PT2E-3050

RIKEN KEIKI

# 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


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# Contents

# 1

# 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

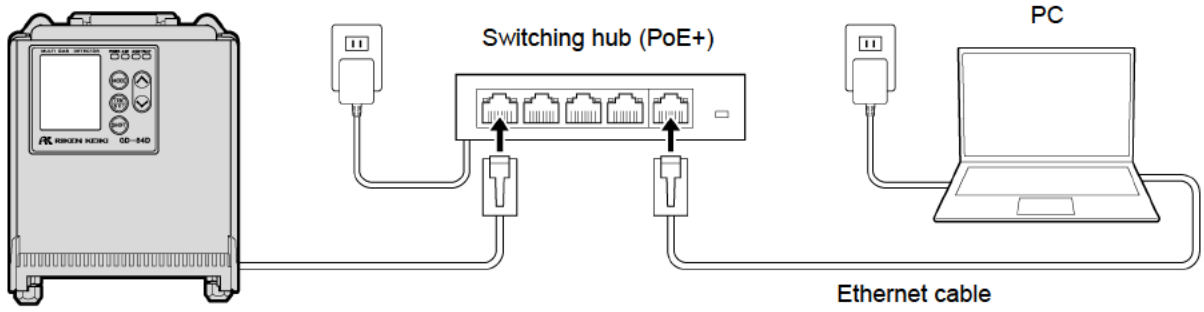
# Device connection

## 2-1 Connecting the product and a PC

Connect the product and the PC as shown below.

### When using a switching hub (PoE+)>

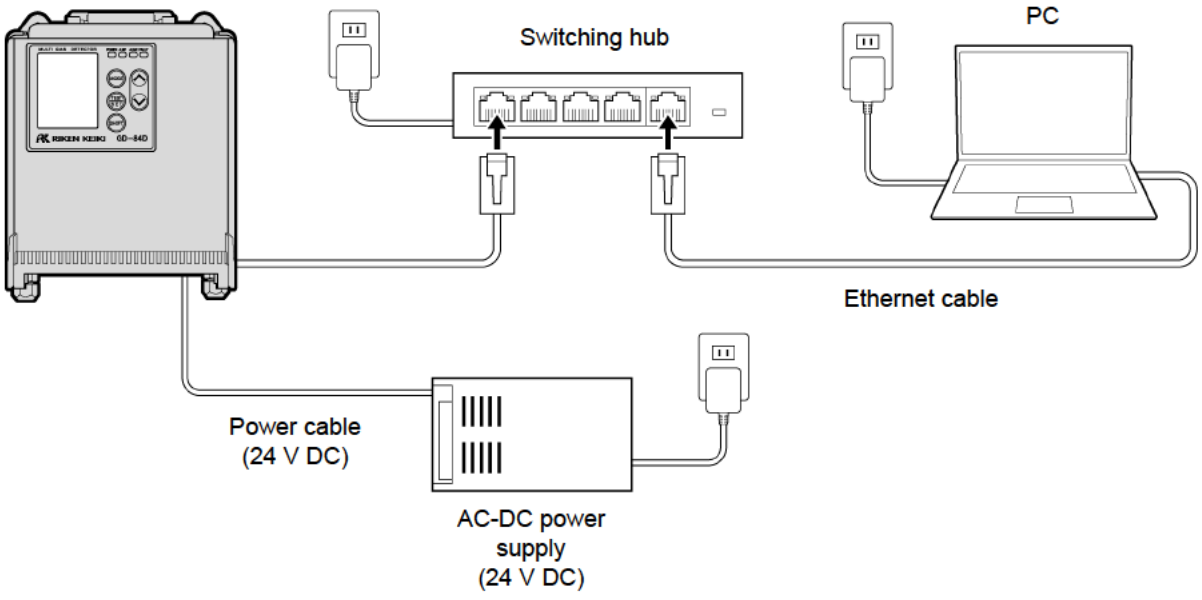
GD-84D-EX (Ethernet model)




### <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

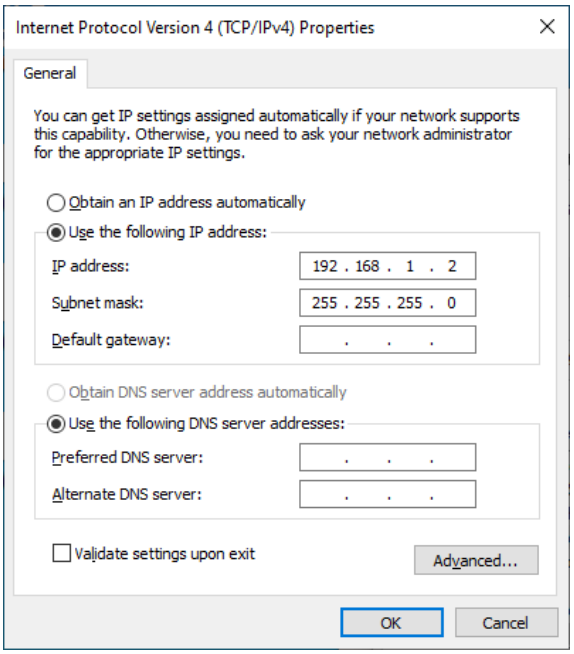
Set the following IP address in this product.
Refer to '7-10-18 ETHERNET settings (ETHERNET)' in the 'GD-84D-EX Series Gas Detector Head Operating Manual' for setting instructions.
IP address: 192.168.1.1
Subnet mask: 255.255.255.0

**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**

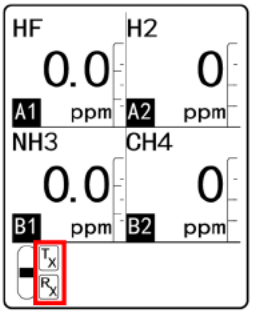
- If the IP address of the device following replacement is identical to the one before replacement, it may not be possible to communicate from the PC to the connected device for a certain period (usually 10 minutes) after replacement.
  To enable communication as quickly as possible, disable the network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

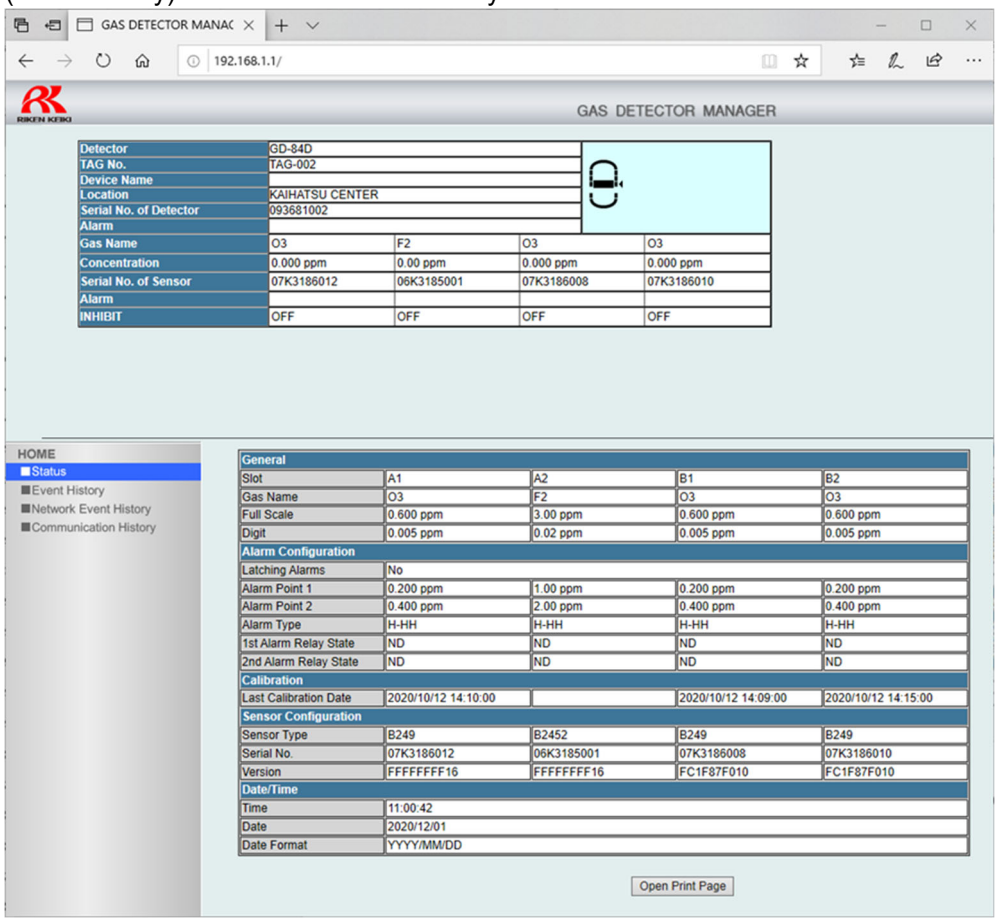
# Setting GAS DETECTOR MANAGER

## 3-1 Overview of GAS DETECTOR MANAGER

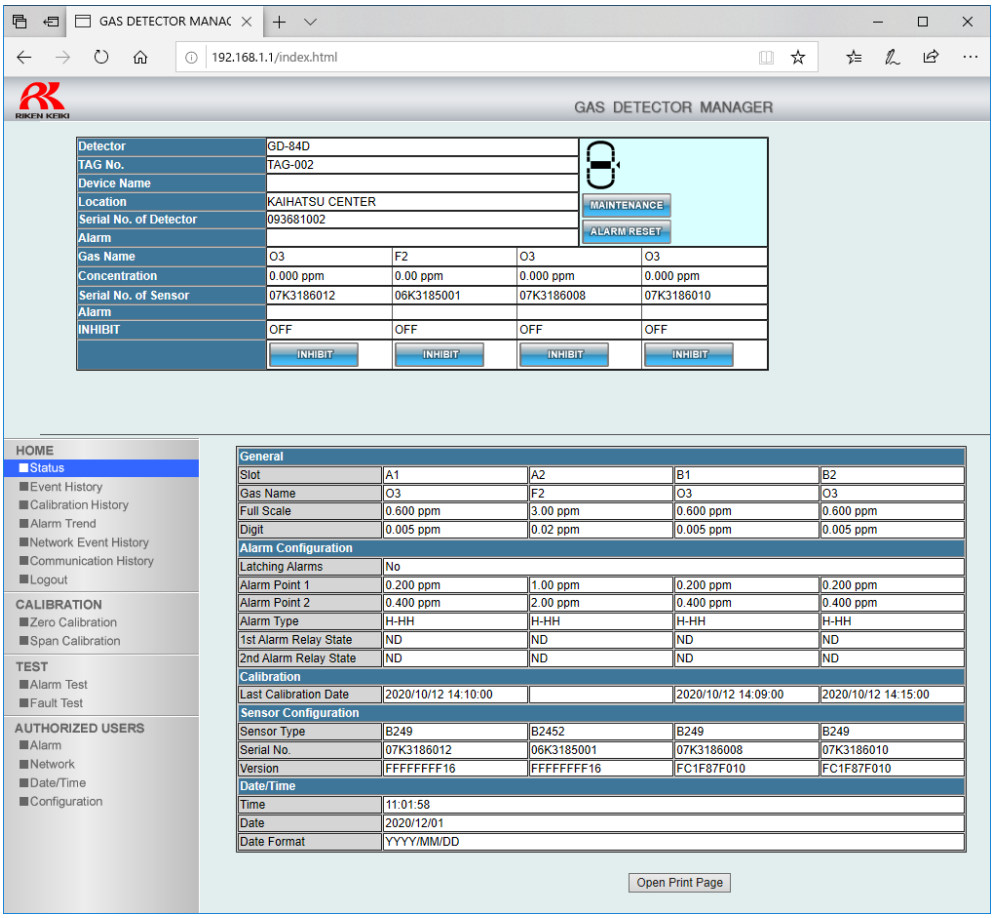
### 3-1-1 About GAS DETECTOR MANAGER

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

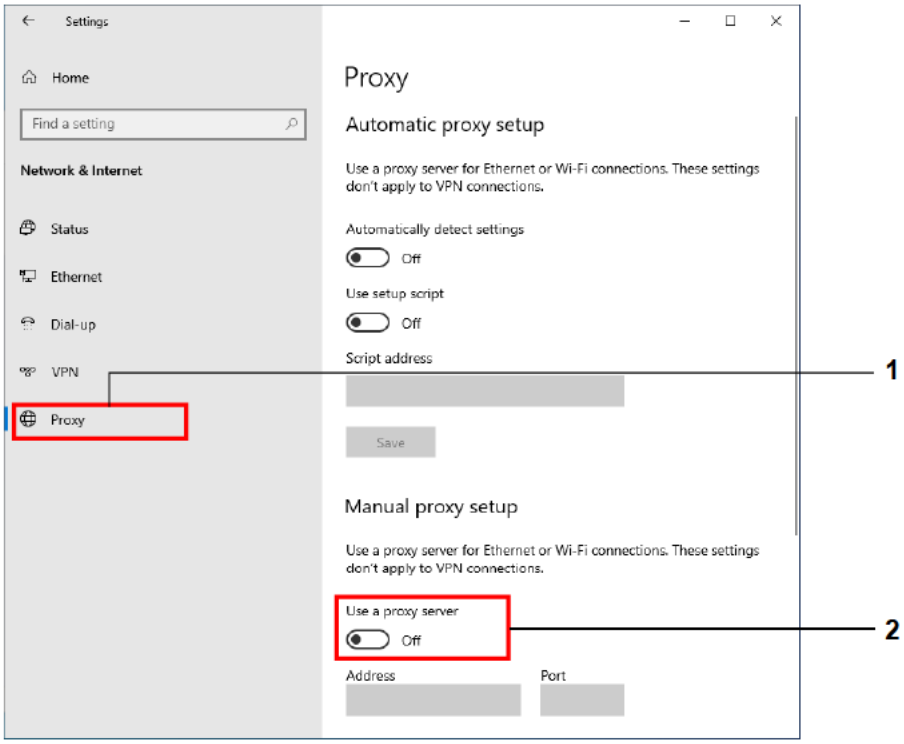
## 3-2-1 Network environment settings

### <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**

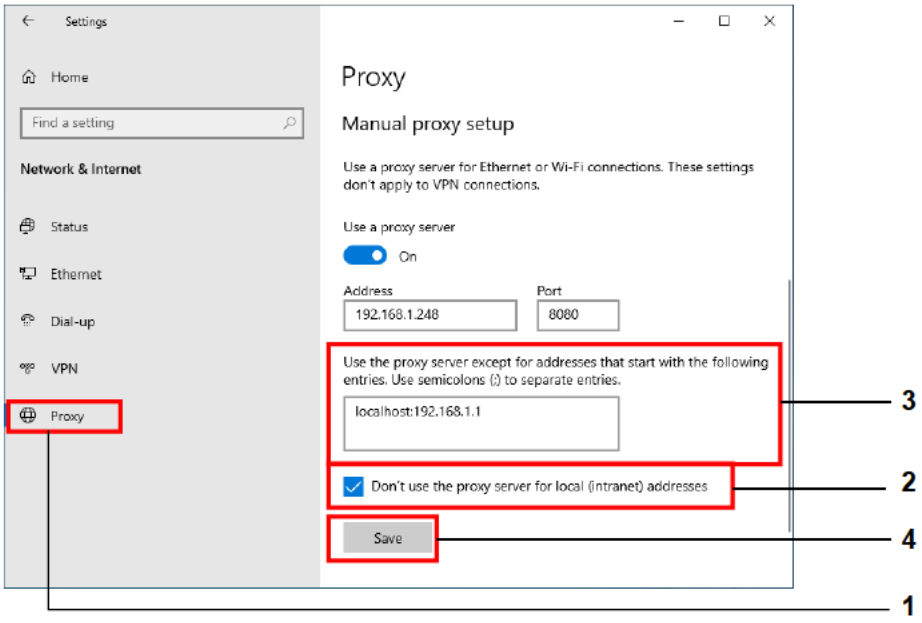
- The following operations are for the settings to use a local address for this product. GAS DETECTOR MANAGER cannot be used via a proxy server.

**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.**



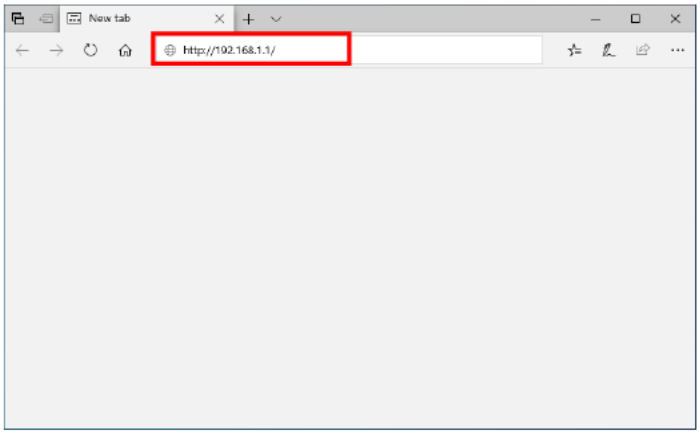

**NOTE**

- 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.

