MITSUBISHI ELECTRIC

Programmable Controller
MELSEC-F

FX3U-128ASL-M

USER'S MANUAL

FX3U

AnyWireASLINK

Safety Precautions

(Read these precautions before use.)

PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS

The FX3U-128ASL-M are jointly developed and manufactured by Mitsubishi and Anywire Corporation. Note that there are some precautions regarding warranty and specifications of this product.

<Warranty>

Item	FX3U-128ASL-M	Other programmable controller products (e.g. MELSEC-F series)
Repair term after discontinuation of production	1 year	7 years

<Application of the EMC Directive>

Item	FX3U-128ASL-M	Other programmable controller products (e.g. MELSEC-F series)
Applicable EMC standard	EN61131-2 (Zone A)	EN61131-2

<Application of the UL/cUL standards>

Item	FX3U-128ASL-M	Other programmable controller products (e.g. MELSEC-F series)
Applicable UL standard/ cUL standard	UL508[*1]	UL508

*1.   December 2014 and later. The UL/cUL mark is indicated on the nameplate of the applicable product.

Safety Precautions

(Read these precautions before use.)

Before installation, operation, maintenance or inspection of this product, thoroughly read through and understand this manual and all of the associated manuals. Also, take care to handle the module properly and safely.

This manual classifies the safety precautions into two categories: ⚠ 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 medium or slight personal injury or physical damage.

Depending on the circumstances, procedures indicated by ⚠ CAUTION may also cause severe injury.
It is important to follow all precautions for personal safety.
Store this manual in a safe place so that it can be taken out and read whenever necessary. Always forward it to the end user.

1. DESIGN PRECAUTIONS

⚠ WARNING	Reference

• An AnyWireASLINK system has no control function for ensuring safety.
• When a communication failure occurs in the network, data in the master block are held.
Check the communication status information and configure an interlock circuit in the sequence program to ensure that the entire system will operate safely.
• Make sure to have the following safety circuits outside of the PLC to ensure safe system operation even during external power supply problems or PLC failure.
Otherwise, malfunctions may cause serious accidents.
  1) Most importantly, have the following: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
  2) Note that when the PLC CPU detects an error, such as a watchdog timer error, during self-diagnosis, all outputs are turned off. Also, when an error that cannot be detected by the PLC CPU occurs in an input/output control block, output control may be disabled.
External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.
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⚠ CAUTION	Reference
• Configure safety circuits, such as an emergency stop circuit and interlock circuit, external to the AnyWireASLINK system. • Install module so that excessive force will not be applied to the terminal blocks. Failure to do so may result in wire damage/breakage or PLC failure. • When executing control (data changes) to an operating PLC, construct an interlock circuit in the sequence program so that the entire system operates conservatively. Additionally, when executing control such as program changes and operation status changes (status control) to an operating PLC, thoroughly read the manual and sufficiently confirm safety in advance.	15

2. INSTALLATION PRECAUTIONS

⚠ WARNING	Reference
• Make sure to cut off all phases of the power supply externally before attempting installation work. Failure to do so may cause electric shock.	30

Safety Precautions

(Read these precautions before use.)

⚠ CAUTION	Reference
• Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl2, H2S, SO2 or NO2), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur. • Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions. • Install the product securely using a DIN rail or mounting screws. • Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities. • When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits. Failure to do so may cause fire, equipment failures or malfunctions. • Be sure to remove the dust proof sheet from the PLC's ventilation slits when installation work is completed. Failure to do so may cause fire, equipment failures or malfunctions. • Make sure to attach the top cover, offered as an accessory, before turning on the power or initiating operation after installation or wiring work. Failure to do so may cause electric shock. • Connect extension cables securely to their designated connectors. Loose connections may cause malfunctions.	30

3. WIRING PRECAUTIONS

⚠ WARNING	Reference
• Make sure to cut off all phases of the power supply externally before attempting wiring work. Failure to do so may cause electric shock or damage to the product.	33

⚠ CAUTION	Reference

• Connect the DC power supply wiring to the dedicated terminals described in this manual.
If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
• Make sure to attach the top cover, offered as an accessory, before turning on the power or initiating operation after installation or wiring work.
Failure to do so may cause electric shock.
• When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
Failure to do so may cause fire, equipment failures or malfunctions.
• Make sure to properly wire to the terminal block (European type) in accordance with the following precautions.
Failure to do so may cause electric shock, equipment failures, a short-circuit, wire breakage, malfunctions, or damage to the product.
  - The disposal size of the cable end should follow the dimensions described in the manual.
  - Tightening torque should follow the specifications in the manual.
  - Twist the end of strand wire and make sure that there are no loose wires.
  - Do not solder-plate the electric wire ends.
  - Do not connect more than the specified number of wires or electric wires of unspecified size.
  - Affix the electric wires so that neither the terminal block nor the connected parts are directly stressed.
• Do not apply the 24 V DC power before wiring the entire AnyWireASLINK system.
• Connect a 24 V DC external power supply to FX3U-128ASL-M for the AnyWireASLINK system.
• Make sure to observe the following precautions in order to prevent any damage to the machinery or accidents due to abnormal data written to the PLC under the influence of noise:
  1) Do not bundle the main circuit line together with or lay it close to the main circuit, high-voltage line or load line.
    Otherwise, noise disturbance and/or surge induction are likely to take place. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or high-voltage lines.
  2) Ground the shield wire or shield of the shielded cable at one point on the PLC. However, do not use common grounding with heavy electrical systems.
• 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.
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Safety Precautions

(Read these precautions before use.)

4. STARTUP AND MAINTENANCE PRECAUTIONS

⚠ WARNING	Reference
• Do not touch any terminal while the PLC's power is on. Doing so may cause electric shock or malfunctions. • Before cleaning or retightening terminals, cut off all phases of the power supply externally. Failure to do so may cause electric shock. • Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation. An operation error may damage the machinery or cause accidents.	71

⚠ CAUTION	Reference

• Do not disassemble or modify the PLC.
Doing so may cause fire, equipment failures, or malfunctions.
For repair, contact your local Mitsubishi Electric representative.
• Turn off the power to the PLC before connecting or disconnecting any extension cable.
Failure to do so may cause equipment failures or malfunctions.
• Turn off the power to the PLC before attaching or detaching the following devices.
Failure to do so may cause equipment failures or malfunctions.
  - Peripheral devices, display module, expansion boards, and special adapters
  - Input/output extension units/blocks, FX Series terminal blocks, and the special function units/blocks
  - Battery and memory cassette
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5. DISPOSAL PRECAUTIONS

⚠ CAUTION	Reference
• Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.	15

6. TRANSPORTATION AND STORAGE PRECAUTIONS

⚠ CAUTION	Reference
• The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications of the PLC main unit manual by using dedicated packaging boxes and shock-absorbing palettes. Failure to do so may cause failures in the PLC. After transportation, verify operation of the PLC and check for damage of the mounting part, etc.	15

FX3U-128ASL-M

User's Manual

Manual number	JY997D52101
Manual revision	F
Date	4/2020

Foreword

This manual describes the FX3U-128ASL-M AnyWireASLINK system master block and should be read and understood before attempting to install or operate the hardware.
Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

Outline Precautions

- This manual provides information for the use of the FX3U-128ASL-M type AnyWireASLINK system master block.
  The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;

1) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with aspects regarding to automated equipment.

2) Any commissioning or maintenance engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill the job. These engineers should also be trained in the use and maintenance of the completed product. This includes being familiar with all associated manuals and documentation for the product. All maintenance should be carried out in accordance with established safety practices.

3) All operators of the completed equipment should be trained to use that product in a safe and coordinated manner in compliance with established safety practices. The operators should also be familiar with documentation that is connected with the actual operation of the completed equipment.

   Note: the term 'completed equipment' refers to a third party constructed device that contains or uses the product associated with this manual.

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions into the system.
- When combining this product with other products, please confirm the standards and codes of regulation to which the user should follow. Moreover, please confirm the compatibility of this product with the system, machines, and apparatuses to be used.
- If there is doubt at any stage during installation of the product, always consult a professional electrical engineer who is qualified and trained in the local and national standards. If there is doubt about the operation or use, please consult your local Mitsubishi Electric representative.
- Since the examples within this manual, technical bulletin, catalog, etc. are used as reference; please use it after confirming the function and safety of the equipment and system. Mitsubishi Electric will not accept responsibility for actual use of the product based on these illustrative examples.
- The content, specification etc. of this manual may be changed for improvement without notice.
- The information in this manual has been carefully checked and is believed to be accurate; however, if you notice any doubtful point, error, etc., please contact your local Mitsubishi Electric representative.

Registration

Anywire and AnyWireASLINK are either registered trademarks or trademarks of Anywire Corporation.

The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies.

In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

Table of Contents

Standards

Certification of UL, cUL standards

FX3U-128ASL-M units comply with the UL standards (UL, cUL). (December 2014 and later)

 UL, cUL File number :E95239

Regarding the standards that comply with the main unit, please refer to either the FX series product catalog or consult with your nearest Mitsubishi product provider.

Compliance with EC directive (CE Marking)

This document does not guarantee that a mechanical system including this product will comply with the following standards.
Compliance to EMC directive and LVD directive for the entire mechanical module should be checked by the user/manufacturer. For more information please consult with your nearest Mitsubishi product provider.
Regarding the standards that comply with the main unit, please refer to either the FX series product catalog or consult with your nearest Mitsubishi product provider.
Regarding the standards that comply with the AnyWireASLINK slave module, please consult with Anywire Corporation.

Requirement for Compliance with EMC directive

The following products have shown compliance through direct testing (of the identified standards below) and design analysis (through the creation of a technical construction file) to the European Directive for Electromagnetic Compatibility (2014/30/EU) when used as directed by the appropriate documentation.

Attention
This product is designed for use in industrial applications.

Type: Programmable Controller (Open Type Equipment)
Models: MELSEC FX3U series manufactured
from October 1st, 2013   FX3U-128ASL-M

Standard	Remark
EN61131-2: 2007 Programmable controllers - Equipment requirements and tests	Compliance with all relevant aspects of the standard. **EMI** • Radiated Emission • Conducted Emission **EMS** • Radiated electromagnetic field • Fast transient burst • Electrostatic discharge • High-energy surge • Voltage drops and interruptions • Conducted RF • Power frequency magnetic field

Caution to conform with EC Directives

- Installation in Enclosure
  Programmable logic controllers are open-type devices that must be installed and used within conductive control cabinets. Please use the programmable logic controller while installed within a conductive shielded control cabinet. Please secure the cabinet door to the control cabinet (for conduction).
  Installation within a control cabinet greatly affects the safety of the system and aids in shielding noise from the programmable logic controller.
- Control cabinet
  - The control cabinet must be conductive.
  - Ground the control cabinet with the thickest possible grounding cable.
  - To ensure that there is electrical contact between the control cabinet and its door, connect the cabinet and its doors with thick wires.
  - In order to suppress the leakage of radio waves, the control cabinet structure must have minimal openings. Also, wrap the cable holes with a shielding cover or other shielding devices.
  - The gap between the control cabinet and its door must be as small as possible by attaching EMI gaskets between them.
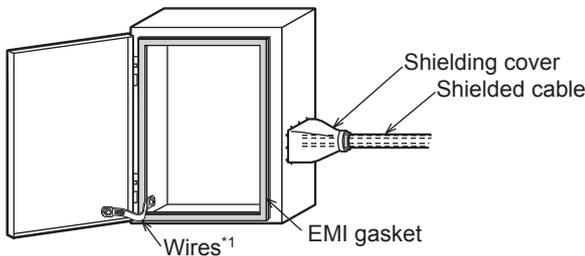
*1. These wires are used to improve the conductivity between the door and control cabinet.

- Use the FX3U-128ASL-M in Zone A[*2] as defined in EN61131-2.

  *2. Zone defined in EN61131-2.
  Separation defined in EN61131-2 for EMC LVD regulation decided depending on condition in industrial setting.
  Zone C = Factory mains which is isolated from public mains by dedicated transformers.
  Zone B = Dedicated power distribution which is protected by secondary surge protection. (300 V or less in the rated voltage is assumed.)
  Zone A = Local power distribution which is isolated from dedicated power distribution by AC/DC converters, isolation transformers, etc. (120 V or less in the rated voltage is assumed.)

- Please attach a ferrite core less than 200 mm from the FX3U-128ASL-M side terminal block to the DP and DN signal wires. The wire should be wound twice around the ferrite core. The ferrite core should be a product equivalent to ZCAT3035-1330 by TDK Corporation.
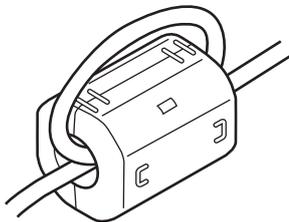
- Please attach a noise filter to the 0 V and 24 V power cables. The noise filter should be a product equivalent to SNR-10-223 by COSEL CO., LTD.

Associated Manuals

Only the installation manual is packed together with the FX3U-128ASL-M type AnyWireASLINK system master block.

For a detailed explanation of the FX3U-128ASL-M type AnyWireASLINK system master block., refer to this manual.

For the hardware information and instructions on the PLC main unit, refer to the respective manuals.

⊙ Refer to these manuals
✓ Refer to the appropriate equipment manual
△ For a detailed explanation, refer to an additional manual

		Title of manual	Document number	Description	Model code
Manual for the Main Module					
FX3G Series PLCs Main Unit					
△	Supplied Manual	FX3G Series Hardware Manual	JY997D46001	Describes FX3G Series PLC specification for I/O, wiring and installation extracted from the FX3G User's Manual - Hardware Edition. For details, refer to FX3G Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3G Series User's Manual - Hardware Edition	JY997D31301	Describes FX3G Series PLC specification details for I/O, wiring, installation and maintenance.	09R521
FX3GC Series PLCs Main Unit					
△	Supplied Manual	FX3GC Series Hardware Manual	JY997D45201	Describes FX3GC Series PLC specification for I/O, wiring and installation extracted from the FX3GC User's Manual - Hardware Edition. For details, refer to FX3GC Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3GC Series User's Manual - Hardware Edition	JY997D45401	Describes FX3GC Series PLC specification details for I/O, wiring, installation and maintenance.	09R533
FX3U Series PLCs Main Unit					
△	Supplied Manual	FX3U Series Hardware Manual	JY997D50301	Describes FX3U Series PLC specification for I/O, wiring and installation extracted from the FX3U User's Manual - Hardware Edition. For details, refer to FX3U Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3U Series User's Manual - Hardware Edition	JY997D16501	Describes FX3U Series PLC specification details for I/O, wiring, installation and maintenance.	09R516
FX3UC Series PLCs Main Unit					
△	Supplied Manual	FX3UC (D, DS, DSS) Series Hardware Manual	JY997D50501	Describes FX3UC (D, DS, DSS) Series PLC specification for I/O, wiring and installation extracted from the FX3UC User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
△	Supplied Manual	FX3UC-32MT-LT-2 Hardware Manual	JY997D31601	Describes FX3UC-32MT-LT-2 specification for I/O, wiring and installation extracted from the FX3UC User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
△	Supplied Manual	FX3UC-32MT-LT Hardware Manual (Only Japanese document)	JY997D12701	Describes FX3UC-32MT-LT specification for I/O, wiring and installation extracted from the FX3UC User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3UC Series User's Manual - Hardware Edition	JY997D28701	Describes FX3UC Series PLC specification details for I/O, wiring, installation and maintenance.	09R519

		Title of manual	Document number	Description	Model code
Programming					
⊙	Additional Manual	FX3S/FX3G/FX3GC/FX3U/FX3UC Series Programming Manual - Basic & Applied Instruction Edition	JY997D16601	Describes FX3S/FX3G/FX3GC/FX3U/FX3UC Series PLC programming for basic/applied instructions and devices.	09R517
✓	Additional Manual	MELSEC-Q/L/F Structured Programming Manual (Fundamentals)	SH-080782	Programming methods, specifications, functions, etc. required to create structured programs.	13JW06
✓	Additional Manual	FX CPU Structured Programming Manual [Device & Common]	JY997D26001	Devices, parameters, etc. provided in structured projects of GX Works2.	09R925
✓	Additional Manual	FX CPU Structured Programming Manual [Basic & Applied Instruction]	JY997D34701	Sequence instructions provided in structured projects of GX Works2.	09R926
✓	Additional Manual	FX CPU Structured Programming Manual [Application Functions]	JY997D34801	Application functions provided in structured projects of GX Works2.	09R927
✓	Additional Manual	GX Works2 Version 1 Operating Manual (Common)	SH-080779ENG	Explains the system configuration of GX Works2 and the functions common to Simple project and Structured project such as parameter setting, operation method for the online function.	13JU63
✓	Additional Manual	GX Works2 Version 1 Operating Manual (Intelligent Function Module)	SH-080921ENG	Explains operation methods of intelligent function module such as parameter setting, monitoring programs, and predefined protocol support function in GX Works2.	13JU69
Manuals for FX3U-128ASL-M type AnyWireASLINK system master block					
△	Supplied Manual	FX3U-128ASL-M Installation Manual	JY997D51901	Describes FX3U-128ASL-M type AnyWireASLINK system master block extracted from the FX3U-128ASL-M User's Manual. For details, refer to FX3U-128ASL-M User's Manual.	-
⊙	Additional Manual	FX3U-128ASL-M User's Manual (This Manual)	JY997D52101	Describes FX3U-128ASL-M type AnyWireASLINK system master block details.	09R521

Generic Names and Abbreviations Used in the Manual

Generic name or abbreviation		Description
PLC		
FX3G series		Generic name for FX3G Series PLC
	FX3G PLC or main unit	Generic name for FX3G Series PLC main unit
FX3GC series		Generic name for FX3GC Series PLC
	FX3GC PLC or main unit	Generic name for FX3GC Series PLC main unit
FX3U series		Generic name for FX3U Series PLC
	FX3U PLC or main unit	Generic name for FX3U Series PLC main unit
FX3UC series		Generic name for FX3UC Series PLC
	FX3UC PLC or main unit	Generic name for FX3UC Series PLC main unit
Expansion board		Generic name for expansion board The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Special adapter		Generic name for high-speed input/output special adapter, communication special adapter, analog special adapter, and CF card special adapter. The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
I/O extension unit/block		Generic name for input/output powered extension unit and input/output extension block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Special function unit/block or Special extension unit		Generic name for special function unit and special function block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
	Special function unit	Generic name for special function unit
	Special function block	Generic name for special function block
	128ASL-M	Abbreviated name for FX3U-128ASL-M
Memory cassette		Generic name for Memory cassette The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
FX Series terminal block		Generic name for FX Series terminal block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Slave module		Generic name for AnyWireASLINK slave module
Peripheral unit		
Peripheral unit		Generic name for programming software, handy programming panel, and indicator
Programming tool		
Programming tool		Generic name for programming software and handy programming panel
Programming software		Generic name for programming software
	GX Works2	Abbreviation of programming software packages SW☐DNC-GXW2-E
Handy programming panel (HPP)		Generic name for FX-30P and FX-20P(-E)
Indicators		
GOT1000 Series		Generic name for GT16, GT15, GT14, GT11 and GT10
Manual		
FX3G Hardware Edition		Abbreviation of FX3G Series User's Manual - Hardware Edition
FX3GC Hardware Edition		Abbreviation of FX3GC Series User's Manual - Hardware Edition
FX3U Hardware Edition		Abbreviation of FX3U Series User's Manual - Hardware Edition
FX3UC Hardware Edition		Abbreviation of FX3UC Series User's Manual - Hardware Edition
Hardware Edition manual		Generic name for User's Manual - Hardware Edition of each of the following Series: FX3G/FX3GC/FX3U/FX3UC
Programming manual		Abbreviation of FX3S/FX3G/FX3GC/FX3U/FX3UC Series Programming Manual - Basic and Applied Instructions Edition

Reading the Manual

Shows the manual title.
This area shows the manual title for the current page.

Shows the title of the chapter and the title of the section.
This area shows the title of the chapter and the title of the section for the current page.

Indexes the chapter number.
The right side of each page indexes the chapter number for the page currently opened.

FX3U-128ASL-M User's Manual

1 Introduction
1.2 External Dimensions and Part Names

1.2   External Dimensions and Part Names

2-φ4.5 mounting holes
[2]
[3]
[5]
[Without top cover]
[8]
[9]
[10]
[6]
[1]
[7]
[11]
90 (3.55")
80 (3.15")(mounting hole pitch)
4 (0.16")
43 (1.7")
[4]
87 (3.43")
95.5 (3.76")
9 (0.36")

Unit: mm (inches)
MASS (Weight): Approx. 0.2 kg (0.44 lbs)

[1]	Extension cable	
[2]	Direct mounting hole 2 holes of φ4.5 (0.18") (mounting screw: M4 screw)	
[3]	Power LED (green)	
[4]	Status LEDs (green, red)	
[5]	Nameplate	
[6]	DIN rail mounting groove (DIN rail: DIN46277, 35 mm (1.38") width)	

[7]   DIN rail mounting hook
[8]   SET switch (Automatic address setting switch)
[9]   Transmission points number setting switch (Rotary switch)
[10]   Extension connector
[11]   AnyWireASLINK connection terminal block

→ Refer to Section 1.3.

