MITSUBISHI ELECTRIC

Mitsubishi Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Application)

-RX40NC6B
-RY40PT5B

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: " ⚠ WARNING" and " ⚠ CAUTION".

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under " ⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠ WARNING

● Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.

   (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.

   (2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:

     • Turned off if the overcurrent or overvoltage protection of the power supply module is activated.

     • Held or turned off according to the parameter setting if the self-diagnostic function of the CPU module detects an error such as a watchdog timer error.

   (3) All outputs may be turned on if an error occurs in a part, such as an I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.

   (4) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.

● In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.

● Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

● For the operating status of each station after a communication failure, refer to manuals relevant to the network. Incorrect output or malfunction due to a communication failure may result in an accident.

● When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.

● Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

[Design Precautions]

⚠ WARNING

- Do not write any data to the "system area" and "write-protect area" of the buffer memory in the module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to each module. Doing so may cause malfunction of the programmable controller system. For the "system area", "write-protect area", and the "use prohibited" signals, refer to the user's manual for the module used.
- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction.
- To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures. To maintain the safety against unauthorized access via the Internet, take measures such as installing a firewall.

[Design Precautions]

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.
- Do not power off the programmable controller or reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM and SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM and SD memory card again. Doing so also may cause malfunction or failure of the module.
- When changing the operating status of the CPU module from external devices (such as the remote RUN/STOP functions), select "Do Not OPEN in Program" for "Open Method Setting" in the module parameters. If "OPEN in Program" is selected, an execution of the remote STOP function causes the communication line to close. Consequently, the CPU module cannot reopen the line, and external devices cannot execute the remote RUN function.

[Installation Precautions]

⚠WARNING

● Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Installation Precautions]

⚠CAUTION

● Use the programmable controller in an environment that meets the general specifications in the Safety Guidelines included with the base unit. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
● To mount a module, place the concave part(s) located at the bottom onto the guide(s) of the base unit, and push in the module until the hook(s) located at the top snaps into place. Incorrect interconnection may cause malfunction, failure, or drop of the module.
● When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
● Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
● When using an extension cable, connect it to the extension cable connector of the base unit securely. Check the connection for looseness. Poor contact may cause malfunction.
● When using an SD memory card, fully insert it into the SD memory card slot. Check that it is inserted completely. Poor contact may cause malfunction.
● Securely insert an extended SRAM cassette into the cassette connector of the CPU module. After insertion, close the cassette cover and check that the cassette is inserted completely. Poor contact may cause malfunction.
● Do not directly touch any conductive parts and electronic components of the module, SD memory card, extended SRAM cassette, or connector. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before installation and wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.
- After installation and wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

⚠ CAUTION

- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Check the rated voltage and signal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause fire or failure.
- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. Incomplete connections may cause short circuit, fire, or malfunction.
- Securely connect the connector to the module. Poor contact may cause malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact. Do not clamp the extension cables with the jacket stripped.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Tighten the terminal screws or connector screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- Programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block. Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring, refer to the MELSEC iQ-R Module Configuration Manual.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual for the module used. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

● Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
● Correctly connect the battery connector. Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire. Also, do not expose it to liquid or strong shock. Doing so will cause the battery to produce heat, explode, ignite, or leak, resulting in injury and fire.
● Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws, connector screws, or module fixing screws. Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠CAUTION

● When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
● Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
● Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
● Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller. Failure to do so may cause malfunction.
● Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
● Tighten the screws within the specified torque range. Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
● After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module, and do not insert/remove the extended SRAM cassette to/from the CPU module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit may cause malfunction.
● After the first use of the product, do not insert/remove the SD memory card to/from the CPU module more than 500 times. Exceeding the limit may cause malfunction.
● Do not touch the metal terminals on the back side of the SD memory card. Doing so may cause malfunction or failure of the module.
● Do not touch the integrated circuits on the circuit board of an extended SRAM cassette. Doing so may cause malfunction or failure of the module.
● Do not drop or apply shock to the battery to be installed in the module. Doing so may damage the battery, causing the battery fluid to leak inside the battery. If the battery is dropped or any shock is applied to it, dispose of it without using.

[Startup and Maintenance Precautions]

⚠CAUTION

- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Operating Precautions]

⚠CAUTION

- When changing data and operating status, and modifying program of the running programmable controller from an external device such as a personal computer connected to an intelligent function module, read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not power off the programmable controller or reset the CPU module while the setting values in the buffer memory are being written to the flash ROM in the module. Doing so will make the data in the flash ROM undefined. The values need to be set in the buffer memory and written to the flash ROM again. Doing so can cause malfunction or failure of the module.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.
- When disposing of batteries, separate them from other wastes according to the local regulations. For details on battery regulations in EU member states, refer to the MELSEC iQ-R Module Configuration Manual.

[Transportation Precautions]

⚠CAUTION

- When transporting lithium batteries, follow the transportation regulations. For details on the regulated models, refer to the MELSEC iQ-R Module Configuration Manual.
- The halogens (such as fluorine, chlorine, bromine, and iodine), which are contained in a fumigant used for disinfection and pest control of wood packaging materials, may cause failure of the product. Prevent the entry of fumigant residues into the product or consider other methods (such as heat treatment) instead of fumigation. The disinfection and pest control measures must be applied to unprocessed raw wood.

CONDITIONS OF USE FOR THE PRODUCT

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;

i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and

ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

• Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.

• Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.

• Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

INTRODUCTION

Thank you for purchasing the Mitsubishi MELSEC iQ-R series programmable controllers.

This manual describes the functions, parameter settings, troubleshooting, I/O signals, and buffer memory of the relevant products listed below.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC iQ-R series programmable controller to handle the product correctly.

When applying the program examples provided in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.

Please make sure that the end users read this manual.

Relevant products

RX40NC6B, RY40PT5B

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- 📖 MELSEC iQ-R Module Configuration Manual
- 📖 Safety Guidelines (This manual is included with the base unit.)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

Additional measures

No additional measures are necessary for the compliance of this product with EMC and Low Voltage Directives.

MEMO

CONTENTS

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Application) [SH-081621ENG] (this manual)	Functions, parameter settings, troubleshooting, I/O signals, and buffer memory of the I/O module with diagnostic functions	Print book
		e-Manual PDF
MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Startup) [SH-081619ENG]	Specifications, procedures before operation, installation, and wiring of the I/O module with diagnostic functions	Print book
		e-Manual PDF
Before Using the Product [BCN-P5999-0209]	Compatible models, specifications, and installation procedure of the Q6TE-18SN spring clamp terminal block	Print book
		PDF

This manual does not include detailed information on the following:

- General specifications
- Applicable combinations of CPU modules and the other modules, and the number of mountable modules
- Applicable combinations of the remote head module and the other modules, and the number of mountable modules
- Installation

For details, refer to the following.

📖 MELSEC iQ-R Module Configuration Manual

This manual does not include information on the module function blocks.

For details, refer to the Function Block Reference for the module used.

> **Point**
>
> e-Manual refers to the Mitsubishi FA electronic book manuals that can be browsed using a dedicated tool.
>
> e-Manual has the following features:
> - Required information can be cross-searched in multiple manuals.
> - Other manuals can be accessed from the links in the manual.
> - The hardware specifications of each part can be found from the product figures.
> - Pages that users often browse can be bookmarked.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
CPU module	A generic term for the MELSEC iQ-R series CPU modules
Engineering tool	Another term for GX Works3
GX Works3	The product name of the software package for the MELSEC programmable controllers
I/O module with diagnostic functions	The abbreviation for the MELSEC iQ-R series I/O module with diagnostic functions
Power supply module	A generic term for MELSEC iQ-R series power supply modules
Remote head module	The abbreviation for the RJ72GF15-T2 CC-Link IE Field Network remote head module

1 FUNCTIONS

1.1 Input Function

This function takes in the ON/OFF state of external inputs.

However, when the input response time setting function or input delay function is enabled, the ON/OFF state of the input signals in the module (X0 to XF) and the ON/OFF state of the actual external inputs (X00 to X0F) may not match.

The following figure shows the processing procedure of the input function.
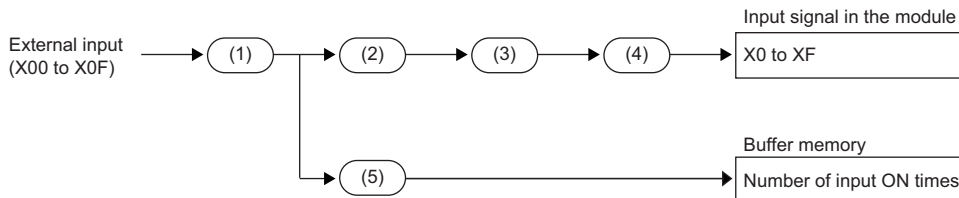
No.	Processing
(1)	Input response time setting function
(2)	Input delay function • OFF delay • ON delay • Pulse stretch
(3)	Input HOLD/CLEAR function
(4)	Event time stamp function
(5)	Number of input ON times integration function

Input response time setting function

This function allows changing the input response times of the input module with diagnostic functions for each input. The input module with diagnostic functions takes in external inputs with the set input response times.
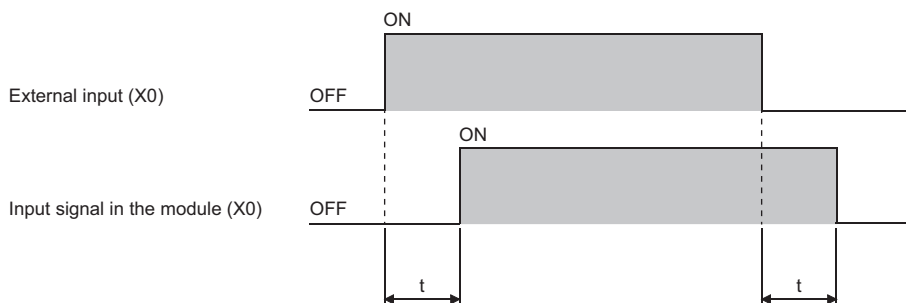
t: Input response time

Setting procedure

Set the following item from "Basic setting".

• "Input response time setting" (☞ Page 88 Input response time setting)

🖰 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Basic setting]

Input response time and pulse width to be ignored as noise

The input module with diagnostic functions may take in noise and others as input because of the setting of an input response time.

The following table lists the minimum pulse widths that can be taken in as input. The pulse width to be ignored as noise should be less than the following minimum values:

Set an input response time with due consideration for the following values and use environment.

Input response time setting value	Minimum pulse width that can be taken in as input (Reference value)
1ms	0.8ms
5ms	4.8ms
10ms	9.8ms
20ms	19.8ms
70ms	69.8ms

Input HOLD/CLEAR function

This function allows setting whether to hold or clear the input status just before an error (alarm, minor error, or moderate error) when the error is detected in the input module with diagnostic functions.

Depending on whether "Input HOLD/CLEAR function enable/disable" is enabled or disabled, the input module with diagnostic functions operates differently when an error is detected.

Input HOLD/CLEAR function enable/disable		Enable (default)		Disable
HOLD/CLEAR setting		CLEAR	HOLD (default)	CLEAR/HOLD (default)
Input status just before an error	OFF	OFF	OFF	OFF
	ON	OFF	ON	OFF

The following table lists the target inputs to be held or cleared for each type of detected errors.

Detected error	Target input to be held or cleared
Alarm[*1]	Only the input with an alarm
Minor error, moderate error[*2]	All inputs

*1   When an alarm is detected, 'Alarm flag' (X11) turns on.
*2   When a minor error or moderate error is detected, 'Error flag' (X10) turns on.
- When 'Alarm flag' (X11) turns on, the input is held or cleared. When 'Alarm flag' (X11) turns off, the HOLD/CLEAR state is cleared.
- When 'Error flag' (X10) turns on, the input is held or cleared. When 'Error flag' (X10) turns off, the HOLD/CLEAR state is cleared.
- When both 'Alarm flag' (X11) and 'Error flag' (X10) turn on, the HOLD/CLEAR state is cleared when both the flags turn off. When only one of them turns off, the HOLD/CLEAR state is not cleared.

Ex.

Operation of when "Input HOLD/CLEAR function setting" is set to "CLEAR"
- When the external input remains on

'Error flag' (X10)/'Alarm flag' (X11)	OFF ON
External input (X0)	ON
Input to the CPU module (X0)	ON OFF

- When the external input turns off
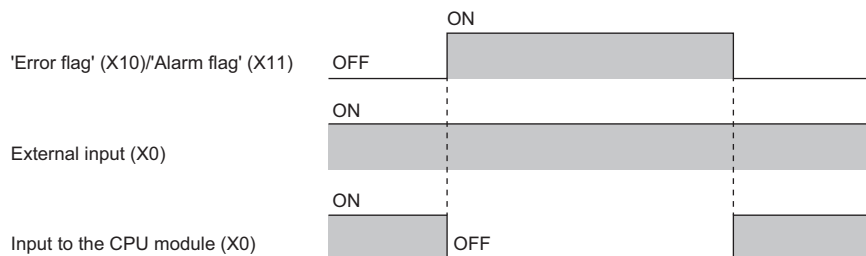
'Error flag' (X10)/'Alarm flag' (X11)	OFF ON
External input (X0)	ON OFF
Input to the CPU module (X0)	ON OFF

Ex.
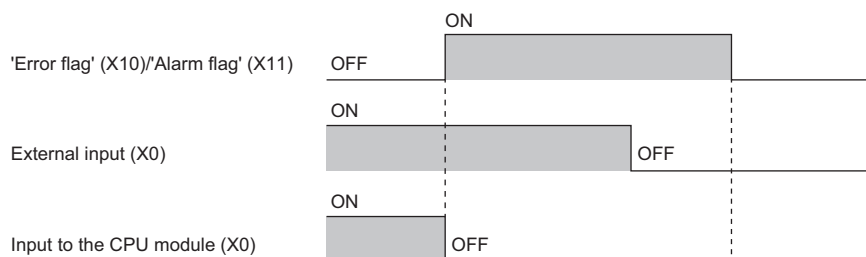
Operation of when "Input HOLD/CLEAR function setting" is set to "HOLD"

 • When the external input remains on

'Error flag' (X10)/'Alarm flag' (X11)	OFF	ON
External input (X0)		ON
Input to the CPU module (X0)		ON

 • When the external input turns off
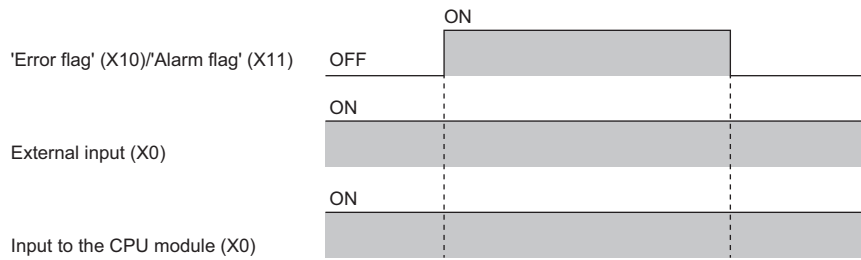
'Error flag' (X10)/'Alarm flag' (X11)	OFF	ON
External input (X0)		ON ... OFF
Input to the CPU module (X0)		ON ... OFF
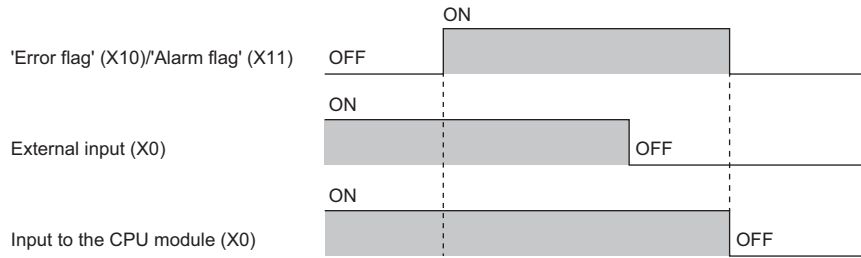
Setting procedure

Set the following items from "Basic setting".

 • "Input HOLD/CLEAR function enable/disable" (☞ Page 88 Input HOLD/CLEAR function enable/disable)

 • "Input HOLD/CLEAR function setting" (☞ Page 89 Input HOLD/CLEAR setting)

Input delay function

This function allows changing the status of an X signal in the module after a certain time (input delay time) elapsed when the status of the external input changes.

The input delay function has the following three functions.

- OFF delay
- ON delay
- Pulse stretch

Point

- The input delay time does not include the external input response time.
- The input delay time is set in the range of 1 to 150000 (in increments of 400μs, 400μs to 60s).
- The accuracy of the input delay time is from 0 to 400μs.
- When the inter-module synchronization function is used, the input delay function cannot be used together. (The settings for the input delay function are ignored.)
- The OFF delay, ON delay, and pulse stretch can be enabled only individually.

OFF delay

When an external input turns off, this function turns off the X signal after a certain time (input delay time) elapsed.

When the input delay time is set to a value larger than the scan time with the OFF delay being used, the program can recognize that the external input turns on even if its ON time is short.

Even when the external input device is replaced, the program can be used as it is only by changing the setting value of the input delay time.

■Operation of the OFF delay

The following figure shows an operation example of the OFF delay.
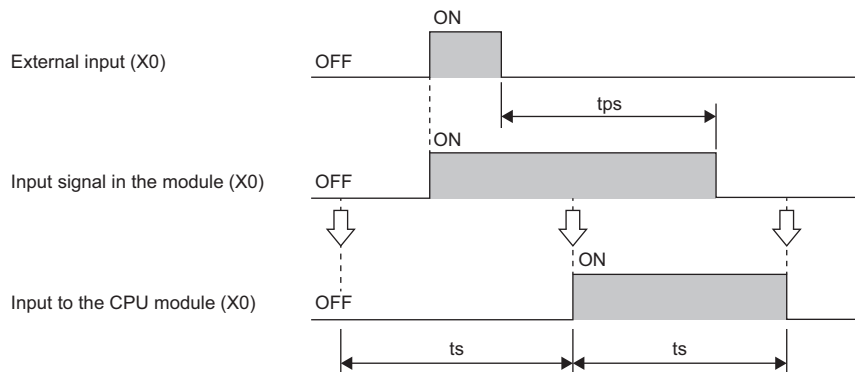
tps: Input delay time
ts: Scan time
⇩: END processing of the CPU module

ON delay

When an external input turns on, this function turns on the X signal after a certain time (input delay time) elapsed.

When the input delay time is set to a value larger than the scan time with the ON delay being used, the program can recognize that the external input turns off even if its OFF time is short.

Even when the external input device is replaced, the program can be used as it is only by changing the setting value of the input delay time.

■Operation of the ON delay

The following figure shows an operation example of the ON delay.
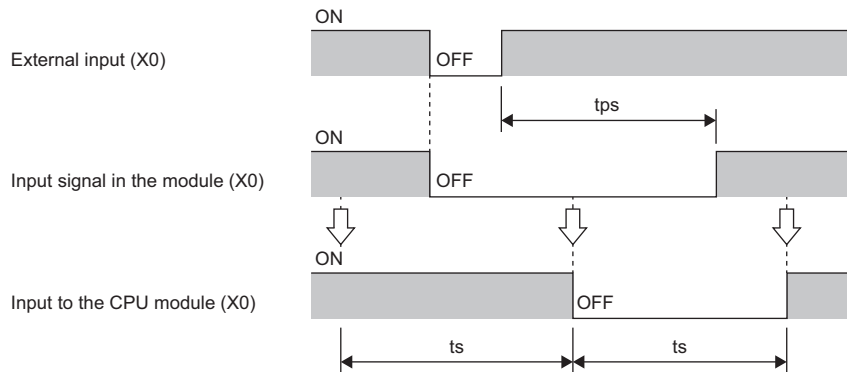
tps: Input delay time
ts: Scan time
⇩: END processing of the CPU module

Pulse stretch

When a status change of an external input is detected, this function can hold the signal status before the change for a certain time (input delay time) from the change. (When a status change of an external input is detected, the external input is not taken in until a certain time has elapsed from the change.)

After a certain time has elapsed, taking in the external input starts.
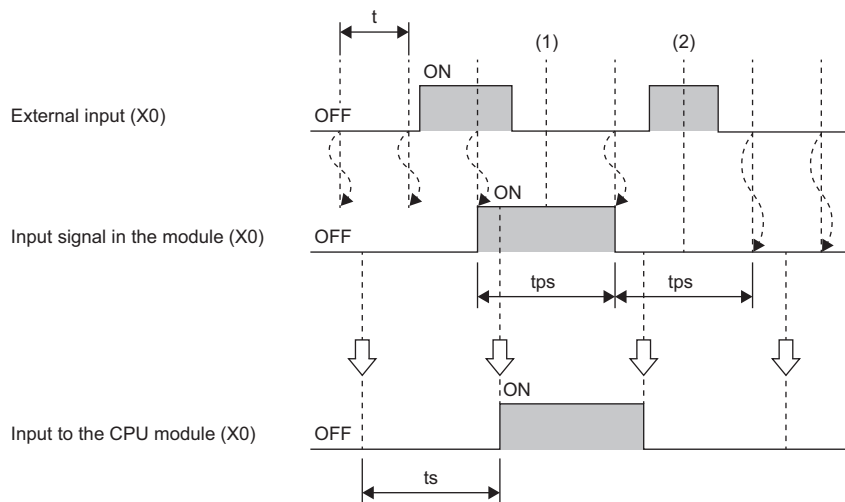
t: Control cycle (200μs)

tps: Input delay time

ts: Scan time

⇩: END processing of the CPU module

(1): Because the signal is ignored until a certain time (tps) has elapsed after the status of the external input changes, the OFF state is not recognized.

(2): Because the signal is ignored until a certain time (tps) has elapsed after the status of the external input changes, the ON state is not recognized.

Setting procedure

Set the following items from "Application setting".

- "Input delay function enable/disable" (☞ Page 89 Input delay function enable/disable)
- "Input delay type setting" (☞ Page 90 Input delay type setting)
- "Input delay time setting" (☞ Page 90 Input delay time setting)

🖱 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

Number of input ON times integration function

This function counts the number of times that an external input turns on.

When the number of input ON times alarm detection count has been set and the number of input ON times reaches the set value, an alarm occurs.

Number of input ON times integration

The input module with diagnostic functions counts the number of times that an external input turns on in the range from 0 to 4294967295.

When the number of input ON times exceeds the maximum value, the count stops. To continue the count, clear the number of input ON times with 'Number of input ON times value clear request' (Un\G3584). (The count starts from 0.)

The number of input ON times is counted for each external input. Only for the input for which "Input ON Number Count Function enable/disable" is set to "Enable", the number of input ON times is counted.

The number of input ON times is stored in 'Number of input ON times' (Un\G2848 to Un\G2879).

> **Point**
>
> - When the input delay function is enabled, the number of input ON times is counted at the timing when the delayed input turns on.
> - The number of input ON times is recorded in the non-volatile memory of the input module with diagnostic functions every second and at power-off. The number of input ON times recorded in the non-volatile memory is restored in 'Number of input ON times' (Un\G2848 to Un\G2879) when the power is turned on or the CPU module is reset. Therefore, the number of input ON times is held even if the power is turned off or the CPU module is reset.

■Operation of the number of input ON times integration function

The following figure shows an operation example of the number of input ON times integration function.
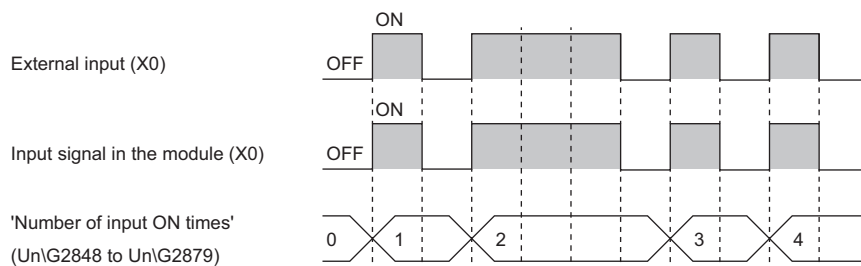
Number of input ON times alarm detection notification

To use the number of input ON times alarm detection notification, set "Number of input ON times alarm detect setting" to "To detect" and set "Number of input ON times alarm detect count setting".

When the number of input ON times reaches the number of input ON times alarm detection count (set value), an alarm (Number of input ON times alarm detection count reached) occurs.

The details of the alarm can be checked in the module diagnostics window of the engineering tool.