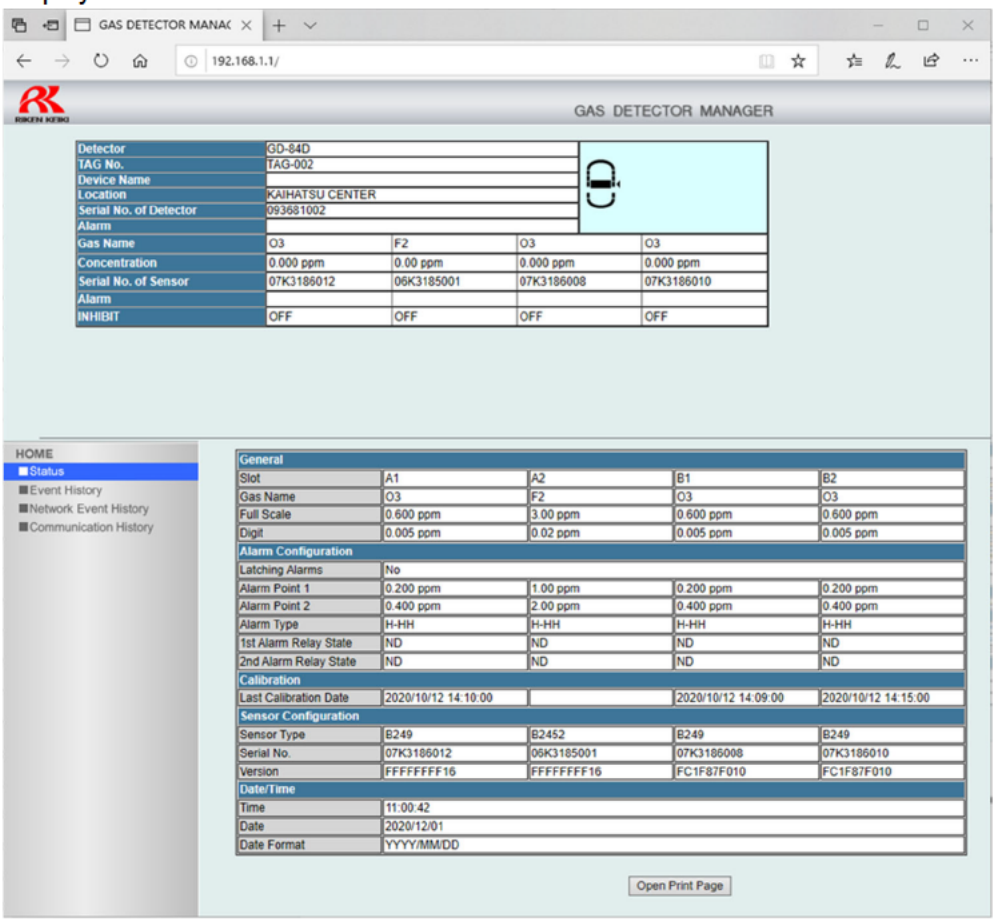
## 3-2-2 Logging on in user mode

**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**

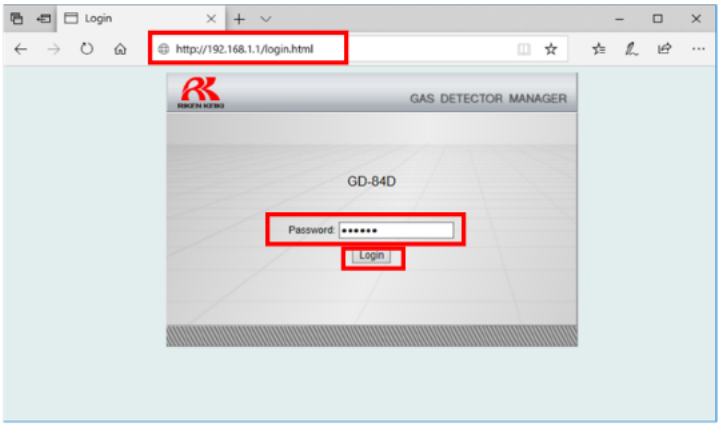
- Depending on the version and settings of the browser, the actual display may differ.

## 3-2-3 Logging on in administrator mode

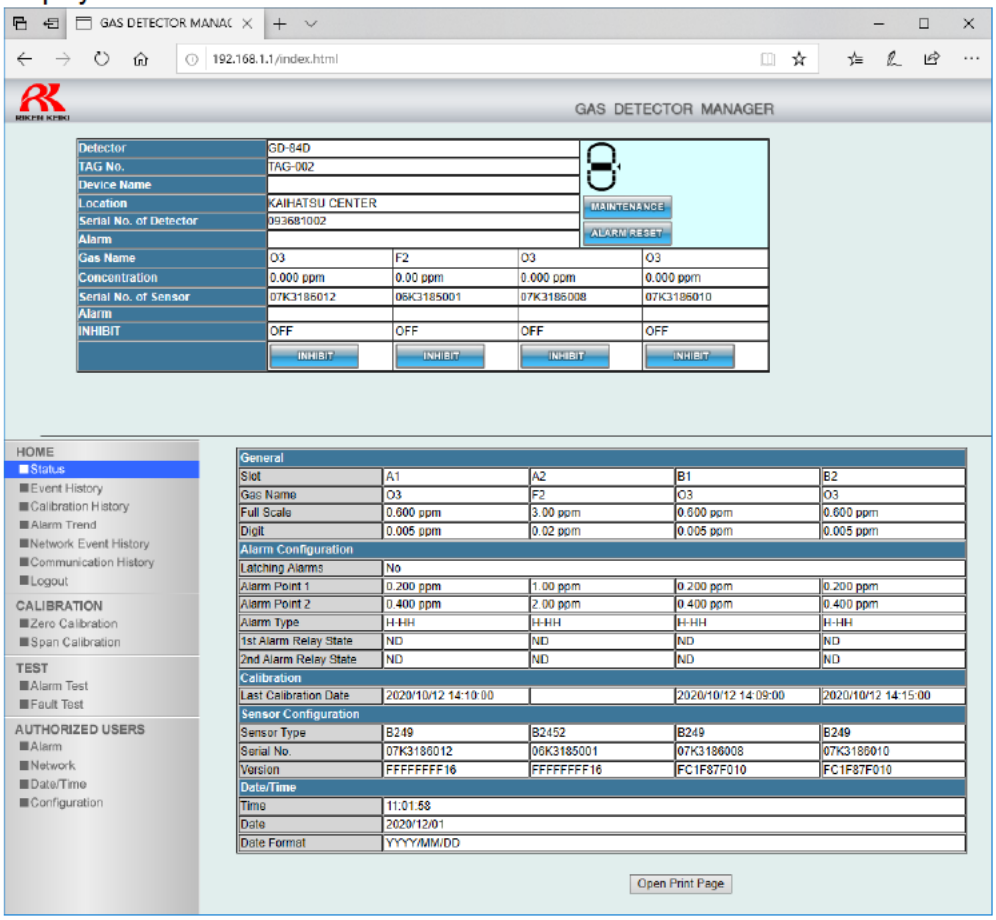
**1 Launch Microsoft Edge.**

**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.

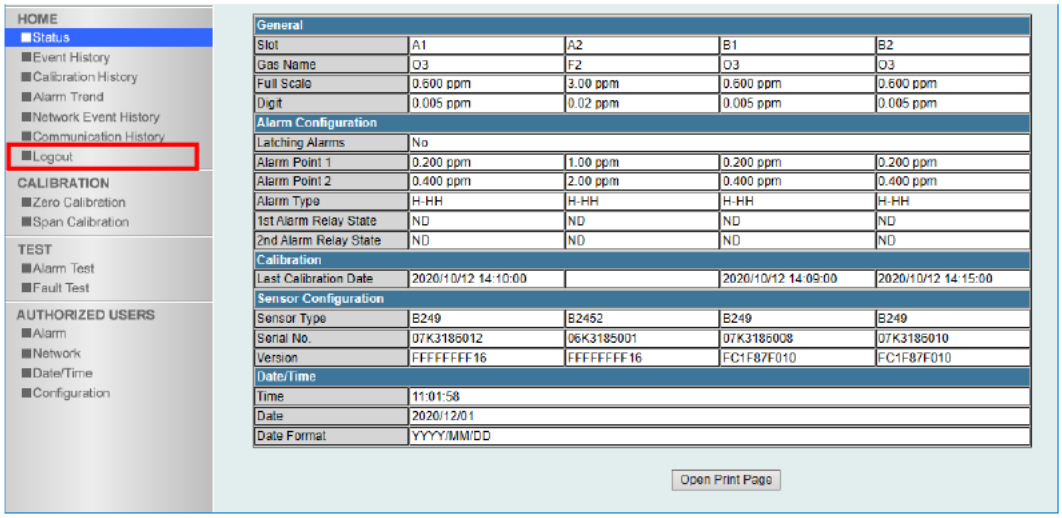



**NOTE**

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

## <Logging out of administrator mode>

Click [Logout] in [HOME].




| 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. | 07K3185012 | 06K3185001 | 07K3185008 | 07K3185010 |
| Version | FFFFFFFF16 | FFFFFFFF16 | FC1F87F010 | FC1F87F010 |
| **Date/Time** | | | | |
| Time | 11:01:58 | | | |
| Date | 2020/12/01 | | | |
| Date Format | YYYY/MM/DD | | | |

# 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>

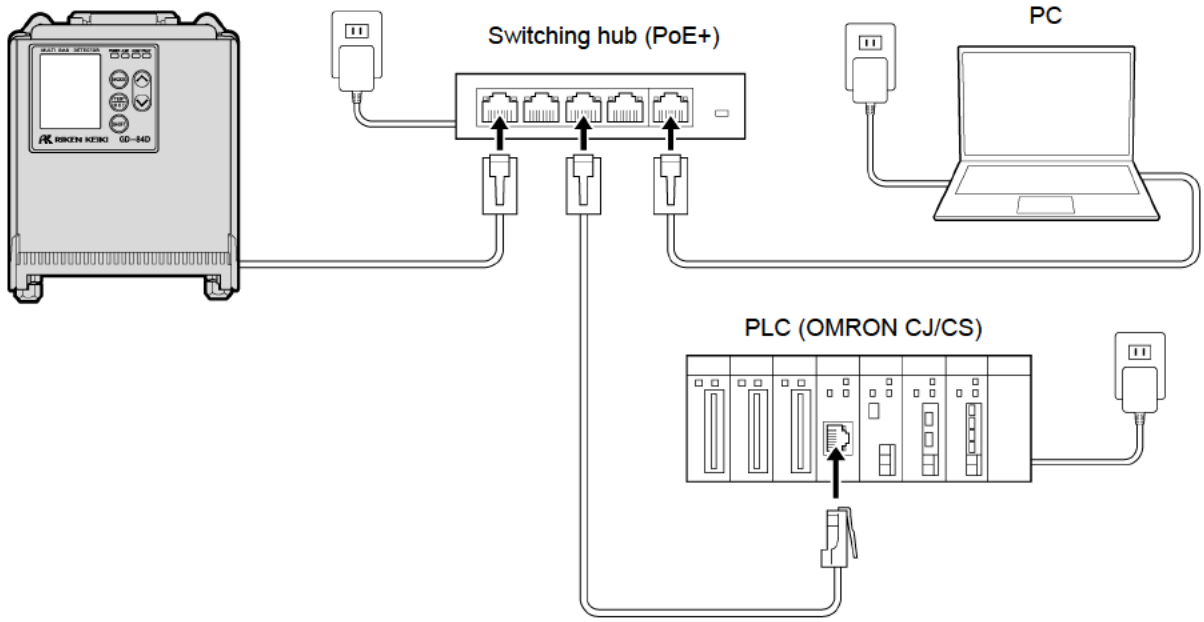
Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode ([SET-18 ETHERNET] in [2-10 SETTING2]).
In each of the [PLC Mode] and [PLC Area] modes, the setting values for the PLC communication settings are set automatically for each area.
For instructions on making or modifying 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)

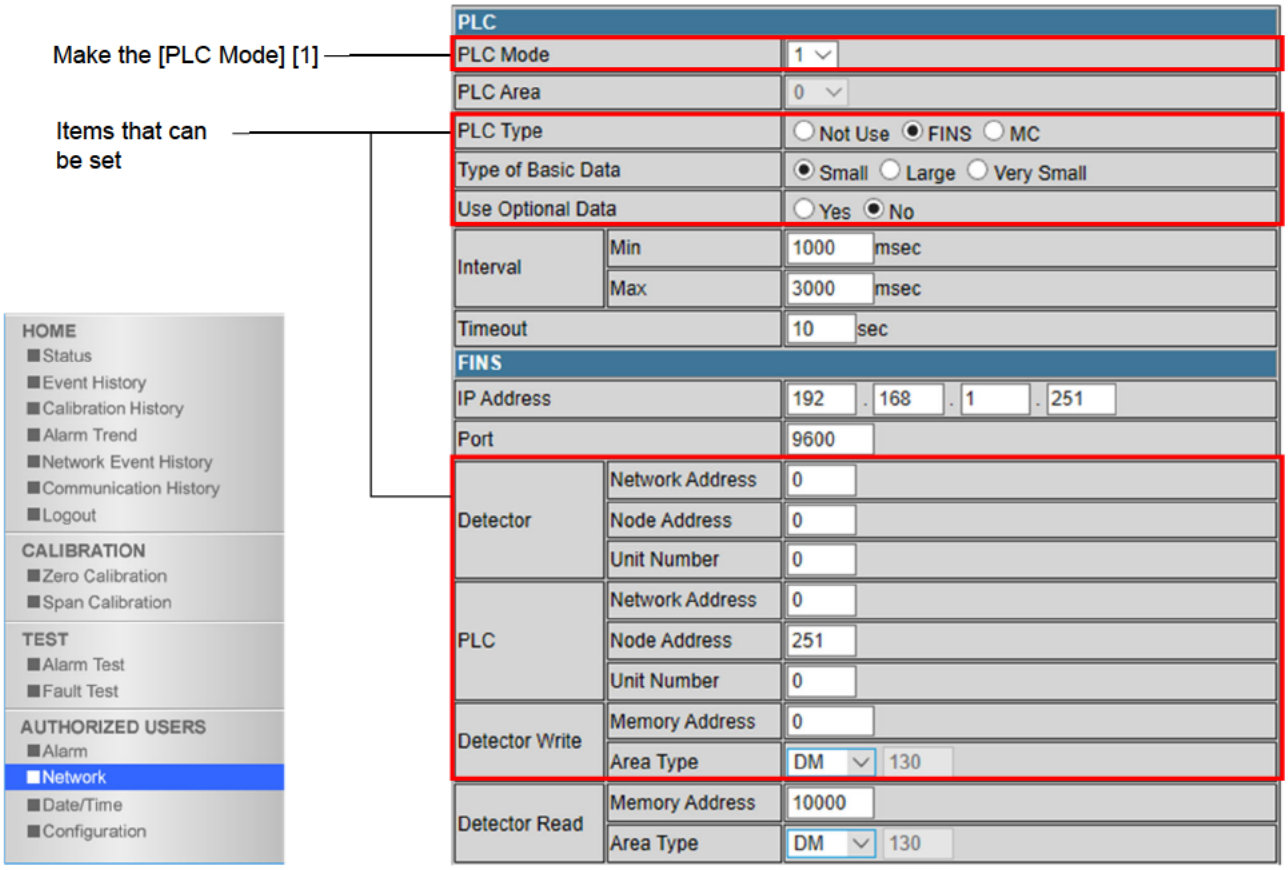



**NOTE**

- 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.




### 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>

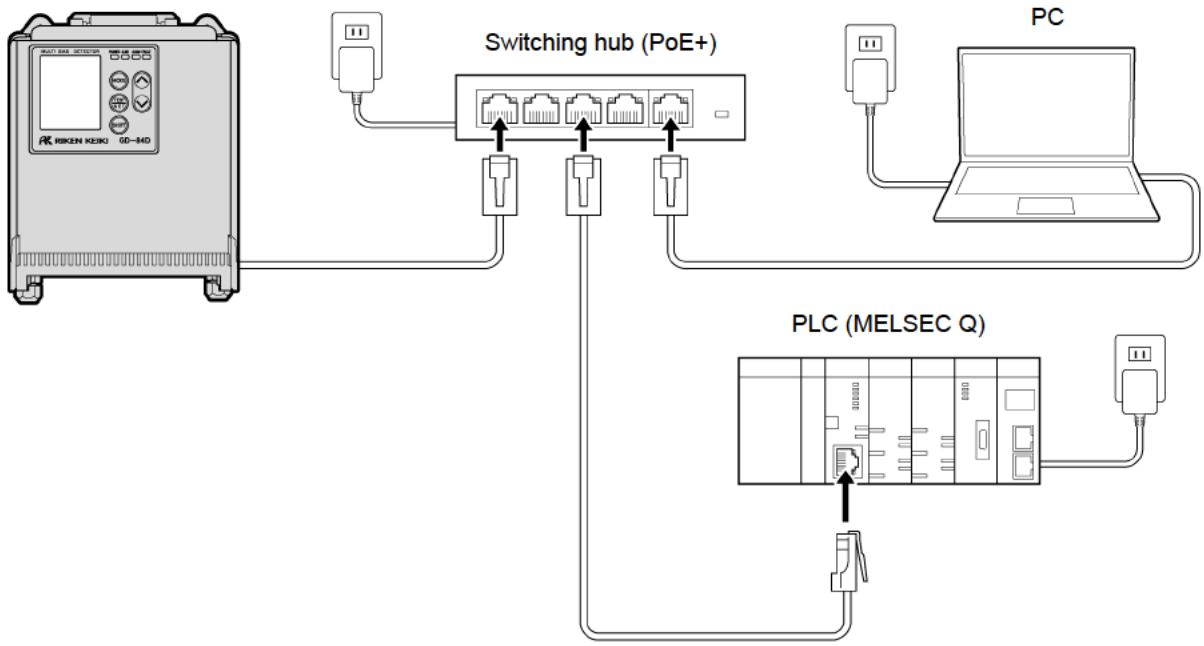
Set [PLC Mode] and [PLC Area] in the ETHERNET settings in product maintenance mode ([SET-18 ETHERNET] in [2-10 SETTING2]).
In each of the [PLC Mode] and [PLC Area] modes, the setting values for the PLC communication settings are set automatically for each area.
For instructions on making or modifying 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)

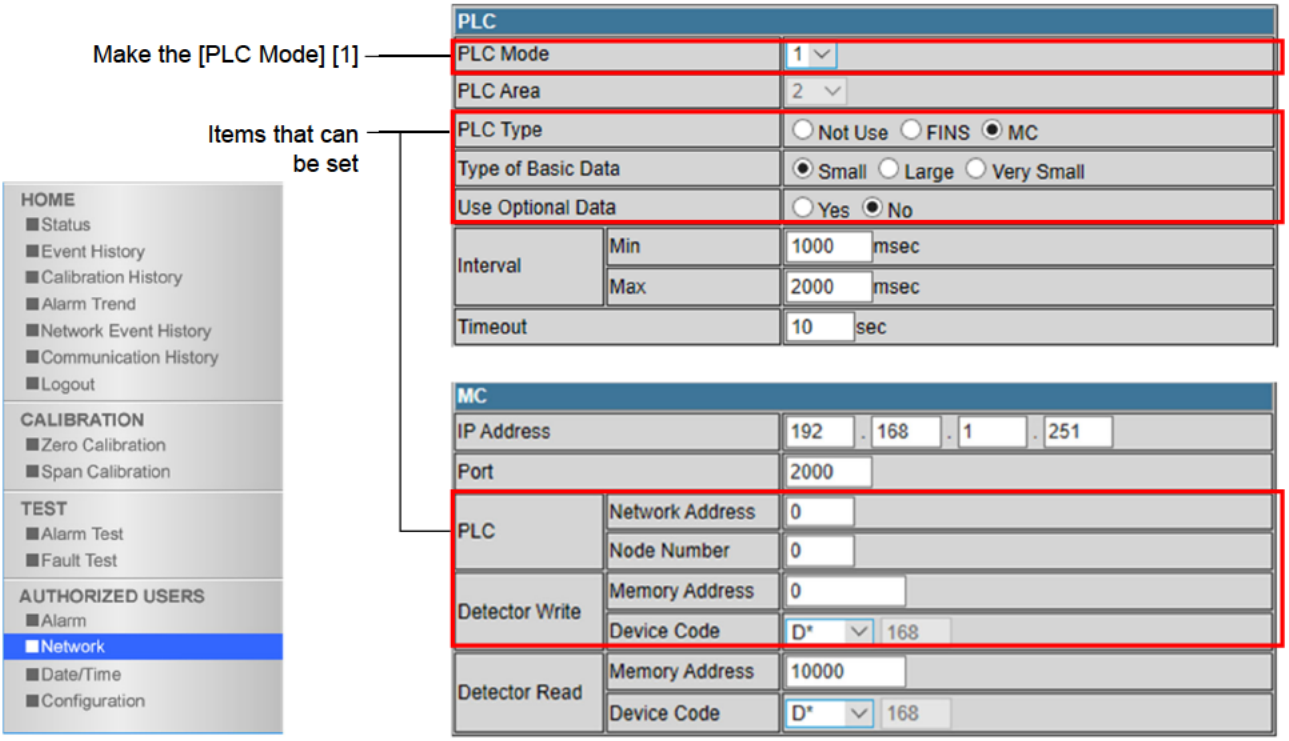



**NOTE**

▶ 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.