→ Refer to Section 1.4.

1.3   Indications of LEDs

LED display	Name	LED color	Status	Description
POWER	Module operation display	Green	ON	5 V DC is being supplied from the PLC.
			OFF	5 V DC is not being supplied from the PLC, or they are the units failure.
LINK	Transmission display	Green	ON	units failure
			Flicker	Operating normally
			OFF	5 V DC power off or the units failure.
SET	Automatic address detection display in progress	Green	ON	Automatic address detection in progress.
			Flicker	Writing in the EEPROM
			OFF	Operating normally
ALM	Transmission alarm display	Red	ON	DP/DN disconnection
			Slow flicker (one-second intervals)	DP/DN short
			Fast flicker (0.2-second intervals)	24 V DC is not being supplied or the voltage is low.
			OFF	Operating normally

Shows the reference.
The "→" mark indicates a reference destination and reference manual.

1	Introduction
2	Specification
3	System Configuration
4	Installation
5	Wiring, Power-on/off timing
6	Introduction of Functions
7	Buffer Memory
8	Program Examples
9	Troubleshooting
A	Version Information

13

The above is different from the actual page, as it is provided for explanation only.

1.   Introduction

1.1   Outline

The FX3U-128ASL-M type AnyWireASLINK system master block (hereinafter referred to as 128ASL-M) is a special function block for building an AnyWireASLINK system with FX3G/FX3GC/FX3U/FX3UC PLC.
The 128ASL-M is jointly developed and manufactured by Mitsubishi and Anywire Corporation.
The AnyWireASLINK system is a sensor network system.

1.1.1   Outline and features of AnyWireASLINK system

AnyWireASLINK is a high-speed and highly reliable system which relieves 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.

1) Flexible wiring
    The AnyWireASLINK allows flexible connections if the overall cable distance of transmission cables is within 200m.
    There is no restriction about, for example, the main line length, station-to-station distance, and number of branches.

2) Single-touch cable connection and disconnection
    Using a dedicated connector enables cables to be connected and disconnected with a single operation and eases module addition and replacement.
    For writing 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.

1.2 External Dimensions and Part Names

Unit: mm (inches)
MASS (Weight): Approx. 0.2 kg (0.44 lbs)

[1]	Extension cable	[7]	DIN rail mounting hook
[2]	Direct mounting hole 2 holes of φ4.5 (0.18") (mounting screw: M4 screw)	[8]	SET switch (Automatic address setting switch)
[3]	Power LED (green)	[9]	Transmission points number setting switch (Rotary switch)
[4]	Status LEDs (green, red) → **Refer to Section 1.3.**	[10]	Extension connector
[5]	Nameplate	[11]	AnyWireASLINK connection terminal block → **Refer to Section 1.4.**
[6]	DIN rail mounting groove (DIN rail: DIN46277, 35 mm (1.38") width)		

1.3 Indications of LEDs

LED display	Name	LED color	Status	Description
POWER	Module operation display	Green	ON	5 V DC is being supplied from the PLC.
			OFF	5 V DC is not being supplied from the PLC, or they are the units failure.
LINK	Transmission display	Green	ON	units failure
			Flicker	Operating normally
			OFF	5 V DC power OFF or the units failure.
SET	Address detection in progress display	Green	ON	Automatic address detection in progress.
			Flicker	Writing in the EEPROM
			OFF	Operating normally
ALM	Transmission alarm display	Red	ON	DP/DN disconnection
			Slow flicker (one-second intervals)	DP/DN short
			Fast flicker (0.2-second intervals)	24 V DC is not being supplied or the voltage is low.
			OFF	Operating normally

1.4   Terminal Layout

Terminal name	Description
24 V	24 V terminal for sensor power and communication.
0 V	0 V terminal for sensor power and communication.
DP	Transmission signal (+) terminal. It connects with DP of the slave module and the Terminator.
DN	Transmission signal (-) terminal. It connects with DN of the slave module and the Terminator.
LG	Functional earth terminal. The one point is grounded with the grounding terminal and functional earth terminal of the PLC (FG terminal).

- AnyWireASLINK connection terminal block specifications
  Type: MSTB2,5/5-STF-5,08AU (Phoenix Contact Co., Ltd.)

Electric wire size: 0.2 to 2.5 mm^2 (AWG24 to 12)

Tightening torque: 0.5 to 0.6 N•m (For both connector fixing screw and transmission cable connection screw)

→ **For transmission cable treatment, refer to Section 5.2.**

Do not tighten terminal screws with a torque outside the above-mentioned range. Failure to do so may cause equipment failures or malfunctions.

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2. Specification

DESIGN PRECAUTIONS ⚠ WARNING

- An AnyWireASLINK system has no control function for ensuring safety.
- When a communication failure occurs in the network, data in the master block are held.
  Check the communication status information and configure an interlock circuit in the sequence program to ensure that the entire system will operate safely.
- Make sure to have the following safety circuits outside of the PLC to ensure safe system operation even during external power supply problems or PLC failure.
  Otherwise, malfunctions may cause serious accidents.
  1) Most importantly, have the following: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
  2) Note that when the PLC CPU detects an error, such as a watchdog timer error, during self-diagnosis, all outputs are turned off. Also, when an error that cannot be detected by the PLC CPU occurs in an input/output control block, output control may be disabled.
  External circuits and mechanisms should be designed to ensure safe machinery operation in such a case.

DESIGN PRECAUTIONS ⚠ CAUTION

- Configure safety circuits, such as an emergency stop circuit and interlock circuit, external to the AnyWireASLINK system.
- Install module so that excessive force will not be applied to the terminal blocks.
  Failure to do so may result in wire damage/breakage or PLC failure.
- When executing control (data changes) to an operating PLC, construct an interlock circuit in the sequence program so that the entire system operates conservatively. Additionally, when executing control such as program changes and operation status changes (status control) to an operating PLC, thoroughly read the manual and sufficiently confirm safety in advance.

DISPOSAL PRECAUTIONS ⚠ CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

TRANSPORTATION AND STORAGE PRECAUTIONS ⚠ CAUTION

- The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications of the PLC main unit manual by using dedicated packaging boxes and shock-absorbing palettes.
  Failure to do so may cause failures in the PLC.
  After transportation, verify operation of the PLC and check for damage of the mounting part, etc.

2.1 General Specifications

Items other than the following are equivalent to those of the PLC main unit.
For general specifications, refer to the Hardware Edition manual of the connected PLC.

Item	Specification	
Ambient temperature	0 to 55 °C (32 to 131 °F) when operating and -25 to 75 °C (-13 to 167 °F) when stored	
Dielectric withstand voltage	500 V AC for one minute	Between PLC all terminals and ground terminal
Insulation resistance	5 MΩ or more by 500 V DC Megger	
Pollution degree	2 or less	

2.2 Power Supply Specification

Item	Specification
Driving power supply	130 mA / 5 V DC 5 V DC power is supplied internally from the main unit.
External power supply for ASLINK communication	Voltage: 21.6 to 27.6 V DC (24 V DC -10% to +15%), ripple voltage 0.5 Vp-p or lower Rated voltage: 24 V DC * Please use a UL Class 2 power supply. Module current consumption: 0.1 A Transmission cable supply current[*1]: Up to 2 A

*1. The 128ASL-M supplies the internal power supply of slave modules and the connection load power
     supply of non-isolated slave modules from transmission signals.
     The following expression shows the rough value of the transmission cable supply current (A):
       Transmission cable supply current = Internal current consumption of slave modules + Maximum
                                            current consumption of sensors and actuators connected to
                                            non-isolated slave modules
   On some slave modules with cables, the cross-sectional area of the integrated transmission cables
   (DP, DN) is 0.75mm^2 or less. However, they can be used without any problem, provided that the cross-
   sectional area of normal transmission cables (DP, DN) meets the following requirements.
   For slave modules with integrated transmission cables (DP, DN), the length of the transmission cables
   (DP, DN) is included in the total length.
   - Relationship between the total length of the AnyWireASLINK system, the cross-sectional area of
     connection cables and transmission cable supply current

Cross-sectional area of transmission cables	Transmission cable supply current		
	Total length of 50 m or less	Total length of 50 m to 100 m	Total length of 100 m to 200 m
1.25 mm^2	Up to 2 A	Up to 1 A	Up to 0.5 A
0.75 mm^2	Up to 1.2 A	Up to 0.6 A	Up to 0.3 A

   - Quick reference chart of total length (m) and transmission cable supply current (A) (1.25 mm^2)

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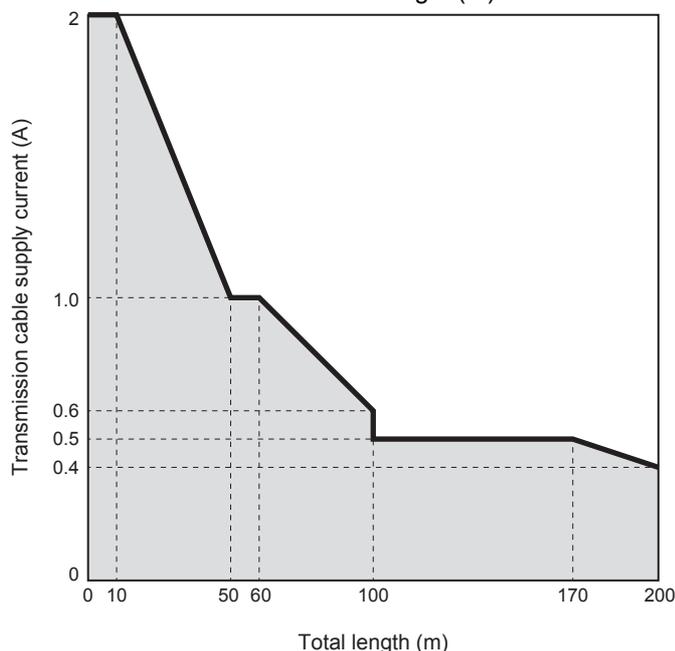
- Quick reference chart of total length (m) and transmission cable supply current (A) (0.75 mm^2)
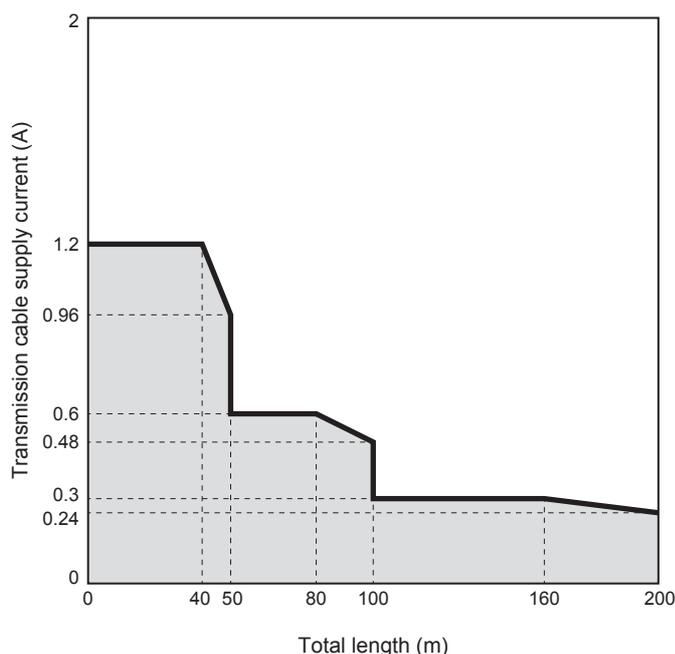
2.3 Performance Specifications

Item	Specification
Transmission clock	27.0 kHz
Maximum transmission distance (total length)	200 m[*1]
Transmission system	DC power supply transmission total frame cyclic system
Connection type	Bus topology (multidrop system, T-branch system, tree branch system)
Transmission protocol	Dedicated protocol (AnyWireASLINK)
Error control	Double-check system, checksum
Number of connected I/O points	Up to 128 points
Number of connectable modules	Up to 128 (varies depending on the current consumption of each slave module)
Maximum number of I/O points per system	Number of input points of the slave module + number of output points of the slave module ≤ 128 points[*2]
RAS function	• Disconnected transmission cable location detection function • Transmission cable short detection function • Transmission cable voltage drop detection function
AnyWireASLINK transmission cable	• UL-listed general-purpose 2-wire cable (VCTF, VCT 1.25 mm^2, 0.75 mm^2, rated temperature 70 °C or higher) • UL-listed general-purpose wire (1.25 mm^2, 0.75 mm^2, rated temperature 70 °C or higher) • Dedicated flat cable (1.25 mm^2, 0.75 mm^2, rated temperature 90 °C)[*3]
Power cable	• UL-listed general-purpose 2-wire cable (VCTF, VCT 0.75 mm^2 to 2.0 mm^2, rated temperature 70 °C or higher) • UL-listed general-purpose wire (0.75 mm^2 to 2.0 mm^2, rated temperature 70 °C or higher) • Dedicated flat cable (1.25 mm^2, 0.75 mm^2, rated temperature 90 °C)[*3]
Communication with PLC	By FROM and TO instructions or direct specification of buffer memory (FX3U/FX3UC) via the buffer memory.
Number of I/O occupied points	8 points (taken from either the input or output points of the PLC)
Number of connectable units to the main unit	One unit

*1. For details on the transmission distance, refer to Section 2.2.
*2. Input points and output points are occupied from the number of remote I/O points available in the system.
    If the number of input points and output points surpasses the number of remote I/O points available in the system, input points are assigned first to remote I/O points, and then the output points are assigned to the remaining available remote I/O points.
    For the assignment of remote I/O points in the whole system, refer to Section 3.4.
*3. Cables FK4-UL125-100, FK4-UL075-100

2.4 Communication Specifications

2.4.1 Transmission cycle time

The transmission cycle time is the time required for the 128ASL-M and all the slave modules to update I/O data.

The transmission cycle time of the 128ASL-M is listed in the table below.

However, "Number of input point settings" and "Number of output point settings" shown in the table below indicate the number of input points and number of output points assigned to 128ASL-M by the main unit (, so not set by the rotary switches of the 128ASL-M).

Transmission cycle time (Rough value)	Number of input point settings	Number of output point settings	Condition, remarks
2.4 ms	8	0	When the larger one between the number of assigned input points and the number of assigned output points meets the following expression, the transmission cycle time becomes the value shown on the left: Number of input or output points ≤ 32
	8	8	
	0	8	
	16	0	
	16	8	
	16	16	
	8	16	
	0	16	
	24	0	
	24	8	
	24	16	
	24	24	
	16	24	
	8	24	
	0	24	
	32	0	
	32	8	
	32	16	
	32	24	
	32	32	
	24	32	
	16	32	
	8	32	
	0	32	
3.6 ms	48	0	When the larger one between the number of assigned input points and the number of assigned output points meets the following expression, the transmission cycle time becomes the value shown on the left: 32 < Number of input or output points ≤ 64
	48	8	
	48	16	
	48	24	
	48	32	
	48	48	
	32	48	
	24	48	
	16	48	
	8	48	
	0	48	
	64	0	
	64	8	
	64	16	
	64	24	
	64	32	
	64	48	

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Transmission cycle time (Rough value)	Number of input point settings	Number of output point settings	Condition, remarks
3.6 ms	64	64	When the larger one between the number of assigned input points and the number of assigned output points meets the following expression, the transmission cycle time becomes the value shown on the left: 32 < Number of input or output points ≤ 64
	48	64	
	32	64	
	24	64	
	16	64	
	8	64	
	0	64	
4.8 ms	80	0	When the larger one between the number of assigned input points and the number of assigned output points meets the following expression, the transmission cycle time becomes the value shown on the left: 64 < Number of input or output points ≤ 96
	80	8	
	80	16	
	80	24	
	80	32	
	80	48	
	48	80	
	32	80	
	24	80	
	16	80	
	8	80	
	0	80	
	96	0	
	96	8	
	96	16	
	96	24	
	96	32	
	32	96	
	24	96	
	16	96	
	8	96	
	0	96	
6.0 ms	112	0	When the larger one between the number of assigned input points and the number of assigned output points meets the following expression, the transmission cycle time becomes the value shown on the left: 96 < Number of input or output points ≤ 128
	112	8	
	112	16	
	16	112	
	8	112	
	0	112	
	128	0	
	0	128	

Caution on the transmission cycle time

- The transmission delay time is a value between one and two transmission cycle times due to the double check (described later).
- To ensure the response, provide an input signal that is longer than two transmission cycle times.

2.4.2　Double check

The 128ASL-M performs double check as the error control method.
By double check, the 128ASL-M does not update the data in the input area until it receives the same input data twice consecutively so that noise errors and other transmission errors can be avoided.
Accordingly, data is updated as described below.

1) Input
In the best case, one transmission cycle time and in the worst case, two transmission cycle times are required as the input data response time to sample once.
Thus, signals of two transmission cycle times or less may not be sampled twice depending on the timing. Therefore, to ensure response, provide an input signal that is longer than two transmission cycle times.
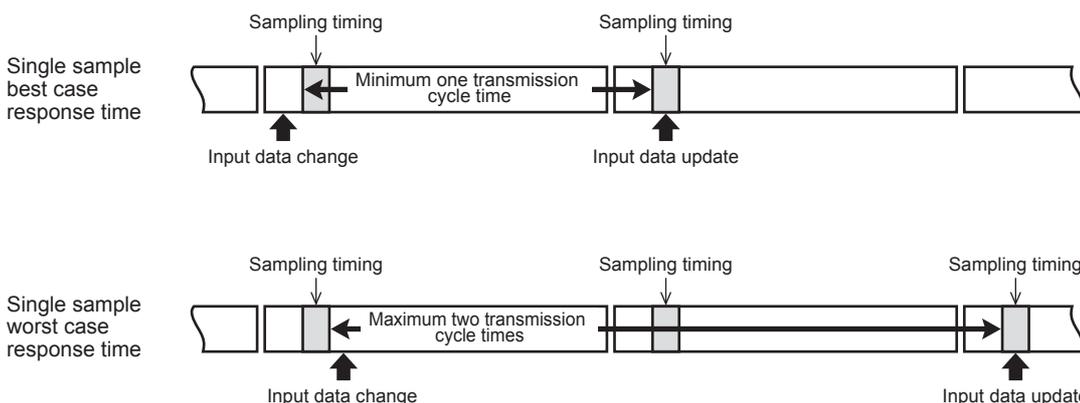
2) Output
As double check is performed on the output slave module side, the time required to sample once is the same as that for input, namely one transmission cycle time in the best case and two transmission cycle times in the worst case.
Thus, signals of two transmission cycle times or less may not be sampled twice depending on the timing. Therefore, to ensure response, provide an input signal that is longer than two transmission cycle times.

2.4.3 Response delay time

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

1) Input response delay time
The figure below shows the time between a signal input to the slave module and the main unit device turning ON/OFF.
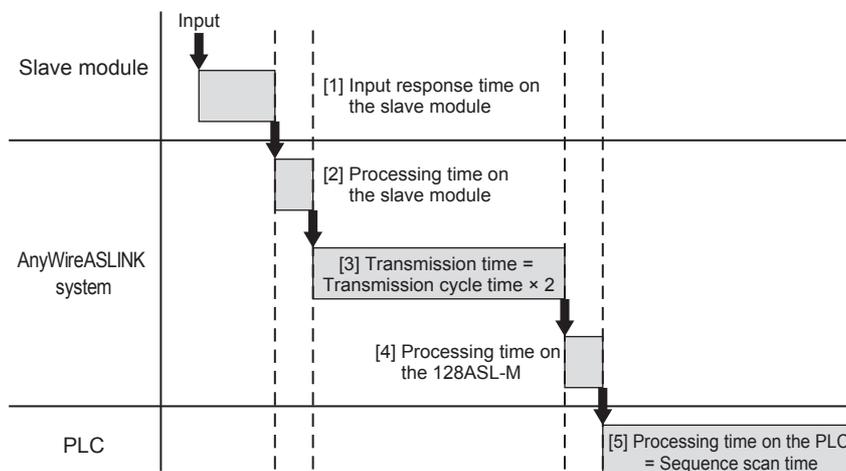
[Calculation formula]
Input response delay time =

[1] Input response time on the slave module + [2] Processing time on the slave module +
[3] Transmission cycle time × 2 + [4] Processing time on the 128ASL-M +
[5] Sequence scan time

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]	Processing time on the slave module	1 [ms] maximum (common to all AnyWireASLINK slave modules)
[3]	Transmission time (Maximum delay time)	Transmission cycle time × 2 The transmission cycle time differs depending on the transmission I/O points setting.
[4]	Processing time on the 128ASL-M	0.6 [ms]
[5]	Processing time on the PLC	Sequence scan time

2) Output response delay time
The figure below shows the time between the PLC main unit device turning ON/OFF and a signal output from the slave module turning ON/OFF.
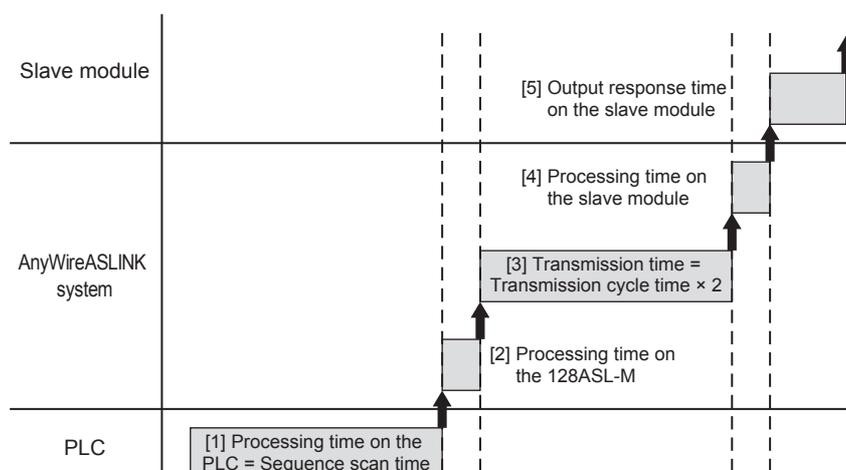
[Calculation formula]
Output response delay time =
    [1] Sequence scan time + [2] Processing time on the 128ASL-M +
    [3] Transmission cycle time × 2 + [4] Processing time on the slave module +
    [5] Output response time on the slave module

No.	Description	Required time
[1]	Processing time on the PLC	Sequence scan time
[2]	Processing time on the 128ASL-M	0.6 [ms]
[3]	Transmission time (Maximum delay time)	Transmission cycle time × 2 The transmission cycle time differs depending on the transmission I/O points setting.
[4]	Processing time on the slave module	1 [ms] maximum (common to the AnyWireASLINK slave modules)
[5]	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.