The alarm occurrence can be checked with the ALM LED.

⇩: Taken in with the control cycle.

--------▶ : Performed by the input module with diagnostic functions.
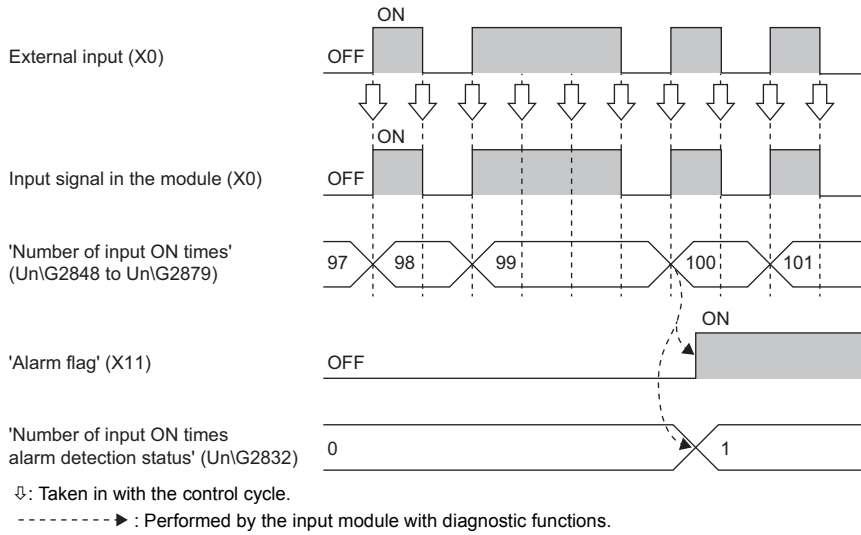
Point

In the following cases, an alarm occurs immediately.

- When the number of input ON times has already reached the number of input ON times alarm detection count at power-on
- When a value equal to or less than the current number of input ON times is set as the number of input ON times alarm detection count

■Clearing an alarm

Although the number of input ON times is cleared to 0, an alarm is not cleared. To clear the alarm, turn on and off 'Alarm clear request' (Y11) after clearing 'Number of input ON times' (Un\G2848 to Un\G2879).

--------▶ : Performed by the input module with diagnostic functions.

──────▶ : Performed by a program.
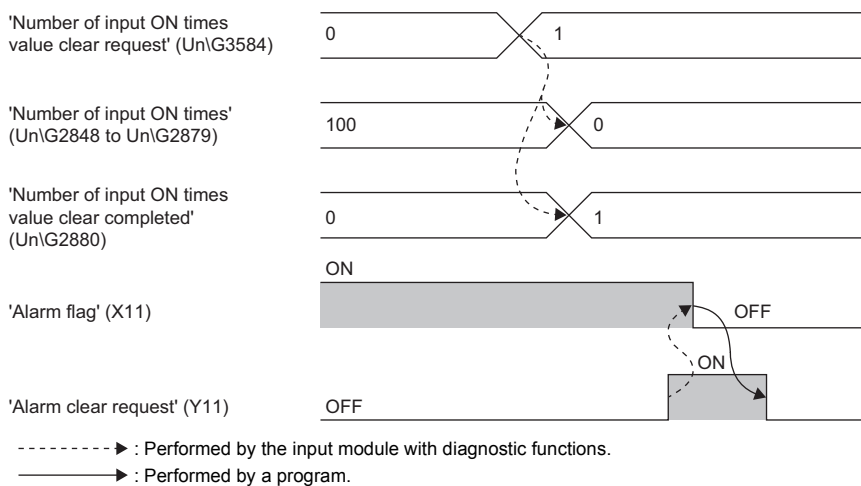
Clearing the number of input ON times

The number of input ON times can be cleared with 'Number of input ON times value clear request' (Un\G3584).

Each bit of 'Number of input ON times value clear request' (Un\G3584) corresponds to each input.

When the bit corresponding to the input to be cleared is changed from 0 (Not requested) to 1 (Requested), the value of 'Number of input ON times' (Un\G2848 to Un\G2879) is cleared and 1 (Completed) is stored in 'Number of input ON times value clear completed' (Un\G2880).

Even if 1 (Completed) is stored in 'Number of input ON times value clear completed' (Un\G2880), the bit of 'Number of input ON times value clear request' (Un\G3584) is not automatically changed to 0 (Not requested). Set 0 (Not requested) in 'Number of input ON times value clear request' (Un\G3584) with a program.

When 0 (Not requested) is stored in 'Number of input ON times value clear request' (Un\G3584), the bit of 'Number of input ON times value clear completed' (Un\G2880) is changed to 0 (Not completed).

- - - - - - - - ▶ : Performed by the input module with diagnostic functions.
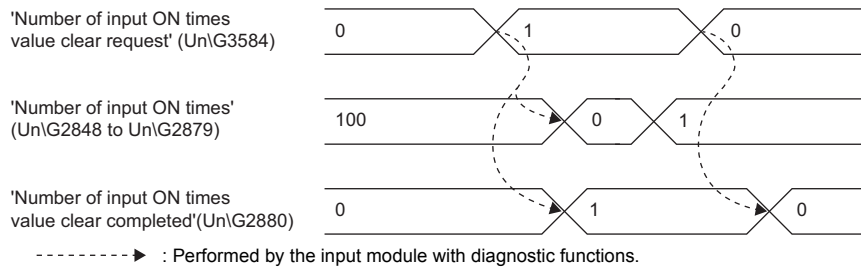
For each bit of 'Number of input ON times value clear request' (Un\G3584) and the input to be cleared, refer to the following.

☞ Page 106 Number of input ON times value clear request

Setting procedure

Set the following items from "Application setting".

- "Input ON Number Count Function enable/disable" (☞ Page 91 Number of input ON times integration function enable/disable)
- "Number of input ON times alarm detect count setting" (☞ Page 91 Number of input ON times alarm detection setting)
- "Number of input ON times alarm detect setting" (☞ Page 92 Number of input ON times alarm detection count setting)

✍ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

Event time stamp function

This function records the time data when an input status changes.

When this function is used, the events in the entire system can be recorded in the correct order of occurrence based on the time data and time stamp value recorded individually by the input module with diagnostic functions. This record helps investigate a cause when a trouble occurs.

Up to 128 event time stamp data sets can be recorded in a module.

The event time stamp data recorded in the input module with diagnostic functions can be read to the CPU module and saved to an SD memory card using function blocks (FB). (To use function blocks (FB), set "Target" to "Module Label" in "Refresh settings".)

Module labels and function blocks (FB) cannot be used when the input module with diagnostic functions is used with a remote head module.

To read the event time stamp data, use the REMFR instruction.

However, when the scan time of the CPU module is long, all the time stamp data set of the events which have occurred may not be read.

Starting collecting event time stamp data

To start collecting the event time stamp data, set the parameter for using the event time stamp function and turn on and off 'Operating condition setting request' (Y12).

The event time stamp data is collected at the interval of 200μs.

When the status of an external input changes, the time data at the change, the set condition (rise or fall), and the terminal number of the changed input are stored in Event time stamp data (Un\G4608 to Un\G5375).
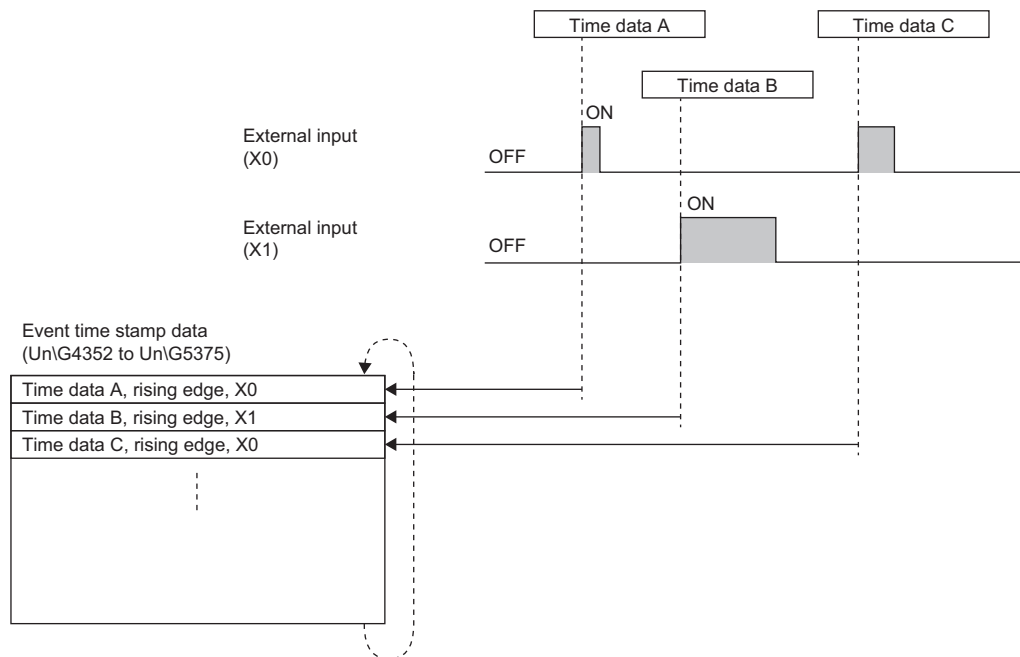
Accuracy

The accuracy of the time data of the event time stamp data is 1ms.

Point

The accuracy of when the module is mounted on a slave station of the CC-Link IE Field is 730ms at a maximum.

Event time stamp data

Collected event time stamp data is stored in Event time stamp data (Un\G4608 to Un\G5375).

After Event time stamp data (Un\G4608 to Un\G5375) becomes full, the data is overwritten from the first data area.

Event time stamp data

1st data
2nd data
3rd data
4th data	*1
128th data
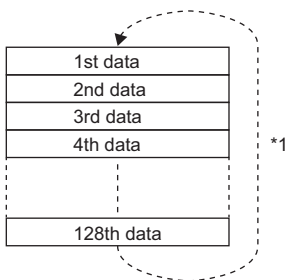
*1 After 128 data sets are stored, the data is overwritten from the first data area.

Reading and saving event time stamp data

Event time stamp data can be read to the CPU module and saved to an SD memory card in the CSV file format.

To read the event time stamp data to the CPU module or save it to an SD memory card in the CSV file format, use function blocks (FB).

I/O:0010	Event type	Input terminal	Store State
DATE:2015/06/30 10:10:30.123	1	X01	0
DATE:2015/06/30 10:20:30.456	0	X0F	0
DATE:2015/06/30 11:15:30.789	1	X02	0
DATE:2015/07/01 14:15:30.012	0	X1C	0
DATE:2015/07/02 16:15:30.345	1	X03	0

(3)

(1): Header row
(2): Data row
(3): Data column

Point

- To use function blocks (FB), set "Target" to "Module Label" in "Refresh settings".
- Module labels and function blocks (FB) cannot be used when the input module with diagnostic functions is used with a remote head module. To read the event time stamp data, use the REMFR instruction.

Setting for not-refreshed data

Whether to overwrite the event time stamp data which have not been read can be set for when an external input status changes 128 times or more before the CPU module refreshes the event time stamp data.

• When the event time stamp data is not overwritten (default), the 128 data sets which have not been read are held and the subsequent data sets are discarded.

• When the event time stamp data is overwritten, the data is overwritten with the 129th data set or later from the oldest one even if the data to be overwritten has not been read.

In the following cases, 1 (Discarded/Overwritten) is stored in 'Event time stamp storage status' (Un\G4354).

• When "Data setting which the refresh is not completed yet" has been set to "Don't overwrite" and the data is discarded

• When "Data setting which the refresh is not completed yet" has been set to "Overwrite" and not-refreshed event time stamp data is overwritten.

Setting procedure

Set the following items from "Application setting".

• "Event time stamp function enable/disable" (☞ Page 92 Event time stamp function enable/disable)

• "Event time stamp condition setting" (☞ Page 93 Event time stamp condition setting)

• "Data setting which the refresh is not completed yet" (☞ Page 93 Setting for not-refreshed data)

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

1.2 Output Function

This function outputs the output data specified by the CPU module to the external device without any change.

However, when the output delay function is enabled, the ON/OFF state of Y signals (Y0 to YF) and the ON/OFF state of the external outputs (Y0 to YF) may not match.

The following figure shows the processing procedure of the output function.
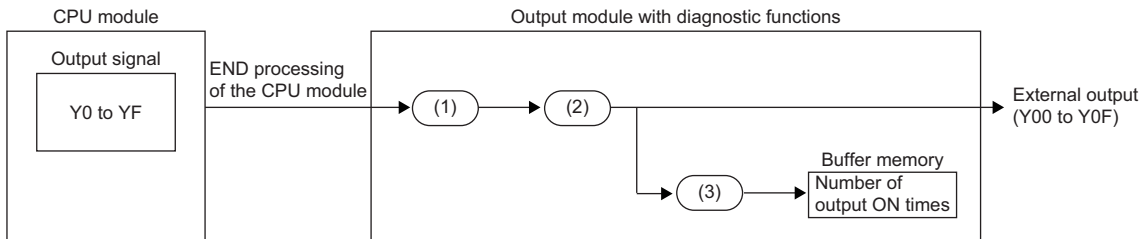
No.	Processing
(1)	Output delay function • OFF delay • ON delay
(2)	Setting of output mode at error
(3)	Number of output ON times integration function

Setting of output mode at error

This function allows setting whether to hold or clear the output status just before a CPU stop error when the error has occurred.

Setting procedure

Set the following item from "Basic setting".

• "In-Error Output Mode Setting" (☞ Page 85 Setting of output mode at error)

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Basic setting]

Output delay function

When the status of an output signal from the CPU module is changed, this function changes the status of the external output after a certain time (output delay time) elapsed.

The output delay function has the following two functions.

- OFF delay
- ON delay

Point

- The output delay time does not include the response time of the hardware.
- The output delay time is set in the range of 1 to 150000 (in increments of 400μs, 400μs to 60s).
- The accuracy of the output delay time is from 0 to 400μs.
- When the inter-module synchronization function is used, the output delay function cannot be used together. (The settings for the output delay function are ignored.)
- The OFF delay and ON delay can be enabled only individually.

OFF delay

When an output signal from the CPU module is turned off, this function turns off the external output after a certain time (output delay time) elapsed.

The ON state of an external output can be held for a certain time by using the OFF delay even if the output signal from the CPU module is turned off.

■Operation of the OFF delay

The following figure shows an operation example of the OFF delay.
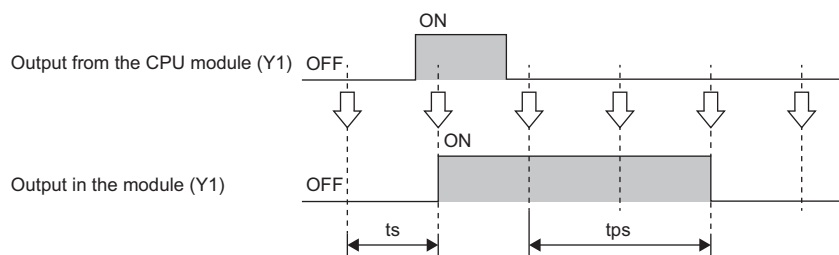
tps: Output delay time
ts: Scan time
⇩: END processing of the CPU module

ON delay

When an output signal from the CPU module is turned on, this function turns on the external output after a certain time (output delay time) elapsed.

The OFF state of an external output can be held for a certain time by using the ON delay even if the output signal from the CPU module is turned on.

■Operation of the ON delay

The following figure shows an operation example of the ON delay.
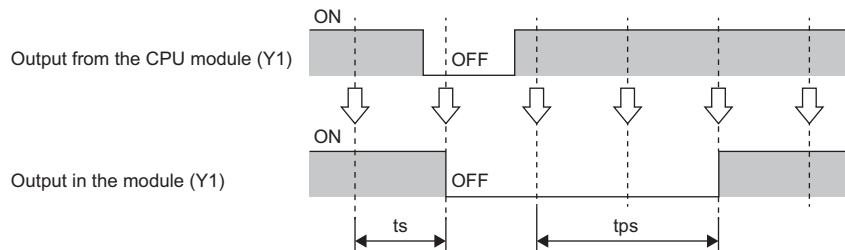
tps: Output delay time
ts: Scan time
⇩: END processing of the CPU module

Setting procedure

Set the following items from "Application setting".

• "Output delay function enable/disable" (☞ Page 95 Output delay function enable/disable)
• "Output delay type setting" (☞ Page 95 Output delay type setting)
• "Output delay time setting" (☞ Page 96 Output delay time setting)

Number of output ON times integration function

This function counts the number of times that an output from the CPU module turns on.

When the number of output ON times alarm detection count has been set and the number of output ON times reaches the set value, an alarm occurs.

This function helps predict the life of external connected devices.

Number of output ON times integration

The output module with diagnostic functions counts the number of times that an output turns on in the range from 0 to 4294967295.

When the number of output ON times exceeds the maximum value, the count stops. To continue the count, clear the number of output ON times with 'Number of output ON times value clear request' (Un\G3840). (The count starts from 0.)

The number of output ON times is counted for each external output. Only for the output for which "Output ON number count function enable/disable" is set to "Enable", the number of output ON times is counted.

The number of output ON times is stored in 'Number of output ON times' (Un\G3136 to Un\G3167).

> **Point**
>
> • The number of output ON times is recorded in the non-volatile memory of the output module with diagnostic functions every second and at power-off. The number of output ON times recorded in the non-volatile memory is restored in 'Number of output ON times' (Un\G3136 to Un\G3167) when the power is turned on or the CPU module is reset. Therefore, the number of output ON times is held even if the power is turned off or the CPU module is reset.

■Operation of the number of output ON times integration function

The following figure shows an operation example of the number of output ON times integration function.

⇩: END processing of the CPU module
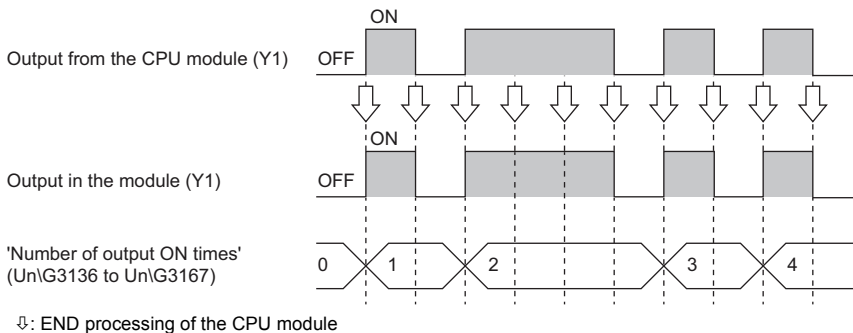
Number of output ON times alarm detection notification

To use the number of output ON times alarm detection notification, set "Number of output ON times alarm detect setting" to "To detect" and set "Number of output ON times alarm detect count setting".

When the number of output ON times reaches the number of output ON times alarm detection count (set value), an alarm (Number of output ON times alarm detection count reached) occurs.

The details of the alarm can be checked in the module diagnostics window of the engineering tool.

The alarm occurrence can be checked with the ALM LED.

⇩: END processing of the CPU module

------- ▶ : Performed by the output module with diagnostic functions.
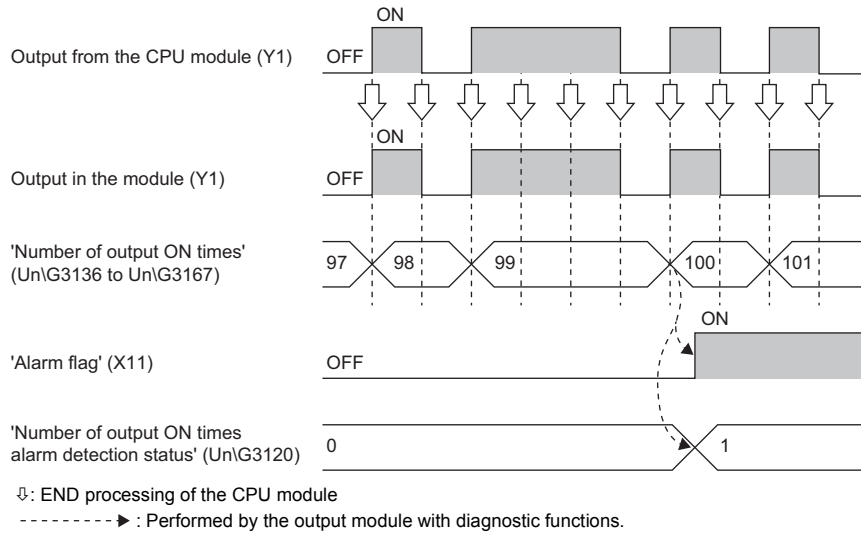
Point

In the following cases, an alarm occurs immediately.
- When the number of output ON times has already reached the number of output ON times alarm detection count at power-on
- When a value equal to or less than the current number of output ON times is set as the number of output ON times alarm detection count

■Clearing an alarm

Although 'Number of output ON times' (Un\G3136 to Un\G3167) is cleared to 0, an alarm is not cleared. To clear the alarm, turn on and off 'Alarm clear request' (Y11) after clearing 'Number of output ON times' (Un\G3136 to Un\G3167).

------- ▶ : Performed by the output module with diagnostic functions.

——————▶ : Performed by a program.
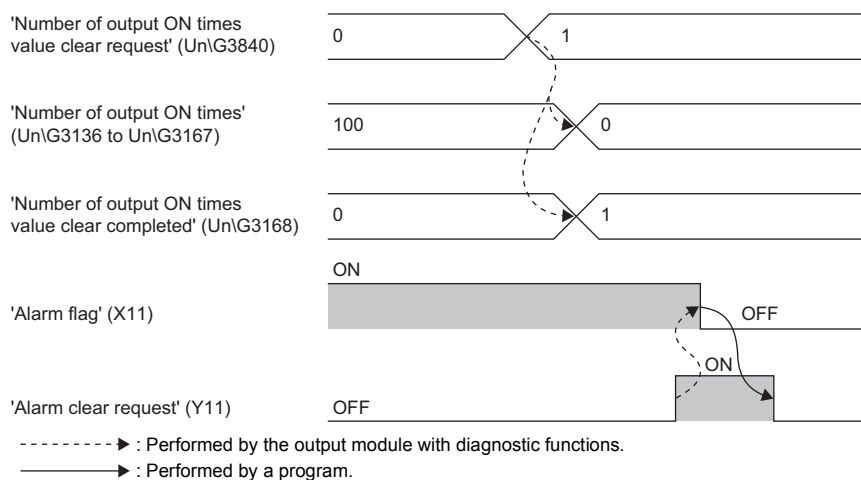
Clearing the number of output ON times

The number of output ON times can be cleared with 'Number of output ON times value clear request' (Un\G3840).

Each bit of 'Number of output ON times value clear request' (Un\G3840) corresponds to each output.

When the bit corresponding to the output to be cleared is changed from 0 (Not requested) to 1 (Requested), the value of 'Number of output ON times' (Un\G3136 to Un\G3167) is cleared and 1 (Completed) is stored in 'Number of output ON times value clear completed' (Un\G3168).

Even if 1 (Completed) is stored in 'Number of output ON times value clear completed' (Un\G3168), the bit of 'Number of output ON times value clear request' (Un\G3840) is not automatically changed to 0 (Not requested). Set 0 (Not requested) in 'Number of output ON times value clear request' (Un\G3840) with a program.

When 0 (Not requested) is stored in 'Number of output ON times value clear request' (Un\G3840), the bit of 'Number of output ON times value clear completed' (Un\G3168) is changed to 0 (Not completed).
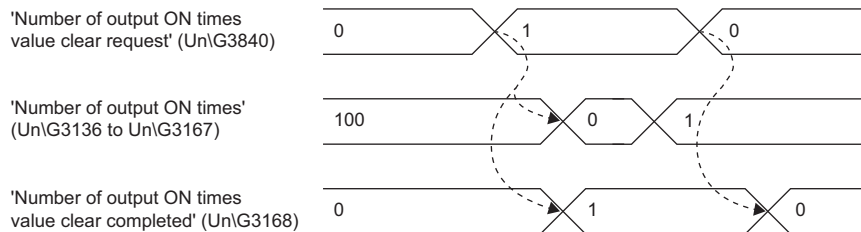
For each bit of 'Number of output ON times value clear request' (Un\G3840) and the output to be cleared, refer to the following.

