B1], and [Slot B2] correspond to the indications [A1], [A2], [B1], and [B2] on the product that indicate the positions at which the sensors are fitted.
⑤	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.
⑥	[Open Print All] button	Click to view the screen for all pages, including pages not currently displayed. To print, press the [Print] button in the printing screen.

5-4-3 Displaying alarm trends (Alarm Trend)

Click [■Alarm Trend] in GAS DETECTOR MANAGER to view 26 alarm trend items in a single screen.
You must log in as an administrator.

<Administrator mode screen>
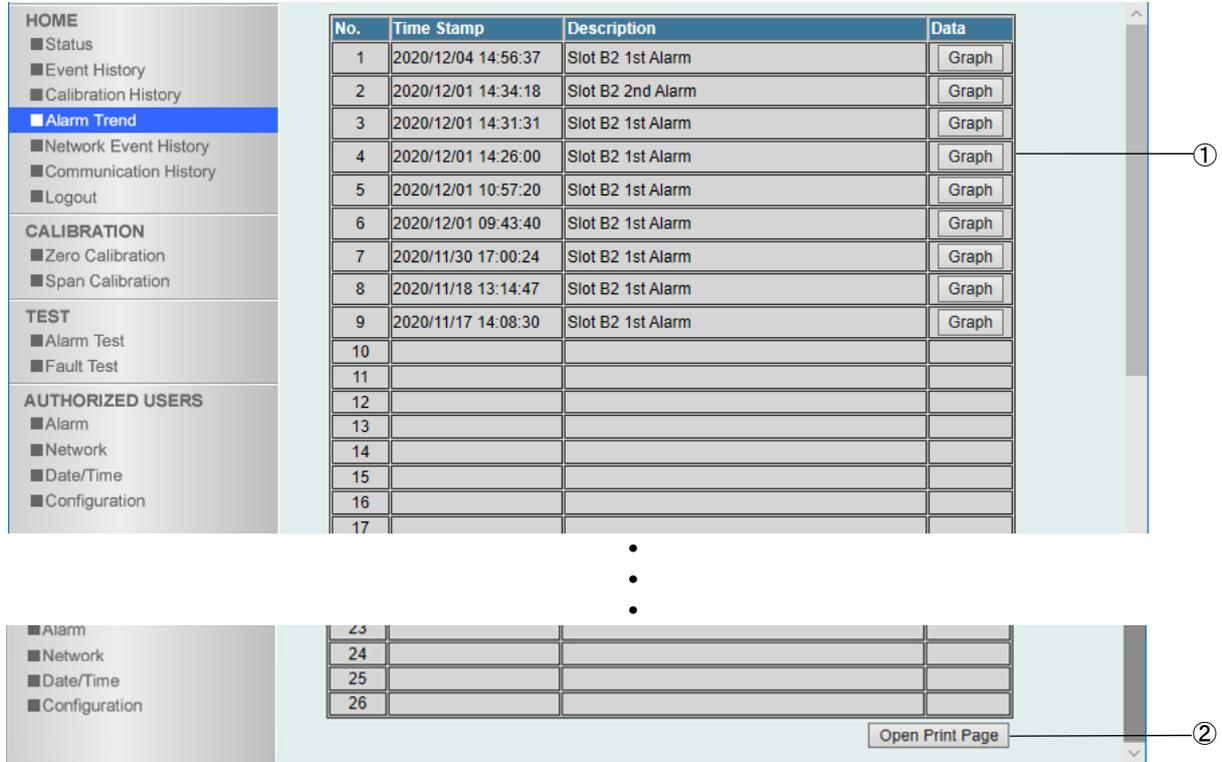
Number	Item	Description
①	Alarm Trend	The times the alarms triggered and the alarm details are displayed. Press the [Graph] button to display the trend graph showing the three minutes before and after the alarm was triggered. (Refer to '<Displaying the trend graph>' on this page)
②	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.

<Displaying the trend graph>
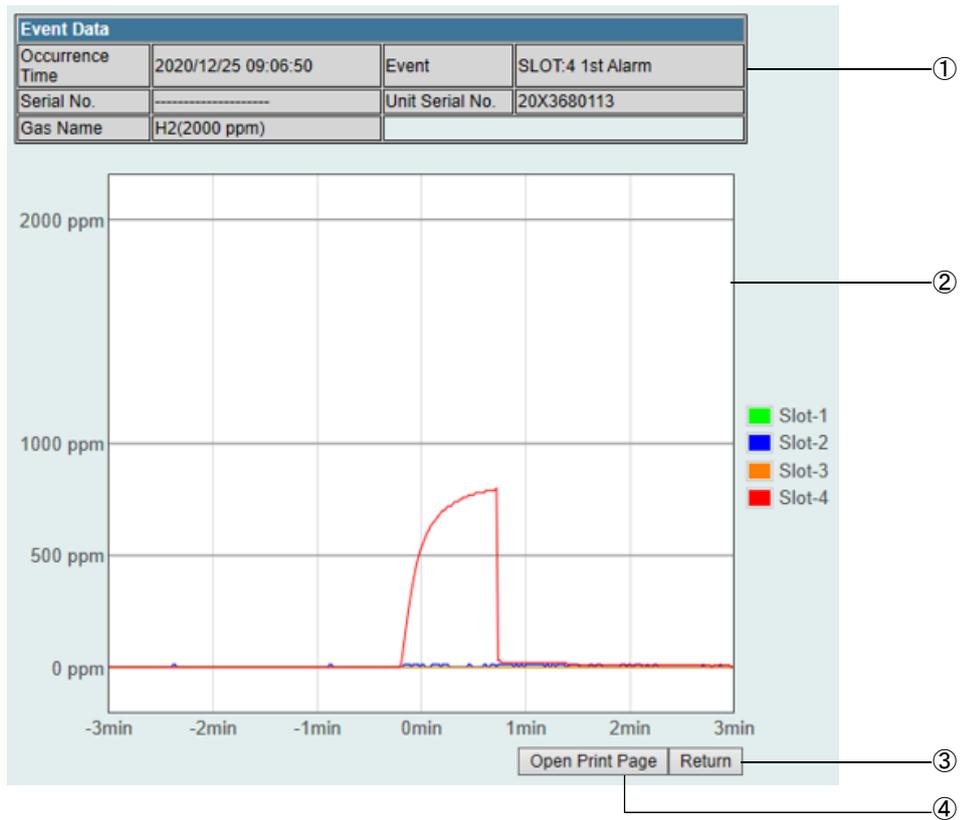
Number	Item	Description
①	Alarm information	Displays for the alarm for which the graph is displayed the date and time the alarm occurred, the description of the alarm, the serial number of the product, the serial number of the sensor, and the gas name.
②	Graph	Displays the trend graph showing the three minutes before and after the alarm was triggered for each slot.
③	[Return] button	Click to return to the event history screen.
④	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.

5-4-4 Displaying network event history (Network Event History)

Click [■Network Event History] in GAS DETECTOR MANAGER to view 100 network event history items in a single screen. You can display a maximum of 2000 history items.

<User mode screen>

<Administrator mode screen>

Number	Item	Description
①	Displayed page number	Displays the page number being displayed.
②	Network event history	Displays the dates and times the network events occurred and descriptions of the network events.
③	Select page number to display	Select the page number to display and click the [GO] button to view the selected page. Press the [>>] button or [<<] button to view the next page or the previous page.
④	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.
⑤	[Open Print All] button	Click to view the screen for all pages, including pages not currently displayed. To print, press the [Print] button in the printing screen.

5-4-5 Displaying communication history (Communication History)

Click [■Communication History] in GAS DETECTOR MANAGER to view 100 communication history events in a single screen. You can display a maximum of 2000 history items.

<User mode screen>

No.	Time Stamp	Sender	Send Port	Receive Port
1	2020/12/04 14:29:33	192.168.1.253	55323	502
2	2020/12/04 14:29:33	192.168.1.253	55323	502
3	2020/12/04 14:29:33	192.168.1.253	55323	502
4	2020/12/04 14:29:33	192.168.1.253	55323	502
5	2020/12/04 14:29:33	192.168.1.253	55323	502
6	2020/12/04 14:29:33	192.168.1.253	55323	502
7	2020/12/04 14:29:33	192.168.1.253	55323	502
8	2020/12/04 14:29:33	192.168.1.253	55323	502
9	2020/12/04 14:29:33	192.168.1.253	55323	502
10	2020/12/04 14:29:32	192.168.1.253	55323	502
11	2020/12/04 14:29:32	192.168.1.253	55323	502
12	2020/12/04 14:29:32	192.168.1.253	55323	502
13	2020/12/04 14:29:32	192.168.1.253	55323	502
95	2020/12/04 14:29:28	192.168.1.253	55325	502
96	2020/12/04 14:29:28	192.168.1.253	55323	502
97	2020/12/04 14:29:28	192.168.1.253	55324	502
98	2020/12/04 14:29:28	192.168.1.253	55324	502
99	2020/12/04 14:29:28	192.168.1.253	55325	502
100	2020/12/04 14:29:28	192.168.1.253	55323	502

HOME
■Status
■Event History
■Network Event History
■Communication History

Page01
Page01 ∨ GO   >>
Open Print All | Open Print Page

① ② ③ ④ ⑤

<Administrator mode screen>

No.	Time Stamp	Sender	Send Port	Receive Port
1	2020/12/04 14:29:33	192.168.1.253	55323	502
2	2020/12/04 14:29:33	192.168.1.253	55323	502
3	2020/12/04 14:29:33	192.168.1.253	55323	502
4	2020/12/04 14:29:33	192.168.1.253	55323	502
5	2020/12/04 14:29:33	192.168.1.253	55323	502
6	2020/12/04 14:29:33	192.168.1.253	55323	502
7	2020/12/04 14:29:33	192.168.1.253	55323	502
8	2020/12/04 14:29:33	192.168.1.253	55323	502
9	2020/12/04 14:29:33	192.168.1.253	55323	502
10	2020/12/04 14:29:32	192.168.1.253	55323	502
11	2020/12/04 14:29:32	192.168.1.253	55323	502
12	2020/12/04 14:29:32	192.168.1.253	55323	502
13	2020/12/04 14:29:32	192.168.1.253	55323	502
95	2020/12/04 14:29:28	192.168.1.253	55325	502
96	2020/12/04 14:29:28	192.168.1.253	55323	502
97	2020/12/04 14:29:28	192.168.1.253	55324	502
98	2020/12/04 14:29:28	192.168.1.253	55324	502
99	2020/12/04 14:29:28	192.168.1.253	55325	502
100	2020/12/04 14:29:28	192.168.1.253	55323	502

HOME
■Status
■Event History
■Calibration History
■Alarm Trend
■Network Event History
■Communication History
■Logout

CALIBRATION
■Zero Calibration
■Span Calibration

TEST
■Alarm Test
■Fault Test

AUTHORIZED USERS

TEST
■Alarm Test
■Fault Test

AUTHORIZED USERS
■Alarm
■Network
■Date/Time
■Configuration

Page01
Page01 ∨ GO   >>
Open Print All | Open Print Page

① ② ③ ④ ⑤

Number	Item	Description
①	Displayed page number	Displays the page number being displayed.
②	Communication history	Displays the date and time the communication occurred, the sender IP address, the sender port, and the receiver port.
③	Select page number to display	Select the page number to display and click the [GO] button to view the selected page. Press the [>>] button or [<<] button to view the next page or the previous page.
④	[Open Print Page] button	Click to view the screen for printing the current page. To print, press the [Print] button in the printing screen.
⑤	[Open Print All] button	Click to view the screen for all pages, including pages not currently displayed. To print, press the [Print] button in the printing screen.

5-5 Performing calibration

5-5-1 Running zero calibration (Zero Calibration)

Click [■Zero Calibration] in GAS DETECTOR MANAGER to view the zero calibration screen.
You must log in as an administrator.
When preparations for zero calibration are complete on the product, click the [Start] button.

⚠️ CAUTION

- When performing zero calibrations, carefully read '7-5 Performing calibration' in the 'GD-84D-EX Series Gas Detector Head Operating Manual'. Comply with the procedures given.

<Administrator mode screen>

<Maintenance service>

Riken Keiki provides services related to regular maintenance, including gas calibration, adjustments, and servicing.
Preparing a calibration gas requires dedicated equipment, including gas cylinders of the specified concentration and gas sampling bags. Our certified service engineers have expert knowledge of these dedicated tools and products.
Please take advantage of the Riken Keiki maintenance service to maintain safe operation of the product.

5-5-2 Running span adjustment (Span Calibration)

Click [■Span Calibration] in GAS DETECTOR MANAGER to view the span adjustments screen.

You must log in as an administrator.

Click the [Start] button when product span adjustment preparations are complete.

![warning triangle] **CAUTION**

- Before performing span adjustments, carefully read '7-5 Performing calibration' in the 'GD-84D-EX Series Gas Detector Head Operating Manual'. Comply with the procedures given.

<Administrator mode screen>

<Maintenance service>

Riken Keiki provides services related to regular maintenance, including gas calibration, adjustments, and servicing.

Preparing a calibration gas requires dedicated equipment, including gas cylinders of the specified concentration and gas sampling bags. Our certified service engineers have expert knowledge of these dedicated tools and products.

Please take advantage of the Riken Keiki maintenance service to maintain safe operation of the product.

5-6 Performing alarm tests and fault alarm tests

5-6-1 Performing alarm tests (Alarm Test)

Click [■Alarm Test] in GAS DETECTOR MANAGER to view the screen for performing alarm tests.
You must log in as an administrator.
Click the [Start] button to start the alarm test.

