MITSUBISHI ELECTRIC

Programmable Controller

MELSEC iQ-R series

MELSEC iQ-R System Recorder User's Manual (Application)

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 for the programmable controller system, refer to MELSEC iQ-R Module Configuration Manual.

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

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

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

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

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

[Design Precautions]

⚠WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.
  (2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:
    - Turned off if the overcurrent or overvoltage protection of the power supply module is activated.
    - Held or turned off according to the parameter setting if the self-diagnostic function of the CPU module detects an error such as a watchdog timer error.
  (3) All outputs may be turned on if an error occurs in a part, such as an I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to "General Safety Requirements" in the MELSEC iQ-R Module Configuration Manual.
  (4) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to manuals relevant to the network. Incorrect output or malfunction due to a communication failure may result in an accident.
- When connecting an external device with a CPU module or intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
- Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

[Design Precautions]

⚠WARNING

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

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- After the CPU module is powered on or is reset, the time taken to enter the RUN status varies depending on the system configuration, parameter settings, and/or program size. Design circuits so that the entire system will always operate safely, regardless of the time.
- Do not power off the programmable controller or do not reset the CPU module while the settings are being written. Doing so will make the data in the flash ROM or SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM or the SD memory card again. Doing so 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 general specifications written in Safety Guidelines included in 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 screw, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- When using an extension cable, connect it to the extension cable connector of the base unit securely. Check the connection for looseness. Poor contact may cause malfunction.
- When using an SD memory card, fully insert it into the 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. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling 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.
- Programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block. Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring, refer to the MELSEC iQ-R Module Configuration Manual.
- For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual for the module used. If not, normal data transmission is not guaranteed.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Correctly connect the battery connector. Do not charge, disassemble, heat, short-circuit, solder, or throw the battery into the fire. Also, do not expose it to liquid or strong shock. Doing so will cause the battery to produce heat, explode, ignite, or leak, resulting in injury or 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 or SD memory card undefined. The values need to be set in the buffer memory and written to the flash ROM or 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) MELSEC 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 ELECTRIC 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 ELECTRIC USER'S, 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 Electric 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 Electric 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 Electric representative in your region.

(3) Mitsubishi Electric 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 performance specifications and procedure for operation to use System Recorder.
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.

COMPLIANCE WITH THE EMC AND LOW VOLTAGE DIRECTIVES

Method of ensuring compliance

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

- 📖MELSEC iQ-R Module Configuration Manual
- 📖Safety Guidelines (included in a base unit)

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

Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the following manuals.

- 📖MELSEC iQ-R Module Configuration Manual
- 📖Safety Guidelines (included in a base unit)

CONTENTS

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R System Recorder User's Manual (Application) [SH-082281ENG] (this manual)	Functions, parameter settings, recording settings, and troubleshooting of System Recorder, and detailed specifications of a recorder module/camera recorder module	Print book e-Manual PDF
MELSEC iQ-R System Recorder User's Manual (Startup) [SH-082279ENG]	Specifications, procedure for operation, and system configuration of System Recorder, and specifications of a recorder module/camera recorder module	Print book e-Manual PDF
MELSEC iQ-R CPU Module User's Manual (Startup) [SH-081263ENG]	Specifications, procedures before operation, and troubleshooting of a CPU module	Print book e-Manual PDF
MELSEC iQ-R CPU Module User's Manual (Application) [SH-081264ENG]	Memory, functions, devices, and parameters of a CPU module	Print book e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configurations, parameter settings, and operation methods for the online function in GX Works3	e-Manual PDF
MELSEC iQ-R Module Configuration Manual [SH-081262ENG]	The combination of the MELSEC iQ-R series modules, common information on the installation/wiring in the system, and specifications of the power supply module, base unit, SD memory card, and battery	Print book e-Manual PDF
Camera Recording Package User's Manual [BCN-P5999-1324]	Network camera settings, programmable controller settings, and function blocks for the camera recording function	e-Manual PDF
Video Verification Tool Operating Manual [BCN-P5999-1327]	Basic operations and method for playing a video file in Video Verification Tool	e-Manual PDF
GX VideoViewer Version 1 Operating Manual [SH-082370ENG]	Basic operations and method for playing a video file in GX VideoViewer	e-Manual PDF

This manual does not include detailed information on the following:

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

For details, refer to the following:

MELSEC iQ-R Module Configuration Manual

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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.
- 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 area for data sampling	A memory area in a CPU module to pass sampled devices and labels to a recorder module/camera recorder module.
ONVIF Profile S	Simple profiles that focus on functions to deliver and display videos compliant with ONVIF standards.
ONVIF supported network camera	A network camera that supports ONVIF Profile S.
ONVIF®	ONVIF (Open Network Video Interface Forum) is a forum for developing common standard interfaces between network camera products.
Recording file	A file that consists of folders to which information such as a date and time or character strings can be added and files saved in the folders.
Recording setting	A setting for the recording function such as a sampling target, sampling interval, and saving period.

For definitions of terms for safety CPUs, refer to the following:

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

1 FUNCTIONS

This chapter explains the details on the functions of System Recorder.

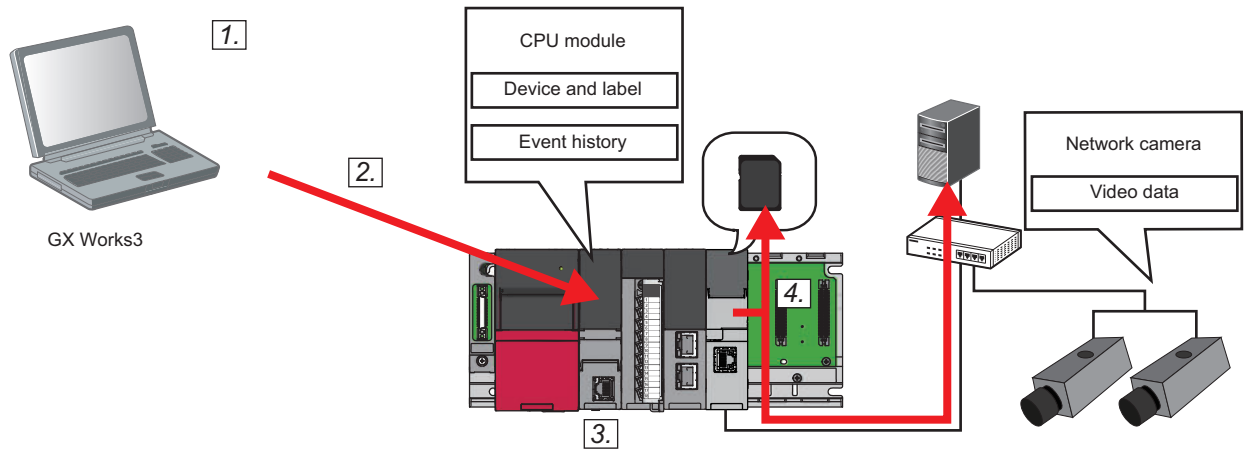
1.1 Recording Function

The recording function can be used to output data in a CPU module and video data captured by a network camera to a recording file and save them to a save destination specified in the recording setting when a file saving trigger is satisfied. The saved recording file can be reproduced by using the offline monitor function. This can facilitate identification and analysis of trouble factors and reduce the downtime of a system. (☞ Page 74 Offline Monitor Function)

The following data (recording target data) can be saved as a recording file.

Recording target data	Description
Device and label	Refers to values in devices and labels of a CPU module, the buffer memory of a module, and link devices on a network. A value at any timing can be saved for a set period. When using a safety CPU, standard devices, safety devices, standard labels, safety labels, and standard/safety shared labels used in all programs including safety programs can be sampled.
Event history	Refers to errors occurred on a network or in a module, and event information such as writing data to devices and labels.
Video data*1	Refers to video data captured by a network camera. Data at any timing can be saved for a set period. It is saved as a video file in a recording file.

*1 When specifying it as recording target data, use a camera recorder module.



1. Set programs, parameters, and recording settings in GX Works3.

2. Write them to a CPU module.

3. Reset the CPU module or turn the power OFF and ON to switch the CPU module to RUN.

When the recording function is in preparation and the preparation is completed, the following operations start according to the recording setting.

- Sampling and accumulating devices and labels*1
- Receiving and accumulating video data*2

*1 Link devices of a network module mounted on the base unit and values in the buffer memory of an intelligent function module can also be sampled and accumulated.

*2 If the communication with a network camera is not established and video data is not delivered from the network camera, data reception and accumulation do not start.
The timing when video data is delivered differs depending on the operating status, performance, and network configuration of a network camera.

4. Satisfy a file saving trigger.

When the trigger is satisfied, accumulated data (devices, labels, and video data) and event history files saved in the CPU module are output to a recording file and saved to a save destination specified in the recording setting.

For the flow to save data, refer to the following:

☞ Page 52 Flow to save data

Point

- Up to four recording settings can be configured and the recording function can be performed for each setting at the same time.
  Configure multiple recording settings and perform the recording function in either of the following cases:
  ·Setting multiple timings for data sampling, reception, and accumulation such as each scan, per day, inter-module synchronization execution*1, multiple CPU synchronization execution*1, or safety program execution*2
  ·Accumulating data even while a file is being saved*3 (The file can be saved without missing data by accumulating data in another recording setting.)
- To reproduce data properly on the offline monitor, the following information is checked for a match when starting the recording function. If it does not match, a recording setting error (error code: 3028H) occurs and the recording function does not start. In this case, write the recording setting to the CPU module again.
  - Project information*4 when the recording setting is configured (parameters and programs including device and label settings)
  - Parameters and programs written to the CPU module
  However, when using a module with the following firmware version, the recording function can be started for the next time without a recording setting error even when changing the program such as online program change or file batch online change while the recording function is running.
  - RnCPU or RnENCPU: '55' or later
  - RnSFCPU: '24' or later
  - Recorder module: '04' or later
  - Camera recorder module: '01' or later

*1 Select "Trigger Instruction" for the sampling method and use the DATATRG instruction in an inter-module synchronization or multiple CPU synchronization program.
☞ Page 39 Sampling methods of devices and labels
*2 Supported for safety CPUs only.
*3 Sampled and received data is not accumulated.
*4 Written to the recording setting.

Precautions

Some functions are restricted depending on the version of a recorder module or GX Works3. For details, refer to the following:

☞ Page 259 Added and Changed Functions

Recording methods

The following table shows the recording methods.

Recording method	Description	Purpose
File saving trigger only	Data (devices, labels, and video data) after the operating status of the recording function switches to 'operating' can be sampled, received, and accumulated.	Select this method to check the status of a device before and after an error occurs in the device when the error occurrence timing is clear. (By specifying an error occurrence as a file saving trigger, the operating status of a device before and after an error occurs can be checked.)
Recording startup trigger + file saving trigger	Devices and labels after the operating status of the recording function switches to 'operating' and a recording startup trigger is satisfied can be accumulated for a specified period.	Select this method when there is a difference in timings between when an error occurs and when it is detected such as when an error occurs while a device is operating at a regular interval and the device does not start operating at the next operating timing. (By using a recording startup trigger to specify a timing to start accumulating devices and labels and by including a timing when an error occurs in an accumulation period, the status of a device when it operated last can be checked.)

File saving trigger only

This is a method for sampling, receiving, and accumulating data (devices, labels, and video data) after the operating status of the recording function switches to 'operating.'[*1] (☞ Page 57 Operating status)

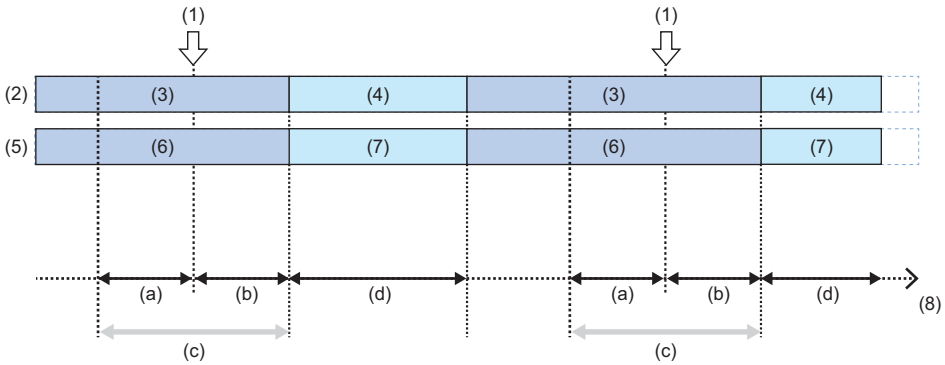
When a file saving trigger is satisfied, data accumulated during a period before and after the trigger is satisfied[*2] is saved.[*3] (☞ Page 25 File saving trigger)

A recording file is saved after a saving period elapses. Data accumulation stops during file saving and restarts after its completion.

*1 For video data, data reception and accumulation start when the operating status of the recording function switches to 'operating,' the communication with a network camera is established, and video data is delivered from the network camera.

*2 A period before or after a trigger is satisfied (saving period before trigger/saving period after trigger) can be set in the saving period setting in the recording setting.
When setting the saving period after trigger to '0' seconds, a recording file is saved when a file saving trigger is satisfied.
☞ Page 97 Saving Period Setting

*3 For video data, data accumulated approximately one second before the saving period may also be saved.



(1) File saving trigger
(2) Device and label
(3) Sampling and accumulating
(4) Sampling
(5) Video data
(6) Receiving and accumulating
(7) Receiving
(8) Time
(a) Saving period before trigger
(b) Saving period after trigger
(c) Saving period
(d) Period during which a recording file is saved

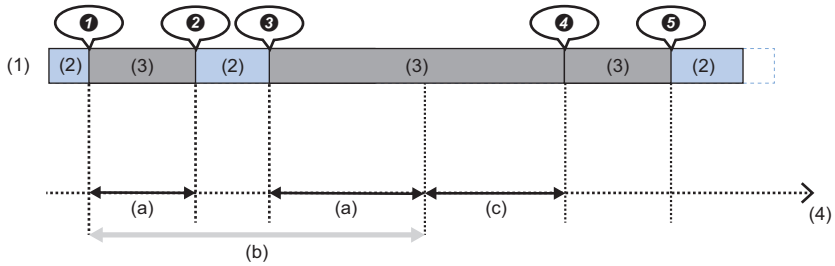
■If the communication with a network camera is disconnected

Video data cannot be received and accumulated.

Receiving and accumulating video data restart when a retry is successful.

If there is a period during which the communication is disconnected in a saving period, only video data in the period during which the communication is established is saved.

The following shows an operation to receive and accumulate video data if the communication with a network camera is disconnected.



(1) Video data
(2) Receiving and accumulating
(3) Communication is disconnected (data cannot be received and accumulated)
(4) Time
(a) Period during which video data cannot be saved
(b) Saving period
(c) Period during which a recording file is saved

❶ The communication is disconnected, and data reception and accumulation stop.

❷ A retry is successful, and data reception and accumulation restart.

❸ The communication is disconnected, and data reception and accumulation stop.

❹ Data accumulation does not start after saving is completed because the communication is disconnected (there is no video data because accumulated video data is deleted when a recording file is saved).

❺ A retry is successful, and data reception and accumulation restart.

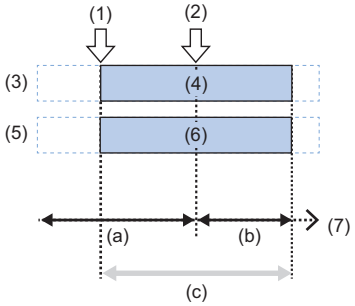
Point

- If the communication is disconnected, a communication retry start (event code: 00600) occurs.
- When a retry is successful, a communication retry recovery (event code: 00610) occurs.
- If the communication is disconnected for 10 seconds, a network camera communication error (error code: 1DF1H) occurs.
- Some network cameras stop delivering video data if disconnected for a long time.
  In this case, video data accumulated before the disconnection is discarded and video data accumulated after reception and accumulation restart is saved as a video file.

■Considerations

- Set the saving period to a length in which changed data can be sampled, received, and accumulated sufficiently.
- When switching a CPU module from RUN to STOP during a saving period after trigger or stopping the recording function in the "Recording Monitor" screen, data accumulated before the stop is saved. (☞ Page 122 RECORDING MONITOR)
- Only data after sampling, reception, or accumulation has started immediately before a file saving trigger is satisfied is saved, and data before the start is not saved.

- If the time from when data sampling, reception, and accumulation start to when a file saving trigger is satisfied is shorter than a saving period before trigger, the total of the time and a saving period after trigger is regarded as a saving period.



(1) Data sampling, reception, and accumulation start
(2) File saving trigger
(3) Device and label
(4) Sampling and accumulating
(5) Video data
(6) Receiving and accumulating
(7) Time
(a) Saving period before trigger
(b) Saving period after trigger
(c) Saving period

- Due to the time accuracy of a recorder module/camera recorder module, an error occurs between a set saving period and an actual one. For the time accuracy, refer to the following:

MELSEC iQ-R System Recorder User's Manual (Startup)

Recording startup trigger + file saving trigger

This is a method for accumulating devices and labels for a specified period[*1] after the operating status of the recording function switches to 'operating' and a recording startup trigger is satisfied.[*2*3] (☞ Page 23 Recording startup trigger)
When a file saving trigger is satisfied, devices and labels accumulated after a recording startup trigger satisfied immediately before the file saving trigger is saved. (☞ Page 25 File saving trigger)
For video data, data reception and accumulation start when the operating status of the recording function switches to 'operating,' the communication with a network camera is established, and video data is delivered from the network camera. In addition, video data is saved for a period same as devices and labels when a file saving trigger is satisfied.[*4]
A recording file is saved when a file saving trigger is satisfied.[*5]

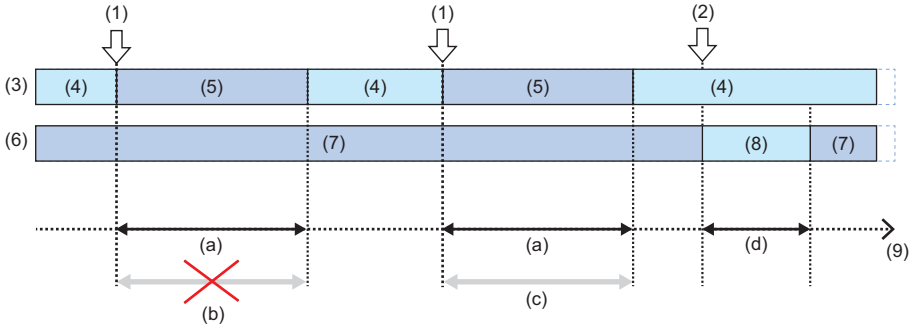
*1 Period from when a recording startup trigger is satisfied to when a time specified for "Saving Period After Recording Startup" in the saving period setting in the recording setting elapses
☞ Page 97 Saving Period Setting

*2 Device and label sampling starts when the operating status of the recording function switches to 'operating.' (☞ Page 57 Operating status)

*3 Device and label accumulation stops after a specified period elapses and restarts after the recording startup trigger is satisfied again; however, the recording startup trigger is disabled during a certain period. (☞ Page 23 Period during which a recording startup trigger is enabled or disabled)

*4 For video data, data accumulated approximately one second before the saving period may also be saved.

*5 During file saving, video data accumulation stops, and restarts after the file saving is completed.



(1) Recording startup trigger
(2) File saving trigger
(3) Device and label
(4) Sampling
(5) Sampling and accumulating
(6) Video data
(7) Receiving and accumulating
(8) Receiving
(9) Time
(a) Set saving period
(b) Period during which data is not saved
(c) Period during which data is saved
(d) Period during which a recording file is saved

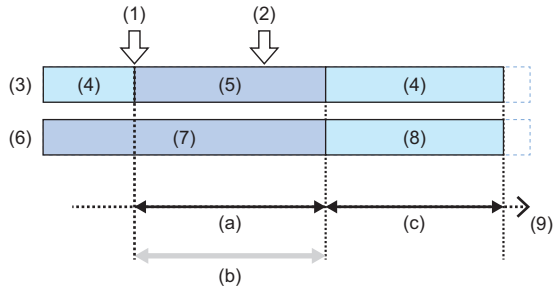
■If the communication with a network camera is disconnected

For an operation in this case, refer to the following:

☞ Page 19 If the communication with a network camera is disconnected

■Considerations

- Set the saving period to a length in which changed data can be sampled, received, and accumulated sufficiently.
- If a file saving trigger is satisfied between when a recording startup trigger is satisfied and when a specified period elapses, data for the specified period is saved to a save destination specified in the recording setting when it is accumulated.



(1) Recording startup trigger
(2) File saving trigger
(3) Device and label
(4) Sampling
(5) Sampling and accumulating
(6) Video data
(7) Receiving and accumulating
(8) Receiving
(9) Time
(a) Set saving period
(b) Saving period
(c) Period during which a recording file is saved

- When switching a CPU module from RUN to STOP or stopping the recording function in the "Recording Monitor" screen during a period from when a file saving trigger is satisfied to when a specified period elapses, data accumulated before the stop is saved. (☞ Page 122 RECORDING MONITOR)
- Due to the time accuracy of a recorder module/camera recorder module, an error occurs between a set saving period and an actual one. For the time accuracy, refer to the following:

📖MELSEC iQ-R System Recorder User's Manual (Startup)

Recording startup trigger

A recording startup trigger is used to start device and label accumulation, and satisfied when a specified device*1 rises or falls.*2 (☞ Page 57 Operating status)

*1 For devices that can be specified, refer to the following:
☞ Page 38 Devices that can be specified as triggers

*2 Whether a trigger has been satisfied is determined during the END processing in a scan of a CPU module.

Precautions

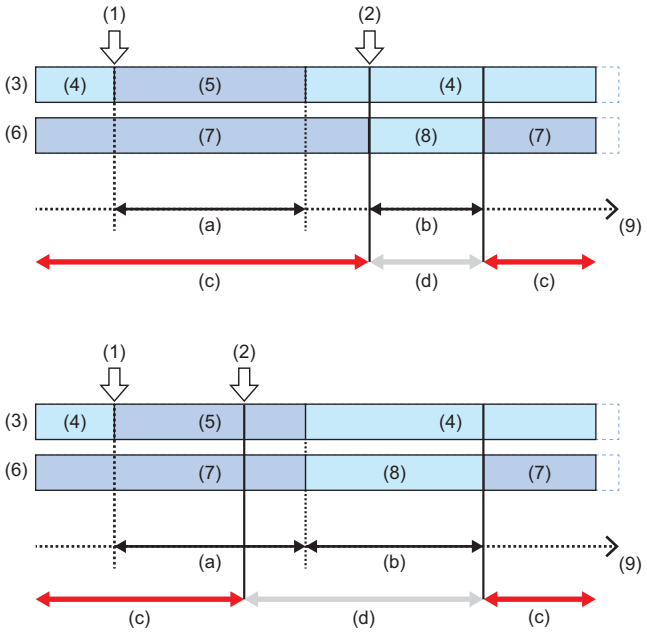
- Start the recording function and check that its operating status switches to 'operating' then satisfy a recording startup trigger. The operating status can be checked in 'In recording operation' (Un\G1501, Un\G1701, Un\G1901, Un\G2101)*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

- If a recording startup trigger is satisfied again after it is satisfied and devices and labels are accumulated, the accumulated ones are discarded and the accumulation restarts.

■Period during which a recording startup trigger is enabled or disabled

A recording startup trigger is enabled except the period from when a file saving trigger is satisfied to when saving a recording file is completed.



(1) Recording startup trigger
(2) File saving trigger
(3) Device and label
(4) Sampling
(5) Sampling and accumulating
(6) Video data
(7) Receiving and accumulating
(8) Receiving
(9) Time
(a) Saving period
(b) Period during which a recording file is saved
(c) Period during which the recording startup trigger is enabled
(d) Period during which the recording startup trigger is disabled

Whether a recording startup trigger is enabled or disabled can be checked with the combination of the values in the following buffer memories[*1] of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Buffer memory			Recording startup trigger
Data sampling	Recording buffer storing status	File saving trigger monitor	
0 (not sampling)	0 (no data)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled
	1 (data exists)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled
1 (sampling)	0 (no data)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled
	1 (data exists)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled

Point

The number of detected or disabled triggers can be checked in 'Recording startup trigger count' (Un\G1575, Un\G1775, Un\G1975, Un\G2175)[*2] or 'Invalid recording startup trigger count' (Un\G1576, Un\G1776, Un\G1976, Un\G2176)[*2] of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*2 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

File saving trigger

A file saving trigger is used to specify when to save accumulated data, and satisfied at any of the following timings.[*1]
(☞ Page 54 Recording buffer, Page 57 Operating status)

*1 Whether a trigger has been satisfied is determined during the END processing in a scan of a CPU module.

When a file saving trigger is satisfied in multiple recording settings, data is saved in order from a setting that can be saved.

- A specified device[*1] rises or falls.[*2]
- A value in a specified buffer memory[*3] rises.
- A specified time elapses after completion of data accumulation[*4*5]
- A file is saved in the "Recording Monitor" screen. (☞ Page 122 RECORDING MONITOR)

*1 For the devices that can be specified, refer to the following:
☞ Page 38 Devices that can be specified as triggers

*2 A trigger is satisfied by setting a device and condition in the file saving trigger setting and when the set condition is satisfied. (☞ Page 115 File Saving Trigger Setting)
Conditions can be set for multiple devices, and a condition number is added to each of them. (Up to 16 conditions can be set.)

*3 A trigger is satisfied when each bit rises in the following buffer memory of a recorder module/camera recorder module. (A condition number is added to each bit.)
☞ Page 192 File saving trigger (Un\G4007)
Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

*4 Can be set only when selecting "Recording Startup Trigger + File Saving Trigger" for the recording method.

*5 Due to the time accuracy of a recorder module/camera recorder module, an error occurs between a set timing and an actual one. For the time accuracy, refer to the following:
📖MELSEC iQ-R System Recorder User's Manual (Startup)

■Position where a file saving trigger is satisfied

The timing when a file saving trigger is satisfied is associated with that of device and label sampling and saved to a recording file, and can be checked as the position where the file saving trigger is satisfied on the offline monitor.[*1]

The position where a file saving trigger is satisfied is displayed on the offline monitor as follows:

- When selecting "Each Scan" for the sampling method: Same timing as device and label sampling
- When selecting an item other than "Each Scan" for the sampling method: Same timing as device and label sampling immediately before a trigger is satisfied

*1 The position can be checked with a trigger position marker even when playing a video file in GX VideoViewer.
The position where it is displayed is the same as the position where the file saving trigger is satisfied.
For details on the trigger position marker, refer to the following:
📖GX VideoViewer Version 1 Operating Manual

Point

Establishment of a trigger condition is registered as an event; therefore, its timing can be checked when reproducing data on the offline monitor.
Completion of saving a recording file is also registered as an event, but an event history is not output to the saved recording file.

Precautions

Start the recording function and check that its operating status switches to 'operating' then satisfy a file saving trigger if data is accumulated in the recording buffer. The operating status can be checked in 'In recording operation' (Un\G1501, Un\G1701, Un\G1901, Un\G2101)[*1] of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

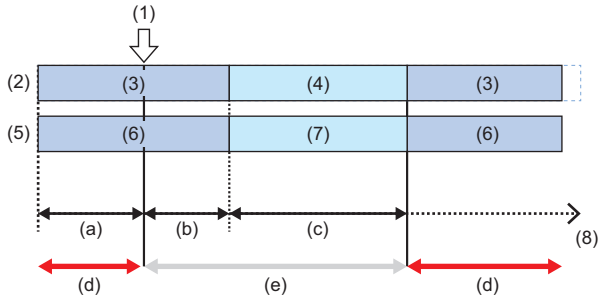
*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

■Period during which a file saving trigger is enabled or disabled

This period differs depending on the recording method.

• When selecting "File Saving Trigger Only" for the recording method

A file saving trigger is enabled except the period from when it is satisfied to when saving a recording file is completed.



(1) File saving trigger
(2) Device and label
(3) Sampling and accumulating
(4) Sampling
(5) Video data
(6) Receiving and accumulating
(7) Receiving
(8) Time
(a) Saving period before trigger
(b) Saving period after trigger
(c) Period during which a recording file is saved
(d) Period during which the file saving trigger is enabled
(e) Period during which the file saving trigger is disabled

Whether a file saving trigger is enabled or disabled can be checked in 'File saving trigger monitor' (Un\G1504, Un\G1704, Un\G1904, Un\G2104)*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Point

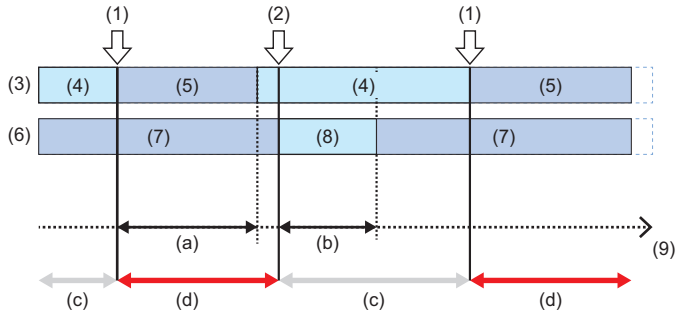
The number of detected or disabled triggers can be checked in 'File saving trigger count' (Un\G1577, Un\G1777, Un\G1977, Un\G2177)*2or 'Invalid file saving trigger count' (Un\G1578,Un\G1778, Un\G1978, Un\G2178)*2 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*2 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

• When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method

A file saving trigger is enabled except the period from when it is satisfied to when saving a recording file is completed. However, if a recording startup trigger is not satisfied after the recording function starts running or file saving is completed, the file saving trigger is disabled.*1

*1 Enabled if it is satisfied at the same time as a recording startup trigger.



(1) Recording startup trigger
(2) File saving trigger
(3) Device and label
(4) Sampling
(5) Sampling and accumulating
(6) Video data
(7) Receiving and accumulating
(8) Receiving
(9) Time
(a) Saving period
(b) Period during which a recording file is saved
(c) Period during which the file saving trigger is disabled
(d) Period during which the file saving trigger is enabled

Whether a file saving trigger is enabled or disabled can be checked with the combination of the values in the following buffer memories*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Buffer memory			File saving trigger
Data sampling	Recording buffer storing status	File saving trigger monitor	
0 (not sampling)	0 (no data)	0 (unsatisfied)	Disabled*2
		1 (satisfied)	Disabled
	1 (data exists)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled
1 (sampling)	0 (no data)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled
	1 (data exists)	0 (unsatisfied)	Enabled
		1 (satisfied)	Disabled

*2 Enabled if it is satisfied at the same time as a recording startup trigger.

Point

The number of detected or disabled triggers can be checked in 'File saving trigger count' (Un\G1577, Un\G1777, Un\G1977, Un\G2177)*3 or 'Invalid file saving trigger count' (Un\G1578, Un\G1778, Un\G1978, Un\G2178)*3 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*3 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Target data

The following shows data used for the recording function.

List of devices and labels that can be sampled for each sampling method

Devices and labels that can be sampled differ depending on the sampling method.

For details on each sampling method, refer to the following:

☞ Page 39 Sampling methods of devices and labels

○: Can be sampled, ×: Cannot be sampled

Sampling method	Standard device	Standard label	Safety device*1	Safety label*1	Standard/safety shared label*1
Each scan	○	○	○	○	○
Time specification	○	○	○	○	○
Trigger instruction	○	○	○	○	○
Safety cycle time	×	×	○	○	○

*1 Can be sampled when using a safety CPU.

Devices and labels that can be sampled

The following table shows the devices and labels that can be sampled by using the recording function.

For the method for specifying a device and label to be sampled, refer to the following:

☞ Page 32 Specifying a device and label to be sampled

■Devices that can be sampled

The following table shows the devices that can be sampled.

Note that digit-specified bit devices, indirect-specified devices, and index-modified devices cannot be specified.

Device name (device)		Sampling unit (point)	Size (word)	Remarks
User device[*1]	Input (X)[*2]	512	32	When specifying a DX, an X is sampled.
	Output (Y)[*2]	512	32	When specifying a DY, a Y is sampled.
	Internal relay (M/#M)[*2]	512	32	—
	Link relay (B)[*2]	512	32	—
	Annunciator (F)[*2]	512	32	—
	Link special relay (SB)[*2]	512	32	—
	Edge relay (V/#V)[*2]	512	32	—
	Timer (T/#T)	32	36	• When specifying a T, a contact (TS), coil (TC), and current value (TN) are sampled. • Even when specifying a TS, TC, or TN individually, all of them are sampled.
	Retentive timer (ST/#ST)	32	36	• When specifying an ST, a contact (STS), coil (STC), and current value (STN) are sampled. • Even when specifying an STS, STC, or STN individually, all of them are sampled.
	Long timer (LT/#LT)	8	32	• When specifying an LT, a contact (LTS), coil (LTC), and current value (LTN) are sampled. • Even when specifying an LTS, LTC, or LTN individually, all of them are sampled.
	Long retentive timer (LST/#LST)	8	32	• When specifying an LST, a contact (LSTS), coil (LSTC), and current value (LSTN) are sampled. • Even when specifying an LSTS, LSTC, or LSTN individually, all of them are sampled.
	Counter (C/#C)	32	36	• When specifying a C, a contact (CS), coil (CC), and current value (CN) are sampled. • Even when specifying a CS, CC, or CN individually, all of them are sampled.
	Long counter (LC/#LC)	32	68	• When specifying an LC, a contact (LCS), coil (LCC), and current value (LCN) are sampled. • Even when specifying an LCS, LCC, or LCN individually, all of them are sampled.
	Data register (D/#D)[*3]	32	32	—
	Link register (W)[*3]	32	32	—
	Link special register (SW)[*3]	32	32	—
	Latch relay (L)[*2]	512	32	—
System device[*1]	Special relay (SM)[*2]	512	32	—
	Special register (SD)[*3]	32	32	—
File register[*1]	(R)[*3]	32	32	—
	(ZR)[*3]	32	32	
Index register (Z, LZ)[*1*5]		24	24	• Even when specifying a Z or LZ individually, all of them are sampled. • A Z or LZ is sampled in 24-word units even when specifying it individually.
Refresh data register (RD)[*1*3]		32	32	—
Module access device (Un\G)[*1*3]		32	32	—
CPU buffer memory access device[*1]	(U3En\G)[*3]	32	32	—
	(U3En\HG)[*3]	32	32	—

Device name (device)		Sampling unit (point)	Size (word)	Remarks
Link direct device*1	Link input (Jn\X)*2	512	32	—
	Link output (Jn\Y)*2	512	32	—
	Link relay (Jn\B)*2	512	32	—
	Link register (Jn\W)*3	32	32	—
	Link special relay (Jn\SB)*2	512	32	—
	Link special register (Jn\SW)*3	32	32	—
Safety user device*4	Safety input (SA\X)*2	512	32	—
	Safety output (SA\Y)*2	512	32	—
	Safety internal relay (SA\M/SA\#M)*2	512	32	—
	Safety link relay (SA\B)*2	512	32	—
	Safety link register (SA\W)*3	32	32	—
	Safety timer (SA\T/ SA\#T)	32	36	• When specifying an SA\T, a contact (SA\TS), coil (SA\TC), and current value (SA\TN) are sampled. • Even when specifying an SA\TS, SA\TC, or SA\TN individually, all of them are sampled.
	Safety retentive timer (SA\ST/SA\#ST)	32	36	• When specifying an SA\ST, a contact (SA\STS), coil (SA\STC), and current value (SA\STN) are sampled. • Even when specifying an SA\STS, SA\STC, or SA\STN individually, all of them are sampled.
	Safety counter (SA\C/ SA\#C)	32	36	• When specifying an SA\C, a contact (SA\CS), coil (SA\CC), and current value (SA\CN) are sampled. • Even when specifying an SA\CS, SA\CC, or SA\CN individually, all of them are sampled.
	Safety data register (SA\D/SA\#D)*3	32	32	—
Safety system device*4	Safety special relay (SA\SM)*2	512	32	—
	Safety special register (SA\SD)*3	32	32	—

*1 Cannot be sampled when selecting "Safety Cycle Time" for "Sampling Method."

*2 When the number of device points set in the CPU parameter is 512 points or less, the set number of points is sampled (the minimum is 64 points (bits)).

*3 When the number of device points is set to 32 points or less in the CPU parameter, the set number of points is sampled (the minimum is 4 points (words)).

*4 Can be sampled only when using a safety CPU.

*5 Local index registers and local long index registers cannot be specified.
When specifying a local index register or local long index register on a program, an index register or a long index register is sampled as a global device.
In addition, 32-bit index modification with ZZ expression cannot be specified.

Precautions

When sampling file registers (R/ZR), select an item to use them in the file register setting in the CPU parameter.

If target file registers (R/ZR) do not exist at the time of sampling, intended values may not be sampled.

Do not change the file name or block number of a file register after the recording function starts running. Otherwise, the recording function may not run normally and a recording result may not be reproduced properly.

■Labels that can be sampled

Labels are sampled in 32-word units.

Bit type (BOOL) and word type (WORD) in a program are calculated as 32 points in a word conversion; therefore, a label that is not used in a program may be included in the sampling target.

When the label size is set to 32 points (words) or less, the set label size is sampled (the minimum is 4 points (words)).

Note that any labels cannot be specified individually.

Label name	Class	Size (word)	Data type
Global label*1*2	VAR_GLOBAL, VAR_GLOBAL_RETAIN	32	■Simple data type • Bit • Word (signed) • Double word (signed) • Word (unsigned) • Double word (unsigned) • Float (single precision) • Float (double precision) • Time • String • Timer • Retentive timer • Counter • Long timer • Long retentive timer • Long counter ■Array ■Structure
Safety global label*2*3	VAR_GLOBAL	32	
Local label*1	VAR, VAR_RETAIN, VAR_INPUT, VAR_OUTPUT, VAR_OUTPUT_RETAIN, VAR_IN_OUT, VAR_PUBLIC, VAR_PUBLIC_RETAIN	32	
Safety local label*3	VAR, VAR_INPUT, VAR_OUTPUT, VAR_IN_OUT, VAR_PUBLIC	32	
Module label*1*4	—	32	
Standard/safety shared label*2*3	VAR_GLOBAL	32	

*1 Cannot be sampled when selecting "Safety Cycle Time" for "Sampling Method."

*2 When a device is assigned to a global label, safety global label, or standard/safety shared label, target data is treated as a device.

*3 Can be sampled when using a safety CPU.

*4 When a device (X, Y, or Un\G) is assigned to a module label, target data is treated as a device.

Precautions

When sampling a global label to which a file register (R/ZR) is assigned, do not change the file name or block number of a file register after the recording function starts running. Otherwise, the recording function may not run normally and a recording result may not be reproduced properly.

Specifying a device and label to be sampled

The following table shows the specification methods of devices and labels to be sampled.

Specification method		Description	Purpose	Screen
Device/label batch specification	—	Devices and labels used in a program can be specified as sampling targets in a batch. When enabling this method, devices and labels used in all programs and FBs set in the program setting and FB/FUN setting in the CPU parameter are specified as sampling targets. ■Target program*1*2*3 Ladder, ST, SFC*4, and FBD/LD ■Target data Refer to the following: ☞ Page 34 Target data in a program	Use this method to easily sample devices and labels used in a program.	☞ Page 98 Device/Label Sampling Setting
	Include the parameter	Select this method to also include devices and labels used in the CPU parameter or module parameter in the sampling target. ■Target data Refer to the following: ☞ Page 36 Target data in a parameter	Use this method to easily sample devices and labels specified in a parameter. This method can also be used to check the module status if a trouble occurs.	
Specify from the device/label list	—	Any devices and labels can be specified as sampling targets from the list of devices and labels used in a program. ■Target program*1*2*3*5 Ladder, ST, SFC*4, and FBD/LD ■Target data Refer to the following: ☞ Page 34 Target data in a program	Use this method in any of the following cases: • Narrowing down devices and labels to be sampled to shorten the sampling time or lengthen the saving period • Multiple recording settings are configured • Sampling data at a fixed cycle such as when using an interrupt program (when specifying "Trigger Instruction")	☞ Page 100 "Specify from the Device/Label List" screen
	Include devices/ labels used in parameter setting	Select this method to display devices and labels used in the CPU parameter or module parameter in the list and specify any devices and labels as sampling targets. ■Target data ☞ Page 36 Target data in a parameter		
Specify the device range		Devices to be sampled can be specified individually.	Use this method in any of the following cases: • Adding data that cannot be sampled by using 'device/label batch specification' and 'specify from the device/label list' as sampling targets • Multiple recording settings are configured • Sampling data at a fixed cycle such as when using an interrupt program (when specifying "Trigger Instruction")	☞ Page 112 "Specify the Device Range" screen

*1 The following types of programs are excluded from the targets:
Program the execution type of which is "No Execution Type"
Unregistered program
Unconverted program
Program that is registered in the program setting in the CPU parameter but does not exist in the navigation window

*2 FUNs are not targets and only FBs used in a program are targets.

*3 Standard programs and standard FBs are not targets when "Safety Cycle Time" is selected for "Sampling Method."

*4 An SFC program (Zoom) including MELSAP-L (instruction format) is a target (excluding an SFC diagram in the detailed expression).

*5 Devices and labels used in the following type of program do not appear in the "Specify from the Device/Label List" screen.
Program that is secured and cannot be displayed

Point

- By default, 'device/label batch specification' is enabled.
  In this case, all devices and labels in a program are set as sampling targets and they are automatically set as sampling targets even when adding or changing the program after configuring the recording setting.
  However, depending on an instruction used in the program, only the start device is set as a sampling target and all devices and labels used by the instruction may not be set.
  Specify sampling targets by using 'specify the device range' as necessary.
- When specifying devices and labels in a batch, those numbers increase and the scan time is longer. It is recommended to use 'specify from the device/label list' to specify only required devices and labels as sampling targets. Also, delete unnecessary programs from a project.
- When configuring multiple recording settings or sampling data at a fixed cycle such as when using an interrupt program (when specifying "Trigger Instruction"), disable 'device/label batch specification' and use 'specify from the device/label list' or 'specify the device range' to specify only required devices among those specified by using 'device/label batch specification' as sampling targets. If 'device/label batch specification' is enabled, the number of devices and labels to be sampled increases and the scan time is longer.
- For using a global label, assign a device and use 'specify the device range' to specify the assigned device.

Ex.

Use 'specify from the device/label list' in the following cases:

Case	Remarks
Sampling values in the buffer memory that are not used in a program such as data for monitoring a module (to use for troubleshooting)	—
Multiple recording settings are configured	Disable 'device/label batch specification' and specify only required devices as sampling targets to reduce the size of data to be sampled.
Sampling data at a fixed cycle such as when using an interrupt program (when specifying "Trigger Instruction")	

Point

When specifying devices and labels used in a project as sampling targets, the scan time can be shortened by selecting 'specify from the device/label list' and specifying required devices and labels only.
Devices and labels used in a parameter can also be specified by using 'specify from the device/label list.'
For the operation to specify sampling targets from the device/label list, refer to the following:
☞ Page 100 "Specify from the Device/Label List" screen

Ex.

Use 'specify the device range' in the following cases:

Case	Remarks
Index modification or indirect specification is specified in a program	To sample a device that cannot be specified as a sampling target by using 'device/label batch specification' and 'specify from the device/label list,' specify it individually.
Sampling data such as control data in an area required for the operation of an instruction	
A device is specified for a numerical value (n) such as the number of devices, transfers, units of data, or character strings	

■Target data in a program

When specifying a sampling target by using 'device/label batch specification' or 'specify from the device/label list,' the following types of data in a target program are targets.

To sample a device not included in the following data, specify it by using 'specify the device range.'

Target data	Remarks
Start of data specified as an operand	☞ Examples of sampling targets for each instruction and operand
Range of devices according to the data type for an operand (number of elements)	Only when the data size is determined (excluding the string type)
Range of devices specified by an operand (n) (number of elements)	Only when the range is specified by a constant*1
Range of labels according to the data type of a label specified as an operand	☞ Examples of sampling targets for each instruction and operand

*1 Excluding character strings and VAR_CONSTANT

• Examples of sampling targets for each instruction and operand

For an instruction that can determine the range of devices and labels when specified, target data within the range is sampled. For the instructions, refer to the following:

☞ Page 252 List of Instructions that can Determine the Range of Devices and Labels When the Instructions are Specified

For instructions that cannot determine the range of devices and labels when specified (ones not included in 'List of Instructions that can Determine the Range of Devices and Labels When Specified'), standard FUNs, and standard FBs, refer to the definition of each operand.

If a constant (excluding a character string and VAR_CONSTANT) is specified for a variable-length argument (n) in an instruction that cannot determine the range of devices and labels when specified, standard FUN, or standard FB, devices according to a specified size are sampled.

The following table shows examples of the sampling targets for each instruction and operand.

Examples of sampling targets for each instruction

Instruction	Sampling target	Example	
		Program	Sampling target
MOV	Specified device	MOV D0 W0	• D0 to D31 (32 points) • W0 to W1F (32 points)
BMOV (Number of transfers = constant)	Devices for the number of transfers	BMOV D31 D100 K10	• D0 to D63 (64 points) • D96 to D127 (32 points)
BMOV (Number of transfers = device)	Specified device (Devices for the number of transfers must be specified by using 'specify the device range.')	BMOV D31 D100 W0 • W0=10	• D0 to 31 (32 points) • D96 to 127 (32 points) • W0 to 1F (32 points)
GP.SWRITE (J/U) (s1) (s2) "(d1)" (d2) "(d3)"	• s1 and s2: Specified device (A device such as control data for the area required for other operations must be specified by using 'specify the device range.') • d1 and d3: Not to be sampled • d2: Two points of the number of elements	GP.SWRITE U0 D0 D100 "D100" M511 "B0"	• D0 to 31 (32 points) • D96 to 127 (32 points) • M0 to 1023 (1024 points)

Examples of sampling targets for each operand

Operand		Sampling target	Example	
			Program	Sampling target
Timer, counter		Contact, coil, and current value of a specified device	OUTH T0 K10	T0 to 31 (TS, TC: 32 points, TN: 32 points)
Indirect specification		Specified device for indirect specification*1	MOV K100 @D0	D0 to D31 (32 points)
Index modification		Specified device and index register for index modification*2	MOV K100 D0Z0	• D0 to 31 (32 points) • Z0 to 23 (24 points)
			MOV K100 U04\G0Z0	U0\G0 to U0\G31 (32 points) Z0 to 23 (24 points)
			MOV K100 J1\W0Z0	J1\W0 to J1\W1F (32 points) Z0 to 23 (24 points)
32-bit index modification with ZZ expression		Specified device for index modification	DMOV K100 D0ZZ0	D0 to 31 (32 points)
Index-modified input/output numbers and network number		No target data	MOV K100 U0Z0\G0	N/A
			MOV K100 J1Z0\W0	N/A
Data specification	Bit-specified word device	Devices in a specified range	LD D0.0	D0 to 31 (32 points)
	Digit-specified bit device	Devices in a specified range	DMOV K4M497 D0	• M0 to 1023 (1024 points) • D0 to 31 (32 points)
Structure	—	All members of a specified structure	BMOV stLabel0 stLabel10 K10	• Entire stLabel0 • Entire stLabel10
	Member	Members of a specified structure	MOV K10 stLabel0.member1	stLabel0.member1 (Members other than stLabel0.member1 are not sampled.)
	Member (for block transfer instructions)	All members of a specified structure	BMOV stLabel0.member1 stLabel10 K10	• Entire stLabel0 • Entire stLabel10
	Timer, counter	Contact, coil, and current value of a specified device	LD tLabel0	tLabel0 (tLabel0.S, tLabel0.C, tLabel0.N)
Array label	—	All elements of a specified array	MOV K0 LabelA	LabelA [0] to LabelA [999] (all elements of LabelA)
	Element	All elements of a specified array	MOV K0 LabelA[K0]	
			MOV K10 LabelA[D100]	• LabelA [0] to LabelA [999] (all elements of LabelA) • D96 to 127 (32 points)

*1 A device specified for indirect specification is not specified as a sampling target. Set it by using 'specify the device range' to sample.
*2 A device specified for index modification is not specified as a sampling target. Set it by using 'specify the device range' to sample.

■Considerations for sampling labels

- Labels cannot be specified by using 'specify the device range.'
- By assigning a device to a global label, the assigned device can be set by using 'specify the device range.' (A device cannot be assigned to a local label.)
- When sampling a label specified as an operand that uses a variable-length value, all members of a structure or all elements of an array can be sampled by specifying a label defined as the structure or array as an operand. (☞ Examples of sampling targets for each instruction and operand)

■Considerations for specifying "Safety Cycle Time"

- When specifying "Safety Cycle Time" for the sampling method for a safety CPU, specify a time including the processing time of the recording function for the safety cycle time in the CPU parameter.
  Otherwise, a safety cycle processing error may occur due to delay in the processing time.
  Set the time to sample required devices and labels only.

■Target data in a parameter

Devices and labels specified in the following parameters can be specified as sampling targets.

The host CPU module and modules under its control[*1] are targets.

*1 Excluding the following types of modules:
Q series module
Module not set in the I/O assignment setting in the system parameter
Module for which "Empty" is selected in the module status setting in the I/O assignment setting in the system parameter

Parameter type		Remarks
CPU parameter	Refresh setting between multiple CPUs	—
Module parameter	Refresh setting in the CC-Link IEF Basic setting	Devices specified for a CPU
	Refresh setting	Refresh target devices and module labels
	Simple CPU communication setting	Devices specified for the host station
	Safety data transfer device setting in safety communication setting	Only when using a safety CPU

Point

When also including parameters in the sampling target, devices and labels specified in the CPU parameter or module parameter can also be included in the sampling target.

By including parameters to check the module status in the sampling target, the module status can be checked by playing it when a trouble occurs.[*2]

However, the scan time is longer because the number of devices and labels to be sampled increases.

*2 A recording result for devices and labels used in a parameter can be checked in the watch window or device batch monitor by starting offline monitoring.

Video data that can be received

Video data delivered from a network camera connected to the Ethernet port of a camera recorder module is received.
The following table shows the specifications of video data that can be set as a receiving target.

Item	Setting item
Resolution*1	• FHD (1920 × 1080) • HD (1280 × 720) • VGA (640 × 480)
Frame rate (fps)*1	• 10 • 30 • 120 • 200
Video codec*1	• H.264 • Motion JPEG
Video rotation angle*1	• 0° • 180°
Video quality*1	• High • Middle • Low

*1 For details on each item, refer to the following:
☞ Page 199 Video data delivery setting

Precautions

Depending on the performance of a network camera used, items that can be selected differ from those in the above table.
For details, refer to the manual of a network camera used.

Devices that can be specified as triggers

The following table shows the devices that can be specified as triggers.

Device name (device)*1		Remarks
User device	Input (X)	DXs cannot be specified.
	Output (Y)	DYs cannot be specified.
	Internal relay (M)	Local devices cannot be specified.
	Link relay (B)	—
	Annunciator (F)	—
	Link special relay (SB)	—
	Edge relay (V)	Local devices cannot be specified.
	Timer (T)	• A contact (TS) is a target. • Local devices cannot be specified.
	Retentive timer (ST)	• A contact (STS) is a target. • Local devices cannot be specified.
	Long timer (LT)	• A contact (LTS) is a target. • Local devices cannot be specified.
	Long retentive timer (LST)	• A contact (LSTS) is a target. • Local devices cannot be specified.
	Counter (C)	• A contact (CS) is a target. • Local devices cannot be specified.
	Long counter (LC)	• A contact (LCS) is a target. • Local devices cannot be specified.
	Data register (D)	• Specify a word device as a bit (example: D0.0). • Local devices cannot be specified.
	Link register (W)	Specify a word device as a bit (example: W0.0).
	Link special register (SW)	Specify a word device as a bit (example: SW0.0).
	Latch relay (L)	—
System device	Special relay (SM)	—
	Special register (SD)	Specify a word device as a bit (example: SD0.0).
File register	(R)	Specify a word device as a bit (example: R0.0).
	(ZR)	
Refresh data register (RD)		Specify a word device as a bit (example: RD0.0).

*1 Digit-specified or indirect-specified bit devices and index-modified devices cannot be specified.

■Selecting "Safety Cycle Time" for "Sampling Method"

When selecting "Safety Cycle Time" for the sampling method when using a safety CPU, specify a standard device as a file saving trigger and recording startup trigger, and create a standard program for a program for trigger detection.

Precautions

- For operating a file saving trigger in a program, an engineering tool, or external device, specify a device specified as a file saving trigger.
- When specifying a file register (R/ZR), do not change the file name or block number of a file register after the recording function starts running. Otherwise, the recording function may not run normally and a recording result may not be reproduced properly.

Sampling methods of devices and labels

The following table shows the sampling methods of devices and labels.

Sampling method	Description
Each scan	Data is sampled during the END processing in a scan of a CPU module.
Time specification	Data is sampled during the END processing in a scan executed first after a specified time elapses.
Trigger instruction	Data is sampled when executing the DATATRG instruction.
Safety cycle time	Data in a safety program and safety FB is sampled at the end of safety cycle processing.

Point

When sampling a device and label in a periodic execution type program, an interrupt program, or a safety program, the program may be executed during data sampling if "Each Scan" or "Time Specification" is specified for the sampling method. In this case, inconsistency of sampled data occurs.
To avoid data inconsistency, configure a new setting with another setting number as follows:

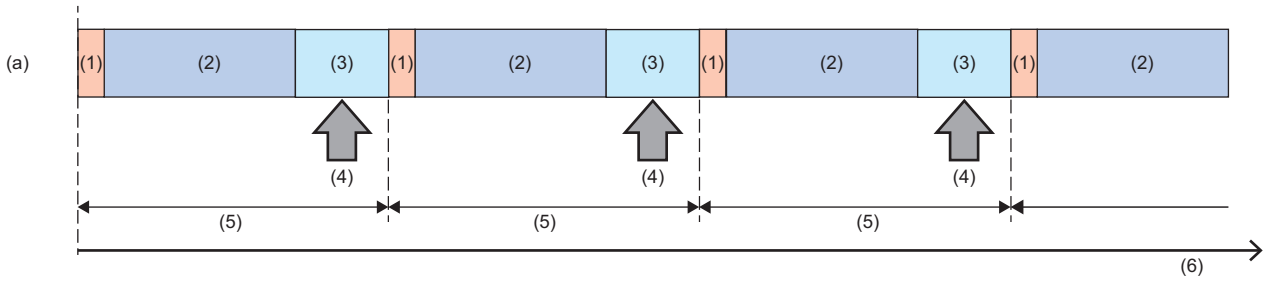
- Periodic execution type program or interrupt program: Specify "Trigger Instruction" for the sampling method and set a device and label used in a periodic execution type program or an interrupt program as a sampling target. In addition, execute the DATATRG instruction immediately before the END processing.
- Safety program: Specify "Safety Cycle Time" for the sampling method and set a device and label used in a safety program as a sampling target.

Precautions

When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method, data is accumulated for a specified period after a recording startup trigger is satisfied. Therefore, no data is accumulated if the sampling timing is out of the specified period.

Sampling timing when selecting "Each Scan"

The sampling timing is as follows:



(1) I/O refresh
(2) Program operation
(3) END processing
(4) Sampling processing*1*2
(5) Scan time
(6) Time
(a) Scan execution program

*1 The time required for sampling processing is added to the scan time. For details on the sampling time, refer to the following:
☞ Page 248 Sampling time

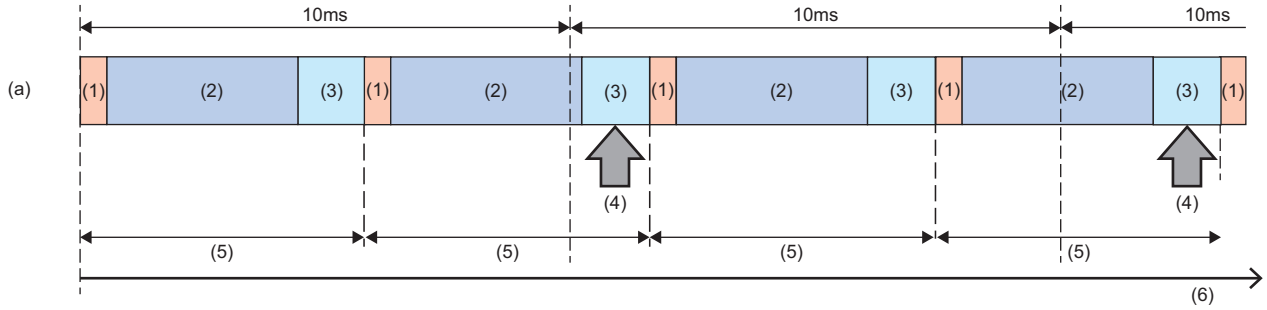
*2 When an interrupt program is executed during the END processing, the execution time of the interrupt program is also included in the sampling time.

Sampling timing when selecting "Time Specification"

The sampling timing is as follows:

Ex.

The timing is set to 10 milliseconds (10 ms).



(1) I/O refresh
(2) Program operation
(3) END processing
(4) Sampling processing*1*2
(5) Scan time
(6) Time
(a) Scan execution program

*1 The time required for sampling processing is added to the scan time. For details on the sampling time, refer to the following:
☞ Page 248 Sampling time

*2 When an interrupt program is executed during the END processing, the execution time of the interrupt program is also included in the sampling time.

Precautions

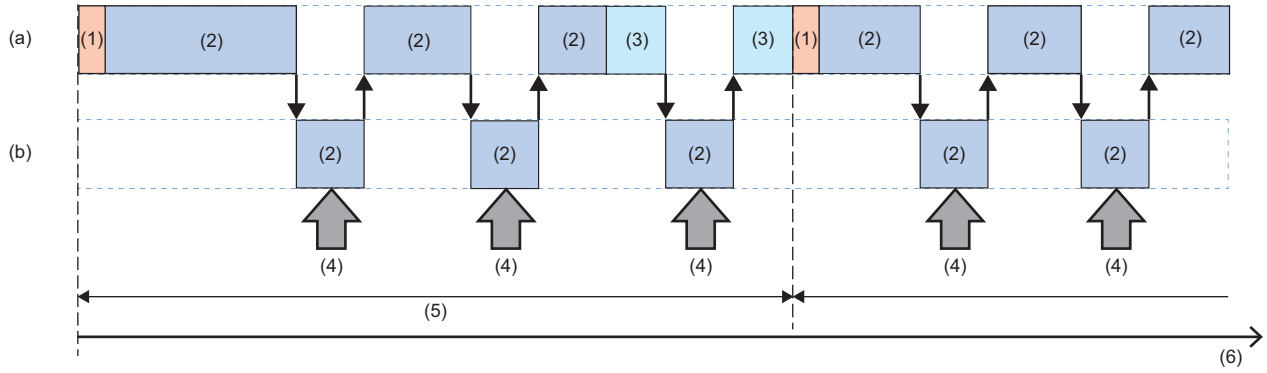
- Set the timing so that the time specification is longer than the scan time; otherwise, data is sampled during the END processing only once if multiple sampling intervals and sampling timings for the time specification are included in one scan. In this case, data is sampled for each scan and the operation will be the same as the each scan.
- If a sampling interval is longer than a saving period, sampled data may not be included in the saving period. In this case, saving a file fails when a file saving trigger is satisfied and an error occurs in a recorder module/camera recorder module. A saving period differs depending on the recording method. (☞ Page 18 Recording methods)

Sampling timing when selecting "Trigger Instruction"

The sampling timing is as follows:

Ex.

When executing the DATATRG instruction in an interrupt program



(1) I/O refresh
(2) Program operation
(3) END processing
(4) DATATRG instruction execution sampling processing*1
(5) Scan time
(6) Time
(a) Scan execution program
(b) Interrupt program

*1 The time required for sampling processing for the number of times the DATATRG instruction is executed is added to the scan time. For details on the sampling time, refer to the following:
☞ Page 248 Sampling time

Point

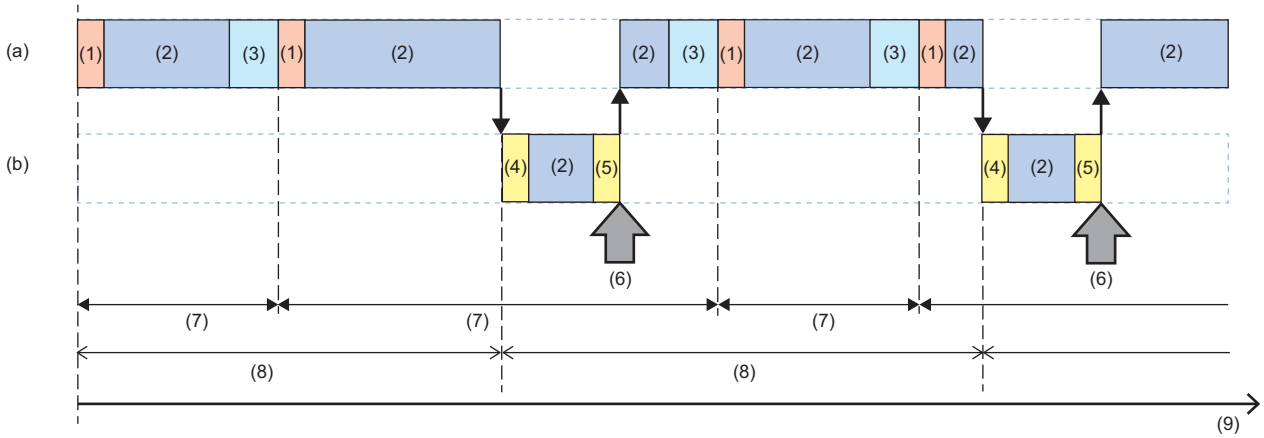
When specifying "Trigger Instruction" for the sampling method and executing the DATATRG instruction in a fixed cycle execution program and an interrupt program, a device and label can be sampled when executing these programs.
The DATATRG instruction cannot be executed in a safety program. To sample a device and label when executing a safety program, specify "Safety Cycle Time" for the sampling method.

Precautions

If an interval for trigger instruction execution is longer than a saving period, sampled data may not be included in the saving period. In this case, saving a file fails when a file saving trigger is satisfied and an error occurs in a recorder module/camera recorder module.
A saving period differs depending on the recording method. For details, refer to the following: (☞ Page 18 Recording methods)

Sampling timing when selecting "Safety Cycle Time"

The sampling timing is as follows:



(1) I/O refresh
(2) Program operation
(3) END processing
(4) Safety input refresh
(5) Safety output refresh
(6) Sampling processing*1
(7) Scan time
(8) Safety cycle time
(9) Time
(a) Scan execution program
(b) Safety program

*1 The time required for sampling processing is included in the safety cycle time. For details on the sampling time, refer to the following:
☞ Page 248 Sampling time

Precautions

If a sampling interval is longer than a saving period, sampled data may not be included in the saving period. In this case, saving a file fails when a file saving trigger is satisfied and an error occurs in a recorder module/camera recorder module. A saving period differs depending on the recording method. For details, refer to the following: (☞ Page 18 Recording methods)

Video data receiving setting

Video data is received from a network camera set as a receiving target in the recording setting when the recording function starts running.
However, if video data cannot be received from the network camera even after 10 seconds or more, a network camera communication start error (error code: 1DC0H) occurs.
Target video data can be set in the "Video Data Receiving Target Setting" screen of the recording setting.
For details on the screen, refer to the following:
☞ Page 120 Video Data Receiving Target Setting
In addition, the video data receiving status for each network camera can be checked in 'Video data receiving status' (Un\G34477, Un\G34977, Un\G35477, Un\G35977).
☞ Page 234 Network camera status area (Un\G34000 to 37999)

Point

A predicted value of the recording buffer capacity of video data, which is calculated based on the network camera setting and video data receiving target status, is displayed in the "Video Data Receiving Target Setting" screen of the recording setting. (☞ Page 54 Recording buffer)
The actual recording time differs depending on the conditions and environment for capturing data.
(Example)

- If the change in a video to be captured is small, the size of a video file actually output is smaller than a predicted value.
- If the performance of a network camera is high, the size of a video file actually output is larger than a predicted value.