☞ Page 106 Number of output ON times value clear request

Setting procedure

Set the following items from "Application setting".

• "Output ON number count function enable/disable" (☞ Page 96 Number of output ON times integration function enable/disable)

• "Number of output ON times alarm detect setting" (☞ Page 97 Number of output ON times alarm detection setting)

• "Number of output ON times alarm detect count setting" (☞ Page 97 Number of output ON times alarm detection count setting)

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

1.3 Common Functions of the I/O Module with Diagnostic Functions

This section describes the functions common to the input module with diagnostic functions and the output module with diagnostic functions.

Interrupt function

When an interrupt factor is detected, this function generates an interrupt to the CPU module.

When this function is used, interrupt programs can be started by an alarm output or others.

Up to 16 interrupt pointers can be used in the I/O module with diagnostic functions for each module.

Setting procedure

Set the following items in "Interrupt setting".
- "Interrupt condition target setting"
- "Interrupt condition target input output terminal setting range"
- "Interrupt pointer"

☞ [Navigation window] ➪ [Parameter] ➪ [Module Information] ➪ Target module ➪ [Module Parameter] ➪ [Interrupt setting]

Item	Description
Interrupt condition target setting [n][1]	Select a target factor of interrupt detection.
Interrupt condition target input output terminal setting range [n][1]	Set the target I/O terminal number so that if an interrupt factor is detected on the set terminal, an interrupt is performed.
Interrupt pointer	Specify the number of an interrupt pointer which is started when an interrupt factor is detected.

[1] n indicates the interrupt setting number. (n: 1 to 16)

■ Interrupt condition target setting [n]

Select a target factor of interrupt detection.

- Input module with diagnostic functions

Item	Target condition	Detection timing
Interrupt condition target setting [n][1]	Disable (default value)	Interrupt detection is not performed.
	Error flag	The rise (OFF to ON) of 'Error flag' (X10) is detected.
	Alarm flag	The rise (OFF to ON) of 'Alarm flag' (X11) is detected.
	Disconnection detection state	The rise (0 (Normal) to 1 (Disconnection detected)) of Input disconnection detection status is detected.
	Number of input ON times alarm detect status	The rise (0 (Normal) to 1 (Alarm detection count reached)) of Number of input ON times alarm detection status is detected.
	Input signal (Rising)	The rise (OFF to ON) of Input signal (X0 to XF) is detected.
	Input signal (Falling)	The fall (ON to OFF) of Input signal (X0 to XF) is detected.
	Input signal (Rising and Falling)	The rise (OFF to ON) and fall (ON to OFF) of Input signal (X0 to XF) are detected.

[1] n indicates the interrupt setting number. (n: 1 to 16)

- Output module with diagnostic functions

Item	Target condition	Detection timing
Interrupt condition target setting [n][2]	Disable (default value)	Interrupt detection is not performed.
	Error flag	The rise (OFF to ON) of 'Error flag' (X10) is detected.
	Alarm flag	The rise (OFF to ON) of 'Alarm flag' (X11) is detected.
	Disconnection detection state	The rise (0 (Normal) to 1 (Disconnection detected)) of Output disconnection detection status is detected.
	Output Short-circuit detection state	The rise (0 (Normal) to 1 (Short circuit detected)) of Output short-circuit detection status is detected.
	Number of output ON times alarm detect status	The rise (0 (Normal) to 1 (Alarm detection count reached)) of Number of output ON times alarm detection status is detected.

[2] n indicates the interrupt setting number. (n: 1 to 16)

■ Interrupt condition target input output terminal setting range [n]

Set the target I/O terminal number so that if an interrupt factor is detected on the set terminal, an interrupt is performed.

- Input module with diagnostic functions

Item	Setting range
Interrupt condition target input output terminal setting range [n][1]	X00
	X01
	X02
	X03
	X04
	X05
	X06
	X07
	X08
	X09
	X0A
	X0B
	X0C
	X0D
	X0E
	X0F
	All input terminal designation[2]

*1   n indicates the interrupt setting number. (n: 1 to 16)
*2   X00 to X0F are set as the interrupt condition target input terminals.

- Output module with diagnostic functions

Item	Setting range
Interrupt condition target input output terminal setting range [n][3]	Y00
	Y01
	Y02
	Y03
	Y04
	Y05
	Y06
	Y07
	Y08
	Y09
	Y0A
	Y0B
	Y0C
	Y0D
	Y0E
	Y0F
	All output terminal designation[4]

*3   n indicates the interrupt setting number. (n: 1 to 16)
*4   Y00 to Y0F are set as the interrupt condition target output terminals.

■ Interrupt pointer

Specify the number of an interrupt pointer which is started when an interrupt factor is detected. For details on the interrupt pointers, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Setting example

Ex.

To execute an interrupt program when a disconnection is detected at X0 of the input module with diagnostic functions

• Parameter setting

Set "Interrupt setting" of the module parameters as shown below.

No.	Interrupt condition target setting	Interrupt condition target input output terminal setting range	Interrupt pointer
1	Disconnection detection state	X00	I50

• Label setting

Classification	Label name	Description	Device
Module label	RCPU.stSM.bAlways_ON	Always ON	SM400
	RCPU.stSM.bAfter_RUN1_Scan_ON	ON only for a scan after RUN	SM402
	RX40NC6B_1.unInterruptFactorMask_D[0]	Interrupt factor mask [1]	U0\G3344
	RX40NC6B_1.unInterruptFactorResetRequest_D[0]	Interrupt factor reset request [1]	U0\G3328
Defined labels	Define global labels as shown below.		

	Label Name	Data Type		Class		Assign (Device/Label)
1	G_bDisconnectDetection	Bit	...	VAR_GLOBAL	▼	F0
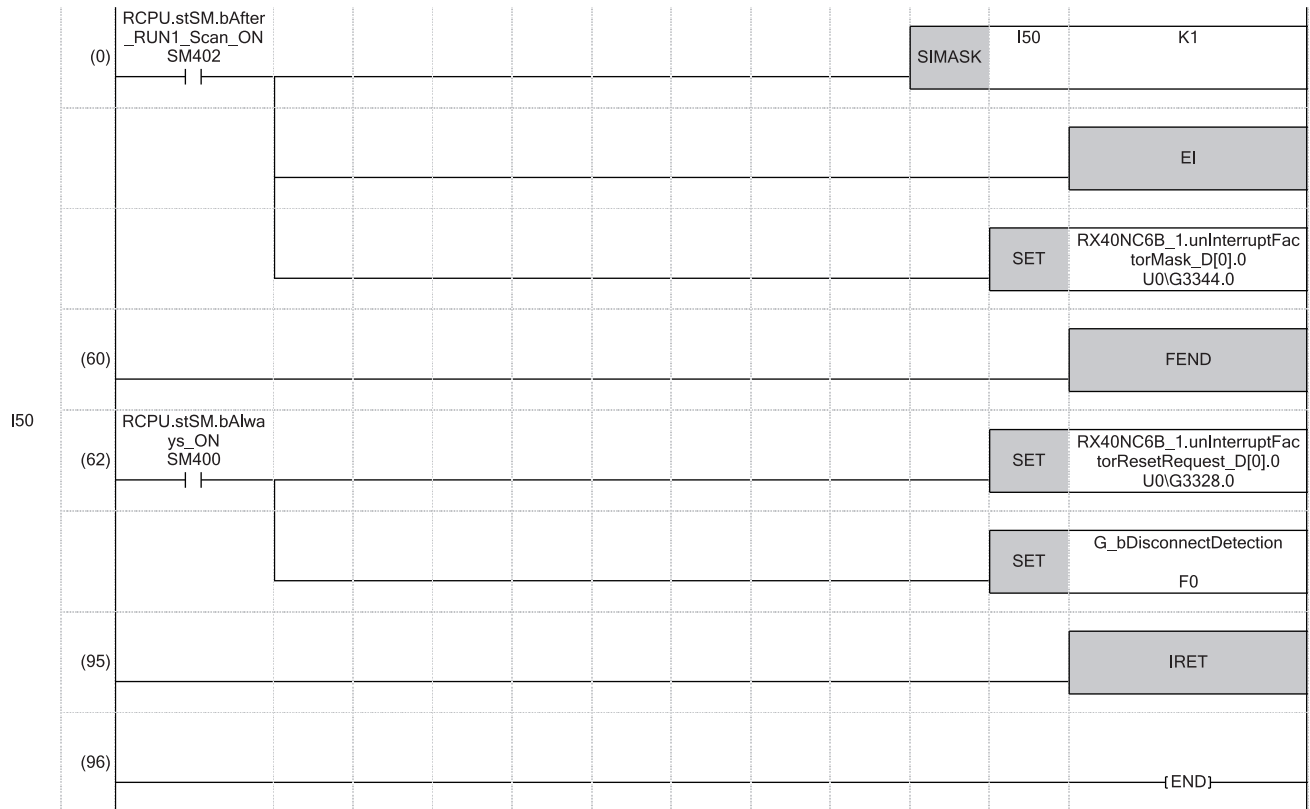
(0)   Only the interrupt pointer I50 can be executed.

(62)   'Interrupt factor reset request [1]' (U0\G3328) is turned on.
         The processing at disconnection detection is performed.

LED indication setting on error condition

This function enables setting the indication of the I/O status indicator LED for when an error occurs.

The following figure shows the LED status on normal and abnormal conditions.

```
Normal condition                                    Error condition
┌─────────────────────────────┐   Error  ┌─────────────────────────────────────┐
│ I/O status indicator LED    │  detected│  ALM/ERR LED      I/O status         │
│                             │──────────│                   indicator LED      │
│ ┌──────────┐   ┌──────────┐ │          │  ┌──────────┐    ┌──────────────┐    │
│ │Off (I/O  │──▶│On (I/O on)│ │◀─────────│  │ On       │    │On/off/flashing│   │
│ │off)      │◀──│          │ │  Error   │  └──────────┘    └──────────────┘    │
│ └──────────┘   └──────────┘ │ eliminated│                                     │
└─────────────────────────────┘          └─────────────────────────────────────┘
```
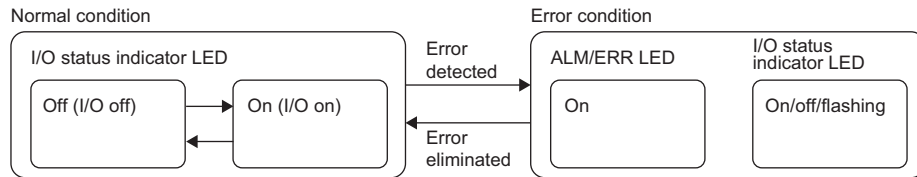
LED indication on error condition

The ERR/ALM LED turns on when an error is detected.

The indication of the I/O status indicator LED can be set in "LED display setting when error occurred" for when an error is detected.

■Hide abnormal occurrence points

The ON/OFF state of an I/O is indicated.

When the ERR/ALM LED is on, check the I/O with an error with the error history/alarm history.

■Always display abnormal occurrence points

Only the LEDs of I/Os with an error turn on. The LEDs of I/Os without error are off. (The ON/OFF state of input/output cannot be indicated.)

The indications of the ERR/ALM LED and I/O status indicator LED enable identifying the input/output with an error.

■Switching display of input status and alarm (1 second intervals)

The LED indication is switched between "Hide abnormal occurrence points" and "Always display abnormal occurrence points" at the interval of a second.

Check the I/O with an error with the error history or alarm history.

Setting procedure

Set the following item from "Basic setting".

 • "LED display setting when error occurred" (Page 85 LED indication setting on error condition)

 [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Basic setting]

1.4 Diagnostic Function

Input disconnection detection function

This function detects disconnections in input wiring.

When the input current is 0.3mA/point or lower, a disconnection (no connection) is detected.

When the leakage current of the input device is 0.3mA/point or lower, connect a bleeder resistor (resistance value as a guide: approximately 56kΩ) in parallel near the input device.

When the external power supply is not supplied, the input disconnection detection function does not operate properly.
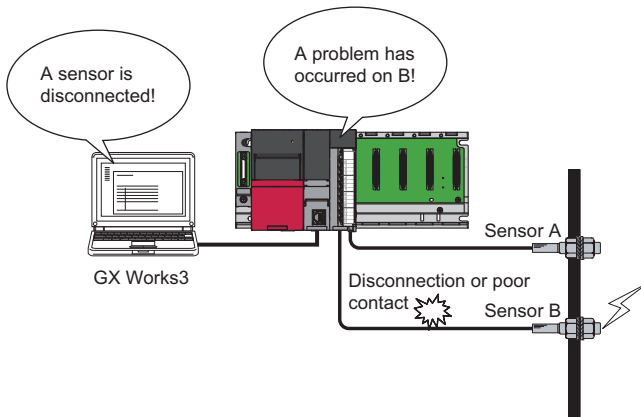
Operation of when an error is detected

When a disconnection occurs or no wiring is connected at an input terminal where "Input disconnection detection setting" is set to "To detect", this function judges this state as a disconnection and 1 (Disconnection detected) is stored in 'Input disconnection detection status' (Un\G2816).

When a disconnection is detected in the input module with diagnostic functions, an alarm (Input disconnection detection) occurs. At this time, the input status depends on the value in "Input HOLD/CLEAR function setting".

The details of the alarm can be checked in the module diagnostics window of the engineering tool.

When a disconnection is detected, the ALM LED on the front side of the module turns on.

Operation of when a connection is recovered from a disconnection

The operation of when the cause of a disconnection is eliminated and the connection with the external device is recovered differs depending on the setting in "Input disconnection detection automatic clear enable/disable".

■When "Input disconnection detection automatic clear enable/disable" is set to "Disable"

The following shows the operation of when 'Alarm clear request' (Y11) is turned on and off.
- The value of 'Input disconnection detection status' (Un\G2816) changes from 1 (Disconnection detected) to 0 (Normal).
- 'Alarm flag' (X11) turns off.
- The ALM LED turns off.

Disconnection status	Normal	Disconnection	Normal

ALM LED	Off	On	Off

'Input disconnection detection status' (Un\G2816)	0	1	0

'Alarm flag' (X11) — OFF — ON

'Alarm clear request' (Y11) — OFF — ON

- - - - - - - ▶ : Performed by the input module with diagnostic functions.
————▶ : Performed by a program.

■When "Input disconnection detection automatic clear enable/disable" is set to "Enable"

The following shows the operation of when the connection is recovered from disconnection.
- The value of 'Input disconnection detection status' (Un\G2816) changes from 1 (Disconnection detected) to 0 (Normal).
- 'Alarm flag' (X11) turns off.
- The ALM LED turns off.

Disconnection status	Normal	Disconnection	Normal

ALM LED	Off	On	Off

'Input disconnection detection status' (Un\G2816)	0	1	0

'Alarm flag' (X11) — OFF — ON

- - - - - - - ▶ : Performed by the input module with diagnostic functions.

Setting procedure

Set the following items from "Application setting".
- "Input disconnection detection setting" (☞ Page 94 Input disconnection detection setting)
- "Input disconnection detection automatic clear enable/disable" (☞ Page 94 Input disconnection detection automatic clear enable/disable)

☞ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

List of detectable conditions

The following shows the devices at which disconnection (no connection) can be detected and the detectable conditions for the sensor power supply.
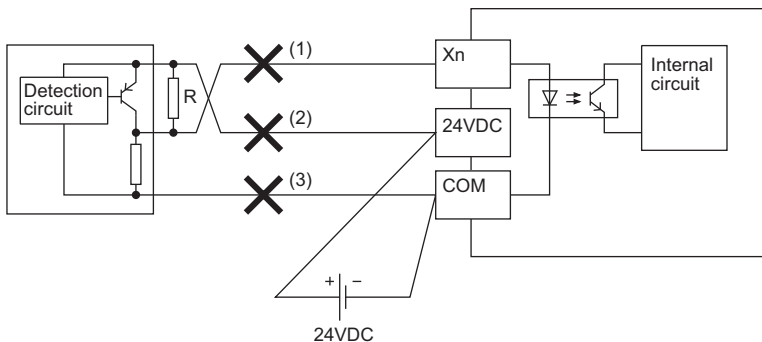
R: Bleeder resistor

◎: Detectable, ○: Detectable depending on the condition, ×: Undetectable

Connected device	Condition	Disconnection (no connection)		
		(1)	(2)	(3)
2-wire type input device	Leakage current is over 0.3mA.	◎	◎	—
	Leakage current is 0.3mA or lower.	○*1	○*1	—
3-wire type input device	Standby current is over 0.3mA.	◎	◎	×
	Standby current is 0.3mA or lower.	○*1	○*1	×

*1   Connect a bleeder resistor (resistance value as a guide: approximately 56kΩ) in parallel near the input device.

Output disconnection detection function

This function allows checking whether the load is disconnected or not when the output is off.

The minimum load current (at output ON) of when the disconnection detection function is used is 3mA/point. If a load of 3mA/point or lower is used, a disconnection is detected erroneously at output OFF.

When the external power supply is not supplied, the disconnection detection function does not operate properly.
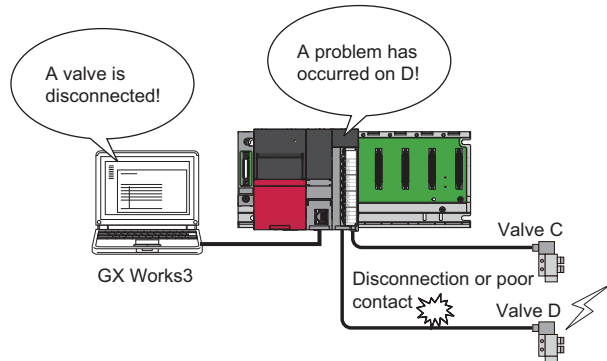
Operation of when an error is detected

When a disconnection occurs or no wiring is connected at an output terminal where "Output disconnection detection setting" is set to "Not detected", this function judges this state as a disconnection and 1 (Disconnection detected) is stored in 'Output disconnection detection status'.

When a disconnection is detected in the output module with diagnostic functions, an alarm (Output disconnection detection) occurs.

The details of the alarm can be checked in the module diagnostics window of the engineering tool.

When a disconnection is detected, the ALM LED turns on.

> **Point**
>
> When an inductive load is used, the module may not judge the wiring status correctly.
>
> Refer to the following manual to take appropriate measure against the back EMF or configure the setting of "Output disconnection detection disable time setting" using the engineering tool.
>
> 📖 MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Startup)

Operation of when a connection is recovered from a disconnection

The operation of when the cause of a disconnection is eliminated and the connection with the external device is recovered differs depending on the setting in "Output disconnection detection automatic clear enable/disable".

■When "Output disconnection detection automatic clear enable/disable" is set to "Disable"
The following shows the operation of when 'Alarm clear request' (Y11) is turned on and off.
- The value of 'Output disconnection detection status' (Un\G3072) changes from 1 (Disconnection detected) to 0 (Normal).
- 'Alarm flag' (X11) turns off.
- The ALM LED turns off.

-------► : Performed by the output module with diagnostic functions.
———► : Performed by a program.

■When "Output disconnection detection automatic clear enable/disable" is set to "Enable"
The following shows the operation of when the connection is recovered from disconnection.
- The value of 'Output disconnection detection status' (Un\G3072) changes from 1 (Disconnection detected) to 0 (Normal).
- 'Alarm flag' (X11) turns off.
- The ALM LED turns off.

-------► : Performed by the output module with diagnostic functions.

Setting procedure

Set the following items from "Application setting".
- "Output disconnection detection setting" (☞ Page 98 Output disconnection detection setting)
- "Output disconnection detection disable time setting" (☞ Page 98 Output disconnection detection automatic clear enable/ disable)
- "Output disconnection detection automatic clear enable/disable" (☞ Page 99 Output short-circuit detection automatic clear enable/disable)

✑ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

■Output disconnection detection disable time setting

With this setting, the time where disconnection detection is disabled after an output is turned off can be selected. The influence of back EMF immediately after an output is turned off can be eliminated and incorrect detections by the disconnection detection function can be reduced. Select a setting range from the table below depending on the connected device and application.

Item	Setting range
Output disconnection detection disable time setting	0ms
	100ms (default value)
	200ms
	300ms

List of detectable conditions

The following shows the places at which disconnection (no connection) and short circuit (ground fault) can be detected and the detectable conditions for the sensor power supply.
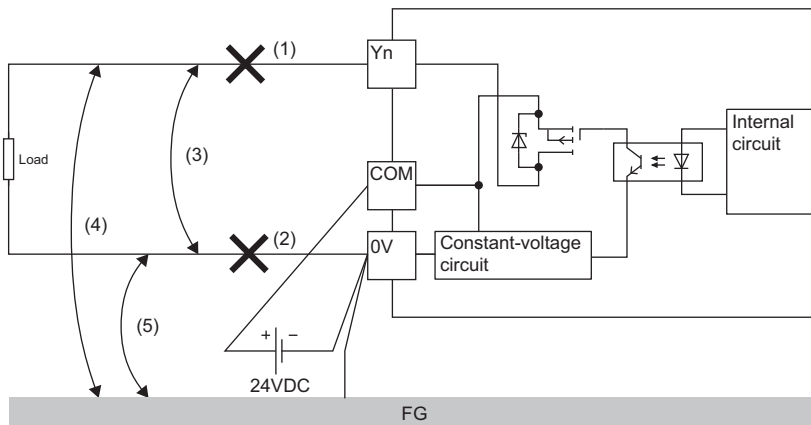
○: Detectable depending on the condition, ×: Undetectable

Connected device	Disconnection (no connection)		Short circuit (ground fault)		
	(1)	(2)	(3)	(4)	(5)
2-wire type input device	○*1	○*1	○*2	○*2*3	×

*1 A disconnection can be detected only when the output is off. However, when an output device whose load current is 3mA or lower is connected, a disconnection may be detected even if no wiring is disconnected.

*2 A short circuit can be detected only when the output is on. When the output current is 0.5A/point or higher, a short circuit is detected.

*3 The negative common (0V) of the external power supply must be connected to the device frame.

Short-circuit detection function

This function detects an overcurrent of outputs and limits the output current.

When the output current is 0.5A/point or higher, a short circuit is detected.
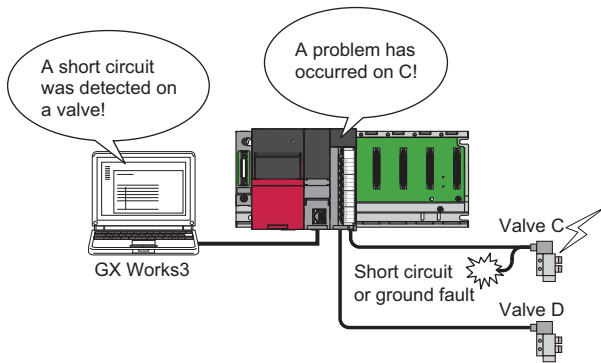
Operation of when an error is detected

When a short circuit occurs on the output terminal for which "Output short-circuit detection setting" is set to "To detect", 'Output short-circuit detection status' is set to 1 (Short circuit detected).

When the output module with diagnostic functions detects a short circuit, an alarm (Output short-circuit detection) occurs.

The output terminal with a short circuit stops the output.

The alarm status due to an output short-circuit detection can be checked in the module diagnostics window of the engineering tool.

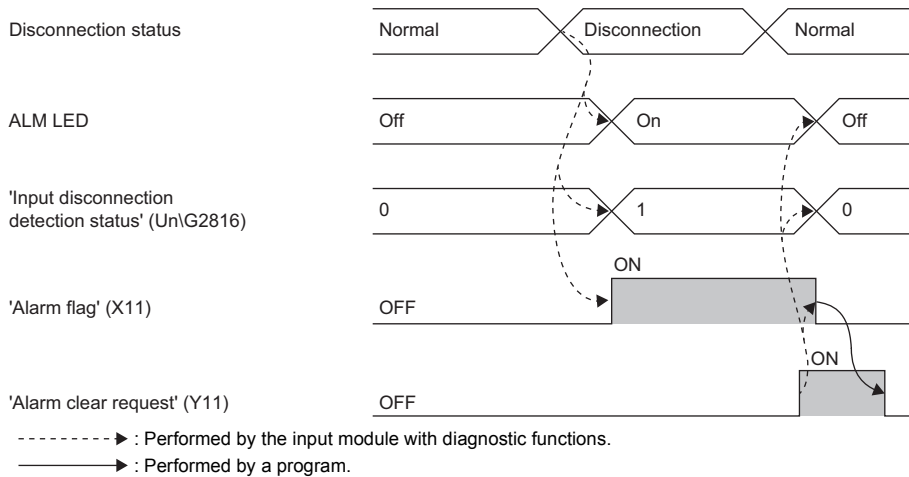When a short circuit is detected, the ALM LED turns on.

