MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Application)

-RD60P8-G

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.
- Configure a circuit so that the external power supply is turned off first and then the programmable controller. If the programmable controller is turned off 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 for the network used. For the manuals, please consult your local Mitsubishi representative. 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. When a Safety CPU is used, data cannot be modified while the Safety CPU is in SAFETY MODE.

[Design Precautions]

⚠ WARNING

- 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 write any data to the "system area" and "write prohibited 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 prohibited area", and the "use prohibited" signals, refer to the user's manual for the module used. For areas used for safety communications, they are protected from being written by users, and thus safety communications failure caused by data writing does not occur.
- 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. Incorrect output or malfunction due to a communication failure may result in an accident. When safety communications are used, an interlock by the safety station interlock function protects the system from an incorrect output or malfunction.

[Design Precautions]

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Doing so may result in malfunction due to electromagnetic interference. Keep a distance of 150mm or more between those cables.
- 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 by Program" for "Opening Method" of "Module Parameter". If "Open by 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.

[Security Precautions]

⚠ WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[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.
- To mount a module with no module fixing hook, place the concave part(s) located at the bottom onto the guide(s) of the base unit, push in the module, and fix it with screw(s). 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 component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction. For the specified torque range, refer to the MELSEC iQ-R Module Configuration Manual.
- 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 or a battery-less option 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, battery-less option 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 a blank cover module (RG60) to each empty slot and an included extension connector protective cover to the unused extension cable connector before powering on the system 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. Doing so may result in malfunction due to noise. Keep a distance of 150mm or more between those cables.
- Place the cables in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in malfunction or damage to modules or cables.
  In addition, the weight of the cables may put stress on modules in an environment of strong vibrations and shocks.
  Do not clamp the extension cables with the jacket stripped. Doing so may change the characteristics of the cables, resulting in malfunction.
- 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.

[Wiring Precautions]

⚠ CAUTION

- 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.
- Ground the shielded cables with a ground resistance of 100 ohm or less. Failure to do so may cause malfunction.

[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 perform each of the following operations more than 50 times (IEC 61131-2/JIS B 3502 compliant).
  Exceeding the limit may cause malfunction.
  - Mounting/removing the module to/from the base unit
  - Inserting/removing the extended SRAM cassette or battery-less option cassette to/from the CPU module
  - Mounting/removing the terminal block to/from the module
- 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 or a battery-less option 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 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 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 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.

(3) Mitsubishi shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC iQ-R series programmable controllers.
This manual describes the functions, parameter settings, and troubleshooting of the relevant product 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.

Point

- Unless otherwise specified, this manual provides program examples in which the I/O numbers of X/Y0 to X/Y1F are assigned to the pulse input module. Assign I/O numbers when applying the program examples to an actual system. For I/O number assignment, refer to the following.

MELSEC iQ-R Module Configuration Manual

- Unless otherwise specified, the buffer memory assignment in this manual are the assignment in R mode.

Relevant product

RD60P8-G

MEMO

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Application) [SH-082005ENG] (this manual)	Functions, parameter settings, troubleshooting, I/O signals, and buffer memory of the pulse input module	Print book e-Manual PDF
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	Common information on the hardware configuration of all modules, overview of each system configuration, and specifications of the power supply module, base unit, SD memory card, and battery	Print book e-Manual PDF
MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Startup) [SH-082003ENG]	Specifications, procedures before operation, wiring, and operation examples of the pulse input module	Print book e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration, parameter settings, and online operations of GX Works3	e-Manual PDF
MELSEC iQ-R Online Module Change Manual [SH-081501ENG]	The online module change, which allows a module to be changed without stopping the system for MELSEC iQ-R series programmable controllers	Print book e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric 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.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Buffer memory	Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitored values of the Ethernet function, or data used for data communication of the multiple CPU system function.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance.
Global label	A label that is valid for all the program data when multiple program data are created in the project. The global label has two types: a module specific label (module label), which is generated automatically by GX Works3, and an optional label, which can be created for any specified device.
Module label	A label that represents one of the memory areas (I/O signals and buffer memory areas) specific to each module with a given character string. For the module used, GX Works3 automatically generates this label, which can be used as a global label.
Q series-compatible mode	A mode in which the module operates with the buffer memory map converted to the equivalent one of the MELSEC Q series
R mode	A mode in which the module operates with the buffer memory map that has been newly laid out in the MELSEC iQ-R series
Redundant system with redundant extension base unit	A redundant system that is configured using extension base unit(s)
Watchdog timer error	A watchdog timer is a timer to monitor whether internal processing of a module is performed normally. A watchdog timer error is an error that occurs when internal processing is not performed normally.

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
Pulse input module	Abbreviation of MELSEC iQ-R channel isolated pulse input module

1 FUNCTIONS

This chapter describes the functions of the pulse input module and the setting procedures for those functions. For details on the I/O signals and the buffer memory, refer to the following.

☞ Page 59 I/O Signals
☞ Page 67 Buffer Memory Areas

Point

- This chapter describes I/O signals and buffer memory addresses for CH1. For details on the I/O signals and buffer memory addresses for CH2 and later, refer to the following.

☞ Page 59 List of I/O signals
☞ Page 67 Lists of buffer memory addresses

- Numerical values come in △ of the error codes described in this chapter. These numerical values indicate details of the error. For details on the numerical values, refer to the following.

☞ Page 54 List of Error Codes

1.1 Count Operation

This section describes the input pulse count operation of the pulse input module as well as how to read each count value.

Pulse input method

The pulse input method of the pulse input module is 1-phase input up count. The down count method is not possible.
The input pulse input signal level, pulse edge, and counting speed (Max.) can be changed with the module parameter settings.

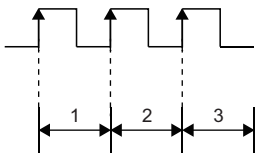
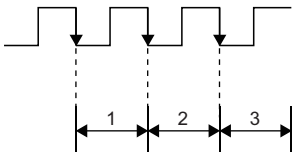
Input signal level

The input signal level can be changed with "Input voltage selection" of the module parameters. This can be set to one of the following values to match the voltage of the input pulse.

- 5VDC
- 12 to 24VDC

Pulse edge

The "Pulse edge selection" of the module parameter can be used to set whether to count input pulses on the rising edge or on the falling edge.

Pulse edge selection	Operation
Pulse up edge	Pulses are counted on their rising edges (↑). Pulse input from a pulse generator (externally) 'CH1 Input pulse value' (Un\G4, Un\G5) 
Pulse down edge	Pulses are counted on their falling edges (↓). Pulse input from a pulse generator (externally) 'CH1 Input pulse value' (Un\G4, Un\G5) 

Counting speed (Max.)

The counting speed (Max.) of the pulse input module can be set with "Input filter setting" of the module parameter. This can be set to one of the following values to match the time that it takes for the input pulse to rise/fall.

- 30kpps
- 10kpps
- 1kpps
- 100pps
- 50pps
- 10pps
- 1pps
- 0.1pps

Point

The counting speed varies depending on the time that it takes for the input pulse to rise/fall. Use the performance specifications to check the counting speed that can be measured, and then set this value. (MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Startup))

Setting method

1. Set "Input voltage selection".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting] ⇨ [Input voltage selection]

2. Set "Pulse edge selection".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting] ⇨ [Pulse edge selection]

3. Set "Input filter setting".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting] ⇨ [Input filter setting]

Point

Each of these settings can only be set from the module parameter. They cannot be set from the buffer memory. However, the current setting details can be checked from the following buffer memory areas.

- 'CH1 Input voltage selection monitor' (Un\G1200) (☞ Page 96 CH1 Input voltage selection monitor)
- 'CH1 Pulse edge selection monitor' (Un\G1201) (☞ Page 96 CH1 Pulse edge selection monitor)
- 'CH1 Input filter setting monitor' (Un\G1203) (☞ Page 97 CH1 Input filter setting monitor)

Count value reading

Pulses input to the pulse input module are stored in separate buffer memory areas as the sampling pulse number, accumulating count value, and input pulse value. Turning off and on 'CH1 Count enable' (Y18) starts the count operation and updates each count value. While 'CH1 Count enable' (Y18) is on, the count operation continues and each count value continues to be updated.

Sampling pulse number

The sampling pulse number is the pulse number converted to a unit pulse number by the pre-scale function or moving average function. The count range is from 0 to 32767.
The count cycle is set with the count cycle change function and updated in the set cycle.
For details on items such as the buffer memory address of the storage location, refer to the following.
☞ Page 76 CH1 Sampling pulse number

Accumulating count value

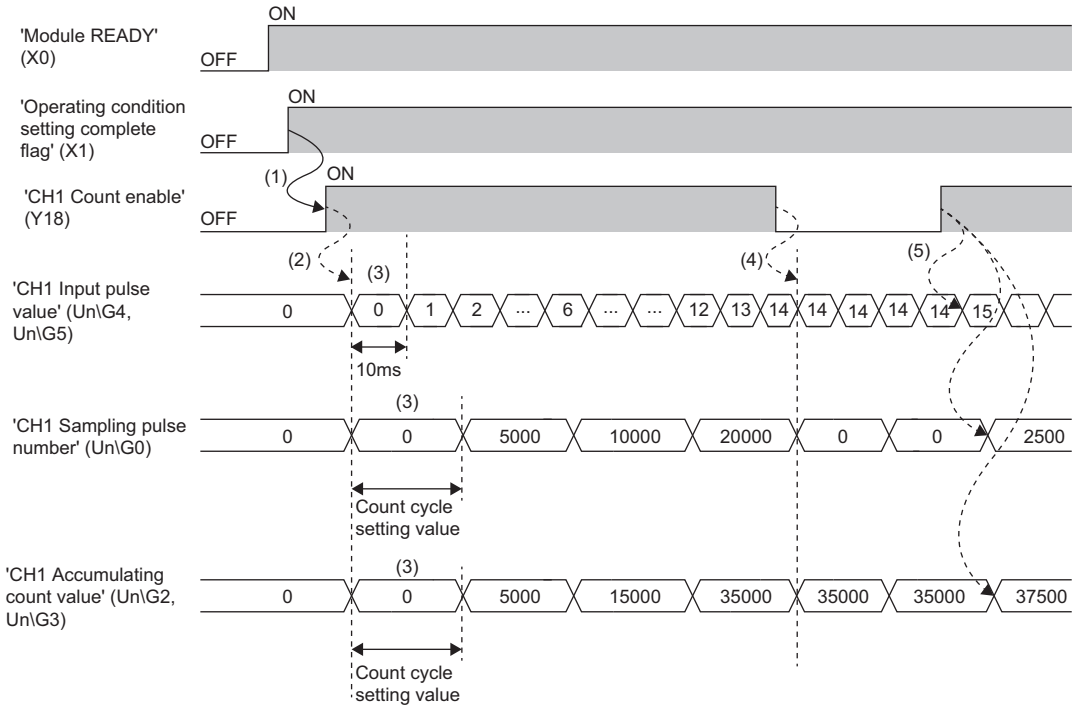
The accumulating count value is the accumulated value of the sampling pulse numbers. The linear counter or ring counter count type can be used. The count range is from 0 to 99999999.
The count cycle is set with the count cycle change function and updated in the set cycle.
For details on items such as the buffer memory address of the storage location, refer to the following.
☞ Page 77 CH1 Accumulating count value

Input pulse value

The input pulse value is the number of pulses that are actually input. It is not converted to a unit pulse number by the pre-scale function or moving average function. The count range is from 0 to 2147483647, and the count type is ring counter.
The count cycle is fixed to 10ms and updated in a cycle of 10ms. Exercise caution when using this module as a counter because the count cycle has a low speed compared to the high-speed counter module.
For details on items such as the buffer memory address of the storage location, refer to the following.
☞ Page 78 CH1 Input pulse value

Input pulse count operation

This section describes the input pulse count operation of the pulse input module.



No.	Operation
(1)	When 'Operating condition setting complete flag' (X1) turns on, the count operation becomes possible. If there is an error in the setting values or something similar, 'Operating condition setting complete flag' (X1) will not turn on, and the count operation will not start.
(2)	When 'CH1 Count enable' (Y18) is turned on, the count operation starts.
(3)	The count values are stored in the following buffer memory areas. The first storage operation lasts from turning on 'CH1 Count enable' (Y18) to the point when one count cycle has elapsed. After that, values are stored once per count cycle while 'CH1 Count enable' (Y18) is on. The count cycle varies depending on the count value. • 'CH1 Sampling pulse number' (Un\G0) • 'CH1 Accumulating count value' (Un\G2, Un\G3) • 'CH1 Input pulse value' (Un\G4, Un\G5)
(4)	When 'CH1 Count enable' (Y18) is turned off, the count operation stops. At this time, the count values are as shown below. • 'CH1 Sampling pulse number' (Un\G0) is reset to 0. • 'CH1 Accumulating count value' (Un\G2, Un\G3) and 'CH1 Input pulse value' (Un\G4, Un\G5) retain their values from before 'CH1 Count enable' (Y18) was turned off.
(5)	When 'CH1 Count enable' (Y18) is turned on, the count operation restarts.

Count cycle change function

This function changes the count cycle for the sampling pulse number and accumulating count value.
Setting 'CH1 Count cycle change function selection' (Un\G141) to Count cycle change function valid (1) sets the refreshing cycle for the following buffer memory areas to the count cycle set in 'CH1 Count cycle setting value' (Un\G142).

- 'CH1 Sampling pulse number' (Un\G0)
- 'CH1 Accumulating count value' (Un\G2, Un\G3)

Count cycle

The count cycles that can be set with 'CH1 Count cycle setting value' (Un\G142) are shown below.

- 1s (0)
- 100ms (1)
- 200ms (2)
- 500ms (3)

When 'CH1 Count cycle change function selection' (Un\G141) is set to Count cycle change function invalid (0), the cycle becomes 1s.

Point

When measuring the frequency of the input pulse, setting 'CH1 Count cycle setting value' (Un\G142) to 1s (0) causes the value of 'CH1 Sampling pulse number' (Un\G0) to become the frequency. This eliminates the need to use a program to calculate the count value every second.

Setting method

1. Set "Count cycle change function selection" to "Count cycle change function valid".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Count cycle change function]

2. Set "Count cycle setting value".

Item	Setting details
Count cycle setting value	1s
	100ms
	200ms
	500ms

Precautions

Inconsistencies may occur in 'CH1 Accumulating count value' (Un\G2, Un\G3) depending on the timing of reading the sampling pulse number and the accumulating count value by the count cycle and the program.

Response delay time

This section describes the response delay time of the I/O signals and buffer memory areas of the pulse input module.
During count operation, the response delay time indicated by the following arithmetic expression occurs.

- Maximum response delay time = program scan time + two control cycles (20ms)

Program scan time

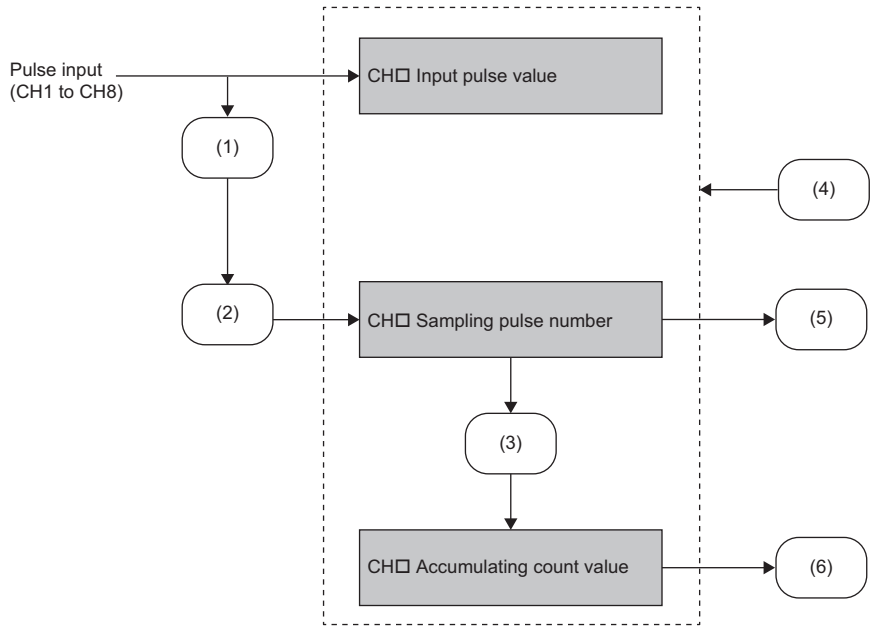
The I/O control mode of the CPU module is a refresh mode that performs batch processing prior to the start of program operation. Therefore, I/O signal (X/Y) delay occurs. Direct access input (DX) and direct access output (DY) can be used to minimize this delay.
For details on direct access input (DX) and direct access output (DY), refer to the following.
MELSEC iQ-R CPU Module User's Manual (Application)

Control cycle (10ms)

A maximum delay of 20ms (one control cycle × 2) occurs until the pulse input module reads the output signals (Y) and buffer memory areas updated by the program and completes processing. There are also variations in the update timing of the input signals (X) and buffer memory areas within the range of one control cycle.

1.2 Processing of Each Function

The functions are processed in the order shown below. If multiple functions are enabled, the output of the first processed function is used as the input of the next function.



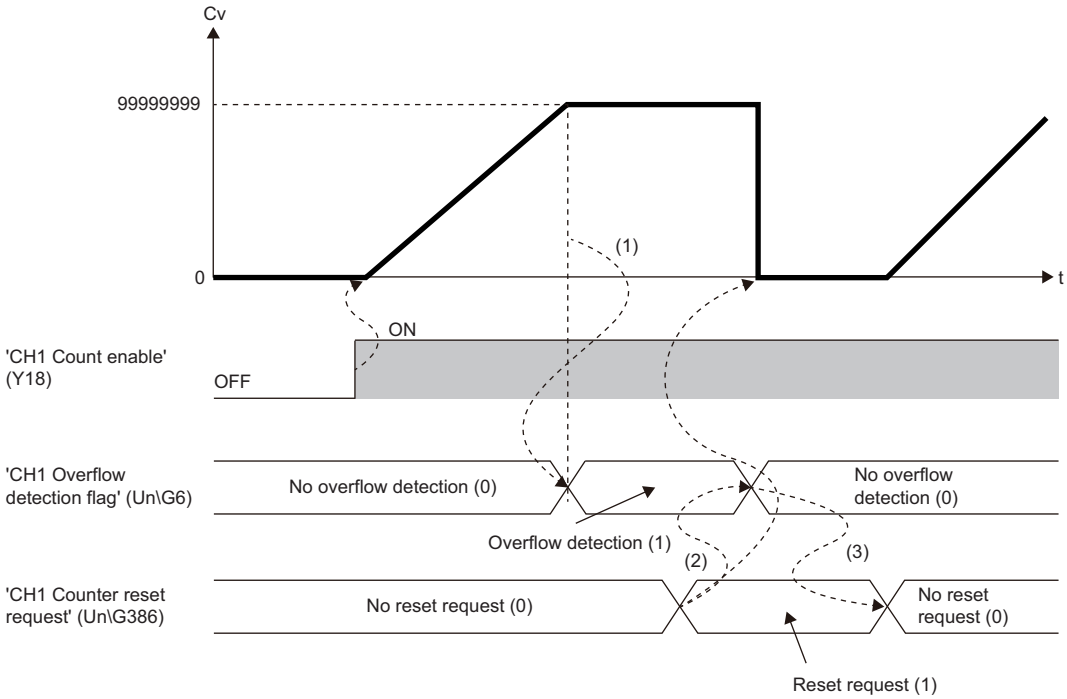
No.	Processing details
(1)	Pre-scale function
(2)	Moving average function
(3)	Linear counter function/ring counter function
(4)	Counter reset function
(5)	Warning output function
(6)	Comparison output function

1.3 Count Type Selection

The count type of the accumulating count value can be selected from linear counter and ring counter.

Linear counter function

This function counts input pulses from 0 to 99999999. If the count range is exceeded, an overflow is detected.



- - - - - - - - - ▶ Performed by the pulse input module

Cv: Accumulating count value

t: Time

No.	Operation
(1)	When 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999, Overflow detection (1) is stored in 'CH1 Overflow detection flag' (Un\G6).
(2)	Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) causes No overflow detection (0) to be stored in 'CH1 Overflow detection flag' (Un\G6). The accumulating count value is reset to 0.
(3)	When the counter reset processing is complete and 'CH1 Counter reset request' (Un\G386) changes to No reset request (0), the count operation restarts.

Overflow error

■Count operation status

When 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999, an overflow error (error code: 1900H) occurs. When an overflow error occurs, the count operation stops. Even if a pulse is received, 'CH1 Accumulating count value' (Un\G2, Un\G3) will not change from 99999999. At this time, 'CH1 Sampling pulse number' (Un\G0) is reset to 0.

■Overflow error clearing

- Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) clears the overflow error (error code: 1900H) and restarts the count operation. No overflow detection (0) is stored in 'CH1 Overflow detection flag' (Un\G6).
- Turning off and on 'CH1 Error reset request' (Y8) does not restart the count operation. To restart the count operation, it is necessary to turn on and off 'Operating condition setting request flag' (Y1) or to set 'CH1 Counter reset request' (Un\G386) to Reset request (1).

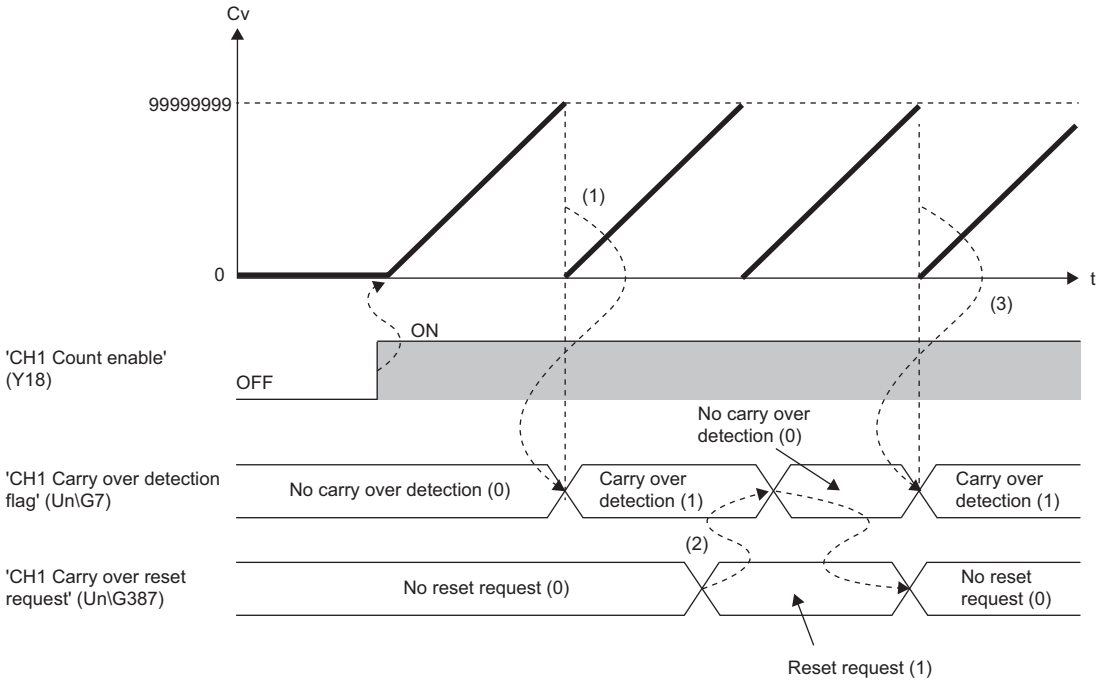
Setting method

1. Set "Linear counter/ring counter selection" to "Linear counter".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting] ⇨ [Linear counter/ring counter selection]

Ring counter function

This function repeatedly counts the input pulses from 0 to 99999999.



Performed by the pulse input module

Cv: Accumulating count value

t: Time

No.	Operation
(1)	When 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999, Carry over detection (1) is stored in 'CH1 Carry over detection flag' (Un\G7). Count operation continues.
(2)	Setting 'CH1 Carry over reset request' (Un\G387) to Reset request (1) causes No carry over detection (0) to be stored in 'CH1 Carry over detection flag' (Un\G7).
(3)	After the carry over is reset, when 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999 again, Carry over detection (1) is stored in 'CH1 Carry over detection flag' (Un\G7).

Point

- 'CH1 Carry over detection flag' (Un\G7) is not cleared until 'CH1 Carry over reset request' (Un\G387) is set to Reset request (1). After 'CH1 Carry over detection flag' (Un\G7) is cleared, it will not be set to Carry over detection (1) until 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999 again.
- Carry over detection is collected on the CPU module as the event history. (☞ Page 41 Event History Function)

Setting method

1. Set "Linear counter/ring counter selection" to "Ring counter".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting] ⇨ [Linear counter/ring counter selection]

1.4 Pre-scale Function

This function converts the pulse number by multiplying the input pulse number by an arbitrary setting value.

Sampling pulse number calculation

The following arithmetic expression is used to convert the input pulse value per count cycle into a unit pulse number. The converted value is stored in 'CH1 Sampling pulse number' (Un\G0) as the sampling pulse number.

Number of sampling pulses = Input pulse value per count cycle × Pre-scale setting value × Unit magnification

Values after the decimal point are omitted.

■Pre-scale setting value

Set this with 'CH1 Pre-scale setting value' (Un\G135). The setting range is from 0 to 32767.

■Unit scaling

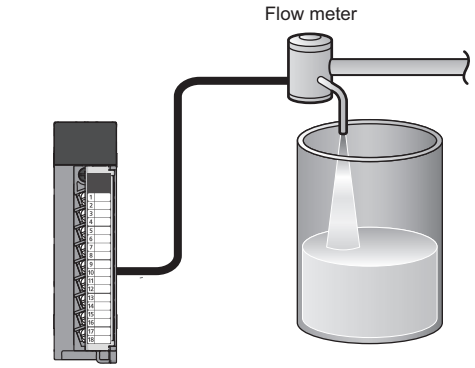
Set this with 'CH1 Pre-scale function selection' (Un\G134).

Setting value	Setting details
0	Pre-scale function invalid
1	×1
2	×0.1
3	×0.01
4	×0.001
5	×0.0001

'CH1 Pre-scale function selection' (Un\G134) is also used to set whether to use the pre-scale function. To use the pre-scale function, select a value other than Pre-scale function invalid (0).

Application example

This section describes an application example of the pre-scale function in an example system that uses a flow meter. In the following example, values stored in 'CH1 Accumulating count value' (Un\G2, Un\G3) are converted as flow rate (unit: cm^3).



■Conditions

- Each pulse input from the flow meter indicates $3cm^3$.
- The number of input pulses per count cycle (1s) is 570 pulses.

■Setting details

From the above conditions, set the pulse input module as follows.

Item	Setting details
'CH1 Pre-scale setting value' (Un\G135)	3
'CH1 Pre-scale function selection' (Un\G134)	×1 (1)
'CH1 Count cycle change function selection' (Un\G141)	Count cycle change function valid (1)
'CH1 Count cycle setting value' (Un\G142)	1s (0)

■Operation result

The sampling pulse number operation result is shown below.

- Sampling pulse number = 570 × 3 × 1 = $1710cm^3/s$

The sampling pulse number for each count cycle (1s) is added to 'CH1 Accumulating count value' (Un\G2, Un\G3), so this can be used with the unit of cm^3.

