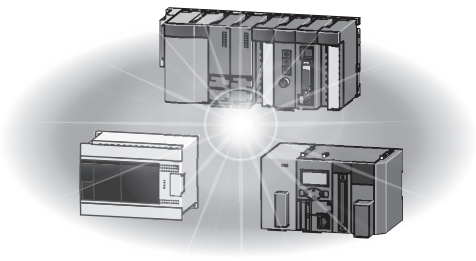
MITSUBISHI ELECTRIC

Programmable Controller

MELSEC Q series MELSEC L series

MELSEC-Q/L AnyWireASLINK Master Module User's Manual

-QJ51AW12AL
-LJ51AW12AL



Powered by Anywire

This product was jointly developed and manufactured by Mitsubishi and Anywire Corporation.
*Note that the warranty on this product differs from that on other programmable controller products. (Refer to "WARRANTY" in this manual.)

AnyWireASLINK

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PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS

The QJ51AW12AL and LJ51AW12AL were jointly developed and manufactured by Mitsubishi and Anywire Corporation.
Note that there are some precautions regarding warranty and specifications of this product.

Warranty

Item	QJ51AW12AL, LJ51AW12AL	Other programmable controller products (e.g. MELSEC-Q series)
Repair term after discontinuation of production	1 year	7 years

Application of the EMC Directive

Item	QJ51AW12AL, LJ51AW12AL	Other programmable controller products (e.g. MELSEC-Q series)
Applicable EMC standard	EN61131-2*1	EN61131-2

*1 The master module with a serial number where the sixth digit is "2" or later complies with this standard.

Application of the UL/cUL standards

Item	QJ51AW12AL, LJ51AW12AL	Other programmable controller products (e.g. MELSEC-Q series)
Applicable UL standard/cUL standard	UL508*2 CSA22.2*2	UL508 CSA22.2

*2 The master module with a serial number where the sixth digit is "3" or later complies with this standard.

●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.

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.

Precautions for using the QJ51AW12AL

[Design Precautions]

⚠WARNING

- An AnyWireASLINK system has no control function for ensuring safety.
- When connecting a peripheral with the CPU module or connecting a personal computer with an 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 or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding.
  Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure.
  To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" of the buffer memory in the intelligent function module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to the intelligent function module. Doing so may cause malfunction of the programmable controller system.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

[Security Precautions]

⚠WARNING

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

[Installation Precautions]

⚠WARNING

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

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used.
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect interconnection may cause malfunction, failure, or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
- Tighten the screws within the specified torque range.
  Undertightening can cause drop of the screw, short circuit, or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module.
  Failure to do so may result in damage to the product.
- Do not directly touch any conductive parts and electronic components of the module.
  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 damage to the product.

[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.
- Check the rated voltage and terminal 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 a fire or failure.
- Tighten the terminal block screws within the specified torque range.
  Undertightening can cause short circuit, fire, or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.
- When a protective film is attached to the top of the module, remove it before system operation. If not, inadequate heat dissipation of the module may cause a fire, failure, or malfunction.
- Do not apply the 24VDC power before wiring the entire AnyWireASLINK system. If the power is applied before wiring, normal data transmission is not guaranteed.
- Connect a 24VDC external power supply to the device(s) in an AnyWireASLINK system.
- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them.
  If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- When disconnecting the cable from the module, do not pull the cable by the cable part.
  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.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal block screws.
  Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠CAUTION

- Do not disassemble or modify the module.
  Doing so may cause failure, malfunction, injury, or a fire.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may cause the module to fail or malfunction.
- Tighten the terminal block screws within the specified torque range.
  Undertightening can cause drop of the component or wire, short circuit, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively.
  Exceeding the limit of 50 times may cause malfunction.
- 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.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

Precautions for using the LJ51AW12AL

[Design Precautions]

⚠WARNING

- An AnyWireASLINK system has no control function for ensuring safety.
- When connecting a peripheral with the CPU module or connecting a personal computer with an 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 or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding.
  Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure.
  To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" of the buffer memory in the intelligent function module. Also, do not use any "use prohibited" signals as an output signal from the CPU module to the intelligent function module. Doing so may cause malfunction of the programmable controller system.

[Design Precautions]

⚠CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

[Security Precautions]

⚠WARNING

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

[Installation Precautions]

⚠WARNING

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

[Installation Precautions]

⚠CAUTION

- Use the programmable controller in an environment that meets the general specifications in the Safety Guidelines provided with the CPU module or head module. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To interconnect modules, engage the respective connectors and securely lock the module joint levers until they click. Incorrect interconnection may cause malfunction, failure, or drop of the module.
- 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.
- Do not directly touch any conductive parts and electronic components of the module.
  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 damage to the product.

[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.
- Check the rated voltage and terminal 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 a fire or failure.
- Tighten the terminal block screws within the specified torque range.
  Undertightening can cause short circuit, fire, or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.
- When a protective film is attached to the top of the module, remove it before system operation. If not, inadequate heat dissipation of the module may cause a fire, failure, or malfunction.
- Do not apply the 24VDC power before wiring the entire AnyWireASLINK system. If the power is applied before wiring, normal data transmission is not guaranteed.
- Connect a 24VDC external power supply to the device(s) in an AnyWireASLINK system.
- Do not install the control lines or communication cables together with the main circuit lines or power cables.
  Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them.
  If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- When disconnecting the cable from the module, do not pull the cable by the cable part.
  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.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal block screws.
  Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠CAUTION

- Do not disassemble or modify the module.
  Doing so may cause failure, malfunction, injury, or a fire.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may cause the module to fail or malfunction.
- Tighten the terminal block 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 (module and terminal block), do not connect/disconnect the product more than 50 times (in accordance with IEC 61131-2).
  Exceeding the limit may cause malfunction.
- 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.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

●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-Q or -L series programmable controllers.
This manual describes the functions and programming of the QJ51AW12AL AnyWireASLINK master module and LJ51AW12AL AnyWireASLINK master module.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC-Q or -L series programmable controller to handle the product correctly.
When applying the program examples introduced 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.

Remark

Unless otherwise specified, this manual describes the program examples in which the I/O numbers of X/Y10 to X/Y2F are assigned for a master module. I/O numbers must be assigned to apply the program examples introduced in this manual to an actual system.
For I/O number assignment, refer to the following.
User's Manual (Function Explanation, Program Fundamentals) for the CPU module used

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

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

- User's manual for the CPU module or head module used
- Safety Guidelines (This manual is included with the CPU module, base unit, or head module.)

Certification marks on the side of the programmable controller indicate compliance with the relevant regulations.

(2) Additional measures

To ensure that this product maintains the EMC and Low Voltage Directives or other regulations, please refer to Page 116, Appendix 4.

RELEVANT MANUALS

(1) CPU module user's manual

Manual name <manual number (model code)>	Description
QCPU User's Manual (Hardware Design, Maintenance and Inspection) <SH-080483ENG, 13JR73>	Specifications of the hardware (CPU modules, power supply modules, base units, batteries, and memory cards), system maintenance and inspection, and troubleshooting
QnUCPU User's Manual (Function Explanation, Program Fundamentals) <SH-080807ENG, 13JZ27>	Functions and devices of the CPU module, and programming
Qn(H)/QnPH/QnPRHCPU User's Manual (Function Explanation, Program Fundamentals) <SH-080808ENG, 13JZ28>	Functions and devices of the CPU module, and programming
MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) <SH-080890ENG, 13JZ36>	Specifications of the CPU modules, power supply modules, display unit, SD memory cards, and batteries, information on how to establish a system, maintenance and inspection, and troubleshooting
MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals) <SH-080889ENG, 13JZ35>	Functions and devices of the CPU module, and programming

(2) Head module user's manual

Manual name <manual number (model code)>	Description
MELSEC-L CC-Link IE Field Network Head Module User's Manual <SH-080919ENG, 13JZ48>	Specifications, procedures before operation, system configuration, installation, wiring, settings, and troubleshooting of the head module

(3) Operating manual

Manual name <manual number (model code)>	Description
GX Works2 Version 1 Operating Manual (Common) <SH-080779ENG, 13JU63>	System configuration, parameter settings, and online operations of GX Works2, which are common to Simple projects and Structured projects

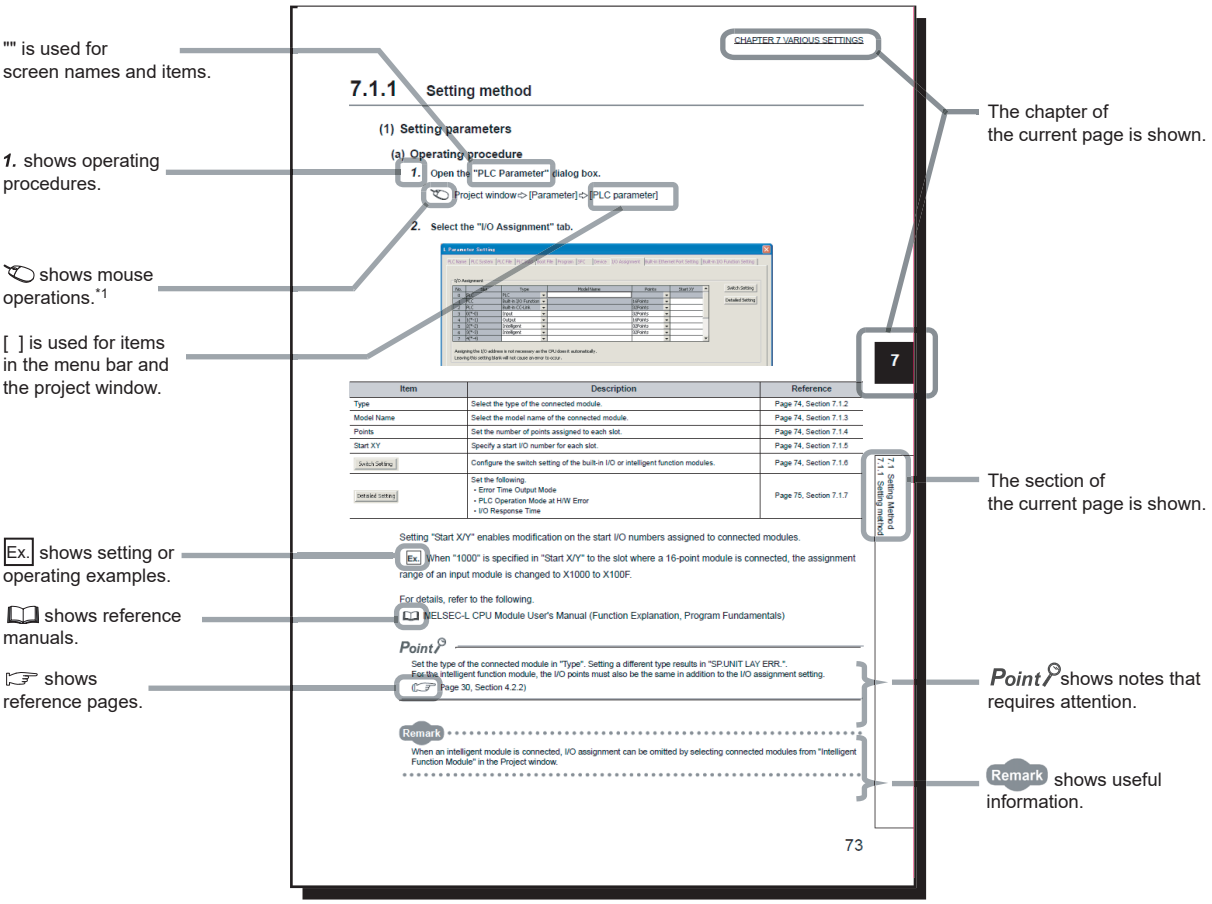
(4) Others

Manual name <manual number (model code)>	Description
iQ Sensor Solution Reference Manual <SH-081133ENG, 13JV28>	Operating methods of iQ Sensor Solution, such as programming and monitoring

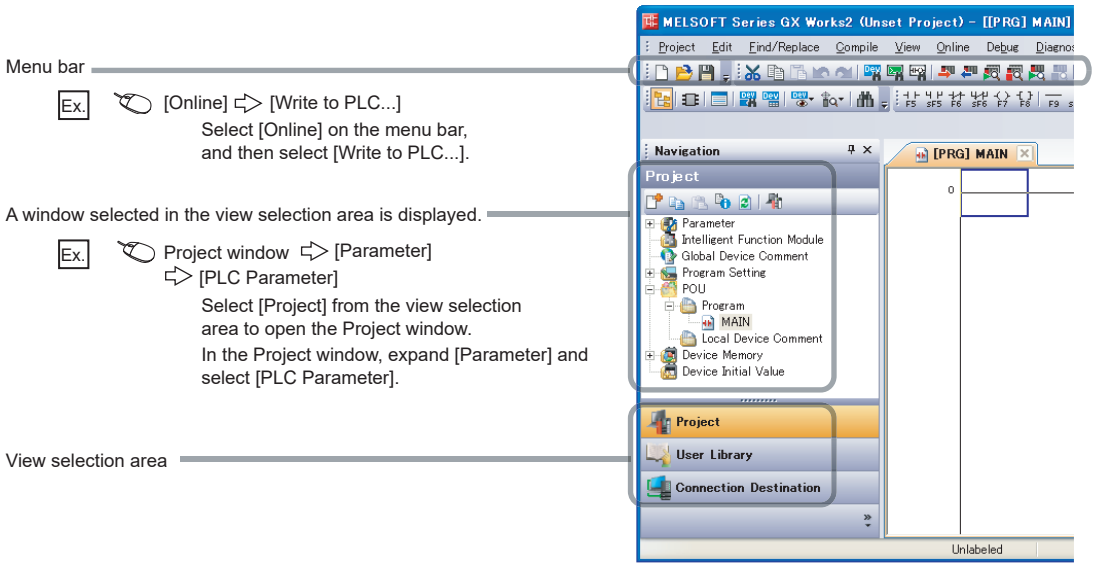
CONTENTS

MANUAL PAGE ORGANIZATION

In this manual, pages are organized and the symbols are used as shown below.
The following illustration is for explanation purpose only, and should not be referred to as an actual documentation.



*1 The mouse operation example (for GX Works2) is provided below.



TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Address	A parameter assigned to a slave module to identify each node on the AnyWireASLINK network
Address writer	A hand-held device to read/write parameters (including addresses) from/to a slave module
AnyWireASLINK	A system where sensors at the end of a control system are connected to a programmable controller in the most suitable way. With this system, a bridge module can detect sensor disconnection and a user can set the I/O operations of a slave module on a bridge module without using I/O areas of the CPU module.
Buffer memory	A memory in an intelligent function module, where data (such as setting values and monitoring values) exchanged with a CPU module are stored
GX Developer	The product name of the software package for the MELSEC programmable controllers
GX Works2	
ID	A parameter to identify whether the module is an input module or output module based on its address Output slave module ID: Address Input slave module/I/O combined slave module ID: Address + 200_H
Intelligent function module	A MELSEC-Q/L series module that has functions other than input and output, such as an A/D converter module and D/A converter module
Power cable (24V, 0V)	A cable that connects a master module to a 24VDC external power supply
Terminating unit	A waveform shaper
Transmission cable (DP, DN)	A signal cable that connects a slave module to a master module
Transmission cycle time	A data sampling interval

GENERIC TERMS AND ABBREVIATIONS

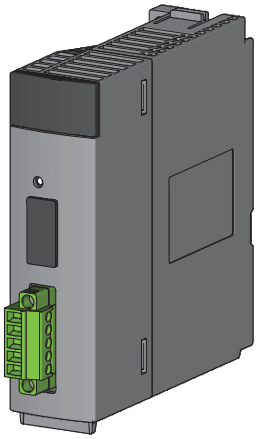
Unless otherwise specified, this manual uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
AnyWireASLINK bridge module	A generic term for the NZ2AW1C2AL and NZ2AW1GFAL
AnyWireASLINK master module	A generic term for the RJ51AW12AL, QJ51AW12AL, and LJ51AW12AL
ASLINKAMP	A generic term for sensor amplifiers that have an AnyWireASLINK interface
ASLINKER	A generic term for I/O devices that have an AnyWireASLINK interface
ASLINKSENSOR	A generic term for sensors that have an AnyWireASLINK interface
CPU module	A generic term for the MELSEC-Q and -L series CPU modules
Head module	The abbreviation for the LJ72GF15-T2 CC-Link IE Field Network head module
Master module	A generic term for the QJ51AW12AL and LJ51AW12AL
MELSEC-L series	An abbreviation for the Mitsubishi programmable controller MELSEC-L series
MELSEC-Q series	An abbreviation for the Mitsubishi programmable controller MELSEC-Q series
Programming tool	A generic term for GX Works2 and GX Developer
Slave module	A generic term for modules that communicate data with a master module

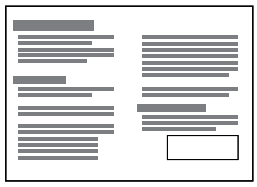
PACKING LIST

The following items are included in the package of this product. Before use, check that all the items are included.

QJ51AW12AL

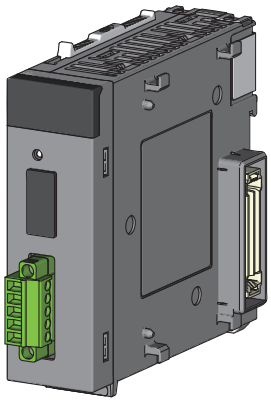


QJ51AW12AL

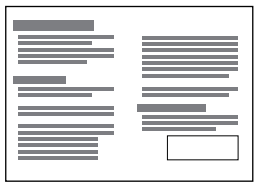


Before Using the Product

LJ51AW12AL



LJ51AW12AL



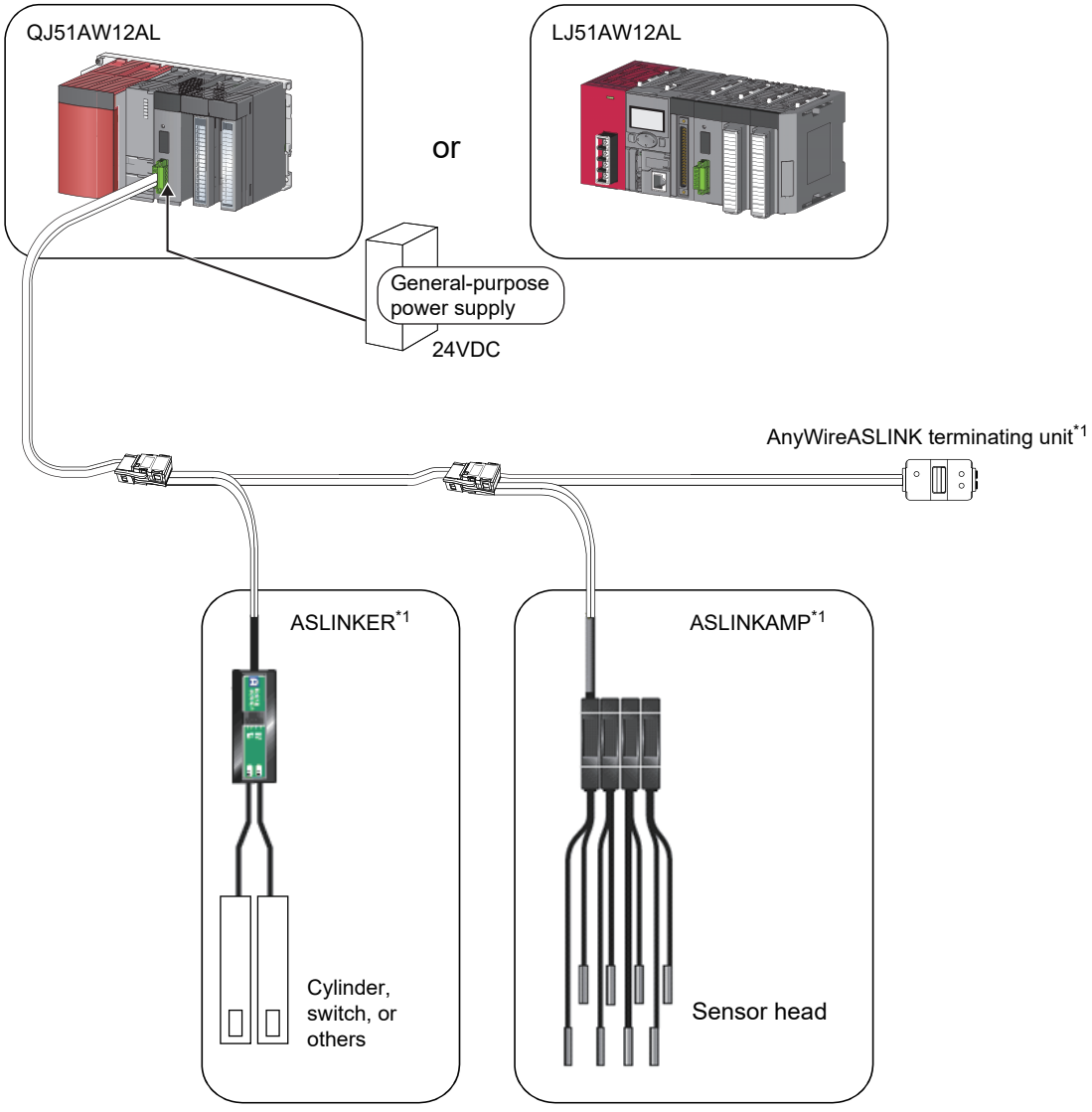
Before Using the Product

CHAPTER 1 FEATURES

1.1 AnyWireASLINK

The AnyWireASLINK® is a high-speed and highly reliable system which releases the work site from complicated and incorrect wiring.
In this network, sensors at the end of a control system are connected to a programmable controller in the optimum form.
Furthermore, this network enables a mater module to detect sensor disconnection and enables a user to set the operations of a slave module only using the areas, 32 points occupied, of a master module with the I/O assignment setting.

The master module, a product of the joint development project with Anywire Corporation, allows the AnyWireASLINK system to be constructed in a MELSEC-Q or MELSEC-L series programmable controller system.



*1 Manufactured by Anywire Corporation

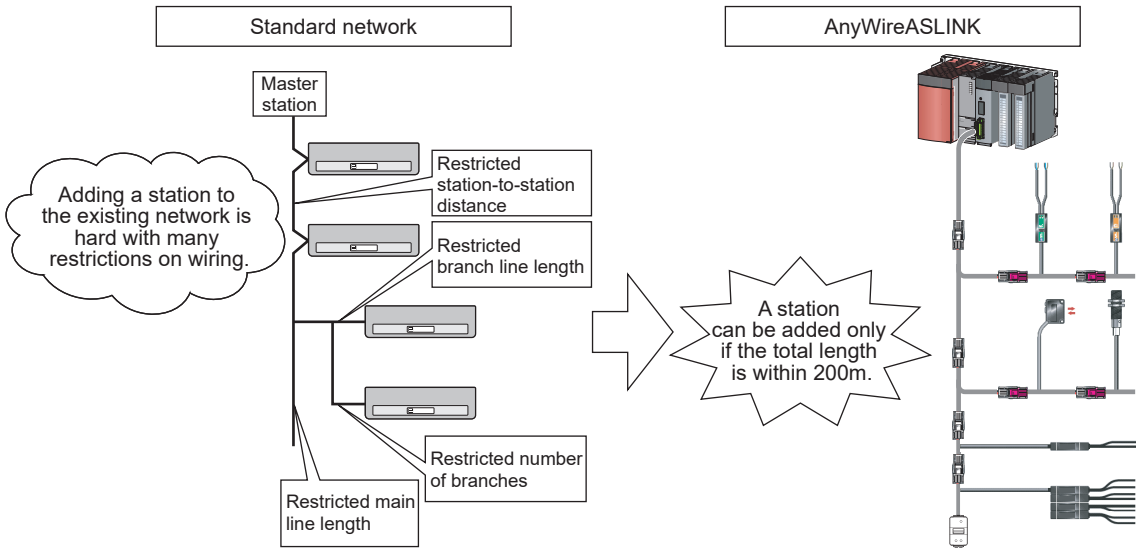
1.2 Features

This section describes the features of the AnyWireASLINK.

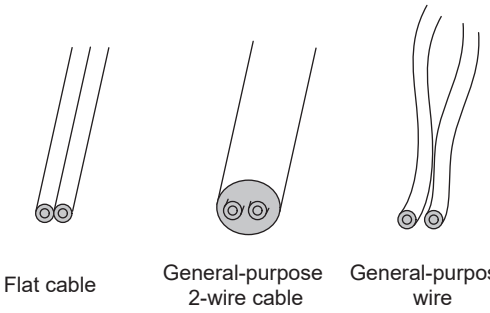
(1) Flexible wiring

The AnyWireASLINK allows flexible connections if the overall cable distance of transmission cables (DP, DN) is within 200m.

There is no restriction about, for example, the main line length, station-to-station distance, and number of branches.



Moreover, because of a little restrictions about cables, cables used for other networks can be used for the AnyWireASLINK without modification, resulting in reduced wiring man-hours and cable cost. *1



*1 Before using, check the performance specifications. (☞ Page 27, Section 3.2.1)

(2) Single-touch cable connection and disconnection

Using a dedicated connector enables cables to be connected and disconnected with a single operation and eases slave module addition and replacement. *1

*1 For wiring with the dedicated connectors, contact Anywire Corporation.

(3) Space saving

The system needs much less space because of a wide selection of small-type slave modules (manufactured by Anywire Corporation).

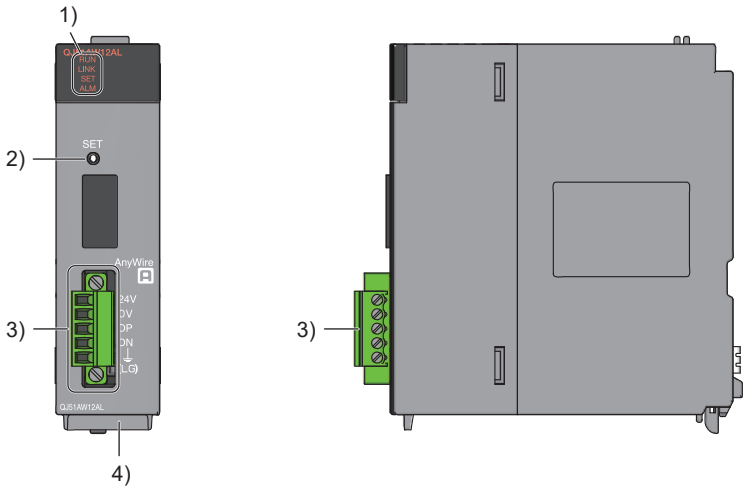
(4) RAS improvement

The system start-up time can be reduced by checking whether a slave module is connected or by detecting an ID setting error.

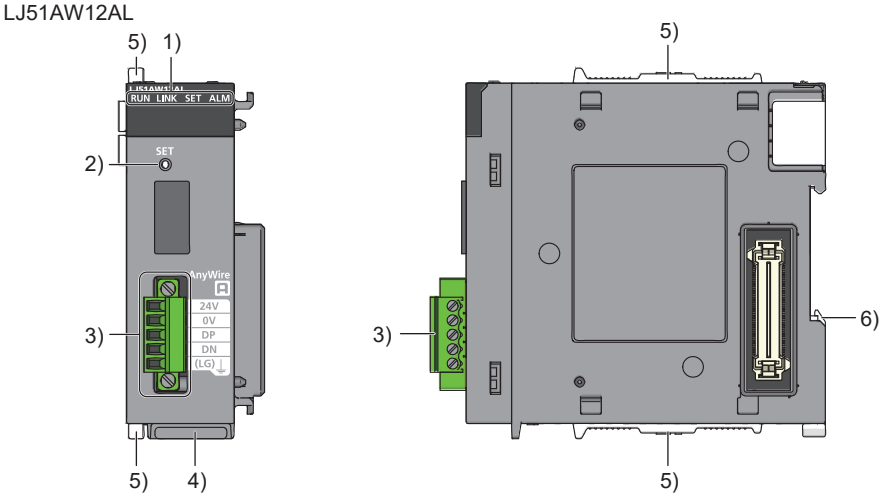
CHAPTER 2 PART NAMES

This chapter describes the part names of the master module.

QJ51AW12AL



LJ51AW12AL



No.	Name	Description	
1)	LED display	The master module status is indicated by the LEDs.	
		LED name	Description
		RUN LED (green)	Indicates the operating status of the master module. ON: Operating normally OFF: Master module error, 5VDC power off, or CPU module stop error
		LINK LED (green)	Indicates the link status of the master module. Flashing: Communication is possible. Off, On: Communication is not possible.
		SET LED (green)	Indicates the address detection status of the master module. On: Automatic address detection in progress Flashing: Address write in progress Off: Before or after automatic address detection
		ALM LED (red)	Indicates the alarm status of the master module. ON: DP/DN disconnection, no response from the slave module Slow flashing (one-second intervals): DP/DN short Fast flashing (0.2-second intervals): 24VDC is not being supplied or the voltage is low. OFF: Operating normally
2)	SET switch	Switch for automatic detection of the slave module ID (address)	
3)	Transmission cable terminal block	A terminal block of the AnyWireASLINK	
4)	Serial number display	Displays the serial number printed on the rating plate	
5)	Module joint lever	A lever for connecting modules	
6)	DIN rail hook	A hook for mounting a module to a DIN rail	

CHAPTER 3 SPECIFICATIONS

This chapter describes the general specifications and performance specifications and lists the functions, I/O signals, and buffer memory addresses.

3.1 General Specifications

For the general specifications of the master module, refer to the following.

📖 "Safety Guidelines" included with the CPU module, base unit, or head module

3.2 Performance Specifications

3.2.1 Performance list

The following table lists the performance specifications of the master module.