Operation of when the connection is recovered from a short circuit

The operation of when the cause of a short circuit is eliminated and the connection with the external device is recovered differs depending on the setting in "Short Circuit Auto Clear enable/disable".

■When "Short Circuit Auto Clear enable/disable" is set to "Disable"

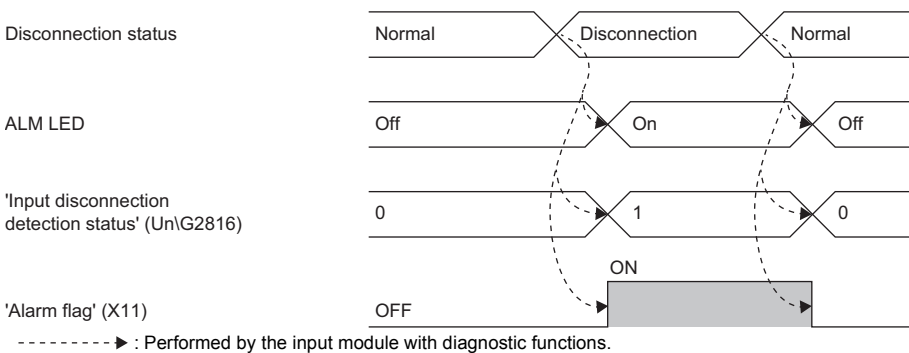The following shows the operation of when 'Alarm clear request' (Y11) is turned on and off.

• The value of 'Output short-circuit detection status' (Un\G3088) changes from 1 (Short circuit detected) to 0 (Normal).

• 'Alarm flag' (X11) turns off.

• The ALM LED turns off.

--------▶ : Performed by the output module with diagnostic functions.

————▶ : Performed by a program.
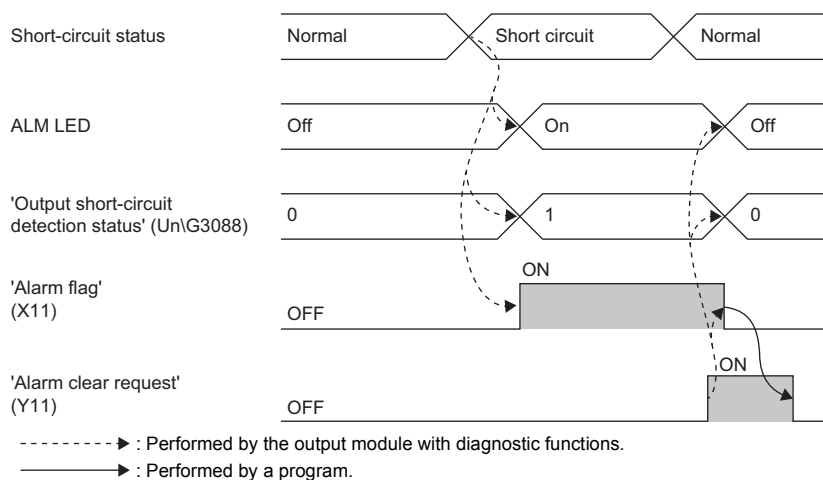
■When "Short Circuit Auto Clear enable/disable" is set to "Enable"

The following shows the operation of when the connection is recovered from the short circuit.

- The value of 'Output short-circuit detection status' (Un\G3088) changes from 1 (Short circuit detected) to 0 (Normal).
- 'Alarm flag' (X11) turns off.
- The ALM LED turns off.

Short-circuit status	Normal	Short circuit	Normal
ALM LED	Off	On	Off
'Output short-circuit detection status' (Un\G3088)	0	1	0
'Alarm flag' (X11)	OFF	ON	

- - - - - - - ▶ : Performed by the output module with diagnostic functions.
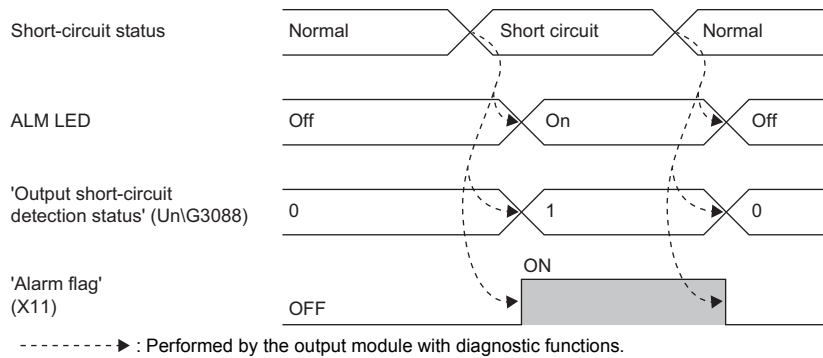
Setting procedure

Set the following items from "Application setting".

- "Output disconnection detection setting" (☞ Page 99 Output short-circuit detection setting)
- "Output disconnection detection automatic clear enable/disable" (☞ Page 99 Output short-circuit detection automatic clear enable/disable)

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]

List of detectable conditions

For the places at which output short circuit can be detected and the detectable conditions, refer to the following.

☞ Page 43List of detectable conditions

Error history function

This function stores errors and alarms, which have occurred in the I/O module with diagnostic functions, in the buffer memory as histories.

Up to 16 histories can be stored for both errors and alarms.

Operation

When an error occurs, the error code and error time are stored sequentially from 'Error history No.1' (Un\G16 to Un\G21).

When an alarm occurs, the alarm code and alarm time are stored sequentially from 'Alarm history No.1' (Un\G272 to Un\G277).

- Assignment of an error history

	b15	to	b8 b7	to	b0
Un\G16			Error code		
Un\G17	First two digits of the year		Last two digits of the year		
Un\G18	Month		Day		
Un\G19	Hour		Minute		
Un\G20	Second		Day of the week		
Un\G21	Millisecond (higher-order digits)		Millisecond (lower-order digits)		
Un\G22					
⋮			System area		
Un\G23					

- Assignment of an alarm history

	b15	to	b8 b7	to	b0
Un\G272			Alarm code		
Un\G273	First two digits of the year		Last two digits of the year		
Un\G274	Month		Day		
Un\G275	Hour		Minute		
Un\G276	Second		Day of the week		
Un\G277	Millisecond (higher-order digits)		Millisecond (lower-order digits)		
Un\G278					
⋮			System area		
Un\G279					

Ex.

Storage example of an error history

Item	Description	Example[1]
Error code	The error code is stored.	1900H
First/Last two digits of the year	The error time is stored in the BCD code.	2016H
Month/Day		527H
Hour/Minute		1234H
Second		56H
Day of the week	The following values are stored in the BCD code for each day of the week. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3 Thursday: 4, Friday: 5, Saturday: 6	5H
Millisecond (upper)	The error time is stored in the BCD code.	7H
Millisecond (lower)		89H
System area	—	—

[1] The value stored when the input response time setting error (error code: 1900H) occurs at 12:34:56.789 on Friday, May 27, 2016

The start address of the error history in which the latest error is stored can be checked with 'Latest address of error history' (Un\G0).

The start address of the alarm history in which the latest alarm is stored can be checked with 'Latest address of alarm history' (Un\G256).

Ex.

When the 3rd error occurs

When the 3rd error is stored in the error history No.3, 32 is stored in 'Latest address of error history' (Un\G0).
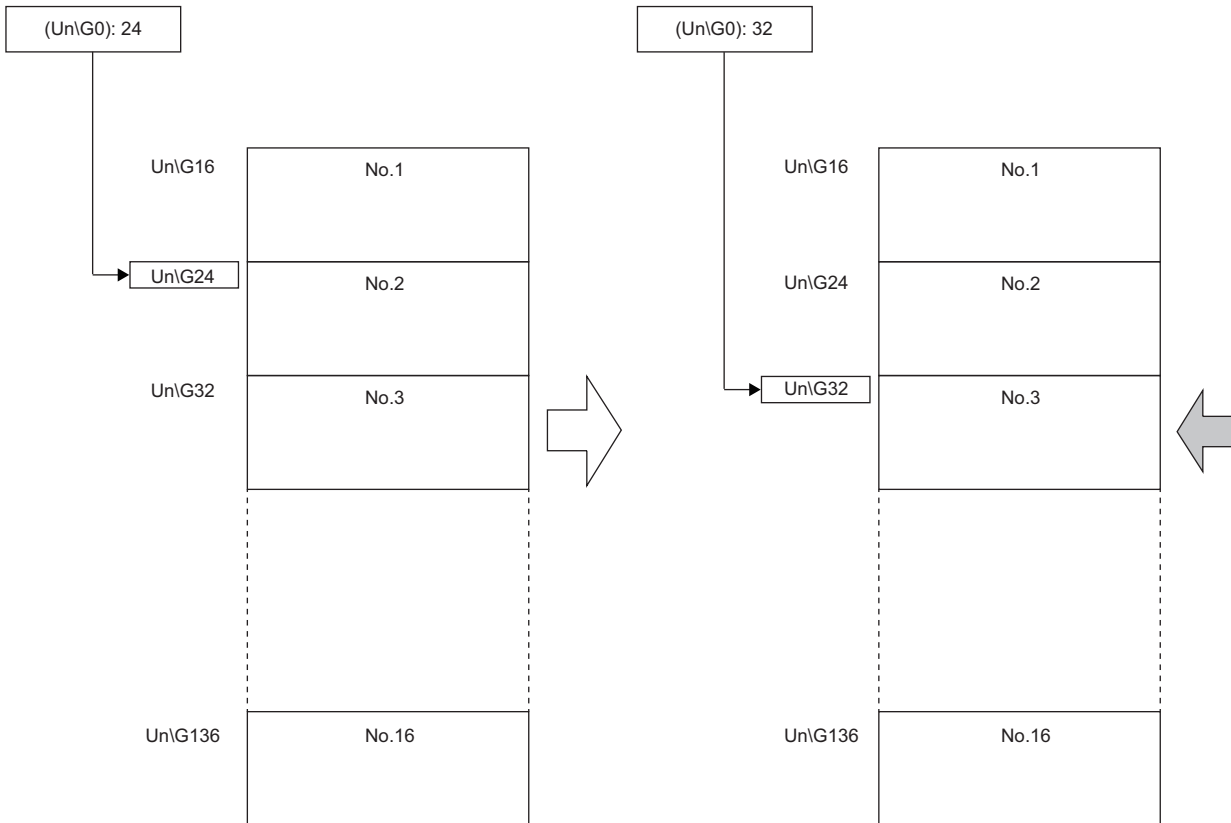
Ex.

When the 17th error occurs

The 17th error is stored in 'Error history No.1' (Un\G16 to Un\G21), and 16 is stored in 'Latest address of error history' (Un\G0).
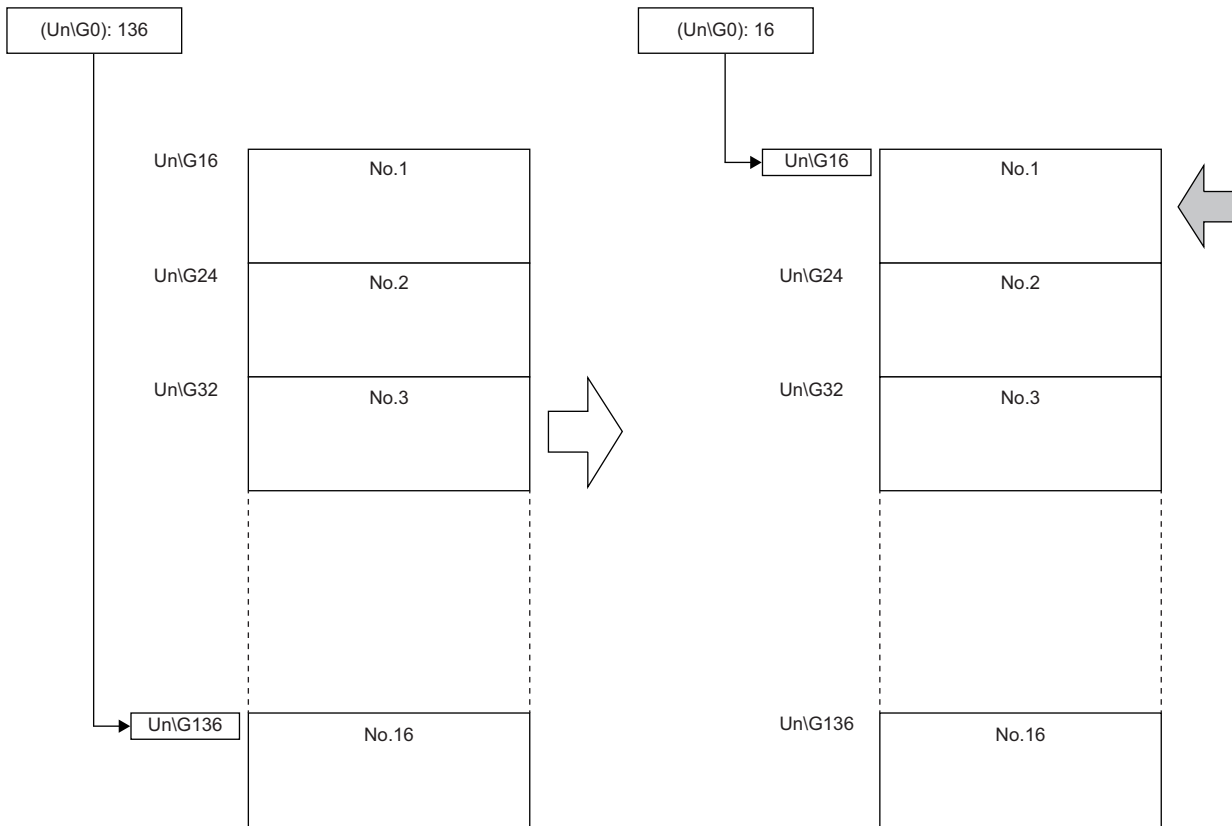
> **Point**
>
> - When the storage areas of the error history become full, the histories are overwritten sequentially from 'Error history No.1' (Un\G16 to Un\G21) and error histories are continued to be recorded. The histories before overwritten are deleted.
> - The same processing is performed when alarms occur.
> - The recorded error histories are cleared when the power supply of the I/O module with diagnostic functions is turned off or the CPU module is reset.

1.5 Event History Function

This function collects errors and alarms that occurred in the I/O module with diagnostic functions and executed operations as event information in the CPU module.

In the CPU module, event information that occurred in the I/O module with diagnostic functions is collected and held in the data memory in the CPU module or an SD memory card.

The event information collected in the CPU module can be displayed using the engineering tool and the occurrence history can be checked in chronological order.

Event type	Classification	Description
System	Error	Self-diagnostics errors detected in each module
	Alarm	Alarms detected in each module
	Information	The operation by the normal detection of the system that is not classified as Error or Alarm, or the operation performed automatically by the system.
Security	Alarm	The operation which is judged as unauthorized access to each module
	Information	The operations which is not judged as unlock of an password or unauthorized access
Operation	Alarm	Deleting (data clear) operations which are not judged as errors by the self-diagnostics but may change the action of the module
	Information	Operations performed by users including operations which changes system behavior, such as error clear, and operations which changes the structure

Setting procedure

Set the event history function in the event history setting window of the engineering tool. For the setting procedure, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

Display of the event history

Display the event history from the menu of the engineering tool. For details on the operating procedure and display description, refer to the following.

📖 GX Works3 Operating Manual

2 PARAMETER SETTINGS

This chapter describes how to set the parameters of the I/O module with diagnostic functions.

Setting parameters with the engineering tool here eliminates the need to program them.

2.1 Basic Settings

Setting procedure

Open "Basic setting" of the engineering tool.

1. Start Module Parameter.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Basic setting]
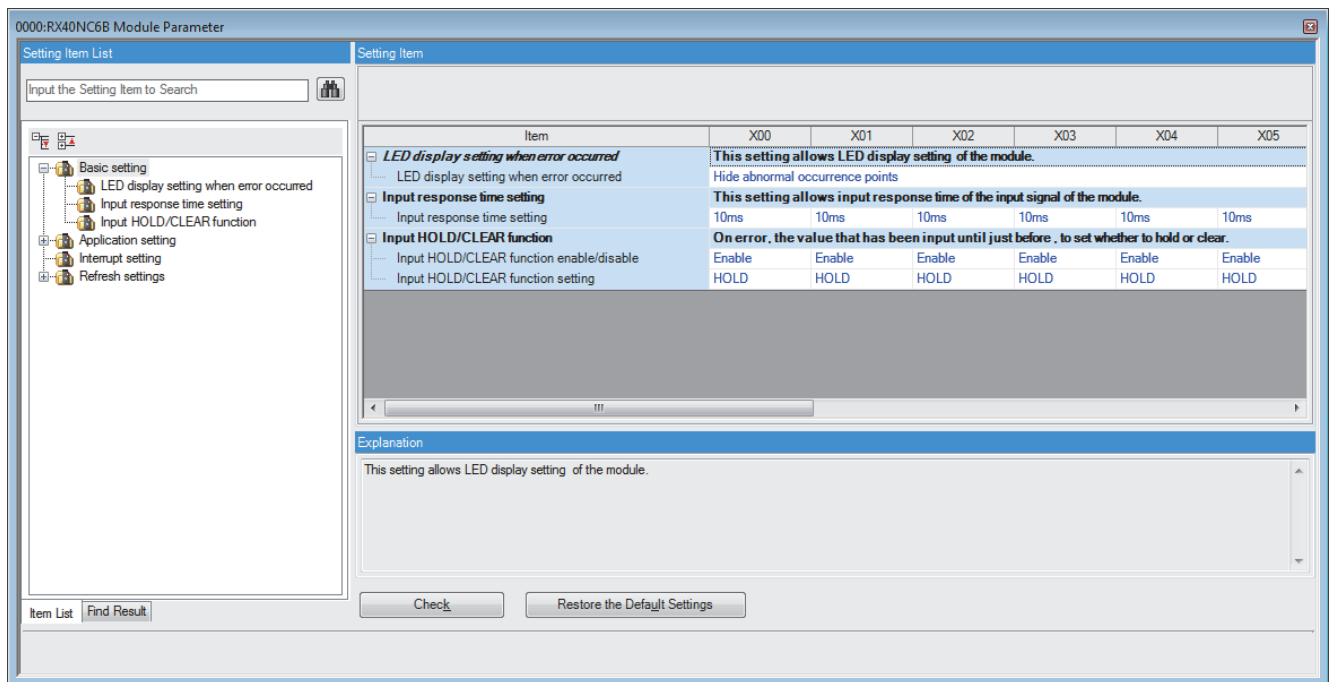
2. Double-click on the item to be changed and enter a setting value.

• Item where a value is selected from a drop-down list

Click the [▼] button of the item to be set to display a drop-down list. Select an item.

• Item where a value is entered into a text box

Double-click on the item to be set and enter a numerical value.

2.2 Application Settings

Setting procedure

Open "Application setting" of the engineering tool.

1. Start Module Parameter.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Application setting]
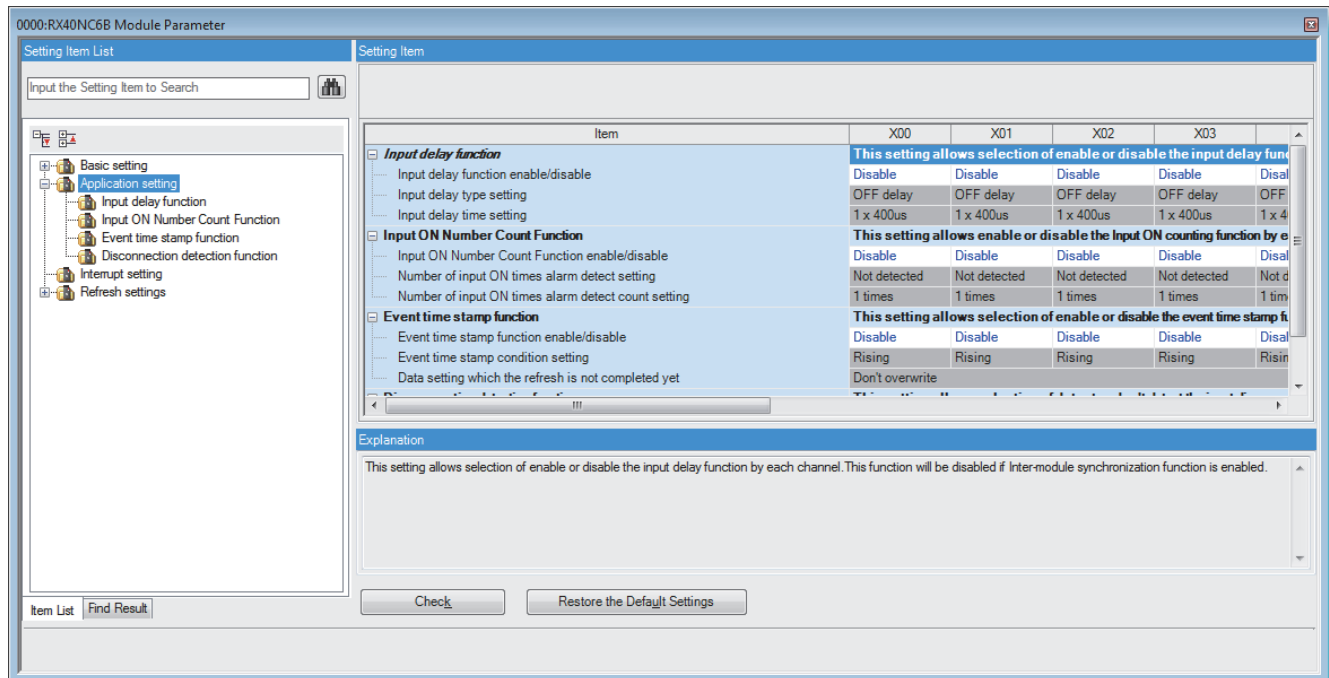
2. Double-click on the item to be changed and enter a setting value.

• Item where a value is selected from a drop-down list

Click the [▼] button of the item to be set to display a drop-down list. Select an item.

• Item where a value is entered into a text box

Double-click on the item to be set and enter a numerical value.

2.3　Interrupt Settings

Setting procedure

Open "Interrupt setting" of the engineering tool.

1. Start Module Parameter.

✎ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Interrupt setting]

No.	Interrupt condition target setting	On target input output term	Interrupt pointer
1	Disable ▼	X00	
2	Disable	X00	
3	Disable	X00	
4	Disable	X00	
5	Disable	X00	
6	Disable	X00	
7	Disable	X00	
8	Disable	X00	
9	Disable	X00	
10	Disable	X00	
11	Disable	X00	
12	Disable	X00	
13	Disable	X00	

Explanation

This setting allows selection of interrupt condition target setting.