Setting method

1. Set "Pre-scale function selection".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Pre-scale function]

Item	Setting range
Pre-scale function selection	Pre-scale function invalid
	×1
	×0.1
	×0.01
	×0.001
	×0.0001

2. Set "Pre-scale setting value" to a value.

Item	Setting range
Pre-scale setting value	0 to 32767

Precautions

When using the pre-scale function, set 'CH1 Pre-scale setting value' (Un\G135) to 1 or higher. If 'CH1 Pre-scale setting value' (Un\G135) is set to 0, the value stored in 'CH1 Sampling pulse number' (Un\G0) will be 0 due to the relationship within the arithmetic expression for the sampling pulse number. Therefore, even if the count operation is performed, it will appear as if the input pulses have not been counted.

1.5 Moving average function

This function calculates the mean value by performing moving average processing on the sampling pulse number obtained per count cycle for the specified number of times of averaging operations. Use this function in situations such as when variations occur in the sampling pulse number.

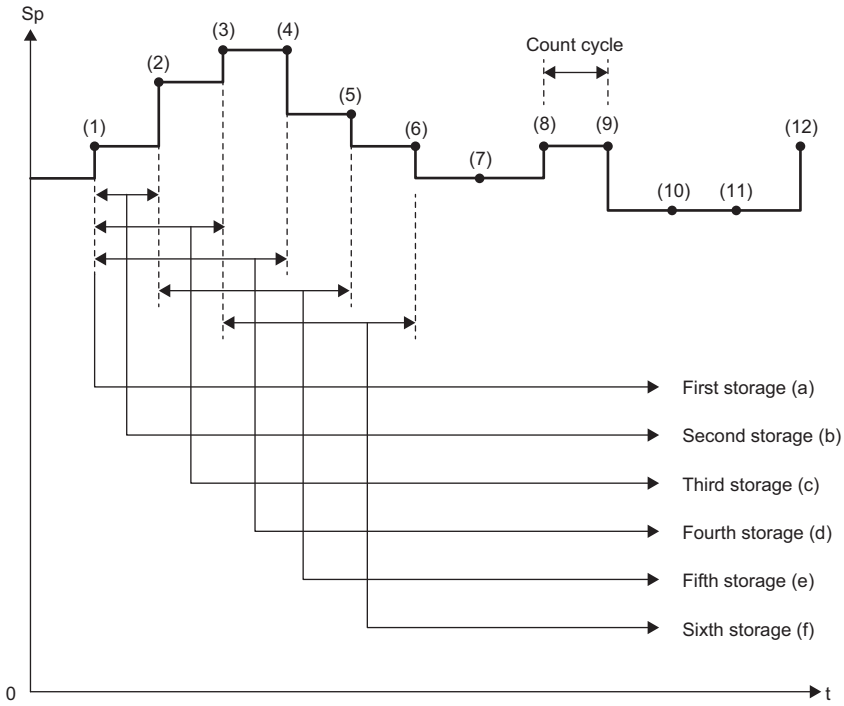
Operation

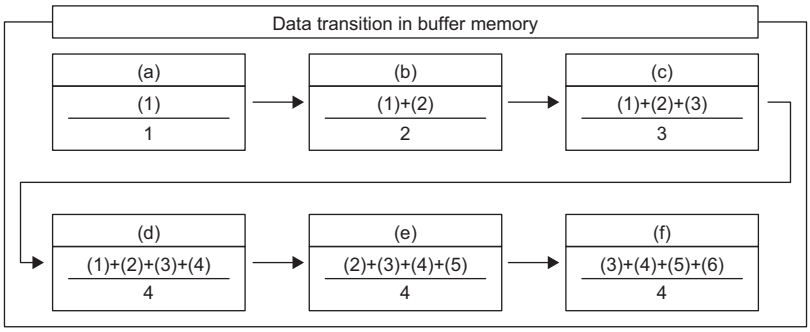
Setting 'CH1 Movement averaging processing selection' (Un\G132) to Moving average processing (1) causes average processing to be performed on the sampling pulse number. Use 'CH1 Number of movement averaging processing' (Un\G133) to set the number of times to perform averaging on the sampling pulse number.

When 'CH1 Movement averaging processing selection' (Un\G132) is set to Sampling processing (0), the sampling pulse number is calculated without averaging processing.

■Example

This section describes an operation example when 'CH1 Number of movement averaging processing' (Un\G133) is set to 4. Until the set count of sampling pulse numbers is calculated, averaging processing is performed with the current count.





Sp: Sampling pulse number
t: Time

Setting method

1. Set "Moving average processing selection" to "Moving average processing".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Moving average function]

2. Set "Number of moving average processing" to a value.

Item	Setting range
Number of moving average processing	2 to 60

1.6 Comparison Output Function

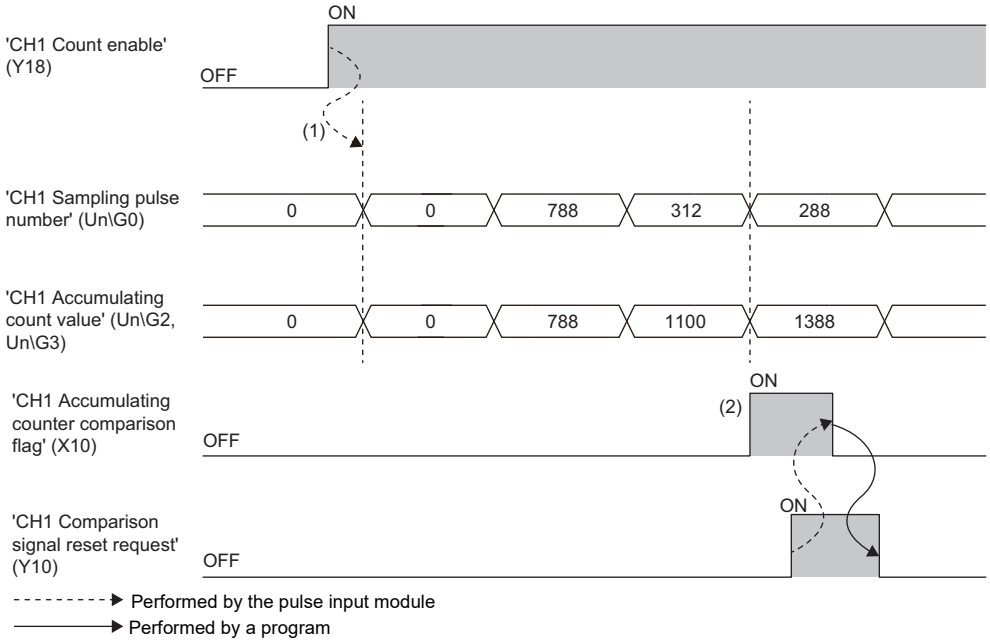
This function detects the accumulating count value reaching or exceeding the set value.

Operation

'CH1 Accumulating counter comparison flag (X10)' turns on to notify the user of the accumulating count value reaching or exceeding 'CH1 Comparison output setting value' (Un\G130, Un\G131). Count operation continues.

Ex.

This section describes an operation example when 'CH1 Comparison output setting value' (Un\G130, Un\G131) is set to 1200.



No.	Operation
(1)	When 'CH1 Count enable' (Y18) is turned on, the count operation starts.
(2)	When 'CH1 Accumulating count value' (Un\G2, Un\G3) reaches or exceeds 1200, 'CH1 Accumulating counter comparison flag' (X10) turns on. 'CH1 Accumulating count value' (Un\G2, Un\G3) is updated in the cycle set with the count cycle change function, so 'CH1 Accumulating counter comparison flag' (X10) turns on at the same timing.

Comparison result clearing

When 'CH1 Comparison signal reset request' (Y10) is turned on, 'CH1 Accumulating counter comparison flag' (X10) turns off. If the count type is linear counter, once 'CH1 Accumulating counter comparison flag' (X10) turns off, it will not turn on again until the accumulating count value is reset and reaches or exceeds the value of 'CH1 Comparison output setting value' (Un\G130, Un\G131) again. If the count type is ring counter, the flag will turn on when the accumulating count value reaches or exceeds the value of 'CH1 Comparison output setting value' (Un\G130, Un\G131) again during ring processing.

Setting method

1. Set "Comparison output selection" to "Comparison output function valid".

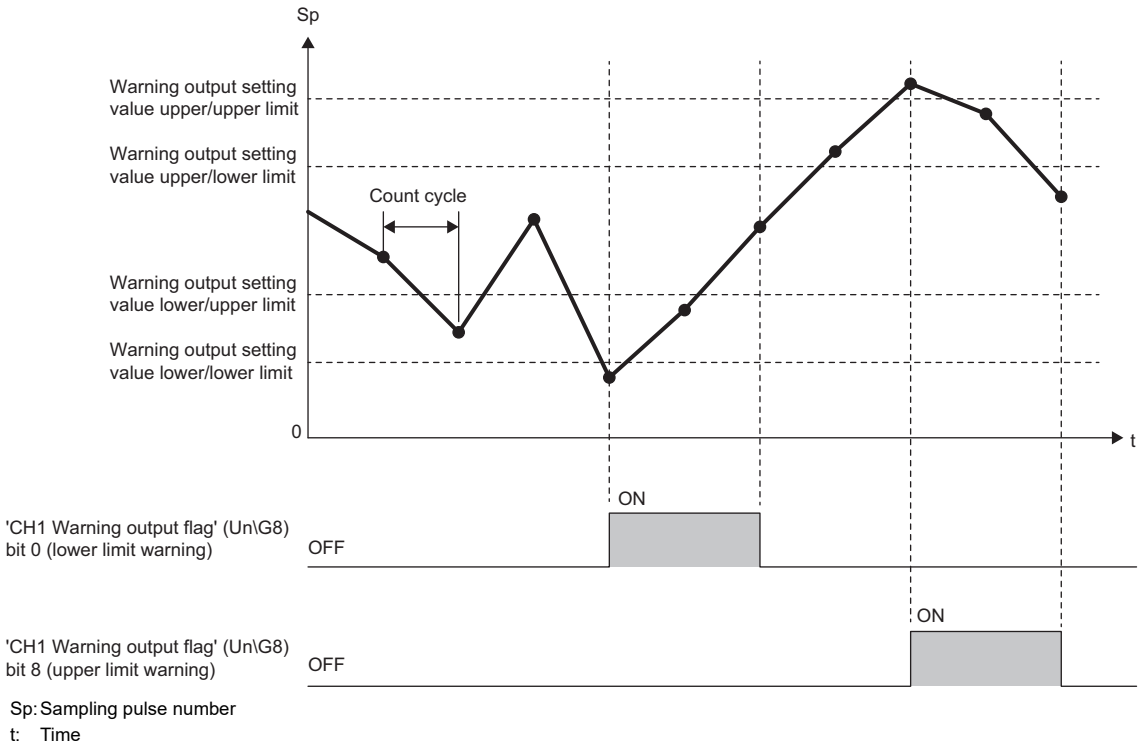
[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Comparison output function]

2. Set "Comparison output setting value" to a value.

Item	Setting range
Comparison output setting value	0 to 99999999

1.7 Warning Output Function

This function outputs a warning when the sampling pulse number enters the preset warning output range.



Sp: Sampling pulse number
t: Time

Operation

■Operation performed when a warning is output

When the sampling pulse number is greater than or equal to 'CH1 Warning output setting value upper/upper limit' (Un\G137) or is less than or equal to 'CH1 Warning output setting value lower/lower limit' (Un\G140) and thus enters the warning output range, a warning is output as follows.

- Range exceeded (1) is stored in bit 8 (upper limit warning) or bit 0 (lower limit warning) of 'CH1 Warning output flag' (Un\G8).
- The ALM LED turns on.

In addition, an alarm code is stored in 'CH1 Alarm code' (Un\G10).

For details on the alarm codes, refer to the following.

☞ Page 56 List of Alarm Codes

■Operation after a warning was output

After warning output, if the sampling pulse number is less than 'CH1 Warning output setting value upper/lower limit' (Un\G138) or is larger than 'CH1 Warning output setting value lower/upper limit' (Un\G139) and thus no longer meets the conditions for outputting warnings, Normal (0) is stored in bit 8 (upper limit warning) or bit 0 (lower limit warning) of 'CH1 Warning output flag' (Un\G8).

Also, when Normal (0) is stored in bit 8 (upper limit warning) and bit 0 (lower limit warning) of the warning output flag for all channels, the ALM LED turns off. The alarm code stored in 'CH1 Alarm code' (Un\G10) is not cleared. To clear the alarm code, after Normal (0) is stored in bit 8 (upper limit warning) and bit 0 (lower limit warning) of 'CH1 Warning output flag' (Un\G8), turn on and off 'CH1 Error reset request' (Y8).

Detection cycle

This function is executed in the cycle set by the count cycle change function.

Setting method

1. Set "Warning output selection" to "Warning output function valid".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Warning output function]

2. Set "Warning output setting value upper/upper limit", "Warning output setting value upper/lower limit", "Warning output setting value lower/upper limit", and "Warning output setting value lower/lower limit" to values.

Item	Setting range
Warning output setting value upper/upper limit	0 to 32767
Warning output setting value upper/lower limit	
Warning output setting value lower/upper limit	
Warning output setting value lower/lower limit	

Point

Set values within the range satisfying the condition that upper/upper limit ≥ upper/lower limit > lower/upper limit ≥ lower/lower limit.

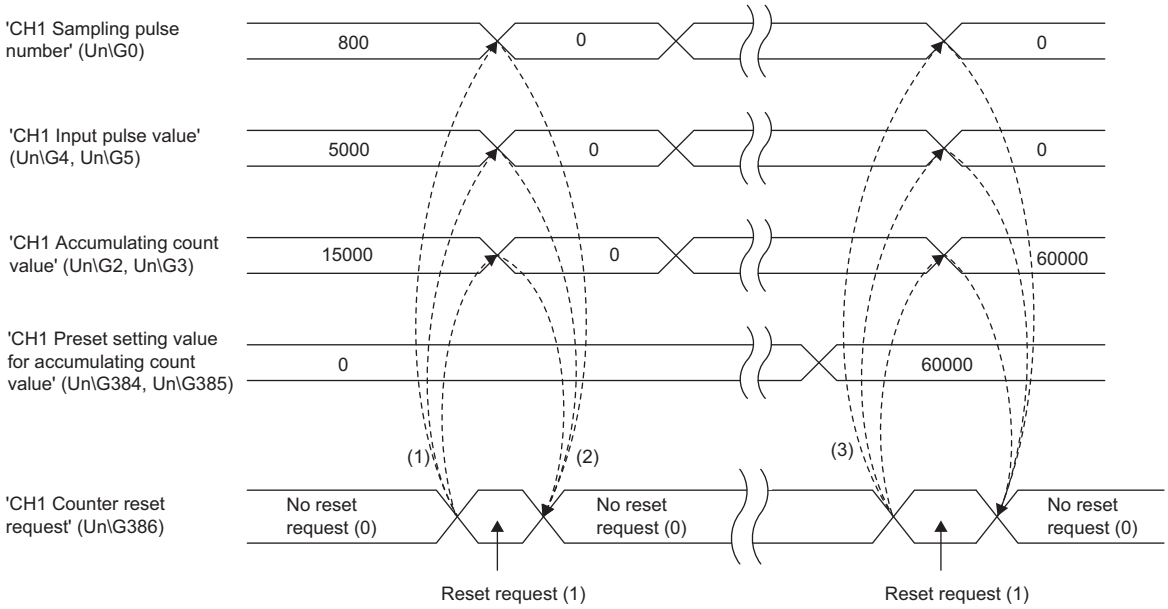
1.8 Counter Reset Function

This function resets the sampling pulse number, accumulating count value, and input pulse value. The reset can be performed at an arbitrary timing. It is also possible to preset the accumulating count value to an arbitrary value.

Operation

Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) changes each count value as shown below.

- 'CH1 Sampling pulse number' (Un\G0) is reset to 0.
- 'CH1 Accumulating count value' (Un\G2, Un\G3) is reset to 0. If 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) is set to a value other than 0, the accumulating count value is preset to the setting value.
- 'CH1 Input pulse value' (Un\G4, Un\G5) is reset to 0.



No.	Operation
(1)	Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) resets each count value.
(2)	After the reset is complete, 'CH1 Counter reset request' (Un\G386) is automatically set to No reset request (0).
(3)	When presetting 'CH1 Accumulating count value' (Un\G2, Un\G3), set 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) to the desired preset value. After making this setting, set 'CH1 Counter reset request' (Un\G386) to Reset request (1).

■Preset setting value for accumulating count value

Regardless of turning on and off of 'Operating condition setting request flag' (Y1), the changed value is valid for 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385). Furthermore, the module parameters can also be used to configure the setting at the point in time that the CPU module changes from STOP to RUN.

1. Set "Preset setting value for accumulating count value" to a value.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting] ⇨ [Counter reset function]

Item	Setting range
Preset setting value for accumulating count value	0 to 99999999

Point

When using a linear counter, if the count operation stops due to the accumulating count value overflowing, the count operation of the accumulating count value' restarts after the reset is complete.

Precautions

- After the reset is complete and 'CH1 Counter reset request' (Un\G386) is set to No reset request (0), input pulses are invalid for a maximum of 20ms.
- If 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) is set to a value outside the setting range and 'CH1 Counter reset request' (Un\G386) is set to Reset request (1), a preset setting value for accumulating count value setting error (error code: 1920H) occurs. In this situation, 'CH1 counter reset request' (Un\G386) is set to No reset request (0), but the count operation continues without resetting any of the count values. To reset each of the count values again, turn on and off 'CH1 Error reset request' (Y8), and then reset 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) to a value within the setting range. Then, set 'CH1 Counter reset request' (Un\G386) to Reset request (1).

1.9 Interrupt Function

This function executes interrupt programs of the CPU module when an interrupt factor such as an error or warning output is detected. For the pulse input module, the maximum number of available interrupt pointers is 16 per module.

Operation

■Interrupt factor detection

An interrupt factor can be detected by setting "Interrupt setting" of the module parameter and by setting 'Interrupt factor mask [n]' (Un\G632 to Un\G647) to Mask clear (Interrupt used) (1) in advance. When an interrupt factor occurs, an interrupt request is sent to the CPU module at the same time as 'Interrupt factor detection flag [n]' (Un\G600 to Un\G615) is changed to Interrupt factor (1).

■How to reset an interrupt factor

When Reset request (1) is set in 'Interrupt factor reset request [n]' (Un\G664 to Un\G679) corresponding to the interrupt factor, the specified interrupt factor is reset and the value of 'Interrupt factor detection flag [n]' (Un\G600 to Un\G615) changes to No interrupt factor (0).

Setting method

To use the interrupt function, set "Condition target setting", "Condition target channel setting", "Interrupt factor generation setting", and "Interruption pointer" with the engineering tool. After completing the settings, write the project to enable the settings.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Interrupt setting]

Item	Description
Condition target setting	Selects the target factor for interrupt detection.
Condition target channel setting	Selects the target channel for interrupt detection.
Interrupt factor generation setting	Sets whether to send an interrupt request when the same interrupt factor occurs during the interrupt factor detection.
Interruption pointer	Specifies the number of an interrupt pointer that is started at the detection of an interrupt factor.

■Condition target setting

Select a factor of the condition target setting for the interrupt detection.

Setting value	Description
Invalid	No interrupt is detected.
Error occurrence	An interrupt is detected on the rising edge of 'CH1 Error occurrence' (X8) turning on.
Accumulating counter comparison flag	An interrupt is detected on the rising edge of 'CH1 Accumulating counter comparison flag' (X10) turning on.
Overflow detection flag	An interrupt is detected on the rising edge of 'CH1 Overflow detection flag' (Un\G6) turning on.
Carry over detection flag	An interrupt is detected on the rising edge of 'CH1 Carry over detection flag' (Un\G7) turning on.
Warning output flag	An interrupt is detected on the rising edge of bit 0 or bit 8 of 'CH1 Warning output flag' (Un\G8) turning on.

■Condition target channel setting

This item selects the target channel. The I/O signal and buffer memory targeted by the interrupt factor are assigned separately for each channel, so use this item to select the channel to target.

■Interrupt factor generation setting

This item sets whether to send an interrupt request when the same interrupt factor occurs during the interrupt factor detection.

- When "Interrupt resend request" has been set and the same interrupt factor occurs while the interrupt factor has been detected, an interrupt request is sent to the CPU module again.
- When "No interrupt resend request" has been set and the same interrupt factor occurs while the interrupt factor has been detected, an interrupt request is not sent to the CPU module.

■Interruption pointer

This item specifies the number of an interrupt pointer that 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)

Precautions

- When 'Condition target setting [n]' (Un\G728 to Un\G743) is Invalid (0), an interrupt request is not sent to the CPU module.
- If an interrupt factor occurs when 'Interrupt factor mask [n]' (Un\G632 to Un\G647) is Mask (Interrupt unused) (0), an interrupt request is not sent to the CPU module. However, 'Interrupt factor detection flag [n]' (Un\G600 to Un\G615) is changed to Interrupt factor (1).
- To reset the interrupt factor, specify Reset request (1) until 'Interrupt factor detection flag [n]' (Un\G600 to Un\G615) changes to No interrupt factor (0).
- Resetting interrupt factors is executed only when 'Interrupt factor reset request [n]' (Un\G664 to Un\G679) changes from No reset request (0) to Reset request (1).
- Multiple interrupt pointers can share the same setting of 'Condition target setting [n]' (Un\G728 to Un\G743). When multiple interrupt pointers have shared the same setting of 'Condition target setting [n]' (Un\G728 to Un\G743) and interrupts occur, interrupt programs are executed in order of priority of the interrupt pointers. For the priority of the interrupt pointers, refer to the following.

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

- When multiple interrupt factors occur at the same time, the CPU module executes multiple interrupt programs at the same time. When it will take a long time for all interrupt programs to finish executing, the CPU module judges that the programs cannot be normally completed with the scan monitoring function, and a CPU error may occur. When a CPU error occurs, refer to the following.

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

Setting example

Ex.

To execute an interrupt program (I50) when an overflow occurs on CH1

• Parameter settings

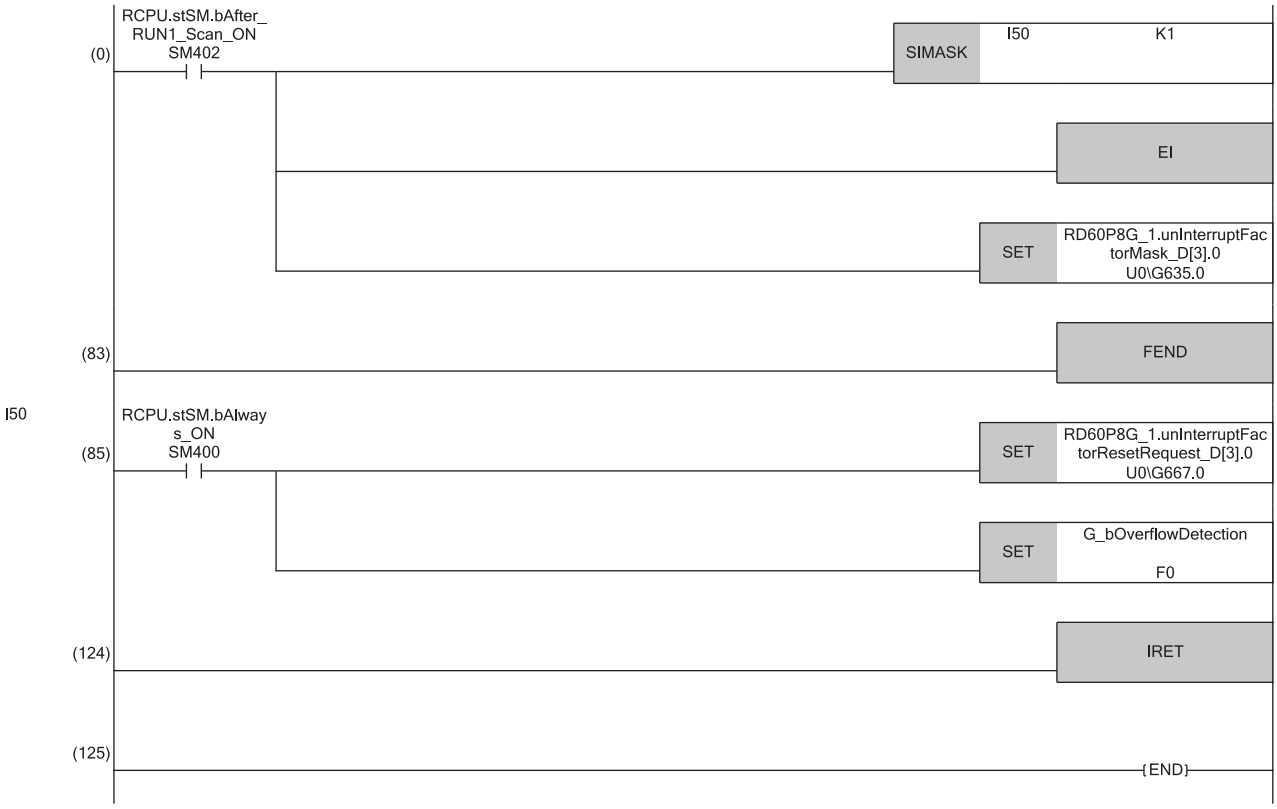
Set "Interrupt setting" of the module parameter as follows.

No.	Condition target setting	Condition target channel setting	Interrupt factor generation setting	Interruption pointer
4	Overflow detection flag	CH1	Interrupt resend request	I50

• Label settings

Classification	Label name	Description	Device
Module label	RCPU.stSM.bAlways_ON	Always ON	SM400
	RCPU.stSM.bAfter_RUN1_Scan_ON	Turning on for one scan after RUN	SM402
	RD60P8G_1.unInterruptFactorMask_D[3].0	Interrupt factor mask	U0\G635.0
	RD60P8G_1.unInterruptFactorResetRequest_D[3].0	Interrupt factor reset request	U0\G667.0
Label to be defined	Define global labels as shown below.		

	Label Name	Data Type		Class	Assign (Device/Label)
1	G_bOverflowDetection	Bit	...	VAR_GLOBAL	F0



(0) Only the interrupt pointer I50 is enabled.

(85)'Interrupt factor reset request [4]' (U0\G667) is turned on. The processing for CH1 overflow detection is performed.

1.10 Error History Function

This function stores up to the latest 16 errors and alarms that have occurred on the pulse input module. The errors and alarms are stored as a history in the buffer memory area.

Operation

When an error occurs, the error code and the error time are stored from Error history 1 (Un\G800 to Un\G809) in order. When an alarm occurs, the alarm code and the alarm time are stored from Alarm history 1 (Un\G960 to Un\G969) in order. Error time and alarm time are stored as follows.

Ex.

The following shows Error history 1 and Alarm history 1.

- Details of the error history

	b15 ... b8	b7 ... b0
Un\G800	Error channel	
Un\G801	Error code	
Un\G802	First two digits of the year	Last two digits of the year
Un\G803	Month	Day
Un\G804	Hour	Minute
Un\G805	Second	Day of the week
Un\G806	Millisecond (upper)	Millisecond (lower)
Un\G807	System area	
⋮		
Un\G809		

- Details of the alarm history

	b15 ... b8	b7 ... b0
Un\G960	Alarm channel	
Un\G961	Alarm code	
Un\G962	First two digits of the year	Last two digits of the year
Un\G963	Month	Day
Un\G964	Hour	Minute
Un\G965	Second	Day of the week
Un\G966	Millisecond (upper)	Millisecond (lower)
Un\G967	System area	
⋮		
Un\G969		

Item		Storage contents	Storage example*1
Error channel or alarm channel		Stores the number of the channel on which the error or alarm occurred.	1H
Error code or alarm code		Stores the error code or alarm code.	1900H
First two digits of the year	Last two digits of the year	Stored in BCD code.	2018H
Month	Day		1031H
Hour	Minute		1234H
Second			56H
Day of the week		One of the following values is stored in BCD code. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3, Thursday: 4, Friday: 5, Saturday: 6	3H
Millisecond (higher-order digits)		Stored in BCD code.	7H
Millisecond (lower-order digits)			89H
System area		—	—

*1 Values stored when an overflow error (error code: 1900H) occurs on CH1 at 12:34:56.789 on Wednesday, October 31st, 2018.

