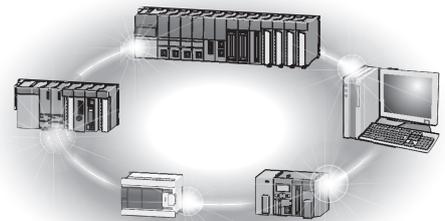


# Mitsubishi Programmable Controller

## CC-Link-AnyWire DB A20 Bridge Module User's Manual

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-NZ2AW1C2D2



Powered by  
**Anywire**

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

***AnyWire DB A20***



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## PRECAUTIONS REGARDING WARRANTY AND SPECIFICATIONS

The NZ2AW1C2D2 was jointly developed and manufactured by Mitsubishi and Anywire Corporation.  
Note that there are some precautions regarding warranty and specifications of this product.

<Warranty>

Item	NZ2AW1C2D2	Other programmable controller products (e.g.: MELSEC-Q series)
Repair term after discontinuation of production	1 year	7 years

<Application of the EMC Directive>

Item	NZ2AW1C2D2	Other programmable controller products (e.g.: MELSEC-Q series)
Applicable EMC standard	EN61131-2* <sup>1</sup>	EN61131-2

\*<sup>1</sup> The module with a serial number where the sixth digit is "3" or later complies with this standard.

<Application of the UL/cUL standards>

Item	NZ2AW1C2D2	Other programmable controller products (e.g.: MELSEC-Q series)
Applicable UL standard/cUL standard	UL508* <sup>2</sup> CSA22.2* <sup>2</sup>	UL508 CSA22.2

\*<sup>2</sup> The module with a serial number where the sixth digit is "3" or later complies with this standard.

# ● SAFETY PRECAUTIONS ●

(Read these precautions before using this product.)

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

The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.

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



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

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

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

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

## [Design Precautions]

### ⚠ WARNING

- An AnyWire DB A20 system has no control function for ensuring safety.
- When a communication failure occurs in the network, data in the master module 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.

## [Design Precautions]

### ⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Configure safety circuits, such as an emergency stop circuit and interlock circuit, external to the AnyWire DB A20 system.

## [Installation Precautions]

### CAUTION

- Use the module in an environment that meets the general specifications in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Securely fix the module with a DIN rail.
- Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.

## [Wiring Precautions]

### CAUTION

- Shut off the external power supply (all phases) used in the system before wiring. Failure to do so may cause the module to fail or malfunction.
- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Tighten the terminal screw within the specified torque range. Undertightening can cause short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- Incorrect wiring may damage modules and external devices. Adjust a cable length and a module position to prevent disconnection of a connector type terminal block or a cable.
- Do not solder stranded wires of a cable when connecting them to the terminal block. Doing so may cause poor contact.
- The power supply voltage of remote slave modules may be insufficient due to a voltage drop in the power supply line. Connect an external power supply so that the voltage of remote slave modules is ensured.
- Do not apply the 24VDC power before wiring the entire AnyWire DB A20 system. If the power is applied before wiring, normal data transmission is not guaranteed.
- Connect a 24VDC external power supply to the device in an AnyWire DB A20 system.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.

## [Wiring Precautions]

### CAUTION

- When disconnecting the cable from the module, do not pull the cable by the cable part. When disconnecting a cable connected to a terminal block, loosen the screws on the terminal block first before removing the cable. If a cable is pulled while being connected to the module, it may cause the module to malfunction or damage the module and the cable.

## [Startup and Maintenance Precautions]

### WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws or module fixing screws. Failure to do so may result in electric shock. Undertightening the terminal screws can cause short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

## [Startup and Maintenance Precautions]

### CAUTION

- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may cause the module to fail or malfunction.
- After the first use of the product, do not mount/remove the terminal block to/from the module more than 50 times (IEC 61131-2 compliant). Exceeding the limit may cause malfunction.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

## [Disposal Precautions]

### CAUTION

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

# ● CONDITIONS OF USE FOR THE PRODUCT ●

- 1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
  - i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
  - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- 2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

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

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

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

# COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

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## (1) Method of ensuring compliance

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

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

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

## (2) Additional measures

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

 Page 61, Appendix 1

# Memo

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# TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
AnyWire DB A20	This system provides a high-speed and highly-reliable sensor network. An original transmission system provided by Anywire Corporation. The full-duplex transmission mode enables a high-speed and long-distance communication.
Buffer memory	A memory in an intelligent function module, where data (such as setting values and monitoring values) exchanged with a CPU module are stored
GX Developer	The product name of the software package for the MELSEC programmable controllers
GX Works2	
Intelligent function module	A Q-series module other than CPU modules, power supply modules, and I/O modules, which is mounted on a base unit
Master module	A module that controls a data link system. One master module is required for one system.
NZ2AW1C2D2	The abbreviation for the CC-Link-AnyWire DB A20 bridge module, NZ2AW1C2D2
Programming tool	A generic term for GX Works2 and GX Developer
Remote I/O module	A remote module that exchanges I/O signals (bit data) with an external device
RWr	Remote register (read area for CC-Link). Information input in 16-bit units from the slave station to the master station.
RWw	Remote register (write area for CC-Link). Information output in 16-bit units from the master station to the slave station.
RX	Remote input (for CC-Link). Information input in bit units from the slave station to the master station.
RY	Remote output (for CC-Link). Information output in bit units from the master station to the slave station.
Slave module	A generic term for modules that communicate data with a bridge module
Terminating unit	A waveform shaper
Transmission cycle time	A data sampling interval

# CHAPTER 1 OVERVIEW

This manual describes the specifications, part names, and settings of the NZ2AW1C2D2 CC-Link–AnyWire DB A20 bridge module (hereafter abbreviated as the NZ2AW1C2D2) used as a remote device station in the CC-Link Ver 2.00 system.

This module, a product of the joint development project with Anywire Corporation, allows the AnyWire DB A20 system to connect with CC-Link.

The AnyWire DB A20 system provides a high-speed and highly reliable sensor network system.

## (1) Features of the NZ2AW1C2D2

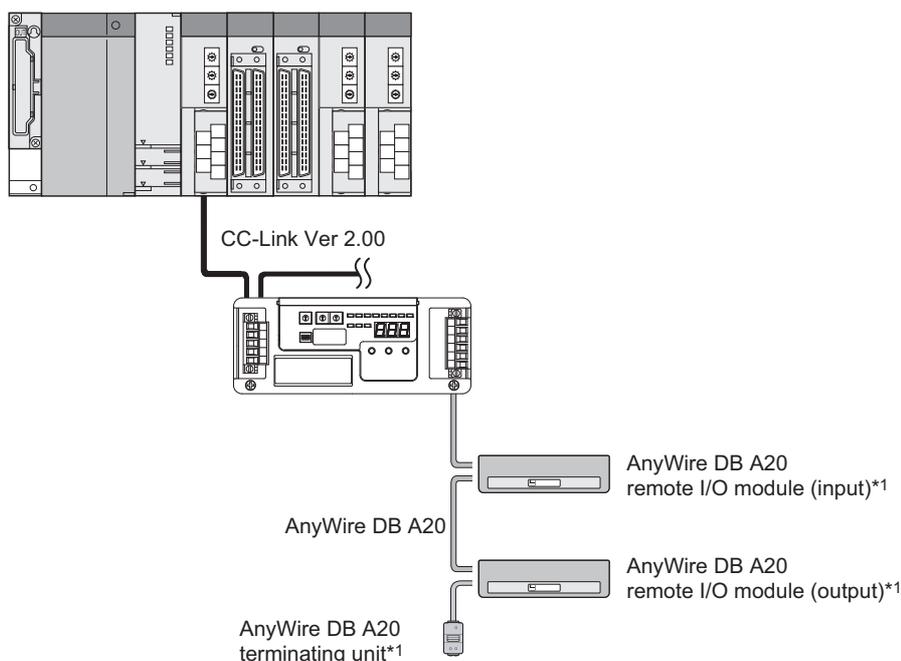
The NZ2AW1C2D2 is a bridge module used for the connection between AnyWire DB A20 having the full-duplex transmission mode and CC-Link Ver 2.00.

The transmission distance can be selected from 50m, 200m, 1km, and 3km using the dip switch.

Disconnections can be detected even when the wiring is branched.

Up to 512 remote input points and 512 remote output points can be connected to one NZ2AW1C2D2 module.

MELSEC-Q series



\*1: Manufactured by Anywire Corporation

## (2) Configuration of the AnyWire DB A20 system

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

☞ Page 14, Section 2.2.1

# Memo

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# CHAPTER 2 SPECIFICATIONS

## 2.1 General Specifications

2

Item	Specifications					
Operating ambient temperature	0 to 55°C					
Storage ambient temperature	-25 to 75°C					
Operating ambient humidity	10 to 90%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	—	Frequency	Constant acceleration	Half amplitude	The number of sweeps
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, and Z directions
			8.4 to 150Hz	9.8m/s <sup>2</sup>	—	
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
8.4 to 150Hz	4.9m/s <sup>2</sup>		—			
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s <sup>2</sup> , 3 times each in X, Y, and Z directions)					
Operating atmosphere	No corrosive gas					
Operating altitude*1	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category*2	II or lower					
Pollution degree*3	2 or less					

- \*1 Do not use or store the programmable controller under pressure higher than the atmospheric pressure at sea level. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi representative.
- \*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
- \*3 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. In pollution degree 2, only non-conductive pollution occurs. A temporary conductivity caused by an accidental condensation may also occur occasionally.

2.1 General Specifications

## 2.2 Performance Specifications

### 2.2.1 Performance specifications

Classification	Item	Specifications			
CC-Link side	Station type	Remote device station			
	CC-Link version	Ver. 2.00			
	Extended cyclic settings	Double			
	Communication speed	10M/5M/2.5M/625K/156Kbps (switching by the transmission speed setting switch)			
	No. of occupied stations of CC-Link	4 stations (RX/RX number of occupied points: 224 points for each) (RWr/RWw 32/32)			
	No. of connectable modules	Up to 16			
	Connection location of the NZ2AW1C2D2	No restriction			
	Connection cable *1	CC-Link dedicated cable/High-performance CC-Link dedicated cable/Ver.1.10-compatible CC-Link dedicated cable			
AnyWire DB A20 side	Transmission clock	125kHz	31.3kHz	7.8kHz	2kHz
	Maximum transmission distance (total length)	50m	200m	1km	3km
	Number of connectable slave modules	Up to 128	Up to 128	Up to 128	Up to 32*2
	Transmission system	Total Frame Cyclic method with double-duplex mode			
	Connection type	Bus topology (Multidrop system, T-branch system, tree branch system)			
	Transmission protocol	Dedicated protocol (AnyWire DB A20)			
	Error control	Double-check system			
	No. of connected I/O points	Up to 1024 points (512 input points/512 output points)			
	RAS function	Disconnected transmission cable location detection function, transmission cable short detection function, transmission cable voltage drop detection function			
	Transmission cable (D, G)	<ul style="list-style-type: none"> <li>• UL-listed general-purpose 2-/4-wire cable (VCTF, VCT 0.75 to 1.25mm<sup>2</sup>, temperature rating: 70°C or higher)</li> <li>• UL-listed general-purpose wire (0.75 to 1.25mm<sup>2</sup>, temperature rating: 70°C or higher)</li> <li>• FK4-UL075-100 (Anywire) (0.75mm<sup>2</sup>, temperature rating: 90°C) (UL listed)</li> </ul> (Regardless of the type of the transmission cable, when the transmission distance exceeds 200m, use wires with a diameter of 0.9 to 1.25mm <sup>2</sup> .)			
	Power cable (24V, 0V)	<ul style="list-style-type: none"> <li>• UL-listed general-purpose 2-wire cable (VCTF, VCT 0.75 to 2.0mm<sup>2</sup>, temperature rating: 70°C or higher)</li> <li>• UL-listed general-purpose wire (0.75 to 2.0mm<sup>2</sup>, temperature rating: 70°C or higher)</li> <li>• FK4-UL075-100 (Anywire) (0.75mm<sup>2</sup>, temperature rating: 90°C) (UL listed)</li> </ul>			
Maximum no. of writes to EEPROM	Up to 100000 times				
Common	Power supply	Voltage	21.6 to 27.6VDC (24VDC -10% to +15%), ripple 0.5Vp-p or lower		
		Current	0.4 [A] (When 128 slave modules are connected and the load current is not included)		
	External dimensions	57mm (H) × 140mm (W) × 44mm (D)			
	Weight	0.18kg			

\*1 Ver.1.10- compatible CC-Link dedicated cable, CC-Link dedicated cable (Ver.1.00), and high-performance CC-Link dedicated cable cannot be used at the same time. If those cables are used at the same time, normal transmission is not guaranteed. In addition, use the terminating resistor according to the type of cable used.

\*2 Up to 64 modules can be connected within 2km.

## 2.2.2 Power supply sequence and handling of I/O data

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An incorrect input/output may occur depending on the procedure for supplying the power to the NZ2AW1C2D2 and the slave module. Pay attention to the following points.

- After the NZ2AW1C2D2 is turned on, do not make the access related to this module until the remote station's READY signal (RX(n+D)B) turns on.
- Supply the power according to the steps below.
  - 1. Turn on the programmable controller (CC-Link master module).**
  - 2. Turn on the bridge module (NZ2AW1C2D2).**
  - 3. Turn on the slave module (when the power supply is only for the slave module).**
  - 4. Before accessing the slave module, turn on the error reset request flag (for 500ms or longer) and turn it off.**

## 2.3 Applicable System

### 2.3.1 Applicable master module

Master modules that can be used are listed on the website of CC-Link Partner Association (CLPA).  
For the website of CC-Link Partner Association (CLPA), refer to the following.  
www.cc-link.org

### 2.3.2 Differences in parameter settings depending on the CC-Link version

The NZ2AW1C2D2 is a remote device station supporting CC-Link Ver.2.00.  
For the setting of "Mode" and "Station Information (Station Type)" of a Mitsubishi master module to which the NZ2AW1C2D2 is connected, use any of the following combinations.

#### (1) Parameter setting of the master module supporting CC-Link Ver.2.00

Master module	Parameter setting item	
	Mode setting <sup>*1</sup>	Station information (station type)
QJ61BT11N, L26CPU-BT, L26CPU-PBT, LJ61BT11, Q80BD-J61BT11N, Q81BD-J61BT11	Remote network-Ver.2 mode	Ver.2 remote device station
	Remote network-addition mode <sup>*2</sup>	Ver.2 remote device station
FX3U-16CCL-M	Remote network-Ver.2 mode	Ver.2-compatible remote device station
	Remote network-addition mode <sup>*2</sup>	
RJ61BT11	Remote network-Ver.1 mode	Ver.1 remote device station
	Remote network-Ver.2 mode	Ver.1 remote device station
		Ver.2 remote device station
	Remote device network-Ver.1 mode	Ver.1 remote device station
	Remote device network-Ver.2 mode	Ver.1 remote device station
Ver.2 remote device station		
Remote I/O net mode	—	

\*1 For the mode setting, refer to the user's manual of the master station used.