If a predicted value exceeds the maximum recording buffer capacity, the recording buffer capacity of video data is compressed by a camera recorder module so that it is included in the maximum recording buffer capacity.
As a result, if a calculated value of the recording buffer capacity is a decimal number, the first decimal place is rounded up to an integer value.
However, the recording buffer capacity is reserved to generate video files of one second or longer.

Recording file

A recording file can be saved to either of the following save destinations.

Save destination	Save destination folder
SD memory card	RECORD/(setting type folder)*1
File server	(Save destination folder*2 specified in the file server setting in the recording setting)/RECORD/(setting type folder)*1

*1 The folder name differs for each recording setting.
Setting No.1: RC1
Setting No.2: RC2
Setting No.3: RC3
Setting No.4: RC4

*2 For details on save destination folders, refer to the following:
☞ Page 117 File server setting

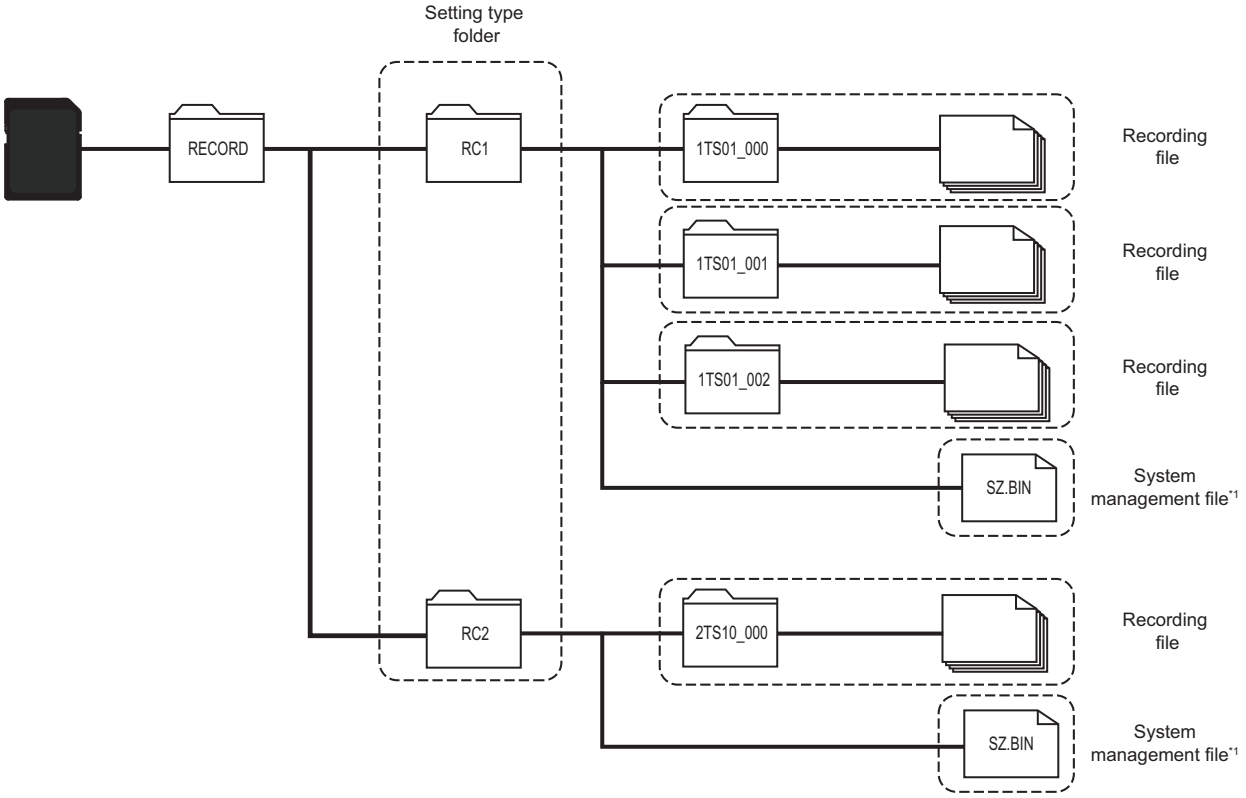
Point

For centrally managing recording files saved in multiple systems, it is recommended to specify a file server as the save destination.

Precautions

- Prepare a folder for saving recording files on a file server in advance; otherwise, recording files will not be saved.
- When using a file server in multiple systems to save recording files, specify a different folder for each system; otherwise, files may not be saved properly.

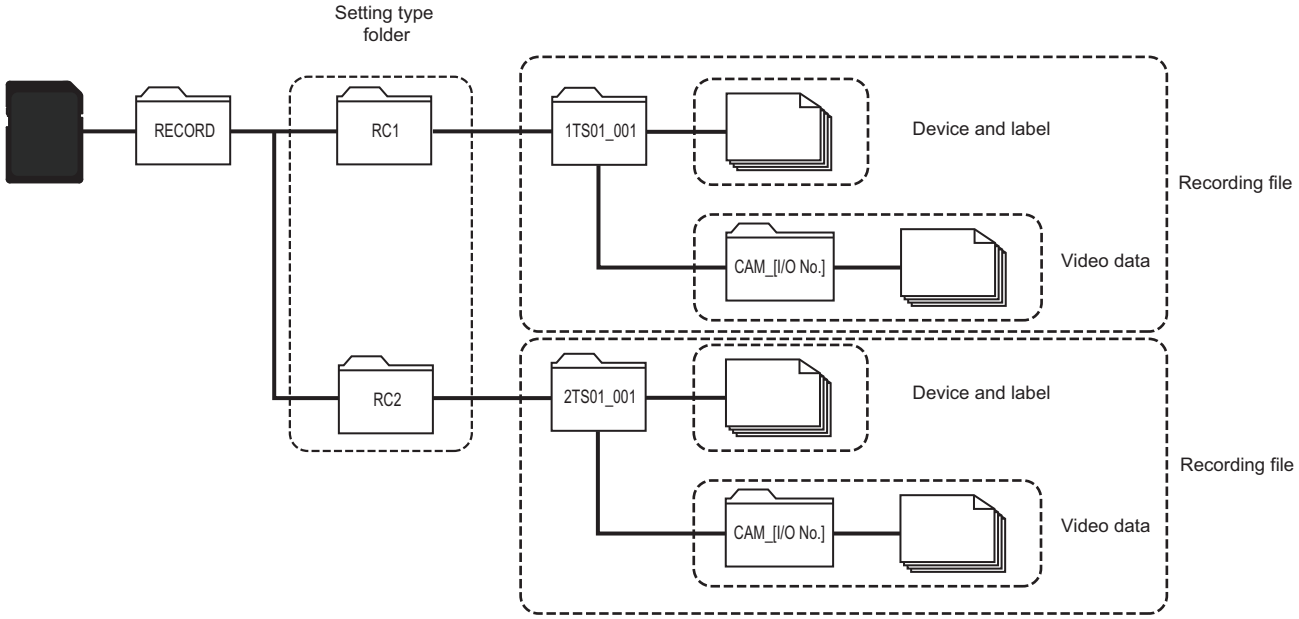
Folder configuration in an SD memory card



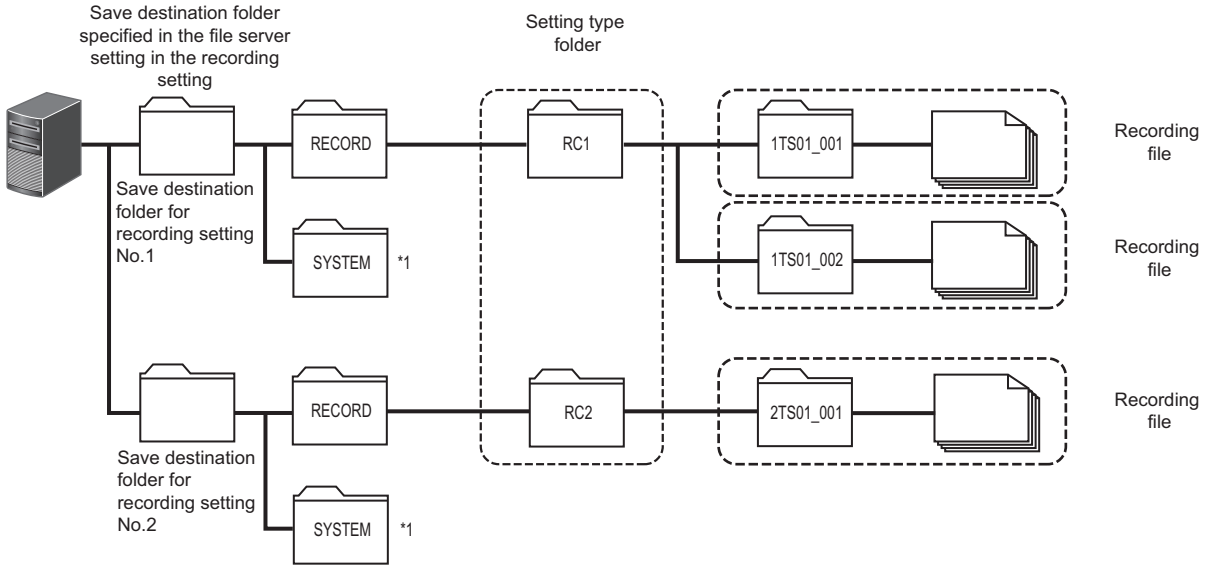
*1 Do not edit or delete it.

Folder configuration in an SD memory card (including video data)

When specifying video data as recording target data, it is saved as a video file to a recording file. (☞ Page 50 Name and save destination of a video file)



Folder configuration in a file server

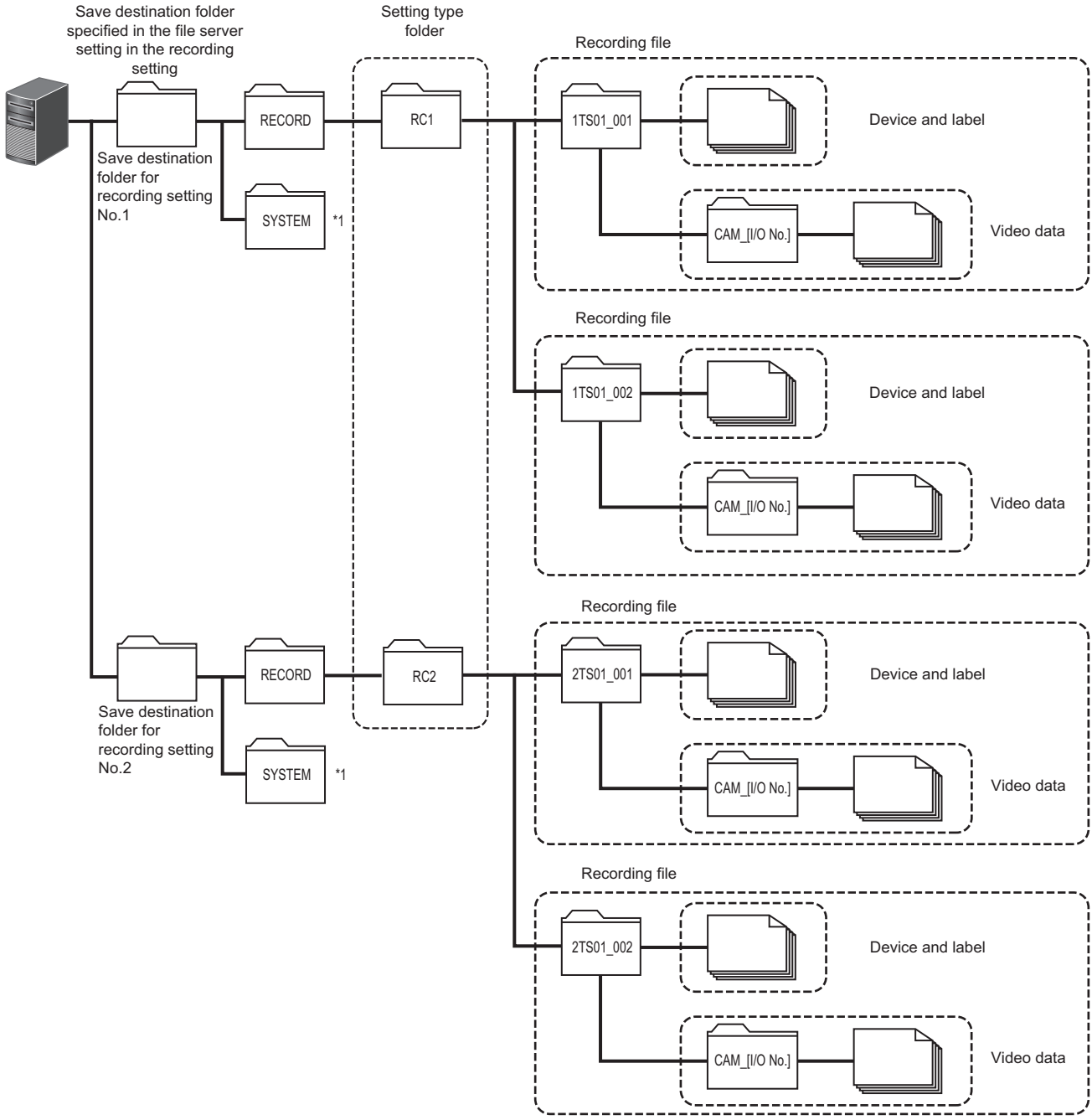


*1 Do not directly operate files in the SYSTEM folder.

Folder configuration in a file server (including video data)

When specifying video data as recording target data, it is saved as a video file to a recording file.

A video file is saved to a CAM_[I/O No.] folder generated for each camera recorder module under the setting type folder of each recording setting. (☞ Page 50 Name and save destination of a video file)



*1 Do not directly operate files in the SYSTEM folder.

Recording file name

The name of a recording file is set as follows:

• [Additional information][Recording setting number][Saving cause]_[Folder number]

Item	Description
Additional information*1	The following information set in the saving detail setting in the recording setting: (☞ Page 118 Saving detail setting) • Date and time (when a file saving trigger is satisfied or a recording file is saved)*2 • Numerical value data (data in the buffer memory when a file saving trigger is satisfied)*3*4*5*6 • Any character strings
Recording setting number	Number of a recording setting • Setting No.1: 1 • Setting No.2: 2 • Setting No.3: 3 • Setting No.4: 4
Saving cause	Character string that represents a timing when a file saving trigger is satisfied*7 • A device of a CPU module rises or falls, or a value in the buffer memory of a recorder module/camera recorder module rises*6: TS + number of a satisfied condition*8 (two digits (decimal)) (Example) When the number of a satisfied condition is 3: TS03 • A specified time elapses after completion of data accumulation: AS • A file is saved in the "Recording Monitor" screen: MS
Folder number	Three-digit number (decimal) (001 to the upper limit set in the saving detail setting) ☞ Page 48 Example of adding folder numbers

*1 Optional

*2 Time in a CPU module (local time)

*3 Up to two units of data, <DATA1> and <DATA2>, can be set, and the following buffer memory addresses can be specified for each. (☞ Page 192 Recording operation specification area (Un\G4000 to 4799))
<DATA1>: Un\G4002 to 4003 (setting No.1), Un\G4102 to 4103 (setting No.2), Un\G4202 to 4203 (setting No.3), Un\G4302 to 4303 (setting No.4)
<DATA2>: Un\G4004 to 4005 (setting No.1), Un\G4104 to 4105 (setting No.2), Un\G4204 to 4205 (setting No.3), Un\G4304 to 4305 (setting No.4)

*4 Decimal or hexadecimal can be selected for the output format.

*5 The number of digits for zero padding can be specified. If the number of digits of data to be output is less than a specified one, '0' is added for padding.
If the number of digits of data to be output exceeds a specified one, the data is output according to its number of digits.

*6 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

*7 If multiple triggers are satisfied at the same time, a trigger with the highest priority will be a file saving trigger.
The priorities are as follows:
Priority 1: A file is saved in the "Recording Monitor" screen.
Priority 2: A specified time elapses after completion of data accumulation.
Priority 3: A device of a CPU module rises or falls, or a value in the buffer memory of a recorder module/camera recorder module rises.

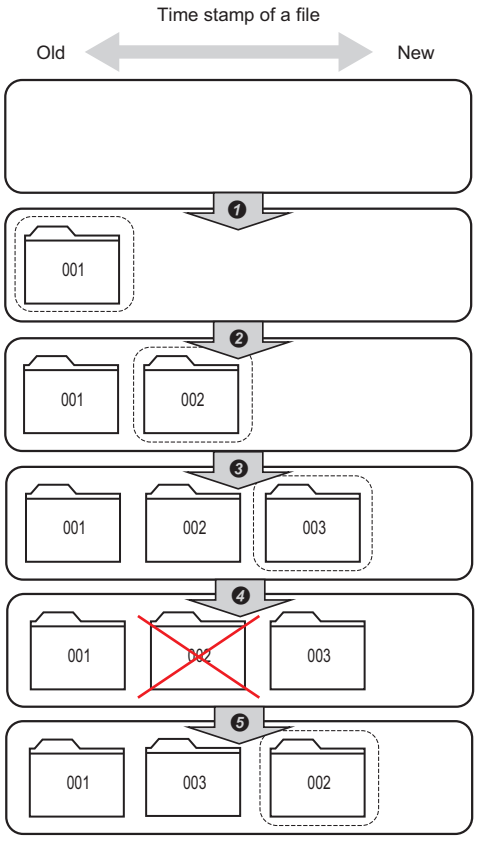
*8 If multiple conditions are satisfied at the same time, a condition with the smallest condition number will be satisfied.

Point

For the considerations for folders and files in an SD memory card, refer to the following:
📖MELSEC iQ-R System Recorder User's Manual (Startup)

Example of adding folder numbers

The following shows an example of adding folder numbers when the upper limit is set to '5' in the saving detail setting.



❶ The smallest number (001) among the numbers from 001 to 005 is added.
❷ The smallest number (002) excluding 001 among the numbers from 001 to 005 is added.
❸ The smallest number (003) excluding 001 and 002 among the numbers from 001 to 005 is added.
❹ The recording file with the folder number 002 is deleted by user operation.
❺ The smallest number (002) excluding 001 and 003 among the numbers from 001 to 005 is added.

Point

When deleting an existing file while saving a new recording file, the smallest number available after the deletion is added to the new file.

If there is no free folder number

If there is no free folder number (001 to the upper limit set in the saving detail setting), processing is performed according to an operation selected in "Operation at Saved Data Upper Limit" in the saving detail setting as follows:*1

*1 The INFO LED turns ON in either of the following cases. The factor can be checked in 'INFO LED lighting factor' (Un\G12) of a recorder module/camera recorder module. (☞ Page 181 Module status area (Un\G0 to 20), Page 225 Module status area (Un\G0 to 20))
There is no more free folder number after saving a recording file.
Saving a file failed because there was no free folder number.

■When selecting "Save data by deleting the one with the oldest timestamp"

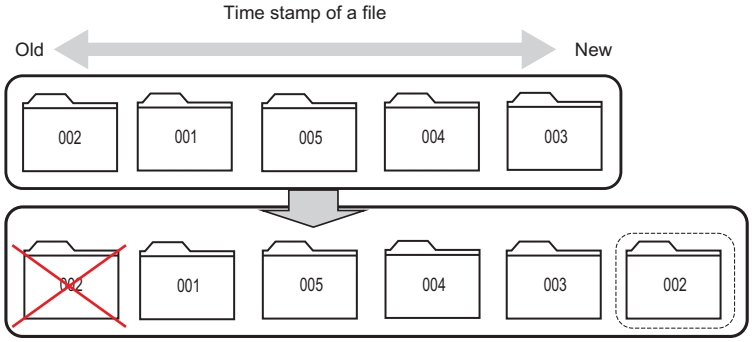
A recording file with the oldest time stamp*1*2 is deleted, and a new file is saved with the folder number of the deleted file.

*1 If there are multiple recording files with the same time stamp, a recording file with the smallest folder number is deleted.
*2 A recording file is not deleted if its folder number is out of the range of 001 to the upper limit set in the saving detail setting.

Ex.

Upper limit set in the saving detail setting: 5

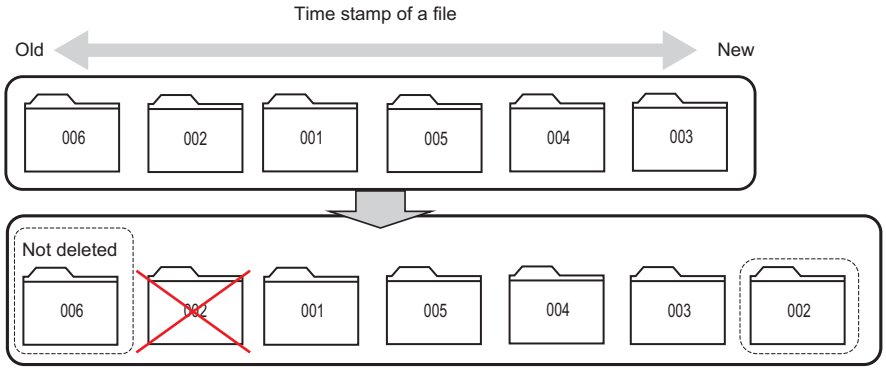
Stored file: Files with the folder numbers 001 to 005



Ex.

Upper limit set in the saving detail setting: 5

Stored file: Files with the folder numbers 001 to 006



Precautions

A recording file being read in GX Works3 may be deleted. To avoid this, select "Discard Data and Continue Sampling."

■When selecting "Discard Data and Continue Sampling"

A new recording file is not saved and data is discarded, and a saving error occurs. (☞ Page 71 Saving files fails)

To save a new recording file, perform either of the following:

- Reduce the number of recording files in a save destination.*1
- Increase the upper limit.

*1 For deleting a recording file saved to an SD memory card, refer to the following:
☞ Page 51 Deleting a recording file

Name and save destination of a video file

■File name

The name of a video file is set as follows:

- [I/O No.]_[Network camera No.]_[Date]_[Time].extension

Item name	Setting content
I/O No.	Start I/O number of a camera recorder module
Network camera No.	Number of a network camera • Camera No.1: 1 • Camera No.2: 2 • Camera No.3: 3 • Camera No.4: 4
Date	Date when a file saving trigger occurred • YYYYMMDD
Time	Time when a file saving trigger occurred • hhmmssmmm
Extension	Extension of a video file • .mp4*1 • .mov*2

*1 For H.264
☞ Page 37 Video data that can be received

*2 For Motion JPEG
☞ Page 37 Video data that can be received

■Save destination

A video file is saved to the following folder:

- CAM_[I/O No.]

Item	Description
I/O No.	Start I/O number of a camera recorder module

Point

- A generated video file can be played in general-purpose playback tools.
  However, do not change the folder, file configuration, and the name of a file in which the video file is stored. If changed, the video file cannot be played in GX VideoViewer.
- If no network camera is set as a receiving target in the "Video Data Receiving Target Setting" screen, a video file and CAM_[I/O No.] folder are not generated. (☞ Page 120 Video Data Receiving Target Setting)

Recording file saving completion file

After a recording file is saved to a file server, a saving completion file is created as follows:

File name	Extension	Storage location
Same name as the recording file	.BTC	Setting type folder in the save destination folder

Deleting a recording file

A recording file saved to an SD memory card can be deleted by any of the following methods:

- Select a recording file to be deleted and click the [Delete] button in the "Recording File Reading" screen of GX Works3. (GX Works3 Operating Manual)
- Remove an SD memory card from a recorder module/camera recorder module, and delete a file manually.
- Remove an SD memory card from a recorder module/camera recorder module, and replace it with a new one.

Precautions

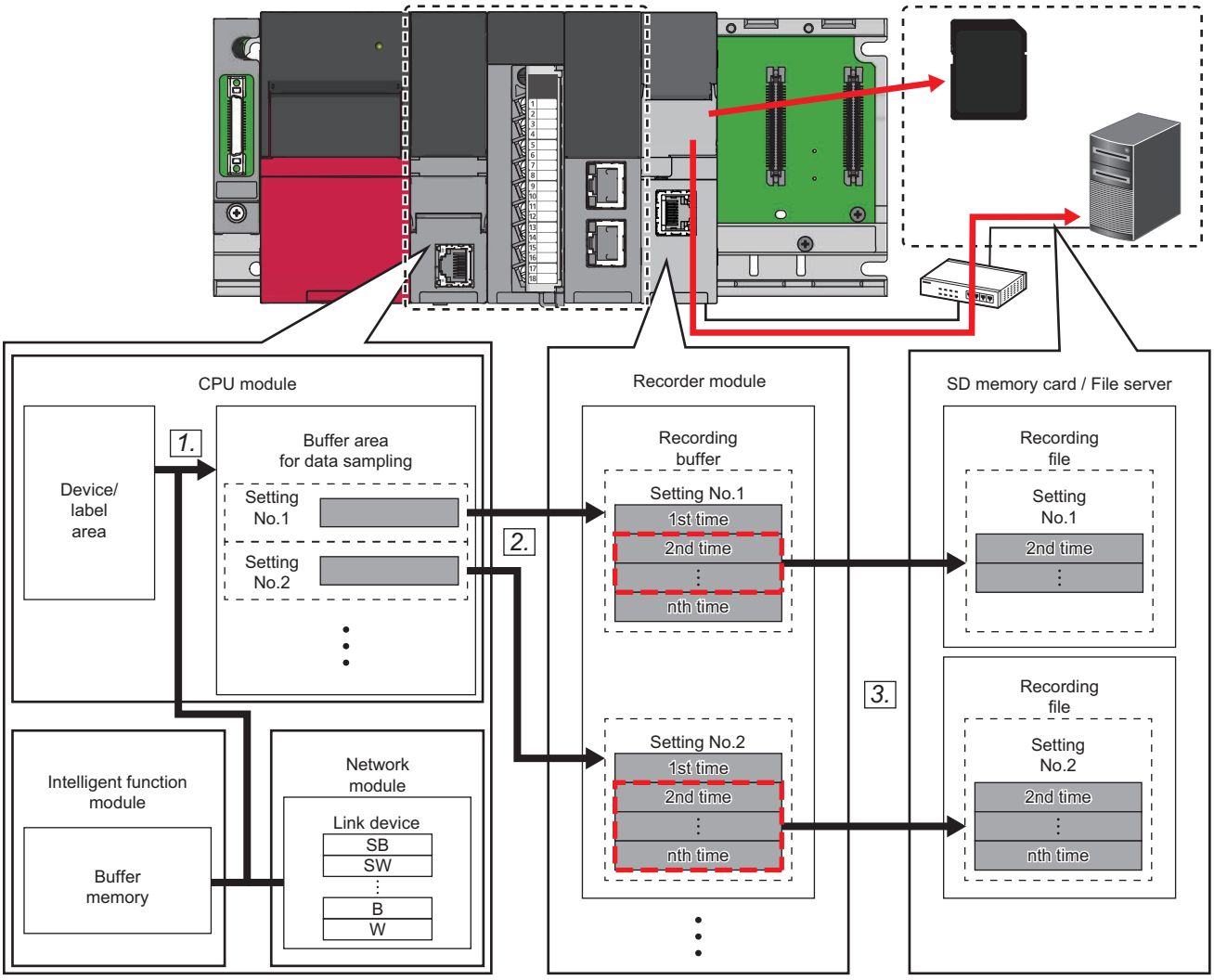
Do not delete any of the following folders or directly edit any files in the folders during recording operation; otherwise, files may not be saved properly.

- Save destination folder specified in the file server setting in the recording setting
- RECORD folder
- SYSTEM folder
- Setting type folder (RC1 to RC4)

Flow to save data

The following shows the flow to save data.

Saving a device and label



1. A device and label specified as a sampling target are sampled in the buffer area for data sampling.

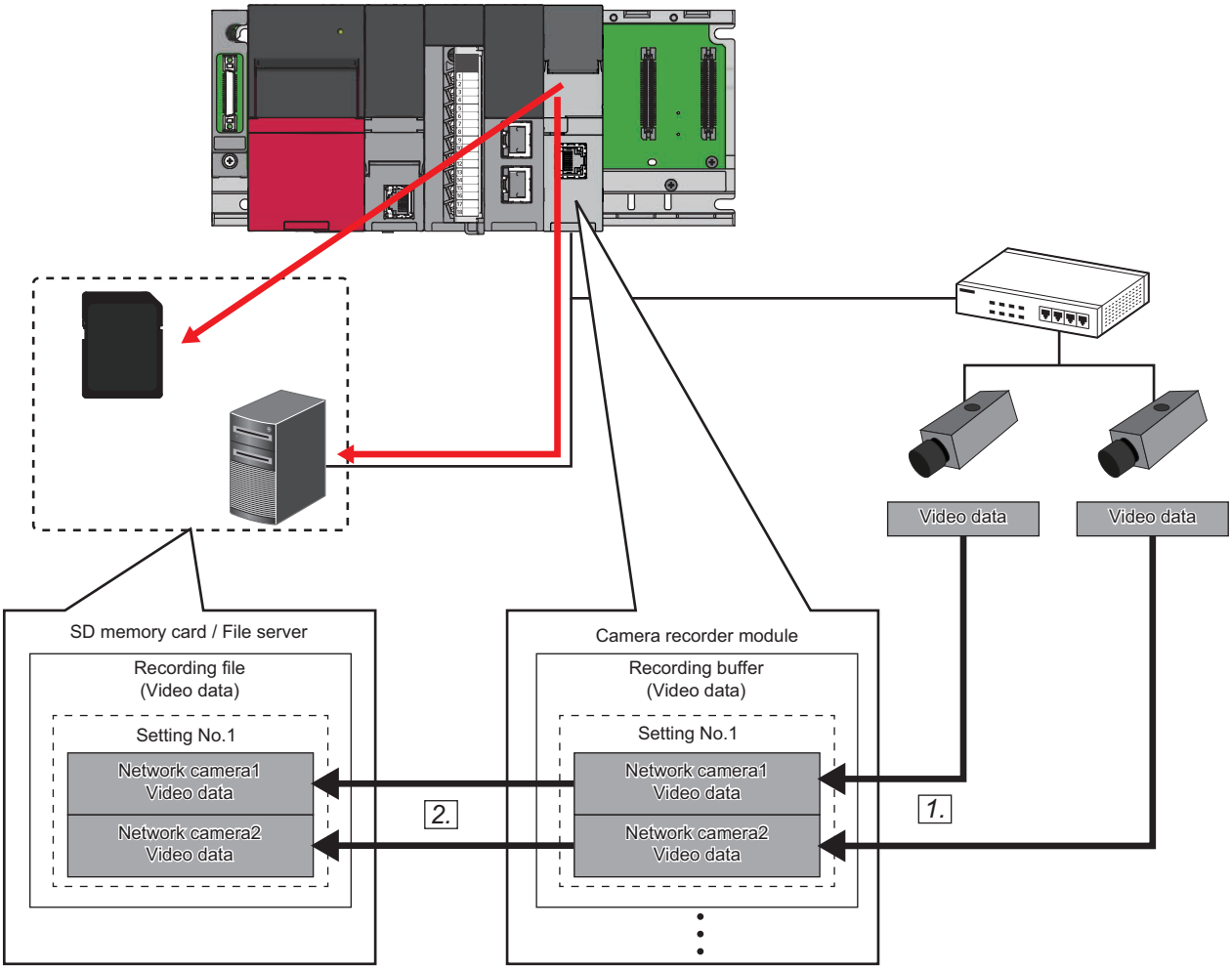
☞ Page 76 Buffer area setting for data sampling

2. The device and label sampled in the buffer area for data sampling are accumulated in the recording buffer.

☞ Page 54 Recording buffer

3. Data for a saving period is output to a recording file and saved to a save destination specified in the recording setting when a file saving trigger is satisfied.

Saving video data



1. Video data received from a network camera is accumulated in the recording buffer.

☞ Page 54 Recording buffer

2. Data for a saving period is output to a recording file and saved to a save destination specified in the recording setting when a file saving trigger is satisfied.

Recording buffer

A sampled device and label are accumulated in the internal buffer (recording buffer) of a recorder module/camera recorder module.

In addition, received video data is accumulated in the internal buffer (recording buffer) of a camera recorder module.

Accumulated data is output to a save destination specified in the recording setting as a recording file when a file saving trigger is satisfied.

The recording buffer capacity can be set for each recording setting, and a period during which data can be saved differs depending on the capacity. (☞ Page 80 Recording buffer setting (recorder module), Page 81 Recording buffer setting (camera recorder module))

■When the capacity of accumulated devices and labels exceeds the buffer capacity

Data for a set saving period may not be saved.

In this case, perform any of the following operations:

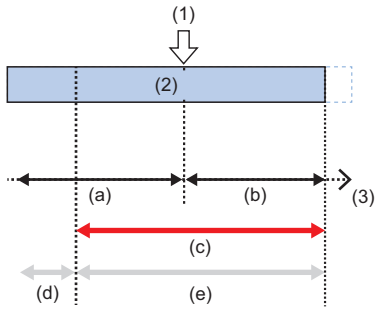
- Reduce the number of devices and labels to be sampled.
- Increase the recording buffer capacity.
- Shorten the saving period.
- Lengthen the sampling interval.

An operation when the buffer capacity is exceeded differs depending on the recording method as follows:

- When selecting "File Saving Trigger Only" for the recording method

Data is overwritten in chronological order when the buffer capacity is exceeded.

In addition, if the data capacity for a set saving period exceeds the recording buffer capacity, old data in the saving period is not saved.

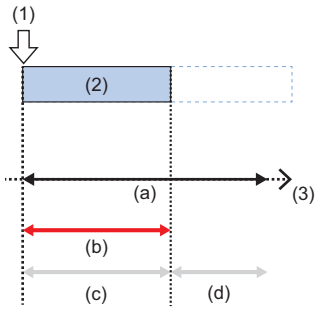


(1) File saving trigger
(2) Accumulating data
(3) Time
(a) Saving period before trigger
(b) Saving period after trigger
(c) Period during which data is accumulated in the recording buffer
(d) Period during which data is not saved
(e) Period during which data is actually saved

• When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method

Data accumulation stops when the buffer capacity is exceeded.

In addition, if the data capacity for a set saving period exceeds the recording buffer capacity, new data in the saving period is not saved.



(1) Recording startup trigger
(2) Accumulating data
(3) Time
(a) Set saving period
(b) Period during which data is accumulated in the recording buffer
(c) Period during which data is actually saved
(d) Period during which data is not saved

■When the capacity of accumulated video data exceeds the buffer capacity

Data for a set saving period may not be saved.

A saving period for video data varies depending on the following conditions:

- Video codec
- Resolution
- Video frame rate
- Video quality
- Maximum video bit rate
- Environment for capturing data

If data for a set saving period is not saved, perform any of the following operations:

- Change the video codec (set it to H.264).
- Lower the resolution.
- Lower the frame rate.
- Lower the video quality.
- Reduce the number of network cameras for data reception.
- Lower the limit value of the maximum video bit rate.
- Increase the recording buffer capacity.
- Shorten the saving period.

Operations when the buffer capacity is exceeded are the same as those shown in the following:

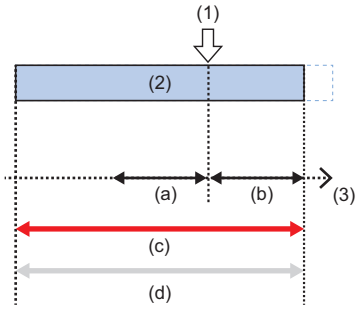
☞ Page 54 When the capacity of accumulated devices and labels exceeds the buffer capacity

■Recording buffer batch saving mode

The recording buffer batch saving mode is a mode for saving all data accumulated in the recording buffer when selecting "File Saving Trigger Only" for the recording method.

When this mode is enabled and a file saving trigger is satisfied, all data accumulated in the recording buffer is saved.

This allows data in a period before a set saving period before trigger to be saved.



(1) File saving trigger
(2) Accumulating data
(3) Time
(a) Saving period before trigger
(b) Saving period after trigger
(c) Period during which data is accumulated in the recording buffer
(d) Period during which data is actually saved

The recording buffer batch saving mode can be enabled or disabled in the following buffer memories*1 of a recorder module/camera recorder module or in the "Recording Status Detailed Information" screen of GX Works3. (☞ Page 192 Recording operation specification area (Un\G4000 to 4799), Page 124 Recording Status Detailed Information Screen)

- Setting No.1: 'Recording buffer batch saving mode' (Un\G4001)
- Setting No.2: 'Recording buffer batch saving mode' (Un\G4101)
- Setting No.3: 'Recording buffer batch saving mode' (Un\G4201)
- Setting No.4: 'Recording buffer batch saving mode' (Un\G4301)

*1 Buffer memory of a module set as the main module when configuring multiple modules
When the mode is enabled for a module set as the master module, this applies to a module set as a slave one.
☞ Page 61 Operation of the recording function when configuring multiple modules

Operating status

The following table shows the operating status of the recording function for each recording setting.
The operating status can be checked in the "Recording Monitor" screen or in the buffer memory*1 of a recorder module/camera recorder module. (☞ Page 122 RECORDING MONITOR, Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Operating status	Description
Stopped	The recording function is stopped. When configuring multiple modules, the function is stopped for all modules*2. (☞ Page 61 Operation of the recording function when configuring multiple modules) The status is 'stopped' in the following cases: • After starting a recorder module/camera recorder module • After resetting a CPU module • No recording settings are written
Preparing	Operations such as analysis of a recording setting are being prepared. When configuring multiple modules, operations for all modules*2 are being prepared. (☞ Page 61 Operation of the recording function when configuring multiple modules)
Operating	The function is running. When configuring multiple modules, the function is running for all modules*2. (☞ Page 61 Operation of the recording function when configuring multiple modules) In this state, devices and labels are sampled by a CPU module according to the sampling method regardless of whether a recording startup trigger is satisfied and a recording file is saved. (☞ Page 39 Sampling methods of devices and labels) Note that a period for data accumulation differs depending on the recording method. (☞ Page 18 Recording methods)
File saving trigger satisfied	A file saving trigger is satisfied and data for a remaining saving period is being sampled, received, and accumulated. When configuring multiple modules, data for a remaining saving period is being sampled, received, and accumulated for all modules*2. (☞ Page 61 Operation of the recording function when configuring multiple modules)
Saving	A recording file is being saved. When configuring multiple modules, recording files are being saved for all modules*2. (☞ Page 61 Operation of the recording function when configuring multiple modules) If the status switches to 'saving' for multiple recording settings, the settings are saved in order from one that switches first.

*2 Main module and sub modules with recording target data

Point

'1' is stored in 'Data sampling' (Un\G1506, Un\G1706, Un\G1906, Un\G2106) of a recorder module/camera recorder module while devices and labels are being sampled and accumulated.
When selecting "File Saving Trigger Only" for the recording method, '1' is stored in 'In recording operation' (Un\G1501, Un\G1701, Un\G1901, Un\G2101)*3 then in 'Data sampling.'
When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method, '1' is stored in 'Data sampling' after a recording startup trigger is satisfied.
(☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*3 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

Precautions

Regardless of the recording method, devices and labels are accumulated while '1' is stored in 'Data sampling' (Un\G1506, Un\G1706, Un\G1906, Un\G2106). For example, if "Trigger Instruction" is selected for the sampling method and '1' is not stored in 'Data sampling,' devices and labels are not accumulated even when executing the DATATRG instruction.
(☞ Page 39 Sampling methods of devices and labels, Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

Operating status for video data

The following table shows the operating status for video data for each network camera.

The operating status can be checked in 'Camera recording status' of a camera recorder module (Un\G1650 to 1653, Un\G1850 to 1853, Un\G2050 to 2053, Un\G2250 to 2253). (☞ Page 226 Recording status area (Un\G1500 to 3199))

Status	Description
Stopped	The recording function is stopped. The status is 'stopped' in the following cases: • After starting a camera recorder module • After resetting a CPU module • No recording settings are written
Preparing	Operations such as analysis of module extended parameters and communication establishment and setting for a target network camera are being prepared.
No setting	The recording function is running and the communication with a target network camera is established, but no network camera is set in the video data receiving target setting.
Operating	The recording function is running for a target network camera. The status remains 'operating' even if the communication with the network camera is disconnected.
File saving trigger satisfied	A file saving trigger is satisfied and video data for a remaining saving period is being received and accumulated.
Saving	A recording file is being saved. If the status switches to 'saving' for multiple recording settings, the settings are saved in order from one that switches first.

■Status after starting the recording function

After starting the recording function, the camera recording status switches to 'preparing' for a target recording setting.

It switches to 'operating' when a camera recorder module completes preparation, the communication with a network camera set as a receiving target is established, and video data is delivered.

For a network camera not set as a receiving target, it switches to 'no setting' even after the camera recorder module completes preparation.

For the operation to start the recording function, refer to the following:

☞ Page 59 Start

■Status after stopping the recording function

After stopping the recording function, the camera recording status switches to 'stopped' for all network cameras for a recording setting.

However, it switches to 'stopped' after saving in a camera recorder module is completed when the status is 'file saving trigger satisfied' or 'saving.'

For the operation to stop the recording function, refer to the following:

☞ Page 60 Stop

Operation of the recording function

The following shows the operations of the recording function.

Start

To start the recording function, perform either of the following operations.

- Switch a CPU module from STOP to RUN.*1
- Start the recording function in the "Recording Monitor" screen.*2 (☞ Page 122 RECORDING MONITOR)

*1 The operating statuses for all written recording settings switch to 'preparing,' then 'operating' after the preparation is completed.

*2 The operating status for a target recording setting switches to 'preparing,' then 'operating' after the preparation is completed.

Point

Devices and labels are sampled in a CPU module while the recording function is running even if they are not accumulated in a recorder module/camera recorder module. Therefore, the END processing time is extended in a scan of a sampling timing.

Effect of the recording function on the END processing time can be checked in the "Recording Status Detailed Information" screen of the recording monitor. (☞ Page 124 Recording Status Detailed Information Screen)

■Data when configuring the recording setting and data written to a CPU module

To use the recording function, the following information must match*1 each other.

If they do not match, a recording setting error (3027H or 3028H) occurs and the recording function does not start. In this case, the recording setting must be written to a CPU module again.

- Project information (parameter and program including device and label settings) when configuring the recording setting
- Parameter and program written to a CPU module

However, when using a module with any of the following firmware versions, a recording setting error does not occur and the recording function starts for the next time (restart) even if the above information does not match due to program change while the recording function is running.

- RnCPU or RnENCPU: '55' or later
- RnSFCPU: '24' or later
- Recorder module: '04' or later
- Camera recorder module: '01' or later

For details on changing programs while the recording function is running, refer to the following:

☞ Page 70 Program change while the recording function is running

*1 Even when not editing programs, they may be different from those that were applied when configuring the recording setting after converting the programs. Make sure to write the recording setting and programs to the CPU module.

Precautions

- The recording function starts running after preparation; therefore, it takes time for it to be ready for data sampling, reception, and accumulation.
- For devices and labels, a timing when sampling and accumulation start differs for each recording method.
  When selecting "File Saving Trigger Only" for the recording method: Sampling and accumulation start when the operating status switches to 'operating.'
  When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method: Sampling starts when the operating status switches to 'operating' and accumulation starts when a recording startup trigger is satisfied.
- For video data, regardless of the recording method, reception and accumulation start when the operating status switches to 'operating,' the communication with a network camera is established, and video data is delivered from the network camera.

Stop

To stop the recording function, perform any of the following operations:

- Switch a CPU module from RUN to STOP.[*1][*2][*3]
- Switch a CPU module to PAUSE.[*1][*2]
- Stop the recording function in the "Recording Monitor" screen.[*2] (☞ Page 122 RECORDING MONITOR)

*1 The operating statuses for all recording settings switch to 'stopped.'

*2 When the operating status for a recording setting is 'saving' or 'file saving trigger satisfied,' data sampling, reception, and accumulation stop and the operating status switches to 'stopped' after file saving is completed.

*3 When the operating status for a recording setting is 'file saving trigger satisfied,' data sampling, reception, and accumulation stop and the operating status switches to 'saving' then 'stopped.'

Precautions

- Sampling devices and labels stops in a CPU module and accumulating devices and labels stops in a recorder module/camera recorder module. Data sampled and accumulated before the stop is discarded.
- Delivering video data from a network camera stops and receiving and accumulating video data stop in a camera recorder module.
- If there is accumulated data, it is recommended to save it by an operation such as satisfying a file saving trigger before stop operation.

Starting to save a recording file

To start saving a recording file, satisfy a file saving trigger. (☞ Page 25 File saving trigger)

After the file saving trigger is satisfied, a recorder module/camera recorder module outputs data accumulated in the recording buffer to a recording file and saves it to a save destination specified in the recording setting. (☞ Page 54 Recording buffer)

Operation of the recording function when configuring multiple modules

The following shows the operation of the recording function when configuring multiple modules.

Main and sub modules

When using multiple modules, configure the main module that controls all recording for the modules and a sub module that operates in synchronization with the main module.
One main module must be set.
After switching a CPU module to RUN, the main module and a sub module with recording target data start recording.
However, a sub module without recording target data does not start recording.
The following table shows the operations of the main module and a sub module.

Type	Description
Main	Controls all recording for a recorder module/camera recorder module, determines whether a recording startup trigger or file saving trigger is satisfied, accumulates devices and labels, and receives and accumulates video data[*1]. A recorder module is always set as the main module.[*2]
Sub	Performs recording in synchronization with the main module. A camera recorder module can be set as a sub module, and it receives and accumulates video data only.

*1 Can be set when using a camera recorder module.
*2 A recorder module with the firmware version '04' or later is required.

■Configuration in which a recorder module is included

In this configuration, a recorder module is always set as the main module. Set a camera recorder module as a sub module.

■Configuration in which only a camera recorder module is included

In this configuration, set a camera recorder module as the main module and another camera recorder module as a sub module.
If no module is set as the main module or multiple modules are set as the main modules, an error occurs in a CPU module.
Devices and labels are accumulated in a module set as the main module.

Operating status after starting the recording function

After starting the recording function, the operating status switches to 'operating' when the operating status for a target recording setting switches to 'preparing,' the main module and all sub modules with recording target data complete preparation and start operating.
If a sub module cannot start operating, the operating status switches to 'operating' when the main module and the other sub modules start operating.
For the operating status of the recording function, refer to the following:
☞ Page 57 Operating status
For the operation to start the recording function, refer to the following:
☞ Page 59 Start

Operating status after stopping the recording function

After stopping the recording function, the operating status switches to 'stopped' when the main module and all sub modules with recording target data stop operating.
However, when the operating status is 'file saving trigger satisfied' or 'saving,' it switches to 'stopped' after saving is completed for the main module and all sub modules with recording target data.
For the operating status of the recording function, refer to the following:
☞ Page 57 Operating status
For the operation to stop the recording function, refer to the following:
☞ Page 60 Stop

Operation of the recording function when an error occurs

It differs for each module.

■When an error occurs in the main module

For a recording setting for which the main module cannot operate due to an error, the recording function stops running for all modules.

■When an error occurs in a sub module

For a recording setting for which a sub module cannot operate due to an error, the recording function starts or continues running for the main module and a sub module that can operate.

Whether a trigger is satisfied

It is determined by the main module and reported to a sub module when the trigger is satisfied.

When specifying an SD memory card as a save destination

For the main module, a recording file is saved to an inserted SD memory card according to the descriptions in the following:
☞ Page 47 Recording file name, Page 49 If there is no free folder number
For a sub module, a recording file is saved to an inserted SD memory card with the same name as one saved to the main module. If there is already a recording file with the same name, the file is saved after the existing one is deleted.[*1]

*1 The folder configuration in a save destination for recording files is the same as that in the main module.

■Reading or deleting a recording file in the "Recording File Reading" screen of GX Works3

Connect the main module and all sub modules to GX Works3.
If the main module is not connected, the "Recording File Reading" screen cannot be opened.
If a sub module is not connected, the "Recording File Reading" screen appears but data saved to an unconnected sub module cannot be read and deleted in the screen. (The [Delete] button is disabled.)

• When reading a recording file

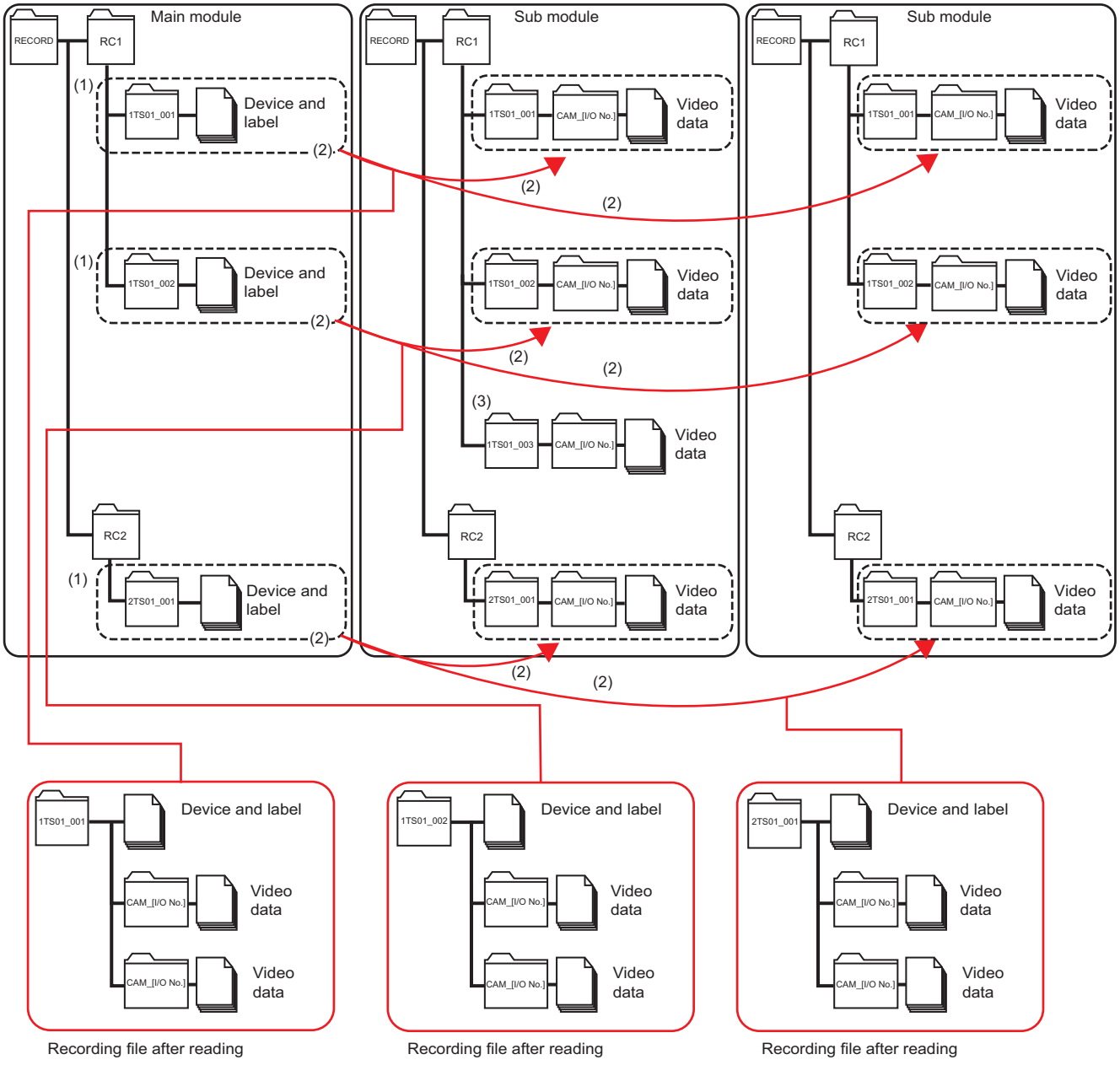
Recording files saved to the main module are listed in the "Recording File Reading" screen.

By selecting a recording file and clicking the [Read to Personal Computer] button, recording files with the same name saved to a connected sub module are read together to a single recording file.

A recording file saved only to a sub module is not read.

For details on the "Recording File Reading" screen, refer to the following:

GX Works3 Operating Manual



(1) Recording files saved to the main module are listed in the "Recording File Reading" screen.
(2) By selecting a recording file and clicking the [Read to Personal Computer] button, recording files with the same name saved to a connected sub module are read together to a single recording file.
(3) A recording file saved only to a sub module is not read.

Point

The total size of recording files with the same name saved to the main module and a connected sub module is displayed in the "Size" column in the "Recording File Reading" screen.

• When deleting a recording file

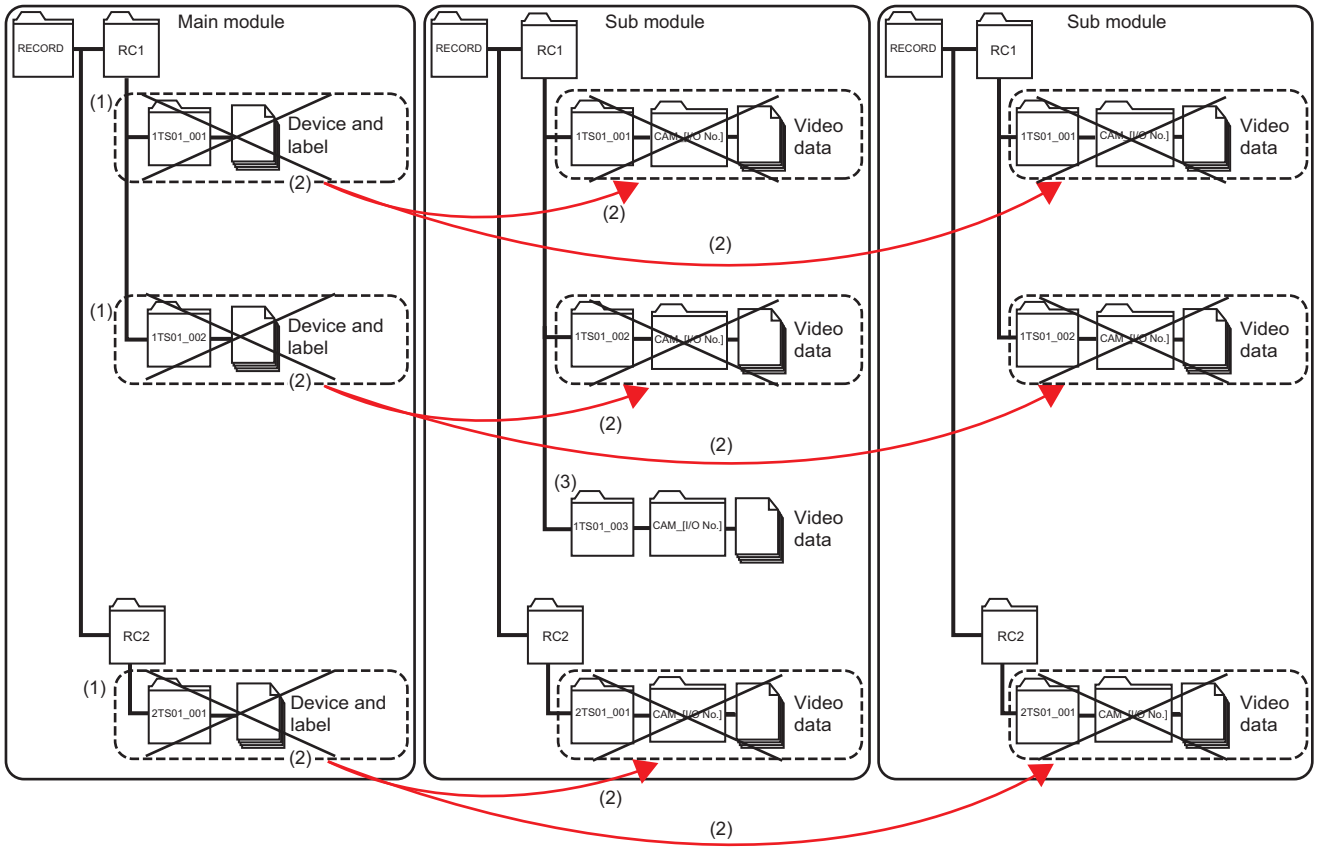
Recording files saved to the main module are listed in the "Recording File Reading" screen.

By selecting a recording file and clicking the [Delete] button, a recording file with the same name saved to a sub module is also deleted.

A recording file saved only to a sub module is not deleted.

For details on the "Recording File Reading" screen, refer to the following:

GX Works3 Operating Manual



(1) Recording files saved to the main module are listed in the "Recording File Reading" screen.

(2) By selecting a recording file and clicking the [Delete] button, a recording file with the same name saved to a sub module is also deleted.

(3) A recording file saved only to a sub module is not deleted.

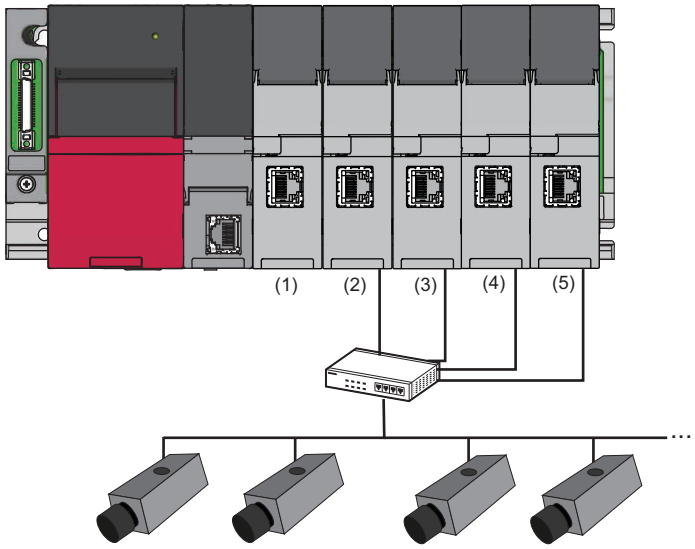
Point

The total size of recording files with the same name saved to the main module and a sub module is displayed in the "Size" column in the "Recording File Reading" screen.

Operation examples of each module

The following shows operation examples of each module according to each module configuration and recording setting.

■Main module (recorder module) + four sub modules (camera recorder module)



—: Not applicable

Connected device	(1) Main	(2) Sub 1	(3) Sub 2	(4) Sub 3	(5) Sub 4
Network camera*1	—	4 (camera ❶, ❷, ❸, ❹)	4 (camera ❺, ❻, ❼, ❽)	2 (camera ❾, ❿)	Not connected

*1 Set a network camera in the module extended parameter of each camera recorder module.
☞ Page 84 Module Extended Parameters (Camera Recorder Module)

Ex.

Recording setting

—: Not set

Recording setting	Recording target data	
	Device and label	Video data
Setting No.1	Included	Not included
Setting No.2 and later	—	—

Operation of each module

Main	Sub 1	Sub 2	Sub 3	Sub 4
Operates	Does not operate	Does not operate	Does not operate	Does not operate

Ex.

Recording setting

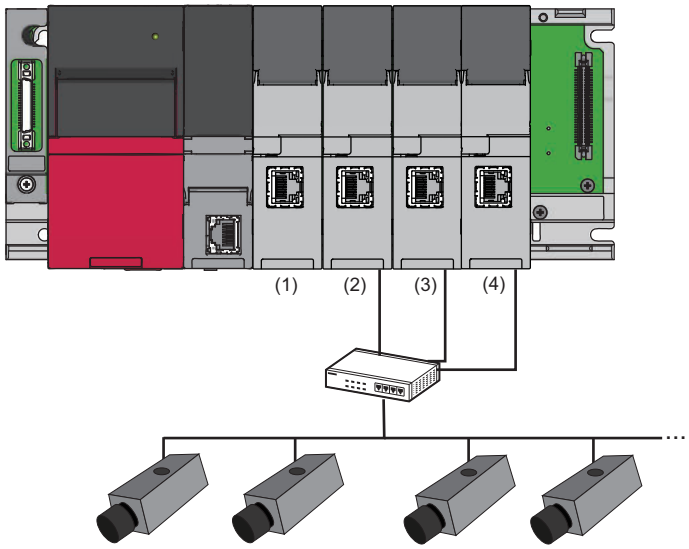
Recording setting	Recording target data	
	Device and label	Video data
Setting No.1	Included	Included (camera ❶, ❷, ❸, ❹)
Setting No.2	Included	Included (camera ❺, ❻)
Setting No.3	Included	Included (camera ❼, ❽)
Setting No.4	Included	Not included

Operation of each module

Main	Sub 1	Sub 2	Sub 3	Sub 4
Operates	Operates	Operates	Does not operate*1	Does not operate

*1 Because camera ❾ and ❿ are not set as targets.

■Main module (camera recorder module) + three sub modules (camera recorder module)



Connected device	(1) Main	(2) Sub 1	(3) Sub 2	(4) Sub 3
Network camera*1	2 (camera ❶, ❷)	4 (camera ❸, ❹, ❺, ❻)	4 (camera ❼, ❽)	Not connected

*1 Set a network camera in the module extended parameter of each camera recorder module.
☞ Page 84 Module Extended Parameters (Camera Recorder Module)

Ex.

Recording setting

—: Not set

Recording setting	Recording target data	
	Device and label	Video data
Setting No.1	Included	Not included
Setting No.2 and later	—	—

Operation of each module

Main	Sub 1	Sub 2	Sub 3
Operates	Does not operate	Does not operate	Does not operate

Ex.

Recording setting

—: Not set

Recording setting	Recording target data	
	Device and label	Video data
Setting No.1	Included	Included (camera ❸, ❹)
Setting No.2	Included	Included (camera ❺, ❻)
Setting No.3 and later	—	—

Operation of each module

Main	Sub 1	Sub 2	Sub 3
Operates	Operates	Does not operate*1	Does not operate

*1 Because camera ❼ and ❽ are not set as targets.

Adding and changing a recording setting

A recording setting can be added and changed while the operation of the recording function is stopped.
The procedures for adding and changing a recording setting differ depending on the CPU module status.
In addition, a recording setting can be written when the recording function is stopped such as when a CPU module is in STOP.
To write a recording setting, and add or change a device and label to be sampled without stopping the system, stop the recording function while the CPU module is in RUN, write the recording setting, and start the recording function again.
Note that the recording function must be stopped in the "Recording Monitor" screen while the CPU module is in RUN.
☞ Page 122 RECORDING MONITOR

Precautions

- After changing the buffer area setting for data sampling in the CPU parameter and the recording buffer setting in the module parameter, a programmable controller must be powered OFF and ON or reset.
- If the sampling size of a recording setting exceeds the capacity of the buffer area setting for data sampling of a CPU module, the recording function cannot be started and a recording setting error (error code: 3026H) occurs in a recorder module/camera recorder module. The sampling size of a recording setting and the required size of buffer area for data sampling can be checked in the "Recording Setting" screen. In addition, the capacity of the buffer area setting for data sampling of a CPU module can be checked in the CPU parameter.