How to clear the error history

The error history and alarm history can be cleared with one of the following methods.

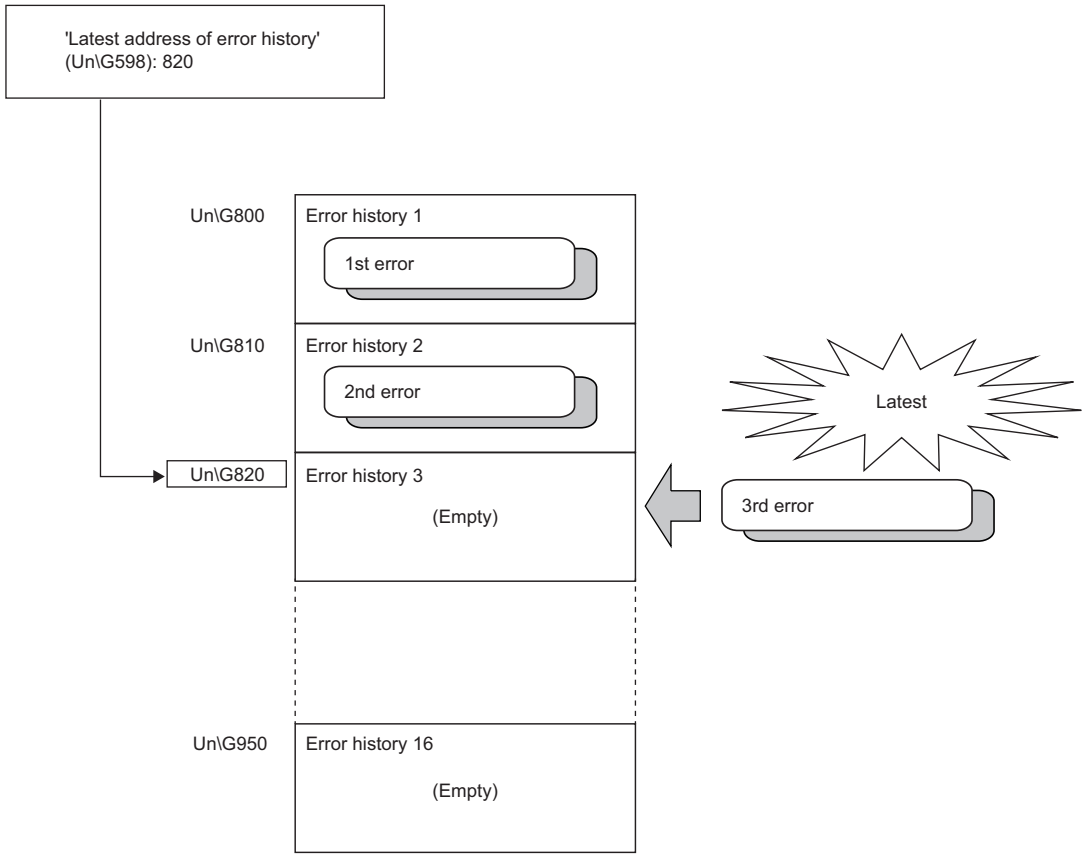
- Power off the programmable controller.
- Reset the CPU module.

Check method

The start address of the error history where the latest error is stored can be checked in 'Latest address of error history' (Un\G598). The start address of the alarm history where the latest alarm is stored can be checked in 'Latest address of alarm history' (Un\G599).

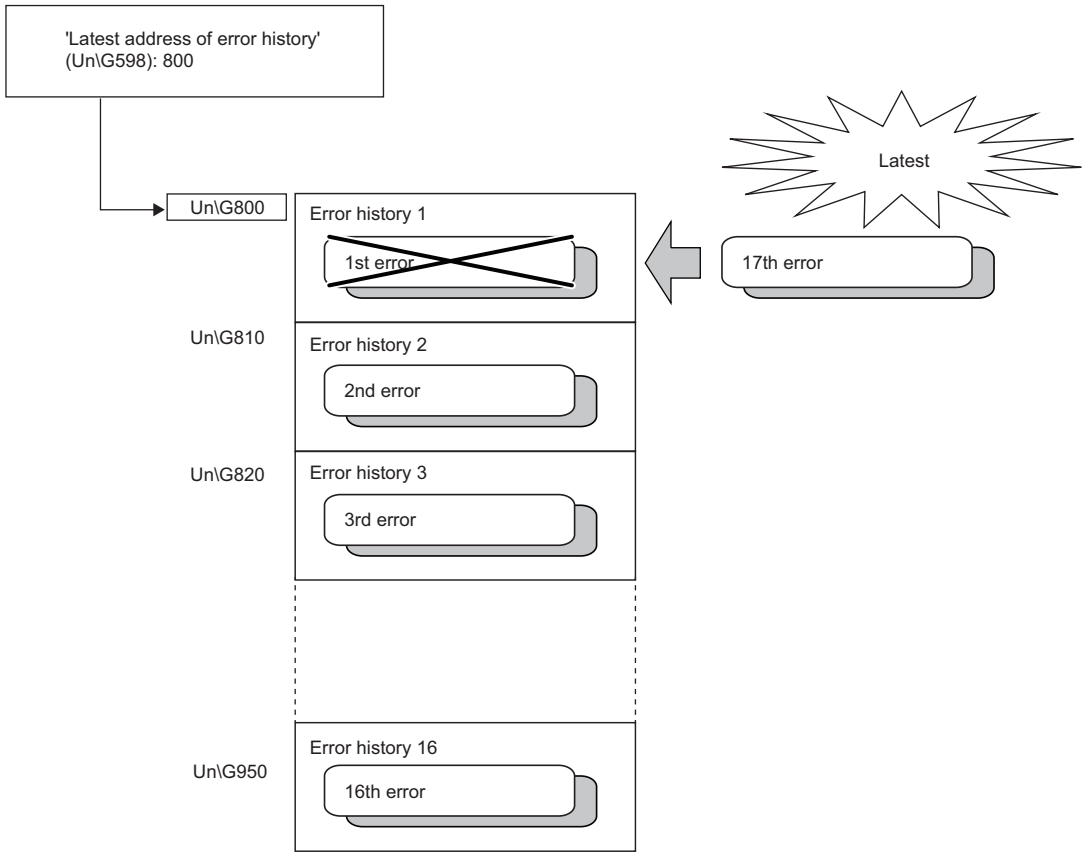
Ex.

The following shows an example of when the third error occurs. The third error is stored in Error history 3, and the value 820 (start address of Error history 3) is stored in 'Latest address of error history' (Un\G598).



Ex.

The following shows an example of when the 17th error occurs. The 17th error is stored in Error history 1, and 'Latest address of error history' (Un\G598) is overwritten with the value 800 (start address of Error history 1).



Point

- Once the error history storage area becomes full, subsequent error information will overwrite the existing data, starting from Error history 1 (Un\G800 to Un\G809), and the overwriting continues sequentially thereafter. The overwritten history is deleted.
- The same processing is performed for the alarm history when an alarm occurs.

1.11 Event History Function

This function collects errors and alarms that occur on and operations executed on the pulse input module as event information in the CPU module.

The CPU module collects the event information of the pulse input module and keeps it in the data memory inside of the CPU module or on an SD memory card.

The event information collected by the CPU module can be displayed on an engineering tool to check the occurrence history in a time series.

Event type	Classification	Description
System	Error	An error detected by the self-diagnostics in each module.
	Warning	A warning (alarm) detected in each module.
	Information	The operation by the normal detection of the system that is not classified as Error or Warning, or the operation performed automatically by the system.
Security	Warning	Operation that is judged as an unauthorized access to each module.
	Information	Operation that is hard to be judged as the success of unlocking passwords or an unauthorized access.
Operation	Warning	Deleting (data clear) operations that may change the action. (These operations are not judged as errors by the self-diagnostics.)
	Information	Operations performed by users to change the system operation or configuration.

Setting method

The event history function can be set from the event history setting window of the engineering tool. For the setting method, refer to the following.

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

Displaying the event history

Access the menu window of the engineering tool. For details on the operating procedure and how to view the contents, refer to the following.

GX Works3 Operating Manual

Lists of event history data

The following tables list the events that occur on the pulse input module when the event type is set to "System" or "Operation".

- The event type is "System"

Event code	Event classification	Event name	Event details	Additional information
500	Information	Carry over detection	Carry over was detected in the accumulating counter. ■Cause 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeded 99999999 when the ring counter was selected. ■Action Set 'CH1 Carry over reset request' (Un\G387) to Reset request (1).	Corresponding channel number

- The event type is "Operation"

Event code	Event classification	Event name	Event details	Additional information
20013	Information	Error reset for a channel	An error reset request was issued. ■Cause An error reset request was issued for a specified channel by the user.	Corresponding channel number
20040	Information	Error clear	An error clear operation was executed. ■Cause An error clear operation was executed by the user.	—
27000	Information	Counter reset	A counter reset request was issued. ■Cause A counter reset request was issued for a specified channel by the user.	• Corresponding channel number • Preset setting value for accumulating count value (for the corresponding channel)

1.12 Q Series-Compatible Mode Function

This function can be used to arrange the buffer memory addresses of the pulse input module in a manner equivalent to that of MELSEC-Q series modules. This makes it possible to reuse sequence programs used with MELSEC-Q series modules.
The MELSEC-Q series compatibility target module is shown below.

MELSEC iQ-R series target module	MELSEC-Q series
RD60P8-G	QD60P8-G

Operation

In Q series-compatible mode, only the buffer memory assignment is changed. The assignment of I/O signals (X/Y) does not change from R mode and is the same as on the QD60P8-G.
For details on Q series-compatible mode buffer memory assignment, refer to the following.
☞ Page 72 When Q series-compatible mode is used

Point

- When reusing MELSEC-Q series sequence programs, if error codes are set to operation conditions or interlock conditions, the programs will not operate normally.
- In Q series-compatible mode, it is not possible to create programs that use RD60P8-G module labels. When using module labels, create programs in R mode.

Setting method

1. When adding a new module, select a module that has "(Q)" at the end of its module model name.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]

2. Set the module parameters the same as when using R mode.
3. After writing the module parameters, restart the CPU module.

Point

- During module operation, it is not possible to switch between R mode and Q series-compatible mode.
- QD60P8-G projects created in GX Works2 can be read from GX Works3. The read project inherits the QD60P8-G settings as the RD60P8-G settings. The settings that can be inherited are the switch setting, parameter setting, auto refresh setting, and I/O assignment setting. For the method to read other file formats in GX Works3, refer to GX Works3 Operating Manual.

2 PARAMETER SETTINGS

Set the parameters of each channel.

Setting parameters here eliminates the need to program them.

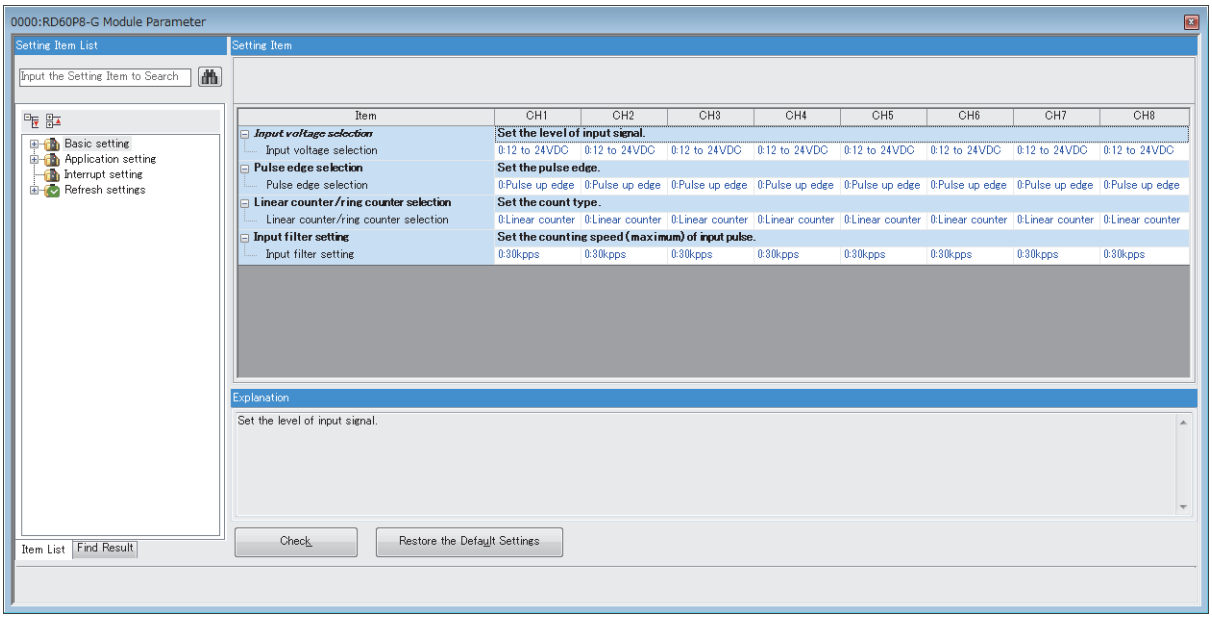
2.1 Basic Setting

Setting method

Open "Basic setting" of the engineering tool.

1. Start the module parameter.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Basic setting]



2. Click the item to be changed to enter the setting value.

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

Click the [▼] button of the item to be set, and from the drop-down list that appears, select the value.

• Item where a value is entered into the text box

Double-click the item to be set to enter the numeric value.

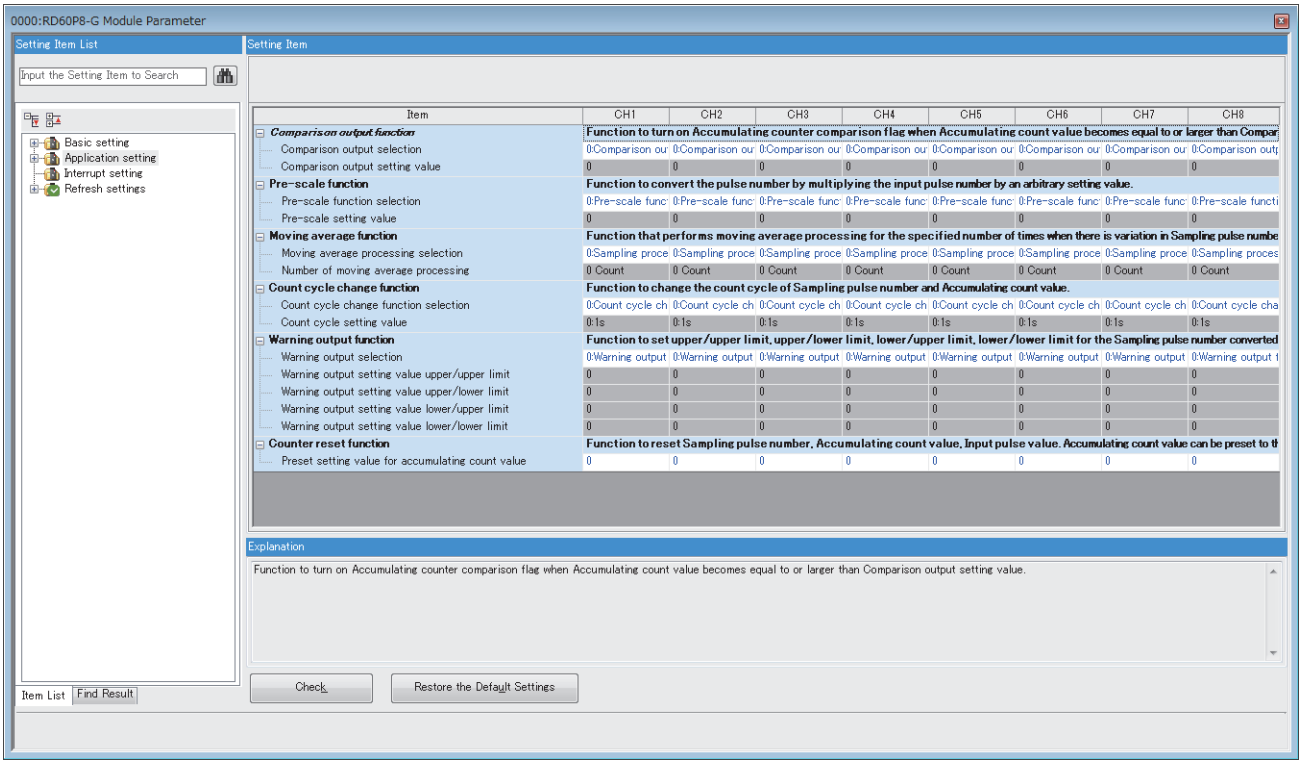
2.2 Application Setting

Setting method

Open "Application setting" of the engineering tool.

1. Start the module parameter.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Application setting]



2. Click the item to be changed to enter the setting value.

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

Click the [▼] button of the item to be set, and from the drop-down list that appears, select the value.

• Item where a value is entered into the text box

Double-click the item to be set to enter the numeric value.

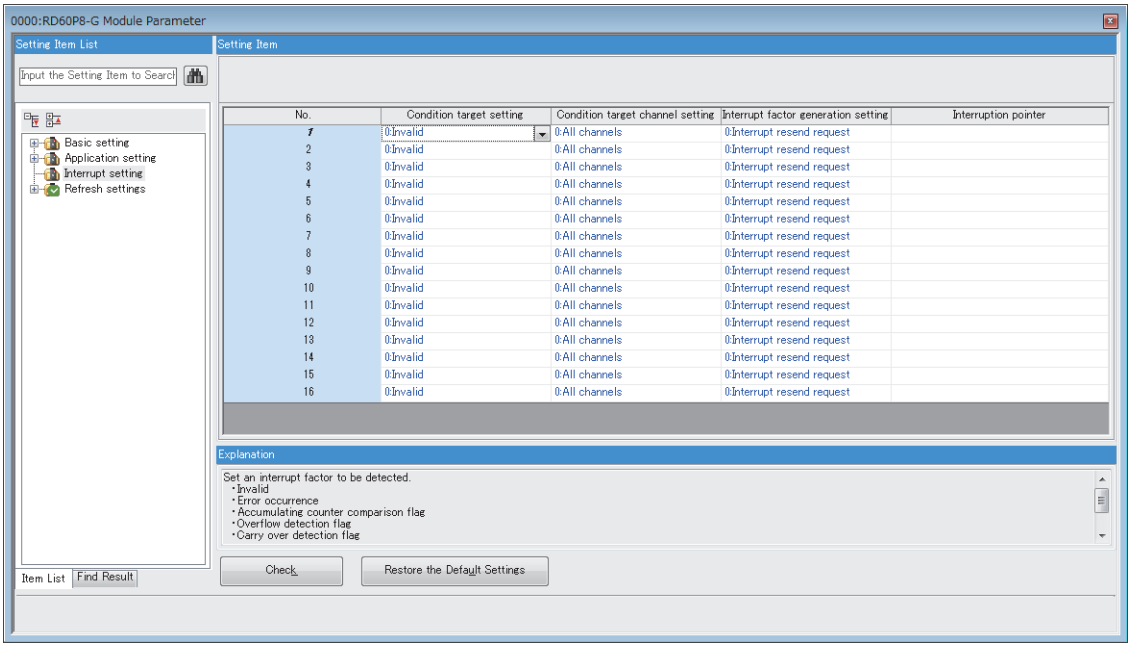
2.3 Interrupt Setting

Setting method

Open "Interrupt setting" of the engineering tool.

1. Start the module parameter.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Interrupt setting]



2. Click the item to be changed to enter the setting value.

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

Click the [▼] button of the item to be set, and from the drop-down list that appears, select the value.

• Item where a value is entered into the text box

Double-click the item to be set to enter the numeric value.

2.4 Refresh Settings

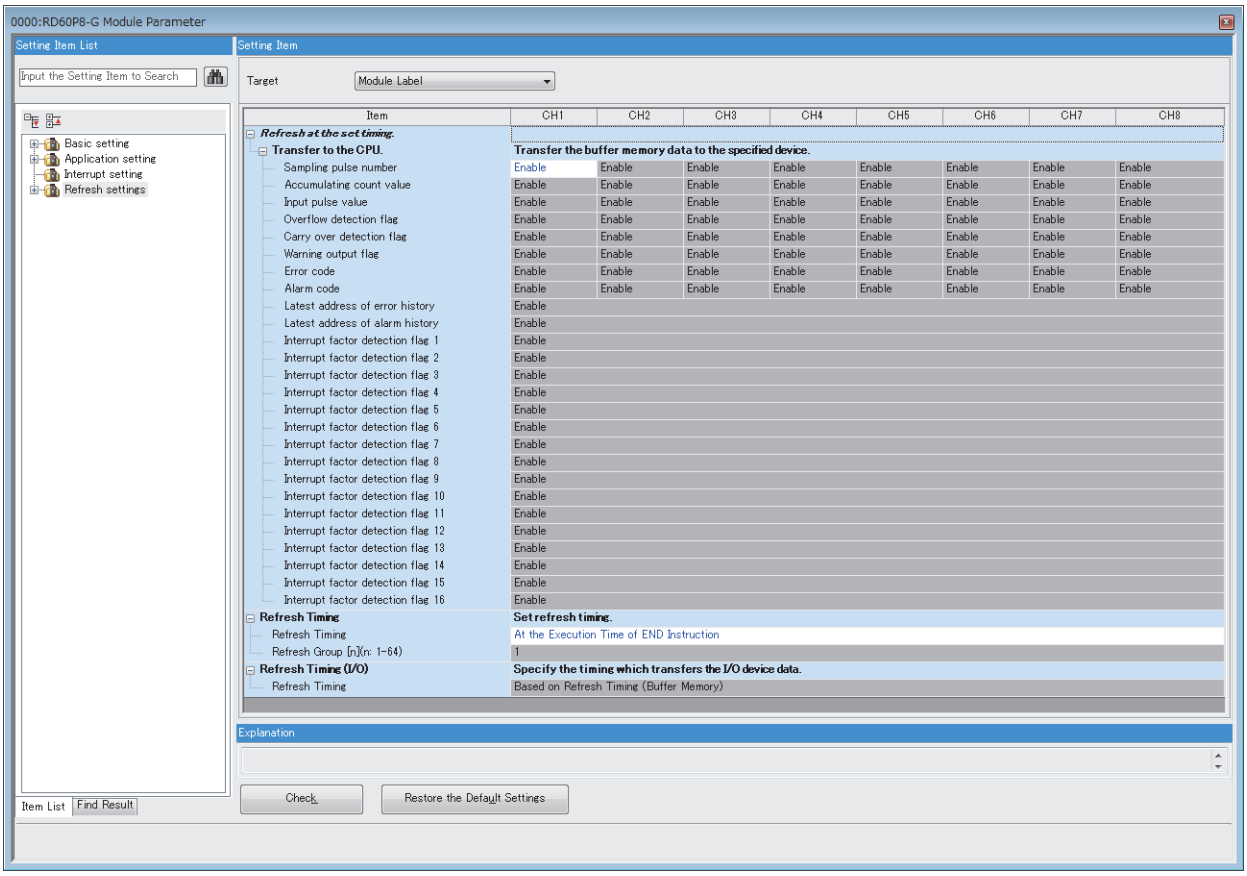
Setting method

Set the buffer memory area of the pulse input module to be refreshed.

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

1. Start the module parameter.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Module model name ⇨ [Refresh settings]



2. Click "Target" and set the refresh target.

• When "Target" is "Module Label"

Set whether to enable or disable the refresh by setting "Sampling pulse number" to Enable or Disable.

• When "Target" is "Refresh Data Register (RD)"

The transfer destinations of all items are automatically set by setting the start device to "Start Device Name".

• When "Target" is "Device"

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

3. Click "Refresh Timing" to set the timing of the refresh operation.

Set "Refresh Timing" to "At the Execution Time of END Instruction" or "At the Execution Time of Specified Program".

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

Point

When the refresh is enabled, the refresh target values will be valid at the timing set in the engineering tool. At that time, buffer memory areas are overwritten with the refresh target values. 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.

Refresh processing time

The refresh processing time [μs] is an element that configures 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 following shows a formula to calculate the refresh processing time [μs] with the refresh settings enabled.

• Refresh processing time [μs] = Refresh read (refresh transfer to the CPU module) time

The refresh read time varies depending on the settings of "Target".

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

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

Model	Classification	When using the refresh settings
RD60P8-G	Refresh read time	20.77μs
RD60P8-G(Q)	Refresh read time	32.43μs

When "Target" is Device

Calculate the refresh read time from the number of items where the refresh settings have been set and the number of transfers (words). For the calculation method, refer to the following.

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

3 TROUBLESHOOTING

This chapter describes errors that may occur in the use of the pulse input module and the corresponding troubleshooting.

3.1 Checking with LEDs

Check the display status of the LEDs to narrow down the possible causes of the trouble. This step is the first diagnostic before using the engineering tool.

The statuses of the pulse input module can be checked with the RUN LED, ERR LED, and ALM LED. The following table shows the correspondence of these LEDs and the statuses of the pulse input module.

Name	Description
RUN LED	Indicates the operating status of the module. On: Normal operation Flashing (400ms cycles): Selected as a module for the online module change Off: 5V power off, watchdog timer error occurred, or module replacement allowed in the process of the online module change
ERR LED	Indicates the error status of the module.*1 On: Error occurred Off: Normal operation
ALM LED	Indicates the alarm status of the module.*2 On: Alarm occurred Off: Normal operation

*1 For details, refer to the following.
☞ Page 54 List of Error Codes

*2 For details, refer to the following.
☞ Page 56 List of Alarm Codes

3.2 Checking the Status of the Module

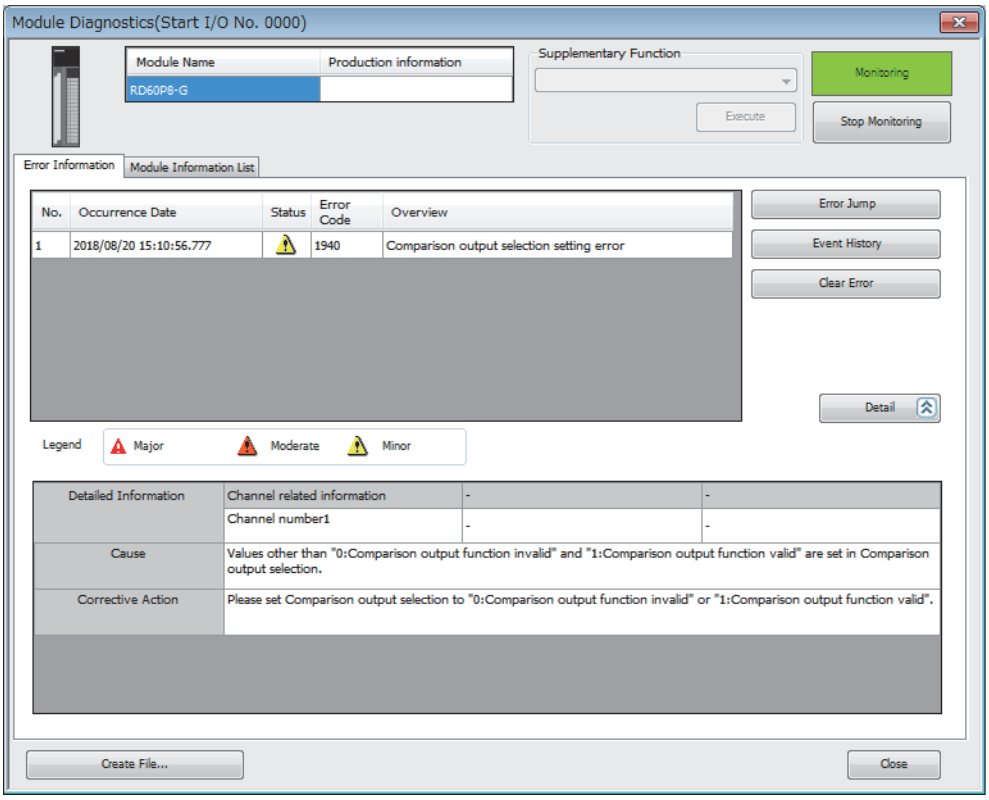
The following functions can be used on the "Module Diagnostics" window of the pulse input module.