<Administrator mode screen>
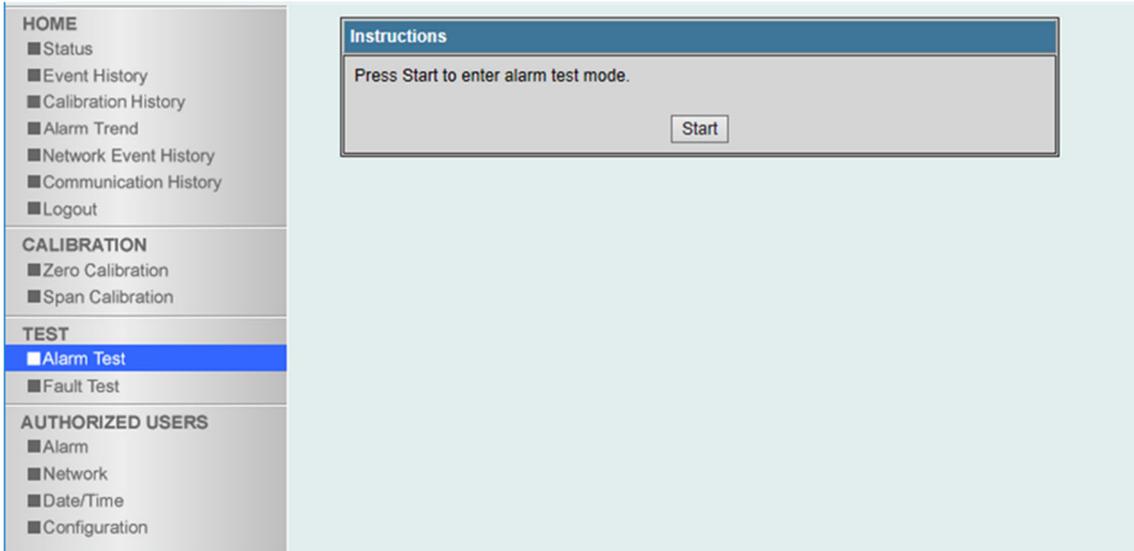
![WARNING icon] **WARNING**

- When performing an alarm test, be sure to notify the relevant departments in advance and take measures to prevent the external output signal or alarm contact from being activated and detected as abnormal by peripheral devices or host systems. Please refer to the instruction manual of the main unit for the operating conditions of the external output signal and alarm contact.

5-6-2 Performing fault alarm tests (Fault Test)

Click [■Fault Test] in GAS DETECTOR MANAGER to view the screen for performing fault alarm tests.
You must log in as an administrator.
Click the [Start] button to start the fault alarm test.

<Administrator mode screen>
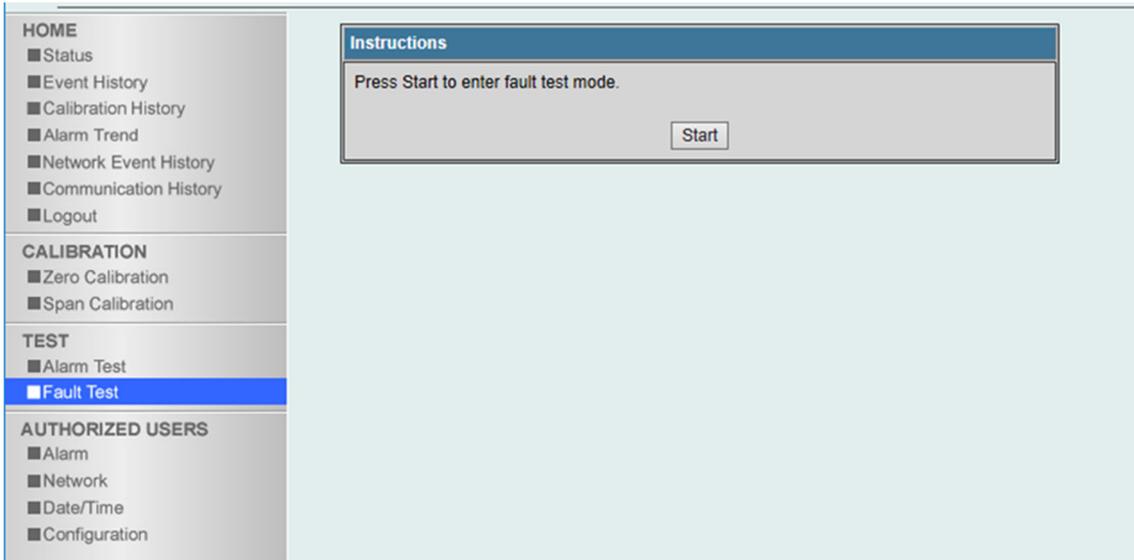
WARNING

- In the case of EA models (GD-84D-EA, GD-84D-EA-ET), if a failure alarm test is performed, the failure contact will be activated depending on the setting even during maintenance mode. Be sure to take measures to prevent external output signals and alarm contacts from operating and being detected as abnormal by peripheral devices and host systems before performing the test. Refer to the instruction manual of the main unit for the operating conditions of the external output signal and alarm contact.

5-7 Viewing and changing setting details

▶ If product settings are modified, the message [Data is updated.] will appear when you exit maintenance mode, and the screen is shown again.
▶ Do not change the settings on GAS DETECTOR MANAGER and this product at the same time.

5-7-1 Changing alarm related settings (Alarm)

Click [■Alarm] in GAS DETECTOR MANAGER to view the screen for viewing and changing a variety of alarm related settings.
You must log in as an administrator.

<Administrator mode screen>
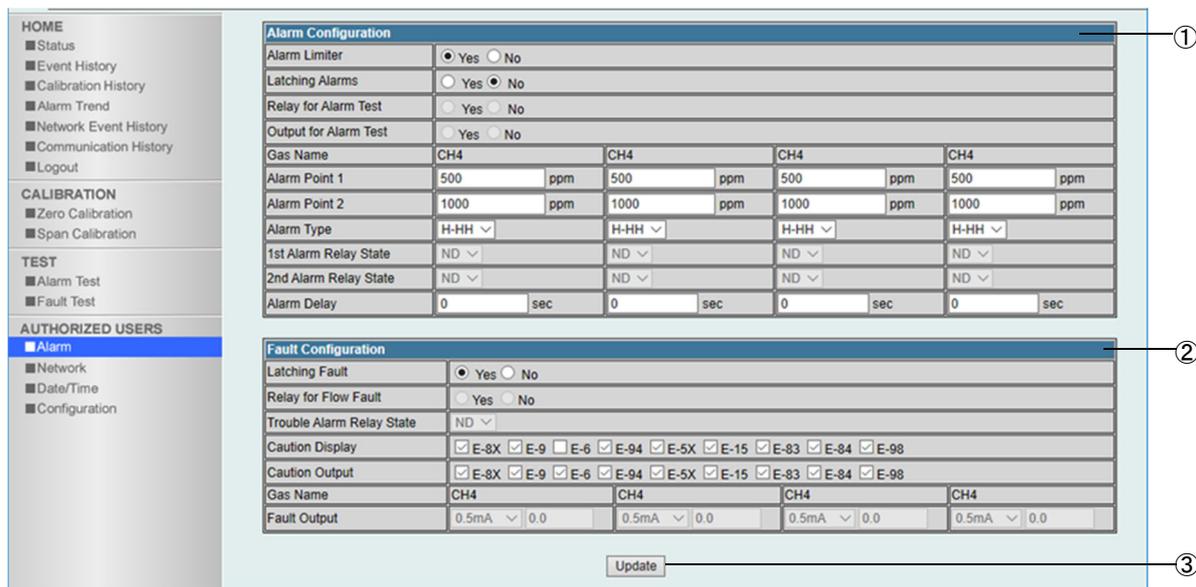
Number	Item		Description
①	Alarm related settings (Alarm Configuration)		
	Alarm Limiter		Set ON/OFF for the alarm point limiter. [Yes]: Set ON for the alarm point limiter. [No]: Set OFF for the alarm point limiter.
	Latching Alarms		Set the alarm pattern. [Yes]: Self-latching [No]: Auto-reset
	Relay for Alarm Test		Enable/disable contacts during alarm tests. [Yes]: Contact operation ON [No]: Contact operation OFF Setting available with EA models

Number	Item		Description
		Output for Alarm Test	Set to enable/disable external output during alarm tests. [Yes]:External output [No]: No external output Setting available with EA models
		Gas Name	Set the detection target gas for each slot. This can be up to eight characters in length.
		Alarm Point 1	Set the first alarm setpoint for the sensors in each slot.
		Alarm Point 2	Set the second alarm setpoint for the sensors in each slot.
		Alarm Type	Set the alarm type for the sensors in each slot. When an oxygen deficiency alarm model ESF sensor is fitted, any of H-HH type, L-LL type, or L-H type can be set.
		1st Alarm Relay State	Set energized/de-energized for the first alarm for the sensors in each slot. [ND]: De-energized [NE]: Energized Setting available with EA models
		2nd Alarm Relay State	Set energized/de-energized for the second alarm for the sensors in each slot. [ND]: De-energized [NE]: Energized Setting available with EA models
		Alarm Delay	Set the alarm delay time (seconds) for the sensors in each slot.
②	Fault alarm related settings (Fault Configuration)		
		Latching Fault	Set the fault alarm pattern. [Yes]: Self-latching [No]: Auto-reset
		Relay for Flow Fault	Set the behavior of fault contacts when flow is low. [Yes]: Contact operation ON [No]: Contact operation OFF
		Trouble Alarm Relay State	Set the energized/de-energized state for the fault alarm pattern. [ND]: De-energized [NE]: Energized Setting available with EA models
		Caution Display	Set to enable/disable warning displays. Select the check boxes for the fault codes to display.
		Caution Output	Set whether to output warnings. Select the check boxes for the fault codes to output.
		Gas Name	Set the detection target gas for each slot. This can be up to eight characters in length.
		Fault Output	Set the value output at a sensor fault for each slot. Select [0.5mA], [21.5mA], or [OPT]. If you selected [OPT], set a value (digit: 0.1) in the 0.0 mA - 4.0 mA range. Setting available with EA models
③	[Update] button		Click this button to update the settings.

⚠️ **CAUTION**

- Be sure to click the [Update] button if you changed the settings.
  The settings will not be updated unless you click the [Update] button.

5-7-2 Changing settings related to the network, email, and PLC communications (Network)

Click [■Network] in GAS DETECTOR MANAGER to view the screen for viewing and changing network, email, time, and PLC communication related settings.
You must log in as an administrator.

NOTE

▶ For information on the PLC communication settings, refer to '7-3 PLC communication setting details'.

<Administrator mode screen>

Number	Item		Description
①	Communication settings (Network)		
		DHCP	Set DHCP ON/OFF. The IP address is acquired automatically from the DHCP server if [On] is selected. [IP Address], [Subnet Mask], and [Default Gateway] settings are not used in this case.
		IP Address	Set the IP address.
		Subnet Mask	Set the subnet mask.
		Default Gateway	Set the default gateway.
		MAC Address	An identification number unique to the device. This setting cannot be changed.
		Net Version	The version of the communication PCB. This setting cannot be changed.
②	Standard time setting (Zone Time)		Set the standard time (Zone Time). This is used by the mail settings and the time synchronization settings.
③	Mail sending settings (Mail)		
		Use	Set enable ([Yes]) or disable ([No]) for the function to send mail when an alarm is triggered. If the function to send mail when an alarm is triggered is set to [Yes], then when an alarm or fault alarm is triggered, an email with the event details is sent to the registered recipient email addresses.
		SMTP Server Domain Name	Set the domain name of the SMTP server for the mail sender.
		SMTP Server Address	Set the IP address for the SMTP Server.
		Mail Address(From)	Set the email address for the mail sender.
		Mail Address(To 1) · · Mail Address(To 10)	Set the email address of the mail recipient. A maximum of 10 recipient email addresses can be registered. The email is sent simultaneously to all of the registered addresses.
④	Time synchronization setting (Time Synchronization)		
		Use	Set enable ([Yes]) or disable ([No]) for the Time Synchronization function. If the Time Synchronization function is set to [Yes], the date and time are acquired from the NTP server at the specified time ([Execution Time]) to adjust the clock. (There is no correction made for the delay caused by communication with the NTP server.)
		NTP Server IP Address	Set the IP address for the NTP server from which date and time are acquired.
		Execution Time	Set the time when date and time are acquired.
⑤	[Update] button		Click this button to update the settings.

⚠ CAUTION

- Be sure to click the [Update] button if you changed the settings.
  The settings will not be updated unless you click the [Update] button.

NOTE

▶ When an alarm is triggered on this product, email such as those below is sent.

<When the first alarm is triggered>

```
2020/11/26 (木) 16:04
GD84D-062 <sendonly@user.com>
[Test] CAUTION [Alarm:1st warning]
宛先  □gdadmin@mobile.user.com

Occurrence Time:
2020/11/26 16:03:52

Location:
KAIHATSU CENTER

Description:
[Test] Alarm:1st warning

Slot:
Slot1A

Tag No.:
GD84D-062

Device Name:
CH4-CH4-CH4-CH4

Sensor Type:
SGF SGF-8581
SGF SGF-8581
SGF SGF-8581
```

<When a flow abnormality alarm is triggered>

```
2020/11/26 (木) 16:12
GD84D-062 <sendonly@user.com>
CAUTION [E-5 FLOW]
宛先  □gdadmin@mobile.user.com

Occurrence Time:
2020/11/26 16:11:43

Location:
KAIHATSU CENTER

Description:
E-51 Low flow error

Slot:
Slot1A
Slot1B
Slot2A
Slot2B

Tag No.:
GD84D-062

Device Name:
CH4-CH4-CH4-CH4

Sensor Type:
```

5-7-3 Changing the date and time (Date/Time)

Click [■Date/Time] in GAS DETECTOR MANAGER to view the screen for viewing and changing date and time settings.
You must log in as an administrator.