# 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.

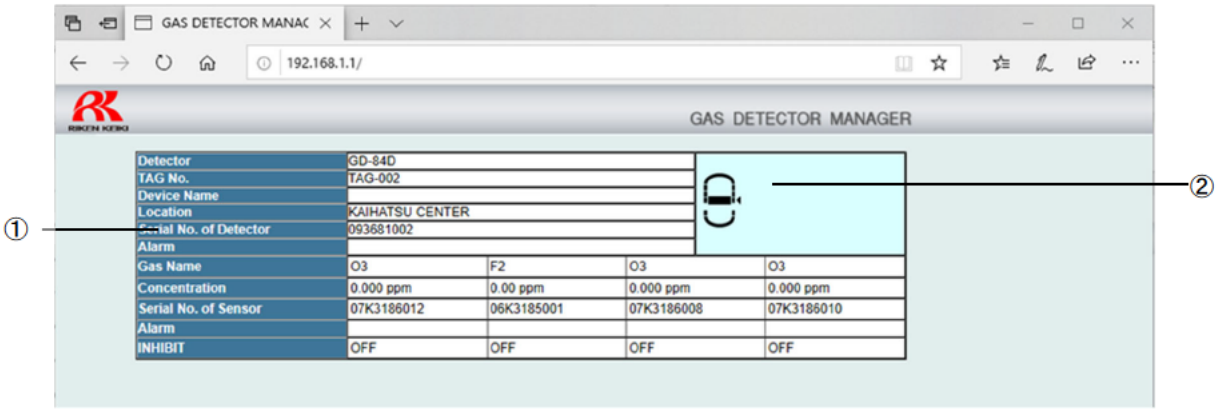
○: Can be displayed ×: Cannot be displayed

| 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).<br>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. |

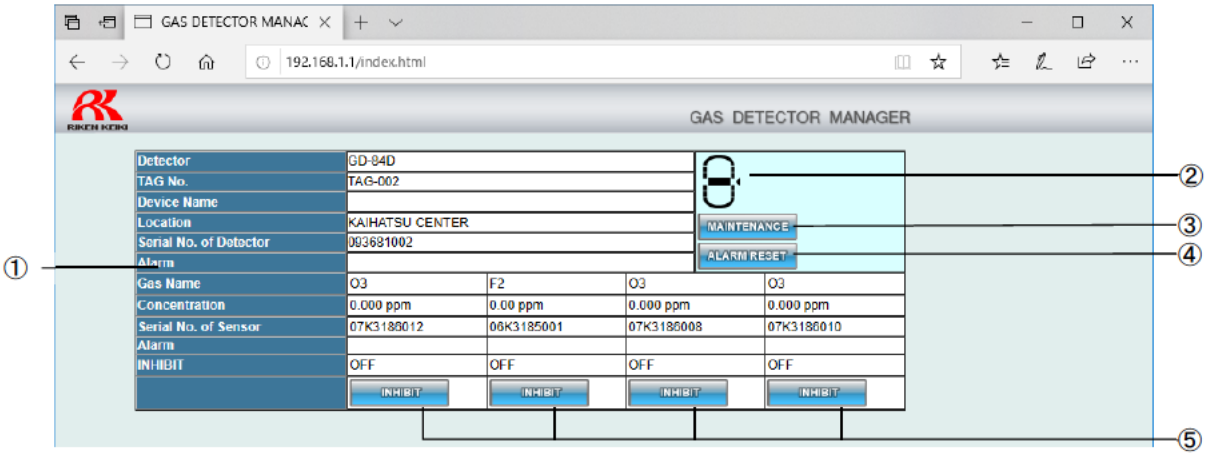
# 5-2 Checking the current status of the product

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>



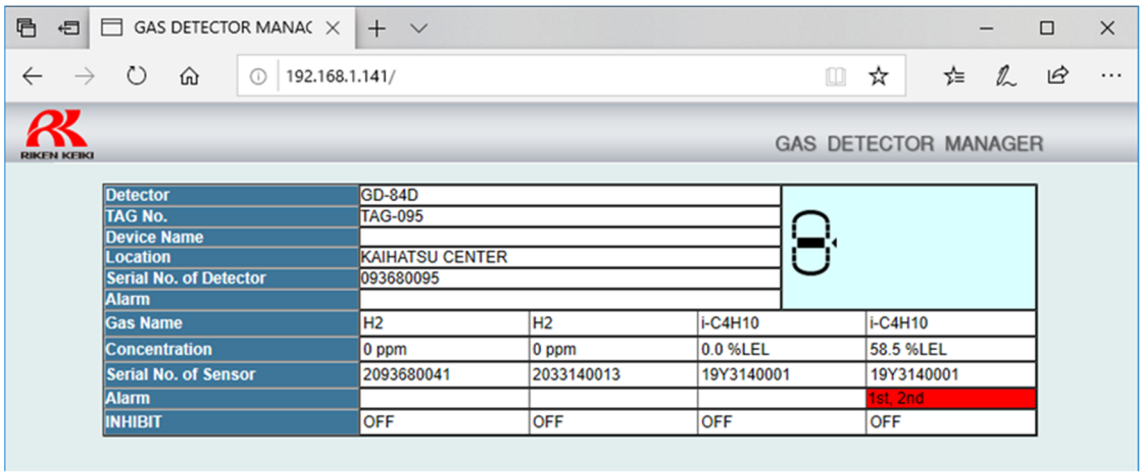

| Number | Item | Description |
|---|---|---|
| ① | Status of this product | Displays the model, TAG number, device name, installation location, serial number, and alarms of the product, along with the gas names, gas concentration, serial numbers, and INHIBIT settings of the sensors fitted. |
| ② | Flow 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

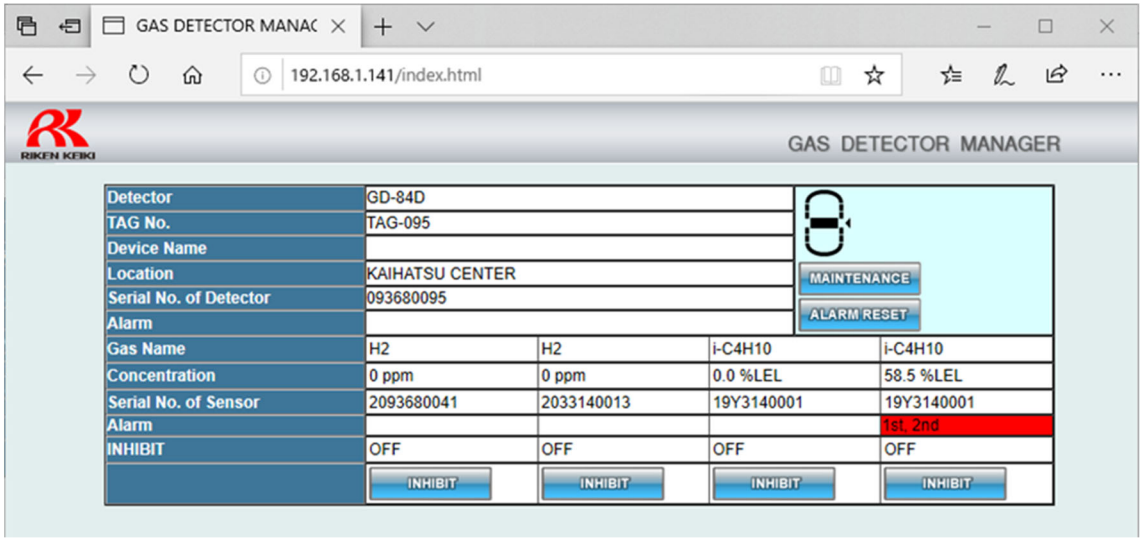
- When the first alarm and second alarm are triggered, the following displays will appear on the screen of GAS DETECTOR MANAGER.

<User mode screen>




<Administrator mode screen>

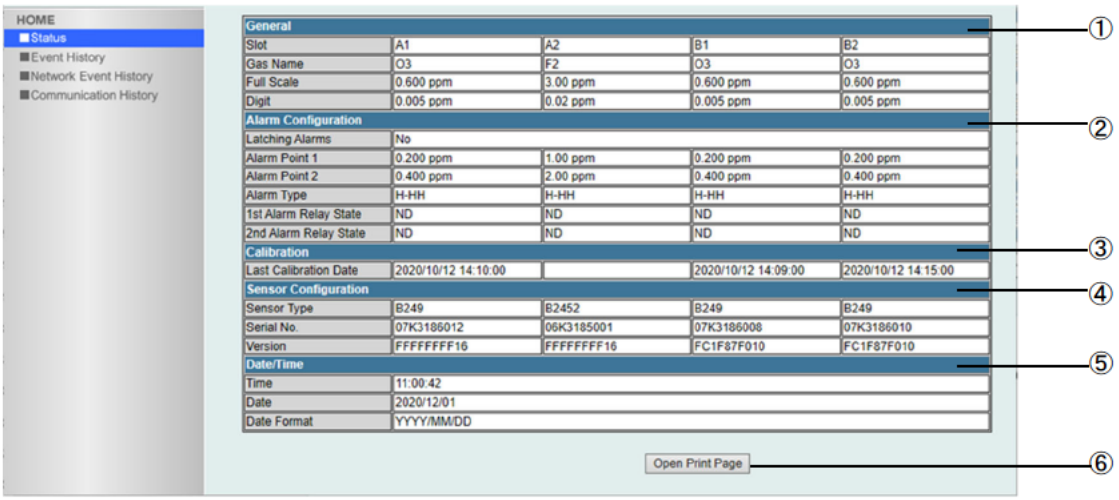
If you logged in as an administrator, you can cancel the alarm state on the product by clicking the [ALARM RESET] button.



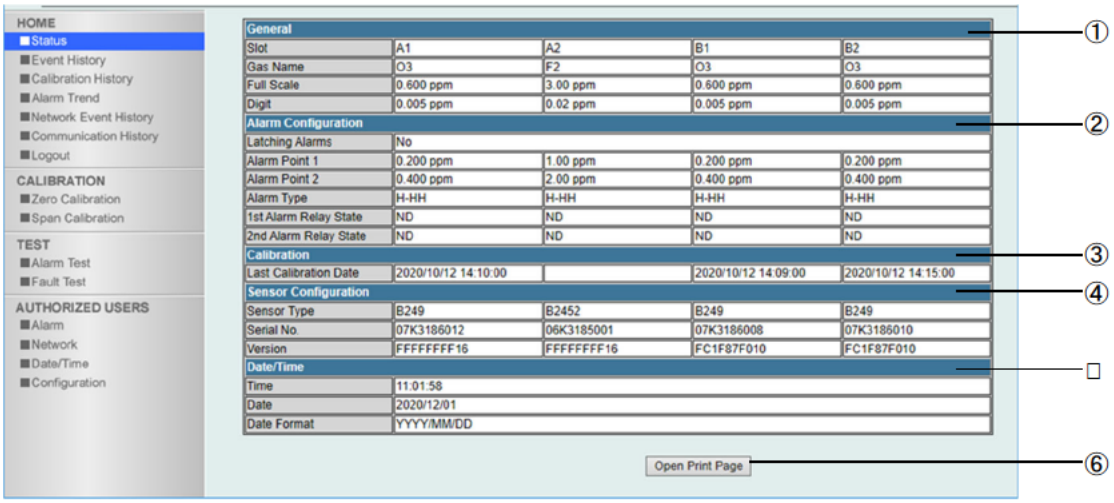
# 5-3 Displaying the setting information for the product (Status)

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

<User mode screen>




<Administrator mode screen>



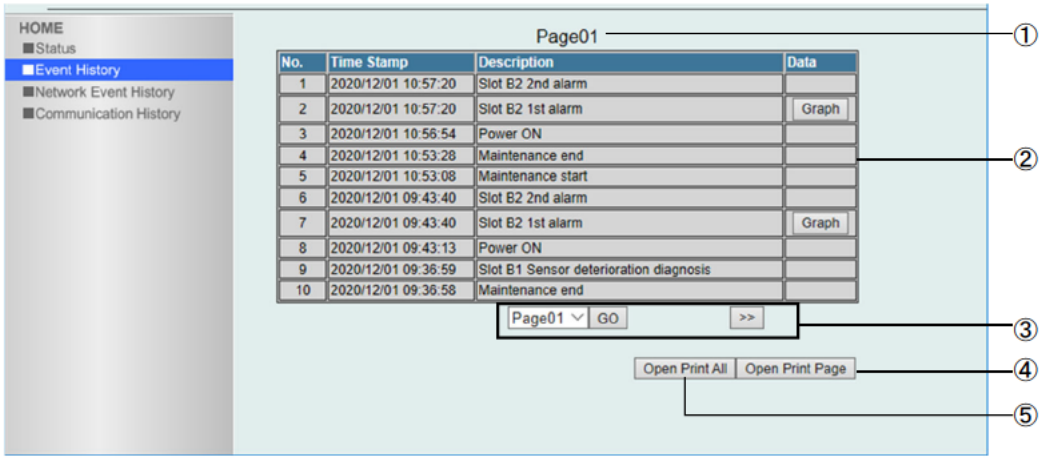

| Number | Item | Description |
|---|---|---|
| ① | General information (General) | Displays the gas names, full scale values, and setting units for the sensors in each of the slots. |
| ② | Alarm setpoint (Alarm Configuration) | Displays the alarm pattern, first and second alarm setpoints for the sensors 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.<br>To print, press the [Print] button in the printing screen. |

# 5-4 Displaying histories

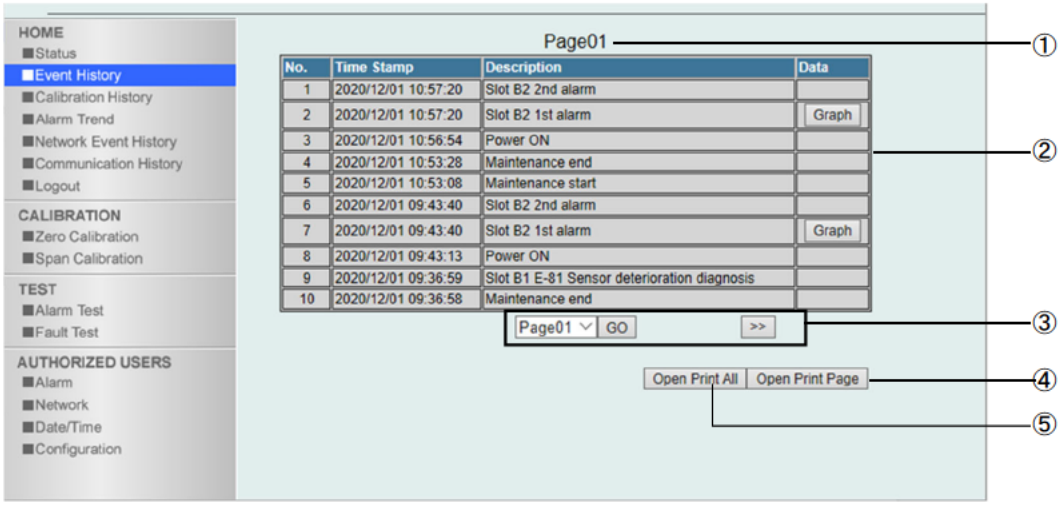
## 5-4-1 Displaying the event history (Event History)