Function	Application
Error Information	Displays the details of the errors currently occurring. Click the [Event History] button to check not only the errors and alarms that have occurred on the pulse input module, but also the errors detected by each module and the operation history.
Module Information List	Displays various status information of the pulse input module.

Error Information

Check the details and actions for the errors that have occurred.

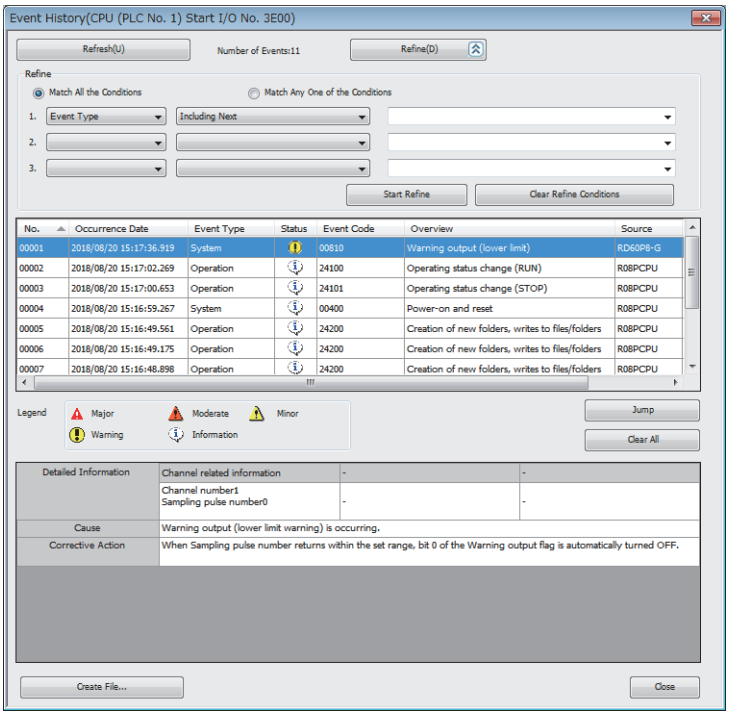
[Diagnostics] ⇨ [System Monitor] ⇨ Right-click the module to be checked. ⇨ "Module Diagnostics"



Item	Description
Cause	Displays the detailed error causes.
Corrective Action	Displays the actions for the error.

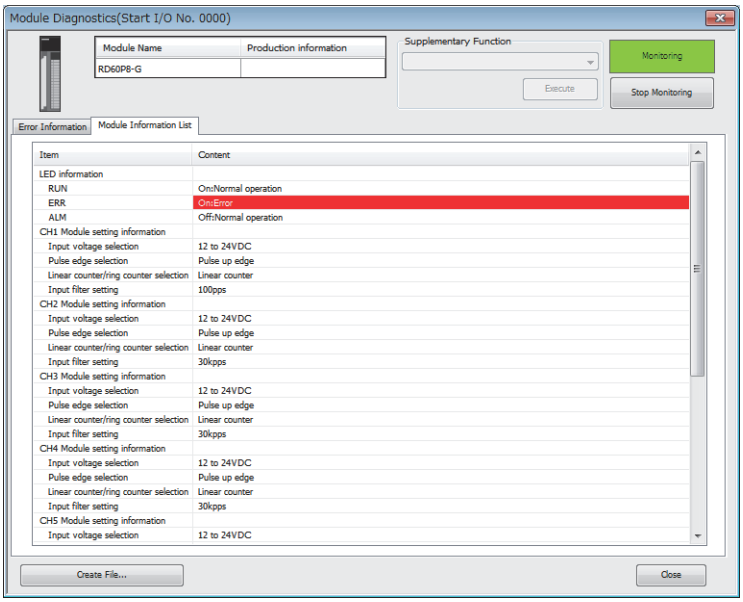
Check alarm codes, error history, and alarm history on the Event History window of the engineering tool.

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



Module Information List

Switch to the "Module Information List" tab to check various status information of the pulse input module.



Item	Description
LED information	Displays the LED status of the pulse input module.
CH□ Module setting information	Displays the setting details of "Basic setting" of the module parameter.

3.3 Troubleshooting by Symptom

When the RUN LED flashes or turns off

When flashing

Check item	Cause	Action
Check whether the module is selected as the target module for the online module change.	The base number and slot number of the pulse input module have been set in Module selection specification (Base No.) (SD1600) and Module selection specification (Slot No.) (SD1601).	Turn on Module selection cancel request flag (SM1615).

When turning off

Check item	Action
Check whether the power is supplied.	Check that the supply voltage of 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 status of the module.
Check whether the module replacement is allowed in the process of the online module change.	Perform the online module change. For details, refer to the following manual. 📖 MELSEC iQ-R Online Module Change Manual
Cases other than the above	Reset the CPU module and check if 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 ERR LED turns on

When turning on

Check item	Action
Check whether any error has occurred.	Check 'CH1 Error code' (Un\G9) and take actions described in the list of error codes. ☞ Page 54 List of Error Codes Error codes are stored in different buffer memory areas depending on the channel on which the error occurred. For details on buffer memory addresses other than CH1, refer to the following. ☞ Page 67 Lists of buffer memory addresses

When the ALM LED turns on

When turning on

Check item	Action
Check whether any alarm has occurred.	Check 'CH1 Alarm code' (Un\G10) and take actions described in the list of alarm codes. ☞ Page 56 List of Alarm Codes Alarm codes are stored in different buffer memory areas depending on the channel on which the alarm occurred. For details on buffer memory addresses other than CH1, refer to the following. ☞ Page 67 Lists of buffer memory addresses

When the count cannot be started or cannot be performed normally

Check item		Action
Check whether the external wiring to the terminal block is normal.		Check the external wiring. (📖 MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Startup))
Measures to reduce noise	Check whether a shielded twisted pair cable is used for the pulse input cable.	Use a shielded twisted pair cable for the pulse input cable.
	Check for the intrusion of noise from the grounding part of the pulse input module.	Disconnect the ground cable of the pulse input module. If the pulse input module case is in contact with the grounding part, separate the pulse input module from the grounding part.
	Check whether measures to reduce noise have been implemented within the panel and on adjacent devices.	Implement measures to reduce noise such as attaching CR surge suppressors to magnet switches and similar devices.
	Check whether the distance between high voltage devices and the pulse input cable is sufficient.	Ensure that the pulse input cable has its own pipe and, even with in-panel wiring, keep a distance of 150mm or more between the pulse input cable and the power cable.
Apply voltage to the pulse input terminal from a stabilized power supply or a similar device and check whether the CH□ LED turns on.		If it turns on, check the external wiring and the wiring on the pulse generator side. If it remains off, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.
Check whether the "Input voltage selection" setting of the module parameter matches the actual input pulse voltage.		Correct "Input voltage selection" of the module parameter to match the actual input pulse voltage.
Check whether the input pulse edge (rise/fall) being counted is correct.		Check whether the input pulses are being counted on the rising edge or on the falling edge, and then correct "Pulse edge selection" of the module parameter.
Check whether the maximum speed of the input pulse is within the range of the counting speed set with "Input filter setting" of the module parameter.		Correct "Input filter setting" of the module parameter to match the maximum speed of the input pulse.
Check whether the input pulse waveform meets the performance specifications.		Observe and check the pulse waveform with a synchroscope or a similar device. If the input pulse does not meet the performance specifications, apply an input pulse that does. (📖 MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Startup))
Check whether 'CH1 Accumulating count value' (Un\G2, Un\G3) and 'CH1 Input pulse value' (Un\G4, Un\G5) are read in units of two words (32 bits) when read by a program.		Perform batch reading of these values in units of two words (32 bits).
Check whether the input pulse values are the same when the same pulse is applied to multiple channels.		If the input pulse values are different, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.
Check whether 'CH1 Count enable' (Y18) is on.		Turn on 'CH1 Count enable' (Y18) from a program.
Check whether Overflow detection (1) is stored in 'CH1 Overflow detection flag' (Un\G6).		Set 'CH1 Counter reset request' (Un\G386) to Reset request (1) to reset 'CH1 Accumulating count value' (Un\G2, Un\G3).
Check whether 'CH1 Pre-scale setting value' (Un\G135) is set to 0.		Set 'CH1 Pre-scale setting value' (Un\G135) to a value other than 0.

Pulse shaping method

As one action against external noise and waveform distortion, this section describes a pulse waveform shaping method using a dummy resistor.

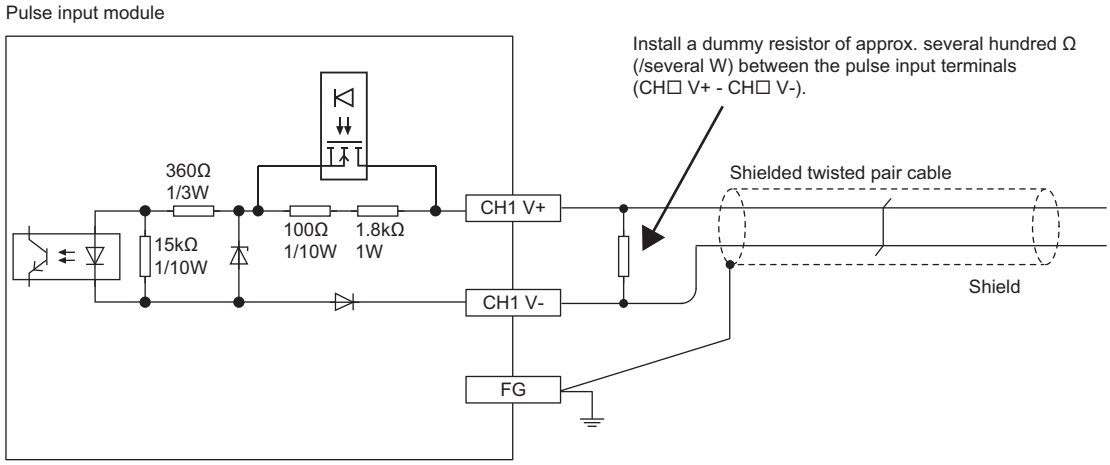
To shape a pulse waveform, it is effective to increase the load current within the cable by inserting a dummy resistor of approximately a few hundred ohms (/a few watts) between the pulse input terminals connected to the pulse generator. The larger the load current, the more effective this shaping method is.

The following countermeasure results can be obtained with this shaping method.

- Improved waveform distortion and stabilized pulse waveforms when the wiring distance between the pulse generator and the pulse input module is large
- Stabilized pulse waveforms and suppressed influence of noise by way of waveform shaping when the pulse waveforms are disturbed in environments where external noise is present

Ex.

The following shows a connection example of a CH1 dummy resistor with a signal level of 24VDC.



An example showing how to select the dummy resistor (how to calculate the resistance contact and rated power of the dummy resistor) is given below.

Target	Calculation method
Resistance constant of the dummy resistor (load current: approximately 30mA)	Calculate the resistance constant (R). • R = V ÷ I = 24V ÷ 30mA = 800Ω
Rated power of the dummy resistor (load current: approximately 30mA)	Calculate the power (P1). • P1 = V × I = 24V × 30mA = 0.72W From the power (P1), calculate the power including the margin (P2). • P2 = P1 × 2 = 0.72 × 2 = 1.44W (approximately 2W)

From the calculation results in the above table, it can be seen that it is beneficial to add a dummy resistor of 800Ω (/2W) between the pulse input terminals.

3.4 List of Error Codes

The pulse input module stores an error code in a buffer memory area of the error channel when an error occurs during its operation. In addition, the input signal (X) of the error channel listed below turns on.
To clear the error, turn on the output signal (Y) of the error channel listed below so that the error code stored in a buffer memory area of the error channel is cleared. With this timing, the input signal (X) of the error channel listed below turns off.
The corresponding buffer memory area and I/O signals (X/Y) vary depending on the channel where an error has occurred.

Error channel	Buffer memory area	Input signal (X)	Output signal (Y)
CH1	'CH1 Error code' (Un\G9)	'CH1 Error occurrence' (X8)	'CH1 Error reset request' (Y8)
CH2	'CH2 Error code' (Un\G25)	'CH2 Error occurrence' (X9)	'CH2 Error reset request' (Y9)
CH3	'CH3 Error code' (Un\G41)	'CH3 Error occurrence' (XA)	'CH3 Error reset request' (YA)
CH4	'CH4 Error code' (Un\G57)	'CH4 Error occurrence' (XB)	'CH4 Error reset request' (YB)
CH5	'CH5 Error code' (Un\G73)	'CH5 Error occurrence' (XC)	'CH5 Error reset request' (YC)
CH6	'CH6 Error code' (Un\G89)	'CH6 Error occurrence' (XD)	'CH6 Error reset request' (YD)
CH7	'CH7 Error code' (Un\G105)	'CH7 Error occurrence' (XE)	'CH7 Error reset request' (YE)
CH8	'CH8 Error code' (Un\G121)	'CH8 Error occurrence' (XF)	'CH8 Error reset request' (YF)

Error codes of the pulse input module are classified as minor errors or moderate errors.

- Minor error: An error that occurs due to failure of programs such as a fault in execution timing. Each function can be performed normally after the error cause is eliminated by reviewing programs. (Number in the 1000s + H)
- Moderate error: An error such as a hardware failure. The count operation does not continue. (Number in the 3000s + H)

The following table lists the error codes to be stored.
△ in error codes: For what this symbol indicates, refer to Description and cause.

Error code	Error name	Description and cause	Action
0000H	—	There is no error.	—
180△H[*1*2]	Interrupt factor generation setting range error	A value other than Interrupt resend request (0) and No interrupt resend request (1) is set in Interrupt factor generation setting [n]. △ indicates the interrupt setting related to the error as follows: 0: Setting 1 to F: Setting 16	Set Interrupt factor generation setting [n] to Interrupt resend request (0) or No interrupt resend request (1).
181△H[*1*2]	Condition target setting range error	A value other than Invalid (0) to Warning output flag (5) has been set in Condition target setting [n]. △ indicates the interrupt setting related to the error as follows: 0: Setting 1 to F: Setting 16	Set Condition target setting [n] to a value from Invalid (0) to Warning output flag (5).
182△H[*1*2]	Condition target channel setting range error	A value other than All channels (0) to CH8 (8) has been set in Condition target channel setting [n]. △ indicates the interrupt setting related to the error as follows: 0: Setting 1 to F: Setting 16	Set Condition target channel setting [n] to a value from All channels (0) to CH8 (8).
1900H[*3*4]	Overflow error	CH☐ Accumulating count value exceeded 99999999 when the ring counter was selected.	Set CH☐ Preset setting value for accumulating count value to a value between 0 and 99999999, and then set CH☐ Counter reset request to Reset request (1) to reset CH☐ Accumulating count value. (It is necessary to restart the count operation with CH☐ Counter reset request.)
1920H[*4*5]	Preset setting value for accumulating count value setting error	A value other than 0 to 99999999 is set in CH☐ Preset setting value for accumulating count value.	Set CH☐ Preset setting value for accumulating count value to a value between 0 and 99999999, and then set CH☐ Counter reset request to Reset request (1).
1940H[*1]	Comparison output selection setting error	A value other than Comparison output function invalid (0) and Comparison output function valid (1) is set in CH☐ Comparison output selection.	Set CH☐ Comparison output selection to Comparison output function invalid (0) or Comparison output function valid (1).
1941H[*1]	Comparison output setting value setting error	A value other than 0 to 99999999 is set in CH☐ Comparison output setting value.	Set CH☐ Comparison output setting value to 0 to 99999999.
1AA0H[*1]	Moving average processing selection setting error	A value other than Sampling processing (0) and Moving average processing (1) is set in CH☐ Moving average processing selection.	Set CH☐ Moving average processing selection to Sampling processing (0) or Moving average processing (1).
1AA1H[*1]	Number of moving average processing setting error	A value other than 2 to 60 is set in CH☐ Number of moving average processing.	Set CH☐ Number of moving average processing to 2 to 60.

Error code	Error name	Description and cause	Action
1AB0H*1	Pre-scale function selection setting error	A value other than Pre-scale function invalid (0) to ×0.0001 (5) is set in CH☐ Pre-scale function selection.	Set CH☐ Pre-scale function selection to a value from Pre-scale function invalid (0) to ×0.0001 (5).
1AB1H*1	Pre-scale setting value setting error	A value other than 0 to 32767 is set in CH☐ Pre-scale setting value.	Set CH☐ Pre-scale setting value to 0 to 32767.
1AC0H*1	Warning output selection setting error	A value other than Warning output function invalid (0) and Warning output function valid (1) is set in CH☐ Warning output selection.	Set CH☐ Warning output selection to Warning output function invalid (0) or Warning output function valid (1).
1AC1H*1	Warning output setting value upper/upper limit setting error	A value other than 0 to 32767 is set in CH☐ Warning output setting value upper/upper limit.	Set CH☐ Warning output setting value upper/upper limit to 0 to 32767.
1AC2H*1	Warning output setting value upper/lower limit setting error	A value other than 0 to 32767 is set in CH☐ Warning output setting value upper/lower limit.	Set CH☐ Warning output setting value upper/lower limit to 0 to 32767.
1AC3H*1	Warning output setting value lower/upper limit setting error	A value other than 0 to 32767 is set in CH☐ Warning output setting value lower/upper limit.	Set CH☐ Warning output setting value lower/upper limit to 0 to 32767.
1AC4H*1	Warning output setting value lower/lower limit setting error	A value other than 0 to 32767 is set in CH☐ Warning output setting value lower/lower limit.	Set CH☐ Warning output setting value lower/lower limit to 0 to 32767.
1AC5H*1	Warning output setting value setting error	Some values set as warning output setting values do not satisfy the following condition. Upper/upper limit ≥ Upper/lower limit > Lower/upper limit ≥ Lower/lower limit	Set the following buffer memory areas so that the condition of Upper/upper limit ≥ Upper/lower limit > Lower/upper limit ≥ Lower/lower limit is satisfied. • CH☐ Warning output setting value upper/upper limit • CH☐ Warning output setting value upper/lower limit • CH☐ Warning output setting value lower/upper limit • CH☐ Warning output setting value lower/lower limit
1AD0H*1	Count cycle change function selection setting error	A value other than Count cycle change function invalid (0) and Count cycle change function valid (1) is set in CH☐ Count cycle change function selection.	Set CH☐ Count cycle change function selection to Count cycle change function invalid (0) or Count cycle change function valid (1).
1AD1H*1	Count cycle setting value setting error	A value other than 1s (0) to 500ms (3) is set in CH☐ Count cycle setting value.	Set CH☐ Count cycle setting value to a value from 1s (0) to 500ms (3).
3001H*2*6	Hardware failure	A hardware failure has occurred in the module.	Power off and on the module. If the error occurs again, the possible cause is a failure of the module. Please consult your local Mitsubishi representative.

*1 When the error occurs, the count operation does not start for all channels.
*2 Since the error does not occur separately on each channel, the error code is stored in 'CH1 Error code' (Un\G9).
*3 The count operation stops for the channel where the error has occurred.
*4 The counting operates normally for channels where no error has occurred.
*5 The count operation continues without reset for the channel where the error has occurred.
*6 When the error occurs, 'Module READY' (X0) turns off.

3.5 List of Alarm Codes

The pulse input module stores an alarm code in a buffer memory area of the alarm channel when an alarm occurs during its operation.

To clear the alarm, turn on the output signal (Y) of the alarm channel listed below so that the alarm code stored in a buffer memory area of the alarm channel is cleared.

The corresponding buffer memory area and output signals (Y) vary depending on the channel where an alarm has occurred.

Alarm channel	Buffer memory area	Output signal (Y)
CH1	'CH1 Alarm code' (Un\G10)	'CH1 Error reset request' (Y8)
CH2	'CH2 Alarm code' (Un\G26)	'CH2 Error reset request' (Y9)
CH3	'CH3 Alarm code' (Un\G42)	'CH3 Error reset request' (YA)
CH4	'CH4 Alarm code' (Un\G58)	'CH4 Error reset request' (YB)
CH5	'CH5 Alarm code' (Un\G74)	'CH5 Error reset request' (YC)
CH6	'CH6 Alarm code' (Un\G90)	'CH6 Error reset request' (YD)
CH7	'CH7 Alarm code' (Un\G106)	'CH7 Error reset request' (YE)
CH8	'CH8 Alarm code' (Un\G122)	'CH8 Error reset request' (YF)

The following table lists the alarm codes to be stored.

Alarm code	Alarm name	Description and cause	Action
0800H*1	Warning output (upper limit)	A warning output (upper limit warning) has occurred.	When the value in CH☐ Sampling pulse number returns to within the setting range, Normal (0) is automatically stored in bit 8 of CH☐ Warning output flag.
0810H*1	Warning output (lower limit)	A warning output (lower limit warning) has occurred.	When the value in CH☐ Sampling pulse number returns to within the setting range, Normal (0) is automatically stored in bit 0 of CH☐ Warning output flag.

*1 The count operation continues for the channel where the alarm has occurred.

APPENDICES

Appendix 1 Module Label

The functions of the pulse input module can be set by using module labels.

Module labels of I/O signals

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

- "Module name"_"module number".b"label name"
- "Module name"_"module number".b"label name"_D
- "Module name"_"module number".b"label name"["(channel)"]
- "Module name"_"module number".b"label name"_D["(channel)"]

Ex.

RD60P8G_1.bModuleREADY_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.

■Channel

The channel number corresponding to a module label is given. A numerical value of 0 to 7 is used to correspond to CH1 to CH8.

(CH1: 0, CH2: 1, CH3: 2, CH4: 3, CH5: 4, CH6: 5, CH7: 6, CH8: 7)

■_D

This string indicates that the module label is for 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 one of the following structures:

- "Module name"_"module number"."data format""label name"
- "Module name"_"module number"."data format""label name"_D
- "Module name"_"module number"."data type"["(channel)"]."data format""label name"
- "Module name"_"module number"."data type"_D["(channel)"]."data format""label name"_D

Ex.

RD60P8G_1.stnMonitor1_D[0].uSamplingPulseNumber_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 the buffer memory area is given. Each data type is as follows:

Data type	Description
stnMonitor1 stnMonitor2	Monitor
stnControl	Control
stnSetting	Setting

■Channel

The channel number corresponding to a module label is given. A numerical value of 0 to 7 is used to correspond to CH1 to CH8.

(CH1: 0, CH2: 1, CH3: 2, CH4: 3, CH5: 4, CH6: 5, CH7: 6, CH8: 7)

■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]
ud	Double word [unsigned]

■Label name

The label identifier unique to a module is given.

■_D

This string indicates that the module label is for direct access. A module label without the string is for auto refresh. The following table shows the differences between 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 time of auto refresh. This shortens the program execution time. To use auto refresh, set "Target" to Module Label in "Refresh settings" of the module parameter.	At auto refresh	RD60P8G_1.stnMonitor1[0].uSamplingPulseNumber
Direct access	Values that are read from or written to the module label are reflected in the module instantly. Compared with auto refresh, the program execution time becomes longer. However, the responsiveness is high.	At reading from/writing to the module label	RD60P8G_1.stnMonitor1_D[0].uSamplingPulseNumber_D

Appendix 2 I/O Signals

List of I/O signals

The following tables list the I/O signals of the pulse input module.
For details on the I/O signals, refer to the following.
☞ Page 61 Details of input signals
☞ Page 65 Details of output signals

Point

- The I/O numbers (X/Y) described below are for the case when the start I/O number of the pulse input module is set to 0.
- Do not use the "Use prohibited" signals shown below because the system uses them. If users use (turn off and on) the signals, the operations of the pulse input module cannot be guaranteed.

Input signals

Device number	Signal name
X0	Module READY
X1	Operating condition setting complete flag
X2 to X7	Use prohibited
X8	CH1 Error occurrence
X9	CH2 Error occurrence
XA	CH3 Error occurrence
XB	CH4 Error occurrence
XC	CH5 Error occurrence
XD	CH6 Error occurrence
XE	CH7 Error occurrence
XF	CH8 Error occurrence
X10	CH1 Accumulating counter comparison flag
X11	CH2 Accumulating counter comparison flag
X12	CH3 Accumulating counter comparison flag
X13	CH4 Accumulating counter comparison flag
X14	CH5 Accumulating counter comparison flag
X15	CH6 Accumulating counter comparison flag
X16	CH7 Accumulating counter comparison flag
X17	CH8 Accumulating counter comparison flag
X18 to X1F	Use prohibited

Output signals

Device number	Signal name
Y0	Use prohibited
Y1	Operating condition setting request flag
Y2 to Y7	Use prohibited
Y8	CH1 Error reset request
Y9	CH2 Error reset request
YA	CH3 Error reset request
YB	CH4 Error reset request
YC	CH5 Error reset request
YD	CH6 Error reset request
YE	CH7 Error reset request
YF	CH8 Error reset request
Y10	CH1 Comparison signal reset request
Y11	CH2 Comparison signal reset request
Y12	CH3 Comparison signal reset request
Y13	CH4 Comparison signal reset request
Y14	CH5 Comparison signal reset request
Y15	CH6 Comparison signal reset request
Y16	CH7 Comparison signal reset request
Y17	CH8 Comparison signal reset request
Y18	CH1 Count enable
Y19	CH2 Count enable
Y1A	CH3 Count enable
Y1B	CH4 Count enable
Y1C	CH5 Count enable
Y1D	CH6 Count enable
Y1E	CH7 Count enable
Y1F	CH8 Count enable

Details of input signals

This section describes the details of the input signals for the pulse input module that are assigned to the CPU module.
The I/O numbers (X/Y) described in this section are for the case when the start I/O number of the pulse input module is set to 0.

Point

This section describes I/O signals and buffer memory addresses for CH1. For details on the I/O signals and buffer memory addresses for CH2 and later, refer to the following.

☞ Page 59 List of I/O signals
☞ Page 67 Lists of buffer memory addresses

Module READY

Module READY turns on to indicate that this module has started normally after the power-on or after the reset operation of the CPU module. It turns off when a watchdog timer error occurs on the pulse input module. When this signal is off, input pulses are not counted.