☞ Page 95 Recording Setting Screen, Page 76 Buffer area setting for data sampling

Without changing parameters

The following shows the procedure for adding and changing a recording setting without changing the buffer area setting for data sampling and the recording buffer setting.

1. Switch a CPU module to the STOP/PAUSE state.
2. Check that 'Stopped' is displayed for all recording settings.
3. Write a changed program and all recording settings to the CPU module.*1
4. Switch the CPU module to RUN.

■Adding or changing a recording setting while a CPU module is in the RUN state

A recording setting can be added or changed by starting/stopping the operation in the "Recording Monitor" screen even while a CPU module is in the RUN state.*2
This allows recording settings to be added or changed at the same time according to a changed program when changing and writing a program during RUN.

1. If the operating status for a recording setting is not 'stopped,' stop the operation in the "Recording Monitor" screen. (☞ Page 122 RECORDING MONITOR)
2. Check that 'Stopped' is displayed for all recording settings.
3. Write a changed program and all recording settings to a CPU module.*1
4. Start the operation in the "Recording Monitor" screen.

*1 When not changing a program, a recording setting can be added or changed individually.
Stop the operation for a recording setting to be changed in the "Recording Monitor" screen, and write the recording setting to the CPU module.
Before writing the recording setting, check the considerations shown in the following:
☞ Page 69 Writing recording settings, parameters, and programs

*2 When adding a new recording setting, set the buffer area for data sampling and recording buffer for the setting, then write the CPU parameters and module parameters.
For the procedure, refer to the following:
☞ Page 68 With changing parameters

Precautions

If the recording function continues running without changing a recording setting after changing a program and data is reproduced on the offline monitor after saving the data, the reproduced values of devices and labels may not be displayed properly.

With changing parameters

The following shows the procedure after changing the buffer area setting for data sampling or the recording buffer setting.

1. Switch a CPU module to the STOP/PAUSE state.
2. Check that 'Stopped' is displayed for all recording settings.
3. Write the CPU parameters, module parameters, programs, and all recording settings to the CPU module.
4. Reset the CPU module or turn the power OFF and ON.
5. Switch the CPU module to the RUN state.

Writing recording settings, parameters, and programs

The following table shows operations when writing recording settings, CPU parameters, and programs to a CPU module individually.

○: Applicable, —: Not applicable

No.	Adding/ changing a recording setting	Changing CPU parameters	Adding/ changing a program*1	Condition
1	○	—	—	Write recording settings while the program setting in the CPU parameter and programs match between a CPU module and GX Works3. [Method for checking whether they match] Verify*1 CPU parameters and programs with a CPU module. For details, refer to the following: 📖GX Works3 Operating Manual [Corrective action if they do not match] Create a new project, read CPU parameters and programs from a CPU module, then create recording settings again.
2	○	○	—	Write recording settings and CPU parameters while programs match between a CPU module and GX Works3. [Method for checking whether they match] Verify*1 programs with a CPU module. For details, refer to the following: 📖GX Works3 Operating Manual [Corrective action if they do not match] Create a new project, read programs from a CPU module, then create recording settings and CPU parameters again.
3	○	—	○	Write recording settings and programs while the program setting in the CPU parameter matches between a CPU module and GX Works3. [Method for checking whether they match] Verify CPU parameters with a CPU module. For details, refer to the following: 📖GX Works3 Operating Manual [Corrective action if they do not match] Read CPU parameters from a CPU module.
4	○	○	○	Refer to the following: ☞ Page 68 With changing parameters
5	—	○	—	Write CPU parameters, recording settings, and programs. Or, read recording settings and programs from a CPU module, then write them and CPU parameters.
6	—	○	○	Write CPU parameters, recording settings, and programs. Or, read recording settings from a CPU module, then write them, CPU parameters, and programs.
7	—	—	○	Write recording settings and programs. Or, read recording settings from a CPU module, then write them and programs. To add or delete a program or change its name, CPU parameters must be changed. Refer to the condition shown in No.6.

*1 Even when not editing programs, they may be different from those that were applied when configuring the recording setting after converting the programs. Make sure to write the recording setting and programs to the CPU module.

Program change while the recording function is running

A program can be changed by performing a function such as online program change or file batch online change even while the recording function is running, and the function continues running after program change.

When changing a program

When performing a function such as online program change or file batch online change for program change while the recording function is running, a warning event (event code: 00C01) occurs in a recorder module/camera recorder module[*1], but the function continues running.[*2]

*1 When configuring multiple modules, a warning event occurs in a module set as the main module according to the module parameter setting.
☞ Page 61 Operation of the recording function when configuring multiple modules

*2 When using any of the following types of CPU modules or recorder modules, a warning event does not occur.
- RnCPU and RnENCPU the firmware version of which is '54' or earlier
- RnSFCPU the firmware version of which is '23' or earlier
- Recorder module the firmware version of which is '03' or earlier

When the recording function restarts

When starting (restarting) the recording function after changing a program while the function is running, a warning event (event code: 00C00) occurs in a recorder module/camera recorder module[*1], but the function starts running.[*2]

*1 When configuring multiple modules, a warning event occurs in a module set as the main module according to the module parameter setting.
☞ Page 61 Operation of the recording function when configuring multiple modules

*2 When using any of the following types of CPU modules or recorder modules, a recording setting error (error code: 3027H or 3028H) occurs and the recording function cannot be started.
- RnCPU and RnENCPU the firmware version of which is '54' or earlier
- RnSFCPU the firmware version of which is '23' or earlier
- Recorder module the firmware version of which is '03' or earlier

Changing a sampling target after changing a program

When changing a program after writing a recording setting, a changed device and label are not automatically set as sampling targets.

To include them in the sampling target, perform the following operations:

1. Stop the recording function.
2. Add/change a device and label to be sampled in the recording setting.[*1]
3. Write the recording setting to a CPU module.
4. Start the recording function.

*1 Not required when 'device/label batch specification' is enabled.

Warning event

A warning event, which occurs when changing a program while the recording function is running and restarting the function, can be changed to a minor error.

This allows a warning event to be checked as an error with the ERROR LED, module diagnostics, or in the buffer memory of a recorder module/camera recorder module.

For details on the setting, refer to the following:

☞ Page 82 Operation setting when an event is detected

Recording monitor

The status of the recording function can be checked in the "Recording Monitor" screen of GX Works3.
In addition, the status of a network camera connected to a camera recorder module can be checked in the "Camera Monitor" screen.
For details, refer to the following:
☞ Page 122 RECORDING MONITOR

Errors that occur when using the recording function

For details on the errors, refer to the following:
Note that errors for a CPU module do not occur when using the recording function.

- Recorder module: ☞ Page 144 Error code list
- Camera recorder module: ☞ Page 158 Error code list

Buffer memory used for the recording function

For the buffer memory used for the recording function, refer to the following:

- Recorder module: ☞ Page 175 Buffer Memory
- Camera recorder module: ☞ Page 215 Buffer Memory

Considerations

The following shows the considerations for the recording function.

When starting the recording function

The recording function does not start if parameters, programs, and FBs written to a CPU module are different from those applied when configuring the recording setting.
When performing a function to change a file in a CPU module or an operation (such as boot operation[*1] from an SD memory card or the backup/restore function of the CPU module), write parameters, programs, and FBs applied when configuring the recording setting to the CPU module.

*1 Not supported by safety CPUs.

Scan time extension

The scan time is extended while the recording function is running.
It is also affected by the size of data to be sampled, device address (number), type, and devices (buffer memory, link devices) that access a module.
By default, 'device/label batch specification' is enabled; therefore, the number of devices and labels to be sampled increases and the scan time is longer.

Saving a recording file

■Saving files fails

If saving files fails due to an insufficient free space on an SD memory card or a file server, an error occurs.
If saving device and label data fails, video data is not saved either. If saving only video data fails, video data other than the failed data is saved.
In addition, the following processing is performed according to the recording method.

- "File Saving Trigger Only" is selected for the recording method: Data that failed to be saved is discarded, and data sampling, reception, and accumulation continue.
- "Recording Startup Trigger + File Saving Trigger" is selected for the recording method: Data that failed to be saved is discarded, and data accumulation stops until the next recording startup trigger is satisfied.

It is recommended to check the free space on an SD memory card or a file server before satisfying the condition for a file saving trigger.

■Switching a CPU module from RUN to STOP while saving a file

When switching a CPU module from RUN to STOP while saving a file, processing continues until the file saving is completed.
In addition, when changing a recording setting before file saving is completed and switching a CPU module from STOP to RUN, the changed setting is enabled after the file saving is completed.
Whether the file saving is completed can be checked in 'Recording files saving completion' (Un\G1508, Un\G1708, Un\G1908, Un\G2108)*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

■Stopping the recording function in the "Recording Monitor" screen while saving a file

When stopping the recording function in the "Recording Monitor" screen while saving a file, processing continues until the file saving is completed.
In addition, when changing a recording setting before file saving is completed and starting the recording function in the "Recording Monitor" screen, the changed setting is enabled after the file saving is completed.
Whether the file saving is completed can be checked in 'Recording files saving completion' (Un\G1508, Un\G1708, Un\G1908, Un\G2108)*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

■Formatting an SD memory card while saving a file

An SD memory card cannot be formatted while saving a file to the SD memory card.
Format it after the file saving is completed.
Whether the file saving is completed can be checked in 'Recording files saving completion' (Un\G1508, Un\G1708, Un\G1908, Un\G2108)*1 of a recorder module/camera recorder module. (☞ Page 186 Recording status area (Un\G1500 to 3199), Page 226 Recording status area (Un\G1500 to 3199))

*1 Buffer memory of a module set as the main module when configuring multiple modules
☞ Page 61 Operation of the recording function when configuring multiple modules

■Turning the power OFF or resetting a CPU module while saving a file

When turning the power OFF or resetting a CPU module while saving a recording file to an SD memory card, the file is deleted without being saved.
In addition, the SD memory card may be damaged. Stop file access, then turn the power OFF or reset the CPU module.
When turning the power OFF or resetting a CPU module while saving a recording file to a file server, the file is deleted without being saved.
Make sure that the file saving is completed in the "Recording Monitor" screen, then turn the power OFF or reset the CPU module.

■Removing an SD memory card while saving a file

If an SD memory card is removed without stopping file access while saving a recording file to the SD memory card, the file is deleted and the SD memory card may be damaged.
Read a required recording file in GX Works3 before removing the SD memory card.

■Network is disconnected while saving a file

If the network is disconnected between a recorder module/camera recorder module and a file server while saving a recording file to the file server, the file is deleted.

■Displaying an event history while saving a file

An event history file is also saved as a recording result. When displaying the event history while saving the file, the time required to display the event history or save the file may be delayed.

■Saving a recording file when configuring multiple modules

A recording file is saved in both the main and a sub modules at the same time.
Once saving a recording file starts, no data is accumulated before the file is saved in all modules.
When the recording file is saved in all modules, data accumulation restarts.
If saving a recording file fails in the main module, it also fails in a sub module.
If there is video data that failed to be saved in a camera recorder module, video data other than the failed data is saved.
☞ Page 61 Operation of the recording function when configuring multiple modules

Writing a recording setting

When adding or changing a program after configuring the recording setting if 'device/label batch specification' is enabled, devices and labels in the added or changed program are also specified as sampling targets. This may cause the sampling size to increase and exceed the capacity of the buffer size for data sampling when writing the recording setting.

Changing module parameters

When changing module parameters and writing them to a CPU module if devices and labels used in the parameters are specified as sampling targets, the recording setting must also be written to the CPU module.
When changing module parameters only and writing them to a CPU module, they cannot be reproduced properly on the offline monitor.

Starting communication with a network camera

If a network camera is not started while the recording function is preparing to run, it takes time for the preparation.
It is recommended to start a network camera before switching a CPU module to RUN.
Note that even if it takes time to prepare to start the communication with a network camera, the recording function completes preparation for other operations and starts running.

Power ON/OFF of a network camera when a trigger occurs

Prevent the power of a network camera from turning OFF when a trigger (recording startup trigger or file saving trigger) is satisfied. If it turns OFF, a created video file may not be played or a displayed time may not match.

Formatting an SD memory card

Initialize an SD memory card inserted in a recorder module/camera recorder module before using it. When configuring multiple modules, initialize all SD memory cards inserted in the main and sub modules before using them.
☞ Page 61 Operation of the recording function when configuring multiple modules

1.2 Offline Monitor Function

The offline monitor function can be used to reproduce the status of a program and operations (videos) of a device when a trouble occurs by using a recording file.
For details, refer to the following:
📖GX Works3 Operating Manual
📖GX VideoViewer Version 1 Operating Manual

1.3 Camera Recording Function

The camera recording function can be used to record camera videos linked with a CPU module by using Camera Recording Package and a network camera connected to the built-in Ethernet of the CPU module.
Recorded video files can be played in GX VideoViewer.
For details, refer to the following:
📖Camera Recording Package User's Manual
📖GX VideoViewer Version 1 Operating Manual

1.4 Data Flow Analysis Function

The data flow analysis function can be used to search for devices, labels, and parameters in a program and the event history of the current value change that cause selected devices and labels to be changed, and display their related items in a flow diagram.
For details, refer to the following:
📖GX Works3 Operating Manual

2 PARAMETER SETTING

This chapter shows each setting that can be configured in the parameter setting of GX Works3.

Configuring multiple recording settings

The capacity of each setting in the following parameters must be changed before configuring recording settings.
If writing recording settings to a CPU module without changing each capacity, an error occurs when starting recording and the recording function does not run.

Target module	Parameter
CPU module	"CPU Parameter" ⇨ "Memory/Device Setting" ⇨ "Buffer Area Setting for Data Sampling" ⇨ "(setting number to be used)"*1
Recorder module	"(Recorder module)" ⇨ "Basic Settings" ⇨ "Recording Buffer Setting"*2 ⇨ "(setting number to be used)"
Camera recorder module	"(Camera recorder module)" ⇨ "Module Parameter" ⇨ "Basic Settings" ⇨ "Recording Buffer Setting"*2 ⇨ "(setting number to be used)"

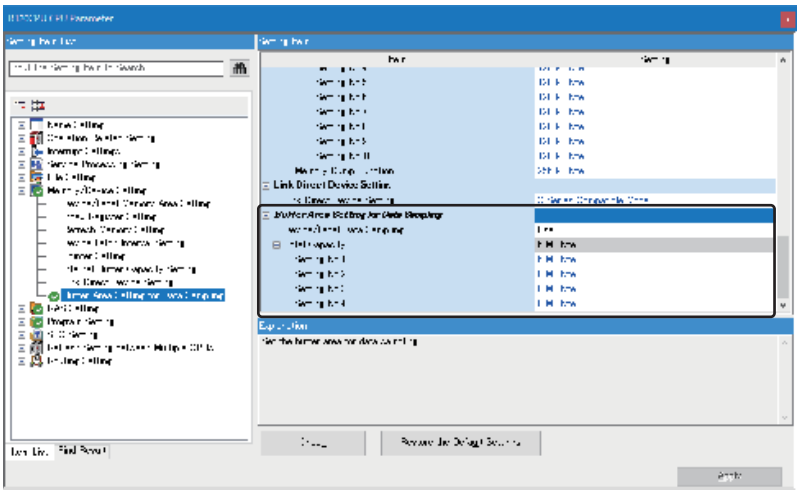
*1 The size required for the capacity of the buffer area setting for data sampling can be checked in the "Recording Setting" screen.
*2 The "Recording Buffer Setting" screen appears by double-clicking the recording buffer setting icon ( ).

2.1 CPU Parameters

This section shows the CPU parameters required to be set for using a CPU module for System Recorder.

Memory/device setting

The following shows the screen for setting each item in the buffer area setting for data sampling of a CPU module.



Buffer area setting for data sampling

Item	Description	Setting range
Device/Label Data Sampling	Select "Use" or "Not to Use."	• Use • Not to Use (Default: Not to Use)
Total Capacity	The total capacity of an area used by a system to temporarily store device/label data is displayed.	—
Setting No.1 to 4*1	Set the capacity of an area used by a system to temporarily store device/label data.	0 to 4 M Byte or 0 to 6 M Byte*2 (Default: 4 M Byte or 6 M Byte (Setting No.1)*2, 0 M Byte (Setting No.2 to 4))

*1 Can be set only when selecting "Use" for "Device/Label Data Sampling."

*2 The maximum value and default of the capacity differ depending on the module type.
R04CPU, R04ENCPU, R08CPU, R08ENCPU, R08SFCPU, R16CPU, R16ENCPU, R16SFCPU: 4 M Byte
R32CPU, R32ENCPU, R32SFCPU, R120CPU, R120ENCPU, R120SFCPU: 6 M Byte

Precautions

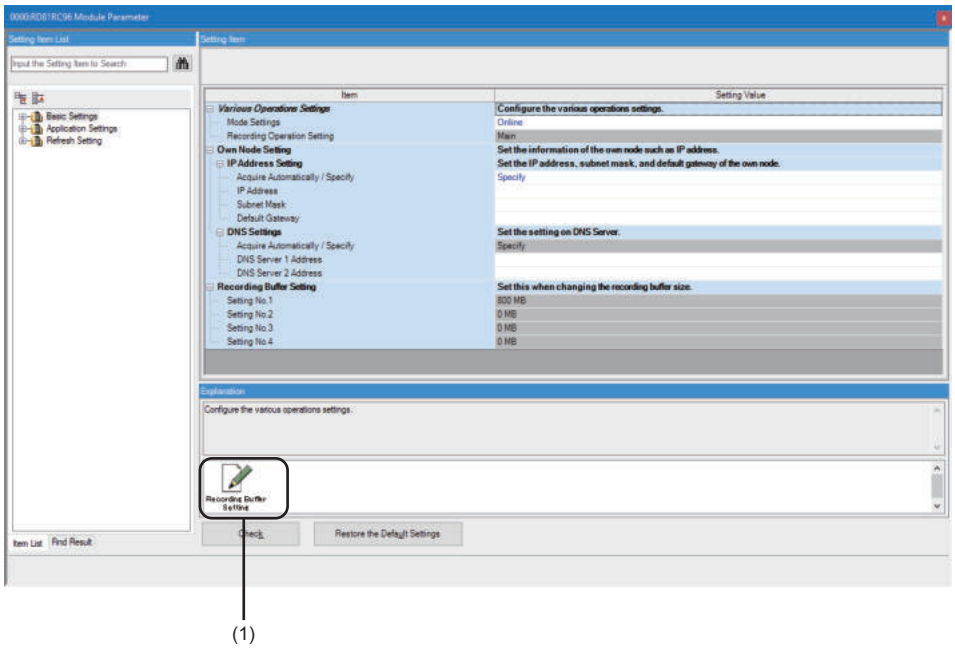
The buffer area for data sampling is a temporary area for sampling data. Set the total number of device and label points to be sampled to a value equal to or smaller than the capacity of the buffer area setting for data sampling. Otherwise, an error occurs when starting recording and the recording function does not run.

2.2 Module Parameters (Recorder Module/Camera Recorder Module)

This section shows the module parameters of a recorder module/camera recorder module.

Basic settings

The following shows the screen for the various operations settings, own node setting, and recording buffer setting for a recorder module/camera recorder module.



(1) Recording buffer setting icon

Various operations settings

The following items can be set for a recorder module/camera recorder module.

Item	Description	Setting range
Mode Settings	Set the operation mode of a recorder module/camera recorder module. • Online: Normal operation mode • Automatic Hardware Test: H/W such as ROM/RAM/Ethernet of the recorder module/camera recorder module is tested. • Hardware Test for LED Check: The LED of the recorder module/camera recorder module is tested. • Firmware Update: A mode to update the firmware of the recorder module/camera recorder module.	• Online • Automatic Hardware Test • Hardware Test for LED Check • Firmware Update (Default: Online)
Recording Operation Setting	Select "Main" or "Sub" for the recording function.*1	• Main • Sub (Default: Main)

*1 Only one main module can be set for one CPU module.

Own node setting

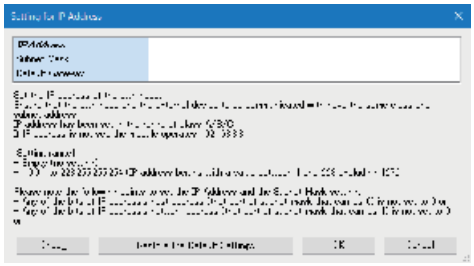
The following items can be set for a recorder module/camera recorder module.

Item		Description	Setting range
IP Address Setting*1	Acquire Automatically/ Specify	Select "Acquire Automatically" or "Specify" for the IP address.	• Acquire Automatically • Specify (Default: Specify)
	IP Address*2	Set an IP address, subnet mask, and default gateway. The "Setting for IP Address" screen appears by double-clicking a cell.	☞ Page 79 IP address setting screen
	Subnet Mask*2		
	Default Gateway*2		
DNS Settings*1	Acquire Automatically/ Specify	Select "Acquire Automatically" or "Specify" for the DNS server address. When selecting "Specify" for "Acquire Automatically/Specify" in "IP Address Setting," "Specify" is automatically set.	• Acquire Automatically • Specify (Default: Specify)
	DNS Server 1 Address*3	Specify the IP address of a preferred DNS server. The "DNS Settings" screen appears by double-clicking a cell.	☞ Page 79 DNS setting screen
	DNS Server 2 Address*3	Specify the IP address of an alternate DNS server. The "DNS Settings" screen appears by double-clicking a cell.	

*1 Can be set only when selecting "Online" for "Mode Settings."
*2 Can be set only when selecting "Specify" for "Acquire Automatically/Specify" in "IP Address Setting."
*3 Can be set only when selecting "Specify" for "Acquire Automatically/Specify" in "DNS Settings."

■IP address setting screen

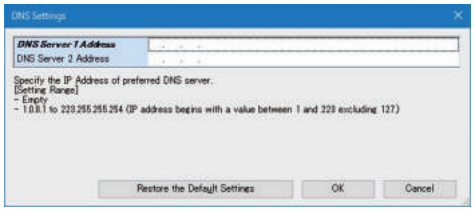
The IP address, subnet mask, and default gateway of a recorder module/camera recorder module can be set.



Item	Description	Setting range
IP Address	Set the IP address of the own node. Ensure that the own node and the external device to be communicated with have the same class and subnet address. Set the IP address in the range of class A/B/C. If IP address is not set, the module operates 192.168.3.3. Please note the following points to set the IP Address and the Subnet Mask setting. • Any of the bits of IP address's host address (that part of subnet mask that carries 0) is not set to 0 or 1. • Any of the bits of IP address's network address (that part of subnet mask that carries 1) is not set to 0 or 1.	• Empty (no setting) • 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)
Subnet Mask	Set the subnet mask of the own node. Set to determine how many bits of the IP address are used as the network address, which is used to identify the network. For example, set '255.255.255.0' to assign the upper 24 bits of IP address to the subnet mask. Please note the following points to set the IP Address and the Subnet Mask setting. • Any of the bits of IP address's host address (that part of subnet mask that carries 0) is not set to 0 or 1. • Any of the bits of IP address's network address (that part of subnet mask that carries 1) is not set to 0 or 1.	• Empty • 128.0.0.0 to 255.255.255.252 (Default: Empty)
Default Gateway	Set the IP address of the default gateway (the device which the own node passes through to access a device of another network). Please set subnet address of default gateway so that it is the same with the one of host station.	• Empty • 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)

■DNS setting screen

The IP addresses of preferred and alternate DNS servers can be set.



Item	Description	Setting range
DNS Server 1 Address	Specify the IP address of a preferred DNS server.	• Empty • 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)
DNS Server 2 Address	Specify the IP address of an alternate DNS server.	• Empty • 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)

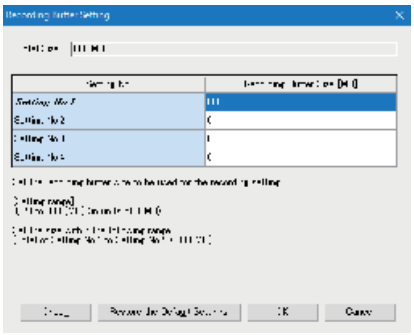
Recording buffer setting (recorder module)

The following items can be set for a recorder module.

Item	Description	Setting range
Setting No.1 to 4	The recording buffer capacity used for each recording setting is displayed. The "Recording Buffer Setting" screen appears by double-clicking the recording buffer setting icon.	☞ Page 80 Recording buffer setting screen

■Recording buffer setting screen

The recording buffer capacity can be set.



Item	Description	Setting range
Total Size	The total capacity of the recording buffer is displayed.	—
Setting No.1 to 4	Set the recording buffer capacity used for each recording setting.	• 0 • 20 to 800 (Default: 800 (Setting No.1), 0 (Setting No.2 to 4))

Recording buffer setting (camera recorder module)

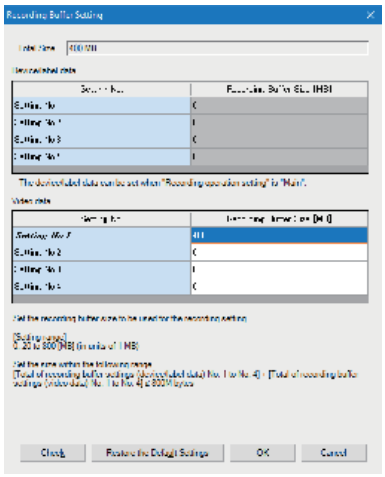
The following items can be set for a camera recorder module.

Item		Description	Setting range
Recording Buffer Setting (device/label data)	Setting No.1 to 4	The recording buffer capacity (device/label data) used for each recording setting is displayed.*1	☞ Page 81 Recording buffer setting screen
Recording Buffer Setting (video data)	Setting No.1 to 4	The recording buffer capacity (video data) used for each recording setting is displayed.*1	

*1 The "Recording Buffer Setting" screen appears by double-clicking the recording buffer setting icon.

■Recording buffer setting screen

The recording buffer capacity can be set.



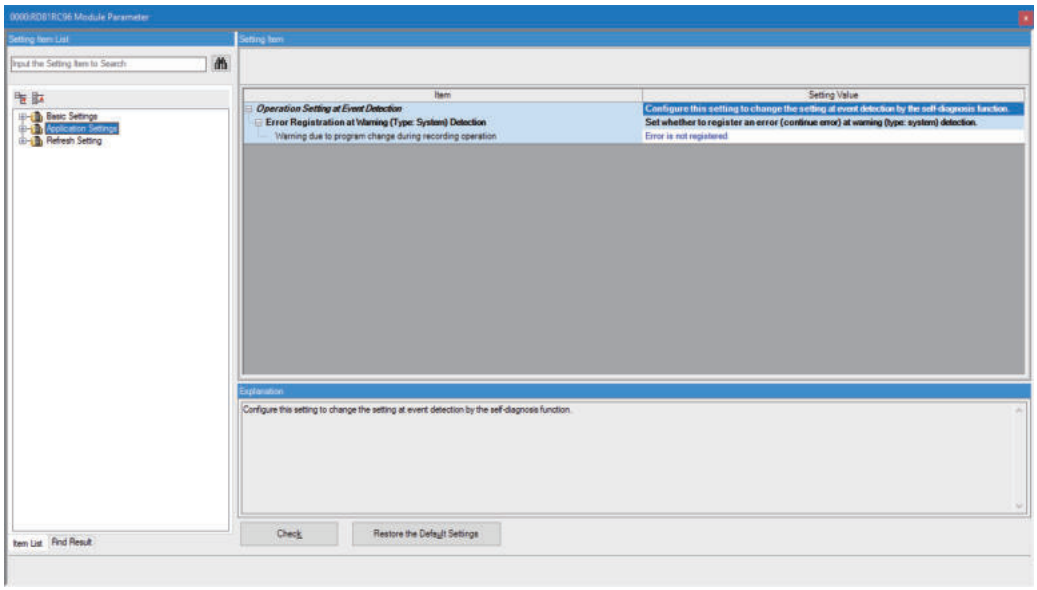
Item		Description	Setting range
Total Size		The total capacity of the recording buffer is displayed.	—
Device/label data	Setting No.1 to 4*1	Set the recording buffer capacity for accumulating device/label data.	• 0 • 20 to 800*2 (Default: 400 (Setting No.1), 0 (Setting No.2 to 4))
Video data	Setting No.1 to 4	Set the recording buffer capacity for accumulating video data.	

*1 Can be set when selecting "Main" for "Recording Operation Setting."

*2 When selecting "Main" for "Recording Operation Setting," device/label data and video data can be set up to 800 MB in total.

Application settings

The following shows the screen for the operation setting when an event is detected in a recorder module/camera recorder module.



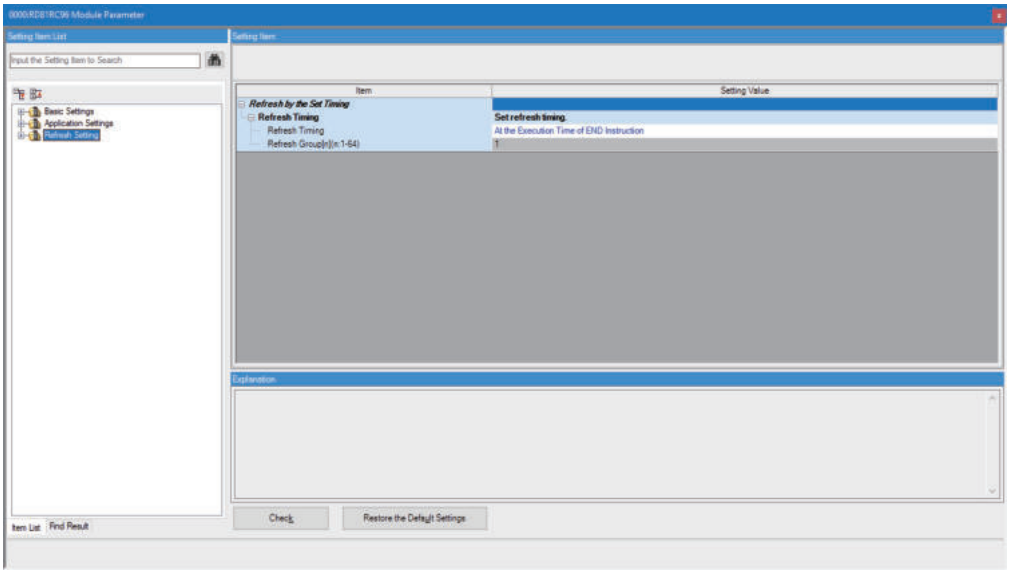
Operation setting when an event is detected

Item		Description	Setting range
Error Registration at Warning (Type: System) Detection	Warning due to program change during recording operation*1	Set whether to register an error (continuation error) when a warning (type: system) is detected due to a change in a program file or an FB/FUN file during recording operation. [Warning due to program change during recording operation] • Recording start with program inconsistency (event code: 0C00) • Program change during recording operation (event code: 0C01)	• Error is not registered • Error is registered (continuous error) (Default: Error is not registered)

*1 Can be set only when selecting "Main" for "Recording Operation Setting."

Refresh setting

The following shows the screen for setting the refresh timing of a specified refresh target.



Displayed items

Item	Description	Setting range
Refresh Timing	Set refresh timing.	• At the Execution Time of END Instruction • At the Execution Time of Specified Program (Default: At the Execution Time of END Instruction)
Refresh Group[n](n: 1-64)	Specify the refresh group of the program. Please set it through Program Setting of CPU Parameter.	1 to 64

Refresh timing

■At the execution time of END instruction

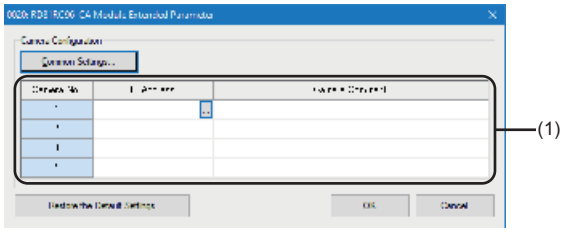
The setting is refreshed at the END processing in the CPU module.

■At the execution time of specified program

The setting is refreshed when a program specified in "Refresh Group[n](n: 1-64)" is executed.

2.3 Module Extended Parameters (Camera Recorder Module)

This section shows the module extended parameters of a camera recorder module.



Item	Description
[Common Settings] button	Click this to display the "Common Settings" screen. ☞ Page 85 Common setting
(1) Camera configuration setting*1	The IP address and camera comment of a network camera set in the "Camera Individual Settings" screen are displayed. The "Camera Individual Settings" screen can be displayed by clicking the [...] button in the "IP Address" or "Camera Comment" column.*2 ☞ Page 86 Camera individual setting The number of network cameras that can be set differs depending on the settings for a connected network camera (resolution, frame rate, and type of the network camera). For details, refer to the following: 📖MELSEC iQ-R System Recorder User's Manual (Startup)

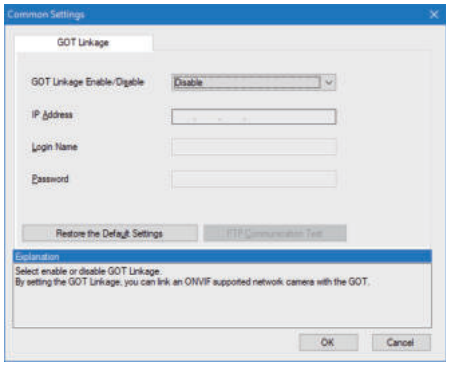
*1 The setting in a selected row can be deleted by selecting and right-clicking the row then selecting [Delete].

*2 Can also be displayed by selecting and right-clicking a row then selecting [Edit camera individual setting].

Common setting

The following shows the screen for setting each item for GOT linkage.

This setting can be configured for each camera recorder module.



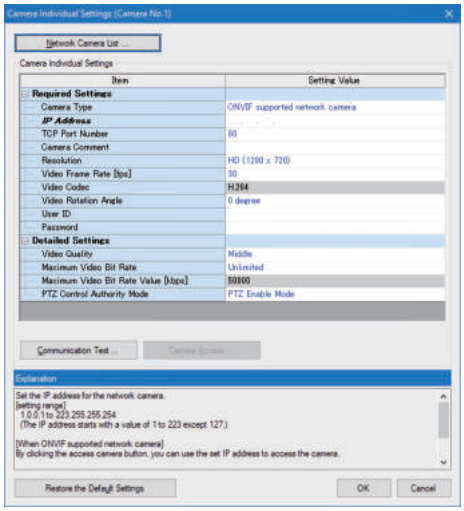
Item	Description	Setting range
GOT Linkage Enable/Disable	Select "Enable" or "Disable" for GOT linkage. By setting the GOT linkage, an ONVIF supported network camera can be linked with a GOT.	• Enable • Disable (Default: Disable)
IP Address*1	Specify the IP address of an FTP server.	• Empty (no IP address set) • 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)
Login Name*1	Specify the login name of an FTP server.	• Empty (no login name set) • Character string up to 16 characters (Default: Empty)
Password*1	Specify the password for an FTP server.	• Empty (no password set) • Character string up to 32 characters (Default: Empty)
[FTP Communication Test] button*1	Click this to perform the communication test on a GOT based on the entered settings.	—

*1 Can be specified or clicked only when selecting "Enable" for "GOT Linkage Enable/Disable."

Camera individual setting

The following shows the screen for setting each item for a network camera.

Items and ranges that can be set differ for each network camera.



Item	Description	Setting range
		ONVIF supported network camera
[Network Camera List] button[*1]	Click this to display the "Network Camera List" screen. ☞ Page 88 Network camera list screen	—

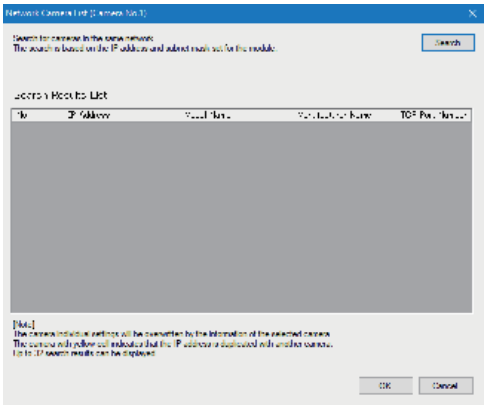
Item			Description	Setting range
				ONVIF supported network camera
Camera Individual Settings*2	Required Settings	Camera Type	Set the type of a network camera.	• ONVIF supported network camera (Default: ONVIF supported network camera)
		IP Address	Set the IP address of a network camera.	• 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Empty)
		TCP Port Number*3	Set the TCP port number of a network camera.	• 1 to 4999, 5010 to 65534 (Default: 80)
		Camera Comment	Set a comment to identify a network camera.	• Empty (no camera comment set) • Character string up to 32 characters (Default: Empty)
		Resolution	Set the resolution of a video captured by a network camera.	• VGA (640 × 480) • HD (1280 × 720) • FHD (1920 × 1080) (Default: HD (1280 × 720))
		Video Frame Rate [fps]	Set the frame rate of a video captured by a network camera.	• 10 • 30 • 120 (Default: 30)
		Video Codec	Set the codec for a video captured by a network camera.	• H.264
		Video Rotation Angle	Set the rotation angle of a video captured by a network camera.	• 0 degree • 180 degree (Default: 0 degree)
		User ID*3	Set the user ID of a network camera.	• Character string up to 32 characters (Default: Empty)
		Password*3	Set the password for a network camera.	• Character string up to 32 characters (Default: Empty)
	Detailed Settings	Video Quality*4	Set the quality of a video captured by a network camera. Select a video quality according to the compression ratio of a video.	• High • Middle • Low (Default: Middle)
		Maximum Video Bit Rate	Set whether to limit the bit rate of a video delivered from a network camera. It can be set when the video codec is H.264.	• Unlimited • Limited (Default: Unlimited)
		Maximum Video Bit Rate Value [kbps]*5	Set the maximum bit rate of a video captured by a network camera.	1 to 50000 (Default: 50000)
		PTZ Control Authority Mode	Set the PTZ control authority mode of a network camera.	• PTZ Enable Mode • PTZ Preset Mode • PTZ Disable Mode (Default: PTZ Enable Mode)
[Communication Test] button			Click this to display the "Communication Test" screen. ☞ Page 89 Communication test screen	—
[Camera Access] button*6			Click this to start a web browser (default browser for the operating system) to access a network camera based on a set IP address.*7*8 The URL of a connection destination is as follows: • http://(IP address):(TCP port number)/	—

*1 Can be clicked only when selecting "ONVIF supported network camera" for "Camera Type."
*2 Each item is displayed in black when its initial value is changed.
*3 Available when selecting "ONVIF supported network camera" for "Camera Type."
*4 Video quality settings correspond to compression ratios as follows:
High: 20%
Middle: 50%
Low: 80%
*5 Available when all of the following conditions are satisfied:
"ONVIF supported network camera" is selected for "Camera Type."
"Limited" is selected for "Maximum Video Bit Rate."
*6 Can be clicked only when "ONVIF supported network camera" is selected for "Camera Type" and an IP address is already set.
*7 For access, a personal computer and network camera must be connected via Ethernet.
*8 It is not guaranteed that a set IP address is available to access a network camera.
The operation when the network camera cannot be accessed depends on the web browser.

■Network camera list screen

Network cameras on the same network as a camera recorder module can be searched for.

By selecting a network camera in the search results list and clicking the [OK] button, the IP address and TCP port number of the selected network camera can be applied to the "Camera Individual Settings" screen.



Item	Description	Setting range
[Search] button	Click this to search for a network camera on the same network as a camera recorder module.	—
Search Results List	The IP address, model name, manufacturer name, and TCP port number of a searched network camera are displayed.*1 Note that the display contents of the model name and manufacturer name differ for each manufacturer of network camera. (Example) The manufacturer name is displayed including the model name.	—

*1 Up to 32 network cameras can be displayed. If 33 or more network cameras are connected, 32 ones are displayed in order from a searched one. (Displayed network cameras differ depending on the network status, etc.)

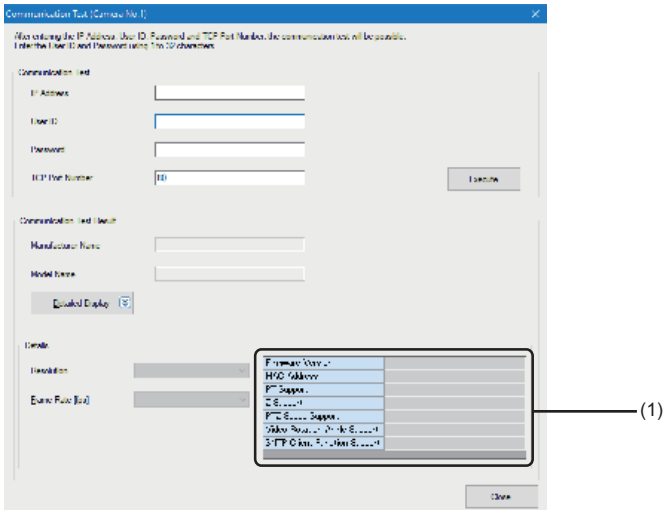
Point

- A search result is retained until the screen for setting module extended parameters is closed.
- If a communication error occurs during search, the search result is not updated and the previous search result remains displayed.

■Communication test screen

An IP address, user ID, password, and TCP port number can be set to perform the communication test between a camera recorder module and a network camera.

When the communication test is successful, basic and support information of a network camera can be acquired. In addition, the acquired resolution or frame rate can be applied to the "Camera Individual Settings" screen.



Item			Description	Setting range
Communication Test	IP Address*1		Set the IP address of a network camera.	• 1.0.0.1 to 223.255.255.254 (The IP address must start with a value between 1 and 223, excluding 127.) (Default: Value set in the "Camera Individual Settings" screen)
	User ID*1*2		Set the user ID of a network camera.	• Character string up to 32 characters (Default: Value set in the "Camera Individual Settings" screen)
	Password*1*2		Set the password for a network camera.	• Character string up to 32 characters (Default: Value set in the "Camera Individual Settings" screen)
	TCP Port Number*1*2		Set the TCP port number of a network camera.	• 1 to 4999, 5010 to 65534 (Default: Value set in the "Camera Individual Settings" screen)
	[Execute] button		Click this to perform the communication test based on the IP address, user ID, password, and TCP port number.	—
Communication Test Result	Manufacturer Name		The manufacturer name of a network camera connected by performing the communication test is displayed.*3	—
	Model Name		The model name of a network camera connected by performing the communication test is displayed.*3	—
	[Detailed Display] button		Click this to expand and collapse detailed information.	—
	Details*4	Resolution	Set the resolution of a network camera.	• FHD (1920 × 1080)*5 • HD (1280 × 720)*5 • VGA (640 × 480)*5 • Not selected (Default: Not selected)
		Frame Rate [fps]	Set the frame rate of a network camera.	• 10*5 • 30*5 • 120*5 • 200*5 • Not selected (Default: Not selected)
		(1) Basic and support information	Basic and support information of a network camera connected by performing the communication test is displayed.	—

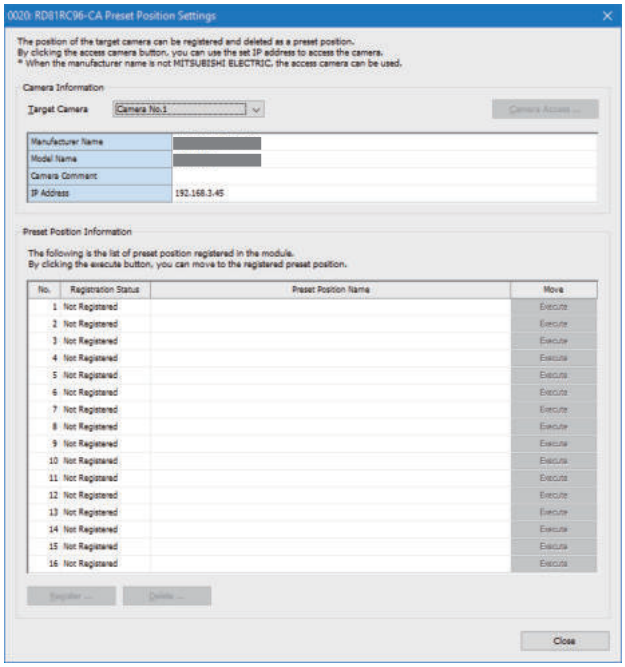
*1 If the setting is changed, it can be applied to the "Camera Individual Settings" screen when closing this screen.
*2 Available when selecting "ONVIF supported network camera" for "Camera Type" in the "Camera Individual Settings" screen.
*3 The display contents differ for the manufacturer of each network camera.
*4 Appears when expanding detailed information.
*5 Only the following items can be displayed: items that can be set for a network camera connected by performing the communication test, and ones set for "Camera Type" in the "Camera Individual Settings" screen.
Selected items can be applied to the "Camera Individual Settings" screen when closing this screen.

2.4 Preset Position Setting (Camera Recorder Module)

This section shows the procedure and screen for registering and deleting a preset position for a network camera connected to a camera recorder module, and moving the range of data captured by a network camera to a registered preset position.

Window

1. Select [Tool] ⇨ [Module Tool List] in GX Works3.
2. Select [Preset Position Settings] in the "Module Tool List" screen, and click the [OK] button.
3. Select a camera recorder module (RD81RC96-CA) in the "Module Selection" screen, and click the [OK] button.



Displayed items

Item		Description
Camera Information	Target Camera	Select a target network camera number.*1
	[Camera Access] button	Click this to start a web browser (default browser for the operating system) to access a network camera.*2 The URL of a connection destination is as follows: • http://(IP address):(TCP port number)/
	Manufacturer Name	The manufacturer name of a network camera with the number selected for "Target Camera" is displayed.
	Model Name	The model name of a network camera with the number selected for "Target Camera" is displayed.
	Camera Comment	The camera comment set for a network camera with the number selected for "Target Camera" is displayed.
	IP Address	The IP address of a network camera with the number selected for "Target Camera" is displayed.
Preset Position Information*3	No.	Preset position numbers are displayed.
	Registration Status	The registration status of a preset position is displayed.
	Preset Position Name	The name of a preset position is displayed.
	Move*4	Click the [Execute] button to move the range of data captured by a target network camera to a registered preset position.*5 While the range is being moved, "Moving" is displayed. (In this case, the [Register] and [Delete] buttons cannot be clicked.)
[Register] button*6		Click this to display the "Preset Position Registration" screen. ☞ Page 93 Preset position registration
[Delete] button*6		Click this to display the "Preset Position Delete" screen. ☞ Page 94 Preset position deletion

*1 Only enabled network cameras can be selected.
Whether it is enabled can be checked in 'Network camera setting enabled/disabled' (Un\G34000, Un\G34500, Un\G35000, Un\G35500)

of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

*2 For access, a personal computer and network camera must be connected via Ethernet.

*3 When selecting and double-clicking a row, the "Preset Position Registration" screen opens with the number of the selected row selected. ☞ Page 93 Preset position registration

*4 The [Execute] button can be clicked only when selecting "PTZ Enable Mode" or "PTZ Preset Mode" for "PTZ Control Authority Mode" of a target network camera.

*5 To check the status, click the [Camera Access] button to access the network camera in advance.

*6 Can be clicked only when selecting "PTZ Enable Mode" for "PTZ Control Authority Mode" of a target network camera.

Point

Registering or deleting a preset position, or moving to a preset position is performed in the communication route set in the "Specify Connection Destination" screen of GX Works3.

Precautions

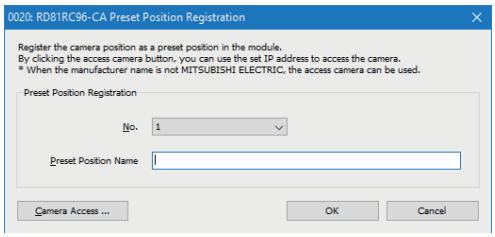
- The range that can be set differs for the manufacturer and type of each network camera. If a position registered as a preset position exceeds the range for a network camera when replacing it, moving to the preset position is not guaranteed.
  In addition, preset position information is not initialized when replacing a network camera.
- When moving the range of captured data to a preset position in this screen and in a dedicated tool for the network camera at the same time, it is moved in order of request.
- If this screen is opened before the communication between a network camera and a camera recorder module is completed, the manufacturer name and model name may not be displayed in the camera information when starting the system. To display them, wait a few minutes until the communication is completed, and then open this screen again.
  Note that the manufacturer name and model name are always blank if a network camera is not connected.

Preset position registration

The following shows the screen for registering the current position of a network camera as a preset position.
By registering a preset position, the range of data captured by a network camera can be moved to the registered preset position.

Window

Click the [Register] button in the "Preset Position Settings" screen.



Displayed items

Item	Description
No.	Select the preset position number of a registration destination (1 to 16).
Preset Position Name	Set the name of a preset position (up to 32 characters).
[Camera Access] button	Click this to start a web browser (default browser for the operating system) to access a network camera.*1 The URL of a connection destination is as follows: • http://(IP address):(TCP port number)/

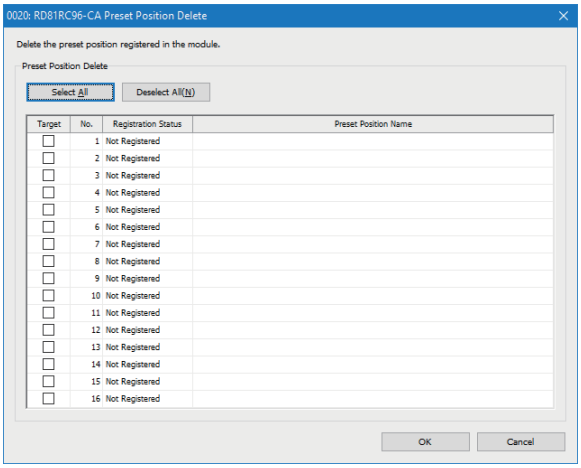
*1 For access, a personal computer and network camera must be connected via Ethernet.

Preset position deletion

The following shows the screen for deleting an unnecessary preset position.

Window

Click the [Delete] button in the "Preset Position Settings" screen.



Displayed items

Item	Description
[Select All] button	Click this to select all checkboxes in the "Target" column.
[Deselect All] button	Click this to unselect all checkboxes in the "Target" column.
Target	Select the checkbox of a preset position to delete.
No.	Preset position numbers are displayed.
Registration Status	The registration status of a preset position is displayed.
Preset Position Name	The name of a preset position is displayed.

3 RECORDING SETTING

This chapter explains the recording setting.

3.1 Recording Setting Screen

This section shows the recording setting screen.

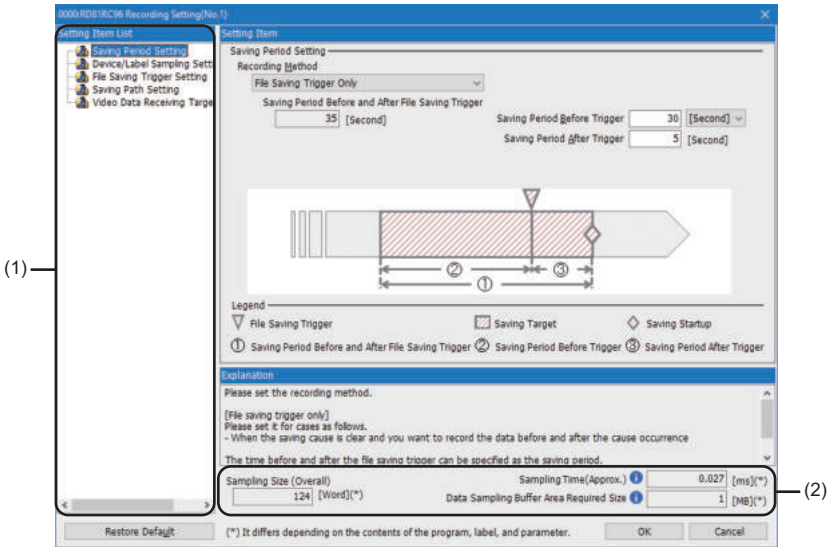
Window

■For creating a new setting

[Navigation window] ⇨ [Parameter] ⇨ [Recording Setting] ⇨ right-click ⇨ [New]

■For editing a setting

[Navigation window] ⇨ [Parameter] ⇨ [Recording Setting] ⇨ [(setting number)]



Displayed items

Item		Description	Reference
(1) Setting item list	Saving Period Setting	Set a saving period for accumulated data.	Page 97 Saving Period Setting
	Device/Label Sampling Setting	Set a device and label to be sampled and their sampling method.	Page 98 Device/Label Sampling Setting
	File Saving Trigger Setting	Set a device specified as a file saving trigger for saving accumulated data when a device of a CPU module rises or falls.	Page 115 File Saving Trigger Setting
	Saving Path Setting	Set a path to save accumulated data.	Page 116 Saving Path Setting
	Video Data Receiving Target Setting*1	Set a network camera from which video data is received.	Page 120 Video Data Receiving Target Setting
(2) Sampling size	Sampling Size (Overall)*2	The total size of devices and labels to be sampled is displayed.	—
	Sampling Time (Approx.)*3*4	A standard for processing time of a CPU module to sample a device and label is displayed. It differs depending on the sampling size.	—
	Data Sampling Buffer Area Required Size*3*4	A size required for the buffer area setting for data sampling in the CPU parameter (memory/device setting) is displayed based on the sampling size.	Page 76 Buffer area setting for data sampling

*1 Does not appear in the following cases:
No camera recorder module is included in a project.
A recorder module and a camera recorder module set as the main module are included in a project, and the slot number of the camera recorder module is larger than that of the recorder module.

*2 Displayed in red and a warning icon appears in any of the following cases:
An unconverted program is included in a target program when using 'device/label batch specification.'
The checkbox of "Include the Parameter" is selected and a project is unconverted when using 'device/label batch specification.'
A target program exists in the program setting in the CPU parameter but not in the navigation window when using 'device/label batch specification.'
A local device and local label used in a program other than a target one are specified as sampling targets when using 'specify from the device/label list.'
A global label (no device assigned) is specified as a sampling target but an unconverted program is included in a target program when using 'specify from the device/label list.'
A module label (no device assigned) is specified as a sampling target but a project is unconverted when using 'specify from the device/label list.'
A local device in an unconverted or a non-existent program is specified as a sampling target when using 'specify the device range.'

*3 Placing the cursor on the information icon ( ) displays the tooltip.

*4 Displayed in red in any of the following cases:
An unconverted program is included in a target program when using 'device/label batch specification.'
The checkbox of "Include the Parameter" is selected and a project is unconverted when using 'device/label batch specification.'
A target program exists in the program setting in the CPU parameter but not in the navigation window when using 'device/label batch specification.'
A local device and local label used in a program other than a target one are specified as sampling targets when using 'specify from the device/label list.'
A global label (no device assigned) is specified as a sampling target but an unconverted program is included in a target program when using 'specify from the device/label list.'
A module label (no device assigned) is specified as a sampling target but a project is unconverted when using 'specify from the device/label list.'
A local device in an unconverted or a non-existent program is specified as a sampling target when using 'specify the device range.'

Point

For the saving period, refer to the following:
☞ Page 249 Period during which devices and labels can be saved, Page 250 Period during which video data can be saved

Precautions

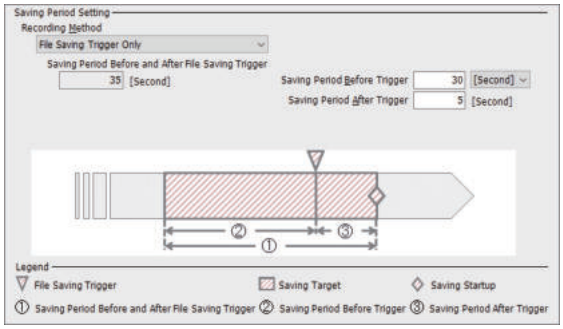
- If a sampling size exceeds the capacity of the buffer area setting for data sampling in the CPU parameter, the recording function cannot be started and a recording setting error (error code: 3026H) occurs in a recorder module/camera recorder module.
- If a warning icon appears in the sampling size and it persists even after converting a program, a non-existent program may be set in the CPU parameter. Check the program registered in the program setting in the CPU parameter.

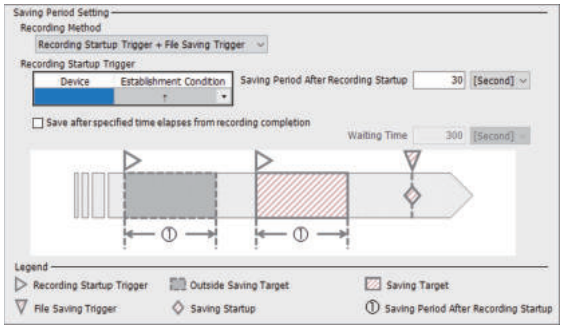
3.2 Saving Period Setting

This section shows the screen for setting a saving period for accumulated data.

Window

Click "Saving Period Setting" in the setting item list.





Displayed items

■When selecting "File Saving Trigger Only" for "Recording Method"

Item	Description
Recording Method	Select "File Saving Trigger Only."
Saving Period Before and After File Saving Trigger	The total of set saving periods before and after trigger is displayed (1 to 86400 seconds).
Saving Period Before Trigger	Set the saving period before trigger. The range of values that can be set differs depending on each unit as follows: • Second: 0 to 86400 • Minute: 0 to 1440 • Hour: 0 to 24
Saving Period After Trigger	Set the saving period after trigger (up to 60 seconds).

■When selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method"

Item		Description
Recording Method		Select "Recording Startup Trigger + File Saving Trigger."
Recording Startup Trigger	Device	Specify a device used to determine whether a recording startup trigger is satisfied.*1*2
	Establishment Condition*3	Select a condition to satisfy a recording startup trigger. • ↑: When the bit rises • ↓: When the bit falls
Saving Period After Recording Startup		Set the accumulation period after a recording startup trigger is satisfied. The range of values that can be set differs depending on each unit as follows: • Second: 1 to 86400 • Minute: 1 to 1440 • Hour: 1 to 24
Save after specified time elapses from recording completion		Select the checkbox to automatically save a recording file after data accumulation is completed and a specified time elapses.
Waiting Time*4		Set the time from when data accumulation is completed to when a recording file is saved. The range of values that can be set differs depending on each unit as follows: • Second: 0 to 86400 • Minute: 0 to 1440 • Hour: 0 to 24

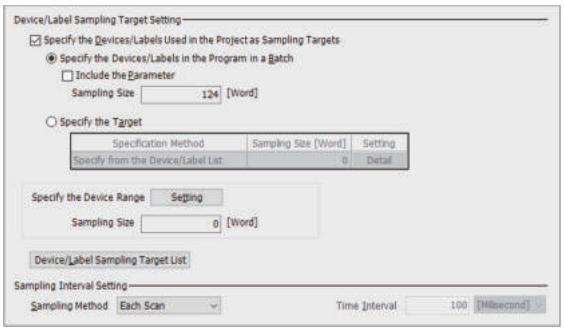
*1 For devices that can be specified, refer to the following:
☞ Page 38 Devices that can be specified as triggers
*2 Displayed in red when specifying a device that is not included in the range set in the device setting in the CPU parameter.
*3 Can be selected when specifying a device in "Device."
*4 Can be set when selecting the checkbox of "Save after specified time elapses from recording completion."

3.3 Device/Label Sampling Setting

This section shows the screen for setting a device and label to be sampled and their sampling method.

Window

Click "Device/Label Sampling Setting" in the setting item list.



Displayed items

Item				Description	Reference
Device/Label Sampling Target Setting	Specify the Devices/Labels Used in the Project as Sampling Targets	—		Select the checkbox to specify a device and label used in a project (program or parameter) as a sampling target.	—
		Specify the Devices/Labels in the Program in a Batch[*1]	—	Select this to specify a sampling target by using 'device/label batch specification.'	Page 32 Specifying a device and label to be sampled
			Include the Parameter[*2]	Select the checkbox to include a parameter in the target.	
			Sampling Size[*3]	The total size of devices and labels specified as sampling targets by using 'device/label batch specification' is displayed.	—
		Specify the Target[*1]	—	Select this to specify a sampling target by using 'specify from the device/label list.'	Page 32 Specifying a device and label to be sampled
			Specification Method	"Specify from the Device/Label List" is displayed.	—
			Sampling Size [Word][*4]	The total size of devices and labels specified as sampling targets in the "Specify from the Device/Label List" screen is displayed.	—
			Setting	Click the [Detail] button to open the "Specify from the Device/Label List" screen.[*5]	Page 100 "Specify from the Device/Label List" screen
	Specify the Device Range	—		Click the [Setting] button to open the "Specify the Device Range" screen.	Page 32 Specifying a device and label to be sampled Page 112 "Specify the Device Range" screen
		Sampling Size[*6]		The total size of devices specified as sampling targets in the "Specify the Device Range" screen is displayed.	—
	[Device/Label Sampling Target List] button			Click this to open the "Device/Label Sampling Target List" screen.	Page 114 "Device/Label Sampling Target List" screen

Item		Description	Reference
Sampling Interval Setting	Sampling Method	Select a sampling method for a device and label. • Each Scan • Time Specification • Trigger Instruction • Safety Cycle Time*7	Page 39 Sampling methods of devices and labels
	Time Interval	Set a sampling interval when selecting "Time Specification" for "Sampling Method." The range of values that can be set differs depending on each unit as follows: • Millisecond: 1 to 60000 • Second: 1 to 86400 • Minute: 1 to 1440 • Hour: 1 to 24	—

*1 Can be selected when selecting the checkbox of "Specify the Devices/Labels Used in the Project as Sampling Targets."
*2 Can be selected when selecting "Specify the Devices/Labels in the Program in a Batch."
*3 Displayed in red and a warning icon appears in any of the following cases:
An unconverted program is included in a target program.
A project is unconverted when the checkbox of "Include the Parameter" is selected.
A target program exists in the program setting in the CPU parameter but not in the navigation window.
*4 Displayed in red in any of the following cases:
A local device and local label used in a program other than a target one are specified as sampling targets.
A global label (no device assigned) is specified as a sampling target but an unconverted program is included in a target program.
A module label (no device assigned) is specified as a sampling target but a project is unconverted.
*5 Can be clicked when selecting "Specify the Target."
*6 Displayed in red and a warning icon appears if it is undetermined.
*7 Can be selected only when using a safety CPU.

Point

- To use program data in a recording file during offline monitoring, save a GX Works3 project file (.gx3) to a personal computer for offline monitoring in advance.
  When performing the offline monitor function, the file must be opened.
- If the checkbox of "Specify Device/Label in batch" is selected in this screen of GX Works3 the version of which is 1.070Y or earlier, the setting is retained with "Specify the Devices/Labels in the Program in a Batch" selected when opening the setting file in GX Works3 the version of which is 1.072A or later.
- If the checkbox of "Include the Parameter" is selected or "Specify the Target" is selected, the setting file does not match that created in GX Works3 the version of which is 1.070Y or earlier when they are verified.