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>



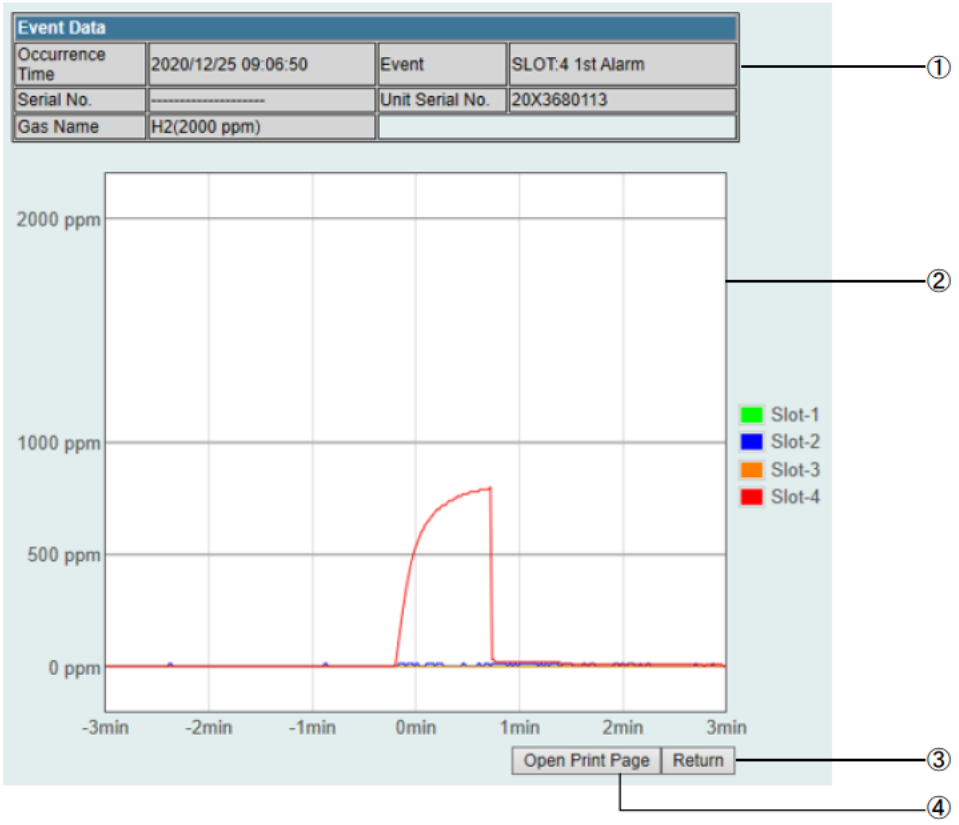

<Administrator mode screen>




| 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).<br>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.<br>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.<br>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.<br>To print, press the [Print] button in the printing screen. |

### <Displaying the trend graph>

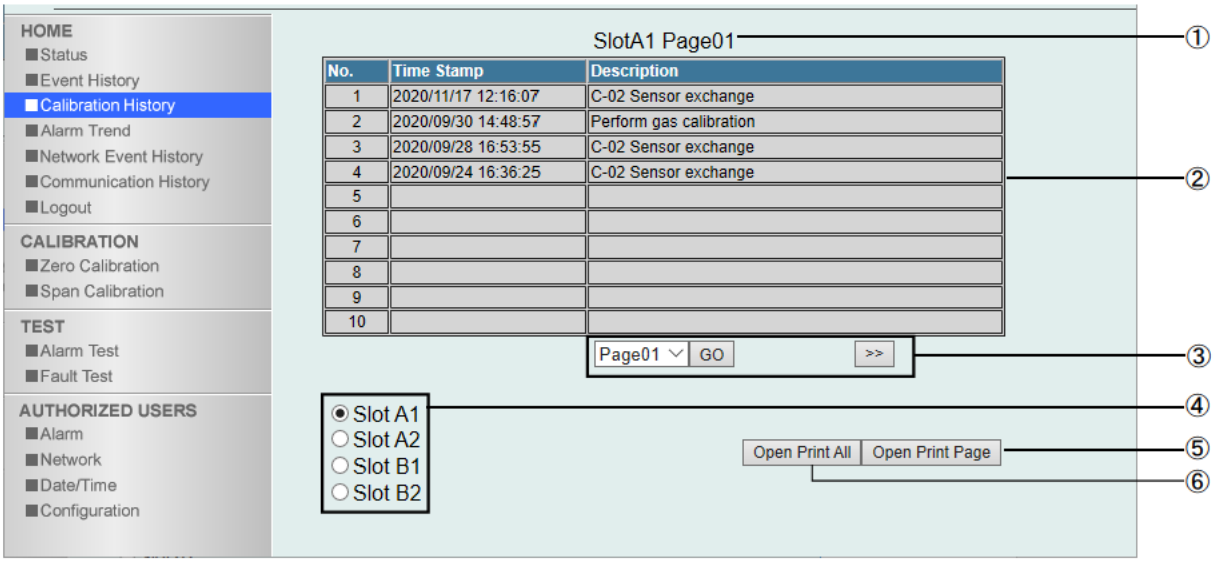



| Number | Item | Description |
|---|---|---|
| ① | Event information | Displays for the event for which the graph is displayed the date and time the event occurred, the description of the event (alarm), the serial number of the product, the serial number of the sensor, and the gas name. |
| ② | Graph | 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.<br>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>

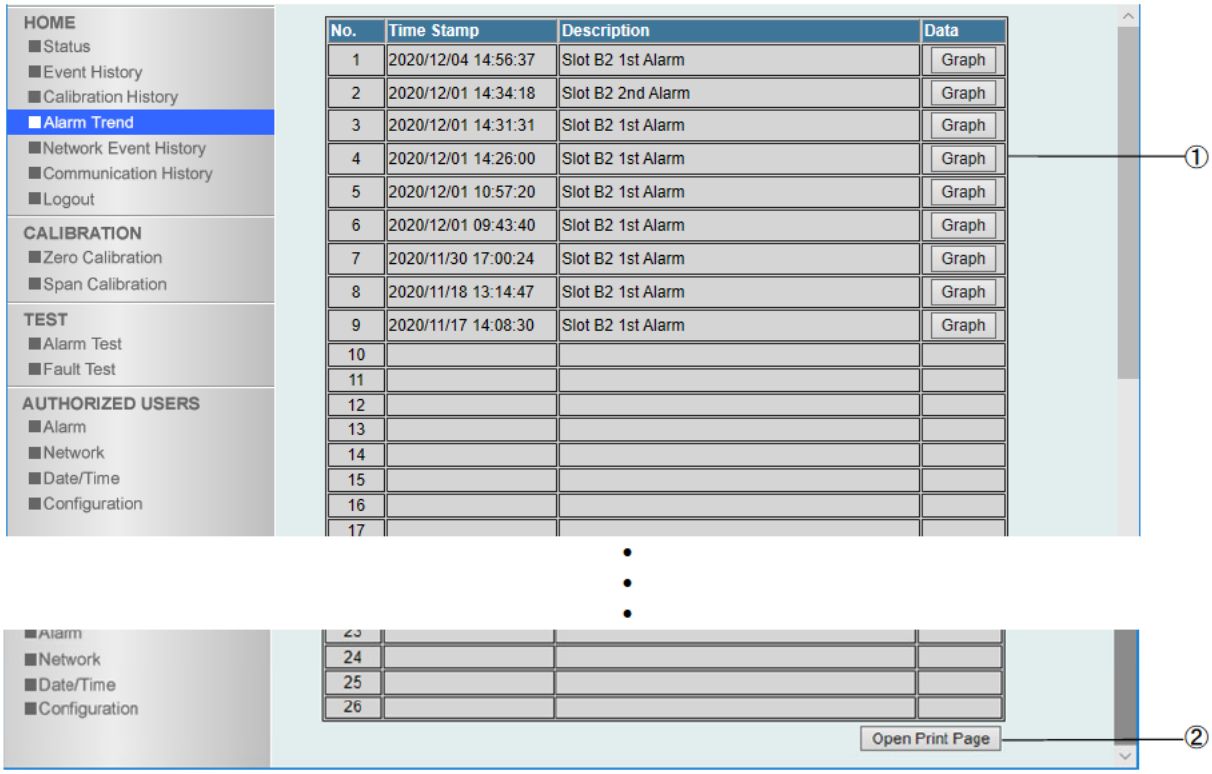



| Number | Item | Description |
|---|---|---|
| ① | Displayed slot number and page number | Displays the slot number and page number being displayed. |
| ② | Calibration History | Displays the date of calibration and calibration details for the sensor fitted in the slot being displayed. |
| ③ | Select page number to display | Select the page number to display and click the [GO] button to view the selected page.<br>Press the [>>] button or [<<] button to view the next page or the previous page. |
| ④ | Slot selection | Select the slot number to display.<br>[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.<br>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.<br>To print, press the [Print] button in the printing screen. |

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

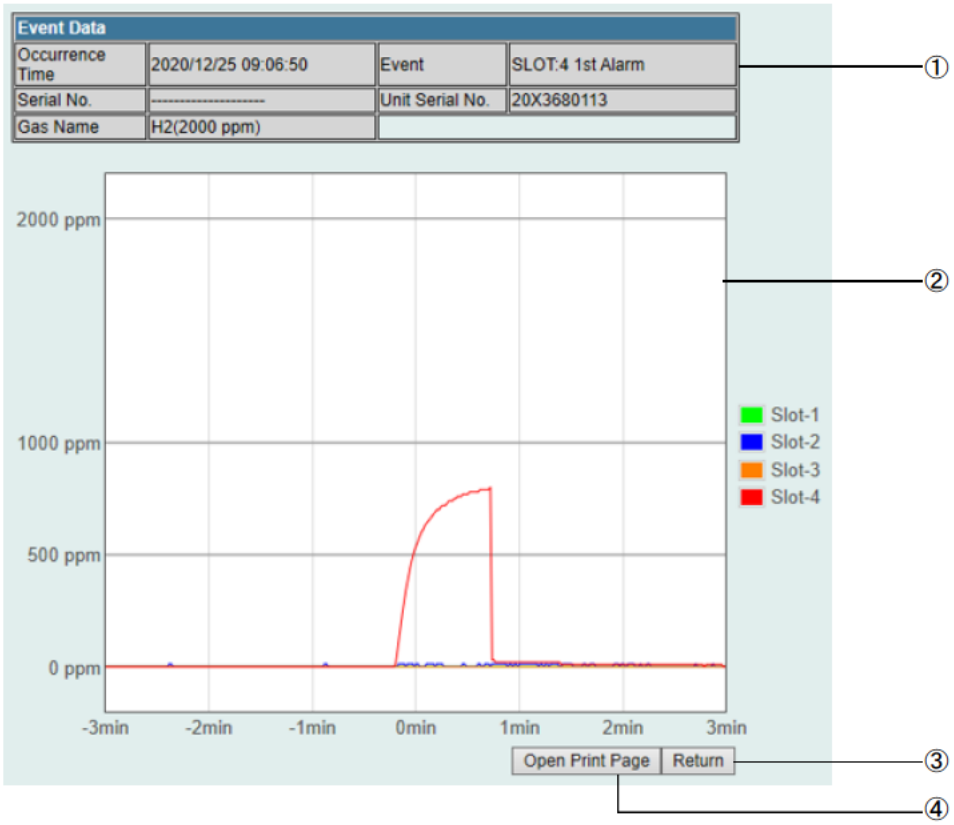
Click [■Alarm Trend] in GAS DETECTOR MANAGER to view 26 alarm trend items in a single screen.
You must log in as an administrator.

<Administrator mode screen>




| Number | Item | Description |
|---|---|---|
| ① | Alarm Trend | The times the alarms triggered and the alarm details are displayed.<br>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.<br>To print, press the [Print] button in the printing screen. |

## <Displaying the trend graph>

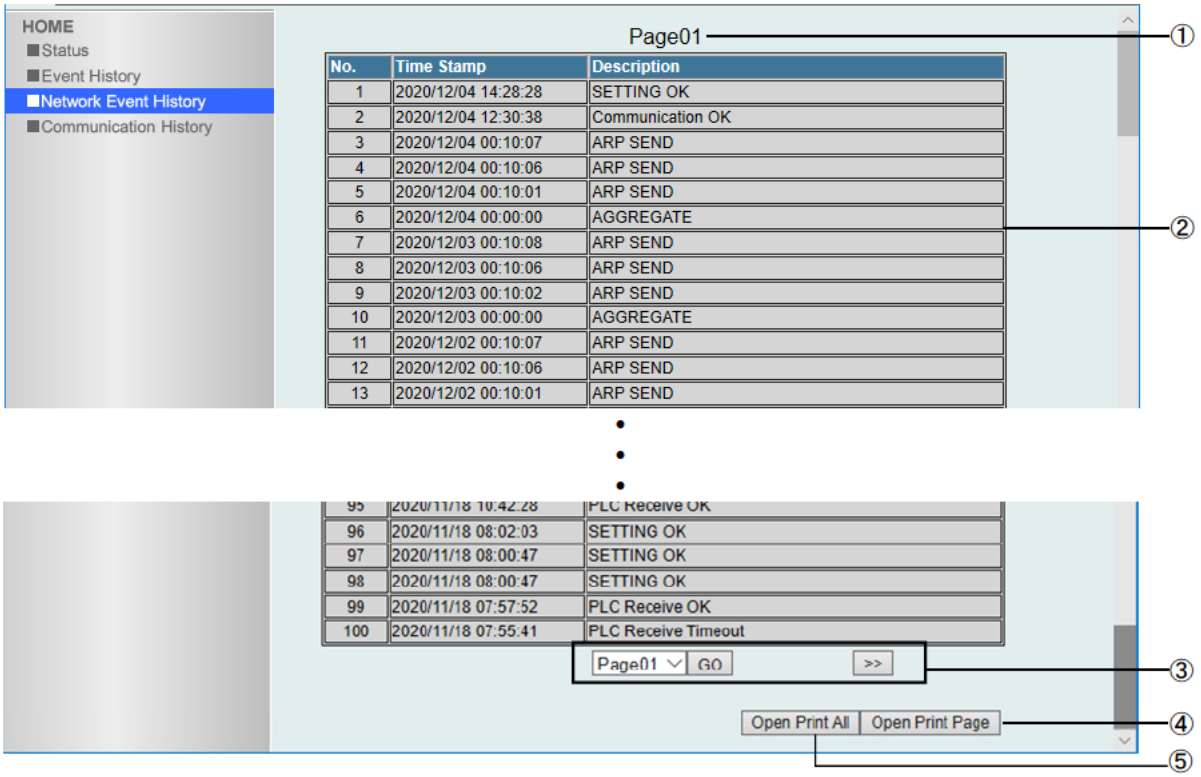



| Number | Item | Description |
|---|---|---|
| ① | Alarm information | Displays for the alarm for which the graph is displayed the date and time the alarm occurred, the description of the alarm, the serial number of the product, the serial number of the sensor, and the gas name. |
| ② | Graph | Displays 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.<br>To print, press the [Print] button in the printing screen. |

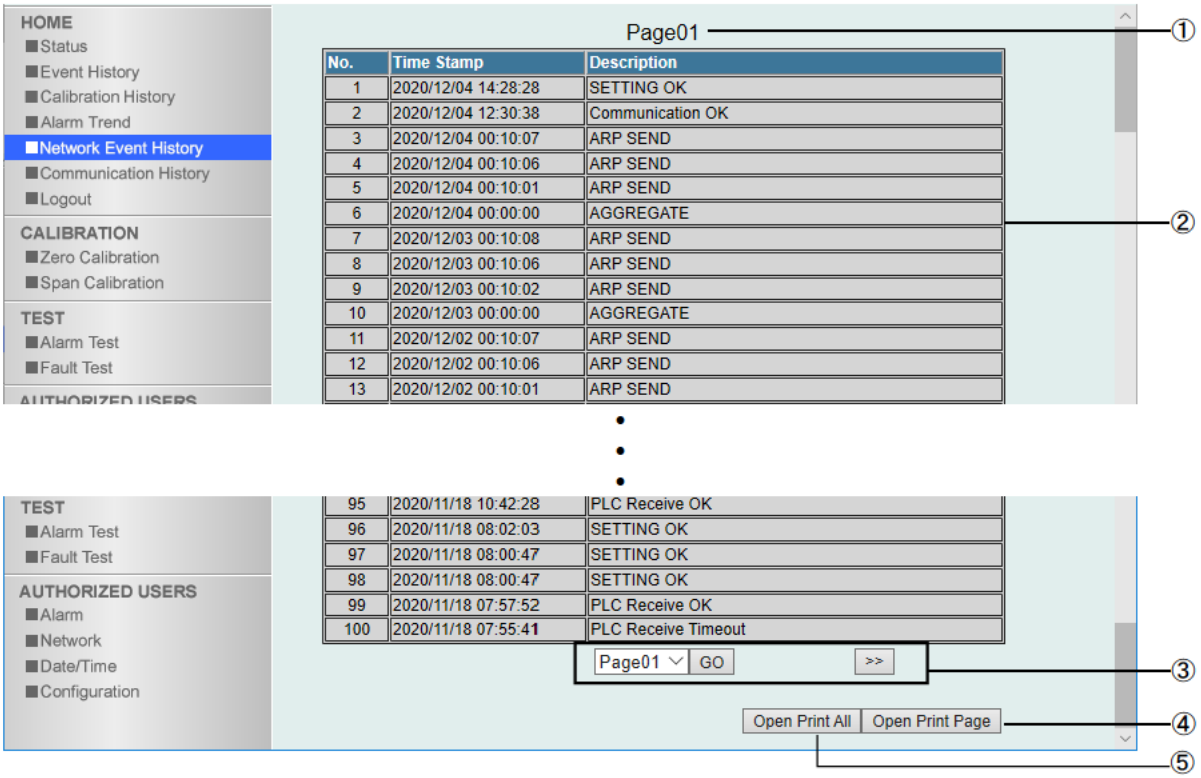
## 5-4-4 Displaying network event history (Network Event History)