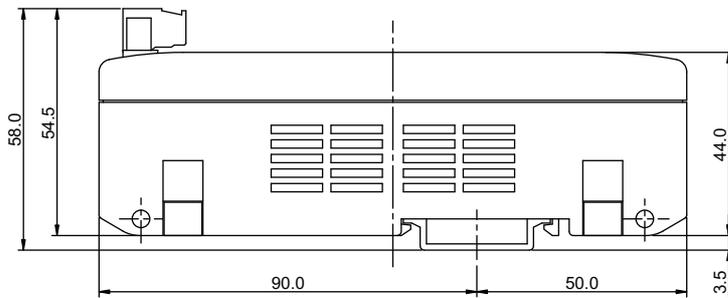
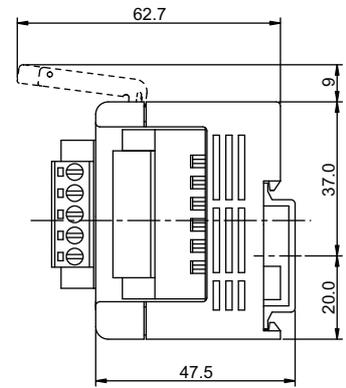
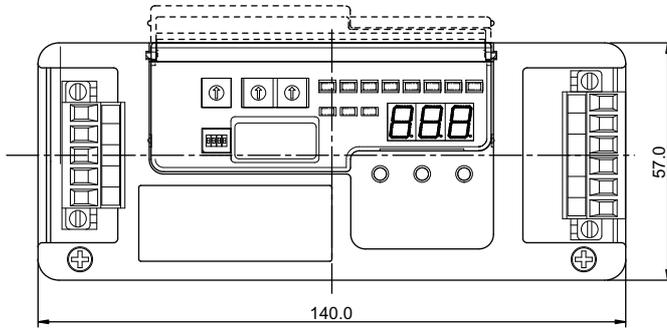
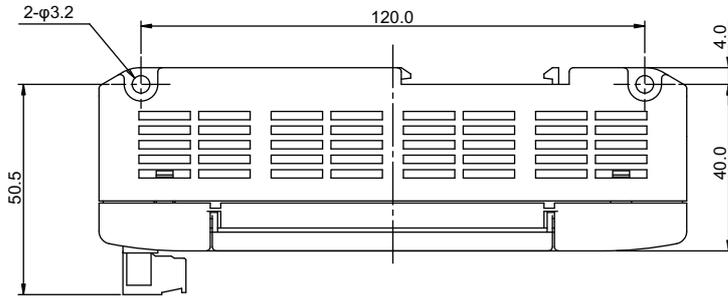
\*2 To add a station number of a Ver.2-compatible remote device station, add it after the station number used in the existing system.

### 2.3.3 CC-Link dedicated instruction

In the NZ2AW1C2D2, dedicated instructions accessing the NZ2AW1C2D2 from a CC-Link master module cannot be used.

# 2.4 External Dimensions

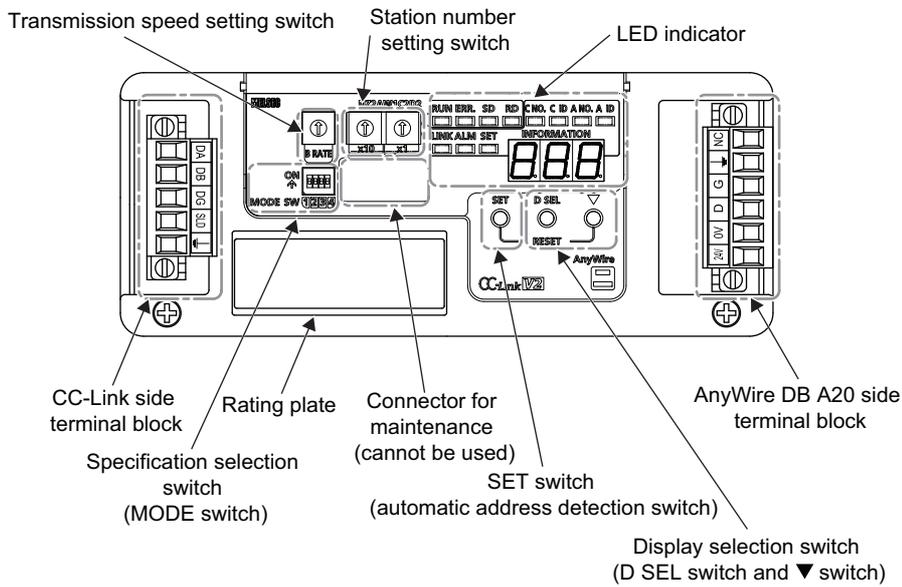
2



(Unit: mm)

2.4 External Dimensions

## 2.5 Part Names



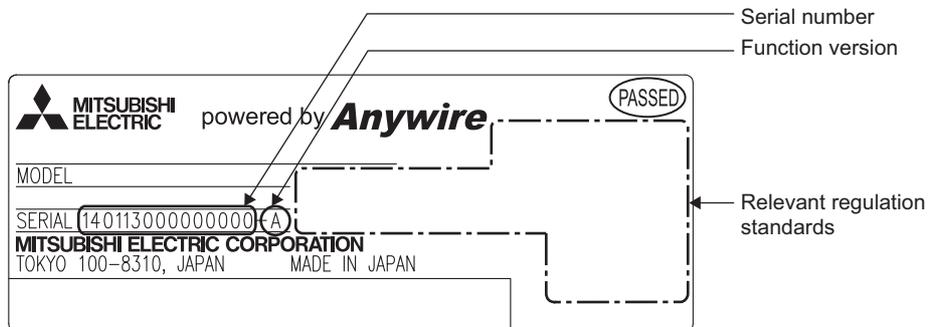
For details on each part, refer to the following.

- CC-Link side terminal block: Page 23, Section 4.1
- AnyWire DB A20 side terminal block: Page 25, Section 4.2
- Station number setting switch: Page 28, Section 5.1 (1)
- Transmission speed setting switch: Page 29, Section 5.1 (2)
- Specification selection switch: Page 30, Section 5.2 (1)
- Reset operation: Page 31, Section 5.3
- SET switch: Page 44, Section 9.1
- LED indicator: Page 41, Section 8.1 (1), Page 42, Section 8.1 (2)
- Display selection switch: Page 43, Section 8.1 (3)

## 2.6 Checking Function Version and Serial Number

### (1) Checking on the rating plate

The rating plate is on the front of the NZ2AW1C2D2.



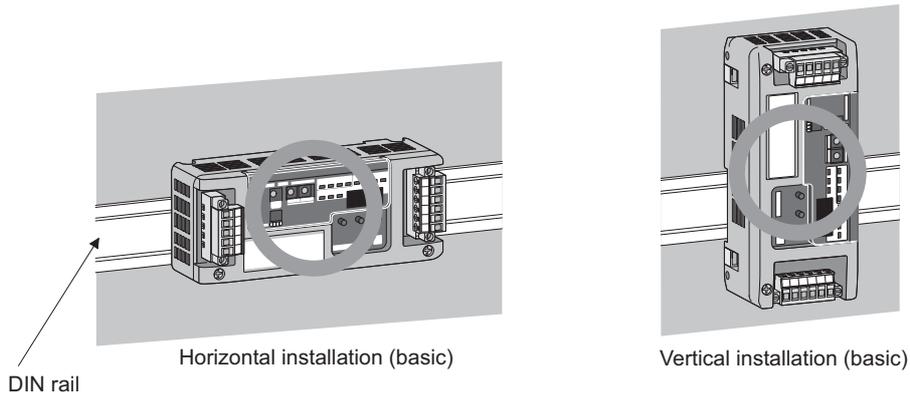
# CHAPTER 3 MODULE MOUNTING

Mount this module on a DIN rail before use.

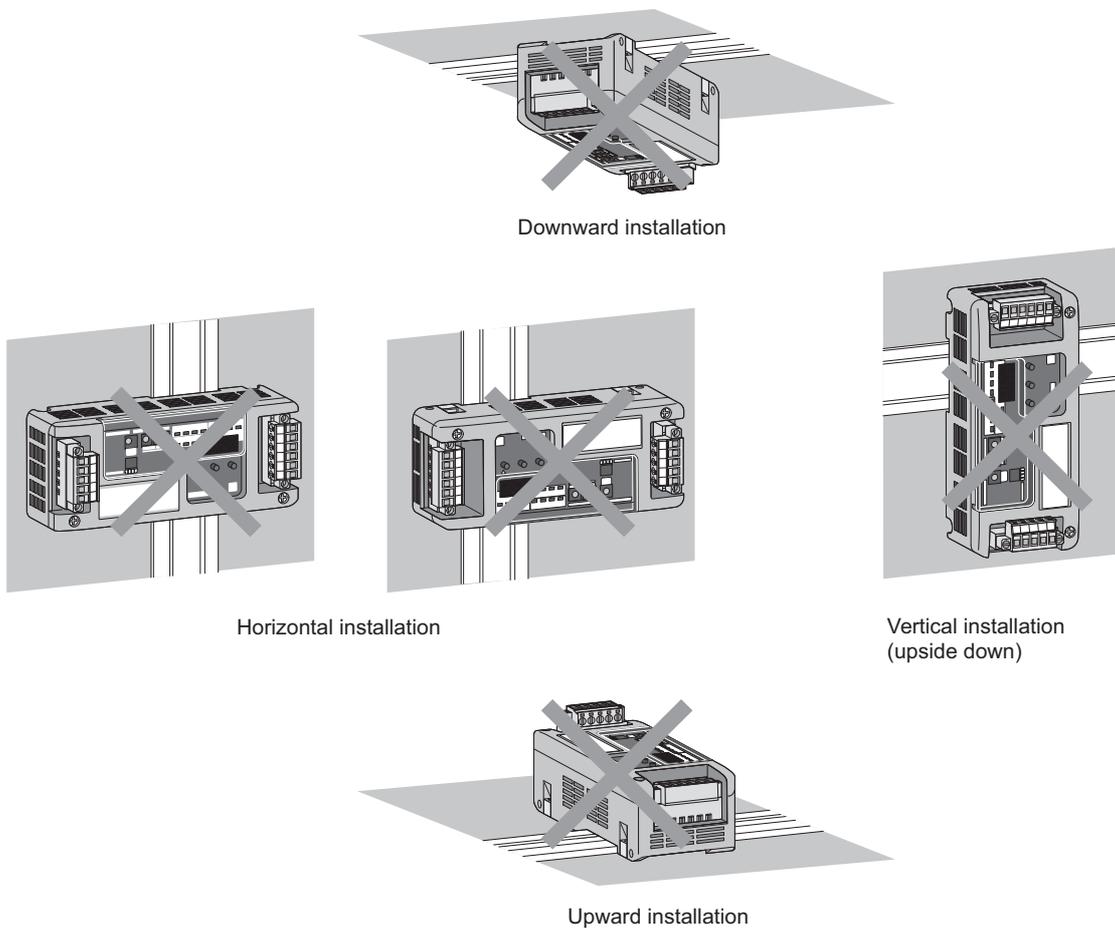
The module can be mounted in horizontal or vertical orientation.

## 3.1 Module Mounting Orientation

Since the NZ2AW1C2D2 radiates heat, place it in an airy place in the orientations shown below.

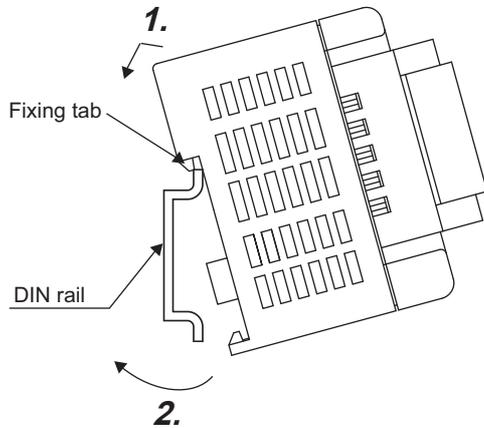


Do not place the module as shown below.



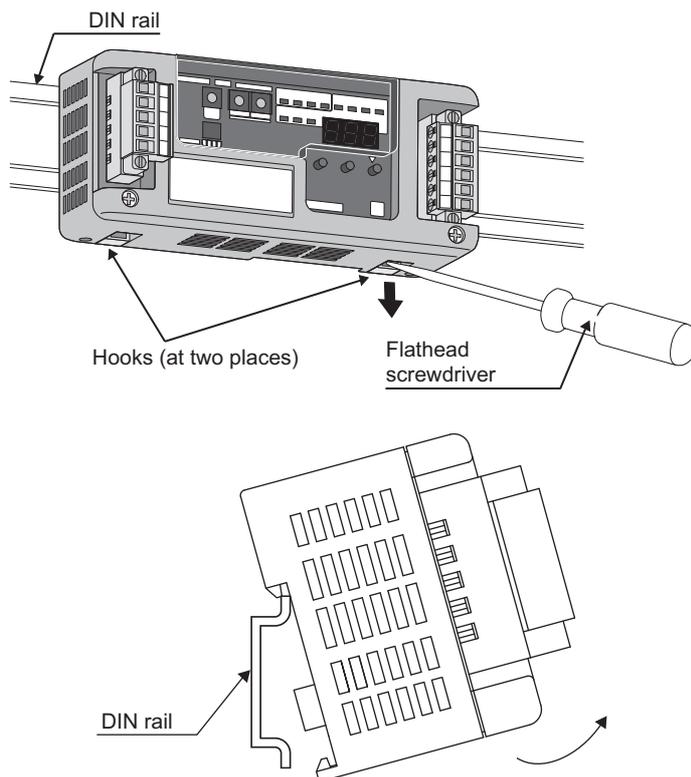
## 3.2 Mounting in Horizontal Orientation

### (1) Mounting on a DIN rail



1. Hook the upper fixing tab on the bottom of the module to the DIN rail.
2. Push and engage the NZ2AW1C2D2 in the DIN rail.