Check　　Restore the Default Settings
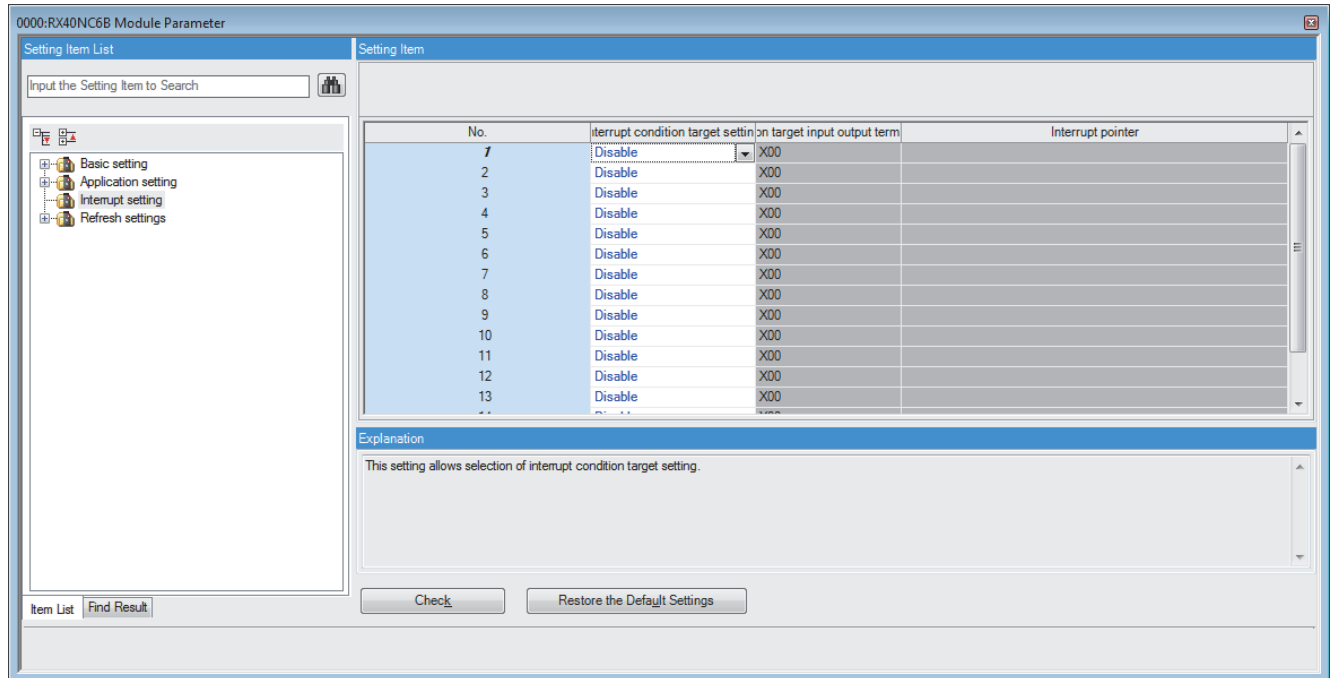
2. Click the item of interrupt setting number (No.1 to 16) to be changed to enter the setting value.

• Item where a value is selected from a drop-down list

Click the [▼] button of the item to be set to display a drop-down list. Select an item.

• Item where a value is entered into a text box

Double-click on the item to be set and enter a numerical value.

2.4 Refresh Settings

Setting procedure

Set the buffer memory area of the I/O module with diagnostic functions to be refreshed.

This refresh setting eliminates the need for reading/writing data by programming.

1. Start Module Parameter.

✍ [Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Target module ⇨ [Module Parameter] ⇨ [Refresh settings]
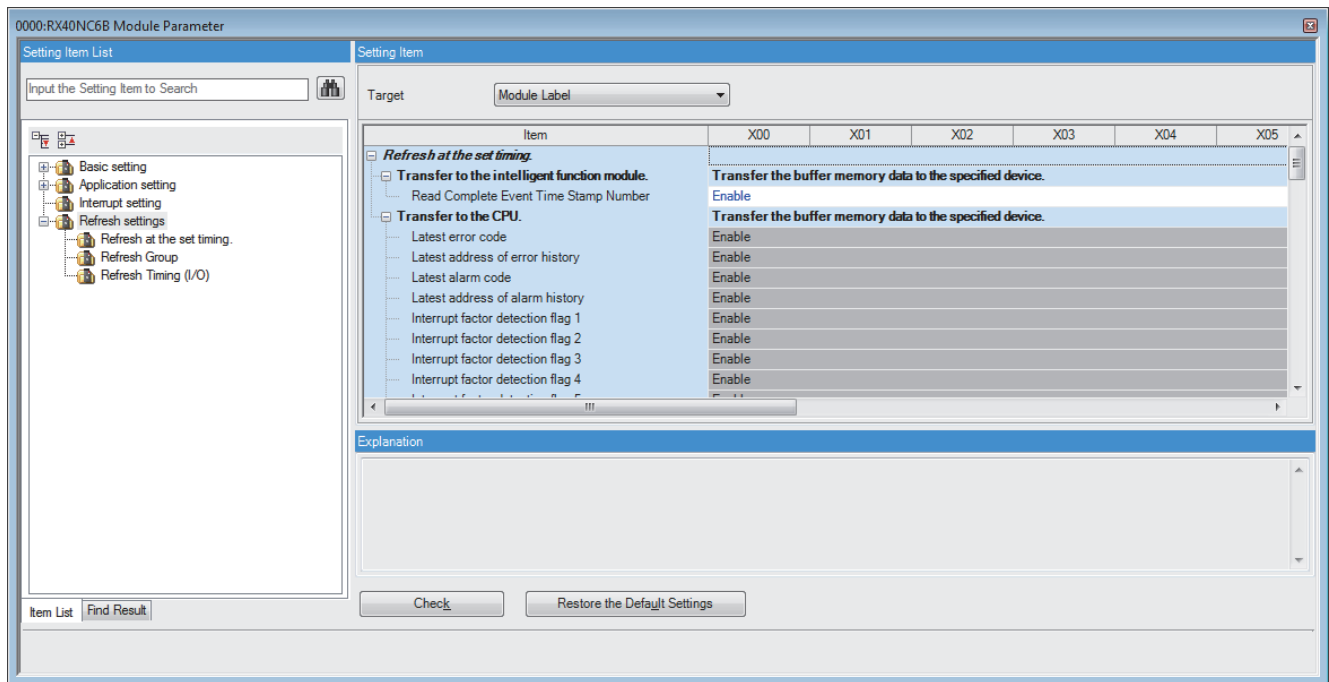
2. Click "Target" and set a refresh destination.

・When "Module Label" is set in "Target"

Set whether to enable or disable the refresh by setting "Read Complete Event Time Stamp Number" to Enable or Disable.

・When "Refresh Data Register (RD)" is set in "Target"

Setting a start device in "Start Device Name" automatically sets the transfer destinations of all the items.

・When "Device" is set in "Target"

Double-click the item to be set to enter the refresh target device.

3. Click "Refresh Group" and set the timing of the auto refresh.

Set "At the Execution Time of END Instruction" or "At the Execution Time of Specified Program" in "Refresh Group".

When "At the Execution Time of Specified Program" is set, double-click on "Group [n] (n: 1-64)" and set a value of 1 to 64.

> *Point*
>
> ・When the refresh is enabled, the values of the refresh target are enabled at the refresh timing set with the engineering tool. At this time, the buffer memory areas are overwritten with the values of the refresh target. To change the values of the refresh target buffer memory areas, create a program so that the values of module labels or devices of the refresh source are changed.
>
> ・To read the event time stamp data to the CPU module using function blocks (FB), set "Target" to "Module Label".

Refresh processing time

A refresh processing time [μs] is a constituent of the scan time of the CPU module. For details on the scan time, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

The refresh processing time [μs], which is taken for refresh, is given by:

- Refresh processing time [μs] = Refresh read time (time for transferring refresh data to the CPU module) + Refresh write time (time for transferring refresh data to the I/O module with diagnostic functions)

The refresh read time and refresh write time vary depending on the settings of "Target".

When "Target" is "Module Label" or "Refresh Data Register (RD)"

The following table shows the refresh read time and refresh write time with an R□CPU used.

Model	Classification	When using the refresh settings
RX40NC6B	Refresh read time	24.71μs
	Refresh write time	9.69μs
RY40PT5B	Refresh read time	22.78μs

When "Target" is "Device"

Calculate the refresh read time and refresh write time according to the number of items and the number of their transfer data (in units of word) that are set to be refreshed. For the calculation method, refer to the following.

📖 MELSEC iQ-R CPU Module User's Manual (Application)

3 TROUBLESHOOTING

3.1 Troubleshooting with the LEDs

When the RUN LED and ERR LED are off

Check item	Action
Check whether power is supplied.	Check that the supply voltage to the power supply module is within the rated range.
Check whether the capacity of the power supply module is enough.	Calculate the current consumption of mounted modules, such as the CPU module, I/O modules, and intelligent function modules, to check that the power capacity is enough.
Check whether the module is mounted properly.	Check the mounting state of the module.
Cases other than the above	Reset the CPU module and check that the RUN LED turns on. If the RUN LED still remains off, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.

When the RUN LED and ERR LED are on

Check item	Action
Check whether any errors have occurred.	Check 'Latest error code' (Un\G2560), and take actions described in the list of error codes. ☞ Page 62 List of Error Codes

When the RUN LED and ALM LED are on

Check item	Action
Check whether any alarms have occurred.	Check 'Latest alarm code' (Un\G2564), and take actions described in the list of alarm codes. ☞ Page 64 List of Alarm Codes

When an I/O LED does not change

Check item	Action
Check whether "Switching display of input status and alarm (1 second intervals)" or "Always display abnormal occurrence points" is set in "LED display setting when error occurred" of the input module with diagnostic functions. Check whether "Switching display of output status and alarm (1 second intervals)" or "Always display abnormal occurrence points" is set in "LED display setting when error occurred" of the output module with diagnostic functions.	Check the current setting of "LED display setting when error occurred".

3.2 Checking the Module Status

The following functions are available in the "Module Diagnostics" window for the I/O module with diagnostic functions.

Function	Application
Error Information	This function displays errors that have occurred. Clicking the [Event History] button displays the history of errors and alarms detected in the I/O module with diagnostic functions and errors detected and operations executed in the other modules.
Module Information List	This function displays each status information of the I/O module with diagnostic functions.

Error Information

Check errors that have occurred and actions against them.

✎ [Diagnostics] ⇨ [System Monitor] ⇨ Right-click the target module. ⇨ "Module Diagnostics"

Item	Description
Cause	Displays the details of the cause of each error.
Corrective Action	Displays actions against the error.

To check alarm codes, error history, and alarm history, use the "Event History" window of the engineering tool.

👉 [Diagnostics] ⇨ [System Monitor] ⇨ [Event History] button

Module Information List

In the "Module Information List" tab, each status information of the I/O module with diagnostic functions can be checked.
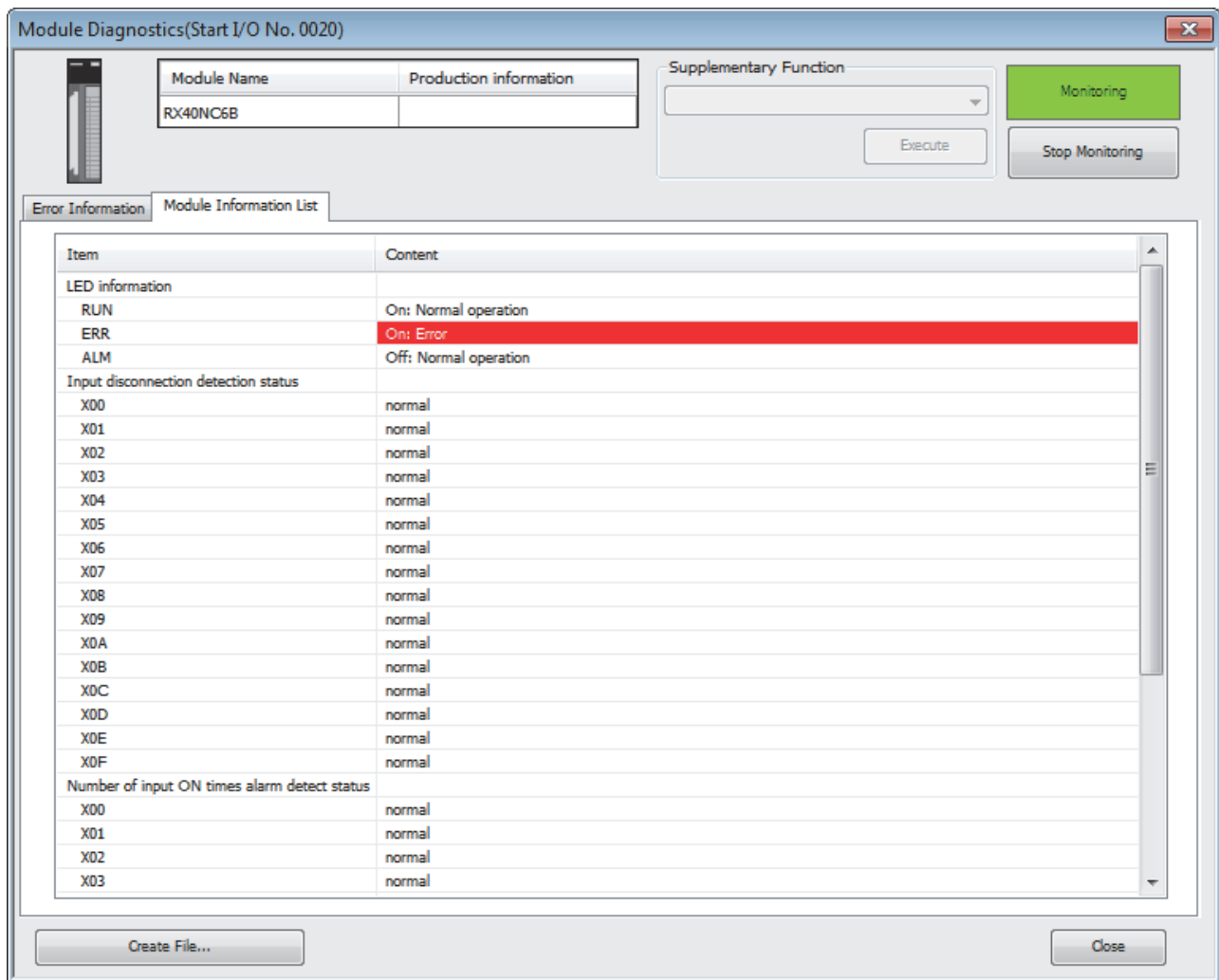
Item	Description
LED information	Displays the status of each LED of the I/O module with diagnostic functions.
Input disconnection detection status	Displays the status of input disconnection detection for each input.
Number of input ON times alarm detect status	Displays the number of input ON times alarm detection status for each input.

3.3 Troubleshooting by Symptom

When the ON/OFF state of an external input cannot be read

Check item	Action
Check whether a disconnection is detected.	If the RUN LED and ALM LED are on, a disconnection in the input wiring may have been detected. Check 'Latest alarm code' (Un\G2564) to check whether a disconnection has been detected. If a disconnection has been detected, take the action for the input disconnection detection (alarm code: 88□H) described in the following. ☞ Page 64 List of Alarm Codes
Check whether the I/O status indicator LED (X0 to XF) of the input module with diagnostic functions turns on when the external input device is on.	When the LED does not turn on, the input wiring has problems. Check whether the input wiring has been disconnected or short-circuited and the voltage of the input signal is proper, and review the wiring. For the rated input voltage, refer to the performance specifications described in the following. 📖 MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Startup)
Check whether the input delay function has been properly used.	When the input delay function is enabled, input signals will turn on or off according to the set input delay type when the delay time has elapsed after the external devices turn on or off. Disable the input delay function, or review the delay time. For details on the input delay function, refer to the following. ☞ Page 19 Input delay function
Check whether the system parameter "Inter-module Synchronous Setting" is correct.	• If "Use Inter-module Synchronous Function in System" is set to "Not Use", change the setting to "Use". • If an expected value has not been set in "Fixed Scan Interval Setting of Inter-module Synchronization", set a correct cycle.
Check whether the module has been selected as the synchronization target module.	If the input module with diagnostic functions has not been selected as the synchronization target module, select it as the target module.
Check whether the external power supply is supplied.	Check that the voltage of the external power supply is within the rated range. For the external power supply, refer to the performance specifications described in the following. 📖 MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Startup)

Point

If the ON/OFF state of the external input still cannot be read even after the actions described above are taken, the possible cause is a failure of the input module with diagnostic functions. Please consult your local Mitsubishi representative.

When a disconnection in the input wiring cannot be detected

Check item	Action
Check whether the I/O status indicator LED (X0 to XF) of the input module with diagnostic functions turns on when the external input device is on.	When the LED does not turn on, the input wiring has problems. Check whether the input wiring has been disconnected or short-circuited and the voltage of the input signal is proper, and review the wiring. For the rated input voltage, refer to the performance specifications described in the following. 📖 MELSEC iQ-R I/O Module (With Diagnostic Functions) User's Manual (Startup)
Check whether "Input disconnection detection setting" has been set to "To detect".	If "Input disconnection detection setting" of the target input has been set to "Not detected", set "To detect".
Check whether a resistor for disconnection detection has been connected.	When the leakage current of the input device is 0.3mA/point or lower, connect a bleeder resistor (resistance value as a guide: approximately 56kΩ) in parallel near the input device.
Check whether the disconnection (no connection) detection current satisfies the specifications.	Check whether the disconnection (no connection) detection current is 0.3mA per point or less.

If a disconnection in the input wiring still cannot be detected even after the actions described above are taken, the possible cause is a failure of the input module with diagnostic functions. Please consult your local Mitsubishi representative.

When a disconnection in the input wiring cannot be detected correctly

Check item	Action
Check whether the wiring is influenced by noise.	Check the wiring status.
Check whether a wireless communication device such as a cellular phone or PHS (Personal Handy-phone System) is close to the programmable controller.	Use any wireless communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller.

When a disconnection was detected in the input wiring

Check item	Action
Check whether the input wiring has any problems.	Check that the voltage of the input signal is proper, and review the wiring.
Check whether the external power supply is supplied.	Check that the supply voltage to the module is within the rated range.
Check whether the wiring is influenced by noise.	Check the wiring status.

When the ON/OFF state of an external output cannot be changed

Check item	Action
Check whether the corresponding I/O status indicator LED (Y0 to YF) of the output module with diagnostic functions turns on when 'Output signal 0 to F' (Y0 to YF) is turned on.	When the LED turns on, the output wiring has problems. Review the output wiring. Check whether the output wiring has been disconnected or short-circuited, and review the wiring.
Check whether the output delay function has been properly used.	When the output delay function is enabled, output signals will turn on or off according to the set output delay type when the delay time has elapsed after the external output signal turn on or off. Disable the output delay function, or review the delay time. For details on the output delay function, refer to the following. ☞ Page 29 Output delay function
Check whether the system parameter "Inter-module Synchronous Setting" is correct.	• If "Use Inter-module Synchronous Function in System" is set to "Not Use", change the setting to "Use". • If an expected value has not been set in "Fixed Scan Interval Setting of Inter-module Synchronization", set a correct cycle.
Check whether the module has been selected as the synchronization target module.	If the output module with diagnostic functions has not been selected as the synchronization target module, select it as the target module.

If the ON/OFF state of the external output still cannot be changed even after the actions described above are taken, the possible cause is a failure of the output module with diagnostic functions. Please consult your local Mitsubishi representative.

When a disconnection or short-circuit in the output wiring cannot be detected

Check item	Action
Check whether the corresponding I/O status indicator LED (Y0 to YF) of the output module with diagnostic functions turns on when 'Output signal 0 to F' (Y0 to YF) is turned on.	When the LED turns on, the output wiring has problems. Review the output wiring. Check whether the output wiring has been disconnected or short-circuited, and review the wiring.
Check whether "Output disconnection detection setting Y□" and "Output short-circuit detection setting Y□" have been set to "To detect".	If the parameter settings of the output point have been set to "Not detected", set "To detect".

Point

If a disconnection or short-circuit in the output wiring still cannot be detected even after the actions described above are taken, the possible cause is a failure of the output module with diagnostic functions. Please consult your local Mitsubishi representative.

When a disconnection or short-circuit in the output wiring cannot be detected correctly

Check item	Action
Check whether the wiring is influenced by noise.	Check the wiring status.
Check whether a wireless communication device such as a cellular phone or PHS (Personal Handy-phone System) is close to the programmable controller.	Use any wireless communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller.

When a disconnection or short-circuit was detected in the output wiring

Check item	Action
Check whether the output wiring has any problems.	Check whether the output wiring is disconnected or short-circuited, and review the wiring.
Check whether the external power supply is supplied.	Check that the supply voltage to the module is within the rated range.
Check whether the wiring is influenced by noise.	Check the wiring status.

3.4 List of Error Codes

If an error occurs during operation, the I/O module with diagnostic functions store the corresponding error code in the buffer memory area 'Latest error code' (Un\G2560). Additionally, 'Error flag' (X10) turns on. Turning on 'Error clear request' (Y10) clears the error code in 'Latest error code' (Un\G2560) and 'Error flag' (X10) turns off.

Error codes of the I/O module with diagnostic functions are classified into minor errors and moderate errors.

 • Minor error: Errors that occur due to an incorrect setting in programs or parameters (1000Hs)
 • Moderate error: Errors including hardware failures or errors at execution of the inter-module synchronization function (2000Hs, 3000Hs)

The following table lists error codes to be stored.

□ in an error code: Indicates the number of an I/O terminal in which the error has occurred. In accordance with X0 to XF (input module) or Y0 to YF (output module), a numerical value of 0 to F is assigned.

△ in an error code: Refer to the error description and cause.

Error code	Error name	Error description and cause	Action
181△H	Interrupt condition target setting range error	■Input module with diagnostic functions A value other than 0 to 3 and 7 to 10 has been set in Interrupt condition target setting [n]. ■Output module with diagnostic functions A value other than 0 to 4 and 7 has been set in Interrupt condition target setting [n]. △ indicates the interrupt setting corresponding to the error, as follows. 0: Setting 1 to F: Setting 16	■Input module with diagnostic functions Set a value of 0 to 3 and 7 to 10 in Interrupt condition target setting [n]. For Interrupt condition target setting [n], refer to the following. ☞ Page 86 Interrupt condition target setting [n] ■Output module with diagnostic functions Set a value of 0 to 4 and 7 in Interrupt condition target setting [n]. For Interrupt condition target setting [n], refer to the following. ☞ Page 86 Interrupt condition target setting [n]
182△H	Interrupt condition target I/O terminal setting range error	A value other than 0 to 16 has been set in Interrupt condition target I/O terminal setting [n]. △ indicates the interrupt setting corresponding to the error, as follows. 0: Setting 1 to F: Setting 16	Set a value of 0 to 16 in Interrupt condition target I/O terminal setting [n]. For Interrupt condition target I/O terminal setting [n], refer to the following. ☞ Page 87 Interrupt condition target I/O terminal setting [n]
190□H	Input response time setting error	A value other than 9H to DH has been set in Input response time setting.	Set a value of 9H to DH in Input response time setting. For details on Input response time setting, refer to the following. ☞ Page 88 Input response time setting
192□H	Input delay type setting error	A value other than 0 to 2 has been set in Input delay type setting.	Set a value of 0 to 2 in Input delay type setting. For details on Input delay type setting, refer to the following. ☞ Page 90 Input delay type setting
194□H	Input delay time setting error	A value other than 1 to 150000 has been set in Input delay time setting.	Set a value of 1 to 150000 in Input delay time setting.
196□H	Number of input ON times alarm detection count setting error	A value other than 1 to 4294967295 has been set in Number of input ON times alarm detection count setting.	Set a value of 1 to 4294967295 in Number of input ON times alarm detection count setting.
198□H	Event time stamp condition setting error	A value other than 0 to 2 has been set in Event time stamp condition setting.	Set a value of 0 to 2 in Event time stamp condition setting. For details on Event time stamp condition setting, refer to the following. ☞ Page 93 Event time stamp condition setting
1A2□H	Output delay type setting error	A value other than 0 and 1 has been set in Output delay type setting.	Set a value 0 or 1 in Output delay type setting. For details on Output delay type setting, refer to the following. ☞ Page 95 Output delay type setting
1A4□H	Output delay time setting error	A value other than 1 to 150000 has been set in Output delay time setting.	Set a value of 1 to 150000 in Output delay time setting.
1A6□H	Number of output ON times alarm detection count setting error	A value other than 1 to 4294967295 has been set in Number of output ON times alarm detection count setting.	Set a value of 1 to 4294967295 in Number of output ON times alarm detection count setting.

Error code	Error name	Error description and cause	Action
1B00H	LED indication setting on error condition error	A value other than 0 to 2 has been set in LED indication setting on error condition.	Set a value of 0 to 2 in LED indication setting on error condition. For details on LED indication setting on error condition, refer to the following. ☞ Page 85 LED indication setting on error condition
1EA0H	Synchronization cycle setting too short error	A value of 0.20ms or less has been set in "Fixed Scan Interval Setting of Inter-module Synchronization", which is a system parameter.	Set a value of 0.222ms or more in "Fixed Scan Interval Setting of Inter-module Synchronization", which is a system parameter.
3001H	Hardware error	A hardware error has been detected.	The possible cause is noise or a hardware failure. If measures to reduce noise do not eliminate this error, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.

3

3.5 List of Alarm Codes

If an alarm occurs during operation, the I/O module with diagnostic functions store the corresponding alarm code in the buffer memory area 'Latest alarm code' (Un\G2564).