3) 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 128ASL-M 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 ASLINK parameter]
    Number of 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

2.4.4 Connection of slave modules
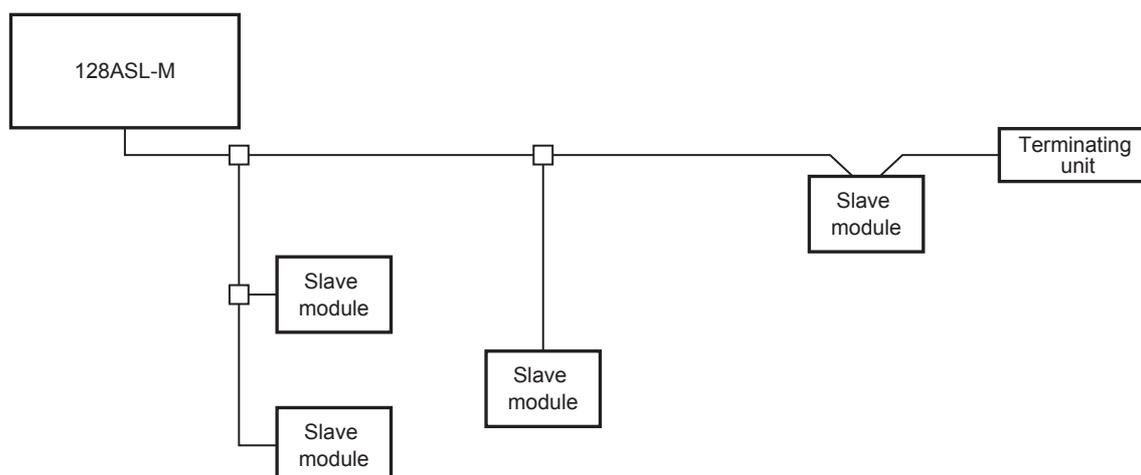
- The maximum transmission distance in the AnyWireASLINK stand-alone system is 200m, which is the total cable length including the main line and branch line (branch). (It varies depending on the cross-sectional area of the transmission cables or the transmission cable supply current.)

- T-branch, multidrop and Tree branch connections are usable in the AnyWireASLINK system.

- Connect one terminating unit for each system at the far end from the 128ASL-M.

1) About the maximum transmission distance
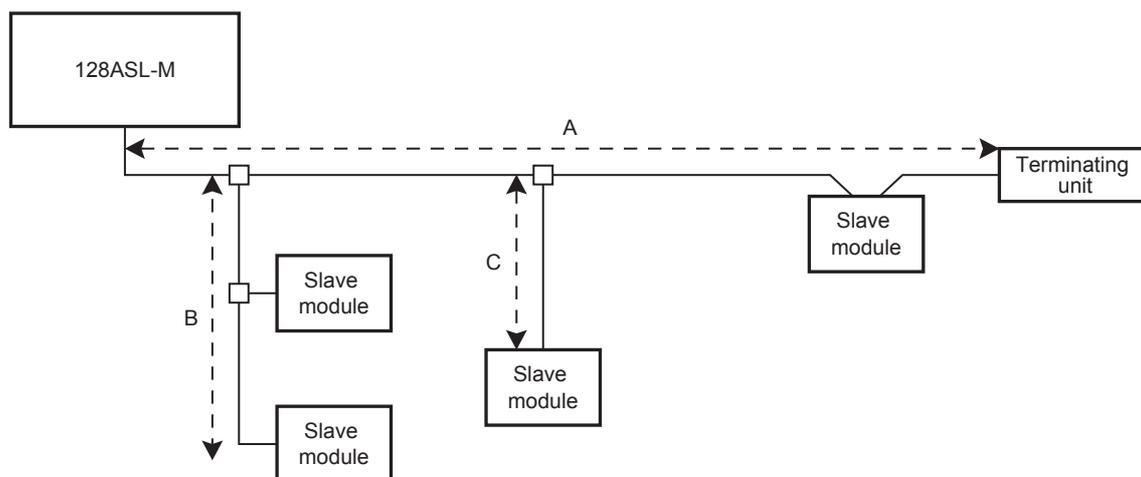
The total length of the transmission distance for the AnyWireASLINK system shown above can be calculated from A + B + C.
Note that the total length should not exceed the maximum transmission distance or the total length according to system restrictions.
For a slave module in which the connection cable is integrated in the main body, the length of the connection cable is included in the total length.

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3.1   General Configuration

[3] PC software
[4] Personal computer

[2] PLC

FX3G/FX3GC/
FX3U/FX3UC
PLC

Ladder

FROM/TO
instructions
etc.

[1] AnyWireASLINK
system master block

FX3U-128ASL-M

[5] Connection
cable

[8] Cable

[7] Terminating unit

Terminating
unit

Slave
module

Slave
module

Slave
module

Slave
module

[6] Slave module

Slave
module
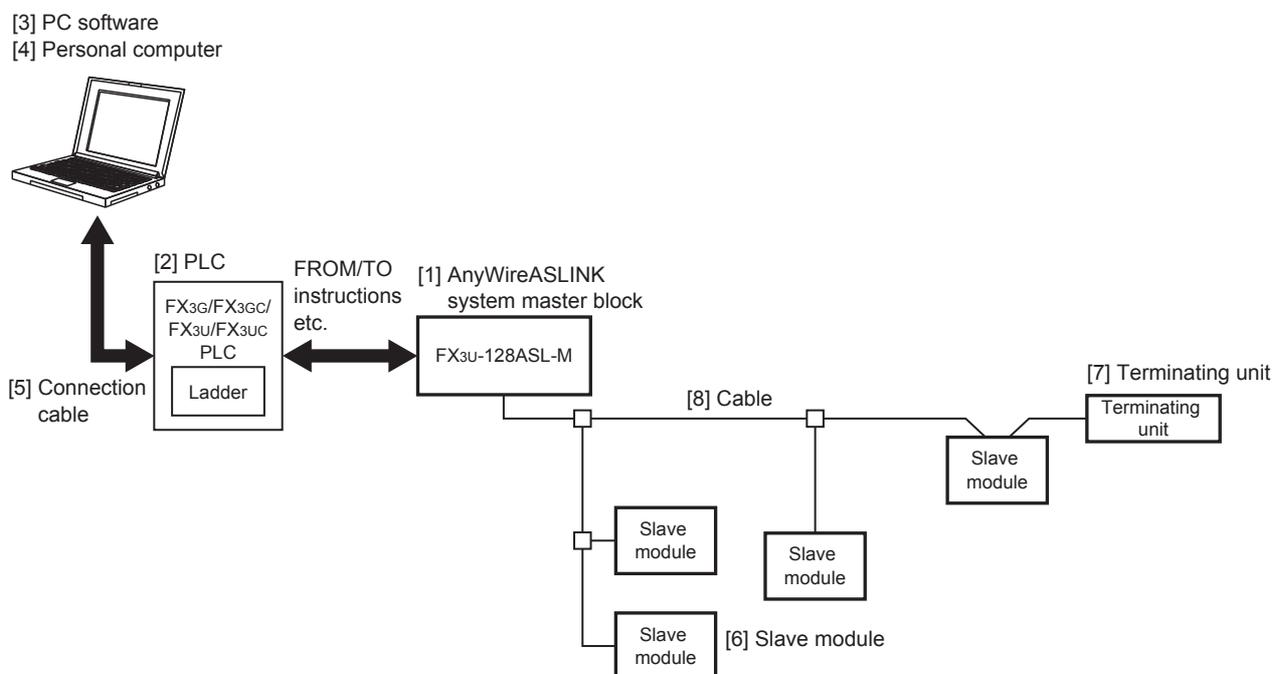
	Part name	Model name	Remarks
[1]	AnyWireASLINK system master block	FX3U-128ASL-M	-
[2]	PLC	FX3G/FX3GC/FX3U/FX3UC PLC	-
[3]	PC software	GX Works2	PLC programming software.
[4]	Personal computer	-	-
[5]	Connection cable (Personal computer)	FX-USB-AW	For the FX3U/FX3UC PLC
		F2-232CAB-1 FX-232AWC-H FX-422CAB0	-
		MR-J3USBCBL3M GT09-C30USB-5P	For the FX3G/FX3GC PLC
[6]	Slave module	-	For the AnyWireASLINK system master block
[7]	Terminating unit	-	For the AnyWireASLINK system master block
[8]	Cable	-	General-purpose wire, VCTF cable and flat cable, etc. can be used. For transmission cables, refer to the Section 2.3.

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3.2 Applicable PLC

Model name	Applicability	Maximum number of connectable units
FX3G Series PLC	Ver.1.00 and later	1 unit
FX3GC Series PLC[*1]	Ver.1.40 and later	1 unit
FX3U Series PLC	Ver.2.20 and later	1 unit
FX3UC Series PLC[*1]	Ver.2.20 and later	1 unit

The version number can be checked by reading the last three digits of device D8001/D8101.

*1. An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 128ASL-M with the FX3GC/FX3UC PLC.

3.3 Connection with PLC

The 128ASL-M connects to a PLC via an extension cable.
The 128ASL-M is handled as a special extension block of the PLC. The unit number of the 128ASL-M is automatically assigned No. 0 to No. 7 (Unit No. 1 to No. 7 is assigned when the main unit is an FX3UC-32MT-LT(-2).) starting from the special function unit/block closest to the PLC main unit.
(This unit number is used in FROM/TO instructions.)
For details on the assignment of the I/O number and unit number of the PLC, refer to the Hardware Edition manual corresponding to the connected PLC.

FX3U PLC   128ASL-M   Other extension units/blocks

FX3UC PLC   Other extension units/blocks   128ASL-M
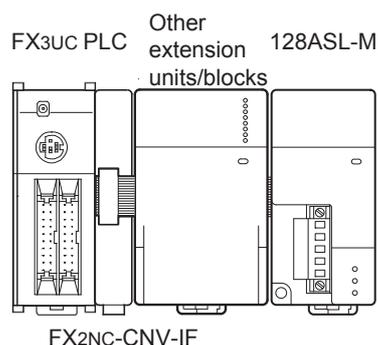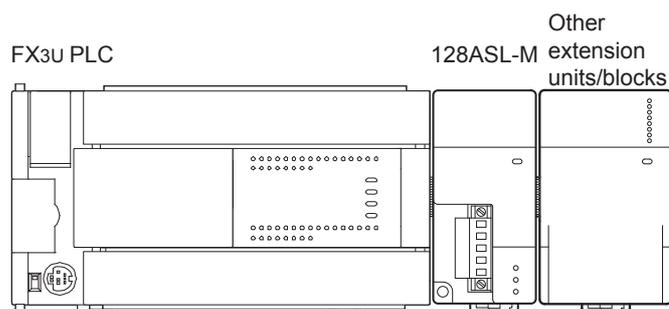
FX2NC-CNV-IF

- An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 128ASL-M with the FX3GC/FX3UC PLC.

- For extension, the separately available FX0N-65EC/FX0N-30EC extension cable and FX2N-CNV-BC are used. One extension cable can be used per system.

- The number of I/O points occupied by the 128ASL-M is eight. Make sure that the total number of I/O points (occupied I/O points) of the main unit, extension unit(s), extension block(s) and the number of points occupied by special function blocks does not exceed the maximum number of I/O points of the PLC.
  For information on the maximum number of I/O points of the PLC, refer to the Hardware Edition manual.

- The 128ASL-M cannot be used at the same time with the FX2N-16CCL-M and/or FX2N-32ASI-M. The FX3U-16CCL-M can be used at the same time when CC-Link parameters are set using network parameters of GX Works2. For details, refer to the Section 3.4.

3.4   About allocation of system-wide remote I/O
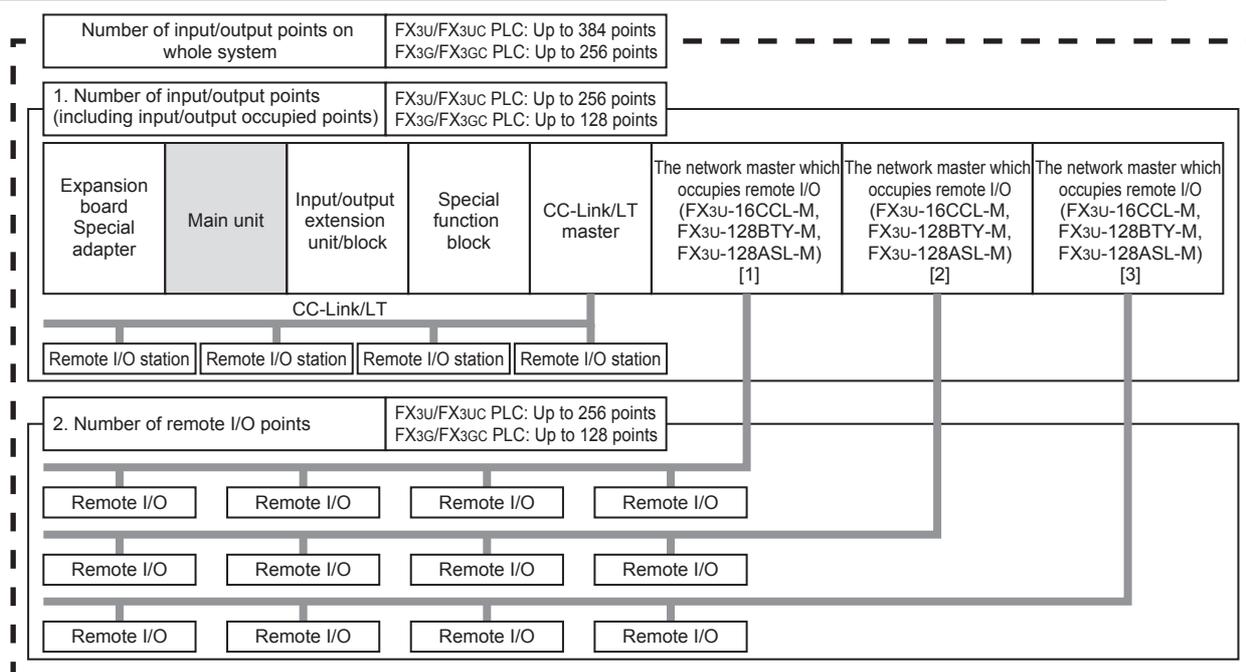
When using two or more network masters which occupy remote I/O available at the same time, the number of remote I/O points is assigned in turn from the network master located nearest to the main unit.
(In the case of above figure, the assignment sequence is "[1] → [2] → [3]").

Network masters which occupy remote I/O available at the same time

- FX3U-128ASL-M[*1]

- FX3U-128BTY-M[*1]

- FX3U-16CCL-M (Excluding the case in which it is connected to the [1] or [2] side and CC-Link parameters are set by the sequence program)[*2*3]

  *1.   If the required number of remote I/O points cannot be occupied depending on the connected system, input points are assigned first to remote I/O points from the network master located nearest to the main unit, and then output points are assigned to remaining available remote I/O points from the network master located nearest to the main unit.

  *2.   When connecting the FX3U-16CCL-M to a side ([1] or [2] side) nearer to the main unit than another network master which occupies remote I/O, the following restriction is imposed:
  -     It is necessary to set CC-Link parameters using network parameters of GX Works2.
      If CC-Link parameters are set by the sequence program, all remote I/O are occupied. As a result, the FX3U-16CCL-M cannot be used at the same time with other network masters.

  *3.   If the required number of remote I/O points cannot be occupied depending on the connected system, the number of input/output points is assigned from the network master located nearest to the main unit.

Network masters which occupy remote I/O not available at the same time
- FX2N-16CCL-M
- FX2N-32ASI-M

Example of calculating I/O when the FX3U-128ASL-M and FX3U-16CCL-M are used at the same time

- When the main unit is FX3U, the FX3U-16CCL-M is connected to the near ([1]) side and the FX3U-128ASL-M is connected to the far ([2]) side
  If the number of I/O occupied points on the main unit side is 160 points (including 8 input/output points occupied by the FX3U-16CCL-M/FX3U-128ASL-M) and the number of remote I/O points on the FX3U-16CCL-M is 128 points,
      384 - 160 - 128 = 96 points
      → Remote I/O (slave module) corresponding to 96 points can be connected to the FX3U-128ASL-M.

- When the main unit is FX3G, the FX3U-128ASL-M is connected to the near ([1]) side and the FX3U-16CCL-M is connected to the far ([2]) side
  If the number of I/O occupied points on the main unit side is 112 points (including 8 input/output points occupied by the FX3U-16CCL-M/FX3U-128ASL-M) and the number of remote I/O points (slave module) on the FX3U-128ASL-M is 80 points,
      128 - 80 = 48 points
      → Remote I/O corresponding to 48 points can be assigned in the FX3U-16CCL-M.
        (Actually, 32 points for 1 station can be assigned).

3.5 Number of transmission points setting

The 128ASL-M requests the main unit for the number of transmission points (number of I/O occupied points) for the AnyWireASLINK system through the rotary switches.
The correspondence between the rotary switch setting value and the number of input/output points is as follows:

Input rotary switch (Input No.) setting value	Number of input points	Output rotary switch (Output No.) setting value	Number of output points
0	128	0	128
1	0	1	0
2	8	2	8
3	16	3	16
4	24	4	24
5	32	5	32
6	48	6	48
7	64	7	64
8	80	8	80
9	96	9	96
A	112	A	112
B	128	B	128
C to F	0	C to F	0

The 128ASL-M requests the main unit for the number of input points and number of output points set by the rotary switches.
The following restriction is imposed on the number of transmission points actually assigned by the main unit:

- Number of input points + Number of output points ≤ 128 points

- In the case of "Number of input points + Number of output points ≥ 128 points", the number of input points is assigned first, and then the number of output points is assigned to remaining available points.
  Example: When the input rotary switch is set to "9" and the output rotary switch is set to "7"
            Number of input points "96" + Number of output points "64" = 160 points ≥ 128 points
            As a result, 96 input points and 32 (= 128 - 96) output points are assigned.

- When the number of transmission points assigned by the main unit is less than 128 points and "Input rotary switch setting value + Output rotary switch setting value" exceeds that, the number of input points is assigned first, and then the number of output points is assigned to remaining available points.
  Example: When the input rotary switch is set to "7", the output rotary switch is set to "7", and only 48 points are assigned by the main unit
            Number of input points "64" + Number of output points "64" = 128 points ≥ 48 points
            As a result, 48 input points and 0 output point are assigned.

Caution

Even if the slave module is connected and set to the area (address) beyond the number of input points set by the rotary switch, input signals from the slave module are not reflected in the buffer memory.
In the same way, even if values are written to the buffer memory area (address) beyond the number of output points set by the rotary switch, they are not output as actual signals.

3.6   Automatic address detection

Automatic address detection is a function to store the IDs (addresses) of the connected slave modules in the EEPROM of the 128ASL-M.

Parameters of connected devices are automatically updated after IDs are stored to EEPROM and after detection of unset IDs (addresses) and duplicate 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 duplicate IDs and the ASLINK parameter information of each slave module are not held.

For details on the automatic address detection, refer to the Subsection 6.2.3.