Item		Model name	
		QJ51AW12AL	LJ51AW12AL
Transmission clock		27.0kHz	
Maximum transmission distance (total length)		200m*2	
Transmission system		DC power supply transmission total frame cyclic system	
Connection type		Bus topology (multidrop system, T-branch system, tree branch system, star topology)	
Transmission protocol		Dedicated protocol (AnyWireASLINK)	
Error control		Checksum, double-check system	
Number of connected I/O points		Up to 512 points (256 input points/256 output points)	
Number of connectable slave modules		Up to 128 (varies depending on the current consumption of each slave module)	
RAS function		Disconnected transmission cable location detection function, transmission cable short detection function, transmission cable voltage drop detection function	
Transmission cable (DP, DN)		• UL-listed general-purpose 2-wire cable (VCTF, VCT 1.25mm², 0.75mm², temperature rating 70℃ or higher) • UL-listed general-purpose wire (1.25mm², 0.75mm², temperature rating 70℃ or higher) • Dedicated flat cable (1.25mm², 0.75mm², temperature rating 90℃)	
Power cable (24V, 0V)		• UL-listed general-purpose 2-wire cable (VCTF, VCT 0.75mm² to 2.0mm², temperature rating 70℃ or higher) • UL-listed general-purpose wire (0.75mm² to 2.0mm², temperature rating 70℃ or higher) • Dedicated flat cable (1.25mm², 0.75mm², temperature rating 90℃)	
Transmission cable supply current*1		When using a 1.25mm² cable: Up to 2A When using a 0.75mm² cable: Up to 1.2A	
Maximum number of writes to EEPROM		Up to 100000 times	
Power supply	Internal current consumption (5VDC)	Voltage: 5VDC ±5% Current consumption: Up to 0.2A	
	External power supply	Voltage: 21.6 to 27.6VDC (24VDC -10% to +15%), ripple voltage 0.5Vp-p or lower Recommended voltage: 26.4VDC (24VDC + 10%) Module current consumption: 0.1A Transmission cable supply current: Up to 2A*1	
Number of occupied I/O points		32 points (I/O assignment: intelligent 32 points)	
External dimensions		98.0mm (H) × 27.4mm (W) × 100.0mm (D)	90.0mm (H) × 28.5mm (W) × 104.5mm (D)
Weight		0.2kg	

*1 For the relationship between the total length, the wire diameter of transmission cables (DP, DN), and the transmission cable supply current, refer to the following. On some slave modules with cables, the wire diameter of module-integrated transmission cables (DP, DN) may be 0.75mm² or less. However, they can be used without any problem, provided that the diameter of the transmission cables (DP, DN) meets the requirement below.

Wire diameter of transmission cables (DP, DN)	Transmission cable supply current		
	Total length of 50m or less*2	Total length of 50m to 100m*2	Total length of 100m to 200m*2
1.25mm²	Up to 2A	Up to 1A	Up to 0.5A
0.75mm²	Up to 1.2A	Up to 0.6A	Up to 0.3A

*2 For slave modules with integrated transmission cables (DP, DN), the length of the transmission cables (DP, DN) is included in the total length.
For wiring of 50m or more with 4 wires (DP, DN, 24V, 0V), insert the noise filter for power supply cables between the power supply and cables. For details, refer to the manual for the ASLINKFILTER (ANF-01) manufactured by Anywire Corporation.

3.2.2 Number of parameters to set

As for the initial settings of a master module and the parameter settings regarding the auto refresh setting, do not set the number of parameters, including those of other intelligent function modules, greater than the number of parameters that can be set in a CPU module.

For the maximum number of parameters settable on the CPU module, refer to the following.

User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used

MELSEC-L CC-Link IE Field Network Head Module User's Manual

(1) The number of parameters for a master module

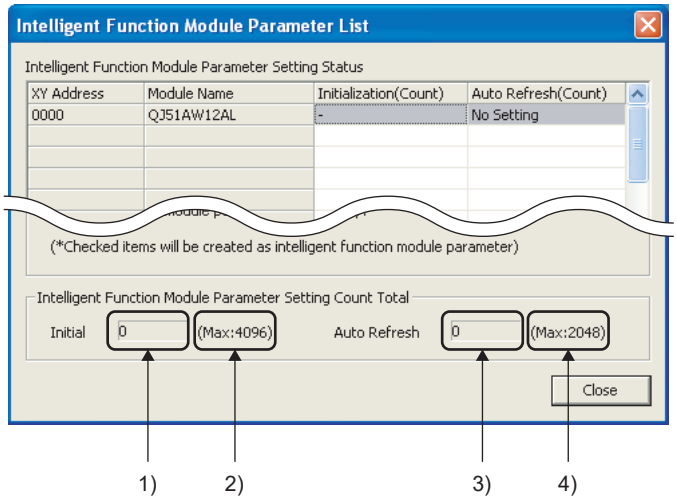
The master module allows the following number of parameters per module.

Target module	Initial setting	Auto refresh setting
QJ51AW12AL	0 (unused)	2 (maximum number of settings)
LJ51AW12AL	0 (unused)	2 (maximum number of settings)

(2) Check method

The number of parameters set in an intelligent function module and the maximum number of parameter settings can be checked with the following operations:

Project window ⇨ [Intelligent Function Module] ⇨ Right click ⇨ [Intelligent Function Module Parameter List]



No.	Description
1)	Total number of initial setting parameters having the checkboxes checked on the window
2)	Maximum number of initial parameter settings
3)	Total number of auto refresh setting parameters having the checkboxes checked on the window
4)	Maximum number of auto refresh setting parameters

3.2.3 Communication performance

(1) Transmission cycle time

The transmission cycle time is the time required for the master module and all the slave modules to update I/O data.

The transmission cycle time of the master module is listed in the table below.

Number of transmission points	64 points (32 input points, 32 output points)	128 points (64 input points, 64 output points)	256 points (128 input points, 128 output points)	512 points (256 input points, 256 output points)
One transmission cycle time	2.4ms	3.6ms	6.0ms	10.7ms

Remark

- The transmission delay time is a value between one- and two-transmission cycle time.
- To ensure the response to the input signal, provide an input signal that is longer than two-transmission cycle time.

(2) Effects of the double check system

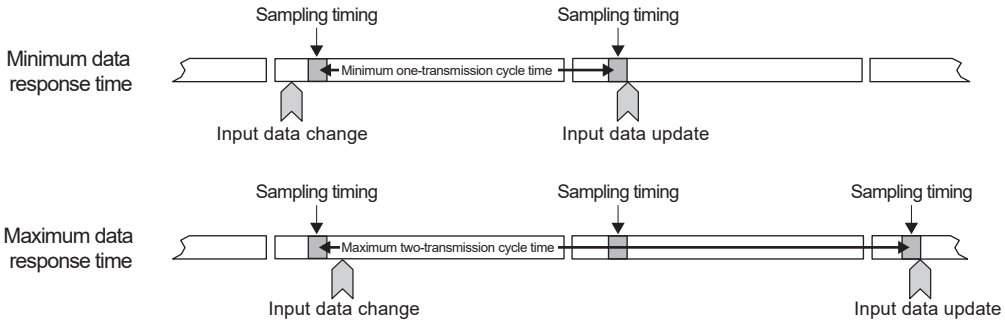
(a) Input

Unless the same data is received twice successively on the master module side, the input area data is not updated.

A minimum of one-transmission cycle time and a maximum of two-transmission cycle time are required as the data response time.

Therefore, when an input signal is shorter than two-transmission cycle time, the input data may not be captured depending on the timing.

To ensure the response, provide an input signal that is longer than two-transmission cycle time.



(b) Output

As the double check is performed on the slave module side, the time required is the same as that for input, namely a minimum of one-transmission cycle time and a maximum of two-transmission cycle time.

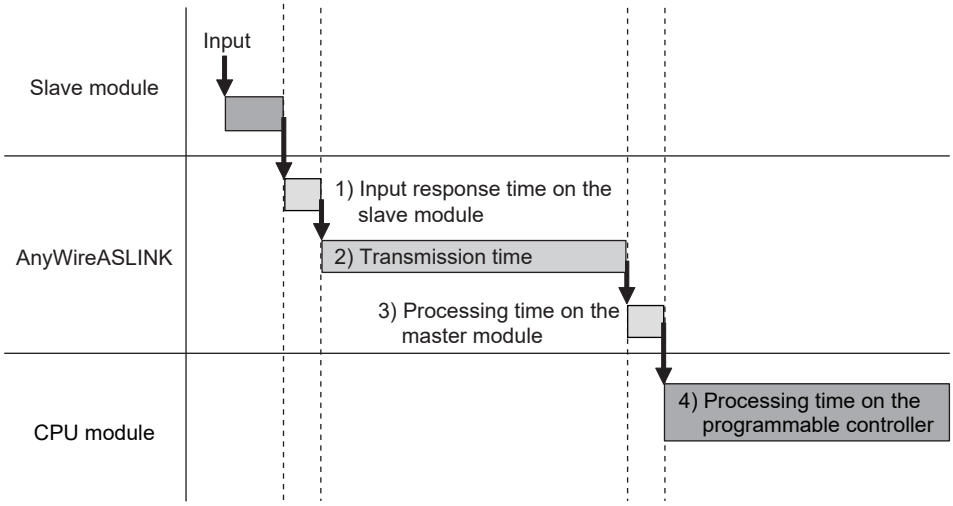
(3) Response delay time

The following shows the response delay time of input and output.

(a) Input response delay time

The figure below shows the time between a signal input to the slave module and the CPU module device turning on/off.

The input response delay time is the total of 1) to 4) in the following figure.

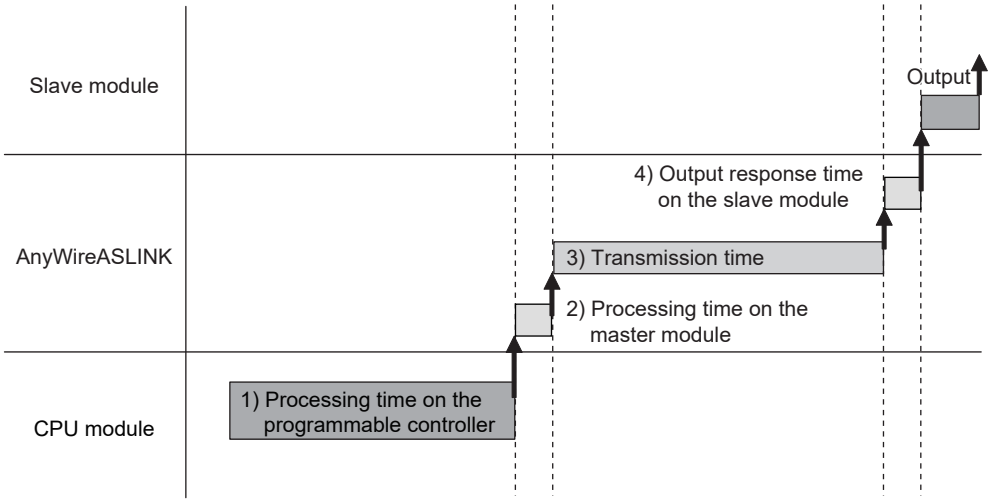


No.	Description	Required time
1)	Input response time on the slave module	Refer to the manual for the slave module connected to the system or the device connected to the slave module.
2)	Transmission time	Transmission cycle time × 2 The transmission cycle time differs depending on the number of transmission points. (☞ Page 30, Section 3.2.3 (1))
3)	Processing time on the master module	0.6ms
4)	Processing time on the programmable controller	Sequence scan time × 2

(b) Output response delay time

The figure below shows the time between the CPU module device turning on/off and a signal output from the slave module turning on/off.

The output response delay time is the total of 1) to 4) in the following figure.



No.	Description	Required time
1)	Processing time on the programmable controller	Sequence scan time
2)	Processing time on the master module	0.6ms
3)	Transmission time	Transmission cycle time × 2 The transmission cycle time differs depending on the number of transmission points. (☞ Page 30, Section 3.2.3 (1))
4)	Output response time on the slave module	Refer to the manual for the slave module connected to the system or the device connected to the slave module.

(4) Parameter access response time

The parameters of the AnyWireASLINK provide the monitoring information of the slave module or the entire system and the setting information of the slave module.

Parameter data are synchronized between the buffer memory of the master module and the slave module at a cycle different from that of the I/O data.

Use the following calculation formulas to obtain the parameter access response time.

[Update interval time of an automatically updated parameter]

Number of AnyWireASLINK connection IDs × transmission cycle time × 3

[Time required for reading a parameter]

Number of target IDs × transmission cycle time × 27

[Time required for writing a parameter]

Number of target IDs × transmission cycle time × 39

3.3 Function List

The following table lists the functions of the master module.

Item	Description	Reference item
Bit transmission function	Performs input and output of up to 512 points (256 input points and 256 output points) between the master module and the slave module.	Page 64, Section 8.1
Parameter reading function	Reads the parameters of a slave module connected to the master module without delaying the AnyWireASLINK bit transmission.	Page 71, Section 8.8
Parameter writing function	Writes the parameters of a slave module connected to the master module without delaying the AnyWireASLINK bit transmission.	Page 71, Section 8.8
Automatic address detection function	The master module detects or stores the ID (address) of the connected slave module when the SET switch on the front of the master module is pressed. (Alternatively a specific bit can be used.)	Page 59, Section 7.3
Transmission cable short detection function	Detects a short in DP-DN cables.	Page 64, Section 8.2
Disconnected transmission cable location detection function	Detects the location of DP-DN cable disconnection.	Page 65, Section 8.3
Transmission cable voltage drop detection function	Monitors a voltage drop in the 24VDC external power supply.	Page 66, Section 8.4
Parameter access error detection function	Detects an error upon reading or writing of the setting values of the slave module.	Page 67, Section 8.5
Same ID used detection function	Checks whether the same ID is used for multiple slave modules. The LEDs of the relevant slave modules are forcibly turned on.	Page 69, Section 8.6
Module with no ID setting detection function	Detects slave modules with no ID assigned (default ID).	Page 70, Section 8.7
iQ Sensor Solution function	Establishes data communications with AnyWireASLINK-compatible slave modules via AnyWireASLINK.	Page 77, Section 8.9

3.4 List of I/O Signals

The following table lists the signals input or output between the CPU module and the master module.
For details on the I/O signals, refer to Page 104, Appendix 1.

Signal direction: Master module to CPU module		Signal direction: CPU module to master module	
Device number	**Signal name**	**Device number**	**Signal name**
Xn0	Module READY	Yn0	Error flag clear command
Xn1	DP/DN short error	Yn1	Automatic address detection command
Xn2	Use prohibited	Yn2 to YnF	Use prohibited
Xn3	Transmission cable voltage drop error		
Xn4	DP/DN disconnection error		
Xn5 to XnF	Use prohibited		
X(n+1)0	Slave module alarm signal	Y(n+1)0	Parameter access request command
X(n+1)1	Parameter access completion flag	Y(n+1)1	Parameter batch read command
X(n+1)2	Parameter access error	Y(n+1)2	Parameter batch write command
X(n+1)3	Use prohibited	Y(n+1)3 to Y(n+1)F	Use prohibited
X(n+1)4	Automatic address detection flag		
X(n+1)5 to X(n+1)F	Use prohibited		

3.5 List of Buffer Memory Addresses

Buffer memory is for data communications between the master module and the CPU module.
When the CPU module is reset or the system is powered off and on, the data in the buffer memory are set back to the default (initial values).
The following table lists the buffer memory addresses for the master module.
For details on the buffer memory, refer to Page 107, Appendix 2.

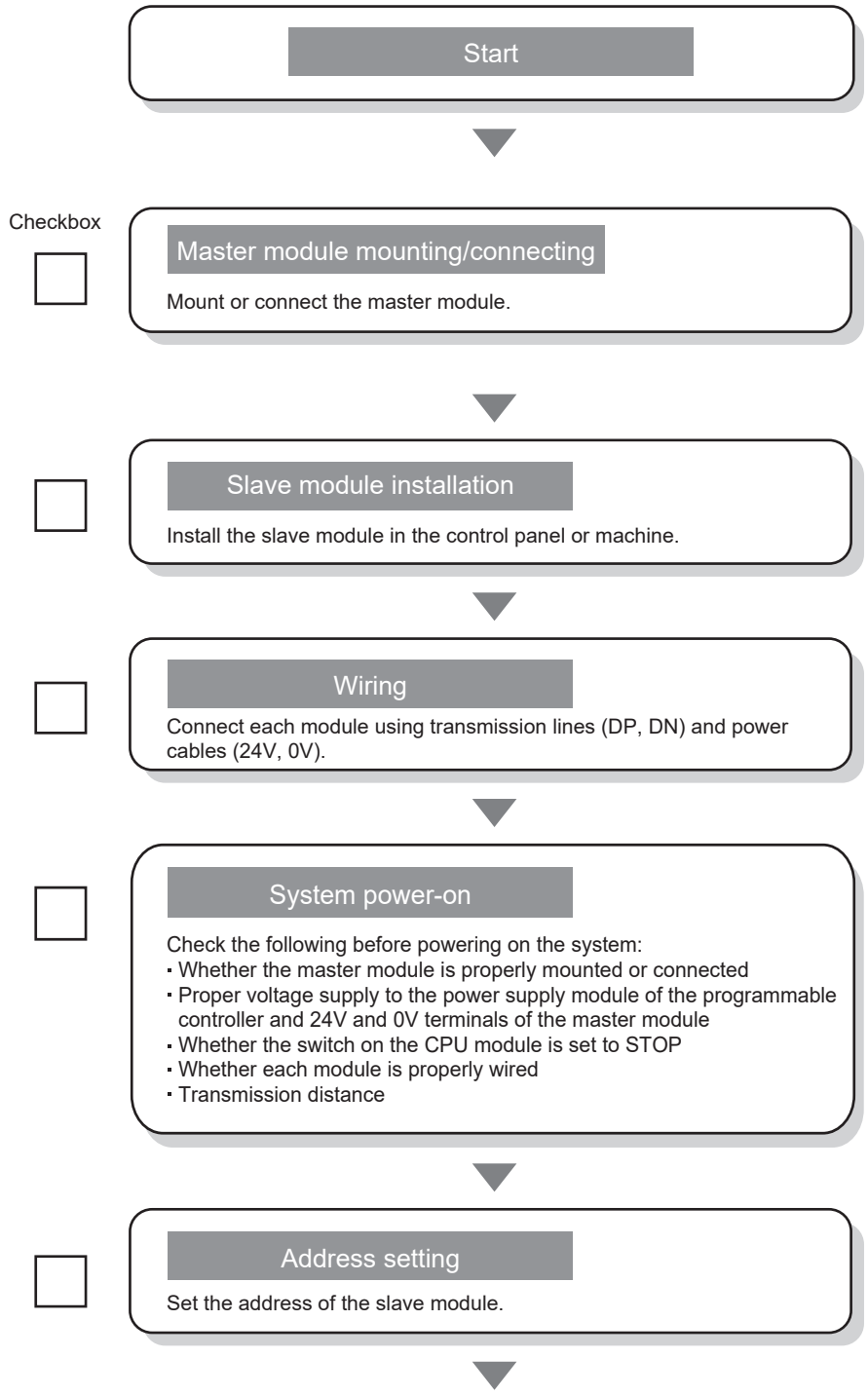
Buffer memory address		Item	Allowable operation (Read/write)
Decimal	Hexadecimal		
0 to 15	0_H to F_H	Input information area	Read only
16 to 4095	10_H to FFF_H	System reserved	—
4096 to 4111	1000_H to $100F_H$	Output information area	Read and write
4112 to 8191	1010_H to $1FFF_H$	System reserved	—
8192	2000_H	Number of the error IDs	Read only
8193 to 8320	2001_H to 2080_H	Error ID information storage area	Read only
8321 to 8959	2081_H to $22FF_H$	System reserved	—
8960	2300_H	Number of the connected modules	Read only
8961 to 9215	2301_H to $23FF_H$	System reserved	—
9216	2400_H	Number of the IDs of the connected modules	Read only
9217 to 9344	2401_H to 2480_H	Connected module ID information storage area	Read only
9345 to 9983	2481_H to $26FF_H$	System reserved	—
9984	2700_H	Number of the alarm IDs	Read only
9985 to 10112	2701_H to 2780_H	Alarm ID information storage area	Read only
10113 to 10255	2781_H to $280F_H$	System reserved	—
10256	2810_H	Latest error code storage area	Read only
10257	2811_H	Latest error ID storage area	Read only
10258 to 10319	2812_H to $284F_H$	System reserved	—
10320	2850_H	Parameter access setting	Read and write
10321	2851_H	Parameter access target module ID specification	Read and write
10322 to 10495	2852_H to $28FF_H$	System reserved	—
10496 to 10751	2900_H to $29FF_H$	Parameter storage location memory number (output)	Read only
10752 to 11007	$2A00_H$ to $2AFF_H$	System reserved	—
11008 to 11263	$2B00_H$ to $2BFF_H$	Parameter storage location memory number (input)	Read only
11264 to 12287	$2C00_H$ to $2FFF_H$	System reserved	—
12288 to 18431	3000_H to $47FF_H$	Parameter storage area	Read and write
18432 to 32767	4800_H to $7FFF_H$	System reserved	—

Point

If data are written in the system reserved area, it may cause malfunction of the programmable controller system.

CHAPTER 4 PROCEDURES BEFORE OPERATION

This chapter describes the procedure from module mounting/connecting to system operation.



User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used

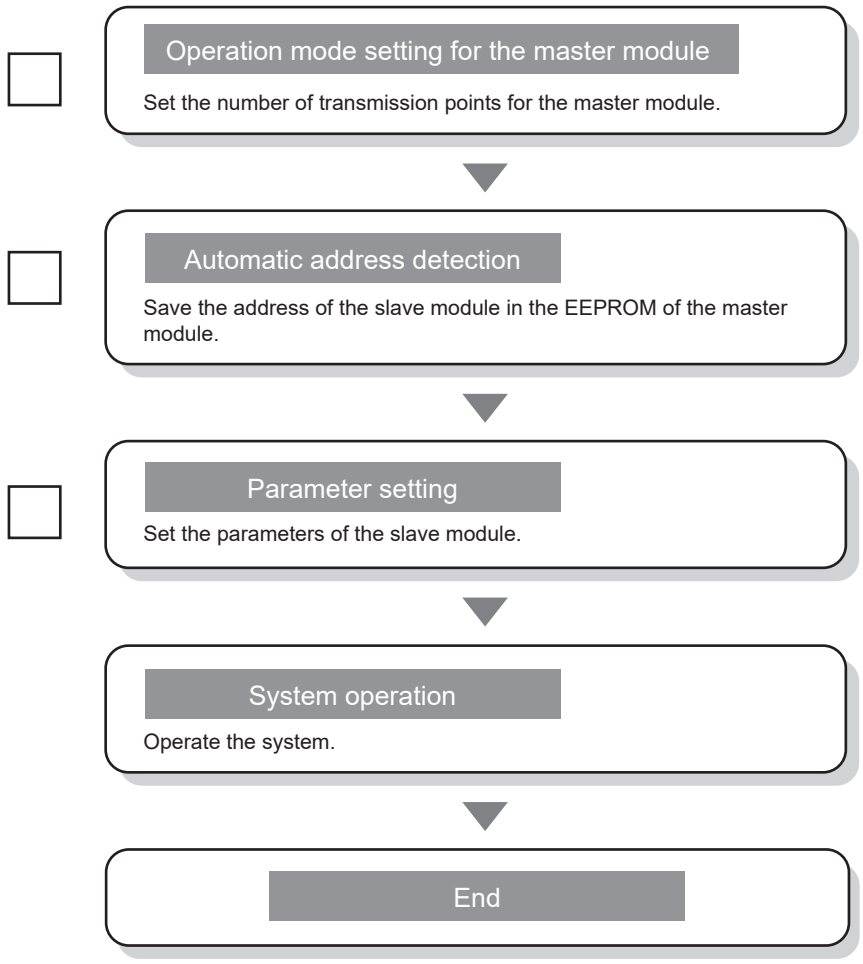
MELSEC-L CC-Link IE Field Network Head Module User's Manual

User's manual for the slave module used (manufactured by Anywire Corporation)

☞ Page 44, Section 6.2

☞ Page 52, Section 6.4

☞ Page 56, Section 7.2



☞ Page 54, Section 7.1

☞ Page 59, Section 7.3

☞ Page 71, Section 8.8

CHAPTER 5 SYSTEM CONFIGURATION

This chapter describes the overall configuration, system configuration of the master module, system configuration of AnyWireASLINK, and applicable systems.

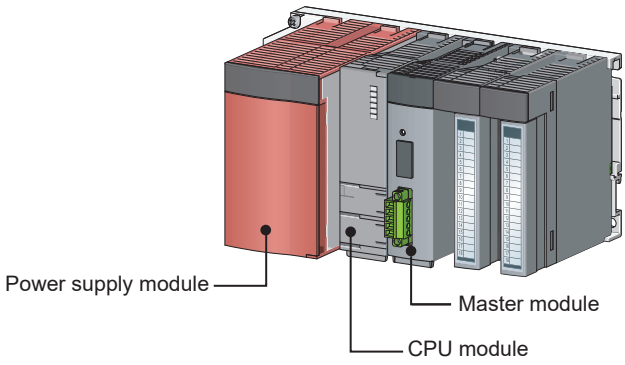
5.1 Overall Configuration

5.1.1 System configuration of the master module

This section describes the system configuration of the master module.

(1) QJ51AW12AL

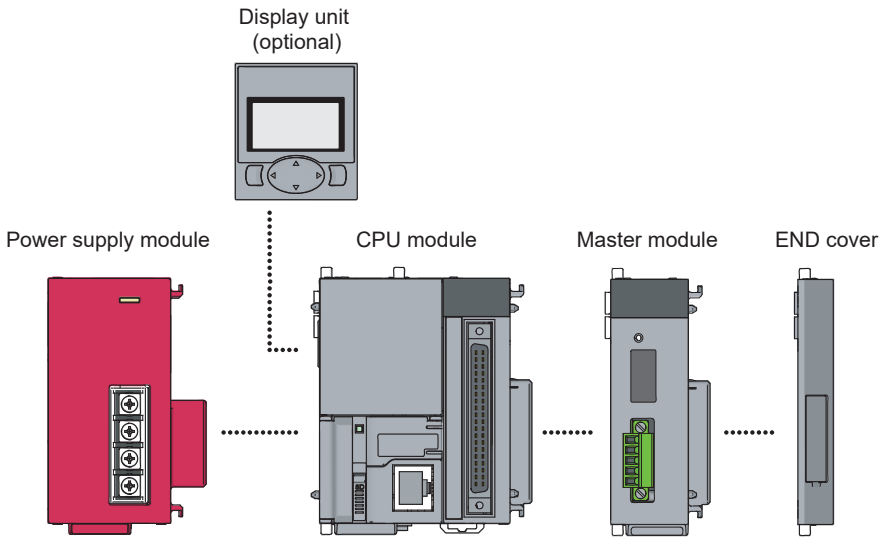
The following system configuration of the QJ51AW12AL is used for explanation purpose.



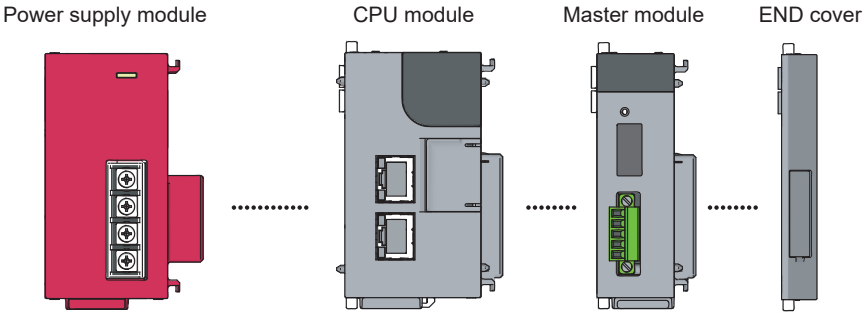
(2) LJ51AW12AL

The following system configurations of the LJ51AW12AL are used for explanation purpose.