If an alarm has occurred, take actions against the alarm, such as reviewing connected devices, wiring, and voltage and replacing connected external devices. After the alarm cause is eliminated, turn on 'Alarm clear request' (Y11) to clear the alarm code in 'Latest alarm code' (Un\G2564). If the alarm occurs again, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.

The following table lists alarm codes to be stored.

□ in an alarm code: Indicates the number of an I/O terminal in which the alarm has occurred. In accordance with X0 to XF (input module) or Y0 to YF (output module), a numerical value of 0 to F is assigned.

Alarm code	Alarm name	Alarm description and cause	Action
80□H	Number of input ON times alarm detection count reached	The number of input ON times has reached the number of input ON times alarm detection count.	Set the corresponding bit of Number of input ON times value clear request to 1 (Requested) to clear the number of input ON times.
88□H	Input disconnection detection	A disconnection has been detected.	After a connection is recovered, turn on and off 'Alarm clear request' (Y11). The value 0 (Normal) is set in all Input disconnection detection status, 'Alarm flag' (X11) turns off, and the alarm code in Latest alarm code is cleared.
90□H	Number of output ON times alarm detection count reached	The number of output ON times has reached the number of output ON times alarm detection count.	Set the corresponding bit of Number of output ON times value clear request to 1 (Requested) to clear the number of output ON times.
98□H	Output disconnection detection	A disconnection has been detected.	After a connection is recovered, turn on and off 'Alarm clear request' (Y11). The value 0 (Normal) is set in all Output disconnection detection status, 'Alarm flag' (X11) turns off, and the alarm code in Latest alarm code is cleared.
A0□H	Output short-circuit detection	A short-circuit has been detected.	After a connection is recovered, turn on and off 'Alarm clear request' (Y11). The value 0 (Normal) is set in all Output short-circuit detection status, 'Alarm flag' (X11) turns off, and the alarm code in Latest alarm code is cleared.

APPENDICES

Appendix 1 Module Label

The functions of the I/O module with diagnostic functions can be set with module labels.

Module labels of I/O signals

The module label name of an I/O signal is defined with the following structure:

"Module name"_"Module number".b"Label name" or "Module name"_"Module number".b"Label name"_D

Ex.
RX40NC6B_1.bErrorFlag_D

■Module name

The character string of a module model name is given.

■Module number

A number starting from 1 is added to identify modules that have the same module name.

■Label name

The label identifier unique to a module is given.

■_D

This string indicates that the module label is for the direct access input (DX) or direct access output (DY). A module label without the string is for the input (X) or output (Y) of the refresh processing.

Module labels of buffer memory areas

The module label name of a buffer memory area is defined with the following structure:

"Module name"_"Module number"."Data type"."Data format"."Label name"_D

Ex.
RX40NC6B_1.stnSetting_uInputResponseTimeSetting_X00_D

■Module name

The character string of a module model name is given.

■Module number

A number starting from 1 is added to identify modules that have the same module name.

■Data type

The data type to sort a buffer memory area is given. Each data type is as follows:

Data type	Description
stnMonitor	Monitor
stnControl	Control
stnSetting	Setting

A

■Data format

The string that represents the data size of a buffer memory area is given. Each data format is as follows:

Data format	Description
u	Word [Unsigned]/Bit string [16-bit]
w	Word [Signed]
d	Double word [Signed]

■Label name

The label identifier unique to a module is given.

■_D

This string indicates that the module label is for the direct access. A module label without the string is for the auto refresh. The following table shows the differences between the auto refresh and direct access.

Type	Description	Access timing	Example
Auto refresh	Values that are read from or written to the module label are reflected in the module collectively at the auto refresh. The run time of the program can be reduced. To use the auto refresh, set "Target" to "Module Label" in "Refresh settings" of "Module Parameter".	At auto refresh	RX40NC6B_1.stnSetting_uInputResponseTimeSetting_X00
Direct access	Values that are read from or written to the module label are reflected in the module instantly. Compared with the auto refresh, the run time of the program becomes longer. However, the responsiveness is high.	At reading/writing from/to the module label	RX40NC6B_1.stnSetting_uInputResponseTimeSetting_X00_D

Appendix 2 I/O Signals

List of I/O signals

The following tables list the I/O signals of the I/O module with diagnostic functions.

For details on the I/O signals, refer to the following.

☞ Page 69 Details on input signals

☞ Page 71 Details on output signals

> **Point**
>
> - The following tables show the I/O numbers (X/Y) of when 0 is set as the start I/O number of the I/O module with diagnostic functions.
> - Do not use the "use prohibited" signals in the following tables since they are used by the system. If users use (turn on) the signals, the functions of the I/O module with diagnostic functions cannot be guaranteed.

Input module with diagnostic functions

■Input signal

Device number	Signal name
X0	External input X00
X1	External input X01
X2	External input X02
X3	External input X03
X4	External input X04
X5	External input X05
X6	External input X06
X7	External input X07
X8	External input X08
X9	External input X09
XA	External input X0A
XB	External input X0B
XC	External input X0C
XD	External input X0D
XE	External input X0E
XF	External input X0F
X10	Error flag
X11	Alarm flag
X12	Operating condition setting completed flag
X13 to X1E	Use prohibited
X1F	Module READY

■Output signal

Device number	Signal name
Y0 to YF	Use prohibited
Y10	Error clear request
Y11	Alarm clear request
Y12	Operating condition setting request
Y13 to Y1F	Use prohibited

Output module with diagnostic functions

■Input signal

Device number	Signal name
X0 to XF	Use prohibited
X10	Error flag
X11	Alarm flag
X12	Operating condition setting completed flag
X13 to X1E	Use prohibited
X1F	Module READY

■Output signal

Device number	Signal name
Y0	External output Y00
Y1	External output Y01
Y2	External output Y02
Y3	External output Y03
Y4	External output Y04
Y5	External output Y05
Y6	External output Y06
Y7	External output Y07
Y8	External output Y08
Y9	External output Y09
YA	External output Y0A
YB	External output Y0B
YC	External output Y0C
YD	External output Y0D
YE	External output Y0E
YF	External output Y0F
Y10	Error clear request
Y11	Alarm clear request
Y12	Operating condition setting request
Y13 to Y1F	Use prohibited

Details on input signals

This section describes the details on the input signals for the I/O module with diagnostic functions that are assigned to the CPU module.

This section describes the I/O numbers (X/Y) of when 0 is set as the start I/O number of the I/O module with diagnostic functions.

Input signal

These signals indicate the ON/OFF state of external inputs.

However, when the input response time setting function or input delay function is enabled, the ON/OFF state of 'Input signal' (X0) and the ON/OFF state of the actual external input (X00) may not match.

■Device number

The following table shows the device numbers of these input signals.

Signal name	External input															
	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
Input signal	X0	X1	X2	X3	X4	X5	X6	X0	X8	X9	XA	XB	XC	XD	XE	XF

Error flag

'Error flag' (X10) turns on when an error occurs.
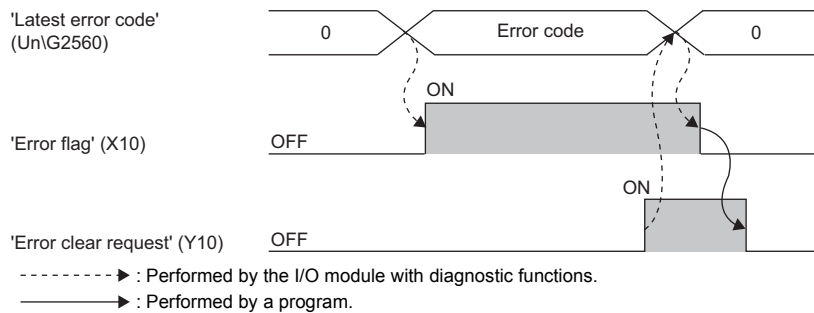
--------▶ : Performed by the I/O module with diagnostic functions.
————▶ : Performed by a program.

■Device number

The following table shows the device number of this input signal.

Signal name	External input
	X00 to X0F
Error flag	X10

Alarm flag

'Alarm flag' (X11) turns on when an alarm occurs.
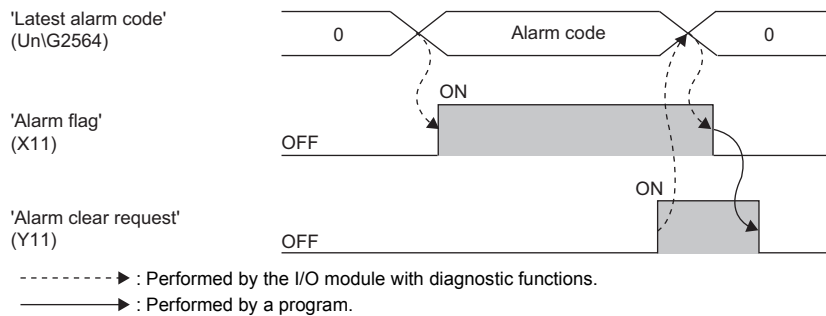
-------▶ : Performed by the I/O module with diagnostic functions.
————▶ : Performed by a program.

■Device number

The following table shows the device number of this input signal.

Signal name	External input
	X00 to 0XF
Alarm flag	X11

Operating condition setting completed flag

This signal is used as an interlock condition to turn on and off 'Operating condition setting request' (Y12) when the value of a buffer memory area is changed.

For the buffer memory areas that require 'Operating condition setting request' (Y12) to be turned on and off to enable new values, refer to the following.

-------▶ : Performed by the I/O module with diagnostic functions.
————▶ : Performed by a program.
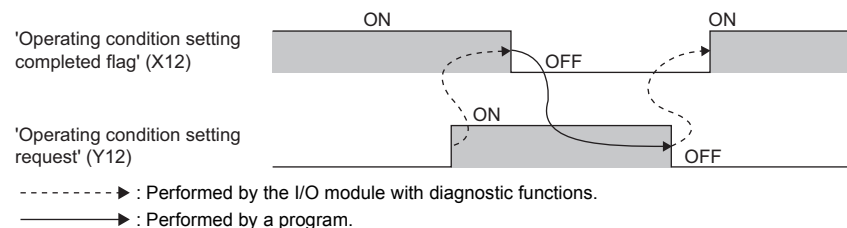
Module READY

This signal is used as an interlock condition to read/write data from/to the CPU module.

When the initial processing of the I/O module with diagnostic functions is completed after the CPU module is powered on or is reset, Module READY turns off.

When a watchdog timer error occurs, Module READY turns on.

■Device number

The following table shows the device number of this input signal.

Signal name	External input
	X00 to X0F
Module READY	X1F

Details on output signals

This section describes the details on the output signals for the I/O module with diagnostic functions that are assigned to the CPU module.

This section describes the I/O numbers (X/Y) of when 0 is set as the start I/O number of the I/O module with diagnostic functions.

Point

This section describes the I/O signals of when 0 is set as the I/O terminal number.

Output signal

These signals indicate the ON/OFF state of external outputs.

However, when the output delay function is enabled, the ON/OFF state of 'Output signal' (Y0) and the ON/OFF state of the external output (Y00) may not match.

■Device number

The following table shows the device numbers of these output signals.

Signal name	External output															
	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
Output signal	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	YA	YB	YC	YD	YE	YF

Error clear request

Turn on and off this signal to clear 'Error flag' (X10) and 'Latest error code' (Un\G2560). For the timing to turn on and off this signal, refer to the following.

■Device number

The following table shows the device number of this output signal.

Signal name	External output
	Y00 to Y0F
Error clear request	Y10

Alarm clear request

Turn on and off this signal to clear 'Alarm flag' (X11) and 'Latest alarm code' (Un\G2564). For the timing to turn on and off this signal, refer to the following.

■Device number

The following table shows the device number of this output signal.

Signal name	External output
	Y00 to Y0F
Alarm clear request	Y11

A

Operating condition setting request

Turn on and off this signal to enable the settings of the I/O module with diagnostic functions.

For the timing to turn on and off this signal, refer to the following.

☞ Page 70 Operating condition setting completed flag

For the buffer memory areas whose settings are to be enabled, refer to the following.

☞ Page 73 List of buffer memory addresses

■Device number

The following table shows the device number of this output signal.

Signal name	External output
	Y00 to Y0F
Operating condition setting request	Y12

Appendix 3 Buffer Memory

List of buffer memory addresses

The following tables list the buffer memory addresses of the I/O module with diagnostic functions. For details on the buffer memory addresses, refer to the following.

☞ Page 83 Details of buffer memory addresses

The buffer memory areas of the I/O module with diagnostic functions are classified into the following data types.

Data type	Description	
Setting data	Description	Set this data according to connected devices and the system applications.
	Read/Write attribute	Data can be read/written from/to this area.
	Setting method	Set this data using the engineering tool or a program.
	Setting timing	After the change of a value, the set value is enabled by turning on and off 'Operating condition setting request' (Y12).
Control data	Description	Use this data to control the I/O module with diagnostic functions.
	Read/Write attribute	Data can be read/written from/to this area.
	Setting method	Set this data using the engineering tool or a program.
	Setting timing	A set value is enabled as soon as the value is changed.
Monitor data	Description	Use this data to monitor the status of the I/O module with diagnostic functions.
	Read/Write attribute	Reading data is only allowed. Writing data is not allowed.
	Setting method	—
	Setting timing	—

> **Point**
>
> Among the buffer memory areas, do not write data in the system areas or the areas whose data types are monitor data. Writing data into these areas can cause a malfunction of the module.

A

For the input module with diagnostic functions

■Error history areas (Un\G0 to Un\G255)

Address (decimal)	Address (hexadecimal)	Name				Default value	Data type	Auto refresh
0	0H	Latest address of error history				0	Monitor	○
1 to 15	1H to FH	System area				—	—	—
16	10H	Error history No.1	Error code			0	Monitor	×
17	11H		Error time	First two digits of the year	Last two digits of the year			
18	12H			Month	Day			
19	13H			Hour	Minute			
20	14H			Second	Day of the week			
21	15H			Millisecond				
22, 23	16H, 17H	System area				—	—	—
24 to 29	18H to 1DH	Error history No.2	Same as Error history No.1			0	Monitor	×
30, 31	1EH, 1FH	System area				—	—	—
32 to 37	20H to 25H	Error history No.3	Same as Error history No.1			0	Monitor	×
38, 39	26H, 27H	System area				—	—	—
40 to 45	28H to 2DH	Error history No.4	Same as Error history No.1			0	Monitor	×
46, 47	2EH, 2FH	System area				—	—	—
48 to 53	30H to 35H	Error history No.5	Same as Error history No.1			0	Monitor	×
54, 55	36H, 37H	System area				—	—	—
56 to 61	38H to 3DH	Error history No.6	Same as Error history No.1			0	Monitor	×
62, 63	3EH, 3FH	System area				—	—	—
64 to 69	40H to 45H	Error history No.7	Same as Error history No.1			0	Monitor	×
70, 71	46H, 47H	System area				—	—	—
72 to 77	48H to 4DH	Error history No.8	Same as Error history No.1			0	Monitor	×
78, 79	4EH, 4FH	System area				—	—	—
80 to 85	50H to 55H	Error history No.9	Same as Error history No.1			0	Monitor	×
86, 87	56H, 57H	System area				—	—	—
88 to 93	58H to 5DH	Error history No.10	Same as Error history No.1			0	Monitor	×
94, 95	5EH, 5FH	System area				—	—	—
96 to 101	60H to 65H	Error history No.11	Same as Error history No.1			0	Monitor	×
102, 103	66H, 67H	System area				—	—	—
104 to 109	68H to 6DH	Error history No.12	Same as Error history No.1			0	Monitor	×
110, 111	6EH, 6FH	System area				—	—	—
112 to 117	70H to 75H	Error history No.13	Same as Error history No.1			0	Monitor	×
118, 119	76H, 77H	System area				—	—	—
120 to 125	78H to 7DH	Error history No.14	Same as Error history No.1			0	Monitor	×
126, 127	7EH, 7FH	System area				—	—	—
128 to 133	80H to 85H	Error history No.15	Same as Error history No.1			0	Monitor	×
134, 135	86H, 87H	System area				—	—	—
136 to 141	88H to 8DH	Error history No.16	Same as Error history No.1			0	Monitor	×
142 to 255	8EH to FFH	System area				—	—	—

■Alarm history areas (Un\G256 to Un\G511)

Address (decimal)	Address (hexadecimal)	Name				Default value	Data type	Auto refresh
256	100H	Latest address of alarm history				0	Monitor	○
257 to 271	101H to 10FH	System area				—	—	—
272	110H	Alarm history No.1	Alarm code			0	Monitor	×
273	111H		Alarm time	First two digits of the year	Last two digits of the year			
274	112H			Month	Day			
275	113H			Hour	Minute			
276	114H			Second	Day of the week			
277	115H			Millisecond				
278, 279	116H, 117H	System area				—	—	—
280 to 285	118H to 11DH	Alarm history No.2	Same as Alarm history No.1			0	Monitor	×
286, 287	11EH, 11FH	System area				—	—	—
288 to 293	120H to 125H	Alarm history No.3	Same as Alarm history No.1			0	Monitor	×
294, 295	126H, 127H	System area				—	—	—
296 to 301	128H to 12DH	Alarm history No.4	Same as Alarm history No.1			0	Monitor	×
302, 303	12EH, 12FH	System area				—	—	—
304 to 309	130H to 135H	Alarm history No.5	Same as Alarm history No.1			0	Monitor	×
310, 311	136H, 137H	System area				—	—	—
312 to 317	138H to 13DH	Alarm history No.6	Same as Alarm history No.1			0	Monitor	×
318, 319	13EH, 13FH	System area				—	—	—
320 to 325	140H to 145H	Alarm history No.7	Same as Alarm history No.1			0	Monitor	×
326, 327	146H, 147H	System area				—	—	—
328 to 333	148H to 14DH	Alarm history No.8	Same as Alarm history No.1			0	Monitor	×
334, 335	14EH, 14FH	System area				—	—	—
336 to 341	150H to 155H	Alarm history No.9	Same as Alarm history No.1			0	Monitor	×
342, 343	156H, 157H	System area				—	—	—
344 to 349	158H to 15DH	Alarm history No.10	Same as Alarm history No.1			0	Monitor	×
350, 351	15EH, 15FH	System area				—	—	—
352 to 357	160H to 165H	Alarm history No.11	Same as Alarm history No.1			0	Monitor	×
358, 359	166H, 167H	System area				—	—	—
360 to 365	168H to 16DH	Alarm history No.12	Same as Alarm history No.1			0	Monitor	×
366, 367	16EH, 16FH	System area				—	—	—
368 to 373	170H to 175H	Alarm history No.13	Same as Alarm history No.1			0	Monitor	×
374, 375	176H, 177H	System area				—	—	—
376 to 381	178H to 17DH	Alarm history No.14	Same as Alarm history No.1			0	Monitor	×
382, 383	17EH, 17FH	System area				—	—	—
384 to 389	180H to 185H	Alarm history No.15	Same as Alarm history No.1			0	Monitor	×
390, 391	186H, 187H	System area				—	—	—
392 to 397	188H to 18DH	Alarm history No.16	Same as Alarm history No.1			0	Monitor	×
398 to 511	18EH to 1FFH	System area				—	—	—

A

■Parameters (Un\G512 to Un\G2559)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
512 to 527	200H to 20FH	System area	—	—	—
528	210H	LED indication setting on error condition	0	Setting	×
529 to 559	211H to 22FH	System area	—	—	—
560 to 575	230H to 23FH	Interrupt condition target setting [n][*1]	0	Setting	×
576 to 591	240H to 24FH	System area	—	—	—
592 to 607	250H to 25FH	Interrupt condition target I/O terminal setting [n][*1]	0	Setting	×
608 to 1023	260H to 3FFH	System area	—	—	—
1024	400H	Input response time setting X00	BH	Setting	×
1025	401H	Input response time setting X01	BH	Setting	×
1026	402H	Input response time setting X02	BH	Setting	×
1027	403H	Input response time setting X03	BH	Setting	×
1028	404H	Input response time setting X04	BH	Setting	×
1029	405H	Input response time setting X05	BH	Setting	×
1030	406H	Input response time setting X06	BH	Setting	×
1031	407H	Input response time setting X07	BH	Setting	×
1032	408H	Input response time setting X08	BH	Setting	×
1033	409H	Input response time setting X09	BH	Setting	×
1034	40AH	Input response time setting X0A	BH	Setting	×
1035	40BH	Input response time setting X0B	BH	Setting	×
1036	40CH	Input response time setting X0C	BH	Setting	×
1037	40DH	Input response time setting X0D	BH	Setting	×
1038	40EH	Input response time setting X0E	BH	Setting	×
1039	40FH	Input response time setting X0F	BH	Setting	×
1040	410H	Input HOLD/CLEAR function enable/disable	FFFFH	Setting	×
1041 to 1043	411H to 413H	System area	—	—	—
1044	414H	Input HOLD/CLEAR setting	FFFFH	Setting	×
1045 to 1055	415H to 41FH	System area	—	—	—
1056	420H	Input delay function enable/disable	0000H	Setting	×
1057 to 1059	421H to 423H	System area	—	—	—
1060	424H	Input delay type setting X00	0	Setting	×
1061	425H	Input delay type setting X01	0	Setting	×
1062	426H	Input delay type setting X02	0	Setting	×
1063	427H	Input delay type setting X03	0	Setting	×
1064	428H	Input delay type setting X04	0	Setting	×
1065	429H	Input delay type setting X05	0	Setting	×
1066	42AH	Input delay type setting X06	0	Setting	×
1067	42BH	Input delay type setting X07	0	Setting	×
1068	42CH	Input delay type setting X08	0	Setting	×
1069	42DH	Input delay type setting X09	0	Setting	×
1070	42EH	Input delay type setting X0A	0	Setting	×
1071	42FH	Input delay type setting X0B	0	Setting	×
1072	430H	Input delay type setting X0C	0	Setting	×
1073	431H	Input delay type setting X0D	0	Setting	×
1074	432H	Input delay type setting X0E	0	Setting	×
1075	433H	Input delay type setting X0F	0	Setting	×
1076 to 1087	434H to 43FH	System area	—	—	—
1088, 1089	440H, 441H	Input delay time setting X00	1	Setting	×
1090, 1091	442H, 443H	Input delay time setting X01	1	Setting	×
1092, 1093	444H, 445H	Input delay time setting X02	1	Setting	×
1094, 1095	446H, 447H	Input delay time setting X03	1	Setting	×
1096, 1097	448H, 449H	Input delay time setting X04	1	Setting	×