3.7 Start-up procedure of the system

Start up the AnyWireASLINK system using the following procedure:

```
┌─────────────────────────────────────────────────────────────┐
│                            Start                             │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Attach the 128ASL-M, slave modules and others to the       │ ----▶  Refer to Chapter 4.
│  control panel or machine.                                  │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Wire the 128ASL-M, slave modules and power supply, and     │ ----▶  Refer to Chapter 5.
│  connect the terminating unit at the end farthest from the  │
│  128ASL-M.                                                  │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Set the number of transmission points of the 128ASL-M      │ ----▶  Refer to Section 3.5.
│  using the rotary switches in accordance with the number    │
│  of input/output points of slave modules.                   │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Slave module address setting (For a slave module equipped  │        Refer to product guide
│  with DIP switch)                                           │        for the slave module
│  (For a slave module equipped with DIP switch, the address  │ ----▶  (manufactured by Anywire
│  can be set even before the power is turned ON. However,    │        Corporation).
│  for a slave module that relies on the address writer, the  │
│  address can be set only after the power is turned ON.)     │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Check before turning ON the power                          │        Refer to the Hardware Edition
│   - Check the attachment status of the 128ASL-M, slave      │        manual of each main unit.
│     modules and power supply.                               │        Refer to Subsection 2.4.4,
│   - Check whether the RUN/STOP switch of the main unit is   │ ----▶  Chapter 4 and Section 5.5.
│     set to "STOP".                                          │
│   - Check whether the total length of the AnyWireASLINK     │
│     system meets the specification.                         │
│   - Check whether the power supply of the AnyWireASLINK     │
│     system meets the specification.                         │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Turn ON the power of the external power supply for the     │ ----▶  Refer to Section 5.6.
│  AnyWireASLINK system and the power of the main unit in     │
│  this order.                                                │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Slave module address setting (For a slave module that      │        Refer to product guide
│  relies on the address writer)                              │        for the slave module
│  (For a slave module equipped with DIP switch, the address  │ ----▶  (manufactured by Anywire
│  can be set even before the power is turned ON. However,    │        Corporation).
│  for a slave module that relies on the address writer, the  │
│  address can be set only after the power is turned ON.)     │
│  Turn OFF the power, and turn it ON again so that the       │
│  address setting for the slave module is reflected.         │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Checking the operation based on LEDs                       │        Refer to Section 1.3 and
│      Check whether the LEDs on the 128ASL-M are as follows: │        Section 9.1.
│          • POWER LED : ON                                   │        Refer to product guide
│          • LINK LED     : Flicker                           │ ----▶  for the slave module
│      Check whether the LEDs in the slave module are as      │        (manufactured by Anywire
│      follows:                                               │        Corporation).
│          • LINK LED     : Flicker                           │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Perform automatic address detection.                       │ ----▶  Refer to Subsection 6.2.3.
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Write the control program to the main unit.                │ ----▶  Refer to Chapter 8.
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│  Operate the system.                                        │
└─────────────────────────────────────────────────────────────┘
                              ↓
┌─────────────────────────────────────────────────────────────┐
│                            End                              │
└─────────────────────────────────────────────────────────────┘
```

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4.   Installation

INSTALLATION PRECAUTIONS	⚠ WARNING

- Make sure to cut off all phases of the power supply externally before attempting installation work.
  Failure to do so may cause electric shock.

INSTALLATION PRECAUTIONS	⚠ CAUTION

- Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition).
  Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl2, H2S, SO2 or NO2), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind.
  If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.
- Do not touch the conductive parts of the product directly.
  Doing so may cause device failures or malfunctions.
- Install the product securely using a DIN rail or mounting screws.
- Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Be sure to remove the dust proof sheet from the PLC's ventilation slits when installation work is completed.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Make sure to attach the top cover, offered as an accessory, before turning on the power or initiating operation after installation or wiring work.
  Failure to do so may cause electric shock.
- Connect extension cables securely to their designated connectors.
  Loose connections may cause malfunctions.

Only one 128ASL-M can be connected to the right side of the main unit, extension unit or extension block.
To connect to an FX3GC/FX3UC PLC or FX2NC PLC extension block, the FX2NC-CNV-IF or FX3UC-1PS-5V is necessary.
For installation method to PLCs, refer to the Hardware Edition manual of the connected PLC.
The 128ASL-M may be installed in a control cabinet with a 35 mm wide DIN46277 DIN rail mounting or M4 screw direct mounting.

4.1 DIN rail mounting

The product may be mounted on a 35 mm wide DIN46277 (DIN rail).

1 **Fit the upper edge (A in the figure to the right) of the DIN rail mounting groove onto the DIN rail.**

2 **Push the product onto the DIN rail.**
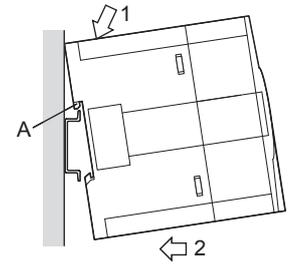
• An interval space of 1 to 2 mm (0.04" to 0.08") between each unit is necessary.

3 **Connect the extension cable.**

Connect the extension cable (B in the figure to the right) to the main unit, I/O extension unit/block or special function unit/block on the left side of the product.
For information on the extension cable connection procedure, refer to the Hardware Edition manual of the connected PLC.
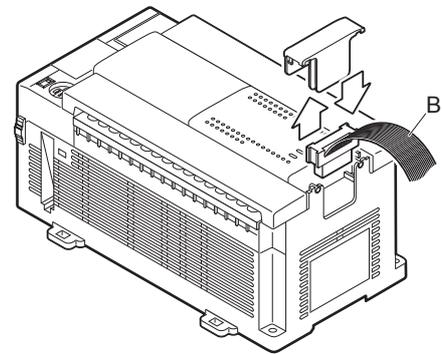
• Example of installation on DIN rail
  - In the case of the FX3G/FX3U PLC

```
        1 to 2 mm                    1 to 2 mm
      (0.04" to 0.08")            (0.04" to 0.08")

┌──┐ ┌──────────┐ ┌──────────────┐ ┌───────────┐ ┌──┐
│  │ │ FX3U Series │ │ FX3U-128ASL-M │ │   Other   │ │  │
│  │ │ main unit  │ │               │ │ extension │ │  │
│  │ │            │ │               │ │ equipment │ │  │
└──┘ └──────────┘ └──────────────┘ └───────────┘ └──┘
   DIN rail
```
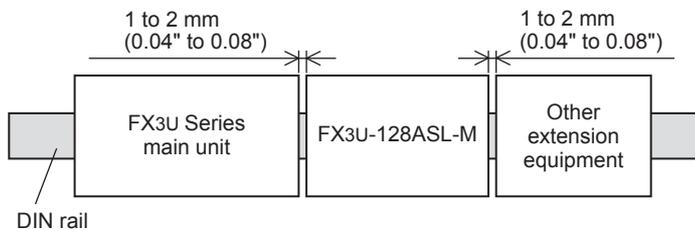
  - In the case of the FX3GC/FX3UC PLC
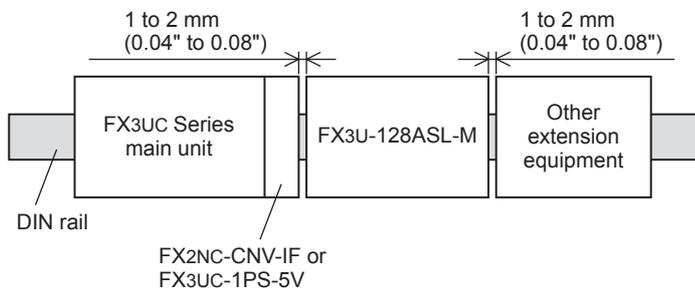
```
        1 to 2 mm                    1 to 2 mm
      (0.04" to 0.08")            (0.04" to 0.08")

┌──┐ ┌──────────┐ ┌──────────────┐ ┌───────────┐ ┌──┐
│  │ │ FX3UC Series │ │ FX3U-128ASL-M │ │   Other   │ │  │
│  │ │ main unit  │ │               │ │ extension │ │  │
│  │ │            │ │               │ │ equipment │ │  │
└──┘ └──────────┘ └──────────────┘ └───────────┘ └──┘
   DIN rail
   FX2NC-CNV-IF or
   FX3UC-1PS-5V
```

4.2 Direct mounting

The product can be installed directly with screws.
An interval space of 1 to 2 mm (0.04" to 0.08") between each unit is necessary.
For installation details, refer to the Hardware Edition manual of the connected PLC.

→ **For mounting hole pitches, refer to Section 1.2.**

1 **Create mounting holes in the mounting surface according to the external dimensions diagram.**

2 **Fit the 128ASL-M (A in the figure to the right) to the mounting holes and tighten with M4 screws (B in the figure to the right).**

For the screw position and quantity, refer to the dimensioned drawing specified below.

→ **For dimensions, refer to Section 1.2.**

3 **Connect the extension cable.**

Connect the extension cable to the main unit, I/O extension unit/block or special function unit/block on the left side of the product.
(Refer to Step 3 in Section 4.1.)
For information on the extension cable connection procedure, refer to the Hardware Edition manual of the connected PLC.
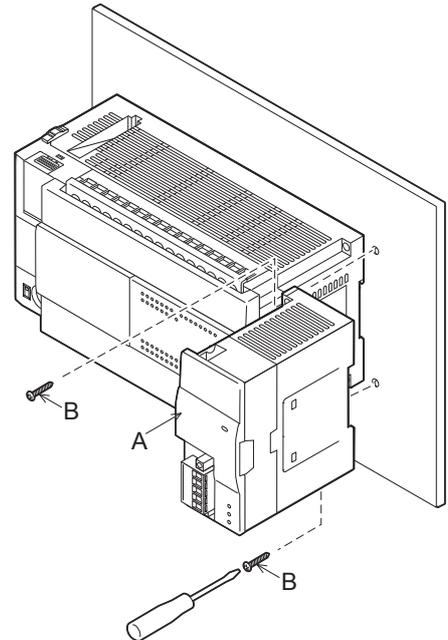
• Example of direct installation
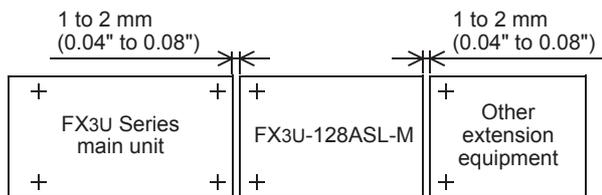
(+ shows the M4 screw)

5. Wiring, Power-ON/OFF Timing

WIRING PRECAUTIONS	⚠ WARNING

- Make sure to cut off all phases of the power supply externally before attempting wiring work.
  Failure to do so may cause electric shock or damage to the product.

WIRING PRECAUTIONS	⚠ CAUTION

- Connect the DC power supply wiring to the dedicated terminals described in this manual.
  If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Make sure to attach the top cover, offered as an accessory, before turning on the power or initiating operation after installation or wiring work.
  Failure to do so may cause electric shock.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Make sure to properly wire to the terminal block (European type) in accordance with the following precautions.
  Failure to do so may cause electric shock, equipment failures, a short-circuit, wire breakage, malfunctions, or damage to the product.
  - The disposal size of the cable end should follow the dimensions described in the manual.
  - Tightening torque should follow the specifications in the manual.
  - Twist the end of strand wire and make sure that there are no loose wires.
  - Do not solder-plate the electric wire ends.
  - Do not connect more than the specified number of wires or electric wires of unspecified size.
  - Affix the electric wires so that neither the terminal block nor the connected parts are directly stressed.
- Do not apply the 24 V DC power before wiring the entire AnyWireASLINK system.
- Connect a 24 V DC external power supply to FX3U-128ASL-M for the AnyWireASLINK system.
- Make sure to observe the following precautions in order to prevent any damage to the machinery or accidents due to abnormal data written to the PLC under the influence of noise:
  1) Do not bundle the main circuit line together with or lay it close to the main circuit, high-voltage line or load line.
     Otherwise, noise disturbance and/or surge induction are likely to take place. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or high-voltage lines.
  2) Ground the shield wire or shield of the shielded cable at one point on the PLC. However, do not use common grounding with heavy electrical systems.
- 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.

For the wiring of the AnyWireASLINK system, refer to the "AnyWireASLINK Series Technical Manual" (prepared by AnyWire).

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5.1 AnyWireASLINK connection terminal block

For details on the terminal block layout, refer to Section 1.4.

Item	Description
Model name	MSTB2,5/5-STF-5,08AU (Phoenix Contact Co., Ltd.)
Electric wire size	0.2 to 2.5 mm^2 (AWG24 to 12)
Tightening torque	0.5 to 0.6 N•m (It is common also on the connector fixing screw and the transmission cable connection screw)

To tighten the terminal block, a flathead screwdriver having a tip size of 0.6 × 3.5 mm as shown in the figure below is required.

0.6 mm   3.5 mm
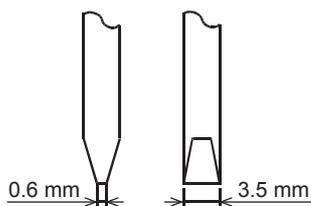
Before removing the AnyWireASLINK connection terminal block, check that the fixing screws on both sides are completely loosened (removed from the socket). Pulling with excessive force while the fixing screws of both ends are still tightened may damage the device.
Before tightening, check that there are no short circuits due to disconnected or frayed wires. Then tighten the screws at both sides securely. (Tightening torque: 0.5 N•m to 0.6 N•m)

5.2 Cable treatment

Bare cables can be connected to the AnyWireASLINK connection terminal block; however, for safety reasons, it is recommended to connect the crimped bar terminals.
Use UL-listed solderless terminals and, for processing, use a tool recommended by their manufacturer.
Recommended bar terminals (Phoenix Contact Co., Ltd.)

Electric wire size	Electric wire connected number	recommended bar terminals model name (Phoenix Contact Co., Ltd.)
0.75 mm^2	1 cable	AI 0,75-8 GY
	2 cables	AI-TWIN 2X 0,75-8 GY
1.25 mm^2	1 cable	AI 1,5-8 BK
	2 cables	AI-TWIN 2X 1,5-8 BK

5.3 Wiring precautions

• Do not run multiple transmission cables (DP, DN) using a multicore cable.

DP
DN
DP
DN

DP
DN
DP
DN
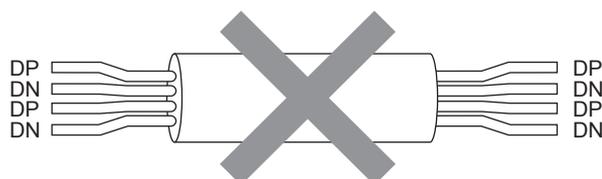
• The voltage should not fall below the lower limit of the allowable voltage range due to voltage drop caused by the cable.
  If the voltage falls below the lower limit, malfunctions may occur.

• Do not connect soldered cables directly to the terminals. Doing so may loosen the screws, resulting in a poor contact.

• It is recommended to use a 1.25 mm^2 lead wire for the main line because the power supply is superimposed on the signal wire in the AnyWireASLINK system.

• General-purpose wire, VCTF cable and flat cable, etc. can be used. Use stranded wires instead of single core wires.

5.4 Power supply and grounding wiring

5.4.1 Power supply and grounding wiring
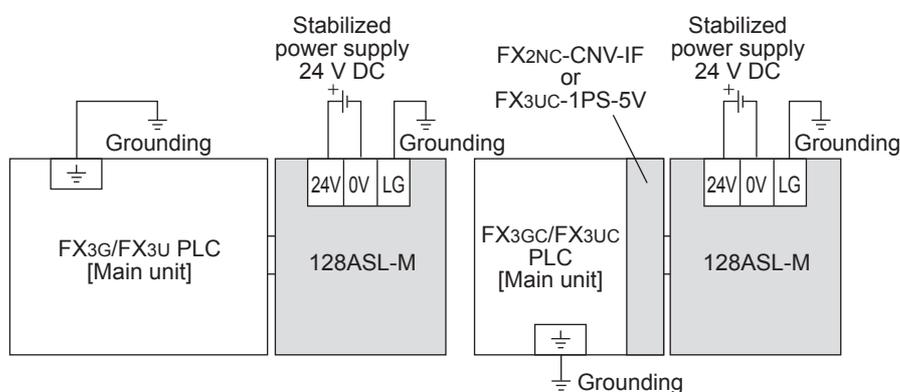
5.4.2 Grounding

Ground the PLC as stated below.

- Perform class D grounding. (Grounding resistance: 100 Ω or less)

- Ground the PLC independently if possible.
  If it cannot be grounded independently, ground it jointly as shown below.
  For details, refer to the Hardware Edition manual of the connected PLC.
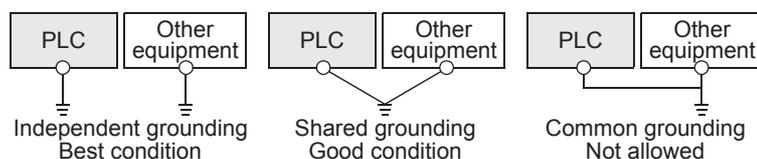
- Position the grounding point as close to the PLC (128ASL-M) as possible to decrease the length of the ground wire.

5.5   Power supply details to the AnyWireASLINK system

1) Method of supplying power to the AnyWireASLINK slave module
   Connect a commercial 24 V DC stabilized power supply to the 128ASL-M.
   The power consumed in the internal control circuits of all AnyWireASLINK slave modules and the external load power connected to non-isolated slave modules are supplied collectively from the 24 V DC external power supply connected to the 128ASL-M.

2) Scope of the power supply with transmission cables
   When constructing the AnyWireASLINK system, the current consumption of the system must satisfy conditions specified by the following calculation formulas [1] to [3] for the 128ASL-M.

Number	Calculation formula	Remarks
[1]	$I(A) = (Ihin \times m) + (Iho \times n) + (Izdin \times p) + (Izdo \times q) \leq$ The maximum value of transmission cable supply current[1]	Ihin: Current consumption of the non-isolated input module Iho: Current consumption of the non-isolated output module Izdin: Current consumption of the isolated input module Izdo: Current consumption of the isolated output module m: Number of connected non-isolated input modules n: Number of non-isolated output modules p: Number of connected isolated input modules q: Number of isolated output modules
[2]	$Vm(V) - \Delta V(V) \geq 20$ V	Vm: Supply voltage for the 128ASL-M ΔV: Cable-to-cable voltage drop
[3]	$Vm(V) - \Delta V(V) \geq$ The lowest allowable voltage of the connected load (Lowest allowable voltage of the external power supply for communication: 21.6 V)	$\Delta V(V)$ = Transmission cable supply current I (A) × Cable resistance R (Ω) Cable resistance R (Ω) = Cable length (m) × Conductor resistance (Ω/m) × 2 • Cross-sectional area 1.25 mm^2: Conductor resistance 0.015 Ω/m • Cross-sectional area 0.75 mm^2: Conductor resistance 0.025 Ω/m

*1. For transmission cable supply current details, refer to the Section 2.2.

3) Description of the condition [1]
   Transmission cable supply current I (A)
   $I(A) = (Ihin \times m) + (Iho \times n) + (Izdin \times p) + (Izdo \times q)$
   m: Number of connected non-isolated input modules
   n: Number of non-isolated output modules
   p: Number of connected isolated input modules
   q: Number of isolated output modules

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

$Ihin(A)$ = Current consumption of the non-isolated input module
= Internal current consumption of the non-isolated input module + Current consumption of connected load (three-wire sensor) × Number of points

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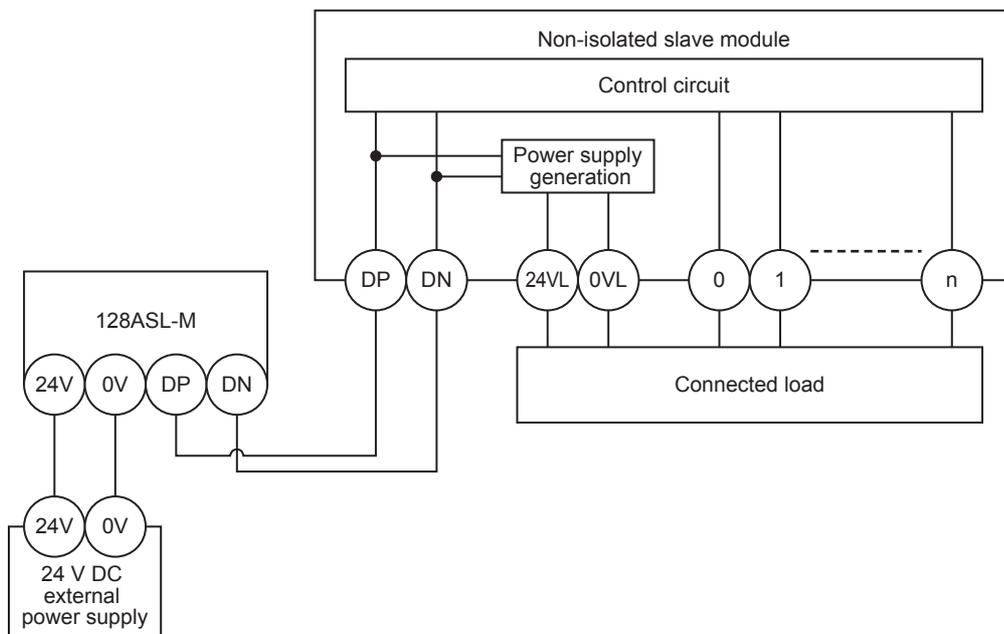
Caution

- The 24VL and 0VL terminals of a slave module are used to supply power to the connected load.