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>

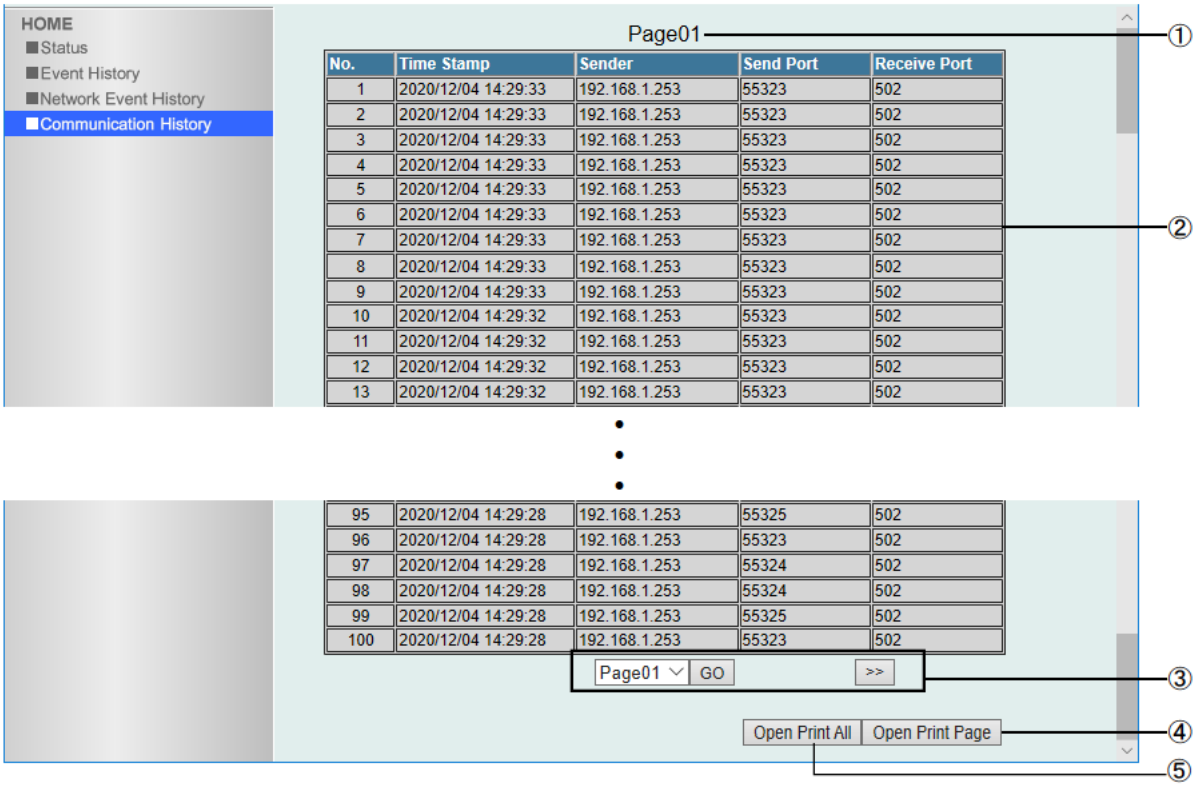


| Number | Item | Description |
|---|---|---|
| ① | Displayed page number | Displays the page number being displayed. |
| ② | Network event history | Displays the dates and times the network events occurred and descriptions of the network events. |
| ③ | Select page number to display | Select the page number to display and click the [GO] button to view the selected page.<br>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.<br>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.<br>To print, press the [Print] button in the printing screen. |

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

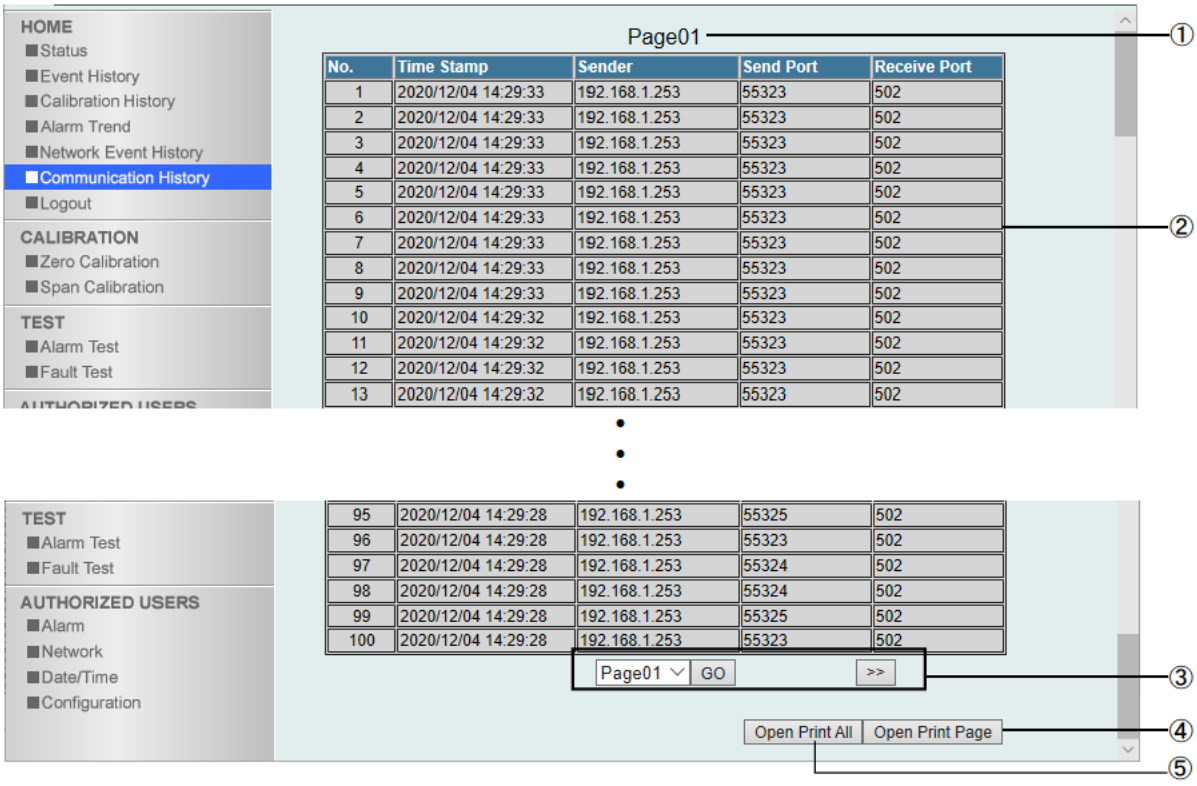
Click [■Communication History] in GAS DETECTOR MANAGER to view 100 communication history events in a single screen. You can display a maximum of 2000 history items.

<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 |

<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 |

| 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.<br>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.<br>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.<br>To print, press the [Print] button in the printing screen. |

# 5-5 Performing calibration

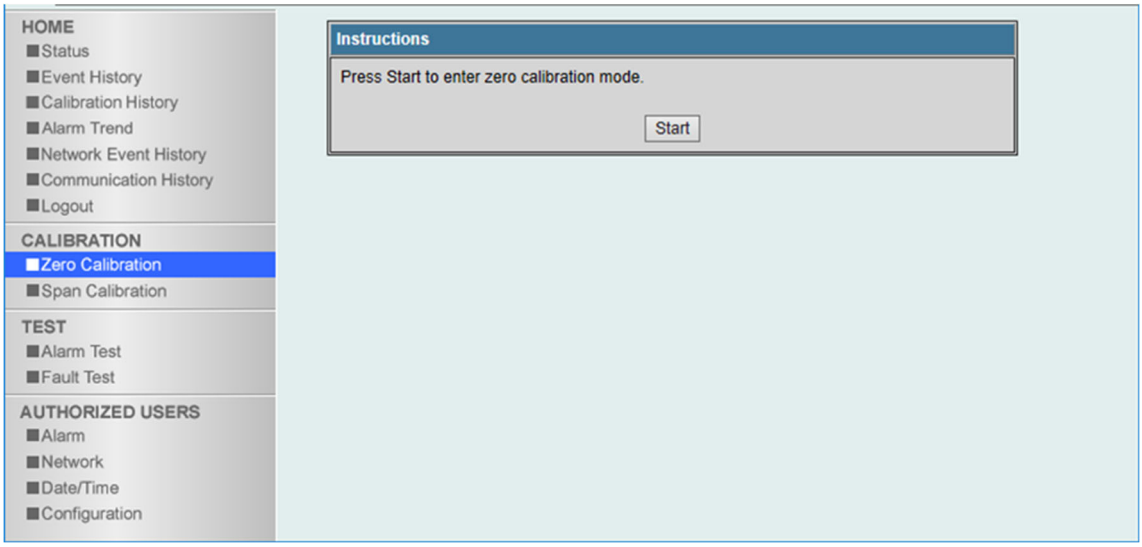
## 5-5-1 Running zero calibration (Zero Calibration)

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.

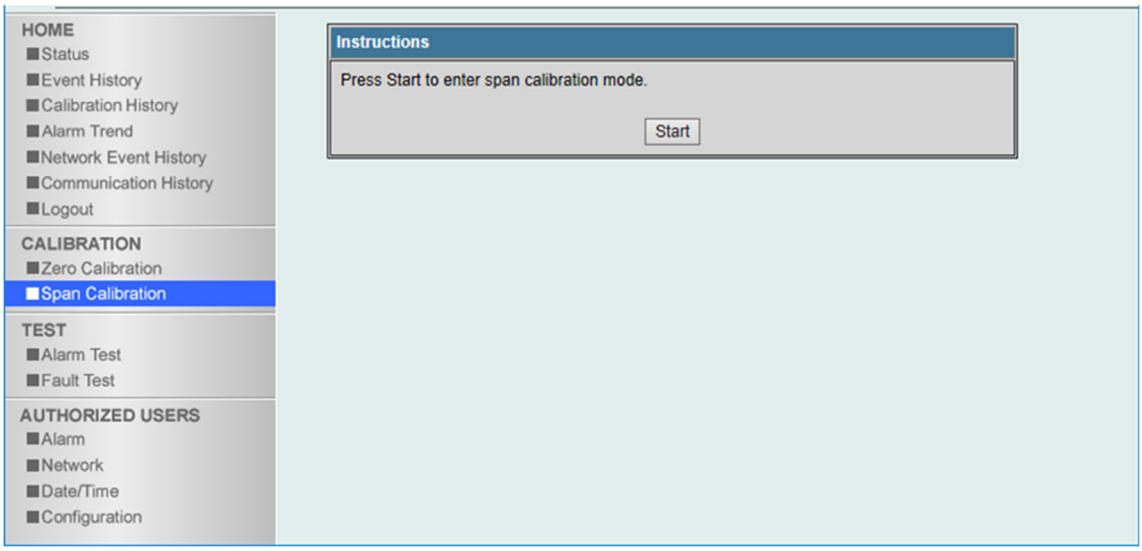
## 5-5-2 Running span adjustment (Span Calibration)

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.

**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>

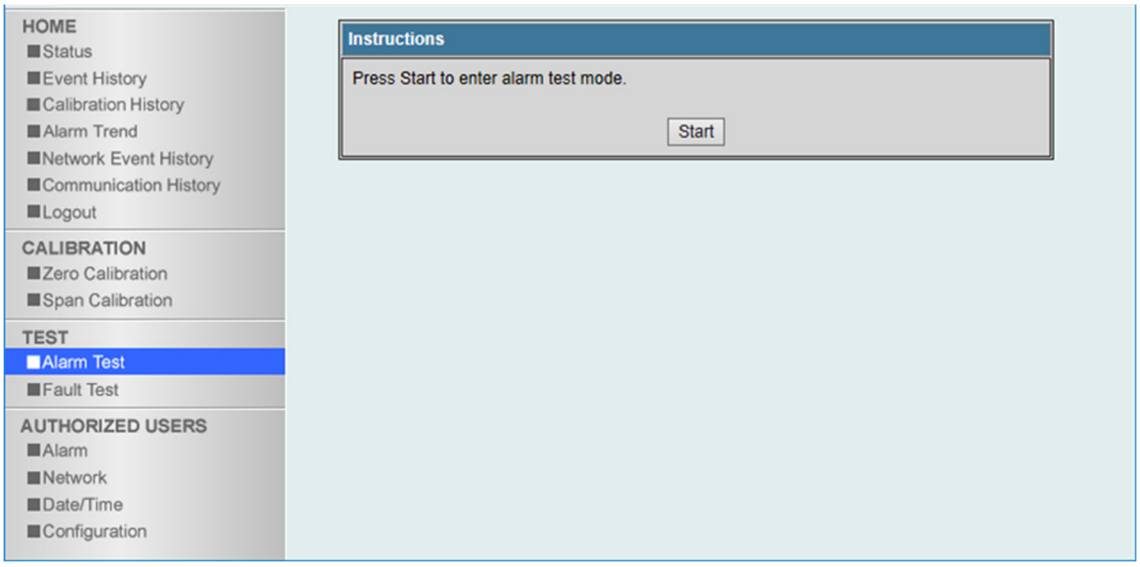
Riken Keiki provides services related to regular maintenance, including gas calibration, adjustments, and servicing.
Preparing a calibration gas requires dedicated equipment, including gas cylinders of the specified concentration and gas sampling bags. Our certified service engineers have expert knowledge 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>



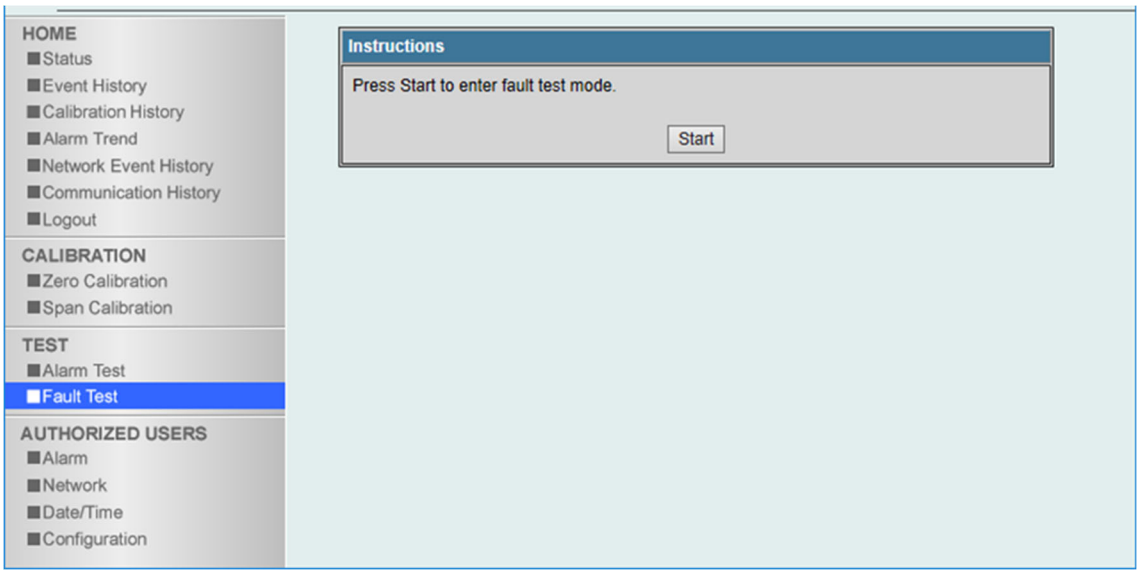

**WARNING**

- 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

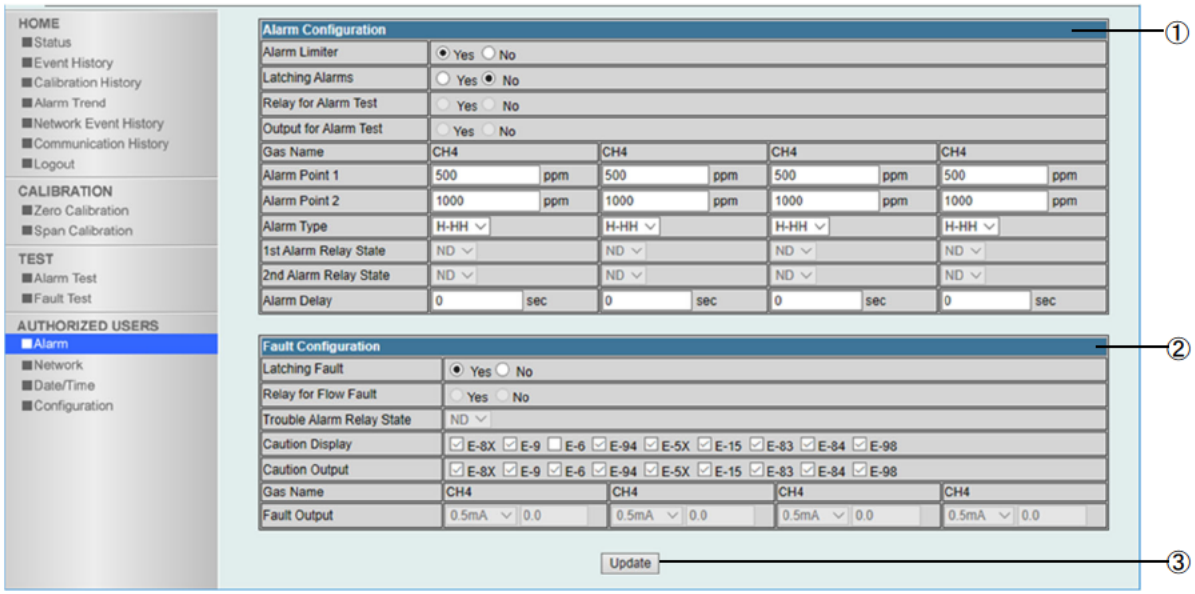
**NOTE**

- 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.<br>[Yes]: Set ON for the alarm point limiter.<br>[No]: Set OFF for the alarm point limiter. |
| | | Latching Alarms | Set the alarm pattern.<br>[Yes]: Self-latching<br>[No]: Auto-reset |
| | | Relay for Alarm Test | Enable/disable contacts during alarm tests.<br>[Yes]: Contact operation ON<br>[No]: Contact operation OFF<br>Setting available with EA models |

| Number | Item | | Description |
|---|---|---|---|
| | | Output for Alarm Test | Set to enable/disable external output during alarm tests.<br>[Yes]:External output<br>[No]: No external output<br>Setting available with EA models |
| | | Gas Name | Set the detection target gas for each slot.<br>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.<br>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.<br>[ND]: De-energized<br>[NE]: Energized<br>Setting available with EA models |
| | | 2nd Alarm Relay State | Set energized/de-energized for the second alarm for the sensors in each slot.<br>[ND]: De-energized<br>[NE]: Energized<br>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.<br>[Yes]: Self-latching<br>[No]: Auto-reset |
| | | Relay for Flow Fault | Set the behavior of fault contacts when flow is low.<br>[Yes]: Contact operation ON<br>[No]: Contact operation OFF |
| | | Trouble Alarm Relay State | Set the energized/de-energized state for the fault alarm pattern.<br>[ND]: De-energized<br>[NE]: Energized<br>Setting available with EA models |
| | | Caution Display | Set to enable/disable warning displays.<br>Select the check boxes for the fault codes to display. |
| | | Caution Output | Set whether to output warnings.<br>Select the check boxes for the fault codes to output. |
| | | Gas Name | Set the detection target gas for each slot.<br>This can be up to eight characters in length. |
| | | Fault Output | Set the value output at a sensor fault for each slot.<br>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.<br>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.