(a) When connected to the CPU module

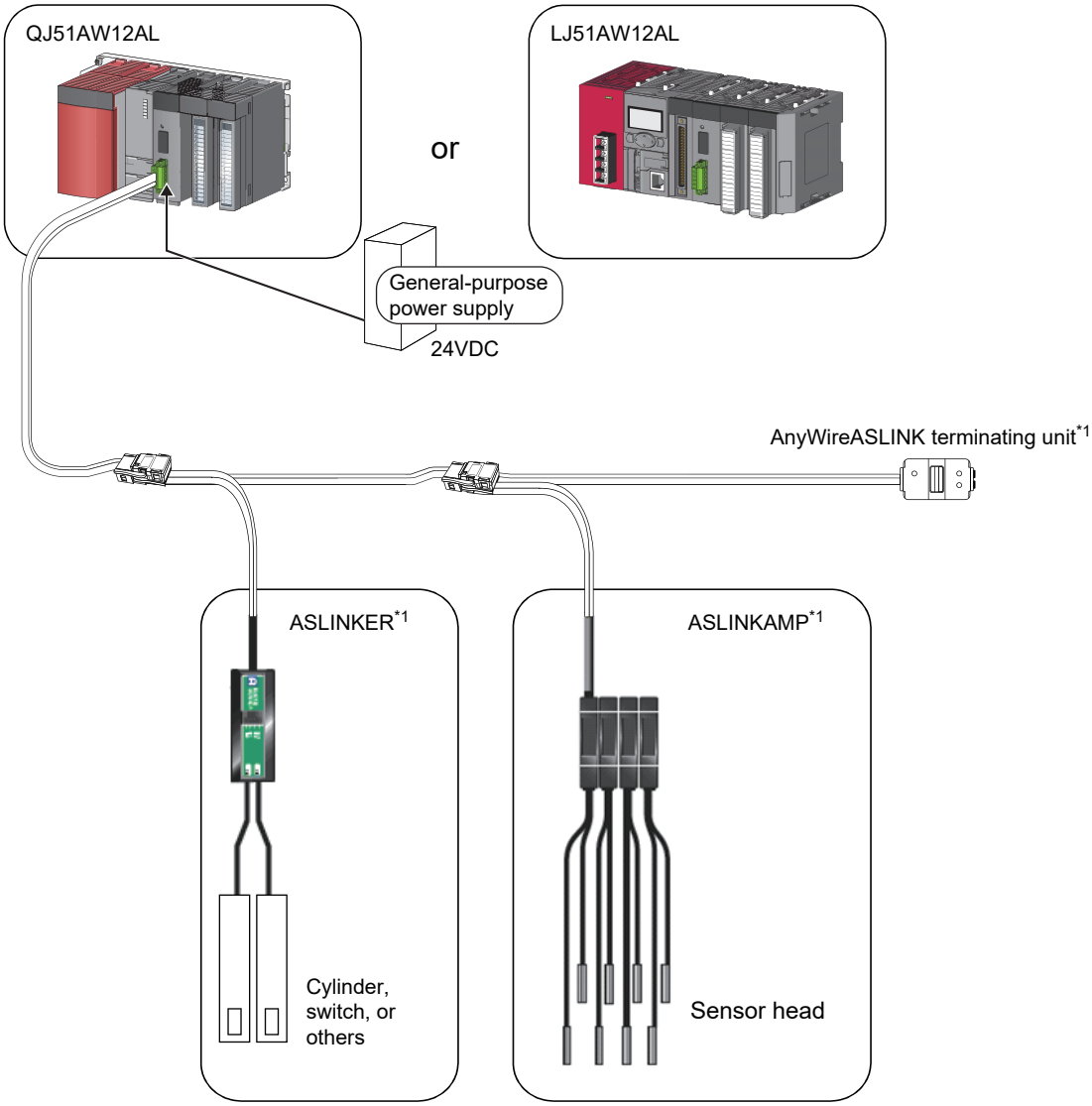


(b) When connected to the head module



5.1.2 System configuration of AnyWireASLINK

The following figure shows the system configuration of AnyWireASLINK.



*1 Manufactured by Anywire Corporation

For the number of connectable slave modules, refer to the following.

☞ Page 27, Section 3.2.1

5.2 Applicable Systems

This section describes applicable systems.

5.2.1 QJ51AW12AL

(1) Mountable modules, number of mountable modules, and applicable base unit

(a) When mounted together with the CPU module

For mountable CPU modules, the number of mountable modules, and the applicable base unit, refer to the user's manual for the CPU module used.

When the QJ51AW12AL is mounted together with the CPU module, note the following.

- Insufficient power capacity may occur depending on the combination of other modules and the number of mountable modules. When mounting the modules, consider the power capacity. If the power capacity is insufficient, reconsider the combination of the mounted modules.
- Mount the module within the range for the number of I/O points of the CPU module. The module can be mounted to any slot only within the range for the number of usable slots.

Remark

When using the module with the C Controller module, refer to the user's manual for the C Controller module used.

(b) When used as the MELSECNET/H remote I/O station

For usable MELSECNET/H remote I/O stations, the number of mountable modules, and the applicable base unit, refer to the Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network).

(c) When mounted on the RQ extension base unit

When mounting the module on the RQ extension base unit, refer to the MELSEC iQ-R Module Configuration Manual.

(2) Compatibility with multiple CPU system

The QJ51AW12AL supports the multiple CPU system from its first product.

When using the QJ51AW12AL in the multiple CPU system, refer to the following.

QCPU User's Manual (Multiple CPU System)

(3) Online module change

The QJ51AW12AL cannot be changed online.

5.2.2 LJ51AW12AL

(1) Number of connectable modules

For the number of connectable modules, refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
MELSEC-L CC-Link IE Field Network Head Module User's Manual

(2) Precautions for the system configuration

(a) Rated output current (5VDC)

The total current consumption upon system configuration must not exceed the rated output current (5VDC) of the power supply module of the programmable controller. For the specifications of the power supply module, refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

5.3 Compatible Software Version

The system which uses a master module is compatible with the software package as follows.

A programming tool is required when a master module is used.

Software	Version
GX Works2	Version 1.98C or later

CHAPTER 6 INSTALLATION AND WIRING

This chapter describes the installation and wiring of the master module.

6.1 Installation Environment and Position of the Master Module

For the precautions for the installation environment and position of the master module, refer to the following.

📖 User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used
📖 MELSEC-L CC-Link IE Field Network Head Module User's Manual

6.2 Wiring

(1) Descriptions of terminals

Terminal	Description
24V	Power supply terminal for driving the transmission circuit for the AnyWireASLINK system. Connect to a 24VDC external power supply.
0V	
DP	AnyWireASLINK transmission signal terminals DP: Transmission cable (+), DN: Transmission cable (-) Connect to the DP and DN terminals on the slave module or terminating unit.
DN	
LG	Connected to the neutral point of the noise filter inserted between the 24V and 0V terminals. Ground the LG terminal with the functional ground terminal (FG terminal) on the programmable controller at a single point.

(2) Transmission cable terminal block

Model name	Applicable tightening torque
MC 1,5/5-STF-3,81*1	0.2N·m to 0.3N·m

*1 Use the one manufactured by PHOENIX CONTACT GmbH & Co. KG. (For contact, visit www.phoenixcontact.com.)

Classification	Name	Wire diameter	Type	Material	Temperature rating
Transmission cable (DP, DN)	UL-listed general-purpose 2-wire cable (VCTF, VCT)	1.25mm²	Stranded wire	Copper wire	70℃ or higher
		0.75mm²			
	UL-listed general-purpose wire	1.25mm²			
		0.75mm²			
	Dedicated flat cable	1.25mm²			90℃
		0.75mm²			
Power supply cable (24V, 0V)	UL-listed general-purpose 2-wire cable (VCTF, VCT)	0.75mm² to 2.0mm²	Stranded wire		70℃ or higher
	UL-listed general-purpose wire	0.75mm² to 2.0mm²	Stranded wire/single wire		
	Dedicated flat cable	1.25mm²	Stranded wire		90℃
		0.75mm²			

To tighten the terminal block, a flathead screwdriver having a tipped size of 0.4 × 2.5mm is required.
Before removing the transmission cable terminal block, check that the terminal block mounting screws on both ends are completely loosened (removed from the socket).
Pulling the terminal block with excessive force while the terminal block mounting screws on both ends are still tightened may damage the devices.
Before connecting the terminal block, check that there are no short-circuits due to the disconnected or frayed wires and tighten the terminal block mounting screws at both ends securely. (Tightening torque: 0.2 to 0.3N·m)

(3) Cable processing

For safety reasons, connect cables using bar solderless terminals.
Use UL-listed solderless terminals and, for processing, use a tool recommended by their manufacturer.

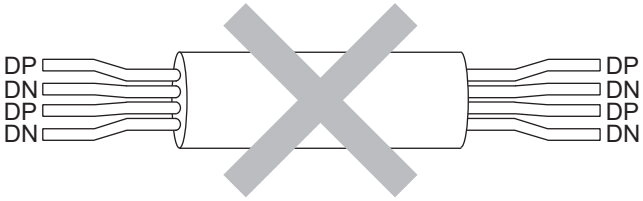
Type	Model name	Application*2	Contact
Bar solderless terminal*1	AI 0,75-8 GY	Processing of a 0.75mm²2 wire	PHOENIX CONTACT GmbH & Co. KG (www.phoenixcontact.com)
	AI 1,5-8 BK	Processing of a 1.25mm²2 wire	
	AI-TWIN 2 × 0,75-8 GY	Processing of two 0.75mm² wires	

*1 When connecting two cables to one terminal, connect the two cables together to the TWIN bar solderless terminal.
*2 When TWIN bar solderless terminals are used, the maximum wire diameter is 0.75mm².

6.2.1 Wiring precautions

The following shows the wiring precautions in the AnyWireASLINK system.

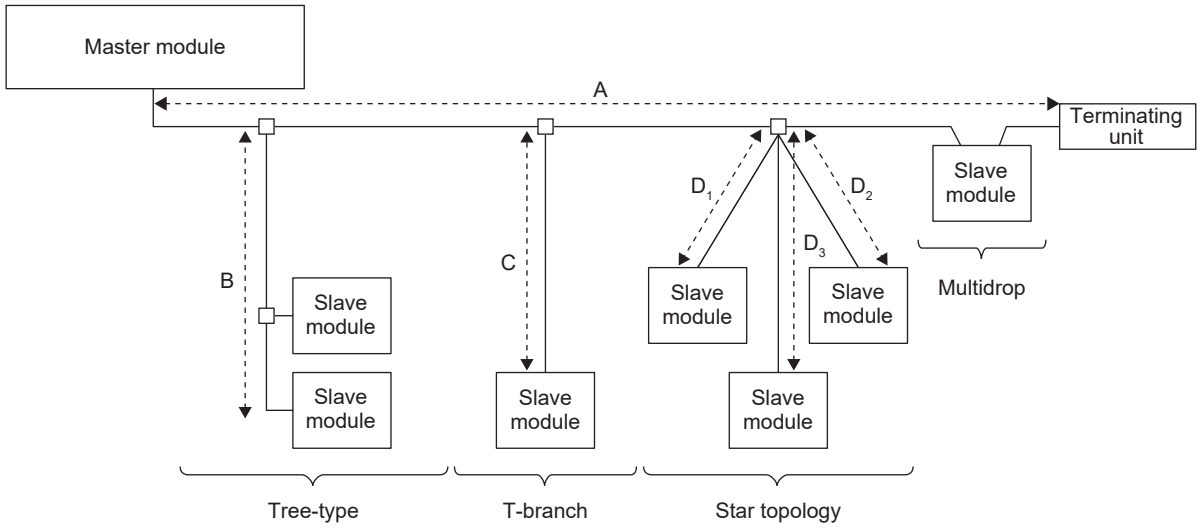
- In the AnyWireASLINK system, signals and power are supplied to a slave module with two types of transmission cables; DP and DN. Therefore, using a stranded wire of 1.25㎟ or larger for the main line is recommended.
- Wires such as general-purpose wires, cabtyre cables, and flat cables can be used.
- Do not run multiple transmission cables (DP, DN) using a multicore cable. Running multiple transmission cables (DP, DN) together may cause noise, resulting in a malfunction.



- The voltage should not fall below the lower limit of the allowable voltage range due to the voltage drop caused by the cable. If the voltage falls below the lower limit, malfunctions may occur.
- Do not connect soldered cables directly to the terminals. Doing so may loosen the screws, resulting in a poor contact.
- Use a crimping tool to connect a cable to a bar solderless terminal.
- Before inserting a bar solderless terminal, check the shapes of the wire insertion opening and bar solderless terminal. Then, insert the terminal in the correct orientation. Inserting a bar solderless terminal wider than the wire insertion opening may damage the terminal block. (☞ Page 45, Section 6.2 (3))

6.2.2 Connection of slave modules

(1) Connection type



- The maximum transmission distance in the AnyWireASLINK stand-alone system is 200m, which is the total cable length including the main line and branch line (branch). (It varies depending on the wire diameter of the transmission cables (DP, DN) or the transmission cable supply current.)
- Tree branch, T-branch, and multidrop connections and star topology are usable in the AnyWireASLINK system.
- Up to 128 slave modules can be connected.

Point

The total length of the transmission distance for the AnyWireASLINK system can be calculated from A + B + C + D (D_1 + D_2 + D_3).
Note that the total length should not exceed the maximum transmission distance or the total length set for the system to branch lines.

6.2.3 Power supply to the AnyWireASLINK system

(1) Method of supplying the power to the slave module

Connect a 24VDC external power supply to the master module.
The power consumed in the internal control circuits of all the slave modules and the external load power connected to non-isolated slave modules are supplied collectively from the 24VDC external power supply connected to the master modules.
(☞ Page 27, Section 3.2)

(2) Scope of the power supply with transmission cables (DP and DN)

The current consumption of the system must satisfy all the conditions specified by the following calculation formulas 1) to 3) for each master module.

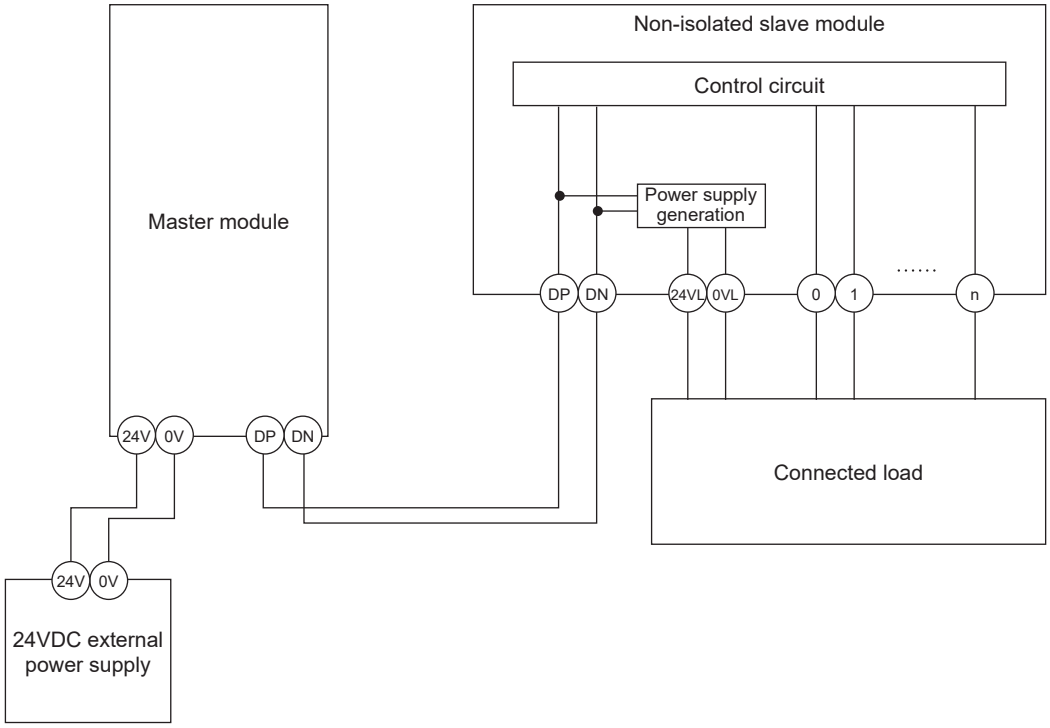
Condition	Calculation formula	Description
1)	I(A) = (Ihin x m) + (Iho x n) + (Izdin x p) + (Izdo x q) ≤ The maximum value of transmission cable supply current	Ihin: Current consumption of the non-isolated input slave module/I/O combined slave module Iho: Current consumption of the non-isolated output slave module Izdin: Current consumption of the isolated input slave module/I/O combined slave module Izdo: Current consumption of the isolated output slave module m: Number of connected non-isolated input slave modules/I/O combined slave modules n: Number of connected non-isolated output slave modules p: Number of connected isolated input slave modules/I/O combined slave modules q: Number of connected isolated output slave modules For details, refer to Page 49, Section 6.2.3 (2) (a).
2)	Vm(V) - ΔV(V) ≥ 20V	Vm: Supply voltage for the master module ΔV: Cable-to-cable voltage drop For details, refer to Page 51, Section 6.2.3 (2) (b).
3)	Vm(V) - ΔV(V) ≥ The lowest allowable voltage of the connected load	

(a) Description of the condition 1)

- Constants related to the non-isolated slave module (Ihin, Iho)
  For the non-isolated slave module, the current required for the internal control circuit and the connected load is supplied over transmission cables (DP, DN).

  Ihin(A) = Current consumption of the non-isolated input slave module/I/O combined slave module
  = Current consumption of the non-isolated input slave module/I/O combined slave module + Current consumption of connected load (three-wire sensor) × Number of points

  Iho(A) = Current consumption of the non-isolated output slave module
  = Current consumption of the non-isolated output slave module + Current consumption of connected load × Number of points



Point

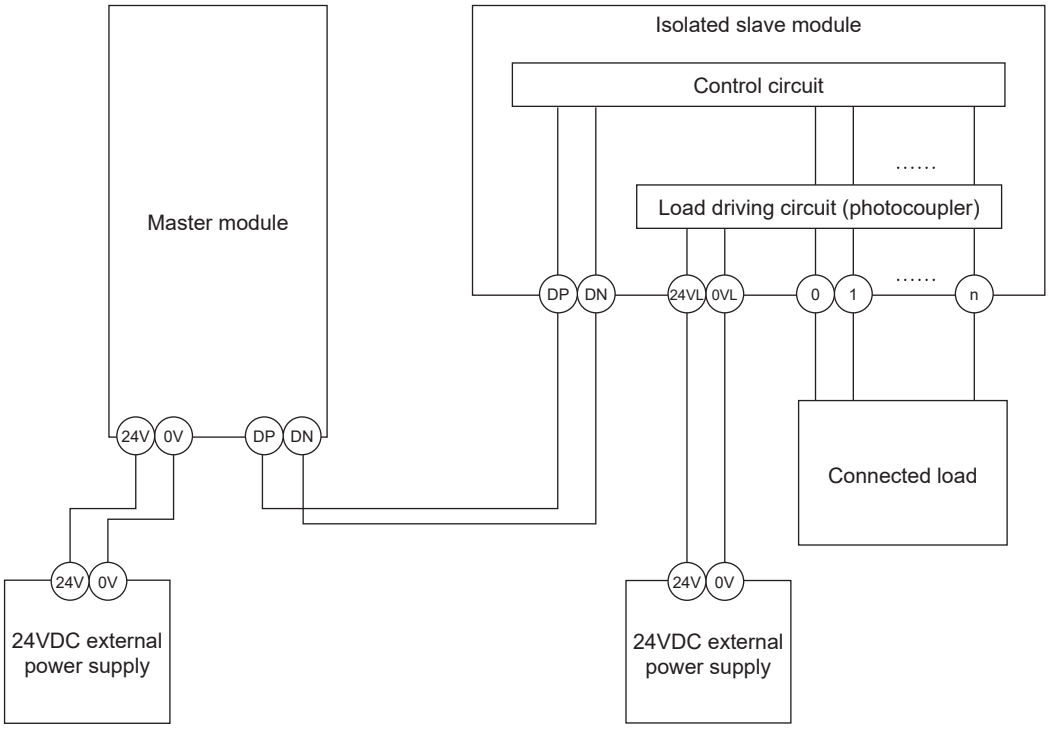
- The 24VL and 0VL terminals of a slave module are used to supply the power to the connected load.
- For the current consumption of a non-isolated slave module, refer to the manual for the slave module used.

- Constants related to the isolated slave module (Izdin, Izdo)

  For the isolated slave module, only the current required for the internal control circuit is supplied over the transmission cables (DP, DN), whereas that for the connected load is supplied from the 24VDC external power supply.

  Izdin(A) = Internal current consumption of the isolated input slave module/I/O combined slave module

  Izdo(A) = Internal current consumption of the isolated output slave module



Point

- In isolated type slave modules, the current consumption of the connected load is not subject to the current restriction condition for the AnyWireASLINK system.
- For the current consumption of isolated slave modules, refer to the manual for the slave module used.

- Transmission cable supply current (I(A))

  The transmission cable supply current in the AnyWireASLINK system is determined by the following formula.

  $I(A) = (Ihin \times m) + (Iho \times n) + (Izdin \times p) + (Izdo \times q)$

  Number of connectable modules: m, n, p, q

- Maximum transmission cable supply current

  For the maximum transmission cable supply current, refer to Page 27, Section 3.2.

(b) Description of the conditions 2) and 3)

- Vm: Supply voltage for the master module

Voltage	21.6 to 27.6VDC (24VDC -10% to +15%), ripple voltage 0.5Vp-p or lower
Recommended voltage	26.4VDC (24VDC +10%)

- ΔV(V): Cable-to-cable voltage drop
  ΔV(V) = Transmission cable supply current I(A) × Cable resistance R(Ω)
  Cable resistance R(Ω) = Cable length (m) × Conductor resistance (Ω/m) × 2
  · Wire diameter 1.25mm² → Conductor resistance 0.015Ω/m
  · Wire diameter 0.75mm² → Conductor resistance 0.025Ω/m

(c) Calculation example

The example shows how to check whether the total length of 100m is sufficient to configure a system in the following conditions.

[Condition]

- Non-isolated slave module (Input ASLINKER)

Number of I/O points	2 points
Module current consumption	15mA
Number of modules	24

- Connected load (three-wire sensor)

Three-wire sensor current consumption	13mA
Number of sensors	2
Power supply voltage	24VDC ± 10%

- Wire diameter of transmission cables (DP, DN)

Wire diameter	1.25mm²

- Power supply for the master module

Power supply voltage	24VDC

[Calculation result]

Condition 1)	(Ihin(A) × m) = I(A) ≤ The maximum transmission cable supply current (0.015 + (0.013 × 2)) × 24 = 0.984A ≤ 1A	→ Satisfied
Condition 2)	Vm(V) - ΔV(V) ≥ 20V 24 - (0.984 × 100 × 0.015 × 2) = 24 - 2.95 = 21.05V ≥ 20V	→ Satisfied
Condition 3)	Vm(V) - ΔV(V) ≥ The lowest limit of the allowable voltage range for connected load The lowest limit of the allowable voltage range for connected load = 24 - 24 × 0.1 = 21.6V 21.05V < 21.6V	→ Not satisfied

The calculation results 1) to 3) above show that no system can be configured.
However, a system can be configured by changing the power supply for the master module to 24.55VDC or higher.

6.3 Check before Power-on

This section describes the items to be checked before power-on.

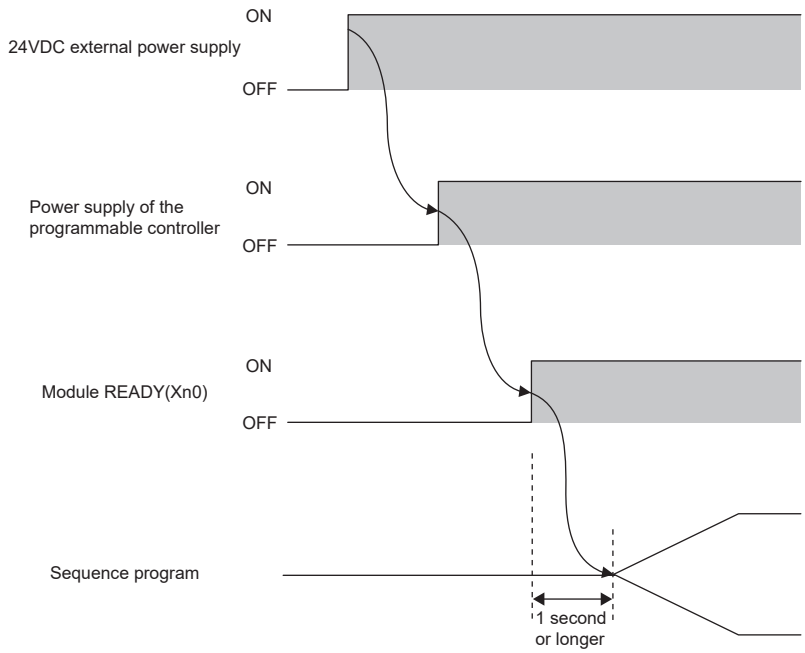
1. **Check that the master module is mounted or connected correctly.**
   (📖 User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used)
   (📖 MELSEC-L CC-Link IE Field Network Head Module User's Manual)
2. **Check that the RUN/STOP/RESET switch*1 of the CPU module is set to STOP.**
3. **Check that the total length of the AnyWireASLINK system is within the specified range. (☞ Page 27, Section 3.2)**
4. **Check that the power supplied to the AnyWireASLINK system is within the specified range. (☞ Page 48, Section 6.2.3)**
5. **Check that the master module, slave module, terminating unit, and 24VDC external power supply are properly connected and wired.**

*1 Some CPU modules have a RUN/STOP switch.

6.4 Power-on

After checking the items described above, power on and start the system.
The following is how the AnyWireASLINK system is powered on.
The order is inverted when the system is powered off.

24VDC external power supply for the AnyWireASLINK system ⇨ Power supply of the programmable controller



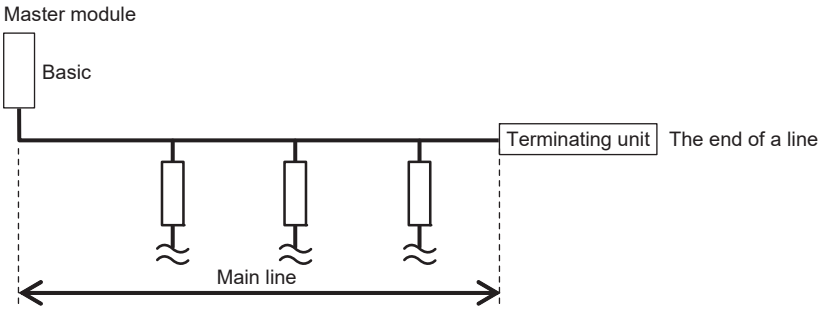
Point

- If the programmable controller is powered on before the 24VDC external power supply in the AnyWireASLINK system, a transmission cable voltage drop detection error may occur.
- After turning on Module READY (Xn0), wait at least one second to start the program.

6.5 Terminating Unit

To ensure more stable transmission quality, connect a terminating unit to the end of a transmission cable (DP, DN).

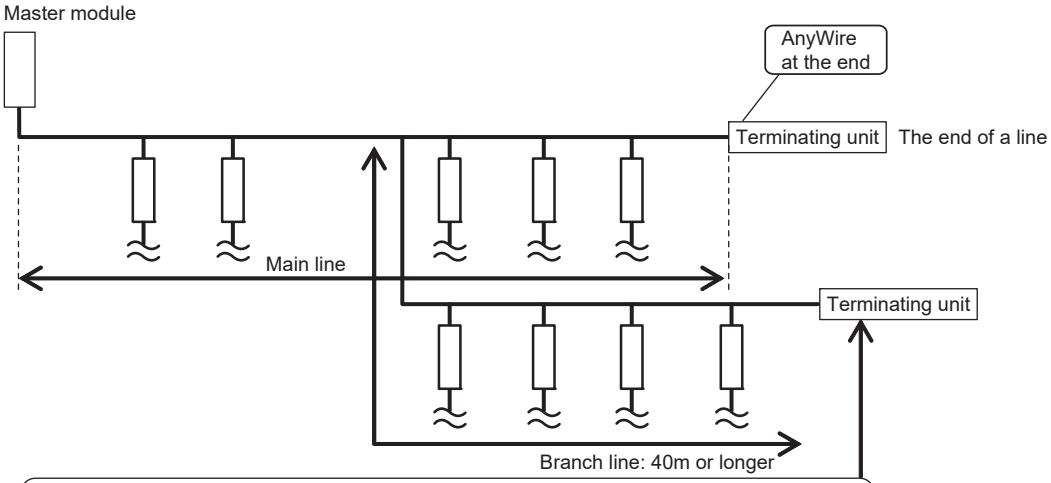
Terminating unit connection



Important Connect at least one terminating unit for one AnyWireASLINK line. Connect it at the farthest end from the master module.

Branch of transmission cables (DP, DN)

[Example]



Important Connect one terminating unit at the end of a branch line that exceeds 40m.

CHAPTER 7 VARIOUS SETTINGS

7.1 Master Module Operation Mode Setting

Set the number of transmission points of the master module.

Point

- Making switch settings in Page 55, Section 7.1.2 enables the number of transmission points to be changed and allows the transmission cycle time to be shorten in comparison with that of the default setting. (☞ Page 30, Section 3.2.3 (1))
- The switch settings made become effective when the CPU module is reset or the power is turned off then on again after writing to the CPU module is finished.

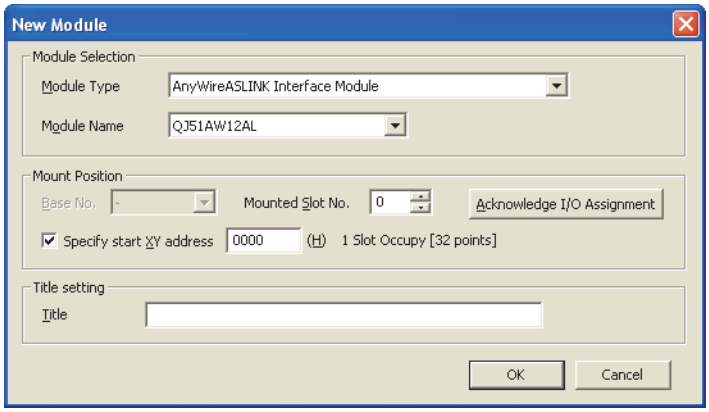
7.1.1 Master module addition

Add the model name of the master module to be used on the project.

(1) Addition method

Open the "New Module" window to add.

Project window ⇨ [Intelligent Function Module] ⇨ Right click ⇨ [New Module]



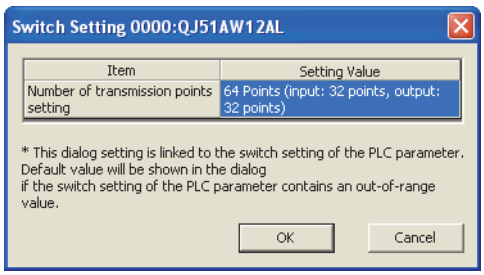
Item		Description
Module Selection	Module Type	Set the "AnyWireASLINK Interface Module".
	Module Name	Set the module name to be connected.
Mount Position	Mounted Slot No.	Set the slot No. where the target module is mounted.
	Specify start XY address	The start I/O number (hexadecimal) of the target module corresponding to "Mounted Slot No." has been set. A different address can be also set.
Title setting	Title	Set a title.

7.1.2 Switch setting

(1) Setting method

Open the "Switch Setting" window to make the setting.

