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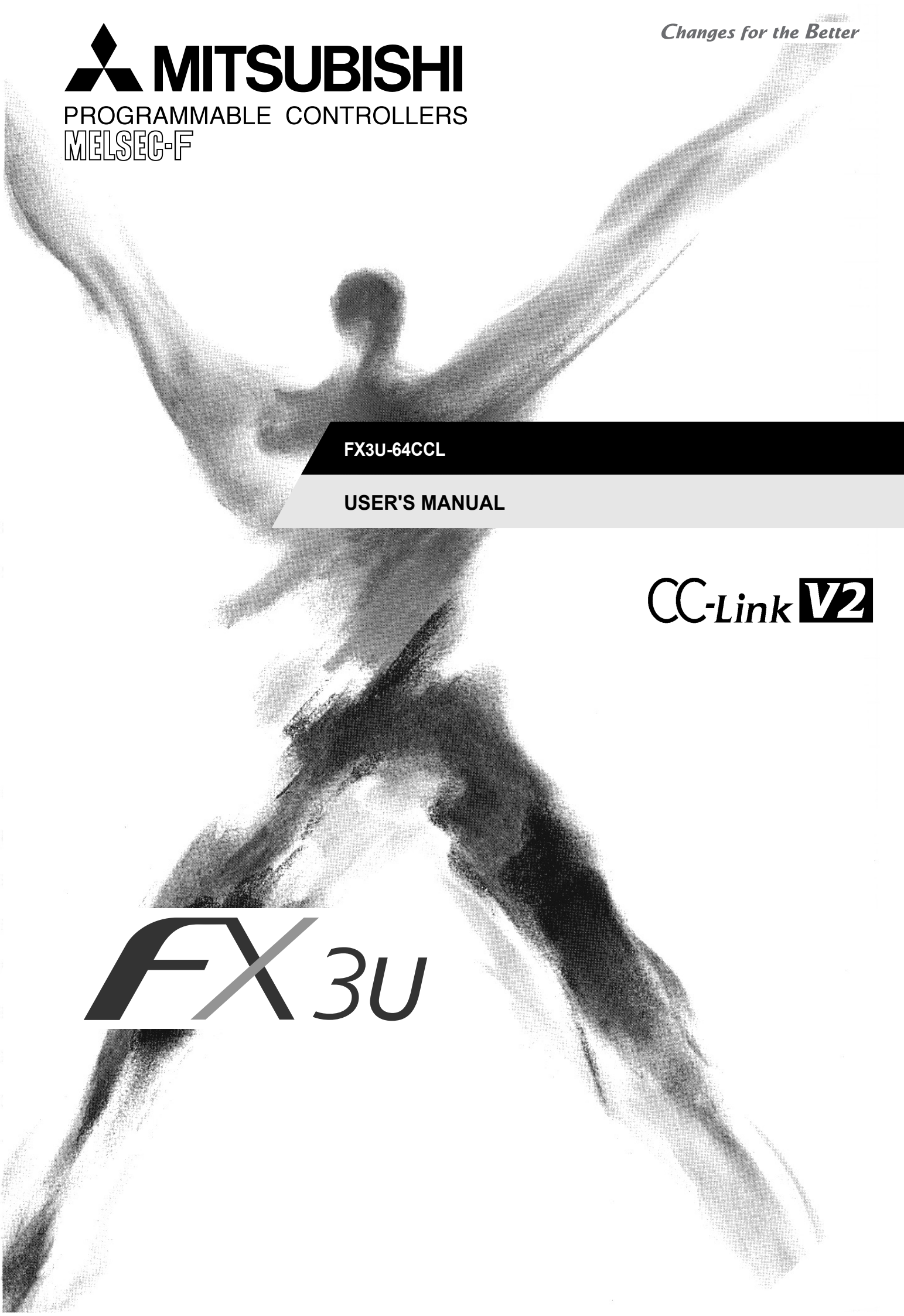

FX3U-64CCL

USER'S MANUAL

CC-Link V2

FX3U

Safety Precautions

(Read these precautions before using.)

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

This manual classifies the safety precautions into two categories: DANGER and CAUTION.

DANGER	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. In any case, it is important to follow all usage directions. 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

DANGER	Reference
• For the status of each station when the main unit stops calculation or when a communication error occurs in the data link, thoroughly read the description of data link processing time in the CC-Link master module manual. Construct an interlock circuit in the sequence program using the communication status information (BFM, SB, SW) so that the system always works conservatively. Erroneous outputs and malfunctions may cause accidents. 1) Setting to hold or clear the input information against data link error. Remote outputs (RY) and remote registers (RWw) are held or cleared in accordance with the setting of BFM #32. 0 (default): Data prior to the error is held. Other than 0: Data prior to the error is cleared. 2) Setting to hold or clear the data against a stop in the main unit. Remote inputs (RX) and remote registers (RWr) are held or cleared in accordance with the setting of BFM #33. 0 (default): Data prior to the stop is held. Other than 0: Data prior to the stop is cleared. • When executing control (data changes) to an operating PLC, construct an interlock circuit in the sequence program so that the entire system operates conservatively. In addition, 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. Especially in control from external equipment to a PLC in a remote place, problems in the PLC may not be able to be handled promptly due to abnormality in data transfer. Construct an interlock circuit in the sequence program. At the same time, determine the actions in the system between the external equipment and the PLC (Master station contains) for protection against abnormalities in data transfer. • Make sure to include the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure. Otherwise, malfunctions may cause serious accidents. 1) Above all, the following components should be included: 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 main unit detects an error during self diagnosis, such as a watchdog timer error, all outputs are turned off. Also, when an error that cannot be detected by the PLC main unit 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 cases.	14

CAUTION	Reference
• Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident. 1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line. Noise may cause malfunctions. 2) Ground the shield wire or shield of a shielded cable. Do not use common grounding with heavy electrical systems (refer to Subsection 5.1.2). • Do not apply excessive pressure to the power supply terminal block or CC-Link connection terminal block. Excessive pressure may cause damage or error.	14 24

2. INSTALLATION PRECAUTIONS

DANGER	Reference
• Make sure to cut off all phases of the power supply externally before attempting installation or wiring work. Failure to do so may cause electric shock or damage to the product.	21

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 port 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.	21

3. WIRING PRECAUTIONS

DANGER	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.	24

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. • Perform class D grounding (grounding resistance: 100Ω or less) to the grounding terminal on the 64CCL with a wire as thick as possible. Do not use common grounding with heavy electrical systems (refer to Subsection 5.1.2). • 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. • For the CC-Link system, use CC-Link dedicated cables. The performance of the CC-Link system cannot be guaranteed with any cable other than CC-Link dedicated cables. For the maximum total extension length and the cable length between stations, observe the specification described in the CC-Link master module manual. With wiring outside the specification range, normal data transfer cannot be guaranteed. • Do not bundle the CC-Link exclusive cable together with or lay it close to the main circuit, high-voltage line, or load line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit, high-voltage line, or load line. Otherwise, noise disturbance and/or surge induction are likely to take place. • Make sure to fix communication cables and power cables connected to the module by placing them in the duct or clamping them. Cables not placed in duct or not clamped may hang or shift, allowing them to be accidentally pulled, which may result in malfunction or damage to the module and the cables.	24

CAUTION	Reference
• When disconnecting a communication/power cable connected to the module, do not hold the cable area. For a cable connected to a terminal block, loosen screws of the terminal block, then disconnect the cable. If a cable is pulled while it is connected to a module, the module may malfunction or the module and the cable may be damaged.	24

4. STARTUP AND MAINTENANCE PRECAUTIONS

DANGER	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.	24

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 distributor. • 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. - Display module, peripheral devices, expansion boards, and special adapters - Terminal blocks, I/O extension units/blocks and special function units/blocks	25

5. DISPOSAL PRECAUTIONS

CAUTION	Reference
• Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.	14

6. TRANSPORTATION 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. Failure to do so may cause failures in the PLC. After transportation, verify the operations of the PLC.	14

MEMO

FX3U-64CCL

User's Manual

Manual number	JY997D30401
Manual revision	B
Date	6/2008

Foreword

This manual describes the FX3U-64CCL CC-Link interface 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.

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

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Outline Precautions

- This manual provides information for the use of the FX3U Series Programmable Controllers. 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 the nearest Mitsubishi Electric distributor.
- 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 the nearest Mitsubishi Electric distributor.

Registration

- The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

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Standards

Certification of UL, cUL standards

FX3U-64CCL units comply with the UL standards (UL, cUL).

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.

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 (89/336/EEC) when used as directed by the appropriate documentation.

Type: Programmable Controller (Open Type Equipment)
Models: MELSEC FX3U series manufactured
from March 1st, 2008 FX3U-64CCL

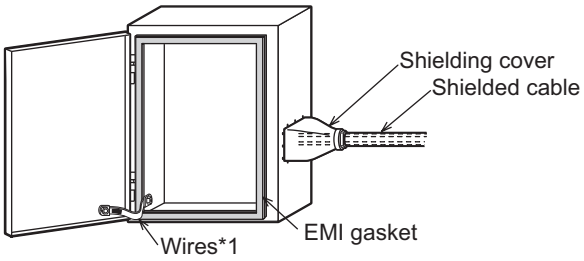
Standard	Remark
EN61131-2:2003 Programmable controllers - Equipment requirements and tests	Compliance with all relevant aspects of the standard. EMI • Radiated Emissions • Conducted Emissions EMS • Radiated electromagnetic field • Fast Transient burst • Electrostatic discharge • High-energy surge • Voltage drops and iterruptions • Conducted RF • Power frequency magnetic field

Caution to conform with EC Directives

- Installation in Enclosure

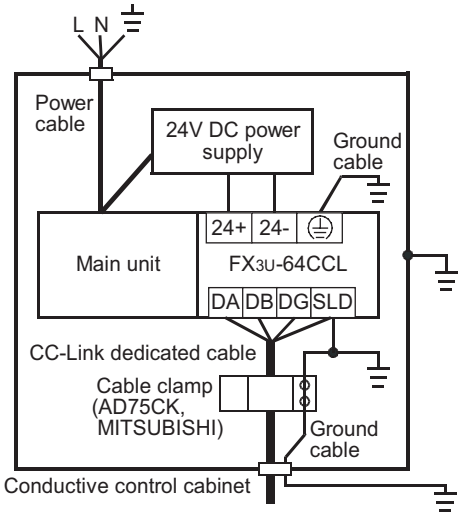
Programmable logic controllers are open-type devices that must be installed and used within conductive control cabinets. Please use the programmable logic controller while installed within a conductive shielded control cabinet. Please secure the cabinet door to the control cabinet (for conduction).
Installation 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 electric 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.

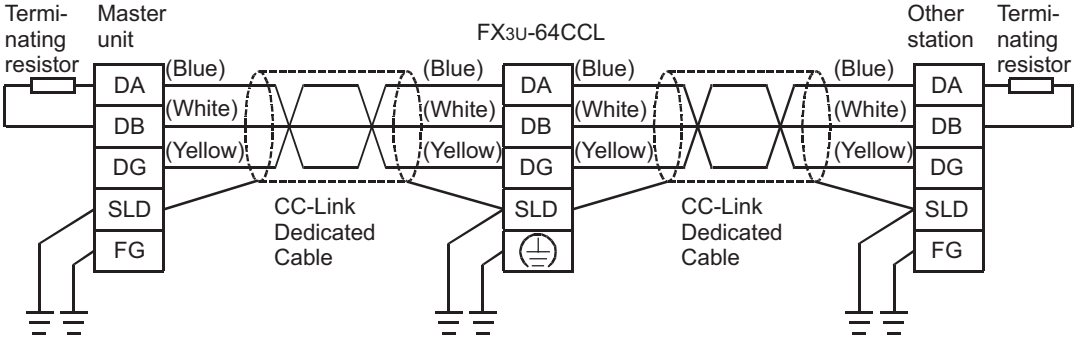


*1. These wires are used to improve the conductivity between the door and control cabinet.