<Administrator mode screen>
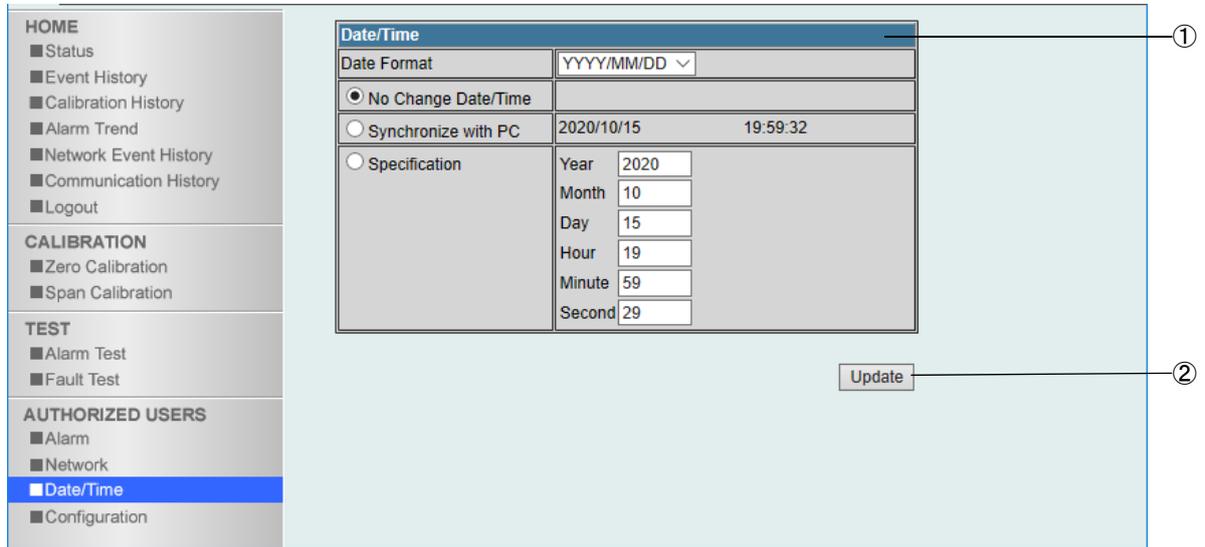
Number	Item		Description
①	Date and time setting (Date/Time)		
		Date Format	Set the format for displaying the date and time.
		No Change Date/Time	You cannot change the date and time.
		Synchronize with PC	The date and time of this product is synchronized with the date and time of the PC.
		Specification	Set date and time of the product as specified. Specify the year ([Year]), month ([Month]), day ([Day]), hour ([Hour]), minutes ([Minute]), and seconds ([Second]).
②	[Update] button		Click this button to update the settings.

⚠ **CAUTION**

- Be sure to click the [Update] button if you changed the settings.
  The settings will not be updated unless you click the [Update] button.

5-7-4 Changing the settings of this product (Configuration)

Click [■Configuration] in GAS DETECTOR MANAGER to view the screen for viewing and changing settings such as TAG number, device name, and installation location of this product.
You must log in as an administrator.

<Administrator mode screen>
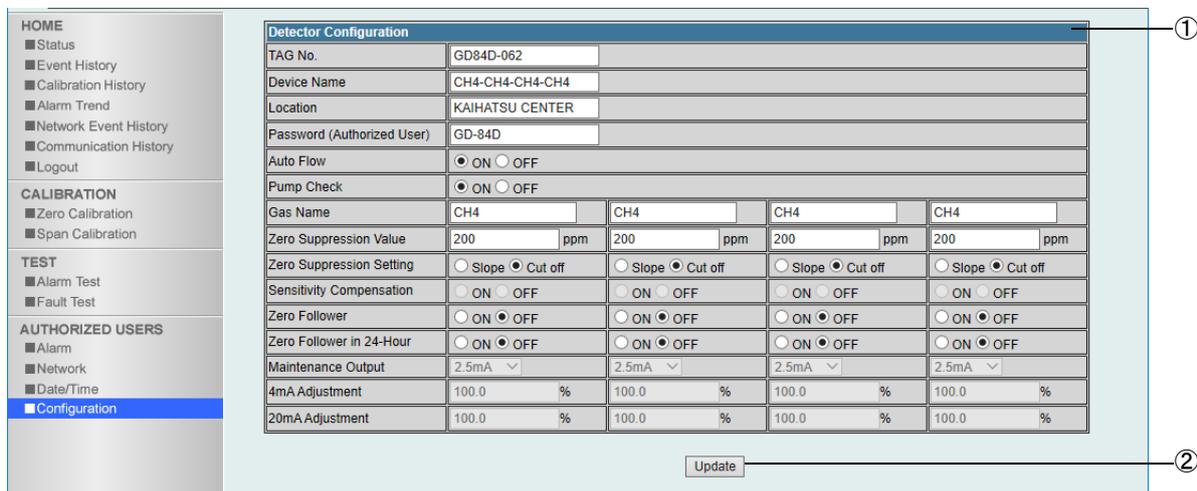
Number	Item		Description
①	Settings of this product (Configuration)		
		TAG No.	Set the TAG number. The TAG number is used as the mail sender when the mail function is used.
		Device Name	Set this device name of this product.
		Location	Set the installation location of this product.
		Password (Authorized User)	Set the password for administrator mode on GAS DETECTOR MANAGER.
		Auto Flow	Set ON/OFF for the automatic flow adjuster function.
		Pump Check	Set ON/OFF for pump drive level diagnostics.
		Gas Name	Set the detection target gas for each slot. This can be up to eight characters in length.
		Zero Suppression Value	Set zero suppression value for the sensors in each slot.
		Zero Suppression Setting	Set the zero suppression type for each sensor in each slot. Select either [Slope] (SLOPE type) or [Cut off] (CUT type).
		Sensitivity Compensation	Set ON/OFF for the sensitivity correction function for the sensors in each slot. This can be set for electrochemical type detection principle sensors.
		Zero Follower	Set ON/OFF for the zero follower function for the sensors in each slot.
		Zero Follower in 24-Hour	Set ON/OFF for the 24-hour zero follower function for the sensors in each slot.

Number		Item	Description
		Maintenance Output	Set the external output during maintenance mode for the sensors in each slot. Select [2.5mA], [4-20mA], [HOLD] (hold previous value), or [4.0mA]. Setting available with EA models
		4mA Adjustment	Adjust the external output of the sensor 4 mA for each slot. Setting available with EA models
		20mA Adjustment	Adjust the external output of the sensor 20 mA for each slot. Setting available with EA models
②		[Update] button	Click this button to update the settings.

⚠ **CAUTION**

- Be sure to click the [Update] button if you changed the settings.
  The settings will not be updated unless you click the [Update] button.

6

Modbus/TCP communication

6-1 Modbus/TCP communication specifications

6-1-1 Communication specifications

The specifications for Modbus/TCP communication are as follows:

Item	Specification
Protocol	Modbus/TCP
Transmission mode	RTU
Port number	502 port
Supported functions	Read Holding Register (0x03) Preset Multiple Registers (0x10)
Simultaneous connections	8

6-1-2 Exception responses

This product will return Modbus/TCP exception responses in the following cases:

<When an unsupported function is specified>

This product supports functions 0x03 and 0x10.
Data example:
Query: 00000000000006010400000001   ← Function code: 0x04
Response: 000000000003018401   ← Exception response 01: invalid function

<When an address that does not exist is specified>

The address of this product is in the range between 40001 and 41024.
Data example:
Query: 00000000000006010304000001   ← Address: 41025
Response: 000000000003018302   ← Exception response 02: invalid data address

<When access to an address that does not exist is specified>

The address is correct, but the data count exceeds the last address (40256).
Data example:
Query: 00000000000006010303FF0002   ← Read two registers from address 41024
Response: 000000000003018303   ← Exception response 03: invalid data

\<When an unwritable address is specified\>

The entire function will return an error if even one location is unwritable.

Data example:

Query: 00000000000D0110002E000306000503E80000 ← Write three registers from address 40047
                                                                (Address 40049 is unwritable)

Response: 000000000003019003   ← Exception response 03: invalid data

\<When an invalid alarm setpoint is specified\>

If the upper 16 bits and lower 16 bits cannot be written as a single query, no query is executed (i.e., the system does not write one or the other instead). The system returns an error. (Exception response 03: invalid data)

An error is also returned if the value is not a valid alarm setpoint, as shown below. (Exception response 03: invalid data)

- Alarm setpoint 1 is a negative value.
- Alarm setpoint 2 is a negative value.
- Alarm setpoint 1 is greater than full scale.
- Alarm setpoint 2 is greater than full scale.
- When alarm setpoint 1 is greater than alarm setpoint 2 (when the alarm type is H-HH or L-H)
- When alarm setpoint 2 is greater than alarm setpoint 1 (when the alarm type is L-LL)
- Alarm setpoint 1 is less than 1/10 of full scale (when the alarm type is H-HH and the alarm point limiter is ON).
- Alarm setpoint 2 is less than 1/10 of full scale (when the alarm type is H-HH and the alarm point limiter is ON).
- Alarm setpoint 1 cannot be divided by a digit (determined by the value after rounding to significant digits).
- Alarm setpoint 2 cannot be divided by a digit (determined by the value after rounding to significant digits).

NOTE

▶ These operating instructions do not address general specifications for Modbus/TCP. Refer to the Modbus/TCP specification documents. (http://www.modbus.org/)

6-2 Modbus/TCP communication register map

The Modbus/TCP register map for this product is as follows:
Slot 1: addresses 40001 - 40256
Slot 2: addresses 40257 - 40512
Slot 3: addresses 40513 - 40768
Slot 4: addresses 40769 - 41024

Lines colored orange (■): information on main unit of the product. All slots have the same values.
Lines colored light blue (■): sensor information. Values for each slot

Address	Write	Item	Description
40001	—	Status	bit0 - 3: Mode (0: initializing; 1: measurement mode, 3: INHIBIT; 5: test mode) bit5: Fault flag bit6: 1st alarm flag bit7: 2nd alarm flag bit8: 1st alarm contact flag bit9: 2nd alarm contact flag bit10: Fault contact flag bit11: Heartbeat (0 and 1 repeat in two-second cycle.)
40002	—	(Reserved)	-
40003	—	Concentration value	Floating point number Address 40003: lower 16 bits Address 40004: upper 16 bits
40004	—		
40005	—	Concentration value[4]	Signed integer (concentration rounded to nearest integer)
40006	—	(Reserved)	-

40007	—	Concentration units	bit0 - 2: Factor
			  (0: same; 1: 1/10; 2: 1/100; 3: 1/1000)
			bit8 - 11: Units
			  (1: ppm; 2: ppb; 4: vol%; 8: %LEL)

40008	—	Temperature	Unsigned integer The temperature is displayed if the value is within the operating temperature range (0 - 40 °C) for the product. Beyond range values are indicated as higher than 40 °C or lower than 0 °C. ・ 0 - 40: temperature (0 - 40 °C) ・ 41 - 3276: Higher than 40 °C ・ Other: Less than 0 °C
40009	—	(Reserved)	-
40010	—	Date and time	The lower 16 bits of the value for the number of seconds elapsed since 0 o'clock, January 1, 1970
40011	—	Flow	Signed integer Indicated in units of mL/min
40012	—	(Reserved)	-
40013	O	Alarm setpoint 1[6]	Floating point number Address 40013: lower 16 bits Address 40014: upper 16 bits
40014	O		
40015	O	Alarm setpoint 2[6]	Floating point number

Address	Write	Item	Description
40016	O		Address 40015: lower 16 bits Address 40016: upper 16 bits
40017	—	Alarm status	bit0: 1st alarm flag bit1: 2nd alarm flag
40018	—	Fault status	bit1: Fault flag
40019	—	Full scale	Floating point number Address 40019: lower 16 bits
40020	—		Address 40020: upper 16 bits
40021	O	(Reserved)	-
40022	O	(Reserved)	-
40023	—	Status[*1, *2]	bit0 - 1: Factor (0: same; 1: 1/10; 2: 1/100; 3: 1/1000) bit2 - 3: Units (0: vol%; 1: %LEL; 2: ppm; 3: ppb) bit4: Flow caution flag bit5: Flow fault flag bit6: Communication fault flag bit7: Sensor fault flag bit8: 1st alarm flag bit9: 2nd alarm flag bit10: Smoke alarm flag (SiO2) bit11: Full scale over flag bit12: Initialization flag bit13: INHIBIT flag bit14: Alarm test flag bit15: Maintenance mode flag
40024	—	Concentration value[*3, *5]	Signed integer (equals significant integers of the concentration value.) The actual concentration value is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40025	—	Flow	Signed integer Indicated in units of mL/min
40026	—	PLU heater temperature	Signed integer The temperature set for the PLU (units: °C)
40027	O	Y/M	Upper bytes: year (0- 99) Lower bytes: month
40028	O	Day/hour	Upper bytes: day Lower bytes: hour
40029	O	Minute/seconds	Upper bytes: minutes Lower bytes: seconds
40030	—	Date and time	The lower 16 bits of the value for the number of seconds elapsed since 0 o'clock, January 1, 1970 (Same as address 40010)
40031	—	Set potential	Signed integer Indicated in units of mV
40032	—	Element voltage	Signed integer Indicated in units of mV
40033	—	Temperature	Signed integer Value that is 10 times the temperature (units: °C)

Address	Write	Item	Description
40034	—	PLU temperature	Signed integer Indicated in units of °C
40035	—	Flow without PLU bypass	Signed integer Indicated in units of mL/min
40036	—	PLU power	Unsigned integer PLU voltage × PLU current
40037	—	PLU voltage	Unsigned integer Indicated in units of mV
40038	—	PLU current	Unsigned integer Indicated in units of mA
40039	—	Device information	bit0 - 1: Model code (0: 70D; 1: 81D; 2: 84D-EX)
40040	—	Percentage for forecasting service life	A percentage that changes, with 100% being the value at the time of the shipping adjustment. 0 - 100 (Units: %)
40041	—	Full scale	Signed integer (the significant figures of the full scale turned into an integer) The actual full scale is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40042	—	Digit	Signed integer (the significant figures of the digit turned into an integer) The actual digit is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40043	—	Factor	0: same; 1: 1/10; 2: 1/100; 3: 1/1000
40044	—	Units	0: vol%; 1: %LEL; 2: ppm; 3: ppb
40045	O	Alarm setpoint 1	Signed integer (the significant figures of alarm setpoint 1 turned into an integer) The actual alarm setpoint 1 is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40046	O	Alarm setpoint 2	Signed integer (the significant figures of alarm setpoint 2 turned into an integer) The actual alarm setpoint 2 is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40047	O	Zero suppression value	A signed integer (the significant figures of the zero suppression value turned into an integer). The actual zero suppression value is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023.
40048	O	Alarm delay time	Signed integer Indicated in units of 10 milliseconds
40049	O	Fault hold	0: Auto reset; 1: Self-latching
40050	O	Smoothing settings	0: Cut off, 1: Slope
40051	O	Alarm type	0: H-HH; 1: L-LL; 2: L-H
40052	O○	Alarm hold	0: Auto reset; 1: Self-latching
40053	O	Contact operation during tests	0: Off; 1: On
40054	O	(Reserved)	-
40055	O	Energized/de-energized	bit0: 1st alarm (0: de-energized; 1: energized) bit1: 2nd alarm (0: de-energized; 1: energized) bit2: Fault (0: de-energized; 1: energized)
40056	O	(Reserved)	-
40057	O	(Reserved)	-
40058	O	(Reserved)	-
40059	O	Automatic correction	0: Off; 1: On