Precautions

When changing the following settings before writing the recording setting to a CPU module after selecting "Specify the Devices/Labels in the Program in a Batch" in this screen, sampling target devices and labels may change according to the setting change. Sampling target devices and labels after the change can be checked in the "Device/Label Sampling Target List" screen. (☞ Page 114 "Device/Label Sampling Target List" screen)

- Program
- Label setting
- Memory/device setting in the CPU parameter
- Program setting in the CPU parameter

When including parameters, the following settings are also targets:

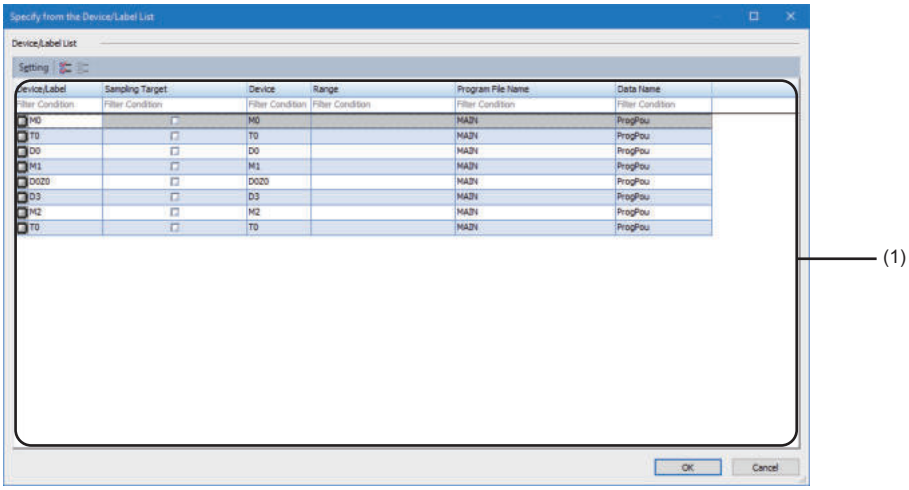
- Refresh setting between multiple CPUs (CPU parameter)
- Refresh setting in the CC-Link IEF Basic setting (module parameter)
- Refresh setting (module parameter)
- Simple CPU communication setting (module parameter)
- Safety data transfer device setting in the safety communication setting (module parameter)

"Specify from the Device/Label List" screen

A device and label to be sampled can be specified from the list of devices and labels used in a project (program or parameter).
In addition, devices and labels to be sampled can be filtered and sorted in the list. This allows them to be narrowed down and easily specified as sampling targets.

Window

1. Select the checkbox of "Specify the Devices/Labels Used in the Project as Sampling Targets" in "Device/Label Sampling Target Setting" and select "Specify the Target."
2. Click the [Detail] button for which "Specify from the Device/Label List" is displayed in "Specification Method."



Displayed items

Item	Description
[Setting] button	Click this to open the "Setting" screen. By selecting the checkbox of "Include Devices/Labels Used in Parameter Setting" in the "Setting" screen, devices and labels used in parameters are also displayed in the list.
	Select this to select the checkbox of a selected row in the "Sampling Target" column.
	Select this to unselect the checkbox of a selected row in the "Sampling Target" column.

Item		Description
(1) Device and label list	—	Devices and labels used in a project (program or parameter[*1]) are listed.[*2] They can also be filtered to display. ☞ Page 109 Filtering display
	Device/Label	The name of a device and label is displayed.
	Sampling Target	Select the checkbox to specify the device and label as sampling targets.
	Class[*3*4]	If a class is set for the label, the class is displayed.
	Label Data Type[*3*4]	If a data type is set for the label, the data type is displayed.
	Device[*4]	The assigned device is displayed.
	Range[*4]	The device range is displayed. It is blank if there is only one device.
	Instruction[*3*4]	For a device and label used in a program, an instruction that uses them is displayed.
	FB/FUN[*3*4]	For a device and label used as an argument of an FB/FUN, the function block name used as the argument is displayed.
	Program File Name[*4]	For a device and label used in a program (program file or FB file), the program file name or FB file name is displayed.
	Data Type[*3*4]	A data type is displayed. • When data is used in a program (program file): Program • When data is used in an FB (FB file): FB • When data is used in the CPU parameter: CPU parameter • When data is used in the module parameter: Module parameter • When data is used in [Properties] ⇨ [Detail] ⇨ [Block Information] of an SFC block: Block information
	Data Name[*4]	A data name is displayed. • When data is used in a program (program file): Program block name • When data is used in an FB (FB file): Function block name • When data is used in a parameter: Module name
	Comment[*3*4*5]	If a comment is set for the device and label, the comment is displayed.

*1 Can be specified when selecting the checkbox of "Include Devices/Labels Used in Parameter Setting" in the "Setting" screen.
*2 If a device and label are used in multiple locations in a program, each of them is displayed in the list.
*3 Does not appear when the screen opens.
*4 By right-clicking the column header and selecting or unselecting the checkbox of each item, items can be displayed or hidden.
*5 If the checkbox of "Enable Multiple Comments Display" is selected in the "Multiple Comments Display Setting" screen, which is displayed by selecting [View] ⇨ [Multiple Comments] ⇨ [Display Setting] in GX Works3, the comment title the "Target" column of which is selected is displayed in the column header. If the checkbox is not selected, "Comment" is displayed instead.

Point

When selecting only a specific program or device as a sampling target, any targets can easily be selected by filtering them. For details, refer to the following:
☞ Page 111 Operation examples

Precautions

■When using a program other than a target one

Devices and labels used in a program other than a target one are not displayed in the list. In addition, they are excluded from the sampling target when writing a recording setting to a CPU module. To set the program as a target, convert it, change the program setting in the CPU parameter, and remove the security protection in advance.

For target programs, refer to the following:

☞ Page 32 Specifying a device and label to be sampled

■Local labels in an FB

If an FB instance is defined as a local label in a program block, it is treated as a local label. If it is defined as a global label, it is treated as a global label.

However, depending on the definition method of an FB instance, it may be defined as both a global label and local label because it is not distinguished for each FB instance. In this case, it is treated as both a global label and local label.*1

*1 For a structure label defined as a local label in an FB, all the members are treated as global labels and local labels.

■When specifying a device as a sampling target

Devices included in a sampling unit (point) shown in the following section are also specified as sampling targets.*1*2

☞ Page 29 Devices that can be sampled

These devices are specified as sampling targets when closing this screen, and the checkboxes of the devices in the list are selected in the "Sampling Target" column when opening this screen again. To exclude them from the sampling target, unselect all the checkboxes.*3

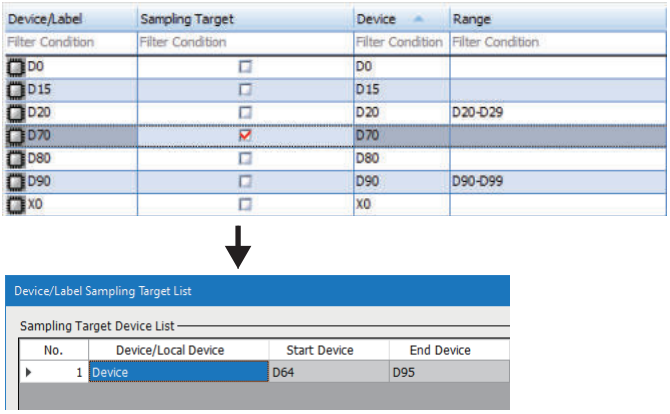
*1 When specifying any one of the following devices and its contact, coil, or current value as sampling targets, the contact, coil, and current value are specified as sampling targets.
- Timer
- Retentive timer
- Long timer
- Long retentive timer
- Counter
- Long counter
- Safety timer
- Safety retentive timer
- Safety counter

*2 When specifying either an index register or a long index register as a sampling target, the other one is also specified.

*3 The selection status of a device in the "Sampling Target" column changes at the same time as that of a device and label in the list that satisfy the conditions shown in the following section.
Therefore, the selection status of another device and label may also change.
☞ Page 104 Selection status of a device in the "Sampling Target" column

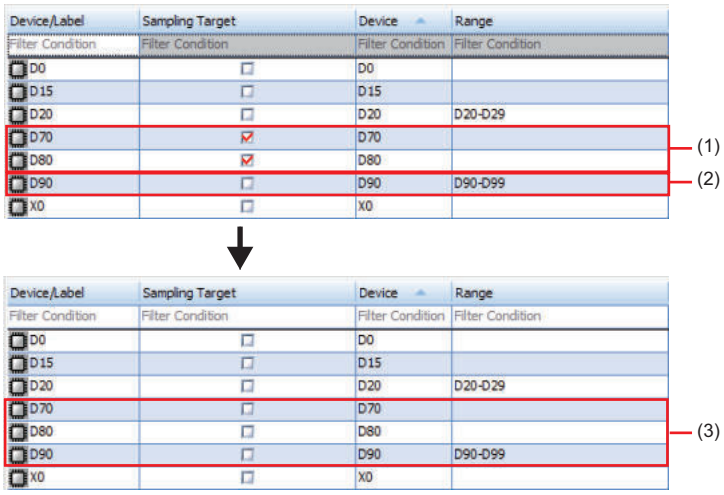
Ex.

When selecting D70 as a sampling target, devices in the range of D64 to D95 (32 words) are specified as sampling targets.



When opening this screen again, the checkboxes of these devices are selected in the "Sampling Target" column.

To exclude them from the sampling target, unselect all the checkboxes in the "Sampling Target" column.



(1) The checkboxes of devices in the range of D64 to D95 are selected in the "Sampling Target" column.

(2) Devices in the range of D90 to D99 are not selected as sampling targets because they are not included in the range of D64 to D95.

(3) Unselect the checkboxes of all the devices in the range of D64 to D95.

■Selection status of a device in the "Sampling Target" column

When changing the selection status of a device in the "Sampling Target" column, the statuses of other devices and labels in the list that satisfy the following conditions also change at the same time. (This change also applies to devices and labels that are hidden by filtering.)

- The device type is the same as a changed device.[*1*2*3]
- The device range is included in the range of a changed device.[*1*2]
- The device range partially overlaps with the range of a changed device, and devices in the remaining range are already specified as sampling targets.[*4]

*1 For example, when changing the selection status of a device in the range of D0 in the "Sampling Target" column, those of devices in the same range also change. (The selection statuses of devices in the ranges of D1, Z0, D0-D1, and D0Z0, etc. do not change.)

*2 For example, when changing the selection status of a device in the range of D0-D1 in the "Sampling Target" column, those of devices in the ranges of D0, D1, and D0-D1 also change. (The selection statuses of devices such as those in the range of D1-D2 do not change.)

*3 The following devices and their contacts, coils, or current values are treated as other device types in this screen; therefore, the selection status does not change at the same time. (For example, the selection status of a coil T0, TS0, TC0, or TN0 does not change at the same time even if that of another one changes.)
- Timer
- Retentive timer
- Long timer
- Long retentive timer
- Counter
- Long counter
- Safety timer
- Safety retentive timer
- Safety counter

*4 For example, when selecting the checkbox of a device in the range of D0 in the "Sampling Target" column, those of devices in the range of D0-D1 are also selected if D1 is already specified as a sampling target. (When unselecting the checkbox of D0, those of devices in the range of D0-D1 are also unselected; however, D1 remains a sampling target.)

■When specifying a label (no device assigned) as a sampling target

Other labels in a project that satisfy the following conditions are also specified as sampling targets according to specified label types.

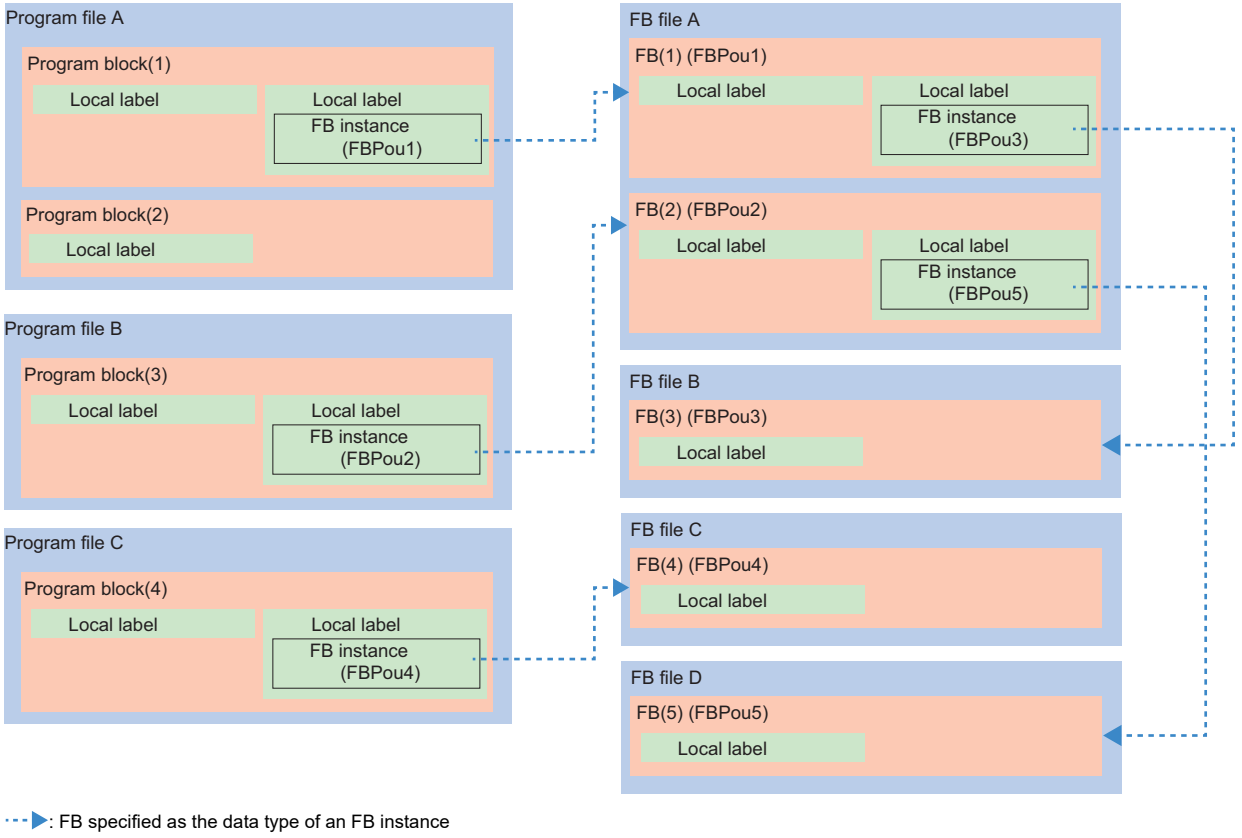
Therefore, when changing the selection status in the "Sampling Target" column, the statuses of other labels in the list that satisfy the following conditions also change at the same time. (This change also applies to labels that are hidden by filtering.)

Label type		Condition
• Global label • Standard/safety shared global label		All global labels (no device assigned)
Local label	Used in a program file (program block)	• All local labels in a program file to which a local label belongs[*1] • All local labels in an FB used in a program file to which a local label belongs[*1]
	Used in an FB file (FB)	• All local labels in an FB file to which a local label belongs[*1] • All local labels in a program file that uses an FB in an FB file to which a local label belongs[*1] • All local labels in another FB file used in an FB file to which a local label belongs[*1]
Module label		All module labels (no device assigned)

*1 Based on a local label specified as a sampling target, other local labels that satisfy their respective conditions are also specified as sampling targets.
For examples of specifying other local labels when specifying a local label as a sampling target, refer to the following:
☞ Examples of specifying other local labels when specifying a local label as a sampling target

• Examples of specifying other local labels when specifying a local label as a sampling target

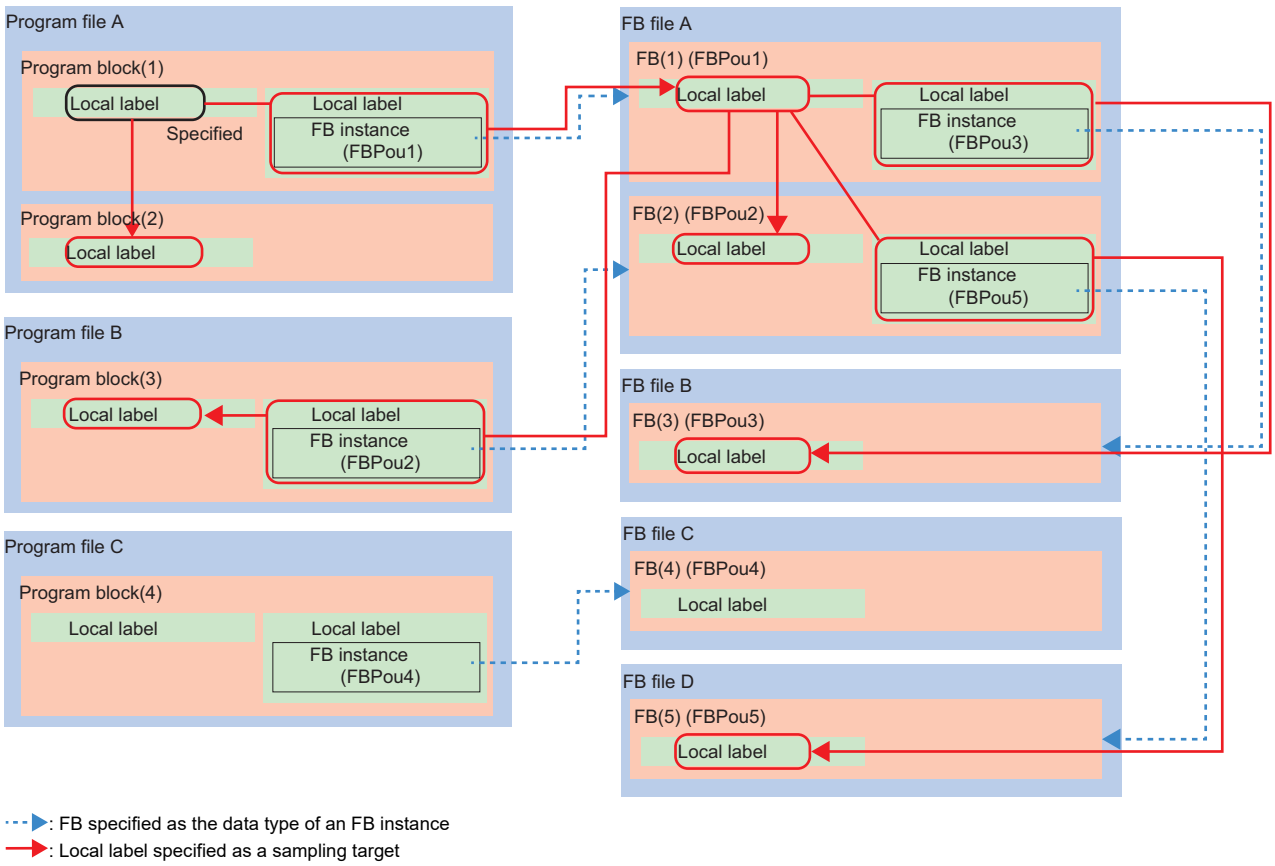
The following configuration is used for specification examples.



: FB specified as the data type of an FB instance

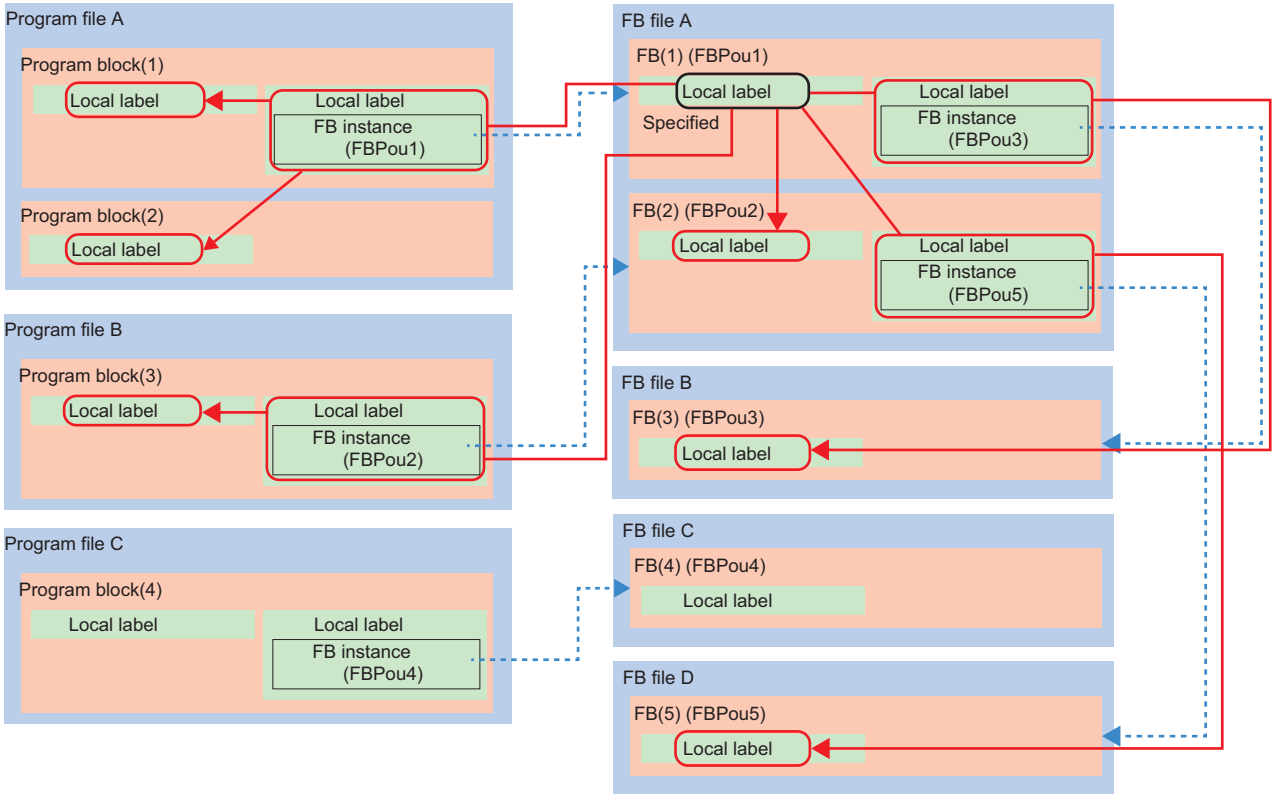
❶ When specifying a local label in program block (1) as a sampling target, local labels in the following blocks are also specified as sampling targets.

- Program block (2) (3)
- FB (1) (2) (3) (5)



❷ When specifying a local label in FB (1) as a sampling target, local labels in the following blocks are also specified as sampling targets.

- Program block (1) (2) (3)
- FB (2) (3) (5)



: FB specified as the data type of an FB instance
: Local label specified as a sampling target

■When specifying a label (device assigned) as a sampling target

Labels (device assigned) are treated the same as global devices. For details, refer to the following:

☞ Page 102 When specifying a device as a sampling target

■When specifying a structure label/member as a sampling target

Devices and labels that satisfy the following conditions are set as sampling targets.

Structure label/member	Condition
Structure label	All members*1 in a structure and labels that satisfy the conditions shown in the following: ☞ Page 104 When specifying a label (no device assigned) as a sampling target
Simple data type member (device assigned)	Same as a device. For details, refer to the following: ☞ Page 102 When specifying a device as a sampling target
Simple data type member (no device assigned)	Same as a label (no device assigned). For details, refer to the following: ☞ Page 104 When specifying a label (no device assigned) as a sampling target
Structure type member	Same as a label (no device assigned). For details, refer to the following: ☞ Page 104 When specifying a label (no device assigned) as a sampling target

*1 The selection status in the "Sampling Target" column does not change at the same time. Members are specified as sampling targets when closing this screen and other devices and labels that satisfy their respective conditions are also specified as sampling targets based on a member specified as a sampling target.

■When changing a program setting or others after specifying a sampling target in this screen

When changing the following settings before writing the recording setting to a CPU module after specifying sampling targets in this screen, sampling target devices and labels may change according to the setting change. Sampling target devices and labels after the change can be checked in the "Device/Label Sampling Target List" screen. (☞ Page 114 "Device/Label Sampling Target List" screen)

- Program
- Label setting
- Memory/device setting in the CPU parameter
- Program setting in the CPU parameter

When including parameters, the following settings are also targets:

- Refresh setting between multiple CPUs (CPU parameter)
- Refresh setting in the CC-Link IEF Basic setting (module parameter)
- Refresh setting (module parameter)
- Simple CPU communication setting (module parameter)
- Safety data transfer device setting in the safety communication setting (module parameter)

The following describes the cases in which sampling target devices and labels change or not after changing any of the above settings.

Cases in which sampling targets change

- Whether to use a label (no device assigned) is changed.
- A device is assigned to a sampling target label (no device assigned).
- The program number of a sampling target local label is changed and a local label in the program is excluded from the sampling target.
- The range of sampling target devices is changed and the devices are excluded from the sampling target.
  (Example)
  - The program corresponding to the program number of a sampling target local device is deleted.
  - The type of the program corresponding to the program number of a sampling target local device is changed (such as a change from a safety program to a standard one).

Case in which sampling targets do not change

- Whether to use a sampling target device is changed.

Filtering display

Displayed devices and labels can be filtered.

The following table shows filtering conditions that can be specified for each column.

Column	Description
Device/Label	Any characters can be specified (up to 32 characters).
Sampling Target	Either of the following items can be selected: • Enable (Sampling Target) • Disable (Sampling Target Excluded)
Class	Any characters can be specified (up to 32 characters).
Label Data Type	
Device	
Range	
Instruction	
FB/FUN	
Program File Name	
Data Type	Any of the following items can be selected: • Program • FB • CPU Parameter • Module Parameter • Block Information
Data Name	Any characters can be specified (up to 32 characters).
Comment	Any characters can be specified (up to 32 characters).

■Filtering condition

A previously entered condition can be selected from the pull-down list.*1*2

A program file name and data name displayed in the list can also be selected in the "Program File Name" and "Data Name" columns.*2

In addition, conditions can be specified in multiple columns. In this case, only devices and labels that match all the conditions are displayed.

*1 Up to 10 conditions are displayed in the following columns. If 11th one is entered, 10 conditions are displayed in order from an added one. Note that the filter history is cleared when closing the project.
Device/Label
Class
Label Data Type
Device
Range
Instruction
FB/FUN
Comment

*2 Up to 50 conditions are displayed in the "Program File Name" and "Data Name" columns (up to 50 program file names and data names in the list are displayed by default).
If 51st one is entered, 50 conditions are displayed in order from an added one. Note that the filter history returns to the default when closing this screen or changing the selection status of the checkbox of "Include Devices/Labels Used in Parameter Setting" in the "Setting" screen.

■Deleting a filtering condition

Filtering of a column can be cleared by deleting the keyword entered as a filtering condition for the column.

■Keywords for a filtering condition

The following table shows the wild cards that can be set as keywords in filtering conditions to search for a character string.

Wild card	Target	Example	Result
*	Any character string	*D30*	red301, @D30, XD30, D30, D30:U
?	Any one character	K4?30	K4X30, K4Y30
[ ]	Any one of specified characters ■Case in which an error occurs '[' and ']' are not paired. (Example) X[0, X1]	[XY]8	X8, Y8

Wild card	Target	Example	Result
[!]	Any one character except for one in the brackets	K4X[!3]0	K4X10, K4X20, K4X40
		K[!1-3]X0	K4X0
[-]	Character strings within the range in the brackets ■Case in which an error occurs • Only the upper or lower limit value is specified or neither is specified. (Example) [-], X[-], X[0-], X[-9] • A value of two or more digits is set for the upper or lower limit value. (Example) X[100-5], X[0-100], X[10-20] • The lower limit value is equal to or greater than the upper limit value. (Example) X[0-0], X[9-0] • A hyphen (-) is specified more than once. (Example) bLabel[a-x0-1]	[B-D]0	B0, C0, D0
		D[0-2]	D0, D1, D2
		K4X[!3-4]0	K4X10, K4X20, K4X50

Precautions

■When specifying an array element as a filter

An array element is regarded as a wild card '[ ].' This causes an unexpected result.

(Example) When specifying "bLabel1[9]" as a filter if 'bLabel1[9]' and 'bLabel19' are included in the list, 'bLabel19' is displayed.

(Example) When specifying "bLabel1[[0-9]]" as a filter if 'bLabel1[0]' and 'bLabel1[9]' are included in the list, an error occurs due to incorrect expression.

■When specifying a data type that includes '[ ]' as a filter

A data type is regarded as a wild card '[ ].' This causes an unexpected result.

(Example) When specifying "Word [Signed]" as a filter, it is not displayed.

■When specifying a comment that includes a wild card as a filter

When specifying a comment that includes a wild card (*, ?, or [ ]) as a filter, an expected result may not be obtained.

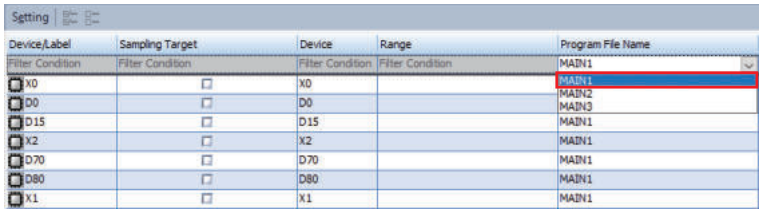
(Example) When specifying "Detailed Information [1]" as a filter if 'detailed information [A],' 'detailed information [1],' and 'detailed information 1' are included in the list, 'detailed information 1' is displayed.

Operation examples

■When specifying only a specific program as a sampling target

Operating procedure

1. Select "Filter Condition" in the "Program File Name" column, and select a program to specify as a sampling target.
Only the devices and labels used in the selected program are displayed.



2. Move the focus to the list.

3. Press the Ctrl + A keys to select all the devices and labels.

4. Press the Ctrl + T keys to select the checkboxes of the selected rows in the "Sampling Target" column.

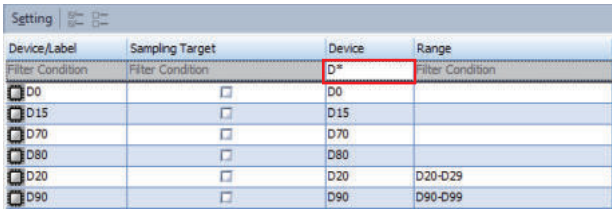
Point

By pressing the Ctrl + D keys, the checkboxes of the selected rows can be unselected in the "Sampling Target" column.

■When specifying only a device of a specific device type as a sampling target

Operating procedure

1. Specify a device to specify as a sampling target for "Filter Condition" in the "Device" column.
(Example) To specify a D device as a sampling target, specify "D*"; only D devices are displayed.



2. Move the focus to the list.

3. Press the Ctrl + A keys to select all the devices.

4. Press the Ctrl + T keys to select the checkboxes of the selected rows in the "Sampling Target" column.

Point

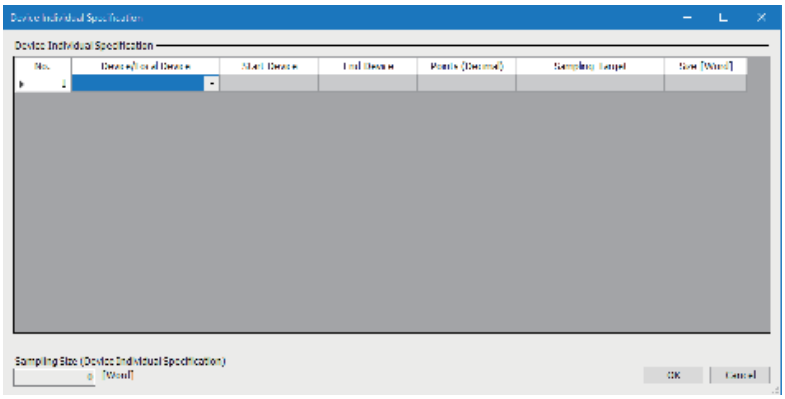
By pressing the Ctrl + D keys, the checkboxes of the selected rows can be unselected in the "Sampling Target" column.

"Specify the Device Range" screen

The range of devices to be sampled can be specified individually.

Window

Click the [Setting] button next to "Specify the Device Range" in "Device/Label Sampling Target Setting."



Displayed items

Item		Description
Specify the Device Range[*1]	—	Specify a device. The following two types of setting methods are available and can be switched by right-clicking in the screen and selecting [Setting Method] ⇨ [Start/End] or [Points/Start]. • Start/End: To set the start and end devices to automatically acquire the number of points. • Points/Start: To set the start device and the number of points to automatically acquire the end device. When entering a device corresponding to the current value, coil, or contact of a timer or counter, it is replaced with its base device symbol.
	Device/Local Device	Select the type of a device (local device or global device).[*2] For a local device, also select a program to which the device belongs. A program name displayed in this item depends on the execution program number.
	Start Device	Specify the start of devices to be sampled.[*3*4]
	End Device	Specify the end of devices to be sampled.[*4*5]
	Points (Decimal)	Specify the number of device points to be sampled.[*6]
	Sampling Target	The range of devices to be sampled is displayed based on the sampling unit.[*7] For the sampling unit of each device, refer to the following: ☞ Page 28 Devices and labels that can be sampled
	Size [Word]	The size of a device to be sampled is displayed.
Sampling Size (Specify the Device Range)		The total size of sampling target devices specified by using 'specify the device range' is displayed.[*8*9]

*1 Up to 65536 rows can be set.

*2 Displayed in red for a local device when any of the following conditions is satisfied.
No program file is registered in the corresponding execution program number.
The program file of the corresponding execution program number does not exist in the navigation window.
A program file registered in the corresponding execution program number is unconverted.
A program file registered in the corresponding execution program number is a standard program when "Safety Cycle Time" is selected for "Sampling Method."

*3 Cannot be set in any of the following cases:
The cell in "Device/Local Device" is blank.
For a local device, no program file is registered in the corresponding execution program number.
For a local device, a program file registered in the corresponding execution program number is a standard program when "Safety Cycle Time" is selected for "Sampling Method."

*4 Displayed in red in any of the following cases:
A standard device is specified when "Safety Cycle Time" is selected for "Sampling Method."
The device range is not set in the CPU parameter.
The specified device is out of the range set in the CPU parameter.
For a local device, a safety device is specified when a program file registered in the corresponding execution program number is a standard program.
For a local device, a standard device is specified when a program file registered in the corresponding execution program number is a

safety program.

*5 Cannot be set in any of the following cases:
The cell in "Device/Local Device" is blank.
For a local device, no program file is registered in the corresponding execution program number.
For a local device, a program file registered in the corresponding execution program number is a standard program when "Safety Cycle Time" is selected for "Sampling Method."
The cell in "Start Device" is blank.
"Points/Start" is selected for the setting method.
A standard device is specified for "Start Device" when "Safety Cycle Time" is selected for "Sampling Method."
A device specified for "Start Device" is one for which the device range is not set in the CPU parameter.
A device specified for "Start Device" is out of the range set in the CPU parameter.

*6 Cannot be set in any of the following cases:
The cell in "Device/Local Device" is blank.
For a local device, no program file is registered in the corresponding execution program number.
For a local device, a program file registered in the corresponding execution program number is a standard program when "Safety Cycle Time" is selected for "Sampling Method."
The cell in "Start Device" is blank.
"Start/End" is selected for the setting method.
A standard device is specified for "Start Device" when "Safety Cycle Time" is selected for "Sampling Method."
A device specified for "Start Device" is one for which the device range is not set in the CPU parameter.
A device specified for "Start Device" is out of the range set in the CPU parameter.

*7 "-" is displayed in any of the following cases:
Some items are not entered.
For a local device, no program file is registered in the corresponding execution program number.
For a local device, a program file registered in the corresponding execution program number is unconverted.
A standard device is specified for "Start Device" when "Safety Cycle Time" is selected for "Sampling Method."
For a local device, a safety device is specified for "Start Device" or "End Device" when a program file registered in the corresponding execution program number is a standard program.
For a local device, a standard device is specified for "Start Device" or "End Device" when a program file registered in the corresponding execution program number is a safety program.
A device that is not set as available in the CPU parameter is specified.
The device range set in the CPU parameter is out of the range of the start to end devices.

*8 Displayed in red in any of the following cases:
A local device, for which no program file is registered in the corresponding execution program number, is specified.
A local device, for which the program file of the corresponding execution program number does not exist in the navigation window, is specified.
A local device, for which a program file registered in the corresponding execution program number is unconverted, is specified when an item other than "Safety Cycle Time" is selected for "Sampling Method."
A local device, for which a program file registered in the corresponding execution program number is an unconverted safety program, is specified when "Safety Cycle Time" is selected for "Sampling Method."

*9 A warning icon appears in any of the following cases:
A local device, for which no program file is registered in the corresponding execution program number, is specified.
A local device, for which a program file registered in the corresponding execution program number is unconverted, is specified.
A standard device is specified when "Safety Cycle Time" is selected for "Sampling Method."

Precautions

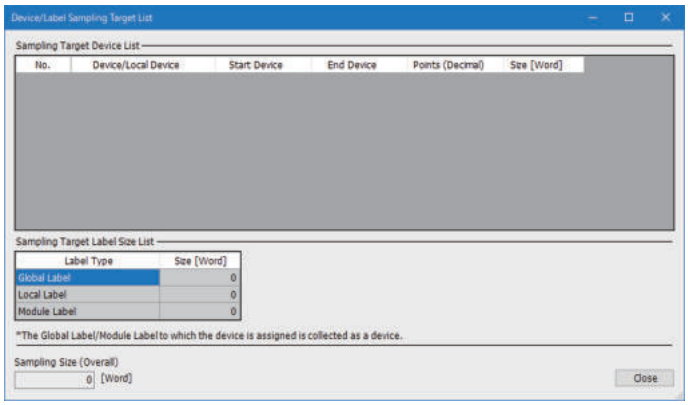
- Devices out of the range set in "Device Setting" in the CPU parameter cannot be specified.
  In addition, devices out of the range are displayed in red if they are changed in "Device Setting" in the CPU parameter after specified in the "Specify the Device Range" screen.
  For an actual range, check the sampling target column.
- When changing the program execution order in the program setting of GX Works3 after setting a local device, set an item in "Device/Local Device" again.

"Device/Label Sampling Target List" screen

Devices and labels specified as sampling targets by using each specification method are listed.

Window

Click the [Device/Label Sampling Target List] button in "Device/Label Sampling Target Setting."



Displayed items

Item		Description
Sampling Target Device List	—	Sampling target devices are listed. • If a sampling target is specified for multiple specification methods, it is displayed without duplication. (Example) When specifying D0 to D31 for 'device/label batch specification' and 'specify the device range,' they are displayed for one of the methods only. • A device is not displayed if "-" is displayed in "Sampling Target" when using 'specify the device range.' • If ranges of devices to be sampled are continuous or overlap, they are displayed as one range. (Example) When specifying D0 to D31 for 'device/label batch specification' and D32 to D95 for 'specify the device range,' D0 to D95 are displayed.
	Device/Local Device	The type of a device is displayed. For a local device, a program to which the device belongs is also displayed.
	Start Device	The start of devices to be sampled is displayed.
	End Device	The end of devices to be sampled is displayed.
	Points (Decimal)	The number of device points to be sampled is displayed.
	Size [Word]	The size of a device to be sampled is displayed.
Sampling Target Label Size List	—	The total size of labels to be sampled is displayed for each type.
	Label Type	The type is displayed.
	Size [Word]	The total size is displayed.
Sampling Size (Overall)		The total size of devices and labels to be sampled is displayed.*1

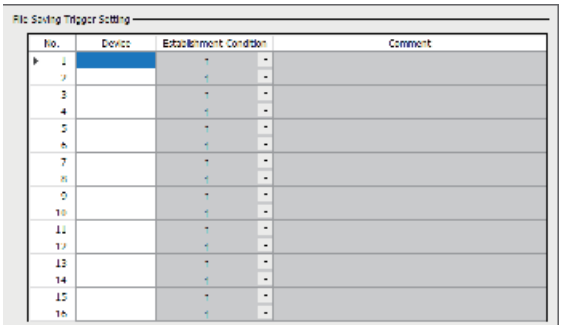
*1 Displayed in red and a warning icon appears in any of the following cases:
An unconverted program is included in a target program when using 'device/label batch specification.'
The checkbox of "Include the Parameter" is selected and a project is unconverted when using 'device/label batch specification.'
A target program exists in the program setting in the CPU parameter but not in the navigation window when using 'device/label batch specification.'
A local device and local label used in a program other than a target one are specified as sampling targets when using 'specify from the device/label list.'
A global label (no device assigned) is specified as a sampling target but an unconverted program is included in a target program when using 'specify from the device/label list.'
A module label (no device assigned) is specified as a sampling target but a project is unconverted when using 'specify from the device/label list.'
A local device in an unconverted or a non-existent program is specified as a sampling target when using 'specify the device range.'

3.4 File Saving Trigger Setting

This section shows the screen for setting a device specified as a file saving trigger for saving accumulated data when a device of a CPU module rises or falls.
This setting is required only when specifying a device of a CPU module as a trigger.

Window

Click "File Saving Trigger Setting" in the setting item list.



Displayed items

Item	Description
Device	Specify a device used to determine whether a file saving trigger is satisfied.*1*2
Establishment Condition*3	Select a condition to satisfy a file saving trigger. • ↑: When the bit rises • ↓: When the bit falls
Comment*3	Set a comment to supplement a saving cause (up to 64 characters).

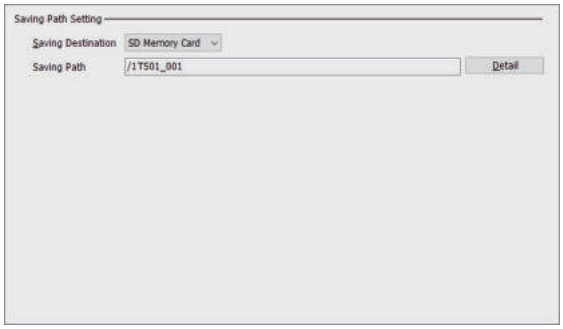
*1 For devices that can be specified, refer to the following:
☞ Page 38 Devices that can be specified as triggers
*2 Displayed in red when specifying a device that is not included in the range set for "Device Setting" in the CPU parameter.
*3 Can be edited when specifying a device in "Device."

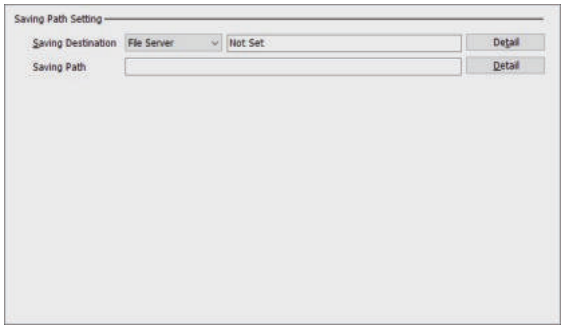
3.5 Saving Path Setting

This section shows the screen for setting a path to save accumulated data.

Window

Click "Saving Path Setting" in the setting item list.





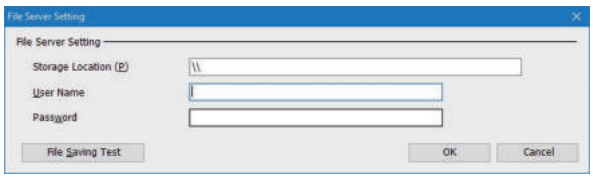
Displayed items

Item		Description	Reference
Saving Path Setting	Saving Destination	Select a save destination. When selecting "File Server," the "File Server Setting" screen appears by clicking the [Detail] button.	Page 117 File server setting
	Saving Path	A saving path set in the "Saving Detail Setting" screen is displayed.	—
	[Detail] button	Click this to open the "Saving Detail Setting" screen.	Page 118 Saving detail setting

File server setting

Window

Click the [Detail] button next to the cells of "Saving Destination" in the saving path setting.



Displayed items

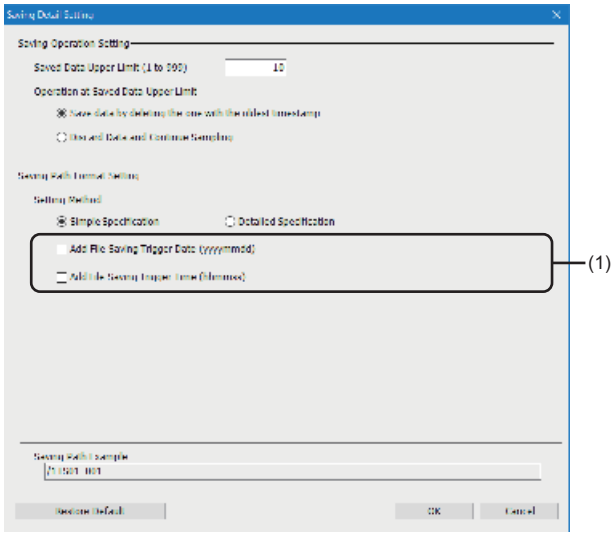
Item	Description
Storage Location	Specify the folder path to a save destination in the following format (1 to 142 characters).*1*2*3 • \\(host name*4*5 or IP address)\(folder path)
User Name	Specify a user name*6 to access a file server (1 to 20 characters).
Password	Specify a password to access a file server (1 to 127 characters).
[File Saving Test] button	Click this to perform the file saving test for a save destination.*7 When the test is successful, a file (0 bytes) with the following name is stored in the save destination folder. • MELSEC_SMB_TEST_(setting number)(start I/O number of a recorder module/camera recorder module).txt

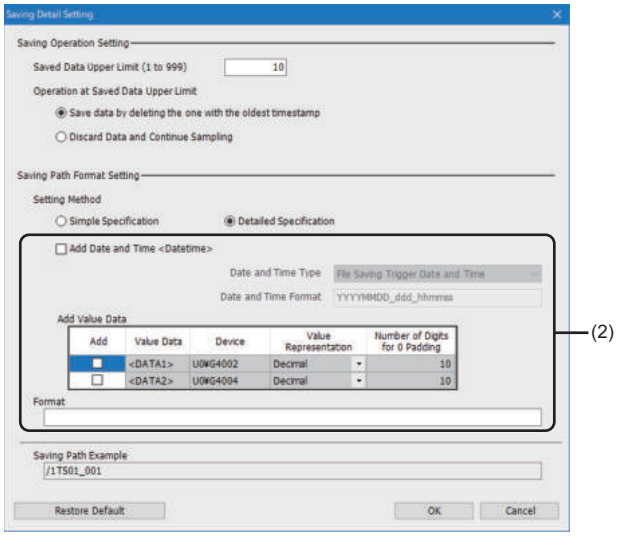
*1 A save destination folder is not generated automatically. Create one in advance.
*2 Use '\' as a delimiter between directories.
*3 When using a multiple CPU system, do not specify the same folder.
*4 Specify it up to 64 characters.
*5 To specify a host name, the DNS setting must be configured in the module parameter of a recorder module/camera recorder module.
☞ Page 77 Module Parameters (Recorder Module/Camera Recorder Module)
*6 A file cannot be saved by specifying a user name that is joined to a domain. Specify one that is not joined to any domain.
*7 When configuring multiple modules, perform the file saving test between a sub module and file server.
☞ Page 61 Operation of the recording function when configuring multiple modules

Saving detail setting

Window

Click the [Detail] button in the saving path setting.





Displayed items

Item		Description
Saving Operation Setting	Saved Data Upper Limit (1 to 999)	Set the upper limit of saved recording files.
	Operation at Saved Data Upper Limit	Select an operation performed when the upper limit of saved recording files is exceeded. • Save data by deleting the one with the oldest timestamp: A recording file with the oldest time stamp is deleted and a new file is saved. • Discard Data and Continue Sampling: A new recording file is not saved, and data is discarded. In addition, a saving error occurs. (☞ Page 71 Saving files fails)

Item				Description
Saving Path Format Setting	Setting Method			Select "Simple Specification" or "Detailed Specification." • Simple Specification: To set only whether to add the date and time when a file saving trigger is satisfied to a file name. • Detailed Specification: To set whether to add the following items to a file name: Date and time (when a file saving trigger is satisfied or a recording file is saved)*1 Numerical value data (data in the buffer memory when a file saving trigger is satisfied) Any character strings
	(1) Simple specification	Add File Saving Trigger Date (yyyymmdd)		Select the checkbox to add the date and time when a file saving trigger occurs to a file name. (Example) February 23, 2019: 20190223
		Add File Saving Trigger Time (hhmmss)		Select the checkbox to add the time when a file saving trigger occurs to a file name. (Example) 18:53:04: 185304
	(2) Detailed specification	Add Date and Time <Datetime>		Select the checkbox to add a date and time to a file name. The date and time according to the settings for "Date and Time Type" and "Date and Time Format" is added to the position of <DATETIME> specified for "Format."
		Date and Time Type*2		Select the type of date and time information to be added ("File Saving Trigger Date and Time" or "File Creation Date and Time").
		Date and Time Format*2		Set the output format of the date and time column (2 to 24 characters). The following reserved words*3 can be specified. • YYYY: Year (4 digits) • YY: Year (2 digits) • MM: Month (2 digits) • DD: Day (2 digits) • ddd: Day of the week (3 digits) • hh: Hour (2 digits) • mm: Minute (2 digits) • ss: Second (2 digits)
		Add Value Data	Add	Select the checkbox to add numerical value data to a file name. Numerical value data according to the settings in "Add Value Data" is added to the position of <DATA1> or <DATA2> specified for "Format."
			Value Data	<DATA1> or <DATA2> is displayed.
			Device	The address of the buffer memory that stores numerical value data is displayed.
			Value Representation*4	Select an output format of numerical value data to be added (decimal or hexadecimal).
			Number of Digits for 0 Padding*4	Specify the number of digits for zero padding in numerical value data to be added. The range of numerical values that can be set differs depending on the data format as follows: • Decimal: 2 to 10 • Hexadecimal: 2 to 8
		Format		Set the format of a file name (up to 34 characters).*5 ASCII characters and the following reserved words can be entered. • <DATETIME> • <DATA1> • <DATA2>
	Saving Path Example			An example of a file name based on the current setting is displayed. • /XXXX_nTS01_001 XXXX: Additional information based on the current setting _: Omitted when not adding additional information n: Number of a recording setting (1 to 4) TS01: Always displayed as a character indicating a saving cause _001: Always displayed as a folder number For details on save destinations and file names, refer to the following: ☞ Page 44 Recording file

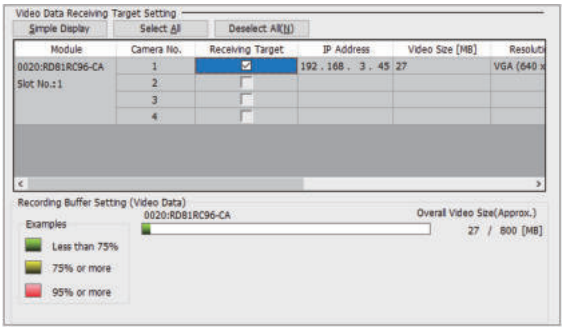
*1 A format can be specified.
*2 Can be set only when selecting the checkbox of "Add Date and Time <Datetime>."
*3 Case-sensitive
*4 Can be set only when selecting the checkbox of "Add."
*5 Cannot be set if the name of a recording file exceeds 64 characters.

3.6 Video Data Receiving Target Setting

This section shows the screen for setting a network camera from which video data is received.

Window

Click "Video Data Receiving Target Setting" in the setting item list.



Displayed items

Item	Description
[Detailed Display]/[Simple Display] button	Click this to switch between the detailed display and the simple display.
[Select All] button	Click this to select all the checkboxes in the "Receiving Target" column.
[Deselect All] button	Click this to unselect all the checkboxes in the "Receiving Target" column.
Module	The start I/O number, module name, and slot number of a camera recorder module are displayed.
Camera No.	The number of a network camera is displayed.
Receiving Target	Select the checkbox to receive video data captured by a network camera.*1
IP Address	The IP address set for a network camera is displayed.*2
Video Size [MB]	The buffer capacity, which is calculated based on the network camera setting and the recording saving time, is displayed.*2 However, if a calculated value of the buffer capacity is a decimal number, the first decimal place is rounded up.
Resolution*3	The resolution set for a network camera is displayed.*2
Video Frame Rate [fps]*3	The video frame rate set for a network camera is displayed.*2
Video Codec*3	The video codec set for a network camera is displayed.*2
Video Quality*3	The video quality set for a network camera is displayed.*2
Camera Comment	The camera comment set for a network camera is displayed.*2
Recording Buffer Setting (Video Data)	The video data capacity calculated based on the network camera setting and the selection status in the "Receiving Target" column is displayed for each camera recorder module in the following format: • Video data capacity/recording buffer setting assigned in the module parameter (video data) [MB]*4

*1 Can be selected only when a network camera is enabled.
Whether it is enabled can be checked in 'Network camera setting enabled/disabled' (Un\G34000, Un\G34500, Un\G35000, Un\G35500) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

*2 Blank when a network camera is disabled.
Whether it is disabled can be checked in 'Network camera setting enabled/disabled' (Un\G34000, Un\G34500, Un\G35000, Un\G35500) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

*3 Appears only for the detailed display. (The simple display is selected by default.)

*4 If the video data capacity is larger than a value assigned in the recording buffer setting (video data) in the module parameter, the video data capacity is displayed in red. In this case, data for a set saving period may not be saved. Perform any of the operations shown in the following:
☞ Page 55 When the capacity of accumulated video data exceeds the buffer capacity

Precautions

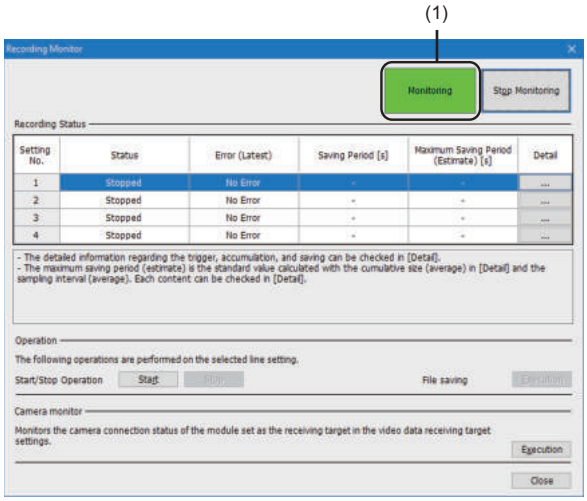
- When changing system parameters, module parameters, or module extended parameters after setting each item in this screen, the selection status in the "Receiving Target" column does not change automatically. Open this screen again to review the settings.
- Up to four camera recorder modules are displayed in ascending order of the slot number even in the following states:
  - "Empty" is selected in the module status setting in the system parameter.
  - An item other than "Online" is selected for the mode setting in the module parameter.
- If there are multiple camera recorder modules set as the main module on the four ascending slot numbers, only the module on the youngest slot number is displayed. The other modules are not displayed.

4 RECORDING MONITOR

This chapter shows the "Recording Monitor" screen of GX Works3 for checking the status of the recording function.
The status of a network camera connected to a camera recorder module can also be checked in the "Camera Monitor" screen.

Window

Select [Diagnostics] ⇨ [Recording Monitor].



Displayed items

Item		Description
(1) Monitoring status		The monitoring status is displayed.
[Start Monitoring]/[Stop Monitoring] button		Click this to start or stop monitoring.
Recording Status	Status	The operating status of the recording function is displayed.*1 ☞ Page 57 Operating status
	Error (Latest)	An error is displayed for each recording setting. If no error occurs, "No Error" is displayed.*2 If an error occurs, the latest error code is displayed. The error description and corrective action can be checked in the module diagnostics of a recorder module/camera recorder module in which an error occurred.
	Saving Period [s]*3*4	A saving period set in the recording setting is displayed.
	Maximum Saving Period (Estimate) [s]*4*5	A standard for a saving period during which data can be accumulated in the recording buffer is displayed. It is calculated based on the cumulative size (average) and the sampling interval (average). The cumulative size (average) and the sampling interval (average) can be checked in the "Recording Status Detailed Information" screen. ☞ Page 124 Recording Status Detailed Information Screen
	Detail	Click a cell in the "Detail" column to open the "Recording Status Detailed Information" screen. ☞ Page 124 Recording Status Detailed Information Screen
Start/Stop Operation	[Start] button*6	Click this to start the recording function that runs for a selected recording setting.
	[Stop] button*7	Click this to stop the recording function that is running for a selected recording setting.

Item		Description
File saving	[Execution] button*7	Click this to perform file saving of the recording function that is running for a selected recording setting. Note that it is not performed if data has never been accumulated and there is no accumulated data. In addition, data is not accumulated if a recording startup trigger has never been satisfied when selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method" in the saving period setting. Accumulated data and the number of successful recording startup triggers can be checked in the "Recording Status Detailed Information" screen. ☞ Page 124 Recording Status Detailed Information Screen
Camera monitor	[Execution] button*8	Click this to open the "Camera Monitor" screen. ☞ Page 126 Camera Monitor Screen

*1 The progress rate (%) is also displayed when "Saving" is displayed.

*2 If data is cleared, "No Error" is displayed.
For the conditions under which data is cleared, refer to the following:
☞ Recording start error, Recording start error cause

*3 "-" is displayed when "Stopped" or "Preparing" is displayed in "Status."

*4 If the maximum saving period (estimate) is shorter than the saving period, the cell is displayed in yellow. In this case, data for a set saving period may not be saved. Perform any of the operations shown in the following:
☞ Page 54 When the capacity of accumulated devices and labels exceeds the buffer capacity

*5 "-" is displayed in any of the following cases:
"Stopped" is displayed in "Status."
"Preparing" is displayed in "Status."
'0' (no data) is stored in 'Recording buffer storing status' (Un\G1507, Un\G1707, Un\G1907, Un\G2107).

*6 Can be clicked when "Stopped" is displayed in "Status."

*7 Can be clicked when an item other than "Stopped" or "Preparing" is displayed in "Status" and '1' (data exists) is stored in 'Recording buffer storing status' (Un\G1507, Un\G1707, Un\G1907, Un\G2107).

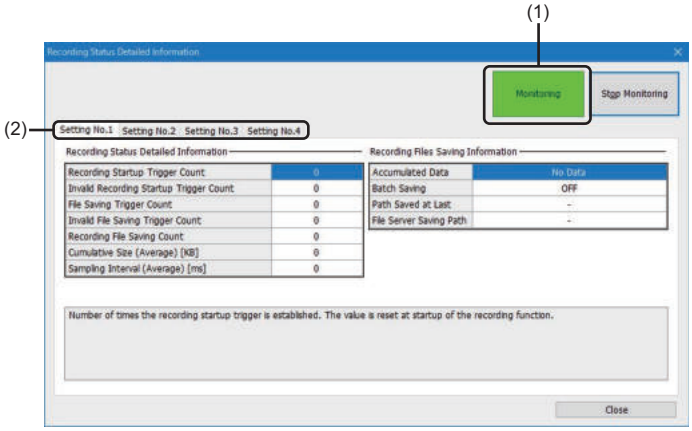
*8 Can be clicked only during monitoring.

4.1 Recording Status Detailed Information Screen

This section shows the screen for displaying detailed information on the recording function status.

Window

Click a [...] button in the "Detail" column.



Displayed items

Item		Description
(1) Monitoring status		The monitoring status is displayed.
[Start Monitoring]/[Stop Monitoring] button		Click this to start or stop monitoring.
(2) Setting tab		Select the tab of a recording setting to display its detailed information. The tab of a recording setting selected in the "Recording Monitor" screen is selected by default.
Recording Status Detailed Information	Recording Startup Trigger Count*1	The number of times that a recording startup trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid Recording Startup Trigger Count*1	The number of invalid recording startup triggers among the recording startup triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	File Saving Trigger Count*1	The number of times that a file saving trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid File Saving Trigger Count*1	The number of invalid file saving triggers among the file saving triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Recording File Saving Count*1	The number of times that a recording file was saved (total of successful and failed ones) is stored. (Value to be stored: 0 to 65535)
	Cumulative Size (Average) [KB]*1	The average size of devices and labels accumulated at a time is stored.
	Sampling Interval (Average) [ms]*1	The average value of device and label sampling intervals is stored. When selecting "Trigger Instruction" for the sampling method, the execution interval of the DATATRG instruction is the sampling interval.

Item		Description
Recording Files Saving Information	Accumulated Data*1	When data accumulation is performed once, "Data Exists" is stored. When using a recording startup trigger, data is not accumulated before the trigger is satisfied. Depending on the timings of data accumulation and a recording startup trigger, accumulated data may not be included in a saving period and may not be saved to a recording file.
	Batch Saving*2	Whether the recording buffer batch saving mode is enabled is stored. (☞ Page 56 Recording buffer batch saving mode) • OFF: Disabled • ON: Enabled The mode can be switched by right-clicking the cell and selecting [ON] or [OFF].
	Path Saved at Last*1*3	The path to a last saved recording file is stored. (Example) 1TS01_001
	File Server Saving Path*4	When specifying a file server as the save destination, the path to a folder that saves a recording file is stored.

*1 For the conditions under which data is cleared, refer to the following:
☞ Page 186 Recording status area (Un\G1500 to 3199)

*2 For the conditions under which data is cleared, refer to the following:
☞ Page 192 Recording buffer batch saving mode (Un\G4001)

*3 A NULL character is used as a termination character, and characters out of the specification range before the termination character are replaced with periods (.) and displayed.
For available characters, refer to the following:
☞ Page 246 ASCII characters that can be used in the format in the saving detail setting

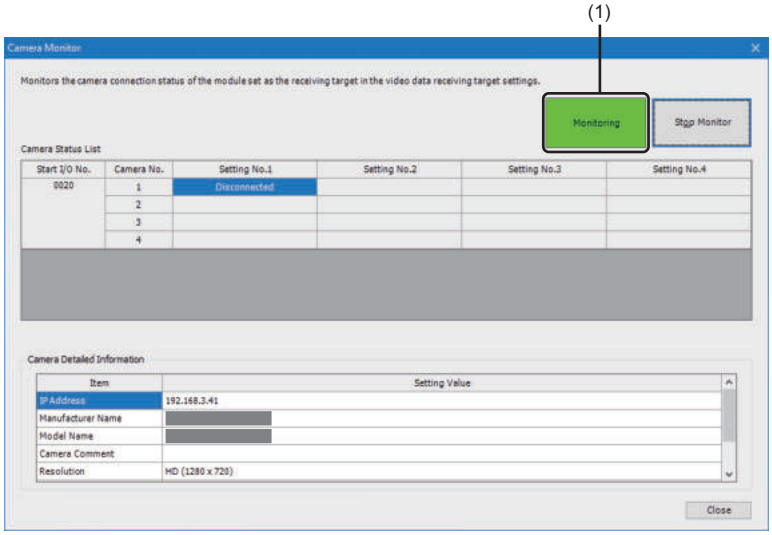
*4 For the conditions under which data is cleared, refer to the following:
☞ Page 193 File server saving information area (Un\G9000 to 10999)

4.2 Camera Monitor Screen

This section shows the screen for displaying the status of a network camera connected to a camera recorder module.

Window

Click the [Execution] button in "Camera monitor."