- Configuration example inside control cabinet



- Wiring simplified diagram



Associated Manuals

Only the installation manual is packed together with the FX3U-64CCL CC-Link interface block.
For a detailed explanation of the FX3U-64CCL CC-Link Interface block, refer to this manual.
For the operation of GX Developer, or 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 (Only Japanese document)	JY997D31901	Describes FX3G Series PLC specification for I/O, wiring and installation extracted from the FX3G Series User's Manual - Hardware Edition. For details, refer to FX3G Series User's Manual - Hardware Edition (Only Japanese document).	-
⊙	Additional Manual	FX3G Series User's Manual - Hardware Edition	JY997D31201	Describes FX3G Series PLC specification details for I/O, wiring, installation and maintenance (This manual will be available in September 2008 or later).	09R520
FX3U Series PLCs Main Unit					
△	Supplied Manual	FX3U Series Hardware Manual	JY997D18801	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,DSS) Series Hardware Manual	JY997D28601	Describes FX3UC(D,DSS) Series PLC specification for I/O, wiring and installation extracted from the FX3UC Series 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 (Only Japanese document).	-
⊙	Additional Manual	FX3UC Series User's Manual - Hardware Edition	JY997D28701	Describes FX3UC Series PLC specification details for I/O, wiring, installation and maintenance.	09R519
Programming for FX3U/FX3UC Series					
⊙	Additional Manual	FX3U/FX3UC Series Programming Manual - Basic & Applied Instruction Edition	JY997D16601	Describes FX3U/FX3UC Series PLC programming for basic/applied instructions and devices.	09R517
Manuals for FX3U-64CCL CC-Link Interface Block					
△	Supplied Manual	FX3U-64CCL Installation Manual	JY997D29801	Describes FX3U-64CCL CC-Link interface block specification for installation extracted from the FX3U-64CCL User's Manual. For details, refer to FX3U-64CCL User's Manual.	-
⊙	Additional Manual	FX3U-64CCL User's Manual (This Manual)	JY997D30401	Describes FX3U-64CCL CC-Link interface block details.	09R718

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
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	
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 Editon of the main unit to be used for your system.
Special adapter	
Special adapter	Generic name for high-speed input/output special adapter, communication special adapter, and analog 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 Editon of the main unit to be used for your system.
Extension equipment	
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 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.
64CCL	Abbreviated name for FX3U-64CCL
Optional unit	
Memory cassette	FX3G-EEPROM-32L, FX3U-FLROM-16, FX3U-FLROM-64, FX3U-FLROM-64L
Battery	FX3U-32BL
FX Series terminal block	FX-16E-TB, FX-32E-TB, FX-16EX-A1-TB, FX-16EYR-TB, FX-16EYT-TB, FX-16EYT-H-TB, FX-16EYS-TB, FX-16E-TB/UL, FX-32E-TB/UL, FX-16EYR-ES-TB/UL, FX-16EYT-ES-TB/UL, FX-16EYT-ESS-TB/UL, FX-16EYS-ES-TB/UL
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 Developer	Generic name for SW□D5C-GPPW-J/SW□D5C-GPPW-E programming software package
FX-PCS/WIN(-E)	Generic name for FX-PCS/WIN or FX-PCS/WIN-E programming software package
Handy programming panel (HPP)	Generic name for FX-20P(-E) and FX-10P(-E)

Generic name or abbreviation	Description
Indicator	
GOT1000 series	Generic name for GT15, GT11 and GT10
GOT-900 series	Generic name for GOT-A900 series and GOT-F900 series
GOT-A900 series	Generic name for GOT-A900 series
GOT-F900 series	Generic name for GOT-F900 series
ET-940 series	Generic name for ET-940 series Only manuals in Japanese are available for these products
Manual	
FX3G Hardware Edition	FX3G Series User's Manual - Hardware Edition (This manuals will be available in September 2008 or later)
FX3U Hardware Edition	FX3U Series User's Manual - Hardware Edition
FX3UC Hardware Edition	FX3UC Series User's Manual - Hardware Edition
Programming manual	FX3U/FX3UC Series Programming Manual - Basic and Applied Instructions Edition
Communication control Edition	FX Series User's Manual - Data Communication Edition
Analog control Edition	FX3U/FX3UC Series User's Manual - Analog Control Edition
Positioning control Edition	FX3U/FX3UC Series User's Manual - Positioning Control Edition

Reading the Manual

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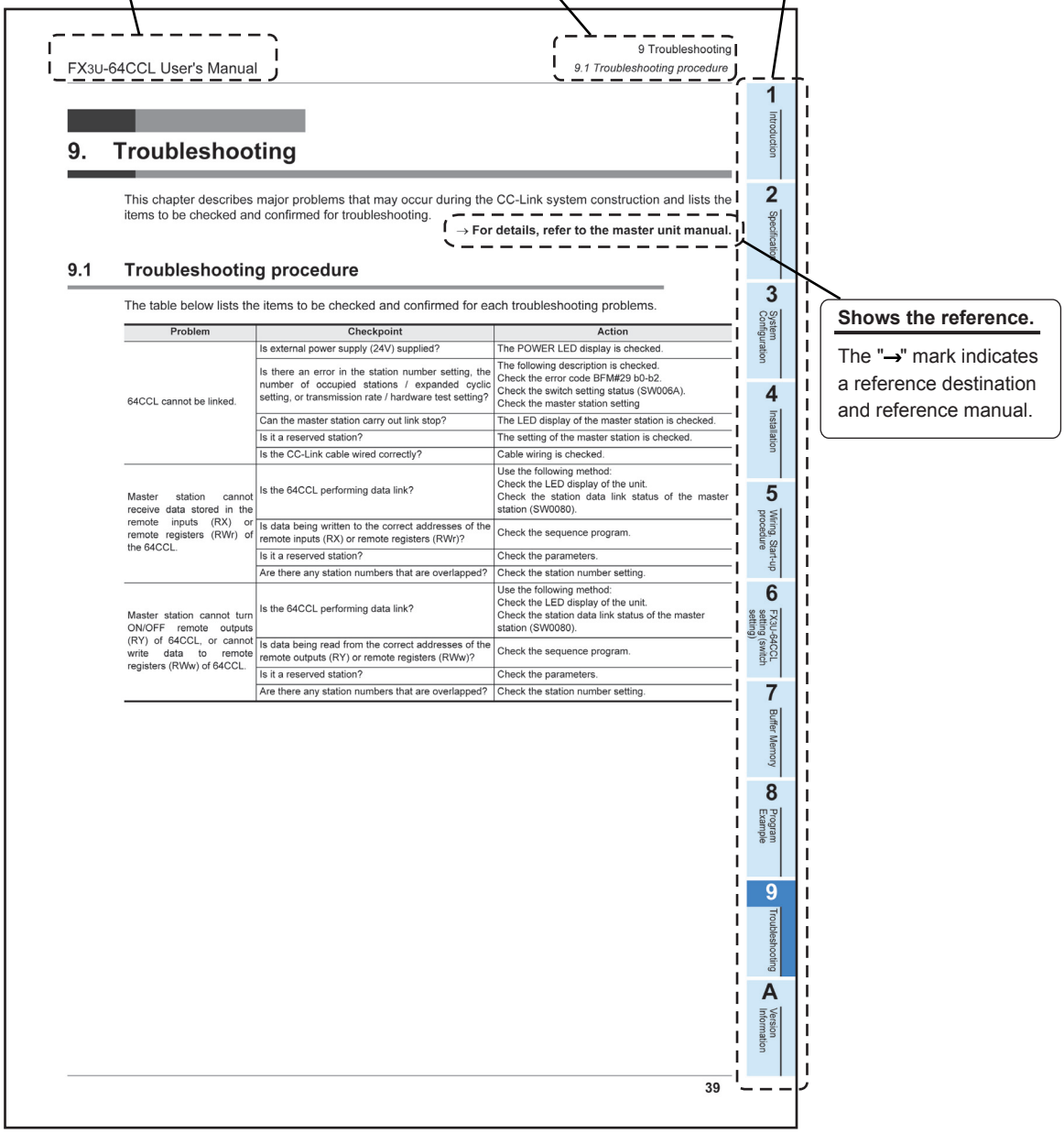

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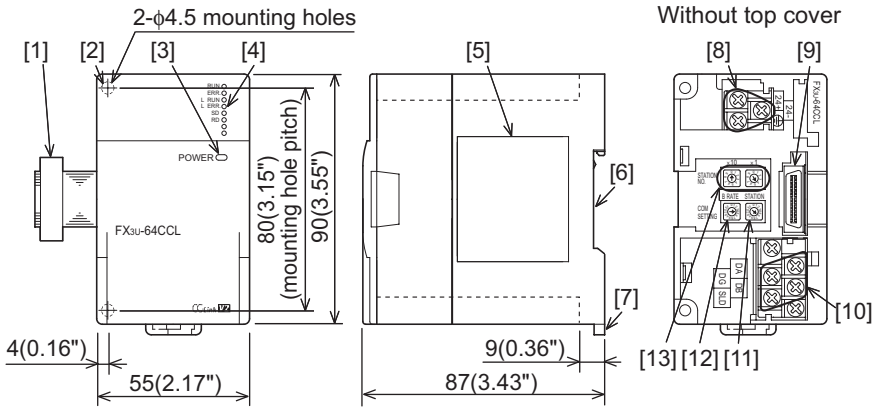
1. Introduction

1.1 Outline

The CC-Link interface block FX3U-64CCL (hereinafter called 64CCL) is a special function block to connect the FX3G/FX3U/FX3UC Series programmable logic controller to a CC-Link network.
The 64CCL works as an intelligent device station on a CC-Link network.
Only one 64CCL unit can be connected to a single programmable logic controller main unit.

- Compatible with CC-Link Ver. 2.00 and Ver. 1.10
  The 64CCL is compatible with CC-Link Ver. 2.00, and enables expanded cyclic transmission to facilitate the handling of applications requiring multiple data processing.
  Ver. 1.10 is also supported by the 64CCL.
- When accessing the FX3U/FX3UC main unit from another station QCPU (Q mode) with GX Developer (Ver. 8.72A or later) is required. Access is carried out by the QCPU (Q mode) connected to the FX3U/FX3UC main unit via CC-Link.

1.2 External Dimensions and Part Names



Unit: mm (inches)
MASS (Weight): 0.3kg (0.66lbs)
Accessories: Label for indication of
special unit/block number,
Dust Proof sheet,
Manual supplied with product

[1] Extension cable

[2] Direct mounting hole: 2 holes of 4.5 (0.18") (mounting screw: M4 screw)

[3] POWER LED (green)

[4] Status LEDs

→ **Refer to Section 1.4**

[5] Name plate

[6] DIN rail mounting groove (DIN rail: DIN46277, 35mm (1.38") width)

[7] DIN rail mounting hook

[8] Power supply terminal block

[9] Extension connector

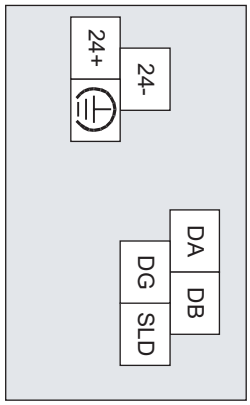
[10] CC-Link connection terminal block

[11] Number of occupied stations and expanded cyclic setting switch

[12] Transmission rate setting switch

[13] Station number setting switch

1.3 Terminal layout



Power supply terminal block

CC-Link connection terminal block

Terminal name	Description
24+	24V DC power supply, + side
24-	24V DC power supply, - side
⏚	Ground terminal (Functional ground)
DA	Send/receive data
DB	Send/receive data
DG	Data ground
SLD	Shield

- Terminal screw and terminal block mounting screw size, and tightening torque Power supply terminal block, CC-Link connection terminal block:
  M3 screw, 42 to 58 N.cm
  CC-Link connection terminal block mounting screw (black):
  M3.5 screw, 66 to 91 N.cm

Caution

CC-Link connection terminal block can be detached or attached. Make sure to cut off all phases of the power supply externally.

1.4 Power and status LEDs

LED display	Color	Status	Description
POWER	Green	OFF	Power is not being supplied from the external power supply (24V DC).
		ON	Power is being supplied from the external power supply (24V DC).
RUN	Green	OFF	64CCL has failed.
		ON	Under 64CCL normal operation.
ERR.	Red	OFF	No errors.
		ON	Error in the settings, error in the parameter details, error with the communication, error with the H/W.
L RUN	Green	OFF	Offline.
		ON	Data link is being executed.
L ERR.	Red	OFF	No communication error.
		Flicker	The switch setting was changed after start. There is no terminating resistor. Influence from noise.
		ON	There is a data linking error. There is a setting error.
SD	Green	OFF	Data is not being sent.
		ON	Data is being sent.
RD	Green	OFF	Data is not being received.
		ON	Data is being received.