- For the current consumption of a non-isolated slave module, refer to the manual for each slave module.

b) Constants related to the isolated slave module (Izdin, Izdo)
In the isolated slave module, only the current required for the internal control circuit is supplied with the transmission cables (DP, DN), whereas that for the connected load is supplied from the 24 V DC external power supply.
Izdin(A) = Internal current consumption of the isolated input module
Izdo(A) = Internal current consumption of the isolated output module
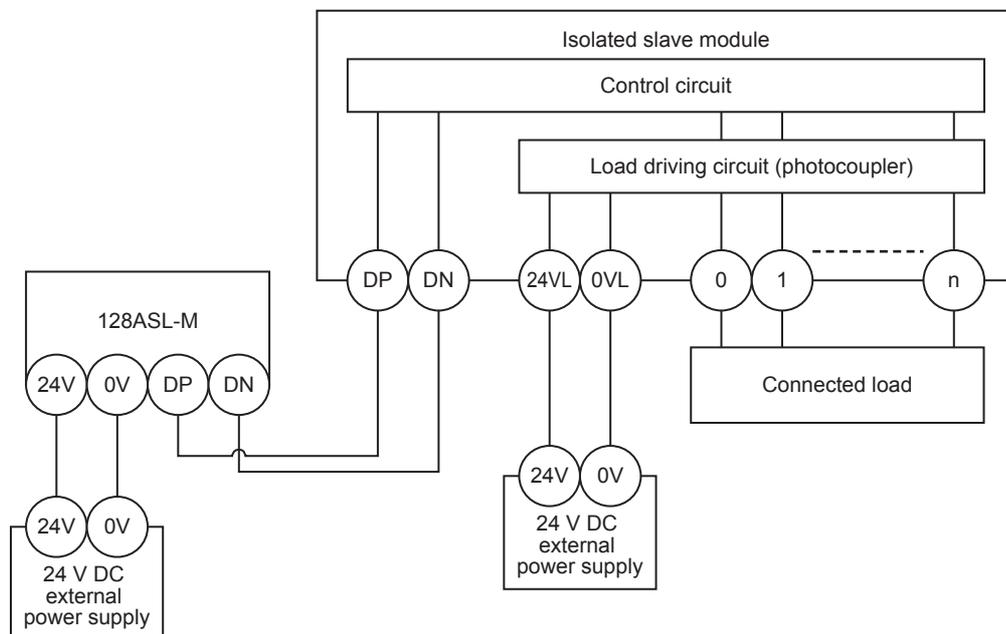
Caution

- 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.

c) Maximum transmission cable supply current
For the maximum transmission cable supply current, refer to Section 2.2.

4) Description of the conditions [2] and [3]

a) Vm: Supply voltage for the 128ASL-M
Voltage   : 24 V DC -10 to +15% (21.6 to 27.6 V DC), ripple voltage 0.5 Vp-p or lower
Rated voltage : 24 V DC

b) $\Delta V(V)$: Cable-to-cable voltage drop
$\Delta V(V)$ = Transmission cable supply current I(A) × Cable resistance R(Ω)
Cable resistance R(Ω) = Cable length (m) × Conductor resistance (Ω/m) × 2

Cross-sectional area 1.25 mm^2: Conductor resistance 0.015 Ω/m

Cross-sectional area 0.75 mm^2: Conductor resistance 0.025 Ω/m

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5.6 Power-ON/OFF timing

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5) Example of power supply calculation

Calculation to check whether a system having the following conditions can be constructed.

Condition 1: Cross-sectional area of transmission cables: 0.75 mm^2 (Conductor resistance 0.025 Ω/m)

Condition 2: Total length: 50 m

Condition 3: Non-isolated slave module (Input ASLINKER)
   Number of I/O points: 4 points
   Module current consumption: 20 mA
   Number of modules: 10 units

Condition 4: Connected load to the slave module (three-wire sensor)
   Three-wire sensor currentconsumption: 13 mA
   Number of sensors: 4 per module
   Power supply voltage: 24 V DC ± 10%

Condition 5: Power supply for the 128ASL-M
   Power supply voltage: 24 V DC

Checking the calculation formulas [1] to [3]

[1] I(A) = (Ihin(A) × m) ≤ The maximum transmission cable supply current
 From conditions [1] and [2], the maximum transmission cable supply current is 0.96 A.
 From conditions [3] and [4], the current consumption "Ihin (A) × m" of 10 non-isolated slave modules is as follows:
  (0.020 + (0.013 × 4)) × 10 = 0.720 A
 I(A) = 0.720 A ≤ 0.96 A   → Satisfied

[2] Vm(V) - ΔV(V) ≥ 20 V
 From conditions [1] and [2], the voltage drop "ΔV (V)" between lines is as follows:
  0.720 × 50 × 0.025 × 2 = 1.8V
 From condition [5], the power supply "Vm (V)" for the 128ASL-M is 24 V.
 24 V - 1.8 V = 22.2 V ≥ 20 V   → Satisfied

[3] Vm(V) - ΔV(V) ≥ The lowest allowable voltage of the connected load (21.6 V)
 22.2 V ≥ 21.6 V   → Satisfied

Based on the calculation results [1] to [3] above, this system can be constructed.

5.6 Power-ON/OFF timing

The AnyWireASLINK system external power supply should be turned ON simultaneously with or before the power supply of the PLC main unit it is connected to.
(The order is inverted when the system is powered OFF.)

Caution

If the PLC main unit is powered ON before the 24 V DC external power supply in the AnyWireASLINK system, a transmission cable voltage drop detection error may occur.
If the error including transmission cable voltage drop detection error is detected, the error can be cleared by turning the error flag clear command (BFM#27 b0) from OFF to ON.

6. Introduction of Functions

6.1 Functions List

Name	Description	Reference
Bit transmission function	Performs input and output of up to 128 points between the master module and the slave module.	Subsection 6.2.1
Parameter reading function	Reads the setting values from the slave module connected to the AnyWireASLINK, without delaying the bit transmission.	Subsection 6.2.2
Parameter writing function	Writes the setting values of the slave modules to all the slave modules connected to the AnyWireASLINK, without delaying the bit transmission.	Subsection 6.2.2
Automatic address detection function	The 128ASL-M detects and stores the ID number (address) of connected slave modules when the SET switch on the front of the 128ASL-M is pressed or when the automatic address detection command output (b1 of BFM#27) is set to ON.	Subsection 6.2.3
Automatic Reading of the System Configuration	GX Works2 automatically reads the information on slave modules.	Subsection 6.2.4
Transmission cable short detection function	Detects a short in DP-DN cables.	Subsection 6.2.5
Disconnected transmission cable location detection function	Detects the location of DP-DN cable disconnection.	Subsection 6.2.6
Transmission cable voltage drop detection function	Monitors a voltage drop in the 24 V DC external power supply.	Subsection 6.2.7
Parameter access error detection function	The 128ASL-M detects parameter access errors.	Subsection 6.2.8
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.	Subsection 6.2.9
Module with no ID setting detection function	Detects modules with no ID assigned (default ID).	Subsection 6.2.10

6.2 Details of functions

6.2.1 Bit transmission function

Performs input and output of up to 128 points between the master module and the slave module.
The power supply for load (corresponding to 24 V DC, 2 A maximum) is superimposed on the transmission signal so that the signal is transferred to the slave module (and rectified by the slave module), and powers the slave module circuit and the load connected to the slave module.
The 128ASL-M performs double check and check sum as the error control method.
By double check, the 128ASL-M does not update the data in the input area until it receives same input data twice consecutively so that noise errors and other transmission errors can be avoided.
For the output data, the output slave module performs double check and check sum in the same way.

6.2.2 Parameter reading/writing function

1) Summary of functions
In the AnyWireASLINK system, parameters, in addition to I/O information, are sent and received between the master module and a slave module.
Parameters are classified into two types, specific setting information (equipment parameters) of slave modules and common network information (AnyWireASLINK parameters).
There are four methods as follows to read or write parameters.

Name	Description
Automatic update	The self-monitoring status of all slave modules and the current values (except the setting values) of the sensors are read at regular intervals.
Parameter access	By specifying the data access direction and target slave module, parameter values of any slave module can be read or written individually.
Parameter batch read	All parameter values of all slave modules can be read out into the buffer memory of the 128ASL-M.
Parameter batch write	All parameter values of all slave modules can be written as specified by the buffer memory of the 128ASL-M.

The parameters which can be set by the parameter reading/writing methods are listed below.

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

- Parameter access, parameter batch read, or parameter batch write cannot be performed to a slave module not registered in the master module with automatic address detection.

- Remove a no ID setting error or a same ID used error of the slave module, and then perform parameter access, parameter batch read or parameter batch write.

- When the automatic address detection is executed, the parameter batch read is executed simultaneously.

- Since all the parameters of the target slave module are updated at the time of writing parameters, all the parameters, including the parameters of the changed part, must be set correctly.
  Make sure to read parameters immediately before writing parameters to store the latest contents of the parameters. After storing the necessary parameter values, write parameters.
  If writing parameters is executed without reading parameters, it may cause malfunction.

- When parameter reading or writing is in progress, the parameter access completion flag (b9 of BFM#28) turns OFF. Refer to the section describing the parameter access timing, and adjust the access timing.

- 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.

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2) Parameter reading and writing methods

- Automatic update
  No special operation is required because data are automatically updated.
  To check the parameter information, refer to the corresponding buffer memory address.

- Parameter access
  The procedure for parameter access is as follows.

  a) To read parameters
  1. Set the access method.
     Store 0000H: read parameter access method setting (BFM#10320).
  2. Set the access target module ID.
     Store the access target module ID in parameter access target module ID specification (BFM#10321).

ID	Description
0000H to 007FH	ID of output slave modules
0200H to 027FH	ID of input slave modules or I/O combined slave modules

  3. Turn ON parameter access request command for the slave module (BFM#27 b8).
     At this time, the parameter access completion flag (b9 of BFM#28) turns OFF.
     The parameter access completion flag (b9 of BFM#28) turning ON completes the access, and turns OFF the parameter access request command for the slave module (b8 of BFM#27).
  4. The read parameters are stored in parameter storage areas (corresponding locations of BFM#12288 and later).

  b) To write parameters
  1. Before writing parameters, read parameters according to the procedure of "a) To read parameters", or "c) Parameter batch read".[*1]

  *1. Since all the parameters of the target slave module are updated at the time of writing parameters, all the parameters, including the parameters of the changed part, must be set correctly.
     If writing parameters is executed without reading parameters, it may cause malfunction.
  2. Set the access method.
     Store 0001H: write parameter access method setting (BFM#10320).
  3. Set the access target module ID.
     Store the access target module ID in parameter access target module ID specification (BFM#10321).

ID	Description
0000H to 007FH	ID of output slave modules
0200H to 027FH	ID of input slave modules or I/O combined slave modules

  4. The written parameters are stored in parameter storage areas (corresponding locations of BFM#12288 and later).
  5. Turn ON parameter access request command for the slave module (BFM#27 b8).
     At this time, the parameter access completion flag (b9 of BFM#28) turns OFF.
     The parameter access completion flag (b9 of BFM#28) turning ON completes the access, and turns OFF the parameter access request command for the slave module (b8 of BFM#27).
  6. After writing parameters, check that the setting have been saved in the slave module by reading parameters in the slave module according to the procedure of "a) To read parameters", or "c) Parameter batch read".

  c) Parameter batch read
  1. Turn ON parameter batch read command for the slave module (BFM#27 b9).
     At this time, the parameter access completion flag (b9 of BFM#28) turns OFF.
     The parameter access completion flag (b9 of BFM#28) turning ON completes the access, and turns OFF the parameter batch read command for the slave module (b9 of BFM#27).
  2. The read parameters are stored in parameter storage areas (corresponding locations of BFM#12288 or later).

  d) Parameter batch write
  1. Before executing parameter batch write, read parameters of all ID registered slave modules according to the procedure of "c) Parameter batch read".[*1]

  *1. Since all the parameters of the target slave module are updated at the time of writing parameters, all the parameters, including the parameters of the changed part, must be set correctly.
     If writing parameters is executed without reading parameters, it may cause malfunction.
  2. The written parameters are stored in parameter storage areas (corresponding locations of BFM#12288 or later).

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3. Turn ON parameter batch write command for the slave module (BFM#27 b10).
At this time, the parameter access completion flag (b9 of BFM#28) turns OFF.
The parameter access completion flag (b9 of BFM#28) turning ON completes the access, and turns OFF the parameter batch write command for the slave module (b9 of BFM#27).

4. After executing parameter batch write, check that the setting have been saved in the slave module by reading parameters in the slave module according to the procedure of "a) To read parameters", or "c) Parameter batch read".

Point

- During the parameter access, parameter batch read, and parameter batch write, parameter access completion flag (BFM#28 b9) is OFF.

- While the parameter access completion flag (b9 of BFM#28) is OFF, the parameter access command, parameter batch read command, parameter batch write command and automatic address detection cannot be executed.

- Upon parameter batch read or parameter batch write, the values stored in parameter access method setting (BFM#10320) and parameter access target module ID specification (BFM#10321) are ignored.

3) Parameter access timing
The parameter access timing is as follows.

No.	Description
1)	Turn ON any of the signals below via program to start parameter access.[1] • Parameter access request command for the slave module (BFM#27 b8) • Parameter batch read command for the slave module (BFM#27 b9) • Parameter batch write command for the slave module (BFM#27 b10)
2)	The operation in 1) turns OFF parameter access completion flag (BFM#28 b9).
3)	When parameter access (read/write) is completed, parameter access completion flag (BFM#28 b9) automatically turns ON.
4)	If parameter access has an error, either of the following signals turns ON, and the parameter access completion flag (b9 of BFM#28) automatically turns ON. [2] • Slave module alarm signal (BFM#28 b8) • Parameter access error (BFM#28 b10)
5)	Turning ON error flag clear command (BFM#27 b0) via program turns OFF parameter access error (BFM#28 b10).
6)	Use the program to turn OFF the signal that turned ON in the step 1).

*1. Before the start of parameter access, store the access method, access target ID and parameter data to the corresponding memory area.

*2. The slave module alarm signal and parameter access error remain held until the error flag clear command output (b0 of BFM#27) is turned ON.
The contents of error are stored in the corresponding memory area.

6.2.3   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 128ASL-M.
Parameters of connected devices are automatically updated after IDs are stored to EEPROM and after detection of unset IDs (addresses) and duplicate IDs (addresses).
The ID (address) information stored in the EEPROM is held even when the power is turned OFF. However, information about unset IDs (address) and duplicate IDs (address) and the ASLINK parameter information of each slave module are not held.
For the address setting for slave modules, refer to the manual for the slave module used.
Whenever starting the system or changing the system configuration as follows, set the correct address to all the slave modules, and perform the automatic address detection.

- When starting the system operation
- 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

The automatic address detection can be performed using two means, the SET switch and automatic address detection command output.

- Using the SET switch
  Step

  1) Check that all of the slave modules are operating normally.

  2) Remove the top cover, and keep pressing the SET switch until the SET LED (green) turns ON.

  3) When the SET LED stays on for a while, and then flickers and turns OFF, the ID (address) has been stored.

  4) When automatic address detection flag (BFM#28 b11) turns OFF, automatic address detection is completed.

- Using Automatic address detection command
  Step

  1) Check that all of the slave modules are operating normally.

  2) Turn on automatic address detection command (BFM#27 b1)

  3) When the SET LED stays ON for a while, and then flickers and turns OFF, the ID (address) has been stored.

  4) When automatic address detection flag (BFM#28 b11) turns OFF, automatic address detection is completed.

Automatic address detection timing

→ Executed by the 128ASL-M

·····► Executed in the program

Turn on automatic address detection command (BFM#27 b1) or press and hold the SET switch.

ON / OFF — Turns OFF by the user.

Automatic address detection flag (BFM#28 b11)

ON / OFF — Automatic address detection being executed

SET LED

LED on   LED flashing

ON / OFF

The address being recorded

No ID setting or ID in use detected

Execution / Stand by — Image of execution

Parameter access completion flag (BFM#28 b9)

ON / OFF — Batch read executed

Slave module alarm signal (BFM#28 b8)
Parameter access error (BFM#28 b10)

ON / OFF — A parameter access error has occurred.

Caution on the automatic address detection operation

- The automatic address detection is disabled when an error such as short in the AnyWireASLINK system and voltage drop in the external power supply occurs, or within approximately five seconds after the AnyWireASLINK system is powered ON.

- Check that all of the slave modules are connected and operating normally, and then perform the automatic address detection.

- After performing the automatic address detection, check that there is no inconsistency between the actual system configuration and the IDs registered in the 128ASL-M, referring to the value stored in Number of IDs of connected modules (BFM#9216) and values stored in connected module ID information storage areas (BFM#9217 to BFM#9344).

- If an error such as DP/DN short error and DP/DN disconnection error occurs during the automatic address detection, perform the automatic address detection again from the beginning.

6.2.4 Automatic Reading of the System Configuration

On the AnyWireASLINK configuration window, GX Works2 automatically reads the information on slave modules connected in the AnyWireASLINK system so that man-hours for setting parameters can be reduced. For the AnyWireASLINK configuration window details, refer to the following manual.

→ **GX Works2 Version 1 Operating Manual (Intelligent Function Module)**

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6.2.5 Transmission cable short detection function

1) Outline
The transmission cable short detection function detects DP/DN short in the AnyWireASLINK system and stops transmission to prevent breakage of the modules and to protect the system.

2) Description

   - When transmission cable short is detected, the ALM LED flashes repeatedly at one-second intervals. [1]
   - DP/DN short error (BFM#28 b1) turns ON.
   - The error code "K201" is stored in the latest error code storage area (BFM#29). [1]
   - The error code "K4095" is stored in the latest error ID storage area (BFM#10257). [1]
   - The transmission clock stops for two seconds. (The system checks for short at two-second intervals.)

   *1. If multiple errors occur simultaneously, the error with the highest priority is displayed and stored.

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

   a) Eliminate the short in the AnyWireASLINK system.
   When the short is removed, the following will occur:
   - Bit transmission is resumed automatically.
   - The ALM LED keeps flashing.
   - The DP/DN short error (b1 of BFM#28) remains in the ON status.
   - The error code "K201" remains stored in the latest error code storage area (BFM#29), and the error code "K4095" remains stored in the latest error ID storage area (BFM#10257).
   (If a new error occurs, the old error is overwritten by the latest error in accordance with the priority.)
   If the status does not change, the short has not been eliminated. Therefore, check it again.

   b) Power OFF the AnyWireASLINK system or turn ON and OFF error flag clear command (BFM#27 b0).
   The following will occur:
   - The ALM LED turns OFF.
   - DP/DN short error (BFM#28 b1) turns OFF.
   - The error code "K201" stored in the latest error code storage area (BFM#29) is cleared.
   - The error code "K4095" stored in the latest error ID storage area (BFM#10257) is cleared.

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6.2.6   Disconnected transmission cable location detection function

1) Outline
This function makes the 128ASL-M send a response request to the ID (address) registered by the automatic address detection during bit transmission, and judges that the transmission cable is disconnected if the slave module does not respond to the response request.

2) Description

- When transmission cable disconnection is detected, the ALM LED turns ON. [1]

- DP/DN disconnection error (BFM#28 b4) turns ON.

- The error code "K202" is stored in the latest error code storage area (BFM#29). [1]

- The number of error IDs is stored in the number of error IDs (BFM#8192).

- The disconnected ID (address) of the slave module is stored in error ID information storage area (BFM#8193 to BFM#8320).

- The disconnected ID (address) is stored in the latest error ID storage area (BFM#10257). [1]

- The bit transmission is not stopped.

   [1]. If multiple errors occur simultaneously, the error with the highest priority is displayed and stored.

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

   a) Clear the disconnection status in the AnyWireASLINK system.
   When the connection is repaired, the following will occur:
   - The bit transmission with the slave module which has been disconnected so far is recovered to the normal status.
   - The ALM LED keeps ON.
   - The DP/DN disconnection error (b1 of BFM#28) remains in the ON status.
   - The error code "K202" remains stored in the latest error code storage area (BFM#29).
   (If a new error occurs, the old error is overwritten by the latest error in accordance with the priority.)
   - The number of error IDs remains stored in the number of error IDs (BFM#8192).
   - The ID (address) of disconnected slave modules remains stored in the error ID information storage areas (BFM#8193 to BFM#8320).
   - The disconnected ID (address) remains stored in the latest error ID storage area (BFM#10257).
   If the status does not change, the connection has not been repaired. Therefore, check it again.

   b) Power OFF the AnyWireASLINK system or turn ON and OFF error flag clear command (BFM#27 b0). The following will occur:
   - The ALM LED turns OFF.
   - DP/DN disconnection error (BFM#28 b4) turns OFF.
   - The error code "K202" stored in the latest error code storage area (BFM#29) is cleared.
   - The number of error IDs is cleared in the number of error IDs (BFM#8192).
   - The ID (address) of disconnected slave modules is cleared in the error ID information storage areas (BFM#8193 to BFM#8320).
   - The disconnected ID (address) is cleared in the latest error ID storage area (BFM#10257).

Caution

• The disconnected transmission cable location detection function becomes effective approximately five seconds after the 128ASL-M is powered ON (and the POWER LED lights).