Displayed items

Item		Description
(1) Monitoring status		The monitoring status of the network camera status is displayed.
[Start Monitor]/[Stop Monitor] button		Click this to start or stop monitoring the status of a network camera. Even when clicking the [Stop Monitor] button, the monitoring status in the "Recording Monitor" screen is not changed to 'stopped.'
Camera Status List	Start I/O No.	The start I/O number of a camera recorder module is displayed.
	Camera No.	The number of a network camera is displayed.
	Setting No.1 to 4	The status of a network camera is displayed for each recording setting. A displayed state is determined by the combination of values in the buffer memories of a camera recorder module. (☞ Page 127 Status of a network camera) If a network camera is disabled, the cell is grayed out and the display content is not updated.*1
Camera Detailed Information	—	Detailed information on a network camera selected in the camera status list is displayed.
	IP Address	The IP address of a network camera is displayed.
	Manufacturer Name	The manufacturer name of a network camera is displayed.
	Model Name	The model name of a network camera is displayed.
	Camera Comment	The camera comment set for a network camera is displayed.
	Resolution	The resolution set for a network camera is displayed.
	Video Frame Rate	The video frame rate set for a network camera is displayed.
	Video Codec	The video codec set for a network camera is displayed.
	Video Quality	The video quality set for a network camera is displayed.

*1 Whether it is enabled can be checked in 'Network camera setting enabled/disabled' (Un\G34000, Un\G34500, Un\G35000, Un\G35500) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

Precautions

- When changing the configuration or start I/O number of a camera recorder module, the status cannot be monitored properly and the operation is not guaranteed. The settings in the "Video Data Receiving Target Setting" screen of the recording setting must also be changed.

☞ Page 120 Video Data Receiving Target Setting

- If this screen is opened before the communication between a network camera and a camera recorder module is completed, the manufacturer name and model name may not be displayed in the camera detailed information. To display them, wait a few minutes until the communication is completed, and then open this screen again.
  Note that the manufacturer name and model name are always blank if a network camera is not connected.
- Even when deleting a recording setting in the "Online Data Operation" screen, the setting may remain displayed in this screen. It is updated by opening this screen again after resetting a CPU module and switching it to RUN.

Status of a network camera

A displayed state is determined by the combination of values in the following buffer memories of a camera recorder module.

- Network camera connection status (Un\G34300, Un\G34800, Un\G35300, Un\G35800) (☞ Page 234 Network camera status area (Un\G34000 to 37999))
- Camera recording status (Un\G1650 to 1653, Un\G1850 to 1853, Un\G2050 to 2053, Un\G2250 to 2253) (☞ Page 226 Recording status area (Un\G1500 to 3199))

Displayed state	Buffer memory	
	Network camera connection status	Camera recording status
Stopped	Connected	Stopped
Preparing		Preparing
Operating		Operating
Saving Trigger Establishment		File saving trigger satisfied
Saving		Saving
No Setting		No setting
Disconnected	Disconnected	—
Retrying	Retrying	
No Setting	No setting	

5 TROUBLESHOOTING

This chapter explains the errors which may occur in System Recorder and the troubleshooting.

5.1 Recording Function

This section shows the troubleshooting on the recording function.

Troubleshooting on starting the recording function

Symptom	Check point	Corrective action
Unable to start the recording function.	Is a recording setting for which the recording function starts written?	• Write a recording setting for which the recording function starts.
	Is a CPU module in the RUN state?	• Switch the CPU module to the RUN state.
	Are programs and parameters when setting a recording setting written to a CPU module?	• Write the programs and parameters to the CPU module.
	Are devices and labels that do not exist in the CPU parameter and modules that are not mounted specified in the device/label sampling setting in the recording setting? (☞ Page 98 Device/Label Sampling Setting)	• Review the recording setting.
	Does the sampling size of a recording setting (total size of devices and labels specified in the device/label sampling setting) exceed the capacity of the buffer area for data sampling in the CPU parameter? (☞ Page 98 Device/Label Sampling Setting, Page 76 Buffer area setting for data sampling)	• Review the recording setting. • Review the buffer area setting for data sampling in the CPU parameter.
	Is the buffer capacity of a recording setting for which the recording function starts set in the recording buffer setting in the module parameter? (☞ Page 80 Recording buffer setting (recorder module), Page 81 Recording buffer setting (camera recorder module))	• Review the recording buffer setting in the module parameter.
	Does a program run properly when the device/label batch specification is enabled in the device/label sampling setting in the recording setting? (Is a program accessing an unmounted module running?) (☞ Page 98 Device/Label Sampling Setting)	• Check the mounted module. • Review the program accessing an unmounted module.
	Is a condition for a device, which is specified as a recording startup trigger in a recording setting for which the recording function starts, satisfied when selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method" in the saving period setting? (☞ Page 97 When selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method", Page 23 Recording startup trigger)	• Satisfy the condition for the device.
	Is a condition for a device, which is specified as a recording startup trigger in a recording setting for which the recording function starts, satisfied while the recording startup trigger is enabled when selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method" in the saving period setting? (☞ Page 97 When selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method", Page 23 Recording startup trigger)	• Satisfy the condition for the device.
	Is a recorder module with a firmware version supporting the function used in the following cases? • A safety CPU is used. • A file server is specified as the save destination for recording files. (☞ Page 259 Added and Changed Functions)	■When using a safety CPU • Update the firmware version of the recorder module to one that supports a safety CPU. ■When specifying a file server as the save destination for recording files • Change the save destination to an SD memory card. • Update the firmware version of the recorder module to one that supports saving to a file server.

Symptom	Check point	Corrective action
Unable to start the recording function.	Is a CPU module*1 or recorder module*2 with a firmware version that supports a configuration with multiple modules used when using a camera recorder module with "Sub" selected for the recording operation setting in the module parameter? (☞ Page 77 Various operations settings)	• Update the firmware version to one that supports the configuration.
	Is a program changed by using a function such as online program change or file batch online change?	• Write the recording setting.
	Is a program changed by using a function such as online program change or file batch online change while the battery voltage of a CPU module is low?	• Replace the battery with another one, then write the recording setting.
Unable to restart the recording function.	Is the operating status of the recording function 'saving'?	• Wait for a recording file to be saved.

*1 The following firmware versions are available:
RnCPU or RnENCPU: '55' or later
RnSFCPU: '24' or later

*2 For the firmware versions, refer to the following:
☞ Page 259 Added and Changed Functions

Troubleshooting on saving recording files

Symptom	Check point	Corrective action
Unable to save a recording file.	Is the operating status of the recording function 'operating'? (☞ Page 57 Operating status)	• Switch the operating status to 'operating.' For the operation method, refer to the following: ☞ Page 59 Operation of the recording function
	Does an SD memory card satisfy the following conditions when it is specified as the save destination for the recording file? • It is inserted in a recorder module/camera recorder module. • An available one is used. • There is free space.	• Check the SD memory card. • Replace or initialize the SD memory card. (📖MELSEC iQ-R System Recorder User's Manual (Startup))
	Is a condition for a device or buffer memory, which is specified as a file saving trigger in a recording setting for which the recording function started, satisfied? (☞ Page 25 File saving trigger)	• Satisfy the condition for the device or buffer memory.
	Is a file saving trigger satisfied after a condition for a device specified as a recording startup trigger in a recording setting for which the recording function started is satisfied when selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method" in the saving period setting? (☞ Page 97 When selecting "Recording Startup Trigger + File Saving Trigger" for "Recording Method", Page 23 Recording startup trigger, Page 25 File saving trigger)	• Satisfy the file saving trigger after the condition for the device is satisfied.
	Is a condition for a device or buffer memory, which is specified as a file saving trigger in a recording setting for which the recording function started, satisfied while the file saving trigger is enabled? (☞ Page 25 File saving trigger)	• Satisfy the condition for the device or buffer memory while the trigger is enabled.
	Is a file server running when it is specified as the save destination for the recording file?	• Start the file server.
	Is there any problem in the connection route when a file server is specified as the save destination for the recording file?	• Check if there is any problem in the connection route to the file server.
	Is the user name or password correct when a file server is specified as the save destination for the recording file?	• Review the specified user name or password.
	Is an operation performed in any buffer memory related to a file saving trigger of a camera recorder module with "Sub" selected for the recording operation setting in the module parameter? (☞ Page 77 Various operations settings)	• Perform an operation in a buffer memory of a camera recorder module with "Main" selected.
	Is 'operating' stored in 'Camera recording status' (Un\G1650 to 1653, Un\G1850 to 1853, Un\G2050 to 2053, Un\G2250 to 2253) and 'connected' in 'Network camera connection status' (Un\G34300, Un\G34800, Un\G35300, Un\G35800) of a camera recorder module, when video data is specified as recording target data? (☞ Page 226 Recording status area (Un\G1500 to 3199), Page 234 Network camera status area (Un\G34000 to 37999)) Is the time set correctly for a camera recorder module and receiving target network camera?	• Check that 'operating' is stored in 'Camera recording status' and 'connected' is stored in 'Network camera connection status' of the camera recorder module. For the transition of the status in 'Camera recording status,' refer to the following: ☞ Page 58 Operating status for video data • Check if an incorrect value is set for the time in the camera recorder module and network camera. Check the time in the network camera by using a dedicated tool for the camera. For details, refer to the manual of the network camera used.
A recording file is not saved at an intended timing.	Is there any difference in the condition numbers between a device and buffer memory when specifying a device as a file saving trigger and using a buffer memory specified as a file saving trigger in a program? (☞ Page 25 File saving trigger)	• Use a buffer memory with a condition number different from a device specified as a file saving trigger.

5.2 Offline Monitor Function

This section shows the troubleshooting on reading recording files and starting offline monitoring.
For the other items, refer to the following:
GX Works3 Operating Manual

Troubleshooting on reading recording files

Symptom	Check point	Corrective action
Unable to read a recording file in GX Works3.	Is a recorder module/camera recorder module connected? Is a CPU module connected when reading project data?	• Connect a cable to the Ethernet port of the recorder module/ camera recorder module. • Connect a CPU module when reading project data.
	Is there any disconnection in the connection route?	• Connect the cables properly. • Replace the cables with new ones.
	Is the IP address of a recorder module/camera recorder module the same as that of another device?	• Review the IP address set in the module parameter. (☞ Page 77 Module Parameters (Recorder Module/ Camera Recorder Module))
	Check that the operation mode of a recorder module/camera recorder module is in the online mode in the system monitor*1 of GX Works3.	• Set the mode setting to "Online" in GX Works3, and reset a CPU module. (☞ Page 77 Various operations settings)
	Is there a firewall or proxy server in the connection route?	• Check the firewall or proxy server settings with the network administrator.
	Is the firewall of a personal computer enabled?	• Disable the firewall when using a direct connection.
	Is antivirus software blocking Ethernet communications?	• Allow Ethernet communications with the antivirus software. • Lower the level of the security settings of the antivirus software. • Stop the antivirus software.
	Check if an SD memory card is accessible by checking either of the following points: • Is the CARD RDY LED ON? • Is '1' (ON) stored in 'CARD RDY LED status' (Un\G4)? (☞ Page 181 Module status area (Un\G0 to 20), Page 225 Module status area (Un\G0 to 20))	• Insert an SD memory card. • If an SD memory card is inserted, turn 'Clear file access stop request' (Y1) ON or remove the SD memory card once and insert it again. • Set the write protect switch of the SD memory card to be inserted to OFF. • If the SD memory card is being mounted or unmounted, wait until it is accessible. • If the SD memory card is being formatted, wait until the formatting is completed.
	Is the write access right set for a folder to which a file is read on a personal computer?	• Set the write access right for the folder to which a file is read.
	Is there sufficient free space on a folder to which a file is read on a personal computer?	• Secure free space for the recording file to be read.
	Is a file server specified as the save destination in the saving path setting? (☞ Page 116 Saving Path Setting)	Check recording files saved in the save destination folder specified in the saving path setting. When reproducing a recording file on the offline monitor, select a saved one.
Unable to read project data in GX Works3.	For details on troubleshooting when data cannot be read from a programmable controller, refer to the following: MELSEC iQ-R CPU Module User's Manual (Application)	
Reading a recording file takes time.	Are files saved up to the capacity limit of an SD memory card?	• Delete unnecessary recording files from the SD memory card, and always secure 10% or more free space of the capacity of the SD memory card for operation.
The following message appears even though there is a recording file in a recorder module/camera recorder module. 'No recording file exists in the Recorder Module.'	Is there any disconnection in the connection route?	Check the following items again, then click the [Refresh] button. • Connect the cables properly. • Replace the cables with new ones.

*1 Can be checked in the "Module Diagnostics" screen of the system monitor. (☞ Page 136 Module information list)

Troubleshooting on starting offline monitoring

Symptom	Check point	Corrective action
Unable to start offline monitoring in GX Works3.	Does the following message appear when starting offline monitoring? 'Unable to read the data because the target model set in file and the one set in project is different.'	• Open a project written to a CPU module when a recording file was saved in GX Works3 before starting offline monitoring.

Troubleshooting on playing a video file

Symptom	Check point	Corrective action
The playback time does not match between devices/ labels and video data.	Is the time synchronized between a camera recorder module and a network camera?	• Check if an incorrect value is set for the time in the network camera. Check the time by using a dedicated tool for the camera. For details, refer to the manual of the network camera used.
	Is a network camera being restarted when a trigger (recording startup trigger or file saving trigger) is satisfied?	Review the system configuration so that the power of the network camera does not turn OFF when a trigger is satisfied.
Unable to play a video file.	Has an error occurred in GX VideoViewer?	• Refer to the troubleshooting described in the following manual to take corrective actions. GX VideoViewer Version 1 Operating Manual
	Is the file name of the video file changed?	Open the recording.xml file in the recording file and refer to the contents the element name of which is 'FileName' to restore the file name.
	Is a network camera being restarted when a trigger (recording startup trigger or file saving trigger) is satisfied?	Review the system configuration so that the power of the network camera does not turn OFF when a trigger is satisfied.
Unable to record a video at a set frame rate.	• Does a captured video continue changing significantly? • Has the load increased on a network camera, such as event settings other than capturing data or recording which is set separately in the network camera? • Is the network communication volume large in the entire system? Check the above points in 'Number of lost frames' (Un\G34475, Un\G34975, Un\G35475, Un\G35975) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))	• Change the setting values of resolution, video frame rate, and video quality to lower ones in the module extended parameter. (☞ Page 84 Module Extended Parameters (Camera Recorder Module)) • If there is a time when the communication load is significantly high, consider countermeasures.
A time is not saved according to the setting.	Is a device or label changing significantly? Or, does video data continue changing significantly?	• Review the module extended parameters. (☞ Page 84 Module Extended Parameters (Camera Recorder Module))

5.3 Camera Recording Function

Details on this function are described in the following:

Camera Recording Package User's Manual

5.4 Data Flow Analysis Function

Details on this function are described in the following:

GX Works3 Operating Manual

5.5 Recorder Module

This section explains the errors which may occur in a recorder module and the troubleshooting.

Checking methods

Checking method	Details
System monitor of GX Works3	Error codes can be checked in the system monitor of GX Works3. ☞ Page 135 Checking the module status
Buffer memory	Error codes can be checked in the following buffer memory: ☞ Page 183 Current error area (Un\G140 to 149) ☞ Page 184 Error log area (Un\G150 to 311)
Recording monitor	The operating status of the recording function for each recording setting can be checked in the recording monitor. ☞ Page 122 RECORDING MONITOR

Point

If multiple errors occur at the same time, take corrective action for the errors in chronological order.

Error code types

The status of an error that occurs in a recorder module can be determined with the statuses of the RUN LED and ERR LED.

RUN LED	ERR LED	Error status	Error code	Description
OFF	ON, flashing	Major error	3C00H to 3FFFH	An error such as a hardware or memory error that causes a module to stop operating.
ON	Flashing	Moderate error	2000H to 3BFFH	An error such as one in a setting or the firmware that causes a module to stop operating.
ON	ON	Minor error	1000H to 1FFFH	An error such as a failure in saving a recording file that causes a module to continue or stop operating.

Error types

There are two types of errors of a recorder module as follows:

Error type	Category	Module status	Corrective action
Module stop error	Moderate error Major error	A module stops operating.	Take corrective action for the error according to the error code, and turn the 'ERR LED' OFF by either of the following operations: • Turn the power OFF and ON. • Reset the CPU module.
Module continuation error	Minor error	A module continues operating.	Take corrective action for the error according to the error code, and turn the 'ERR LED' OFF by any of the following operations: • Error clear request (Y3) • Click the [Clear Error] button in the "Module Diagnostics" screen. • Turn the power OFF and ON. • Reset the CPU module.

Checking the module status

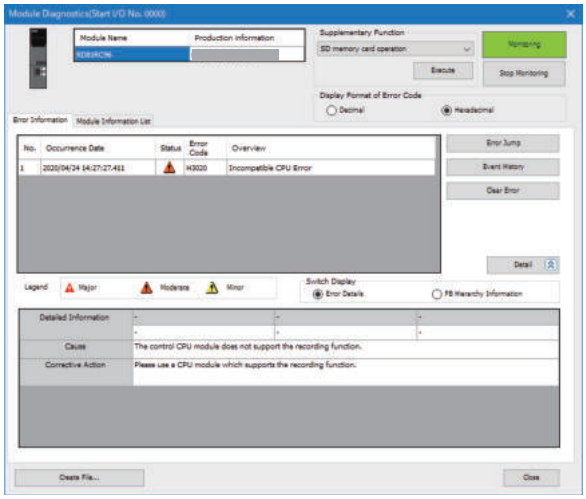
The status of a module can be checked by using the following functions or testing operations in the "Module Diagnostics" screen of GX Works3.

Function		Purpose
Error information		To display the description of an error occurring. The history of errors detected and operations performed in a module can be checked by clicking the [Event History] button.
Module information list		To display the information on each status of a module.
Supplementary function	SD memory card operation	To check the free space on an SD memory card inserted in a module or format the SD memory card.
Self-diagnostic test		To perform a test to check the hardware of a module.

Error information

The description of an error occurring and its corrective action can be checked.

Window



Displayed items

Item	Description
Detailed Information	Up to three details of each error are displayed.
Cause	The details of an error cause is displayed.
Corrective Action	A corrective action for an error is displayed.

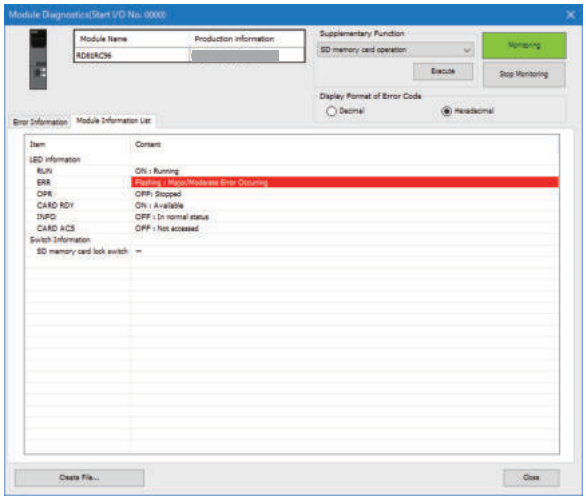
Point

Up to 15 continuation errors and 1 stop error can be displayed. If 15 continuation errors are displayed, new continuation errors will not be displayed. In addition, if the new error has the same error code as the already displayed error, the error occurrence date/time and its detailed information will not be updated.

Module information list

The information on each status of a module can be checked by switching to the [Module Information List] tab.

Window



■Checking LED information

The LED status or the self-diagnostic status of a module can be checked.

When the automatic hardware test or the hardware test for LED check is being performed, or the firmware is being updated, "Automatic Hardware Test being Executed," "Hardware Test for LED Check being Executed," or "Firmware update being Executed" is displayed for all LED information.

If an error occurs, refer to the following section to take corrective action.

☞ Page 141 Troubleshooting on RUN LED

Item	Description
RUN	• ON (green): Running • OFF: Hardware Error Occurring
ERR	• ON (red): Module Normal Error Occurring/Hardware Error Occurring • Flashing (red): Major/Moderate Error Occurring • OFF: Normally
OPR	• ON (green): Running • OFF: Stopped
CARD RDY	• ON (green): Available • Flashing (green): Ready or SD memory card format in progress • OFF: Not available
INFO	• ON (green): Caution information available • OFF: In normal status
CARD ACS	• ON (green): Being accessed • OFF: Not accessed

■Checking the switch information

When the automatic hardware test or the hardware test for LED check is being performed, "Automatic Hardware Test being Executed" or "Hardware Test for LED Check being Executed" is displayed.

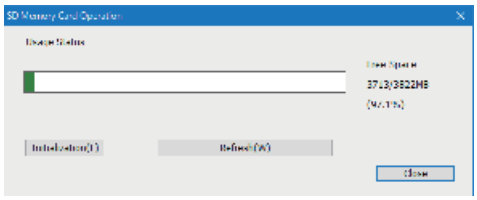
Item	Description
SD memory card lock switch	• The switch is not pressed, or the firmware is being updated: — • The switch is pressed: Stop instructions available

SD memory card operation

The following shows the screen for checking the free space on an SD memory card inserted in a module and formatting the SD memory card.

Window

Select [Diagnostics] ⇨ [System Monitor] ⇨ (model name of a module), then select "SD memory card operation" in "Supplementary Function" and click the [Execute] button.



Displayed items

Item	Description
Free Space	The free space on an SD memory card is displayed as follows: • Free space*1*2/Total capacity*1*2
[Initialization] button*3	Click this to format an SD memory card.
[Refresh] button	Click this to update the status of an SD memory card to the latest information.

*1 The value after the decimal point is rounded off.
*2 If the capacity of an SD memory card cannot be acquired, '0' is displayed.
*3 Can be clicked when the capacity of an SD memory card can be acquired.

Self-diagnostic tests

■Automatic hardware test

The following explains the test on hardware such as ROM/RAM/Ethernet of a module.

Restriction

- The values in the buffer memory cannot be referenced in GX Works3 during the automatic hardware test.
- If the automatic hardware test is completed abnormally, the error details cannot be checked even if the error code is displayed in GX Works3.

Operating procedure

1. Select "Automatic Hardware Test" in [Basic Settings] ⇨ [Various Operations Settings] ⇨ [Mode Settings] in the module parameter of a module in the parameter setting of GX Works3.
2. Disconnect a cable if it is connected to a 1000BASE-T/100BASE-TX/10BASE-T interface.
3. Remove an SD memory card if it is inserted.
4. Set the CPU module to the STOP state, and write the parameters.
5. Reset the CPU module.
6. After resetting the CPU module, the automatic hardware test is performed.
   The LED display when performing the automatic hardware test is as follows:

Status		RUN LED status	ERR LED status
Automatic hardware test is in process		Flashing	OFF
Automatic hardware test is complete.	Normal completion	ON	OFF
	Abnormal completion	ON	ON

7. When the test is completed normally, select "Online" in "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Mode Settings" in the module parameter of the module in the parameter setting of GX Works3, and reset the CPU module.
8. When the test is completed abnormally, check if measures are taken to reduce noise of the system, and perform the test again.
   If it is completed abnormally again, a hardware failure may occur in the module. Please contact your local Mitsubishi Electric sales office or representative.
   Do not use an electric screwdriver when removing the module. Loose the module fixing screws completely to remove the module.

■Hardware test for LED check

The following explains the LED hardware diagnostic of a module. For the diagnostic, the LED of a module needs to be turned ON.

Restriction

The values in the buffer memory cannot be referenced in GX Works3 during the hardware test for LED check.

Operating procedure

1. Select "Hardware Test for LED Check" in "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Mode Settings" in the module parameter of a module in the parameter setting of GX Works3.
2. Set the CPU module to the STOP state, and write the parameters.
3. Reset the CPU module.
4. After the CPU module is reset, the hardware test for LED check is performed automatically.
   The following contents are displayed. Check visually whether there is no error.

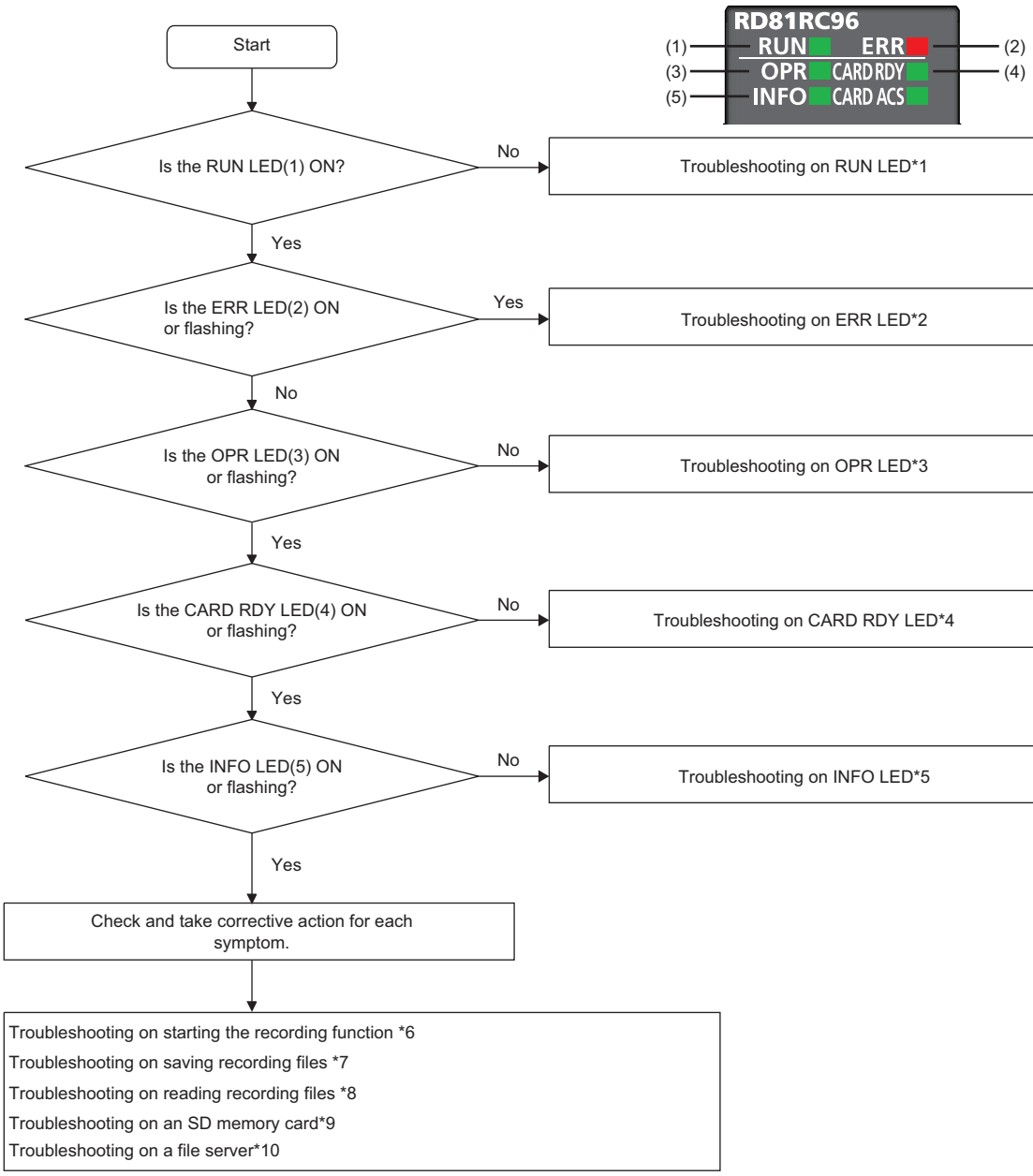
LED name	Display color	Display status
RUN	Green	ON
ERR	Red	ON
OPR	Green	ON
CARD RDY	Green	ON
INFO	Green	ON
CARD ACS	Green	ON

5. When the test is completed normally, select "Online" in "Basic Settings" ⇨ "Various Operations Settings" ⇨ "Mode Settings" in the module parameter of the module in the parameter setting of GX Works3, and reset the CPU module.
6. When the test is completed abnormally, check if measures are taken to reduce noise of the system, and perform the test again.
   If it is completed abnormally again, a hardware failure may occur in the module. Please contact your local Mitsubishi Electric sales office or representative.

Troubleshooting by symptom

The following shows the flowchart for troubleshooting while a recorder module is operating.

The LED status can be checked in the "Module Diagnostics" screen of the system monitor. (☞ Page 136 Module information list)



*1 ☞ Page 141 Troubleshooting on RUN LED
*2 ☞ Page 141 Troubleshooting on ERR LED
*3 ☞ Page 141 Troubleshooting on OPR LED
*4 ☞ Page 141 Troubleshooting on CARD RDY LED
*5 ☞ Page 142 Troubleshooting on INFO LED
*6 ☞ Page 128 Troubleshooting on starting the recording function
*7 ☞ Page 130 Troubleshooting on saving recording files
*8 ☞ Page 131 Troubleshooting on reading recording files
*9 ☞ Page 142 Troubleshooting on an SD memory card
*10 ☞ Page 143 Troubleshooting on a file server

Troubleshooting on RUN LED

Symptom	Check point	Corrective action
The RUN LED does not turn ON.	Is the module properly mounted on the base unit?	• Mount the module properly.
	Has an error occurred in a CPU module?	• Take corrective action for the error that occurred in the CPU module.
	Is the ERR LED flashing?	• Refer to the following section to take corrective action. ☞ Page 141 Troubleshooting on ERR LED
The RUN LED is flashing in red or ON in red.	Is "Firmware Update" displayed in [Module Diagnostics] ⇨ [Module Information List]*1 of GX Works3?	• Wait until the firmware update is completed, and check the error code and take corrective action if it is completed abnormally. (☞ Page 194 Firmware update history information area (Un\G13392 to 13427))

*1 Can be checked in the "Module Diagnostics" screen of the system monitor. (☞ Page 136 Module information list)

Troubleshooting on ERR LED

Symptom	Check point	Corrective action
The ERR LED is ON or flashing.	Check the error code in the system monitor of GX Works3.	• Check the error description and take corrective action according to the error code.
	Is "Automatic Hardware Test" displayed in [Module Diagnostics] ⇨ [Module Information List]*1 of GX Works3?	• Wait until the automatic hardware test is completed, and check the error code and take corrective action if it is completed abnormally. ☞ Page 138 Automatic hardware test

*1 Can be checked in the "Module Diagnostics" screen of the system monitor. (☞ Page 136 Module information list)

Troubleshooting on OPR LED

Symptom	Check point	Corrective action
The OPR LED does not turn ON.	Check if a recording setting is written to a CPU module by reading the project from the CPU module in GX Works3.	• Write the recording setting to the CPU module. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Is the operating status of the recording function 'operating'? (☞ Page 57 Operating status)	• Switch the operating status to 'operating.' For the operation method, refer to the following: ☞ Page 59 Operation of the recording function
	Has the SD memory card been removed while being formatted?	• Reset the CPU module or cycle the power of the programmable controller. (Do not remove an SD memory card while being formatted.)

Troubleshooting on CARD RDY LED

Symptom	Check point	Corrective action
The CARD RDY LED does not turn ON.	Is an SD memory card inserted?	• Insert an SD memory card. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Is 'File access status' (X2) ON (file access stopped)?	• Release the file access stop state. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Is a supported SD memory card used?	• Use a supported SD memory card. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Has the power been turned OFF or a CPU module been reset while saving a file?	• Use the SD memory card format function to format the SD memory card. (☞ Page 169 SD memory card format function)
	Has the SD memory card been formatted in another device such as a personal computer?	• Use the SD memory card format function to format the SD memory card again. (☞ Page 169 SD memory card format function)
	Has the power been turned OFF or a CPU module been reset while formatting an SD memory card?	
It takes time for the CARD RDY LED to turn ON.	Is the number of files in the inserted SD memory card large?	• Delete unnecessary files from the SD memory card.
The CARD RDY LED remains flashing after removing an SD memory card.	Has the SD memory card been removed while being mounted (while the CARD RDY LED is flashing)?	• Reset the CPU module or cycle the power. (Do not remove an SD memory card while being mounted.)

Troubleshooting on INFO LED

Symptom	Check point	Corrective action
The INFO LED is ON.	Is 'SD memory card free capacity lowering' (b0) in 'INFO LED lighting factor' (Un\G12) ON? (☞ Page 181 Module status area (Un\G0 to 20))	• Delete unnecessary recording files from the SD memory card, and always secure 10% or more free space of the capacity of the SD memory card for operation.*1
	Is 'No save folder free number' (b1) in 'INFO LED lighting factor' (Un\G12) ON?*2 (☞ Page 181 Module status area (Un\G0 to 20))	• Increase the upper limit of saved files in the saving detail setting.*2 (☞ Page 118 Saving detail setting) • Delete unnecessary recording files from the save destination specified in the saving path setting.*1

*1 Recording files can be deleted in the "Recording File Reading" screen of GX Works3. For details, refer to the following:
📖GX Works3 Operating Manual

*2 For the folder number and the number of saved files, refer to the following:
☞ Page 44 Recording file

Troubleshooting on an SD memory card

Symptom	Check point	Corrective action
Unable to reproduce a recording file on the offline monitor of GX Works3.	Has the power been turned OFF or a CPU module been reset while accessing a file in an SD memory card?	• Use the SD memory card format function to format the SD memory card. (☞ Page 169 SD memory card format function)
Files in an SD memory card disappear when the power is interrupted.	Is a supported SD memory card used?	• Use a supported SD memory card. (📖MELSEC iQ-R System Recorder User's Manual (Startup))
	Has the power been turned OFF or a CPU module been reset while writing a file to the SD memory card?	• Use the SD memory card format function to format the SD memory card. (☞ Page 169 SD memory card format function) • Stop file access before turning the power OFF or resetting the CPU module. (📖MELSEC iQ-R System Recorder User's Manual (Startup))
The access speed to an SD memory card becomes slower.	Are files saved up to the capacity limit of the SD memory card?	• Delete unnecessary recording files from the SD memory card, and always secure 10% or more free space of the capacity of the SD memory card for operation.
Formatting an SD memory card is not completed in GX Works3.	Has the SD memory card been removed while being formatted?	• Reset the CPU module or cycle the power of the programmable controller. (Do not remove an SD memory card while being formatted.)
A recording file is not saved.	Is a file server specified as the save destination in the saving path setting? (☞ Page 116 Saving Path Setting)	Check recording files saved in the save destination folder specified in the saving path setting. When reproducing a recording file on the offline monitor, select a saved one.

Troubleshooting on a file server

Symptom	Check point	Corrective action
A recording file is not saved.	Is an SD memory card specified as the save destination in the saving path setting? (☞ Page 116 Saving Path Setting)	Specify a file server as the save destination.
	Is the path to the save destination specified in the saving path setting correct? (☞ Page 116 Saving Path Setting)	Review the specified path.
	Is the DNS setting in the module parameter correct when the save destination is specified by using its host name? (☞ Page 116 Saving Path Setting, Page 79 DNS setting screen)	Review the DNS setting in the module parameter.
	Is the same path specified for the save destination in multiple systems?	Specify a different path for the save destination for each system.
	Is there any disconnection in the connection route?	• Connect the cables properly. • Replace the cables with new ones.
	Are there a firewall and proxy server in the connection route?	Check the firewall and proxy server settings with the network administrator.
	Is the firewall of a personal computer enabled?	Disable the firewall when using a direct connection.
	Is antivirus software blocking Ethernet communications?	• Change the antivirus software settings to allow Ethernet communication. • Lower the level of the security settings of the antivirus software. • Stop the antivirus software.
	Is there any problem with the network of the connection route?	• Reduce the load on the network by separating the network. • Review the connection route settings.
	Is there any problem with the load on a file server?	• Reduce the load on the file server by reviewing the antivirus software and Windows update settings. • Reduce access to the file server.
File saving test fails.	Is there any disconnection in the connection route?	• Connect the cables properly. • Replace the cables with new ones.
	Is the path to the save destination specified in the saving path setting correct? (☞ Page 116 Saving Path Setting)	Review the specified path.
	Is the DNS setting in the module parameter correct when the save destination is specified by using its host name? (☞ Page 116 Saving Path Setting, Page 79 DNS setting screen)	Review the DNS setting in the module parameter.
	Are the user name and password for connecting to a file server correct?	Review the user name and password specified in the saving path setting. (☞ Page 116 Saving Path Setting)
	Is the write access right set for the save destination specified in the saving path setting?	Set the write access right for the save destination.
	Is there sufficient free space on a file server?	Secure sufficient free space for saving recording files.
	Are there a firewall and proxy server in the connection route?	Check the firewall and proxy server settings with the network administrator.
	Is the firewall of a personal computer enabled?	Disable the firewall when using a direct connection.
	Is antivirus software blocking Ethernet communications?	• Change the antivirus software settings to allow Ethernet communication. • Lower the level of the security settings of the antivirus software. • Stop the antivirus software.
	Is there any problem with the network of the connection route?	• Reduce the load on the network by separating the network. • Review the connection route settings.
	Is there any problem with the load on a file server?	• Reduce the load on the file server by reviewing the antivirus software and Windows update settings. • Reduce access to the file server.
	Are multiple modules or applications accessing the save destination specified in the saving path setting at the same time?	Perform the file saving test to the save destination while multiple modules or applications are not accessing it at the same time.

Error code list

The following table shows the error code list of a recorder module.

Error code	Error name	Error description	Corrective action
0C00H[*1]	Recording Start with Program Inconsistency	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.	When a device/label that is not a sampling target is added, stop recording, write the recording setting file to the CPU module again, and restart recording. When the devices/labels in the program are not specified in a batch in the device/label sampling target setting, please review the recording setting so that the added devices/labels are included in the sampling targets and write it to the CPU module.
0C01H[*1]	Program Inconsistency during Recording Operation	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.	When a device/label that is not a sampling target is added, stop recording, write the recording setting file to the CPU module again, and restart recording. When the devices/labels in the program are not specified in a batch in the device/label sampling target setting, please review the recording setting so that the added devices/labels are included in the sampling targets and write it to the CPU module.
1810H	Recording Setting Acquisition Error	Failed to acquire the recording setting.	Please write the recording setting with the engineering tool.
1811H to 1813H	Recording Setting Error	The contents of the recording setting file are broken.	• Please write the recording setting again with the engineering tool. • Please check that the versions of the recorder module, CPU module, and engineering tool are appropriate to be used together.
1814H	Recording Start Error in Sub	A recording start error has occurred in the Sub.	Please check the details of the Sub error by the module diagnostics of the engineering tool, and clear the error.
1815H	Recording Start Error in Sub	• The mode of the module parameter is not set to "Online" in some Sub. • The module status setting is set to "Empty" with the system parameter (I/O assignment setting) in some Sub. • The Sub is not mounted.	• Please set the operation mode of the module parameter of the Sub whose recording function is to be used to "Online". • Please set the module status setting of the system parameter (I/O assignment setting) of the Sub whose recording function is to be used to "No setting". • Please check the system parameter and actual system configuration, please review the recording setting.
1816H	Module Error	An unrecognized error has been detected by the firmware version of the target recorder module.	Please check that the versions of the recorder module, CPU module, and engineering tool are appropriate to be used together.
1830H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target recorder module was written.	Please check the version of the recorder module, use a compatible product, and then write the recording file again.
1850H	Recording Setting Error	The size is not set in the buffer area for data sampling of the CPU parameter.	Please set the size in the buffer area for data sampling of the CPU parameter.
1851H	Recording Setting Error	The size is not set in the recording buffer of the basic settings of the module parameter.	Please set the size in the recording buffer of the basic settings of the module parameter.
1900H	Recording Files Saving Error	Failed to save recording files because there is no free folder number for recording folders.	Please delete unnecessary recording folders in the setting-specific folder in which the error has occurred.
1901H	Recording Files Saving Error	Failed to save recording files because accessing the SD memory card failed.	• Please save files after checking that the SD memory card is not being initialized. • Please save files after checking that the SD memory card is in the accessible state (mount state).
1902H	Recording Files Saving Error	Failed to save recording files because accessing the SD memory card failed.	• Please check whether the SD memory card is inserted. • Please save files after checking that the SD memory card is in the accessible state (mount state). • If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it.
1904H	Recording Files Saving Error	Failed to save recording files because the control file could not be saved due to the insufficient free space in the SD memory card.	Please delete unnecessary files in the SD memory card to allocate free space.

Error code	Error name	Error description	Corrective action
1905H	Recording Files Saving Error	Failed to save some recording files because the free space in the SD memory card was insufficient.	Please delete unnecessary files in the SD memory card to allocate free space.
1906H	Recording Files Saving Error	Failed to save recording files because old recording files could not be deleted.	• Please initialize the SD memory card. • Please replace the SD memory card.
1910H	Event History File Acquisition Error	The event history file could not be acquired because no event history file was created in the control CPU module.	Please perform any one of the following. • Writing parameters to the control CPU module • Inserting the SD memory card (when the save destination of the event history is the SD memory card) • Initializing the SD memory card • Resetting the control CPU • Turning the power off and on
1911H	Control CPU Communication Error	Failed to save recording files because the data communication with the control CPU module failed.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
1913H	Recording Files Saving Error	No recording files were saved because no device/label data was collected during the retention period.	Please check the sampling method and saving period of the device/label data.
1914H	Recording Files Saving Error	Failed to save Recording file because the data communication with the management CPU module timed out.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
1920H	Recording Files Saving Error	Failed to save recording files because an error of the SD memory card was detected.	• Please initialize the SD memory card. • Please replace the SD memory card.
1921H	Recording Files Saving Error	Failed to save recording files. • The free space in the SD memory card was insufficient. • An error of the SD memory card was detected.	• Please delete unnecessary files in the SD memory card to allocate free space. • Please initialize the SD memory card. • Please replace the SD memory card.
1930H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	• Please save files after checking that the host name and IP address of the file server are correct. • Please save files after checking that the file server is connected to the network. • If the load on the network is high, please reduce the load by separating the network and save files. • If the load on the file server is high, please reduce the load by reducing the access to the file server and save files. • When the file server is specified by the host name, please save files after checking that the DNS server setting of the recorder module is correct. • When the file server is specified by the host name, please save files after checking that the DNS server is connected to the network.
1931H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	Please save files after checking that the user name/ password used for the connection to the file server is correct.
1932H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	Please save files after checking that the folder name set in the saving path setting exists in the file server.
1934H	Recording Files Saving Error	Failed to save recording files because the access to the file server failed.	Please save files after checking that the file server is connected to the network.
1935H	Recording Files Saving Error	Failed to save recording files because the management file could not be saved due to the insufficient free space in the file server.	Please delete unnecessary files in the file server to allocate free space.
1936H	Recording Files Saving Error	Failed to save some recording files because the free space in the file server was insufficient.	Please delete unnecessary files in the file server to allocate free space.
1937H	Recording Files Saving Error	Failed to save recording files because old recording files could not be deleted.	• Please check if the user set in the saving path setting has write authority to the saving path. • Please check if several modules and applications are accessing the saving destination folder in the file server simultaneously.

Error code	Error name	Error description	Corrective action
1938H	Recording Files Saving Error	Failed to save recording files because an error was detected at the time of access to the file in the file server.	• Please check if the user set in the saving path setting has write authority to the saving path. • Please check if several modules and applications are accessing the saving destination folder in the file server simultaneously.
1939H	Recording File Saving Error Detection of Sub	An error has been detected in the recording file saving processing of the Sub.	Please check the details of the Sub error by the module diagnostics of the engineering tool, and clear the error.
1981H	SD Memory Card Initialization Error	Failed to initialize the SD memory card.	• Please check whether the SD memory card is inserted without fail. • Please check the SD memory card is not initializing. • If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it. • If the recording function is active, stop it. • Please replace the SD memory card.
1982H	SD Memory Card Error	An error of the SD memory card was detected.	• If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it. • Please format the SD memory card, or insert the SD memory card again. If the same error is displayed, a hardware error may have occurred in the SD memory card. Please replace the SD memory card.
1A80H	IP Address Automatic Acquisition Error	Failed to acquire the network parameter information from the DHCP server.	• Please check the status of the connection with the DHCP server. • Please check the connection cable. • Please review the DHCP server setting.
1A81H	IP Address Automatic Acquisition Update Error	Failed to perform the automatic lease update processing which is performed when the lease term of the IP address acquired from the DHCP server expires.	Please check the connection cable and status of the DHCP server (operating status and whether the IP address to be assigned is allocated).
1A82H	IP Address Setting Error	The setting value of the IP address setting is incorrect.	Please review the IP address setting in the basic settings of the module parameter.
1A83H	DNS Setting Error	The setting value of the DNS setting is incorrect.	Please review the DNS setting in the basic settings of the module parameter.
2440H	Module Major Error	• In the multiple CPU system, the control CPU setting in the system parameter is set to the one different from those set in the other CPU Nos. • An error of the I/O module or intelligent function module was detected at the initial processing.	• Please review the system parameters of CPU No. 2 and later, unify them to the one set in the CPU whose CPU No. is the smallest. • A hardware error may have occurred in the module in which the error occurred. Please consult your local Mitsubishi representative.
2450H	Module Major Error	A major error occurrence notification from the I/O module or intelligent function module was detected.	• Please check the connection status of the extension cable. • Please check that the I/O module or intelligent function module is correctly mounted. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the module in which the error occurred. Please consult your local Mitsubishi representative.
24C0H to 24C1H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C2H	System Bus Error	An error of the system bus was detected.	• Please check the connection status of the extension cable. • Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
24C3H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C4H to 24C5H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C6H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module or extension cable. Please consult your local Mitsubishi representative.
24C8H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the I/O module, intelligent function module, or extension cable. Please consult your local Mitsubishi representative.
24E0H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module or base unit. Please consult your local Mitsubishi representative.
3000H	Module Parameter Error	There is no module parameter.	• Please check the module position set in the system parameter of the CPU module (I/O assignment setting) and the module position of the implemented module. If they are different, please match the parameter and implementation status. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3001H	Module Parameter Error	The contents in the module parameter are broken.	Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3002H	Module Parameter Error	• A parameter which is not supported by the firmware version of the target recorder module was written. • The contents in the module parameter are broken.	• Please check the version of the recorder module, use a compatible product, and then write the module parameter again. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3010H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3013H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3020H	Incompatible CPU Error	The control CPU module does not support the recording function.	Please use a CPU module which supports the recording function.
3021H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target CPU module was written.	Please check the version of the CPU module, use a compatible product, and then write the recording file again.
3022H	Recording Setting Error	The contents of the recording setting file are broken.	• Please take anti-noise measures. • Please write the recording setting file again. If the same error is displayed, a hardware error may have occurred in the data memory of the CPU module. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
3023H to 3024H	Recording Setting Error	• A recording setting file which is not supported by the firmware version of the target recorder module was written. • The contents of the recording setting file are broken.	• Please check the version of the recorder module, use a compatible product, and then write the recording file again. • Please take anti-noise measures. • Please write the recording setting file again. If the same error is displayed, a hardware error may have occurred in the data memory of the CPU module. Please consult your local Mitsubishi representative.
3025H	Recording Setting Error	The module type set in the engineering tool does not match the CPU module which is the write destination of the recording setting file.	Please read the recording setting file, and match the write destination CPU module and model type.
3026H	Recording Setting Error	Device/label data which exceeds the size of the buffer area for data sampling in the CPU parameter is specified in the recording setting file.	Please read the CPU parameter and recording setting file, and reduce the device/label data to be saving targets so that the size is within the buffer area for data sampling in the CPU parameter. Or, please increase the size of the buffer area for data sampling in the CPU parameter.
3027H	Recording Setting Error	The program setting and FB/FUN file setting in the CPU parameter in the CPU module are different from the project (program setting and FB/FUN file setting in the CPU parameter) at recording setting.	• Please write the CPU parameter and recording setting file to the CPU module. • Please read the CPU parameter and recording setting file, and write them to the CPU module again.
3028H	Recording Setting Error	• The program file and FB/FUN file in the CPU module are different from the project (program, FB/FUN) at recording setting. • They are different from the program file and FB/FUN file in the CPU module at recording setting because the project (program, FB/FUN) was changed during recording operation.	• Please write the program file, FB/FUN file, and recording setting file to the CPU module. • When the program file and FB/FUN file in the CPU module were changed during recording operation, please write the recording setting file to the CPU module again. • Please read the program file, FB/FUN file, and recording setting file, and write them to the CPU module again.
3029H	Recording Setting Error	The device/label operation is not set to "Save" in the event history setting of the CPU parameter.	Please set device/label operation to "Save" in the event history setting of the CPU parameter.
3030H to 3031H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target recorder module was written.	Please check the version of the recorder module, use a compatible product, and then write the recording file again.
3032H	Recording Setting Error	• The mounting position and control CPU of the recorder module are different from the ones of the system parameter at the recording setting. • The mode of the module parameter is not set to "Online" or the module status setting of the system parameter (I/O assignment setting) is set to "Empty" in some Main.	• Please check the mounting position and control CPU of the recorder module. • Please check the system parameter and actual system configuration. • Please review the recording operation setting of the module parameter and set the number of modules of "Main" to one. • Please remove the module from Main where the module status setting of the system parameter (I/O assignment setting) is set to "Empty".
3033H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target recorder module was written.	Please check the version of the recorder module, use a compatible product, and then write the recording file again.
3034H	Recording Setting Error	The link-direct device, module access device, or CPU buffer memory access device specified for collection does not have an access destination or is out of range.	• Please review the device/label collection target setting in the recording setting. • If the Device/Label collection target setting is set to the Device/Label batch setting, review the program used to set recording.
3040H to 3043H	Control CPU Communication Error	Failed to communicate data with the control CPU module.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3045H	Control CPU Communication Timeout	The data communication with the control CPU module has timed out.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
3050H to 3064H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3070H to 3071H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3080H to 308AH	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3090H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3092H to 309AH	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
30A0H to 30A2H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3140H to 3142H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3150H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
31C0H to 31C4H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
31C5H	Module Parameter Error	• A module parameter of the recording operation setting which is not supported by the firmware version of the target recorder module was written. • The contents in the module parameter are broken.	• Please check the version of the recorder module, use a compatible product, and then write the module parameter again. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3300H to 3303H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3305H	Module Configuration Error	The number of modules set in "Sub" in the camera recorder module has exceeded the available number.	Please set "Sub" in the camera recorder module less than the available number.
3306H	Recording Setting Error	• The start I/O No. and mounting position of the camera recorder module are different from the ones of the system parameter at the recording setting. • The recording operation setting of the camera recorder module is different from the one at the recording setting.	• Please check the system parameter and actual system configuration, and review the video data receiving target settings in the recording setting. • Please check the recording operation setting with the module parameter of the camera recorder module and review the video data receiving target settings in the recording setting.

Error code	Error name	Error description	Corrective action
3405H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target recorder module was written.	Please check the version of the recorder module, use a compatible product, and then write the recording file again.
3C00H to 3C03H	Hardware Error	A hardware error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3C0FH	Hardware Error	A hardware error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3C22H	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3C2FH	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative. • If this error occurs during the automated hardware test, perform a firmware update and perform the automated hardware test again. If the same error is displayed again, the recorder module may have a hardware error. Contact the nearest Mitsubishi Electric System Service Co., Ltd. or Mitsubishi Electric Corporation branch office or agent.
3C32H	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.
3EA0H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the recorder module. Please consult your local Mitsubishi representative.

*1 An event is registered as a continuation error when "Error is registered (continuous error)" is selected for "Warning due to program change during recording operation" under "Operation Setting at Event Detection" in the application setting in the module parameter.

Event code list

The following table shows the event code list of a recorder module.

Event code	Event type	Event classification	Overview	Cause
00C00	System	Warning	Recording Start with Program Inconsistency	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.
00C01	System	Warning	Program Inconsistency during Recording Operation	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.
20400	Operation	Information	Firmware update succeeded(Recorder module)	The firmware of the Recorder module was successfully updated.
20401	Operation	Information	Firmware update failed(Recorder module)	The firmware update of the Recorder module failed.
24020	Operation	Information	Recording Operation Start	The recording operation has been started.
24021	Operation	Information	Recording Operation Stop	The recording operation has been stopped.
24030	Operation	Information	File Saving Trigger Establishment	The file saving trigger has been established.
24031	Operation	Information	Recording Files Saving Completion	Saving the recording files has been completed.
24040	Operation	Information	Error Clear	Errors have been cleared.
24044	Operation	Information	INFO LED Off	INFO LED has been turned off.
2A010	Operation	Warning	SD Memory Card Initialization	The SD memory card has been initialized.
2A030	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • Failed to save the event history file.
2A032	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • The sampled device and label data have exceeded the size that can be stored in the recording buffer. • Please set a sufficient size for the recording buffer in the basic settings of the module parameter. • Please set a shorter saving period before and after the file saving trigger or saving period after the recording startup trigger in the saving period setting of the recording setting. • Please reduce some device and label data to be stored in the Device/Label collection target setting of the recording settings.
2A040	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • Failed to save some video data.

5.6 Camera Recorder Module

This section explains the errors which may occur in a camera recorder module and the troubleshooting.

Checking methods

Checking method	Details
System monitor of GX Works3	Error codes can be checked in the system monitor of GX Works3. ☞ Page 135 Checking the module status
Buffer memory	Error codes can be checked in the following buffer memory: ☞ Page 225 Current error area (Un\G140 to 149) ☞ Page 226 Error log area (Un\G150 to 311)
Recording monitor	The operating status of the recording function for each recording setting can be checked in the recording monitor. ☞ Page 122 RECORDING MONITOR
Camera monitor	The connection status with a network camera can be checked in the camera monitor. ☞ Page 126 Camera Monitor Screen

Point

If multiple errors occur at the same time, take corrective action for the errors in chronological order.

Error code types

For details, refer to the following:

☞ Page 134 Error code types

Error types

For details, refer to the following:

☞ Page 134 Error types

Checking the module status

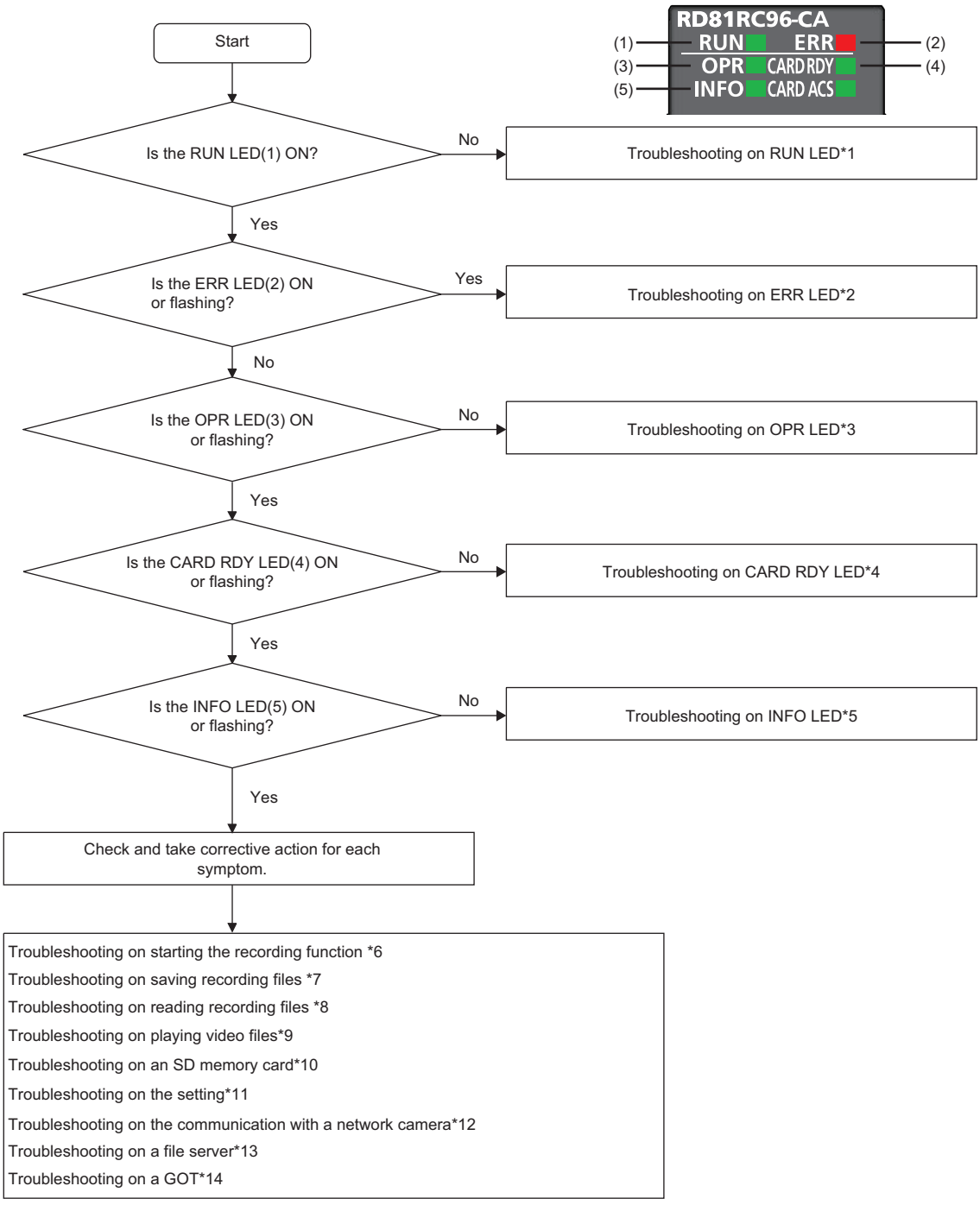
For details, refer to the following:

☞ Page 135 Checking the module status

Troubleshooting by symptom

The following shows the flowchart for troubleshooting while a camera recorder module is operating.

The LED status can be checked in the "Module Diagnostics" screen of the system monitor. (☞ Page 136 Module information list)



*1 ☞ Page 155 Troubleshooting on RUN LED
*2 ☞ Page 155 Troubleshooting on ERR LED
*3 ☞ Page 155 Troubleshooting on OPR LED
*4 ☞ Page 155 Troubleshooting on CARD RDY LED
*5 ☞ Page 155 Troubleshooting on INFO LED
*6 ☞ Page 128 Troubleshooting on starting the recording function
*7 ☞ Page 130 Troubleshooting on saving recording files
*8 ☞ Page 131 Troubleshooting on reading recording files
*9 ☞ Page 132 Troubleshooting on playing a video file
*10 ☞ Page 155 Troubleshooting on an SD memory card
*11 ☞ Page 155 Troubleshooting on settings

*12 ☞ Page 157 Troubleshooting on the communication with a network camera
*13 ☞ Page 157 Troubleshooting on a file server
*14 Refer to the following: (It can be downloaded from Mitsubishi Electric FA site.)
📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)

Troubleshooting on RUN LED

For details, refer to the following:
☞ Page 141 Troubleshooting on RUN LED

Troubleshooting on ERR LED

For details, refer to the following:
☞ Page 141 Troubleshooting on ERR LED

Troubleshooting on OPR LED

For details, refer to the following:
☞ Page 141 Troubleshooting on OPR LED

Troubleshooting on CARD RDY LED

For details, refer to the following:
☞ Page 141 Troubleshooting on CARD RDY LED

Troubleshooting on INFO LED

For details, refer to the following:
☞ Page 142 Troubleshooting on INFO LED

Troubleshooting on an SD memory card

For details, refer to the following:
☞ Page 142 Troubleshooting on an SD memory card

Troubleshooting on settings

Symptom	Check point	Corrective action
Unable to search for a network camera.	Check each network environment. • Is PoE power supplied when using a PoE network camera? • Is the power of a hub turned ON? • Is there any disconnection in the connection route?	Take any of the following corrective actions according to the check result. • Supply PoE power to the network camera. • Turn the power of the hub ON. • Connect the cables properly, or replace them with new ones.
	Are the IP address, subnet mask, and default gateway set for the network camera? (Check the IP address set for the network camera by using a dedicated tool for the camera.)	Set the IP address, subnet mask, and default gateway of the network camera according to those of a camera recorder module by using a dedicated tool for the camera. For details, refer to the manual of a network camera used.
	Does the IP address (first octet to third octet) set for the network camera match that of a camera recorder module? (Check the IP address set for the network camera by using a dedicated tool for the camera.)	Set the IP address of the network camera according to that of the camera recorder module by using a dedicated tool for the camera. For details, refer to the manual of a network camera used.
	Is the default gateway set for the network camera correct?	Check if the network configuration is correct. If another LAN segment is relayed via a gateway, contact the network administrator of the connected LAN.
	Is the IP address duplicated in the system?	Review the setting to avoid IP address duplication in the system.
	Are 33 or more network cameras connected on the same network to which a camera recorder module is connected?	Perform either of the following operations to reduce the number of connected network cameras to 32 or less for search. • Turn OFF the power of a network camera that is not searched for. • Disconnect the cable to a network camera that is not searched for.

Symptom	Check point	Corrective action
Unable to check an account.	Check each network environment. • Is PoE power supplied when using a PoE network camera? • Is the power of a hub turned ON? • Is there any disconnection in the connection route?	Take any of the following corrective actions according to the check result. • Supply PoE power to the network camera. • Turn the power of the hub ON. • Connect the cables properly, or replace them with new ones.
	Is a user created for a network camera?	Create a user by using a dedicated tool for the network camera. For some network cameras, create another account for ONVIF communication. For details, refer to the manual of the network camera.
	Do the user ID and password set in the module extended parameter match those set for a network camera? (For the checking method of the user ID and password set for a network camera, refer to the manual of the network camera used.) (☞ Page 84 Module Extended Parameters (Camera Recorder Module))	Enter the user ID and password set for the network camera.
A video is not displayed according to the setting for PTZ control of a network camera.	Is PTZ operation performed in multiple devices?	Do not perform PTZ control for a network camera in multiple devices. (Some network cameras have the camera control authority when performing PTZ control. For details, refer to the manual of the network camera.)
	Has an operation been performed while a value other than 'not requested' is stored in 'PTZ operation status' (Un\G38002, Un\G38702, Un\G39402, Un\G40102)? (☞ Page 239 PTZ control area (Un\G38000 to 43599))	Perform an operation while 'not requested' is stored in 'PTZ operation status.'
	Is 'PTZ preset mode' or 'PTZ disable mode' stored in 'PTZ control authority mode' (Un\G38000, Un\G38700, Un\G39400, Un\G40100)? (☞ Page 239 PTZ control area (Un\G38000 to 43599))	Change the value to "PTZ Enable Mode" for "PTZ Control Authority Mode" in the module extended parameter. (☞ Page 84 Module Extended Parameters (Camera Recorder Module))
	Check each network environment. • Is PoE power supplied when using a PoE network camera? • Is the power of a hub turned ON? • Is there any disconnection in the connection route?	Take any of the following corrective actions according to the check result. • Supply PoE power to the network camera. • Turn the power of the hub ON. • Connect the cables properly, or replace them with new ones.
	Has the network camera been restarted?	Perform PTZ or preset operation, because the home position specific to the network camera is the direction to capture data when restarting the network camera.
A video when performing PTZ control is not displayed.	Is the setting of a GOT or SoftGOT correct?	Refer to the troubleshooting described in the following manual to take corrective actions. 📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1

*1 Can be downloaded from Mitsubishi Electric FA site.