### (2) Removing from a DIN rail

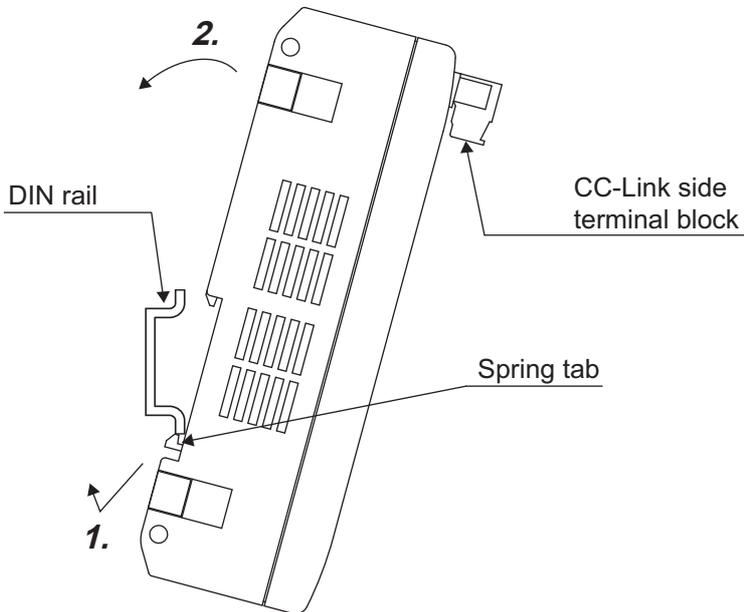


1. Insert a flathead screwdriver into the hook shown on the left and pull the hook downward to remove from the DIN rail (two hooks).
2. Lift the module on the hook side and remove it using the fixing tab as the supporting point.

## 3.3 Mounting in Vertical Orientation

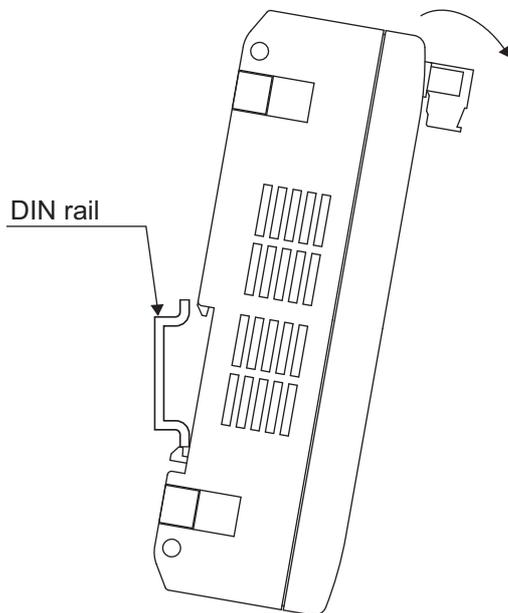
---

### (1) Mounting on a DIN rail



1. Hook the lower spring tab on the bottom of the module to the DIN rail.
2. Push and engage the NZ2AW1C2D2 in the DIN rail.

### (2) Removing from a DIN rail



1. Pull the upper side of the NZ2AW1C2D2 to remove it from the DIN rail.

---

### **Point**

When mounting the NZ2AW1C2D2 vertically, do not mount it in reverse orientation (with the CC-Link side terminal block placed down).

Doing so may cause the module to come off from the DIN rail due to vibration or other reasons.

---

# CHAPTER 4 CONNECTIONS

## Point

For compliance with the EMC and Low Voltage Directives, refer to the following.

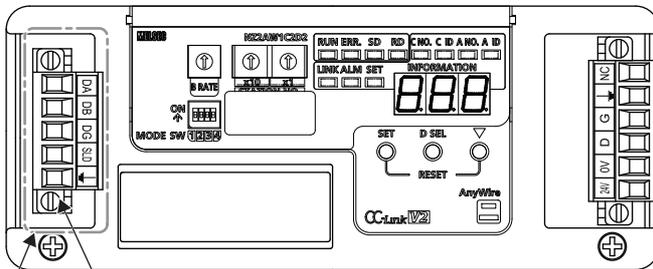
☞ Page 61, Appendix 1

Even when the compliance with the EMC and Low Voltage Directives is not required, use of an EMC-compliant configuration may reduce the influence from external noise.

## 4.1 CC-Link Side Terminal Block

4

The NZ2AW1C2D2 is handled as a remote device station on CC-Link. The CC-Link side terminal block is a connector-type terminal block which is easily connected and disconnected.



CC-Link side terminal block    Fixing screw

Manufacturer: PHOENIX CONTACT GmbH & Co. KG (Contact: [www.phoenixcontact.com](http://www.phoenixcontact.com))

Model: MSTB2,5/5-STF-5,08AU

Tightening torque: 0.2 to 0.3N·m

To tighten the connector, a flathead screwdriver having a tipped size of  $0.6 \times 3.5\text{mm}$  is required.

Before removing the CC-Link side terminal block, check that the fixing screws on both sides are completely loosened (removed from the socket).

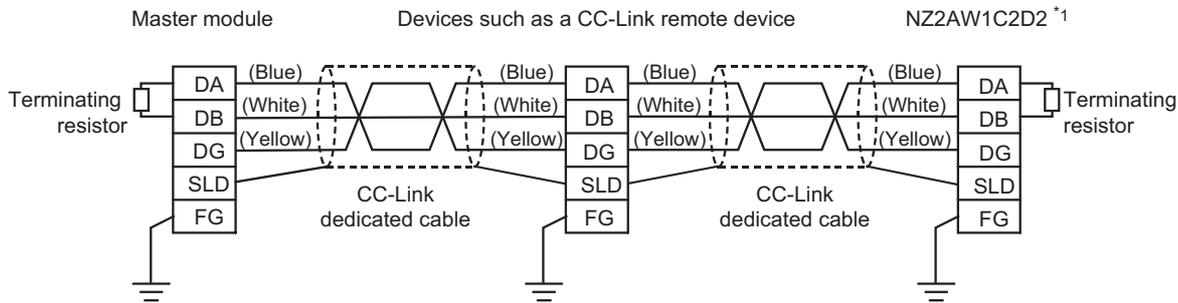
Pulling with excessive force while the fixing screws on both sides are still tightened may cause damage to the devices. Before connecting the connector, check that there are no short circuits due to the disconnected or frayed wires. Then tighten the screws at both sides securely. (Tightening torque: 0.2 to 0.3N·m)

## Point

The fixing screws are not tightened when shipped. Securely tighten the screws on both sides when connecting the terminal block.

## 4.1.1 Connecting a CC-Link dedicated cable

The connection example of the CC-Link dedicated cable is shown below.



\*1 SLD and FG are connected inside the module.

When the NZ2AW1C2D2 is the last station, mount a terminating resistor between DA and DB.

Users need to process the terminating resistor to be mounted on the NZ2AW1C2D2. Refer to the catalog or website of PHOENIX CONTACT GmbH & Co. KG.

If the terminating resistor is not mounted, communication on the CC-Link side may fail.

## 4.1.2 Cable processing

Bare cables can be connected to the CC-Link side terminal block; however, for safety reasons, it is recommended to connect cables using the bar solderless terminals.

For wiring, use the connection cables listed in the performance specifications and tighten them within the applicable tightening torque range. (☞ Page 14, Section 2.2.1)

Use UL-listed solderless terminals and for processing, use a tool recommended by their manufacturer.

For processing and installing the CC-Link dedicated cables, refer to "CC-Link Cable Wiring Manual" published by CC-Link Partner Association.

Recommended bar solderless terminals (manufactured by PHOENIX CONTACT GmbH & Co. KG)

- For crimping one wire to any of the DA, DB, or DG terminal: AI 0,5-8 WH
- For crimping one wire to the SLD terminal: AI 2,5-8 BU<sup>\*1</sup>
- For crimping two wires collectively to any of the DA, DB, or DG terminal: AI-TWIN 2×05-8 WH<sup>\*2</sup>
- For crimping two wires collectively to the SLD terminal: AI-TWIN 2×1,5-8 BK<sup>\*2\*3</sup>

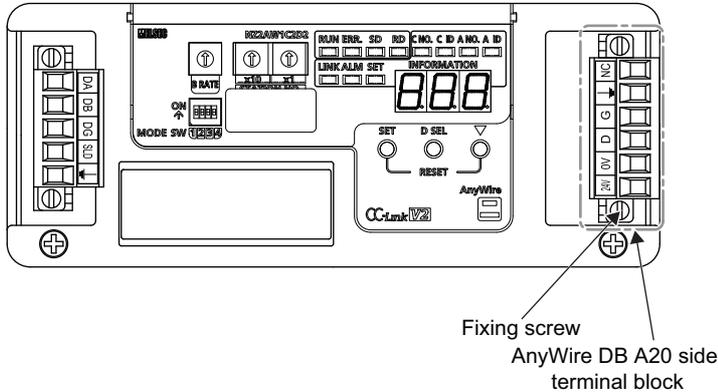
\*1 When crimping one SLD wire to the solderless terminal, twist the shield mesh and the drain wires together.

\*2 When connecting two wires to one terminal, crimp the two wires together to the TWIN bar solderless terminal. When TWIN bar solderless terminals are used for the CC-Link side terminal block, the maximum wire diameter is 1.25mm<sup>2</sup>.

\*3 When crimping the SLD wire to the TWIN bar solderless terminal, twist the drain wires only.

## 4.2 AnyWire DB A20 Side Terminal Block

The AnyWire DB A20 side terminal block is a connector-type terminal block which is easily connected and disconnected.



Manufacturer: PHOENIX CONTACT GmbH & Co. KG (Contact: [www.phoenixcontact.com](http://www.phoenixcontact.com))

Model: MSTBT2,5/6-STF-5,08

Tightening torque: 0.2 to 0.3N·m

To tighten the connector, a flathead screwdriver having a tipped size of  $0.6 \times 3.5\text{mm}$  is required.

Before removing the AnyWire DB A20 side 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 on both sides are still tightened may cause damage to the devices. Before connecting the connector, check that there are no short circuits due to the disconnected or frayed wires. Then tighten the screws at both sides securely. (Tightening torque: 0.2 to 0.3N·m)

### Point

The fixing screws are not tightened when shipped. Securely tighten the screws on both sides when connecting the terminal block.

### 4.2.1 Description of the terminals of an AnyWire DB A20 side terminal block

Terminal	Description
D	AnyWire DB A20 transmission signal terminals D: Transmission cable (+), G: Transmission cable (-)
G	Connect the D and G terminals to those on the slave module and terminating unit.
24V	Power supply for the NZ2AW1C2D2.
0V	Connect these terminals to a 24VDC external power supply.
⏏	AnyWire DB A20 LG terminal Connect the LG terminal to the neutral point of the noise filter inserted between the 24V and 0V terminals. Ground the LG terminal at a single point along with the FG terminal.
NC	Do not connect anything to this terminal.

## 4.2.2 Cable processing

---

Bare cables can be connected to the AnyWire DB A20 side terminal block; however, for safety reasons, it is recommended to connect cables using the bar solderless terminals.

For wiring, use the transmission cables and power cables listed in the performance specifications and tighten them within the applicable tightening torque range. (🔧 Page 14, Section 2.2.1)

Use UL-listed solderless terminals and for processing, use a tool recommended by their manufacturer.

Recommended bar solderless terminals (manufactured by PHOENIX CONTACT GmbH & Co. KG)

- For processing a 0.75mm<sup>2</sup> wire : AI 0,75-8 GY
- For processing a 1.25mm<sup>2</sup> wire : AI 1,5-8 BK or others
- For processing a 2mm<sup>2</sup> wire : AI 2,5-8 BU or others
- For processing two 0.75mm<sup>2</sup> wires : AI-TWIN 2 × 0,75-8 GY
- For processing two 1.25mm<sup>2</sup> wires : AI-TWIN 2 × 1,5-8 BK or others

When connecting two wires to one terminal, connect the two wires together to the TWIN bar solderless terminal.

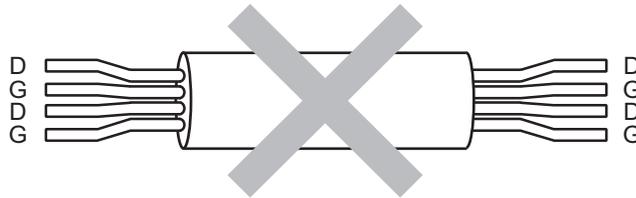
When TWIN bar solderless terminals are used for these transmission cable connectors, the maximum wire diameter is 1.25mm<sup>2</sup>.

For details on sizes other than those listed above and crimping tools, refer to the catalog or website of PHOENIX CONTACT GmbH & Co. KG.

### Point

---

- Do not run multiple transmission cables (D, G) using a multicore cable. Running multiple transmission cables (D, G) together may cause noise, resulting in a malfunction.



- Use the following cable diameters for the transmission cables (D, G).
    - 200m or shorter: 0.75mm<sup>2</sup> to 1.25mm<sup>2</sup>
    - 200m or longer: 0.9mm<sup>2</sup> to 1.25mm<sup>2</sup>
  - The voltage should not fall below the lower limit of the allowable voltage range due to the voltage drop caused by the cable. If the voltage falls below the lower limit, malfunctions may occur. If the voltage falls substantially, install the external power supply.
  - Do not connect soldered cables directly to the terminals. Doing so may loosen the screws, resulting in a poor contact.
  - Use a crimping tool to connect a cable to a bar solderless terminal.
  - Before inserting a bar solderless terminal, check the shapes of the wire insertion opening and bar solderless terminal. Then, insert the terminal in the correct orientation. Inserting a bar solderless terminal wider than the wire insertion opening may damage the terminal block.
-

# 4.3 Terminating Unit

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

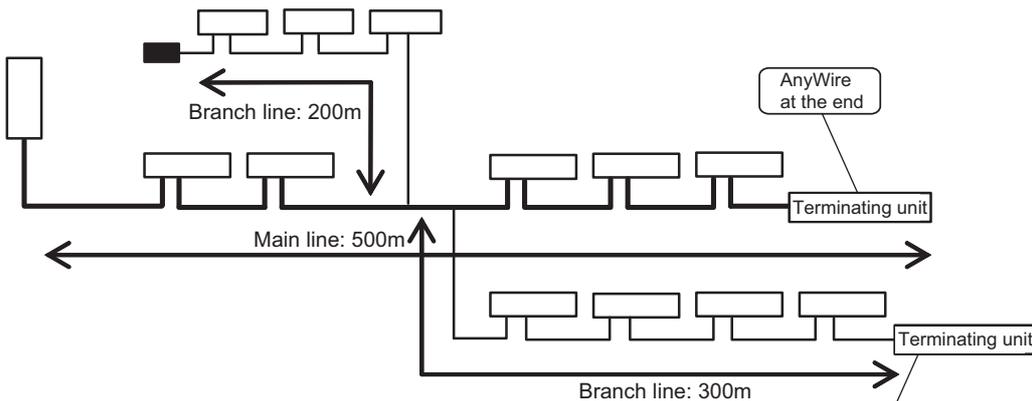
## Terminating unit connection



**Important** Connect at least one terminating unit for one AnyWire DB A20 line.  
 Connect it at the farthest end from the bridge module.  
 Transmission distance 50m (total length)  
 200m (total length)  
 1km (total length)  
 3km (total length)  
 The setting applies to all the transmission speeds.