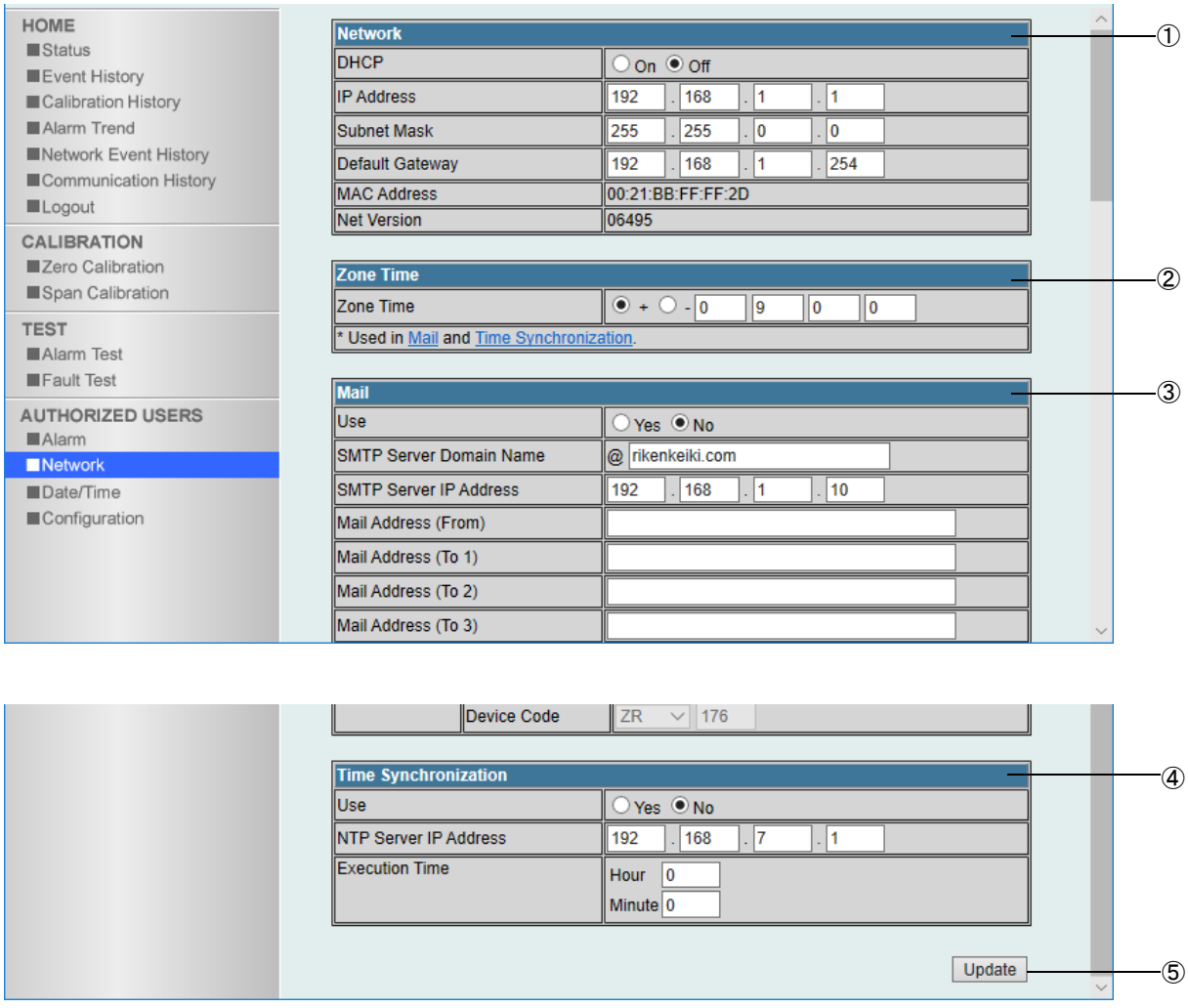
## 5-7-2 Changing settings related to the network, email, and PLC communications (Network)

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.<br>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).<br>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.<br>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)<br>.<br>.<br>Mail Address(To 10) | Set the email address of the mail recipient.<br>A maximum of 10 recipient email addresses can be registered.<br>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.<br>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. |

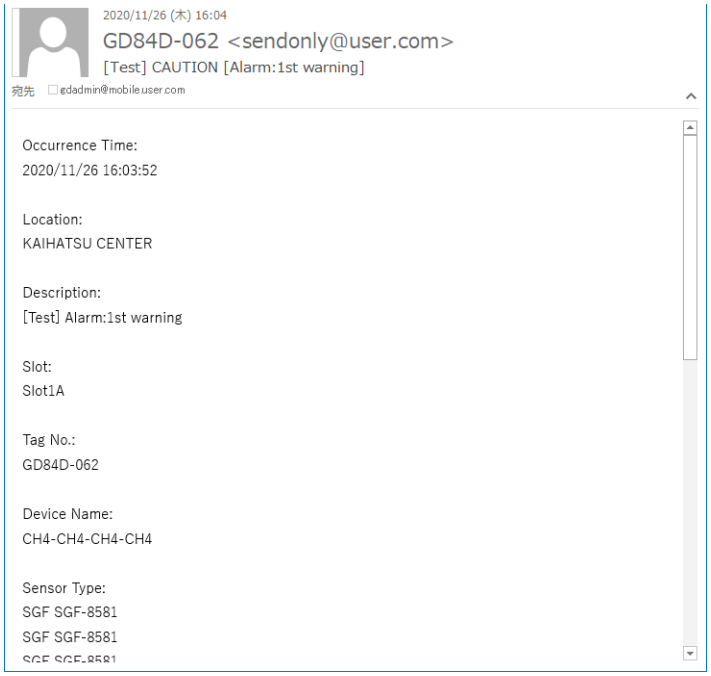
**CAUTION**

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

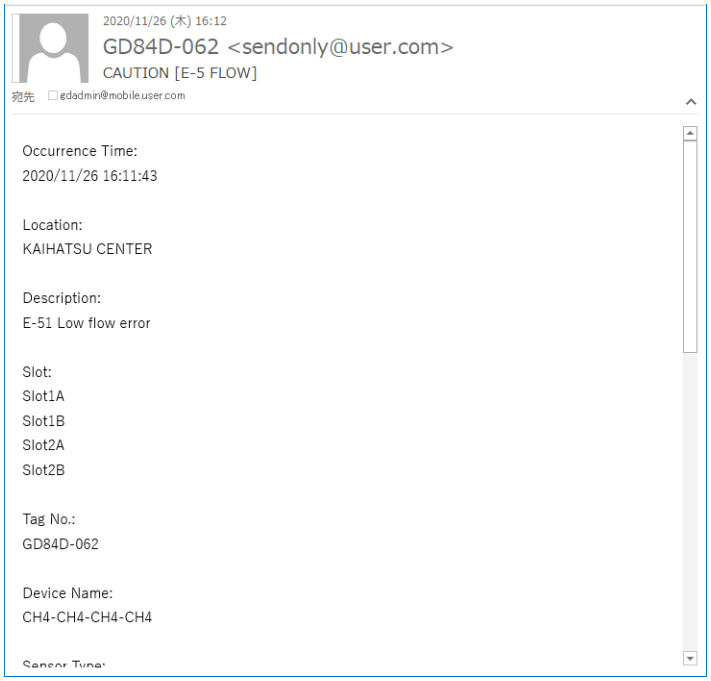
## NOTE

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

<When the first alarm is triggered>



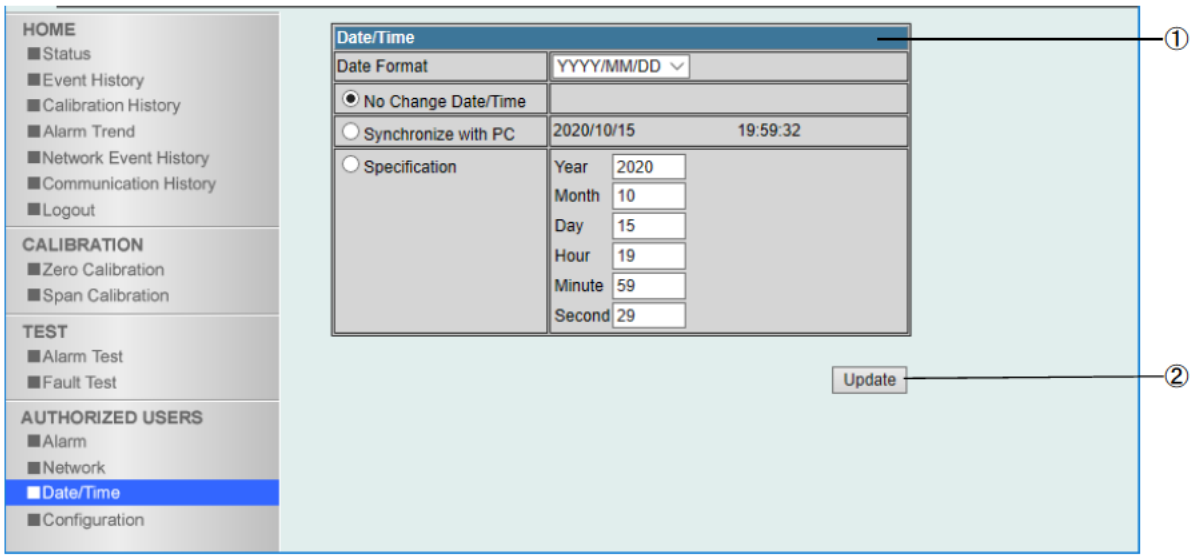

<When a flow abnormality alarm is triggered>



## 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. |

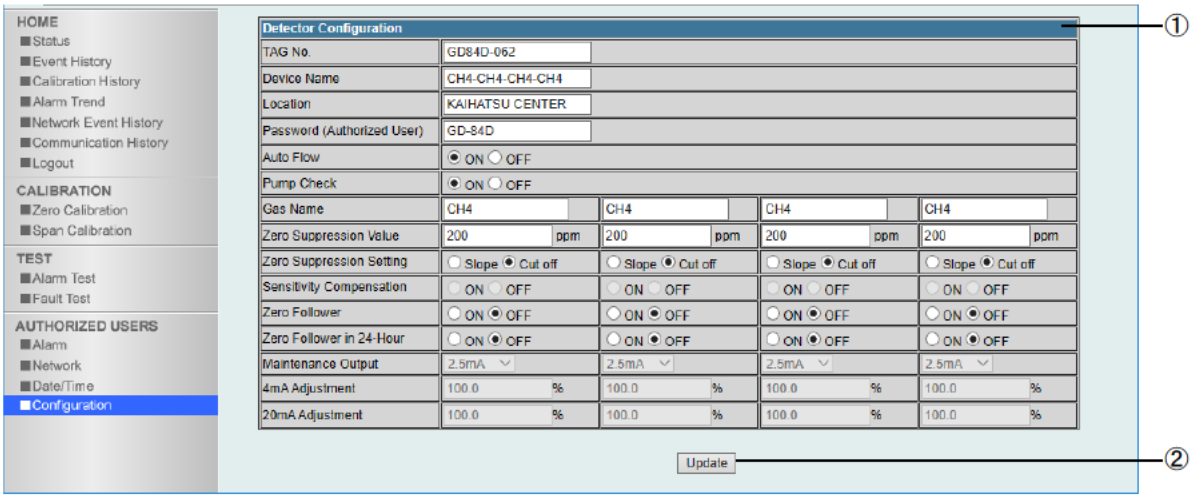
**CAUTION**

- 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.<br>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.<br>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.<br>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.<br>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.<br>Select [2.5mA], [4-20mA], [HOLD] (hold previous value), or [4.0mA].<br>Setting available with EA models |
| | | 4mA Adjustment | Adjust the external output of the sensor 4 mA for each slot.<br>Setting available with EA models |
| | | 20mA Adjustment | Adjust the external output of the sensor 20 mA for each slot.<br>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)<br>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: 000000000006010400000001 ← 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: 000000000006010304000001 ← 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: 000000000006010303FF0002 ← 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<br>(0: initializing; 1: measurement mode, 3: INHIBIT; 5: test mode)<br>bit5: Fault flag<br>bit6: 1st alarm flag<br>bit7: 2nd alarm flag<br>bit8: 1st alarm contact flag<br>bit9: 2nd alarm contact flag<br>bit10: Fault contact flag<br>bit11: Heartbeat (0 and 1 repeat in two-second cycle.) |
| 40002 | — | (Reserved) | - |
| 40003 | — | Concentration value | Floating point number<br>Address 40003: lower 16 bits<br>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<br>(0: same; 1: 1/10; 2: 1/100; 3: 1/1000)<br>bit8 - 11: Units<br>(1: ppm; 2: ppb; 4: vol%; 8: %LEL) |
| 40008 | — | Temperature | Unsigned integer<br>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.<br>・ 0 - 40: temperature (0 - 40 °C)<br>・ 41 - 3276: Higher than 40 °C<br>・ 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<br>Indicated in units of mL/min |
| 40012 | — | (Reserved) | - |
| 40013 | ○ | Alarm setpoint 1*6 | Floating point number<br>Address 40013: lower 16 bits<br>Address 40014: upper 16 bits |
| 40014 | ○ | | |
| 40015 | ○ | Alarm setpoint 2*6 | Floating point number |

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

| Address | Write | Item | Description |
|---|---|---|---|
| 40034 | — | PLU temperature | Signed integer<br>Indicated in units of °C |
| 40035 | — | Flow without PLU bypass | Signed integer<br>Indicated in units of mL/min |
| 40036 | — | PLU power | Unsigned integer<br>PLU voltage × PLU current |
| 40037 | — | PLU voltage | Unsigned integer<br>Indicated in units of mV |
| 40038 | — | PLU current | Unsigned integer<br>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.<br>0 - 100 (Units: %) |
| 40041 | — | Full scale | Signed integer (the significant figures of the full scale turned into an integer)<br>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)<br>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 | ○ | Alarm setpoint 1 | Signed integer (the significant figures of alarm setpoint 1 turned into an integer)<br>The actual alarm setpoint 1 is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023. |
| 40046 | ○ | Alarm setpoint 2 | Signed integer (the significant figures of alarm setpoint 2 turned into an integer)<br>The actual alarm setpoint 2 is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023. |
| 40047 | ○ | Zero suppression value | A signed integer (the significant figures of the zero suppression value turned into an integer).<br>The actual zero suppression value is the value obtained by multiplying this value by the bit0 - 1 (= factor) of address 40023. |
| 40048 | ○ | Alarm delay time | Signed integer<br>Indicated in units of 10 milliseconds |
| 40049 | ○ | Fault hold | 0: Auto reset; 1: Self-latching |
| 40050 | ○ | Smoothing settings | 0: Cut off, 1: Slope |
| 40051 | ○ | Alarm type | 0: H-HH; 1: L-LL; 2: L-H |
| 40052 | ○○ | Alarm hold | 0: Auto reset; 1: Self-latching |
| 40053 | ○ | Contact operation during tests | 0: Off; 1: On |
| 40054 | ○ | (Reserved) | - |
| 40055 | ○ | Energized/de-energized | bit0: 1st alarm (0: de-energized; 1: energized)<br>bit1: 2nd alarm (0: de-energized; 1: energized)<br>bit2: Fault (0: de-energized; 1: energized) |
| 40056 | ○ | (Reserved) | - |
| 40057 | ○ | (Reserved) | - |
| 40058 | ○ | (Reserved) | - |
| 40059 | ○ | 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<br>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<br>Left-justified; blanks are spaces (0x20). |
| 40070 | ○ | | |
| 40071 | ○ | | |
| 40072 | ○ | | |
| 40073 | ○ | | |
| 40074 | ○ | | |
| 40075 | ○ | | |
| 40076 | ○ | | |
| 40077 | ○ | | |
| 40078 | ○ | | |
| 40079 | — | Gas name | ASCII character string<br>Left-justified; blanks are spaces (0x20). |
| 40080 | — | | |
| 40081 | — | | |
| 40082 | — | | |
| 40083 | — | | |
| 40084 | ○ | TAG number | ASCII character string<br>Left-justified; blanks are spaces (0x20). |
| 40085 | ○ | | |
| 40086 | ○ | | |
| 40087 | ○ | | |
| 40088 | ○ | | |
| 40089 | ○ | | |
| 40090 | ○ | | |
| 40091 | ○ | | |
| 40092 | ○ | | |
| 40093 | ○ | | |
| 40094 | ○ | Device Name | ASCII character string<br>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<br>Left-justified; blanks are spaces (0x20). |
| 40105 | ○ | | |
| 40106 | ○ | | |
| 40107 | ○ | | |
| 40108 | ○ | | |
| 40109 | ○ | | |
| 40110 | ○ | | |
| 40111 | ○ | | |
| 40112 | ○ | | |
| 40113 | ○ | | |
| 40114 | ○ | Client code | ASCII character string<br>Left-justified; blanks are spaces (0x20). |
| 40115 | ○ | | |
| 40116 | ○ | | |
| 40117 | ○ | | |
| 40118 | ○ | | |
| 40119 | — | Sensor serial number | ASCII character string<br>Left-justified; blanks are spaces (0x20). |
| 40120 | — | | |
| 40121 | — | | |
| 40122 | — | | |
| 40123 | — | | |
| 40124 | — | | |
| 40125 | — | | |
| 40126 | — | | |
| 40127 | — | | |
| 40128 | — | | |
| 40129 | — | Sensor model | ASCII character string<br>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<br><br>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<br>bit1: Fault new flag |
| 40144 | — | Fault flag | bit0: E-1<br>bit1 - 3: Reserved<br>bit4: E-5<br>bit5: E-6<br>bit6: E-7<br>bit7: Reserved<br>bit8: E-9<br>bit9: FLOW<br>bit10: RTC<br>bit11 - 14: Reserved<br>bit15: Concentration display flag |
| 40145 | — | MAC address | From the upper bytes of address 40145: First octet<br>to lower bytes of address 40147: Sixth octet |
| 40146 | — | | |
| 40147 | — | | |
| 40148 | ○ | IP address | From the upper bytes of address 40148: First octet<br>to lower bytes of address 40149: Fourth octet |
| 40149 | ○ | | |
| 40150 | ○ | Subnet mask | From the upper bytes of address 40150: First octet<br>to lower bytes of address 40151: Fourth octet |
| 40151 | ○ | | |
| 40152 | ○ | Default gateway | From the upper bytes of address 40152: First octet<br>to lower bytes of address 40153: Fourth octet |
| 40153 | ○ | | |
| 40154 | ○ | 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)<br>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<br>Left-justified; blanks are spaces (0x20). |
| 40161 | — | | |
| 40162 | — | | |
| 40163 - 40250 | ○ | (Reserved) | - |
| 40251 | ○ | Command | Refer to '6-3 Modbus/TCP communication commands'. |
| 40252 | ○ | Subcommand | |
| 40253 | ○ | Parameter 1 | |

| Address | Write | Item | Description |
|---|---|---|---|
| 40254 | ○ | Parameter 2 | |
| 40255 | ○ | Parameter 3 | |
| 40256 | ○ | 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 ($SiO_2$) | 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<br>For MELSEC PLCs: MC/UDP |
| Supported PLCs | OMRON CJ/CS Series<br>MELSEC Q series |
| Data type | Basic Data (Small)<br>Basic Data (Large)<br>Basic Data (Small) + Optional Data<br>Basic Data (Large) + Optional Data<br>Very Small<br>Very Small + Optional Data |