2. Specification and function

DESIGN PRECAUTIONS DANGER

- For the status of each station when the main unit stops calculation or when a communication error occurs in the data link, thoroughly read the description of data link processing time in the CC-Link master module manual. Construct an interlock circuit in the sequence program using the communication status information (BFM, SB, SW) so that the system always works conservatively.
  Erroneous outputs and malfunctions may cause accidents.
  1) Setting to hold or clear the input information against data link error.
     Remote outputs (RY) and remote registers (RWw) are held or cleared in accordance with the setting of BFM #32.
     0 (default): Data prior to the error is held.
     Other than 0: Data prior to the error is cleared.
  2) Setting to hold or clear the data against a stop in the main unit.
     Remote inputs (RX) and remote registers (RWr) are held or cleared in accordance with the setting of BFM #33.
     0 (default): Data prior to the stop is held.
     Other than 0: Data prior to the stop is cleared.
- When executing control (data changes) to an operating PLC, construct an interlock circuit in the sequence program so that the entire system operates conservatively.
  In addition, 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.
  Especially in control from external equipment to a PLC in a remote place, problems in the PLC may not be able to be handled promptly due to abnormality in data transfer.
  Construct an interlock circuit in the sequence program. At the same time, determine the actions in the system between the external equipment and the PLC (Master station contains) for protection against abnormalities in data transfer.
- Make sure to include the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure.
- Otherwise, malfunctions may cause serious accidents.
  1) Above all, the following components should be included: 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 main unit detects an error during self diagnosis, such as a watchdog timer error, all outputs are turned off. Also, when an error that cannot be detected by the PLC main unit 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 cases.

DESIGN PRECAUTIONS CAUTION

- Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident.
  1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line.
     Noise may cause malfunctions.
  2) Ground the shield wire or shield of a shielded cable.
     Do not use common grounding with heavy electrical systems (refer to Subsection 5.1.2).
- Do not apply excessive pressure to the power supply terminal block or CC-Link connection terminal block.
  Excessive pressure may cause damage or error.

DISPOSAL PRECAUTIONS CAUTION

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

TRANSPORTATION PRECAUTIONS CAUTION

- The product is a precision instrument. During transportation, avoid any impacts. Failure to do so may cause failures in the product. After transportation, verify the operations of the product.

2.1 General specifications

For items not listed below, specifications are the same as the of the PLC main unit.
For general specifications, refer to the manual of the PLC main unit.

→ **Refer to FX3G Hardware Edition**
→ **Refer to FX3U Hardware Edition**
→ **Refer to FX3UC Hardware Edition**

Item	Specification	
Dielectric withstand voltage	500V AC for one minute	Conforming to JEM-1021 Between all terminals and ground terminal
Insulation resistance	5MΩ or more by 500V DC Megger	

2.2 Power supply specification

Item		Specification
External power supply	Power supply voltage	24V DC +20% -15% Ripple (p-p) within 5%
	Permitted instantaneous power failure time	Operation continues when the instantaneous power failure is shorter than PS1:1ms.
	Current consumption	220mA

2.3 Performance specification

Item	Specification
CC-Link applicable version	Ver.2.00 (Ver.1.10 also supported.)*1
Station type	Intelligent device station
Station number	1 to 64
Transmission rate	156Kbps/625Kbps/2.5Mbps/5Mbps/10Mbps
Transmission distance	In accordance with the CC-Link specification. Refer to the PLC main unit manual for details.
Number of occupied stations	1 to 4 stations
Setting items	Station number, Transmission rate, Number of occupied stations, Expanded cyclic setting
Communication method	Broadcast polling system
Synchronous method	Flag synchronization method
Encoding method	NRZI method
Transmission path type	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control method	CRC($X^{16}+X^{12}+X^{5}+1$)
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high-performance cable/ Ver.1.10 compatible CC-Link dedicated cable
Number of I/O occupied points	8 points
Number of connectable units to the main unit	1

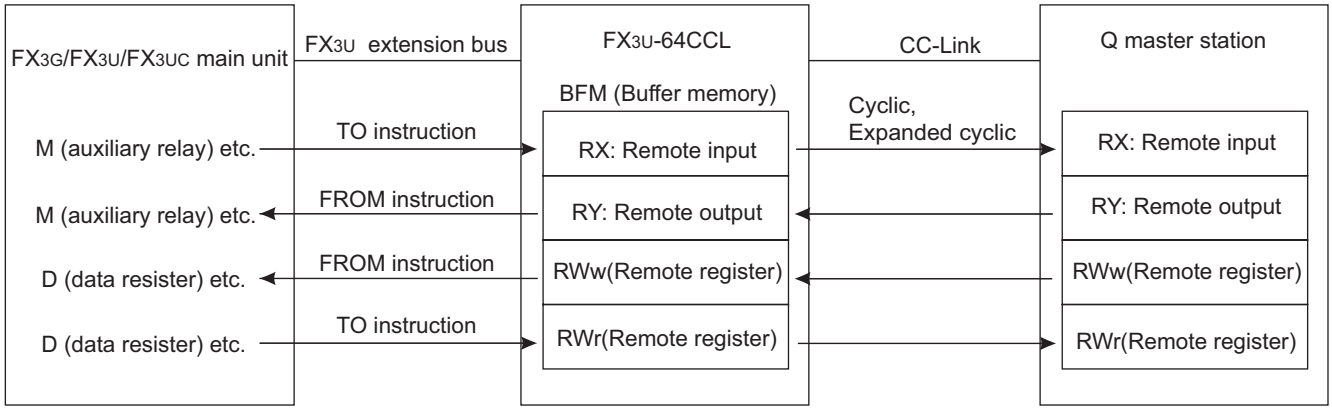
*1. When the setting of the 64CCL is the single setting, please set up the master station as a Ver.1 intelligent device station. When the setting of the 64CCL are the double setting, the quadruple setting, or the octuple setting, please set up the master station as a Ver.2 intelligent device station.

- Expanded cyclic setting and number of link points

		CC-Link Ver.1.10	CC-Link Ver.2.00		
Expanded cyclic setting		Single	Double	Quadruple	Octuple
Occupies 1 station	bit (RX)	32 points	32 points	64 points	128 points
	bit (RY)	32 points	32 points	64 points	128 points
	word (RWw)	4 points	8 points	16 points	32 points
	word (RWr)	4 points	8 points	16 points	32 points
Occupies 2 stations	bit (RX)	64 points	96 points	192 points	-
	bit (RY)	64 points	96 points	192 points	
	word (RWw)	8 points	16 points	32 points	
	word (RWr)	8 points	16 points	32 points	
Occupies 3 stations	bit (RX)	96 points	160 points	-	-
	bit (RY)	96 points	160 points		
	word (RWw)	12 points	24 points		
	word (RWr)	12 points	24 points		
Occupies 4 stations	bit (RX)	128 points	224 points	-	-
	bit (RY)	128 points	224 points		
	word (RWw)	16 points	32 points		
	word (RWr)	16 points	32 points		

2.4 Communication function

2.4.1 Data transfer between 64CCL and master station



Data is transferred using FROM/TO instructions via the buffer memory (or direct specification of buffer memory) between the FX3G/FX3U/FX3UC PLC and the 64CCL. Data is replaced with internal devices (such as M, R and D), and used in sequence programs.
Cyclic transmission and extended cyclic transmission are available between the master station and the 64CCL.

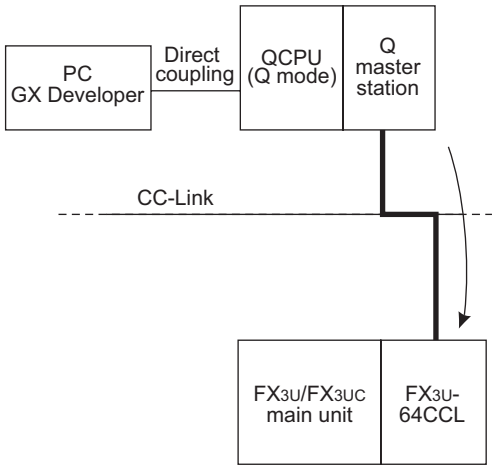
2.4.2 Summary of accessing the FX3U/FX3UC main unit from another station QCPU (Q mode) station.

The FX3U/FX3UC which is connected to the 64CCL can be accessed via CC-Link from QCPU (Q mode) master / local station when GX Developer (Ver. 8.72A or later) is used.
Accessing permits write and read, verify, carry out device batch monitoring and complete device test.

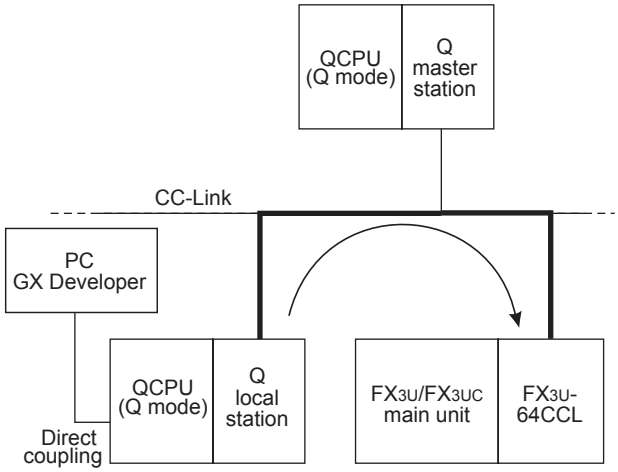
2.4.3 The accessing path to the FX3U/FX3UC from another QCPU (Q mode) controller.

From the master station/local station of the QCPU (Q mode), the FX3U/FX3UC programmable logic controller main unit can be accessed. The communication path of CC-Link is illustrated as follows.