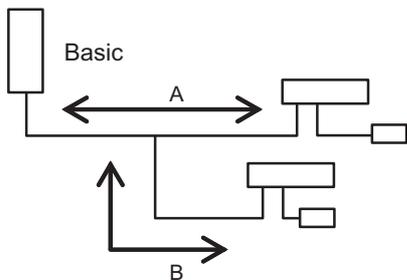
## Branch of transmission cables (DP, DN) (transmission distance: 1km)

<Example>



**Important** Connect one terminating unit at the end of a branch line that exceeds 200m. Contact us if more than two branch lines exceed 200m.

## Total length



The total length of the transmission distance for the AnyWire DB A20 system can be calculated from  $A + B$ . Note that the total length should not exceed the maximum transmission distance set for the system to branch lines.

4

4.3 Terminating Unit

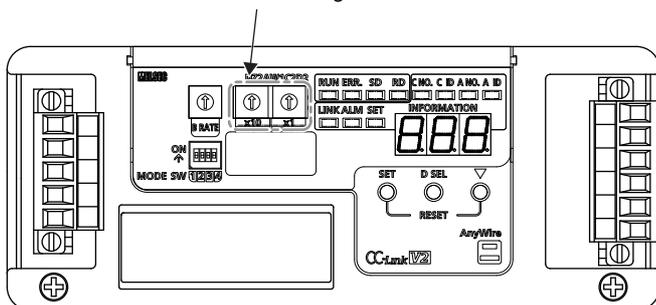
# CHAPTER 5 SWITCH SETTING

## 5.1 CC-Link Side

### (1) Station number setting switch

Set the station number of CC-Link using the station number setting switch (STATION NO. switch).  
 Since the NZ2AW1C2D2 occupies four stations, the maximum setting value is 61.

Station number setting switch



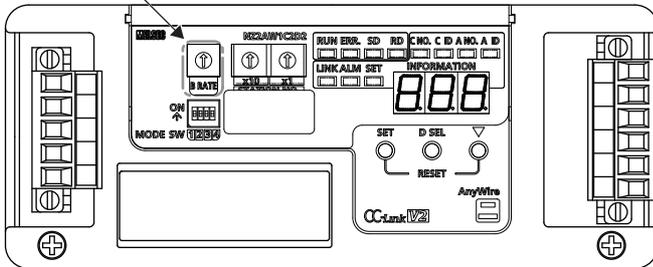
Station number*1	Station number setting switch	
	×10	×1
1	0	1
2	0	2
3	0	3
4	0	4
⋮	⋮	⋮
60	6	0
61	6	1

\*1 All the switch positions are zero (0) at the shipment of the product. The ERR.LED turns on when a station number is set to zero (0) or 62 or larger.

## (2) Transmission speed setting switch

Set the communication speed of CC-Link using the transmission speed setting switch (B RATE switch).  
Set the same value as the master station.

Transmission speed setting switch



Setting value of the transmission speed setting switch	Communication speed
0*1	156Kbps
1	625Kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
5 to F	Unable to set*2

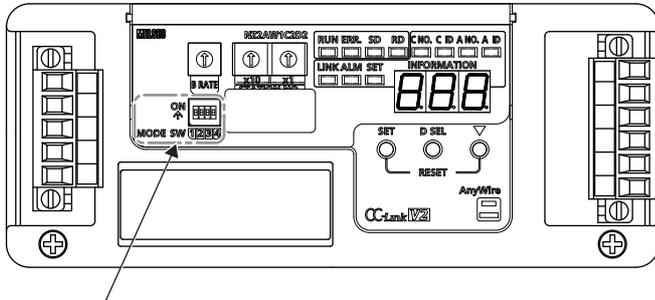
\*1 The switch is set to zero (0) when the product is shipped.

\*2 The ERR.LED turns on when the switch is set to five (5) or larger.

## 5.2 AnyWire DB A20 Side

### (1) Specification selection switch (MODE switch)

Set the transmission specifications of AnyWire DB A20 using the specification selection switch (MODE switch).



Specification selection switch (MODE switch)

SW-1, 2: Set the transmission specification using a combination of ON/OFF for 1 and 2.

SW-3: System reserve (Set the switch to OFF. Using the module with this switch set to ON may cause malfunction.)

SW-4: Select the clear mode/hold mode of the output.

Specification selection switch		Specifications
1	2	
OFF	OFF	2kHz, 3km
OFF	ON	7.8kHz, 1km
ON	OFF	31.3kHz, 200m
ON	ON	125kHz, 50m

Specification selection switch	Operation mode	Specifications
4		
OFF	Clear mode	Clears the output on the AnyWire DB A20 side when the CPU module is switched to STOP from RUN or the Reset switch is pressed. Forced output is not available from the programming tool.
ON	Hold mode	Holds the output on the AnyWire DB A20 side when the CPU module is switched to STOP from RUN or the Reset switch is pressed. Forced output is available from the programming tool.

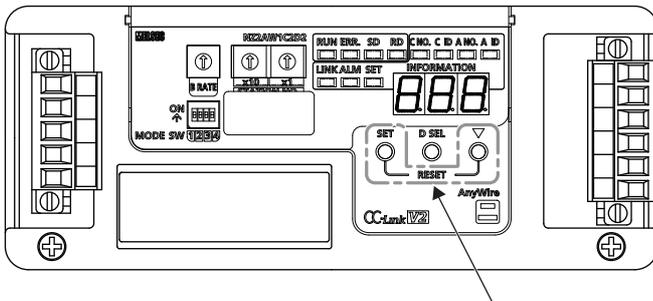
### Point

- Switch off the power supply before setting the specification selection switch.
- Set the specification selection switch according to the number of transmission points to be used.
- If the transmission specifications of the NZ2AW1C2D2 do not match with those of the connected slave module, transmission cannot be performed correctly. Failure to do so may cause malfunction.
- The specification selection switch is recessed from the front surface. When setting the switch, use a precision driver or a similar tool and be careful not to damage any of the internal boards.

## 5.3 Reset Operation

The NZ2AW1C2D2 can be reset by pressing the SET switch with the "▼" switch pressed. After reset, release both of the switches at the same time.

When the SET switch is held down for three seconds or longer, the automatic address detection is performed. Do not try to reset the NZ2AW1C2D2 during automatic address detection. Otherwise, the address of the slave module may not be registered successfully.



SET switch and ▼ switch

During reset, the transmission signal goes into suspend state and the slave module for output operates according to the setting assigned to Switch 4 of the specification selection switch. Check that no problem exists in the system when resetting the module.

# CHAPTER 6 MEMORY MAPS

The NZ2AW1C2D2 occupies four stations starting from the station number specified in the CC-Link system and operates in the extended cyclic double mode.

Remote input (RX) and remote output (RY) use 224 points (14 words), respectively.

Remote registers (RWw and RWr) use 32 words, respectively.

For information about the buffer memory address of the master module, refer to the user's manual of the master module used.

## 6.1 Remote I/O Signal List

Signal direction: From the NZ2AW1C2D2 to the master module		Signal direction: From the master module to the NZ2AW1C2D2			
Remote input (RX)	Name	Remote output (RY)	Name		
RXn0	The D/G line short-circuited detection	RYn0	Automatic address detection command output <sup>*1</sup>		
RXn1	The D/24V line short-circuited detection	RYn1 to RY(n+D)9	Use prohibited		
RXn2	24V not applied or voltage drop detection				
RXn3	Transmission cable disconnection detection, slave module failure, or power not applied				
RXn4 to RXn7	Use prohibited				
RXn8 to RXnF	No. of error addresses				
RX(n+1)0 to RX(n+1)F	Error address 1				
RX(n+2)0 to RX(n+2)F	Error address 2				
RX(n+3)0 to RX(n+3)F	Error address 3				
RX(n+4)0 to RX(n+4)F	Error address 4				
RX(n+5)0 to RX(n+5)F	Error address 5				
RX(n+6)0 to RX(n+6)F	Error address 6				
RX(n+7)0 to RX(n+7)F	Error address 7				
RX(n+8)0 to RX(n+8)F	Error address 8				
RX(n+9)0 to RX(n+9)F	Error address 9				
RX(n+A)0 to RX(n+A)F	Error address 10				
RX(n+B)0 to RX(n+B)F	Error address 11				
RX(n+C)0 to RX(n+C)F	Error address 12				
RX(n+D)0 to RX(n+D)9	Use prohibited				
RX(n+D)A	Error status flag			RY(n+D)A	Error reset request flag
RX(n+D)B	Remote station READY			RY(n+D)B	Use prohibited
RX(n+D)C	Use prohibited	RY(n+D)C			
RX(n+D)D		RY(n+D)D			
RX(n+D)E		RY(n+D)E			
RX(n+D)F		RY(n+D)F			

n: Address assigned to the master station by the station number setting

\*1 Turning it from OFF to ON starts the automatic address detection. However, it does not start if a transmission error occurs in AnyWire DB A20.

**Point**

● How to check error addresses

Below is the example of when the NZ2AW1C2D2 is station No. 1 and RX is assigned starting from X1000 on GX Works2. The following are the areas related to error addresses:

- X1000 to X100F: RX0000 to RX000F
- X1010 to X101F: RX0010 to RX001F
- X1020 to X102F: RX0020 to RX002F
- ⋮
- X10C0 to X10CF: RX00C0 to RX00CF

		Bit No.															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X1000 to X100F		Number of modules with an error detected								Spare				D-G line disconnection	24V not supplied/low voltage	D-24V line short-circuited	D-G line short-circuited
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X1010 to X101F		0				Error address 1											
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X1020 to X102F		0				Error address 2											
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
⋮		⋮				⋮											
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X10C0 to X10CF		0				Error address 12											
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

● Expression of error addresses

- Binary values for 0 to 511 = Output slave module address
- Binary values for 512 to 1023 - 512 = Input slave module address or I/O combined slave module address

## 6.2 Remote Register List

Input or output of AnyWire DB A20 uses the remote register of CC-Link.

Thirty-two words are used respectively for input and output.

Set the address of each slave module within the range of 0 to 511.

CC-Link side remote register input	AnyWire DB A20 side input address	CC-Link side remote register output	AnyWire DB A20 side output address
RWrn+0H	0 to 15	RWwm+0H	0 to 15
RWrn+1H	16 to 31	RWwm+1H	16 to 31
RWrn+2H	32 to 47	RWwm+2H	32 to 47
⋮	⋮	⋮	⋮
RWrn+1DH	464 to 479	RWwm+1DH	464 to 479
RWrn+1EH	480 to 495	RWwm+1EH	480 to 495
RWrn+1FH	496 to 511	RWwm+1FH	496 to 511

m, n: Address assigned to the master station by the station number setting

## 6.3 Correspondence Between Remote Registers and Addresses

This section describes the correspondence between the remote register and slave module address.

**Ex.** When RWrn = D1000 is set with the network parameters of GX Works2

Remote register	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RWrn + 0H	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RWrn + 1H	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16

⋮
⋮
⋮

D1001.F = Address: 31
D1000.0 = Address: 0

The slave module requires "Address setting" which specifies the start number assigned in the transmission frame. The settings are configured in 2-point unit. The addresses of both an input slave module (e.g. input remote I/O module) and an output slave module (e.g. output remote I/O module) start from "0", and the area later than that number is occupied corresponding to the number of module points.

**Ex.** Assignment of two 8-point input remote I/O modules

Remote register	Bit No.															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RWrn + 0H	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

△
△

Address: 15
Address: 0

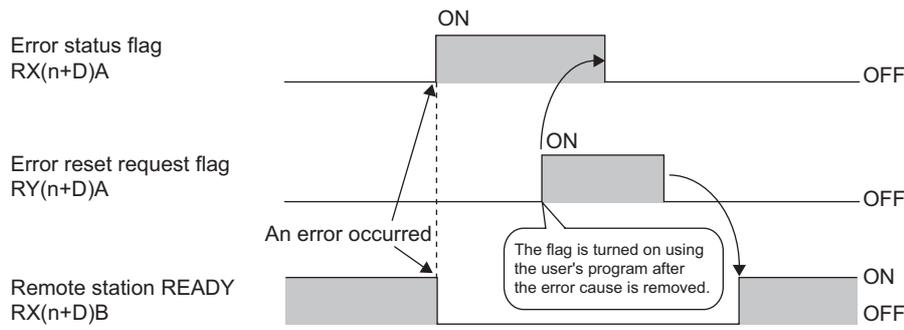
← Occupied area by the address 8 on the 8-point input remote I/O module
← Occupied area by the address 0 on the 8-point input remote I/O module →

## 6.4 Error Reset

Remote station READY is turned on after the reset by supplying the power.

Error status flag is set (turns on) when an error occurs. Turning on Error reset request flag resets Error status flag (this flag turns off), provided that the error cause has been eliminated.

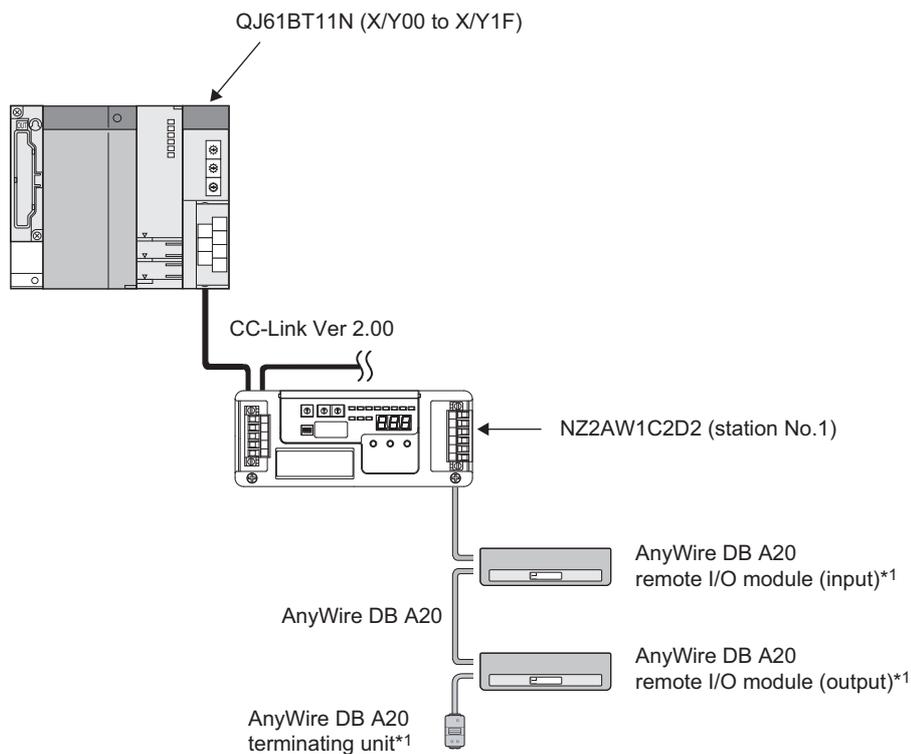
Remote station READY is reset (turns off) when an error occurs. Remote station READY remains reset (remains off) until Error reset request flag is turned off.