**NOTE**

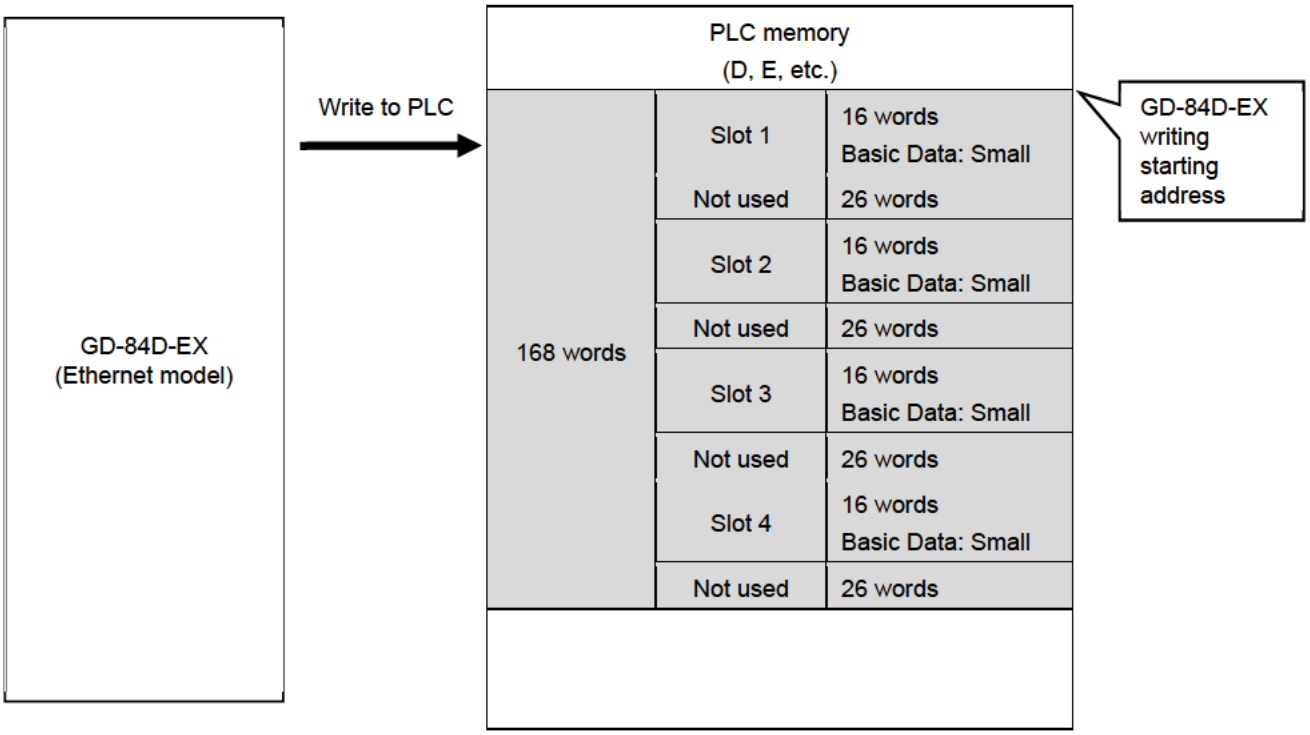
- These instructions do not address the use or specifications of PLCs. Refer to the operating manual for your PLC.

# 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



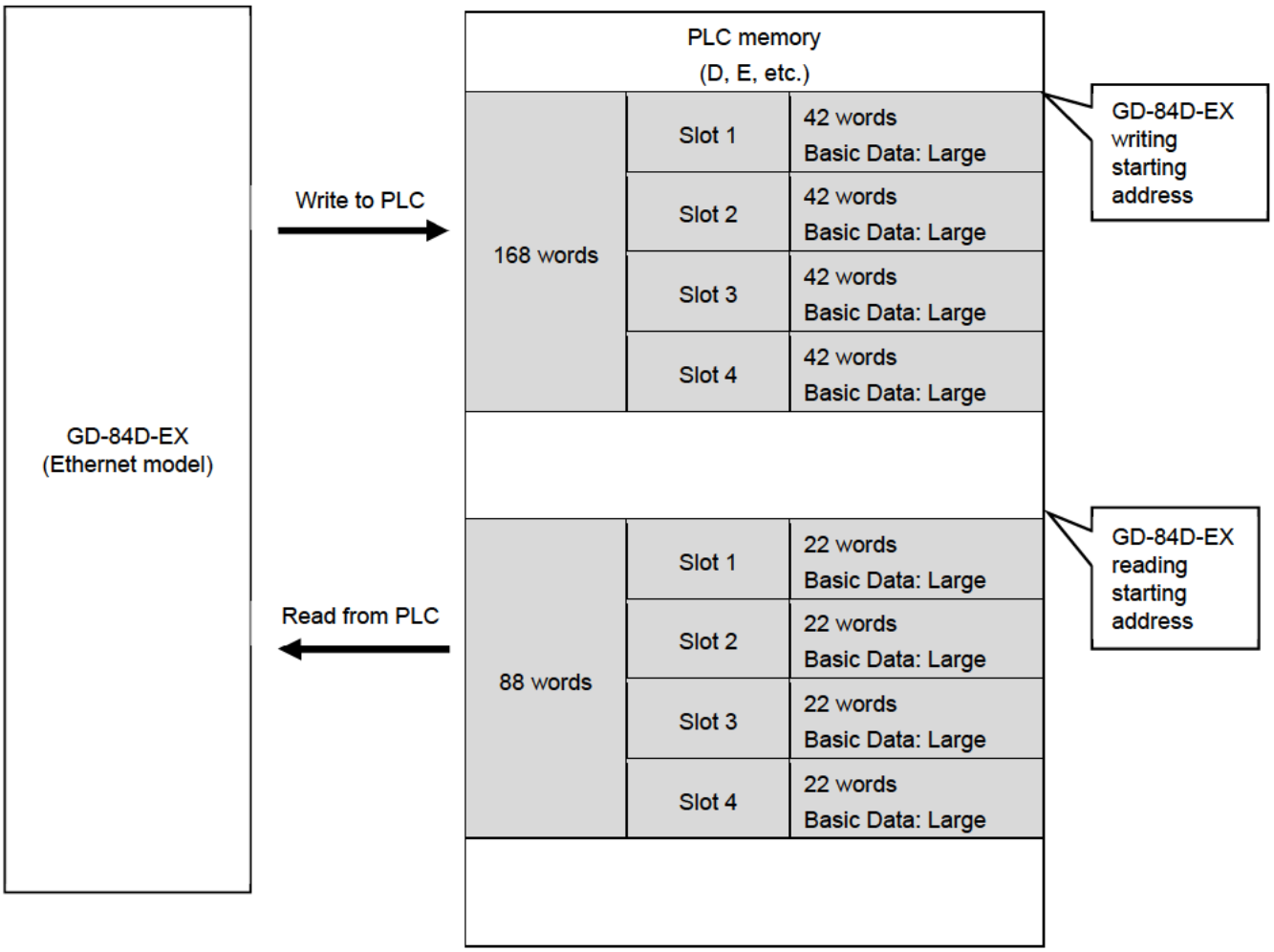
## 7-2-2 Basic Data: Large

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.



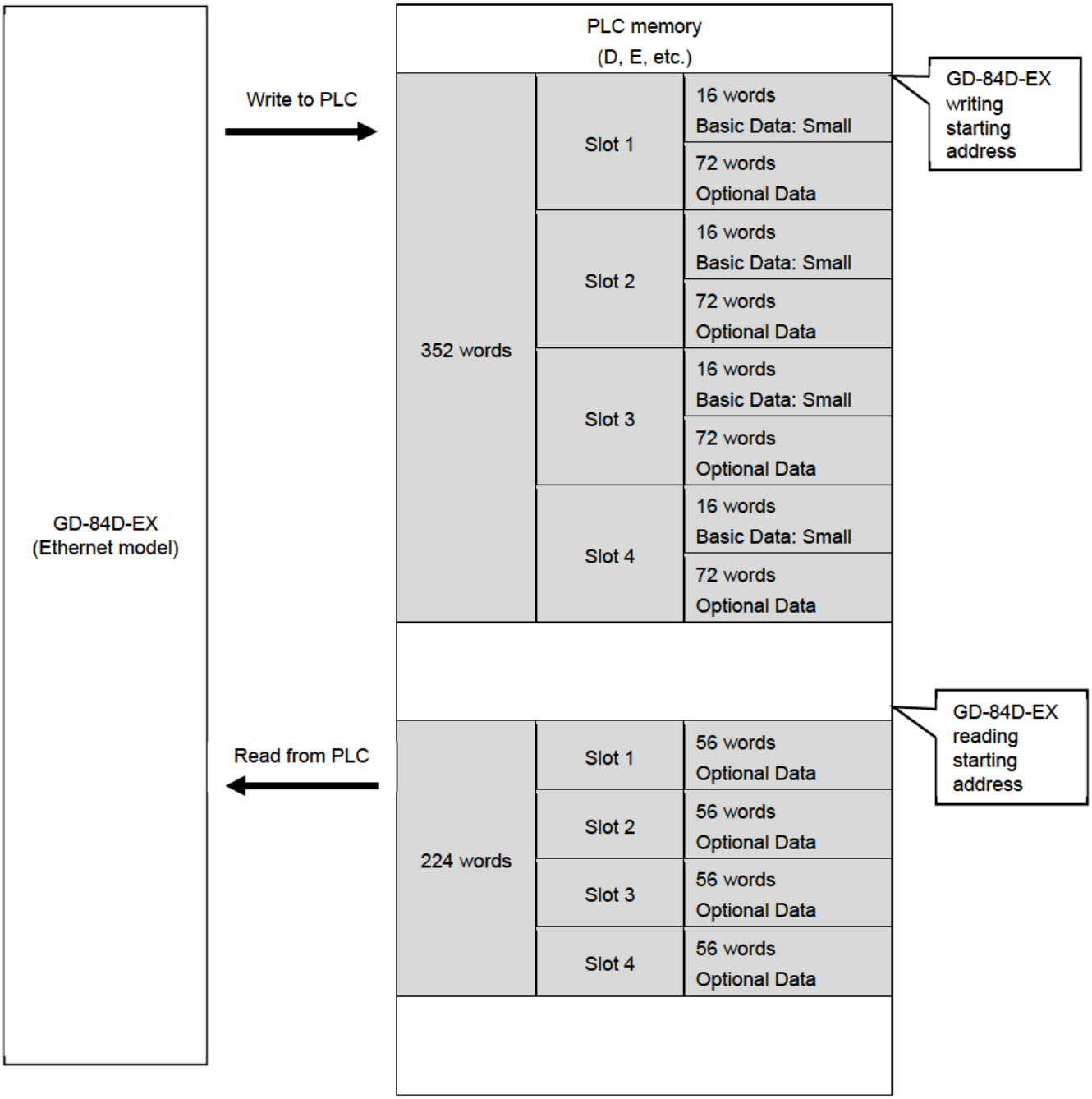
## 7-2-3 Basic Data: Small + Optional Data

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.



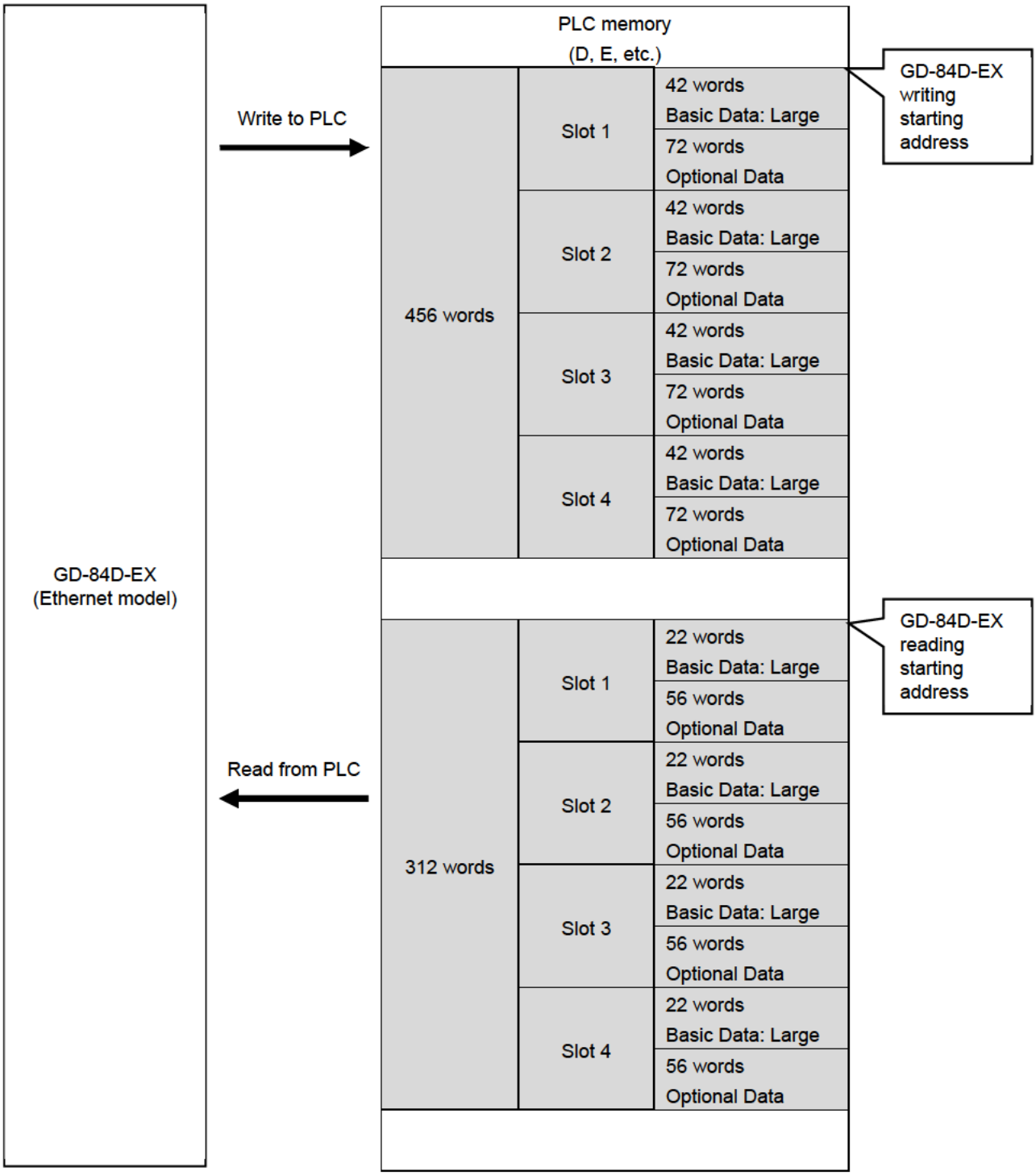
## 7-2-4 Basic Data: Large + Optional Data

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.