1) The path when accessing from the master QCPU (Q mode) station

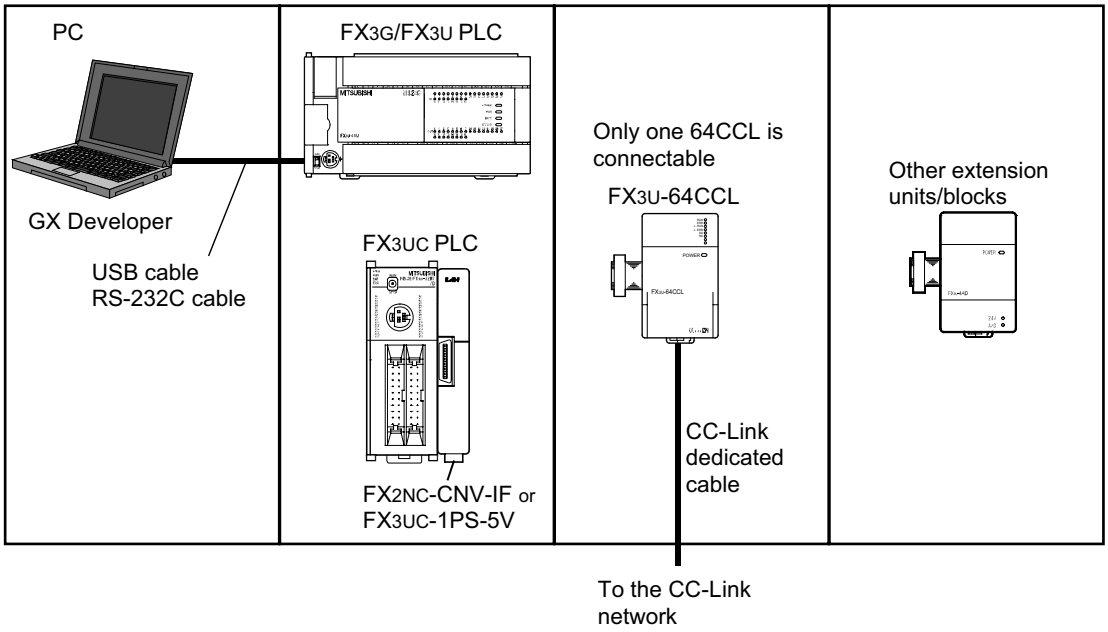


2) The path when accessing from a local QCPU (Q mode) station



3. System Configuration

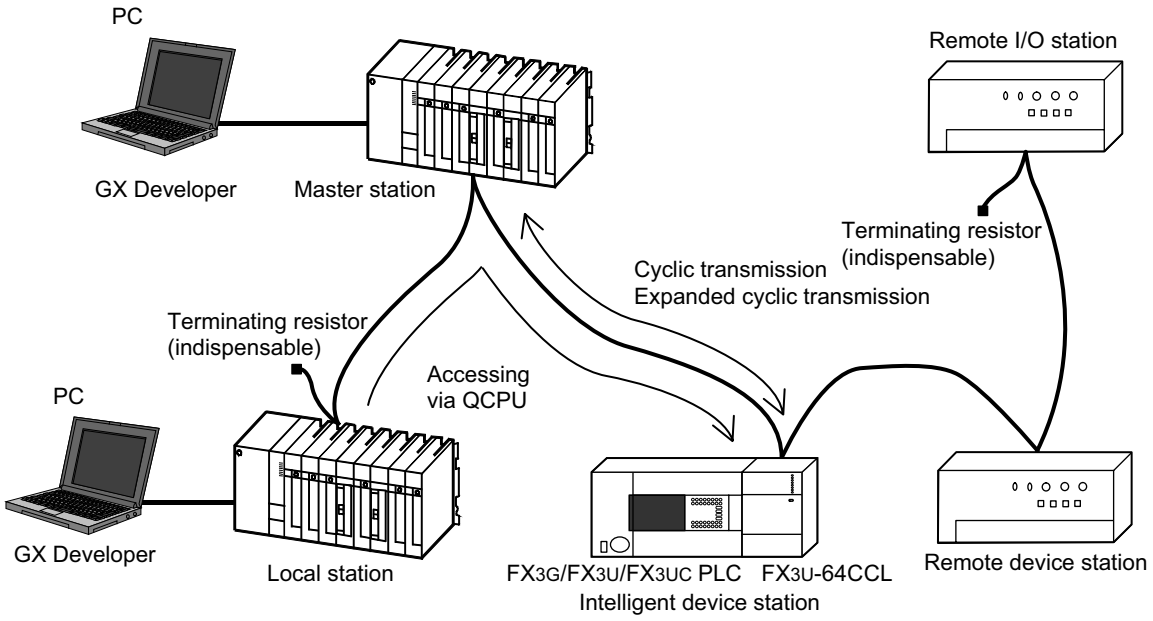
3.1 General configuration



Component list

Part name	Model name	Remarks
CC-Link interface block	FX3U-64CCL	An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 64CCL with the FX3UC PLC.
PLC	FX3G/FX3U/FX3UC PLC	-
PC software	GX Developer	PLC programming software
PC	-	-
USB cable	FX-USB-AW	Connection cable between FX PLC and PC
RS-232C cable	F2-232CAB-1	PC connection cable and interface
	FX-232AWC-H	
	FX-422CAB0	

3.2 CC-Link network configuration



3.3 Applicable PLC

3.3.1 Connectable PLC

Model name	Applicability
FX3G Series PLC	Ver. 1.00 (from the first product) and later Only one 64CCL unit can be connected to a main unit.
FX3U Series PLC	Ver. 2.20 (from the first product) and later Only one 64CCL unit can be connected to a main unit.
FX3UC Series PLC*1	Ver. 2.20 (from products manufactured in May, 2005 with SER No. 55****) and later Only one 64CCL unit can be connected to a main unit.

The version number can be checked by monitoring the last three digits of D8001.

*1. An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 64CCL with the FX3UC PLC.

3.3.2 Corresponding Q Series controllers when accessing via another station QCPU (Q mode)

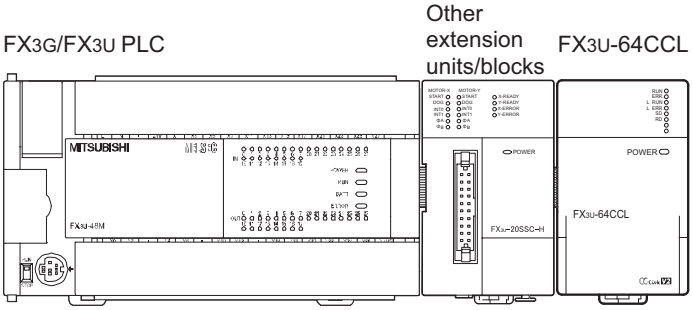
CC-Link system master / local unit QJ61BT11N is required.

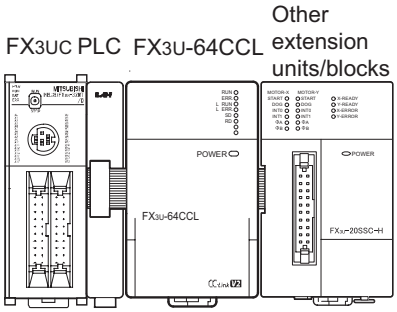
QCPU(Q mode) series name	Corresponding model name
Basic model QCPU	Q00JCPU,Q00CPU,Q01CPU
High performance model QCPU	Q02CPU,Q02HCPU,Q06HCPU,Q12HCPU,Q25HCPU
Universal model QCPU	Q02UCPU,Q03UDCPU,Q04UDHCPU,Q06UDHCPU,Q13UDHCPU,Q26UDHCPU

3.4 Connection with PLC

The 64CCL connects with an FX3U PLC via an extension cable.
The 64CCL is handled as a special extension block of the PLC. The unit number of the 64CCL 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 for the designation of a FROM/TO instruction.)
For details on the assignment of the I/O number and unit number of the PLC, refer to the following manual corresponding to the connected PLC.

→ **FX3G Hardware Edition**
→ **FX3U Hardware Edition**
→ **FX3UC Hardware Edition**





FX2NC-CNV-IF

- Only one 64CCL unit can be connected to the FX3G/FX3U/FX3UC PLC.
- An FX2NC-CNV-IF or FX3UC-1PS-5V is necessary to connect the 64CCL with the FX3UC PLC.
- The optional FX0N-65EC (FX0N-30EC) and FX2N-CNV-BC are necessary to lengthen the extension cable.
- The number of I/O points occupied by the 64CCL is eight. Make sure that the total number of I/O points (occupied I/O points) of the main unit, power 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 respective product manual.

→ **FX3G Hardware Edition**
→ **FX3U Hardware Edition**
→ **FX3UC Hardware Edition**

4. Installation

INSTALLATION PRECAUTIONS DANGER

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

INSTALLATION PRECAUTIONS CAUTION

- Use the product within the generic environment specifications described in Section 2.1 of this manual. Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl_2, H_2S, SO_2 or NO_2), flammable gas, vibration or impacts, or exposed 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 port 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 64CCL unit can be connected to the right side of the main unit, extension unit or extension block.
To connect to an FX3UC PLC or FX2NC PLC extension block, the FX2NC-CNV-IF or FX3UC-1PS-5V is necessary.
For details, refer to the respective PLC manual.

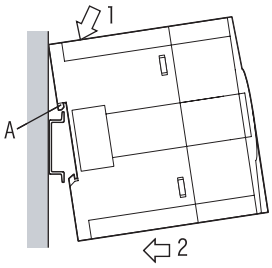
→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

The 64CCL 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 35mm 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.



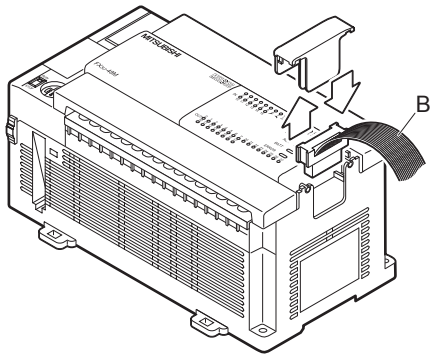
2 Push the product onto the DIN rail.

- An interval space of 1 to 2 mm (0.04" to 0.08") between each unit is necessary.

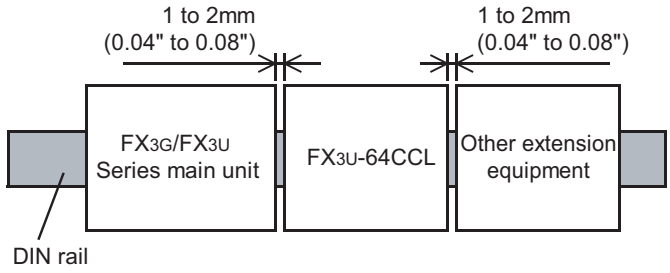
3 Connect the extension cable.

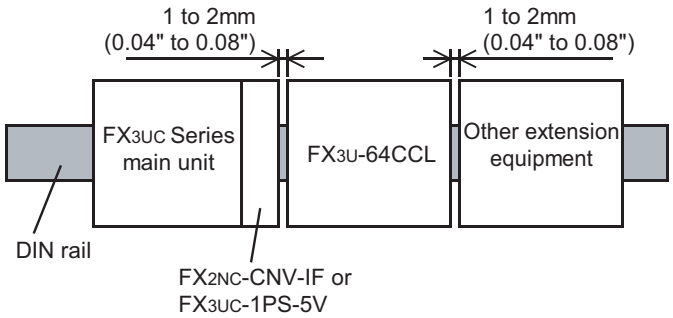
Connect the extension cable (B in the figure to the right) to the main unit, I/O extension unit/block or special function unit/block on the left side of the product.
For information on the extension cable connection procedure, refer to the respective product PLC manual.

→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**



- Example of anchoring





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 following respective PLC manual.

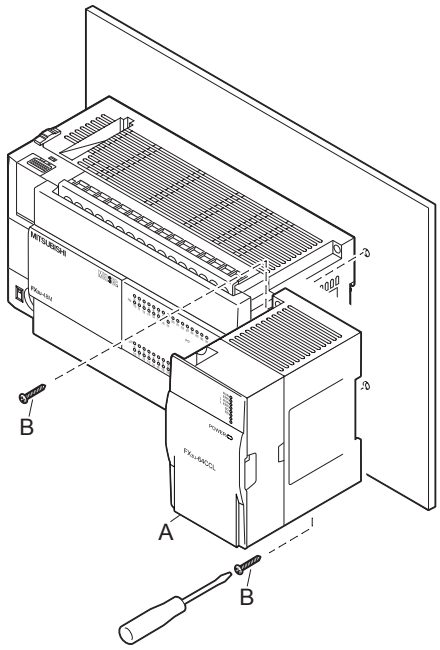
→ **For mounting hole pitches, refer to Section 1.2.**
→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

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

2 Fit the 64CCL (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.**

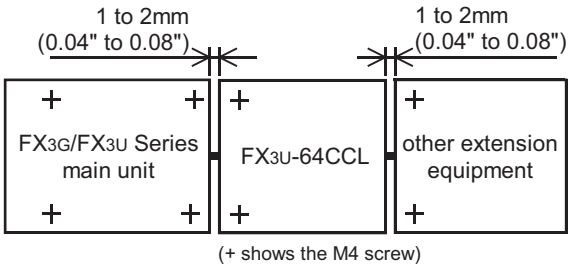


3 Connect the extension cable.

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 respective PLC manual.

→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

- Example of anchoring



5. Wiring, Start-up procedure

DESIGN PRECAUTIONS ⚠ CAUTION

- Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident.
  1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line.
     Noise may cause malfunctions.
  2) Ground the shield wire or shield of a shielded cable. Do not use common grounding with heavy electrical systems (refer to Subsection 5.1.2).
- Do not apply excessive pressure to the power supply terminal block or CC-Link connection terminal block.
  Excessive pressure may cause damage or error.

WIRING PRECAUTIONS ⚠ DANGER

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

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.
- Perform class D grounding (grounding resistance: 100Ω or less) to the grounding terminal on the 64CCL with a wire as thick as possible.
  Do not use common grounding with heavy electrical systems (refer to Subsection 5.1.2).
- 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.
- For the CC-Link system, use CC-Link dedicated cables.
  The performance of the CC-Link system cannot be guaranteed with any cable other than CC-Link dedicated cables.
  For the maximum total extension length and the cable length between stations, observe the specification described in the CC-Link master module manual.
  With wiring outside the specification range, normal data transfer cannot be guaranteed.
- Do not bundle the CC-Link exclusive cable together with or lay it close to the main circuit, high-voltage line, or load line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit, high-voltage line, or load line.
  Otherwise, noise disturbance and/or surge induction are likely to take place.
- Make sure to fix communication cables and power cables connected to the module by placing them in the duct or clamping them.
  Cables not placed in duct or not clamped may hang or shift, allowing them to be accidentally pulled, which may result in malfunction or damage to the module and the cables.
- When disconnecting a communication/power cable connected to the module, do not hold the cable area.
  For a cable connected to a terminal block, loosen screws of the terminal block, then disconnect the cable.
  If a cable is pulled while it is connected to a module, the module may malfunction or the module and the cable may be damaged.