Address	Write	Item	Description
40060	○	Zero following	0: Off; 1: On
40061	○	24-hour zero follower	0: Off; 1: On
40062	—	Date and time last calibrated	ASCII character string Indicated as year 4 places + month 2 places + days 2 places + hours 2 places + minutes 2 places + seconds 2 places
40063	—		
40064	—		
40065	—		
40066	—		
40067	—		
40068	—		
40069	○	Serial number	ASCII character string Left-justified; blanks are spaces (0x20).
40070	○		
40071	○		
40072	○		
40073	○		
40074	○		
40075	○		
40076	○		
40077	○		
40078	○		
40079	—	Gas name	ASCII character string Left-justified; blanks are spaces (0x20).
40080	—		
40081	—		
40082	—		
40083	—		
40084	○	TAG number	ASCII character string Left-justified; blanks are spaces (0x20).
40085	○		
40086	○		
40087	○		
40088	○		
40089	○		
40090	○		
40091	○		
40092	○		
40093	○		
40094	○	Device Name	ASCII character string Left-justified; blanks are spaces (0x20).
40095	○		
40096	○		
40097	○		
40098	○		
40099	○		

Address	Write	Item	Description
40100	○		
40101	○		
40102	○		
40103	○		
40104	○	Measured location	ASCII character string Left-justified; blanks are spaces (0x20).
40105	○		
40106	○		
40107	○		
40108	○		
40109	○		
40110	○		
40111	○		
40112	○		
40113	○		
40114	○	Client code	ASCII character string Left-justified; blanks are spaces (0x20).
40115	○		
40116	○		
40117	○		
40118	○		
40119	—	Sensor serial number	ASCII character string Left-justified; blanks are spaces (0x20).
40120	—		
40121	—		
40122	—		
40123	—		
40124	—		
40125	—		
40126	—		
40127	—		
40128	—		
40129	—	Sensor model	ASCII character string Left-justified; blanks are spaces (0x20).
40130	—		
40131	—		
40132	—		
40133	—		
40134	—	Unit type	0: None; 1: NCF; 2: TEF; 3: IRF; 4: SGF; 5: SHF; 6: ESF; 7: OSF; 8: PIF; 9: SSF
40135	—	Error flag	From the most significant bits of address 40135: Error flag 0 to least significant bit of address 40142: Error flag 127 However, 100 - 127 are unused.
40136	—		
40137	—		
40138	—		

Address	Write	Item	Description
40139	—		
40140	—		
40141	—		
40142	—		
40143	—	Alarm/fault new flag	bit0: Alarm new flag bit1: Fault new flag
40144	—	Fault flag	bit0: E-1 bit1 - 3: Reserved bit4: E-5 bit5: E-6 bit6: E-7 bit7: Reserved bit8: E-9 bit9: FLOW bit10: RTC bit11 - 14: Reserved bit15: Concentration display flag
40145	—	MAC address	From the upper bytes of address 40145: First octet to lower bytes of address 40147: Sixth octet
40146	—		
40147	—		
40148	O	IP address	From the upper bytes of address 40148: First octet to lower bytes of address 40149: Fourth octet
40149	O		
40150	O	Subnet mask	From the upper bytes of address 40150: First octet to lower bytes of address 40151: Fourth octet
40151	O		
40152	O	Default gateway	From the upper bytes of address 40152: First octet to lower bytes of address 40153: Fourth octet
40153	O		
40154	O	DHCP	0: Off; 1: On
40155	—	Service life determination flag	Upper bytes: Service life forecast support flag (0: service life forecasting not supported; 1: service life forecasting supported) Lower bytes: Service life determination flag (0: Before service life expiration; 1: Service life expired)
40156	—	Serviceable life expiration flag	0: Before serviceable life expiration; 1: Serviceable life expired
40157	—	Additional status	
40158	—	Degradation diagnosis rate	
40159	—	Days sensor used	
40160	—	Sensor type	ASCII character string Left-justified; blanks are spaces (0x20).
40161	—		
40162	—		
40163 - 40250	O	(Reserved)	-
40251	O	Command	Refer to '6-3 Modbus/TCP communication commands'.
40252	O	Subcommand	
40253	O	Parameter 1	

Address	Write	Item	Description
40254	O	Parameter 2	
40255	O	Parameter 3	
40256	O	Parameter 4	
40257 - 40512	*	Slot 2	Same as 40001 - 40256.
40513 - 40768	*	Slot 3	Same as 40001 - 40256.
40769 - 41024	*	Slot 4	Same as 40001 - 40256.

*1 Bit patterns for each status (address 40023)

Status	15	14	13	12	11	10	9	8	7	6	5	4	3 - 0
	Maintenance mode flag	Alarm test flag	INHIBIT flag	Initialization flag	Full scale over flag	Smoke alarm flag (SiO₂)	2nd alarm flag	1st alarm flag	Sensor fault flag	Communication fault flag	Flow fault flag	Flow caution flag	Factor, units
Normal: measuring	0	0	0	0	0	0	0	0	0	0	0	0	*
Normal: alarm (1st)	0	0	0	0	0	0	0	1	0	0	0	0	*
Normal: alarm (2nd)	0	0	0	0	0	0	1	*	0	0	0	0	*
Normal: alarm (smoke)	0	0	0	0	1	1	1	1	0	0	0	0	*
Full scale over	0	0	0	0	1	0	*	*	0	0	0	0	*
Initialization	0	0	0	1	0	0	0	0	0	0	0	0	*
Maintenance	1	0	0	0	0	0	0	0	0	0	0	0	*
Alarm test	1	1	0	0	*	0	*	*	0	0	0	0	*
Fault alarm test	1	0	0	0	0	0	0	0	1	1	1	0	*
Problem: sensor	0	0	0	0	0	0	0	0	1	0	0	0	*
Problem: communication	0	0	0	0	0	0	0	0	0	1	0	0	*
Problem: flow	0	0	0	0	0	0	0	0	0	0	1	0	*
Caution: flow	0	0	0	0	0	0	0	0	0	0	0	1	*
INHIBIT	1	0	1	0	0	0	0	0	0	0	0	0	*

*: Undetermined value

*2   When in the maintenance status, the alarm flag will not stand even if the concentration value goes above the alarm setpoint. However, in a case such as when performing the maintenance mode [2- 0 GAS TEST] on the main unit, then the maintenance flag and the alarm flag will both stand.

*3   If the sensor output is under the 0 base point, then the concentration value will be output as 0 during the normal detection state. In the maintenance status, a negative concentration value (2's complement representation) will be output.

*4   An integer rounded off to the closest whole number.
       Example: ・ Full scale 25.0 concentration value 20.9 → 21
                  ・ Full scale 50.0 concentration value 0.2 → 0
                  ・ Full scale 5.00 concentration value 0.20 → 0

*5   An integer including the significant figures
      Example: ・ Full scale 25.0 concentration value 20.9 → 209
              ・ Full scale 50.0 concentration value 0.2 → 2
              ・ Full scale 5.00 concentration value 0.20 → 20

*6   Be aware of the following points when writing alarm setpoints.
    (1) The upper 16 bits and lower 16 bits must be written as a single query. A query to write one of them only is not executed, and an error is returned. (Exception response 03: invalid data)
    (2) Concentration value is rounded off after the significant digits.
        Example: 20.888 → 20.9
    (3) An error is returned if the value is not a valid alarm setpoint, as shown below. (Exception response 03: invalid data)
        ・ Alarm setpoint 1 is a negative value.
        ・ Alarm setpoint 2 is a negative value.
        ・ Alarm setpoint 1 is greater than full scale.
        ・ Alarm setpoint 2 is greater than full scale.
        ・ Alarm setpoint 1 is greater than alarm setpoint 2 (when the alarm type is H-HH or L-H).
        ・ Alarm setpoint 2 is greater than alarm setpoint 1 (when the alarm type is L-LL).
        ・ Alarm setpoint 1 is less than 1/10 of full scale (when the alarm type is H-HH and the alarm point limiter is ON).
        ・ Alarm setpoint 2 is less than 1/10 of full scale (when the alarm type is H-HH and the alarm point limiter is ON).
        ・ Alarm setpoint 1 cannot be divided by a digit (determined by the value after rounding to significant digits).
        ・ Alarm setpoint 2 cannot be divided by a digit (determined by the value after rounding to significant digits).

6-3 Modbus/TCP communication commands

You can execute the following functions by writing commands and parameters in the registers of addresses 40251 - 40256.
Execution of the functions is triggered by writing to the command (address 40251).
Normally, commands, subcommands, and if necessary, parameters, are written in a single query for execution, but if only a command is written, then the subcommand and parameter at that point are used for execution.

NOTE
> ▶ You can execute the functions by writing the commands and parameters as shown below to the registers for addresses 40507 - 40512 for Slot 2, 40763 - 40768 for Slot 3, and 41019 - 41024 for Slot 4.

40251	40252	40253	40254	40255	40256	Function
Command	Subcommand	Parameter 1	Parameter 2	Parameter 3	Parameter 4	
MM (0x4D4D)	S (0x0053)	-	-	-	-	Maintenance mode start
	E (0x0045)	-	-	-	-	Maintenance mode exit
GS (0x4753)	W (0x0057)	0x0000	-	-	-	INHIBIT off
		0x0001	-	-	-	INHIBIT on
RA (0x5241)	S (0x0053)	-	-	-	-	Alarm test Start
	E (0x0045)	-	-	-	-	Alarm test End
	W (0x0057)	Concentration value	-	-	-	Alarm test, apply concentration value
RT (0x5254)	S (0x0053)	-	-	-	-	Fault alarm test Start
	E (0x0045)	-	-	-	-	Fault alarm test End
SB (0x5342)	W (0x0057)	-	-	-	-	Alarm reset
SP (0x5350)	W (0x0057)	-	-	-	-	Air calibration execute
SZ (0x535A)	W (0x0057)	-	-	-	-	Zero calibration execute

NOTE
> ▶ Only one slot specified is effective in the alarm test. If multiple slots are specified simultaneously, only one of the specified slots will be applied.

⚠️ **CAUTION**

- Exception responses are not returned if you write any commands other than those shown above. This is also the case if failure is the execution result of the above commands. Modbus/TCP responses merely indicate whether the write was successful. To determine whether a command execution succeeded, reload the status and concentration values.

7

PLC communication

7-1 PLC communication specifications

The specifications for PLC communication are as follows:

Item	Specification
Protocol	For OMRON PLCs: FINS/UDP For MELSEC PLCs: MC/UDP
Supported PLCs	OMRON CJ/CS Series MELSEC Q series
Data type	Basic Data (Small) Basic Data (Large) Basic Data (Small) + Optional Data Basic Data (Large) + Optional Data Very Small Very Small + Optional Data

NOTE

▶ These instructions do not address the use or specifications of PLCs. Refer to the operating manual for your PLC.

7-2 PLC communication data types

7-2-1 Basic Data: Small

The following data is written to the PLC:

・ Alarm status, concentration value, alarm setpoint, other basic data

GD-84D-EX (Ethernet model)	→ Write to PLC →	PLC memory (D, E, etc.)

		PLC memory (D, E, etc.)		
	168 words	Slot 1	16 words Basic Data: Small	GD-84D-EX writing starting address
		Not used	26 words	
		Slot 2	16 words Basic Data: Small	
		Not used	26 words	
		Slot 3	16 words Basic Data: Small	
		Not used	26 words	
		Slot 4	16 words Basic Data: Small	
		Not used	26 words	
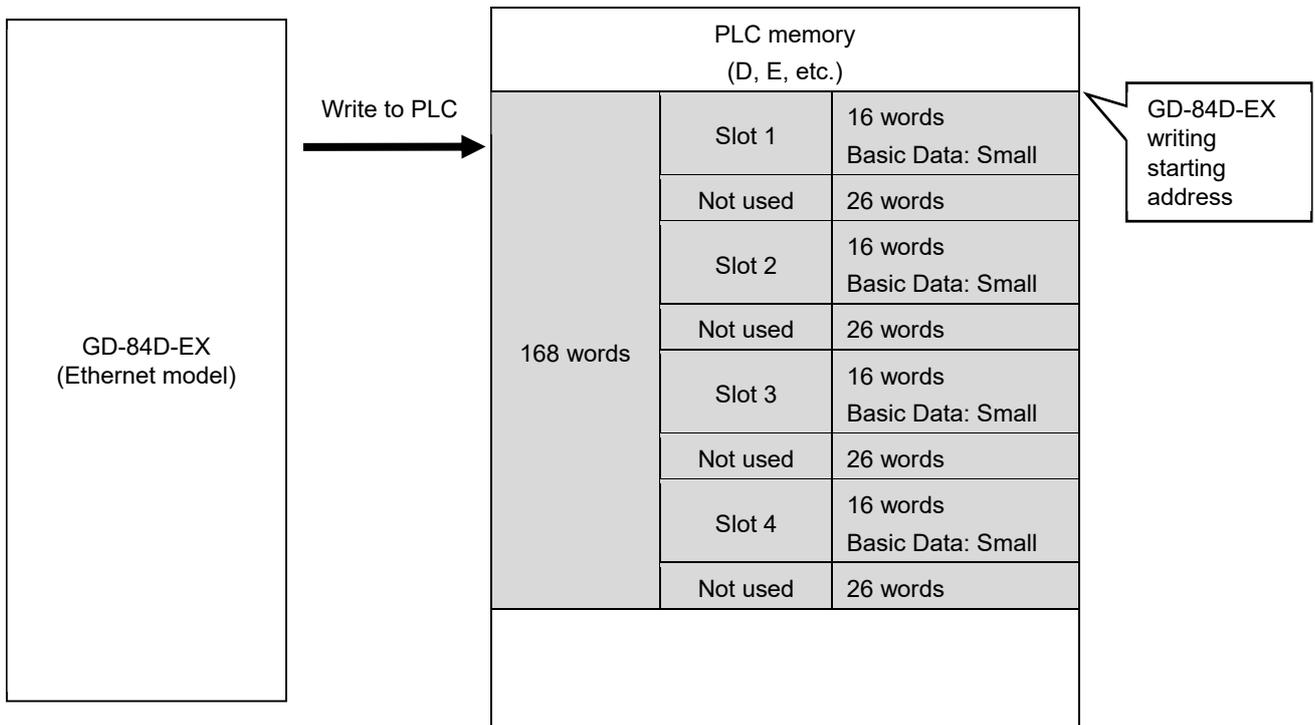
7-2-2 Basic Data: Large