Troubleshooting on the communication with a network camera

Symptom	Check point	Corrective action
Unable to start communication with a network camera.	Is the Ethernet cable connected properly?	If it is not connected properly, take the following actions: • Lock the cable securely. • Check the wiring. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Is the power of the network camera, PoE switching hub, or router, etc. turned ON?	Turn the power ON.
	Has an error occurred in the network camera, PoE switching hub, or router, etc.?	Check the manual of each device to take corrective actions.
	Has a device on the line been replaced (with one with the same IP address), such as a CPU module, connected device (personal computer), hub, or router, etc.?	Reset the devices on the line.*1
	Is the IP address of the network camera specified correctly?	Search for the network camera in the module extended parameter. (☞ Page 84 Module Extended Parameters (Camera Recorder Module)) If whether the network camera exists cannot be checked, there is any problem in the network configuration used. In this case, contact the system administrator or network administrator.
	Is the network camera supported by a camera recorder module?	Check if a network camera supported by the camera recorder module is used. (MELSEC iQ-R System Recorder User's Manual (Startup))
	Is the IP address duplicated in the system?	• Review the setting to avoid IP address duplication in the system. • Review the settings for all modules used to avoid IP address duplication of the network camera in the module extended parameter.
	Are there a firewall and proxy server in the connection route?	Check the firewall and proxy server settings with the network administrator.
	Is the network camera ready for communication?	Check the manual of the network camera to take corrective actions.
The communication is frequently disconnected. ('00600: communication retry start' occurs in the event history.)	Is the bit rate high to the communication band?	• Lower the maximum video bit rate in the module extended parameter. (☞ Page 84 Module Extended Parameters (Camera Recorder Module)) • For the network configuration used, contact the system administrator or network administrator.
The communication with a network camera does not restart after it is disconnected.	Is the time in a CPU module changed after starting the operation of a camera recorder module?	If the clock data in the CPU module is changed after starting the operation of the system, it may take time to synchronize the time between the camera recorder module and network camera. In this case, wait until the time synchronization is completed.

*1 Devices on Ethernet have the correspondence table between IP addresses and MAC addresses called the ARP cache. When replacing a device on the line with one with the same IP address, the MAC address does not match between the ARP cache and the new device and the communication may not be established normally. The ARP cache is updated when the device is reset or a certain period of time elapses. The time differs depending on the device.

Troubleshooting on a file server

For details, refer to the following:

☞ Page 143 Troubleshooting on a file server

Error code list

The following table shows the error code list of a camera recorder module.

Error code	Error name	Error description	Corrective action
0C00H[*1]	Recording Start with Program Inconsistency	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.	When a device/label that is not a sampling target is added, stop recording, write the recording setting file to the CPU module again, and restart recording. When the devices/labels in the program are not specified in a batch in the device/label sampling target setting, please review the recording setting so that the added devices/labels are included in the sampling targets and write it to the CPU module.
0C01H[*1]	Program Inconsistency during Recording Operation	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.	When a device/label that is not a sampling target is added, stop recording, write the recording setting file to the CPU module again, and restart recording. When the devices/labels in the program are not specified in a batch in the device/label sampling target setting, please review the recording setting so that the added devices/labels are included in the sampling targets and write it to the CPU module.
1810H	Recording Setting Acquisition Error	Failed to acquire the recording setting.	Please write the recording setting with the engineering tool.
1811H to 1813H	Recording Setting Error	The contents of the recording setting file are broken.	• Please write the recording setting again with the engineering tool. • Please check that the versions of the camera recorder module, CPU module, and engineering tool are appropriate to be used together.
1814H	Recording Start Error in Sub	A recording start error has occurred in the Sub.	Please check the details of the Sub error by the module diagnostics of the engineering tool, and clear the error.
1815H	Recording Start Error in Sub	• The mode of the module parameter is not set to "Online" in some Sub. • The module status setting is set to "Empty" with the system parameter (I/O assignment setting) in some Sub. • The Sub is not mounted.	• Please set the operation mode of the module parameter of the Sub whose recording function is to be used to "Online". • Please set the module status setting of the system parameter (I/O assignment setting) of the Sub whose recording function is to be used to "No setting". • Please check the system parameter and actual system configuration, please review the recording setting.
1816H	Module Error	An unrecognized error has been detected by the firmware version of the target camera recorder module.	Please check that the versions of the camera recorder module, CPU module, and engineering tool are appropriate to be used together.
1830H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target camera recorder module was written.	Please check the version of the camera recorder module, use a compatible product, and then write the recording file again.
1850H	Recording Setting Error	The size is not set in the buffer area for data sampling of the CPU parameter.	Please set the size in the buffer area for data sampling of the CPU parameter.
1851H	Recording Setting Error	The size is not set in the recording buffer of the basic settings of the module parameter.	Please set the size in the recording buffer of the basic settings of the module parameter.
1900H	Recording Files Saving Error	Failed to save recording files because there is no free folder number for recording folders.	Please delete unnecessary recording folders in the setting-specific folder in which the error has occurred.
1901H	Recording Files Saving Error	Failed to save recording files because accessing the SD memory card failed.	• Please save files after checking that the SD memory card is not being initialized. • Please save files after checking that the SD memory card is in the accessible state (mount state).
1902H	Recording Files Saving Error	Failed to save recording files because accessing the SD memory card failed.	• Please check whether the SD memory card is inserted. • Please save files after checking that the SD memory card is in the accessible state (mount state). • If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it.
1904H	Recording Files Saving Error	Failed to save recording files because the control file could not be saved due to the insufficient free space in the SD memory card.	Please delete unnecessary files in the SD memory card to allocate free space.

Error code	Error name	Error description	Corrective action
1905H	Recording Files Saving Error	Failed to save some recording files because the free space in the SD memory card was insufficient.	Please delete unnecessary files in the SD memory card to allocate free space.
1906H	Recording Files Saving Error	Failed to save recording files because old recording files could not be deleted.	• Please initialize the SD memory card. • Please replace the SD memory card.
1910H	Event History File Acquisition Error	The event history file could not be acquired because no event history file was created in the control CPU module.	Please perform any one of the following. • Writing parameters to the control CPU module • Inserting the SD memory card (when the save destination of the event history is the SD memory card) • Initializing the SD memory card • Resetting the control CPU • Turning the power off and on
1911H	Control CPU Communication Error	Failed to save recording files because the data communication with the control CPU module failed.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
1913H	Recording Files Saving Error	No recording files were saved because no device/label data was collected during the retention period.	Please check the sampling method and saving period of the device/label data.
1914H	Recording Files Saving Error	Failed to save Recording file because the data communication with the management CPU module timed out.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
1920H	Recording Files Saving Error	Failed to save recording files because an error of the SD memory card was detected.	• Please initialize the SD memory card. • Please replace the SD memory card.
1921H	Recording Files Saving Error	Failed to save recording files. • The free space in the SD memory card was insufficient. • An error of the SD memory card was detected.	• Please delete unnecessary files in the SD memory card to allocate free space. • Please initialize the SD memory card. • Please replace the SD memory card.
1930H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	• Please save files after checking that the host name and IP address of the file server are correct. • Please save files after checking that the file server is connected to the network. • If the load on the network is high, please reduce the load by separating the network and save files. • If the load on the file server is high, please reduce the load by reducing the access to the file server and save files. • When the file server is specified by the host name, please save files after checking that the DNS server setting of the camera recorder module is correct. • When the file server is specified by the host name, please save files after checking that the DNS server is connected to the network. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.
1931H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	• Please save files after checking that the user name/password used for the connection to the file server is correct. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.
1932H	Recording Files Saving Error	Failed to save recording files because the connection to the file server failed.	• Please save files after checking that the folder name set in the saving path setting exists in the file server. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.
1934H	Recording Files Saving Error	Failed to save recording files because the access to the file server failed.	• Please save files after checking that the file server is connected to the network. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.

Error code	Error name	Error description	Corrective action
1935H	Recording Files Saving Error	Failed to save recording files because the management file could not be saved due to the insufficient free space in the file server.	Please delete unnecessary files in the file server to allocate free space.
1936H	Recording Files Saving Error	Failed to save some recording files because the free space in the file server was insufficient.	Please delete unnecessary files in the file server to allocate free space.
1937H	Recording Files Saving Error	Failed to save recording files because old recording files could not be deleted.	• Please check if the user set in the saving path setting has write authority to the saving path. • Please check if several modules and applications are accessing the saving destination folder in the file server simultaneously. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.
1938H	Recording Files Saving Error	Failed to save recording files because an error was detected at the time of access to the file in the file server.	• Please check if the user set in the saving path setting has write authority to the saving path. • Please check if several modules and applications are accessing the saving destination folder in the file server simultaneously. • If video data receiving targets set in the recording setting, please reduce the load by modifying the module extended parameter.
1939H	Recording File Saving Error Detection of Sub	An error has been detected in the recording file saving processing of the Sub.	Please check the details of the Sub error by the module diagnostics of the engineering tool, and clear the error.
1981H	SD Memory Card Initialization Error	Failed to initialize the SD memory card.	• Please check whether the SD memory card is inserted without fail. • Please check the SD memory card is not initializing. • If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it. • If the recording function is active, stop it. • Please replace the SD memory card.
1982H	SD Memory Card Error	An error of the SD memory card was detected.	• If the write-protect switch of the SD memory card is enabled, please insert the SD memory card after disabling it. • Please format the SD memory card, or insert the SD memory card again. If the same error is displayed, a hardware error may have occurred in the SD memory card. Please replace the SD memory card.
1A80H	IP Address Automatic Acquisition Error	Failed to acquire the network parameter information from the DHCP server.	• Please check the status of the connection with the DHCP server. • Please check the connection cable. • Please review the DHCP server setting.
1A81H	IP Address Automatic Acquisition Update Error	Failed to perform the automatic lease update processing which is performed when the lease term of the IP address acquired from the DHCP server expires.	Please check the connection cable and status of the DHCP server (operating status and whether the IP address to be assigned is allocated).
1A82H	IP Address Setting Error	The setting value of the IP address setting is incorrect.	Please review the IP address setting in the basic settings of the module parameter.
1A83H	DNS Setting Error	The setting value of the DNS setting is incorrect.	Please review the DNS setting in the basic settings of the module parameter.
1C40H	PTZ Control Request Error	The network camera setting is not written.	Please write the module extended parameter with the engineering tool.
1C50H	PTZ Control Error	Failed to perform the PTZ control of the network camera.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected. • Please perform the PTZ control again. If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1C51H	PTZ Function Unsupported Error	The target network camera does not support the PTZ function.	Please review the network camera specified as the PTZ control target.

Error code	Error name	Error description	Corrective action
1C60H	Preset Position Registration Error	Failed to register the specified preset position.	• Please register the preset position again. • If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1C70H	Preset Position Deletion Error	Failed to delete the specified preset position.	• Please delete the preset position again. • If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1C80H	Preset Position Unregistered Error	The specified preset position is not registered.	Please specify the number of the registered preset position.
1C90H	Preset Position Execution Error	Unable to move to the specified preset position.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected. • Please check if the specified preset position No. and preset position speed are within the settable ranges.
1CA0H	Preset Position Registration Count Upper Limit Reach Error	The number of preset registration counts has exceeded the guaranteed maximum value.	Even if more preset positions are registered, the setting value cannot be guaranteed.
1CB0H	PTZ Authority Mode Unexecutable Error	Moving to the preset position was performed while the PTZ control authority mode is "PTZ disabled mode".	Please perform moving to the preset position while the PTZ control authority mode is "PTZ enabled mode" or "PTZ preset mode".
1D00H	Module Extended Parameter Error	The contents in the module extended parameter are broken.	Please write the module extended parameter again with the engineering tool. If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1D01H	Network Camera Undetected Error	The target network camera cannot be found.	• Please check the operation status of the other device. • Please check if the set camera type, IP address, and TCP port number are correct. • Please change the IP addresses of the network camera and this product to the same segment. • If a LAN of different segments is communicated via a gateway, please consult the network administrator of the connected LAN. • Please change the IP address of the module to the same segment as the network camera to be connected. (Please do not select automatic acquisition.)
1D10H	Parameter Inconsistency Error	The number of network cameras that receive video data is inconsistent between the module extension parameter and the recording setting.	Please exclude the network camera(s) that is(are) disabled in the module extension parameter from the receiving targets in the recording setting.
1D11H	Parameter Inconsistency Error	The number of network cameras that receive video data is inconsistent between the recording operation setting of the module parameter and the recording setting.	Please set the number of network cameras that receive video data to two or less in the camera recorder module set to "Main" in the module parameter.
1D30H	Network Camera Account Authentication Error	Failed to authenticate the target network camera.	• Please review the account information (user ID, use password). • Please check the account information (use ID, use password) set for the network camera. • An account for ONVIF communication exists in some network cameras. If the account exists, please check the account information for ONVIF communication of the network camera. For details, please refer to the manual of the network camera to be used.
1D40H	Network Camera Video Maximum Bit Rate Limit Unsupported Error	The target network camera does not support the function which limits the maximum video bit rate.	• Please review the resolution, frame rate, video quality, and codec to reduce the bit rate.
1D50H	Network Camera Video Setting Error	The resolution of the target network camera is incorrect.	Please set the resolution that can be set for the network camera.
1D51H	Network Camera Video Setting Error	The frame rate setting of the target network camera is incorrect.	Please set the frame rate that can be set for the network camera.
1D52H	Network Camera Video Setting Error	The combination of the resolution and frame rate of the target network camera is incorrect.	Please review the combination of the resolution and frame rate that can be set for the network camera.

Error code	Error name	Error description	Corrective action
1D53H	Network Camera Video Setting Error	The number of connected network cameras exceeds the upper limit.	Please review the number of network cameras connected to the module and the setting value of the network camera.
1D80H	Network Camera Video Rotation Angle Unsupported Error	The specified target network camera does not support the video rotation function.	Please clear the setting of the video rotation angle with the engineering tool. After changing the setting, please write the network camera setting again with the engineering tool.
1D81H	Network Camera Video Rotation Angel Setting Error	The video rotation angle of the target network camera is incorrect.	Please set the video rotation angle that can be set for the network camera.
1D90H	Network Camera SNTP Client Unsupported Error	The target network camera does not support the SNTP client function.	Please use a network camera that supports the SNTP client function.
1DB0H	Network Camera Time Synchronization Setting Error	Failed to set the time synchronization of the network camera.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected.
1DC0H	Network Camera Communication Start Error	Failed to communicate with the target network camera.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected.
1DE0H	Network Camera Video Data Storage Start Error	Failed to store video data of the target network camera.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected.
1DF1H	Network Camera Communication Error	Unable to connect with the target network camera.	• Please check the operation status of the target network camera. • Please check if the connection cable is not disconnected. • The line may be busy with packets. Please consult the network administrator of the connected LAN.
1E10H	Recording Files (Video Data) Saving Failure	Because the video data of the target network camera has never been stored in the saving target period, the recording files (video data) were not saved.	• Please check that the time of the target network camera and the camera recorder module are synchronized. • Please check the status receiving the video data from the target network camera. • If the load on the network is high, please reduce the load by modifying the module extended parameter.
1E11H	Recording Files (Video Data) Saving Failure	Failed to save the video file of the target network camera.	• If the load on the network is high, please reduce the load by modifying the module extended parameter. • Please restart the network camera. • Please switch the CPU module to RUN after resetting it. If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1E71H	Network Camera Setting Error	A setting error has occurred in the target network camera.	• Please check if the network camera supported by this product is used. For details, please refer to "4.5 Connectable camera". • Please restart the network camera. • Please switch the CPU module to RUN after resetting it. If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1E72H	Network Camera Communication Error	An error has occurred in the communication with the target network camera.	• Please check if the network camera supported by this product is used. For details, please refer to "4.5 Connectable camera". • Please restart the network camera. • Please switch the CPU module to RUN after resetting it. If the same error is displayed again, the camera recorder module may be defective. Please consult your local Mitsubishi representative.
1E80H	Network Camera Error	An error has occurred in the target network camera.	• Please check if the network camera supported by this product is used. For details, please refer to "4.5 Connectable camera". • Please restart the network camera. • Please check the target network camera. For details, please refer to the manual of the network camera to be used.

Error code	Error name	Error description	Corrective action
2440H	Module Major Error	• In the multiple CPU system, the control CPU setting in the system parameter is set to the one different from those set in the other CPU Nos. • An error of the I/O module or intelligent function module was detected at the initial processing.	• Please review the system parameters of CPU No. 2 and later, unify them to the one set in the CPU whose CPU No. is the smallest. • A hardware error may have occurred in the module in which the error occurred. Please consult your local Mitsubishi representative.
2450H	Module Major Error	A major error occurrence notification from the I/O module or intelligent function module was detected.	• Please check the connection status of the extension cable. • Please check that the I/O module or intelligent function module is correctly mounted. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the module in which the error occurred. Please consult your local Mitsubishi representative.
24C0H to 24C1H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C2H	System Bus Error	An error of the system bus was detected.	• Please check the connection status of the extension cable. • Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C3H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module, I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C4H to 24C5H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the I/O module, intelligent function module, base unit, or extension cable. Please consult your local Mitsubishi representative.
24C6H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module or extension cable. Please consult your local Mitsubishi representative.
24C8H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the I/O module, intelligent function module, or extension cable. Please consult your local Mitsubishi representative.
24E0H	System Bus Error	An error of the system bus was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the CPU module or base unit. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
3000H	Module Parameter Error	There is no module parameter.	• Please check the module position set in the system parameter of the CPU module (I/O assignment setting) and the module position of the implemented module. If they are different, please match the parameter and implementation status. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3001H	Module Parameter Error	The contents in the module parameter are broken.	Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3002H	Module Parameter Error	• A parameter which is not supported by the firmware version of the target camera recorder module was written. • The contents in the module parameter are broken.	• Please check the version of the camera recorder module, use a compatible product, and then write the module parameter again. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3010H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3013H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3020H	Incompatible CPU Error	The control CPU module does not support the recording function.	Please use a CPU module which supports the recording function.
3021H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target CPU module was written.	Please check the version of the CPU module, use a compatible product, and then write the recording file again.
3022H	Recording Setting Error	The contents of the recording setting file are broken.	• Please take anti-noise measures. • Please write the recording setting file again. If the same error is displayed, a hardware error may have occurred in the data memory of the CPU module. Please consult your local Mitsubishi representative.
3023H to 3024H	Recording Setting Error	• A recording setting file which is not supported by the firmware version of the target camera recorder module was written. • The contents of the recording setting file are broken.	• Please check the version of the camera recorder module, use a compatible product, and then write the recording file again. • Please take anti-noise measures. • Please write the recording setting file again. If the same error is displayed, a hardware error may have occurred in the data memory of the CPU module. Please consult your local Mitsubishi representative.
3025H	Recording Setting Error	The module type set in the engineering tool does not match the CPU module which is the write destination of the recording setting file.	Please read the recording setting file, and match the write destination CPU module and model type.
3026H	Recording Setting Error	Device/label data which exceeds the size of the buffer area for data sampling in the CPU parameter is specified in the recording setting file.	Please read the CPU parameter and recording setting file, and reduce the device/label data to be saving targets so that the size is within the buffer area for data sampling in the CPU parameter. Or, please increase the size of the buffer area for data sampling in the CPU parameter.
3027H	Recording Setting Error	The program setting and FB/FUN file setting in the CPU parameter in the CPU module are different from the project (program setting and FB/FUN file setting in the CPU parameter) at recording setting.	• Please write the CPU parameter and recording setting file to the CPU module. • Please read the CPU parameter and recording setting file, and write them to the CPU module again.

Error code	Error name	Error description	Corrective action
3028H	Recording Setting Error	• The program file and FB/FUN file in the CPU module are different from the project (program, FB/FUN) at recording setting. • They are different from the program file and FB/FUN file in the CPU module at recording setting because the project (program, FB/FUN) was changed during recording operation.	• Please write the program file, FB/FUN file, and recording setting file to the CPU module. • When the program file and FB/FUN file in the CPU module were changed during recording operation, please write the recording setting file to the CPU module again. • Please read the program file, FB/FUN file, and recording setting file, and write them to the CPU module again.
3029H	Recording Setting Error	The device/label operation is not set to "Save" in the event history setting of the CPU parameter.	Please set device/label operation to "Save" in the event history setting of the CPU parameter.
3030H to 3031H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target camera recorder module was written.	Please check the version of the camera recorder module, use a compatible product, and then write the recording file again.
3032H	Recording Setting Error	• The mounting position and control CPU of the camera recorder module are different from the ones of the system parameter at the recording setting. • The mode of the module parameter is not set to "Online" or the module status setting of the system parameter (I/O assignment setting) is set to "Empty" in some Main.	• Please check the mounting position and control CPU of the camera recorder module. • Please check the system parameter and actual system configuration. • Please review the recording operation setting of the module parameter and set the number of modules of "Main" to one. • Please remove the module from Main where the module status setting of the system parameter (I/O assignment setting) is set to "Empty".
3033H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target camera recorder module was written.	Please check the version of the camera recorder module, use a compatible product, and then write the recording file again.
3034H	Recording Setting Error	The link-direct device, module access device, or CPU buffer memory access device specified for collection does not have an access destination or is out of range.	• Please review the device/label collection target setting in the recording setting. • If the Device/Label collection target setting is set to the Device/Label batch setting, review the program used to set recording.
3040H to 3043H	Control CPU Communication Error	Failed to communicate data with the control CPU module.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3045H	Control CPU Communication Timeout	The data communication with the control CPU module has timed out.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3050H to 3064H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3070H to 3071H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3080H to 308AH	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3090H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
3092H to 309AH	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
30A0H to 30A2H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3140H to 3142H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3150H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
31C0H to 31C4H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
31C5H	Module Parameter Error	• A module parameter of the recording operation setting which is not supported by the firmware version of the target camera recorder module was written. • The contents in the module parameter are broken.	• Please check the version of the camera recorder module, use a compatible product, and then write the module parameter again. • Please write the module parameter again with the engineering tool. If the same error is displayed again, please consult your local Mitsubishi representative.
3300H to 3303H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3305H	Module Configuration Error	The number of modules set in "Sub" in the camera recorder module has exceeded the available number.	Please set "Sub" in the camera recorder module less than the available number.
3306H	Recording Setting Error	• The start I/O No. and mounting position of the camera recorder module are different from the ones of the system parameter at the recording setting. • The recording operation setting of the camera recorder module is different from the one at the recording setting.	• Please check the system parameter and actual system configuration, and review the video data receiving target settings in the recording setting. • Please check the recording operation setting with the module parameter of the camera recorder module and review the video data receiving target settings in the recording setting.
3405H	Recording Setting Error	A recording setting file which is not supported by the firmware version of the target camera recorder module was written.	Please check the version of the camera recorder module, use a compatible product, and then write the recording file again.
3600H to 3606H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3C00H to 3C03H	Hardware Error	A hardware error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3C0FH	Hardware Error	A hardware error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.

Error code	Error name	Error description	Corrective action
3C22H	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3C2FH	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative. • If this error occurs during the automated hardware test, perform a firmware update and perform the automated hardware test again. If the same error is displayed again, the camera recorder module may have a hardware error. Contact the nearest Mitsubishi Electric System Service Co., Ltd. or Mitsubishi Electric Corporation branch office or agent.
3C32H	Memory Error	A memory error was detected.	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.
3EA0H	Module Error	—	• Please take anti-noise measures. • Please switch the CPU module to RUN after resetting it. If the same error is displayed, a hardware error may have occurred in the camera recorder module. Please consult your local Mitsubishi representative.

*1 An event is registered as a continuation error when "Error is registered (continuous error)" is selected for "Warning due to program change during recording operation" under "Operation Setting at Event Detection" in the application setting in the module parameter.

Event code list

The following table shows the event code list of a camera recorder module.

Event code	Event type	Event classification	Overview	Cause
00600	System	Information	Communication Retry Start	• Because the communication with the network camera was disconnected, the communication retry processing was performed. • Unable to receive or store the video shot by the network camera during the communication disconnected period.
00610	System	Information	Communication Retry Recovery	The communication with the network camera has been recovered.
00C00	System	Warning	Recording Start with Program Inconsistency	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.
00C01	System	Warning	Program Inconsistency during Recording Operation	It is different from the project (program, FB/FUN) at the recording setting because a program file or FB/FUN file in the CPU module was changed during recording operation. When a device/label that is not a sampling target is added, the added device/label cannot be saved and replayed.
20400	Operation	Information	Firmware update succeeded(Camera recorder module)	The firmware of the Camera recorder module was successfully updated.
20401	Operation	Information	Firmware update failed(Camera recorder module)	The firmware update of the Camera recorder module failed.
24020	Operation	Information	Recording Operation Start	The recording operation has been started.
24021	Operation	Information	Recording Operation Stop	The recording operation has been stopped.
24030	Operation	Information	File Saving Trigger Establishment	The file saving trigger has been established.
24031	Operation	Information	Recording Files Saving Completion	Saving the recording files has been completed.
24040	Operation	Information	Error Clear	Errors have been cleared.
24044	Operation	Information	INFO LED Off	INFO LED has been turned off.
26190	Operation	Information	Live Video Delivery Failure	Failed to perform the live video delivery start processing.
261A0	Operation	Information	Live Video Delivery Failure	Failed to deliver the live video.
261B0	Operation	Information	Live Video Delivery Failure	An error has occurred on the live video receiving side.
261C0	Operation	Information	Live Video Delivery Failure	Failed to perform the live video delivery stop processing.
2A010	Operation	Warning	SD Memory Card Initialization	The SD memory card has been initialized.
2A030	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • Failed to save the event history file.
2A032	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • The sampled device and label data have exceeded the size that can be stored in the recording buffer. • Please set a sufficient size for the recording buffer in the basic settings of the module parameter. • Please set a shorter saving period before and after the file saving trigger or saving period after the recording startup trigger in the saving period setting of the recording setting. • Please reduce some device and label data to be stored in the Device/Label collection target setting of the recording settings.
2A040	Operation	Warning	Recording Files Saving Completion	• Saving the recording files has been completed. • Failed to save some video data.

6 RECORDER MODULE (DETAILED SPECIFICATIONS)

This chapter explains the function details, module labels, input/output signals, and buffer memory of a recorder module.

6.1 Function Details

This section shows the details on the functions of a recorder module.

Recording function

This function can be used to accumulate devices and labels sampled by a CPU module, and output them and the event history of the CPU module to a recording file and save the file to a save destination specified in the recording setting when a file saving trigger is satisfied.
For details, refer to the following:
☞ Page 16 Recording Function

SD memory card format function

This function can be used to format an SD memory card inserted in a recorder module.
The procedure is as follows:

Operating procedure

1. Check that 'Recording function operation status' (X3) is 'stopped.'
2. If it is 'operating,' switch it to 'stopped' by either of the following operations:
- Switch a CPU module from RUN to STOP.
- Stop the recording function in the "Recording Monitor" screen. (☞ Page 122 RECORDING MONITOR)

3. Use GX Works3 to format an SD memory card.
☞ Page 137 SD memory card operation
After formatting, the volume label will be RD81RC96.

Self-diagnostic function

This function is an internal function to check the hardware health of a recorder module and diagnose whether the module operates properly.
There are two main functions for the self-diagnostic function.
- Automatic hardware test (☞ Page 138 Automatic hardware test)
- Hardware test for LED check (☞ Page 139 Hardware test for LED check)

6.2 Module Labels

This section shows the module labels used to set input/output signals and the buffer memory of a recorder module.

Module label configuration

The name of a module label is defined in the following configurations:

"Instance name"_"Module number"."Label name"

"Instance name"_"Module number"."Label name"_D

Ex.

RC96_1.stIOSignal.bModuleReady

■Instance name

The instance name of a recorder module (RD81RC96) is 'RC96.'

■Module number

A module number is a number starting from 1, which is added to identify a module that has the same instance name.

■Label name

This is a label name unique to a module.

■_D

This indicates that the module label is for direct access. Without this symbol, the label is for refresh. There are some differences between refresh and direct access as shown below.

Type	Description	Access timing
Refresh	Values written to/read from a module label are applied to a module in a batch at the time of refresh. This shortens the program execution time.	At the time of refresh
Direct access	Values written to/read from a module label are immediately applied to a module. Although the program execution time is longer than refresh, the responsiveness will be increased.	At the time of writing to/reading from a module label

6.3 Input/Output Signals

This section explains the input/output signals of a recorder module.
The following shows an example of assigning input/output signals when the start input/output number of a module is '0.'
A device X indicates an input signal from a module to a CPU module.
A device Y indicates an output signal from a CPU module to a module.

Precautions

As for input/output signals to a CPU module, do not output (turn ON) 'Use prohibited' signals. Doing so may cause malfunction of a programmable controller system.

Input/output signal list

The following shows the input/output signal list of a module.
For details on the input/output signals, refer to either of the following:
☞ Page 172 Input signal details
☞ Page 174 Output signal details

Input signals

Device No.	Signal name
X0	Module READY
X1	SD memory card status
X2	File access status
X3	Recording function operation status
X4	INFO LED status
X5	Module stop error status
X6	Module continuation error status
X7 to X1F	Use prohibited

Output signals

Device No.	Signal name
Y0	File access stop request
Y1	Clear file access stop request
Y2	Clear INFO LED request
Y3	Error clear request
Y4 to Y1F	Use prohibited

Input signal details

The following shows the details on the input signals to a CPU module.

Module READY (X0)

This signal turns ON when a module is ready after turning the power OFF and ON or resetting a CPU module.
It turns OFF when a hardware error occurs.

SD memory card status (X1)

This signal turns ON when an SD memory card is inserted and 'File access status' (X2) is OFF.
It turns OFF when an SD memory card is not inserted or 'File access status' (X2) is ON.

File access status (X2)

● This signal turns ON while file access is stopped or an SD memory card is write-protected.
The following operations can be performed while file access is stopped.

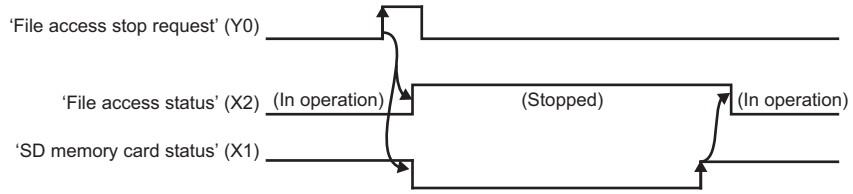
- Insertion/removal method of an SD memory card (MELSEC iQ-R System Recorder User's Manual (Startup))

The status is in the following state while file access is stopped.

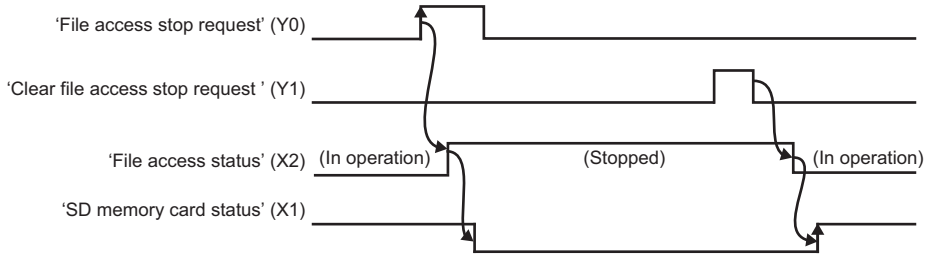
- SD memory card read/write-protected

● This signal turns OFF when a file is accessible.
The following shows time charts of 'File access status' (X2) and its related input/output signals.

- When inserting or removing an SD memory card



- When not inserting or removing an SD memory card



Recording function operation status (X3)

This signal turns ON while the recording function is running for any of the recording settings. (☞ Page 95 RECORDING SETTING)
It turns OFF when the recording function is stopped for all recording settings.
For the operating status for a recording setting, refer to the following:
☞ Page 57 Operating status

INFO LED status (X4)

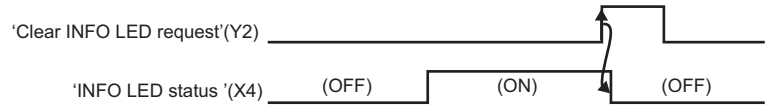
This signal turns ON when the INFO LED turns ON.

For the factor that the INFO LED turns ON, refer to the following:

☞ Page 136 Module information list

It turns OFF when turning 'Clear INFO LED request' (Y2) ON while the INFO LED is ON.

In addition, it turns OFF when switching the status of a CPU module from STOP to RUN.



Module stop error status (X5)

This signal is ON while a module stop error is occurring.

Module continuation error status (X6)

This signal is ON while a module continuation error is occurring.

It turns OFF when turning 'Error clear request' (Y3) ON.

Output signal details

The following shows the details on the output signals to a CPU module.

Point

The output signals will be enabled when they turn from OFF to ON. In addition, they are not turned from ON to OFF by a system. To turn the signals ON again, turn them from ON to OFF once, then OFF to ON.

File access stop request (Y0)

When turning this signal ON, accessing a file in an SD memory card is stopped.

For details, refer to the following:

☞ Page 172 File access status (X2)

Clear file access stop request (Y1)

Turn this signal ON when 'File access stop request' is accidentally turned ON.

When turning this signal ON without replacing an SD memory card after turning 'File access stop request' ON, file access restarts.

For details, refer to the following:

☞ Page 172 File access status (X2)

Clear INFO LED request (Y2)

When turning this signal ON while the INFO LED is ON, the following operations are performed:

- The INFO LED is turned OFF.
- 'INFO LED status' (X4) is turned OFF.
- 'INFO LED lighting factor' (Un\G12) is cleared.

Error clear request (Y3)

When turning this signal ON while a module continuation error is occurring, the following operations are performed:

- The ERR LED is turned OFF.
- 'Module continuation error status' (X6) is turned OFF.
- 'Current error area' (Un\G140 to 149) are cleared.
- 'Error log' (Un\G150 to 311) are cleared.

6.4 Buffer Memory

This section explains the buffer memory of a recorder module.

Precautions

- Do not write any data in the "system area" of the buffer memory. Doing so may cause malfunction of a programmable controller system.

Buffer memory list

The following table shows the buffer memory list of a recorder module.

R: Read-only, W: Write-only, R/W: Readable/Writable

Address Dec (Hex)	Application	Name	Initial value	R/W
0 (0H)	Module status area	RUN LED status	0	R
1 (1H)		ERR LED status	0	R
2 (2H)		CARD RDY LED status	0	R
3 (3H)		System area	—	—
4 (4H)		OPR LED status	0	R
5 (5H)		INFO LED status	0	R
6 to 11 (6H to BH)		System area	—	—
12 (CH)		INFO LED lighting factor	0	R
13 to 16 (DH to 10H)		System area	—	—
17 (11H)		Recording operation setting	0	R
18 to 20 (12H to 14H)		System area	—	—
21 to 22 (15H to 16H)	SD memory card information area	SD memory card total capacity	0	R
23 to 24 (17H to 18H)		SD memory card free capacity	0	R
25 (19H)		SD memory card usage rate	0	R
26 to 27 (1AH to 1BH)		SD memory card usage capacity	0	R
28 to 46 (1CH to 2EH)	System area		—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
47 to 54 (2FH to 36H)	Network connection status area	IP address (string notation)		—	R
55 to 56 (37H to 38H)		IP address		0	R
57 to 58 (39H to 3AH)		Subnet mask		0	R
59 to 60 (3BH to 3CH)		Default gateway		0	R
61 to 62 (3DH to 3EH)		DNS server 1 address		0	R
63 to 64 (3FH to 40H)		DNS server 2 address		0	R
65 to 69 (41H to 45H)		System area		—	—
70 (46H)	Common setting status area	IP address specification method		0	R
71 to 72 (47H to 48H)		IP address		0	R
73 to 74 (49H to 4AH)		Subnet mask		0	R
75 to 76 (4BH to 4CH)		Default gateway		0	R
77 to 78 (4DH to 4EH)		DNS server 1 address		0	R
79 to 80 (4FH to 50H)		DNS server 2 address		0	R
81 to 86 (51H to 56H)		System area		—	—
87 to 139 (57H to 8BH)	System area			—	—
140 (8CH)	Current error area	Error code		0	R
141 (8DH)		System area		—	—
142 to 147 (8EH to 93H)		Time		0	R
148 to 149 (94H to 95H)		System area		—	—
150 (96H)	Error log area	Error count		0	R
151 (97H)		Error log write pointer		0	R
152 (98H)		Error log 1	Error code	0	R
153 (99H)			System area	—	—
154 to 159 (9AH to 9FH)			Time	0	R
160 to 161 (A0H to A1H)			System area	—	—
162 to 311 (A2H to 137H)		Error log 2 to 16	Same as error log 1		
312 to 1499 (138H to 5DBH)	System area			—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
1500 (5DCH)	Recording status area	Recording status 1	System area	—	—
1501 (5DDH)			In recording operation	0	R
1502 (5DEH)			Recording start error	0	R
1503 (5DFH)			Recording start error cause	0	R
1504 (5E0H)			File saving trigger monitor	0	R
1505 (5E1H)			Recording files saving	0	R
1506 (5E2H)			Data sampling	0	R
1507 (5E3H)			Recording buffer storing status	0	R
1508 (5E4H)			Recording files saving completion	0	R
1509 (5E5H)			Recording files saving error	0	R
1510 (5E6H)			Recording files saving completion code	0	R
1511 (5E7H)			Recording files saving count	0	R/W
1512 to 1513 (5E8H to 5E9H)			System area	—	—
1514 (5EAH)			Recording files saving progress	0	R
1515 to 1522 (5EBH to 5F2H)			Recording files saving path (setting type folder)	0	R
1523 to 1555 (5F3H to 613H)			Recording files saving path (under setting type folder)	0	R
1556 to 1574 (614H to 626H)			System area	—	—
1575 (627H)			Recording startup trigger count	0	R
1576 (628H)			Invalid recording startup trigger count	0	R
1577 (629H)			File saving trigger count	0	R
1578 (62AH)			Invalid file saving trigger count	0	R
1579 to 1580 (62BH to 62CH)			Average device/label sampling interval	0	R
1581 to 1582 (62DH to 62EH)			Average device/label sampling size	0	R
1583 to 1584 (62FH to 630H)			Device/label maximum sampling period	0	R
1585 (631H)			Recording buffer status	0	R
1586 (632H)			Sampling execution time (ms unit)	0	R
1587 (633H)			Sampling execution time (μs unit)	0	R
1588 (634H)			Accumulating execution time (ms unit)	0	R
1589 (635H)			Accumulating execution time (μs unit)	0	R
1590 to 1699 (636H to 6A3H)	Recording status area	Recording status 1	System area	—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
1700 to 2299 (6A4H to 8FBH)	Recording status area	Recording status 2 to 4	Same as recording status 1		
2300 to 3199 (8FCH to C7FH)		System area		—	—
3200 (C80H)	Recording setting information area	Recording setting information 1	Recording buffer size	0	R
3201 to 3202 (C81H to C82H)			Saving period	0	R
3203 (C83H)			Saving setting when there is no free folder number	0	R
3204 (C84H)			Recording startup trigger specification	0	R
3205 (C85H)			Recording startup trigger establishment condition	0	R
3206 (C86H)			Saving specification after the specified time has elapsed from recording completion	0	R
3207 to 3208 (C87H to C88H)			Waiting time from recording completion to file saving	0	R
3209 (C89H)			Establishment condition of file saving trigger	0	R
3210 (C8AH)			Recording files saving destination	0	R
3211 to 3299 (C8BH to CE3H)			System area	—	—
3300 to 3599 (CE4H to E0FH)		Recording setting information 2 to 4	Same as recording setting information 1		
3600 to 3999 (E10H to F9FH)		System area		—	—
4000 (FA0H)	Recording operation specification area	Recording operation specification 1	System area	—	—
4001 (FA1H)			Recording buffer batch saving mode	0	R/W
4002 to 4003 (FA2H to FA3H)			Folder name additional data 1	0	R/W
4004 to 4005 (FA4H to FA5H)			Folder name additional data 2	0	R/W
4006 (FA6H)			System area	—	—
4007 (FA7H)			File saving trigger	0	R/W
4008 to 4099 (FA8H to 1003H)			System area	—	—
4100 to 4399 (1004H to 112FH)		Recording operation specification 2 to 4	Same as recording operation specification 1		
4400 to 4799 (1130H to 12BFH)		System area		—	—
4800 to 8999 (12C0H to 2327H)	System area			—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
9000 to 9255 (2328H to 2427H)	File server saving area	File server saving 1	Recording files saving path (setting type folder)	0	R
9256 to 9399 (2428H to 24B7H)			System area	—	—
9400 to 10599 (24B8H to 2967H)		File server saving 2 to 4	Same as file server saving 1		
10600 to 10999 (2968H to 2AF7H)		System area		—	—
11000 to 13391 (2AF8H to 344FH)	System area			—	—

Address Dec (Hex)	Application	Name			Initial value	R/W
13392 (3450H)	Firmware update history information	Firmware update completion with/without an error			0	R
13393 to 13401 (3451H to 3459H)		System area			—	—
13402 (345AH)		Latest firmware update information	History information	Execution time (year)	0	R
13403 (345BH)				Execution time (month)	0	R
13404 (345CH)				Execution time (day)	0	R
13405 (345DH)				Execution time (hour)	0	R
13406 (345EH)				Execution time (minute)	0	R
13407 (345FH)				Execution time (second)	0	R
13408 (3460H)				Execution time (day of the week)	0	R
13409 (3461H)				Firmware version after update	0	R
13410 (3462H)				Firmware version before update	0	R
13411 (3463H)		Latest firmware update result		Firmware update target	0	R
13412 (3464H)				Firmware update result	0	R
13413 (3465H)		Previous firmware update information	History information	Execution time (year)	0	R
13414 (3466H)				Execution time (month)	0	R
13415 (3467H)				Execution time (day)	0	R
13416 (3468H)				Execution time (hour)	0	R
13417 (3469H)				Execution time (minute)	0	R
13418 (346AH)				Execution time (second)	0	R
13419 (346BH)				Execution time (day of the week)	0	R
13420 (346CH)				Firmware version after update	0	R
13421 (346DH)				Firmware version before update	0	R
13422 (346EH)		Previous firmware update result		Firmware update target	0	R
13423 (346FH)				Firmware update result	0	R
13424 to 13427 (3470H to 3473H)		System area			—	—
13428 to 30003 (3474H to 7533H)	System area				—	—

Address Dec (Hex)	Application	Name	Initial value	R/W
30004 to 30011 (7534H to 753BH)	SD memory card history information area	System area	—	—
30012 to 30013 (753CH to 753DH)		Write count	0	R
30014 (753EH)		System area	—	—
30100 to 32815 (7594H to 802FH)	System area		—	—

Buffer memory details

The following explains the buffer memory details of a recorder module.

Module status area (Un\G0 to 20)

The status of each LED of a recorder module can be checked.

Buffer memory name	Address	Description
RUN LED status	Un\G0	0: OFF 1: ON
ERR LED status	Un\G1	0: OFF 1: ON 2: Flashing
CARD RDY LED status	Un\G2	0: OFF 1: ON
OPR LED status	Un\G4	0: OFF 1: ON
INFO LED status	Un\G5	0: OFF 1: ON
INFO LED lighting factor*1	Un\G12	The factor that the INFO LED turns ON is stored. • b0: ON: SD memory card free capacity lowering • b1: ON: No save folder free number
Recording operation setting*2	Un\G17	The recording operation setting of a recorder module is stored. 0: Main

*1 Check the INFO LED lighting factor, and take a corrective action shown in the following table:

Lighting factor	Location to check	Corrective action
SD memory card free capacity lowering	b0	Check 'SD memory card information area' (Un\G21 to 27) in the buffer memory to make sure that there is a sufficient free space. Delete unnecessary recording files in an SD memory card for a required capacity. ☞ Page 142 Troubleshooting on INFO LED
No save folder free number	b1	It turns ON if there is no free folder number when and after saving a recording file. Delete unnecessary recording files from an SD memory card as necessary. ☞ Page 142 Troubleshooting on INFO LED

*2 Only for a recorder module the version of which is 04 or later.

SD memory card information area (Un\G21 to 27)

The status of an SD memory card inserted in a recorder module can be checked.

Buffer memory name	Address	Description
SD memory card total capacity	Un\G21 to 22	The capacity of an SD memory card is stored (unit: KB).
SD memory card free capacity	Un\G23 to 24	The free space on an SD memory card is stored (unit: KB).
SD memory card usage rate	Un\G25	The usage rate of an SD memory card is stored (unit: %).
SD memory card usage capacity	Un\G26 to 27	The usage capacity of an SD memory card is stored (unit: KB).

Network connection status area (Un\G47 to 69)

The network connection status of a recorder module can be checked.

Buffer memory name	Address	Description
IP address (string notation)	Un\G47 to 54	Stored as a string.
IP address	Un\G55 to 56	Stored as a double word (32-bit value). • Un\G55: Third octet, fourth octet • Un\G56: First octet, second octet
Subnet mask	Un\G57 to 58	Stored as a double word (32-bit value). • Un\G57: Third octet, fourth octet • Un\G58: First octet, second octet
Default gateway	Un\G59 to 60	Stored as a double word (32-bit value). • Un\G59: Third octet, fourth octet • Un\G60: First octet, second octet
DNS server 1 address	Un\G61 to 62	Stored as a double word (32-bit value). • Un\G61: Third octet, fourth octet • Un\G62: First octet, second octet
DNS server 2 address	Un\G63 to 64	Stored as a double word (32-bit value). • Un\G63: Third octet, fourth octet • Un\G64: First octet, second octet

Common setting status area (Un\G70 to 86)

The status of the own node setting in the common setting can be checked.

Buffer memory name	Address	Description
IP address specification method	Un\G70	The specification method of an IP address is stored. 0: Acquire Automatically 1: Specify
IP address	Un\G71 to 72	Stored as a double word (32-bit value). • Un\G71: Third octet, fourth octet • Un\G72: First octet, second octet
Subnet mask	Un\G73 to 74	Stored as a double word (32-bit value). • Un\G73: Third octet, fourth octet • Un\G74: First octet, second octet
Default gateway	Un\G75 to 76	Stored as a double word (32-bit value). • Un\G75: Third octet, fourth octet • Un\G76: First octet, second octet
DNS server 1 address	Un\G77 to 78	Stored as a double word (32-bit value). • Un\G77: Third octet, fourth octet • Un\G78: First octet, second octet
DNS server 2 address	Un\G79 to 80	Stored as a double word (32-bit value). • Un\G79: Third octet, fourth octet • Un\G80: First octet, second octet

Current error area (Un\G140 to 149)

The latest code of an error occurring can be checked.

Buffer memory name	Address	Description
Error code	Un\G140	The latest error code is stored.
Time	Un\G142	b0 to 7: Time zone and summer time flag b8 to 15: System area
	Un\G143	b0 to 7: Last two digits of the year b8 to 15: Month (01 to 12)
	Un\G144	b0 to 7: Day (01 to 31) b8 to 15: Hour (00 to 23)
	Un\G145	b0 to 7: Minute (00 to 59) b8 to 15: Second (00 to 59)
	Un\G146	b0 to 7: Day of the week (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat) b8 to 15: First two digits of the year
	Un\G147	b0 to 7: First two digits of the millisecond b8 to 15: Last two digits of the millisecond

■Error code (Un\G140)

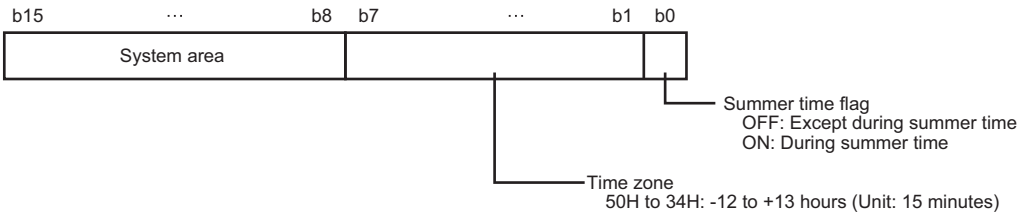
An error code is stored.

■Time (Un\G142 to 149)

The time when an error occurred is stored as a BCD code.

	b15 … b8	b7 … b0
Un\G142	System area	Time zone and summer time flag *1
Un\G143	Month (01H to 12H)	Year (00H to 99H) last 2 digits
Un\G144	Hour (00H to 23H)	Day (01H to 31H)
Un\G145	Second (00H to 59H)	Minute (00H to 59H)
Un\G146	Year (00H to 99H) first 2 digits	Day of the week (0H to 6H)
Un\G147	Lower milliseconds (00H to 99H)	Upper milliseconds (00H to 09H)

*1 Time zone and summer time flag details are as follows:



Error log area (Un\G150 to 311)

The history of an error occurred in a recorder module can be checked.

Buffer memory name		Address	Description
Error count		Un\G150	The total number of times an error log is registered in the error log area is stored.
Error log write pointer		Un\G151	An error log number in which the latest error log is registered is stored. 0: No error 1 to 16: Error log number
Error log 1	Error code	Un\G152	An error code is stored.
	Time	Un\G154	b0 to 7: Time zone and summer time flag b8 to 15: System area
		Un\G155	b0 to 7: Last two digits of the year b8 to 15: Month (01 to 12)
		Un\G156	b0 to 7: Day (01 to 31) b8 to 15: Hour (00 to 23)
		Un\G157	b0 to 7: Minute (00 to 59) b8 to 15: Second (00 to 59)
		Un\G158	b0 to 7: Day of the week (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat) b8 to 15: First two digits of the year
		Un\G159	b0 to 7: First two digits of the millisecond b8 to 15: Last two digits of the millisecond
Error log 2 to 16		Un\G162 to 311	Details are the same as error log 1.

■Error count (Un\G150)

The total number of times an error log is registered in the error log area is stored.

■Error log write pointer (Un\G151)

An error log number in which the latest error log is registered is stored. (When '16' is stored, the latest error log is registered in the area of error log 16.)

Up to 15 continuation errors and 1 stop error are registered.

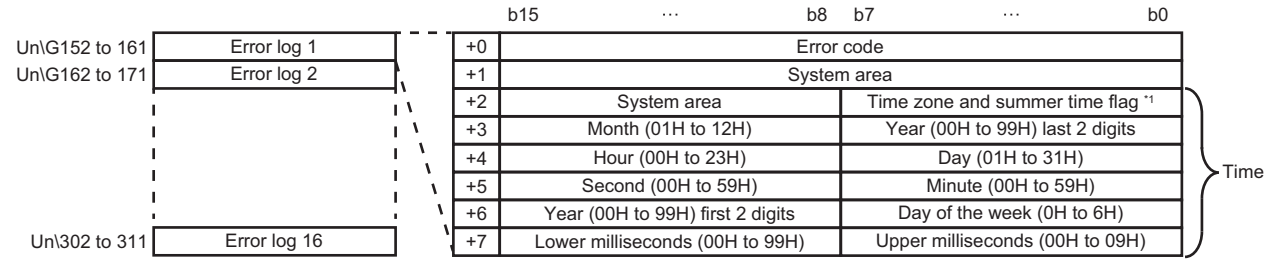
If 15 continuation errors are displayed, new continuation errors will not be registered. If the new error has the same error code as the already registered error, the error occurrence date/time and its detailed information will not be updated.

Even if a new error occurs after a stop error occurs, the new one is not registered.

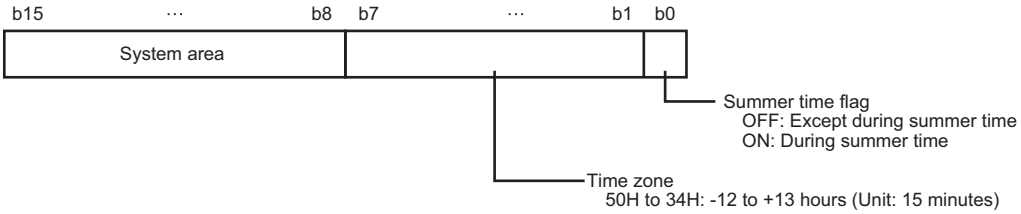
■Error log (Un\G152 to 311)

The history of an error occurred in a recorder module is stored.

The error log area consists of 16 error logs with the same data configuration.



*1 Time zone and summer time flag details are as follows:



● Error code

An error code is stored.

● Time

The time when an error occurred is stored as a BCD code.

Recording status area (Un\G1500 to 3199)

The recording status can be checked.

Buffer memory name		Address	Description
Recording status 1	In recording operation	Un\G1501	The operating status of the recording function is stored. (☞ Page 57 Operating status) 0: Stopped 1: Operating The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 189 In recording operation (Un\G1501)
	Recording start error[*1]	Un\G1502	Whether an error occurred when the recording function started running is stored. 0: No error 1: Error exists The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 189 Recording start error (Un\G1502)
	Recording start error cause[*1]	Un\G1503	The code of an error that occurred when the recording function started running is stored. 0: No error Values other than 0: Error code The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 189 Recording start error cause (Un\G1503)
	File saving trigger monitor	Un\G1504	Whether a file saving trigger is satisfied is stored. 0: Unsatisfied 1: Satisfied When '1' (satisfied) is stored, recording startup triggers and file saving triggers are disabled. The period during which '1' (satisfied) is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 190 File saving trigger monitor (Un\G1504)
	Recording files saving	Un\G1505	Whether a recording file is being saved is stored. 0: Not saving 1: Saving The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 190 Recording files saving (Un\G1505)
	Data sampling	Un\G1506	Whether devices and labels are being sampled and accumulated is stored. 0: Not sampling 1: Sampling ■When selecting "File Saving Trigger Only" for the recording method • '1' (sampling) is stored when the recording function starts running ('1' (operating) is stored in 'In recording operation' (Un\G1501)) after starting the function. • '0' (not sampling) is stored when saving a recording file starts, and '1' (sampling) is stored after the file saving is completed. • '0' (not sampling) is stored when stopping the operation of the recording function or a module stop error occurs. ■When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method • '1' (sampling) is stored when a recording startup trigger is satisfied, and '0' (not sampling) is stored after devices and labels for a saving period are accumulated. • When '1' (sampling) is stored, data accumulation stops and '0' (not sampling) is stored if the capacity of accumulated data exceeds that of the recording buffer. (☞ Page 54 Recording buffer) • '0' (not sampling) is stored when stopping the operation of the recording function or a module stop error occurs.

Buffer memory name		Address	Description
Recording status 1	Recording buffer storing status*1	Un\G1507	Whether data in a sampled device and label is accumulated in the recording buffer is stored. 0: No data 1: Data exists '1' (data exists) is stored when a device and label are sampled and data is accumulated in the recording buffer. '0' (no data) is stored when saving a recording file starts. When a recording startup trigger is satisfied, accumulated data is discarded and '0' (no data) is stored. When the operating status switches to 'operating' after starting the recording function, '0' (no data) is stored. (It is initialized to '0' (no data).)
	Recording files saving completion*1	Un\G1508	Whether saving a recording file is completed is stored. 0: Not completed 1: Completed The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 190 Recording files saving completion (Un\G1508)
	Recording files saving error*1	Un\G1509	Whether an error occurred when saving a recording file is stored. 0: No error 1: Error exists The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 190 Recording files saving error (Un\G1509)
	Recording files saving completion code*1	Un\G1510	The code of an error occurred when saving a recording file is stored. 0: No error Values other than 0: File saving failed (error code) The timing when a value is stored differs depending on the version of a recorder module used. For details, refer to the following: ☞ Page 190 Recording files saving completion code (Un\G1510)
	Recording files saving count*1	Un\G1511	The number of recording file saving executions (both successful and failed) is stored. It is initialized to '0' when the operating status switches to 'operating' after turning the power ON or resetting a CPU module and starting the recording function. In addition, it is initialized to '0' when the operating status switches to 'operating' after adding or changing a recording setting and starting the recording function. When it reaches 65535 times, it returns to 1 and continues counting. If it is reset, '0' is stored. (Value to be stored: 0 to 65535)
	Recording files saving progress*1	Un\G1514	The progress rate (%) of saving a recording file is stored. For a recorder module the version of which is 04 or later, the progress rate of all recording settings including sub modules is stored. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Value to be stored: 0 to 100%)

Buffer memory name		Address	Description
Recording status 1	Recording files saving path (setting type folder)[*1]	Un\G1515 to 1522	The path to the setting type folder for a recording file last saved to an SD memory card is stored. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Example) When the path to a recording file is /SD/RECORD/RC1/1TS01_001, /SD/RECORD/RC1/ is stored.
	Recording files saving path (under setting type folder)[*1]	Un\G1523 to 1555	The path under the setting type folder to a last saved recording file is stored. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Example) When the path to a recording file is /SD/RECORD/RC1/1TS01_001, 1TS01_001 is stored.
	Recording startup trigger count[*1*2]	Un\G1575	When the operating status of the recording function is 'operating,' the number of times that a recording startup trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid recording startup trigger count[*1*2]	Un\G1576	When the operating status of the recording function is 'operating,' the number of invalid recording startup triggers among the recording startup triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	File saving trigger count[*1*2]	Un\G1577	When the operating status of the recording function is 'operating,' the number of times that a file saving trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid file saving trigger count[*1*2]	Un\G1578	When the operating status of the recording function is 'operating,' the number of invalid file saving triggers among the file saving triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Average device/label sampling interval[*1*3]	Un\G1579 to 1580	The average value of device and label sampling intervals is stored (unit: millisecond). It is calculated based on eight moving averages. If an average value exceeds 4294967295 milliseconds, 4294967295 is stored.
	Average device/label sampling size[*1*3]	Un\G1581 to 1582	The average size of devices and labels to be sampled at a time is stored (unit: KB).
	Device/label maximum sampling period[*1*3]	Un\G1583 to 1584	The maximum period during which a device and label can be sampled in the current setting is stored (unit: second). A period is calculated with the following formula each time a device and label are sampled. • Recording buffer size ÷ Average device/label sampling size × Average device/label sampling interval If a period exceeds 4294967295 seconds, 4294967295 is stored.
	Recording buffer status[*1]	Un\G1585	Whether the recording buffer capacity is sufficient for a saving period set in the recording setting is stored. 0: Sufficient 1: Insufficient '1' (insufficient) is stored when a value in 'Device/label maximum sampling period' (Un\G1583 to 1584) is smaller than a set saving period. If a value in 'Device/label maximum sampling period' (Un\G1583 to 1584) and a set saving period are extremely close, '0' (sufficient) and '1' (insufficient) may be stored alternately in a short time. It is initialized to '0' (sufficient) when the operating status switches to 'operating' after starting the recording function.
	Sampling execution time (ms unit)	Un\G1586	The data sampling execution time of a CPU module is stored.[*4*5*6] When using a recording startup trigger or specifying a device as a file saving trigger, the time required for trigger detection is also included. Note that when an interrupt program is executed during the END processing, the execution time of the interrupt program is also included in the sampling time, and if the program execution time of a CPU module is shorter than the accumulating execution time of a recorder module, the accumulating execution time is included in the sampling execution time of the CPU module. • Sampling execution time (ms unit): An ms digit is stored (value to be stored: 0 to 65535). • Sampling execution time (μs unit): A μs digit is stored (value to be stored: 0 to 999).
	Sampling execution time (μs unit)	Un\G1587	

Buffer memory name		Address	Description
Recording status 1	Accumulating execution time (ms unit)	Un\G1588	The data accumulating execution time of a recorder module is stored.*6*7*8 • Accumulating execution time (ms unit): An ms digit is stored (value to be stored: 0 to 65535). • Accumulating execution time (μs unit): A μs digit is stored (value to be stored: 0 to 999).
	Accumulating execution time (μs unit)	Un\G1589	
Recording status 2 to 4		Un\G1700 to 2299	Details are the same as recording status 1.

*1 A value is not updated when the operating status is 'stopped.'
*2 '0' is stored when turning the power ON or resetting a CPU module.
It starts from '0' when the operating status switches to 'operating' after adding or changing a recording setting and starting the recording function. When it reaches 65535 times, it returns to 1 and continues counting.
*3 If the sufficient number of times of data sampling is not performed for calculation after data sampling starts, an error occurs.
It is cleared to the initial value (0) when the operating status switches to 'operating' after starting the recording function.
*4 A value is updated when data in a CPU module is sampled.
*5 When the sampling execution time is 23.6 ms, it is stored as follows:
Sampling execution time (ms unit): 23
Sampling execution time (μs unit): 600
*6 Initialized to '0' in any of the following cases:
The power is turned ON.
A CPU module is reset.
The recording function is started.
*7 A value is updated when data accumulation for a recorder module is completed.
*8 When the accumulating execution time is 23.6 ms, it is stored as follows:
Accumulating execution time (ms unit): 23
Accumulating execution time (μs unit): 600

■In recording operation (Un\G1501)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (stopped)	• The recording function is stopped*1 or a module stop error occurs.	• The recording function is stopped, and a recorder module and all sub modules with recording target data stop operating.*1 • A module stop error occurs in a recorder module.
1 (operating)	• The recording function starts running after starting the function.	• A recorder module and all sub modules with recording target data start operating after starting the recording function.*2

*1 When the operating status is 'saving trigger establishment' or 'saving,' a value is stored at either of the following timings:
Version 03 or earlier: After saving is completed
Version 04 or later: After saving is completed in a recorder module and all sub modules with recording target data
*2 If there is any sub module that cannot start operating, a value is stored when the other sub modules and a recorder module start operating.

■Recording start error (Un\G1502)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (no error)	• The operating status switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)	• The operating status of a recorder module switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)
1 (error exists)*1	• A CPU module or recorder module cannot start recording due to an error after starting the recording function.	• A CPU module or recorder module cannot start recording due to an error after starting the recording function. • There is any sub module with recording target data that cannot start recording after starting the recording function.

*1 An error cause can be checked in 'Recording start error cause' (Un\G1503).

■Recording start error cause (Un\G1503)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (no error)	• The operating status switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)	• The operating status of a recorder module switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)
Values other than 0 (error code)	• A CPU module or recorder module cannot start recording due to an error after starting the recording function.	• A CPU module or recorder module cannot start recording due to an error after starting the recording function. • There is any sub module with recording target data that cannot start recording after starting the recording function.

■File saving trigger monitor (Un\G1504)

'1 (satisfied)' is stored during either of the following periods:

Value	Version 03 or earlier	Version 04 or later
1 (satisfied)	• From when a file saving trigger is satisfied to when saving is completed	• From when a file saving trigger is satisfied to when saving is completed in a recorder module and all sub modules with recording target data

■Recording files saving (Un\G1505)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (not saving)	• Saving a recording file is completed.	• Saving a recording file is completed in a recorder module and all sub modules with recording target data.
1 (saving)	• Saving a recording file is started.	• Saving a recording file is started.

■Recording files saving completion (Un\G1508)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (not completed)	• A file saving trigger is satisfied. • The operating status switches to 'operating' after starting the recording function. (It is initialized to '0' (not completed).)	• A file saving trigger is satisfied. • The operating status of a recorder module switches to 'operating' after starting the recording function. (It is initialized to '0' (not completed).)
1 (completed)	• Saving a recording file is completed.	• Saving a recording file is completed in a recorder module and all sub modules with recording target data.

■Recording files saving error (Un\G1509)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (no error)	• A file saving trigger is satisfied. • The operating status switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)	• A file saving trigger is satisfied. • The operating status of a recorder module switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)
1 (error exists)	• Saving a recording file fails.	• Saving a recording file fails in a recorder module. • Saving a recording file fails in a sub module with recording target data. • There is video data that failed to be saved in all sub modules with recording target data.