STARTUP AND MAINTENANCE PRECAUTIONS ⚠ DANGER

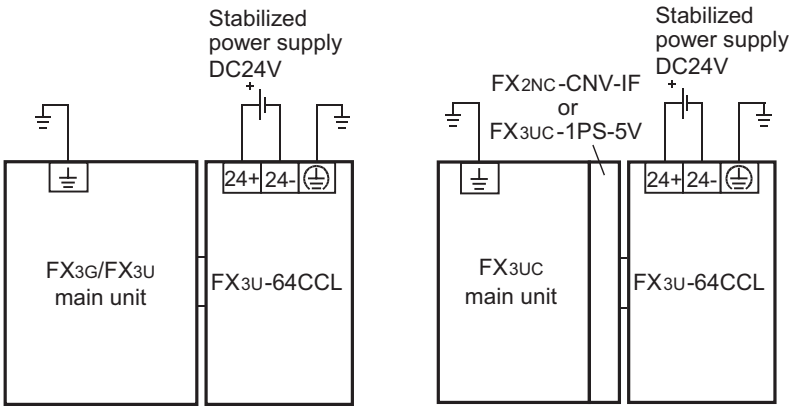
- Do not touch any terminal while the PLC's power is on.
  Doing so may cause electric shock or malfunctions.
- Before cleaning or retightening terminals, cut off all phases of the power supply externally.
  Failure to do so may cause electric shock.
- Before modifying or disrupting the program in operation 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 distributor.
- 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.
  - Display module, peripheral devices, expansion boards, and special adapters
  - Terminal blocks, I/O extension units/blocks and special function units/blocks

5.1 Power supply wiring

5.1.1 Power supply wiring



Power-on/off timing

The 64CCL power supply should be turned ON simultaneously with or before the power supply of the PLC main unit. Before turning the power OFF, ensure the safety of the system and then simultaneously turn the main unit, 64CCL, and other extension equipment (the special extension equipment is included) OFF.
For details, refer to the respective PLC manual.

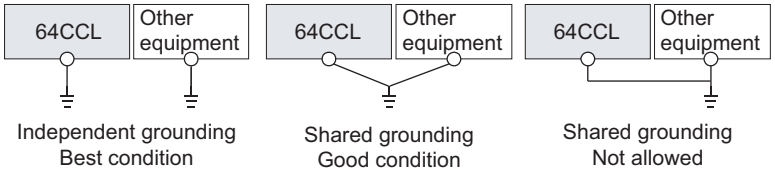
→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

5.1.2 Grounding

Ground the cables as follows

- The grounding resistance should be 100Ω or less.
- Independent grounding should be established whenever possible.
  Independent grounding should be performed for best results.
  When independent grounding is not configured, perform "shared grounding" as shown in the following figure.
  For details, refer to the respective PLC manual.

→ **Refer to the FX3G Hardware Edition**
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

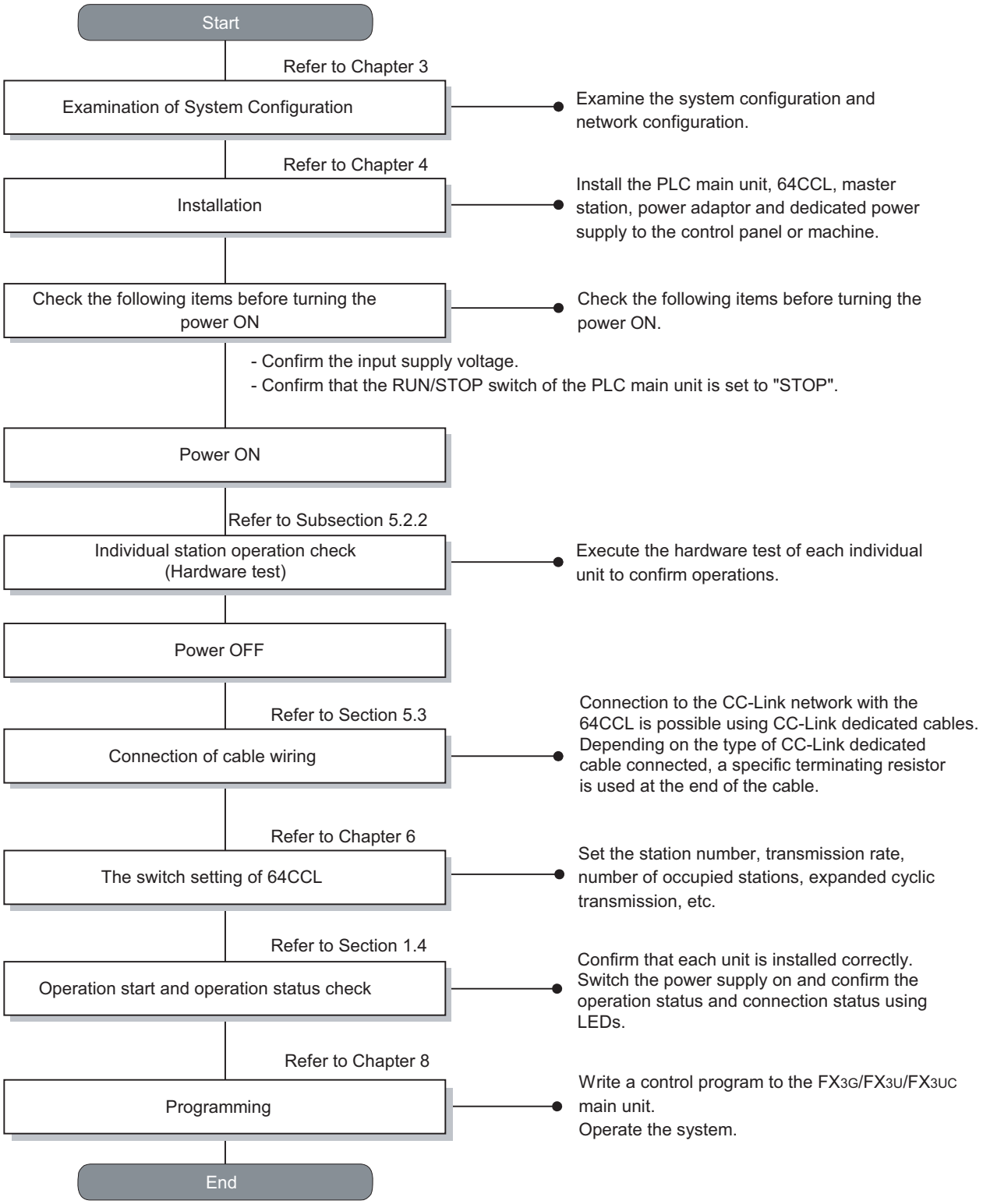


- The grounding point should be close to the 64CCL, and all grounding wires should be as short as possible.

5.2 Start-up procedure

Before wiring the CC-Link network, use the 64CCL to execute the hardware test.
Refer to the manual of the master unit for details on various procedures including data linking of the CC-Link system.

5.2.1 64CCL summary start-up procedure



5.2.2 Hardware test

Using only the 64CCL, confirm that the hardware operates normally.
Make sure to execute the hardware test before configuring the CC-Link system.
Make sure to execute the hardware test using the 64CCL without any cable connections. Connected cables disable normal operation of the hardware test.
Check the following items in the hardware test.

Hardware test item
Communication LSI test
ROM test
RAM test
Timer functionality test
Watchdog timer functionality test

- The following sequence outlines the hardware test execution procedure:

1) Power OFF the 64CCL.
2) With the transmission rate to be used, set the rotary switch for the transmission rate setting to the hardware test status, "A" to "E".
   → **For details on the hardware test status for the transmission rate setting rotary switch, refer to Section 6.2.**
3) Set the station number setting switches to "×10: 0" and "×1: 0".
4) Power ON the 64CCL.
5) Confirm the test results using LEDs.
   - When the initial communication processing is normally completed: The RUN LED turns ON.
   - Normal status: The watchdog timer function is activated, and the RUN LED turns OFF.
   - Abnormal status: The ERR. LED flickers to indicate abnormality in the hardware.

5.3 CC-Link wiring

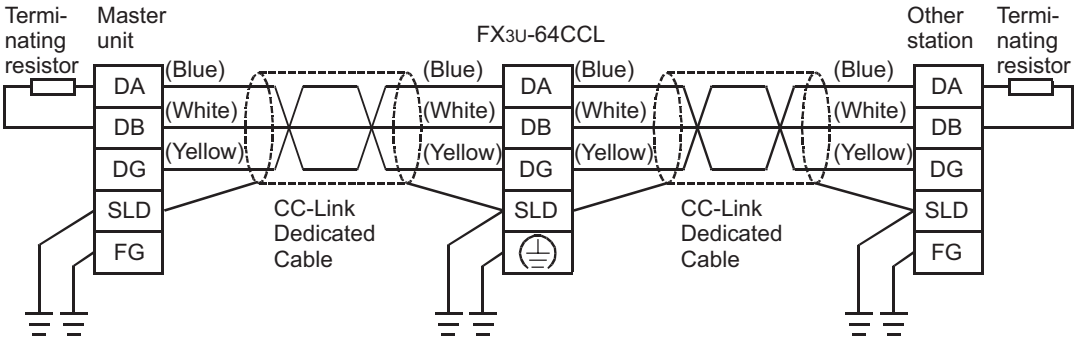
5.3.1 CC-Link cabling

Use dedicated CC-Link cables in the CC-Link system.
If any other cable is used, the performance of the CC-Link system cannot be guaranteed.
For the specifications of CC-Link dedicated cables, please refer to the CC-Link catalog published by the CC-Link Partner Association or the following website:
CC-Link Partner Association website: http://www.cc-link.org/

5.3.2 Wiring with CC-Link cabling

Wire the 64CCL to the CC-Link with CC-Link network dedicated cables as follows.

- Wiring example



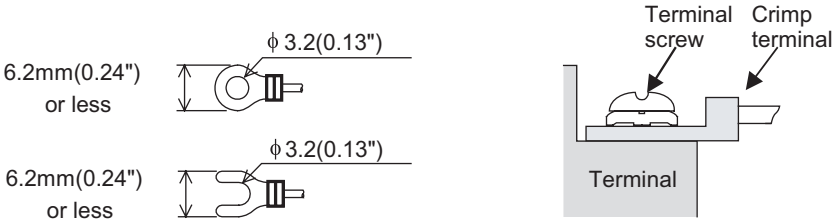
- Connect the [DA] and [DA] terminals, [DB] and [DB] terminals and [DG] and [DG] terminals of each station respectively with CC-Link dedicated cables.
- Connect the [SLD] terminal of each station to the shielded area of the CC-Link dedicated cables.
- Execute Class D grounding to the [FG] terminal of each station.
- Each station can be wired without regard to the station number sequence.
- Connect a terminating resistor between the [DA] and [DB] terminals of the terminal station. The terminating resistor is packed together with the master unit.
- The maximum transmission distance and distance among stations for the CC-Link system varies depending on the specified transmission rate. For details, follow the specifications described in the manual of the CC-Link master unit.

5.4 Screw size and tightening torque

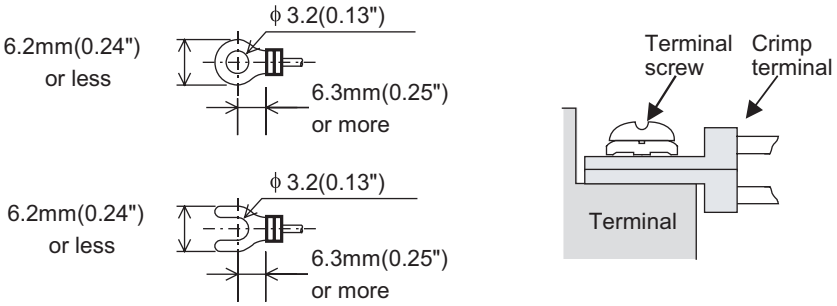
5.4.1 Terminal screw size and tightening torque

The power terminals and CC-Link connection terminals on the 64CCL use M3 screws.
Refer to the figures below for cable end treatment.
Set the tightening torque to 42 to 58 N•cm.

- When one wire is connected to one terminal



- When two wires are connected to one terminal



5.4.2 Terminal block mounting screw size and tightening torque

The CC-Link connection terminal block of the 64CCL can be removed.
(Black) mounting screws for the CC-Link connection terminal block are M3.5 size.
Set the tightening torque to 66 to 91 N•cm.

6. FX3U-64CCL setting (switch setting)

Set the station number, transmission rate, hardware test, number of occupied stations and expanded cyclic transmission options using the rotary switches provided under the top cover of the 64CCL.

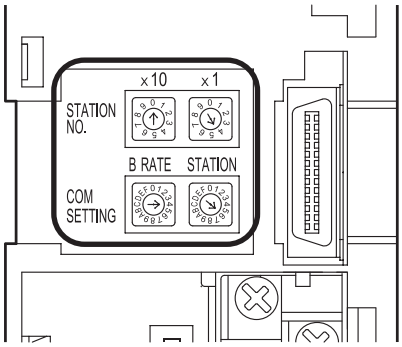
→ **For an illustration of the 64CCL without the top cover, refer to Section 1.2.**

The setting contents of each switch becomes valid after 64CCL startup. Set the switches while the power to the PLC and 64CCL is OFF. If the switch settings are changed after 64CCL startup, the L ERR. LED will flicker. To make the switch setting changes valid, reset the power to the PLC and the 64CCL.