The following data is written to the PLC:
- Alarm status, concentration value, alarm setpoint, other basic data
- Date/time, gas name

The following data is read from the PLC:
- Data for changing settings such as alarm patterns, alarm setpoints, etc.
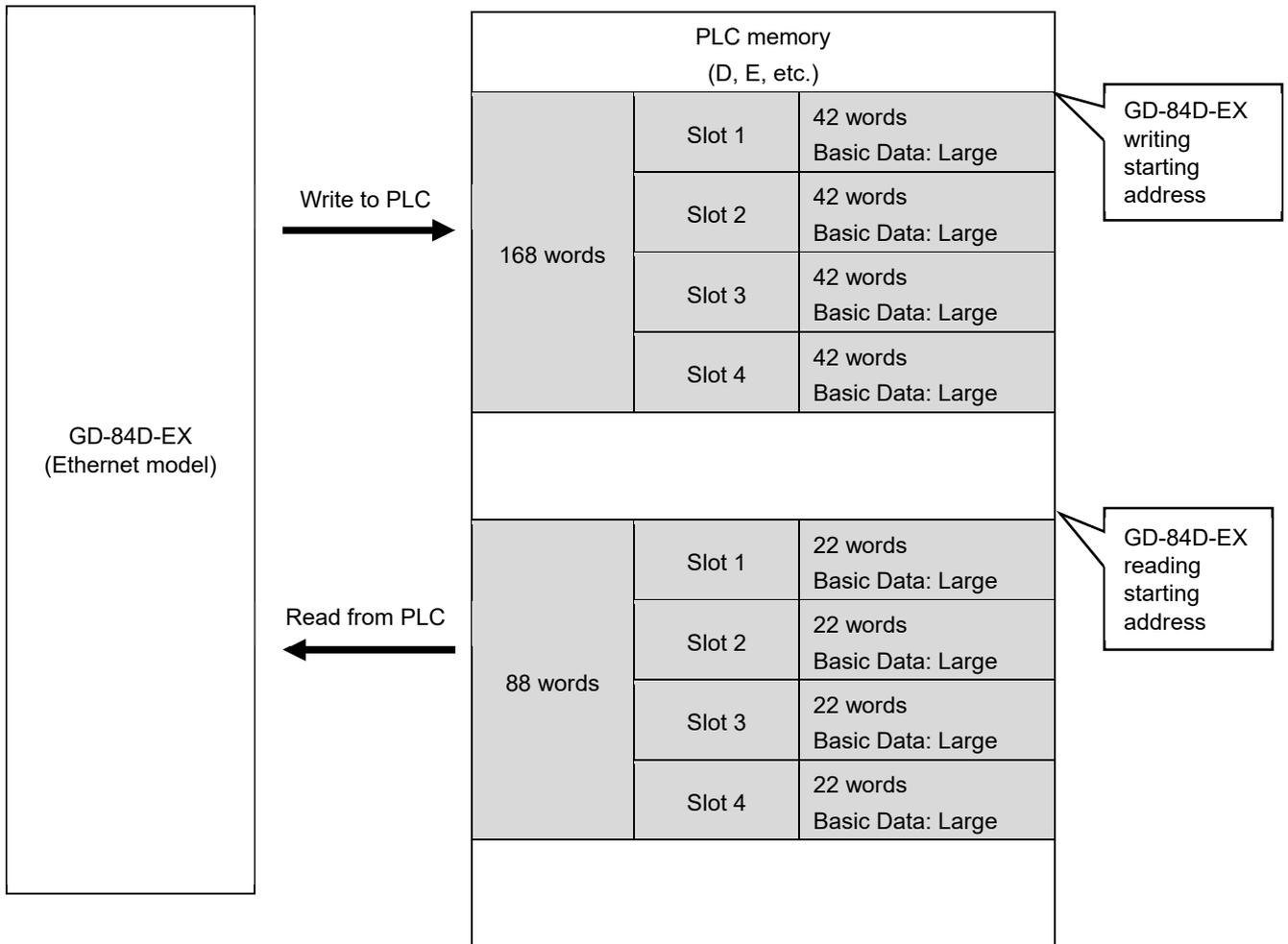
7-2-3 Basic Data: Small + Optional Data

The following data is written to the PLC:
・ Alarm status, concentration value, alarm setpoint, other basic data

The following data is read from the PLC:
・ Extended data: names, sensor models, sensor serial numbers, etc.
・ Data for changing various names, etc.

GD-84D-EX (Ethernet model)	Write to PLC →		PLC memory (D, E, etc.)

GD-84D-EX (Ethernet model)

Write to PLC →

PLC memory (D, E, etc.)

352 words

Slot 1 — 16 words Basic Data: Small / 72 words Optional Data
Slot 2 — 16 words Basic Data: Small / 72 words Optional Data
Slot 3 — 16 words Basic Data: Small / 72 words Optional Data
Slot 4 — 16 words Basic Data: Small / 72 words Optional Data

GD-84D-EX writing starting address

← Read from PLC

224 words

Slot 1 — 56 words Optional Data
Slot 2 — 56 words Optional Data
Slot 3 — 56 words Optional Data
Slot 4 — 56 words Optional Data

GD-84D-EX reading starting address

7-2-4 Basic Data: Large + Optional Data

The following data is written to the PLC:
· Alarm status, concentration value, alarm setpoint, other basic data
· Date/time, gas name

The following data is read from the PLC:
· Data for changing settings such as alarm patterns, alarm setpoints, etc.
· Extended data: names, sensor models, sensor serial numbers, etc.
· Data for changing various names, etc.

	PLC memory (D, E, etc.)		
GD-84D-EX (Ethernet model)	**Write to PLC** →	**456 words**	Slot 1	42 words / Basic Data: Large
				72 words / Optional Data	← GD-84D-EX writing starting address
			Slot 2	42 words / Basic Data: Large
				72 words / Optional Data
			Slot 3	42 words / Basic Data: Large
				72 words / Optional Data
			Slot 4	42 words / Basic Data: Large
				72 words / Optional Data
	Read from PLC ←	**312 words**	Slot 1	22 words / Basic Data: Large
				56 words / Optional Data	← GD-84D-EX reading starting address
			Slot 2	22 words / Basic Data: Large
				56 words / Optional Data
			Slot 3	22 words / Basic Data: Large
				56 words / Optional Data
			Slot 4	22 words / Basic Data: Large
				56 words / Optional Data

7-2-5 Basic Data: Very Small

The following data is written to the PLC:
・ Alarm status, concentration value data

The following data is read from the PLC:
・ Point skip, data required for maintenance mode

GD-84D-EX (Ethernet model)		PLC memory (D, E, etc.)		
	Write to PLC →	16 words	Slot 1	4 words Basic Data: Very Small
			Slot 2	4 words Basic Data: Very Small
			Slot 3	4 words Basic Data: Very Small
			Slot 4	4WORD Basic Data: Very Small

GD-84D-EX writing starting address

	Read from PLC ←	16 words	Slot 1	4 words Basic Data: Very Small
			Slot 2	4 words Basic Data: Very Small
			Slot 3	4 words Basic Data: Very Small
			Slot 4	4 words Basic Data: Very Small

GD-84D-EX reading starting address
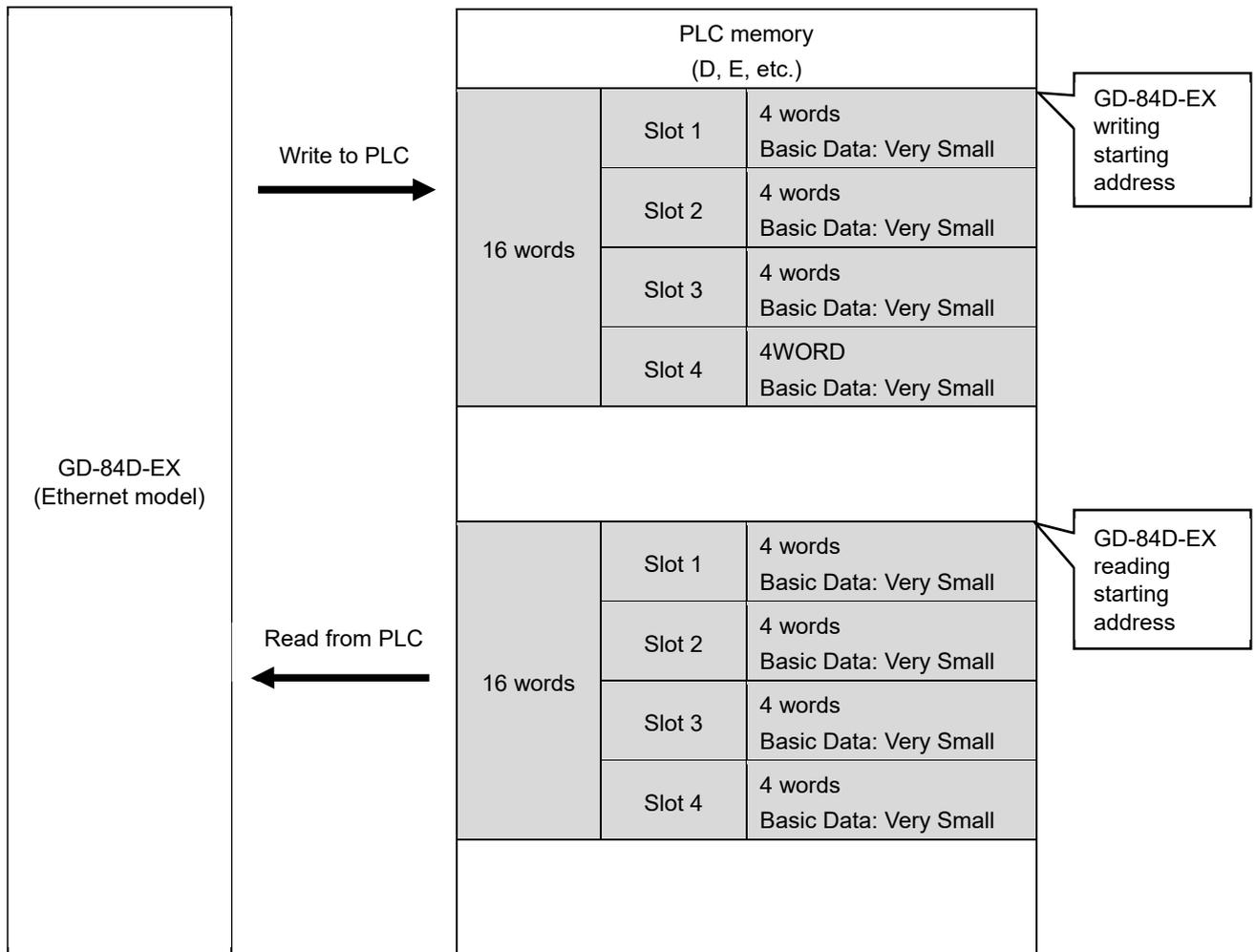
7-2-6 Basic Data: Very Small + Optional Data

The following data is written to the PLC:
・ Alarm status, concentration value data
・ Date/time, gas name

The following data is read from the PLC:
・ Point skip, data required for maintenance mode
・ Extended data: names, sensor models, sensor serial numbers, etc.
・ Data for changing various names, etc.

GD-84D-EX (Ethernet model)		PLC memory (D, E, etc.)			
	Write to PLC →	304 words	Slot 1	4 words Basic Data: Very Small	GD-84D-EX writing starting address
				72 words Optional Data	
			Slot 2	4 words Basic Data: Very Small	
				72 words Optional Data	
			Slot 3	4 words Basic Data: Very Small	
				72 words Optional Data	
			Slot 4	4 words Basic Data: Very Small	
				72 words Optional Data	
	← Read from PLC	240 words	Slot 1	4 words Basic Data: Very Small	GD-84D-EX reading starting address
				56 words Optional Data	
			Slot 2	4 words Basic Data: Very Small	
				56 words Optional Data	
			Slot 3	4 words Basic Data: Very Small	
				56 words Optional Data	
			Slot 4	4 words Basic Data: Very Small	
				56 words Optional Data	

7-3 PLC communication setting details

Use GAS DETECTOR MANAGER and this product to make PLC communication settings.
To make settings in GAS DETECTOR MANAGER, log on in Administrator mode and go to the Network screen.
(Refer to '5-7-2 Changing settings related to the network, email, and PLC communications (Network)'.)
While making product settings, refer to '7-10-18 ETHERNET settings (ETHERNET)' in the 'GD-84D-EX Series Gas Detector Head Operating Manual'. For more information on communication settings for this product, refer to '7-6 PLC communication setting specifications using this product'. Note that some settings are not available with this product.