■Recording files saving completion code (Un\G1510)

Each value is stored at each timing as follows:

Value	Version 03 or earlier	Version 04 or later
0 (no error)	• A file saving trigger is satisfied. • The operating status switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)	• A file saving trigger is satisfied. • The operating status of a recorder module switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)
Values other than 0 (error code)	• Saving a recording file fails.	• Saving a recording file fails in a recorder module. • Saving a recording file fails in a sub module with recording target data. • There is video data that failed to be saved in all sub modules with recording target data.

Recording setting information area (Un\G3200 to 3999)

Setting information of recording settings can be checked.

Buffer memory name		Address	Description
Recording setting information 1*1	Recording buffer size	Un\G3200	The recording buffer capacity set in the module parameter is stored (unit: MB).
	Saving period	Un\G3201 to 3202	A saving period set in the recording setting is stored (unit: second). ■When selecting "File Saving Trigger Only" for the recording method Total saving period before and after trigger ■When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method Accumulation period
	Saving setting when there is no free folder number	Un\G3203	A saving setting when there is no free folder number set in the recording setting is stored. 0: Overwrite 1: Not save
	Recording startup trigger specification	Un\G3204	A recording startup trigger specification set in the recording setting is stored. 0: Not specify (when selecting "File Saving Trigger Only" for the recording method) 1: Specify (when selecting "Recording Startup Trigger + File Saving Trigger" for the recording method)
	Recording startup trigger establishment condition*2	Un\G3205	The condition to satisfy a recording startup trigger set in the recording setting is stored in b0. OFF: Rising ON: Falling
	Saving specification after the specified time has elapsed from recording completion*2	Un\G3206	The saving specification after the specified time has elapsed from recording completion set in the recording setting is stored. 0: Not specify 1: Specify
	Waiting time from recording completion to file saving*3	Un\G3207 to 3208	The waiting time from recording completion to file saving set in the recording setting is stored (unit: second).
	Establishment condition of file saving trigger*4	Un\G3209	The condition to satisfy a file saving trigger set in the recording setting is stored. OFF: Rising ON: Falling
	Recording files saving destination	Un\G3210	The save destination for a recording file set in the recording setting is stored. 0: SD memory card 1: File server
Recording setting information 2 to 4*1		Un\G3300 to 3599	Details are the same as recording setting information 1.

*1 A value is updated when the operating status switches to 'operating.'

*2 Enabled only when specifying a recording startup trigger.

*3 Enabled only when specifying a recording startup trigger and selecting the checkbox of "Save after specified time elapses from recording completion."

*4 A set condition and a bit in the buffer memory are linked by a condition number as follows:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Recording setting No.1: Un\G3209	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.2: Un\G3309	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.3: Un\G3409	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.4: Un\G3509	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Recording operation specification area (Un\G4000 to 4799)

File saving triggers for recording, the recording buffer batch saving mode, and data values added to save folder names can be checked.

Buffer memory name		Address	Description
Recording operation specification 1	Recording buffer batch saving mode	Un\G4001	Use this to specify the recording buffer batch saving mode. When enabling this mode, '1' (ON) is stored. 0: Not use the batch saving mode (OFF) 1: Use the batch saving mode (ON)
	Folder name additional data 1	Un\G4002 to 4003	Data 1 added to a recording file save folder name. Use these when specifying "DATA1" as additional information for a recording file save folder name.
	Folder name additional data 2	Un\G4004 to 4005	Data 2 added to a recording file save folder name. Use these when specifying "DATA2" as additional information for a recording file save folder name.
	File saving trigger	Un\G4007	Use this for file saving triggers.
Recording operation specification 2 to 4		Un\G4100 to 4399	Details are the same as recording operation specification 1.

■Recording buffer batch saving mode (Un\G4001)

Use this to specify the recording buffer batch saving mode. (☞ Page 56 Recording buffer batch saving mode)

A value when a file saving trigger is satisfied will be valid.

'0' (not use the batch saving mode) is stored at either of the following timings:

- The power is turned ON or a CPU module is reset.
- The operating status switches to 'operating' after writing a recording setting.

■Folder name additional data 1 (Un\G4002 to 4003)/folder name additional data 2 (Un\G4004 to 4005)

Use these to specify data added to a recording file save folder name. (☞ Page 44 Recording file)

When setting "DATA1" or "DATA2" as additional information for a folder name, a value in this buffer memory is added to the folder name.

A value when a file saving trigger is satisfied will be valid.

A value is cleared to the initial value (0) at either of the following timings:

- The power is turned ON or a CPU module is reset.
- The operating status switches to 'operating' after writing a recording setting.

■File saving trigger (Un\G4007)

Use this for file saving triggers.

It can be used in bit units.

A condition number is added to each bit as follows:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Recording setting No.1: Un\G4007	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
Recording setting No.2: Un\G4107	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
Recording setting No.3: Un\G4207	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01
Recording setting No.4: Un\G4307	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01

A value is cleared to the initial value (OFF) at either of the following timings:

- A module is started.
- The operating status switches to 'operating' after writing a recording setting.

File server saving information area (Un\G9000 to 10999)

The path to the setting type folder for a recording file saved to a file server can be checked.

Buffer memory name		Address	Description
File server saving 1	Recording files saving path (setting type folder)	Un\G9000 to 9255	The path to the setting type folder for a last saved recording file is stored in Unicode. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. A value is not updated when the operating status is 'stopped.' (Example) When the path to a recording file is /HOSTNAME/SAVE/RECORD/RC1/1TS01_001, /HOSTNAME/SAVE/RECORD/RC1/ is stored.*1
File server saving 2 to 4		Un\G9400 to 10599	Details are the same as file server saving 1.

*1 '1TS01_001' is stored in 'Recording files saving path (under setting type folder)' (Un\G1523 to 1555).

Firmware update history information area (Un\G13392 to 13427)

The firmware update history information of a recorder module can be checked.

Buffer memory name			Address	Description
Firmware update completion with/without an error			Un\G13392	The error occurrence state on the firmware update function is stored. • 0: Update completed without an error (including successful completion) • 1: Update completed with an error When any of 100 to 300H is stored in 'Firmware update result' (Un\G13412), '1' is stored.
System area			Un\G13393 to 13401	Use prohibited
Latest firmware update information	History information	Execution time (year)	Un\G13402	The value of the year (four digits) when the firmware update was executed is stored as a BIN code.
		Execution time (month)	Un\G13403	The value of the month when the firmware update was executed is stored as a BIN code.
		Execution time (day)	Un\G13404	The value of the day when the firmware update was executed is stored as a BIN code.
		Execution time (hour)	Un\G13405	The value of the hour when the firmware update was executed is stored as a BIN code.
		Execution time (minute)	Un\G13406	The value of the minutes when the firmware update was executed is stored as a BIN code.
		Execution time (second)	Un\G13407	The value of the seconds when the firmware update was executed is stored as a BIN code.
		Execution time (day of the week)	Un\G13408	The value of the day of the week when the firmware update was executed is stored as a BIN code. (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat)
		Firmware version after update	Un\G13409	The firmware version after update is stored. (When the update is completed with an error, '0' is stored.)
		Firmware version before update	Un\G13410	The firmware version before update is stored.
Latest firmware update result		Firmware update target	Un\G13411	The start input/output number of the module where the firmware update was executed is stored.
		Firmware update result	Un\G13412	The execution result of the firmware update is stored. • 1H: Normal end • 100H: Flash ROM error • 200H: Model mismatched • 201H: File invalid • 203H: Firmware update prohibited state • 300H: Firmware data error
Previous firmware update information	History information	Execution time (year)	Un\G13413	The value of the year (four digits) when the firmware update was executed is stored as a BIN code.
		Execution time (month)	Un\G13414	The value of the month when the firmware update was executed is stored as a BIN code.
		Execution time (day)	Un\G13415	The value of the day when the firmware update was executed is stored as a BIN code.
		Execution time (hour)	Un\G13416	The value of the hour when the firmware update was executed is stored as a BIN code.
		Execution time (minute)	Un\G13417	The value of the minutes when the firmware update was executed is stored as a BIN code.
		Execution time (second)	Un\G13418	The value of the seconds when the firmware update was executed is stored as a BIN code.
		Execution time (day of the week)	Un\G13419	The value of the day of the week when the firmware update was executed is stored as a BIN code. (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat)
		Firmware version after update	Un\G13420	The firmware version after update is stored. (When the update is completed with an error, '0' is stored.)
		Firmware version before update	Un\G13421	The firmware version before update is stored.

Buffer memory name		Address	Description
Previous firmware update result	Firmware update target	Un\G13422	The start input/output number of the module where the firmware update was executed is stored.
	Firmware update result	Un\G13423	The execution result of the firmware update is stored. • 1H: Normal end • 100H: Flash ROM error • 200H: Model mismatched • 201H: File invalid • 203H: Firmware update prohibited state • 300H: Firmware data error

SD memory card history information area (Un\G30004 to 30014)

The history information of an SD memory card inserted in a recorder module can be checked.

Buffer memory name	Address	Description
Write count*1	Un\G30012 to 30013	The number of writes to an SD memory card is stored.*2 An SD memory card has a life (a limit on the number of times for writing data), and use a value in this buffer memory as a guide to determine the time for replacement.

*1 Use one of the following SD memory cards manufactured by Mitsubishi Electric.
MELSEC iQ-R System Recorder User's Manual (Startup)

*2 The update frequency of the write count may differ depending on an SD memory card used.

7 CAMERA RECORDER MODULE (DETAILED SPECIFICATIONS)

This chapter explains the function details, module labels, input/output signals, and buffer memory of a camera recorder module.

7.1 Function Details

This section shows the details on the functions of a camera recorder module.

Recording function

This function can be used to accumulate data (devices and labels) sampled by a CPU module and video data delivered from a network camera, and save them and an event history of the CPU module as a recording file when a file saving trigger is satisfied.

For details, refer to the following:

☞ Page 16 Recording Function

Network camera communication function

This function can be used to communicate with a network camera via a network.

By communicating with a network camera, the following functions can be used.

Function	Description	Reference
Search	To search for up to 32 ONVIF supported network cameras in the same network as a camera recorder module.	Page 197 Search
Account authentication	To authenticate an account to connect a camera recorder module to an ONVIF supported network camera.	Page 198 Account authentication
Specific information monitoring*1	To acquire specific information of a network camera.	Page 198 Specific information monitoring
Video data delivery setting*1	To set parameters of a network camera connected to a camera recorder module.	Page 199 Video data delivery setting
Video data reception and accumulation*1	To receive and accumulate video data delivered from a network camera.	Page 199 Video data reception and accumulation
Time synchronization control*1	To synchronize the time between a camera recorder module and a network camera.	Page 199 Time synchronization control
PTZ control*1	To perform PTZ control on a network camera if it is supported by the network camera.	Page 200 PTZ control
Alive check*1	To periodically monitor whether the communication is established with a network camera.	Page 200 Alive check

*1 Can be used after account authentication is successful.

Search

Up to 32 ONVIF supported network cameras in the same network as a camera recorder module can be searched for.

This function can be performed in the "Network Camera List" screen in the module extended parameter. (☞ Page 88 Network camera list screen)

By using this function, an ONVIF supported network camera can be detected from an actual system configuration and information on the network camera (IP address and TCP port number) can be applied to the "Camera Individual Settings" screen. (☞ Page 86 Camera individual setting)

Precautions

- This function can be used when 'stopped' is stored in 'In recording operation' (Un\G1501, Un\G1701, Un\G1901, Un\G2101) of a camera recorder module.
- If 33 or more ONVIF supported network cameras are connected on the same network, the 33rd and later ones are not recognized. They are recognized in order from a searched one.
- A manufacturer name may be displayed including a model name in the "Network Camera List" screen.

Account authentication

An account can be authenticated to connect a camera recorder module to an ONVIF supported network camera.
For account authentication, the camera type, IP address, TCP port number, user ID, and password of a target network camera must be specified in the module extended parameter and written to a camera recorder module. (☞ Page 84 Module Extended Parameters (Camera Recorder Module))

Point

Before writing module extended parameters, a user ID and password can be checked in advance by performing the communication test in the "Communication Test" screen in the module extended parameter. (☞ Page 89 Communication test screen)
However, the communication test can be performed only when 'stopped' is stored in 'In recording operation' (Un\G1501, Un\G1701, Un\G1901, Un\G2101) of a camera recorder module.
In addition, it can be performed on a network camera for which 'disabled' is stored in 'Network camera setting enabled/disabled' (Un\G34000, Un\G34500, Un\G35000, Un\G35500) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

Precautions

- Specify values set for a network camera to be connected for the IP address, TCP port number, user ID, and password in the module extended parameter.
- An account is authenticated when the communication with a network camera starts. If the camera type, IP address, or TCP port number is incorrect, a network camera undetected error (error code: 1D01H) occurs. In addition, if the user ID or password is incorrect, a network camera account authentication error (error code: 1D30H) occurs.
- Some ONVIF supported network cameras may require an account for ONVIF communication. For details, refer to the manual of a network camera used or visit the ONVIF website (www.onvif.org/conformant-products).

Specific information monitoring

Specific information of a network camera can be acquired.
Acquired information can be checked in the following screens or buffer memory; however, information that can be checked differs for each screen.

- "Network Camera List" screen in the module extended parameter (☞ Page 88 Network camera list screen)
- "Communication Test" screen in the module extended parameter (☞ Page 89 Communication test screen)
- Buffer memory of a camera recorder module (setting information in the network camera 1 to 4 status areas) (☞ Page 234 Network camera status area (Un\G34000 to 37999))

○: Can be checked, ×: Cannot be checked

Information	Network camera list screen*1	Communication test screen*1	Buffer memory*2
Camera manufacturer name	○	○	○
Camera model name	○	○	○
IP address	○	×	○
TCP port number	○	×	○
Camera F/W version	×	○	○
MAC address	×	○	○
Resolution support list	×	○	○
Frame rate support upper/lower limit value	×	○	○
PT support	×	○	○
Z support	×	○	○
PTZ speed support	×	○	○
Video rotation angle support	×	○	○
SNTP client function support	×	○	○

*1 Information on a network camera acquired when searching for the network camera or performing the communication test is displayed.
*2 Information on a network camera acquired when starting the communication with the network camera is displayed.

Video data delivery setting

Parameters of a network camera connected to a camera recorder module can be set.

They can be set in the "Camera Individual Settings" screen in the module extended parameter. (☞ Page 86 Camera individual setting)

Items that can be set are as follows:

Item	Description
Resolution	Set the resolution of video data. The higher the resolution, the larger the file size and the shorter the saving period.
Video Frame Rate	Set the number of frames of video data delivered from a network camera per second. The higher the video frame rate, the larger the file size and the shorter the saving period.
Video Codec	Set the encoding method for video data. • Motion JPEG: The video quality does not deteriorate because JPEG still images are played continuously. The bit rate is higher than H.264; therefore, the file size is larger and the saving period is shorter. • H.264: Only the part of a video changed from the reference frame is sent. The video quality is lower than Motion JPEG, but the file size can be reduced and the saving period is longer.
Video Rotation Angle	Set the video rotation angle of video data.
Video Quality	Set the video quality of video data. The higher the video quality, the larger the file size and the shorter the saving period. • High: The video quality is high, but the file size is large. • Middle: The video quality and file size are intermediate values between 'high' and 'low.' • Low: The video quality is low, but the file size is small.
Maximum Video Bit Rate	Set the maximum bit rate of video data delivered from a network camera per second. By limiting the bit rate of video data, the video quality is lower but the effect on other network devices can be reduced. Even when limiting the maximum video bit rate, a network camera operates to maintain the video quality; therefore, the bit rate value may exceed a set value depending on the combination of setting values of resolution/frame rate/video codec/video quality. When selecting "Motion JPEG" for the video codec in the required settings, the maximum video bit rate is not applied.

Precautions

- The range that can be set differs for each network camera. For details, refer to the manual of a network camera used or perform the communication test in the "Communication Test" screen in the module extended parameter to check the range. (☞ Page 89 Communication test screen)
- If a parameter out of the setting range is set, any of the following errors occurs.
  Network camera video setting error (error code: 1D50H, 1D51H, 1D52H)
  Network camera video rotation angle unsupported error (error code: 1D80H)

Video data reception and accumulation

Video data delivered from a network camera can be received and accumulated.

Based on information set in the following section, video data is delivered from a network camera.

☞ Page 199 Video data delivery setting

For details on video data reception and accumulation, refer to the following:

☞ Page 16 Recording Function

Time synchronization control

The time can be synchronized between a camera recorder module and a network camera.

For details, refer to the following:

☞ Page 201 Camera time synchronization function

PTZ control

PTZ control can be performed on a network camera if it is supported by the network camera.

For details, refer to the following:

☞ Page 203 Camera adjustment function (PTZ)

Alive check

Whether the communication is established with a network camera can be monitored periodically.

If the communication is interrupted, retries are performed every one second.

If 10 seconds elapse for a retry, a network camera communication error (error code: 1DF1H) occurs.

The retry continues even if an error occurs, and video data reception from a network camera restarts when the retry is successful.

In addition, a communication retry start (event code: 00600) and communication retry recovery (event code: 00610) are registered in the event history.

Point

The connection status can be checked for each network camera in 'Network camera connection status' (Un\G34300, Un\G34800, Un\G35300, Un\G35800) of a camera recorder module. (☞ Page 234 Network camera status area (Un\G34000 to 37999))

Precautions

When replacing a network camera with one with the same IP address, the communication restarts if the new network camera can operate with the same network camera setting.

Camera time synchronization function

This function can be used to synchronize the time between a camera recorder module and a network camera.
Time information set by using this function is used for the time in a network camera and a time stamp of video data delivered from the network camera.

Precautions

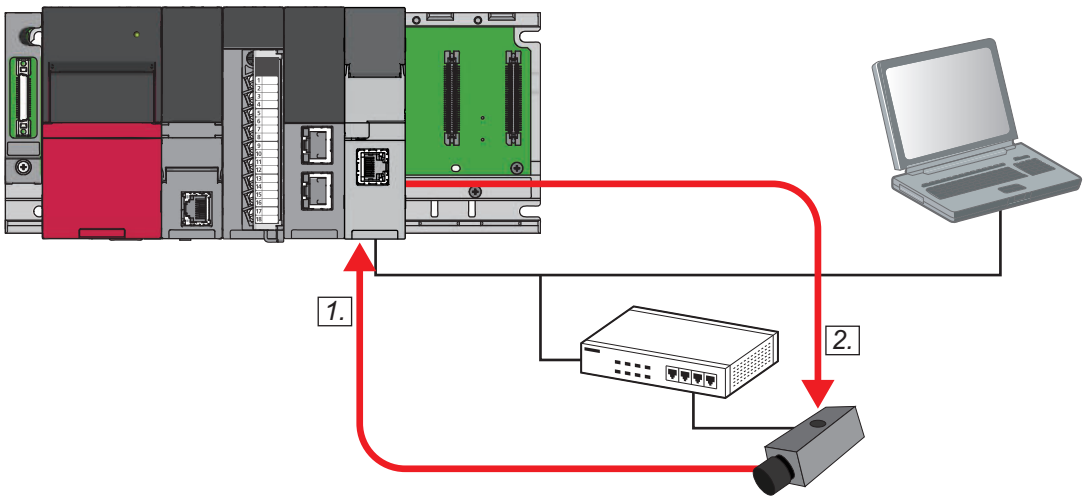
To use this function, account authentication is required. (☞ Page 198 Account authentication)

Time synchronization method

Time can be synchronized by using SNTP. The time synchronization destination, timing, and interval are as follows:

Destination	Timing	Interval
Camera recorder module	On request from a network camera	Depends on the specifications of a network camera used.

The flow of time synchronization is as follows:



1. A request for the time is sent.

2. The time in the camera recorder module is set for the network camera.

Steps 1 and 2 are repeated periodically.

Precautions

- When using an ONVIF supported network camera that does not support the SNTP client function, a network camera SNTP client unsupported error (error code: 1D90H) occurs.
- If the time synchronization setting from a camera recorder module to a network camera fails, a network camera time synchronization setting error (error code: 1DB0H) occurs.

Considerations

■Clock data setting of a CPU module

Before operating a camera recorder module, set the clock data in a CPU module. If the clock data is changed after operating the camera recorder module and the time does not match between the camera recorder module and a network camera, a network camera communication error (error code: 1DF1H) occurs.

For details on the clock data setting, refer to the following:

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

■Time synchronization using SNTP

When setting the time synchronization by using SNTP, the synchronization timing and interval depend on the specifications of a network camera used.

■Time zone and daylight saving time

The time zone and daylight saving time are not set for a network camera from a camera recorder module.

■Time setting using a dedicated tool for a network camera

Do not use a dedicated tool for a network camera for the time setting.

If it is used, the time information does not match that of a camera recorder module.

■Synchronization with the time information of a device and label

It may take time to synchronize a time stamp of video data delivered from a network camera with the time information of a device and label. Check the synchronization status in 'Time synchronization status' of a camera recorder module.

If the time synchronization is not completed, a video file is generated with a time when video data is received by a camera recorder module, not a time when video data is captured by a network camera. This may cause an error due to network delay.

Camera adjustment function (PTZ)

This function can be used to adjust the range of data captured by a network camera set in the module extended parameter. An adjusted range can also be registered in a camera recorder module as a preset position.

This function can be set and performed in the following:

- "Camera Individual Settings" screen in the module extended parameter (☞ Page 86 Camera individual setting)
- "Preset Position Settings" screen (☞ Page 91 Preset Position Setting (Camera Recorder Module))
- Sample screen of a GOT (📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1)

*1 Can be downloaded from Mitsubishi Electric FA site.

- Buffer memory of a camera recorder module

The following table shows the list of functions included in the camera adjustment function.

○: Can be performed/set, ×: Cannot be performed/set

Item	Description	Operation/setting availability			
		"Camera Individual Settings" screen	"Preset Position Settings" screen	Sample screen of a GOT	Buffer memory
PTZ control function	To adjust the range of data captured by a network camera by performing PTZ control.	×	×	○	×
Preset position function	To register an adjusted range (PTZ values) as a preset position. Moving to a registered preset position is also available.	×	○	○	○ (Moving to a preset position only)
PTZ control authority mode function	To set the authority to perform the PTZ control function and preset position function.	○	×	×	×

Precautions

To use this function, account authentication is required. (☞ Page 198 Account authentication)

PTZ control function

This function can be used to adjust the range of data captured by a network camera by setting PTZ values (pan, tilt, and zoom) and a movement speed value for a specified network camera in a camera recorder module.

The following table shows the setting items used for PTZ control.

Setting item	Description
Specified pan value	Specify a position to move the range of data captured by a network camera horizontally (-1000 to 1000).
Specified tilt value	Specify a position to move the range of data captured by a network camera vertically (-1000 to 1000).
Specified zoom value	Specify a position to zoom in or out the range of data captured by a network camera (0 to 1000).
Specified movement speed value	Specify a movement speed of the range of captured data by performing PTZ control (0 to 1000).

PTZ control can be performed in a sample screen of a GOT. (📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1)

*1 Can be downloaded from Mitsubishi Electric FA site.

Preset position function

This function can be used to register and delete up to 16 patterns of the current ranges of captured data (PTZ values) as preset positions for one specified network camera.

Moving to a registered preset position is also available.

Registering and deleting preset positions, and moving to a registered preset position can be performed in the "Preset Position Settings" screen or a sample screen of a GOT.

- "Preset Position Settings" screen (☞ Page 91 Preset Position Setting (Camera Recorder Module))
- Sample screen of a GOT (📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1)

*1 Can be downloaded from Mitsubishi Electric FA site.

Moving to a preset position is also available in the buffer memory of a camera recorder module.

■Registering a preset position

The range of data captured by a specified network camera can be written to the flash memory of a camera recorder module.

Up to 16 patterns of preset positions can be registered for one network camera.

Each preset position is numbered, and the current range of data captured by a network camera is stored as preset position information for each number.

If registering preset position information fails, a preset position registration error (error code: 1C60H) occurs.

Preset position information that can be registered is as follows:

Name	Description	Range
Preset position name	Refers to the name of a preset position.	Number of characters: Up to 32 characters Available characters: Basic Multilingual Plane in UTF-16LE*1
Position information (P)	Refers to a pan value (horizontal direction) when registering a preset position.	-1000 to 1000
Position information (T)	Refers to a tilt value (vertical direction) when registering a preset position.	-1000 to 1000
Position information (Z)	Refers to a zoom value (zoom in/out) when registering a preset position.	0 to 1000

*1 The following cannot be used. (Note that no error message is output when entering surrogate pair characters and combining characters.)
Characters other than ones in the Basic Multilingual Plane (U+10000 to U+10FFFF)
Line feed codes (U+2028, U+2029)
Surrogate pairs (0xD800 to 0xDBFF, 0xDC00 to 0xDFFF)
Control codes (U+0000 to U+001F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF)
Combining characters

Point

- If preset position information is already registered, it is overwritten when registering a preset position. Check the current preset position information before registering it.
- If the power of a camera recorder module is turned OFF while registering a preset position, the preset position information may be lost. Do not turn the power OFF during registration.
- If the preset position registration count upper limit is reached, a preset position registration count upper limit reach error (error code: 1CA0H) occurs.

■Deleting a preset position

Registered preset position information can be deleted from a camera recorder module.

After deletion, preset position information returns to its initial value.

When deleting a network camera in the setting screen of the module extended parameter and writing module extended parameters to a camera recorder module, preset position information of the corresponding network camera retained at the time of startup is also deleted from the camera recorder module.

If deleting preset position information fails, a preset position deletion error (error code: 1C70H) occurs.

■Moving to a preset position

The range of data captured by a network camera can be moved to a preset position registered in advance.

- Operation using the buffer memory of a camera recorder module

The following shows the operating procedure using the buffer memory.

1. Check the preset position registered for the number of a network camera to adjust the captured position.

It can be checked in 'Preset position 1 to 16' in 'Network camera 1 to 4 PTZ information' (Un\G38010 to 38649, Un\G38710 to 39349, Un\G39410 to 40049, Un\G40110 to 40749) of the camera recorder module. (☞ Page 239 PTZ control area (Un\G38000 to 43599))

2. Set a preset position number of a move destination in 'Specified preset position No.' (Un\G38006, Un\G38706, Un\G39406, Un\G40106) of the camera recorder module. (☞ Page 239 PTZ control area (Un\G38000 to 43599))

3. Change the value from '0' to '1' in 'Preset position execution request' (Un\G38008, Un\G38708, Un\G39408, Un\G40108) of the camera recorder module. (☞ Page 239 PTZ control area (Un\G38000 to 43599))

The range is adjusted by PTZ values of the specified preset position.

After adjustment, the value in 'PTZ operation status' (Un\G38002, Un\G38702, Un\G39402, Un\G40102) of the camera recorder module changes from 'preset request being executed: 7H' to 'preset request completed successfully: 8H.' (☞ Page 239 PTZ control area (Un\G38000 to 43599))

After '8H: preset request completed successfully' is stored in 'PTZ operation status,' return the value in 'Preset position execution request' from '1H: requested' to '0H: not requested.' The value in 'PTZ operation status' returns to '0H: not requested.'

Even if the value in 'Preset position execution request' is not returned to '0H: not requested,' the value in 'PTZ operation status' automatically returns to '0H: not requested' when 30 seconds elapses after '8H: preset request completed successfully' is stored.

Errors that occur

An error occurs if any of the following cases is applied when changing the value from '0' to '1' in 'Preset position execution request' (Un\G38008, Un\G38708, Un\G39408, Un\G40108) of a camera recorder module.

- If an unregistered preset position number is specified in 'Preset position 1 to 16' in 'Network camera 1 to 4 PTZ information' (Un\G38010 to 38649, Un\G38710 to 39349, Un\G39410 to 40049, Un\G40110 to 40749) of a camera recorder module, a preset position unregistered error (error code: 1C80H) occurs.
- When changing the value from '0' to '1' in 'Preset position execution request' of a camera recorder module for a network camera that does not support the PTZ control function, a PTZ function unsupported error (error code: 1C51H) occurs.
- If a value out of the range is specified in 'Specified preset position No.' (Un\G38006, Un\G38706, Un\G39406, Un\G40106) or 'Specified preset position movement speed' (Un\G38007, Un\G38707, Un\G39407, Un\G40107), a preset position execution error (error code: 1C90H) occurs. (☞ Page 239 PTZ control area (Un\G38000 to 43599))

Point

When moving the range to a preset position by using the buffer memory, check 'PTZ support' (Un\G34235 for network camera 1) of the network camera and change the value in 'Preset position execution request' to '1: ON.'

If the value in 'Preset position execution request' is changed to '1: ON' for a network camera that does not support the PTZ function or it is changed before the bit information (supported) is applied to 'PTZ support' even for a network camera that supports the PTZ function, a PTZ function unsupported error (error code: 1C51H) occurs.

■Considerations

- PTZ control, registering and deleting preset positions, and moving to a preset position cannot be performed on one network camera at the same time.
- The direction to capture data when starting a network camera differs depending on a network camera used. To change the direction, move it to an intended position when starting the network camera.
- When moving to the range set by registering a preset position, an error may occur in the range depending on the operation accuracy of a network camera.

PTZ control authority mode function

This function can be used to set the authority to perform the PTZ control function and preset position function for each network camera.

The following table shows the availability for each mode of the PTZ control authority mode.

○: Available, ×: Not available

PTZ control authority mode	Description	Operation availability for each mode			
		PTZ control function	Preset position function		
			Registration	Deletion	Movement
PTZ enable mode	The PTZ control function and preset position function can be performed.	○	○	○	○
PTZ preset mode	Only the movement of the preset position function can be performed.	×	×	×	○
PTZ disable mode	Neither the PTZ control function nor the preset position function can be performed.	×	×	×	×

The authority can be set in the "Camera Individual Settings" screen in the module extended parameter. (☞ Page 86 Camera individual setting)

If "PTZ Disable Mode" is selected for the PTZ control authority mode, a PTZ authority mode unexecutable error (error code: 1CB0H) occurs when moving to a preset position is performed by using the buffer memory.

The PTZ control authority mode of a network camera can be checked in 'PTZ control authority mode' (Un\G38000, Un\G38700, Un\G39400, Un\G40100) of a camera recorder module. (☞ Page 239 PTZ control area (Un\G38000 to 43599))

GOT linkage function

This function can be used to check a live video of a network camera and adjust its PTZ in a GOT connected to a CPU module on the same network as the network camera.

To use this function, the setting in a GOT is required.

For details on the setting, refer to the following:

📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1

*1 Can be downloaded from Mitsubishi Electric FA site.

The following table shows the list of functions included in the GOT linkage function.

Function	Description
Live video display function	To display a live video from a network camera set as a connection target in a GOT.
Camera adjustment function (PTZ)	To adjust the range of data captured by a network camera set as a connection target in a GOT. In addition, an adjusted range can be registered as a preset position. For details, refer to the following: ☞ Page 203 Camera adjustment function (PTZ)

Point

- This function can be used only for one GOT per camera recorder module.
- A CPU module and GOT must be connected via Ethernet; otherwise, this function cannot be used.

Precautions

To use the GOT linkage function, select "Enable" for "GOT Linkage Enable/Disable" in the "Common Settings" screen in the module extended parameter.

When selecting "Enable" for "GOT Linkage Enable/Disable," a GOT with the IP address set in the "Common Settings" screen in the module extended parameter can be linked.

For details on the module extended parameter, refer to the following:

☞ Page 84 Module Extended Parameters (Camera Recorder Module)

Live video display function

This function can be used to display a live video of a network camera in a GOT connected to a CPU module on the same network as the network camera.

To use this function, the login name and password set in the FTP server setting in a GOT must be specified in the "Common Settings" screen in the module extended parameter.

The following table shows the items that can be set in a GOT.

Item	Description	Setting value
Resolution	Specify the resolution of a live video to be displayed in a GOT.	A value is fixed for each sample project as follows: Sample project: VGA — Live video: QVGA(320×240) Sample project: XGA — Live video: VGA(640×480) Sample project: SoftGOT(1024×631) — Live video: VGA(640×480) Sample project: SoftGOT(1920×960) — Live video: SVGA(800×600)
Video rotation angle	Specify the rotation angle of a live video to be displayed in a GOT.	• 0° • 180°
Video quality	Set the quality of a live video to be displayed in a GOT.	• High • Middle • Low

For the procedure for setting each item in a GOT, refer to the following:

📖Mitsubishi Electric Sequencer Camera Recorder Module RD81RC96-CA Sample Screen Manual (BCN-P5999-1333)*1

*1 Can be downloaded from Mitsubishi Electric FA site.

Point

Whether an FTP login name and FTP password to be set in the "Common Settings" screen in the module extended parameter are correct can be checked by performing the FTP communication test. Use this function to check that those set in a GOT in advance are correct.

Precautions

The live video display function can be used only for one network camera.

SD memory card format function

This function can be used to format an SD memory card inserted in a camera recorder module.
The procedure is the same as a recorder module.
However, the volume label after formatting will be RD81RC96_CA.
☞ Page 169 SD memory card format function

Self-diagnostic function

This function is an internal function to check the hardware health of a camera recorder module and diagnose whether the module operates properly.
Details are the same as a recorder module.
☞ Page 169 Self-diagnostic function

7.2 Module Labels

This section shows the module labels used to set input/output signals and the buffer memory of a camera recorder module.

Module label configuration

The name of a module label is defined in the following configurations:

"Instance name"_"Module number"."Label name"

"Instance name"_"Module number"."Label name"_D

Ex.

RC96C_1.stIOSignal.bModuleReady

■Instance name

The instance name of a camera recorder module (RD81RC96-CA) is 'RC96C.'

■Module number

A module number is a number starting from 1, which is added to identify a module that has the same instance name.

■Label name

This is a label name unique to a module.

■_D

This indicates that the module label is for direct access. Without this symbol, the label is for refresh. There are some differences between refresh and direct access as shown below.

Type	Description	Access timing
Refresh	Values written to/read from a module label are applied to a module in a batch at the time of refresh. This shortens the program execution time.	At the time of refresh
Direct access	Values written to/read from a module label are immediately applied to a module. Although the program execution time is longer than refresh, the responsiveness will be increased.	At the time of writing to/reading from a module label

7.3 Input/Output Signals

This section explains the input/output signals of a camera recorder module.
The following shows an example of assigning input/output signals when the start input/output number of a module is '0.'
A device X indicates an input signal from a module to a CPU module.
A device Y indicates an output signal from a CPU module to a module.

Precautions

As for input/output signals to a CPU module, do not output (turn ON) 'Use prohibited' signals. Doing so may cause malfunction of a programmable controller system.

Input/output signal list

The following shows the input/output signal list of a module.
For details on the input/output signals, refer to either of the following:
☞ Page 212 Input signal details
☞ Page 214 Output signal details

Input signals

Device No.	Signal name
X0	Module READY
X1	SD memory card status
X2	File access status
X3	Recording function operation status
X4	INFO LED status
X5	Module stop error status
X6	Module continuation error status
X7 to X1F	Use prohibited

Output signals

Device No.	Signal name
Y0	File access stop request
Y1	Clear file access stop request
Y2	Clear INFO LED request
Y3	Error clear request
Y4 to Y1F	Use prohibited

Input signal details

The following shows the details on the input signals to a CPU module.

Module READY (X0)

This signal turns ON when a module is ready after turning the power OFF and ON or resetting a CPU module.
It turns OFF when a hardware error occurs.

SD memory card status (X1)

This signal turns ON when an SD memory card is inserted and 'File access status' (X2) is OFF.
It turns OFF when an SD memory card is not inserted or 'File access status' (X2) is ON.

File access status (X2)

● This signal turns ON while file access is stopped or an SD memory card is write-protected.
The following operations can be performed while file access is stopped.

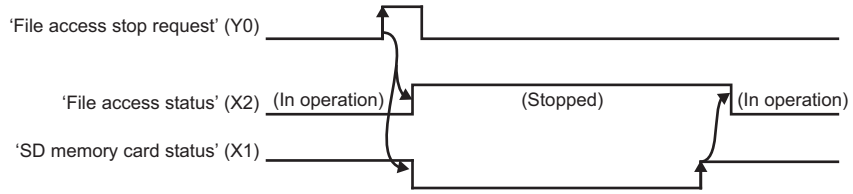
- Insertion/removal method of an SD memory card (📖MELSEC iQ-R System Recorder User's Manual (Startup))

The status is in the following state while file access is stopped.

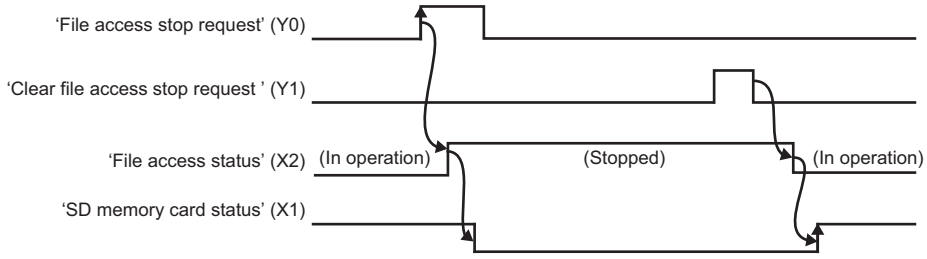
- SD memory card read/write-protected

● This signal turns OFF when a file is accessible.
The following shows time charts of 'File access status' (X2) and its related input/output signals.

- When inserting or removing an SD memory card



- When not inserting or removing an SD memory card



Recording function operation status (X3)

This signal turns ON while the recording function is running for any of the recording settings regardless of the communication status with a connected network camera. (☞ Page 95 RECORDING SETTING)
It turns OFF when the recording function is stopped for all recording settings.
For the operating status for a recording setting, refer to the following:
☞ Page 57 Operating status

INFO LED status (X4)

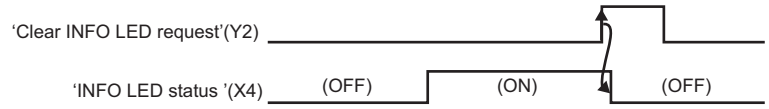
This signal turns ON when the INFO LED turns ON.

For the factor that the INFO LED turns ON, refer to the following:

☞ Page 136 Module information list

It turns OFF when turning 'Clear INFO LED request' (Y2) ON while the INFO LED is ON.

In addition, it turns OFF when switching the status of a CPU module from STOP to RUN.



Module stop error status (X5)

This signal is ON while a module stop error is occurring.

Module continuation error status (X6)

This signal is ON while a module continuation error is occurring.

It turns OFF when turning 'Error clear request' (Y3) ON.

Output signal details

The following shows the details on the output signals to a CPU module.

Point

The output signals will be enabled when they turn from OFF to ON. In addition, they are not turned from ON to OFF by a system. To turn the signals ON again, turn them from ON to OFF once, then OFF to ON.

File access stop request (Y0)

When turning this signal ON, accessing a file in an SD memory card is stopped.

For details, refer to the following:

☞ Page 212 File access status (X2)

Clear file access stop request (Y1)

Turn this signal ON when 'File access stop request' is accidentally turned ON.

When turning this signal ON without replacing an SD memory card after turning 'File access stop request' ON, file access restarts.

For details, refer to the following:

☞ Page 212 File access status (X2)

Clear INFO LED request (Y2)

When turning this signal ON while the INFO LED is ON, the following operations are performed:

- The INFO LED is turned OFF.
- 'INFO LED status' (X4) is turned OFF.
- 'INFO LED lighting factor' (Un\G12) is cleared.

Error clear request (Y3)

When turning this signal ON while a module continuation error is occurring, the following operations are performed:

- The ERR LED is turned OFF.
- 'Module continuation error status' (X6) is turned OFF.
- 'Current error area' (Un\G140 to 149) are cleared.
- 'Error log' (Un\G150 to 311) are cleared.
- A part of 'Network camera status area' (Un\G34301 to 34472, Un\G34801 to 34972, Un\G35301 to 35472, Un\G35801 to 35972) is cleared.

7.4 Buffer Memory

This section explains the buffer memory of a camera recorder module.

Precautions

- Do not write any data in the "system area" or an area with "R" (read-only) of the buffer memory. Doing so may cause malfunction of a programmable controller system.

Buffer memory list

The following table shows the buffer memory list of a camera recorder module.

R: Read-only, W: Write-only, R/W: Readable/Writable

Address Dec (Hex)	Application	Name	Initial value	R/W
0 (0H)	Module status area	RUN LED status	0	R
1 (1H)		ERR LED status	0	R
2 (2H)		CARD RDY LED status	0	R
3 (3H)		System area	—	—
4 (4H)		OPR LED status	0	R
5 (5H)		INFO LED status	0	R
6 to 11 (6H to BH)		System area	—	—
12 (CH)		INFO LED lighting factor	0	R
13 to 16 (DH to 10H)		System area	—	—
17 (11H)		Recording operation setting	0	R
18 to 20 (12H to 14H)		System area	—	—
21 to 22 (15H to 16H)	SD memory card information area	SD memory card total capacity	0	R
23 to 24 (17H to 18H)		SD memory card free capacity	0	R
25 (19H)		SD memory card usage rate	0	R
26 to 27 (1AH to 1BH)		SD memory card usage capacity	0	R
28 to 46 (1CH to 2EH)	System area		—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
47 to 54 (2FH to 36H)	Network connection status area	IP address (string notation)		—	R
55 to 56 (37H to 38H)		IP address		0	R
57 to 58 (39H to 3AH)		Subnet mask		0	R
59 to 60 (3BH to 3CH)		Default gateway		0	R
61 to 62 (3DH to 3EH)		DNS server 1 address		0	R
63 to 64 (3FH to 40H)		DNS server 2 address		0	R
65 to 69 (41H to 45H)		System area		—	—
70 (46H)	Common setting status area	IP address specification method		0	R
71 to 72 (47H to 48H)		IP address		0	R
73 to 74 (49H to 4AH)		Subnet mask		0	R
75 to 76 (4BH to 4CH)		Default gateway		0	R
77 to 78 (4DH to 4EH)		DNS server 1 address		0	R
79 to 80 (4FH to 50H)		DNS server 2 address		0	R
81 to 86 (51H to 56H)		System area		—	—
100 to 139 (64H to 8BH)	System area			—	—
140 (8CH)	Current error area	Error code		0	R
141 (8DH)		System area		—	—
142 to 149 (8EH to 95H)		Time		0	R
150 (96H)	Error log area	Error count		0	R
151 (97H)		Error log write pointer		0	R
152 (98H)		Error log 1	Error code	0	R
153 (99H)			System area	—	—
154 to 161 (9AH to A1H)			Time	0	R
162 to 311 (A2H to 137H)		Error log 2 to 16	Same as error log 1		
312 to 1499 (138H to 5DBH)	System area			—	—

Address Dec (Hex)	Application	Name		Initial value	R/W
1500 (5DCH)	Recording status area	Recording status 1	System area	—	—
1501 (5DDH)			In recording operation	0	R
1502 (5DEH)			Recording start error	0	R
1503 (5DFH)			Recording start error cause	0	R
1504 (5E0H)			File saving trigger monitor	0	R
1505 (5E1H)			Recording files saving	0	R
1506 (5E2H)			Data sampling	0	R
1507 (5E3H)			Recording buffer storing status	0	R
1508 (5E4H)			Recording files saving completion	0	R
1509 (5E5H)			Recording files saving error	0	R
1510 (5E6H)			Recording files saving completion code	0	R
1511 (5E7H)			Recording files saving count	0	R/W
1512 to 1513 (5E8H to 5E9H)			System area	—	—
1514 (5EAH)			Recording files saving progress	0	R
1515 to 1522 (5EBH to 5F2H)			Recording files saving path (setting type folder)	0	R
1523 to 1555 (5F3H to 613H)			Recording files saving path (under setting type folder)	0	R
1556 to 1574 (614H to 626H)			System area	—	—
1575 (627H)			Recording startup trigger count	0	R
1576 (628H)			Invalid recording startup trigger count	0	R
1577 (629H)			File saving trigger count	0	R
1578 (62AH)			Invalid file saving trigger count	0	R
1579 to 1580 (62BH to 62CH)			Average device/label sampling interval	0	R
1581 to 1582 (62DH to 62EH)			Average device/label sampling size	0	R
1583 to 1584 (62FH to 630H)			Device/label maximum sampling period	0	R
1585 (631H)			Recording buffer status	0	R
1586 (632H)			Sampling execution time (ms unit)	0	R
1587 (633H)			Sampling execution time (μs unit)	0	R
1588 (634H)			Accumulating execution time (ms unit)	0	R
1589 (635H)			Accumulating execution time (μs unit)	0	R

Address Dec (Hex)	Application	Name			Initial value	R/W
1590 to 1649 (636H to 671H)	Recording status area	Recording status 1	System area		—	—
1650 (672H)			Camera recording status	Network camera 1	0	R
1651 (673H)				Network camera 2	0	R
1652 (674H)				Network camera 3	0	R
1653 (675H)				Network camera 4	0	R
1654 to 1657 (676H to 679H)				System area	—	—
1658 to 1659 (67AH to 67BH)			Video data maximum accumulation period	Network camera 1	0	R
1660 to 1661 (67CH to 67DH)				Network camera 2	0	R
1662 to 1663 (67EH to 67FH)				Network camera 3	0	R
1664 to 1665 (680H to 681H)				Network camera 4	0	R
1666 to 1673 (682H to 689H)				System area	—	—
1674 (68AH)			Recording buffer storing status	Network camera 1	0	R
1675 (68BH)				Network camera 2	0	R
1676 (68CH)				Network camera 3	0	R
1677 (68DH)				Network camera 4	0	R
1678 to 1699 (68EH to 6A3H)			System area		—	—
1700 to 2299 (6A4H to 8FBH)		Recording status 2 to 4	Same as recording status 1			
2300 to 3199 (8FCH to C7FH)		System area			—	—
3200 (C80H)	Recording setting information area	Recording setting information 1	Recording buffer size		0	R
3201 to 3202 (C81H to C82H)			Saving period		0	R
3203 (C83H)			Saving setting when there is no free folder number		0	R
3204 (C84H)			Recording startup trigger specification		0	R
3205 (C85H)			Recording startup trigger establishment condition		0	R
3206 (C86H)			Saving specification after the specified time has elapsed from recording completion		0	R
3207 to 3208 (C87H to C88H)			Waiting time from recording completion to file saving		0	R
3209 (C89H)			Establishment condition of file saving trigger		0	R
3210 (C8AH)			Recording files saving destination		0	R
3211 to 3212 (C8BH to C8CH)			System area		—	—

Address Dec (Hex)	Application	Name			Initial value	R/W
3213 (C8DH)	Recording setting information area	Recording setting information 1	Recording buffer size (video data)	Network camera 1	0	R
3214 (C8EH)				Network camera 2	0	R
3215 (C8FH)				Network camera 3	0	R
3216 (C90H)				Network camera 4	0	R
3217 to 3299 (C91H to CE3H)			System area		—	—
3300 to 3599 (CE4H to E0FH)		Recording setting information 2 to 4		Same as recording setting information 1		
3600 to 3999 (E10H to F9FH)		System area			—	—
4000 (FA0H)	Recording operation specification area	Recording operation specification 1		System area	—	—
4001 (FA1H)				Recording buffer batch saving mode	0	R/W
4002 to 4003 (FA2H to FA3H)				Folder name additional data 1	0	R/W
4004 to 4005 (FA4H to FA5H)				Folder name additional data 2	0	R/W
4006 (FA6H)				System area	—	—
4007 (FA7H)				File saving trigger	0	R/W
4008 to 4099 (FA8H to 1003H)				System area	—	—
4100 to 4399 (1004H to 112FH)		Recording operation specification 2 to 4		Same as recording operation specification 1		
4400 to 4799 (1130H to 12BFH)		System area			—	—
4800 to 8999 (12C0H to 2327H)	System area				—	—
9000 to 9255 (2328H to 2427H)	File server saving information area	File server saving information 1		Recording files saving path (setting type folder)	0	R
9256 to 9399 (2428H to 24B7H)				System area	—	—
9400 to 10599 (24B8H to 2967H)		File server saving information 2 to 4		Same as file server saving information 1		
10600 to 10999 (2968H to 2AF7H)		System area			—	—
11000 to 13391 (2AF8H to 344FH)	System area				—	—

Address Dec (Hex)	Application	Name			Initial value	R/W
13392 (3450H)	Firmware update history information	Firmware update completion with/without an error			0	R
13393 to 13401 (3451H to 3459H)		System area			—	—
13402 (345AH)		Latest firmware update information	History information	Execution time (year)	0	R
13403 (345BH)				Execution time (month)	0	R
13404 (345CH)				Execution time (day)	0	R
13405 (345DH)				Execution time (hour)	0	R
13406 (345EH)				Execution time (minute)	0	R
13407 (345FH)				Execution time (second)	0	R
13408 (3460H)				Execution time (day of the week)	0	R
13409 (3461H)				Firmware version after update	0	R
13410 (3462H)				Firmware version before update	0	R
13411 (3463H)		Latest firmware update result		Firmware update target	0	R
13412 (3464H)				Firmware update result	0	R
13413 (3465H)		Previous firmware update information	History information	Execution time (year)	0	R
13414 (3466H)				Execution time (month)	0	R
13415 (3467H)				Execution time (day)	0	R
13416 (3468H)				Execution time (hour)	0	R
13417 (3469H)				Execution time (minute)	0	R
13418 (346AH)				Execution time (second)	0	R
13419 (346BH)				Execution time (day of the week)	0	R
13420 (346CH)				Firmware version after update	0	R
13421 (346DH)				Firmware version before update	0	R
13422 (346EH)		Previous firmware update result		Firmware update target	0	R
13423 (346FH)				Firmware update result	0	R
13424 to 13427 (3470H to 3473H)		System area			—	—
13428 to 30003 (3474H to 7533H)	System area				—	—
30004 to 30011 (7534H to 753BH)	SD memory card history information area	System area			—	—
30012 to 30013 (753CH to 753DH)		Write count			0	R
30014 (753EH)		System area			—	—

Address Dec (Hex)	Application	Name	Initial value	R/W
30100 to 33999 (7594H to 84CFH)	System area		—	—

Address Dec (Hex)	Application	Name			Initial value	R/W
34000 (84D0H)	Network camera status area	Network camera 1 status area	Setting information	Network camera setting enabled/ disabled	0	R
34001 to 34008 (84D1H to 84D8H)				IP address (string)	0	R
34009 to 34010 (84D9H to 84DAH)				IP address	0	R
34011 to 34014 (84DBH to 84DEH)				System area	—	—
34015 (84DFH)				TCP port number	80	R
34016 to 34047 (84E0H to 84FFH)				Network camera comment	0	R
34048 to 34079 (8500H to 851FH)				Network camera manufacturer name	0	R
34080 to 34111 (8520H to 853FH)				Network camera model name	0	R
34112 to 34143 (8540H to 855FH)				Network camera firmware version	0	R
34144 to 34207 (8560H to 859FH)				System area	—	—
34208 to 34223 (85A0H to 85AFH)				Network camera MAC address	0	R
34224 to 34225 (85B0H to 85B1H)				System area	—	—
34226 (85B2H)				Resolution	2	R
34227 (85B3H)				Video frame rate	30	R
34228 (85B4H)				Video codec	1	R
34229 (85B5H)				Max. video bit rate	FFFFH	R
34230 (85B6H)				Video quality	1	R
34231 (85B7H)				Video rotation angle	0	R
34232 (85B8H)				Resolution support list	0	R
34233 (85B9H)				Frame rate support upper limit value	0	R
34234 (85BAH)				Frame rate support lower limit value	0	R
34235 (85BBH)				PTZ support	0	R
34236 (85BCH)				PTZ speed support	0	R
34237 (85BDH)				Video rotation angle support	0	R
34238 (85BEH)				SNTP client function support	0	R
34239 to 34299 (85BFH to 85FBH)				System area	—	—

Address Dec (Hex)	Application	Name				Initial value	R/W
34300 (85FCH)	Network camera status area	Network camera 1 status area	Network status	Network camera connection status		0	R
34301 (85FDH)				Current error		0	R
34302 (85FEH)				System area		—	—
34303 to 34310 (85FFH to 8606H)				Time		0	R
34311 (8607H)				Error count		0	R
34312 (8608H)				Error log write pointer		0	R
34313 (8609H)				Error log 1	Error code	0	R
34314 (860AH)					System area	—	—
34315 to 34322 (860BH to 8612H)					Time	0	R
34323 to 34472 (8613H to 86A8H)				Error log 2 to 16	Same as error log 1		
34473 to 34474 (86A9H to 86AAH)				Average bit rate		0	R
34475 (86ABH)				Number of lost frames		0	R
34476 (86ACH)				Time synchronization status		0	R
34477 (86ADH)				Video data receiving status		0	R
34478 to 34479 (86AEH to 86AFH)				System area		—	—
34480 to 34499 (86B0H to 86C3H)			System area			—	—
34500 to 35999 (86C4H to 8C9FH)		Network camera 2 to 4 status area	Same as network camera 1 status area				
36000 to 37999 (8CA0H to 946FH)		System area				—	—
38000 (9470H)	PTZ control area	Network camera 1 PTZ information	PTZ control authority mode			0	R
38001 (9471H)			PTZ operation processing requestor			0	R
38002 (9472H)			PTZ operation status			0	R
38003 to 38005 (9473H to 9475H)			System area			—	—
38006 (9476H)			Preset	Specified preset position No.		0	R/W
38007 (9477H)				Specified preset position movement speed		500	R/W
38008 (9478H)				Preset position execution request		0	R/W
38009 (9479H)			System area			—	—

Address Dec (Hex)	Application	Name			Initial value	R/W
38010 to 38041 (947AH to 9499H)	PTZ control area	Network camera 1 PTZ information	Preset position 1	Preset position name	0	R
38042 (949AH)				Position information (P)	FFFFH	R
38043 (949BH)				Position information (T)	FFFFH	R
38044 (949CH)				Position information (Z)	FFFFH	R
38045 to 38049 (949DH to 94A1H)				System area	—	—
38050 to 38649 (94A2H to 96F9H)			Preset position 2 to 16	Same as preset position 1		
38650 to 38699 (96FAH to 972BH)			System area		—	—
38700 to 40799 (972CH to 9F5FH)		Network camera 2 to 4 PTZ information	Same as network camera 1 PTZ information			
40800 to 43599 (9F60H to AA4FH)		System area			—	—
43600 to 47099 (AA50H to B7FBH)	System area				—	—
47100 (B7FCH)	GOT registration area	GOT linkage enabled/disabled			0	R
47101 to 47102 (B7FDH to B7FEH)		IP address			0	R
47103 to 47110 (B7FFH to B806H)		IP address (string)			0	R
47111 (B807H)		GOT registration status			0	R
47112 to 47129 (B808H to B819H)		System area			—	—
47130 to 47270 (B81AH to B8A6H)	System area				—	—

Buffer memory details

The following explains the buffer memory details of a camera recorder module.

Module status area (Un\G0 to 20)

The status of each LED of a camera recorder module can be checked.

Buffer memory name	Address	Description
RUN LED status	Un\G0	0: OFF 1: ON
ERR LED status	Un\G1	0: OFF 1: ON 2: Flashing
CARD RDY LED status	Un\G2	0: OFF 1: ON
OPR LED status	Un\G4	0: OFF 1: ON
INFO LED status	Un\G5	0: OFF 1: ON
INFO LED lighting factor*1	Un\G12	The factor that the INFO LED turns ON is stored. • b0: ON: SD memory card free capacity lowering • b1: ON: No save folder free number
Recording operation setting	Un\G17	The recording operation setting of a camera recorder module is stored. 0: Main 1: Sub

*1 Check the INFO LED lighting factor, and take a corrective action shown in the following table:

Lighting factor	Location to check	Corrective action
SD memory card free capacity lowering	b0	Check 'SD memory card information area' (Un\G21 to 27) in the buffer memory to make sure that there is a sufficient free space. Delete unnecessary recording files in an SD memory card for a required capacity. ☞ Page 142 Troubleshooting on INFO LED
No save folder free number	b1	It turns ON if there is no free folder number when and after saving a recording file. Delete unnecessary recording files from an SD memory card as necessary. ☞ Page 142 Troubleshooting on INFO LED

SD memory card information area (Un\G21 to 27)

This area is the same as a recorder module.

☞ Page 182 SD memory card information area (Un\G21 to 27)

Network connection status area (Un\G47 to 69)

This area is the same as a recorder module.

☞ Page 182 Network connection status area (Un\G47 to 69)

Common setting status area (Un\G70 to 86)

This area is the same as a recorder module.

☞ Page 182 Common setting status area (Un\G70 to 86)

Current error area (Un\G140 to 149)

This area is the same as a recorder module.

☞ Page 183 Current error area (Un\G140 to 149)

Error log area (Un\G150 to 311)

This area is the same as a recorder module.

☞ Page 184 Error log area (Un\G150 to 311)

Point

If multiple errors with the same error code occur, only the log of the first error is stored in this area.

Logs of errors with the same error code occurred in each network camera can be checked in the following buffer memories:

- 'Current error' (Un\G34301, Un\G34801, Un\G35301, Un\G35801)
- 'Error log 1 to 16' (Un\G34313 to 34470, Un\G34813 to 34970, Un\G35313 to 35470, Un\G35813 to 35970)

For details, refer to the following:

☞ Page 234 Network camera status area (Un\G34000 to 37999)

Recording status area (Un\G1500 to 3199)

The recording status can be checked.

Buffer memory name		Address	Description
Recording status 1	In recording operation	Un\G1501	The operating status of the recording function is stored. (☞ Page 57 Operating status) 0: Stopped 1: Operating The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 231 In recording operation (Un\G1501)
	Recording start error*1	Un\G1502	Whether an error occurred when the recording function started running is stored. 0: No error 1: Error exists The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 231 Recording start error (Un\G1502)
	Recording start error cause*1	Un\G1503	The code of an error that occurred when the recording function started running is stored. 0: No error Values other than 0: Error code The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 231 Recording start error cause (Un\G1503)
	File saving trigger monitor	Un\G1504	Whether a file saving trigger is satisfied is stored. 0: Unsatisfied 1: Satisfied If '1' (satisfied) is stored in 'File saving trigger monitor' of the main module, a recording startup trigger and file saving trigger are disabled. The period during which '1 (satisfied)' is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 231 File saving trigger monitor (Un\G1504)
	Recording files saving	Un\G1505	Whether a recording file is being saved is stored. 0: Not saving 1: Saving The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 231 Recording files saving (Un\G1505)

Buffer memory name		Address	Description
Recording status 1	Data sampling*2	Un\G1506	Whether devices and labels are being sampled and accumulated is stored. 0: Not sampling 1: Sampling ■When selecting "File Saving Trigger Only" for the recording method • '1' (sampling) is stored when the recording function starts running ('1' (operating) is stored in 'In recording operation' (Un\G1501)) after starting the function. • '0' (not sampling) is stored when saving a recording file starts, and '1' (sampling) is stored after the file saving is completed. • '0' (not sampling) is stored when stopping the operation of the recording function or a module stop error occurs. ■When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method • '1' (sampling) is stored when a recording startup trigger is satisfied, and '0' (not sampling) is stored after devices and labels for a saving period are accumulated. • When '1' (sampling) is stored, data accumulation stops and '0' (not sampling) is stored if the capacity of accumulated data exceeds that of the recording buffer. (☞ Page 54 Recording buffer) • '0' (not sampling) is stored when stopping the operation of the recording function or a module stop error occurs.
	Recording buffer storing status*1*2	Un\G1507	Whether data in a sampled device and label is accumulated in the recording buffer is stored. 0: No data 1: Data exists '1' (data exists) is stored when a device and label are sampled and data is accumulated in the recording buffer. '0' (no data) is stored when saving a recording file starts. When a recording startup trigger is satisfied, accumulated data is discarded and '0' (no data) is stored. When the operating status switches to 'operating' after starting the recording function, '0' (no data) is stored. (It is initialized to '0' (no data).)
	Recording files saving completion*1	Un\G1508	Whether saving a recording file is completed is stored. 0: Not completed 1: Completed The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 232 Recording files saving completion (Un\G1508)
	Recording files saving error*1	Un\G1509	Whether an error occurred when saving a recording file is stored. 0: No error 1: Error exists The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 232 Recording files saving error (Un\G1509)
	Recording files saving completion code*1	Un\G1510	The code of an error occurred when saving a recording file is stored. 0: No error Values other than 0: File saving failed (error code) The timing when a value is stored differs depending on the recording operation setting of a camera recorder module used. For details, refer to the following: ☞ Page 232 Recording files saving completion code (Un\G1510)

Buffer memory name		Address	Description
Recording status 1	Recording files saving count[*1]	Un\G1511	The number of recording file saving executions (both successful and failed) is stored. The definition of the number of saving executions differs depending on the recording operation setting of a camera recorder module used. • Main module: Number of saving executions of recording settings • Sub module: Number of saving executions in the camera recorder module itself It is initialized to '0' when the operating status switches to 'operating' after turning the power ON or resetting a CPU module and starting the recording function. In addition, it is initialized to '0' when the operating status switches to 'operating' after adding or changing a recording setting and starting the recording function. When it reaches 65535 times, it returns to 1 and continues counting. If it is reset, '0' is stored. (Value to be stored: 0 to 65535)
	Recording files saving progress[*1]	Un\G1514	The progress rate (%) of saving a recording file is stored. The definition of the progress rate differs depending on the recording operation setting of a camera recorder module used. • Main module: Progress rate of recording file saving for all recording settings including sub modules • Sub module: Progress rate of recording file saving in the camera recorder module itself It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Value to be stored: 0 to 100%)
	Recording files saving path (setting type folder)[*1]	Un\G1515 to 1522	The path to the setting type folder for a recording file last saved to an SD memory card is stored. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Example) When the path to a recording file is /SD/RECORD/RC1/1TS01_001, /SD/RECORD/RC1/ is stored.
	Recording files saving path (under setting type folder)[*1*2]	Un\G1523 to 1555	The path under the setting type folder to a last saved recording file is stored. It is initialized to '0' when the operating status switches to 'operating' after a file saving trigger is satisfied or starting the recording function. (Example) When the path to a recording file is /SD/RECORD/RC1/1TS01_001, 1TS01_001 is stored.
	Recording startup trigger count[*1*2*3]	Un\G1575	When the operating status of the recording function is 'operating,' the number of times that a recording startup trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid recording startup trigger count[*1*2*3]	Un\G1576	When the operating status of the recording function is 'operating,' the number of invalid recording startup triggers among the recording startup triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	File saving trigger count[*1*2*3]	Un\G1577	When the operating status of the recording function is 'operating,' the number of times that a file saving trigger was detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Invalid file saving trigger count[*1*2*3]	Un\G1578	When the operating status of the recording function is 'operating,' the number of invalid file saving triggers among the file saving triggers detected to have been satisfied is stored. (Value to be stored: 0 to 65535)
	Average device/label sampling interval[*1*2*4]	Un\G1579 to 1580	The average value of device and label sampling intervals is stored (unit: millisecond). It is calculated based on eight moving averages. If an average value exceeds 4294967295 milliseconds, 4294967295 is stored.