6.1 Station number setting

Set the station number using two rotary switches (Setting range: 0 to 9).
The upper left switch specifies the 10's digit (×10), and the upper right switch specifies the 1's digit (×1).

- Rotary switch section



Set the station number within the range of 1 to 64.

Setting items	Range	Description
× 10	0 to 6	1 to 64 0 and 65 to 99 results in a setting error.
× 1	0 to 9	

Caution

It is necessary to avoid in correctly setting the station number of the 64CCL depending on the number of occupied stations setting the surrounding stations in the CC-Link network.

6.2 Transmission rate setting, hardware test

Set the transmission rate or execute the hardware test using the "COM SETTING: B RATE" rotary switch (Setting range: 0 to 4 and A to E) provided in the lower left position.

→ **For details on the rotary switch layout, refer to Section 6.1.**

Setting	Description	Status
0	Transmission rate 156Kbps	Online
1	Transmission rate 625Kbps	
2	Transmission rate 2.5Mbps	
3	Transmission rate 5Mbps	
4	Transmission rate 10Mbps	
5 to 9	Unusable	Unusable
A	Transmission rate 156Kbps	Hardware test
B	Transmission rate 625Kbps	
C	Transmission rate 2.5Mbps	
D	Transmission rate 5Mbps	
E	Transmission rate 10Mbps	
F	Unusable	Unusable

For the hardware test, refer to the following.

→ **For details on the hardware test, refer to Subsection 5.2.2.**

Caution

Set the transmission rate within the specification of the maximum transmission distance and transmission rate, along with the transmission rate selected in the master station.

6.3 Number of occupied stations, expanded cyclic setting

Set the number of occupied stations and expanded cyclic transmission using the "COM SETTING: STATION" rotary switch (Setting range: 0 to 9 and C) provided in the lower right position.

→ **For the rotary switch layout, refer to Section 6.1.**

Setting	Number of occupied stations	Expanded cyclic setting*1
0	1 station	Single
1	2 stations	Single
2	3 stations	Single
3	4 stations	Single
4	1 station	Double
5	2 stations	Double
6	3 stations	Double
7	4 stations	Double
8	1 station	Quadruple
9	2 stations	Quadruple
A, B	Unusable	Unusable
C	1 station	Octuple
D to F	Unusable	Unusable

*1. For single expanded cyclic setting intelligent device station becomes Ver.1. For double, quadruple or octuple expanded cyclic setting intelligent device station becomes Ver.2.

Caution

The number of occupied stations setting for the 64CCL affects the station number setting.

7. Buffer Memory

7.1 Buffer memory list

The table below provides a brief description and reference information for the 64CCL buffer memory.

→ **For details on the buffer memory, refer to Section 7.2.**

BFM No.	Description	Read/Write	Reference
#0 to #7	FROM instruction: remote outputs (RY) TO instruction: remote inputs (RX)	R/W*1,*2	Subsection 7.2.1
#8 to #23	FROM instruction: remote registers (RWw) TO instruction: remote registers (RWr)	R/W*1,*2	Subsection 7.2.2
#24	Transmission rate, hardware test set value	R	Subsection 7.2.3
#25	Communication status	R	Subsection 7.2.4
#26	CC-Link model code	R	Subsection 7.2.5
#27	Set value of host station number	R	Subsection 7.2.6
#28	Number of occupied stations, expanded cyclic set value	R	Subsection 7.2.7
#29	Error code	R/W*3	Subsection 7.2.8
#30	FX Series model code	R	Subsection 7.2.9
#31	Not available	-	-
#32,#33	Treatment of link data	R/W	Subsection 7.2.10
#34,#35	Not available	-	-
#36	Unit status	R	Subsection 7.2.11
#37 to #59	Not available	-	-
#60 to #63	Consistency control	R/W	Subsection 7.2.12
#64 to #77	The 224 remote inputs (RX000 to RX0DF) These devices set the ON/OFF data to be sent to the master station when the TO instruction (or direct buffer memory specification) is executed.	R/W*2	Subsection 7.2.13
#78 to #119	Not available	-	-
#120 to #133	The 224 remote outputs (RY000 to RY0DF) These devices read the ON/OFF data received from the master station when the FROM instruction (or direct buffer memory specification) is executed.	R	Subsection 7.2.14
#134 to #175	Not available	-	-
#176 to #207	32 words (RWw00 to RWw1F) of remote registers These devices set the word data to be sent to the master station when the TO instruction (or direct buffer memory specification) is executed.	R	Subsection 7.2.15
#208 to #303	Not available	-	-
#304 to #335	32 words (RWr00 to RWr1F) of remote registers These devices read the word data received from the master station when the FROM instruction (or direct buffer memory specification) is executed.	R/W*2	Subsection 7.2.16
#336 to #511	Not available	-	-
#512 to #543	Link special relay SB The operator can check the data link status using the bit information of these devices.	R	Subsection 7.2.17
#544 to #767	Not available	-	-
#768 to #1279	Link special register SW The operator can check the data link status using the word information of these devices.	R	Subsection 7.2.18
#1280-	Not available	-	-

R/W : Read/write is possible
R : Read only

*1. Read/write is only possible when the expanded cyclic transmission is set to "single."

*2. When writing to an area without assigned link points, writing is invalid. When reading from an area without assigned link points, the reading operation results in "0" being read.

*3. Only a value of "0" can be written and accepted.

7.2 Buffer memory details

7.2.1 [BFM#0 to #7] Remote I/O (RX/RY)

[BFM #0 to #7] Remote inputs/outputs (RX/RY) are compatible with the FX2N-32CCL.
This area is available only when the expanded cyclic transmission is set to "single".
When the expanded cyclic transmission is set to "single", either of the following is available:

a) RX/RY: BFM #0 to #7

b) RX: BFM #64 to #71 and RY: BFM #120 to #127 (within the range of "single" expanded transmission)

1) When the FROM instruction (or reading through direct buffer memory specification) is executed:
Remote outputs (RY) are requited
These devices read the output signal (Remote outputs RY) transmitted from the master station to the 64CCL.

2) When the TO instruction (or writing through direct buffer memory specification) is executed:
Remote inputs (RX) are requited
These devices write the input signal (Remote inputs RX) to be transmitted from the 64CCL to the master station.

When the TO instruction (or direct buffer memory specification) is executed for writing to an area without assigned link points, writing is invalid.
When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.
The table below shows details for buffer memory allocation.

✓: User area ●: System area -: With no allocation

BFM No.	Read (FROM instruction)	Write (TO instruction)	Number of occupied stations (Expanded cyclic setting : single)			
			Occupies 1 station	Occupies 2 stations	Occupies 3 stations	Occupies 4 stations
#0	RY00-0F	RX00-0F	✓	✓	✓	✓
#1	RY10-1F	RX10-1F	●	✓	✓	✓
#2	RY20-2F	RX20-2F	-	✓	✓	✓
#3	RY30-3F	RX30-3F	-	●	✓	✓
#4	RY40-4F	RX40-4F	-	-	✓	✓
#5	RY50-5F	RX50-5F	-	-	●	✓
#6	RY50-5F	RX60-6F	-	-	-	✓
#7	RY70-7F	RX70-7F	-	-	-	●
User area points			16	48	80	112
System area points			16	16	16	16
Total number of points			32	64	96	128
Buffer memory points (System area is included)			2	4	6	8

Caution

- RX/RY for the upper word in the last station is occupied as the system area.
- When the expanded cyclic transmission is set to "double", "quadruple" or "octuple", writing with the TO instruction (or direct buffer memory specification) to BFM#0 to #7 is invalid, and reading with the FROM instruction (or direct buffer memory specification) results in "0".
- Refer to Appendix B for differences between the 64CCL and the FX2N-32CCL.

7.2.2 [BFM#8-#23] Remote register (RWw/RWr)

[BFM #8 to #23] Remote registers (RWw/RWr) are compatible with the FX2N-32CCL.
This area is available only when the expanded cyclic transmission is set to "single".
When the expanded cyclic transmission is set to "single", either of the following is available:

a) RWw/RWr: BFM #8 to #23

b) RWw: BFM #176 to #191 and RWr: BFM #304 to #319 (within the range of "single" expanded cyclic transmission)

1) When the FROM instruction (or reading through direct buffer memory specification) is executed:
Remote registers (RWw) are involved
These devices read the data (Remote registers RWw) transmitted from the master station to the 64CCL.

2) When the TO instruction (or writing through direct buffer memory specification) is executed:
Remote registers (RWr) are involved
These devices write data (Remote registers RWr) to be transmitted from the 64CCL to the master station.

When the TO instruction (or direct buffer memory specification) is executed for writing to an area without assigned link points, writing is invalid.
When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.
The table below shows details for buffer memory allocation.

✓: Applicable -: With no allocation

BFM No.	Read (FROM instruction)	Write (TO instruction)	Number of occupied stations (Expanded cyclic setting : single)			
			Occupies 1 station	Occupies 2 stations	Occupies 3 stations	Occupies 4 stations
#8	RWw0	RWr0	✓	✓	✓	✓
#9	RWw1	RWr1	✓	✓	✓	✓
#10	RWw2	RWr2	✓	✓	✓	✓
#11	RWw3	RWr3	✓	✓	✓	✓
#12	RWw4	RWr4	-	✓	✓	✓
#13	RWw5	RWr5	-	✓	✓	✓
#14	RWw6	RWr6	-	✓	✓	✓
#15	RWw7	RWr7	-	✓	✓	✓
#16	RWw8	RWr8	-	-	✓	✓
#17	RWw9	RWr9	-	-	✓	✓
#18	RWwA	RWrA	-	-	✓	✓
#19	RWwB	RWrB	-	-	✓	✓
#20	RWwC	RWrC	-	-	-	✓
#21	RWwD	RWrD	-	-	-	✓
#22	RWwE	RWrE	-	-	-	✓
#23	RWwF	RWrF	-	-	-	✓
BFM (word) points			4	8	12	16

Caution

- When the expanded cyclic transmission is set to "double", "quadruple" or "octuple", writing with the TO instruction (or direct buffer memory specification) to BFM#8 to #23 is invalid, and reading with the FROM instruction (or direct buffer memory specification) results in "0".
- Refer to Appendix B for differences between the 64CCL and the FX2N-32CCL.

7.2.3 [BFM#24] Transmission rate, hardware test set value

This buffer memory address stores the setting contents of the transmission rate/hardware test switch of the 64CCL.
Setting contents are determined when the 64CCL is started. The contents stored in this buffer memory address do not change when the setting is changed after startup.

BFM#24 Transmission rate, hardware test set value		
Setting (hexadecimal)	**Description**	**Status**
0	Transmission rate 156Kbps	Online
1	Transmission rate 625Kbps	
2	Transmission rate 2.5Mbps	
3	Transmission rate 5Mbps	
4	Transmission rate 10Mbps	
5 to 9	Unusable	Setting error
A	Transmission rate 156Kbps	Hardware test
B	Transmission rate 625Kbps	
C	Transmission rate 2.5Mbps	
D	Transmission rate 5Mbps	
E	Transmission rate 10Mbps	
F	Unusable	Setting error

7.2.4 [BFM#25] Communication status

This buffer memory address stores the communication status of CC-Link communication data as ON/OFF information of in bits 0 to 15.
The information on the master station PLC is valid only while communication is executed in the link.

BFM#25 Communication status			
bit	**Description**		**Explanation**
0	CRC error	Information for the 64CCL	0: The receive data does not have a CRC error. 1: The receive data has a CRC error This bit turns ON when there is a discrepancy with the CRC value due to unwanted noise or other disruptions affecting the transmission path.
1	Timeout error		0: Normal 1: Timeout error This error occurs when the next refresh is not given during the execution of a current refresh. This bit turns ON when the transmission data send time exceeds the fixed time for normal reception completion. The line may be shut down, the system may go down, or the power may be turned OFF.
2	Reserved		0 (Not used)
3	Reserved		0 (Not used)
4	Reserved		0 (Not used)
5	Reserved		0 (Not used)
6	Reserved		0 (Not used)
7	Link execution*1		0: Link non-execution 1: Link execution (L RUN is ON) This bit is ON during data link with the master station.
8	Master PLC RUN status*1	Information for the master station	0: During STOP 1: During RUN This bit is ON when the PLC connected to the master station is in RUN mode. This bit operates only during normal data link operation.
9	Master PLC error status*1		0: Normal 1: Abnormal This bit turns ON when the PLC connected to the master station has an error. The status is only valid when the master station CPU's designated operation condition is shown as "resuming". This bit operates only during normal data link operation. For details, refer to the master unit manual.
10	Refresh*1		0: With no refresh 1: With refresh This bit operates only during normal data link operation.
11	Reserved		0 (Not used)
12	Reserved		0 (Not used)
14 13	Protocol version		The CC-Link protocol version is stored. 00: Ver.1 01: Ver.2
15	Reserved		0 (Not used)

*1. When "Link execution (bit 7)" is OFF, the "Master PLC RUN status (bit 8)", "Master PLC error status (bit 9)" and "Refresh (bit 10)" bits hold their final values from the link execution.