• The error status in the LED and buffer memory can be reset also by the automatic address detection. However, if there are slave modules which do not give response, they are not detected automatically and not registered. As a result, they are not regarded as monitoring targets of the disconnected transmission cable location detection function. (Even if such slave modules are not regarded as monitoring targets, their I/O areas still function.)

6.2.7   Transmission cable voltage drop detection function

1) Outline
   This function detects voltage drop in the external input power supply (24 V DC).
   Detection voltage: Approximately 18.6 V
   After voltage drop is detected, the transmission clock is forcibly stopped by hardware processing, and error indication is provided.

2) Description
   - When voltage drop is detected, the ALM LED flashes repeatedly at 0.2-second intervals. [1]
   - Transmission cable voltage drop error (BFM#28 b3) turns ON.
   - The error code "K200" is stored in the latest error code storage area (BFM#29). [1]
   - The error code "K4095" is stored in the latest error ID storage area (BFM#10257). [1]
   - The transmission is stopped by hardware processing.

   *1. If multiple errors occur simultaneously, the error with the highest priority is displayed and stored.

3) How to recover from the transmission cable voltage drop status
   How to recover from the transmission cable voltage drop status is as follows.
   a) Recover the AnyWireASLINK system from the voltage drop status.
      Check the voltage of the 24 V DC external power supply, and replace the power supply or check the wiring, as necessary.
      When the voltage is recovered to the normal status, the following will occur:
      - The transmission is restarted by hardware processing.
      - The ALM LED keeps ON.
      - The transmission cable voltage drop error (b3 of BFM#28) remains in the ON status.
      - The error code "K200" remains stored in the latest error code storage area (BFM#29), and the error code "K4095" remains stored in the latest error ID storage area (BFM#10257).
        (If a new error occurs, the old error is overwritten by the latest error in accordance with the priority.)
      If the status does not change, the voltage drop has not been fixed. Therefore, check it again.
   b) Power OFF the AnyWireASLINK system or turn ON and OFF error flag clear command (BFM#27 b0).
      The following will occur:
      - The ALM LED turns OFF.
      - Transmission cable voltage drop error (BFM#28 b3) turns OFF.
      - The error code "K200" stored in the latest error code storage area (BFM#29) is cleared.
      - The error code "K4095" stored in the latest error ID storage area (BFM#10257) is cleared.

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6.2.8 Parameter access error detection function

1) Outline
This function allows the following parameter access errors to be detected, and stores the error code in the latest error code storage area (BFM#29).
- Slave module hardware error (error code: K300, K301)
- Parameter access target module ID error (error code: K302)
- Parameter value error (error code: K303)
- Parameter access error (error code: K304)
- Same ID used error (error code: K400)
- No ID setting error (error code: K401)
Even if above errors occur, they do not affect the LED indication or I/O communication.
For details on countermeasures, refer to Subsection 7.3.4 and Section 9.2.

2) Parameter access error status
The parameter access error status and check method are listed below.

Error code		Error name	Status of each part upon an error		
decimal	hexa-decimal		Status information (BFM#28)	Number of the error IDs (BFM#8192) Error ID information storage areas (BFM#8193 to BFM#8320)	Number of the alarm IDs (BFM#9984) Alarm ID information storage areas (BFM#9985 to BFM#10112)
300	012CH	Slave module hardware error	b8 turns ON.	No change.	The number of alarm IDs and alarm ID information are stored.
301	012DH				
302	012EH	Parameter access target module ID error			No change.
303	012FH	Parameter value error			The number of alarm IDs and alarm ID information are stored.
304	0130H	Parameter access error	b10 turns ON.	The number of error IDs and error ID information are stored.	No change.
305	0131H	Slave module status error	b8 turns ON.	No change.	The number of alarm IDs and alarm ID information are stored.
400	0190H	Same ID used error			
401	0191H	No ID setting error			

Error code		Status of each part upon an error		
decimal	hexa-decimal	Latest error ID storage area (BFM#10257)	Parameter storage areas (BFM#12288 to BFM#18432)	Effect on parameter communication
300	012CH	Error ID is stored.	No change.	No effect.
301	012DH			
302	012EH	K4095 (0FFFH) is stored.		
303	012FH			
304	0130H	Error ID is stored.		Parameter access to error IDs is automatically stopped until errors are cleared.
305	0131H		The details of the status error are indicated in the status details of each ID in AnyWireASLINK parameters.	No effect.
400	0190H		No change.	Parameter access to error IDs is automatically stopped until errors are cleared.
401	0191H			

3) Errors are cleared
   How to recover the AnyWireASLINK system from a parameter access error is as described below.
   a) Reset the parameter access error status.
   b) When the error status is reset, the following automatically occurs:

Error code		Error name	Status of each part upon an error			
decimal	hexa-decimal		Status information (BFM#28)	Latest error code storage area (BFM#29)	Number of the error IDs (BFM#8192) Error ID information storage areas (BFM#8193 to BFM#8320)	Number of the alarm IDs (BFM#9984) Alarm ID information storage areas (BFM#9985 to BFM#10112)
300	012CH	Slave module hardware error	The ON status of b8 or b10 is held.	The error code is held. (If a new error occurs, the old error is overwritten by the latest error in accordance with the priority.)	No change.	The number of alarm IDs and alarm ID information are held.
301	012DH					
302	012EH	Parameter access target module ID error				No change.
303	012FH	Parameter value error				The number of alarm IDs and alarm ID information are held.
304	0130H	Parameter access error			The number of error IDs and error ID information are held.	No change.
305	0131H	Slave module status error			No change.	The number of alarm IDs and alarm ID information are held.
400	0190H	Same ID used error				
401	0191H	No ID setting error				

Error code		Status of each part upon an error		
decimal	hexa-decimal	Latest error ID storage area (BFM#10257)	Parameter storage areas (BFM#12288 to BFM#18432)	Effect on parameter communication
300	012CH	The error ID (or K4095) is held. (If a new error occurs, the old error is overwritten by the latest error in accordance with the priority.)	No change.	No effect.
301	012DH			
302	012EH			
303	012FH			
304	0130H			
305	0131H		The error indication is not held.	
400	0190H		No change.	The indication and various error flags are cleared by the error flag clear command output, but the parameter communication is not recovered. The parameter communication to error IDs is stopped until the power is reset or until the automatic address detection is performed.
401	0191H			

c) For resetting the error status, remove factors causing errors, and then power OFF the AnyWireASLINK system or turn ON and OFF the error flag clear command (b0 of BFM#27).
   However, when the same ID used error or no ID setting error has occurred, it is necessary to set the address of the slave module again using the address writer and then perform the automatic address detection.
   If only the power is reset without setting of the address again, a parameter access error may occur.

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6.2.9 Same ID used detection function

1) Outline
This function allows the 128ASL-M to check whether a duplicate ID is used for any slave module whose address has been automatically detected.

Point

- IDs are detected with automatic address detection.
When the AnyWireASLINK system is powered OFF after the ID detection, the ID status is not displayed until the automatic address detection is performed again.

- Only a single ID is stored in Number of alarm IDs (BFM#9984) and alarm ID information storage area (BFM#9985 to BFM#10112) when a duplicate ID is the cause.
For example, when ID10 is used for multiple modules, "1" is shown as the value stored in Number of alarm IDs (BFM#9984) and "10" is shown as a value stored in alarm ID information storage area (BFM#9985 to BFM#10112).

2) Same ID used status
When the AnyWireASLINK system is in the following status, the same ID is used for multiple modules.

- Slave module alarm signal (BFM#28 b8) turns ON.

- Same ID used error (error code: K400) is stored in latest error code storage area (BFM#29) and the same ID is stored in latest error ID storage area (BFM#10257).[1]

- The relevant ID is stored in alarm ID information storage area (BFM#9985 to BFM#10112).

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

3) How to recover from same ID used status
Check Number of alarm IDs (BFM#9984) and alarm ID information storage area (BFM#9985 to BFM#G10112). Then set a unique ID (address) in all the slave modules.
Error status is reset by executing automatic address detection in the 128ASL-M after setting the IDs (addresses) in the slave modules.

Point

Error status is reset by powering OFF the AnyWireASLINK system or by turning ON error flag clear command (BFM#27 b0). However, the IDs (addresses) of the slave modules remain the same.

6.2.10   Module with no ID setting detection function

1) Outline
A module with no ID set is detected as having a factory default ID (for input modules, 767; for output modules, 255) when automatic address detection is executed.

Point

- No ID set detection is performed with automatic address detection.
When the AnyWireASLINK system is powered OFF after the No ID set detection, the No ID set status is not displayed until the automatic address detection is performed again.

- Only a single ID is stored in Number of alarm IDs (BFM#9984) and alarm ID information storage area (BFM#9985 to BFM#10112) when no ID setting is the cause.
For example, when multiple IDs are ID255, "1" is shown as the value stored in Number of alarm IDs (BFM#9984) and "255" is shown as a value stored in alarm ID information storage area (BFM#9985 to BFM#10112).

2) No ID set status
When the AnyWireASLINK system is in the following status, a module with no ID setting has been detected.

- Slave module alarm signal (BFM#28 b8) turns ON.

- No ID set error (error code: K401) is stored in latest error code storage area (BFM#29) and unset IDs are stored in latest error ID storage area (BFM#10257).[*1]

- Unset IDs are stored in alarm ID information storage areas (BFM#9985 to BFM#10112).

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

3) How to recover from the No ID set status
Check Number of alarm IDs (BFM#9984) and alarm ID information storage area (BFM#9985 to BFM#10112). Then set a unique ID (address) in all the slave modules.
Error status is reset by executing automatic address detection in the 128ASL-M after setting the IDs (addresses) in the slave modules.

Point

Error status is reset by powering OFF the AnyWireASLINK system or by turning ON error flag clear command (BFM#27 b0). However, the slave module addresses remain unset.

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7. Buffer Memory

The 128ASL-M I/O information, various set data, and error information are read/written from/to the PLC via the buffer memory (BFM).
When the 128ASL-M power supply is OFF, the buffer memory data is cleared, and initial values are written when the power supply is turned ON.

7.1 How to Read/Write from/to Buffer Memory

To read/write from/to buffer memory in the 128ASL-M, use the FROM/TO instructions or applied instructions that directly specify the buffer memory. For details on the other methods, refer to the Programming manual.

7.1.1 Direct specification of buffer memory

When directly specifying the buffer memory, specify the following device in the source or destination area of the applied instruction as follows:

U☐ \G☐   ☐ is substituted with a number

Unit No. (0 to 7) ●   ● Buffer memory No. (0 to 32766)
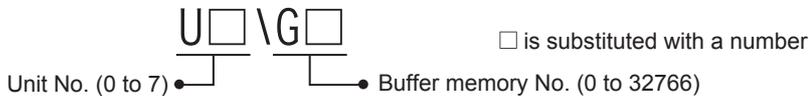
1. Reading out BFM data to PLC (MOV instruction)

If the following program is created, 1 point of data will be read out from the buffer memory BFM#30 of unit No. 1 to data register D10.

```
Read command
    ┤├          FNC 12    U1\G30    D10
                MOV

            Unit No. ●
    Buffer memory No. ●                        ● Transfer result
```
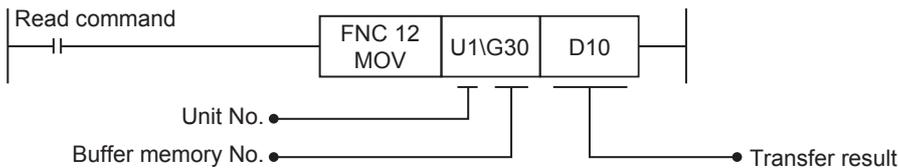
2. Writing PLC data into BFM (MOV instruction)

If the following program is created, 1 point of data (K4000) will be written to buffer memory BFM#0 of unit No. 1.

```
Write command
    ┤├          FNC 12    K4000    U1\G0
                MOV

                                    ● Buffer memory No.
    Transfer source ●                ● Unit No.
```
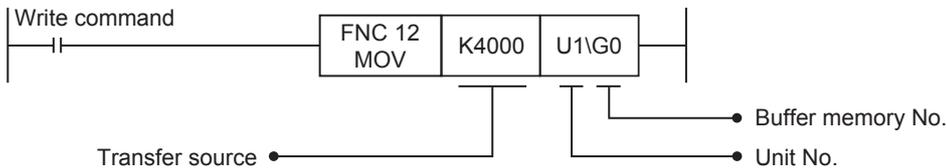
7.1.2 FROM/TO instructions

1. FROM instruction (Reading out BFM data to PLC)

Use the FROM instruction to read the data from the buffer memory.
If the following program is created, 1 point of data will be read out from the buffer memory BFM#30 of unit No. 1 to data register D10.

```
Read command
    ┤├      FNC 78    K1    K30    D10    K1
            FROM

        Unit No. ●
Buffer memory No. ●                        ● Number of transfer points
                                           ● Transfer destination
```
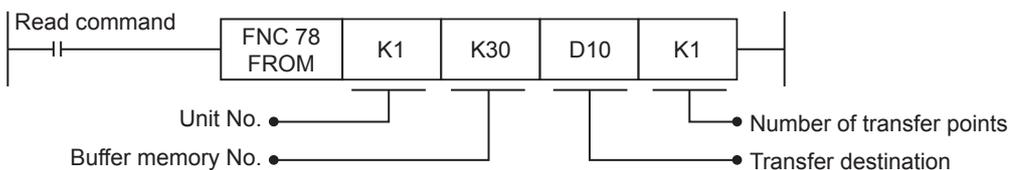
2. TO instruction (Writing PLC data into BFM)

Use the TO instruction to write data to the buffer memory.
If the following program is created, 1 point of data (K4000) will be written to buffer memory BFM#0 of unit No. 1.

```
Write command
    ┤├      FNC 79    K1    K0    K4000    K1
            TO

        Unit No. ●
Buffer memory No. ●                        ● Number of transfer points
                                           ● Transfer source
```

53
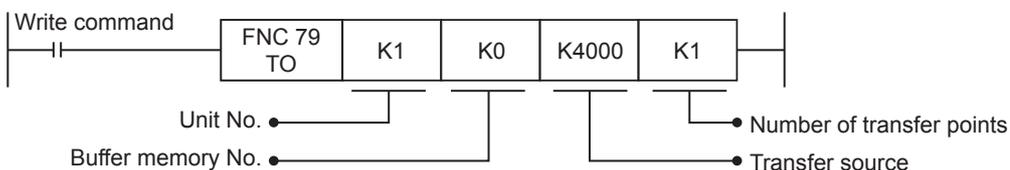
7.2 Buffer Memory List

The table below provides a brief description and reference information for the 128ASL-M buffer memory.

→ For details on the buffer memory, refer to the Section 7.3 or later.

BFM No. decimal	BFM No. hexa-decimal	Item	Content, Setting range	R/W	Default (decimal)	Reference
#0 to #7	#0000H to #0007H	Input information area	The ON/OFF status of the input signal of the slave module is stored. Address: 0 to 127 (16bit × 8 = 128bit)	R	0	Subsection 7.3.1
#8 to #26	#0008H to #001AH	Not used	-	-	-	-
#27	#001BH	Data access command	Various data access commands from the main unit to the 128ASL-M are stored.	R/W	0	Subsection 7.3.2
#28	#001CH	Status information	The status information of the 128ASL-M is stored.	R	-	Subsection 7.3.3
#29	#001DH	Error code	The error code of the 128ASL-M is stored.	R	0	Subsection 7.3.4
#30	#001EH	Model code	The model code of the 128ASL-M is stored.	R	7550	Subsection 7.3.5
#31	#001FH	Not used	-	-	-	-
#32	#0020H	Number of input points setting value	The number of input points set by the rotary switch is stored.	R	-	Subsection 7.3.6
#33	#0021H	Number of output points setting value	The number of output points set by the rotary switch is stored.	R	-	Subsection 7.3.6
#34	#0022H	Number of input points allowed by main unit	The number of input points allowed by the main unit is stored.	R	-	Subsection 7.3.7
#35	#0023H	Number of output points allowed by main unit	The number of output points allowed by the main unit is stored.	R	-	Subsection 7.3.7
#36 to #4095	#0024H to #0FFFH	Not used	-	-	-	-
#4096 to #4103	#1000H to #1007H	Output information area	The ON/OFF status of the output signal of the slave module is stored. Address: 0 to 127 (16bit × 8 = 128bit)	R/W	0	Subsection 7.3.8
#4104 to #8191	#1008H to #1FFFH	Not used	-	-	-	-
#8192	#2000H	Number of the error IDs	The number of error IDs that send no response is stored.	R	0	Subsection 7.3.9
#8193 to #8320	#2001H to #2080H	Error ID information storage areas	The error IDs are stored for the number of error IDs (BFM#8192) in ascending order. Up to 128 IDs.	R	0	Subsection 7.3.10
#8321 to #8959	#2081H to #22FFH	Not used	-	-	-	-
#8960	#2300	Number of the connected modules	The number of slave modules detected by the automatic address detection is stored.	R	-	Subsection 7.3.11
#8961 to #9215	#2301H to #23FFH	Not used	-	-	-	-
#9216	#2400H	Number of IDs of connected modules	The number of IDs of connected modules is stored by the automatic address detection. Up to 128 IDs.	R	-	Subsection 7.3.12
#9217 to #9344	#2401H to #2480H	Connected module ID information storage areas	IDs of all the connected slave modules (BFM#9216) are stored in ascending order. Up to 128 IDs.	R	-	Subsection 7.3.13
#9345 to #9983	#2481H to #26FFH	Not used	-	-	-	-

BFM No.		Item	Content, Setting range	R/W	Default (decimal)	Reference
decimal	**hexa-decimal**					
#9984	#2700H	Number of the alarm IDs	The number of IDs related to alarm occurrence is stored. Up to 128 IDs.	R	0	Subsection 7.3.14
#9985 to #10112	#2701H to #2780H	Alarm ID information storage areas	IDs of all alarm slave modules (BFM#9984) are stored in ascending order. Up to 128 IDs.	R	0	Subsection 7.3.15
#10113 to #10256	#2781H to #2810H	Not used	-	-	-	-
#10257	#2811H	Latest error ID storage area	The error ID corresponding to the latest error code is stored.	R	0	Subsection 7.3.16
#10258 to #10319	#2812H to #284FH	Not used	-	-	-	-
#10320	#2850H	Parameter access method setting	Specify the parameter access method. 0 or 1	R/W	0	Subsection 7.3.17
#10321	#2851H	Parameter access target module ID specification	Specify parameter access target ID. 0000 to 007FH: ID of output slave modules 0200 to 027FH: ID of input slave modules or I/O combined slave modules	R/W	0	Subsection 7.3.18
#10322 to #10495	#2852H to #28FFH	Not used	-	-	-	-
#10496 to #10623	#2900H to #297FH	Parameter storage location memory number (output)	The start number of the buffer memories which store the ASLINK parameters for each connected ID. Up to 128 IDs.	R	-	Subsection 7.3.19
#10624 to #11007	#2980H to #2AFFH	Not used	-	-	-	-
#11008 to #11135	#2B00H to #2B7FH	Parameter storage location memory number (input)	The start number of the buffer memories which store the ASLINK parameters for each connected ID. Up to 128 IDs.	R	-	Subsection 7.3.19
#11136 to #12287	#2B80H to #2FFFH	Not used	-	-	-	-
#12288 to #18431	#3000H to #47FFH	Parameter storage areas	The ASLINK parameter of each ID is stored. 48 words × 128 parameters maximum	R/W	-	Subsection 7.3.20
#18432 or later	#4800H or later	Not used	-	-	-	-

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7.3 Details of buffer memory

7.3.1 [BFM#0 to #7] Input information area

The ON/OFF status of the input signal of the slave module is stored as listed in the table below.

BFM No.		Bit No.															
decimal	hexa-decimal	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
#0	#0000H	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
#1	#0001H	31	30	29	28	27[*1]	26[*1]	25	24	23	22	21	20	19	18	17	16
#2	#0002H	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
#3	#0003H	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
#4	#0004H	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
#5	#0005H	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
#6	#0006H	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
#7	#0007H	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

*1. Ex. For a two-point input slave module (address: 26):
Two bits from b10 of BFM#1 shown in the above table are occupied for the input signal because the setting address is 26. (BFM#1 b10 and BFM#1 b11)

Caution

When it is necessary to handle two or more bit data as a series of data, set the address of the slave module in such a way that they are assigned to the same buffer memory.

7.3.2 [BFM#27] Data access command

Various data access commands from the main unit to the 128ASL-M are stored as shown below.

BFM No.		Bit No.															
decimal	hexa-decimal	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
#27	#001BH								Refer to the following table.								

Bit No.	Description	Bit status	
		ON	OFF
#27 b0	Error flag clear command	Execution	Standby
#27 b1	Automatic address detection command	Execution	Standby
#27 b2 to b7	Not used	-	-
#27 b8	Parameter access request command for the slave module	Execution	Standby
#27 b9	Parameter batch read command for the slave module	Execution	Standby
#27 b10	Parameter batch write command for the slave module	Execution	Standby
#27 b11 to b15	Not used	-	-

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7.3.3 [BFM#28] Status information

The status information of the 128ASL-M is stored as shown below.