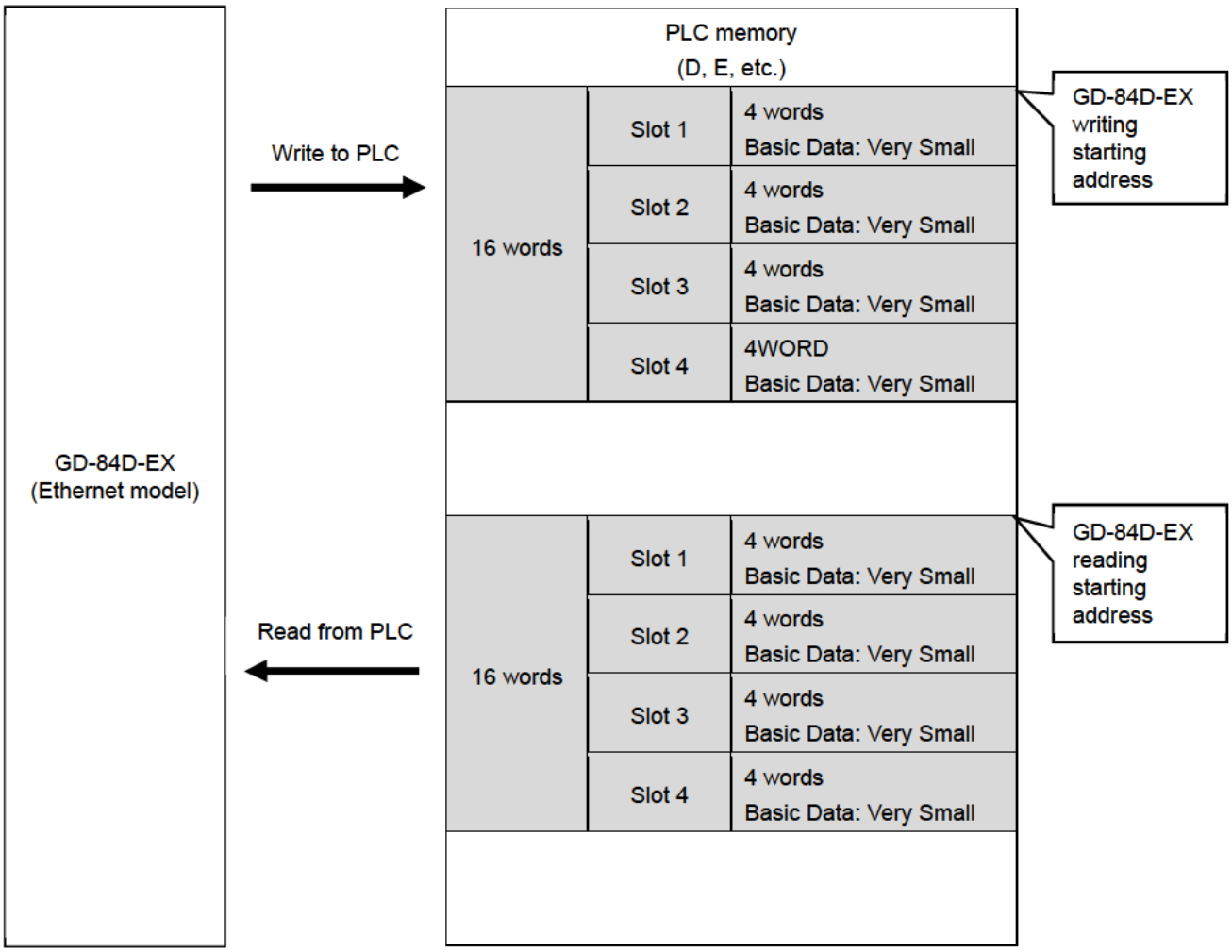
## 7-2-5 Basic Data: Very Small

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



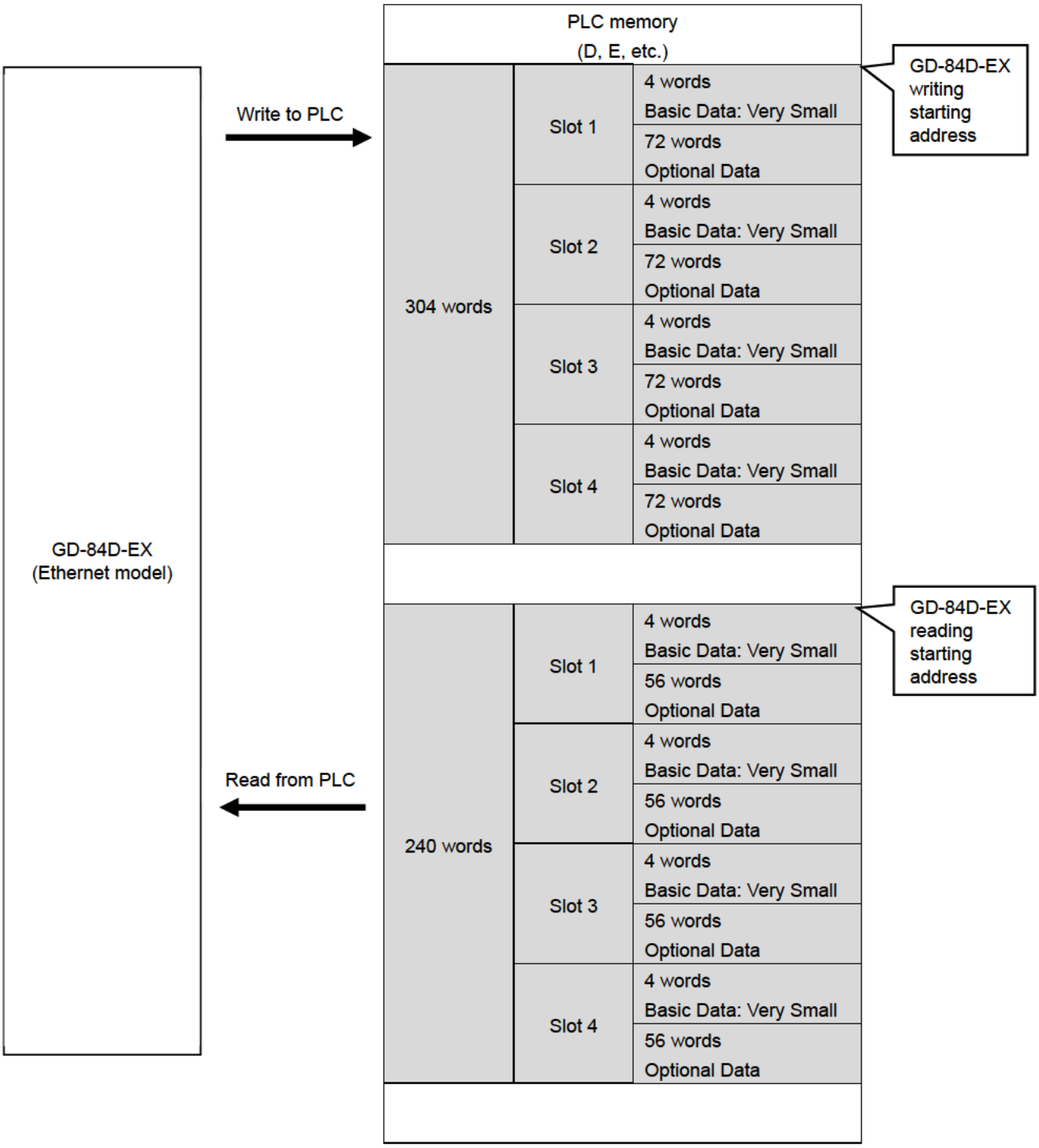
## 7-2-6 Basic Data: Very Small + Optional Data

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.



# 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.<br>Also, addresses for Detector Write and Detector Read are set automatically: | 1: User-defined setting<br>2: FINS; Basic Data: Small; do not use Optional.<br>3: FINS; Basic Data: Large; do not use Optional.<br>4: MC; Basic Data: Small; do not use Optional.<br>5: MC; Basic Data: Large; do not use Optional.<br>6: FINS; Basic Data: Very Small; do not use Optional.<br>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).<br>FINS: OMRON CJ/CS series<br>MC: MELSEC Q series |
| | Type of Basic Data | | Set the basic data type. | Small: small<br>Large: large<br>Very Small: very small |
| | Use Optional Data | | Set whether to use optional data. | Yes: Use<br>No: Do not use (default). |
| | Interval | Min | Set the minimum transmission interval.<br>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<br>Default minimum time: 1,000 msec (with variation in concentration)<br>Default maximum time: 3,000 msec (without variation in concentration) |
| | | Max | Set the maximum transmission interval.<br>This is the transmission interval in detection mode when the data does not vary. | |
| | Timeout | | Set the timeout for reception from a PLC.<br>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<br>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<br>bit14: Test<br>bit13: INHIBIT<br>bit12: Initial<br>bit11: Alarm: RANGE OVER<br>bit10: Smoke detection<br>bit9: Alarm: 2nd<br>bit8: Alarm: 1st<br>bit7: Error: Sensor<br>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.)<br>bit5: Error: Flow<br>bit4: Caution: Flow<br>bit2 - 3: Concentration unit code (00: vol%; 01: %LEL; 10: ppm; 11: ppb)<br>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.)<br>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.<br>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<br>Example: For 192.168.0.1, this would be 0xC0A8. |
| | 6 | IP address (Lower 16 bits) | Second half of IP address.<br>Example: For 192.168.0.1, this would be 0x0001. |
| | 7 | Subnet mask (Upper 16 bits) | First half of subnet mask<br>Example: For 255.225.225.0, this would be 0xFFFF. |
| | 8 | Subnet mask (Lower 16 bits) | Second half of subnet mask<br>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)<br>bit9 - 10: Model code (0: 70D; 1: 81D; 2: 84D-EX)<br>bit8: Fault new flag<br>bit7: Alarm new flag<br>bit6: Sensitivity correction (0: off; 1: on)<br>bit5: Zero following (0: off; 1: on)<br>bit4: Suppression type (0: Cut off; 1: Slope)<br>bit3: Fault alarm pattern (0: auto reset; 1: self-latching)<br>bit2: Gas alarm pattern (0: auto reset; 1: self-latching)<br>bit0 - 1: Alarm type (0: H-HH; 1: L-LL, 2: L-H) |
| | 10 | Full scale | Signed integer<br>The full scale is the value obtained by multiplying this value by the decimal places code in status. |
| | 11 | 1st alarm setpoint | Signed integer<br>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<br>The actual 2nd alarm setpoint is the value obtained by multiplying this value by the decimal places code in status. |
| | 13 | Concentration value<br>3200 units | The relative value when full scale is represented as 3200. |
| | 14 | 1st alarm setpoint<br>3200 units | The relative value when full scale is represented as 3200. |
| | 15 | 2nd alarm setpoint<br>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)<br>(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<br>The actual digit is the value obtained by multiplying this value by the decimal places code in status. |
| | 21 | Zero suppression value | Signed integer<br>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.<br>Left-justified; blanks are spaces (0x20). |
| | 28 - 33 | (Reserved) | |
| | 34 | Pump duty | |
| | 35 | (Reserved) | |
| | 36 | Service life data | bit0 - 7: Service life forecasting percentage<br>bit8 - 11: Reserved<br>bit12: Degradation diagnosis result<br>bit13: Used determination<br>bit14: Service life determination<br>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<br>1: Processing |
| | 41 | Command execution result | For Command 1 (setting changes) (When successful: bit on; when unsuccessful: bit off)<br>bit12: Sensitivity correction<br>bit11: Date and time<br>bit10: Zero following<br>bit9: Zero suppression type<br>bit8: Zero suppression value<br>bit7: Alarm delay time<br>bit6: Fault alarm pattern<br>bit5: Gas alarm pattern<br>bit4: 2nd alarm setpoint<br>bit3: 1st alarm setpoint<br>bit2: Alarm type<br>bit1: Subnet mask<br>bit0: IP address<br>Command 2 -<br>0: failure<br>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)<br>bit2: Gas alarm pattern (0: auto reset; 1: self-latching)<br>bit0 - 1: Alarm type (0: H-HH; 1: L-LL, 2: L-H) |
| | 5 | 1st alarm setpoint | Signed integer<br>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<br>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<br>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<br>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<br>bit14: Test<br>bit13: INHIBIT<br>bit12: Initial<br>bit11: Alarm: RANGE OVER<br>bit10: Smoke detection<br>bit9: Alarm: 2nd<br>bit8: Alarm: 1st<br>bit7: Error: Sensor<br>bit6: Error: Communication<br>bit5: Error: Flow<br>bit4: Caution: Flow<br>bit2 - 3: Concentration unit code (00: vol%; 01: %LEL; 10: ppm; 11: ppb)<br>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.)<br>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.<br>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<br>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<br>1: Processing |
| | 87 | 113 | 75 | Command execution result | For Command 1 (setting changes)<br>(When successful: bit on; when unsuccessful: bit off)<br>bit3: Client code<br>bit2: Measured location<br>bit1: Device name<br>bit0: TAG number<br>Command 2 - (Reserved)<br>0: Failure<br>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<br>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 |
|---|---|---|---|
| | 40 | Command execution status (GD-84D-EX) | 0: Normal state<br>1: Processing |
| GD-84D-EX write area | 41 | Command execution result | For Command 1 (setting changes)<br>(When successful: bit on; when unsuccessful: bit off)<br>bit12: Sensitivity correction<br>bit11: Date and time<br>bit10: Zero following<br>bit9: Zero suppression type<br>bit8: Zero suppression value<br>bit7: Alarm delay time<br>bit6: Fault alarm pattern<br>bit5: Gas alarm pattern<br>bit4: 2nd alarm setpoint<br>bit3: 1st alarm setpoint<br>bit2: Alarm type<br>bit1: Subnet mask<br>bit0: IP address<br>Command 2 -<br>0: Failure<br>1: Success |

| | Address | Item | Description |
|---|---|---|---|
| GD-84D-EX read area | 0 - 15 | Data for different settings | |
| | 16 | Command execution status (PLC) | 0: Normal state<br>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<br>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<br>1: Processing |
| | 87 | 113 | 75 | Command execution result | For Command 1 (setting changes)<br>(When successful: bit on; when unsuccessful: bit off)<br>bit3: Client code<br>bit2: Measured location<br>bit1: Device name<br>bit0: TAG number<br>Command 2 - (Reserved)<br>0: NG<br>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<br>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<br>GD-84D-EX read area address: 5 |
| [Command execution status (PLC)] | Basic Data: Large<br>GD-84D-EX read area address: 16 |
| [Command code] | Basic Data: Large<br>GD-84D-EX read area address: 17 |
| [Parameter] | Basic Data: Large<br>GD-84D-EX read area address: 18 |
| [Command execution status (GD-84D-EX)] | Basic Data: Large<br>GD-84D-EX write area address: 40 |
| [Command execution result] | Basic Data: Large<br>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<br>GD-84D-EX read area address: 16 |
| [Command code] | Basic Data: Large<br>GD-84D-EX read area address: 17 |
| [Parameter] | Basic Data: Large<br>GD-84D-EX read area address: 18 |
| [Command execution status (GD-84D-EX)] | Basic Data: Large<br>GD-84D-EX write area address: 40 |
| [Command execution result] | Basic Data: Large<br>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)].**

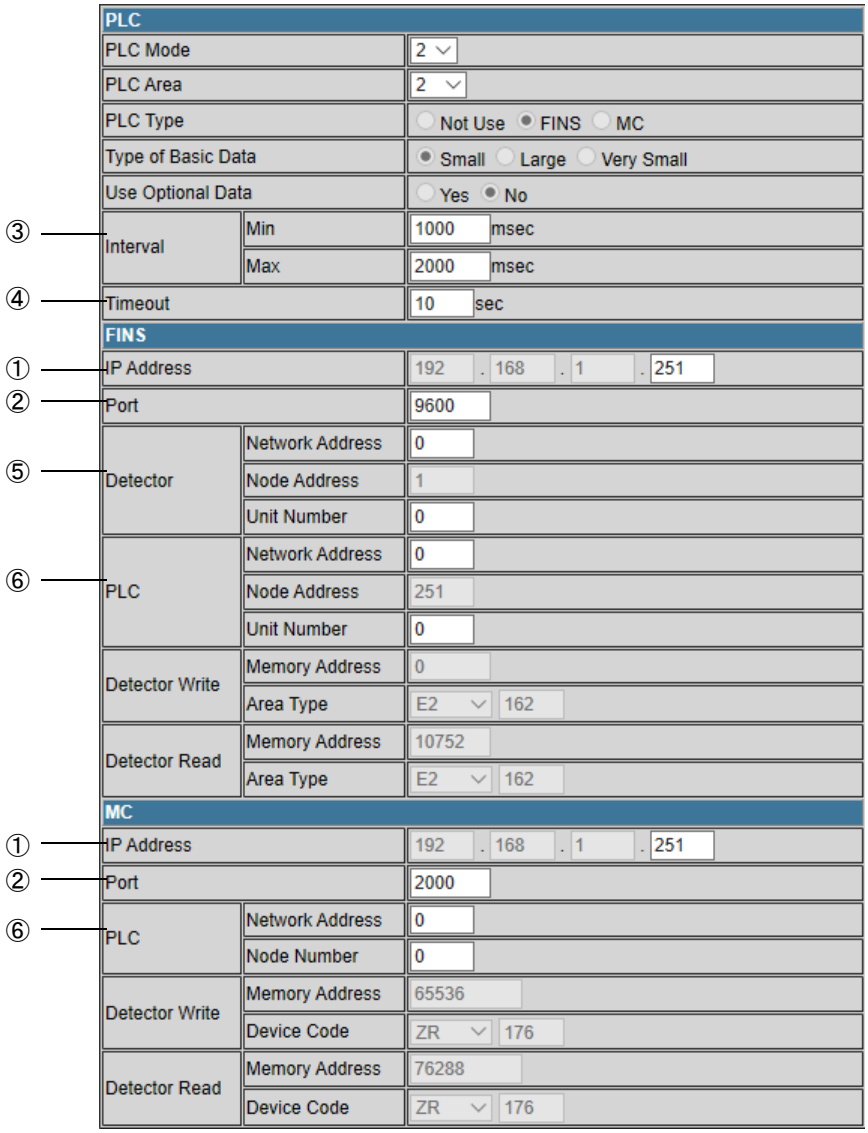
If the setting change was successful, the [Command execution result] will be “1”.

If the setting change was unsuccessful, the [Command execution result] will be “0”.

# 7-6 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.



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)<br>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 |