Project window ⇨ [Intelligent Function Module] ⇨ Module name ⇨ [Switch Setting]



Item	Setting value	Description
Number of transmission points setting	64 Points (input: 32 points, output: 32 points)	Set the number of transmission points. One transmission cycle time is determined by setting the number of transmission points. (☞ Page 30, Section 3.2.3 (1))
	128 Points (input: 64 points, output: 64 points)	
	256 Points (input: 128 point, output: 128 points)	
	512 Points (input: 256 points, output: 256 points)	

7.1.3 Auto refresh

Data in the buffer memory is transferred to a specified device.
With this setting, reading data with a program is not required.

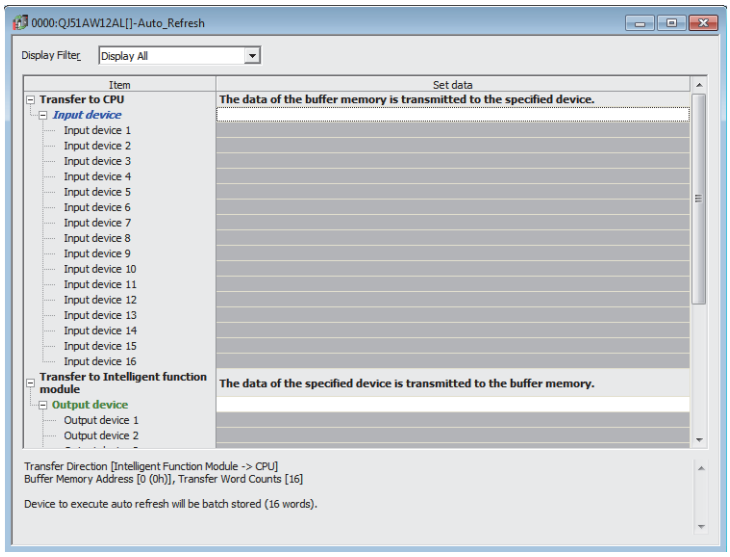
(1) Setting method

Open the "Auto Refresh" window.

1. Start "Auto Refresh" on the project window.

Project window ⇨ [Intelligent Function Module] ⇨ Module name ⇨ [Auto Refresh]

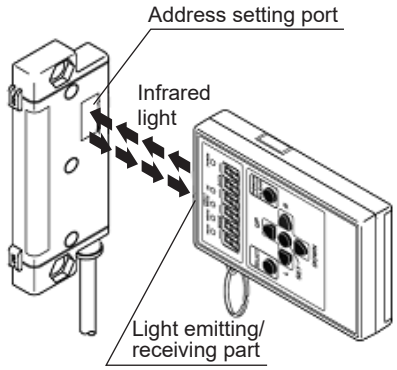
2. Click the item to set. Then enter the device where auto refresh is performed.



7.2 Slave Module Address Setting

Setting the start number of the addresses assigned for data communications is required for slave modules.
An address can be written to a slave module or the address assigned to a slave module can be read through infrared communications using an address writer (manufactured by Anywire Corporation).
For details, refer to the manual of the address writer used.

■ Image of address reading/writing



(1) Address setting

Set the address of each slave module to assign the slave module to the buffer memory area.
Address means the start bit of the memory area occupied by the slave module, which is set using a decimal number.
The buffer memory area corresponding to the number of slave module points is occupied from the specified address.
The number of occupied points differs depending on the slave module. In addition, the same buffer memory area cannot be occupied by different slave modules.
For details, refer to the following.
📖 Manual of the slave module used (manufactured by Anywire Corporation)

(2) Address setting example

(a) Assignment by 2-point slave module only

When 0 is set for the input slave module address, and 0 and 2 are set for the output slave module address, bits are occupied as follows.

●Buffer memory address of the input slave module

Buffer memory address	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G0	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
															←	→
															(1)	

●Buffer memory address of the output slave module

Buffer memory address	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G4096	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
													←	→	←	→
													(3)		(2)	

(1) Areas occupied by address 0 of the 2-point input slave module
(2) Areas occupied by address 0 of the 2-point output slave module
(3) Areas occupied by address 2 of the 2-point output slave module

(b) Mixed assignment by 2-point slave module and 1-point slave module

When 0, 2, and 3 are set for the input slave module address, and 0, 2, and 3 for the output slave module address, bits are occupied as follows.

●Buffer memory address of the input slave module

Buffer memory address	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G0	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
												←(3)→		←(2)→	←(1)→	

●Buffer memory address of the output slave module

Buffer memory address	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G4096	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
												←(6)→		←(5)→	←(4)→	

(1) Areas occupied by address 0 of the 2-point input slave module
(2) Areas occupied by address 2 of the 1-point input slave module
(3) Areas occupied by address 3 of the 2-point input slave module
(4) Areas occupied by address 0 of the 2-point output slave module
(5) Areas occupied by address 2 of the 1-point output slave module
(6) Areas occupied by address 3 of the 2-point output slave module

Point

- A slave module address is not deleted even when the power supply of a programmable controller or a 24VDC external power supply is turned off. The address is retained until a new address is set when a system is configured.
- For the address setting, ensure that the address occupied by the slave module does not exceed the number of transmission points set in the master module. For the operation mode setting of the master module, refer to Page 55, Section 7.1.2.
- In the slave module, a value between 0 and 254 can be written. (This is not an ID value.) Note that 255 cannot be set. Doing so may cause a No ID setting error.

Model	Address (decimal)	ID (hexadecimal)	ID (decimal)
Output slave module	0 to 254	0000_H to $00FE_H$	0 to 254
Input slave module or I/O combined slave module	0 to 254	0200_H to $02FE_H$	512 to 766

7.3 Automatic Address Detection Function

Automatic address detection is a function to store the IDs (addresses) of the connected slave modules in the EEPROM of the master module.
The parameters of the connected devices are automatically updated after storage in EEPROM of the master module followed by detection of IDs (addresses) not set and the same IDs (addresses).
The ID (address) information stored in the EEPROM is held even when the power is turned off. However, information about unset IDs and the same IDs and the parameter information of each slave module are not held.
Whenever starting the system or changing the system configuration, set the correct addresses to all the slave modules and perform the automatic address detection.

7.3.1 Performing the automatic address detection

To perform the automatic address detection, use the SET switch or Automatic address detection command (Yn1).

(1) Using the SET switch

1. **Check that all of the slave modules are operating normally.**
2. **Keep pressing the SET switch on the master module until the SET LED (green) turns on.**
   (At this time, Automatic address detection flag (X(n+1)4) turns on.)
3. **When the SET LED flashes for a while and turns off, the ID (address) has been stored.**
4. **When Automatic address detection flag (X(n+1)4) turns off, automatic address detection is completed.**

(2) Using Automatic address detection command (Yn1)

1. **Check that all of the slave modules are operating normally.**
2. **Turn on and off Automatic address detection command (Yn1). (☞ Page 34, Section 3.4)**
   (At this time, Automatic address detection flag (X(n+1)4) turns on.)
3. **When the SET LED flashes for a while and turns off, the ID (address) has been stored.**
4. **When Automatic address detection flag (X(n+1)4) turns off, automatic address detection is completed.**

(3) Precautions

(a) The automatic address detection cannot be performed in the following cases.

- Upon an error in the AnyWireASLINK system (Example: Short-circuit, 24VDC external power supply voltage drop)
- Within approximately five seconds after the AnyWireASLINK system is powered on or system reset recovery
- Automatic address detection or parameter access by Y(n+1)0 to Y(n+1)2 is in progress.
- When any of the following errors has occurred

Error code	Error description
0064H	Master module hardware error
0065H	Master module hardware error
0067H	Master module hardware error
00C8H	Transmission cable voltage drop error
00C9H	DP/DN short error

(b) Perform the automatic address detection in the following cases.

- When starting the system operation (when all of the slave modules are connected and operating normally.)
- When adding a slave module after starting the system operation
- When removing a slave module after starting the system operation
- When changing the address of a slave module after starting the system operation

(c) After performing the automatic address detection, check that there is no inconsistency between the actual system configuration and the IDs registered in the master module, referring to the value stored in Number of the IDs of the connected modules (Un\G9216) and values stored in Connected module ID information storage areas (Un\G9217 to Un\G9344).

(d) Use an address writer to set the ID (address) in a slave module that has the same ID as other slave modules or where an ID is not set. Then execute automatic address detection again.

(e) Do not perform the automatic address detection in any of the following cases. If executed, the automatic address detection is not processed.

- When Parameter access completion flag (X(n+1)1) is off
- When Automatic address detection flag (X(n+1)4) is on

7.3.2 Interlock program

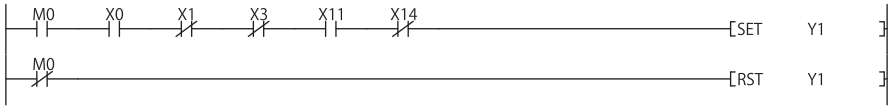
The interlock program described here prevents Automatic address detection command (Yn1) from being turned on while parameter access is being executed[*1] or the automatic address detection is in progress[*1], allowing proper automatic address detection.
The following shows an interlock program in which the start I/O number of the master module is assigned to X/Y00 to X/Y1F.

*1 This is the state where Parameter access completion flag (X(n+1)1) is off or Automatic address detection flag (X(n+1)4) is on.

(1) Devices used by users

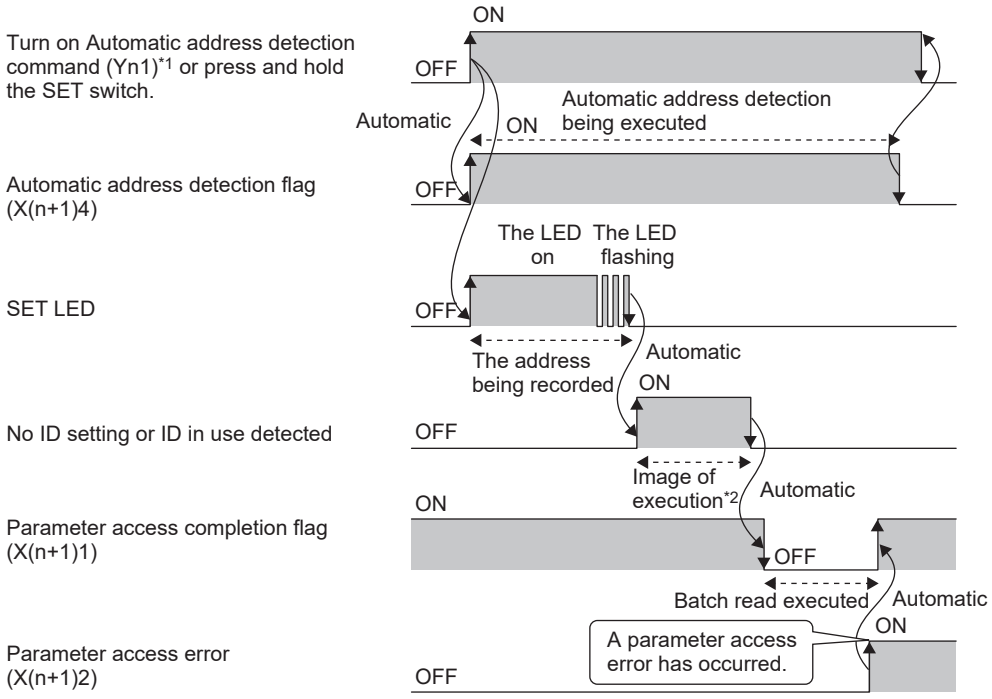
Device	Description
M0	Program starting contact
X0	Module READY
X1	DP/DN short error
X3	Transmission cable voltage drop error
X11	Parameter access completion flag
X14	Automatic address detection flag
Y1	Automatic address detection command

(2) Program example



7.3.3 Automatic address detection execution timing

The following is automatic address detection execution timing.



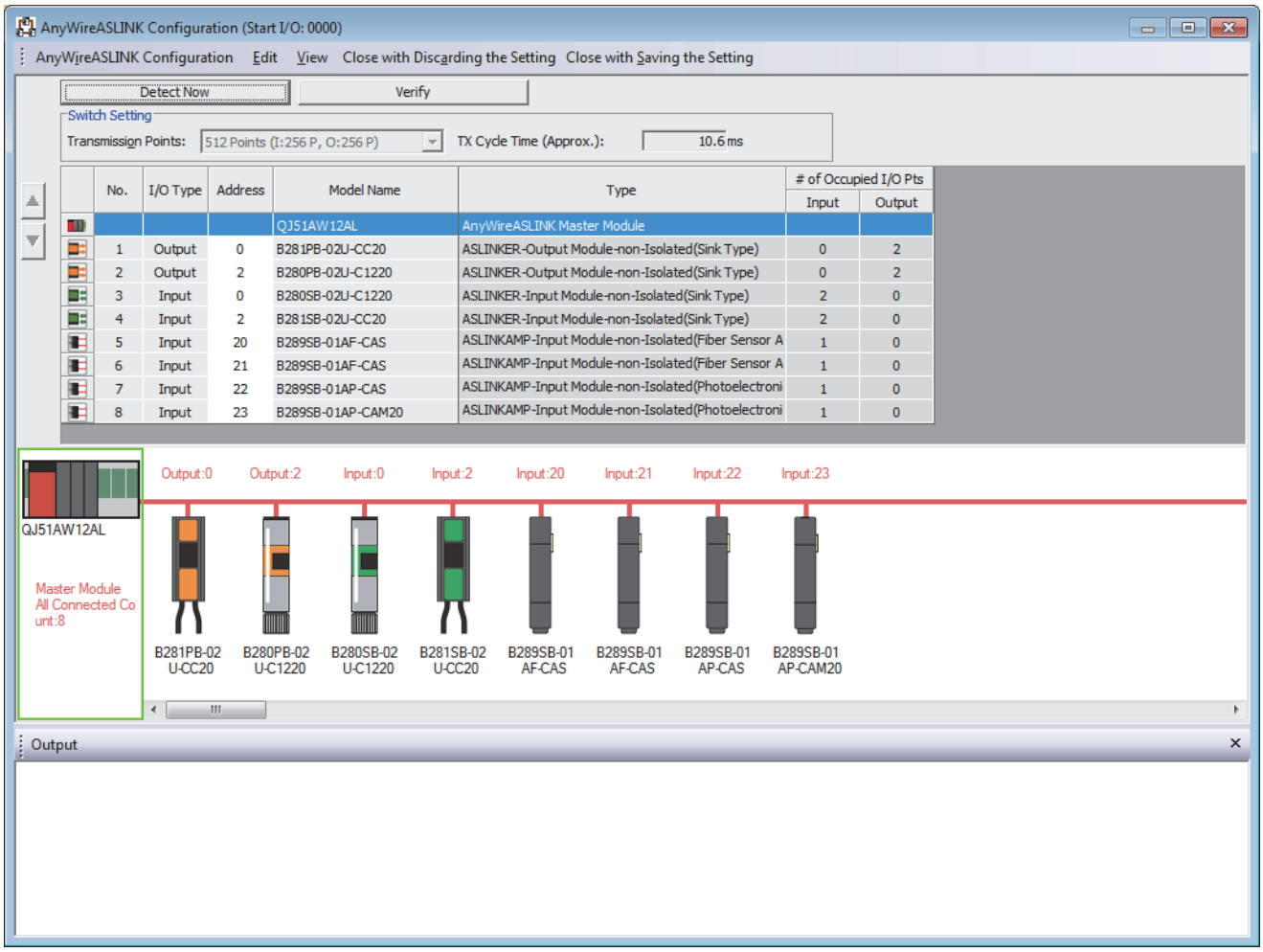
*1 After turning on Automatic address detection command (Yn1), check that Automatic address detection flag (X(n+1)4) is turned on or check the SET LED status. Then, turn off Automatic address detection command (Yn1) with a program.

*2 There is no status flag that indicates whether modules with no ID setting or the same IDs are being detected. The execution duration is approximately 0.5 seconds after the SET LED turns off.

7.4 Automatic Reading of the System Configuration

Man-hours for the parameter setting can be reduced by automatically reading the information of the slave modules connected in the AnyWireASLINK system.

Project window ⇨ [Intelligent Function Module] ⇨ Module name ⇨ [AnyWireASLINK Configuration]



For the AnyWireASLINK configuration window, refer to the following.

GX Works2 Version 1 Operating Manual (Intelligent Function Module)

CHAPTER 8 FUNCTIONS

This chapter describes the details of the functions that can be used in the master module.

8.1 Bit Transmission Function

I/O data for up to 512 points (input 256 points, output 256 points) can be exchanged between the master module and a slave module.

8.2 Transmission Cable Short Detection Function

This function protects the system by detecting the current out of the specifications of AnyWireASLINK and stopping the transmission.

(1) Transmission cable short status

When the following occurs, the AnyWireASLINK system is in the transmission cable short status.

- The LINK LED turns off and the ALM LED flashes repeatedly at one second intervals. *1
- DP/DN short error (Xn1) turns on.
- A DP/DN short error (error code: $00C9_H$) is stored in Latest error code storage area (Un\G10256) and $0FFF_H$ is stored in Latest error ID storage area (Un\G10257).*1
- An error (error code: $00C9_H$) is displayed in the detailed information section on the system monitor window of GX Works2. *1
- The AnyWireASLINK bit transmission stops.

*1 If multiple errors occur simultaneously, the latest error is displayed.

(2) How to recover from the transmission cable short status

How to recover from the transmission cable short status is as follows.

1. **Eliminate the short-circuit in the AnyWireASLINK system.**
   When the short-circuit is eliminated, AnyWireASLINK bit transmission is resumed automatically.
   If the status does not change, the short-circuit has not been eliminated. Therefore, check the system again.
2. **Power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).**
   The following status is resulted:
   - DP/DN short error (Xn1) turns off.
   - The ALM LED turns off.
   - The data in Latest error code storage area (Un\G10256) and Latest error ID storage area (Un\G10257) are cleared.

8.3 Disconnected Transmission Cable Location Detection Function

This function notifies the ID of the slave module that has been disconnected from the master module because of disconnection in the transmission cables (DP, DN) between the master module and the slave module, to locate the disconnection in the transmission cables(DP, DN) from the upper system.

Point

- To enable the disconnected transmission cable location detection function, perform the automatic address detection when configuring, modifying, or expanding the system. (☞ Page 59, Section 7.3)
- After the system configuration, the disconnection detection may work when the slave module is disconnected from the system. Perform the automatic address detection after modifying the system.
- Even if disconnection in the transmission cables (DP, DN) is detected, the AnyWireASLINK bit transmission is not stopped.

(1) Transmission cable disconnection status

When the system is in the following status, the transmission cables (DP, DN) have been disconnected or a slave module error has occurred.

- The ALM LED turns on. *1
- DP/DN disconnection error (Xn4) turns on.
- The number of error IDs is stored in Number of the error IDs (Un\G8192).
- The disconnected ID (address) is stored in Error ID information storage area (Un\G8193 to Un\G8320).
- A DP/DN disconnection error (error code: $00CA_H$) is stored in Latest error code storage area (Un\G10256) and the disconnected ID is stored in Latest error ID storage area (Un\G10257). *1
- An error (error code: $00CA_H$) is displayed in the detailed information section on the system monitor window of GX Works2. *1

*1 If multiple errors occur simultaneously, the latest error is displayed.

(2) How to recover from the transmission cable disconnection status

How to recover from the transmission cable disconnection status is as follows.

1. **Eliminate the disconnection in the AnyWireASLINK system.**
   When the slave module has been disconnected from the system, perform the automatic address detection.
2. **Power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).**
   The following status is resulted:
   - DP/DN disconnection error (Xn4) turns off.
   - The ALM LED turns off.
   - The data in Latest error code storage area (Un\G10256) and Latest error ID storage area (Un\G10257) are cleared.

Point

- For performing the automatic address detection, refer to Page 59, Section 7.3.
- When the automatic address detection is performed in the step 1, the operation in the step 2 is not necessary.

8.4 Transmission Cable Voltage Drop Detection Function

This function detects a voltage drop in the 24VDC external power supply, enabling the master module to detect a failure in the 24VDC external power supply or a wiring error from the upper system.

Point

For the specifications of the 24VDC external power supply to the master module, refer to Page 27, Section 3.2.1.

(1) Transmission cable voltage drop status

When the system is in the following status, a voltage drop in the 24VDC external power supply has been detected.

- The ALM LED flashes at 0.2 second intervals. *1
- Transmission cable voltage drop error (Xn3) turns on.
- Transmission cable voltage drop error (error code: $00C8_H$) is stored in Latest error code storage area (Un\G10256) and $0FFF_H$ is stored in Latest error ID storage area (Un\G10257). *1
- An error (error code: $00C8_H$) is displayed in the detailed information section on the system monitor window of GX Works2. *1
- The AnyWireASLINK bit transmission stops.

*1 If multiple errors occur simultaneously, the latest error is displayed.

(2) How to recover from the transmission cable voltage drop status

How to recover from the transmission cable voltage drop status is as follows.

1. **Check the voltage of the 24VDC external power supply and replace the power supply or check the wiring, as necessary.**
   When the transmission cable voltage drop is corrected, AnyWireASLINK bit transmission is resumed automatically.
2. **Power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).**
   The following status is resulted:
   - Transmission cable voltage drop error (Xn3) turns off.
   - The ALM LED turns off.
   - The data in Latest error code storage area (Un\G10256) and Latest error ID storage area (Un\G10257) are cleared.

8.5 Parameter Access Error Detection Function

This function allows the following parameter access errors to be detected.

- Slave module hardware error (error code: $012C_H$, $012D_H$)
- Parameter access target module ID error (error code: $012E_H$)
- Parameter value error (error code: $012F_H$)
- Parameter access error (error code: 0130_H)
- Slave module status error (error code: 0131_H)
- Same ID used error (error code: 0190_H)
- No ID setting error (error code: 0191_H)

(1) How to check the parameter access error status

The parameter access error status is listed below.

<table>
<tr><th rowspan="2">Error</th><th colspan="4">Status of each part upon an error</th></tr>
<tr><th>I/O signal</th><th>Latest error code storage area (Un\G10256), Latest error ID storage area (Un\G10257)</th><th>Number of the alarm IDs (Un\G9984), Alarm ID information storage area (Un\G9985 to Un\10112)</th><th>Detailed information of the system monitor window of the programming tool</th></tr>
<tr><td>Slave module hardware error</td><td rowspan="3">Slave module alarm signal (X(n+1)0) turns on.</td><td rowspan="6">The error codes and IDs corresponding to the error codes are stored.*1</td><td rowspan="6">The number of alarm IDs and alarm IDs are stored.*2</td><td rowspan="6">The error code is displayed.*1</td></tr>
<tr><td>Parameter access target module ID error</td></tr>
<tr><td>Parameter value error</td></tr>
<tr><td>Parameter access error</td><td>Parameter access error (X(n+1)2) turns on.</td></tr>
<tr><td>Slave module status error</td><td rowspan="3">Slave module alarm signal (X(n+1)0) turns on.</td></tr>
<tr><td>Same ID used error</td></tr>
<tr><td>No ID setting error</td></tr>
</table>

*1 If multiple errors occur simultaneously, the latest error is displayed.

*2 Upon Parameter access error, data are stored in Number of the error IDs (Un\G8192) and Error ID information storage area (Un\G8193 to Un\G8320).

(2) How to recover from the parameter access error status

How to recover from the parameter access error status is as follows.

(a) Slave module hardware error

Eliminate the error cause by taking measures such as noise prevention. Then power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).

(b) Parameter access target module ID error, parameter value error

Eliminate the error cause such as a parameter access program. Then power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).

(c) Parameter access error

If any of the following errors has occurred, eliminate the error cause.

- Slave module hardware error (error code: $012C_H$, $012D_H$)
- Slave module status error (error code: 0131_H)
- Same ID used error (error code: 0190_H)

When a parameter access error other than the above occurs, the possible cause is noise. Eliminate the error cause by taking measures such as noise prevention. Then power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).

(d) Slave module status error

Check the status details of the target slave module to eliminate an error cause. Then power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).

The status details of the slave module can be checked with the AnyWireASLINK parameter in Parameter storage area 1 (Un\G12288 to Un\G12335). *1

*1 Buffer memory address when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

(e) Same ID used error, no ID setting error

Eliminate the error cause such as Same ID used error. Then power off and on the AnyWireASLINK system or turn on and off Error flag clear command (Yn0).

After recovery from parameter access error status, the following status is resulted:

Type	Signal status
Slave module hardware error	• Slave module alarm signal (X(n+1)0) turns off. • The data in Latest error code storage area (Un\G10256) is cleared. • The data in Latest error ID storage area (Un\G10257) is cleared. • The data in Number of the alarm IDs (Un\G9984) is cleared. • The data in Alarm ID information storage area (Un\G9985 to Un\G10112) is cleared.
Parameter access target module ID error	
Parameter value error	
Slave module status error	
Same ID used error	
No ID setting error	
Parameter access error	• Parameter access error (X(n+1)2) turns off. • The data in Latest error code storage area (Un\G10256) is cleared. • The data in Latest error ID storage area (Un\G10257) is cleared. • The data in Number of the error IDs (Un\G8192) is cleared. • The data in Error ID information storage area (Un\G8193 to Un\G8320) is cleared.

8.6 Same ID Used Detection Function

This function allows the master module to check whether the same ID is used for all the slave modules with the addresses that have been automatically detected.

Point

- IDs are detected with automatic address detection. If the CPU module is reset or the system is powered off after ID duplication detection, the ID duplication status cannot be checked until the automatic address detection is performed again.
- Only a single ID is stored in Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112) when the same ID is the cause. For example, when multiple modules have ID 10, "1" is stored in Number of the alarm IDs (Un\G9984) and "10" is stored in Alarm ID information storage area (Un\G9985 to Un\G10112).

(1) Same ID used status

When the AnyWireASLINK system is in the following status, the same ID is used for multiple modules.
Even in the same ID used status, the AnyWireASLINK bit transmission is not stopped.

- Slave module alarm signal (X(n+1)0) turns on.
- Same ID used error (error code: 0190_H) is stored in Latest error code storage area (Un\G10256) and the duplicated ID is stored in Latest error ID storage area (Un\G10257). *1
- An error (error code: 0190_H) is displayed in the detailed information section on the system monitor window of GX Works2. *1
- The relevant ID is stored in Alarm ID information storage area (Un\G9985 to Un\G10112).

*1 If multiple errors occur simultaneously, the latest error is displayed.

(2) How to recover from same ID used status

Check Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112).
Then set a unique ID (address) in all the slave modules. (☞ Page 56, Section 7.2)
Error status is cleared by executing automatic address detection in the master module after setting the IDs (addresses) in the slave modules. (☞ Page 59, Section 7.3)

Remark

While an ID (address) is used for multiple slave modules, executing either of the following can eliminate the same ID used error. However, the address is still used for the multiple slave modules.

- Powering off and on the AnyWireASLINK system
- Turning on and off Error flag clear command (Yn0)

8.7 Module with No ID Setting Detection Function

This function detects slave modules with no ID (factory default ID) by performing the automatic address detection.

Module	Factory default ID
Input slave module, I/O combined slave module	767
Output slave module	255

Point

- ID unset detection is performed with automatic address detection. If the CPU module is reset or the system is powered off after the ID unset detection, the ID unset status cannot be checked until automatic address detection is performed again.
- Only a single ID is stored in Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112) when no ID setting is the cause. For example, when multiple modules have ID 255, "1" is stored in Number of the alarm IDs (Un\G9984) and "255" is stored in Alarm ID information storage area (Un\G9985 to Un\G10112).

(1) ID unset status

When the AnyWireASLINK system is in the following status, a module with no ID setting has been detected.
Even in the no ID number setting status, the AnyWireASLINK bit transmission is not stopped.

- Slave module alarm signal (X(n+1)0) turns on.
- No ID setting error (error code: 0191_H) is stored in Latest error code storage area (Un\G10256) and unset IDs are stored in Latest error ID storage area (Un\G10257). *1
- An error (error code: 0191_H) is displayed in the detailed information section on the system monitor window of GX Works2. *1
- IDs not set yet are stored in Alarm ID information storage areas (Un\G9985 to Un\G10112).

*1 If multiple errors occur simultaneously, the latest error is displayed.

(2) How to recover from the ID unset status

Check Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112).
Then set addresses to slave modules. (☞ Page 56, Section 7.2)
Check that "255" is not set as the address of the slave module.
The IDs of the slave module is stored in the master module and the error status is cleared by performing the automatic address detection in the master module after setting the IDs (addresses) in the slave modules. (☞ Page 59, Section 7.3)

Remark

While the ID (address) of a slave module is not set, executing either of the following can eliminate the no ID setting error. However the address of the slave module is still not set.

- Powering off and on the AnyWireASLINK system
- Turning on and off Error flag clear command (Yn0)

8.8 Reading and Writing Parameters

In the AnyWireASLINK system, the parameter information of a slave module and the AnyWireASLINK system in addition to I/O information are sent and received between the master module and a slave module.
Use this function to check or change parameter information of a slave module.
For details on the parameter information to be sent and received, refer to the following.

- ☞ Page 110, Appendix 2 (12)
- ☞ Page 110, Appendix 2 (13)
- ☞ Page 111, Appendix 2 (14)
- ☞ Page 112, Appendix 2 (15)

(1) Parameter reading and writing methods

There are four methods as follows to read or write the parameter information from or to a slave module.

Parameter reading and writing methods	Description
Automatic update	The current status of all slave modules and the current values of the sensors are read at regular intervals. (Excluding the setting values.)
Parameter access	By specifying the access method (read or write) and target slave module, all the parameter values of each slave module are read or written individually.
Parameter batch read	All the parameter values of all slave modules are read out into the buffer memory of the master module.
Parameter batch write	Parameter setting values stored in the buffer memory of the master module are written to all slave modules.