■Device number

The following shows the device number of this input signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Module READY	X0							

A

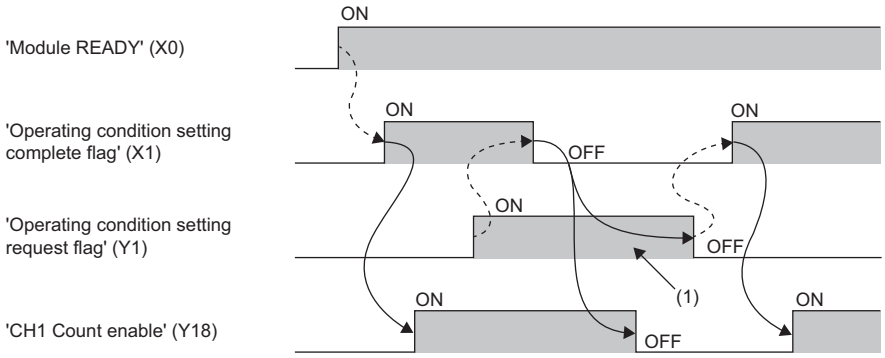
Operating condition setting complete flag

When changing the values of the buffer memory, use 'Operating condition setting complete flag' as an interlock condition to turn on and off 'Operating condition setting request flag' (Y1). For the buffer memory items that require 'Operating condition setting request flag' (Y1) to be turned on and off to enable the new values, refer to the following.

☞ Page 67 Lists of buffer memory addresses

When this signal is off, input pulses are not counted. Check that 'Operating condition setting complete flag' (X1) is on before turning on 'CH1 Count enable' (Y18) to start the count operation.

When 'Operating condition setting request flag' (Y1) is on, 'Operating condition setting complete flag' (X1) turns off.



Performed by the pulse input module

Performed by a program

(1) When using a program to turn on 'Operating condition setting request flag' (Y1), ensure that it remains on for 10ms or more.

■Device number

The following shows the device number of this input signal.

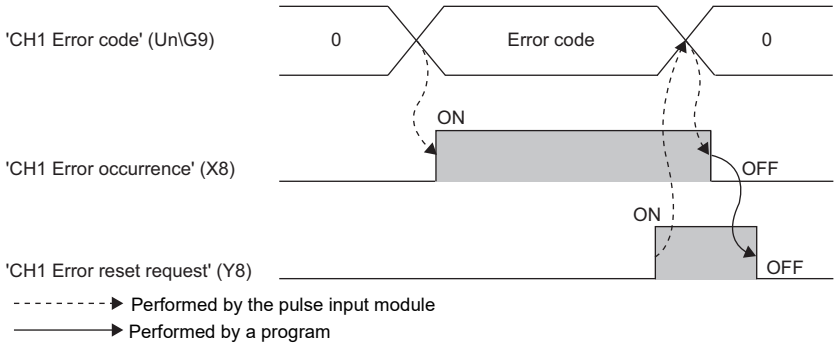
Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Operating condition setting complete flag	X1							

Point

If an out-of-setting-value-range error occurs, this signal will not turn on even if 'Operating condition setting request flag' (Y1) is turned on and off. After clearing the error cause, turn on and off 'Operating condition setting request flag' (Y1). Create programs that keep this signal on for 10ms or more.

CH1 Error occurrence

When an error occurs, the version of this signal corresponding to the channel on which the error occurred turns on.



■Turning off 'CH1 Error occurrence' (X8)

Eliminating the error cause and turning on and off 'CH1 Error reset request' (Y8) or 'Operating condition setting request flag' (Y1) clears the following.

- 'CH1 Error occurrence' (X8)
- 'CH1 Error code' (Un\G9)

■Device numbers

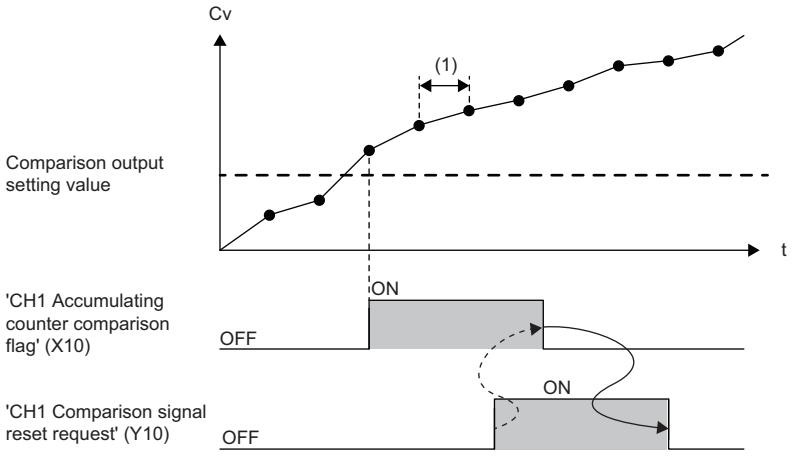
The following shows the device numbers of this input signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH□ Error occurrence	X8	X9	XA	XB	XC	XD	XE	XF

A

CH1 Accumulating counter comparison flag

This signal corresponding to the relevant channel turns on when 'CH1 Accumulating count value' (Un\G2, Un\G3) reaches or exceeds the setting value of 'CH1 Comparison output setting value' (Un\G130, Un\G131).



Cv: Accumulating count value

t: Time

(1) The accumulating count value is compared in the cycle set by 'CH1 Count cycle setting value' (Un\G142).

■Turning off 'CH1 Accumulating counter comparison flag' (X10)

Turning on and off 'CH1 Comparison signal reset request' (Y10) turns off this signal. Once this signal has turned off, it will not turn on until 'CH1 Accumulating count value' (Un\G2, Un\G3) is reset and reaches the setting value of 'CH1 Comparison output setting value' (Un\G130, Un\G131) again.

■Device numbers

The following shows the device numbers of this input signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH□ Accumulating counter comparison flag	X10	X11	X12	X13	X14	X15	X16	X17

Details of output signals

This section describes the details of the output signals for the pulse input module that are assigned to the CPU module.
The I/O numbers (X/Y) described in this section are for the case when the start I/O number of the pulse input module is set to 0.

Point

This section describes I/O signals and buffer memory addresses for CH1. For details on the I/O signals and buffer memory addresses for CH2 and later, refer to the following.
☞ Page 59 List of I/O signals
☞ Page 67 Buffer Memory Areas

Operating condition setting request flag

When the buffer memory values are changed, turn on and off this signal to enable the changed settings.
For the timing of turning on and off the signal, refer to the following.
☞ Page 62 Operating condition setting complete flag
For details on the buffer memory items to be enabled, refer to the following.
☞ Page 67 Lists of buffer memory addresses
Turning on this signal resets the following buffer memory areas.

- 'CH1 Sampling pulse number' (Un\G0)
- 'CH1 Accumulating count value' (Un\G2, Un\G3)
- 'CH1 Input pulse value' (Un\G4, Un\G5)
- 'CH1 Overflow detection flag' (Un\G6)
- 'CH1 Carry over detection flag' (Un\G7)
- 'CH1 Warning output flag' (Un\G8)
- 'CH1 Error code' (Un\G9)
- 'CH1 Alarm code' (Un\G10)

■Clearing errors and alarms

Turning on this signal clears errors and alarms. 'CH1 Error occurrence' (X8) turns off and 'CH1 Error code' (Un\G9) and 'CH1 Alarm code' (Un\G10) are cleared to 0.

■Device number

The following shows the device number of this output signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Operating condition setting request flag	Y1							

■Operation timing

The change is enabled on the rising edge (OFF → ON) of the signal.

CH1 Error reset request

When an error occurs and 'CH1 Error occurrence' (X8) is on or when an alarm occurs, turning on and off this signal corresponding to the relevant channel clears the error and alarm.
For the timing of turning on and off the signal, refer to the following.
☞ Page 63 CH1 Error occurrence

■Device numbers

The following shows the device numbers of this output signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH□ Error reset request	Y8	Y9	YA	YB	YC	YD	YE	YF

■Operation timing

The change is enabled on the rising edge (OFF → ON) of the signal.

CH1 Comparison signal reset request

To turn off 'CH1 Accumulating counter comparison flag' (X10), turn on and off this signal corresponding to the relevant channel.

For the timing of turning on and off the signal, refer to the following.

☞ Page 64 CH1 Accumulating counter comparison flag

■Device numbers

The following shows the device numbers of this output signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Comparison signal reset request	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17

■Operation timing

The change is enabled while the signal is on.

CH1 Count enable

Turn on this signal to start the count operation.

Turning on this signal starts the count operation and stores values in the following buffer memory areas.

- 'CH1 Sampling pulse number' (Un\G0)
- 'CH1 Accumulating count value' (Un\G2, Un\G3)
- 'CH1 Input pulse value' (Un\G4, Un\G5)

When this signal turns off, the count operation stops.

For the timing of turning on and off the signal, refer to the following.

☞ Page 62 Operating condition setting complete flag

■Device numbers

The following shows the device numbers of this output signal.

Signal name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Count enable	Y18	Y19	Y1A	Y1B	Y1C	Y1D	Y1E	Y1F

■Operation timing

The change is enabled while the signal is on.

Appendix 3 Buffer Memory Areas

Lists of buffer memory addresses

This section shows the lists of buffer memory addresses of the pulse input module. For details on the buffer memory, refer to the following.

☞ Page 76 Details of buffer memory addresses

The buffer memory areas of the pulse input module are classified by the following data types.

Data type	Description	
Setting data	Description	Set this data according to the connected device and the application of the system.
	Read/write attribute	Data can be read and written from/to this area.
	Setting method	Set this data using the engineering tool or a program.
	Setting timing	After changing values, turn on and off 'Operating condition setting request flag' (Y1) to enable the setting values.
Control data	Description	Use this data to control the pulse input module.
	Read/write attribute	Data can be read and written from/to this area.
	Setting method	Set this data using the engineering tool or a program.
	Setting timing	As soon as values are changed, the setting values are enabled.
Monitor data	Description	Use this data to monitor the status of the pulse input module.
	Read/write attribute	Only reading data is allowed. Writing data is not allowed.
	Setting method	—
	Setting timing	—

Point

Do not write data to the system areas and areas whose data types are monitor in the buffer memory. Writing data into these areas can cause the module to malfunction.

A

When R mode is used

■Un\G0 to Un\G511

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
0 (0H)	16 (10H)	32 (20H)	48 (30H)	64 (40H)	80 (50H)	96 (60H)	112 (70H)	CH□ Sampling pulse number	0	Monitor	○
1 (1H)	17 (11H)	33 (21H)	49 (31H)	65 (41H)	81 (51H)	97 (61H)	113 (71H)	System area	—	—	—
2 (2H)	18 (12H)	34 (22H)	50 (32H)	66 (42H)	82 (52H)	98 (62H)	114 (72H)	CH□ Accumulating count value (L)	0	Monitor	○
3 (3H)	19 (13H)	35 (23H)	51 (33H)	67 (43H)	83 (53H)	99 (63H)	115 (73H)	CH□ Accumulating count value (H)			
4 (4H)	20 (14H)	36 (24H)	52 (34H)	68 (44H)	84 (54H)	100 (64H)	116 (74H)	CH□ Input pulse value (L)	0	Monitor	○
5 (5H)	21 (15H)	37 (25H)	53 (35H)	69 (45H)	85 (55H)	101 (65H)	117 (75H)	CH□ Input pulse value (H)			
6 (6H)	22 (16H)	38 (26H)	54 (36H)	70 (46H)	86 (56H)	102 (66H)	118 (76H)	CH□ Overflow detection flag	0	Monitor	○
7 (7H)	23 (17H)	39 (27H)	55 (37H)	71 (47H)	87 (57H)	103 (67H)	119 (77H)	CH□ Carry over detection flag	0	Monitor	○
8 (8H)	24 (18H)	40 (28H)	56 (38H)	72 (48H)	88 (58H)	104 (68H)	120 (78H)	CH□ Warning output flag	0	Monitor	○
9 (9H)	25 (19H)	41 (29H)	57 (39H)	73 (49H)	89 (59H)	105 (69H)	121 (79H)	CH□ Error code	0	Monitor	○
10 (AH)	26 (1AH)	42 (2AH)	58 (3AH)	74 (4AH)	90 (5AH)	106 (6AH)	122 (7AH)	CH□ Alarm code	0	Monitor	○
11 (BH) to 15 (FH)	27 (1BH) to 31 (1FH)	43 (2BH) to 47 (2FH)	59 (3BH) to 63 (3FH)	75 (4BH) to 79 (4FH)	91 (5BH) to 95 (5FH)	107 (6BH) to 111 (6FH)	123 (7BH) to 127 (7FH)	System area	—	—	—
128 (80H)	160 (A0H)	192 (C0H)	224 (E0H)	256 (100H)	288 (120H)	320 (140H)	352 (160H)	CH□ Comparison output selection	0	Setting	×
129 (81H)	161 (A1H)	193 (C1H)	225 (E1H)	257 (101H)	289 (121H)	321 (141H)	353 (161H)	System area	—	—	—
130 (82H)	162 (A2H)	194 (C2H)	226 (E2H)	258 (102H)	290 (122H)	322 (142H)	354 (162H)	CH□ Comparison output setting value (L)	0	Setting	×
131 (83H)	163 (A3H)	195 (C3H)	227 (E3H)	259 (103H)	291 (123H)	323 (143H)	355 (163H)	CH□ Comparison output setting value (H)			
132 (84H)	164 (A4H)	196 (C4H)	228 (E4H)	260 (104H)	292 (124H)	324 (144H)	356 (164H)	CH□ Moving average processing selection	0	Setting	×
133 (85H)	165 (A5H)	197 (C5H)	229 (E5H)	261 (105H)	293 (125H)	325 (145H)	357 (165H)	CH□ Number of moving average processing	0	Setting	×
134 (86H)	166 (A6H)	198 (C6H)	230 (E6H)	262 (106H)	294 (126H)	326 (146H)	358 (166H)	CH□ Pre-scale function selection	0	Setting	×
135 (87H)	167 (A7H)	199 (C7H)	231 (E7H)	263 (107H)	295 (127H)	327 (147H)	359 (167H)	CH□ Pre-scale setting value	0	Setting	×
136 (88H)	168 (A8H)	200 (C8H)	232 (E8H)	264 (108H)	296 (128H)	328 (148H)	360 (168H)	CH□ Warning output selection	0	Setting	×
137 (89H)	169 (A9H)	201 (C9H)	233 (E9H)	265 (109H)	297 (129H)	329 (149H)	361 (169H)	CH□ Warning output setting value upper/upper limit	0	Setting	×
138 (8AH)	170 (AAH)	202 (CAH)	234 (EAH)	266 (10AH)	298 (12AH)	330 (14AH)	362 (16AH)	CH□ Warning output setting value upper/lower limit	0	Setting	×
139 (8BH)	171 (ABH)	203 (CBH)	235 (EBH)	267 (10BH)	299 (12BH)	331 (14BH)	363 (16BH)	CH□ Warning output setting value lower/upper limit	0	Setting	×
140 (8CH)	172 (ACH)	204 (CCH)	236 (ECH)	268 (10CH)	300 (12CH)	332 (14CH)	364 (16CH)	CH□ Warning output setting value lower/lower limit	0	Setting	×
141 (8DH)	173 (ADH)	205 (CDH)	237 (EDH)	269 (10DH)	301 (12DH)	333 (14DH)	365 (16DH)	CH□ Count cycle change function selection	0	Setting	×

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
142 (8EH)	174 (AEH)	206 (CEH)	238 (EEH)	270 (10EH)	302 (12EH)	334 (14EH)	366 (16EH)	CH□ Count cycle setting value	0	Setting	×
143 (8FH) to 159 (9FH)	175 (AFH) to 191 (BFH)	207 (CFH) to 223 (DFH)	239 (EFH) to 255 (FFH)	271 (10FH) to 287 (11FH)	303 (12FH) to 319 (13FH)	335 (14FH) to 351 (15FH)	367 (16FH) to 383 (17FH)	System area	—	—	—
384 (180H)	400 (190H)	416 (1A0H)	432 (1B0H)	448 (1C0H)	464 (1D0H)	480 (1E0H)	496 (1F0H)	CH□ Preset setting value for accumulating count value (L)	0	Control	×
385 (181H)	401 (191H)	417 (1A1H)	433 (1B1H)	449 (1C1H)	465 (1D1H)	481 (1E1H)	497 (1F1H)	CH□ Preset setting value for accumulating count value (H)			
386 (182H)	402 (192H)	418 (1A2H)	434 (1B2H)	450 (1C2H)	466 (1D2H)	482 (1E2H)	498 (1F2H)	CH□ Counter reset request	0	Control	×
387 (183H)	403 (193H)	419 (1A3H)	435 (1B3H)	451 (1C3H)	467 (1D3H)	483 (1E3H)	499 (1F3H)	CH□ Carry over reset request	0	Control	×
388 (184H) to 399 (18FH)	404 (194H) to 415 (19FH)	420 (1A4H) to 431 (1AFH)	436 (1B4H) to 447 (1BFH)	452 (1C4H) to 463 (1CFH)	468 (1D4H) to 479 (1DFH)	484 (1E4H) to 495 (1EFH)	500 (1F4H) to 511 (1FFH)	System area	—	—	—

■Un\G512 to Un\G1199

Address (Decimal)	Address (Hexadecimal)	Name				Default value	Data type	Auto refresh
512 to 597	200H to 255H	System area				—	—	—
598	256H	Latest address of error history				0	Monitor	○
599	257H	Latest address of alarm history				0	Monitor	○
600 to 615	258H to 267H	Interrupt factor detection flag [n]*1				0	Monitor	○
616 to 631	268H to 277H	System area				—	—	—
632 to 647	278H to 287H	Interrupt factor mask [n]*1				0	Control	×
648 to 663	288H to 297H	System area				—	—	—
664 to 679	298H to 2A7H	Interrupt factor reset request [n]*1				0	Control	×
680 to 695	2A8H to 2B7H	System area				—	—	—
696 to 711	2B8H to 2C7H	Interrupt factor generation setting [n]*1				0	Setting	×
712 to 727	2C8H to 2D7H	System area				—	—	—
728 to 743	2D8H to 2E7H	Condition target setting [n]*1				0	Setting	×
744 to 759	2E8H to 2F7H	System area				—	—	—
760 to 775	2F8H to 307H	Condition target channel setting [n]*1				0	Setting	×
776 to 799	308H to 31FH	System area				—	—	—
800	320H	Error history 1	Error channel			0	Monitor	×
801	321H		Error code					
802	322H		Error time	First two digits of the year	Last two digits of the year			
803	323H			Month	Day			
804	324H			Hour	Minute			
805	325H			Second	Day of the week			
806	326H			Millisecond				
807 to 809	327H to 329H	System area				—	—	—
810 to 816	32AH to 330H	Error history 2	Same as error history 1			0	Monitor	×
817 to 819	331H to 333H	System area				—	—	—
820 to 826	334H to 33AH	Error history 3	Same as error history 1			0	Monitor	×
827 to 829	33BH to 33DH	System area				—	—	—
830 to 836	33EH to 344H	Error history 4	Same as error history 1			0	Monitor	×
837 to 839	345H to 347H	System area				—	—	—
840 to 846	348H to 34EH	Error history 5	Same as error history 1			0	Monitor	×
847 to 849	34FH to 351H	System area				—	—	—

Address (Decimal)	Address (Hexadecimal)	Name				Default value	Data type	Auto refresh
850 to 856	352H to 358H	Error history 6	Same as error history 1			0	Monitor	×
857 to 859	359H to 35BH	System area				—	—	—
860 to 866	35CH to 362H	Error history 7	Same as error history 1			0	Monitor	×
867 to 869	363H to 365H	System area				—	—	—
870 to 876	366H to 36CH	Error history 8	Same as error history 1			0	Monitor	×
877 to 879	36DH to 36FH	System area				—	—	—
880 to 886	370H to 376H	Error history 9	Same as error history 1			0	Monitor	×
887 to 889	377H to 379H	System area				—	—	—
890 to 896	37AH to 380H	Error history 10	Same as error history 1			0	Monitor	×
897 to 899	381H to 383H	System area				—	—	—
900 to 906	384H to 38AH	Error history 11	Same as error history 1			0	Monitor	×
907 to 909	38BH to 38DH	System area				—	—	—
910 to 916	38EH to 394H	Error history 12	Same as error history 1			0	Monitor	×
917 to 919	395H to 397H	System area				—	—	—
920 to 926	398H to 39EH	Error history 13	Same as error history 1			0	Monitor	×
927 to 929	39FH to 3A1H	System area				—	—	—
930 to 936	3A2H to 3A8H	Error history 14	Same as error history 1			0	Monitor	×
937 to 939	3A9H to 3ABH	System area				—	—	—
940 to 946	3ACH to 3B2H	Error history 15	Same as error history 1			0	Monitor	×
947 to 949	3B3H to 3B5H	System area				—	—	—
950 to 956	3B6H to 3BCH	Error history 16	Same as error history 1			0	Monitor	×
957 to 959	3BDH to 3BFH	System area				—	—	—
960	3C0H	Alarm history 1	Alarm channel			0	Monitor	×
961	3C1H		Alarm code					
962	3C2H		Alarm time	First two digits of the year	Last two digits of the year			
963	3C3H			Month	Day			
964	3C4H			Hour	Minute			
965	3C5H			Second	Day of the week			
966	3C6H			Millisecond				
967 to 969	3C7H to 3C9H	System area				—	—	—
970 to 976	3CAH to 3D0H	Alarm history 2	Same as alarm history 1			0	Monitor	×
977 to 979	3D1H to 3D3H	System area				—	—	—
980 to 986	3D4H to 3DAH	Alarm history 3	Same as alarm history 1			0	Monitor	×
987 to 989	3DBH to 3DDH	System area				—	—	—
990 to 996	3DEH to 3E4H	Alarm history 4	Same as alarm history 1			0	Monitor	×
997 to 999	3E5H to 3E7H	System area				—	—	—
1000 to 1006	3E8H to 3EEH	Alarm history 5	Same as alarm history 1			0	Monitor	×
1007 to 1009	3EFH to 3F1H	System area				—	—	—
1010 to 1016	3F2H to 3F8H	Alarm history 6	Same as alarm history 1			0	Monitor	×
1017 to 1019	3F9H to 3FBH	System area				—	—	—
1020 to 1026	3FCH to 402H	Alarm history 7	Same as alarm history 1			0	Monitor	×
1027 to 1029	403H to 405H	System area				—	—	—
1030 to 1036	406H to 40CH	Alarm history 8	Same as alarm history 1			0	Monitor	×
1037 to 1039	40DH to 40FH	System area				—	—	—
1040 to 1046	410H to 416H	Alarm history 9	Same as alarm history 1			0	Monitor	×
1047 to 1049	417H to 419H	System area				—	—	—
1050 to 1056	41AH to 420H	Alarm history 10	Same as alarm history 1			0	Monitor	×
1057 to 1059	421H to 423H	System area				—	—	—
1060 to 1066	424H to 42AH	Alarm history 11	Same as alarm history 1			0	Monitor	×
1067 to 1069	42BH to 42DH	System area				—	—	—
1070 to 1076	42EH to 434H	Alarm history 12	Same as alarm history 1			0	Monitor	×
1077 to 1079	435H to 437H	System area				—	—	—

Address (Decimal)	Address (Hexadecimal)	Name		Default value	Data type	Auto refresh
1080 to 1086	438H to 43EH	Alarm history 13	Same as alarm history 1	0	Monitor	×
1087 to 1089	43FH to 441H	System area		—	—	—
1090 to 1096	442H to 448H	Alarm history 14	Same as alarm history 1	0	Monitor	×
1097 to 1099	449H to 44BH	System area		—	—	—
1100 to 1106	44CH to 452H	Alarm history 15	Same as alarm history 1	0	Monitor	×
1107 to 1109	453H to 455H	System area		—	—	—
1110 to 1116	456H to 45CH	Alarm history 16	Same as alarm history 1	0	Monitor	×
1117 to 1199	45DH to 4AFH	System area		—	—	—

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

■Un\G1200 to Un\G1282

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
1200 (4B0H)	1210 (4BAH)	1220 (4C4H)	1230 (4CEH)	1240 (4D8H)	1250 (4E2H)	1260 (4ECH)	1270 (4F6H)	CH☐ Input voltage selection monitor	0	Monitor	×
1201 (4B1H)	1211 (4BBH)	1221 (4C5H)	1231 (4CFH)	1241 (4D9H)	1251 (4E3H)	1261 (4EDH)	1271 (4F7H)	CH☐ Pulse edge selection monitor	0	Monitor	×
1202 (4B2H)	1212 (4BCH)	1222 (4C6H)	1232 (4D0H)	1242 (4DAH)	1252 (4E4H)	1262 (4EEH)	1272 (4F8H)	CH☐ Linear counter/ring counter selection monitor	0	Monitor	×
1203 (4B3H)	1213 (4BDH)	1223 (4C7H)	1233 (4D1H)	1243 (4DBH)	1253 (4E5H)	1263 (4EFH)	1273 (4F9H)	CH☐ Input filter setting monitor	0	Monitor	×
1204 (4B4H) to 1209 (4B9H)	1214 (4BEH) to 1219 (4C3H)	1224 (4C8H) to 1229 (4CDH)	1234 (4D2H) to 1239 (4D7H)	1244 (4DCH) to 1249 (4E1H)	1254 (4E6H) to 1259 (4EBH)	1264 (4F0H) to 1269 (4F5H)	1274 (4FAH) to 1279 (4FFH)	System area	—	—	—
1280 (500H)								RUN LED status monitor	0	Monitor	×
1281 (501H)								ERR LED status monitor	0	Monitor	×
1282 (502H)								ALM LED status monitor	0	Monitor	×