# CHAPTER 7 PREPARATION FOR OPERATION

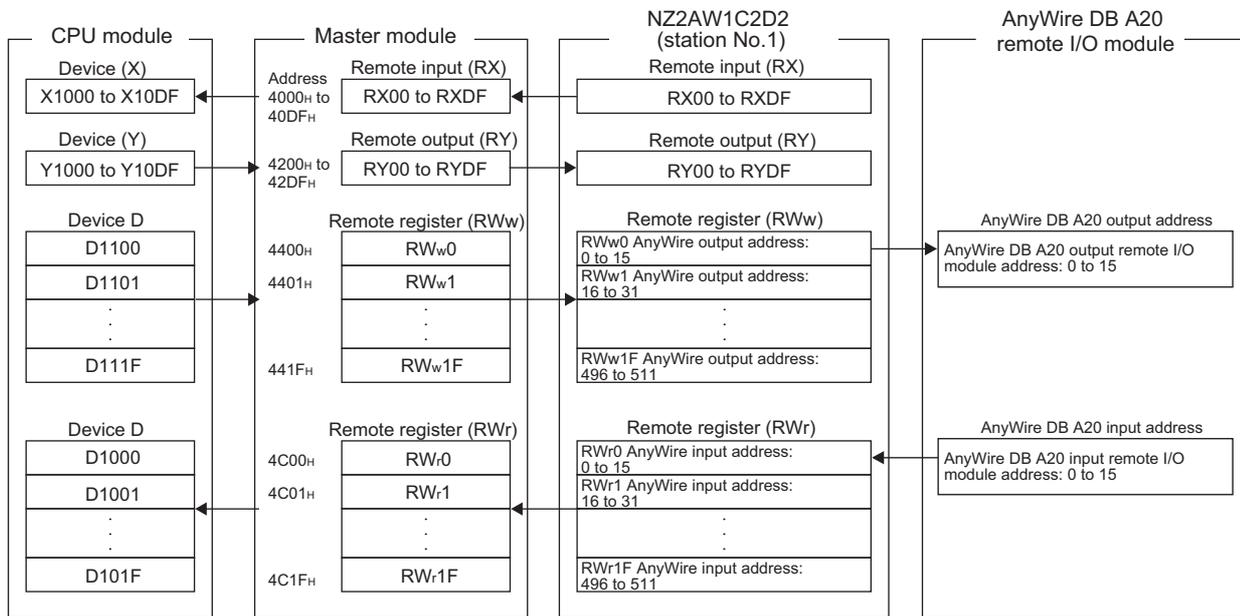
This chapter provides examples of the parameter setting for the MELSEC-Q series systems.

## (1) System configuration



\*1: Manufactured by Anywire Corporation

**(2) Correlation among a CPU module, a mater module, the NZ2AW1C2D2, and an AnyWire DB A20 remote I/O module**



**(3) Parameter setting**

Parameter setting is required for CC-Link communication between the master station and the NZ2AW1C2D2. Parameter setting for CC-Link can be configured by the network parameter of the programming tool. (Setting can also be configured using the program.)

**Point**

Configure the parameter setting by either the network parameter setting or program. Redundant settings by different means may cause unstable output because of the duplicated access to the buffer memory.

**(a) Setting example**

Project window ⇒ [Parameter] ⇒ [Network parameter] ⇒ [CC-Link]

	1
Start I/O No.	0000
Operation Setting	Operation Setting
Type	Master Station
Master Station Data Link Type	PLC Parameter Auto Start
Mode	Remote Net(Ver.2 Mode)
Total Module Connected	1
Remote Input(RX)	X1000
Remote Output(RY)	Y1000
Remote Register(RWr)	D1000
Remote Register(RWw)	D1100
Ver.2 Remote Input(RX)	
Ver.2 Remote Output(RY)	
Ver.2 Remote Register(RWr)	
Ver.2 Remote Register(RWw)	
Special Relay(SB)	SB0
Special Register(SW)	SW0
Retry Count	3
Automatic Reconnection Station Count	1
Standby Master Station No.	
PLC Down Select	Stop
Scan Mode Setting	Asynchronous
Delay Time Setting	0
Station Information Setting	Station Information
Remote Device Station Initial Setting	Initial Setting
Interrupt Settings	Interrupt Settings

Click "Station Information" to open the following window.

Station No.	Station Type	Expanded Cyclic Setting	Exclusive Count	Remote Station Points	Reserve/Invalid Station Select	Intelligent Buffer Select(Word)		
						Send	Receive	Automatic
1/ 1	Ver.2 Remote Device Station	Double	Exclusive Station 4	224Points	No Setting			

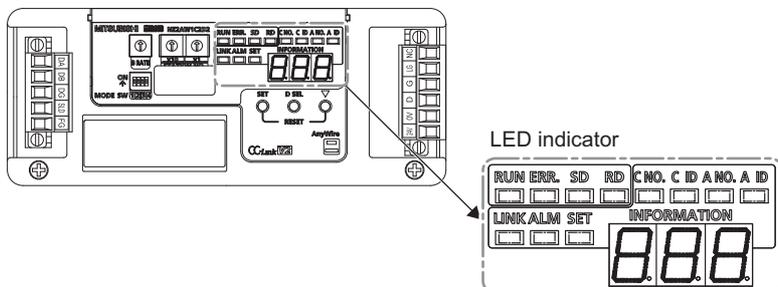
In this sample setting, the correspondence between each signal and device is as indicated in the following table.

Signal	Name	Corresponding device for station No.1
RX	The D/G line short-circuited detection	X1000
	The D/24V line short-circuited detection	X1001
	24V not applied or voltage drop detection	X1002
	Transmission cable disconnection detection, slave module failure, or power not applied	X1003
	Use prohibited	X1004 to X1007
	No. of error addresses	X1008 to X100F
	Error address 1	X1010 to X101F
	⋮	⋮
	Error address 12	X10C0 to X10CF
	Use prohibited	X10D0 to X10D9
	Error status flag	X10DA
	Remote station READY	X10DB
	Use prohibited	X10DC to X10DF
	RY	Automatic address detection command output
Use prohibited		Y1001 to Y10D9
Error reset request flag		Y10DA
Use prohibited		Y10DB to Y10DF
RW <sub>r</sub>	AnyWire DB A20 input address 0	D1000.0
	AnyWire DB A20 input address 1	D1000.1
	⋮	⋮
	AnyWire DB A20 input address 14	D1000.E
	AnyWire DB A20 input address 15	D1000.F
RW <sub>w</sub>	AnyWire DB A20 output address 0	D1100.0
	AnyWire DB A20 output address 1	D1100.1
	⋮	⋮
	AnyWire DB A20 output address 14	D1100.E
	AnyWire DB A20 output address 15	D1100.F

# CHAPTER 8 POWER-ON AND PART INDICATION

Check each connection before turning on the power.

The status of the indicator is as shown below when each setting and connection are correct.



## (1) LED indication on the NZ2AW1C2D2

LED on the CC-Link side		LED on the AnyWire DB A20 side	
Indicator	Status	Indicator	Status
RUN	On	LINK	Flashing
ERR.	Off	ALM	Off
SD	On	SET	Off
RD	On	—	—

## (2) LED indication on a slave module

LED on the AnyWire DB A20 side	
Indicator	Status
RDY	On
LINK	Flashing

Check the LED indication described above before performing the automatic address detection. (☞ Page 44, Section 9.1)

When the indication is different from the information above, check the indication condition and possible cause.

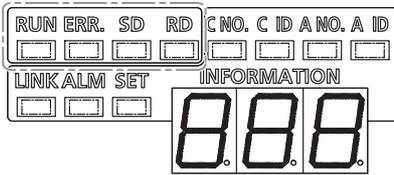
Then eliminate the problem according to the troubleshooting steps. (☞ Page 51, CHAPTER 12)

### Point

- When the power is turned on for the first time, "A-4" is indicated on the INFORMATION display. This is because the slave module has not been registered. Press the SET switch to perform the automatic address detection. (☞ Page 44, Section 9.1)
- Registering a slave module by performing the automatic address detection enables the disconnected transmission cable location detection function.
- Data is transmitted regardless of whether the automatic address detection is performed.
- After the automatic address detection is performed, the number of registered slave modules is indicated on the INFORMATION display. If the displayed number differs from the actual number of connected modules, the possible cause may be a duplicated address setting, incorrect wiring, or effect of noise. Eliminate the problem according to the troubleshooting steps. (☞ Page 51, CHAPTER 12)

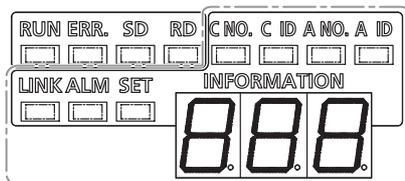
# 8.1 LED Indication Specification

## (1) LED on the CC-Link side



Indicator	Name	Color	Description	
			State	Details
RUN	CC-Link communication status	Green	On	Normal communication
			Off	<ul style="list-style-type: none"> <li>Transmission cable disconnected</li> <li>Transmission cable connected incorrectly</li> <li>Wrong transmission speed selected</li> <li>Hardware reset under way</li> </ul>
ERR.	CC-Link error display	Red	On	<ul style="list-style-type: none"> <li>CRC error</li> <li>Incorrect setting of the station number setting switch (set to zero or 62 or larger)</li> <li>Incorrect setting of the transmission speed setting switch (set to 5 or larger)</li> </ul>
			Off	<ul style="list-style-type: none"> <li>Normal communication</li> <li>Hardware reset under way</li> </ul>
			Flashing	<ul style="list-style-type: none"> <li>Flashing regularly (0.4-second intervals): Setting for the station number or transmission speed setting switch has been changed while the power is on.</li> <li>Flashing irregularly: A terminating resistor has not been connected. The module or CC-Link dedicated cable is affected by noise.</li> </ul>
SD	CC-Link data transmission display	Yellow	On	Data transmission under way
			Off	<ul style="list-style-type: none"> <li>Transmission cable disconnected</li> <li>Transmission cable connected incorrectly</li> <li>Wrong transmission speed selected</li> <li>Hardware reset under way</li> </ul>
			Flashing	A terminating resistor has not been inserted on the CC-Link master module and the last station module.
RD	CC-Link data reception display	Yellow	On	Data reception under way
			Off	<ul style="list-style-type: none"> <li>Transmission cable disconnected</li> <li>Transmission cable connected incorrectly</li> <li>Hardware reset under way</li> </ul>
			Flashing	A terminating resistor has not been inserted on the CC-Link master module and the last station module.

## (2) LED on the AnyWire DB A20 side



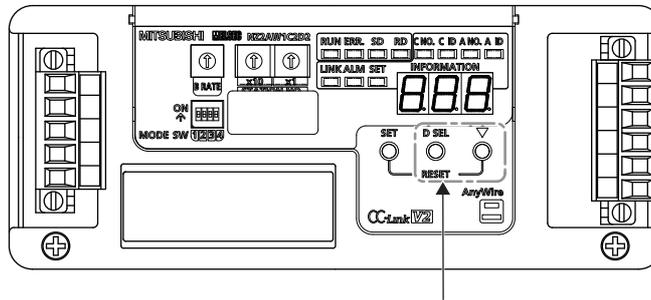
Indicator	Name	Color	Description	
LINK	AnyWire DB A20 transmission status	Green	On	Module operating status
			Off	Module failure
ALM	AnyWire DB A20 alarm display	Red	On	D/G line disconnection, or no response from the slave module
			Slow flashing (one-second intervals)	The D/G or D/24V line short-circuited, or the equivalent status
			Rapid flashing (0.2-second intervals)	24VDC is not supplied, or the supply voltage is too low.
			Off	During normal transmission
SET	Automatic address detection display	Yellow	On	Automatic address detection in progress
			Off	Before or after automatic address detection
C NO.	INFORMATION indication	Green	On	No. of connected modules displayed
C ID		Green	On	Connection address displayed
A NO.		Green	On	No. of error modules displayed
A ID		Green	On	Error address displayed
INFORMATION (Segment indication)	AnyWire DB A20 connection information	—	The number of connected modules is indicated in normal operation (ALM LED: Off), and the alarm code is indicated when an error occurs (ALM LED: On).	
			A-1	The D/G line short-circuited
			A-2	The D/24V line short-circuited
			A-3	24VDC is not supplied, or the supply voltage is too low
			A-4	Transmission cable disconnection, slave module failure, or power not applied

### Point

- Indication of "A-1", "A-2", or "A-3" on the INFORMATION display is restored, not retained, when the error is removed.
- Indication of "A-4" on the INFORMATION display is retained until the power is turned off, the error is reset, or the automatic address detection is performed.
- When the D SEL switch or ▼ switch is not operated for about five seconds, the indication shows the number of the connected modules in normal operation and the alarm code in the case of an error.

### (3) Display selection switch

Select indication on the INFORMATION display by using the D SEL or ▼ switch.



Display selection switch  
(D SEL switch and ▼ switch)

The following table lists indication displayed using the D SEL switch.

INFORMATION display	Error description
Normal operation	<pre>           ┌───▶ C.No. ──▶ C.ID ──┐           │                       │           └────────────────────────┘                     </pre>
Error (in the case of A-4)	<pre> Alarm code ───▶ A.No. ──▶ A.ID ──▶ C.No. ──▶ C.ID ──┐                     │                       │           │                     └────────────────────────┘           └──────────┘                     </pre>
Error (in the case other than A-4)	<pre> Alarm code ───▶ C.No. ──▶ C.ID ──┐                     │           │                     └──────────┘                     </pre>

Pressing the ▼ switch while the C ID LED or the A ID LED is on displays the address of the slave module. The addresses are displayed in hexadecimal.

INFORMATION display	Description
000H to 1FFH	Address of the output slave module
200H to 3FFH	Address of the input slave module or I/O combined slave module

# CHAPTER 9 MONITORING FUNCTION

The AnyWire DB A20 slave module has a specific ID (address). By sending an ID (address) and receiving a response from the slave module having that ID (address), the NZ2AW1C2D2 detects disconnection and the existence of the slave module.