BFM No.		Bit No.															
decimal	hexa-decimal	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
#28	#001CH	Refer to the following table.															

Bit No.	Description	Bit status	
		ON	OFF
#28 b0	Module READY	Normal	Failure
#28 b1	DP/DN short error	Error	Normal
#28 b2	Not used	-	-
#28 b3	Transmission cable voltage drop error	Error	Normal
#28 b4	DP/DN disconnection error	Error	Normal
#28 b5 to b7	Not used	-	-
#28 b8	Slave module alarm signal	Error	Normal
#28 b9	Parameter access completion flag	Access completion	Progress
#28 b10	Parameter access error	Error	Normal
#28 b11	Automatic address detection flag	Being executed	waiting
#28 b12 to b15	Not used	-	-

7.3.4 [BFM#29] Error code

The error code is stored when an error occurs.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#29	#001DH	The error code of the 128ASL-M is stored. For details, refer to the following table.	R	0

Error code List

Error code		Description of error	Cause and corrective action	Priority
decimal	hexa-decimal			
100 to 103	0064H to 0067H	128ASL-M hardware error	A malfunction has been detected in the 128ASL-M hardware. Check the status of the main unit, and power it OFF and ON. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	1 (high)
104	0068H	Main unit error	A data access error related to the main unit and 128ASL-M has been detected. Check the status of the main unit, and power it OFF and ON. Check that there is no influence from noise. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	2
200	00C8H	Transmission cable voltage drop error	The voltage of the external power supply may be insufficient. Perform the following: • Adjust the power supply voltage of the external power supply within the rated value (21.6 V DC to 27.6 V DC). • Check that the power cables (24 V, 0 V) are not disconnected or short-circuited. When crimping the link connector, check that the pin assignment is correct. • Check that the external power supply is properly connected to the terminal blocks of the 128ASL-M and the slave module. Check that there is no short circuit or incorrect wiring, and screws are tightened sufficiently.	3

Error code		Description of error	Cause and corrective action	Priority
decimal	hexa-decimal			
201	00C9H	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 assignment 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 128ASL-M and the slave module. • Correct the cables (cross-sectional area, 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 128ASL-M.	4
202	00CAH	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 have failed or the system configuration may have been changed after the automatic address detection. Check error ID information in the buffer memory, identify the disconnected area, and perform the following: • Check that the transmission cables (entire cables) are free from disconnection. Also check that the cables have been crimped with proper pin assignment using link connectors appropriate for the cross-sectional area. • Check that the signal cables are properly connected to the terminal block of the 128ASL-M. In addition, check that there is no incorrect wiring and that 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 the automatic address detection is performed, 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.	5
300 301	012CH 012DH	Slave module hardware error	A malfunction has been detected in the slave module hardware. Check the status of the main unit or slave module, and power it OFF and ON. Check that there is no influence from noise. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	6
302	012EH	Parameter access target module ID error	The 128ASL-M accessed the parameter of an 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 +200H. • 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 the automatic address detection is performed, check that the number of slave modules and the addresses are consistent with those of the actual system.	6
303	012FH	Parameter value error	The slave module has detected a parameter write value that cannot be set to the slave module itself. Use Number of alarm IDs (BFM#9984) and alarm ID information storage areas (BFM#9985 to BFM#10112) to identify the error ID. Then check that the slave module parameter setting value is within the allowable setting range.	6
304	0130H	Parameter access error	An ASLINK parameter access signal error has been detected. Check that there is no influence from noise.	6
305	0131H	Slave module status error	The slave module has notified of error status. Check the target module's status details and solve the problem.	6
400	0190H	Same ID used error	The same address (ID) has been set to some of the connected slave modules. Use Number of alarm IDs (BFM#9984) and alarm ID information storage areas (BFM#9985 to BFM#10112) to identify the error ID. Check the address (ID) of the slave module, then set a unique number.	6
401	0191H	No ID setting error	There is a slave module with no address setting. Perform the following: • Set the address of the slave module. • Set the address of the slave module to a value other than 255.	6

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7.3.5 [BFM#30] Model code

The model code of the 128ASL-M is stored.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#30	#001EH	Stores the model code of the 128ASL-M (K7550).	R	7550

7.3.6 [BFM#32, #33] Number of I/O points setting value

The number of input points and number of output points set by the rotary switches of the 128ASL-M are stored.
These values may be different from the number of input points and number of output points whose use is allowed by the main unit.

BFM No.		Item	Description	R/W	Default (decimal)
decimal	hexa-decimal				
#32	#0020H	Number of input points setting value	The number of input points set by the rotary switch is stored.	R	-
#33	#0021H	Number of output points setting value	The number of output points set by the rotary switch is stored.	R	-

7.3.7 [BFM#34, #35] Number of I/O points whose use is allowed by main unit

Different from the number of input points and number of output points set by the rotary switches of the 128ASL-M, the number of input points and number of output points allowed by the main unit are stored.
These values indicate the number of input points and number of output points which can be used by the AnyWireASLINK system.

BFM No.		Item	Description	R/W	Default (decimal)
decimal	hexa-decimal				
#34	#0022H	Number of input points allowed by main unit	The number of input points allowed by the main unit is stored.	R	-
#35	#0023H	Number of output points allowed by main unit	The number of output points allowed by the main unit is stored.	R	-

7.3.8   [BFM#4096 to #4103] Output information area

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

BFM No.		Bit No.															
decimal	hexa-decimal	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
#4096	#1000H	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
#4097	#1001H	31*1	30*1	29	28	27	26	25	24	23	22	21	20	19	18	17	16
#4098	#1002H	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
#4099	#1003H	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
#4100	#1004H	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
#4101	#1005H	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
#4102	#1006H	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
#4103	#1007H	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112

*1.   Ex. For a two-point output slave module (address: 30):
Two bits from b14 of BFM#4097 shown in the above table are occupied for the output signal because the setting address is 30. (BFM#4097 b14 and BFM#4097 b15)

Caution

When it is necessary to handle two or more bit data as a series of data, set the address of the slave module in such a way that they are assigned to the same buffer memory.

7.3.9   [BFM#8192] Number of the error IDs

Among the IDs of the connected modules, the number of error IDs that send no response due to disconnection of the transmission cables or a failure in the slave module alone is stored in BFM#8192.
The stored value is retained until the error flag clear command (b0 of BFM#27) is turned ON or the 128ASL-M is powered OFF and ON.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#8192	#2000H	The number of error IDs that send no response is stored. (0 to 128)	R	0

7.3.10   [BFM#8193 to #8320] Error ID information storage areas

When the transmission cables are disconnected or a slave module response error (error code: K202) occurs, up to 128 error IDs are stored in ascending order in BFM#8193 to #8320.
After the automatic address detection, the data are updated as soon as a response error is detected.
The stored value is retained until the error flag clear command (b0 of BFM#27) is turned ON or the 128ASL-M is powered OFF and ON.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#8193 to #8320	#2001H to #2080H	Error ID information is stored. (Up to 128 IDs) The error IDs are stored for the number of error IDs (BFM#8192) in ascending order. The IDs to be stored are as follows. 0000H to 007FH: ID of output slave modules 0200H to 027FH: ID of input slave modules or I/O combined slave modules The stored error IDs are cleared when the 128ASL-M is powered OFF and ON or the error flag clear command (b0 of BFM#27) is turned ON via program after the error is cleared.	R	0

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7.3.11 [BFM#8960] Number of the connected modules

The number of slave modules detected by the automatic address detection is stored in BFM#8960.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#8960	#2300H	The number of slave modules is stored. (Up to 128 modules)	R	-

7.3.12 [BFM#9216] Number of IDs of connected modules

The number of IDs of connected modules is stored in BFM#9216 by the automatic address detection.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#9216	#2400H	The number of IDs of connected modules is stored. (Up to 128 IDs)	R	-

7.3.13 [BFM#9217 to #9344] Connected module ID information storage areas

Up to 128 IDs of connected slave modules are stored in ascending order in BFM#9217 to #9344.
The ID information is updated after the 128ASL-M is powered ON and the automatic address detection is executed.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#9217 to #9344	#2401H to #2480H	Connected module ID information is stored. (Up to 128 IDs) IDs of all connected slave modules (BFM#9216) are stored in ascending order. The IDs to be stored are as follows. 0000H to 007FH: ID of output slave modules 0200H to 027FH: ID of input slave modules or I/O combined slave modules	R	-

7.3.14 [BFM#9984] Number of the alarm IDs

The number of IDs related to alarm occurrence is stored in BFM#9984.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#9984	#2700H	The number of IDs related to alarm occurrence is stored. (Up to 128 IDs)	R	0

7.3.15 [BFM#9985 to #10112] Alarm ID information storage areas

Up to 128 alarm IDs are stored in ascending order in BFM#9985 to #10112.
The ID information is updated after the 128ASL-M is powered ON and the automatic address detection is executed.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#9985 to #10112	#2701H to #2780H	Alarm ID information is stored. (Up to 128 IDs) IDs of all alarm slave modules (BFM#9984) are stored in ascending order. The IDs to be stored are as follows. 0000H to 007FH: ID of output slave modules 0200H to 027FH: ID of input slave modules or I/O combined slave modules	R	0

7.3.16 [BFM#10257] Latest error ID storage area

The error ID corresponding to the latest error code is stored in BFM#10257.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#10257	#2811H	The error ID corresponding to the latest error code is stored.	R	0

The table below shows the relationship between the error code and the error ID.

Error code		Description of error	Value of the error ID storage area
decimal	hexa-decimal		
100 to 103	0064H to 0067H	128ASL-M hardware error	- (Buffer memorys cannot be accessed.)
104	0068H	Main unit error	K4095 (0FFFH) Error contents without regard to the ID
200	00C8H	Transmission cable voltage drop error	
201	00C9H	DP/DN short error	
202	00CAH	DP/DN disconnection error	Error ID
300 301	012CH 012DH	Slave module hardware error	
302	012EH	Parameter access target module ID error	K4095 (0FFFH) Error contents without regard to the ID
303	012FH	Parameter value error	Error ID
304	0130H	Parameter access error	
305	0131H	Slave module status error	
400	0190H	Same ID used error	
401	0191H	No ID setting error	

7.3.17 [BFM#10320] Parameter access method setting

Specify in BFM#10320 the access method (data direction) for access to ASLINK parameters of an individual ID.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#10320	#2850H	Specify the parameter access method (data direction). Reading direction (Slave → Master): 0 (0000H) Writing direction (Master → Slave): 1 (0001H)	R/W	0

7.3.18 [BFM#10321] Parameter access target module ID specification

Specify in BFM#10321 the access target ID for access to ASLINK parameters of an individual ID.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#10321	#2851H	Specify parameter access target ID. Write one of the following to specify the ID. 0000H to 007FH: ID of output slave modules 0200H to 027FH: ID of input slave modules or I/O combined slave modules	R/W	0

7.3.19 [BFM#10496 to #10623, #11008 to #11135] Parameter storage location memory number

After the automatic address detection, the start number of the buffer memory which stores ASLINK parameters saved in each connected ID is stored.

The ASLINK parameter storage area for each ID is 48 words (including both the write area and the read area).

BFM No.		Description		R/W	Default (decimal)
decimal	hexa-decimal				
#10496	#2900H	Parameter storage location memory number (output)	Buffer memory start address for ASLINK parameters of the output slave module at the address 0 (ID: 0000H)	R	-
#10497	#2901H		Buffer memory start address for ASLINK parameters of the output slave module at the address 1 (ID: 0001H)		
• • •	• • •		• • •		
#10622	#297EH		Buffer memory start address for ASLINK parameters of the output slave module at the address 126 (ID: 007EH)		
#10623	#297FH		Buffer memory start address for ASLINK parameters of the output slave module at the address 127 (ID: 007FH)		
#10624 to #11007	#2980H to #2AFFH	Not used		-	-
#11008	#2B00H	Parameter storage location memory number (input/input and output)	Buffer memory start address for ASLINK parameters of the input slave module at the address 0 (ID: 0200H)	R	-
#11009	#2B01H		Buffer memory start address for ASLINK parameters of the input slave module at the address 1 (ID: 0201H)		
• • •	• • •		• • •		
#11134	#2B7EH		Buffer memory start address for ASLINK parameters of the input slave module at the address 126 (ID: 027EH)		
#11135	#2B7FH		Buffer memory start address for ASLINK parameters of the input slave module at the address 127 (ID: 027FH)		

Example:

When the automatic address detection detects an input slave module at address 0, an output slave module at address 10 and an output slave module at address 100, the start number of the buffer memory area for parameters of each slave module is set as listed in the table below.

BFM No.		Stores data	Description
decimal	hexa-decimal		
#10506	#290AH	12288[*1]	Buffer memory start address for ASLINK parameters of the output slave module at the address 10 (ID: 000AH)
#10596	#2964H	12336	Buffer memory start address for ASLINK parameters of the output slave module at the address 100 (ID: 0064H)
#11008	#2B00H	12384	Buffer memory start address for ASLINK parameters of the input slave module at the address 0 (ID: 0200H)

*1. When "12288" has been stored at the buffer memory address "#10506", it can be known that parameters of the output slave module at the address 10 have been stored at the buffer memory addresses "#12288 to #12335" (#3000H to #302FH).

Point

For the parameter storage location memory number of a non-existing ID, "0" is stored.

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7.3.20   [BFM#12288 to #18431] Parameter storage areas

ASLINK parameters of each ID are stored in BFM#12288 to #18431.

BFM No.		Description	R/W	Default (decimal)
decimal	hexa-decimal			
#12288	#3000H	Parameter storage areas 1 (48 words)	R/W	-
• • •	• • •			
#12335	#302FH			
#12336	#3030H	Parameter storage areas 2 (48 words)		
• • •	• • •			
#12383	#305FH			
• • •	• • •	• • •		
#18384	#47D0H	Parameter storage areas 128 (48 words)		
• • •	• • •			
#18431	#47FFH			

The parameter storage area of each ID has 48 words. Information of up to 128 parameters can be stored. The ID is displayed at the start address of each parameter area. A single storage area has 48 words and the data are sorted in ascending order of ID. When adding a slave module or changing the ID of a slave module, perform the automatic address detection again.

1) Details on the parameter storage area (48-word structure)
   The parameter storage area 1 (#12288 to #12335) is given as an example of the 48-word structure for parameters listed in the table below.

BFM No.		Description	
decimal	**hexa-decimal**		
#12288	#3000H	Module ID	AnyWireASLINK parameter Data direction: Slave → Master
#12289	#3001H	Device parameter 1	
#12290	#3002H	Device parameter 2	
#12291	#3003H	Device parameter 3	
#12292	#3004H	Device parameter 4	
#12293	#3005H	Device parameter 5	
#12294	#3006H	Device parameter 6	
#12295	#3007H	Device parameter 7	
#12296	#3008H	Device parameter 8	Device parameter (1 to 19)
#12297	#3009H	Device parameter 9	These parameters are unique to each slave module. The contents of the parameters vary depending on the type of slave module.
#12298	#300AH	Device parameter 10	
#12299	#300BH	Device parameter 11	
#12300	#300CH	Device parameter 12	Data direction: Master → Slave
#12301	#300DH	Device parameter 13	
#12302	#300EH	Device parameter 14	
#12303	#300FH	Device parameter 15	
#12304	#3010H	Device parameter 16	
#12305	#3011H	Device parameter 17	
#12306	#3012H	Device parameter 18	
#12307	#3013H	Device parameter 19	
#12308	#3014H	Device parameter 1	
#12309	#3015H	Device parameter 2	
#12310	#3016H	Device parameter 3	
#12311	#3017H	Device parameter 4	
#12312	#3018H	Device parameter 5	
#12313	#3019H	Device parameter 6	
#12314	#301AH	Device parameter 7	
#12315	#301BH	Device parameter 8	Device parameter (1 to 19)
#12316	#301CH	Device parameter 9	These parameters are unique to each slave module. The contents of the parameters vary depending on the type of slave module.
#12317	#301DH	Device parameter 10	
#12318	#301EH	Device parameter 11	
#12319	#301FH	Device parameter 12	Data direction: Slave → Master
#12320	#3020H	Device parameter 13	
#12321	#3021H	Device parameter 14	
#12322	#3022H	Device parameter 15	
#12323	#3023H	Device parameter 16	
#12324	#3024H	Device parameter 17	
#12325	#3025H	Device parameter 18	
#12326	#3026H	Device parameter 19	
#12327	#3027H	Status details	AnyWireASLINK parameter Data direction: Slave → Master
#12328	#3028H	Sensing level	
#12329	#3029H	Not used	-
#12330	#302AH		
#12331	#302BH	Bit-point pattern	AnyWireASLINK parameter Data direction: Slave → Master
#12332	#302CH	Unit code	
#12333	#302DH	Device version	
#12334	#302EH	Not used	-
#12335	#302FH		

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2) AnyWireASLINK parameters
These parameters are common to all slave modules connected to AnyWireASLINK, and the description and storage areas are common to all models.

Name	BFM No. decimal	Description
Module ID	12288 + (n × 48) (n: 0 to 127) 1st of 48 words	Indicates the slave module ID. • 0000H to 007FH: ID of output slave modules • 0200H to 027FH: ID of input slave modules or I/O combined slave modules

Status details	12327 + (n × 48) (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 the ON or OFF of each bit as below.
		
		b15 •••••••• b6 b5 b4 b3 b2 b1 b0
		6) 5) 6) 4) 3) 2) 1)
		
		1) Module power supply status (Status of DP, DN side) (b0)
		   ON: Slave module voltage drop
		   OFF: No fault
		2) Sensing level status (b1)
		   ON: Sensing level drop
		   OFF: No fault
		3) I/O disconnection (b2)
		   ON: I/O disconnection
		   OFF: No fault
		4) I/O short-circuit (b3)
		   ON: I/O short-circuit
		   OFF: No fault
		5) I/O power supply status (Status of 24V, 0V side) (b5)
		   ON: I/O power supply drop
		   OFF: No fault
		6) Differs for each slave module (b4, b6 to b15)
		   Refer to the manual of the slave module.

Sensing level	12328+ (n × 48) (n: 0 to 127) 41th of 48 words	Indicates the sensing level of the slave module. Refer to the manual of each slave module because the specification differs depending on the slave module.

Bit-point pattern	12331 + (n × 48) (n: 0 to 127) 44th of 48 words	b15 •••••••• b8 b7 b6 b5 •••••••• b0
		3) 2) 1)
		
		1) Number of occupied bit points (b0 to b5)
		  • 0 to 63 (00H to 3FH): Number of bit points occupied by the slave module[1]
		    (Example) 0: Number of occupied bit points is 1
		               7: Number of occupied bit points is 8
		2) I/O type (b6, b7)
		  • 0: Input slave
		  • 1: Output slave
		  • 2: I/O combined slave
		3) System area (b8 to b15)
		(Example) 0001H: Indicates the input slave module of 2 input points.
		        0043H: Indicates the output slave module of 4 output points.
		        0087H: Indicates the I/O combined slave module of 4 input points and 4 output points.

Unit code	12332 + (n × 48) (n: 0 to 127) 45th of 48 words	Indicates the module model number of the slave module. For the module model number of each slave module, refer to the web site of Anywire Corporation or the manual of the slave module.
Device version	12333 + (n × 48) (n: 0 to 127) 46th of 48 words	Indicates the device version of the slave module.

*1. The read value+1 is the number of occupied bit points. For the I/O combined slave module, the number of points is a value adding the number of input points and the number of output points.

8. Program Examples

8.1 Basic Program Example

System configuration
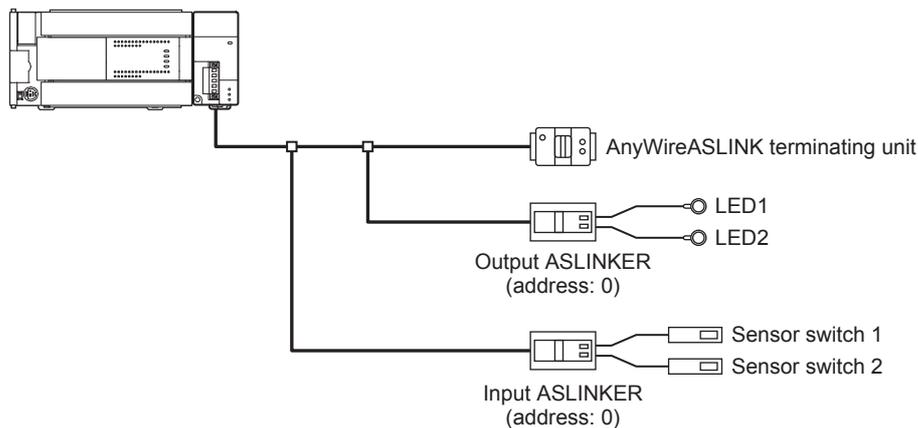
Program explanation

The input signals of the input ASLINKER, stored in input information area (BFM#0 to 3) of the 128ASL-M, are batch-transferred to the device data of the main unit.

Moreover, the device data of the main unit is batch-transferred to output information area (BFM#4096 to 4099) of the 128ASL-M, and the output signals of the output ASLINKER are transmitted.

Set the number of transmission points.