A

When Q series-compatible mode is used

■Un\G0 to Un\G255

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
0 (0H)	32 (20H)	64 (40H)	96 (60H)	128 (80H)	160 (A0H)	192 (C0H)	224 (E0H)	CH□ Sampling pulse number	0	Monitor	○
1 (1H)	33 (21H)	65 (41H)	97 (61H)	129 (81H)	161 (A1H)	193 (C1H)	225 (E1H)	CH□ Comparison output selection	0	Setting	○
2 (2H)	34 (22H)	66 (42H)	98 (62H)	130 (82H)	162 (A2H)	194 (C2H)	226 (E2H)	CH□ Comparison output setting value (L)	0	Setting	○
3 (3H)	35 (23H)	67 (43H)	99 (63H)	131 (83H)	163 (A3H)	195 (C3H)	227 (E3H)	CH□ Comparison output setting value (H)			
4 (4H)	36 (24H)	68 (44H)	100 (64H)	132 (84H)	164 (A4H)	196 (C4H)	228 (E4H)	CH□ Moving average processing selection	0	Setting	○
5 (5H)	37 (25H)	69 (45H)	101 (65H)	133 (85H)	165 (A5H)	197 (C5H)	229 (E5H)	CH□ Number of moving average processing	0	Setting	○
6 (6H)	38 (26H)	70 (46H)	102 (66H)	134 (86H)	166 (A6H)	198 (C6H)	230 (E6H)	CH□ Pre-scale function selection	0	Setting	○
7 (7H)	39 (27H)	71 (47H)	103 (67H)	135 (87H)	167 (A7H)	199 (C7H)	231 (E7H)	CH□ Pre-scale setting value	0	Setting	○
8 (8H)	40 (28H)	72 (48H)	104 (68H)	136 (88H)	168 (A8H)	200 (C8H)	232 (E8H)	CH□ Accumulating count value (L)	0	Monitor	○
9 (9H)	41 (29H)	73 (49H)	105 (69H)	137 (89H)	169 (A9H)	201 (C9H)	233 (E9H)	CH□ Accumulating count value (H)			
10 (AH)	42 (2AH)	74 (4AH)	106 (6AH)	138 (8AH)	170 (AAH)	202 (CAH)	234 (EAH)	CH□ Input pulse value (L)	0	Monitor	○
11 (BH)	43 (2BH)	75 (4BH)	107 (6BH)	139 (8BH)	171 (ABH)	203 (CBH)	235 (EBH)	CH□ Input pulse value (H)			
12 (CH)	44 (2CH)	76 (4CH)	108 (6CH)	140 (8CH)	172 (ACH)	204 (CCH)	236 (ECH)	CH□ Overflow detection flag	0	Monitor	○
13 (DH)	45 (2DH)	77 (4DH)	109 (6DH)	141 (8DH)	173 (ADH)	205 (CDH)	237 (EDH)	CH□ Counter reset request	0	Control	○
14 (EH)	46 (2EH)	78 (4EH)	110 (6EH)	142 (8EH)	174 (AEH)	206 (CEH)	238 (EEH)	CH□ Carry over detection flag	0	Monitor	○
15 (FH)	47 (2FH)	79 (4FH)	111 (6FH)	143 (8FH)	175 (AFH)	207 (CFH)	239 (EFH)	CH□ Carry over reset request	0	Control	○
16 (10H)	48 (30H)	80 (50H)	112 (70H)	144 (90H)	176 (B0H)	208 (D0H)	240 (F0H)	CH□ Error code	0	Monitor	○
17 (11H)	49 (31H)	81 (51H)	113 (71H)	145 (91H)	177 (B1H)	209 (D1H)	241 (F1H)	CH□ Warning output selection	0	Setting	○
18 (12H)	50 (32H)	82 (52H)	114 (72H)	146 (92H)	178 (B2H)	210 (D2H)	242 (F2H)	CH□ Warning output flag	0	Monitor	○
19 (13H)	51 (33H)	83 (53H)	115 (73H)	147 (93H)	179 (B3H)	211 (D3H)	243 (F3H)	CH□ Warning output setting value upper/upper limit	0	Setting	○
20 (14H)	52 (34H)	84 (54H)	116 (74H)	148 (94H)	180 (B4H)	212 (D4H)	244 (F4H)	CH□ Warning output setting value upper/lower limit	0	Setting	○
21 (15H)	53 (35H)	85 (55H)	117 (75H)	149 (95H)	181 (B5H)	213 (D5H)	245 (F5H)	CH□ Warning output setting value lower/upper limit	0	Setting	○
22 (16H)	54 (36H)	86 (56H)	118 (76H)	150 (96H)	182 (B6H)	214 (D6H)	246 (F6H)	CH□ Warning output setting value lower/lower limit	0	Setting	○
23 (17H)	55 (37H)	87 (57H)	119 (77H)	151 (97H)	183 (B7H)	215 (D7H)	247 (F7H)	CH□ Count cycle change function selection	0	Setting	○
24 (18H)	56 (38H)	88 (58H)	120 (78H)	152 (98H)	184 (B8H)	216 (D8H)	248 (F8H)	CH□ Count cycle setting value	0	Setting	○
25 (19H)	57 (39H)	89 (59H)	121 (79H)	153 (99H)	185 (B9H)	217 (D9H)	249 (F9H)	CH□ Alarm code	0	Monitor	○

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
26 (1AH)	58 (3AH)	90 (5AH)	122 (7AH)	154 (9AH)	186 (BAH)	218 (DAH)	250 (FAH)	CH□ Preset setting value for accumulating count value (L)	0	Control	×
27 (1BH)	59 (3BH)	91 (5BH)	123 (7BH)	155 (9BH)	187 (BBH)	219 (DBH)	251 (FBH)	CH□ Preset setting value for accumulating count value (H)			
28 (1CH) to 31 (1FH)	60 (3CH) to 63 (3FH)	92 (5CH) to 95 (5FH)	124 (7CH) to 127 (7FH)	156 (9CH) to 159 (9FH)	188 (BCH) to 191 (BFH)	220 (DCH) to 223 (DFH)	252 (FCH) to 255 (FFH)	System area	—	—	—

■Un\G256 to Un\G1199

Address (Decimal)	Address (Hexadecimal)	Name				Default value	Data type	Auto refresh
256 to 597	100H to 255H	System area				—	—	—
598	256H	Latest address of error history				0	Monitor	○
599	257H	Latest address of alarm history				0	Monitor	○
600 to 615	258H to 267H	Interrupt factor detection flag [n]*1				0	Monitor	○
616 to 631	268H to 277H	System area				—	—	—
632 to 647	278H to 287H	Interrupt factor mask [n]*1				0	Control	×
648 to 663	288H to 297H	System area				—	—	—
664 to 679	298H to 2A7H	Interrupt factor reset request [n]*1				0	Control	×
680 to 695	2A8H to 2B7H	System area				—	—	—
696 to 711	2B8H to 2C7H	Interrupt factor generation setting [n]*1				0	Setting	×
712 to 727	2C8H to 2D7H	System area				—	—	—
728 to 743	2D8H to 2E7H	Condition target setting [n]*1				0	Setting	×
744 to 759	2E8H to 2F7H	System area				—	—	—
760 to 775	2F8H to 307H	Condition target channel setting [n]*1				0	Setting	×
776 to 799	308H to 31FH	System area				—	—	—
800	320H	Error history 1	Error channel			0	Monitor	×
801	321H		Error code					
802	322H		Error time	First two digits of the year	Last two digits of the year			
803	323H			Month	Day			
804	324H			Hour	Minute			
805	325H			Second	Day of the week			
806	326H			Millisecond				
807 to 809	327H to 329H	System area				—	—	—
810 to 816	32AH to 330H	Error history 2	Same as error history 1			0	Monitor	×
817 to 819	331H to 333H	System area				—	—	—
820 to 826	334H to 33AH	Error history 3	Same as error history 1			0	Monitor	×
827 to 829	33BH to 33DH	System area				—	—	—
830 to 836	33EH to 344H	Error history 4	Same as error history 1			0	Monitor	×
837 to 839	345H to 347H	System area				—	—	—
840 to 846	348H to 34EH	Error history 5	Same as error history 1			0	Monitor	×
847 to 849	34FH to 351H	System area				—	—	—
850 to 856	352H to 358H	Error history 6	Same as error history 1			0	Monitor	×
857 to 859	359H to 35BH	System area				—	—	—
860 to 866	35CH to 362H	Error history 7	Same as error history 1			0	Monitor	×
867 to 869	363H to 365H	System area				—	—	—
870 to 876	366H to 36CH	Error history 8	Same as error history 1			0	Monitor	×
877 to 879	36DH to 36FH	System area				—	—	—
880 to 886	370H to 376H	Error history 9	Same as error history 1			0	Monitor	×
887 to 889	377H to 379H	System area				—	—	—
890 to 896	37AH to 380H	Error history 10	Same as error history 1			0	Monitor	×

Address (Decimal)	Address (Hexadecimal)	Name				Default value	Data type	Auto refresh
897 to 899	381H to 383H	System area				—	—	—
900 to 906	384H to 38AH	Error history 11	Same as error history 1			0	Monitor	×
907 to 909	38BH to 38DH	System area				—	—	—
910 to 916	38EH to 394H	Error history 12	Same as error history 1			0	Monitor	×
917 to 919	395H to 397H	System area				—	—	—
920 to 926	398H to 39EH	Error history 13	Same as error history 1			0	Monitor	×
927 to 929	39FH to 3A1H	System area				—	—	—
930 to 936	3A2H to 3A8H	Error history 14	Same as error history 1			0	Monitor	×
937 to 939	3A9H to 3ABH	System area				—	—	—
940 to 946	3ACH to 3B2H	Error history 15	Same as error history 1			0	Monitor	×
947 to 949	3B3H to 3B5H	System area				—	—	—
950 to 956	3B6H to 3BCH	Error history 16	Same as error history 1			0	Monitor	×
957 to 959	3BDH to 3BFH	System area				—	—	—
960	3C0H	Alarm history 1	Alarm channel			0	Monitor	×
961	3C1H		Alarm code					
962	3C2H		Alarm time	First two digits of the year	Last two digits of the year			
963	3C3H			Month	Day			
964	3C4H			Hour	Minute			
965	3C5H			Second	Day of the week			
966	3C6H			Millisecond				
967 to 969	3C7H to 3C9H	System area				—	—	—
970 to 976	3CAH to 3D0H	Alarm history 2	Same as alarm history 1			0	Monitor	×
977 to 979	3D1H to 3D3H	System area				—	—	—
980 to 986	3D4H to 3DAH	Alarm history 3	Same as alarm history 1			0	Monitor	×
987 to 989	3DBH to 3DDH	System area				—	—	—
990 to 996	3DEH to 3E4H	Alarm history 4	Same as alarm history 1			0	Monitor	×
997 to 999	3E5H to 3E7H	System area				—	—	—
1000 to 1006	3E8H to 3EEH	Alarm history 5	Same as alarm history 1			0	Monitor	×
1007 to 1009	3EFH to 3F1H	System area				—	—	—
1010 to 1016	3F2H to 3F8H	Alarm history 6	Same as alarm history 1			0	Monitor	×
1017 to 1019	3F9H to 3FBH	System area				—	—	—
1020 to 1026	3FCH to 402H	Alarm history 7	Same as alarm history 1			0	Monitor	×
1027 to 1029	403H to 405H	System area				—	—	—
1030 to 1036	406H to 40CH	Alarm history 8	Same as alarm history 1			0	Monitor	×
1037 to 1039	40DH to 40FH	System area				—	—	—
1040 to 1046	410H to 416H	Alarm history 9	Same as alarm history 1			0	Monitor	×
1047 to 1049	417H to 419H	System area				—	—	—
1050 to 1056	41AH to 420H	Alarm history 10	Same as alarm history 1			0	Monitor	×
1057 to 1059	421H to 423H	System area				—	—	—
1060 to 1066	424H to 42AH	Alarm history 11	Same as alarm history 1			0	Monitor	×
1067 to 1069	42BH to 42DH	System area				—	—	—
1070 to 1076	42EH to 434H	Alarm history 12	Same as alarm history 1			0	Monitor	×
1077 to 1079	435H to 437H	System area				—	—	—
1080 to 1086	438H to 43EH	Alarm history 13	Same as alarm history 1			0	Monitor	×
1087 to 1089	43FH to 441H	System area				—	—	—
1090 to 1096	442H to 448H	Alarm history 14	Same as alarm history 1			0	Monitor	×
1097 to 1099	449H to 44BH	System area				—	—	—
1100 to 1106	44CH to 452H	Alarm history 15	Same as alarm history 1			0	Monitor	×
1107 to 1109	453H to 455H	System area				—	—	—
1110 to 1116	456H to 45CH	Alarm history 16	Same as alarm history 1			0	Monitor	×
1117 to 1199	45DH to 4AFH	System area				—	—	—

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

■Un\G1200 to Un\G1282

Address Decimal (Hexadecimal)								Name	Default value	Data type	Auto refresh
CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8				
1200 (4B0H)	1210 (4BAH)	1220 (4C4H)	1230 (4CEH)	1240 (4D8H)	1250 (4E2H)	1260 (4ECH)	1270 (4F6H)	CH☐ Input voltage selection monitor	0	Monitor	×
1201 (4B1H)	1211 (4BBH)	1221 (4C5H)	1231 (4CFH)	1241 (4D9H)	1251 (4E3H)	1261 (4EDH)	1271 (4F7H)	CH☐ Pulse edge selection monitor	0	Monitor	×
1202 (4B2H)	1212 (4BCH)	1222 (4C6H)	1232 (4D0H)	1242 (4DAH)	1252 (4E4H)	1262 (4EEH)	1272 (4F8H)	CH☐ Linear counter/ring counter selection monitor	0	Monitor	×
1203 (4B3H)	1213 (4BDH)	1223 (4C7H)	1233 (4D1H)	1243 (4DBH)	1253 (4E5H)	1263 (4EFH)	1273 (4F9H)	CH☐ Input filter setting monitor	0	Monitor	×
1204 (4B4H) to 1209 (4B9H)	1214 (4BEH) to 1219 (4C3H)	1224 (4C8H) to 1229 (4CDH)	1234 (4D2H) to 1239 (4D7H)	1244 (4DCH) to 1249 (4E1H)	1254 (4E6H) to 1259 (4EBH)	1264 (4F0H) to 1269 (4F5H)	1274 (4FAH) to 1279 (4FFH)	System area	—	—	—
1280 (500H)								RUN LED status monitor	0	Monitor	×
1281 (501H)								ERR LED status monitor	0	Monitor	×
1282 (502H)								ALM LED status monitor	0	Monitor	×

A

Details of buffer memory addresses

This section describes the details of the buffer memory addresses of the pulse input module.

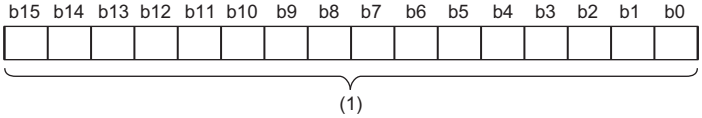
Point

This chapter describes I/O signals and buffer memory addresses for CH1. For details on the I/O signals and buffer memory addresses for CH2 and later, refer to the following.

☞ Page 59 List of I/O signals
☞ Page 67 Lists of buffer memory addresses

CH1 Sampling pulse number

The pulse number converted to a unit pulse number by the pre-scale function or moving average function is stored as a 16-bit unsigned binary value.



(1) Data section

The count range is from 0 to 32767.

■Buffer memory address

The following shows the buffer memory address of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Sampling pulse number	0	16	32	48	64	80	96	112
CH☐ Sampling pulse number (when Q series-compatible mode is used)	0	32	64	96	128	160	192	224

■Refreshing cycle

After 'CH1 Count enable' (Y18) is turned on to start the count operation, refreshing is performed in the count cycle set by 'CH1 Count cycle setting value' (Un\G142). The default refreshing cycle is 1s.

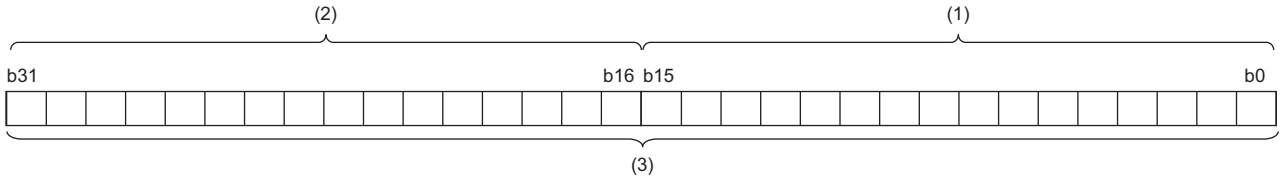
■Sampling pulse number reset

Carrying out the following resets 'CH1 Sampling pulse number' (Un\G0) to 0.

- Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1).
- Turning off and on 'Operating condition setting request flag' (Y1)

CH1 Accumulating count value

The accumulated value of the sampling pulse numbers is stored as a 32-bit unsigned binary value. The linear counter or ring counter count type can be used.



(1) CH1 Accumulating count value (L) (Un\G2)
(2) CH1 Accumulating count value (H) (Un\G3)
(3) Data section

The count range is from 0 to 99999999. Depending on the count type, one of the following operations is performed when the count range is exceeded.

- When the linear counter is used, Overflow detection (1) is stored in 'CH1 Overflow detection flag' (Un\G6). 'CH1 Accumulating count value' (Un\G2, Un\G3) is fixed to 99999999 until it is reset or preset.
- When the ring counter is used, Carry over detection (1) is stored in 'CH1 Carry over detection flag' (Un\G7). 'CH1 Accumulating count value' (Un\G2, Un\G3) is returned to 0.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Accumulating count value	2, 3	18, 19	34, 35	50, 51	66, 67	82, 83	98, 99	114, 115
CH☐ Accumulating count value (when Q series-compatible mode is used)	8, 9	40, 41	72, 73	104, 105	136, 137	168, 169	200, 201	232, 233

■Refreshing cycle

After 'CH1 Count enable' (Y18) is turned on to start the count operation, refreshing is performed in the count cycle set by 'CH1 Count cycle setting value' (Un\G142). The default refreshing cycle is 1s.

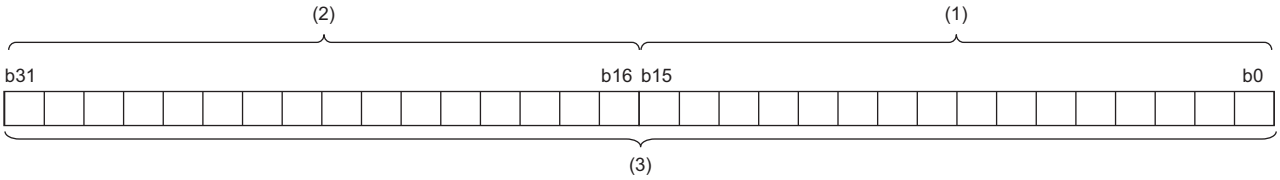
■Accumulating count value reset

Carrying out the following resets 'CH1 Accumulating count value' (Un\G2, Un\G3).

- Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) resets the value to 0. If 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) is set to a value other than 0, the accumulating count value is preset to the set value.
- Turning off and on 'Operating condition setting request flag' (Y1) resets the value to 0.

CH1 Input pulse value

The actual number of input pulses is stored as a 32-bit unsigned binary value. It is not converted to a unit pulse number by the pre-scale function or moving average function. The count type is ring counter.



(1) CH1 Input pulse value (L) (Un\G4)
(2) CH1 Input pulse value (H) (Un\G5)
(3) Data section

The count range is from 0 to 2147483647.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Input pulse value	4, 5	20, 21	36, 37	52, 53	68, 69	84, 85	100, 101	116, 117
CH☐ Input pulse value (when Q series-compatible mode is used)	10, 11	42, 43	74, 75	106, 107	138, 139	170, 171	202, 203	234, 235

■Refreshing cycle

After 'CH1 Count enable' (Y18) is turned on to start the count operation, refreshing is performed in a 10ms cycle.

Even if an overflow error (error code: 1900H) occurs, the count operation and the refreshing of this area continue so long as 'CH1 Count enable' (Y18) is on.

■Input pulse value reset

Carrying out the following resets 'CH1 Input pulse value' (Un\G4, Un\G5) to 0.

- Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1).
- Turning off and on 'Operating condition setting request flag' (Y1)

CH1 Overflow detection flag

When the count type is linear counter, the overflow detection status can be checked.

Monitored value	Description
0	No overflow detection
1	Overflow detection

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Overflow detection flag	6	22	38	54	70	86	102	118
CH☐ Overflow detection flag (when Q series-compatible mode is used)	12	44	76	108	140	172	204	236

■Overflow detection flag status

- When an overflow occurs, Overflow detection (1) is stored in 'CH1 Overflow detection flag' (Un\G6). An overflow occurs when 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999.
- At the same time as the occurrence of an overflow, an overflow error (error code: 1900H) occurs and the count operation stops. 'CH1 Accumulating count value' (Un\G2, Un\G3) is fixed to 99999999 and 'CH1 Sampling pulse number' (Un\G0) is reset to 0. After an overflow error occurs, 'CH1 Accumulating count value' (Un\G2, Un\G3) remains fixed to 99999999 even if a pulse is received.

■Clearing the overflow detection flag

- Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) causes No overflow detection (0) to be stored in 'CH1 Overflow detection flag' (Un\G6). At the same time, the overflow error (error code: 1900H) is cleared and the count operation restarts.
- Turning off and on 'CH1 Error reset request' (Y8) does not restart the count operation. To restart the count operation, it is necessary to turn on and off 'Operating condition setting request flag' (Y1) or to set 'CH1 Counter reset request' (Un\G386) to Reset request (1).

CH1 Carry over detection flag

When the count type is ring counter, the carry over detection status can be checked.

Monitored value	Description
0	No carry over detection
1	Carry over detection

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Carry over detection flag	7	23	39	55	71	87	103	119
CH☐ Carry over detection flag (when Q series-compatible mode is used)	14	46	78	110	142	174	206	238

■Carry over detection flag status

- When a carry over occurs, Carry over detection (1) is stored in 'CH1 Carry over detection flag' (Un\G7). A carry over occurs when 'CH1 Accumulating count value' (Un\G2, Un\G3) exceeds 99999999.
- When a carry over occurs, the count operation continues without stopping. No error occurs.

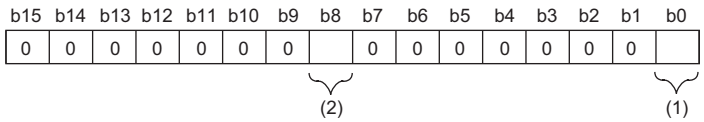
■Clearing the carry over detection flag

No carry over detection (0) is stored in 'CH1 Carry over detection flag' (Un\G7) with the following methods.

- Setting 'CH1 Carry over reset request' (Un\G387) to Reset request (1)
- Turning off and on 'Operating condition setting request flag' (Y1)

CH1 Warning output flag

The statuses of the upper limit and lower limit warnings can be checked.



(1) Lower limit warning (0: Normal, 1: Range exceeded)
(2) Upper limit warning (0: Normal, 1: Range exceeded)

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output flag	8	24	40	56	72	88	104	120
CH☐ Warning output flag (when Q series-compatible mode is used)	18	50	82	114	146	178	210	242

■Warning output flag status

When the sampling pulse number meets one of the following conditions, Range exceeded (1) is stored in the appropriate bit of 'CH1 Warning output flag' (Un\G8).

- The value is greater than or equal to the setting value of 'CH1 Warning output setting value upper/upper limit' (Un\G137).
- The value is less than or equal to the setting value of 'CH1 Warning output setting value lower/lower limit' (Un\G140).

■Clearing the warning output flag

- If an upper limit warning has occurred, Normal (0) is stored in bit 8 of 'CH1 Warning output flag' (Un\G8) when the sampling pulse number becomes less than the setting value of 'CH1 Warning output setting value upper/lower limit' (Un\G138).
- If a lower limit warning has occurred, Normal (0) is stored in bit 0 of 'CH1 Warning output flag' (Un\G8) when the sampling pulse number becomes greater than the setting value of 'CH1 Warning output setting value lower/upper limit' (Un\G139).

CH1 Error code

The latest error code detected in the pulse input module is stored. For details, refer to the following.

☞ Page 54 List of Error Codes

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Error code	9	25	41	57	73	89	105	121
CH☐ Error code (when Q series-compatible mode is used)	16	48	80	112	144	176	208	240

■Clearing an error

Turn on and off 'CH1 Error reset request' (Y8).

CH1 Alarm code

The latest alarm code detected in the pulse input module is stored. For details, refer to the following.

☞ Page 56 List of Alarm Codes

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Alarm code	10	26	42	58	74	90	106	122
CH☐ Alarm code (when Q series-compatible mode is used)	25	57	89	121	153	185	217	249

■Clearing an alarm

Turn on and off 'CH1 Error reset request' (Y8).

CH1 Comparison output selection

Set whether to use the comparison output function.

For details on the comparison output function, refer to the following.

☞ Page 30 Comparison Output Function

Setting value	Setting details
0	Comparison output function invalid
1	Comparison output function valid

If a value other than those shown in the above table is set, a comparison output selection setting error (error code: 1940H) occurs.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Comparison output selection	128	160	192	224	256	288	320	352
CH☐ Comparison output selection (when Q series-compatible mode is used)	1	33	65	97	129	161	193	225

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Comparison output function invalid (0) for all channels.

CH1 Comparison output setting value

Set the value to compare against the accumulating count value.

For details on the comparison output function, refer to the following.

☞ Page 30 Comparison Output Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Comparison output setting value	130, 131	162, 163	194, 195	226, 227	258, 259	290, 291	322, 323	354, 355
CH☐ Comparison output setting value (when Q series-compatible mode is used)	2, 3	34, 35	66, 67	98, 99	130, 131	162, 163	194, 195	226, 227

■Setting range

- The setting range is from 0 to 99999999.
- For channels on which the set value is outside the setting range, a comparison output setting value setting error (error code: 1941H) occurs.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Moving average processing selection

Set the processing method of the sampling pulse number.

Setting value	Setting details
0	Sampling processing
1	Moving average processing

- If a value other than those shown in the above table is set, a moving average processing selection setting error (error code: 1AA0H) occurs.
- When Moving average processing (1) is set, moving average processing is performed on the sampling pulse number for the number of operations set by 'CH1 Number of movement averaging processing' (Un\G133).

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Moving average processing selection	132	164	196	228	260	292	324	356
CH☐ Moving average processing selection (when Q series-compatible mode is used)	4	36	68	100	132	164	196	228

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Sampling processing (0) for all channels.

CH1 Number of moving average processing

Set the number of moving average processing operations.

For details on moving average processing, refer to the following.

☞ Page 28 Moving average function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Number of times of moving average processing	133	165	197	229	261	293	325	357
CH☐ Number of times of moving average processing (when Q series-compatible mode is used)	5	37	69	101	133	165	197	229

■Setting range

- The setting range is from 2 to 60.
- For channels on which the set value is outside the setting range, a number of average processing setting error (error code: 1AA1H) occurs.
- The default value of this area is 0, so change the setting value to a value in the range of 2 to 60 when using moving average processing.
- When 'CH1 Movement averaging processing selection' (Un\G132) is set to Sampling processing (0), the setting in this area is ignored.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Pre-scale function selection

Set whether to use the pre-scale function. When using this function, also set the unit scaling to use in calculating the sampling pulse number.

The sampling pulse number is calculated with the following arithmetic expression. Values after the decimal point are omitted.

Number of sampling pulses = Input pulse value per count cycle × Pre-scale setting value × Unit magnification

For details on the pre-scale function, refer to the following.

☞ Page 25 Pre-scale Function

Setting value	Setting details
0	Pre-scale function invalid
1	×1
2	×0.1
3	×0.01
4	×0.001
5	×0.0001

- If a value other than those shown in the above table is set, a pre-scale function selection setting error (error code: 1AB0H) occurs.
- When 'CH1 Movement averaging processing selection' (Un\G132) is set to Moving average processing (1), moving average processing is performed on the sampling pulse number for the number of operations set by 'CH1 Number of movement averaging processing' (Un\G133).

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Pre-scale function selection	134	166	198	230	262	294	326	358
CH☐ Pre-scale function selection (when Q series-compatible mode is used)	6	38	70	102	134	166	198	230

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Pre-scale function invalid (0) for all channels.

CH1 Pre-scale setting value

Set the pre-scale setting value to use in calculating the sampling pulse number.

For details on the pre-scale function, refer to the following.

☞ Page 25 Pre-scale Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Pre-scale setting value	135	167	199	231	263	295	327	359
CH☐ Pre-scale setting value (when Q series-compatible mode is used)	7	39	71	103	135	167	199	231

■Setting range

- The setting range is from 0 to 32767.
- For channels on which the set value is outside the setting range, a pre-scale setting value setting error (error code: 1AB1H) occurs.
- If this area is set to 0, the value stored in 'CH1 Sampling pulse number' (Un\G0) will be 0 due to the relationship within the arithmetic expression for the sampling pulse number. Set 'CH1 Pre-scale setting value' (Un\G135) to a value of 1 or more.
- When 'CH1 Pre-scale function selection' (Un\G134) is set to Pre-scale function invalid (0), the setting in this area is ignored.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Warning output selection

Set whether to output warnings for the sampling pulse number.