The readable/writable parameters are listed below.
○: Possible, ×: Impossible

Parameter name		Read/write	Parameter reading and writing methods				
			Automatic update	Parameter access		Parameter batch read	Parameter batch write
				Read	Write		
Device parameter*1		Read/write	×	○	○	○	○
AnyWireASLINK parameter	Module ID	Read	×	○	×	○	×
	Status details	Read	○	○	×	○	×
	Sensing level	Read	○	○	×	○	×

*1 The device parameter name differs depending on the slave module to be used.

Point

Even when the parameter access, parameter batch read, or parameter batch write is executed, the bit transmission speed of AnyWireASLINK is not reduced.

(2) Automatic update

No special operation is required because data are automatically updated.

To check the parameter information, refer to the corresponding buffer memory address.

(3) Parameter access

The procedure for parameter access is as follows.

(a) To read parameters

1. **Set the access method.**

Store 0000_H: read in Parameter access setting (Un\G10320).

2. **Set the access target module ID.**

Store the access target module ID in Parameter access target module ID specification (Un\G10321).

ID	Description
0000_H to $00FF_H$	Output slave module ID
0200_H to $02FF_H$	ID of an input slave module or I/O combined slave module

3. **Turn on and off Parameter access request command (Y(n+1)0).**

At this time, Parameter access completion flag (X(n+1)1) turns off. When the parameter access is completed, Parameter access completion flag (X(n+1)1) automatically turns on.

4. **The read parameters are stored in the following location of each ID.**

Device parameter in Parameter storage area 1 (Un\G12288 to Un\G12335)*1

*1 Buffer memory addresses when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

(b) To write parameters

1. **Read the parameters referring to the procedure in "To read parameters" or "Parameter batch read".**

Read the parameters of all slave modules with registered IDs before executing parameter write.*1

*1 Because parameter write updates all parameters of target slave modules, all parameters to which no changes are made need to be set correctly.
Executing parameter write without executing parameter read will result in a malfunction.

2. **Set the access method.**

Store 0001_H: write in Parameter access setting (Un\G10320).

3. **Set the access target module ID.**

Store the access target module ID in Parameter access target module ID specification (Un\G10321).

ID	Description
0000_H to $00FF_H$	Output slave module ID
0200_H to $02FF_H$	ID of an input slave module or I/O combined slave module

4. **The written parameters are stored in the following location.**

Device parameter read/write areas in Parameter storage area 1 (Un\G12288 to Un\G12335)*1

*1 Buffer memory address when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

5. **Turn on and off Parameter access request command (Y(n+1)0).**

At this time, Parameter access completion flag (X(n+1)1) turns off. When the parameter access is completed, Parameter access completion flag (X(n+1)1) automatically turns on.

6. **Turn on Parameter access request command (Y(n+1)0) or Parameter batch read command (Y(n+1)1) to check that the settings have been saved in the slave module.**

(4) Parameter batch read

The procedure for parameter batch read is as follows.

1. **Turn on and off Parameter batch read command (Y(n+1)1).**
   At this time, Parameter access completion flag (X(n+1)1) turns off. When the parameter access is completed, Parameter access completion flag (X(n+1)1) automatically turns on.
2. **The read parameters are stored in the following location of each ID.**
   Device parameter in Parameter storage area 1 (Un\G12288 to Un\G12335)*1

*1 Buffer memory addresses when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

(5) Parameter batch write

The procedure for parameter batch write is as follows.

1. **Read the parameters referring to the procedure in "Parameter batch read".**
   Read the parameters of all slave modules with registered IDs before executing parameter batch write.

*1 Because parameter batch write updates all parameters of target slave modules, all parameters to which no changes are made need to be set correctly.
Executing parameter batch write without executing parameter batch read will result in a malfunction.

2. **Store the parameters to be written in the following location.**
   Device parameter read/write areas in Parameter storage area 1 (Un\G12288 to Un\G12335)*1

*1 Buffer memory address when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

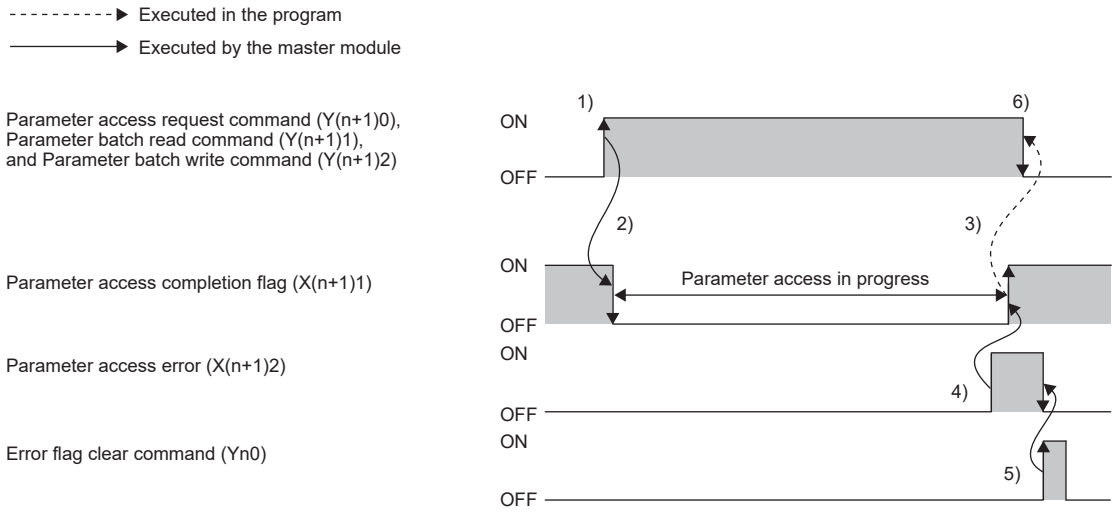
3. **Turn on and off Parameter batch write command (Y(n+1)2).**
   At this time, Parameter access completion flag (X(n+1)1) turns off. When the parameter access is completed, Parameter access completion flag (X(n+1)1) automatically turns on.
4. **Check that the parameters have been correctly applied to the slave modules.**
   After executing parameter batch write, read the parameters of the slave module referring to the procedure in "To read parameters" or "Parameter batch read" to check that the parameters have been correctly applied to the slave modules.

Point

- During the parameter access, parameter batch read, and parameter batch write, Parameter access completion flag (X(n+1)1) is off. When Parameter access completion flag (X(n+1)1) is off, the parameter access, parameter batch read, and parameter batch write cannot be executed.
- Upon parameter batch read or parameter batch write, the values stored in Parameter access setting (Un\G10320) and Parameter access target module ID specification (Un\G10321) are ignored.
- The buffer memory address start number of the parameter storage location of each ID is stored in the following area. The 48 words from the buffer memory address start number is the parameter information of each ID.
  - The buffer memory addresses of the parameter storage locations of output slave modules are Un\G10496 to Un\G10751.
  - The buffer memory addresses of the parameter storage locations of input slave modules or I/O combined slave modules are Un\G11008 to Un\G11263.

(6) Parameter access timing

The parameter access timing is as follows.



No.	Description
1)	Turn on any of the signals below with a program to start parameter access.*1 • Parameter access request command (Y(n+1)0) • Parameter batch read command (Y(n+1)1) • Parameter batch write command (Y(n+1)2)
2)	The operation in 1) turns off Parameter access completion flag (X(n+1)1).
3)	When parameter access (read/write) is completed, Parameter access completion flag (X(n+1)1) automatically turns on.
4)	If parameter access has an error, Parameter access error (X(n+1)2) turns on and Parameter access completion flag (X(n+1)1) automatically turns on.*2
5)	Turning on Error flag clear command (Yn0) with a program turns off Parameter access error (X(n+1)2).
6)	Use the program to turn off the signal that turned on in the step 1.

*1 Before the start of parameter access from the master module to the slave module, reflect the access method, access target ID, and parameter data to the buffer memory.

*2 sError codes are stored in Latest error code storage area (Un\G10256) and the target IDs are stored in Latest error ID storage area (Un\G10257). (The latest information is overwritten.)

(7) Precautions

(a) Parameter setting

Parameters cannot be set in the following cases.

- Upon an error in the AnyWireASLINK system (Example: Short-circuit, 24VDC external power supply voltage drop)
- Within approximately five seconds after the AnyWireASLINK system is powered on or the system is reset
- When the automatic address detection is in progress (While Automatic address detection flag (X(n+1)4) is on)
- When parameter access is in progress (While Parameter access request command (Y(n+1)0), Parameter batch read command (Y(n+1)1), or Parameter batch write command (Y(n+1)2) is on)
- When any of the following errors has occurred

Error code	Error description
0064H	Master module hardware error
0065H	Master module hardware error
0067H	Master module hardware error
00C8H	Transmission cable voltage drop error
00C9H	DP/DN short error

(b) Parameter reading and writing

- When parameter reading or writing is in progress, Parameter access completion flag (X(n+1)1) turns off. Refer to the section describing the parameter access timing, and adjust the access timing. (☞ Page 75, Section 8.8 (6))
- When parameter reading or writing is in progress, do not execute re-access to the parameters and automatic address detection. Doing so can cause a malfunction of the module.

(c) Parameter access, parameter batch read, and parameter batch write

- These operations cannot be performed to a slave module whose ID has not been registered in the master module.
- Clear a no ID setting error or a same ID used error of the slave module. Then perform the operations.
- Because parameter batch write updates all parameters of target slave modules, all parameters to which no changes are made need to be set correctly. Be sure to execute parameter batch read right before executing parameter batch write. Then, import the latest parameters and execute parameter batch write. Executing parameter batch write without executing parameter batch read will result in a malfunction.

(d) Others

- The parameter batch read is executed at the same time as when the automatic address detection is executed.
- Note that the master module may communicate with a slave module and output parameters even if no parameters are set.

8.9 iQ Sensor Solution Function

This function establishes data communications with AnyWireASLINK-compatible slave modules via AnyWireASLINK.
The following iQ Sensor Solution functions can be used.

- Automatic detection of connected devices
- Sensor/device monitor
- Sensor parameter read/write
- Data backup/restoration

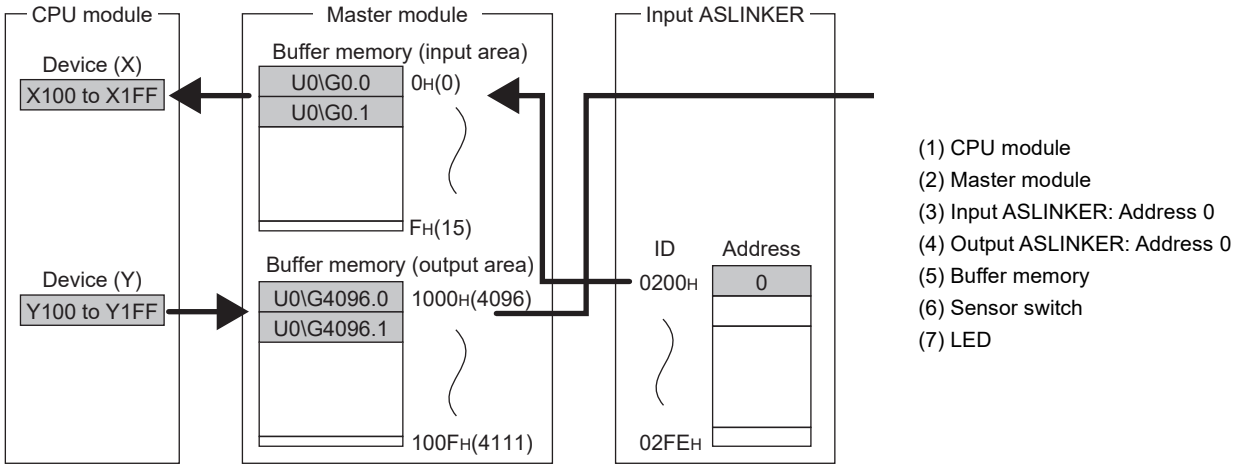
For details about the function, refer to the following.
📖 iQ Sensor Solution Reference Manual

CHAPTER 9 PROGRAMMING

This chapter describes the programming of the master module.

9.1 Correlations Between Devices

Using the system configuration in Page 79, Section 9.2 as an example, the correlations between devices are shown below.



Point

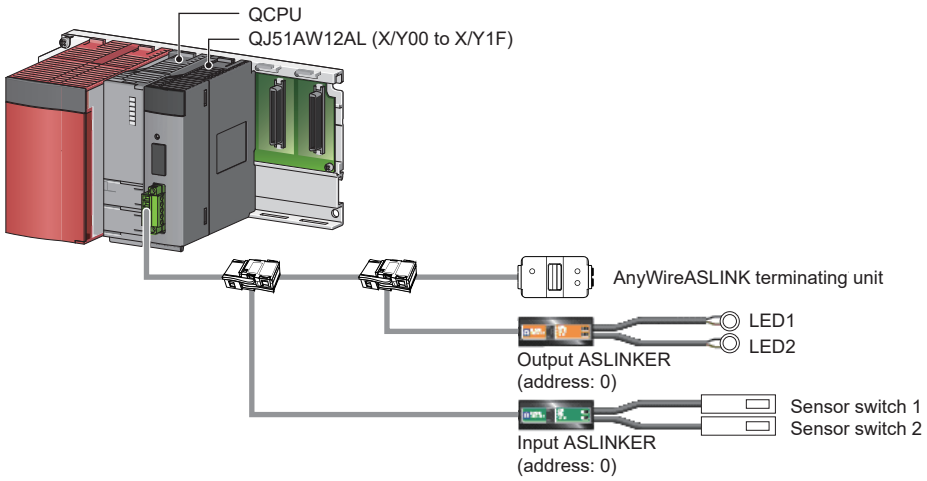
Depending on the CPU module used, the devices used in the program example in this chapter may not be usable.
For the settable ranges of devices, refer to the user's manual for the CPU module used.

9.2 System Using the QJ51AW12AL

9.2.1 When using a module in the ordinary system configuration

This section provides a program example with the following system configuration and conditions.

(1) System configuration



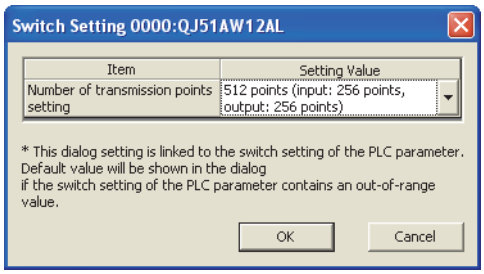
(2) Programming conditions

The input signals of the input ASLINKER, stored in Input information area (Un\G0 to Un\G15) of the master module, are batch-transferred to the device data of the CPU module.
Moreover, the device data of the CPU module is batch-transferred to Output information area (Un\G4096 to Un\G4111) of the master module, and the output signals of the output ASLINKER are transmitted.

(3) QJ51AW12AL operation setting

Set the number of transmission points.

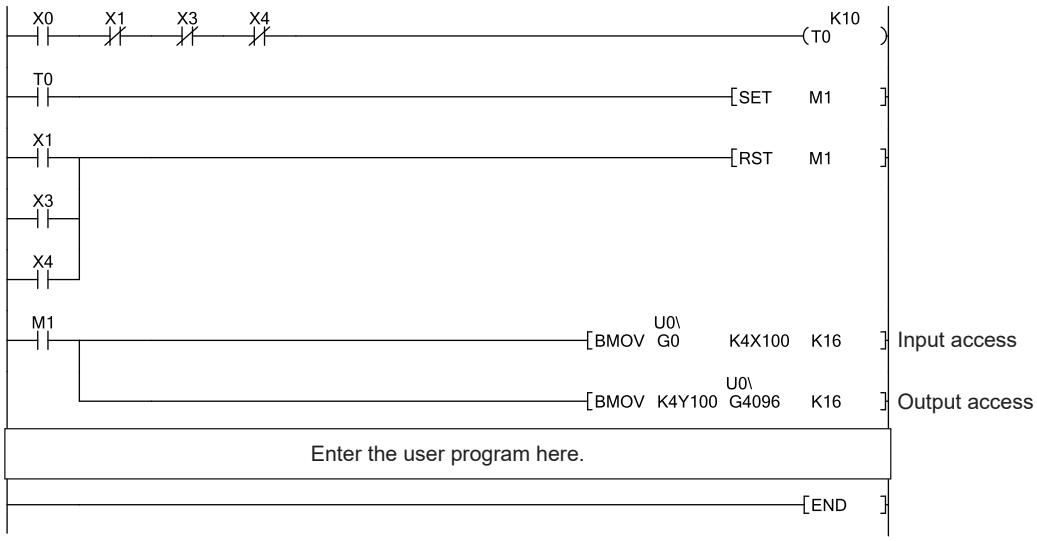
Project window ⇨ [Intelligent Function Module] ⇨ QJ51AW12AL ⇨ [Switch Setting]



(4) Devices used by users

Device	Description
X0	Module READY
X1	DP/DN short error
X3	Transmission cable voltage drop error
X4	DP/DN disconnection error
X100 to X1FF	Input data
Y100 to Y1FF	Output data
M1	Program starting contact
T0	Timer contact after module READY
U0\G0	Input information area
U0\G4096	Output information area

(5) Program example



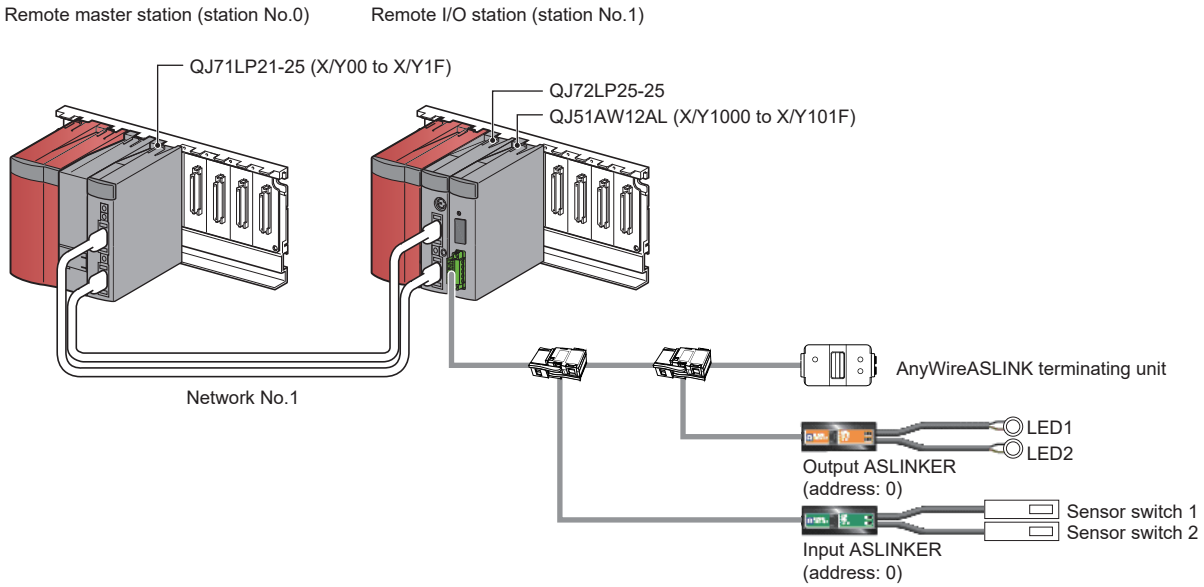
9.2.2 When connecting a module in a remote I/O station

This section describes a system configuration and a program example for when connecting the QJ51AW12AL in a remote I/O station.

Point

For the MELSECNET/H remote I/O network, refer to the following.
Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)

(1) System configuration



(2) Programming conditions

The input signals of the input ASLINKER, stored in Input information area (Un\G0 to Un\G15) of the master module in the remote I/O station, are batch-transferred to the device data of the CPU module.
Moreover, the device data of the CPU module is batch-transferred to Output information area (Un\G4096 to Un\G4111) of the master module in the remote I/O station, and the output signals of the output ASLINKER are transmitted.

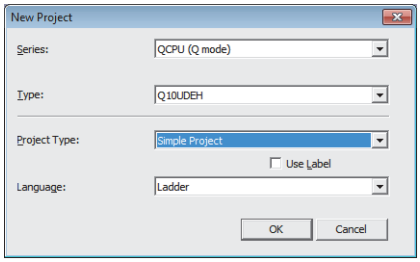
(3) QJ51AW12AL operation setting

(a) Settings on the remote master station

1. Create a project in GX Works2.

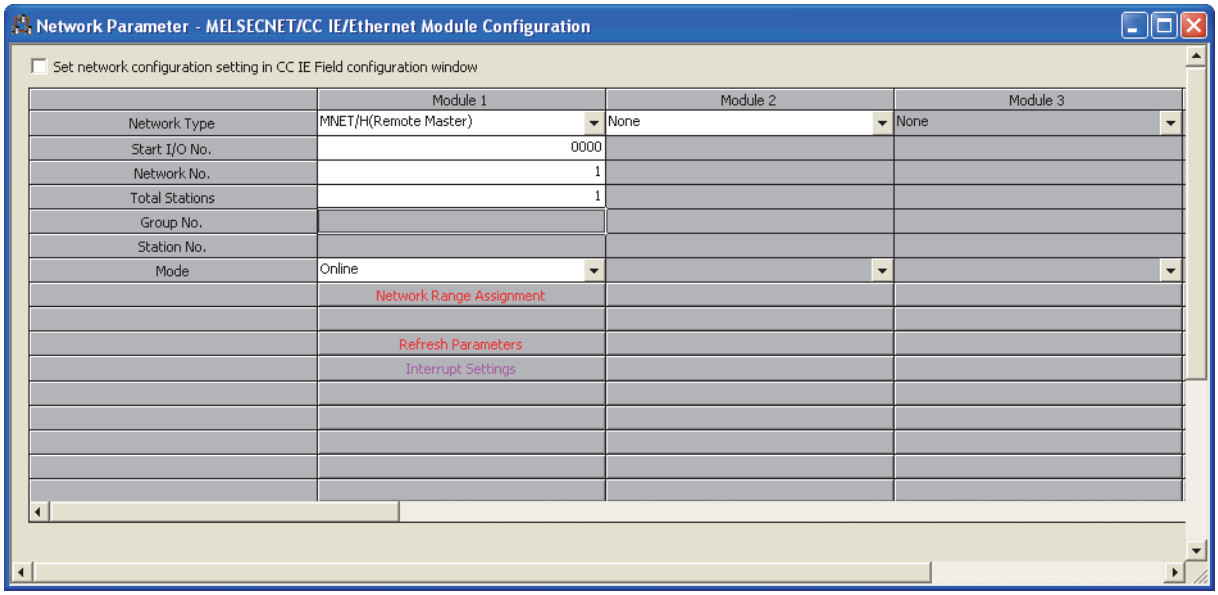
For "Series", select "QCPU (Q mode)". For "Type", select the CPU module to use.

[Project] ⇨ [New]



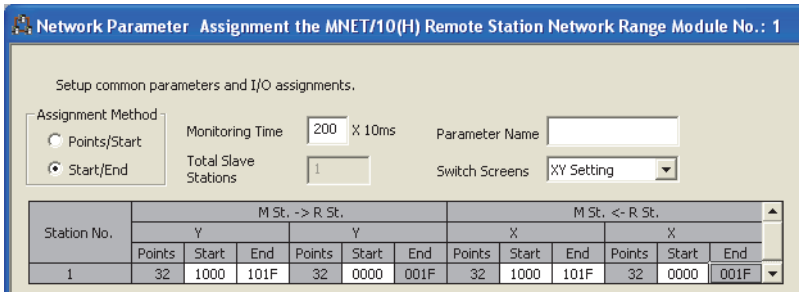
2. Open the network parameter setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET]



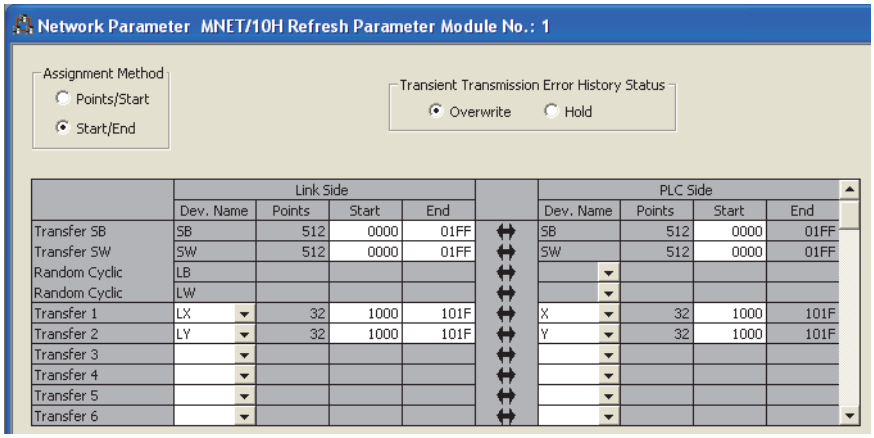
3. Open the network range assignment setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET] ⇨ Network Range Assignment button ⇨ "Switch Screens" ⇨ "XY Setting"



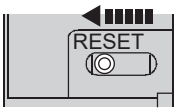
4. Open the refresh parameter setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET] ⇨ Refresh Parameters button



5. Write the set parameters into the CPU module of the master station, and reset the CPU module or power off and on the programmable controller.

[Online] ⇨ [Write to PLC]



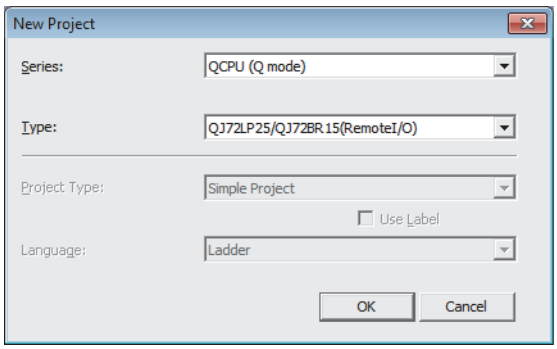
or Power OFF→ON

(b) Settings on the remote I/O station

1. Create a project in GX Works2.

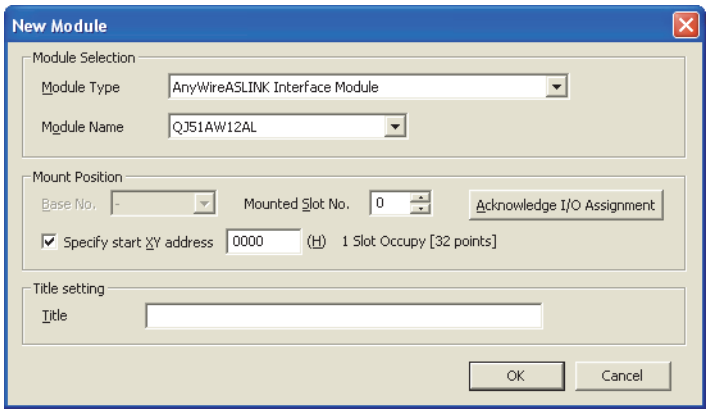
For "Series", select "QCPU (Q mode)". For "Type", select "QJ72LP25/QJ72BR15(RemoteI/O)".

[Project] ⇨ [New]



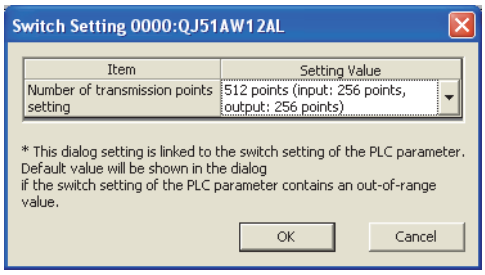
2. Add QJ51AW12AL to a project in GX Works2.

Project window ⇨ [Intelligent Function Module] ⇨ Right click ⇨ [New Module]



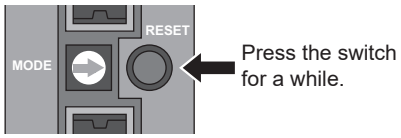
3. Open the QJ51AW12AL switch setting window, and set the number of transmission points.