The NZ2AW1C2D2 uses the automatic address detection operation to store the addresses of the currently connected slave modules in the EEPROM.

This information is stored even when the power is turned off.

Then the NZ2AW1C2D2 sends registered IDs (addresses) in order. If the module does not receive a response from the corresponding slave modules, it regards them as disconnected and the ALM LED shows the disconnection.

The addresses of the error slave modules can be checked using the INFORMATION display.

## 9.1 Automatic Address Detection

Automatic address detection is a function to store the IDs (addresses) of the connected slave modules in the EEPROM of the NZ2AW1C2D2.

Perform the automatic address detection in the following situations.

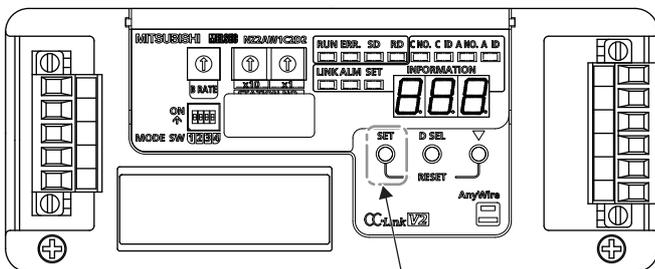
- When starting the system operation with all the slave modules connected to the bridge module
- When adding a slave module
- When removing a slave module
- When changing the address of a slave module

### 9.1.1 Performing the automatic address detection

Use the SET switch or Automatic address detection command output (RYn0) to perform the automatic address detection.

#### (1) When using the SET switch

1. Check that all of the slave modules are operating normally.
2. Keep pressing the SET switch until the SET LED (yellow) turns on.
3. When the SET LED turns on, flashes, and turns off, the ID (address) has been stored.



**(2) When using Automatic address detection command output (RYn0)**

- 1. Check that all of the slave modules are operating normally.**
- 2. Turn Automatic address detection command output (RYn0) from off to on.**  
For details on Automatic address detection command output (RYn0), refer to the following.  
☞ Page 32, CHAPTER 6
- 3. When the SET LED turns on, flashes, and turns off, the ID (address) has been stored.**

**Point**

- During the automatic address detection, input or output may not be accepted. Perform an automatic address detection in the status that does not affect the operation of the equipment, such as while the program execution of the programmable controller is being stopped.
- When an error such as a short circuit occurs in AnyWire DB A20, or for approximately five seconds after the power is turned on or the module is reset, the automatic address detection cannot be performed.
- Do not perform the automatic address detection when a disconnection error has occurred while in operation. Otherwise, disconnection information may be lost.

## 9.2 Monitoring Operation

Registered IDs (addresses) are sent in order. If the slave module does not reply, disconnection is detected.

This error information is maintained until the power is turned off or Error reset request flag (RY(n+D)A) is turned on.

**Point**

To reset the ALM LED indication detected during operation or Transmission line disconnection detection (RXn3: On), eliminate the error cause and reset the power of the NZ2AW1C2D2 or turn on Error reset request flag (RY(n+D)A). The automatic address detection also clears the indication and the flag. However, if an unresponding module exists, its ID (address) is not registered; therefore it is not monitored.

# CHAPTER 10 CC-LINK I/O RESPONSE TIME

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For information about the transmission delay time on the CC-Link side, refer to the user's manual for the master module used.

**Remark** .....

When only one NZ2AW1C2D2 is connected to the master station, the link scan time is about 1.4ms at a transmission speed of 10Mbps.

The table below provides the transmission delay time on the CC-Link side in the asynchronous mode when the sequence scan time of the master station is "10ms", the extended cyclic setting is "Double", and the processing time of the NZ2AW1C2D2 is "1ms".

Signal direction	Transmission delay time	
	TYP	MAX
Remote device station (RX) to the master station (RX)	Approx. 15.3ms	Approx. 19.6ms
Master station (RY) to the remote device station (RY)	Approx. 16.7ms	Approx. 21.0ms
Remote device station (RW <sub>r</sub> ) to the master station (RW <sub>r</sub> )	Approx. 15.3ms	Approx. 19.6ms
Master station (RW <sub>w</sub> ) to the remote device station (RW <sub>w</sub> )	Approx. 16.7ms	Approx. 21.0ms

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# Memo

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# CHAPTER 11 TRANSMISSION TIME

This chapter describes the transmission cycle time and transmission delay time of AnyWire DB A20.

## 11.1 Transmission Cycle Time

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

### 11.1.1 Transmission cycle time of the NZ2AW1C2D2

The transmission cycle time of the NZ2AW1C2D2 is listed in the table below.

Setting of the maximum no. of transmission points	Transmission cycle time			
	125kHz	31.3kHz	7.8kHz	2kHz
	(50m)	(200m)	(1km)	(3km)
1024 points (512 points × 2)	4.3ms	17.1ms	68.2ms	262.9ms

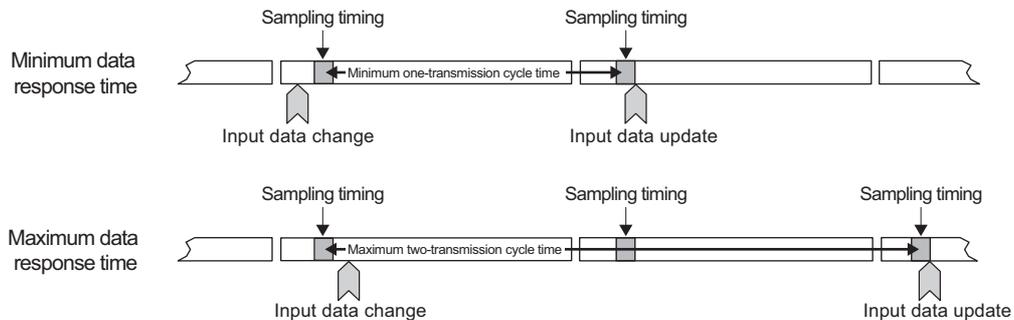
### 11.1.2 Effects of the double check system

#### (1) Input

Unless the same data is received twice successively on the NZ2AW1C2D2 side, the input area data is not updated. Therefore, a minimum of one-transmission cycle time and a maximum of two-transmission cycle time are required as the data response time.

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

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



#### (2) Output

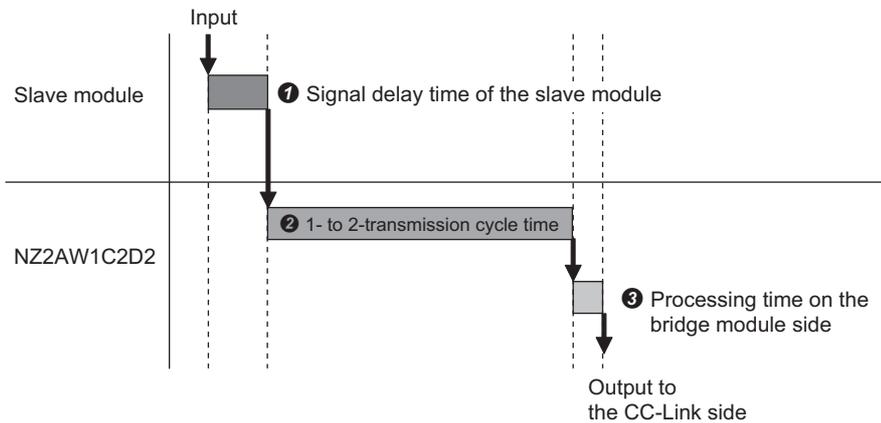
As the double check is performed on the slave module side, the time required is the same as that for input, namely a minimum of one-transmission cycle time and a maximum of two-transmission cycle time.

## 11.2 Transmission Delay Time

This section describes the transmission delay time (time until data is transmitted).

### 11.2.1 Slave module (input) to bridge module

The figure below shows the time between a signal input to the slave module and the bridge module remote device (RX) turning on/off.



Calculation formula

① Signal delay time of the slave module + ② Transmission cycle time  $\times$  2 + ③ Processing time on the bridge module side [ms]

Calculation example

① Signal delay time of the slave module

Signal delay time of the slave module is 0.17ms. : 0.17[ms]

② Transmission cycle time  $\times$  2

When the transmission speed is set to 31.3kHz:  $(1 \div 31.3k) \times 16 = 0.511$ [ms]

③ Processing time on the bridge module side

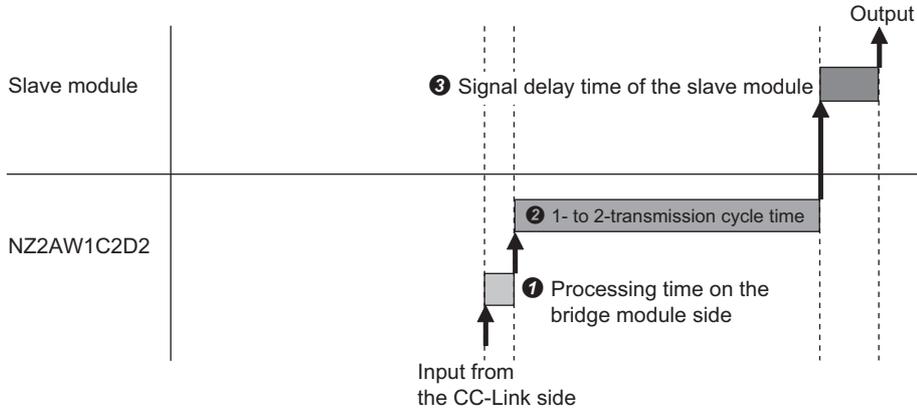
Processing time on the bridge module side = Transmission speed clock width  $\times$  16

When the transmission speed is set to 31.3kHz:  $(1 \div 31.3k) \times 16 = 0.511$ [ms]

Therefore, the transmission delay time is  $0.17 + 34.2 + 0.511 \approx 35$ [ms].

## 11.2.2 Bridge module to slave module (output)

The figure below shows the time between the bridge module remote device (RY) turning on/off and the slave module output turning on/off.



Calculation formula

① Processing time on the bridge module side + ② Transmission cycle time × 2 + ③ Signal delay time of the slave module [ms]

Calculation example

① Processing time on the bridge module side

Processing time on the bridge module side = Transmission speed clock width × 16

When the transmission speed is set to 31.3kHz:  $(1 \div 31.3k) \times 16 = 0.511[\text{ms}]$

② Transmission cycle time × 2

When the transmission speed is set to 31.3kHz:  $17.1 \times 2 = 34.2[\text{ms}]$

③ Signal delay time of the slave module

Signal delay time of the slave module is 0.01ms. : 0.01[ms]

Therefore, the transmission delay time is  $0.511 + 34.2 + 0.01 \approx 35[\text{ms}]$ .

# CHAPTER 12 TROUBLESHOOTING

If the transmission does not start normally, check the following items and perform the troubleshooting.

- The CC-Link cable is properly connected.
- The terminating resistor of CC-Link is properly connected.
- A unique station number has been set for each station on CC-Link.
- AnyWire DB A20 devices are being supplied with 24VDC power.
- The LINK LED on the slave module of AnyWire DB A20 is flashing.
- The address settings of AnyWire DB A20 are correct and unique.

**Remark**

The reference pages for each specification required during troubleshooting are listed below.

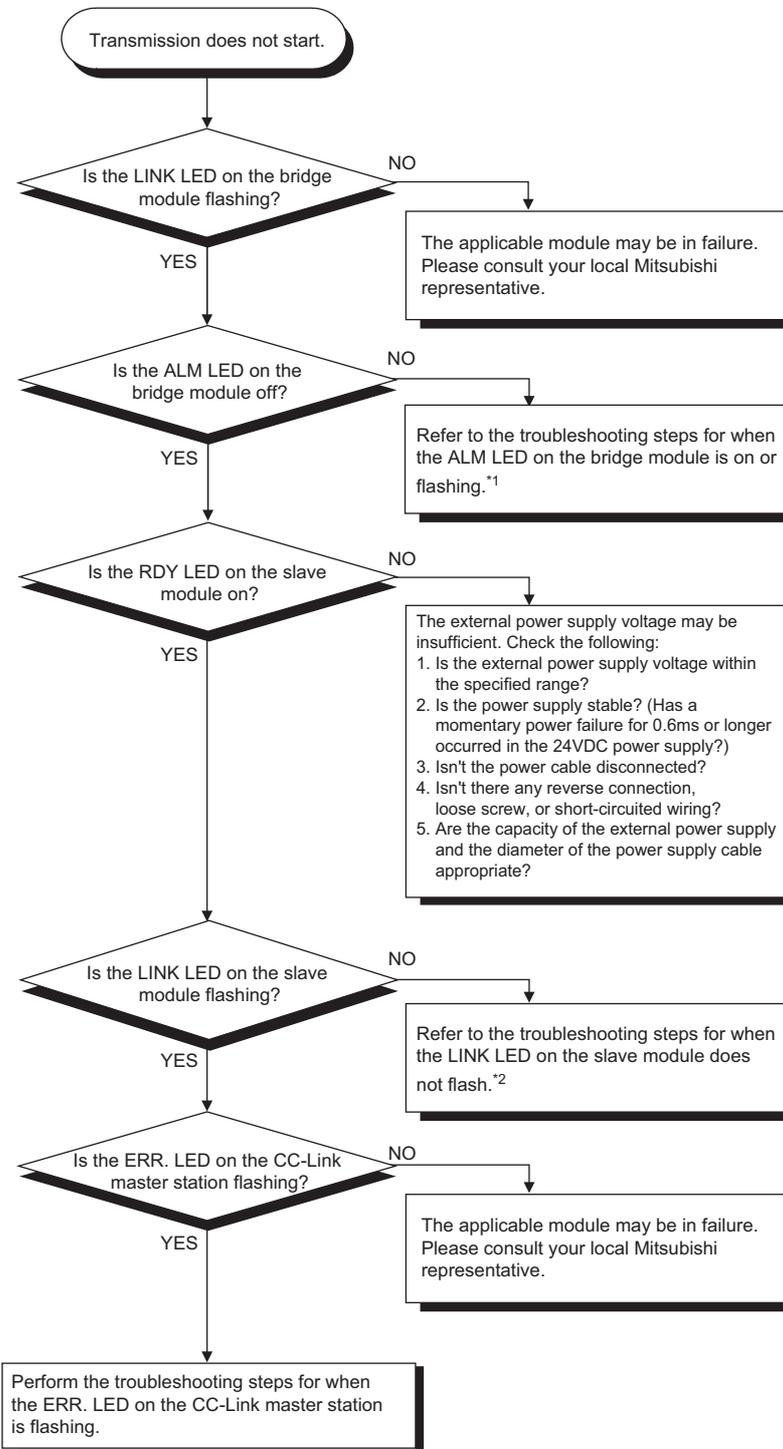
- Connections:  Page 23, CHAPTER 4
- Operation mode:  Page 28, CHAPTER 5
- Data I/O:  Page 32, CHAPTER 6, Page 36, CHAPTER 7
- Details of the LED display:  Page 40, CHAPTER 8

For details on the entire AnyWire DB A20 system, refer to the "AnyWire DB A20 Series Technical Manual" (manufactured by Anywire Corporation).