Buffer memory name			Address	Description
Recording status 1	Average device/label sampling size[*1*2*4]		Un\G1581 to 1582	The average size of devices and labels to be sampled at a time is stored (unit: KB).
	Device/label maximum sampling period[*1*2*4]		Un\G1583 to 1584	The maximum period during which a device and label can be sampled in the current setting is stored (unit: second). A period is calculated with the following formula each time a device and label are sampled. • Recording buffer size ÷ Average device/label sampling size × Average device/label sampling interval If a period exceeds 4294967295 seconds, 4294967295 is stored.
	Recording buffer status[*1*2]		Un\G1585	Whether the recording buffer capacity (device/label data) is sufficient for a saving period set in the recording setting is stored. 0: Sufficient 1: Insufficient '1' (insufficient) is stored when a value in 'Device/label maximum sampling period' (Un\G1583 to 1584) is smaller than a set saving period. If a value in 'Device/label maximum sampling period' (Un\G1583 to 1584) and a set saving period are extremely close, '0' (sufficient) and '1' (insufficient) may be stored alternately in a short time. It is initialized to '0' (sufficient) when the operating status switches to 'operating' after starting the recording function.
	Sampling execution time (ms unit)[*2]		Un\G1586	The data sampling execution time of a CPU module is stored.[*5*6*7] When using a recording startup trigger or specifying a device as a file saving trigger, the time required for trigger detection is also included. Note that when an interrupt program is executed during the END processing, the execution time of the interrupt program is also included in the sampling time, and if the program execution time of a CPU module is shorter than the accumulating execution time of a camera recorder module, the accumulating execution time is included in the sampling execution time of the CPU module. • Sampling execution time (ms unit): An ms digit is stored (value to be stored: 0 to 65535). • Sampling execution time (μs unit): A μs digit is stored (value to be stored: 0 to 999).
	Sampling execution time (μs unit)[*2]		Un\G1587	
	Accumulating execution time (ms unit)[*2]		Un\G1588	The data accumulating execution time of a camera recorder module is stored.[*7*8*9] • Accumulating execution time (ms unit): An ms digit is stored (value to be stored: 0 to 65535). • Accumulating execution time (μs unit): A μs digit is stored (value to be stored: 0 to 999).
	Accumulating execution time (μs unit)[*2]		Un\G1589	
	Camera recording status	Network camera 1	Un\G1650	The operating status for video data is stored. (☞ Page 232 Camera recording status (Un\G1650 to 1657)) 0: Stopped 1: Preparing 2: No setting 3: Operating 4: File saving trigger satisfied 5: Saving
		Network camera 2	Un\G1651	Details are the same as network camera 1.
		Network camera 3	Un\G1652	
		Network camera 4	Un\G1653	

Buffer memory name			Address	Description
Recording status 1	Video data maximum accumulation period*1*10	Network camera 1	Un\G1658 to 1659	The maximum period (seconds) during which video data can be accumulated is stored at the current bit rate. It is calculated with the following formula each time video data from a network camera is accumulated. • Accumulation period = Recording buffer size ÷ Average bit rate If a period exceeds 4294967295 seconds, 4294967295 is stored.
		Network camera 2	Un\G1660 to 1661	Details are the same as network camera 1.
		Network camera 3	Un\G1662 to 1663	
		Network camera 4	Un\G1664 to 1665	
	Recording buffer storing status	Network camera 1	Un\G1674	Whether received video data is accumulated in the recording buffer is stored. 0: No data 1: Data exists '1' (data exists) is stored when video data is received and accumulated in the recording buffer. '0' (no data) is stored when saving a recording file starts. When a recording startup trigger is satisfied, accumulated data is discarded and '0' (no data) is stored. When the operating status switches to 'operating' after starting the recording function, '0' (no data) is stored. (It is initialized to '0' (no data).)
		Network camera 2	Un\G1675	Details are the same as network camera 1.
		Network camera 3	Un\G1676	
		Network camera 4	Un\G1677	
Recording status 2 to 4			Un\G1700 to 2299	Details are the same as recording status 1.

*1 A value is not updated when the operating status is 'stopped.'

*2 Available only for a camera recorder module with "Main" selected for the recording operation setting.

*3 '0' is stored when turning the power ON or resetting a CPU module.
It starts from '0' when the operating status switches to 'operating' after adding or changing a recording setting and starting the recording function. When it reaches 65535 times, it returns to 1 and continues counting.

*4 If the sufficient number of times of data sampling is not performed for calculation after data sampling starts, an error occurs.
It is cleared to the initial value (0) when the operating status switches to 'operating' after starting the recording function.

*5 A value is updated when data in a CPU module is sampled.

*6 When the sampling execution time is 23.6 ms, it is stored as follows:
Sampling execution time (ms unit): 23
Sampling execution time (μs unit): 600

*7 Initialized to '0' in any of the following cases:
The power is turned ON.
A CPU module is reset.
The recording function is started.

*8 A value is updated when data accumulation for a camera recorder module is completed.

*9 When the accumulating execution time is 23.6 ms, it is stored as follows:
Accumulating execution time (ms unit): 23
Accumulating execution time (μs unit): 600

*10 A value is not stored before the number of average bit rates required for calculation is sampled after data accumulation starts.
It is cleared to the initial value (0) when the operating status switches to 'operating' after starting the recording function.
For details on 'Average bit rate' (Un\G34473 to 34474), refer to the following:
☞ Page 234 Network camera status area (Un\G34000 to 37999)

■In recording operation (Un\G1501)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (stopped)	• The recording function is stopped, and the main module and all sub modules with recording target data stop operating.*1 • A module stop error occurs in the main module.	• The recording function is stopped, and the camera recorder module itself stops operating.*1 • A module stop error occurs in the camera recorder module itself. • A module stop error occurs in the main module.
1 (operating)	• The main module and all sub modules with recording target data start operating after starting the recording function.*2	• The camera recorder module itself starts operating after starting the recording function.

*1 When the operating status is 'saving trigger establishment' or 'saving,' a value is stored at either of the following timings:
Main module: After saving is completed in the main module and all sub modules with recording target data
Sub module: After saving is completed

*2 If there is any sub module that cannot start operating, a value is stored when the other sub modules and main module start operating.

■Recording start error (Un\G1502)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (no error)	• The operating status of the main module switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)	• The operating status of the camera recorder module itself switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)
1 (error exists)*1	• A CPU module or the main module cannot start recording due to an error after starting the recording function. • There is any sub module with recording target data that cannot start recording after starting the recording function.	• The camera recorder module itself cannot start recording due to an error after starting the recording function.

*1 An error cause can be checked in 'Recording start error cause' (Un\G1503).

■Recording start error cause (Un\G1503)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (no error)	• The operating status of the main module switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)	• The operating status of the camera recorder module itself switches to 'preparing' after starting the recording function. (It is initialized to '0' (no error).)
Values other than 0 (error code)	• A CPU module or the main module cannot start recording due to an error after starting the recording function. • There is any sub module with recording target data that cannot start recording after starting the recording function.	• The camera recorder module itself cannot start recording due to an error after starting the recording function.

■File saving trigger monitor (Un\G1504)

'1 (satisfied)' is stored during either of the following periods:

Value	Main module	Sub module
1 (satisfied)	• From when a file saving trigger is satisfied to when saving is completed in the main module and all sub modules with recording target data	• From when a file saving trigger is satisfied to when saving is completed in the camera recorder module itself

■Recording files saving (Un\G1505)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (not saving)	• Saving a recording file is completed in the main module and all sub modules with recording target data.	• Saving a recording file is completed in the camera recorder module itself.
1 (saving)	• Saving a recording file is started.	• Saving a recording file is started in the camera recorder module itself.

■Recording files saving completion (Un\G1508)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (not completed)	• A file saving trigger is satisfied. • The operating status of the main module switches to 'operating' after starting the recording function. (It is initialized to '0' (not completed).)	• A file saving trigger is satisfied. • The operating status of the camera recorder module itself switches to 'operating' after starting the recording function. (It is initialized to '0' (not completed).)
1 (completed)	• Saving a recording file is completed in the main module and all sub modules with recording target data.	• Saving a recording file is completed in the camera recorder module itself.

■Recording files saving error (Un\G1509)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (no error)	• A file saving trigger is satisfied. • The operating status of the main module switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)	• A file saving trigger is satisfied. • The operating status of the camera recorder module itself switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)
1 (error exists)	• Saving a recording file fails in the main module. • Saving a recording file fails in a sub module with recording target data. • There is video data that failed to be saved in the main module and all sub modules with recording target data.	• Saving a recording file fails in the camera recorder module itself. • There is video data that failed to be saved in the camera recorder module itself.

■Recording files saving completion code (Un\G1510)

Each value is stored at each timing as follows:

Value	Main module	Sub module
0 (no error)	• A file saving trigger is satisfied. • The operating status of the main module switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)	• A file saving trigger is satisfied. • The operating status of the camera recorder module itself switches to 'operating' after starting the recording function. (It is initialized to '0' (no error).)
Values other than 0 (error code)	• Saving a recording file fails in the main module. • Saving a recording file fails in a sub module with recording target data. • There is video data that failed to be saved in the main module and all sub modules with recording target data.	• Saving a recording file fails in the camera recorder module itself. • There is video data that failed to be saved in the camera recorder module itself.

■Camera recording status (Un\G1650 to 1657)

The operating status for video data is stored.

Value	Description
0 (stopped)	The recording function is stopped. The status switches to 'stopped' in the following cases: • After starting a camera recorder module • After resetting a CPU module • No recording settings are written
1 (preparing)	An operation is being prepared (such as analyzing recording settings or establishing the communication with a target network camera).
2 (no setting)	The recording operation status is 'operating' and the communication with a target network camera is established, but the network camera is not set in the receiving target setting.
3 (operating)	The recording function is running for a target network camera. The status remains 'operating' even if the communication with the network camera is disconnected.
4 (file saving trigger satisfied)	A file saving trigger is satisfied and video data for a remaining saving period is being received and accumulated.
5 (saving)	A video file is being saved.

Recording setting information area (Un\G3200 to 3999)

Setting information of recording settings can be checked.

Buffer memory name			Address	Description
Recording setting information 1*1	Recording buffer size		Un\G3200	The recording buffer capacity set in the module parameter is stored (unit: MB).
	Saving period		Un\G3201 to 3202	A saving period set in the recording setting is stored. (Unit: second) ■When selecting "File Saving Trigger Only" for the recording method Total saving period before and after trigger ■When selecting "Recording Startup Trigger + File Saving Trigger" for the recording method Accumulation period
	Saving setting when there is no free folder number		Un\G3203	A saving setting when there is no free folder number set in the recording setting is stored. 0: Overwrite 1: Not save
	Recording startup trigger specification		Un\G3204	A recording startup trigger specification set in the recording setting is stored. 0: Not specify (when selecting "File Saving Trigger Only" for the recording method) 1: Specify (when selecting "Recording Startup Trigger + File Saving Trigger" for the recording method)
	Recording startup trigger establishment condition*2		Un\G3205	The condition to satisfy a recording startup trigger set in the recording setting is stored in b0. OFF: Rising ON: Falling
	Saving specification after the specified time has elapsed from recording completion*2		Un\G3206	The saving specification after the specified time has elapsed from recording completion set in the recording setting is stored. 0: Not specify 1: Specify
	Waiting time from recording completion to file saving*3		Un\G3207 to 3208	The waiting time from recording completion to file saving set in the recording setting is stored (unit: second).
	Establishment condition of file saving trigger*4		Un\G3209	The condition to satisfy a file saving trigger set in the recording setting is stored. OFF: Rising ON: Falling
	Recording files saving destination		Un\G3210	The save destination for a recording file set in the recording setting is stored. 0: SD memory card 1: File server
	Recording buffer size (video data)	Network camera 1	Un\G3213	The recording buffer capacity (MB) set for network camera 1 in the recording setting is stored. The total value of the recording buffer capacities of network cameras 1 to 4 is equal to a value of the recording buffer capacity (video data) assigned to the corresponding setting number set in the module parameter.
		Network camera 2	Un\G3214	Details are the same as network camera 1.
		Network camera 3	Un\G3215	
		Network camera 4	Un\G3216	
Recording setting information 2 to 4*1			Un\G3300 to 3599	Details are the same as recording setting information 1.

*1 A value is updated when the operating status switches to 'operating.'

*2 Enabled only when specifying a recording startup trigger.

*3 Enabled only when specifying a recording startup trigger and selecting the checkbox of "Save after specified time elapses from recording completion."

*4 A set condition and a bit in the buffer memory are linked by a condition number as follows:

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Recording setting No.1: Un\G3209	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.2: Un\G3309	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.3: Un\G3409	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Recording setting No.4: Un\G3509	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Recording operation specification area (Un\G4000 to 4799)

This area is the same as a recorder module.

It is available only for a camera recorder module with "Main" selected for the recording operation setting.

☞ Page 192 Recording operation specification area (Un\G4000 to 4799)

File server saving information area (Un\G9000 to 10999)

This area is the same as a recorder module.

It is available only for a camera recorder module with "Main" selected for the recording operation setting.

☞ Page 193 File server saving information area (Un\G9000 to 10999)

Firmware update history information area (Un\G13392 to 13427)

This area is the same as a recorder module.

☞ Page 194 Firmware update history information area (Un\G13392 to 13427)

SD memory card history information area (Un\G30004 to 30014)

This area is the same as a recorder module.

☞ Page 196 SD memory card history information area (Un\G30004 to 30014)

Network camera status area (Un\G34000 to 37999)

The operating status of a network camera can be checked.

Buffer memory name			Address	Description
Network camera 1 status area	Setting information	Network camera setting enabled/disabled	Un\G34000	Whether the setting of a network camera connected to a camera recorder module is enabled or disabled is stored. 0: Disabled 1: Enabled
		IP address (string)	Un\G34001 to 34008	The IP address of a network camera set as a connection target for a camera recorder module is stored as a character string.
		IP address	Un\G34009 to 34010	The IP address of a network camera set as a connection target for a camera recorder module is stored. • Un\G34009: Third octet, fourth octet • Un\G34100: First octet, second octet
		TCP port number	Un\G34015	The TCP port number of a network camera set as a connection target for a camera recorder module is stored. (Value to be stored: 0 to 4999, 5010 to 65534)
		Network camera comment	Un\G34016 to 34047	A set camera comment is stored.
		Network camera manufacturer name	Un\G34048 to 34079	The manufacturer name of a network camera is stored.
		Network camera model name	Un\G34080 to 34111	The model name of a network camera is stored.
		Network camera firmware version	Un\G34112 to 34143	The firmware version of a network camera is stored as a character string.
		Network camera MAC address	Un\G34208 to 34223	The MAC address of a network camera is stored.

Buffer memory name			Address	Description
Network camera 1 status area	Setting information	Resolution	Un\G34226	The resolution of a network camera is stored. 1: VGA(640×480) 2: HD (1280 × 720) 3: FHD (1920 × 1080)
		Video frame rate	Un\G34227	The frame rate (fps)[*1] of a network camera is stored. • 10 • 30 • 120
		Video codec	Un\G34228	The video codec of a network camera is stored. 0: H.264 1: Motion JPEG
		Max. video bit rate	Un\G34229	The maximum video bit rate (kbps)[*2] of a network camera is stored. (Value to be stored: 1 to 50000, FFFFH: No limit)
		Video quality	Un\G34230	The video quality is stored. 0: High 1: Middle 2: Low
		Video rotation angle[*3]	Un\G34231	The rotation angle of a video captured by a network camera is stored. 0: 0 degrees 180: 180 degrees
		Resolution support list	Un\G34232	A resolution supported by a network camera is stored. (OFF: Not supported/ON: Supported) b0: QVGA (320 × 240) b1: VGA (640 × 480) b2: HD (1280 × 720) b3: FHD (1920 × 1080) b4: SVGA (800 × 600) b5 to b15: Not used
		Frame rate support upper limit value	Un\G34233	The upper limit value of a frame rate supported by a network camera is stored.
		Frame rate support lower limit value	Un\G34234	The lower limit value of a frame rate supported by a network camera is stored.
		PTZ support	Un\G34235	Whether PTZ for a network camera is supported is stored. (OFF: Not supported/ON: Supported) 0b: PT supported 1b: Z supported
		PTZ speed support	Un\G34236	Whether PTZ speed for a network camera is supported is stored. 0: Not supported 1: Supported
		Video rotation angle support	Un\G34237	Whether the rotation for a network camera is supported is stored. 0: Not supported 1: Supported
		SNTP client function support	Un\G34238	Whether the SNTP client function is supported is stored. 0: Not supported 1: Supported
	Network status	Network camera connection status	Un\G34300	The connection status of a network camera is stored. (☞ Page 237 Network camera connection status (Un\G34300)) 0: No setting 1: Disconnected 2: Connected 3: Retrying
		Current error[*4]	Un\G34301	The code of the latest error occurred for a network camera is stored.

Buffer memory name				Address	Description
Network camera 1 status area	Network status	Time[*4]		Un\G34303	b0 to 7: Time zone and summer time flag b8 to 15: System area
				Un\G34304	b0 to 7: Last two digits of the year b8 to 15: Month (01 to 12)
				Un\G34305	b0 to 7: Day (01 to 31) b8 to 15: Hour (00 to 23)
				Un\G34306	b0 to 7: Minute (00 to 59) b8 to 15: Second (00 to 59)
				Un\G34307	b0 to 7: Day of the week (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat) b8 to 15: First two digits of the year
				Un\G34308	b0 to 7: First two digits of the millisecond b8 to 15: Last two digits of the millisecond
		Error count[*5]		Un\G34311	The total number of times an error log is registered in the error log area is stored.
		Error log write pointer[*5]		Un\G34312	An error log number in which the latest error log is registered is stored. 0: No error 1 to 16: Error log number
		Error log 1[*5]	Error code	Un\G34313	The code of an error occurred for a network camera is stored.
			Time	Un\G34315	b0 to 7: Time zone and summer time flag b8 to 15: System area
				Un\G34316	b0 to 7: Last two digits of the year b8 to 15: Month (01 to 12)
				Un\G34317	b0 to 7: Day (01 to 31) b8 to 15: Hour (00 to 23)
				Un\G34318	b0 to 7: Minute (00 to 59) b8 to 15: Second (00 to 59)
				Un\G34319	b0 to 7: Day of the week (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat) b8 to 15: First two digits of the year
				Un\G34320	b0 to 7: First two digits of the millisecond b8 to 15: Last two digits of the millisecond
		Error log 2 to 16[*5]		Un\G34323 to 34472	Details are the same as error log 1.
		Average bit rate[*6]		Un\G34473 to 34474	An average bit rate value (kbps) in communication with a network camera is stored.
		Number of lost frames		Un\G34475	The total number of frames lost while receiving video data for the past 60 seconds is stored. If incomplete data due to packet loss, etc. is included in a frame that configures video data received from a network camera, it is deleted for each frame and the cumulative number of deletions is stored.
		Time synchronization status		Un\G34476	The status of time synchronization between a camera recorder module and a network camera is stored. 0: Time not synchronized 1: Time synchronized Time is synchronized when the time stamp of video data delivered from a network camera and the time information of a device and label are synchronized. It may take time to complete.
		Video data receiving status		Un\G34477	The video data receiving status of a camera recorder module is stored. 0: Not receiving 1: Receiving
Network camera 2 status area				Un\G34500 to 34999	Details are the same as network camera 1 status area.
Network camera 3 status area				Un\G35000 to 35499	
Network camera 4 status area				Un\G35500 to 35999	

*1 A unit that indicates the maximum number of frames delivered from a network camera per second.

*2 The maximum bit rate depends on the performance of a network camera used; therefore, a setting value and an actual bit rate may differ.
For details, refer to the manual of a network camera used.

*3 The setting is applied when '1: supported' is stored in 'Video rotation angle support' (Un\G34237).

*4 For details, refer to the following:
☞ Page 237 Current error area (Un\G34301 to 34310)

*5 For details, refer to the following:
☞ Page 238 Error log area (Un\G34311 to 34472)

*6 An average value calculated based on eight moving averages is stored.
It is not stored in the buffer memory before eight values are sampled.

■Network camera connection status (Un\G34300)

The connection status of a network camera is stored.

Value	Description
0 (no setting)	No network camera is set. '0 (no setting)' is stored for a network camera number not set in the module extended parameter.
1 (disconnected)	A network camera is not connected yet.
2 (connected)	A network camera is connected properly. '2 (connected)' is stored for a network camera not set as a receiving target in the "Video Data Receiving Target Setting" screen when the communication is established. '2 (connected)' is stored for a network camera set as a receiving target in the "Video Data Receiving Target Setting" screen when video data is being received.
3 (retrying)	The connection with a network camera is disconnected and it is being retried.

■Current error area (Un\G34301 to 34310)

The code of the latest error occurred for a network camera is stored.

- Current error (Un\G34301)

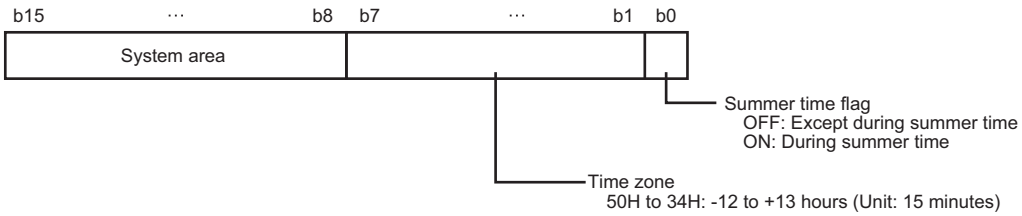
An error code is stored.

- Time (Un\G34303 to 34310)

The time when an error occurred is stored as a BCD code.

	b15 … b8	b7 … b0
Un\G142	System area	Time zone and summer time flag *1
Un\G143	Month (01H to 12H)	Year (00H to 99H) last 2 digits
Un\G144	Hour (00H to 23H)	Day (01H to 31H)
Un\G145	Second (00H to 59H)	Minute (00H to 59H)
Un\G146	Year (00H to 99H) first 2 digits	Day of the week (0H to 6H)
Un\G147	Lower milliseconds (00H to 99H)	Upper milliseconds (00H to 09H)

*1 Time zone and summer time flag details are as follows:



■Error log area (Un\G34311 to 34472)

The history of an error occurred for a network camera is stored.

• Error count (Un\G34311)

The total number of times an error log is registered in the error log area is stored.

• Error log write pointer (Un\G34312)

An error log number in which the latest error log is registered is stored. (When '16' is stored, the latest error log is registered in the area of error log 16.)

Up to 16 minor errors are registered.

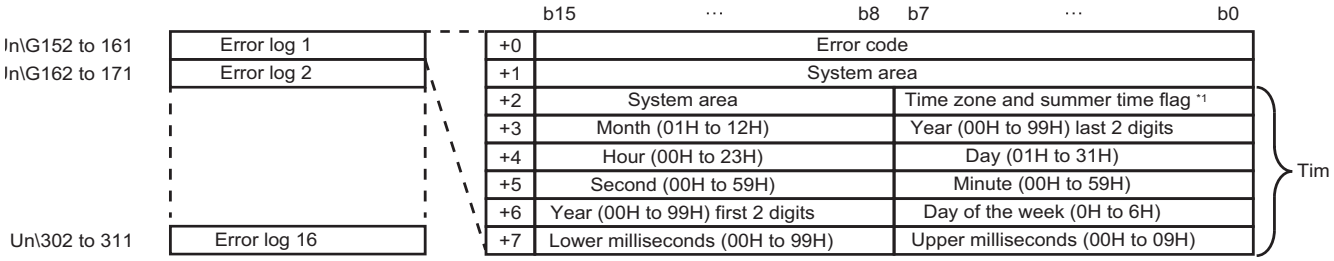
If 16 minor errors are displayed, new minor errors will not be registered. If the new error has the same error code as the already registered error, the error occurrence date/time and its detailed information will not be updated.

Even if a new error occurs after a stop error occurs, the new one is not registered.

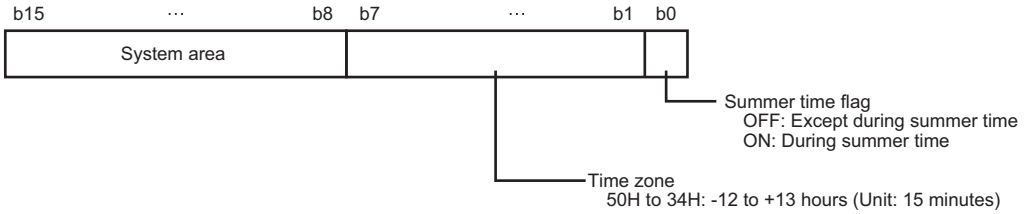
• Error log (Un\G34313 to 34472)

The history of an error occurred for a network camera is stored.

The error log area consists of 16 error logs with the same data configuration.



*1 Time zone and summer time flag details are as follows:



● Error code

An error code is stored.

● Time

The time when an error occurred is stored as a BCD code.

PTZ control area (Un\G38000 to 43599)

Information on PTZ control can be checked.

Buffer memory name			Address	Description
Network camera 1 PTZ information	PTZ control authority mode		Un\G38000	The operation mode of PTZ control authority mode is stored. 0: PTZ enable mode 1: PTZ preset mode 2: PTZ disable mode
	PTZ operation processing requestor		Un\G38001	The request source for PTZ operation processing to a camera recorder module is stored. (☞ Page 240 PTZ operation processing requestor (Un\G38001)) 0H: Not requested 1H: Tool 2H: GOT 3H: Ladder program
	PTZ operation status		Un\G38002	The current PTZ operation status is stored. (☞ Page 240 PTZ operation status (Un\G38002)) 0H: Not requested 1H: PTZ control being performed 2H: PTZ control completed successfully 3H: Preset position being registered 4H: Preset position registered successfully 5H: Preset position being deleted 6H: Preset position deleted successfully 7H: Preset request being executed 8H: Preset request completed successfully FFFFH: Error completion
	Preset	Specified preset position No.	Un\G38006	Specify the preset position number of a move destination (setting range: 1 to 16).
		Specified preset position movement speed[*1]	Un\G38007	Specify a movement speed to adjust the range captured by a specified network camera (setting range: 0 to 1000).
		Preset position execution request	Un\G38008	Request to move the range to a specified preset position. (☞ Page 241 Preset position execution request (Un\G38008)) 0: Not requested 1: Requested
	Preset position 1	Preset position name	Un\G38010 to 38041	The name of a preset position set for preset position 1 is stored.
		Position information (P)[*2]	Un\G38042	A value of the pan (P) (horizontal direction), which is position information of preset position 1, is stored. (Value to be stored: -1000 to 1000)
		Position information (T)[*2]	Un\G38043	A value of the tilt (T) (vertical direction), which is position information of preset position 1, is stored. (Value to be stored: -1000 to 1000)
		Position information (Z)[*3]	Un\G38044	A value of the zoom (Z) (zoom in/out), which is position information of preset position 1, is stored. (Value to be stored: 0 to 1000)
	Preset position 2 to 16		Un\G38050 to 38649	Details are the same as preset position 1.
Network camera 2 PTZ information			Un\G38700 to 39399	Details are the same as network camera 1 PTZ information.
Network camera 3 PTZ information			Un\G39400 to 40099	
Network camera 4 PTZ information			Un\G40100 to 40799	

*1 The setting is applied when '1: supported' is stored in 'PTZ speed support' (Un\G34236).
When '0: not supported' is stored in 'PTZ speed support,' a set value is ignored.

*2 A value stored in this area is converted to a relative value in the range of -1000 to 1000 for an actual position (coordinate) captured by a network camera.

*3 A value stored in this area is converted to a relative value in the range of 0 to 1000 for an actual position (coordinate) captured by a network camera.

■PTZ operation processing requestor (Un\G38001)

The request source for PTZ operation processing to a camera recorder module is stored.

Value	Description
0H (not requested)	PTZ operation is not requested.
1H (tool)	A PTZ operation request was sent from a tool.
2H (GOT)	A PTZ operation request was sent from a GOT.
3H (ladder program)	A PTZ operation request was sent from a program.

■PTZ operation status (Un\G38002)

The current PTZ operation status is stored.

Value	Description
0H (not requested)	PTZ operation is not requested.
1H (PTZ control being performed)	PTZ control is being performed on a network camera in a direction specified in a camera recorder module.
2H (PTZ control completed successfully)	PTZ control is completed for a network camera in a direction specified in a camera recorder module.
3H (preset position being registered)	A preset position is being registered in the flash memory of a camera recorder module.
4H (preset position registered successfully)	Registering a preset position in the flash memory of a camera recorder module is completed.
5H (preset position being deleted)	A preset position registered in the flash memory of a camera recorder module is being deleted.
6H (preset position deleted successfully)	Deleting a preset position registered in the flash memory of a camera recorder module is completed.
7H (preset request being executed)	PTZ control is being performed on a network camera for a preset position specified in a camera recorder module.
8H (preset request completed successfully)	PTZ control is completed for a network camera for a preset position specified in a camera recorder module.
FFFFH (error completion)	An error occurred in PTZ operation.

■Preset position execution request (Un\G38008)

Adjusting the range to a specified preset position number can be requested.

When adjusting the range of data captured by a network camera, change the value in 'Preset position execution request' (Un\G38008) to '1: requested.' For details on the procedure, refer to the following:

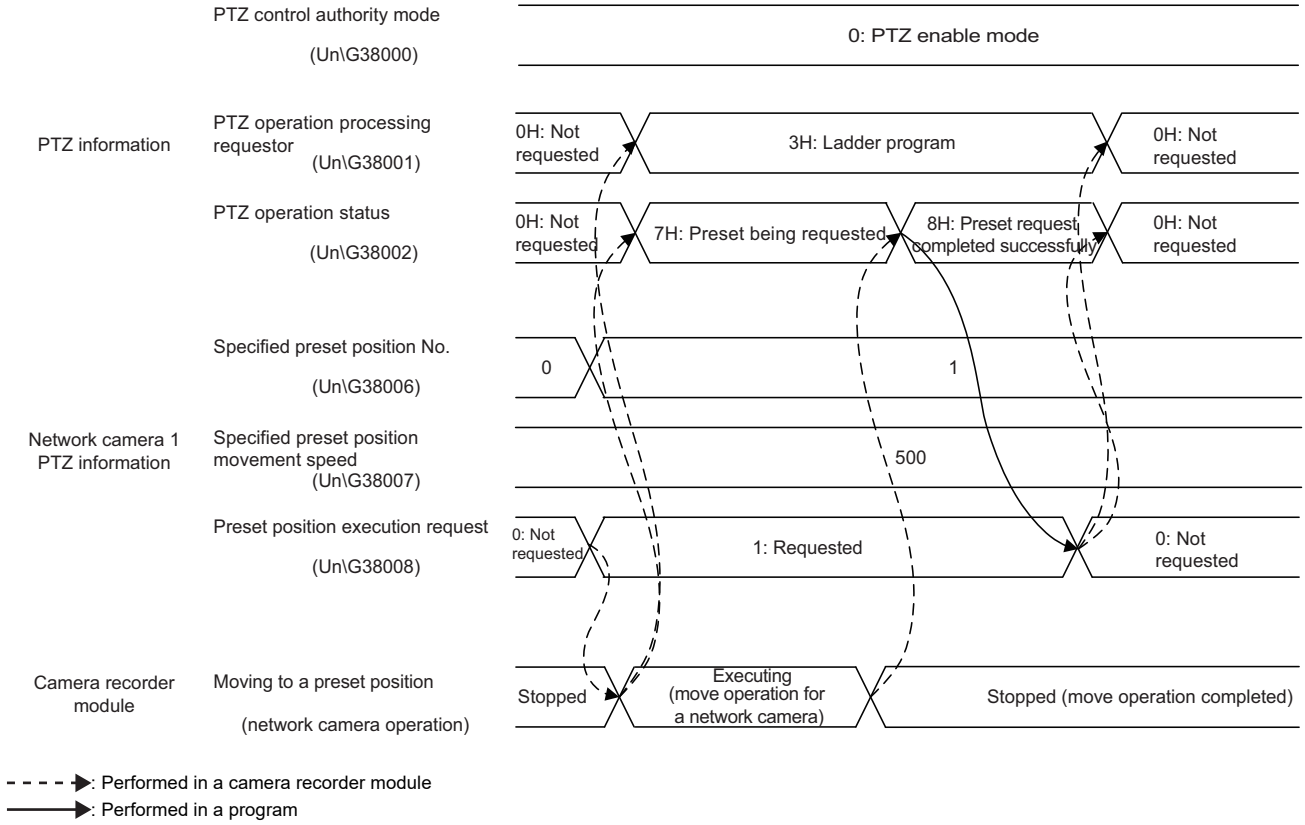
☞ Page 205 Moving to a preset position

Return the value in 'Preset position execution request' (Un\G38008) from '1H: requested' to '0H: not requested' after '8H: preset request completed successfully' is stored in 'PTZ operation status' (Un\G38002). The value in 'PTZ operation status' returns to '0H: not requested.'

Even if the value in 'Preset position execution request' (Un\G38008) is not returned to '0H: not requested,' the value in 'PTZ operation status' (Un\G38002) automatically returns to '0H: not requested' when 30 seconds elapses after '8H: preset request completed successfully' is stored.

- Timing chart

The following shows a timing chart for moving to the PTZ values of preset position number 1 for network camera 1 by using a program.



Precautions

A preset position execution request is not accepted in the following cases:

- 'PTZ control authority mode' (Un\G38000) is set to '2: PTZ disable mode.'
- 'PTZ operation status' (Un\G38002) is set to a value other than '0H: not requested.'

GOT registration area (Un\G47100 to 47129)

Information on the GOT linkage function of a camera recorder module can be checked.

Buffer memory name		Address	Description
GOT registration area	GOT linkage enabled/ disabled	Un\G47100	Whether the GOT linkage is enabled or disabled is stored. 0H: Disable 1H: Enable
	IP address	Un\G47101 to 47102	The IP address of a GOT set as a connection target for a camera recorder module is stored. • Un\G47101: Third octet, fourth octet • Un\G47102: First octet, second octet
	IP address (string)	Un\G47103 to 47110	The IP address of a GOT set as a connection target for a camera recorder module is stored as a character string.
	GOT registration status	Un\G47111	The GOT registration status is stored. 0H: Not registered 1H: Registering 2H: Registered

APPENDIX

Appendix 1 Available Characters in the Recording Setting

This section shows the characters that can be used for each setting item in the recording setting.

Screen	Item		Available character	Reference
Saving Period Setting	Recording Startup Trigger	Device	☞ Page 243 ASCII characters that can be used for a device name	Page 97 Saving Period Setting
Specify the Device Range	Start Device			Page 112 "Specify the Device Range" screen
	End Device			
File Saving Trigger Setting	Device			Page 115 File Saving Trigger Setting
	Comment		Basic Multilingual Plane in UTF-16LE (without BOM)*1	
File Server Setting	Storage Location (host name)		☞ Page 244 Storage location (host name)	Page 117 File server setting
	Storage Location (folder path)		Basic Multilingual Plane in UTF-16LE (without BOM)*1 and the ASCII characters shown in the following: ☞ Page 244 Storage location (folder path)	
	User Name		☞ Page 244 User name	
	Password		☞ Page 245 Password	
Saving Detail Setting	Date and Time Format		☞ Page 246 ASCII characters that can be used in the format in the saving detail setting	Page 118 Saving detail setting
	Format			

*1 The following cannot be used. (Note that no error message is output when entering surrogate pair characters and combining characters.)
Characters other than ones in the Basic Multilingual Plane (U+10000 to U+10FFFF)
Line feed codes (U+2028, U+2029)
Surrogate pairs (0xD800 to 0xDBFF, 0xDC00 to 0xDFFF)
Control codes (U+0000 to U+001F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF)
Combining characters

ASCII characters that can be used for a device name

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#*1	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	*1	l	|
D			-	=	M	]	m	}
E			.*2	>	N	^	n	~
F			/	?	O	_	o	

*1 Cannot be used for "Device" in the "Saving Period Setting" and "File Saving Trigger Setting" screens.
*2 Cannot be used for "Start Device" and "End Device" in the "Specify the Device Range" screen.

ASCII characters that can be used in the file server setting

■Storage location (host name)

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	*1	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

■Storage location (folder path)

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	*1	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

■User name

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	*1	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

■Password

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<	L	*1	l	|
D			-	=	M	]	m	}
E			.	>	N	^	n	~
F			/	?	O	_	o	

A

ASCII characters that can be used in the format in the saving detail setting

Characters in the shaded area can be used.

	0	1	2	3	4	5	6	7
0	NUL		(SP)	0	@	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			'	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
A			*	:	J	Z	j	z
B			+	;	K	[	k	{
C			,	<*1	L	\	l	|
D			-	=	M	]	m	}
E			.	>*1	N	^	n	~
F			/	?	O	_	o	

*1 Can be used when entering the following keywords in "Format" (cannot be used for "Date and Time Format").
<DATETIME>, <DATA1>, <DATA2>

Appendix 2 Available Characters in the Camera Setting

This section shows the characters that can be used for each setting item in the camera setting (module extended parameter and preset position setting).

Screen	Item	Available character	Reference
Common Settings	FTP Login Name	Basic Multilingual Plane in UTF-16LE*1*2	Page 85 Common setting
	FTP Password	Basic Multilingual Plane in UTF-16LE*1*3	
Camera Individual Settings	Camera Comment	Basic Multilingual Plane in UTF-16LE*4	Page 86 Camera individual setting
	User ID	Basic Multilingual Plane in UTF-16LE*1*3	
	Password		
Communication Test	User ID		Page 89 Communication test screen
	Password		
Preset Position Registration	Preset Position Name	Basic Multilingual Plane in UTF-16LE*4	Page 93 Preset position registration

*1 Compliant with the specifications of a network camera. Refer to the manual of a network camera used.
*2 Alphanumeric characters can be used.
*3 The following characters can be used:
Alphanumeric characters
Space
!, ", #, $, %, &, ', (,), *, +, ,, -, ., /, :, ;, <, =, >, ?, @, [, \,], ^, _, `, {, |, }, ~
*4 The following cannot be used. (Note that no error message is output when entering surrogate pair characters and combining characters.)
Characters other than ones in the Basic Multilingual Plane (U+10000 to U+10FFFF)
Line feed codes (U+2028, U+2029)
Surrogate pairs (0xD800 to 0xDBFF, 0xDC00 to 0xDFFF)
Control codes (U+0000 to U+001F, U+0080 to U+009F, U+00A0 to U+00BF, U+FFFE, U+FFFF)
Combining characters

Appendix 3 Processing Time

This section shows the processing time of the recording function.

Sampling time

The following shows the processing time of a CPU module required to sample a device and label.

It is added to the END processing when selecting "Each Scan" or "Time Specification" for the sampling method and to the program execution time when selecting "Trigger Instruction" (processing time for the DATATRG instruction). (☞ Page 39 Sampling methods of devices and labels)

In addition, when selecting "Safety Cycle Time" for the sampling method, the processing time of a CPU module (sampling time) is included in the safety cycle time. (☞ Page 39 Sampling methods of devices and labels)

When an interrupt program is executed during the END processing, the execution time of the interrupt program is included in the sampling time.

In addition, if the program execution time of a CPU module is shorter than the accumulating execution time of a recorder module/camera recorder module, the accumulating execution time is also included in the sampling time.

Note that the time required for data sampling differs depending on the CPU module type, device number of a sampling target, type, and memory of a module (buffer memory, link device).

The sampling time is calculated with the following formula:

Sampling time (μs unit) = 25 + ❶ + ❷ + ❸ + ❹ + ❺ + ❻ + ❼ + ❽ + ❾

The following table shows the details of each variable in the calculation formula.

Variable	Details (device type)		R04(EN)CPU	R08/16/32/120(EN)CPU	R08/16/32/120SFCPU
❶	Global devices[*1] and global/local labels[*2] other than those listed below		0.016 × Number of sampling points[*3]	0.016 × Number of sampling points[*3]	0.016 × Number of sampling points[*3]
❷	File register (R, ZR)	Without an extended SRAM cassette and a battery-less option cassette	0.110 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]
		When using an extended SRAM cassette	0.135 × Number of sampling points[*3]	0.135 × Number of sampling points[*3]	0.135 × Number of sampling points[*3]
		When using a battery-less option cassette	0.135 × Number of sampling points[*3]	0.135 × Number of sampling points[*3]	— (Cannot be used)
❸	Local device[*4], latch label[*5]		0.110 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]
❹	Refresh data register (RD)		0.048 × Number of sampling points[*3]	0.048 × Number of sampling points[*3]	0.048 × Number of sampling points[*3]
❺	CPU buffer memory access device	Host CPU U3En\G	0.075 × Number of sampling points[*3]	0.075 × Number of sampling points[*3]	0.075 × Number of sampling points[*3]
❻		Host/another CPU U3En\HG	0.064 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]	0.064 × Number of sampling points[*3]
❼		Another CPU U3En\G	0.025 × Number of sampling points[*3] + 11.3 × Number of blocks[*6] + 13.4[*7]	0.025 × Number of sampling points[*3] + 11.3 × Number of blocks[*6] + 13.4[*7]	0.025 × Number of sampling points[*3] + 11.3 × Number of blocks[*6] + 13.4[*7]
❽	Module access device (Un\G)		0.025 × Number of sampling points[*3] + 15.6 × Number of blocks[*6] + 9.4[*7]	0.025 × Number of sampling points[*3] + 15.6 × Number of blocks[*6] + 9.4[*7]	0.025 × Number of sampling points[*3] + 15.6 × Number of blocks[*6] + 9.4[*7]
❾	Link direct device (Jn\□)		0.028 × Number of sampling points[*3] + 51.6 × Number of blocks[*6] + 2.4[*7]	0.028 × Number of sampling points[*3] + 51.6 × Number of blocks[*6] + 2.4[*7]	0.028 × Number of sampling points[*3] + 51.6 × Number of blocks[*6] + 2.4[*7]

*1 Refers to a standard global device including a safety global device and safety local device for a safety CPU.

*2 Refers to a standard global label and standard local label including a safety global label, safety local label, and standard/safety shared label for a safety CPU.

*3 Total number of sampling points in word conversion

*4 Refers to a standard local device for a safety CPU.

*5 Refers to a standard latch label for a safety CPU.

*6 Refers to the number of settings (number of 'No.'s) in GX Works3.

*7 Will be '0' if the corresponding device is not set.

Period during which devices and labels can be saved

A period during which devices and labels can be saved is calculated with the following formula:

Saving possible period (second) = ❶ ÷ (❷ × ❸) × ❹ × 471,859.2

A saving possible period calculated with this formula is an approximate value because the rate of change and sampling interval vary depending on the program and operating status.

The following table shows the details of each variable in the calculation formula.

Variable	Item	Details
❶	Recording buffer capacity [MB]	The buffer capacity for devices and labels accumulated by a recorder module/camera recorder module. It can be set in the module parameter of a recorder module/camera recorder module.
❷	Sampling size [word]	The size of all sampling targets set in the recording setting. It can be checked in "Sampling Size (Overall)" in the "Recording Setting" screen.
❸	Rate of change	The rate of values of sampled devices and labels that have changed since the last sampling. It is 1 when all values of devices and labels to be sampled are assumed to change per sampling, and 0.5 when half of them are assumed to change.*1 It is calculated with the following formula: Rate of change = Size of changed data ÷ Sampling size (overall)
❹	Sampling interval [second]	The sampling interval for devices and labels. It differs depending on the sampling method. • Each scan: Scan time • Time specification: Sampling interval set in the recording setting*2 • Trigger instruction: Execution interval of a trigger instruction*3 • Safety cycle time: Safety cycle time for executing a safety program

*1 The minimum saving possible period (approximate value) can be calculated by calculating the rate of change as 1.

*2 When selecting "Time Specification" for the sampling method, the sampling interval for devices and labels will not be shorter than the scan time. Set a value greater than or equal to the scan time for the sampling interval for calculation.

*3 When selecting "Trigger Instruction" for the sampling method and executing a trigger instruction once per program execution, the saving possible period (approximate value) can be calculated by calculating the sampling interval as the scan time.

Ex.

For calculating the saving possible period under the following conditions:

❶ Recording buffer capacity: 400 MB

❷ Sampling size (overall): 10,000 words

❸ Rate of change: 0.3

❹ Sampling interval: 100 ms

Saving possible period (second):

❶ ❷ ❸ ❹

400 ÷ (10,000 × 0.3) × (100 × 0.001) × 471,859.2 ≈ 6,291.5(seconds)

A

Period during which video data can be saved

The following table shows periods during which video data can be saved.

Point

- These periods are applied in the following cases:
  - One network camera is connected to one camera recorder module.
  - The upper limit of the recording buffer capacity (800 MB) is all assigned to video data.
- An actual period differs depending on each condition and environment and others for capturing data.

■ONVIF supported network camera

- When using H.264 codec

Video data			Period
Resolution	**Frame rate**	**Quality**	
FHD (1920 × 1080)	30	High	Approx. 2 min 50 sec
		Middle	Approx. 12 min
		Low	Approx. 41 min
	10	High	Approx. 6 min
		Middle	Approx. 25 min
		Low	Approx. 94 min
HD (1280 × 720)	120	High	Approx. 5 min 30 sec
		Middle	Approx. 17 min
		Low	Approx. 64 min
	30	High	Approx. 6 min
		Middle	Approx. 25 min
		Low	Approx. 89 min
	10	High	Approx. 16 min
		Middle	Approx. 67 min
		Low	Approx. 247 min
VGA (640 × 480)	120	High	Approx. 9 min
		Middle	Approx. 27 min
		Low	Approx. 103 min
	30	High	Approx. 13 min
		Middle	Approx. 57 min
		Low	Approx. 200 min
	10	High	Approx. 36 min
		Middle	Approx. 147 min
		Low	Approx. 540 min

• When using Motion JPEG codec

Video data			Period
Resolution	**Frame rate**	**Quality**	
FHD (1920 × 1080)	30	High	Approx. 1 min 15 sec
		Middle	Approx. 1 min 50 sec
		Low	Approx. 3 min 30 sec
	10	High	Approx. 2 min
		Middle	Approx. 3 min 30 sec
		Low	Approx. 7 min
HD (1280 × 720)	120	High	Approx. 1 min 5 sec
		Middle	Approx. 1 min 5 sec
		Low	Approx. 2 min
	30	High	Approx. 2 min 20 sec
		Middle	Approx. 4 min
		Low	Approx. 7 min 30 sec
	10	High	Approx. 4 min 30 sec
		Middle	Approx. 7 min 30 sec
		Low	Approx. 15 min
VGA (640 × 480)	120	High	Approx. 1 min 45 sec
		Middle	Approx. 2 min 45 sec
		Low	Approx. 5 min
	30	High	Approx. 5 min 30 sec
		Middle	Approx. 10 min
		Low	Approx. 20 min
	10	High	Approx. 11 min
		Middle	Approx. 20 min
		Low	Approx. 40 min

Appendix 4 List of Instructions that can Determine the Range of Devices and Labels When the Instructions are Specified

The following table shows the instructions that can determine the range of devices and labels to be used when the instructions are specified.

Instruction					
ACOSD	ACOSDP	ACOSP	ADRSET	ADRSETP	ANDD<
ANDD<=	ANDD<>	ANDD=	ANDD>	ANDD>=	ANDDT<
ANDDT<=	ANDDT<>	ANDDT=	ANDDT>	ANDDT>=	ANDE<
ANDE<=	ANDE<>	ANDE=	ANDE>	ANDE>=	ANDED<
ANDED<=	ANDED<>	ANDED=	ANDED>	ANDED>=	ANDF
ANDFI	ANDP	ANDPI	ANDTM<	ANDTM<=	ANDTM<>
ANDTM=	ANDTM>	ANDTM>=	ASIND	ASINDP	ASINP
ATAND	ATANDP	ATANP	BCDDA	BCDDAP	BINDA
BINDAP	BINHA	BINHAP	COSD	COSDP	DABCD
DABCDP	DABIN	DABINP	DAND	DANDP	DB+
DB+P	DB-	DB-P	DBAND	DBANDP	DBCD
DBCDDA	DBCDDAP	DBCDP	DBIN	DBINDA	DBINDAP
DBINHA	DBINHAP	DBINP	DBL	DBL2DINT	DBL2DINTP
DBL2FLT	DBL2FLTP	DBL2INT	DBL2INTP	DBLP	DCML
DCMLP	DDABCD	DDABCDP	DDABIN	DDABINP	DDEC
DDECP	DEGD	DEGDP	DEGP	DELTA	DELTAP
DFLT	DFLTD	DFLTDP	DFLTP	DGBIN	DGBINP
DGRY	DGRYP	DHABIN	DHABINP	DINC	DINCP
DINT	DINT2DBL	DINT2DBLP	DINT2FLT	DINT2FLTP	DINT2INT
DINT2INTP	DINTD	DINTDP	DINTP	DLIMIT	DLIMITP
DMOV	DMOVP	DNEG	DNEGP	DOR	DORP
DSCL	DSCL2	DSCL2P	DSCLP	DSQRT	DSQRTP
DSUM	DSUMP	DSWAP	DSWAPP	DTEST	DTESTP
DXCH	DXCHP	DXNR	DXNRP	DXOR	DXORP
DZONE	DZONEP	E/	E/P	ECON	ECONP
ED+	ED+P	ED-	ED-P	ED/	ED/P
EDCON	EDCONP	EDMOV	EDMOVP	EDNEG	EDNEGP
EDSQRT	EDSQRTP	EMOV	EMOVP	ENEG	ENEGP
EVAL	EVALP	EXPD	EXPDP	EXPP	FIFR
FIFRP	FIFW	FIFWP	FLT	FLT2DBL	FLT2DBLP
FLT2DINT	FLT2DINTP	FLT2INT	FLT2INTP	FLTD	FLTDP
FLTP	FPOP	FPOPP	GBIN	GBINP	HABIN
HABINP	ICCNTRD1	ICCNTRD1P	ICCNTRD2	ICCNTRD2P	ICFCNT1
ICFCNT2	ICPLSRD1	ICPLSRD1P	ICPLSRD2	ICPLSRD2P	ICPREWR1
ICPREWR1P	ICPREWR2	ICPREWR2P	ICPWM1	ICPWM2	ICRCNT1
ICRCNT2	ICRNGWR1	ICRNGWR1P	ICRNGWR2	ICRNGWR2P	ICSMPRD1
ICSMPRD1P	ICSMPRD2	ICSMPRD2P	INSTR	INSTRP	INT2DBL
INT2DBLP	INT2DINT	INT2DINTP	INT2FLT	INT2FLTP	INTD
INTDP	INTP	IPSTOP1	IPSTOP2	IPTPCHG1	IPTPCHG1P
IPTPCHG2	IPTPCHG2P	LDD<	LDD<=	LDD<>	LDD=
LDD>	LDD>=	LDDT<	LDDT<=	LDDT<>	LDDT=
LDDT>	LDDT>=	LDE<	LDE<=	LDE<>	LDE=
LDE>	LDE>=	LDED<	LDED<=	LDED<>	LDED=
LDED>	LDED>=	LDF	LDFI	LDP	LDPI
LDTM<	LDTM<=	LDTM<>	LDTM=	LDTM>	LDTM>=

Instruction					
LEDR	LENP	LIMIT	LIMITP	LOG	LOG10
LOG10D	LOG10DP	LOG10P	LOGD	LOGDP	LOGP
LOGTRG	LOGTRGR	NDIS	NDISP	NEXT	NUNI
NUNIP	ORD<	ORD<=	ORD<>	ORD=	ORD>
ORD>=	ORDT<	ORDT<=	ORDT<>	ORDT=	ORDT>
ORDT>=	ORE<	ORE<=	ORE<>	ORE=	ORE>
ORE>=	ORED<	ORED<=	ORED<>	ORED=	ORED>
ORED>=	ORTM<	ORTM<=	ORTM<>	ORTM=	ORTM>
ORTM>=	PIDCONT	PIDCONTP	PIDINIT	PIDINITP	PIDPRMW
PIDPRMWP	PIDRUN	PIDRUNP	PIDSTOP	PIDSTOPP	POWD
POWDP	RADD	RADDP	RBMOV	RBMOVP	RND
RNDP	RSET	RSETP	SCL2	SCL2P	SIND
SINDP	SINP	SQRT	SRND	SRNDP	STOP
STRINS	STRINSP	TAND	TANDP	TANP	TIMCHK
WAND	WANDP	WDT	WDTP	WOR	WORD
WORDP	WORP	WXNR	WXNRP	WXOR	WXORP
XCH	XCHP	ZONE	ZONEP	ZPOP	ZPOPP
ZPUSH	ZPUSHP	ZRRDB	ZRRDBP	ZRWRB	ZRWRBP

Appendix 5 Number of Connected Network Cameras and Module Configuration

This section shows the number of connected network cameras and module configuration.

Number of network cameras and module configuration list

The following table shows the number of modules (recorder module/camera recorder module per CPU module) required for each number of connected network cameras.

Up to 16 network cameras can be set in the recording setting.

Note that the numbers shown in the following table are minimum required ones because the number of required modules differs depending on the type, frame rate, and resolution of a network camera used.

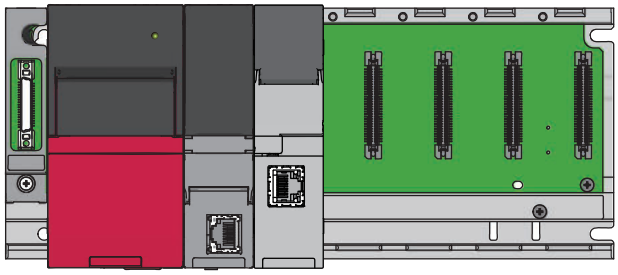
No.	Maximum number of connected network cameras	Number of required modules		Reference
		Camera recorder module	Recorder module	
1	0	0	1*1	Page 254 Configuration No.1
2	2	1	0	Page 255 Configuration No.2
3	4	1	1*1	Page 255 Configuration No.3
4	6	2	0	Page 256 Configuration No.4
5	8	2	1*1	Page 256 Configuration No.5
6	10	3	0	Page 257 Configuration No.6
7	12	3	1*1	Page 257 Configuration No.7
8	14	4	0	Page 258 Configuration No.8
9	16*2	4	1	Page 258 Configuration No.9

*1 A camera recorder module can be used instead.

*2 Only when the frame rate of a network camera is 30 fps or lower.

Number of connectable network cameras for each module configuration

■Configuration No.1

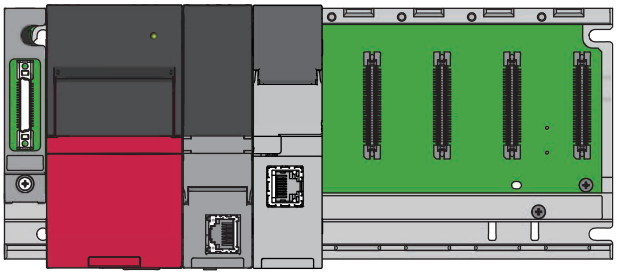


(1)

—: N/A

Item		(1)
Module type		Recorder module
Recording operation setting		Main
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	—
	A network camera with a frame rate of 120 fps is included	—

■Configuration No.2

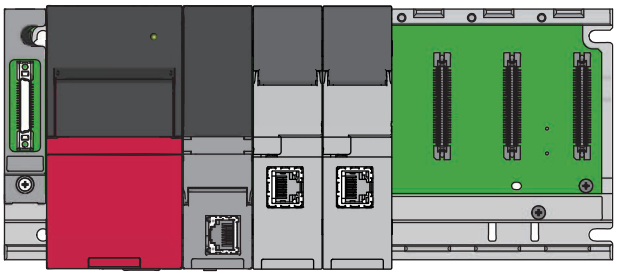


(1)

Item		(1)
Module type		Camera recorder module
Recording operation setting		Main
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	2
	A network camera with a frame rate of 120 fps is included	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

■Configuration No.3



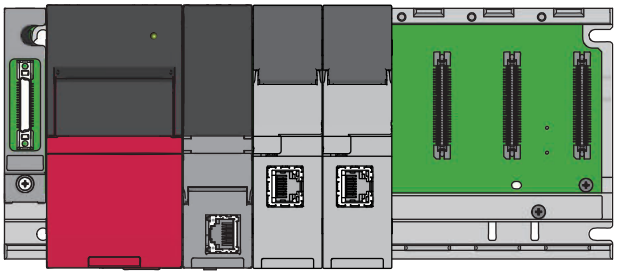
(1) (2)

—: N/A

Item		(1)	(2)
Module type		Recorder module	Camera recorder module
Recording operation setting		Main	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	—	4
	A network camera with a frame rate of 120 fps is included	—	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

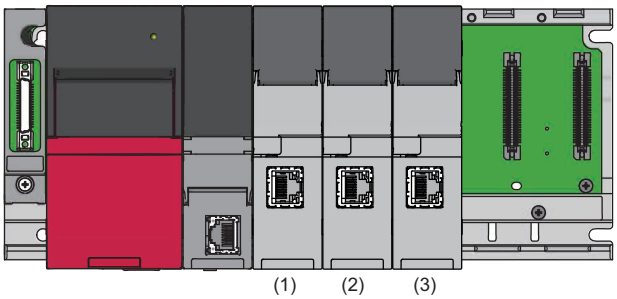
■Configuration No.4



Item		(1)	(2)
Module type		Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	2	4
	A network camera with a frame rate of 120 fps is included	2	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

■Configuration No.5

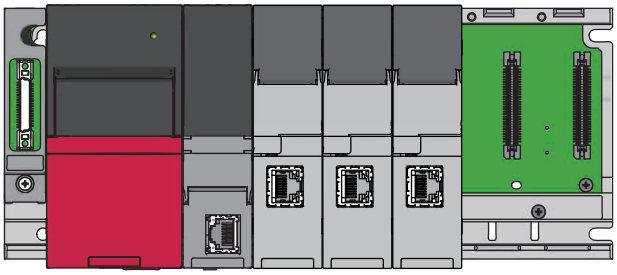


—: N/A

Item		(1)	(2)	(3)
Module type		Recorder module	Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	—	4	4
	A network camera with a frame rate of 120 fps is included	—	2*1	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

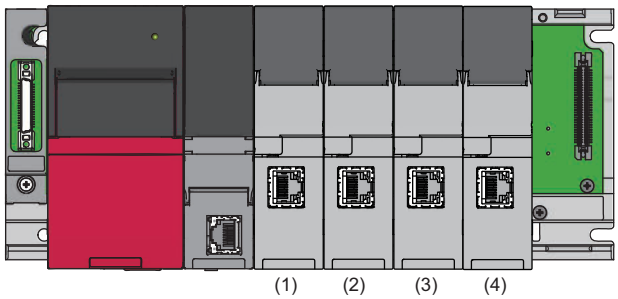
■Configuration No.6



Item		(1)	(2)	(3)
Module type		Camera recorder module	Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	2	4	4
	A network camera with a frame rate of 120 fps is included	2	2*1	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

■Configuration No.7

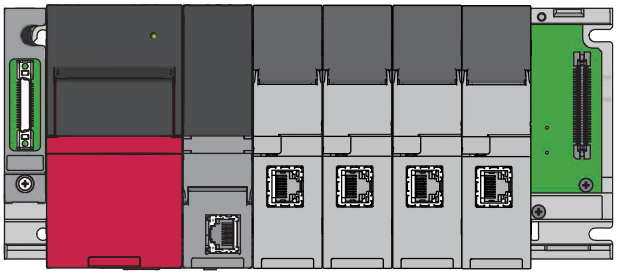


—: N/A

Item		(1)	(2)	(3)	(4)
Module type		Recorder module	Camera recorder module	Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub	Sub	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	—	4	4	4
	A network camera with a frame rate of 120 fps is included	—	2*1	2*1	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

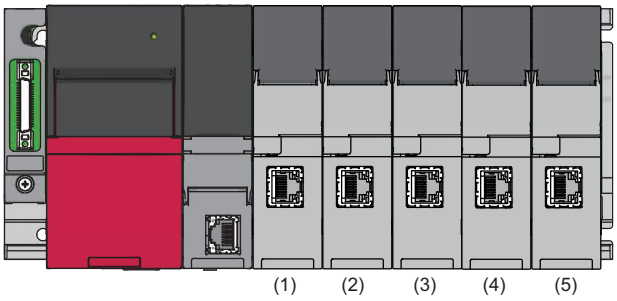
■Configuration No.8



Item		(1)	(2)	(3)	(4)
Module type		Camera recorder module	Camera recorder module	Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub	Sub	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	2	4	4	4
	A network camera with a frame rate of 120 fps is included	2	2*1	2*1	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

■Configuration No.9



—: N/A

Item		(1)	(2)	(3)	(4)	(5)
Module type		Recorder module	Camera recorder module	Camera recorder module	Camera recorder module	Camera recorder module
Recording operation setting		Main	Sub	Sub	Sub	Sub
Number of connectable network cameras	Only network cameras with a frame rate of 30 fps or lower	—	4	4	4	4
	A network camera with a frame rate of 120 fps is included	—	2*1	2*1	2*1	2*1

*1 For ONVIF supported network cameras with VGA resolution.
1 for ONVIF supported network cameras with HD resolution.

Appendix 6 Added and Changed Functions

This section shows the added and changed functions of System Recorder.

Recording function

Added/changed contents	Firmware version of a module		Software version	Reference
	Recorder module	Camera recorder module	GX Works3	
Safety devices, safety labels (standard/ safety shared labels), and safety cycle time are supported. (Safety CPUs are supported.)	03 or later	01 or later	• When using a recorder module: 1.070Y or later • When using a camera recorder module: 1.072A or later	MELSEC iQ-R System Recorder User's Manual (Startup)
Files can be saved to a file server.				Page 16 Recording Function
Video data can be saved.	—		1.072A or later	Page 16 Recording Function
Multiple modules can be configured.	04 or later			MELSEC iQ-R System Recorder User's Manual (Startup) Page 61 Operation of the recording function when configuring multiple modules
Restarting recording operation after online change is improved.				Page 70 Program change while the recording function is running

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REVISIONS

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

Revision date	*Manual number	Description
June 2020	SH(NA)-082281ENG-A	First edition
June 2020	SH(NA)-082281ENG-B	Partial correction
October 2020	SH(NA)-082281ENG-C	■Added or modified parts TERMS, Section 1.1, Section 1.3, Section 2.1, Section 2.2, Section 3.1, Section 3.3, Section 3.5, Section 4.1, Section 5.1, Section 5.2, Section 5.5, Section 6.1, Section 6.4, Appendix 1, Appendix 2, Appendix 4
February 2021	SH(NA)-082281ENG-D	■Added or modified parts TERMS, Section 1.1, Section 2.2, Section 2.3, Section 2.4, Section 3.1, Section 3.2, Section 3.3, Section 3.6, Chapter 4, Section 5.1, Section 5.2, Section 5.5, Section 5.6, Section 6.4, Chapter 7, Appendix 2, Appendix 3, Appendix 5, Appendix 6

Japanese manual number: SH-082280-D

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.

TRADEMARKS

ONVIF is a trademark of Onvif, Inc.

The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies.

In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

SH(NA)-082281ENG-D(2102)KWIX
MODEL: SYSRECORDER-U-OU-E
MODEL CODE: 13JX3B

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