Project window ⇨ [Intelligent Function Module] ⇨ QJ51AW12AL ⇨ [Switch Setting]



4. Write the set parameters into the remote I/O module, and reset the remote I/O module.

[Online] ⇨ [Write to PLC]



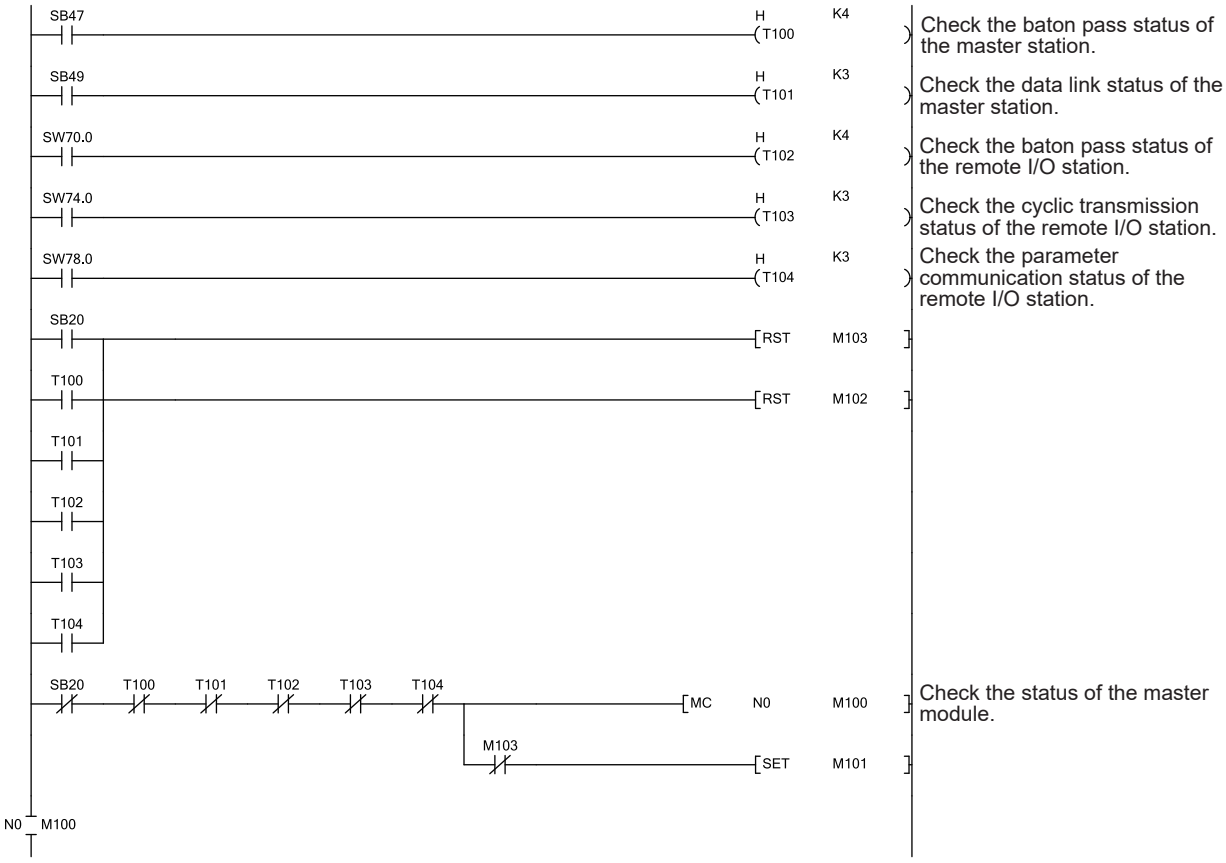
(4) Devices used by users

Device	Description
X1000	Module READY
X1001	DP/DN short error
X1003	Transmission cable voltage drop error
X1004	DP/DN disconnection error
X100 to X1FF	Input data
Y100 to Y1FF	Output data
D500 to D515	Input information area
D100 to D115	Output information area
M1	Program starting contact
M10	Z.REMTO instruction completion device
M11	Z.REMTO abnormal end device
M12	Z.REMFR instruction completion device
M13	Z.REMFR abnormal end device
M100	Device for checking the master module status (for executing the MC and MCR instructions)
M101, M102, M103	Initial setting execution supporting device
M155	Z.REMTO instruction starting device (from the second time)
SM62	Annunciator detection
SB20	Module status
SB47	Baton pass status (own station)
SB49	Data link status of own station
SW70.0	Baton pass status of each station (station No.1)
SW74.0	Cyclic transmission status of each station (station No.1)
SW78.0	Parameter communication status of each station (station No.1)
T0	Timer contact after module READY
T100 to T104	Interlock for own station and other stations
F30	Z.REMTO instruction error
F31	Z.REMFR instruction error

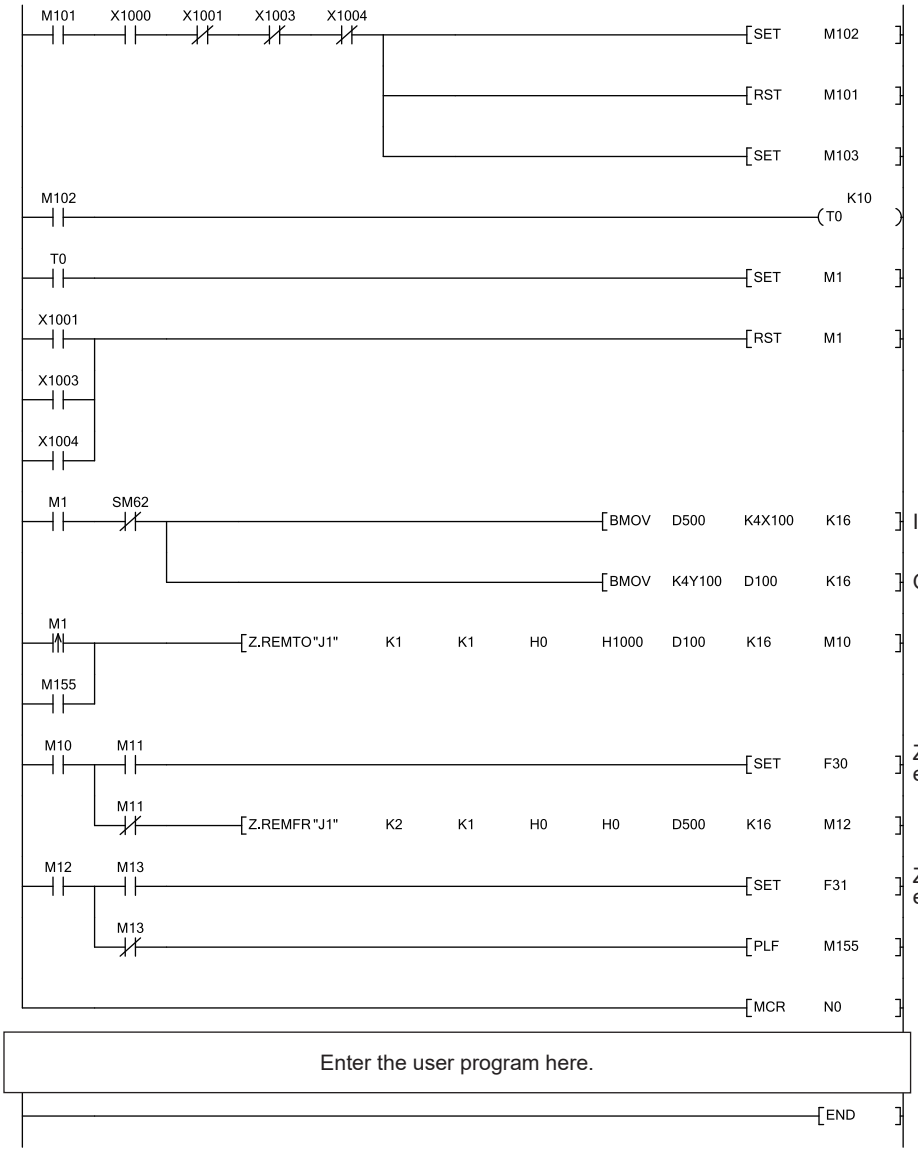
(5) Program example

Write a program to the CPU module of the master station.

- Operation status check program of the remote I/O station



- Master module operation program



9.3 System Using the LJ51AW12AL

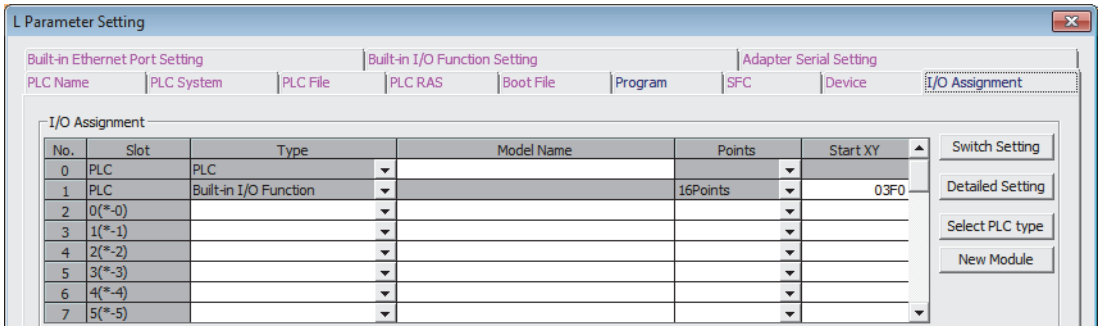
9.3.1 When using a module in the ordinary system configuration

In an ordinary system configuration using the LJ51AW12AL, programs of the QJ51AW12AL can be used. Make settings as instructed in this section and follow the program example in Page 80, Section 9.2.1 (5).

(1) LJ51AW12AL operation setting

(a) PLC parameter setting

Following the program example of the QJ51AW12AL, change the setting for I/O assignment of the built-in I/O function. Using "I/O Assignment" of "PLC Parameter", set to I/O assignment not used in the system.
The following is an example of "I/O Assignment" for when the L02CPU is used.

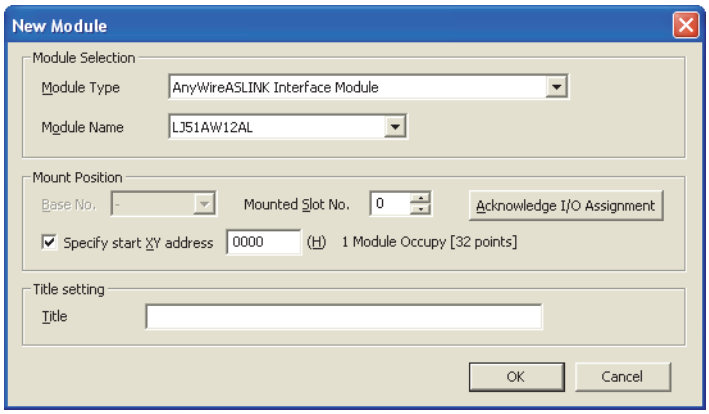


If using an LCPU with the built-in CC-Link function, set the I/O assignment of the built-in CC-Link function to "0000", and set the start I/O number setting of the built-in I/O function to I/O assignment not used in the system.

(b) Setting the number of transmission points

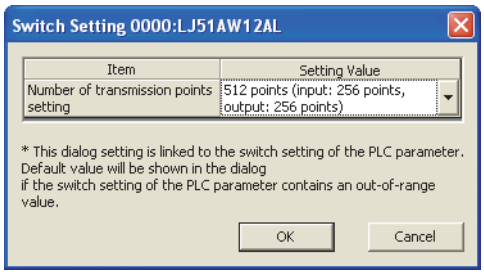
1. **Add LJ51AW12AL to a project in GX Works2.**

Project window ⇨ [Intelligent Function Module] ⇨ Right click ⇨ [New Module]



2. Open the LJ51AW12AL switch setting window, and set the number of transmission points.

Project window ⇨ [Intelligent Function Module] ⇨ LJ51AW12AL ⇨ [Switch Setting]



(2) Program example

Refer to Page 80, Section 9.2.1 (4) and Page 80, Section 9.2.1 (5), and follow the program example of the QJ51AW12AL .

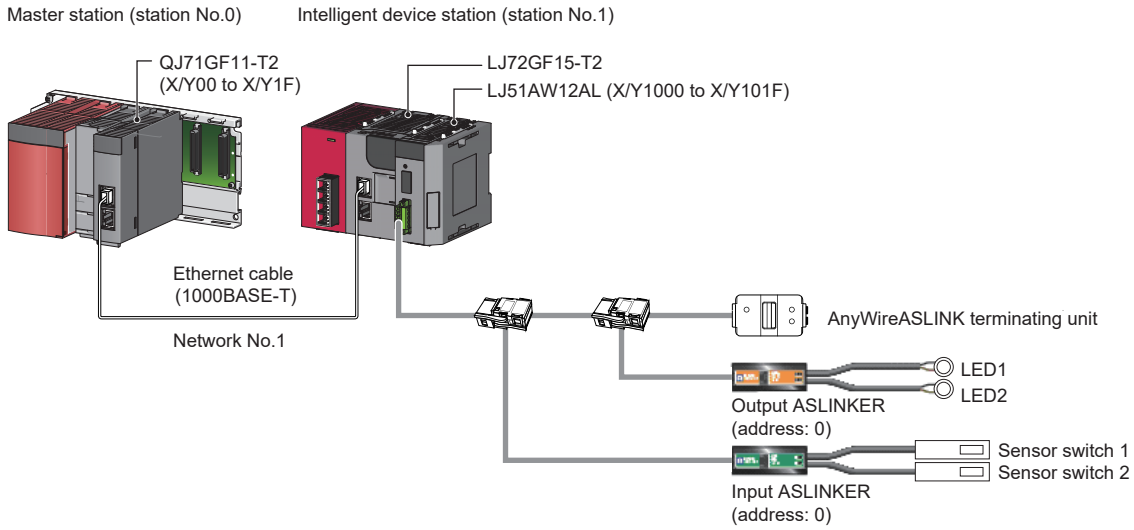
9.3.2 When connecting a module to a head module

This section describes a system configuration and a program example for when connecting the LJ51AW12AL to a head module.

Point

For the head module, refer to the following.
MELSEC-L CC-Link IE Field Network Head Module User's Manual

(1) System configuration



(2) Programming conditions

The input signals of the input ASLINKER, stored in Input information area (Un\G0 to Un\G15) of the master module connected to the head module, are batch-transferred to the device data of the CPU module.
Moreover, the device data of the CPU module is batch-transferred to Output information area (Un\G4096 to Un\G4111) of the master module connected to the head module, and the output signals of the output ASLINKER are transmitted.

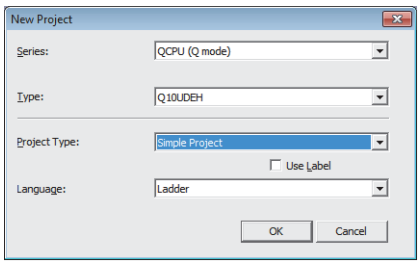
(3) LJ51AW12AL operation setting

(a) Settings on the master station

1. Create a GX Works2 project.

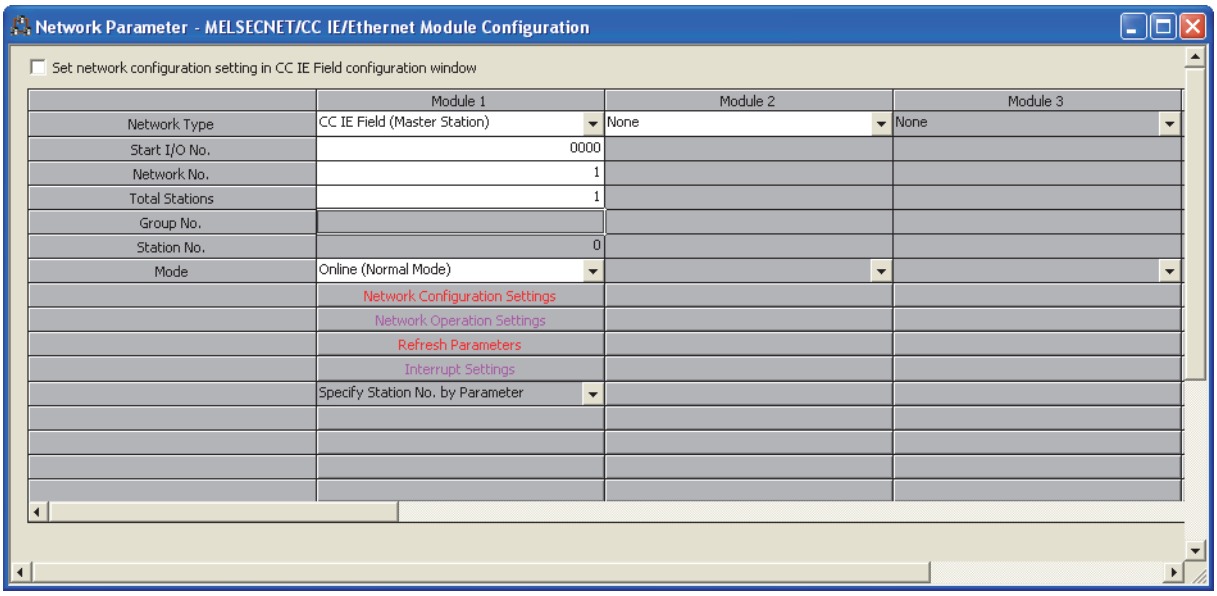
For "Series", select "QCPU (Q mode)". For "Type", select the CPU module to use.

[Project] ⇨ [New]



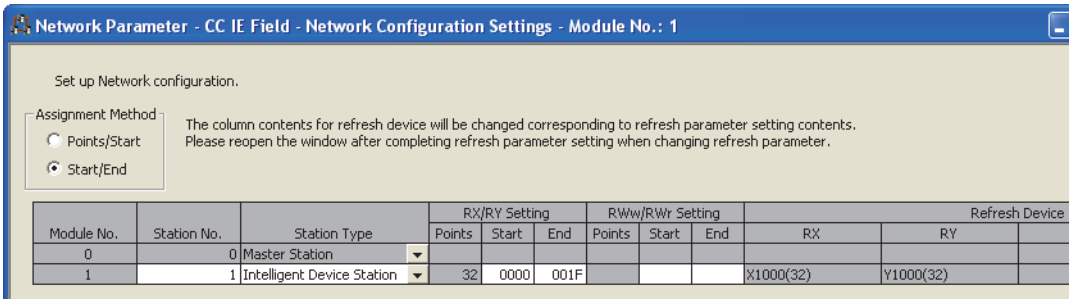
2. Open the network parameter setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET]



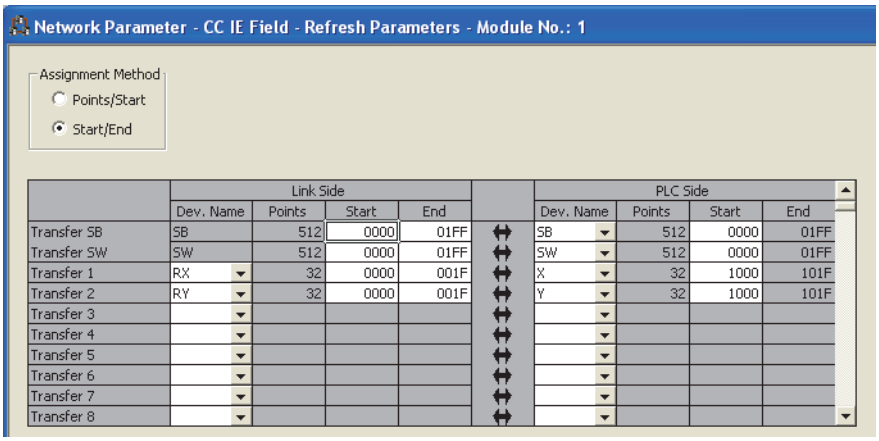
3. Open the network configuration setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET] ⇨ Network Configuration Setting button



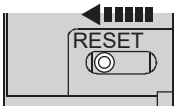
4. Open the refresh parameter setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [Ethernet/CC IE/MELSECNET] ⇨ Refresh Parameters button



5. Write the set parameters into the CPU module of the master station, and reset the CPU module or power off and on the programmable controller.

[Online] ⇨ [Write to PLC]



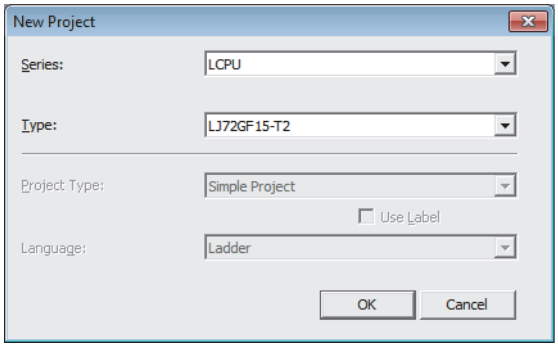
or Power OFF→ON

(b) Settings on the intelligent device station

1. Create a project in GX Works2.

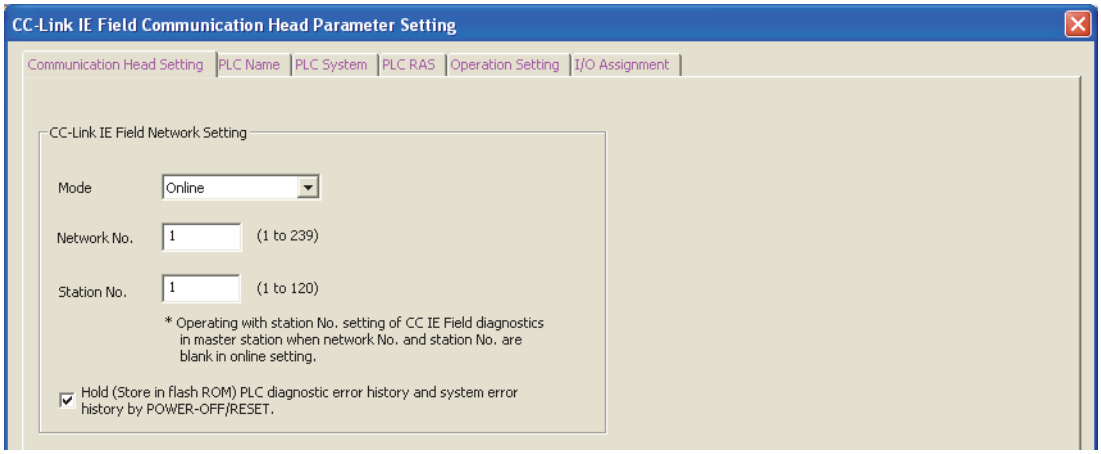
For "Series", select "LCPU". For "Type", select "LJ72GF15-T2".

[Project] ⇨ [New]



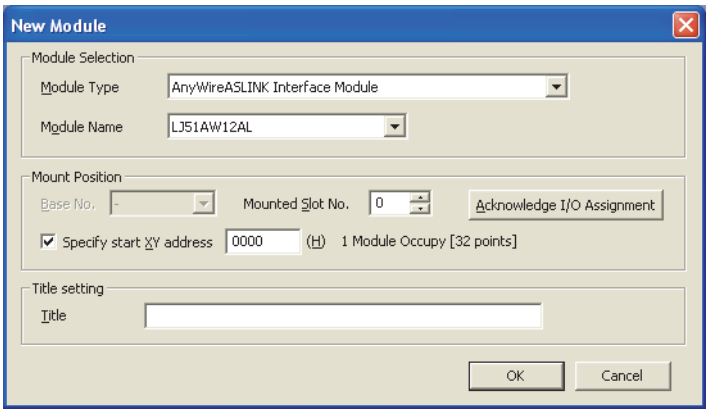
2. Open the PLC parameter setting window, and make settings as below.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "Communication Head Setting"



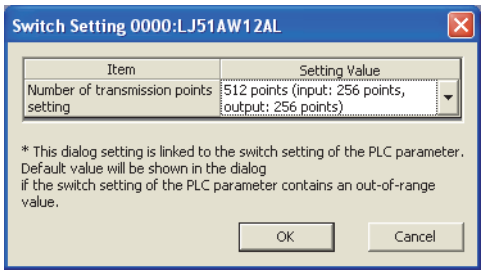
3. Add LJ51AW12AL to a project in GX Works2.

Project window ⇨ [Intelligent Function Module] ⇨ Right click ⇨ [New Module]



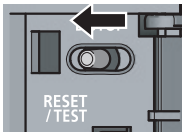
4. Open the LJ51AW12AL switch setting window, and set the number of transmission points.

Project window ⇨ [Intelligent Function Module] ⇨ LJ51AW12AL ⇨ [Switch Setting]



5. Write the set parameters to the head module, and reset the head module or power off and on the programmable controller.

[Online] ⇨ [Write to PLC]



or Power OFF → ON

(4) Devices used by users

Device	Description
X1000	Module READY
X1001	DP/DN short error
X1003	Transmission cable voltage drop error
X1004	DP/DN disconnection error
D500 to D515	Input information area
D100 to D115	Output information area
X100 to X1FF	Input data
Y100 to Y1FF	Output data
M0	Device for checking the master module status (for executing the MC and MCR instructions)
M1	Program starting contact
M10	ZP.REMTO instruction completion device
M11	ZP.REMTO instruction abnormal end device

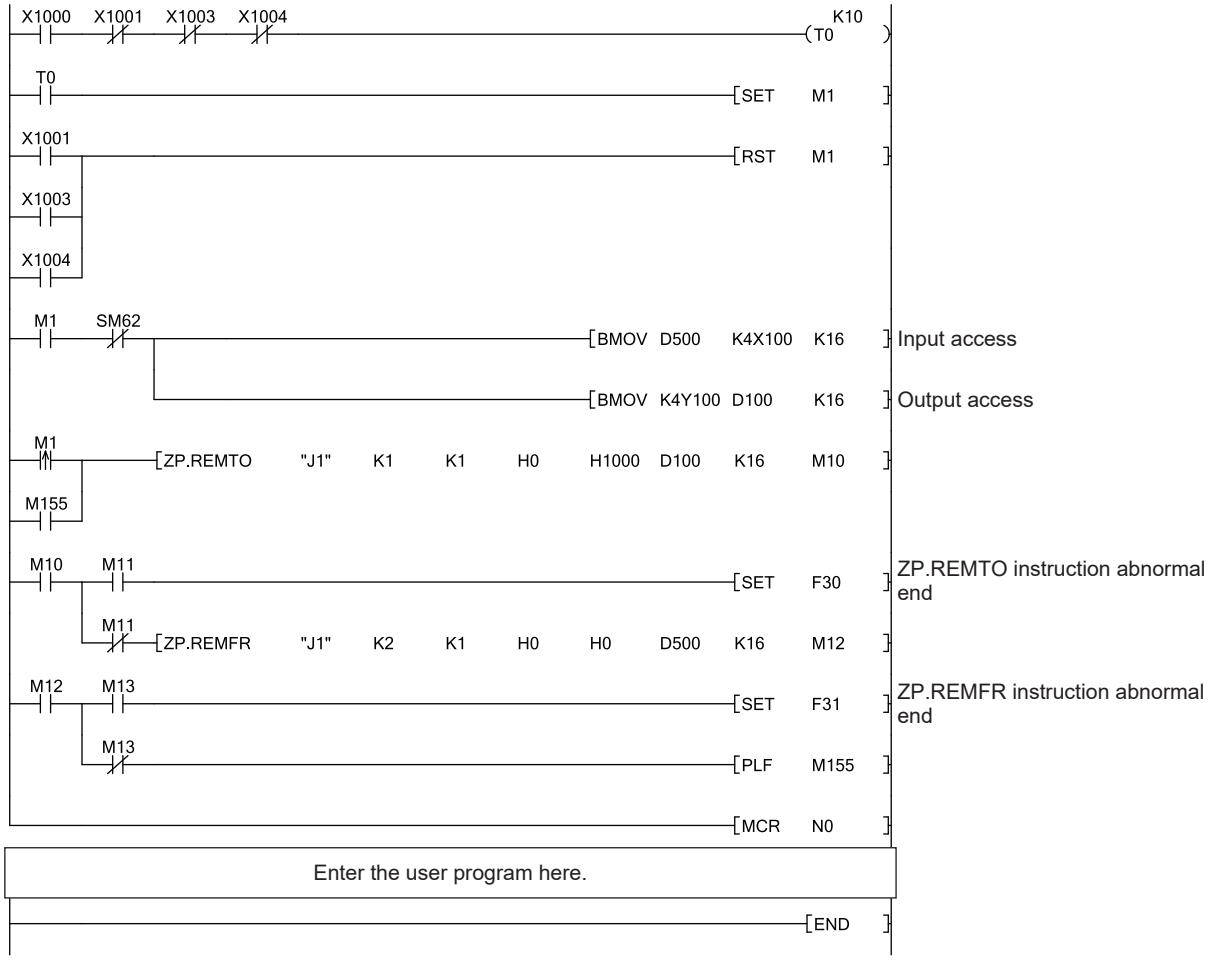
Device	Description
M12	ZP.REMFR instruction completion device
M13	ZP.REMFR instruction abnormal end device
M155	ZP.REMTO instruction starting device (from the second time)
SM62	Annunciator detection
SB49	Data link status of own station
SWB0.0	Data link status of each station (station No.1)
T0	Timer contact after module READY
F30	ZP.REMTO instruction error
F31	ZP.REMFR instruction error

(5) Program example

Write a program to the CPU module of the master station.

- Data link status check program of the head module

- Master module operation program



CHAPTER 10 TROUBLESHOOTING

This chapter describes how to identify and eliminate the error cause in the master module.

10.1 Before Troubleshooting

Check that the POWER LED of the power supply module and the MODE LED of the CPU module are on. If they are off, perform the troubleshooting of the CPU module.
📖 User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used

10.2 Check by Visual Inspection

Check that the communication cables and wires are not disconnected and check the following items.

(1) Checking the LED status of the master module

With the following LEDs, errors regarding the operating status and communications of the master module can be checked. When the LEDs are in the following status, settings and wiring need to be corrected.

1. **Check the RUN LED of the master module.**
   If the RUN LED does not turn on, perform the following troubleshooting.
   ☞ Page 101, Section 10.6
2. **Check the LINK LED of the master module.**
   If the LINK LED does not flash, perform the following troubleshooting.
   ☞ Page 101, Section 10.6
3. **Check the ALM LED of the master module.**
   If the ALM LED is flashing or on, perform the following troubleshooting.
   ☞ Page 101, Section 10.6

(2) Checking the operating status of the slave module

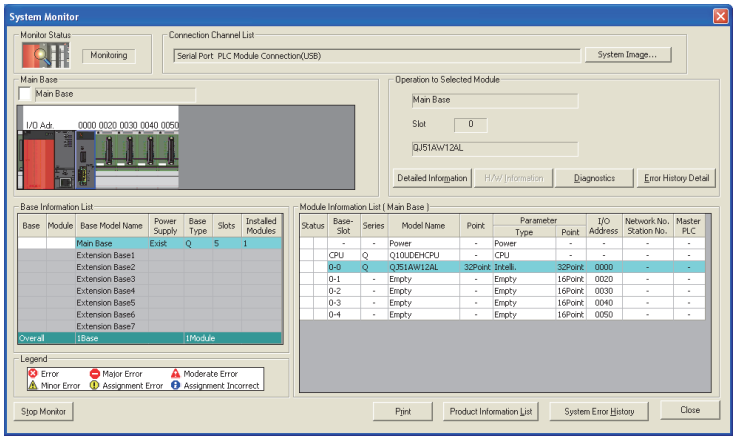
Check that there is no error in the slave module. For the troubleshooting of the slave module, refer to Page 103, Section 10.7.