Input rotary switch: 7 (64 points)
Output rotary switch: 7 (64 points)

Devices used by users

Device	Description
M0	Module READY
M1	DP/DN short error
M3	Transmission cable voltage drop error
M4	DP/DN disconnection error
M2000 to M2063	Input data
M3000 to M3063	Output data
M100	Program starting contact
T0	Timer contact after module READY
BFM#0	Start number of input information area
BFM#4096	Start number of output information area

Program example
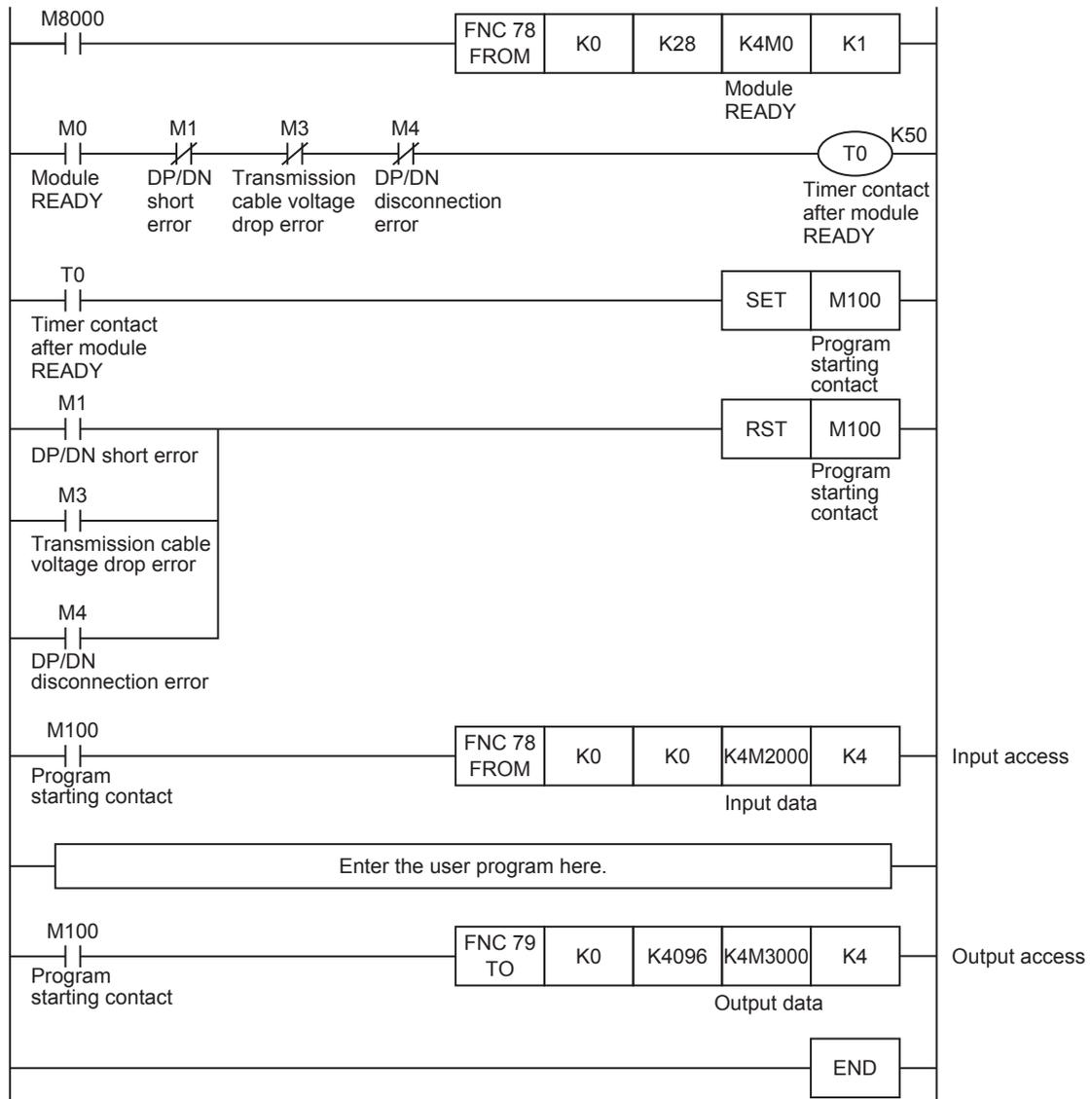
8.2 Error Flag Clear Command Output Program Example

Program explanation
This is an example of the sample program for clearing errors using the error flag clear command (b0 of BFM#27).

Devices used by users

Device	Description
M0	Error clear execution condition
M1	Error clear execution
M2	Error flag clear reset
D0	Data access command (BFM#27) save area
T0	Error flag clear execution waiting time (100 ms)

Program example

Ladder	Description
M0 — FNC 78 FROM, K0, K27, D0, K1	The error clear execution condition is established, and M0 turns ON. The value of BFM#27 is saved to D0.
FNC 26 WAND, D0, HFFFE, D0	b0 (corresponding to the error flag clear command of BFM#27) of D0 is turned OFF.
FNC 79 TO, K0, K27, D0, K1	The value of D0 is input to BFM#27. (b0 is turned OFF.)
FNC 27 WOR, D0, H0001, D0	b0 of D0 is turned ON.
SET M1	M1 is turned ON, and error clear is executed.
RST M0	M0 is turned OFF.
M1 — FNC 79 TO, K0, K27, D0, K1	M1 turns ON, and the value of D0 is input to BFM#27. (b1 turns ON, and error clear is executed).
T0 (K1)	The error clear execution time is secured by the timer T0. (The setting value of the timer should be 100 ms or more).
T0 — FNC 26 WAND, D0, HFFFE, D0	After the timer T0 completes counting-up, b0 of D0 is turned OFF. (The error flag clear command is reset).
SET M2	M2 is turned ON, and reset of the error flag clear command is executed).
RST M1	M1 is turned OFF.
M2 — FNC 79 TO, K0, K27, D0, K1	M2 turns ON, and the value of D0 is input to BFM#27. (b1 turns OFF, and the error flag clear command is reset).
RST M2	M2 is turned OFF.
END	

8.3   Automatic Address Detection Command Output Program Example

Program explanation

This is an example of the sample program for executing the automatic address detection using the automatic address detection command (b1 of BFM#27).

Devices used by users

Device	Description
M0	Automatic address detection command execution condition
M1	Automatic address detection command execution
M2	Automatic address detection reset
D0	Data access command (BFM#27) save area
D1	Error flag clear execution waiting time (100 ms)

Program example

Ladder	Explanation
M0 —— FNC 78 FROM | K0 | K27 | D0 | K1	The automatic address detection execution condition is established, and M0 turns ON. The value of BFM#27 is saved to D0.
FNC 26 WAND | D0 | HFFFD | D0	b1 (corresponding to the automatic address detection command of BFM#27) of D0 is turned OFF.
FNC 79 TO | K0 | K27 | D0 | K1	The value of D0 is input to BFM#27. (b1 is turned OFF.)
FNC 27 WOR | D0 | H0002 | D0	b1 of D0 is turned ON.
SET | M1	M1 is turned ON, and automatic address detection is executed.
RST | M0	M0 is turned OFF.
M1 —— FNC 79 TO | K0 | K27 | D0 | K1	M1 turns ON, and the value of D0 is input to BFM#27. (b1 turns ON, and automatic address detection is executed).
FNC 78 FROM | K0 | K28 | D1 | K1	The value of BFM#28 (status information) is saved to D1.
FNC 26 WAND | D1 | H0800 | D1	All bits except b11 of D1 are turned OFF.
FNC232 AND= | D1 | K0 —— SET | M2	The value of D1 is judged. When it is "0" (b11 of D1 is OFF. → The automatic address detection state flag is reset.), M2 is turned ON.
M2 —— FNC 26 WAND | D0 | HFFFD | D0	M2 is turned ON, and b1 of D0 is turned OFF.
FNC 79 TO | K0 | K27 | D0 | K1	The value of D0 is input to BFM#27. (b1 turns OFF, and the automatic address detection command is reset).
RST | M1	M1 is turned OFF.
RST | M2	M2 is turned OFF.
END	

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STARTUP AND MAINTENANCE PRECAUTIONS	⚠ WARNING

- Do not touch any terminal while the PLC's power is on.
  Doing so may cause electric shock or malfunctions.
- Before cleaning or retightening terminals, cut off all phases of the power supply externally.
  Failure to do so may cause electric shock.
- Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation.
  An operation error may damage the machinery or cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS	⚠ CAUTION

- Do not disassemble or modify the PLC.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric representative.
- Turn off the power to the PLC before connecting or disconnecting any extension cable.
  Failure to do so may cause equipment failures or malfunctions.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause equipment failures or malfunctions.
  - Peripheral devices, display module, expansion boards, and special adapters
  - Input/output extension units/blocks, FX Series terminal blocks, and the special function units/blocks
  - Battery and memory cassette

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9.1   LED Diagnosis of 128ASL-M

LED display	Status	Description	Corrective action
POWER	ON	5 V DC is being supplied from the PLC.	The power supply is normal.
POWER	OFF	Unit error or 5 V DC is not being supplied from the PLC.	• Correctly connect the extension cable. • Check that there is no disconnection or poor contact in the extension cable. • Properly supply the power of the PLC. • When the service power supply of the PLC main units used, make sure that the supply capacity is not exceeded. • When both the connection status and the PLC main unit are all right, the hardware may have failed. For repair, contact your local Mitsubishi Electric representative.
LINK	ON	Unit error	• Check the wiring in the AnyWireASLINK system. • Properly supply the external power for communication. • When both the wiring and the external power supply for communication are all right, the hardware may have failed. For repair, contact your local Mitsubishi Electric representative.
LINK	Flicker	Operating normally	Communication is normal.
LINK	OFF	Unit error or 5 V DC power OFF	• Check the wiring in the AnyWireASLINK system. • Properly supply the external power for communication. • Correctly connect the extension cable. • Properly supply the power of the PLC. • When both the wiring and the external power supply for communication are all right, the hardware may have failed. For repair, contact your local Mitsubishi Electric representative.
SET	ON	Automatic address detection in progress	The automatic address detection is in progress.
SET	Flicker	Writing in the EEPROM	Data is being written to the EEPROM.
SET	OFF	Operating normally	The system is operating normally.
ALM	ON	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 have failed or the system configuration may have been changed after the automatic address detection. Check error ID information in the buffer memory, identify the disconnected area, and perform the following: • Check that the transmission cables (entire cables) are free from disconnection. Also check that the cables have been crimped with proper pin assignment using link connectors appropriate for the cross-sectional area. • Check that the signal cables are properly connected to the terminal block of the 128ASL-M. In addition, check that there is no incorrect wiring and that 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 the automatic address detection is performed, 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.
ALM	Slow flicker (one-second intervals)	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 assignment 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 128ASL-M and the slave module. • Correct the cables (cross-sectional area, 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 128ASL-M.

LED display	Status	Description	Corrective action
ALM	Fast flicker (0.2-second intervals)	Transmission cable voltage drop error	The voltage of the external power supply may be insufficient. Perform the following: • Adjust the power supply voltage of the external power supply within the rated value (21.6 V DC to 27.6 V DC). • Check that the power cables (24 V, 0 V) are not disconnected or short-circuited. When crimping the link connector, check that the pin assignment is correct. • Check that the external power supply is properly connected to the terminal blocks of the 128ASL-M and the slave module. Check that there is no short circuit or incorrect wiring, and screws are tightened sufficiently.
	OFF	Operating normally	The system is operating normally.

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9.2 Error Codes

When an error occurs, the error contents can be checked by the error code (BFM#29).
After removing the error cause, clear the error code by turning OFF the power supply or by error flag clear command (BFM#27 b0).

Error code		Description of error	Cause and corrective action	Priority
decimal	hexa-decimal			
100 to 103	0064H to 0067H	128ASL-M hardware error	A malfunction has been detected in the 128ASL-M hardware. Check the status of the main unit, and power it OFF and ON. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	1 (high)
104	0068H	Main unit error	A data access error related to the main unit and 128ASL-M has been detected. Check the status of the main unit, and power it OFF and ON. Check that there is no influence from noise. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	2
200	00C8H	Transmission cable voltage drop error	The voltage of the external power supply may be insufficient. Perform the following: • Adjust the power supply voltage of the external power supply within the rated value (21.6 V DC to 27.6 V DC). • Check that the power cables (24 V, 0 V) are not disconnected or short-circuited. When crimping the link connector, check that the pin assignment is correct. • Check that the external power supply is properly connected to the terminal blocks of the 128ASL-M and the slave module. Check that there is no short circuit or incorrect wiring, and screws are tightened sufficiently.	3
201	00C9H	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 assignment 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 128ASL-M and the slave module. • Correct the cables (cross-sectional area, 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 128ASL-M.	4
202	00CAH	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 have failed or the system configuration may have been changed after the automatic address detection. Check error ID information in the buffer memory, identify the disconnected area, and perform the following: • Check that the transmission cables (entire cables) are free from disconnection. Also check that the cables have been crimped with proper pin assignment using link connectors appropriate for the cross-sectional area. • Check that the signal cables are properly connected to the terminal block of the 128ASL-M. In addition, check that there is no incorrect wiring and that 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 the automatic address detection is performed, 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.	5
300 301	012CH 012DH	Slave module hardware error	A malfunction has been detected in the slave module hardware. Check the status of the main unit or slave module, and power it OFF and ON. Check that there is no influence from noise. If the error occurs again, the 128ASL-M may have failed. Please consult your local Mitsubishi representative.	6

Error code		Description of error	Cause and corrective action	Priority
decimal	hexa-decimal			
302	012EH	Parameter access target module ID error	The 128ASL-M accessed the parameter of an 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 +200H. • 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 the automatic address detection is performed, check that the number of slave modules and the addresses are consistent with those of the actual system.	6
303	012FH	Parameter value error	The slave module has detected a parameter write value that cannot be set to the slave module itself. Use Number of alarm IDs (BFM#9984) and alarm ID information storage areas (BFM#9985 to BFM#10112) to identify the error ID. Then check that the slave module parameter setting value is within the allowable setting range.	6
304	0130H	Parameter access error	An ASLINK parameter access signal error has been detected. Check that there is no influence from noise.	6
305	0131H	Slave module status error	The slave module has notified of error status. Check the target module's status details and solve the problem.	6
400	0190H	Same ID used error	The same address (ID) has been set to some of the connected slave modules. Use Number of alarm IDs (BFM#9984) and alarm ID information storage areas (BFM#9985 to BFM#10112) to identify the error ID. Check the address (ID) of the slave module, then set a unique number.	6
401	0191H	No ID setting error	There is a slave module with no address setting. Perform the following: • Set the address of the slave module. • Set the address of the slave module to a value other than 255.	6

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9.3 Diagnostics on the PLC Main Unit

The following describes some of the PLC errors from the LED lights ON the PLC.
For details related to the PLC main unit wiring, special auxiliary relays, and special data registers, refer to the Hardware Edition manual of the connected PLC.

9.3.1 POWER (POW) LED [ON/Flicker/OFF]

The table below describes details for the LED statuses.

LED Status	PLC Status	Error corrective action
ON	Power of the specified voltage is being supplied to the power supply terminal.	The power supply is normal.
Flicker	One of the following causes may have occurred. • Power and current of the specified voltage is not being supplied to the power supply terminal. • Incorrect external wiring. • Internal errors in the PLC.	• Check the supply voltage. • After disconnecting cables other than the power cable, turn the power ON again, and check for changes in the state. If no improvement is obtained, consult your local Mitsubishi Electric representative.
OFF	One of the following causes may have occurred. • The power supply is OFF. • Incorrect external wiring. • Power of the specified voltage is not being supplied to the power supply terminal. • The power cable is broken.	• If the power is not OFF, check the power supply and the power supply route. If power is being supplied correctly, consult your local Mitsubishi Electric representative. • After disconnecting cables other than the power cable, turn the power ON again, and check for changes in the state. If no improvement is obtained, consult your local Mitsubishi Electric representative.

9.3.2 ALM LED, BATT (BAT) LED [ON/OFF]

The table below describes details for the ALM LED statuses of the FX3G/FX3GC PLC.
This LED is valid when the optional battery is installed and the battery mode is selected using a parameter.

LED Status	PLC Status	Error corrective action
ON	The battery voltage is low.	Immediately replace the battery.
OFF	The battery voltage is higher than the value with D8006.	Normal.

The table below describes details for the BATT (BAT) LED statuses of the FX3U/FX3UC PLC.

LED Status	PLC Status	Error corrective action
ON	The battery voltage is low.	Immediately replace the battery.
OFF	The battery voltage is higher than the value with D8006.	Normal.

9.3.3 ERROR (ERR) LED [ON/Flicker/OFF]

The table below describes details for the LED statuses.

LED Status	PLC Status	Error corrective action

ON	A watchdog timer error may have occurred, or the hardware of the PLC may be damaged.	1) Stop the PLC, and turn the power ON again.
		   If the ERROR (ERR) LED goes out, a watchdog timer error may have occurred. Adopt any of the following measures:
		   - Review the program.
		     Set the maximum value (D8012) lower than the watchdog timer value.
		   - Check that the input used for input interrupt or pulse catch is not being abnormally turned ON and OFF in one scan.
		   - Check that the frequency of the pulse (duty 50%) input to the high-speed counter is not exceeding the specified range.
		   - Add WDT instructions.
		     Add some WDT instructions to the program, and reset the watchdog timer several times in one scan.
		   - Change the watchdog timer value.
		     Change the watchdog timer setting (D8000) in the program so that the setting is larger than the maximum value of the scan time (D8012).
		2) Remove the PLC and supply the power to it from another power source.
		   If the ERROR (ERR) LED goes out, noise may have affected the PLC. Adopt the following measures:
		   - Check the ground wiring, and re-examine the wiring route and installation location.
		   - Fit a noise filter onto the power supply line.
		3) If the ERROR (ERR) LED does not go out even after measures in 1) and 2) are adopted, consult your local Mitsubishi Electric representative.

Flicker	One of the following errors has occurred on the PLC: • Parameter error • Syntax error • Ladder error	Perform PLC diagnosis and program check with the programming tool.
OFF	No errors to stop the PLC have occurred.	If the operations of the PLC are abnormal, perform PLC diagnosis and program check with the programming tool. An I/O error, parallel link/communication error, or operation error may have occurred.

9.4 Diagnostics by GX Works2

Some functions of GX Works2 are available to check the status of the 128ASL-M, status of slave modules and others.
For details of GX Works2 operation, refer to the following manual.

→ **GX Works2 Version 1 Operating Manual (Common)**
→ **GX Works2 Version 1 Operating Manual (Intelligent Function Module)**

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Appendix A: Version Information

Appendix A-1 Version check method

The version of 128ASL-M can be checked by the following method.

1. Checking the nameplate

The version of the 128ASL-M is shown as "S/N" indicated on the label adhered to the right side of the product.
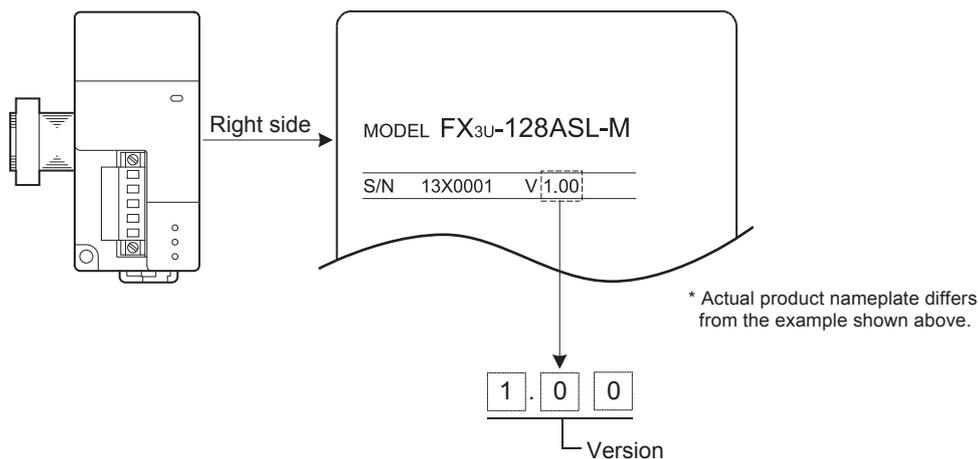
Appendix A-2 Version upgrade history

The table below lists the version upgrade history of the 128ASL-M.

Version	Contents of version upgrade
Ver.1.00	First product

MEMO

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. Relay failure or output contact failure caused by usage beyond the specified Life of contact (cycles).
6. 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.
7. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
8. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

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

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

3. Overseas service

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

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

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

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

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

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

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

5. Changes in product specifications

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

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.

In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.

However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

Revised History

Date	Revision	Description
11/2013	A	First Edition
3/2014	B	UL/cUL standards compliance is added.
1/2015	C	Partial correction
4/2015	D	A part of the cover design is changed.
3/2018	E	• The contents of parameter reading/writing function are changed. • Errors are corrected.
4/2020	F	Buffer memory is added.

FX3U-128ASL-M

USER'S MANUAL

MODEL	FX3U128ASLM-U-E
MODEL CODE	09R731