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
1098, 1099	44AH, 44BH	Input delay time setting X05	1	Setting	×
1100, 1101	44CH, 44DH	Input delay time setting X06	1	Setting	×
1102, 1103	44EH, 44FH	Input delay time setting X07	1	Setting	×
1104, 1105	450H, 451H	Input delay time setting X08	1	Setting	×
1106, 1107	452H, 453H	Input delay time setting X09	1	Setting	×
1108, 1109	454H, 455H	Input delay time setting X0A	1	Setting	×
1110, 1111	456H, 457H	Input delay time setting X0B	1	Setting	×
1112, 1113	458H, 459H	Input delay time setting X0C	1	Setting	×
1114, 1115	45AH, 45BH	Input delay time setting X0D	1	Setting	×
1116, 1117	45CH, 45DH	Input delay time setting X0E	1	Setting	×
1118, 1119	45EH, 45FH	Input delay time setting X0F	1	Setting	×
1200	4B0H	Number of input ON times integration function enable/disable	0000H	Setting	×
1201 to 1203	4B1H to 4B3H	System area	—	—	—
1204	4B4H	Number of input ON times alarm detection setting	0000H	Setting	×
1205 to 1207	4B5H to 4B7H	System area	—	—	—
1208, 1209	4B8H, 4B9H	Number of input ON times alarm detection count setting X00	1	Setting	×
1210, 1211	4BAH, 4BBH	Number of input ON times alarm detection count setting X01	1	Setting	×
1212, 1213	4BCH, 4BDH	Number of input ON times alarm detection count setting X02	1	Setting	×
1214, 1215	4BEH, 4BFH	Number of input ON times alarm detection count setting X03	1	Setting	×
1216, 1217	4C0H, 4C1H	Number of input ON times alarm detection count setting X04	1	Setting	×
1218, 1219	4C2H, 4C3H	Number of input ON times alarm detection count setting X05	1	Setting	×
1220, 1221	4C4H, 4C5H	Number of input ON times alarm detection count setting X06	1	Setting	×
1222, 1223	4C6H, 4C7H	Number of input ON times alarm detection count setting X07	1	Setting	×
1224, 1225	4C8H, 4C9H	Number of input ON times alarm detection count setting X08	1	Setting	×
1226, 1227	4CAH, 4CBH	Number of input ON times alarm detection count setting X09	1	Setting	×
1228, 1229	4CCH, 4CDH	Number of input ON times alarm detection count setting X0A	1	Setting	×
1230, 1231	4CEH, 4CFH	Number of input ON times alarm detection count setting X0B	1	Setting	×
1232, 1233	4D0H, 4D1H	Number of input ON times alarm detection count setting X0C	1	Setting	×
1234, 1235	4D2H, 4D3H	Number of input ON times alarm detection count setting X0D	1	Setting	×
1236, 1237	4D4H, 4D5H	Number of input ON times alarm detection count setting X0E	1	Setting	×
1238, 1239	4D6H, 4D7H	Number of input ON times alarm detection count setting X0F	1	Setting	×
1240 to 1247	4D8H to 4DFH	System area	—	—	—
1248	4E0H	Event time stamp function enable/disable	0000H	Setting	×
1249 to 1251	4E1H to 4E3H	System area	—	—	—
1252	4E4H	Event time stamp condition setting X00	0	Setting	×
1253	4E5H	Event time stamp condition setting X01	0	Setting	×
1254	4E6H	Event time stamp condition setting X02	0	Setting	×
1255	4E7H	Event time stamp condition setting X03	0	Setting	×
1256	4E8H	Event time stamp condition setting X04	0	Setting	×
1257	4E9H	Event time stamp condition setting X05	0	Setting	×
1258	4EAH	Event time stamp condition setting X06	0	Setting	×
1259	4EBH	Event time stamp condition setting X07	0	Setting	×
1260	4ECH	Event time stamp condition setting X08	0	Setting	×
1261	4EDH	Event time stamp condition setting X09	0	Setting	×
1262	4EEH	Event time stamp condition setting X0A	0	Setting	×
1263	4EFH	Event time stamp condition setting X0B	0	Setting	×
1264	4F0H	Event time stamp condition setting X0C	0	Setting	×
1265	4F1H	Event time stamp condition setting X0D	0	Setting	×
1266	4F2H	Event time stamp condition setting X0E	0	Setting	×
1267	4F3H	Event time stamp condition setting X0F	0	Setting	×
1268 to 1279	4F4H to 4FFH	System area	—	—	—
1280	500H	Setting for not-refreshed data	0000H	Setting	×

A

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
1281 to 1311	501H to 51FH	System area	—	—	—
1312	520H	Input disconnection detection setting	0000H	Setting	×
1313 to 1315	521H to 523H	System area	—	—	—
1316	524H	Input disconnection detection automatic clear enable/disable	1	Setting	×
1317 to 2559	525H to 9FFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■Monitor areas (Un\G2560 to Un\G3327)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
2560	A00H	Latest error code	0	Monitor	○
2561 to 2563	A01H to A03H	System area	—	—	—
2564	A04H	Latest alarm code	0	Monitor	○
2565 to 2591	A05H to A1FH	System area	—	—	—
2592 to 2607	A20H to A2FH	Interrupt factor detection flag [n][1]	0	Monitor	○
2608 to 2815	A30H to AFFH	System area	—	—	—
2816	B00H	Input disconnection detection status	0000H	Monitor	○
2817 to 2831	B01H to B0FH	System area	—	—	—
2832	B10H	Number of input ON times alarm detection status	0000H	Monitor	○
2833 to 2847	B11H to B1FH	System area	—	—	—
2848, 2849	B20H, B21H	Number of input ON times X00	0	Monitor	○
2850, 2851	B22H, B23H	Number of input ON times X01	0	Monitor	○
2852, 2853	B24H, B25H	Number of input ON times X02	0	Monitor	○
2854, 2855	B26H, B27H	Number of input ON times X03	0	Monitor	○
2856, 2857	B28H, B29H	Number of input ON times X04	0	Monitor	○
2858, 2859	B2AH, B2BH	Number of input ON times X05	0	Monitor	○
2860, 2861	B2CH, B2DH	Number of input ON times X06	0	Monitor	○
2862, 2863	B2EH, B2FH	Number of input ON times X07	0	Monitor	○
2864, 2865	B30H, B31H	Number of input ON times X08	0	Monitor	○
2866, 2867	B32H, B33H	Number of input ON times X09	0	Monitor	○
2868, 2869	B34H, B35H	Number of input ON times X0A	0	Monitor	○
2870, 2871	B36H, B37H	Number of input ON times X0B	0	Monitor	○
2872, 2873	B38H, B39H	Number of input ON times X0C	0	Monitor	○
2874, 2875	B3AH, B3BH	Number of input ON times X0D	0	Monitor	○
2876, 2877	B3CH, B3DH	Number of input ON times X0E	0	Monitor	○
2878, 2879	B3EH, B3FH	Number of input ON times X0F	0	Monitor	○
2880	B40H	Number of input ON times value clear completed	0000H	Monitor	○
2881 to 3327	B41H to CFFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■Control areas (Un\G3328 to Un\G4351)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
3328 to 3343	D00H to D0FH	Interrupt factor reset request [n][1]	0	Control	×
3344 to 3359	D10H to D1FH	Interrupt factor mask [n][1]	0	Control	×
3360 to 3583	D20H to DFFH	System area	—	—	—
3584	E00H	Number of input ON times value clear request	0000H	Control	×
3585 to 4351	E01H to 10FFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■Event time stamp areas (Un\G4352 to Un\G65535)

Address (decimal)	Address (hexadecimal)	Name			Default value	Data type	Auto refresh
4352	1100H	Event time stamp number for next storage[1]			0000H	Monitor	○
4353	1101H	Event time stamp number for CPU read[1]			0000H	Monitor	○
4354	1102H	Event time stamp storage status[1]			0000H	Monitor	○
4355	1103H	System area			—	—	—
4356	1104H	Event time stamp data 1 for refresh[1]	First two digits of the year	Last two digits of the year	0000H	Monitor	○
4357	1105H		Month	Day			
4358	1106H		Hour	Minute			
4359	1107H		Second	Day of the week			
4360	1108H		Millisecond				
4361	1109H		Event type	I/O terminal			
4362 to 4367	110AH to 110FH	Event time stamp data 2 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4368 to 4373	1110H to 1115H	Event time stamp data 3 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4374 to 4379	1116H to 111BH	Event time stamp data 4 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4380 to 4385	111CH to 1121H	Event time stamp data 5 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4386 to 4391	1122H to 1127H	Event time stamp data 6 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4392 to 4397	1128H to 112DH	Event time stamp data 7 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4398 to 4403	112EH to 1133H	Event time stamp data 8 for refresh[1]	Same as Event time stamp data 1 for refresh		0000H	Monitor	○
4404 to 4415	1134H to 113FH	System area			—	—	—
4416	1140H	Event time stamp number of read completion[1]			0000H	Monitor	○
4417 to 4607	1141H to 11FFH	System area			—	—	—
4608 to 4613	1200H to 1205H	Event time stamp data 1	Same as Event time stamp data 1 for refresh		0000H	Monitor	×
4614 to 4619	1206H to 120BH	Event time stamp data 2	Same as Event time stamp data 1 for refresh		0000H	Monitor	×
4620 to 5363	120CH to 14F3H	Event time stamp data 3 to Event time stamp data 126			0000H	Monitor	×
5364 to 5369	14F4H to 14F9H	Event time stamp data 127	Same as Event time stamp data 1 for refresh		0000H	Monitor	×
5370 to 5375	14FAH to 14FFH	Event time stamp data 128	Same as Event time stamp data 1 for refresh		0000H	Monitor	×
5376 to 65535	1500H to FFFFH	System area			—	—	—

[1] Used for reading event time stamp data to the CPU module using function blocks. To read the event time stamp data to the CPU module using function blocks, set the items of the refresh settings.

A

For the output module with diagnostic functions

■Error history areas (Un\G0 to Un\G255)

Same as the input module with diagnostic functions

☞ Page 74 Error history areas (Un\G0 to Un\G255)

■Alarm history areas (Un\G256 to Un\G511)

Same as the input module with diagnostic functions

☞ Page 75 Alarm history areas (Un\G256 to Un\G511)

■Parameter areas (Un\G512 to Un\G2559)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
512	200H	Setting of output mode at error	FFFFH	Setting	×
513 to 527	201H to 20FH	System area	—	—	—
528	210H	LED indication setting on error condition	0	Setting	×
529 to 559	211H to 22FH	System area	—	—	—
560 to 575	230H to 23FH	Interrupt condition target setting [n][*1]	0	Setting	×
576 to 591	240H to 24FH	System area	—	—	—
592 to 607	250H to 25FH	Interrupt condition target I/O terminal setting [n][*1]	0	Setting	×
608 to 1807	260H to 70FH	System area	—	—	—
1808	710H	Output delay function enable/disable	0000H	Setting	×
1809 to 1811	711H to 713H	System area	—	—	—
1812	714H	Output delay type setting Y00	0	Setting	×
1813	715H	Output delay type setting Y01	0	Setting	×
1814	716H	Output delay type setting Y02	0	Setting	×
1815	717H	Output delay type setting Y03	0	Setting	×
1816	718H	Output delay type setting Y04	0	Setting	×
1817	719H	Output delay type setting Y05	0	Setting	×
1818	71AH	Output delay type setting Y06	0	Setting	×
1819	71BH	Output delay type setting Y07	0	Setting	×
1820	71CH	Output delay type setting Y08	0	Setting	×
1821	71DH	Output delay type setting Y09	0	Setting	×
1822	71EH	Output delay type setting Y0A	0	Setting	×
1823	71FH	Output delay type setting Y0B	0	Setting	×
1824	720H	Output delay type setting Y0C	0	Setting	×
1825	721H	Output delay type setting Y0D	0	Setting	×
1826	722H	Output delay type setting Y0E	0	Setting	×
1827	723H	Output delay type setting Y0F	0	Setting	×
1828 to 1839	724H to 72FH	System area	—	—	—
1840, 1841	730H, 731H	Output delay time setting Y00	1	Setting	×
1842, 1843	732H, 733H	Output delay time setting Y01	1	Setting	×
1844, 1845	734H, 735H	Output delay time setting Y02	1	Setting	×
1846, 1847	736H, 737H	Output delay time setting Y03	1	Setting	×
1848, 1849	738H, 739H	Output delay time setting Y04	1	Setting	×
1850, 1851	73AH, 73BH	Output delay time setting Y05	1	Setting	×
1852, 1853	73CH, 73DH	Output delay time setting Y06	1	Setting	×
1854, 1855	73EH, 73FH	Output delay time setting Y07	1	Setting	×
1856, 1857	740H, 741H	Output delay time setting Y08	1	Setting	×
1858, 1859	742H, 743H	Output delay time setting Y09	1	Setting	×
1860, 1861	744H, 745H	Output delay time setting Y0A	1	Setting	×
1862, 1863	746H, 747H	Output delay time setting Y0B	1	Setting	×
1864, 1865	748H, 749H	Output delay time setting Y0C	1	Setting	×
1866, 1867	74AH, 74BH	Output delay time setting Y0D	1	Setting	×
1868, 1869	74CH, 74DH	Output delay time setting Y0E	1	Setting	×

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
1870, 1871	74EH, 74FH	Output delay time setting Y0F	1	Setting	×
1872 to 1903	750H to 76FH	System area	—	—	—
1904	770H	Number of output ON times integration function enable/disable	0000H	Setting	×
1905 to 1907	771H to 773H	System area	—	—	—
1908	774H	Number of output ON times alarm detection setting	0000H	Setting	×
1909 to 1911	775H to 777H	System area	—	—	—
1912, 1913	778H, 779H	Number of output ON times alarm detection count setting Y00	1	Setting	×
1914, 1915	77AH, 77BH	Number of output ON times alarm detection count setting Y01	1	Setting	×
1916, 1917	77CH, 77DH	Number of output ON times alarm detection count setting Y02	1	Setting	×
1918, 1919	77EH, 77FH	Number of output ON times alarm detection count setting Y03	1	Setting	×
1920, 1921	780H, 781H	Number of output ON times alarm detection count setting Y04	1	Setting	×
1922, 1923	782H, 783H	Number of output ON times alarm detection count setting Y05	1	Setting	×
1924, 1925	784H, 785H	Number of output ON times alarm detection count setting Y06	1	Setting	×
1926, 1927	786H, 787H	Number of output ON times alarm detection count setting Y07	1	Setting	×
1928, 1929	788H, 789H	Number of output ON times alarm detection count setting Y08	1	Setting	×
1930, 1931	78AH, 78BH	Number of output ON times alarm detection count setting Y09	1	Setting	×
1932, 1933	78CH, 78DH	Number of output ON times alarm detection count setting Y0A	1	Setting	×
1934, 1935	78EH, 78FH	Number of output ON times alarm detection count setting Y0B	1	Setting	×
1936, 1937	790H, 791H	Number of output ON times alarm detection count setting Y0C	1	Setting	×
1938, 1939	792H, 793H	Number of output ON times alarm detection count setting Y0D	1	Setting	×
1940, 1941	794H, 795H	Number of output ON times alarm detection count setting Y0E	1	Setting	×
1942, 1943	796H, 797H	Number of output ON times alarm detection count setting Y0F	1	Setting	×
1944 to 1951	798H to 79FH	System area	—	—	—
1952	7A0H	Output disconnection detection setting	0000H	Setting	×
1953 to 1955	7A1H to 7A3H	System area	—	—	—
1956	7A4H	Output disconnection detection automatic clear enable/disable	0001H	Setting	×
1957 to 1967	7A5H to 7AFH	System area	—	—	—
1968	7B0H	Output short-circuit detection setting	0000H	Setting	×
1969 to 1971	7B1H to 7B3H	System area	—	—	—
1972	7B4H	Output short-circuit detection automatic clear enable/disable	0001H	Setting	×
1973 to 1987	7B5H to 7C3H	System area	—	—	—
1988	7C4H	Output disconnection detection disable time setting	0001H	Setting	×
1989 to 2559	7C5H to 9FFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■Monitor areas (Un\G2560 to Un\G3327)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
2560	A00H	Latest error code	0	Monitor	○
2561 to 2563	A01H to A03H	System area	—	—	—
2564	A04H	Latest alarm code	0	Monitor	○
2565 to 2591	A05H to A1FH	System area	—	—	—
2592 to 2607	A20H to A2FH	Interrupt factor detection flag [n][1]	0	Monitor	○
2608 to 3071	A30H to BFFH	System area	—	—	—
3072	C00H	Output disconnection detection status	0000H	Monitor	○
3073 to 3087	C01H to C0FH	System area	—	—	—
3088	C10H	Output short-circuit detection status	0000H	Monitor	○
3089 to 3119	C11H to C2FH	System area	—	—	—
3120	C30H	Number of output ON times alarm detection status	0000H	Monitor	○
3121 to 3135	C31H to C3FH	System area	—	—	—
3136, 3137	C40H, C41H	Number of output ON times Y00	0	Monitor	○
3138, 3139	C42H, C43H	Number of output ON times Y01	0	Monitor	○
3140, 3141	C44H, C45H	Number of output ON times Y02	0	Monitor	○
3142, 3143	C46H, C47H	Number of output ON times Y03	0	Monitor	○
3144, 3145	C48H, C49H	Number of output ON times Y04	0	Monitor	○
3146, 3147	C4AH, C4BH	Number of output ON times Y05	0	Monitor	○
3148, 3149	C4CH, C4DH	Number of output ON times Y06	0	Monitor	○
3150, 3151	C4EH, C4FH	Number of output ON times Y07	0	Monitor	○
3152, 3153	C50H, C51H	Number of output ON times Y08	0	Monitor	○
3154, 3155	C52H, C53H	Number of output ON times Y09	0	Monitor	○
3156, 3157	C54H, C55H	Number of output ON times Y0A	0	Monitor	○
3158, 3159	C56H, C57H	Number of output ON times Y0B	0	Monitor	○
3160, 3161	C58H, C59H	Number of output ON times Y0C	0	Monitor	○
3162, 3163	C5AH, C5BH	Number of output ON times Y0D	0	Monitor	○
3164, 3165	C5CH, C5DH	Number of output ON times Y0E	0	Monitor	○
3166, 3167	C5EH, C5FH	Number of output ON times Y0F	0	Monitor	○
3168	C60H	Number of output ON times value clear completed	0000H	Monitor	○
3169 to 3327	C61H to CFFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■Control areas (Un\G3328 to Un\G4351)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
3328 to 3343	D00H to D0FH	Interrupt factor reset request [n][1]	0	Control	×
3344 to 3359	D10H to D1FH	Interrupt factor mask [n][1]	0	Control	×
3360 to 3839	D20H to EFFH	System area	—	—	—
3840	F00H	Number of output ON times value clear request	0000H	Control	×
3841 to 4351	F01H to 10FFH	System area	—	—	—

*1   [n] in the table indicates the interrupt setting number. (n = 1 to 16)

■System areas (Un\G4352 to Un\G65535)

Address (decimal)	Address (hexadecimal)	Name	Default value	Data type	Auto refresh
4352 to 65535	1100H to FFFFH	System area	—	—	—

Details of buffer memory addresses

This section describes the details of buffer memory addresses of the I/O module with diagnostic functions.

Latest address of error history

This area shows the buffer memory address where the latest error history is stored.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X/Y0 to X/YF
Latest address of error history	0

Error history No.

Up to 16 errors that have occurred in the module are registered.

Ex.

For Error history No.1

Item	Description	Example[1]
Error code	The error code is stored.	1900H
First/Last two digits of the year	The error time is stored in the BCD code.	2016H
Month/Day		527H
Hour/Minute		1234H
Second		56H
Day of the week	The following values are stored in the BCD code for each day of the week. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3 Thursday: 4, Friday: 5, Saturday: 6	5H
Millisecond (upper)	The error time is stored in the BCD code.	7H
Millisecond (lower)		89H
System area	—	—

*1 The value stored when the input response time setting error (error code: 1900H) occurs at 12:34:56.789 on Friday, May 27, 2016

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Error history No.1 to Error history No.16
Error history No.	16 to 143

A

Latest address of alarm history

This area shows the buffer memory address where the latest alarm history is stored.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X/Y0 to X/YF
Latest address of alarm history	256

Alarm history No.

Up to 16 alarms that have occurred in the module are registered.

Ex.

For Alarm history No.1

	b15	to	b8 b7	to	b0
Un\G272			Alarm code		
Un\G273	First two digits of the year		Last two digits of the year		
Un\G274	Month		Day		
Un\G275	Hour		Minute		
Un\G276	Second		Day of the week		
Un\G277	Millisecond (higher-order digits)		Millisecond (lower-order digits)		
Un\G278 ⋮ Un\G279			System area		

Item	Description	Example[*1]
Alarm code	The alarm code is stored.	800H
First/Last two digits of the year	The error time is stored in the BCD code.	2016H
Month/Day		527H
Hour/Minute		1234H
Second		56H
Day of the week	The following values are stored in the BCD code for each day of the week. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3 Thursday: 4, Friday: 5, Saturday: 6	5H
Millisecond (upper)	The error time is stored in the BCD code.	7H
Millisecond (lower)		89H
System area	—	—

*1 The value stored when the number of input ON times alarm detection count reached (alarm code: 800H) occurs at 12:34:56.789 on Friday, May 27, 2016

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Alarm history No.1 to Alarm history No.16
Alarm history No.	272 to 399

Setting of output mode at error

Set the output mode for when an error occurs for each output.
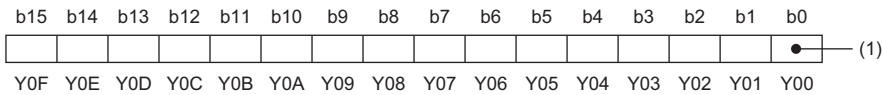
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	— (1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	

(1) 0: CLEAR, 1: HOLD

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Setting of output mode at error	512

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (HOLD) for all the outputs.

LED indication setting on error condition

Set the LED indication method for when an error occurs for each module.

Setting value	Description
0	I/O with an error not indicated
1	I/O status and error indication switching (at the interval of a second)
2	I/O with an error always indicated

When a value other than the above is set, the LED indication setting on error condition error (error code: 1B00H) occurs.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X/Y0 to X/YF
LED indication setting on error condition	528

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (I/O with an error not indicated).

A

Interrupt condition target setting [n]

Set the factor to be detected for interrupt operation.

• Input module with diagnostic functions

Setting value	Description
0	Disable
1	'Error flag' (X10)
2	'Alarm flag' (X11)
3	Input disconnection detection status
7	Number of input ON times alarm detection status
8	Input signal (rise)[*1]
9	Input signal (fall)[*1]
10	Input signal (rise + fall)[*1]

*1 When the input response time setting function or input delay function is enabled, the status of an input signal may be different from the status of the actual external input signal (X00 to X0F).

• Output module with diagnostic functions

Setting value	Description
0	Disable
1	'Error flag' (X10)
2	'Alarm flag' (X11)
3	Output disconnection detection status
4	Output short-circuit detection status
7	Number of output ON times alarm detection status

When a value other than the above is set, the interrupt condition target setting range error (error code: 181△H) occurs.

△ indicates the interrupt setting number. (△ = 1 to 16)

When an input signal (X), output signal (Y), or buffer memory area set in 'Interrupt condition target setting [n]' (Un\G560 to Un\G575) is turned on, an interrupt request is sent to the CPU module.

n indicates the interrupt setting number. (n = 1 to 16)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt condition target setting [n]	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 for all the areas.

Interrupt condition target I/O terminal setting [n]

Set the target I/O terminal number for the interrupt detection. Setting 16 specifies all the I/O terminals and an interrupt is issued when the condition is detected in any of the I/O terminals.

- Input module with diagnostic functions

Setting value	Description
0 to 15	X00 to X0F
16	All input terminals specified

- Output module with diagnostic functions

Setting value	Description
0 to 15	Y00 to Y0F
16	All output terminals specified

When a value other than the above is set, the interrupt condition target I/O terminal setting range error (error code: 182△H) occurs.

△ indicates the interrupt setting number. (△ = 1 to 16)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt condition target I/O terminal setting [n]	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 for all the areas.

A

Input response time setting

Set the input response time of input signals for each input signal.

Setting value	Description
9H	1ms
AH	5ms
BH	10ms
CH	20ms
DH	70ms

When a value other than the above is set, the input response time setting error (error code: 190□H) occurs. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0 to F)

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Input response time setting	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039

■Enabling the setting
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value
The default value is set to BH (10ms) for all the signals.

Input HOLD/CLEAR function enable/disable

Set whether to enable or disable the input HOLD/CLEAR for each input.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
														●	— (1)
X0F	X0E	X0D	X0C	X0B	X0A	X09	X08	X07	X06	X05	X04	X03	X02	X01	X00

(1) 0: Disable, 1: Enable

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X00 to X0F
Input HOLD/CLEAR function enable/disable	1040

■Enabling the setting
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value
The default value is set to 1 (Enable) for all the inputs.

Input HOLD/CLEAR setting

Set whether to hold or clear inputs for each input.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	— (1)
X0F	X0E	X0D	X0C	X0B	X0A	X09	X08	X07	X06	X05	X04	X03	X02	X01	X00	

(1) 0: CLEAR, 1: HOLD

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Input HOLD/CLEAR setting	1044

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (HOLD) for all the inputs.

Input delay function enable/disable

Set whether to enable or disable the input delay function for each input. This setting is disabled when the synchronization function is used.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	— (1)
X0F	X0E	X0D	X0C	X0B	X0A	X09	X08	X07	X06	X05	X04	X03	X02	X01	X00	

(1) 0: Disable, 1: Enable

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Input delay function enable/disable	1056

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Disable) for all the inputs.

Input delay type setting

Set the input delay type for each input.

Setting value	Description
0	OFF delay
1	ON delay
2	Pulse stretch

When a value other than the above is set, the input delay type setting error (error code: 192□H) occurs. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0 to F)

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Input delay type setting	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075

■Enabling the setting
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value
The default value is set to 0 (OFF delay) for all the inputs.

Input delay time setting

Set the input delay time for each input.