- Slave module data (I/O data and parameter data) cannot be checked.
- Slave module data (I/O data and parameter data) are unstable.

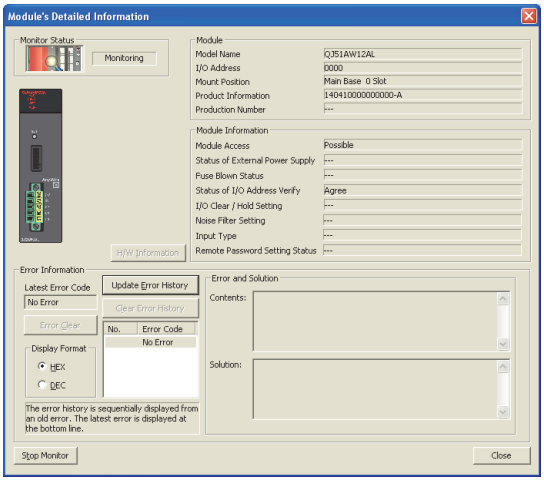
10.3 Checking with Module's Detailed Information

The method for checking in the module's detailed information window is described below.

[Diagnostics] ⇨ [System Monitor]



↓



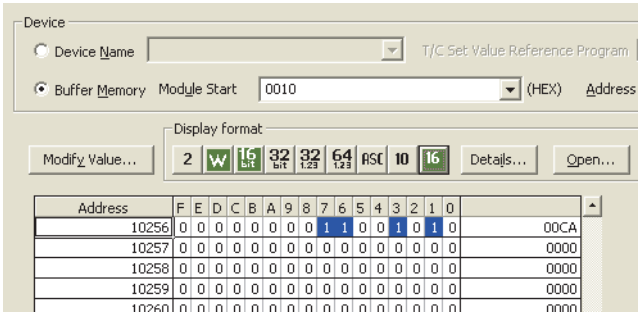
1. **From "Main Base", select the master module, and click the Detailed Information button. (For the MELSEC-L series, select the master module from "Main Block".)**

2. **"Module's Detailed Information" for the master module is displayed.**

10.4 Checking with Buffer Memory

This section describes the check method using the buffer memory of the programming tool.

[Online] ⇨ [Monitor] ⇨ [Device/Buffer Memory Batch Monitor]



For details on the buffer memory, refer to Page 107, Appendix 2.

(1) Check of the error details

The error code of the master module is stored in Latest error code storage area (Un\G10256).

(2) Check of the error ID area

The number of error IDs and the ID information are stored in Number of the error IDs (Un\G8192) and Error ID information storage areas (Un\G8193 to Un\G8320), respectively.

(3) Check of the alarm signal area

The number of slave modules having an error and the ID information are stored in Number of the alarm IDs (Un\sG9984) and Alarm ID information storage areas (Un\G9985 to Un\G10112), respectively.

(4) Check of the error details of the slave module

The details of errors in the slave module are stored in the status details in Parameter storage area 1 (Un\G12288 to Un\G12335). *1

*1 Buffer memory address when one slave module is connected. For details, refer to Page 112, Appendix 2 (15).

10.5 Error Code List

The following table lists the error codes of the master module.

Error code	Error description	Corrective action
0064_H to 0067_H	Master module hardware error	A malfunction has been detected in the master module hardware. Reset the CPU module, or power off and on the system. If the error occurs again, the master module may be in failure. Please consult your local Mitsubishi representative.
0068_H	CPU module stop error	A stop error has occurred in the CPU module. Check and correct the error of the CPU module.
$00C8_H$	Transmission cable voltage drop error	The voltage of the 24VDC external power supply may be insufficient. Perform the following: • Adjust the power supply voltage of the 24VDC external power supply within the rated value (21.6VDC to 27.6VDC). (The recommended voltage is 26.4VDC.) • Check that the power cables (24V, 0V) are not disconnected or short-circuited. • When crimping the link connector, check that the pin layout is correct. • Check that the 24VDC external power supply is properly connected to the terminal blocks of the master module and the slave module. • Check that there is no short circuit or incorrect wiring and screws are tightened sufficiently.
$00C9_H$	DP/DN short error	There may be a short in the transmission cables (DP, DN) or the current supplied through the transmission cables (DP, DN) is over the maximum allowable value. Perform the following: • Check that the transmission cables (DP, DN) are not short-circuited. • When crimping the link connector, check that the pin layout is correct. • Check that the transmission cables (DP, DN) are not in contact with each other and that there is no incorrect wiring in the terminal block wiring of the master module and the slave module. • Correct the cables (wire diameter, total length) and modules (type, the number of connected modules) so that the current consumption of all the slave modules does not exceed the transmission cable supply current of the master module. (☞ Page 27, Section 3.2.1, Page 48, Section 6.2.3)

Error code	Error description	Corrective action
$00CA_H$	DP/DN disconnection error	The transmission cables (DP, DN) may be disconnected, or there may be no response from the slave module. The slave module may be in failure or the system configuration may have been changed after the automatic address detection. Check Number of the error IDs (Un\G8192) and Error ID information storage area (Un\G8193 to Un\G8320), find out the disconnected area, and perform the following: • Check that the transmission cables (entire cables) are free from disconnection. • Check that the cables have been crimped with proper pin layout using link connectors appropriate to the wire diameter. • Check that the transmission cables (DP, DN) are properly connected to the terminal block of the master module. • Check that there is no incorrect wiring and screws are tightened sufficiently. • When creating a new system, adding or removing a slave module, or changing the address of the slave module, perform the automatic address detection. After performing the automatic address detection, check that the number of slave modules and the address are consistent with those of the actual system. • If the LINK LED of the slave module does not flash, check that there is no disconnection, short circuit, incorrect wiring, or poor contact in the transmission cables (DP, DN) around the module.
$012C_H$, $012D_H$	Slave module hardware error	A malfunction has been detected in the slave module hardware. Perform the following: • Power off and on the slave module. • Reset the CPU module, or power off and on the system. Check that there is no influence from noise.
$012E_H$	Parameter access target module ID error	The master module accessed the parameter of the ID where the automatic address detection has not been performed. Perform the following: • Check that the slave module ID for parameter access in the actual system matches that of the program. Especially note that the input slave module ID is the input slave module address + 200_H and that the I/O combined slave module ID is the I/O combined slave module address + 200_H. • When creating a new system, adding or removing a slave module, or changing the address of the slave module, perform the automatic address detection. After performing the automatic address detection, check that the number of slave modules and the address are consistent with those of the actual system. • Check that one or more slave modules have been registered by the automatic address detection.
$012F_H$	Parameter value error	The slave module has detected a signal of writing a parameter that cannot be set to the slave module itself. Check Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112) to find out the alarm ID. Then check that the slave module parameter setting value is within the allowable setting range.
0130_H	Parameter access error	The parameter access signal sent by the master module is corrupt. Check that none of the following errors have occurred. (☞ Page 68, Section 8.5 (2) (c)) • Slave module hardware error • Same ID used error When none of the above have occurred, check that there is no influence from noise.

Error code	Error description	Corrective action
0131_H	Slave module status error	The slave module has notified of error status. Check the target module's status details and solve the problem.
0190_H	Same ID used error	The same ID (address) has been set to some of the connected slave modules. Check Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112) to find out the alarm ID. Check the ID (address) of the slave module, and then set a unique number.
0191_H	No ID setting error	There is a slave module with no address setting. Set the address of the slave module to a value between 0 to 254.
$01F4_H$	Backup data error	Data backed up in the SD memory card of the CPU module has been damaged. Check that there is no influence from noise, and perform the following: • Reset the CPU module or power off and on the system, and then set the CPU module to the RUN state again. • Use normal backup data, and restore the data. • Disable the write protect switch of the SD memory card (write enabled). If the error occurs again, the SD memory card may be in failure. Please consult your local Mitsubishi representative.

10.6 Troubleshooting of the Master Module

This section describes the troubleshooting of the master module.

(1) When the RUN LED does not turn on even when the power supply is turned on.

Check item	Action
Check the installation or connection of the master module.	Remove the master module. Then mount or connect it again.
Check the internal current consumption of the entire system.	Examine the system configuration so that the internal current consumption does not exceed the rated output current of the power supply module. For how to calculate the current consumption of the system, refer to the following. 📖 User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used 📖 MELSEC-L CC-Link IE Field Network Head Module User's Manual
Check for a programmable controller error using the programming tool.	Check and correct the error using the PLC diagnostics of the programming tool.

(2) When the LINK LED on the master module does not flash

Check item	Action
Check for a programmable controller error using the programming tool.	Check and correct the error using the PLC diagnostics of the programming tool.

(3) When the ALM LED on the master module is flashing at 0.2 second intervals

Check item	Action
Check the power supply voltage of the 24VDC external power supply.	Adjust the power supply voltage of the 24VDC external power supply within the rated value (21.6VDC to 27.6VDC). (The recommended voltage is 26.4VDC.)
Check that the power cables (24V, 0V) are not short-circuited.	• Check that the power cables (24V, 0V) are not disconnected or short-circuited. • When crimping the link connector, check that the pin layout is correct.
Check the wiring of the terminal blocks.	• Check that the 24VDC external power supply is properly connected to the terminal blocks of the master module and the slave module. • Check that there is no short circuit or incorrect wiring and screws are tightened sufficiently.

(4) When the ALM LED on the master module is flashing at one second intervals

Check item	Action
Check that the transmission cables (DP, DN) are not short-circuited.	• Check that the transmission cables (DP, DN) are not short-circuited. • When crimping the link connector, check that the pin layout is correct.
Check the wiring of the terminal blocks.	Check that the transmission cables (DP, DN) are not in contact with each other and that there is no incorrect wiring in the terminal block wiring of the master module or the slave module.
Check that the current consumption of the AnyWireASLINK system is within the specified range.	Correct the cables (wire diameter, total length) and modules (type, the number of connected modules) so that the current consumption of all the slave modules does not exceed the transmission cable supply current of the master module. (☞ Page 27, Section 3.2.1, Page 48, Section 6.2.3)

(5) When the ALM LED on the master module is on

Check item	Action
Check that the transmission cables (DP, DN) are not disconnected.	• Check that the transmission cables (DP, DN) are free from disconnection. • Check that the cables have been crimped with proper pin layout using link connectors appropriate to the wire diameter.
Check the wiring of the terminal blocks.	• Check that the transmission cables (DP, DN) and power cables (24V, 0V) are properly connected to the terminal block of the master module. • Check that there is no incorrect wiring and screws are tightened sufficiently.
Perform the automatic address detection.	When creating a new system, adding or removing a slave module, or changing the address of the slave module, perform the automatic address detection. After performing the automatic address detection, check that the number of slave modules and the address are consistent with those of the actual system.
Check the existence of the slave module.	If the LINK LED of the slave module does not flash, check that there is no disconnection, short circuit, incorrect wiring, or poor contact in the transmission cables (DP, DN) around the module.

(6) When the SET LED on the master module is flashing and does not turn off

Check item	Action
Check that Parameter access completion flag (X(n+1)1) is not off or Automatic address detection flag (X(n+1)4) is not on.	• Reset the CPU module, or power off and on the system. • Check that automatic address detection is not performed while parameter access is in progress.

10.7 Troubleshooting of the Slave Module

This section describes the troubleshooting of the slave module.

(1) When I/O data and parameter data of the slave module cannot be checked

Check item	Action
Check the following buffer memory addresses in the program. • Input information area (Un\G0 to Un\G15) • Output information area (Un\G4096 to Un\G4111)	Check that information regarding the slave module has been properly assigned and that the commands written in the program are free from mistakes.
Check the number of transmission points of the master module and the address setting of the slave module.	• Check that the address of the slave module is within the number of transmission points of the master module. • Check that the ID of the slave module is not the same as the IDs of other slave modules.
Check the I/O LED status of the slave module.	Check the I/O LED status of the slave module and check that there is no disconnection, short circuit, or poor contact in the wiring on the load side.

(2) When the I/O data and parameter data of the slave module are unstable

Check item	Action
Check the connection of the terminating unit.	Pay attention to the polarities of the terminating unit and connect it correctly.
Check the total length of the transmission cables (DP, DN).	Adjust the total length of the AnyWireASLINK system within the specified range.
Check the specifications of the transmission cables (DP, DN).	• Use transmission cables (DP, DN) that have the specified type, wire diameter, and tightening torque to the terminal block. • Do not run multiple transmission cables (DP, DN) using a multicore cable.
Check the power supply voltage of the 24VDC external power supply.	Adjust the power supply voltage of the 24VDC external power supply within the rated value (21.6VDC to 27.6VDC). (The recommended voltage is 26.4VDC.)
Check that the slave module does not have the same address as the addresses of other slave modules.	Set a unique address in the slave module.
Check that two or more master modules are not connected within one AnyWireASLINK line.	Connect only one master module within one AnyWireASLINK line.
Check that AnyWireASLINK master modules of different series are not connected within one AnyWireASLINK line.	Connect only one AnyWireASLINK master module within one AnyWireASLINK line.
Check that a master module and an AnyWireASLINK bridge module are not connected together within one AnyWireASLINK line.	Connect either a master module or an AnyWireASLINK bridge module within one AnyWireASLINK line.

APPENDICES

Appendix 1 Details of I/O Signals

The details of the I/O signals of the master module for the CPU module are described.

Appendix 1.1 Input signals

(1) Module READY (Xn0)

When the CPU module is reset or the system is powered on, this signal turns on as soon as the master module is completely ready to be processed.

(2) DP/DN short error (Xn1)

This signal turns on when a short occurs in the transmission cables (DP, DN) or the maximum supply current is exceeded.

(a) Turning off DP/DN short error (Xn1)

After eliminating the short circuit in the transmission cables (DP, DN) or adjusting the current within the specification range, perform either of the following operations.

Until then, DP/DN short error (Xn1) remains on.

- Reset the CPU module or power off and on the system.
- Turn on and off Error flag clear command (Yn0).

For how to remove the short in the transmission cables (DP, DN) or adjust the current within the specification range, refer to the following. (☞ Page 98, Section 10.5)

(3) Transmission cable voltage drop error (Xn3)

This signal turns on when the 24VDC external power supply voltage drops.

(a) Turning off Transmission cable voltage drop error (Xn3)

After eliminating the drop of the 24VDC external power supply voltage, perform either of the following operations.

Until then, Transmission cable voltage drop error (Xn3) remains on.

- Reset the CPU module or power off and on the system.
- Turn on and off Error flag clear command (Yn0).

For how to eliminate the drop of the 24VDC external power supply voltage, refer to the following. (☞ Page 98, Section 10.5)

(4) DP/DN disconnection error (Xn4)

This signal turns on when disconnection occurs in the transmission cables (DP, DN) or the slave module is disconnected.

(a) Turning off DP/DN disconnection error (Xn4)

After eliminating the disconnection in the transmission cables (DP, DN) or that of the slave module, perform either of the following operations.

Until then, DP/DN disconnection error (Xn4) remains on.

- Reset the CPU module or power off and on the system.
- Turn on and off Error flag clear command (Yn0).

For how to deal with disconnection of the transmission cables (DP, DN) or that of the slave module, refer to the following. (☞ Page 98, Section 10.5)

(5) Slave module alarm signal (X(n+1)0)

This signal turns on when a status error in a slave module occurs or an error occurs in the address setting of the slave module. (The status error includes an I/O disconnection and short circuit.)

For details about the target slave module's addresses and alarms, refer to Number of the alarm IDs (Un\G9984) and Alarm ID information storage area (Un\G9985 to Un\G10112).

(☞ Page 109, Appendix 2 (8), Page 109, Appendix 2 (9))

(a) Turning off Slave module alarm signal (X(n+1)0)

After eliminating the status error of the slave module or setting the address of the slave module again, perform either of the following operations.

Until then, Slave module alarm signal (X(n+1)0) remains on.

- Reset the CPU module or power off and on the system.
- Turn on and off Error flag clear command (Yn0).

For how to eliminate the status error in the slave module, refer to the following. (☞ Page 98, Section 10.5)

(6) Parameter access completion flag (X(n+1)1)

This signal turns on when the parameter access is completed.

(7) Parameter access error (X(n+1)2)

This signal turns on when an error occurs in the parameter access.

The latest error codes are stored in Latest error code storage area (Un\G10256) and the target IDs of the error codes are stored in Latest error ID storage area (Un\G10257).

The error address is stored in Alarm ID information storage areas (Un\G9985 to Un\G10112) as the alarm information. (☞ Page 109, Appendix 2 (9))

(a) Turning off Parameter access error (X(n+1)2)

After eliminating the error, perform either of the following operations.

Until then, Parameter access error (X(n+1)2) remains on.

- Reset the CPU module or power off and on the system.
- Turn on and off Error flag clear command (Yn0).

For how to remove the parameter access error, refer to the following. (☞ Page 98, Section 10.5)

(8) Automatic address detection flag (X(n+1)4)

The signal remains on after start of automatic address detection operation until the end of the operation.

Appendix 1.2 Output signals

(1) Error flag clear command (Yn0)

This signal is turned on to turn off the following input signals that are on.

- DP/DN short error (Xn1)
- Transmission cable voltage drop error (Xn3)
- DP/DN disconnection error (Xn4)
- Slave module alarm signal (X(n+1)0)
- Parameter access error (X(n+1)2)
- Number of the error IDs (Un\G8192)
- Error ID information storage area (Un\G8193 to Un\G8320)
- Number of the alarm IDs (Un\G9984)
- Alarm ID information storage area (Un\G9985 to Un\G10112)

Resetting the CPU module or powering off and on the system also turns off the input signals and the buffer memory areas above.

(2) Automatic address detection command (Yn1)

This signal is turned on to perform the automatic address detection.

(3) Parameter access request command (Y(n+1)0)

This signal is turned on to read or write parameters from the master module to the slave module.
When this signal is turned off and on, Parameter access completion flag (X(n+1)1) turns off.

(4) Parameter batch read command (Y(n+1)1)

This signal is turned on to instruct the master module to collectively read parameters from all slave modules recognized.

(5) Parameter batch write command (Y(n+1)2)

This signal is turned on to instruct the master module to collectively write parameters into all slave modules recognized.

Appendix 2 Details of Buffer Memory

(1) Input information area (Un\G0 to Un\G15)

The ON/OFF status of the input signal of the slave module is automatically stored.

Ex. For a two-point input slave module (address: 10):
The two bits from Un\G0.A are occupied for the input signal because the setting address is 10.

(ON: 1, OFF: 0)

Area with the setting address of 10

Buffer memory address	Bit No.															
	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
Un\G0	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G1	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Un\G2	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Un\G3	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Un\G4	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Un\G5	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
Un\G6	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
Un\G7	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
Un\G8	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128
Un\G9	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144
Un\G10	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160
Un\G11	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176
Un\G12	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193	192
Un\G13	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209	208
Un\G14	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225	224
Un\G15	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240

Input area (256 points)

(2) Output information area (Un\G4096 to Un\G4111)

When the ON/OFF data of the output signal of the slave module is written from the CPU module, the slave module automatically outputs the signal.

Ex. For a two-point output slave module (address: 30):
The two bits from Un\G4097.E are occupied for the output signal because the setting address is 30.

(ON: 1, OFF: 0)

Area with the setting address of 30

Buffer memory address	Bit No.															
	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
Un\G4096	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Un\G4097	31	30	29	28	27	26	25	24	22	22	21	20	19	18	17	16
Un\G4098	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Un\G4099	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
Un\G4100	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
Un\G4101	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
Un\G4102	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
Un\G4103	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
Un\G4104	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128
Un\G4105	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144
Un\G4106	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160
Un\G4107	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176
Un\G4108	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193	192
Un\G4109	223	222	221	220	219	218	217	216	215	214	213	212	211	210	209	208
Un\G4110	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225	224
Un\G4111	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240

Output area (256 points)

(3) Number of the error IDs (Un\G8192)

Among the IDs of the connected modules, the number of error IDs that send no response due to disconnection of the transmission cables (DP, DN) or a failure in the slave module alone is stored. (Up to 128 IDs)
The stored values are retained until the power is turned off and on or Error flag clear command (Yn0) is turned off and on after the error is solved.

(a) Data update timing

After the automatic address detection, the data are updated as soon as a response error is detected.

(4) Error ID information storage areas (Un\G8193 to Un\G8320)

When the transmission cables (DP, DN) are disconnected or an error occurs in the slave module or an error (error code: $00CA_H$, 0130_H), the error IDs are stored for the number of error IDs in the ascending order. (Up to 128 IDs)
The IDs to be stored are as follows.

- 0000_H to $00FF_H$: ID of output slave modules
- 0200_H to $02FF_H$: ID of an input slave module or I/O combined slave module

The stored values are retained until the power is turned off and on or Error flag clear command (Yn0) is turned off and on after the error is solved.

(a) Data update timing

After the automatic address detection, the data are updated as soon as a response error is detected.

(5) Number of the connected modules (Un\G8960)

The number of slave modules detected by the automatic address detection is stored. (Up to 128 modules)

(6) Number of the IDs of the connected modules (Un\G9216)

The number of the IDs of the connected modules is stored by the automatic address detection. (Up to 128 IDs)
The number of IDs stored is retained even after power-off.

(a) Data update timing

The data are updated at the time of power-on or automatic address detection.

(7) Connected module ID information storage areas (Un\G9217 to Un\G9344)

The ID information of all the slave modules connected to the master module is stored in the ascending order.
The IDs to be stored are as follows.

- 0000_H to $00FF_H$: ID of output slave modules
- 0200_H to $02FF_H$: ID of an input slave module or I/O combined slave module

The information of IDs stored is retained even after power-off.

(a) Data update timing

The data are updated at the time of power-on or automatic address detection.

(8) Number of the alarm IDs (Un\G9984)

When a status error occurs on the slave module or an ID or parameter setting error regarding a slave module occurs, the number of IDs relevant to alarm occurrence is stored. (Up to 128 IDs)

The stored values are retained until the power is turned off and on or Error flag clear command (Yn0) is turned on and off after the error is eliminated.

(a) Data update timing

The data are updated when the power is turned on or when an alarm has occurred after the automatic address detection.

(b) Alarm target error code (☞ Page 98, Section 10.5)

Error code	Error description
$012C_H$, $012D_H$	Slave module hardware error
$012E_H$	Parameter access target module ID error
$012F_H$	Parameter value error
0131_H	Slave module status error
0190_H	Same ID used error
0191_H	No ID setting error

(9) Alarm ID information storage areas (Un\G9985 to Un\G10112)

The ID information of all the slave modules where an alarm has occurred is stored in the ascending order.

The IDs to be stored are as follows.

- 0000_H to $00FF_H$: ID of output slave modules
- 0200_H to $02FF_H$: ID of an input slave module or I/O combined slave module

The stored values are retained until the power is turned off and on or Error flag clear command (Yn0) is turned on and off after the error is eliminated.

(a) Data update timing

The data are updated when the power is turned on or when an alarm has occurred after the automatic address detection.

(10) Latest error code storage area (Un\G10256)

The latest error code detected in the master module is stored.

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

- Error code list (☞ Page 98, Section 10.5)

(11) Latest error ID storage area (Un\G10257)

The IDs corresponding to the error codes stored in the latest error code storage area (Un\G10256) are stored.

However, for the errors below, "$0FFF_H$" is stored.

Error code	Error description
$00C8_H$	Transmission cable voltage drop error
$00C9_H$	DP/DN short error
0064_H to 0067_H	Master module hardware error
0068_H	CPU module stop error
$012E_H$	Parameter access target module ID error

(12)Parameter access setting (Un\G10320)

Specify the parameter access method. When a value other than those below is stored, the parameter is read.

- 0000_H: Read (slave module → master module → CPU module)
- 0001_H: Write (CPU module → master module → slave module)

However, when the output signals below are executed, the set value is ignored.

- Parameter batch read command (Y(n+1)1)
- Parameter batch write command (Y(n+1)2)

(13)Parameter access target module ID specification (Un\G10321)

Specify the access ID for accessing the parameters of individual IDs.

Write one of the following to specify the ID.

- 0000_H to $00FF_H$: ID of output slave modules
- 0200_H to $02FF_H$: ID of an input slave module or I/O combined slave module

However, when the output signals below are executed, the set value is ignored.

- Parameter batch read command (Y(n+1)1)
- Parameter batch write command (Y(n+1)2)

(14)Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263)

This buffer memory area stores the start addresses of the buffer memory areas of the parameter storage areas for each slave modules.

Buffer memory address	Description	Details
Un\G10496	Parameter storage location memory number (output)	Output slave module ID 0000_H buffer memory start address
Un\G10497		Output slave module ID 0001_H buffer memory start address
to		to
Un\G10750		Output slave module ID $00FE_H$ buffer memory start address
Un\G10751		Output slave module ID $00FF_H$ buffer memory start address
Un\G11008	Parameter storage location memory number (input/output)	Input slave module, I/O combined slave module ID 0200_H buffer memory start address
Un\G11009		Input slave module, I/O combined slave module ID 0201_H buffer memory start address
to		to
Un\G11262		Input slave module, I/O combined slave module ID $02FE_H$ buffer memory start address
Un\G11263		Input slave module, I/O combined slave module ID $02FF_H$ buffer memory start address

Ex. The following table describes the buffer memory areas corresponding to the addresses of slave modules.

- Address 0: Input slave module
- Address 10: Output slave module
- Address 100: Output slave module

Buffer memory address	Data*1	Description
Un\G10506	3000_H (12288)	Parameter storage start address of the output slave module with the address 10 (ID:$000A_H$)
Un\G10596	3030_H (12336)	Parameter storage start address of the output slave module with the address 100 (ID:0064_H)
Un\G11008	3060_H (12384)	Parameter storage start address of the input slave module with the address 0 (ID:0200_H)

*1 Data stored in the buffer memory address

Ex. In a case where "3000_H" has been stored at buffer memory address "Un\G10506", it can be known that parameters have been stored at buffer memory addresses "Un\G12288 to Un\G12335".

Point

For the parameter storage location memory number of a non-existing ID, 0000_H is stored

(15)Parameter storage areas (Un\G12288 to Un\G18431)

The parameter of each ID is stored.

Buffer memory address	Description	Details
Un\G12288 to Un\G12335	Parameter storage area 1 (48 words)	• The parameter storage area of each ID has 48 words. • Information of up to 128 parameters can be stored. • The ID is stored in the start address of each parameter area. • A single storage area has 48 words and the data are sorted in the ascending order of IDs. • When adding a slave module or changing the ID of a slave module, perform the automatic address detection.
Un\G12336 to Un\G12383	Parameter storage area 2 (48 words)	
...	...	
Un\G18336 to Un\G18383	Parameter storage area 127 (48 words)	
Un\G18384 to Un\G18431	Parameter storage area 128 (48 words)	

Ex. When five slave modules are connected, the buffer memory addresses of the parameter storage areas are as follows.

Module	Parameter storage area	Device parameter read/write area
First slave module	Un\G12288 to Un\G12335	Un\G12289 to Un\G12307
Second slave module	Un\G12336 to Un\G12383	Un\G12337 to Un\G12355
Third slave module	Un\G12384 to Un\G12431	Un\G12385 to Un\G12403
Fourth slave module	Un\G12432 to Un\G12479	Un\G12433 to Un\G12451
Fifth slave module	Un\G12480 to Un\G12527	Un\G12481 to Un\G12499

Point

The parameter of the slave module is moved over in order of ID and stored in Parameter storage areas (Un\G12288 to Un\G18431) after executing the automatic address detection function.
Because of this, the address of the parameter storage area for the slave module later than the ID where the slave module is added or deleted in the AnyWireASLINK system is changed. (The parameter of a non-existing ID is deleted and displayed.)
Therefore, the address of slave module later than the ID where the slave module is added or deleted must be changed when the program is created by directly specifying the buffer memory address. (This also applies if the ID is changed and sorting order is switched.)
If Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263) is used, the program that reads/writes the parameter can be created without considering the addition or deletion of the slave module. (☞ Page 120, Appendix 6)

(a) 48-word structure (details on the parameter storage area)

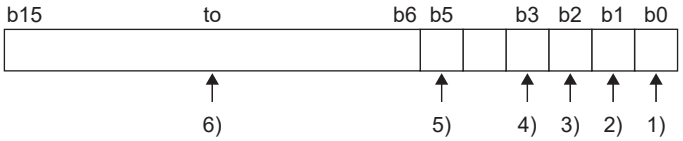
Parameter storage area 1 (Un\G12288 to Un\G12335) is given as an example of the 48-word structure below.

Buffer memory address	Bit number																Read/write	Parameter name
	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0		
Un\G12288	Module ID																Read (Slave module to master module)	AnyWireASLINK parameter
Un\G12289	Device parameter 1																Read/write (Master module to slave module)	Device parameter
Un\G12290	Device parameter 2																	
Un\G12291	Device parameter 3																	
Un\G12292	Device parameter 4																	
Un\G12293	Device parameter 5																	
Un\G12294	Device parameter 6																	
Un\G12295	Device parameter 7																	
Un\G12296	Device parameter 8																	
Un\G12297	Device parameter 9																	
Un\G12298	Device parameter 10																	
Un\G12299	Device parameter 11																	
Un\G12300	Device parameter 12																	
Un\G12301	Device parameter 13																	
Un\G12302	Device parameter 14																	
Un\G12303	Device parameter 15																	
Un\G12304	Device parameter 16																	
Un\G12305	Device parameter 17																	
Un\G12306	Device parameter 18																	
Un\G12307	Device parameter 19																	
Un\G12308	Device parameter 1																Read (Slave module to master module)	
Un\G12309	Device parameter 2																	
Un\G12310	Device parameter 3																	
Un\G12311	Device parameter 4																	
Un\G12312	Device parameter 5																	
Un\G12313	Device parameter 6																	
Un\G12314	Device parameter 7																	
Un\G12315	Device parameter 8																	
Un\G12316	Device parameter 9																	
Un\G12317	Device parameter 10																	
Un\G12318	Device parameter 11																	
Un\G12319	Device parameter 12																	
Un\G12320	Device parameter 13																	
Un\G12321	Device parameter 14																	
Un\G12322	Device parameter 15																	
Un\G12323	Device parameter 16																	
Un\G12324	Device parameter 17																	
Un\G12325	Device parameter 18																	
Un\G12326	Device parameter 19																	
Un\G12327	Status details																Read (Slave module to master module)	AnyWireASLINK parameter
Un\G12328	Sensing level																	
Un\G12329 to Un\G12335	System reserved																—	—

(b) Parameters

Each slave module has the following types of parameters:

- Device parameter (19 types)
  These parameters are unique to each slave module. The contents of the parameters vary depending on the types of slave module. For details, refer to the specifications of the slave module.
- AnyWireASLINK parameter (three types)
  These parameters are common to all the slave modules connected to the AnyWireASLINK.