Item			Description	Remarks
PLC	PLC Mode		Make batch settings for PLC Type, Type of Basic Data, and Use Optional Data. Also, addresses for Detector Write and Detector Read are set automatically:	1: User-defined setting 2: FINS; Basic Data: Small; do not use Optional. 3: FINS; Basic Data: Large; do not use Optional. 4: MC; Basic Data: Small; do not use Optional. 5: MC; Basic Data: Large; do not use Optional. 6: FINS; Basic Data: Very Small; do not use Optional. 7: FINS; Basic Data: Very Small; do not use Optional.
	PLC Area		Used to determine the address when setting automatically in PLC Mode	
	PLC Type		Select the PLC communication type. The FINS settings in this table are used when FINS is selected. The MC settings in this table are used when MC is selected.	Not Used: Do not use (default). FINS: OMRON CJ/CS series MC: MELSEC Q series
	Type of Basic Data		Set the basic data type.	Small: small Large: large Very Small: very small
	Use Optional Data		Set whether to use optional data.	Yes: Use No: Do not use (default).
	Interval	Min	Set the minimum transmission interval. This is the transmission interval when the data varies and the mode is not detection mode (at an alarm state, in maintenance state).	250 - 10,000 msec Default minimum time: 1,000 msec (with variation in concentration) Default maximum time: 3,000 msec (without variation in concentration)
		Max	Set the maximum transmission interval. This is the transmission interval in detection mode when the data does not vary.	
	Timeout		Set the timeout for reception from a PLC. Waiting is canceled if the specified time elapses after a transmission from a PLC and no response is made. Data is resent after the time set in [Interval] elapses.	1 - 10 sec Default: 5 sec
FINS	IP Address		Set the IP address for the PLC.	
	Port		Set the UDP port number.	Default: 9600

Item			Description	Remarks
	Detector	Network Address	Set the network address for this product. (Setting value in FINS specifications)	
		Node Address	Set the node address for this product. (Setting value in FINS specifications)	
		Unit Number	The unit number of this product (Setting value in FINS specifications)	
	PLC	Network Address	Set the network address for the PLC. (Setting value in FINS specifications)	
		Node Address	Set the node address for the PLC. (Setting value in FINS specifications)	
		Unit Number	Set the PLC unit number. (Setting value in FINS specifications)	
	Detector Write	Memory Address	Set the memory address for writing to the PLC.	
		Area Type	Set the memory area for writing to the PLC.	
	Detector Read	Memory Address	Set the memory address to be read from the PLC.	
		Area Type	Set the memory area to be read from the PLC.	
MC	IP Address		Set the IP address for the PLC.	
	Port		Set the UDP port number.	Default: 5000
	PLC	Network Address	Set the network address for the PLC. (Setting value in MC specifications)	
		Node Address	Set the node address for the PLC. (Setting value in MC specifications)	
	Detector Write	Memory Address	Set the starting memory address for writing to the PLC.	
		Area Type	Set the memory area for writing to the PLC.	
	Detector Read	Memory Address	Set the starting memory address to be read from the PLC.	
		Area Type	Set the memory area to be read from the PLC.	

7-4 PLC communication data map

7-4-1 Basic Data: Small

<Write data map (GD-84D-EX write area)>

	Address	Item	Remarks
GD-84D-EX data	0	Status	bit15: Maintenance bit14: Test bit13: INHIBIT bit12: Initial bit11: Alarm: RANGE OVER bit10: Smoke detection bit9: Alarm: 2nd bit8: Alarm: 1st bit7: Error: Sensor bit6: Error: Communication(Internally, it consists of the CPU on the main unit side and the CPU for Ethernet communication, and the CPU on the main unit side and the CPU for Ethernet communication communicate with each other via serial communication. This indicates a communication error between the CPU on the main unit side and the CPU for Ethernet communication.) bit5: Error: Flow bit4: Caution: Flow bit2 - 3: Concentration unit code (00: vol%; 01: %LEL; 10: ppm; 11: ppb) bit0 - 1: Decimal places code (00: 1/1; 01: 1/10; 10: 1/100; 11: 1/1000)
	1	Concentration value	Signed integer (equals significant integers of the concentration value.) The actual concentration value is the value obtained by multiplying this value by the decimal places code in status.
	2	Counter to confirm continued operation	This value increments with each transmission. Reverts to 0 if an overflow occurs.
	3	Supply flow rate	Indicated in mL/min
	4	Pyrolyzer temperature	Indicated in °C (or 0x8000 if no pyrolyzer is present)
	5	IP address (Upper 16 bits)	First half of IP address Example: For 192.168.0.1, this would be 0xC0A8.
	6	IP address (Lower 16 bits)	Second half of IP address. Example: For 192.168.0.1, this would be 0x0001.
	7	Subnet mask (Upper 16 bits)	First half of subnet mask Example: For 255.225.225.0, this would be 0xFFFF.
	8	Subnet mask (Lower 16 bits)	Second half of subnet mask Example: For 255.225.225.0, this would be 0xFF00.

Address	Item	Remarks
9	Flag	bit11 - 12: Slot numbers (0: Slot 1; 1: Slot 2; 2: Slot 3; 3: Slot 4) bit9 - 10: Model code (0: 70D; 1: 81D; 2: 84D-EX) bit8: Fault new flag bit7: Alarm new flag bit6: Sensitivity correction (0: off; 1: on) bit5: Zero following (0: off; 1: on) bit4: Suppression type (0: Cut off; 1: Slope) bit3: Fault alarm pattern (0: auto reset; 1: self-latching) bit2: Gas alarm pattern (0: auto reset; 1: self-latching) bit0 - 1: Alarm type (0: H-HH; 1: L-LL, 2: L-H)
10	Full scale	Signed integer The full scale is the value obtained by multiplying this value by the decimal places code in status.
11	1st alarm setpoint	Signed integer The actual 1st alarm setpoint is the value obtained by multiplying this value by the decimal places code in status.
12	2nd alarm setpoint	Signed integer The actual 2nd alarm setpoint is the value obtained by multiplying this value by the decimal places code in status.
13	Concentration value 3200 units	The relative value when full scale is represented as 3200.
14	1st alarm setpoint 3200 units	The relative value when full scale is represented as 3200.
15	2nd alarm setpoint 3200 units	The relative value when full scale is represented as 3200.

⚠ CAUTION

- During maintenance, the concentration value of address 1 can become a negative value.
  Take into account the issue of negative values when obtaining working values from measured concentrations.

7-4-2 Basic Data: Large

<Write data map (GD-84D-EX write area)>

	Address	Item	Remarks
GD-84D-EX data	0 - 15	Concentration/Alarm status, etc.	Same as Basic Data (Small) (Refer to '7-4-1 Basic Data: Small'.)
	16	Date and time (Year/Date)	The upper bytes indicate year (last two digits); the lower bytes indicate month.
	17	Date and time (Day/hour)	The upper bytes indicate day; the lower bytes indicate hour.
	18	Date and time (minute/seconds)	The upper bytes indicate minutes; the lower bytes indicate seconds.
	19	Alarm delay time	Indicated in 10 milliseconds
	20	Digit	Signed integer The actual digit is the value obtained by multiplying this value by the decimal places code in status.
	21	Zero suppression value	Signed integer The actual zero suppression value is the value obtained by multiplying this value by the decimal places code in status.
	22 - 27	Gas name	An ASCII character string. Left-justified; blanks are spaces (0x20).
	28 - 33	(Reserved)	
	34	Pump duty	
	35	(Reserved)	
	36	Service life data	bit0 - 7: Service life forecasting percentage bit8 - 11: Reserved bit12: Degradation diagnosis result bit13: Used determination bit14: Service life determination bit15: Service life function yes/no
	37	Service life data 2	bit0 - 7: Degradation diagnosis rate
	38	Service life data 3	Number of days sensor used
	39	(Reserved)	
Command data	40	Command execution status (GD-84D-EX)	0: Normal state 1: Processing
	41	Command execution result	For Command 1 (setting changes) (When successful: bit on; when unsuccessful: bit off) bit12: Sensitivity correction bit11: Date and time bit10: Zero following bit9: Zero suppression type bit8: Zero suppression value bit7: Alarm delay time bit6: Fault alarm pattern bit5: Gas alarm pattern bit4: 2nd alarm setpoint bit3: 1st alarm setpoint bit2: Alarm type bit1: Subnet mask bit0: IP address Command 2 - 0: failure 1: success

⚠️ **CAUTION**

- During maintenance, the concentration value of address 1 can become a negative value.
  Take into account the issue of negative values when obtaining working values from measured concentrations.

<Read data map (GD-84D-EX read area)>

	Address	Item	Remarks
GD-84D-EX setting data	0	IP address (Upper 16 bits)	First half of IP address
	1	IP address (Lower 16 bits)	Second half of IP address.
	2	Subnet mask (Upper 16 bits)	First half of subnet mask
	3	Subnet mask (Lower 16 bits)	Second half of subnet mask
	4	Flag	bit3: Fault alarm pattern (0: auto reset; 1: self-latching) bit2: Gas alarm pattern (0: auto reset; 1: self-latching) bit0 - 1: Alarm type (0: H-HH; 1: L-LL, 2: L-H)
	5	1st alarm setpoint	Signed integer The actual 1st alarm setpoint is the value obtained by multiplying this value by the decimal places code in status.
	6	2nd alarm setpoint	Signed integer The actual 2nd alarm setpoint is the value obtained by multiplying this value by the decimal places code in status.
	7	Date and time (Year/Date)	The upper bytes indicate year (last two digits); the lower bytes indicate month.
	8	Date and time (Day/hour)	The upper bytes indicate day; the lower bytes indicate hour.
	9	Date and time (minute/seconds)	The upper bytes indicate minutes; the lower bytes indicate seconds.
	10	Alarm delay time	Indicated in 10 milliseconds
	11	Zero suppression value	Signed integer The actual zero suppression value is the value obtained by multiplying this value by the decimal places code in status.
	12 - 15	(Reserved)	
Command data	16	Command execution status (PLC)	0: Normal state 1: Processing
	17	Command code	(Refer to '7-5 PLC communication commands'.)
	18	Parameter	
	19 - 21	(Reserved)	

7-4-3 Basic Data: Very Small

<Write data map (GD-84D-EX write area)>

	Address	Item	Remarks
GD-84D-EX data	0	Status	bit15: Maintenance bit14: Test bit13: INHIBIT bit12: Initial bit11: Alarm: RANGE OVER bit10: Smoke detection bit9: Alarm: 2nd bit8: Alarm: 1st bit7: Error: Sensor bit6: Error: Communication bit5: Error: Flow bit4: Caution: Flow bit2 - 3: Concentration unit code (00: vol%; 01: %LEL; 10: ppm; 11: ppb) bit0 - 1: Decimal places code (00: 1/1; 01: 1/10; 10: 1/100; 11: 1/1000)
	1	Concentration value	Signed integer (equals significant integers of the concentration value.) The actual concentration value is the value obtained by multiplying this value by the decimal places code in status.
	2	Counter to confirm continued operation	This value increments with each transmission. Reverts to 0 if an overflow occurs.
	3	(Reserved)	

⚠ CAUTION

- During maintenance, the concentration value of address 1 can become a negative value.
  Take into account the issue of negative values when obtaining working values from measured concentrations.

<Read data map (GD-84D-EX read area)>

	Address	Item	Remarks
Command data	0	Command execution status (PLC)	0: Normal state 1: Processing
	1	Command code	(Refer to '7-5 PLC communication commands'.)
	2 - 3	(Reserved)	

7-4-4 Optional Data

<Write data map (GD-84D-EX write area)>

	Address Basic Data (Small)	Address Basic Data (Large)	Address Basic Data (Very Small)	Item	Remarks
GD-84D-EX data	16 - 25	42 - 51	4 - 13	TAG number	An ASCII character string. Left-justified; blanks are spaces (0x20).
	26 - 35	52 - 61	14 - 23	Device Name	An ASCII character string. Left-justified; blanks are spaces (0x20).
	36 - 45	62 - 71	24 - 33	Measured location	An ASCII character string. Left-justified; blanks are spaces (0x20).
	46 - 50	72 - 76	34 - 38	Client code	An ASCII character string. Left-justified; blanks are spaces (0x20).
	51 - 55	77 - 81	39 - 43	Sensor model	An ASCII character string. Left-justified; blanks are spaces (0x20).
	56 - 65	82 - 91	44 - 53	Sensor serial number	An ASCII character string. Left-justified; blanks are spaces (0x20).
	66 - 67	92 - 93	54 - 55	Unit type setting.	An ASCII character string. Justified left.
	68 - 85	94 - 111	56 - 73	(Reserved)	
Command data	86	112	74	Command execution status (GD-84D-EX)	0: Normal state 1: Processing
	87	113	75	Command execution result	For Command 1 (setting changes) (When successful: bit on; when unsuccessful: bit off) bit3: Client code bit2: Measured location bit1: Device name bit0: TAG number Command 2 - (Reserved) 0: Failure 1: Success

<Read data map (GD-84D-EX read area)>

	Address Basic Data (Small)	Address Basic Data (Large)	Address Basic Data (Very Small)	Item	Remarks
GD-84D-EX setting data	0 - 9	22 - 31	4 - 13	TAG number	An ASCII character string. Left-justified; blanks are spaces (0x20).
	10 - 19	32 - 41	14 - 23	Device Name	An ASCII character string. Left-justified; blanks are spaces (0x20).
	20 - 29	42 - 51	24 - 33	Measured location	An ASCII character string. Left-justified; blanks are spaces (0x20).
	30 - 34	52 - 56	34 - 38	Client code	An ASCII character string. Left-justified; blanks are spaces (0x20).
	35 - 49	57 - 71	39 - 53	(Reserved)	
Command data	50	72	54	Command execution status (PLC)	0: Normal state 1: Processing
	51	73	55	Command code	(Refer to '7-5 PLC communication commands'.)
	52	74	56	Parameter	
	53 - 55	75 - 77	57 - 59	(Reserved)	

7-5 PLC communication commands

Execute a variety of functions by writing Basic Data: Large, Basic Data: Very Small, and Optional Data GD-84D-EX setting data, command execution statuses (PLC), command codes, and parameters.

7-5-1 Issuing command 1 (setting change)

1   Confirm that [Command execution status (PLC)] is "0" (normal state).

2   Issue command 1 (setting change).
   (1) Set data in the items to be changed in [GD-84D-EX setting data] (multiple settings possible).
   (2) Set "1" (setting change) in [Command code].
   (3) Set the values that turn on the bits for the items to be changed in [Parameter] (multiple settings possible).

3   Set "1" (execute process) in [Command execution status (PLC)].

4   Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).

5   Set "0" (normal state) in [Command execution status (PLC)].
If the setting change was successful, the bits for the changed items in [Command execution result] will be on.
If the setting change was unsuccessful, the bits for the changed items in [Command execution result] will be off.

⚠️ **CAUTION**

- Do not change the values for [GD-84D-EX setting data], [Command code], or [Parameter] between issuing the command and the completion of the process.

7-5-2 Issuing command 2 - 9 (Basic Data: Large only)

1   Confirm that [Command execution status (PLC)] is "0" (normal state).

2   Issue commands 2 - 9.
   (1) Set data in the items to be changed in [GD-84D-EX setting data] (multiple settings possible).
   (2) Set one of commands "2" to "9" in the [Command code].
   (3) Set "0" in [Parameter] (commands 2 - 9 do not use parameters).