# 12.1 Troubleshooting Flow

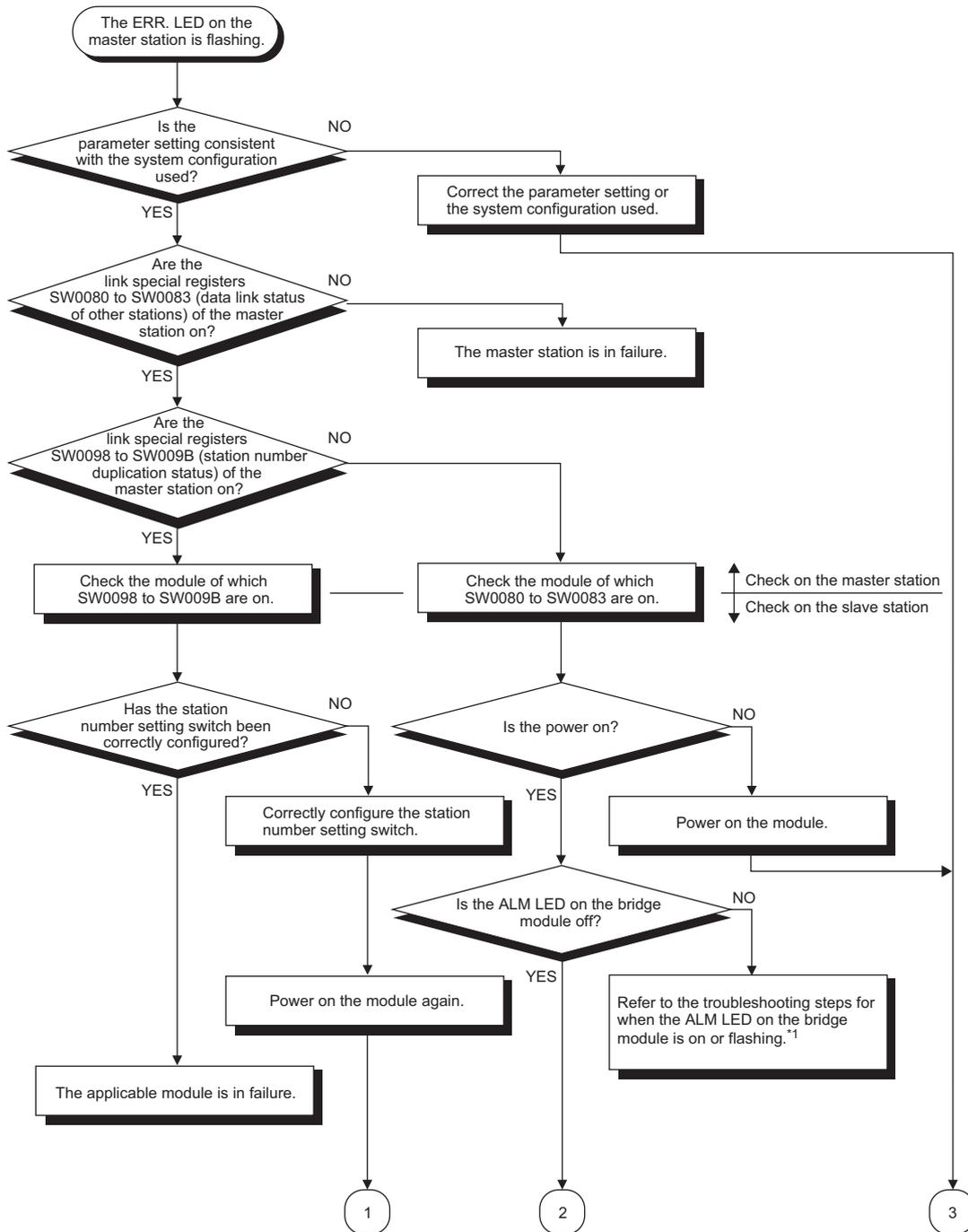
## 12.1.1 When transmission does not start



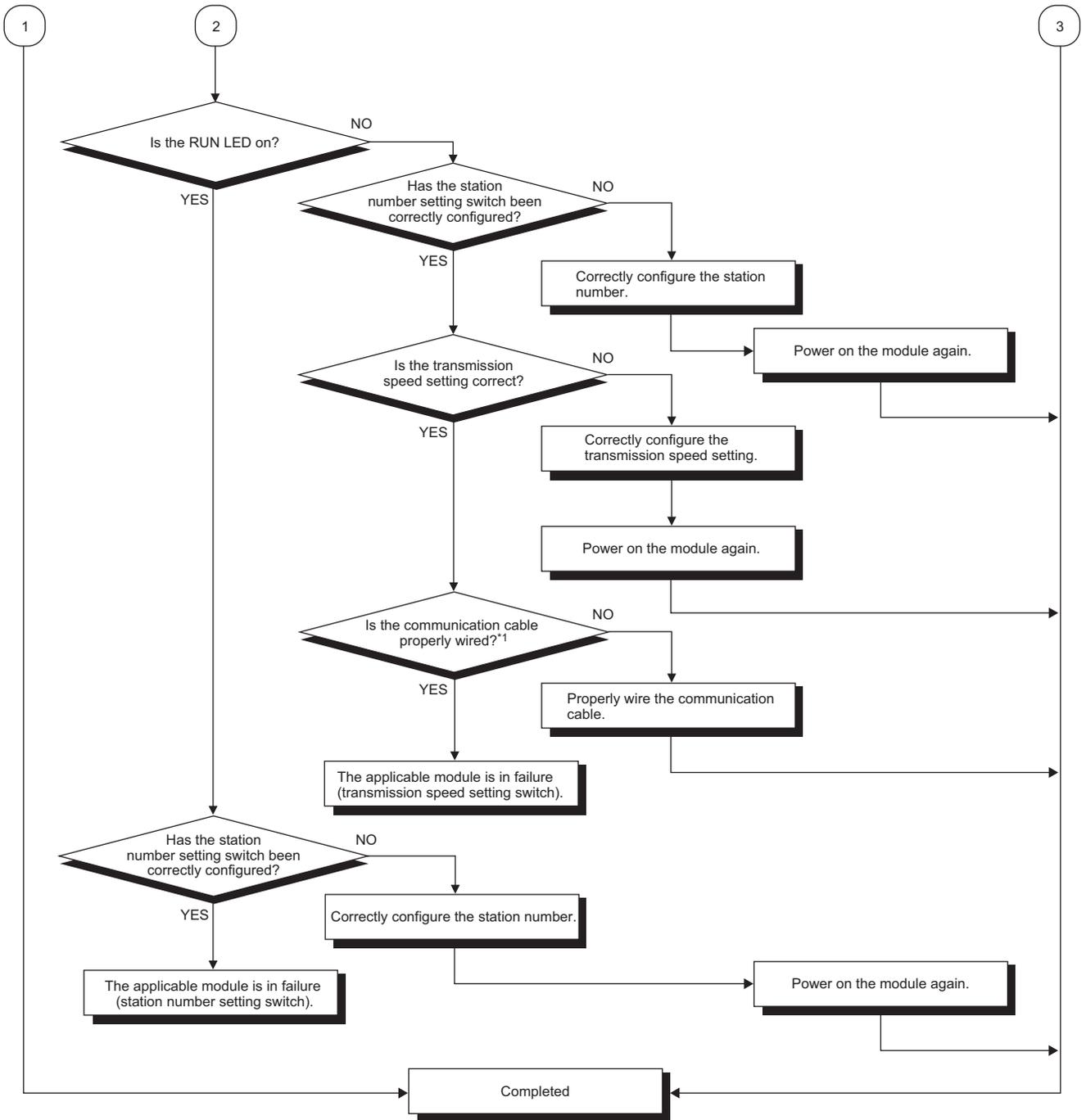
\*1 Page 55, Section 12.1.3

\*2 Page 56, Section 12.1.4

# 12.1.2 When the ERR.LED on the CC-Link master station is flashing

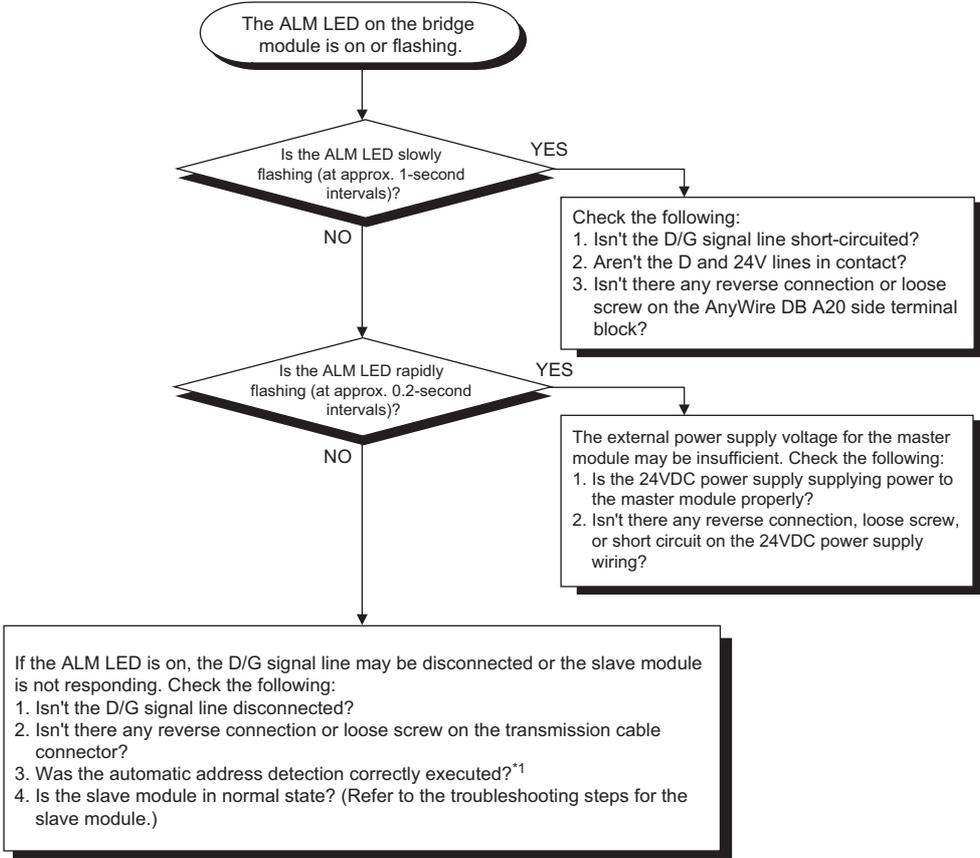


\*1 Page 55, Section 12.1.3



\*1 Check for short circuit, reverse connection, disconnection, terminating resistor, FG connection, total length, and distance between stations.

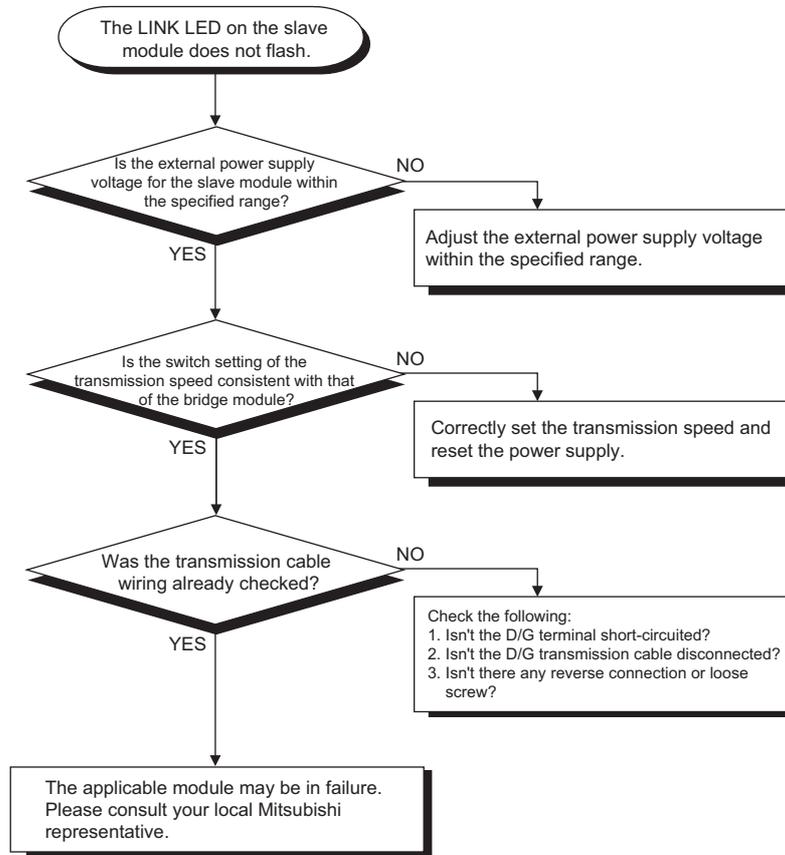
# 12.1.3 When the ALM LED on the bridge module is on or flashing