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Input delay time setting	1088	1090	1092	1094	1096	1098	1100	1102	1104	1106	1108	1110	1112	1114	1116	1118
	1089	1091	1093	1095	1097	1099	1101	1103	1105	1107	1109	1111	1113	1115	1117	1119

■Setting range
- The available range is 1 to 150000 (400μs to 60s). (Set the range in increments of 400μs.)
- The input delay time setting error (error code: 194□H) occurs in the input terminal where a value out of the setting range has been set. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0 to F)
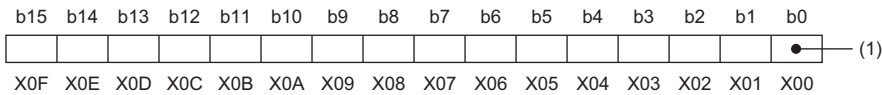
■Enabling the setting
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value
The default value is set to 1 (400μs) for all the inputs.

Number of input ON times integration function enable/disable

Set whether to enable or disable the number of input ON times integration function for each input.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															● |— (1)

X0F X0E X0D X0C X0B X0A X09 X08 X07 X06 X05 X04 X03 X02 X01 X00

(1) 0: Disable, 1: Enable

■Buffer memory address

The following table shows the buffer memory address of this area.

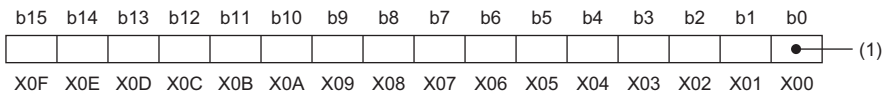| Buffer memory name	X0 to XF
Number of input ON times integration function enable/disable	1200

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Disable) for all the inputs.

Number of input ON times alarm detection setting

Set whether to detect an alarm for the number of input ON times for each input.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															● |— (1)

X0F X0E X0D X0C X0B X0A X09 X08 X07 X06 X05 X04 X03 X02 X01 X00

(1) 0: Not detect, 1: Detect

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Number of input ON times alarm detection setting	1204

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not detect) for all the inputs.

A

Number of input ON times alarm detection count setting

Set the number of input ON times alarm detection count for each input.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Number of input ON times alarm detection count setting	1208 1209	1210 1211	1212 1213	1214 1215	1216 1217	1218 1219	1220 1221	1222 1223	1224 1225	1226 1227	1228 1229	1230 1231	1232 1233	1234 1235	1236 1237	1238 1239

■Setting range

- The available range is 1 to 4294967295.
- The number of input ON times alarm detection count setting error (error code: 196□H) occurs in the input terminal where a value out of the setting range has been set. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0H to FH)
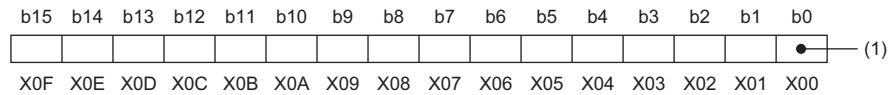
■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 for all the inputs.

Event time stamp function enable/disable

Set whether to enable or disable the event time stamp function for each input.

```
 b15  b14  b13  b12  b11  b10  b9   b8   b7   b6   b5   b4   b3   b2   b1   b0
┌────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┬────┐
│    │    │    │    │    │    │    │    │    │    │    │    │    │    │    │ ●  │──── (1)
└────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┴────┘
 X0F  X0E  X0D  X0C  X0B  X0A  X09  X08  X07  X06  X05  X04  X03  X02  X01  X00
```

(1) 0: Disable, 1: Enable

■Buffer memory address

The following table shows the buffer memory address of this area.

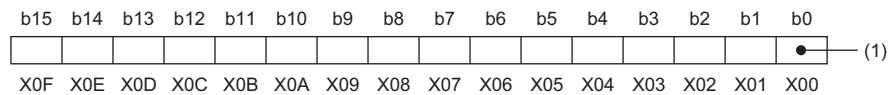| Buffer memory name	X0 to XF
Event time stamp function enable/disable	1248

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Disable) for all the inputs.

Event time stamp condition setting

Set the event time stamp condition for each input.

Setting value	Description
0	Rise
1	Fall
2	Rise + Fall

When a value other than the above is set, the event time stamp condition setting error (error code: 198□H) occurs. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0H to FH)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Event time stamp condition setting	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Rise) for all the inputs.

Setting for not-refreshed data

Set whether to overwrite older data with new event data for when 129 or more non-refreshed event time stamp data sets exist.

Setting value	Description
0	Not overwrite
1	Overwrite

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Setting for not-refreshed data	1280

■Enabling the setting
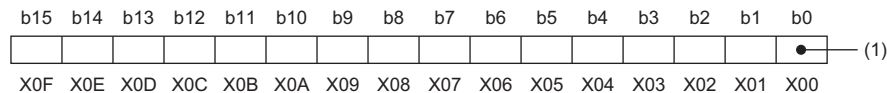
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not overwrite) for all the inputs.

A

Input disconnection detection setting

Set whether to detect input disconnections for each input.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	— (1)

X0F X0E X0D X0C X0B X0A X09 X08 X07 X06 X05 X04 X03 X02 X01 X00

(1) 0: Not detect, 1: Detect

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Input disconnection detection setting	1312

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not detect) for all the inputs.

Input disconnection detection automatic clear enable/disable

Set whether to enable or disable the automatic clear of disconnection detection for the input disconnection detection function.

Setting value	Description
0	Disable
1	Enable

When a numerical value other than the above is set, the set value is regarded as 1 (Enable).

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Input disconnection detection automatic clear enable/disable	1316

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (Enable).

Output delay function enable/disable

Set whether to enable or disable the output delay for each output. This setting is disabled when the synchronization function is used.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	—(1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	

(1) 0: Disable, 1: Enable

■Buffer memory address

The following table shows the buffer memory address of this area.

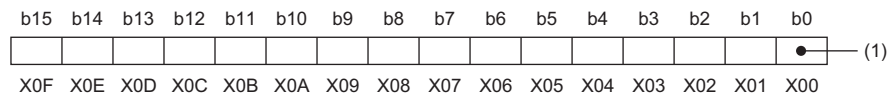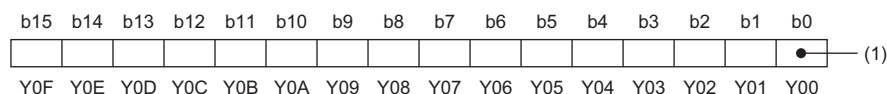| Buffer memory name	Y0 to YF
Output delay function enable/disable	1808

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Disable) for all the outputs.

Output delay type setting

Set the output delay type for each output.

Setting value	Description
0	OFF delay
1	ON delay

When a value other than the above is set, the output delay type setting error (error code: 1A2□H) occurs. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0H to FH)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y00	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08	Y09	Y0A	Y0B	Y0C	Y0D	Y0E	Y0F
Output delay type setting	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (OFF delay) for all the outputs.

Output delay time setting

Set the output delay time for each output.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y00	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08	Y09	Y0A	Y0B	Y0C	Y0D	Y0E	Y0F
Output delay time setting	1840	1842	1844	1846	1848	1850	1852	1854	1856	1858	1860	1862	1864	1866	1868	1870
	1841	1843	1845	1847	1849	1851	1853	1855	1857	1859	1861	1863	1865	1867	1869	1871

■Setting range

- The available range is 1 to 150000 (400µs to 60s). (Set the range in increments of 400µs.)
- The output delay time setting error (error code: 1A4□H) occurs in the output terminal where a value out of the setting range has been set. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0H to FH)

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (400µs) for all the inputs.

Number of output ON times integration function enable/disable

Set whether to enable or disable the number of output ON times integration function for each output.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
														●—(1)	
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00

(1) 0: Disable, 1: Enable

■Buffer memory address

The following table shows the buffer memory address of this area.

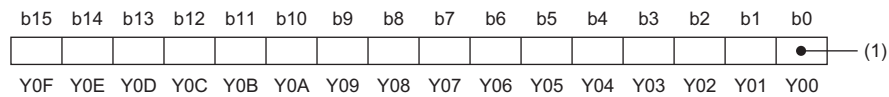| Buffer memory name	Y0 to YF
Number of output ON times integration function enable/disable	1904

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Disable) for all the outputs.

Number of output ON times alarm detection setting

Set whether to detect an alarm for the number of output ON times for each output.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	—— (1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	

(1) 0: Not detect, 1: Detect

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Number of output ON times alarm detection setting	1908

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not detect) for all the outputs.

Number of output ON times alarm detection count setting

Set the number of output ON times alarm detection count for each output.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y00	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08	Y09	Y0A	Y0B	Y0C	Y0D	Y0E	Y0F
Number of output ON times alarm detection count setting	1912 1913	1914 1915	1916 1917	1918 1919	1920 1921	1922 1923	1924 1925	1926 1927	1928 1929	1930 1931	1932 1933	1934 1935	1936 1937	1938 1939	1940 1941	1942 1943

■Setting range

- The available range is 1 to 4294967295.
- The number of output ON times alarm detection count setting error (error code: 1A6□H) occurs in the output terminal where a value out of the setting range has been set. □ indicates the number of an I/O terminal in which the error has occurred. (□ = 0H to FH)
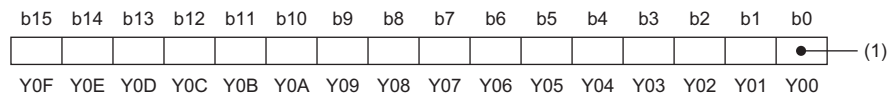
■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 for all the inputs.

Output disconnection detection setting

Set whether to detect output disconnections for each output.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															●	— (1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00

(1) 0: Not detect, 1: Detect

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output disconnection detection setting	1952

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not detect) for all the outputs.

Output disconnection detection automatic clear enable/disable

Set whether to enable or disable the automatic clear of disconnection detection for the output disconnection detection function.

Setting value	Description
0	Disable
1	Enable

When a numerical value other than the above is set, the set value is regarded as 1 (Enable).

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output disconnection detection automatic clear enable/disable	1956

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (Enable).

Output short-circuit detection setting

Set whether to detect an output short-circuit for each output.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															●	─── (1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00

(1) 0: Not detect, 1: Detect

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output short-circuit detection setting	1968

■Enabling the setting
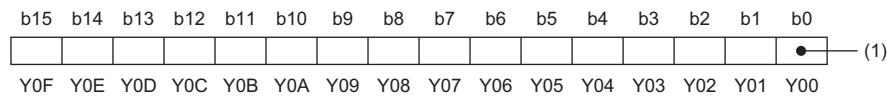
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 0 (Not detect) for all the outputs.

Output short-circuit detection automatic clear enable/disable

Set whether to enable or disable the automatic clear of short-circuit detection for the output short circuit detection function.

Setting value	Description
0	Disable
1	Enable

When a numerical value other than the above is set, the set value is regarded as 1 (Enable).

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y00 to Y0F
Output short-circuit detection automatic clear enable/disable	1972

■Enabling the setting

Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value

The default value is set to 1 (Enable).

A

Output disconnection detection disable time setting

Set an output disconnection detection disable time for each module.

Setting value	Description
0	0ms
1	100ms
2	200ms
3	300ms

When a numerical value other than the above is set, the set value is regarded as 1 (100ms).

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output disconnection detection disable time setting	1988

■Enabling the setting
Turn on and off 'Operating condition setting request' (Y12) to enable the setting.

■Default value
The default value is set to 1 (100ms).

Latest error code

The latest error code detected in the I/O module with diagnostic functions is stored. For details, refer to the following.
☞ Page 62 List of Error Codes

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X/Y0 to X/YF
Latest error code	2560

■How to clear an error
Turn on and off 'Error clear request' (Y10).

Latest alarm code

The latest alarm code detected in the I/O module with diagnostic functions is stored. For details, refer to the following.
☞ Page 64 List of Alarm Codes

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X/Y0 to X/YF
Latest alarm code	2564

■How to clear an alarm
Turn on and off 'Alarm clear request' (Y11).

Interrupt factor detection flag [n]

The detection status of an interrupt factor is stored.

Monitor value	Description
0	No interrupt factor
1	Interrupt factor

When an interrupt factor occurs, an interrupt request is sent to the CPU module at the same time as 1 (Interrupt factor) is stored in 'Interrupt factor detection flag [n]' (Un\G2592 to Un\G2607).

If the same interrupt factor occurs while 1 (Interrupt factor) is stored in 'Interrupt factor detection flag [n]' (Un\G2592 to Un\G2607), the interrupt request is not sent. If a different interrupt factor occurs, the interrupt request is sent.

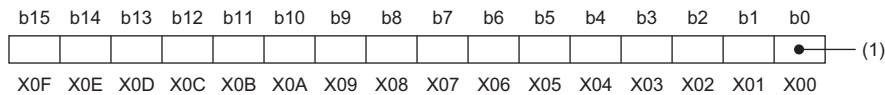n indicates the interrupt setting number. (n = 1 to 16)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt factor detection flag [n]	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607

Input disconnection detection status

When 'Input disconnection detection setting' (Un\G1312) is set to 1 (Detect), the input disconnection detection status is stored.

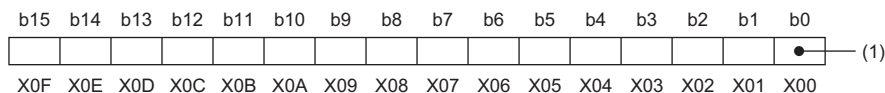(1) 0: Normal, 1: Disconnection detected

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Input disconnection detection status	2816

Number of input ON times alarm detection status

When 'Number of input ON times integration function enable/disable' (Un\G1200) is set to 1 (Enable) and 'Number of input ON times alarm detection setting' (Un\G1204) is set to 1 (Detect), whether the number of input ON times reaches the number of input ON times alarm detection count is stored.

(1) 0: Normal, 1: Alarm detection count reached

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Number of input ON times alarm detection status	2832

Number of input ON times

When 'Number of input ON times integration function enable/disable' (Un\G1200) is set to 1 (Enable), the number of times that the status of an input is changed from off to on is stored.
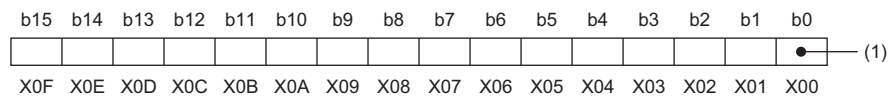
■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X00	X01	X02	X03	X04	X05	X06	X07	X08	X09	X0A	X0B	X0C	X0D	X0E	X0F
Number of input ON times	2848 2849	2850 2851	2852 2853	2854 2855	2856 2857	2858 2859	2860 2861	2862 2863	2864 2865	2866 2867	2868 2869	2870 2871	2872 2873	2874 2875	2876 2877	2878 2879

Number of input ON times value clear completed

This area shows whether the number of input ON times held in the module is cleared.

When 'Number of input ON times value clear request' (Un\G3584) is 1 (Requested), 1 (Completed) is stored in this area after the number of input ON times is cleared. The value returns to 0 (Not completed) when 'Number of input ON times value clear request' (Un\G3584) turns to 0 (Not requested).

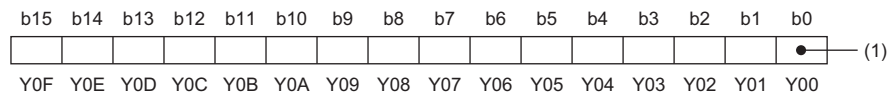| b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●	— (1)
X0F	X0E	X0D	X0C	X0B	X0A	X09	X08	X07	X06	X05	X04	X03	X02	X01	X00	

(1) 0: Not completed, 1: Completed

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Number of input ON times value clear completed	2880

Output disconnection detection status

When 'Output disconnection detection setting' (Un\G1952) is set to 1 (Detect), the output disconnection detection status is stored.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	—(1)

(1) 0: Normal, 1: Disconnection detected

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output disconnection detection status	3072

Output short-circuit detection status

When 'Output short-circuit detection setting' (Un\G1968) is set to 1 (Detect), the output short-circuit detection status is stored.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	—(1)

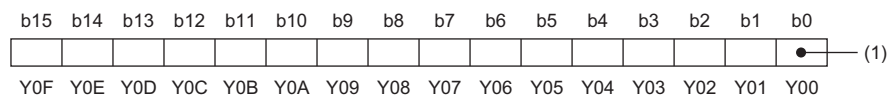(1) 0: Normal, 1: Short-circuit detected

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Output short-circuit detection status	3088

A

Number of output ON times alarm detection status

When 'Number of output ON times integration function enable/disable' (Un\G1904) is set to 1 (Enable) and 'Number of output ON times alarm detection count setting Y0 to YF' (Un\G1912 to Un\G1943) is set to 1 (Detect), whether the number of output ON times reaches the number of output ON times alarm detection count is stored.

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●—(1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	

(1) 0: Normal, 1: Alarm detection count reached

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Number of output ON times alarm detection status	3120

Number of output ON times

When 'Number of output ON times integration function enable/disable' (Un\G1904) is set to 1 (Enable), the number of times that the status of an output is changed from off to on is stored.

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	Y00	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08	Y09	Y0A	Y0B	Y0C	Y0D	Y0E	Y0F
Number of output ON times	3136	3138	3140	3142	3144	3146	3148	3150	3152	3154	3156	3158	3160	3162	3164	3166
	3137	3139	3141	3143	3145	3147	3149	3151	3153	3155	3157	3159	3161	3163	3165	3167

Number of output ON times value clear completed

This area shows whether the number of output ON times held in the module is cleared.
When 'Number of output ON times value clear request' (Un\G3840) is 1 (Requested), 1 (Completed) is stored in this area after the number of output ON times is cleared. The value returns to 0 (Not completed) when 'Number of output ON times value clear request' (Un\G3840) turns to 0 (Not requested).

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0	
															●—(1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00	

(1) 0: Not completed, 1: Completed

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Number of output ON times value clear completed	3168

Interrupt factor reset request [n]

Set this area to send an interrupt factor reset request.

Setting value	Description
0	No reset request
1	Reset request

When 'Interrupt factor reset request [n]' (Un\G3328 to Un\G3343) corresponding to a generated interrupt factor has been set to 1 (Reset request), the interrupt factor corresponding to the specified interrupt is reset. After that, the value of 'Interrupt factor reset request [n]' (Un\G3328 to Un\G3343) changes to 0 (No reset request). A setting value of 2 or larger is regarded as 1 (Reset request).

n indicates the interrupt setting number. (n = 1 to 16)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt factor reset request [n]	3328	3329	3330	3331	3332	3333	3334	3335	3336	3337	3338	3339	3340	3341	3342	3343

■Default value

The default value is set to 0 (No reset request) for all the areas.

Interrupt factor mask [n]

Set the mask for an interrupt factor to be used.

Setting value	Description
0	Mask (Interrupt not used)
1	Clear mask (Interrupt used)

When the value of 'Interrupt factor mask [n]' (Un\G3344 to Un\G3359) has been changed to 1 (Clear mask (Interrupt used)) and an interrupt factor occurs, an interrupt request is sent to the CPU module. A setting value of 2 or larger is regarded as 1 (Clear mask (Interrupt used)).

n indicates the interrupt setting number. (n = 1 to 16)

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt factor mask [n]	3344	3345	3346	3347	3348	3349	3350	3351	3352	3353	3354	3355	3356	3357	3358	3359

■Default value

The default value is set to 0 (Mask (Interrupt not used)) for all the areas.

A

Number of input ON times value clear request

When 'Number of input ON times value clear request' (Un\G3584) is set to 1 (Requested), the number of input ON times is cleared.
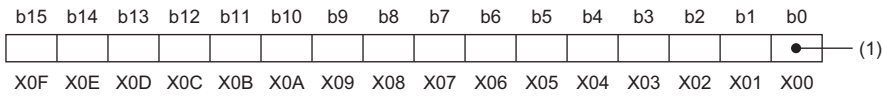
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															● — (1)
X0F	X0E	X0D	X0C	X0B	X0A	X09	X08	X07	X06	X05	X04	X03	X02	X01	X00

(1) 0: Not requested, 1: Requested

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Number of input ON times value clear request	3584

■Default value

The default value is set to 0 (Not requested) for all the inputs.

Number of output ON times value clear request

When 'Number of output ON times value clear request' (Un\G3840) is set to 1 (Requested), the number of output ON times is cleared.
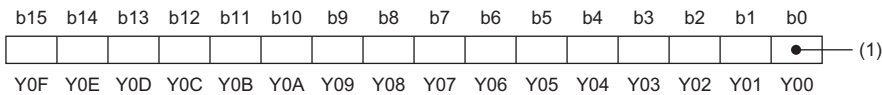
b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
															● — (1)
Y0F	Y0E	Y0D	Y0C	Y0B	Y0A	Y09	Y08	Y07	Y06	Y05	Y04	Y03	Y02	Y01	Y00

(1) 0: Not requested, 1: Requested

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Y0 to YF
Number of output ON times value clear request	3840

■Default value

The default value is set to 0 (Not requested) for all the outputs.

Event time stamp number for next storage

When an event occurs and the event time stamp data area is updated, the next number for storing the event time stamp data is stored.

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Event time stamp number for next storage	4352

Event time stamp number for CPU read

The number of event time stamp that has been read to the CPU module is stored.

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Event time stamp number for CPU read	4353

Event time stamp storage status

In the following cases, 1 (Discarded/Overwritten) is stored.
- When "Data setting which the refresh is not completed yet" has been set to "Don't overwrite" and the data is discarded
- When "Data setting which the refresh is not completed yet" has been set to "Overwrite" and not-refreshed event time stamp data is overwritten.

■Buffer memory address
The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Event time stamp storage status	4354

A

Event time stamp data for refresh

Out of data stored in 'Event time stamp data' (Un\G4608 to Un\G5375), up to the eight events are stored in this area.

This buffer memory area is used for reading event time stamp data to the CPU module using function blocks (FB).

To use function blocks (FB), set "Target" to "Module Label" in "Refresh settings".

Ex.

For Event time stamp data 0 for refresh

Item	Description	Example[1]
First/Last two digits of the year	The time of an event occurrence is stored in the BCD code.	2016H
Month/Day		527H
Hour/Minute		1234H
Second		56H
Day of the week	The following values are stored in the BCD code for each day of the week. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3 Thursday: 4, Friday: 5, Saturday: 6	5H
Millisecond (upper)	The time of an event occurrence is stored in the BCD code.	7H
Millisecond (lower)		89H
Event type	The type of the event that has occurred is stored. • Rise of signal: 0H • Fall of signal: 1H	1
I/O terminal	The I/O terminal where an event has occurred is stored.	1

[1] The value stored when a fall of the signal is detected on I/O terminal 1 at 12:34:56.789 on Friday, May 27, 2016.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Data 1 to Data 8
Event time stamp data for refresh	4356 to 4403

Event time stamp number of read completion

The number of event time stamp that has been read to the CPU module is stored.

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	X0 to XF
Event time stamp number of read completion	4416

Event time stamp data

When an event has occurred, data of up to 128 events are stored in this area.

The data to be stored in this area has the same structure and contents of data stored in 'Event time stamp data for refresh' (Un\G4356 to Un\G4403).

■Buffer memory address

The following table shows the buffer memory address of this area.

Buffer memory name	Data 1 to Data 128
Event time stamp data	4608 to 5375

Appendix 4 Optional Item

Spring clamp terminal block

The spring clamp terminal block Q6TE-18SN for the Q series can be connected for use.

For details on the Q6TE-18SN, refer to the following.

📖 Before Using the Product (BCN-P5999-0209)

A

INDEX

I

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
May 2016	SH(NA)-081621ENG-A	First edition

Japanese manual number: SH-081620-A

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WARRANTY

Please confirm the following product warranty details before using this product.

1. **Gratis Warranty Term and Gratis Warranty Range**

    If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

    However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

    [Gratis Warranty Term]

    The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

    [Gratis Warranty Range]

    (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

    (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

        1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.

        2. Failure caused by unapproved modifications, etc., to the product by the user.

        3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.

        4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.

        5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.

        6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.

        7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

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    (2) Product supply (including repair parts) is not available after production is discontinued.

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    Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

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    Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

    (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

    (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

    (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

    (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. **Changes in product specifications**

    The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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SH(NA)-081621ENG-A(1605)MEE
MODEL: R-DFIO-U-OU-E
MODEL CODE: 13JX51

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