3   Set "1" (execute process) in [Command execution status (PLC)].

4   Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).

5   Set "0" (normal state) in [Command execution status (PLC)].
   If the setting change was successful, the [Command execution result] will be "1".
   If the setting change was unsuccessful, the [Command execution result] will be "0".

⚠ CAUTION

- Do not change the values for [GD-84D-EX setting data], [Command code], or [Parameter] between issuing the command and the completion of the process.

7-5-3 Issuing command 10 (alarm test concentration setting) (Basic Data: Large only)

1   Confirm that [Command execution status (PLC)] is "0" (normal state).

2   Issue command 10 (alarm test concentration setting).
   (1) Set data in the items to be changed in [GD-84D-EX setting data] (multiple settings possible).
   (2) Set "10" (alarm test concentration setting) in [Command code].
   (3) Set the alarm test concentration value in [Parameter].

3   Set "1" (execute process) in [Command execution status (PLC)].

4   Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).

5   Set "0" (normal state) in [Command execution status (PLC)].
   If the setting change was successful, the [Command execution result] will be "1".
   If the setting change was unsuccessful, the [Command execution result] will be "0".

⚠️ **CAUTION**

- Do not change the values for [GD-84D-EX setting data], [Command code], or [Parameter] between issuing the command and the completion of the process.

7-5-4 Issuing command 3 - 6 (Basic Data: Very Small only)

1   **Confirm that [Command execution status (GD-84D-EX)] is "0" (normal state).**

2   **Set one of commands "3" to "6" in the [Command code].**

3   **Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).**

4   **Confirm that it is the value specified in bit15: maintenance and bit13: INHIBIT of [Status].**

⚠ **CAUTION**

- Do not change the values for [GD-84D-EX setting data], [Command code], or [Parameter] between issuing the command and the completion of the process.

7-5-5 Basic Data: Large command related data

	Address	Item	Description
GD-84D-EX write area	40	Command execution status (GD-84D-EX)	0: Normal state 1: Processing
	41	Command execution result	For Command 1 (setting changes) (When successful: bit on; when unsuccessful: bit off) bit12: Sensitivity correction bit11: Date and time bit10: Zero following bit9: Zero suppression type bit8: Zero suppression value bit7: Alarm delay time bit6: Fault alarm pattern bit5: Gas alarm pattern bit4: 2nd alarm setpoint bit3: 1st alarm setpoint bit2: Alarm type bit1: Subnet mask bit0: IP address Command 2 - 0: Failure 1: Success

	Address	Item	Description
GD-84D-EX read area	0 - 15	Data for different settings	
	16	Command execution status (PLC)	0: Normal state 1: Execute process
	17	Command	Sets the command code.
	18	Depends on parameters and commands.	(Refer to '<Basic Data: Large command codes>' below.)

\<Basic Data: Large command codes\>

Command code	Details	Parameter
1	Setting changes	Setting flags (Refer to '\<Parameters (setting flags) for Command code 1 (setting change)\>' below.)
2	Buzzer stop	Not used
3	INHIBIT on	Not used
4	INHIBIT off	Not used
5	Maintenance mode start	Not used
6	Maintenance mode exit	Not used
7	Zero calibration execute	Not used
8	Alarm test mode start	Not used
9	Alarm test mode end	Not used
10	Alarm test concentration setting	Test concentration value
11	Air calibration execute	Not used

\<Parameters (setting flags) for Command code 1 (setting change)\>

Multiple items can be changed simultaneously. In this case, turn on multiple bits at the same time.

Parameter (bit)	Details
bit15	(Reserved)
bit14	(Reserved)
bit13	(Reserved)
bit12	Sensitivity correction
bit11	Date and time
bit10	Zero following
bit9	Zero suppression type
bit8	Zero suppression value
bit7	Alarm delay time
bit6	Fault alarm pattern
bit5	Gas alarm pattern
bit4	2nd alarm setpoint
bit3	1st alarm setpoint
bit2	Alarm type
bit1	Subnet mask
bit0	IP address

7-5-6 Basic Data: Very Small command related data

	Address	Item	Description
GD-84D-EX read area	0	Command execution status (PLC)	0: Normal state 1: Execute process
	1	Command	Sets the command code.

\<Basic Data: Very Small command codes\>

Command code	Details	Parameter
3	INHIBIT on	Not used
4	INHIBIT off	Not used
5	Maintenance mode start	Not used
6	Maintenance mode exit	Not used

7-4-4 Optional Data command related data

	Address Basic Data (Small)	Address Basic Data (Large)	Address Basic Data (Very Small)	Item	Description
GD-84D-EX write area	86	112	74	Command execution status (GD-84D-EX)	0: Normal state 1: Processing
	87	113	75	Command execution result	For Command 1 (setting changes) (When successful: bit on; when unsuccessful: bit off) bit3: Client code bit2: Measured location bit1: Device name bit0: TAG number Command 2 - (Reserved) 0: NG 1: OK

	Address Basic Data (Small)	Address Basic Data (Large)	Address Basic Data (Very Small)	Item	Description
GD-84D-EX read area	0 - 49	22 - 71	4 - 53	Data for different settings	
	50	72	54	Command execution status (PLC)	0: Normal state 1: Execute process
	51	73	55	Command	Sets the command code.
	52	74	56	Depends on parameters and commands.	(Refer to '<Optional Data command code>' below.)

<Optional Data command code>

Command code	Details	Parameter
1	Setting changes	Setting flags (Refer to '<Parameters (setting flags) for Command code 1 (setting change)>' below.

<Parameters (setting flags) for Command code 1 (setting change)>

Multiple items can be changed simultaneously. In this case, turn on multiple bits at the same time.

Parameter (bit)	Details
bit15	(Reserved)
bit14	(Reserved)
bit13	(Reserved)
bit12	(Reserved)
bit11	(Reserved)
bit10	(Reserved)
bit9	(Reserved)
bit8	(Reserved)
bit7	(Reserved)
bit6	(Reserved)
bit5	(Reserved)
bit4	(Reserved)
bit3	Client code
bit2	Measured location
bit1	Device Name
bit0	TAG number

7-5-8 Changing alarm setpoint settings

The alarm setpoint settings use the following addresses:

Item	Address
[GD-84D-EX setting data (1st alarm setpoint)]	Basic Data: Large GD-84D-EX read area address: 5
[Command execution status (PLC)]	Basic Data: Large GD-84D-EX read area address: 16
[Command code]	Basic Data: Large GD-84D-EX read area address: 17
[Parameter]	Basic Data: Large GD-84D-EX read area address: 18
[Command execution status (GD-84D-EX)]	Basic Data: Large GD-84D-EX write area address: 40
[Command execution result]	Basic Data: Large GD-84D-EX write area address: 41

Set as shown below to set the 1st alarm setpoint to "500" and the 2nd alarm setpoint to "1000".

1 **Confirm that [Command execution status (PLC)] is "0" (normal state).**

2 **Set the alarm setpoints.**
   (1) Set "500" in [GD-84D-EX setting data].
   (2) Set "1" (setting change) in [Command code].
   (3) Set "0x0018" in [Parameter].
   "0x0018" is a parameter (setting flag) with command code 1 (setting change) indicating that the 1st alarm setpoint (bit3) and the 2nd alarm setpoint (bit4) were turned on.

3 **Set "1" (execute process) in [Command execution status (PLC)].**

4 **Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).**

5 **Set "0" (normal state) in [Command execution status (PLC)].**
   If the setting change was successful, the [Command execution result] will be "0x0018".
   ("0x0018" indicates the 1st alarm setpoint (bit3) and the 2nd alarm setpoint (bit4) were turned on.)
   If the setting change was unsuccessful, the [Command execution result] will be "0x0000".
   ("0x0000" indicates the 1st alarm setpoint (bit3) and 2nd alarm setpoint (bit4) were turned off.)

7-5-9 Setting INHIBIT

The INHIBIT setting uses the following addresses:

Item	Address
[Command execution status (PLC)]	Basic Data: Large GD-84D-EX read area address: 16
[Command code]	Basic Data: Large GD-84D-EX read area address: 17
[Parameter]	Basic Data: Large GD-84D-EX read area address: 18
[Command execution status (GD-84D-EX)]	Basic Data: Large GD-84D-EX write area address: 40
[Command execution result]	Basic Data: Large GD-84D-EX write area address: 41

1   Confirm that [Command execution status (PLC)] is "0" (normal state).

2   Set ON/OFF for INHIBIT.
(1) When turning INHIBIT on, set "3" in the [Command code]; when turning off, set "4" in the [Command code].
(2) Set "0" (parameter not used) in [Parameter]

3   Set "1" (execute process) in [Command execution status (PLC)].

4   Confirm that [Command execution status (GD-84D-EX)] is "1" (processing complete).

5   Set "0" (normal state) in [Command execution status (PLC)].
If the setting change was successful, the [Command execution result] will be "1".
If the setting change was unsuccessful, the [Command execution result] will be "0".

7-5-9 Setting INHIBIT

7-6 PLC communication setting specifications using this product

You can configure the ETHERNET settings in the maintenance mode of the product
([SET-18 ETHERNET] in [2-10 SETTING2]) to set the [PLC Mode] to [1] - [7] and [PLC Area] to [0] - [15].
(Refer to '7-10-18 ETHERNET settings (ETHERNET)' in the 'GD-84D-EX Series Gas Detector Head
Operating Manual'.)

When [PLC Mode] setting of this product is [2] - [7], and [PLC Area] setting is [0] - [15], the following
values corresponding to the different PLC modes and PLC memory areas set on this product are
automatically set in the Network screen of GAS DETECTOR MANAGER. Note that items that were
automatically set are grayed out and cannot be changed.

PLC		
PLC Mode	2 ⌄	
PLC Area	2 ⌄	
PLC Type	○ Not Use ● FINS ○ MC	
Type of Basic Data	● Small ○ Large ○ Very Small	
Use Optional Data	○ Yes ● No	
③ Interval	Min	1000 msec
	Max	2000 msec
④ Timeout	10 sec	
FINS		
① IP Address	192 . 168 . 1 . 251	
② Port	9600	
⑤ Detector	Network Address	0
	Node Address	1
	Unit Number	0
⑥ PLC	Network Address	0
	Node Address	251
	Unit Number	0
Detector Write	Memory Address	0
	Area Type	E2 ⌄ 162
Detector Read	Memory Address	10752
	Area Type	E2 ⌄ 162
MC		
① IP Address	192 . 168 . 1 . 251	
② Port	2000	
⑥ PLC	Network Address	0
	Node Number	0
Detector Write	Memory Address	65536
	Device Code	ZR ⌄ 176
Detector Read	Memory Address	76288
	Device Code	ZR ⌄ 176

The IP address for this product is assumed to be IP1.IP2.IP3.IP4.

	Item		Remarks		[PLC Mode] (When [2] - [7])	
①	IP Address*		0 - 254	IP4 of IP1.IP2.IP3.PLC	Default: 251	
②	Port*		0 - 65535		Default: 9600 (FINS) Default: 5000 (MC)	
③	Interval	Min	250 - 10000		Default: 1,000 msec	
		Max	250 - 10000		Default: 3,000 msec	
④	TimeOut		1 - 10		Default: 5 sec	
⑤	Detector	Network Address	0 - 255		Default: 0	
		(Node Address)	0 - 255	IP4		
		Unit Number	0 - 255		Default: 0	
⑥	PLC	Network Address	0 - 255		Default: 0	
		(Node Address)	0 - 255	IP4 of PLC		
		Unit Number	0 - 255		Default: 0	

 * [FINS] and [MC] share the same [IP Address] and [Port].

NOTE

▶ Log on in Administrator mode to view the Network screen.
▶ Grayed out items cannot have their settings changed in GAS DETECTOR MANAGER.
▶ When [PLC Mode] has been set to [1] in the product ETHERNET settings, communication settings can be made in Network screen of GAS DETECTOR MANAGER. (Refer to '4. PLC communication settings'.)
▶ For more information on settings for each item, refer to '7-3 PLC communication setting details'.

7-6-1 PLC Mode settings

When [2] - [7] are set in [PLC Mode] on the product, the following Network screen items are set automatically.

The information set differs for each IP address on the product. Refer to the following table for details of the settings:

[PLC Mode] setting value ——

Items automatically set by [PLC Mode] settings ([2] - [7])

PLC		
PLC Mode	2 ⌄	
PLC Area	2 ⌄	
PLC Type	○ Not Use ● FINS ○ MC	
Type of Basic Data	● Small ○ Large ○ Very Small	
Use Optional Data	○ Yes ● No	
Interval	Min	1000	msec
	Max	2000	msec
Timeout	10	sec
FINS		
IP Address	192 . 168 . 1 . 251	
Port	9600	
Detector	Network Address	0
	Node Address	1
	Unit Number	0
PLC	Network Address	0
	Node Address	251
	Unit Number	0
Detector Write	Memory Address	0
	Area Type	E2 ⌄ 162
Detector Read	Memory Address	10752
	Area Type	E2 ⌄ 162
MC		
IP Address	192 . 168 . 1 . 251	
Port	2000	
PLC	Network Address	0
	Node Number	0
Detector Write	Memory Address	65536
	Device Code	ZR ⌄ 176
Detector Read	Memory Address	76288
	Device Code	ZR ⌄ 176

NOTE

▶ Log on in Administrator mode to view the Network screen.