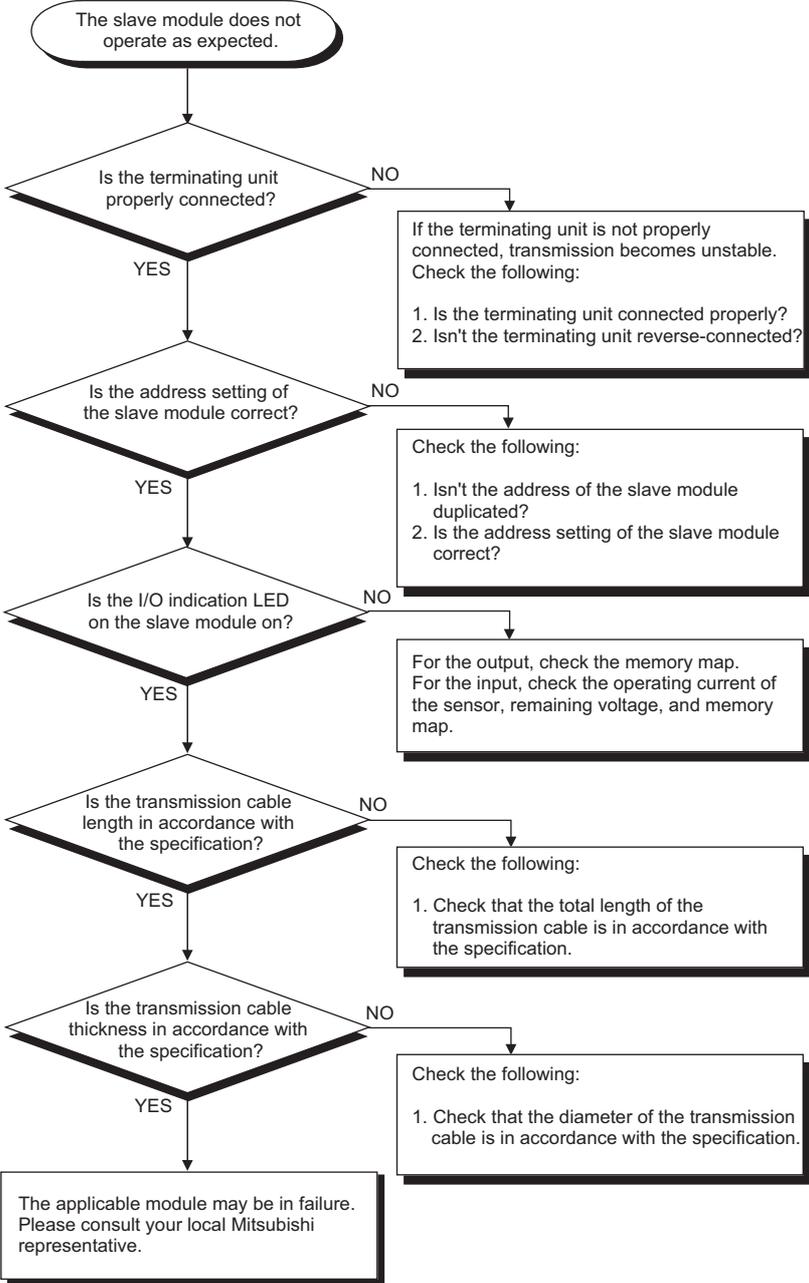
\*1 Page 44, Section 9.1

## 12.1.4 When the LINK LED on the slave module does not flash

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# 12.1.5 When the slave module does not operate as expected



12

12.1 Troubleshooting Flow  
12.1.5 When the slave module does not operate as expected

## 12.2 Symptom Checklist

### (1) CC-Link side

Symptom	Check item	Check method	Check
The data link is failed in the entire system.	Is the cable disconnected?	Check the condition of the cable visually or by line test. Check Line status (SW0090).	<input type="checkbox"/>
	Are the terminating resistors (110Ω) connected to the stations on both ends?	Connect the terminating resistors included with the master/local modules to the stations on both ends.	<input type="checkbox"/>
	Is there an error in the CPU module of the master station?	Check the error code of the CPU module and take corrective actions.	<input type="checkbox"/>
	Were the parameters set in the master station?	Check the parameter settings. • Remote network-Ver.2 mode or Remote network-addition mode • Ver.2 remote device station • Double, Exclusive Station 4	<input type="checkbox"/>
	Is Data link startup request (Yn6 or Yn8) turned on?	Check the program.	<input type="checkbox"/>
	Is there an error in the master station?	Check the following. • Host parameter status (SW0068) • Switch setting status (SW006A) • Loading status (SW0069) • Whether the ERR.LED on the master station is flashing or not.	<input type="checkbox"/>
	Does the scan time exceed the maximum value while the synchronous mode is selected?	Select the asynchronous mode or reduce the transmission speed.	<input type="checkbox"/>
The remote input (RX) of the NZ2AW1C2D2 cannot be loaded.	Is the remote device station in the data link?	Check the status by the following methods. • LED indication status of the module • Other station data link status (SW0080 to SW0083)	<input type="checkbox"/>
	Is the data being read from the correct address of the remote input (RX)?	Check the program.	<input type="checkbox"/>
	Was it set as a reserved station?	Check the parameters.	<input type="checkbox"/>
	Is the same station number used for multiple stations?	Check the station numbers.	<input type="checkbox"/>
The remote output (RY) of the NZ2AW1C2D2 cannot be turned on/off.	Is the remote device station in the data link?	Check the status by the following methods. • LED indication status of the module • Other station data link status (SW0080 to SW0083)	<input type="checkbox"/>
	Is Refresh instruction (Yn0) of the master station turned on?	Check the program.	<input type="checkbox"/>
	Is the data being written to the correct address of the remote output (RY)?	Check the program.	<input type="checkbox"/>
	Was it set as a reserved station?	Check the parameters.	<input type="checkbox"/>
	Is the same station number used for multiple stations?	Check the station numbers.	<input type="checkbox"/>
The data of the remote register (RWr) of the NZ2AW1C2D2 cannot be loaded.	Is the remote device station in the data link?	Check the status by the following methods. • LED indication status of the module • Other station data link status (SW0080 to SW0083)	<input type="checkbox"/>
	Is the data being read from the correct address of the remote register (RWr)?	Check the program.	<input type="checkbox"/>
	Was it set as a reserved station?	Check the parameters.	<input type="checkbox"/>
	Is the same station number used for multiple stations?	Check the station numbers.	<input type="checkbox"/>

Symptom	Check item	Check method	Check
Faulty stations cannot be detected.	Was it set as an error invalid station?	Check the parameters.	<input type="checkbox"/>
	Is the same station number used for multiple stations?	Check the station numbers.	<input type="checkbox"/>

## (2) AnyWire DB A20 side

Symptom	Check item	Check method	Check	
Data I/O is impossible.	NZ2AW1 C2D2 side	Is 24VDC power being supplied appropriately?	Check the power voltage.	<input type="checkbox"/>
		Are the transmission cables (D, G) connected correctly?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>
		Was the MODE switch set correctly?	Check the MODE switch setting.	<input type="checkbox"/>
	Slave module side	Is 24VDC power being supplied appropriately?	Check the power voltage.	<input type="checkbox"/>
		Are the transmission cables (D, G) connected correctly?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>
		Was the address set correctly?	Check the address setting.	<input type="checkbox"/>
		Is the transmission speed consistent with that of the bridge module?	Check the transmission speed setting.	<input type="checkbox"/>
Data I/O is unstable.	Are terminating units connected? Are they connected in the correct polarities?	Check that the terminating units are connected correctly.	<input type="checkbox"/>	
	Does the total length of the transmission cables (D, G) exceed the specifications?	Check that the total length and transmission speed have been set correctly.	<input type="checkbox"/>	
	Is the shield line being used for multiple-point grounding?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
The RDY LED on the slave module is flashing.	Is the supply voltage within the allowable voltage range (21.6V to 27.6V)?	Check the power voltage.	<input type="checkbox"/>	
	Is the power cable (24V, 0V) disconnected? Is the power supply terminal loosened?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
	Is the transmission speed consistent with that of the bridge module?	Check the transmission speed setting.	<input type="checkbox"/>	
	Are the terminal block screws loosened?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
	Are the transmission cables (D, G) disconnected?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
The ALM LED on the NZ2AW1C2D2 is on.	Are the transmission cables (D, G) disconnected?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
	At the startup, was the automatic address detection performed correctly?	Check the status of the slave module and the wiring of AnyWire DB A20, and perform the automatic address detection.	<input type="checkbox"/>	
	Are the terminal block screws loosened?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
The ALM LED on the NZ2AW1C2D2 is flashing slowly (one-second intervals).	Are the transmission cables (D, G) short-circuited?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
	Is the D/24V line short-circuited?	Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	
The ALM LED on the NZ2AW1C2D2 is flashing rapidly (0.2-second intervals).	Is 24VDC power being supplied to the NZ2AW1C2D2? Is the voltage too low?	Check the power voltage. Check the wiring for AnyWire DB A20.	<input type="checkbox"/>	

# Memo

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# APPENDIX

## Appendix 1 EMC and Low Voltage Directives

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for the products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.

To prove the compliance with these Directives, manufacturers must issue an EC Declaration of Conformity and the products must bear a CE marking.

### (1) Sales representative in EU member states

The sales representative in EU member states will be:

Name: Mitsubishi Electric Europe BV

Address: Gothaer Strasse 8, 40880 Ratingen, Germany

## Appendix 1.1 Measures to comply with the EMC Directive

The EMC Directive sets two requirements for compliance: emission (conducted and radiated electromagnetic energy emitted by a product) and immunity (the ability of a product to function without being influenced by externally generated electromagnetic energy), and all applicable products are required to satisfy these requirements. This section summarizes the precautions for machinery constructed with this product to comply with the EMC Directive. These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive. The manufacturer of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

## **(1) Installation in a control panel**

This product is an open type device and must be installed inside a control panel. \*1

This ensures safety as well as effective shielding of electromagnetic noise emitted from this product.

\*1 Modules on the remote station in each network must be also installed inside the control panel. However, waterproof modules on the remote station can be installed outside the control panel.

### **(a) Control panel**

- Use a conductive control panel.
- Mask off the area used for grounding when securing the top or bottom plate to the control panel using bolts.
- To ensure electrical contact between the inner plate and the control panel, mask off the bolt installation areas of an inner plate so that conductivity can be ensured in the largest possible area.
- Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.
- Keep the diameter of the holes in the control panel 10cm or less. If the diameter is larger than 10cm, electromagnetic wave may be emitted. In addition, because electromagnetic wave leaks through a clearance between the control panel and its door, reduce the clearance as much as possible. The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.
- The tests by Mitsubishi were conducted using a panel having the damping characteristics of 37dB (maximum) and 30db (average) (measured at 3m distance, 30 to 300MHz).

### **(b) Wiring a ground cable**

Run the cable of this product as instructed below.

- Provide a ground point to the control panel near this product. Ground the LG terminal of this product to the ground point with the thickest and shortest ground cable possible (30cm or shorter).

**(2) Cables**

**(a) CC-Link dedicated cable**

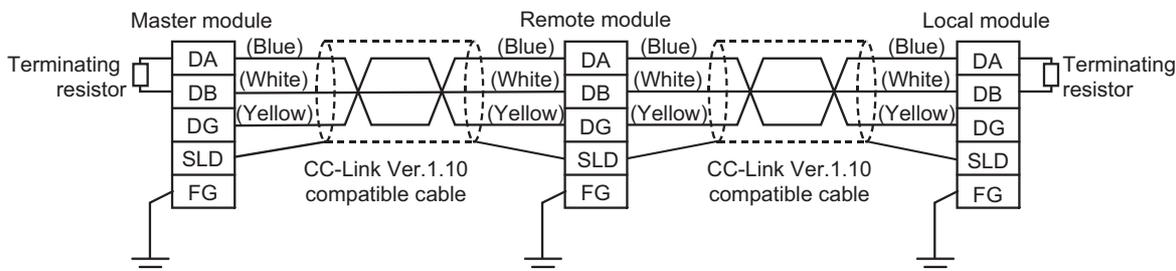
Use the AD75CK cable clamp (Mitsubishi) to shield the cable connected to the CC-Link module located close to the exit of the control panel or each CC-Link station, and ground the shielded part of the CC-Link dedicated cable to the control panel within 30cm from the module or station.

The Ver.1.10-compatible CC-Link dedicated cable is a shielded cable. Strip a part of the jacket of the cable as shown below and ground the exposed shield to the ground as much as possible.

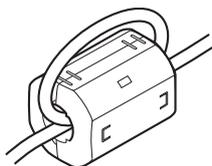


Use the specified Ver.1.10-compatible CC-Link dedicated cable.

Use the FG terminals of the CC-Link module and CC-Link stations as shown below to connect to the FG line inside the control panel.

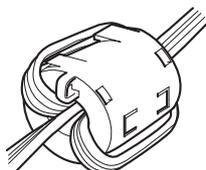


For the CC-Link dedicated cable, attach a ferrite core having the attenuation characteristics equivalent to that of ZCAT3035-1330 made by TDK Corporation as close to the CC-Link side terminal block of this product as possible. Use a ferrite core with two turns of wire as shown below.



**(b) AnyWire DB A20 cable**

For the AnyWire DB A20 cable, attach a ferrite core having the attenuation characteristics equivalent to that of ZCAT3035-1330 made by TDK Corporation as close to the AnyWire DB A20 side terminal block of this product as possible. Use a ferrite core with three turns of wire as shown below.



**(c) Power cable for the 24VDC power supply terminal**

Use a CE-marked DC power supply. The DC power supply must be placed together with the module in the same control panel, and the power cable connected to the power terminal of this product should be 30cm or shorter.

### (3) Power supply module

Use a CE-marked external power supply and ground the FG terminal.

(External power supply used for the tests conducted by Mitsubishi: PS5R-SF24 made by IDEC Corporation)

### (4) Installation environment

Use this product in Zone A<sup>\*1</sup>.

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

Zone C: Main power supply insulated from the public power supply by a special transformer

Zone B: Special power supply with the secondary surge protector from the main power (Rated voltage is assumed to be 300V or less.)

Zone A: Local power supply protected by an AC-DC converter or an insulating transformer from the special power supply (Rated voltage is assumed to be 120V or less.)

## Appendix 1.2 Measures to comply with the Low Voltage Directive

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The Low Voltage Directive does not apply to this product because it operates on 24VDC power supply.

For making the PLC system used comply with the Low Voltage Directive, refer to the section about the EMC and Low Voltage Directives in the user's manual of the CPU module to be used.

# Memo

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A

Appendix 1 EMC and Low Voltage Directives  
Appendix 1.2 Measures to comply with the Low Voltage Directive

# REVISIONS

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

Print date	*Manual number	Revision
June 2011	SH(NA)-080993ENG-A	First edition
March 2013	SH(NA)-080993ENG-B	Revision due to compliance with EMC and UL/cUL
August 2016	SH(NA)-080993ENG-C	Revision due to changes in the rating plate and grounding mark

Japanese manual version SH-080992-C

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# WARRANTY

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

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

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

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

[Gratis Warranty Term]

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

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
  1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
  2. Failure caused by unapproved modifications, etc., to the product by the user.
  3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
  4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
  5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
  6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
  7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

## **2. Onerous repair term after discontinuation of production**

- (1) Mitsubishi shall accept onerous product repairs for one year after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

## **3. Overseas service**

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

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

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

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

## **5. Changes in product specifications**

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

# TRADEMARKS

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Anywire is either a registered trademark or a trademark 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 <sup>™</sup> or <sup>®</sup> are not specified in this manual.



**Anywire** Anywire Corporation [www.anywire.jp](http://www.anywire.jp)

SH(NA)-080993ENG-C(1608)MEE

MODEL: NZ2AW1C2D2-U-E

MODEL CODE: 13JZ62

## **MITSUBISHI ELECTRIC CORPORATION**

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN  
NAGOYA WORKS : 1-14, YADA-MINAMI 5-CHOME, HIGASHI-KU, NAGOYA, JAPAN

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