For details on the warning output function, refer to the following.

☞ Page 31 Warning Output Function

Setting value	Setting details
0	Warning output function invalid
1	Warning output function valid

If a value other than those shown in the above table is set, a warning output selection setting error (error code: 1AC0H) occurs.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output selection	136	168	200	232	264	296	328	360
CH☐ Warning output selection (when Q series-compatible mode is used)	17	49	81	113	145	177	209	241

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Warning output function invalid (0) for all channels.

CH1 Warning output setting value upper/upper limit

Set the upper/upper limit value of the warning output function.

For details on the warning output function, refer to the following.

☞ Page 31 Warning Output Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output setting value upper/upper limit	137	169	201	233	265	297	329	361
CH☐ Warning output setting value upper/upper limit (when Q series-compatible mode is used)	19	51	83	115	147	179	211	243

■Setting range

- The setting range is from 0 to 32767.
- For channels on which the set value is outside the setting range, a warning output setting value upper/upper limit setting error (error code: 1AC1H) occurs.
- Set the value so that the condition of upper/upper limit ≥ upper/lower limit > lower/upper limit ≥ lower/lower limit is satisfied. If a value that does not meet this condition is set, a warning output setting value setting error (error code: 1AC5H) will occur. However, the value can be set such that upper/upper limit = upper/lower limit and lower/upper limit = lower/lower limit.
- The default values of the upper/upper limit, upper/lower limit, lower/upper limit, and lower/lower limit are 0, so change each warning output setting value when using the warning output function.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Warning output setting value upper/lower limit

Set the upper/lower limit value of the warning output function.

For details on the warning output function, refer to the following.

☞ Page 31 Warning Output Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output setting value upper/lower limit	138	170	202	234	266	298	330	362
CH☐ Warning output setting value upper/lower limit (when Q series-compatible mode is used)	20	52	84	116	148	180	212	244

■Setting range

- The setting range is from 0 to 32767.
- For channels on which the set value is outside the setting range, a warning output setting value upper/lower limit setting error (error code: 1AC2H) occurs.
- Set the value so that the condition of upper/upper limit ≥ upper/lower limit > lower/upper limit ≥ lower/lower limit is satisfied. If a value that does not meet this condition is set, a warning output setting value setting error (error code: 1AC5H) will occur. However, the value can be set such that upper/upper limit = upper/lower limit and lower/upper limit = lower/lower limit.
- The default values of the upper/upper limit, upper/lower limit, lower/upper limit, and lower/lower limit are 0, so change each warning output setting value when using the warning output function.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Warning output setting value lower/upper limit

Set the lower/upper limit value of the warning output function.

For details on the warning output function, refer to the following.

☞ Page 31 Warning Output Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output setting value lower/upper limit	139	171	203	235	267	299	331	363
CH☐ Warning output setting value lower/upper limit (when Q series-compatible mode is used)	21	53	85	117	149	181	213	245

■Setting range

- The setting range is from 0 to 32767.
- For channels on which the set value is outside the setting range, a warning output setting value lower/upper limit setting error (error code: 1AC3H) occurs.
- Set the value so that the condition of upper/upper limit ≥ upper/lower limit > lower/upper limit ≥ lower/lower limit is satisfied. If a value that does not meet this condition is set, a warning output setting value setting error (error code: 1AC5H) will occur. However, the value can be set such that upper/upper limit = upper/lower limit and lower/upper limit = lower/lower limit.
- The default values of the upper/upper limit, upper/lower limit, lower/upper limit, and lower/lower limit are 0, so change each warning output setting value when using the warning output function.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Warning output setting value lower/lower limit

Set the lower/lower limit value of the warning output function.

For details on the warning output function, refer to the following.

☞ Page 31 Warning Output Function

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Warning output setting value lower/lower limit	140	172	204	236	268	300	332	364
CH☐ Warning output setting value lower/lower limit (when Q series-compatible mode is used)	22	54	86	118	150	182	214	246

■Setting range

- The setting range is from 0 to 32767.
- For channels on which the set value is outside the setting range, a warning output setting value lower/lower limit setting error (error code: 1AC4H) occurs.
- Set the value so that the condition of upper/upper limit ≥ upper/lower limit > lower/upper limit ≥ lower/lower limit is satisfied. If a value that does not meet this condition is set, a warning output setting value setting error (error code: 1AC5H) will occur. However, the value can be set such that upper/upper limit = upper/lower limit and lower/upper limit = lower/lower limit.
- The default values of the upper/upper limit, upper/lower limit, lower/upper limit, and lower/lower limit are 0, so change each warning output setting value when using the warning output function.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 0 for all channels.

CH1 Count cycle change function selection

Set whether to use the count cycle change function.

For details on the count cycle change function, refer to the following.

☞ Page 19 Count cycle change function

Setting value	Setting details
0	Count cycle change function invalid
1	Count cycle change function valid

If a value other than those shown in the above table is set, a count cycle change function selection setting error (error code: 1AD0H) occurs.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Count cycle change function selection	141	173	205	237	269	301	333	365
CH☐ Count cycle change function selection (when Q series-compatible mode is used)	23	55	87	119	151	183	215	247

■Count cycle

Setting this area to Count cycle change function valid (1) sets the refreshing cycle for the following buffer memory areas to the count cycle set by 'CH1 Count cycle setting value' (Un\G142).

- 'CH1 Sampling pulse number' (Un\G0)
- 'CH1 Accumulating count value' (Un\G2, Un\G3)

When this area is set to Count cycle change function invalid (0), the cycle becomes 1s.

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Count cycle change function invalid (0) for all channels.

CH1 Count cycle setting value

Set the count cycle for the sampling pulse number and accumulating count value.

For details on the count cycle change function, refer to the following.

☞ Page 19 Count cycle change function

Setting value	Setting details
0	1s
1	100ms
2	200ms
3	500ms

If a value other than those shown in the above table is set, a count cycle setting value setting error (error code: 1AD1H) occurs.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Count cycle setting value	142	174	206	238	270	302	334	366
CH☐ Count cycle setting value (when Q series-compatible mode is used)	24	56	88	120	152	184	216	248

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is 1s (0) for all channels.

CH1 Preset setting value for accumulating count value

Set the value to preset the accumulating count value when resetting the accumulating count value.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Preset setting value for accumulating count value	384, 385	400, 401	416, 417	432, 433	448, 449	464, 465	480, 481	496, 497
CH☐ Preset setting value for accumulating count value (when Q series-compatible mode is used)	26, 27	58, 59	90, 91	122, 123	154, 155	186, 187	218, 219	250, 251

■Setting range

- The setting range is from 0 to 99999999.
- For channels on which the set value is outside the setting range, a preset setting value for accumulating count value setting error (error code: 1920H) occurs.

■Enabling the setting

Regardless of turning on and off 'Operating condition setting request flag' (Y1), the value becomes enabled when it is set.

■Default value

The default value is 0 for all channels.

CH1 Counter reset request

This area is used to reset the sampling pulse number, input pulse value, and accumulating count value.

For details on the counter reset function, refer to the following.

☞ Page 33 Counter Reset Function

Setting value	Setting details
0	No reset request (The setting value is automatically returned to 0 after the resetting of the counter value is complete.)
1	Reset request

Setting 'CH1 Counter reset request' (Un\G386) to Reset request (1) changes each count value as shown below.

- 'CH1 Sampling pulse number' (Un\G0) is reset to 0. After the reset is complete and 'CH1 Counter reset request' (Un\G386) is set to No reset request (0), input pulses are invalid for a maximum of 20ms.
- 'CH1 Accumulating count value' (Un\G2, Un\G3) is reset to 0. If 'CH1 Preset setting value for accumulating count value' (Un\G384, Un\G385) is set to a value other than 0, the accumulating count value is preset to the setting value.
- 'CH1 Input pulse value' (Un\G4, Un\G5) is reset to 0.

If a value other than Reset request (1) is set, the setting details are ignored.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Counter reset request	386	402	418	434	450	466	482	498
CH☐ Counter reset request (when Q series-compatible mode is used)	13	45	77	109	141	173	205	237

■Default value

The default value is No reset request (0) for all channels.

CH1 Carry over reset request

This area is used to reset the carry over when using the ring counter.

For details on the ring counter, refer to the following.

☞ Page 24 Ring counter function

Setting value	Setting details
0	No reset request (The setting value is automatically returned to 0 after the resetting of the carry over is complete.)
1	Reset request

Setting 'CH1 Carry over reset request' (Un\G387) to Reset request (1) resets carry over. When it is reset, No carry over detection (0) is stored in 'CH1 Carry over detection flag' (Un\G7).

If a value other than Reset request (1) is set, the setting details are ignored.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Carry over reset request	387	403	419	435	451	467	483	499
CH☐ Carry over reset request (when Q series-compatible mode is used)	15	47	79	111	143	175	207	239

■Default value

The default value is No reset request (0) for all channels.

Latest address of error history

Among Error history ☐ (Un\G800 to Un\G959), a buffer memory address that stores the latest error code is stored.

■Buffer memory address

The following shows the buffer memory address of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Latest address of error history	598							
Latest address of error history (when Q series-compatible mode is used)								

Latest address of alarm history

Among Alarm history ☐ (Un\G960 to Un\G1119), a buffer memory address that stores the latest alarm code is stored.

■Buffer memory address

The following shows the buffer memory address of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Latest address of alarm history	599							
Latest address of alarm history (when Q series-compatible mode is used)								

Interrupt factor detection flag [n]

The detection status of the interrupt factor is stored.

Monitored 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 'Interrupt factor detection flag [n]' (Un\G600 to Un\G615) is changed to Interrupt factor (1).
"n" indicates an interrupt setting number. (n = 1 to 16)

■Buffer memory addresses

The following shows the buffer memory addresses 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]	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615
Interrupt factor detection flag [n] (when Q series-compatible mode is used)																

Interrupt factor mask [n]

Set whether to mask interrupt factors.

Setting value	Setting details
0	Mask (Interrupt unused)
1	Mask clear (Interrupt used)

When 'Interrupt factor mask [n]' (Un\G632 to Un\G647) is changed to Mask clear (Interrupt used) (1) and an interrupt factor occurs, an interrupt request is sent to the CPU module. When the setting value is two or larger, the setting is regarded as Mask clear (Interrupt used) (1).
"n" indicates an interrupt setting number. (n = 1 to 16)

■Buffer memory addresses

The following shows the buffer memory addresses 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]	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647
Interrupt factor mask [n] (when Q series-compatible mode is used)																

■Default value

The default value is Mask (Interrupt unused) (0) for all areas.

Interrupt factor reset request [n]

Set whether to send the interrupt factor reset request.

Setting value	Setting details
0	No reset request
1	Reset request

When Reset request (1) is set in 'Interrupt factor reset request [n]' (Un\G664 to Un\G679) corresponding to the interrupt factor, the interrupt factor of the specified interrupt is reset. After that, 'Interrupt factor reset request [n]' (Un\G664 to Un\G679) changes to No reset request (0). When the setting value is two or larger, the setting is regarded as Reset request (1).
Turning on and off 'Operating condition setting request flag' (Y1) also resets interrupt factors.
"n" indicates an interrupt setting number. (n = 1 to 16)

■Buffer memory addresses

The following shows the buffer memory addresses 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]	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679
Interrupt factor reset request [n] (when Q series-compatible mode is used)																

■Default value

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

Interrupt factor generation setting [n]

Set whether to send an interrupt request when the same interrupt factor occurs during the interrupt factor detection.

Setting value	Setting details
0	Interrupt resend request
1	No interrupt resend request

- If a value other than the above is set, an interrupt factor generation setting range error (error code: 180△H) occurs.
- When 'Interrupt factor generation setting [n]' (Un\G696 to Un\G711) is Interrupt resend request (0) and the same interrupt factor occurs while the interrupt factor has been detected, an interrupt request is sent to the CPU module again.
- When 'Interrupt factor generation setting [n]' (Un\G696 to Un\G711) is No interrupt resend request (1) and the same interrupt factor occurs while the interrupt factor has been detected, an interrupt request is not sent to the CPU module. Before sending an interrupt request to the CPU module, set 'Interrupt factor reset request [n]' (Un\G664 to Un\G679) to Reset request (1) and reset the interrupt factor.

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

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interrupt factor generation setting [n]	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711
Interrupt factor generation setting [n] (when Q series-compatible mode is used)																

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Interrupt resend request (0) for all areas.

Condition target setting [n]

Set an interrupt factor to be detected.

Setting value	Setting details
0	Invalid
1	Error occurrence
2	Accumulating counter comparison flag
3	Overflow detection flag
4	Carry over detection flag
5	Warning output flag

- If a value other than those shown in the above table is set, a condition target setting range error (error code: 181△H) occurs.
- When an input signal (X) or a buffer memory area set in 'Condition target setting [n]' (Un\G728 to Un\G743) turns off and on, an interrupt request is sent to the CPU module. The interrupt conditions for the setting values are shown below.

Setting value	Description
Invalid	No interrupt is detected.
Error occurrence	An interrupt is detected on the rising edge of 'CH1 Error occurrence' (X8) turning on.
Accumulating counter comparison flag	An interrupt is detected on the rising edge of 'CH1 Accumulating counter comparison flag' (X10) turning on.
Overflow detection flag	An interrupt is detected on the rising edge of 'CH1 Overflow detection flag' (Un\G6) turning on.
Carry over detection flag	An interrupt is detected on the rising edge of 'CH1 Carry over detection flag' (Un\G7) turning on.
Warning output flag	An interrupt is detected on the rising edge of bit 0 or bit 8 of 'CH1 Warning output flag' (Un\G8) turning on.

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

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Condition target setting [n]	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743
Condition target setting [n] (when Q series-compatible mode is used)																

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is Invalid (0) for all areas.

Condition target channel setting [n]

Set a channel where an interrupt is detected.

Setting value	Setting details
0	All channels
1	CH1
2	CH2
3	CH3
4	CH4
5	CH5
6	CH6
7	CH7
8	CH8

An interrupt factor is monitored for according to 'Condition target setting [n]' (Un\G760 to Un\G775) in the channel set by this area.

If a value other than the above is set, a condition target channel setting range error (error code: 182△H) occurs.

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

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Condition target channel setting [n]	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775
Condition target channel setting [n] (when Q series-compatible mode is used)																

■Enabling the setting

Turn on and off 'Operating condition setting request flag' (Y1).

■Default value

The default value is All channels (0) for all areas.

A

Error history

Up to 16 errors that occurred in the module are recorded.

Ex.

For error history 1

	b15 ... b8	b7 ... b0
Un\G800	Error channel	
Un\G801	Error code	
Un\G802	First two digits of the year	Last two digits of the year
Un\G803	Month	Day
Un\G804	Hour	Minute
Un\G805	Second	Day of the week
Un\G806	Millisecond (upper)	Millisecond (lower)
Un\G807	System area	
⋮		
Un\G809		

Item		Stored data	Storage example*1
Error channel		Stores the number of the channel on which the error occurred.	1H
Error code		Stores the error code.	1900H
First two digits of the year	Last two digits of the year	Stored in BCD code.	2018H
Month	Day		1031H
Hour	Minute		1234H
Second			56H
Day of the week		One of the following values is stored in BCD code. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3, Thursday: 4, Friday: 5, Saturday: 6	3H
Millisecond (higher-order digits)		Stored in BCD code.	7H
Millisecond (lower-order digits)			89H
System area		—	—

*1 Values stored when an overflow error (error code: 1900H) occurs on CH1 at 12:34:56.789 on Wednesday, October 31st, 2018.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	No.1 to No.16
Error history	800 to 959

Alarm history

Up to 16 alarms that occurred in the module are recorded.

Ex.

For alarm history 1

	b15 ... b8	b7 ... b0
Un\G960	Alarm channel	
Un\G961	Alarm code	
Un\G962	First two digits of the year	Last two digits of the year
Un\G963	Month	Day
Un\G964	Hour	Minute
Un\G965	Second	Day of the week
Un\G966	Millisecond (upper)	Millisecond (lower)
Un\G967	System area	
⋮		
Un\G969		

Item		Stored data	Storage example*1
Alarm channel		Stores the number of the channel on which the alarm occurred.	1H
Alarm code		Stores the alarm code.	0800H
First two digits of the year	Last two digits of the year	Stored in BCD code.	2018H
Month	Day		1031H
Hour	Minute		1234H
Second			56H
Day of the week		One of the following values is stored in BCD code. Sunday: 0, Monday: 1, Tuesday: 2, Wednesday: 3, Thursday: 4, Friday: 5, Saturday: 6	3H
Millisecond (higher-order digits)		Stored in BCD code.	7H
Millisecond (lower-order digits)			89H
System area		—	—

*1 Values stored when a warning output (upper limit) (alarm code: 0800H) occurs on CH1 at 12:34:56.789 on Wednesday, October 31st, 2018.

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	No.1 to No.16
Alarm history	960 to 1119

A

CH1 Input voltage selection monitor

The setting of "CH1 Input voltage selection" of the module parameter is stored.

Monitored value	Description
0	12 to 24VDC
1	5VDC

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Input voltage selection monitor	1200	1210	1220	1230	1240	1250	1260	1270
CH☐ Input voltage selection monitor (when Q series-compatible mode is used)								

CH1 Pulse edge selection monitor

The setting of "CH1 Pulse edge selection" of the module parameter is stored.

Monitored value	Description
0	Pulse up edge
1	Pulse down edge

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Pulse edge selection monitor	1201	1211	1221	1231	1241	1251	1261	1271
CH☐ Pulse edge selection monitor (when Q series-compatible mode is used)								

CH1 Linear counter/ring counter selection monitor

The setting of "CH1 Linear counter/ring counter selection" of the module parameter is stored.

Monitored value	Description
0	Linear counter
1	Ring counter

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Linear counter/ring counter selection monitor	1202	1212	1222	1232	1242	1252	1262	1272
CH☐ Linear counter/ring counter selection monitor (when Q series-compatible mode is used)								

CH1 Input filter setting monitor

The setting of "CH1 Input filter setting" of the module parameter is stored.

Monitored value	Description
0	30kpps
1	10kpps
2	1kpps
3	100pps
4	50pps
5	10pps
6	1pps
7	0.1pps

■Buffer memory addresses

The following shows the buffer memory addresses of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
CH☐ Input filter setting monitor	1203	1213	1223	1233	1243	1253	1263	1273
CH☐ Input filter setting monitor (when Q series-compatible mode is used)								

RUN LED status monitor

The current status of the RUN LED is stored.

Monitored value	Description
0	Off
1	On
3	Flashing (400ms cycle)

■Buffer memory address

The following shows the buffer memory address of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
RUN LED status monitor	1280							
RUN LED status monitor (when Q series-compatible mode is used)								

ERR LED status monitor

The current status of the ERR LED is stored.

Monitored value	Description
0	Off
1	On

■Buffer memory address

The following shows the buffer memory address of this area.

Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
ERR LED status monitor	1281							
ERR LED status monitor (when Q series-compatible mode is used)								

ALM LED status monitor

The current status of the ALM LED is stored.

Monitored value	Description
0	Off
1	On

■Buffer memory address

The following shows the buffer memory address of this area.

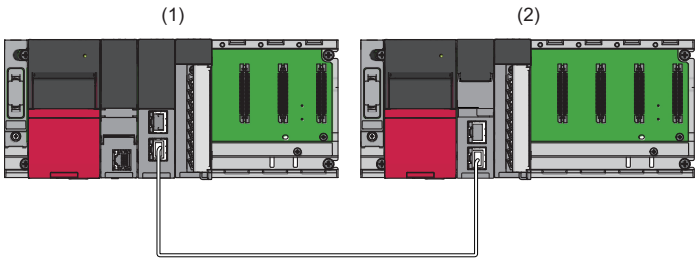
Buffer memory name	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
ALM LED status monitor	1282							
ALM LED status monitor (when Q series-compatible mode is used)								

Appendix 4 Operation Examples of When the Remote Head Module Is Mounted

This section describes operation examples of when the remote head module is mounted.

System configuration example

An operation is explained using the following system configuration.



(1) Master station (network number 1, station number 0)
- Power supply module: R61P
- CPU module: R04CPU
- Master/local module: RJ71GF11-T2 (start I/O number: 0000H to 001FH)
- Input module: RX10 (start I/O number: 0020H to 002FH)

(2) Intelligent device station (network number 1, station number 1)
- Power supply module: R61P
- Remote head module: RJ72GF15-T2
- Pulse input module: RD60P8-G (start I/O number: 0000H to 001FH)*1

*1 In the RX/RY setting of the master station, set 1000H to 101FH as the start I/O number of the pulse input module.

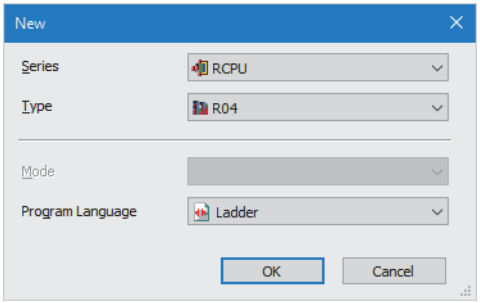
A

Master station settings

Connect the engineering tool to the CPU module of the master station and set parameters.

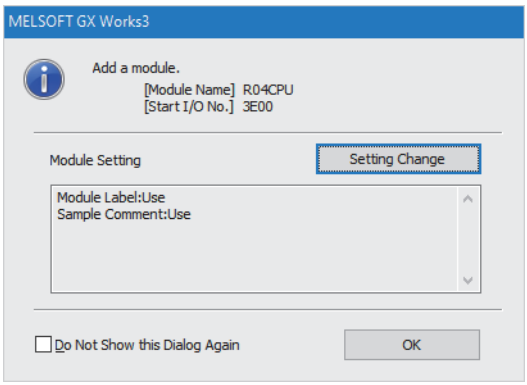
1. Create a project with the following settings.

[Project] ⇨ [New]



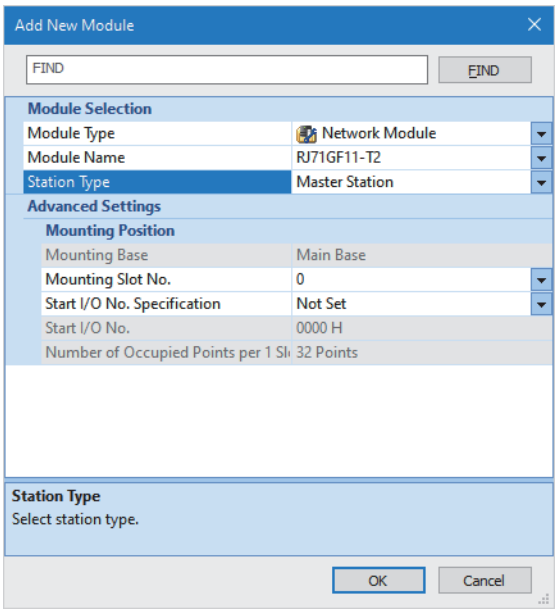
2. Click the [Setting Change] button and set the module to use the module label.

3. Click the [OK] button in the following window to add the module labels of the CPU module.

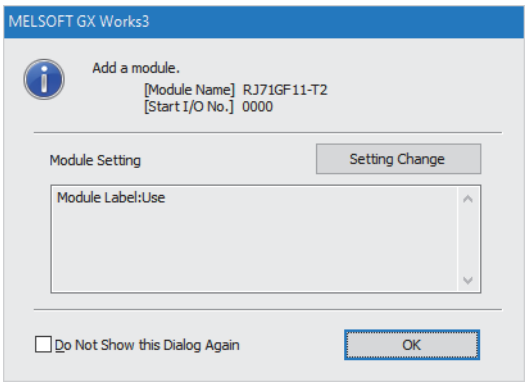


4. Add the master/local module with the following settings.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



5. Click the [OK] button in the following window to add the module labels of the master/local module.



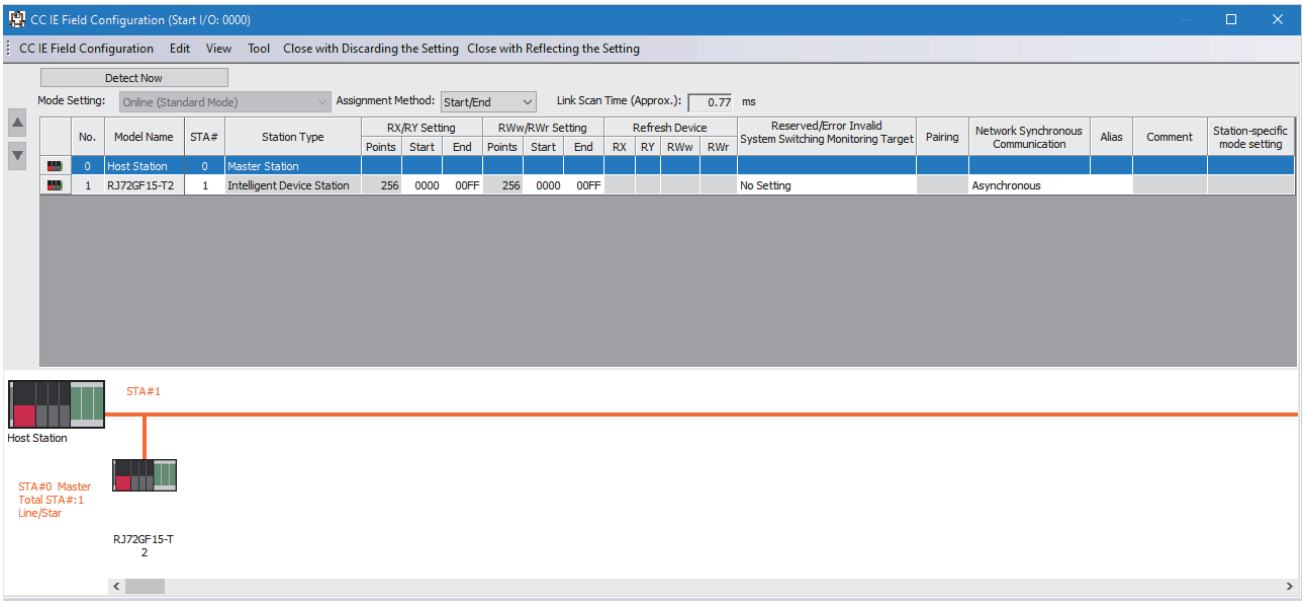
6. Set "Required Settings" of the module parameter of the master/local module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Required Settings]

Item	Setting
Station Type	
Station Type	Master Station
Network Number	
Network Number	1
Station Number	
Setting Method	Parameter Editor
Station No.	0
Parameter Setting Method	
Setting Method of Basic/Application Settings	Parameter Editor

7. Set "Network Configuration Settings" of the module parameter of the master/local module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Basic Settings] ⇨ [Network Configuration Settings]



A

8. Set "Refresh Setting" of the module parameter of the master/local module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RJ71GF11-T2] ⇨ [Basic Settings] ⇨ [Refresh Setting]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB									
-	SW									
1	RX	256	00000	000FF		Specify Devic	X	256	01000	010FF
2	RY	256	00000	000FF		Specify Devic	Y	256	01000	010FF
3	RWw	256	00000	000FF		Specify Devic	W	256	00000	000FF
4	RWr	256	00000	000FF		Specify Devic	W	256	01000	010FF
5										

9. Write the set parameters to the CPU module on the master station. Then reset the CPU module or power off and on the system.

[Online] ⇨ [Write to PLC]

Point

For parameters of the master/local module that are not described in this procedure, set default values. For details on parameters of the master/local module, refer to the following.