<[PLC Mode]: [1] - [4]>

Communication mode [PLC Mode]	1	2		3		4	
Default: 1							
PLC Type	Not use	FINS		FINS		MC	
Type of Basic Data		Small		Large		Small	
Memory Address IP address		Detector write	Detector read	Detector write	Detector read	Detector write	Detector read
xxx.xxx.xxx.1		0 - 167	-	0 - 167	10752 - 10839	0 - 167	-
xxx.xxx.xxx.2		42 - 209	-	42 - 209	10774 - 10861	42 - 209	-
xxx.xxx.xxx.3		84 - 251	-	84 - 251	10796 - 10883	84 - 251	-
xxx.xxx.xxx.4		126 - 293	-	126 - 293	10818 - 10905	126 - 293	-
xxx.xxx.xxx.5		168 - 335	-	168 - 335	10840 - 10927	168 - 335	-
xxx.xxx.xxx.6		210 - 377	-	210 - 377	10862 - 10949	210 - 377	-
xxx.xxx.xxx.7		252 - 419	-	252 - 419	10884 - 10971	252 - 419	-
xxx.xxx.xxx.8		294 - 461	-	294 - 461	10906 - 10993	294 - 461	-
xxx.xxx.xxx.9		336 - 503	-	336 - 503	10928 - 11015	336 - 503	-
xxx.xxx.xxx.10		378 - 545	-	378 - 545	10950 - 11037	378 - 545	-
xxx.xxx.xxx.11		420 - 587	-	420 - 587	10972 - 11059	420 - 587	-
xxx.xxx.xxx.12		462 - 629	-	462 - 629	10994 - 11081	462 - 629	-
xxx.xxx.xxx.13		504 - 671	-	504 - 671	11016 - 11103	504 - 671	-
xxx.xxx.xxx.14		546 - 713	-	546 - 713	11038 - 11125	546 - 713	-
xxx.xxx.xxx.15		588 - 755	-	588 - 755	11060 - 11147	588 - 755	-
xxx.xxx.xxx.16		630 - 797	-	630 - 797	11082 - 11169	630 - 797	-
. .	. .	. .	. .	. .	. .	. .	. .
xxx.xxx.xxx.164		6846 - 7013	-	6846 - 7013	14338 - 14425	6846 - 7013	-
xxx.xxx.xxx.165		6888 - 7055	-	6888 - 7055	14360 - 14447	6888 - 7055	-
xxx.xxx.xxx.166		6930 - 7097	-	6930 - 7097	14382 - 14469	6930 - 7097	-
xxx.xxx.xxx.167		6972 - 7139	-	6972 - 7139	14404 - 14491	6972 - 7139	-
xxx.xxx.xxx.168		7014 - 7181	-	7014 - 7181	14426 - 14513	7014 - 7181	-
xxx.xxx.xxx.169		7056 - 7223	-	7056 - 7223	14448 - 14535	7056 - 7223	-
xxx.xxx.xxx.170		7098 - 7265	-	7098 - 7265	14470 - 14557	7098 - 7265	-
xxx.xxx.xxx.171		7140 - 7307	-	7140 - 7307	14492 - 14579	7140 - 7307	-
xxx.xxx.xxx.172		7182 - 7349	-	7182 - 7349	14514 - 14601	7182 - 7349	-
xxx.xxx.xxx.173		7224 - 7391	-	7224 - 7391	14536 - 14623	7224 - 7391	-
xxx.xxx.xxx.174		7266 - 7433	-	7266 - 7433	14558 - 14645	7266 - 7433	-
xxx.xxx.xxx.175		7308 - 7475	-	7308 - 7475	14580 - 14667	7308 - 7475	-
xxx.xxx.xxx.176		7350 - 7517	-	7350 - 7517	14602 - 14689	7350 - 7517	-
xxx.xxx.xxx.177		7392 - 7559	-	7392 - 7559	14624 - 14711	7392 - 7559	-
xxx.xxx.xxx.178		7434 - 7601	-	7434 - 7601	14646 - 14733	7434 - 7601	-
xxx.xxx.xxx.179		7476 - 7643	-	7476 - 7643	14668 - 14755	7476 - 7643	-
xxx.xxx.xxx.180		7518 - 7685	-	7518 - 7685	14690 - 14777	7518 - 7685	-
. .	. .	. .	. .	. .	. .	. .	. .
xxx.xxx.xxx.249		10416 - 10583	-	10416 - 10583	16208 - 16295	10416 - 10583	-
xxx.xxx.xxx.250		10458 - 10625	-	10458 - 10625	16230 - 16317	10458 - 10625	-
xxx.xxx.xxx.251		IP address of the communication destination PLC					

xxx: Product IP address

<[PLC Mode]: [5] - [7]>

Communication mode [PLC Mode]	5		6		7	
Default: 1						
PLC Type	MC		FINS		MC	
Type of Basic Data	Large		Very Small		Very Small	
Memory Address IP address	Detector write	Detector read	Detector write	Detector read	Detector write	Detector read
xxx.xxx.xxx.1	0 - 167	10752 - 10839	0 - 15	1024 - 1039	0 - 15	1024 - 1039
xxx.xxx.xxx.2	42 - 209	10774 - 10861	4 - 19	1028 - 1043	4 - 19	1028 - 1043
xxx.xxx.xxx.3	84 - 251	10796 - 10883	8 - 23	1032 - 1047	8 - 23	1032 - 1047
xxx.xxx.xxx.4	126 - 293	10818 - 10905	12 - 27	1036 - 1051	12 - 27	1036 - 1051
xxx.xxx.xxx.5	168 - 335	10840 - 10927	16 - 31	1040 - 1055	16 - 31	1040 - 1055
xxx.xxx.xxx.6	210 - 377	10862 - 10949	20 - 35	1044 - 1059	20 - 35	1044 - 1059
xxx.xxx.xxx.7	252 - 419	10884 - 10971	24 - 39	1048 - 1063	24 - 39	1048 - 1063
xxx.xxx.xxx.8	294 - 461	10906 - 10993	28 - 43	1052 - 1067	28 - 43	1052 - 1067
xxx.xxx.xxx.9	336 - 503	10928 - 11015	32 - 47	1056 - 1071	32 - 47	1056 - 1071
xxx.xxx.xxx.10	378 - 545	10950 - 11037	36 - 51	1060 - 1075	36 - 51	1060 - 1075
xxx.xxx.xxx.11	420 - 587	10972 - 11059	40 - 55	1064 - 1079	40 - 55	1064 - 1079
xxx.xxx.xxx.12	462 - 629	10994 - 11081	44 - 59	1068 - 1083	44 - 59	1068 - 1083
xxx.xxx.xxx.13	504 - 671	11016 - 11103	48 - 63	1072 - 1087	48 - 63	1072 - 1087
xxx.xxx.xxx.14	546 - 713	11038 - 11125	52 - 67	1076 - 1091	52 - 67	1076 - 1091
xxx.xxx.xxx.15	588 - 755	11060 - 11147	56 - 71	1080 - 1095	56 - 71	1080 - 1095
xxx.xxx.xxx.16	630 - 797	11082 - 11169	60 - 75	1084 - 1099	60 - 75	1084 - 1099
. .	. .	. .	. .	. .	. .	. .
xxx.xxx.xxx.164	6846 - 7013	14338 - 14425	652 - 667	1676 - 1691	652 - 667	1676 - 1691
xxx.xxx.xxx.165	6888 - 7055	14360 - 14447	656 - 671	1680 - 1695	656 - 671	1680 - 1695
xxx.xxx.xxx.166	6930 - 7097	14382 - 14469	660 - 675	1684 - 1699	660 - 675	1684 - 1699
xxx.xxx.xxx.167	6972 - 7139	14404 - 14491	664 - 679	1688 - 1703	664 - 679	1688 - 1703
xxx.xxx.xxx.168	7014 - 7181	14426 - 14513	668 - 683	1692 - 1707	668 - 683	1692 - 1707
xxx.xxx.xxx.169	7056 - 7223	14448 - 14535	672 - 687	1696 - 1711	672 - 687	1696 - 1711
xxx.xxx.xxx.170	7098 - 7265	14470 - 14557	676 - 691	1700 - 1715	676 - 691	1700 - 1715
xxx.xxx.xxx.171	7140 - 7307	14492 - 14579	680 - 695	1704 - 1719	680 - 695	1704 - 1719
xxx.xxx.xxx.172	7182 - 7349	14514 - 14601	684 - 699	1708 - 1723	684 - 699	1708 - 1723
xxx.xxx.xxx.173	7224 - 7391	14536 - 14623	688 - 703	1712 - 1727	688 - 703	1712 - 1727
xxx.xxx.xxx.174	7266 - 7433	14558 - 14645	692 - 707	1716 - 1731	692 - 707	1716 - 1731
xxx.xxx.xxx.175	7308 - 7475	14580 - 14667	696 - 711	1720 - 1735	696 - 711	1720 - 1735
xxx.xxx.xxx.176	7350 - 7517	14602 - 14689	700 - 715	1724 - 1739	700 - 715	1724 - 1739
xxx.xxx.xxx.177	7392 - 7559	14624 - 14711	704 - 719	1728 - 1743	704 - 719	1728 - 1743
xxx.xxx.xxx.178	7434 - 7601	14646 - 14733	708 - 723	1732 - 1747	708 - 723	1732 - 1747
xxx.xxx.xxx.179	7476 - 7643	14668 - 14755	712 - 727	1736 - 1751	712 - 727	1736 - 1751
xxx.xxx.xxx.180	7518 - 7685	14690 - 14777	716 - 731	1740 - 1755	716 - 731	1740 - 1755
. .	. .	. .	. .	. .	. .	. .
xxx.xxx.xxx.249	10416 - 10583	16208 - 16295	992 - 1007	2016 - 2031	992 - 1007	2016 - 2031
xxx.xxx.xxx.250	10458 - 10625	16230 - 16317	996 - 1011	2020 - 2035	996 - 1011	2020 - 2035
xxx.xxx.xxx.251	IP address of the communication destination PLC					

xxx: Product IP address

NOTE

▶ To make detailed communication settings in the Network screen of GAS DETECTOR MANAGER, set [PLC Mode] in the product ETHERNET settings to [1]. (Refer to '4. PLC communication settings'.)

⚠ **CAUTION**

- The PLC IP address is fixed at xxx.xxx.xxx.251. (xxx is the product IP address.)
- You cannot use the IP address of the PLC or IP addresses after xxx.xxx.xxx.252. (xxx is the product IP address.)
- When [PLC Mode] is [2] - [7], four IP address areas are used by each unit of this product. Leave at least four spaces for IP addresses when allocating them so that the areas used do not overlap.
- When setting Very Small, it is not possible to mix with other PLC Modes.

7-6-2 PLC Area settings

When [1] - [15] are set in [PLC Area], the following Network screen items are set automatically:
Refer to the following table for details of the settings:

[PLC Area] setting value ——

Items automatically set
by [PLC Area] settings
([1] - [15])

PLC		
PLC Mode		2 ∨
PLC Area		2 ∨
PLC Type		○ Not Use ● FINS ○ MC
Type of Basic Data		● Small ○ Large ○ Very Small
Use Optional Data		○ Yes ● No
Interval	Min	1000 msec
	Max	2000 msec
Timeout		10 sec
FINS		
IP Address		192 . 168 . 1 . 251
Port		9600
Detector	Network Address	0
	Node Address	1
	Unit Number	0
PLC	Network Address	0
	Node Address	251
	Unit Number	0
Detector Write	Memory Address	0
	Area Type	E2 ∨ 162
Detector Read	Memory Address	10752
	Area Type	E2 ∨ 162
MC		
IP Address		192 . 168 . 1 . 251
Port		2000
PLC	Network Address	0
	Node Number	0
Detector Write	Memory Address	65536
	Device Code	ZR ∨ 176
Detector Read	Memory Address	76288
	Device Code	ZR ∨ 176

NOTE

▶ Log on in Administrator mode to view the Network screen.

[PLC Area] (PLC memory area)		[PLC Mode] (When [1] - [5])		[PLC Mode] (When [6] - [7])	
		FINS	MC	FINS	MC
Default: 3	0	E0(0)	ZR(0)	E0(0)	ZR(0)
	1	E1(0)	ZR(32768)	E0(2048)	ZR(2048)
	2	E2(0)	ZR(65536)	E0(4096)	ZR(4096)
	3	E3(0)	ZR(98304)	E0(6144)	ZR(6144)
	4	E4(0)	ZR(131072)	E0(8192)	ZR(8192)
	5	E5(0)	ZR(163840)	E0(10240)	ZR(10240)
	6	E6(0)	ZR(196608)	E0(12288)	ZR(12288)
	7	E7(0)	ZR(229376)	E0(14336)	ZR(14336)
	8	E8(0)	ZR(262144)	E0(16384)	ZR(16384)
	9	E9(0)	ZR(294912)	E0(18432)	ZR(18432)
	10	E10(0)	ZR(327680)	E0(20480)	ZR(20480)
	11	E11(0)	ZR(360448)	E0(22528)	ZR(22528)
	12	E12(0)	ZR(393216)	E0(24576)	ZR(24576)
	13	E13(0)	ZR(425984)	E0(26624)	ZR(26624)
	14	E14(0)	ZR(458752)	E0(28672)	ZR(28672)
	15	E15(0)	ZR(491520)	E0(30720)	ZR(30720)

NOTE

▶ When using the [MC], note that the numbers in parentheses () are the offset values for the [Memory Address].

Example of communication setting) OMRON PLC

	Model	IP address	PLC Mode	PLC Area	Detector write	Detector read
Gas detector 1	GD-70D	192.168.0.1	3	3	E3 0~41	E3 10752~10773
Gas detector 2	GD-84D A1	192.168.0.2	3	3	E3 42~83	E3 10774~10795
	A2				E3 84~125	E3 10796~10817
	B1				E3 126~167	E3 10818~10839
	B2				E3 168~209	E3 10840~10861
Gas detector 3	GD-81D	192.168.0.6	3	3	E3 210~251	E3 10862~10883
Communication target PLC	OMRON CJ series	192.168.0.251	–	–	–	–

*For both devices, the subnet mask should be "255.255.255.0".

Example of communication setting) MITSUBISHI ELECTRIC Corporation PLC

	Model	IP address	PLC Mode	PLC Area	Detector write	Detector read
Gas detector 1	GD–84D A1	192.168.0.1	5	2	ZR 65536~65577	ZR 76288~76309
	GD–84D A2				ZR 65578~65619	ZR 76310~76331
	GD–84D B1				ZR 65620~65661	ZR 76332~76353
	GD–84D B2				ZR 65662~65703	ZR 76354~76375
Gas detector 2	GD–84D A1	192.168.0.5	5	2	ZR 65704~65745	ZR 76376~76397
	A2				ZR 65746~65787	ZR 76398~76419
	B1				ZR 65788~65829	ZR 76420~76441
	B2				ZR 65830~65871	ZR 76442~76463
Communication target PLC	MITSUBISHI ELECTRIC Corporation Q series	192.168.0.251	–	–	–	–

*For both devices, the subnet mask should be "255.255.255.0".

Revision History

Issue	Revision details	Issue date
0	First issue	1/25/2021
1	PLC memory saving function added.	1/23/2023