Name	Read/write	Corresponding buffer memory area	Detailed description
Module ID	Read	Un\G12288+n × 30_H (n: 0 to 127) 1st of 48 words	Indicates the slave module ID. • 0000_H to $00FF_H$: ID of output slave modules • 0200_H to $02FF_H$: ID of an input slave module or I/O combined slave module
Status details	Read	Un\G12327+n × 30_H (n: 0 to 127) 40th of 48 words	Indicates the status of the slave module. The status 1) to 6) of the slave module are indicated depending on ON or OFF of each bit as below.  1) Module power supply status On: Slave module voltage drop Off: No fault 2) Sensing level status On: Sensing level drop Off: No fault 3) I/O disconnection (ASLINKER) On: I/O disconnection Off: No fault 4) I/O short-circuit (ASLINKER) On: I/O short-circuit Off: No fault 5) I/O power supply voltage drop (isolated slave module) On: I/O power supply voltage drop Off: No fault 6) System reserved
Sensing level	Read	Un\G12328+n × 30_H (n: 0 to 127) 41st of 48 words	Indicates the value of the connected sensor. The value differs depending on the connected slave module. (Example: An analog value of 0 to 100% is indicated for an ON/OFF sensor.)

Appendix 3 Checking the Serial Number and Function Version

For how to check the serial number and the function version, refer to the following.

User's Manual (Hardware Design, Maintenance and Inspection) for the CPU module used
MELSEC-L CC-Link IE Field Network Head Module User's Manual

Appendix 4 EMC and Low Voltage Directives

In each country, laws and regulations concerning electromagnetic compatibility (EMC) and electrical safety are enacted.
For the products sold in the European countries, compliance with the EU's EMC Directive has been a legal obligation as EMC regulation since 1996, as well as the EU's Low Voltage Directive as electrical safety regulation since 1997.
Manufacturers who recognize their products are compliant with the EMC and Low Voltage Directives are required to attach a "CE marking" on their products in European countries.
In some other countries and regions, manufacturers are required to make their products compliant with applicable laws or regulations and attach a certification mark on the products as well (such as UK Conformity Assessed (UKCA) marking in the UK, and Korea Certification (KC) marking in South Korea).
Each country works to make their regulatory requirements consistent across countries based on international standards. When the requirements are consistent, measures to comply with the EMC and electrical safety regulations become common across countries.
The UK and South Korea have enacted EMC regulations whose requirements are consistent with those of the EMC Directive.
The UK has also enacted electrical safety regulations whose requirements are consistent with those of the Low Voltage Directive. In this section, the requirements of the EMC and Low Voltage Directives are described as examples of those of the EMC and electrical safety regulations.

Appendix 4.1 Measures to comply with the EMC Directive

The EMC Directive sets two requirements for compliance: emission (conducted and radiated electromagnetic energy emitted by a product) and immunity (the ability of a product to not be influenced by externally generated electromagnetic energy). This section summarizes the precautions for machinery constructed with this product to comply with the EMC Directive.
These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.
The manufacturer of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

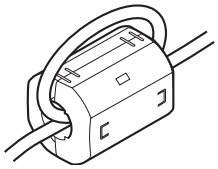
(1) Installation in a control panel

For precautions for the installation in a control panel, refer to the user's manuals for the CPU module or head module used.

(2) Cables

(a) Cable connected to the transmission cable terminal block

For the cable connected to the transmission cable terminal block, attach a ferrite core having the attenuation characteristics equivalent to that of ZCAT3035-1330 made by TDK Corporation within 20cm from the transmission cable terminal block of this product. Use a ferrite core with three turns of wire as shown below.



(b) Power cable for the 24VDC power supply terminal

Use a power cable of 30m or shorter when connecting it to 24VDC power supply terminal of the transmission cable terminal block.

(3) External power supply

Use a CE-marked external power supply and ground the FG terminal.
(External power supply used for the tests conducted by Mitsubishi: PS5R-SF24 made by IDEC Corporation)

(4) Connection with a slave station

Connect ASLINKFILTER (ANF-01) manufactured by Anywire Corporation between the power supply and cables regardless of installation method or wiring length.

(5) Installation environment

Use this product in Zone B. *1*2

*1 Zone means a category determined according to the industrial environment conditions and defined by the harmonized standard EN61131-2 of the EMC and Low Voltage Directives.

Zone C:	Main power supply insulated from the public power supply by a special transformer
Zone B:	Special power supply with the secondary surge protector from the main power (Rated voltage is assumed to be 300V or less.)
Zone A:	Local power supply protected by an AC-DC converter or an insulating transformer from the special power supply (Rated voltage is assumed to be 120V or less.)

*2 The master module with a serial number (first six digits) of "151013" or earlier must be used in Zone A.

Appendix 4.2 Requirements for compliance with the Low Voltage Directive

The Low Voltage Directive does not apply to this product because it operates on 5VDC and 24VDC power supply. For making the PLC system used comply with the Low Voltage Directive, refer to the manual supplied with the CPU module or the base unit.

Appendix 5 When Using GX Developer

This section describes how to set parameters with GX Developer.

Appendix 5.1 Operating GX Developer

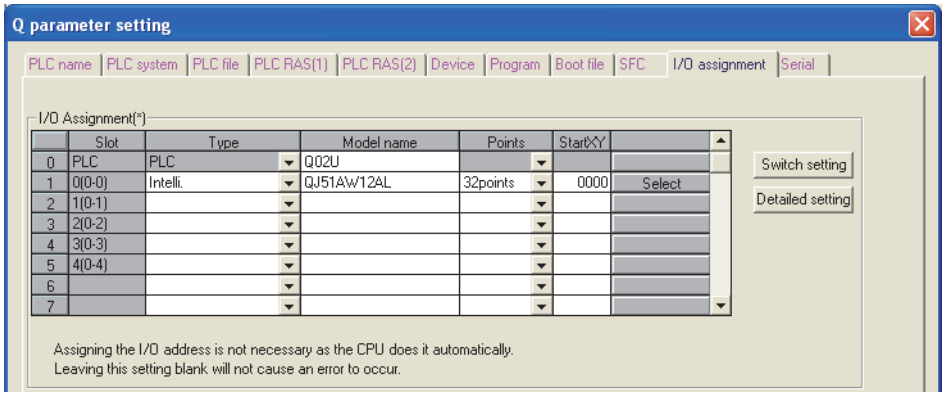
When using GX Developer, configure settings in the windows below:

Window name	Application	Reference page
I/O assignment	Set the type of the module to connect and the range of I/O signals.	Page 118, Appendix 5.1 (1)
Switch setting for I/O and intelligent function module	Set the number of transmission points of the master module.	Page 119, Appendix 5.1 (2)

(1) I/O assignment setting

Select "I/O assignment" from "PLC parameter".

Project window ⇨ [Parameter] ⇨ [PLC parameter] ⇨ "I/O assignment" tab

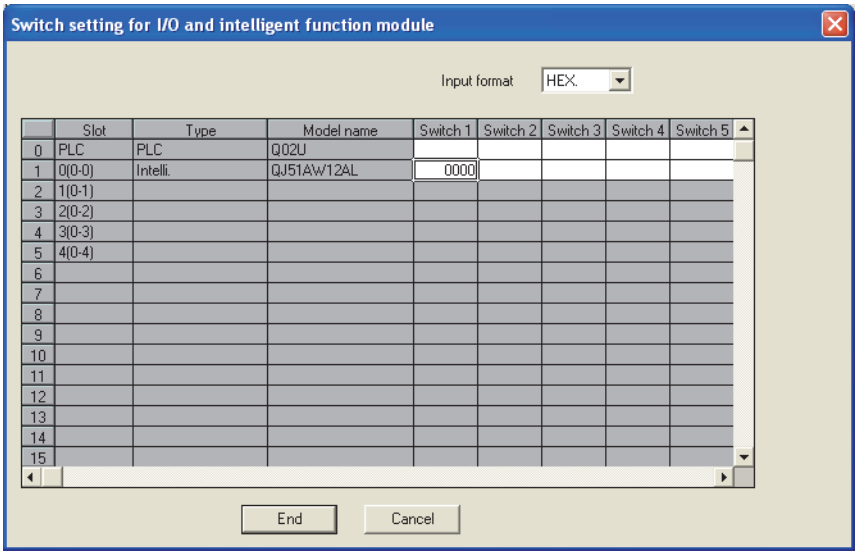


Item	Description
Type	Select "Intelli."
Model name	Enter the model name.
Points	Select "32 points".
Start XY	Enter any start I/O number of the master module.

(2) Intelligent function module switch setting

Select "Switch setting" from "PLC parameter".

Project window ⇨ [Parameter] ⇨ [PLC parameter] ⇨ "I/O assignment" tab ⇨ Switch setting button



In the above window, set any value from 0 to 3 in "Switch 1".

When no switch setting is configured or a value other than 0 to 3 is entered in "Switch 1", 0003 is set.

Switch 1 setting value (hexadecimal)	Transmission points		Description
	Input	Output	
0000	32	32	Set the number of transmission points. One transmission cycle time is determined by setting the number of transmission points. (☞ Page 30, Section 3.2.3 (1))
0001	64	64	
0002	128	128	
0003	256	256	

Appendix 6 Precautions for Creating Program for Slave Module Parameter Access

The parameter of the slave module is moved over in order of ID and stored in Parameter storage areas (Un\G12288 to Un\G18431) after executing the automatic address detection function.
Because of this, the address of the parameter storage area for the slave module later than the ID where the slave module is added or deleted in the AnyWireASLINK system is changed. (The parameter of a non-existing ID is deleted and displayed.)
Therefore, the address of slave module later than the ID where the slave module is added or deleted must be changed when the program is created by directly specifying the buffer memory address. (This also applies if the ID is changed and sorting order is switched.)

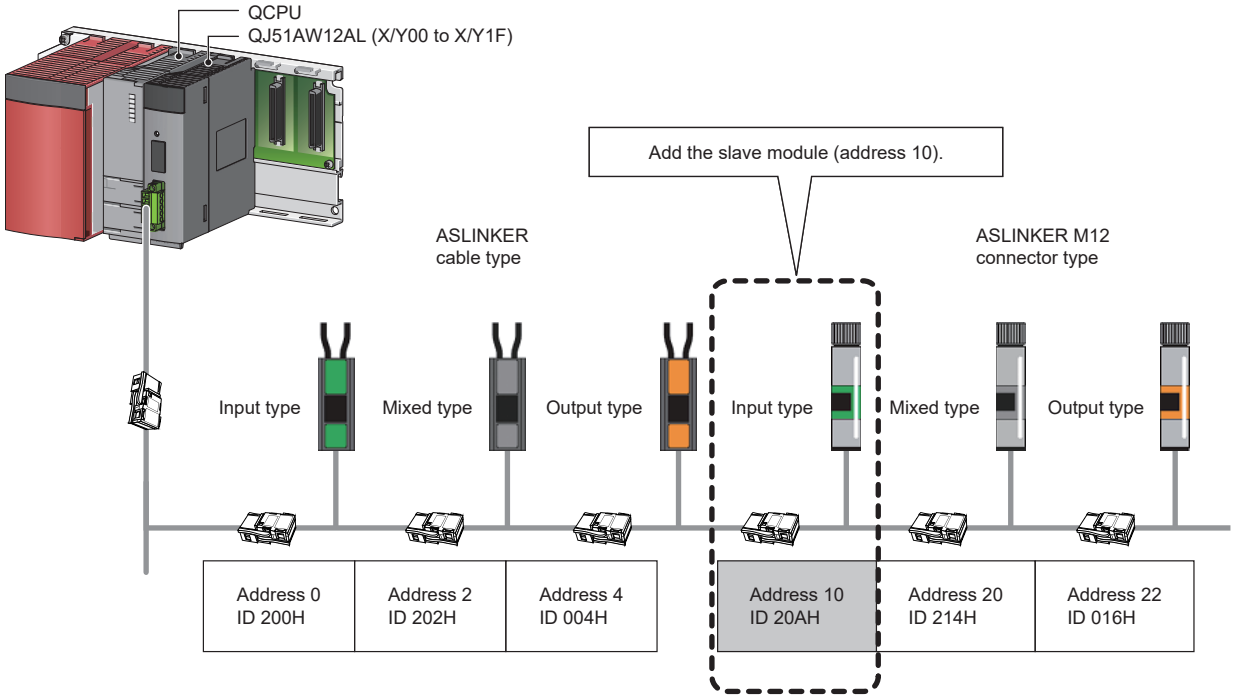
To create the program that reads/writes the parameter, use Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263) without considering the addition or deletion of the slave module.
After the automatic address detection, the start address of the buffer memory which stores ID parameters is stored in these areas. (☞ Page 111, Appendix 2 (14))

Appendix 6.1 Program examples

This section provides program examples using Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263).

(1) System configuration

When the ASLINKER M12 connector type (input type) is added with address 10



(a) Change of Parameter storage areas (Un\G12288 to Un\G18431)

Parameter storage area of the ASLINKER M12 connector type (mixed type) of address 20 (ID 214_H) moves from Parameter storage area 5 to Parameter storage area 6 by entering the ASLINKER M12 connector type (input type) of address 10 (ID $20A_H$).

Buffer memory address	Parameter storage area	Before the slave module (address 10) is added	After the slave module (address 10) is added
Un\G12288 to Un\G12335	Parameter storage area 1	ASLINKER cable type (output type) parameter Address 4 (ID 004_H)	ASLINKER cable type (output type) parameter Address 4 (ID 004_H)
Un\G12336 to Un\G12383	Parameter storage area 2	ASLINKER M12 connector type (output type) parameter Address 22 (ID 016_H)	ASLINKER M12 connector type (output type) parameter Address 22 (ID 016_H)
Un\G12384 to Un\G12431	Parameter storage area 3	ASLINKER cable type (input type) parameter Address 0 (ID 200_H)	ASLINKER cable type (input type) parameter Address 0 (ID 200_H)
Un\G12432 to Un\G12479	Parameter storage area 4	ASLINKER cable type (mixed type) parameter Address 2 (ID 202_H)	ASLINKER cable type (mixed type) parameter Address 2 (ID 202_H)
Un\G12480 to Un\G12527	Parameter storage area 5	ASLINKER M12 connector type (mixed type) parameter Address 20 (ID 214_H)*2	ASLINKER M12 connector type (input type) parameter Address 10 (ID $20A_H$)*1
Un\G12528 to Un\G12575	Parameter storage area 6	No data	ASLINKER M12 connector type (mixed type) parameter Address 20 (ID 214_H)*2
...	...	...	...
Un\G18384 to Un\G18431	Parameter storage area 128	No data	No data

*1 The parameter for the slave module of address 10 (ID $20A_H$) added is stored.

*2 Parameter storage area 5 moves to Parameter storage area 6.

(b) Stored value for Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263)

A stored value for Parameter storage location memory number (Un\G10496 to Un\G10751, Un\G11008 to Un\G11263) is changed as below by executing the automatic address detection after the ASLINKER M12 connector type (input type) of address 10 (ID $20A_H$) is added.

Buffer memory address	Data	Details	Slave module
Un\G10496	0000_H	Output slave module ID 000_H buffer memory start address	—
Un\G10497	0000_H	Output slave module ID 001_H buffer memory start address	—
Un\G10498	0000_H	Output slave module ID 002_H buffer memory start address	—
Un\G10499	0000_H	Output slave module ID 003_H buffer memory start address	—
Un\G10500	3000_H	Output slave module ID 004_H buffer memory start address	ASLINKER cable type (output type) Address 4 (ID 004_H)
Un\G10501	0000_H	Output slave module ID 005_H buffer memory start address	—
...	...	...	—
Un\G10518	3030_H	Output slave module ID 016_H buffer memory start address	ASLINKER M12 connector type (output type) Address 22 (ID 016_H)
...	...	...	—
Un\G10751	0000_H	Output slave module ID $0FF_H$ buffer memory start address	—
Un\G11008	3060_H	Input/mixed slave module ID 200_H buffer memory start address	ASLINKER cable type (input type) Address 0 (ID 200_H)
Un\G11009	0000_H	Input/mixed slave module ID 201_H buffer memory start address	—
Un\G11010	3090_H	Input/mixed slave module ID 202_H buffer memory start address	ASLINKER cable type (mixed type) Address 2 (ID 202_H)
Un\G11011	0000_H	Input/mixed slave module ID 203_H buffer memory start address	—
...	...	...	—
Un\G11018	0000_H (before addition) ↓ $30C0_H$ (after addition)	Input/mixed slave module ID $20A_H$ buffer memory start address	ASLINKER M12 connector type (input type) Address 10 (ID $20A_H$)
...	...	...	—
Un\G11028	$30C0_H$ (before addition) ↓ $30F0_H$ (after addition)	Input/mixed slave module ID 214_H buffer memory start address	ASLINKER M12 connector type (mixed type) Address 20 (ID 214_H)
...	...	...	—
Un\G11263	0000_H	Input/mixed slave module ID $2FF_H$ buffer memory start address	—

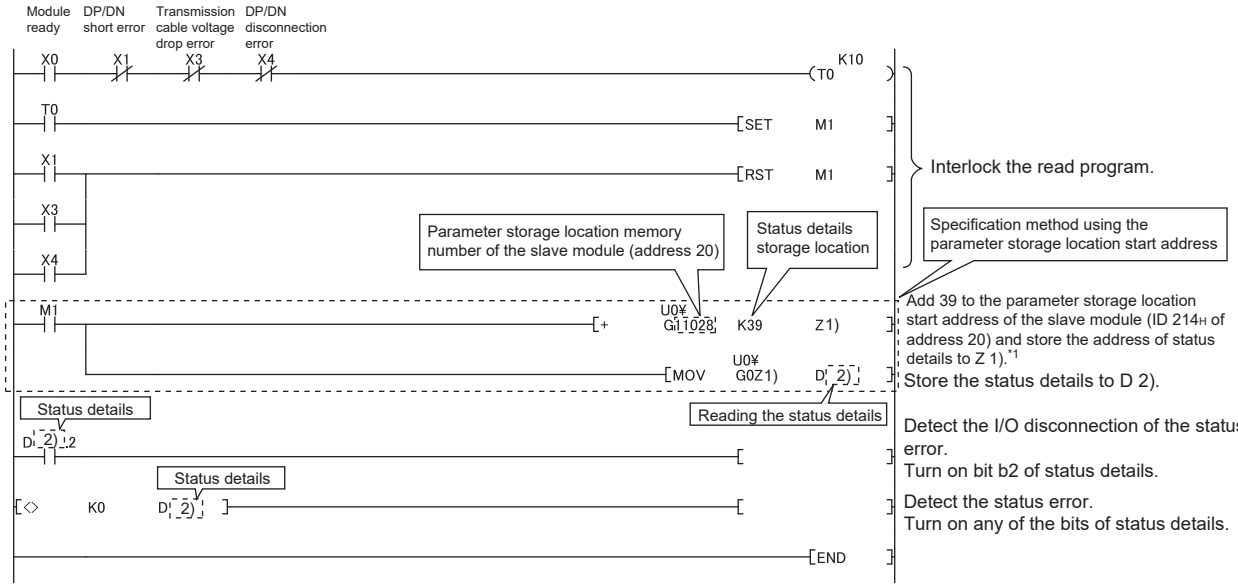
A

(2) Program examples

This section provides examples of programs that read the status details and sensing level information. Parameter of a threshold value can be written in the same way as parameter read.

(a) Example of a program that reads the status details (I/O disconnection)

The following shows an example of a program that reads the status details of the slave module (address 20) when the start I/O number of the master module is assigned to X/Y00 to X/Y1F.



*1 For details on the parameter storage area, refer to the following.
☞ Page 113, Section (15) (a)

The status details of the slave module (address 20) is stored in 40th (Un\G12567) of 48 words of Parameter storage area 6 (Un\G12528 to Un\G12575). (☞ Page 114, Section (15) (b))

(b) Example of a program that reads the sensing level information

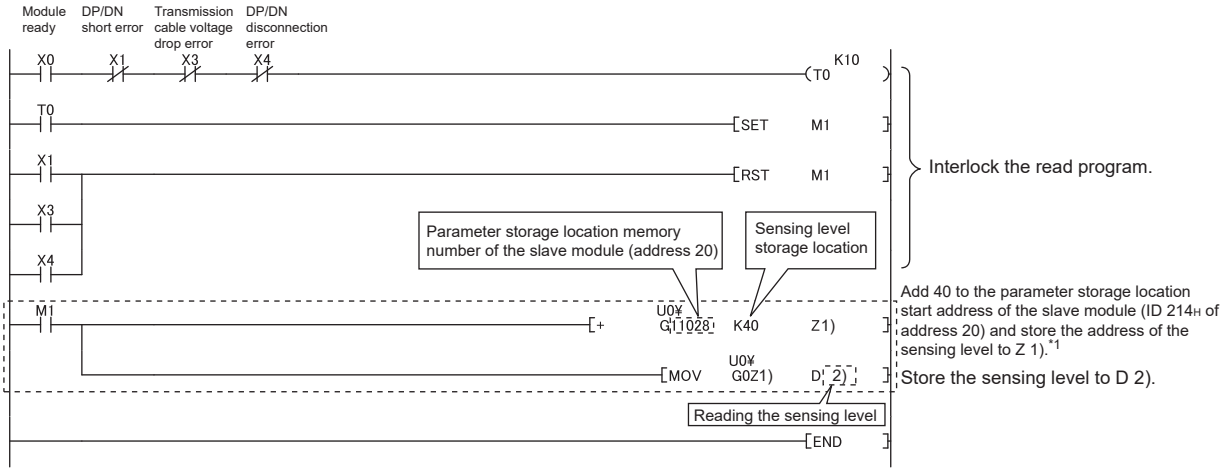
The sensing level is a device parameter for the ASLINKAMP or ASLINKSENSOR only.

The slave module of address 20 is the system configuration which replaces the ASLINKER M12 connector type (mixed type) with the ASLINKAMP or ASLINKSENSOR.

This section describes an example of a program that replaces with photoelectric transmission type of the ASLINKSENSOR. Photoelectric transmission type operates based on the combination of the two types; "Transmission floodlight type" and "Transmission light receiving type".

When the slave module of address 20 is replaced with the ASLINKSENSOR, it replaces with two slave modules of "Transmission floodlight type" and "Transmission light receiving type" (Both of them are address 20.). Therefore, the system is configured with seven slave modules.

The following shows an example of a program that reads the sensing level of the slave module (address 20) when the start I/O number of the master module is assigned to X/Y00 to X/Y1F.



*1 For details on the parameter storage area, refer to the following.
☞ Page 113, Appendix 2 (15) (a)

The sensing level of the slave module (address 20) is stored in 41st (Un\G12616) of 48 words of Parameter storage area 7 (Un\G12576 to Un\G12623). (☞ Page 114, Appendix 2 (15) (b))

Appendix 7 Functions Added and Modified with Version Upgrade

The master module has some new functions added and specifications modified as a result of a version upgrade. Available functions and specifications vary depending on the function version and the serial number.

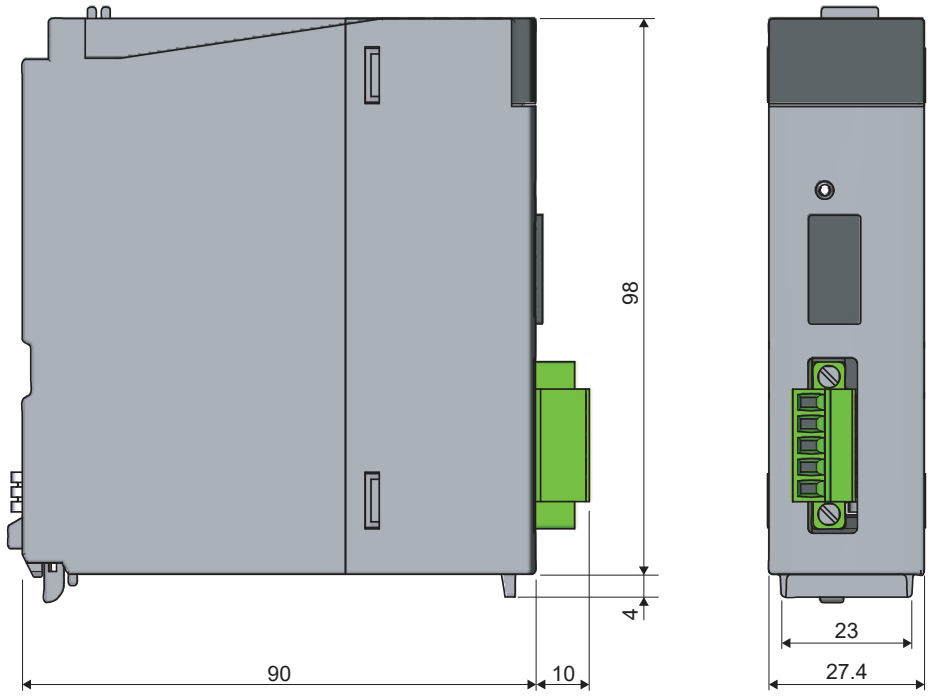
(1) QJ51AW12AL

Added function	Function version	Serial number (first five digits)
iQ Sensor Solution function (☞ Page 77, Section 8.9)	B	Refer to the following. 📖 iQ Sensor Solution Reference Manual

Appendix 8 External Dimensions

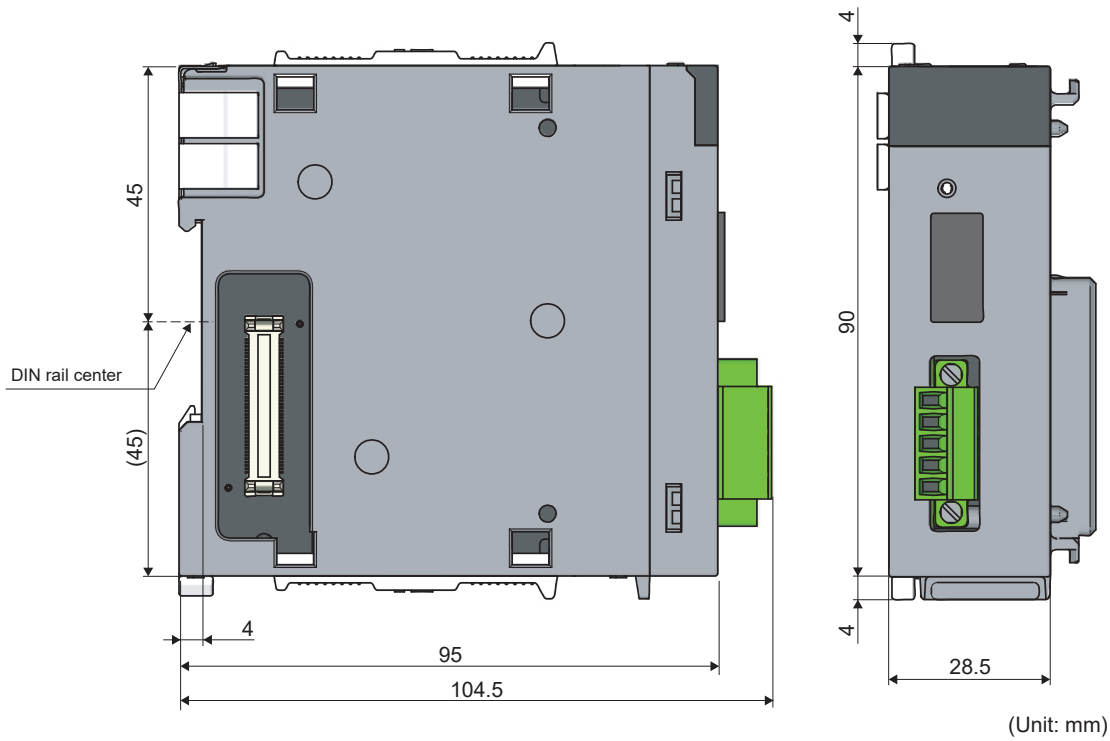
The following figures show the external dimensions of the master modules.

(1) QJ51AW12AL



(Unit: mm)

(2) LJ51AW12AL



(Unit: mm)

Memo

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REVISIONS

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

Print date	*Manual number	Revision
February 2013	SH(NA)-081094ENG-A	First edition
May 2014	SH(NA)-081094ENG-B	Revision due to compliance with UL/cUL
November 2014	SH(NA)-081094ENG-C	Addition of precautions for creating program for slave module parameter access
March 2015	SH(NA)-081094ENG-D	Revision due to the addition of the functions
November 2016	SH(NA)-081094ENG-E	Revision due to the modification of the automatic address detection function
January 2020	SH(NA)-081094ENG-F	Error correction
March 2021	SH(NA)-081094ENG-G	Addition of security precautions
January 2022	SH(NA)-081094ENG-H	Addition of connection type

Japanese manual version SH-081086-I

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 one year after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

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

3. Overseas service

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

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

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

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

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

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

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

5. Changes in product specifications

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

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SH(NA)-081094ENG-H(2201)MEE
MODEL: Q/LJ51AW12AL-U-E
MODEL CODE: 13JZ70

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