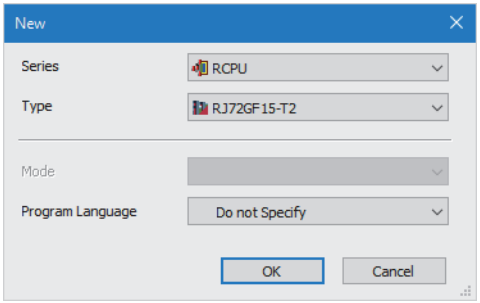
MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

Intelligent device station settings

Connect the engineering tool to the remote head module of the intelligent device station and set parameters.

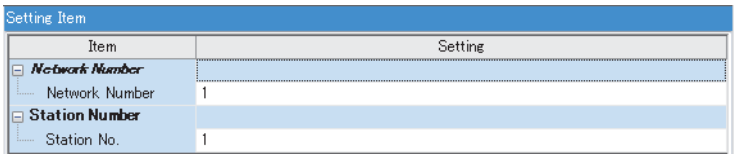
1. Create a project with the following settings.

[Project] ⇨ [New]



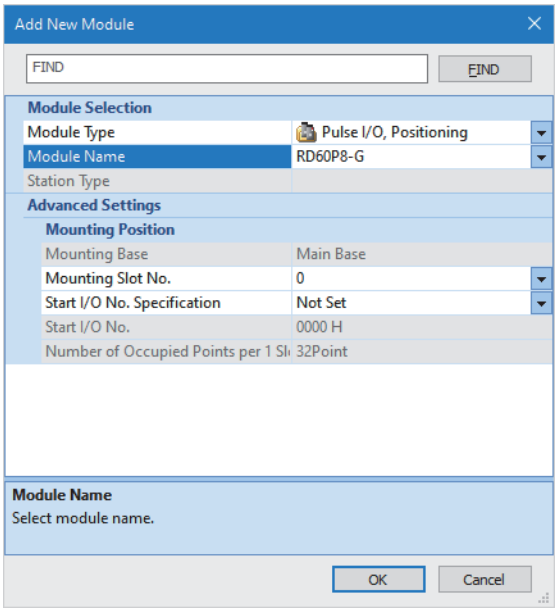
2. Set "Network Required Setting" of "CPU Parameter" of the remote head module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [RJ72GF15-T2] ⇨ [CPU Parameter] ⇨ [Network Required Setting]



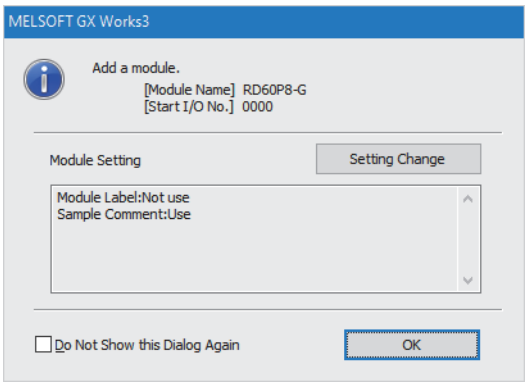
3. Add the pulse input module with the following settings.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]



A

4. Configure the setting not to use the module labels.



5. Set "Basic setting" of the module parameter of the pulse input module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RD60P8-G] ⇨ [Basic setting]

Item	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Input voltage selection	Set the level of input signal.							
Input voltage selection	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC	0:12 to 24VDC
Pulse edge selection	Set the pulse edge.							
Pulse edge selection	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge	0:Pulse up edge
Linear counter/ring counter selection	Set the count type.							
Linear counter/ring counter selection	0:Linear counter	0:Linear counter	0:Linear counter	0:Linear counter	0:Linear counter	0:Linear counter	0:Linear counter	0:Linear counter
Input filter setting	Set the counting speed (maximum) of input pulse.							
Input filter setting	0:30kpps	0:30kpps	0:30kpps	0:30kpps	0:30kpps	0:30kpps	0:30kpps	0:30kpps

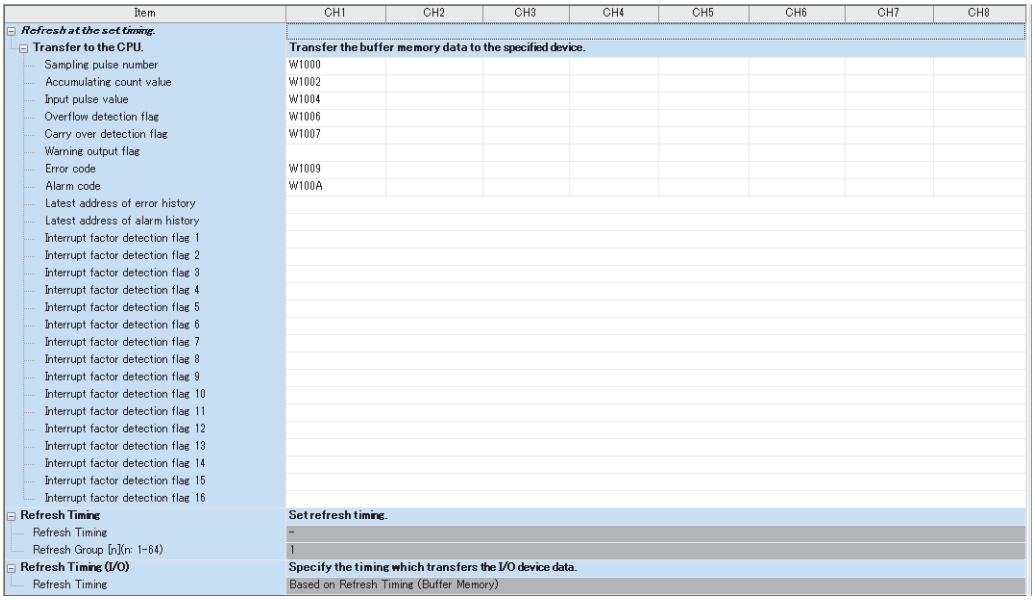
6. Set "Application setting" of the module parameter of the pulse input module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RD60P8-G] ⇨ [Application setting]

Item	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Comparison output function	Function to turn on Accumulating counter comparison flag when Accumulating count value becomes equal to or larger than Comparison outpu							
Comparison output selection	1:Comparison outpu	0:Comparison ou	0:Comparison ou	0:Comparison ou	0:Comparison ou	0:Comparison ou	0:Comparison ou	0:Comparison output func
Comparison output setting value	500000	0	0	0	0	0	0	0
Pre-scale function	Function to convert the pulse number by multiplying the input pulse number by an arbitrary setting value.							
Pre-scale function selection	3:x0.01	0:Pre-scale func	0:Pre-scale func	0:Pre-scale func	0:Pre-scale func	0:Pre-scale func	0:Pre-scale func	0:Pre-scale function inva
Pre-scale setting value	252	0	0	0	0	0	0	0
Moving average function	Function that performs moving average processing for the specified number of times when there is variation in Sampling pulse number.							
Moving average processing selection	1:Moving average pr	0:Sampling proce	0:Sampling proce	0:Sampling proce	0:Sampling proce	0:Sampling proce	0:Sampling proce	0:Sampling processing
Number of moving average processing	10 Count	0 Count	0 Count	0 Count	0 Count	0 Count	0 Count	0 Count
Count cycle change function	Function to change the count cycle of Sampling pulse number and Accumulating count value.							
Count cycle change function selection	0:Count cycle chang	0:Count cycle ch	0:Count cycle ch	0:Count cycle ch	0:Count cycle ch	0:Count cycle ch	0:Count cycle ch	0:Count cycle change fur
Count cycle setting value	0:1s	0:1s	0:1s	0:1s	0:1s	0:1s	0:1s	0:1s
Warning output function	Function to set upper/upper limit, upper/lower limit, lower/upper limit, lower/lower limit for the Sampling pulse number converted by Pre-sc							
Warning output selection	1:Warning output fur	0:Warning output	0:Warning output	0:Warning output	0:Warning output	0:Warning output	0:Warning output	0:Warning output functior
Warning output setting value upper/upper limit	1100	0	0	0	0	0	0	0
Warning output setting value upper/lower limit	1000	0	0	0	0	0	0	0
Warning output setting value lower/upper limit	600	0	0	0	0	0	0	0
Warning output setting value lower/lower limit	500	0	0	0	0	0	0	0
Counter reset function	Function to reset Sampling pulse number, Accumulating count value, Input pulse value. Accumulating count value can be preset to the set valu							
Preset setting value for accumulating count value	0	0	0	0	0	0	0	0

7. Set "Refresh settings" of the module parameter of the pulse input module as shown below.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ [RD60P8-G] ⇨ [Refresh settings]



Item	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Refresh at the set timing.								
Transfer to the CPU.	Transfer the buffer memory data to the specified device.							
Sampling pulse number	W1000							
Accumulating count value	W1002							
Input pulse value	W1004							
Overflow detection flag	W1006							
Carry over detection flag	W1007							
Warning output flag								
Error code	W1009							
Alarm code	W100A							
Latest address of error history								
Latest address of alarm history								
Interrupt factor detection flag 1								
Interrupt factor detection flag 2								
Interrupt factor detection flag 3								
Interrupt factor detection flag 4								
Interrupt factor detection flag 5								
Interrupt factor detection flag 6								
Interrupt factor detection flag 7								
Interrupt factor detection flag 8								
Interrupt factor detection flag 9								
Interrupt factor detection flag 10								
Interrupt factor detection flag 11								
Interrupt factor detection flag 12								
Interrupt factor detection flag 13								
Interrupt factor detection flag 14								
Interrupt factor detection flag 15								
Interrupt factor detection flag 16								
Refresh Timing	Set refresh timing.							
Refresh Timing	-							
Refresh Group [n](n: 1-64)	1							
Refresh Timing (I/O)	Specify the timing which transfers the I/O device data.							
Refresh Timing	Based on Refresh Timing (Buffer Memory)							

8. Write the set parameters to the remote head module on the intelligent device station. Then reset the remote head module or power off and on the system.

[Online] ⇨ [Write to PLC]

Point

For parameters of the remote head module that are not described in this procedure, set default values. For details on parameters of the remote head module, refer to the following.

MELSEC iQ-R CC-Link IE Field Network Remote Head Module User's Manual (Application)

Checking the network status

After setting parameters to the master station and the intelligent device station, check whether data link is normally performed between the master station and the intelligent device station. Check the network status using the CC-Link IE Field Network diagnostics of the engineering tool.

For how to perform the CC-Link IE Field Network diagnostics from the master station, refer to the following.

📖 MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)

Program examples

For the program examples, the module labels of the master/local module are used.

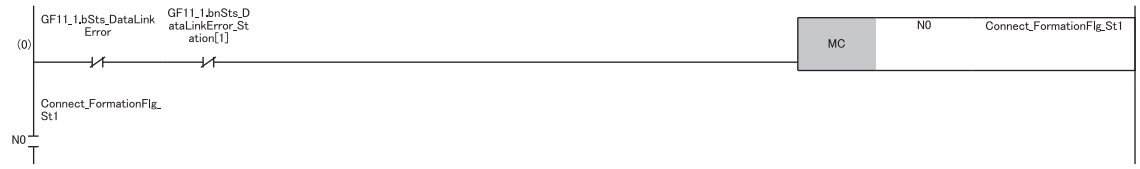
Write the programs to the CPU module on the master station.

Classification	Label name	Description	Device
Module label	GF11_1.bSts_DataLinkError	Data link error status of own station	SB0049
	GF11_1.bnSts_DataLinkError_Station[1]	Data link status of each station (station number 1)	SW00B0.0
Labels to be defined	Define global labels as shown below.		

	Label Name	Data Type	Class	Assign (Device/Label)
1	OverflowDetectionFlag	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
2	CounterResetting	Bit	VAR_GLOBAL	
3	CarryOverDetectionFlag	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
4	CarryOverResetting	Bit	VAR_GLOBAL	
5	SamplingPulseNumber	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
6	AccumulatingCountValue	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	
7	InputPulseValue	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	
8	ErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
9	AlarmCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
10	CounterResetRequest	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
11	TransitionOfProcessingForCounterResetRequest	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
12	CounterResetRequestRet1	Bit(0..1)	VAR_GLOBAL	
13	CounterResetRequestRet2	Bit(0..1)	VAR_GLOBAL	
14	CarryOverResetRequest	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
15	TransitionOfProcessingForCarryOverResetRequest	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	
16	CarryOverResetRequestRet1	Bit(0..1)	VAR_GLOBAL	
17	CarryOverResetRequestRet2	Bit(0..1)	VAR_GLOBAL	
18	Connect_FormationFlg_St1	Bit	VAR_GLOBAL	
19	CH1_SamplingPulseNumber	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	W1000
20	CH1_AccumulatingCountValue	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	W1002
21	CH1_InputPulseValue	Double Word [Unsigned]/Bit String [32-bit]	VAR_GLOBAL	W1004
22	CH1_OverflowDetectionFlag	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	W1006
23	CH1_CarryOverDetectionFlag	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	W1007
24	CH1_ErrorCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	W1009
25	CH1_AlarmCode	Word [Unsigned]/Bit String [16-bit]	VAR_GLOBAL	W100A
26	CountEnableOnCommand	Bit	VAR_GLOBAL	X21
27	CountEnableOffCommand	Bit	VAR_GLOBAL	X22
28	ComparisonSignalResetCommand	Bit	VAR_GLOBAL	X23
29	ErrorResetCommand	Bit	VAR_GLOBAL	X24
30	CounterResetRequestCommand	Bit	VAR_GLOBAL	X25
31	SamplingPulseNumberReadCommand	Bit	VAR_GLOBAL	X26
32	AccumulatingCountValueReadCommand	Bit	VAR_GLOBAL	X27
33	InputPulseValueReadCommand	Bit	VAR_GLOBAL	X28
34	ModuleREADY	Bit	VAR_GLOBAL	X1000
35	OperatingConditionSettingCompleteFlag	Bit	VAR_GLOBAL	X1001
36	CH1_ErrorOccurrence	Bit	VAR_GLOBAL	X1008
37	CH1_AccumulatingCounterComparisonFlag	Bit	VAR_GLOBAL	X1010
38	CH1_ErrorResetRequest	Bit	VAR_GLOBAL	Y1008
39	CH1_ComparisonSignalResetRequest	Bit	VAR_GLOBAL	Y1010
40	CH1_CountEnable	Bit	VAR_GLOBAL	Y1018

Common program

The following figure shows an example of the program to check the data link status of the remote head module (station number 1).

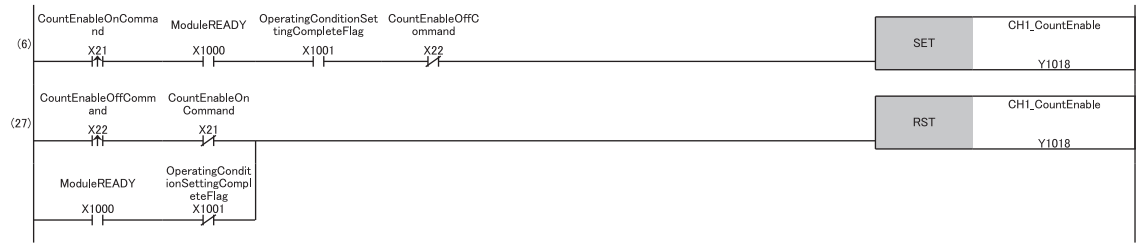


(0) Checks the data link status of the remote head module (station number 1).

After creating the program examples shown later, add the MCR instruction to the end of the program as shown below.

Program example 1

In this program example, the count operation starts when CH1 Count enable turns on and stops when CH1 Count enable turns off.

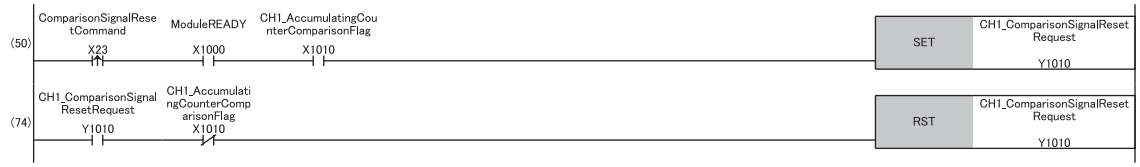


(6) Turns on 'CH1 Count enable' (Y1018).

(27)Turns off 'CH1 Count enable' (Y1018).

Program example 2

In this program example, CH1 Accumulating counter comparison flag is reset.



(50)Turns on 'CH1 Comparison signal reset request' (Y1010).

(74)Turns off 'CH1 Comparison signal reset request' (Y1010).

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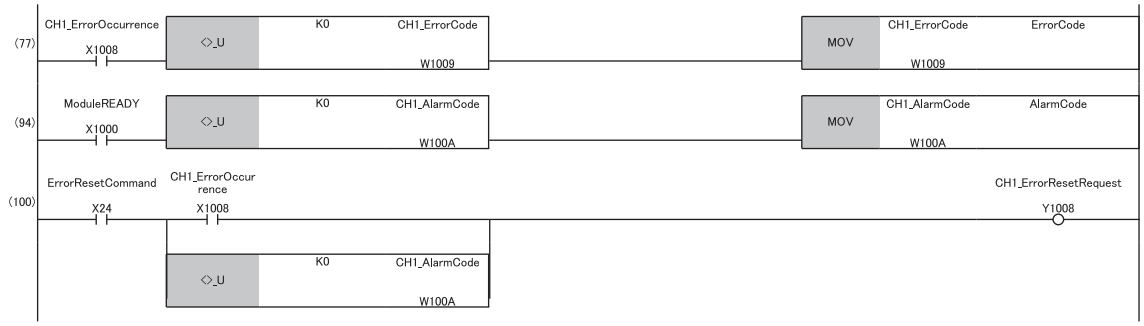
Program example 3

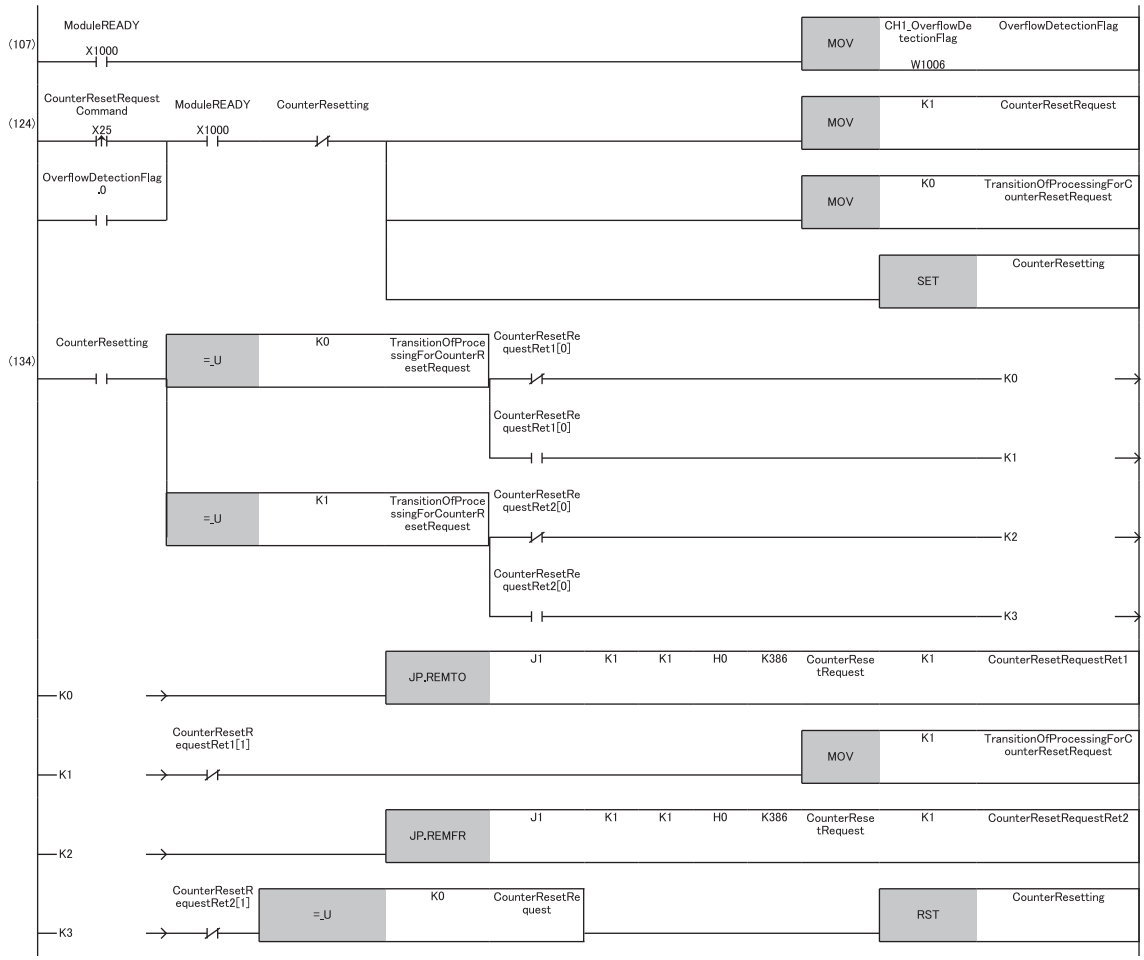
In this program example, the errors and alarms are reset.



(77) Reads 'CH1 Error code' (W1009) to hold this value after the error reset.
(94) Reads 'CH1 Alarm code' (W100A) to hold this value after the error reset.
(100) Turns on 'CH1 Error reset request' (Y1008).

Program example 4

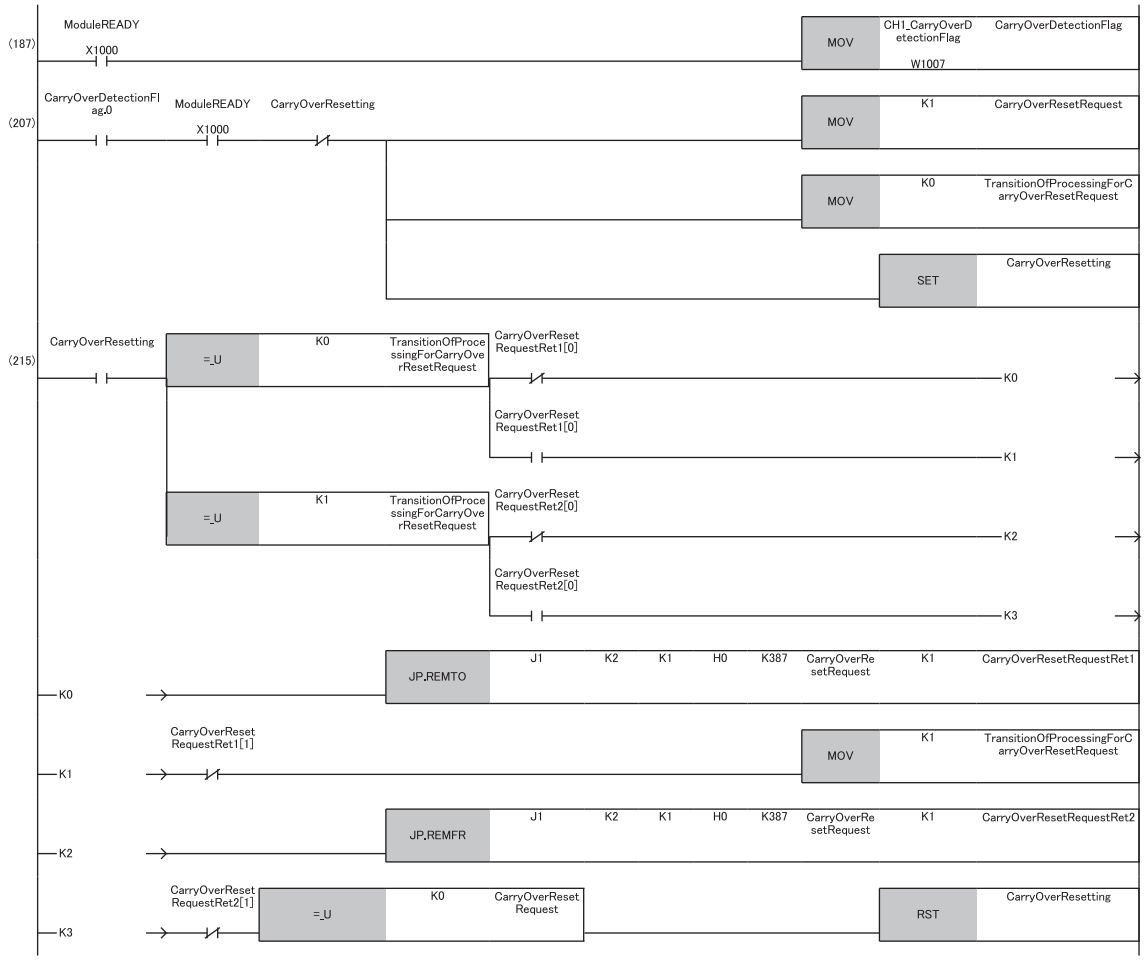
In this program example, CH1 sampling pulse number, CH1 accumulating count value, and CH1 input pulse value are reset.



(107) Reads 'CH1 Overflow detection flag' (W1006).
(124) Stores Reset request (1) in 'CH1 Counter reset request'. Turns on 'Counter resetting'.
(134) Turns off 'Counter resetting'.

Program example 5

In this program example, CH1 Carry over detection flag is reset.



(187) Reads 'CH1 Carry over detection flag' (W1007).

(207) Stores Reset request (1) in 'CH1 Carry over reset request'. Turns on 'Carry over resetting'.

(215) Turns off 'Carry over resetting'.

Program example 6

In this program example, CH1 sampling pulse number is read.

(268) Reads 'CH1 Sampling pulse number' (W1000).

Program example 7

In this program example, CH1 accumulating count value is read.

(290) Reads 'CH1 Accumulating count value' (W1002, W1003).

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Program example 8

In this program example, CH1 input pulse value is read.

(309) Reads 'CH1 Input pulse value' (W1004, W1005).

Appendix 5 Using the Module in the Redundant System with Redundant Extension Base Unit

This chapter describes restrictions and precautions for using the pulse input module that is mounted on the extension base unit in the redundant system.

Restrictions on functions and specifications

Function

Function	Restriction
Interrupt function	The interrupt program cannot be executed.

Precautions

Program examples

Unless otherwise specified, program examples provided in this manual and the following manual are for when the module is used in the single CPU system or in the multiple CPU system.

📖 MELSEC iQ-R Channel Isolated Pulse Input Module User's Manual (Startup)

When using the module in the redundant system, refer to the following manual and observe the precautions on programming for when using the Process CPU (redundant mode).

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

Signal flow tracking setting

When using the module FBs and applying the program examples to an actual system, set "Signal Flow Memory Tracking Setting" to "Transfer". If not, the module FBs and programs may not work properly when system switching occurs.

[CPU Parameter] ⇨ [Redundant System Settings] ⇨ [Tracking Setting]

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REVISIONS

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

Revision date	*Manual number	Description
October 2018	SH(NA)-082005ENG-A	First edition
October 2020	SH(NA)-082005ENG-B	■Added or modified parts SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, RELEVANT MANUALS, GENERIC TERMS AND ABBREVIATIONS, Appendix 4, 5

Japanese manual number: SH-082004-B

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.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

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

3. Overseas service

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

4. Exclusion of loss in opportunity and secondary loss from warranty liability

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)-082005ENG-B(2010)MEE
MODEL: RD60P8-G-U-OU-E
MODEL CODE: 13JX90

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