7.2.5 [BFM#26] CC-Link model code

The CC-Link model code is stored as follows:

BFM#26 CC-Link model code	
bit15 to 8	**bit7 to 0**
CC-Link coded identification (PLC type) H01	CC-Link software version H01

7.2.6 [BFM#27] Set value of host station number

This buffer memory address stores the set value of the host station number and is determined when the 64CCL is started.
The stored value does not change even if the setting is changed after startup.

BFM#27 Set value of host station number	
Setting (decimal)	**Description**
1 to 64	Host station number
0,65 to 99	Setting error The set value remains stored even if a setting error occurs.

7.2.7 [BFM#28] Number of occupied stations, expanded cyclic set value

This buffer memory address stores the value set by the rotary switch and is determined when the 64CCL is started.
The stored value does not change even if the setting is changed after startup.

BFM#28 Number of occupation stations, expanded cyclic set value		
Setting (hexadecimal)	**Number of occupied stations**	**Expanded cyclic setting**
0	1 station	Single
1	2 stations	Single
2	3 stations	Single
3	4 stations	Single
4	1 station	Double
5	2 stations	Double
6	3 stations	Double
7	4 stations	Double
8	1 station	Quadruple
9	2 stations	Quadruple
A, B	Setting error	Setting error
C	1 station	Octuple
D to F	Setting error	Setting error

7.2.8 [BFM#29] Error code

This buffer memory address stores error code information for the 64CCL.
The following meaning is assigned to the error code handled as the ON/OFF information of bit 0 to bit 15.

BFM#29 Error code		
bit	**Description**	**Explanation**
0	Station number setting error	OFF: No errors in the setting ON: The rotary switch is set outside the allowable setting range. Communication state: Stop Action: Please check the setting of the rotary switch.
1	Transmission rate setting error	
2	Occupied station, expanded cyclic setting error	
3	Reserved	0 (Not used)
4	Station number change error	OFF: No setting change ON: This bit turns ON when the rotary switch setting is changed after the 64CCL is started, and turns OFF when the rotary switch is returned to its previous setting. Communication state: Continuation Action: Please check the setting of the rotary switch.
5	Transmission rate change error	
6	Occupied station, expanded cyclic setting change error	
7	Reserved	0 (Not used)
8	Errors in internal communication power supply	OFF: No error ON: Inside communication power supply error Communication state: Stop Action: For repair, contact your local Mitsubishi Electric distributor.
9	Hardware error	OFF: No error ON: Hardware error Communication state: Stop Action: For repair, contact your local Mitsubishi Electric distributor.
10	Module status	OFF: Normal ON: Abnormal (SB0020) Data cannot be transferred normally to/from the main unit. Communication state: Stop
11	Host station operation status	OFF: Normal ON: Abnormal (BFM#25 b0, 1) Communication state: Continuation or stop
12	Transient transmission status	OFF: No error ON: Error(SB0094) Communication state: Continuation or stop
13	Reserved	0 (Not used)
14	BFM accessibility error	OFF: No error ON: The executed TO instruction specifies an unavailable area or unassigned remote I/O (RX/RY) area or remote register (RWw/RWr) area. Communication state: Continuation Action: Please check the PLC program. To reset this bit, write "K0" to BFM #29.
15	Global error	OFF: No error ON: One of the bits BFM#29 b0-b14 turns on. Action: Please check the applicable error definition.

7.2.9 [BFM#30] FX Series model code

The model code of the FX3U-64CCL (K7160) is stored here.

7.2.10 [BFM#32, #33] Treatment of link data

The treatment of link data is defined as follows.

BFM No.	Description	Explanation
#32	Holding/clear of input data at data link error	This device specifies whether remote outputs (RY) and remote registers (RWw) (input data from the master station to the 64CCL) are held or cleared when link data is abnormal. 0 (initial value): Data is held Except 0: Data is cleared
#33	Forcible clear of output data at main unit stop	This device specifies whether remote inputs (RX) and remote registers (RWr) (output data from the 64CCL to the master station) are held or cleared when the main unit stops. 0 (initial value): Data is held Except 0: Data is cleared

7.2.11 [BFM#36] Unit status

This buffer memory address stores the 64CCL status.

BFM#36 Unit status		
bit	**Name**	**Description**
0	Unit error(s)	The error status of the 64CCL is shown. OFF: Unit normal ON: Unit error
1	Data link status	The data link status is shown. OFF: Data link stopped ON: Data link execution
2 to 14	Use prohibited	-
15	Unit ready	This bit automatically turns ON when the unit becomes ready. OFF: Unit is not operable, errors in the switch setting ON: Unit is operable

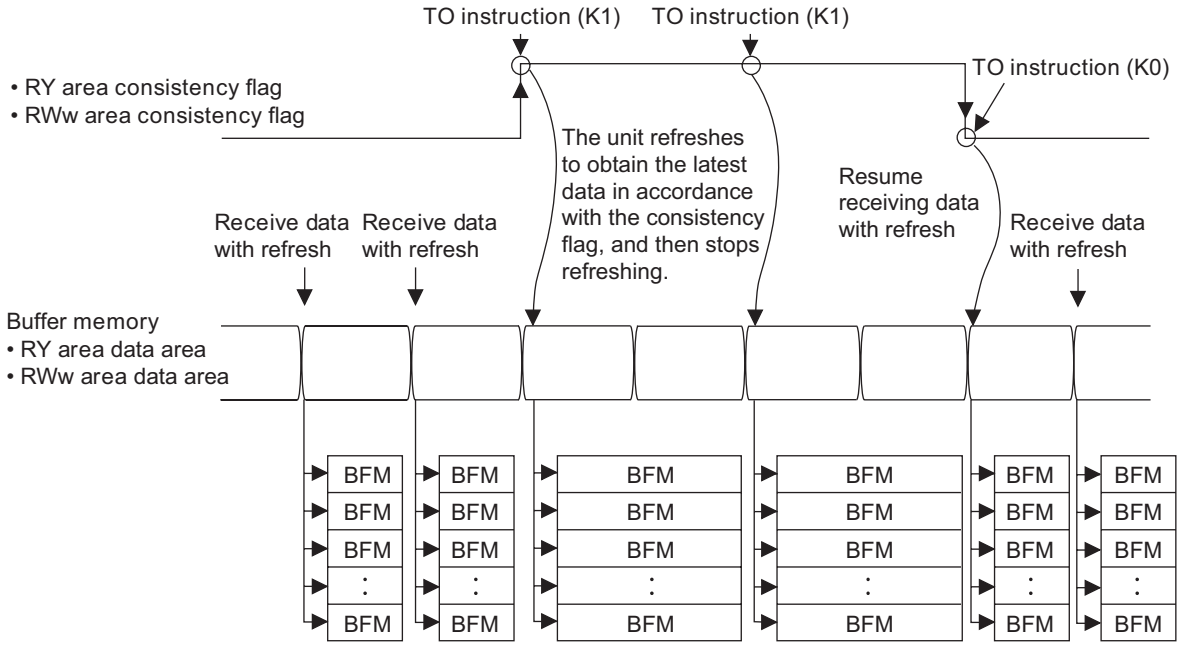
7.2.12 [BFM#60 to 63] Consistency control

Use these buffer memory addresses for consistency control to send or receive link data composed of 1 word (16 bits) or more or 2 words (32 bits) or more.
These buffer memory addresses assure data consistency for 1 word (16 bits) or more when read or written by the FROM/TO instructions, or data consistency for 2 words (32 bits) or more when read or written by the DFROM/DTO instructions.

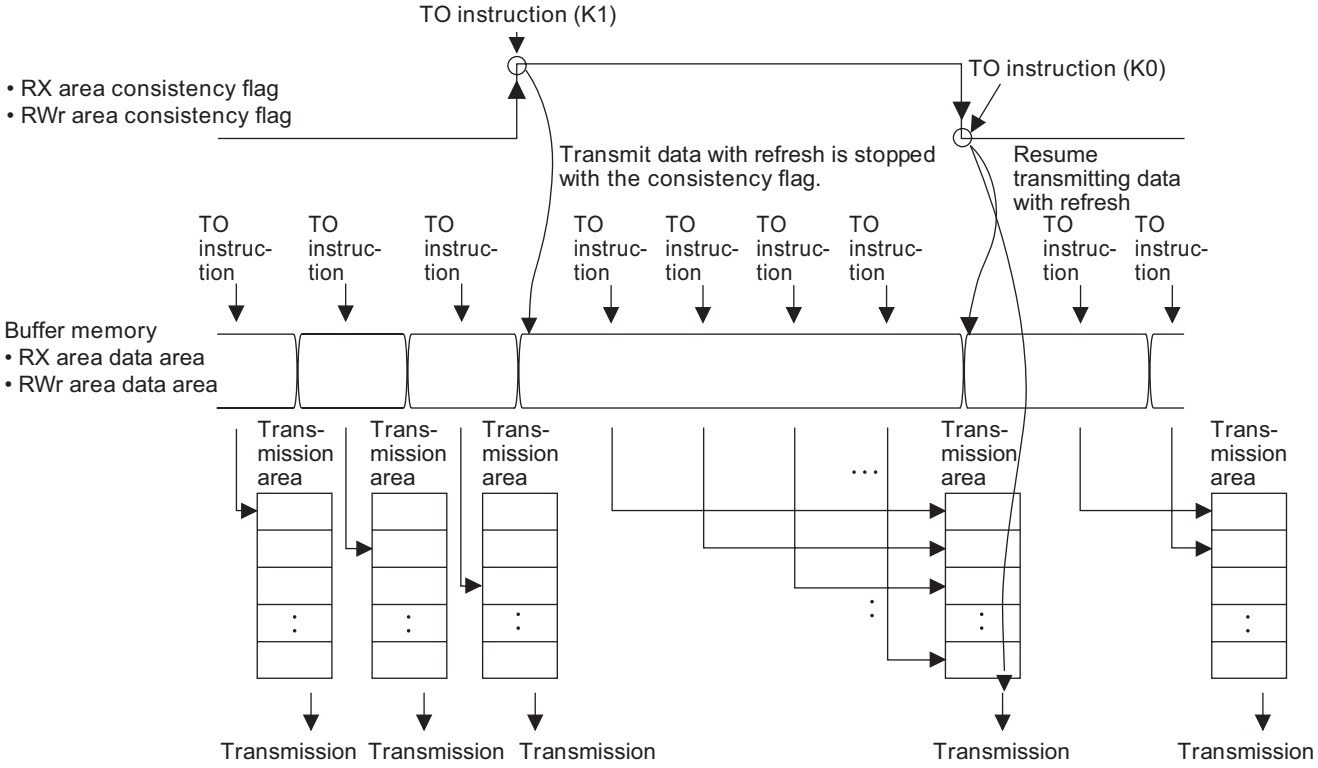
BFM No.	Description	Explanation
#60	RX area consistency flag	1: Consistency accessibility start Set the latest data, and stop the buffer memory from being refreshed. 0: Data consistency accessibility is completed or not used.("0" is the initial value.) Refresh the communication data and buffer memory as required. (When a device changes from "1" to "0", the unit resumes refreshing the communication data and buffer memory.) When any other number is set, these devices do not control the consistency in the same way as "0".
#61	RY area consistency flag	
#62	RWw area consistency flag	
#63	RWr area consistency flag	

Consistency control operation examples and a sequence program example are as follows:

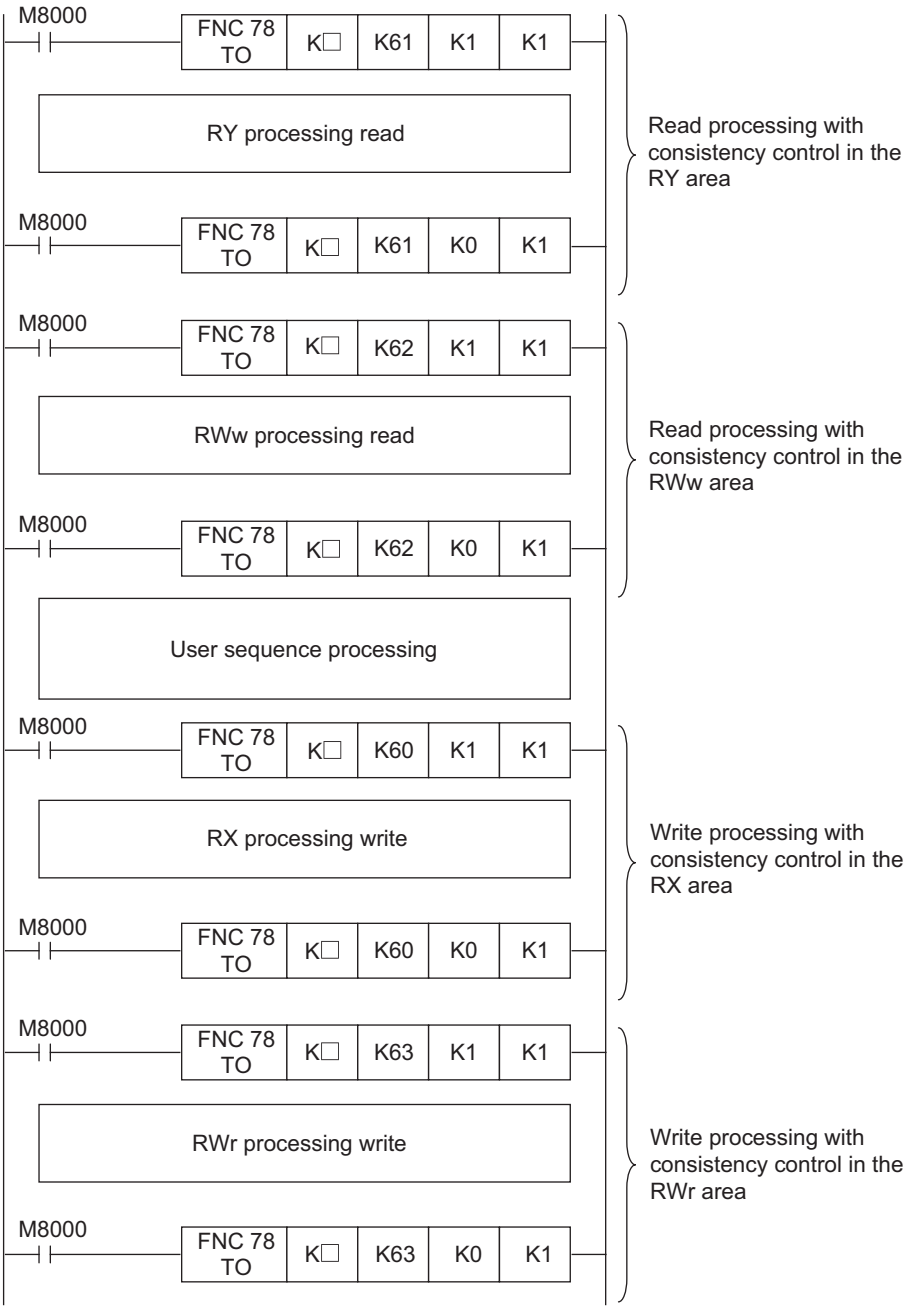
1) Explanation of RY and RWw consistency flag operation



2) Explanation of RX and RWr consistency flag operation



3) Sequence program example



□: Unit No. of 64CCL enters.

7.2.13 [BFM#64 to 77] Remote input (RX)

Using these remote input (RX) buffer memory addresses, the TO instruction (or direct buffer memory specification) sets the ON/OFF information to be sent to the master station.
For the buffer memory allocation in accordance with the number of occupied stations and expanded cyclic transmission, refer to the next page.

1) Details for the buffer memory allocation related to remote inputs (RX)
The table below shows details for the buffer memory allocation related to remote inputs (RX)

BFM No.	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
#64	RX00F	RX00E	RX00D	RX00C	RX00B	RX00A	RX009	RX008	RX007	RX006	RX005	RX004	RX003	RX002	RX001	RX000
#65	RX01F	RX01E	RX01D	RX01C	RX01B	RX01A	RX019	RX018	RX017	RX016	RX015	RX014	RX013	RX012	RX011	RX010
#66	RX02F	RX02E	RX02D	RX02C	RX02B	RX02A	RX029	RX028	RX027	RX026	RX025	RX024	RX023	RX022	RX021	RX020
#67	RX03F	RX03E	RX03D	RX03C	RX03B	RX03A	RX039	RX038	RX037	RX036	RX035	RX034	RX033	RX032	RX031	RX030
#68	RX04F	RX04E	RX04D	RX04C	RX04B	RX04A	RX049	RX048	RX047	RX046	RX045	RX044	RX043	RX042	RX041	RX040
#69	RX05F	RX05E	RX05D	RX05C	RX05B	RX05A	RX059	RX058	RX057	RX056	RX055	RX054	RX053	RX052	RX051	RX050
#70	RX06F	RX06E	RX06D	RX06C	RX06B	RX06A	RX069	RX068	RX067	RX066	RX065	RX064	RX063	RX062	RX061	RX060
#71	RX07F	RX07E	RX07D	RX07C	RX07B	RX07A	RX079	RX078	RX077	RX076	RX075	RX074	RX073	RX072	RX071	RX070
#72	RX08F	RX08E	RX08D	RX08C	RX08B	RX08A	RX089	RX088	RX087	RX086	RX085	RX084	RX083	RX082	RX081	RX080
#73	RX09F	RX09E	RX09D	RX09C	RX09B	RX09A	RX099	RX098	RX097	RX096	RX095	RX094	RX093	RX092	RX091	RX090
#74	RX0AF	RX0AE	RX0AD	RX0AC	RX0AB	RX0AA	RX0A9	RX0A8	RX0A7	RX0A6	RX0A5	RX0A4	RX0A3	RX0A2	RX0A1	RX0A0
#75	RX0BF	RX0BE	RX0BD	RX0BC	RX0BB	RX0BA	RX0B9	RX0B8	RX0B7	RX0B6	RX0B5	RX0B4	RX0B3	RX0B2	RX0B1	RX0B0
#76	RX0CF	RX0CE	RX0CD	RX0CC	RX0CB	RX0CA	RX0C9	RX0C8	RX0C7	RX0C6	RX0C5	RX0C4	RX0C3	RX0C2	RX0C1	RX0C0
#77	RX0DF	RX0DE	RX0DD	RX0DC	RX0DB	RX0DA	RX0D9	RX0D8	RX0D7	RX0D6	RX0D5	RX0D4	RX0D3	RX0D2	RX0D1	RX0D0

2) Details for the buffer memory allocation related to remote inputs (RX) when the expanded cyclic transmission is set
The table below shows details for the buffer memory allocation related to remote inputs (RX) when the expanded cyclic transmission is set.

✓: User area ●: System area -: With no allocation

BFM No.	Remote input RX number	Number of occupied stations										
		Occupies 1 station				Occupies 2 stations			Occupies 3 stations		Occupies 4 stations	
		Expanded cyclic setting										
		Single	Double	Quadruple	Octuple	Single	Double	Quadruple	Single	Double	Single	Double
#64	RX00-0F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#65	RX10-1F	●	●	✓	✓	✓	✓	✓	✓	✓	✓	✓
#66	RX20-2F	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
#67	RX30-3F	-	-	●	✓	●	✓	✓	✓	✓	✓	✓
#68	RX40-4F	-	-	-	✓	-	✓	✓	✓	✓	✓	✓
#69	RX50-5F	-	-	-	✓	-	●	✓	●	✓	✓	✓
#70	RX60-6F	-	-	-	✓	-	-	✓	-	✓	✓	✓
#71	RX70-7F	-	-	-	●	-	-	✓	-	✓	●	✓
#72	RX80-8F	-	-	-	-	-	-	✓	-	✓	-	✓
#73	RX90-9F	-	-	-	-	-	-	✓	-	●	-	✓
#74	RXA0-AF	-	-	-	-	-	-	✓	-	-	-	✓
#75	RXB0-BF	-	-	-	-	-	-	●	-	-	-	✓
#76	RXC0-CF	-	-	-	-	-	-	-	-	-	-	✓
#77	RXD0-DF	-	-	-	-	-	-	-	-	-	-	●
User area points		16	16	48	112	48	80	176	80	144	112	208
System area points		16	16	16	16	16	16	16	16	16	16	16
Total number of points		32	32	64	128	64	96	192	96	160	128	224
Buffer memory points (System area is included)		2	2	4	8	4	6	12	6	10	8	14

Caution

- RX for the upper word in the last station is occupied as the system area.
- When the TO instruction (or direct buffer memory specification) is executed for writing to an area without assigned link points, writing is invalid. When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.

7.2.14 [BFM#120 to 133] Remote output (RY)

These remote output (RY) buffer memory addresses store the ON/OFF information received from the master station.
Read these buffer memory addresses using the FROM instruction (or direct buffer memory specification) to use the stored ON/OFF information.
For the buffer memory allocation in accordance with the number of occupied stations and expanded cyclic transmission, refer to the next page.

1) Details for the buffer memory allocation related to remote outputs (RY)
   The table below shows details for the buffer memory allocation related to remote outputs (RY)

BFM No.	bit15	bit14	bit13	bit12	bit11	bit10	bit9	bit8	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
#120	RY00F	RY00E	RY00D	RY00C	RY00B	RY00A	RY009	RY008	RY007	RY006	RY005	RY004	RY003	RY002	RY001	RY000
#121	RY01F	RY01E	RY01D	RY01C	RY01B	RY01A	RY019	RY018	RY017	RY016	RY015	RY014	RY013	RY012	RY011	RY010
#122	RY02F	RY02E	RY02D	RY02C	RY02B	RY02A	RY029	RY028	RY027	RY026	RY025	RY024	RY023	RY022	RY021	RY020
#123	RY03F	RY03E	RY03D	RY03C	RY03B	RY03A	RY039	RY038	RY037	RY036	RY035	RY034	RY033	RY032	RY031	RY030
#124	RY04F	RY04E	RY04D	RY04C	RY04B	RY04A	RY049	RY048	RY047	RY046	RY045	RY044	RY043	RY042	RY041	RY040
#125	RY05F	RY05E	RY05D	RY05C	RY05B	RY05A	RY059	RY058	RY057	RY056	RY055	RY054	RY053	RY052	RY051	RY050
#126	RY06F	RY06E	RY06D	RY06C	RY06B	RY06A	RY069	RY068	RY067	RY066	RY065	RY064	RY063	RY062	RY061	RY060
#127	RY07F	RY07E	RY07D	RY07C	RY07B	RY07A	RY079	RY078	RY077	RY076	RY075	RY074	RY073	RY072	RY071	RY070
#128	RY08F	RY08E	RY08D	RY08C	RY08B	RY08A	RY089	RY088	RY087	RY086	RY085	RY084	RY083	RY082	RY081	RY080
#129	RY09F	RY09E	RY09D	RY09C	RY09B	RY09A	RY099	RY098	RY097	RY096	RY095	RY094	RY093	RY092	RY091	RY090
#130	RY0AF	RY0AE	RY0AD	RY0AC	RY0AB	RY0AA	RY0A9	RY0A8	RY0A7	RY0A6	RY0A5	RY0A4	RY0A3	RY0A2	RY0A1	RY0A0
#131	RY0BF	RY0BE	RY0BD	RY0BC	RY0BB	RY0BA	RY0B9	RY0B8	RY0B7	RY0B6	RY0B5	RY0B4	RY0B3	RY0B2	RY0B1	RY0B0
#132	RY0CF	RY0CE	RY0CD	RY0CC	RY0CB	RY0CA	RY0C9	RY0C8	RY0C7	RY0C6	RY0C5	RY0C4	RY0C3	RY0C2	RY0C1	RY0C0
#133	RY0DF	RY0DE	RY0DD	RY0DC	RY0DB	RY0DA	RY0D9	RY0D8	RY0D7	RY0D6	RY0D5	RY0D4	RY0D3	RY0D2	RY0D1	RY0D0

2) Details for the buffer memory allocation related to remote outputs (RY) when the expanded cyclic transmission is set

The table below shows details for the buffer memory allocation related to remote outputs (RY) when the expanded cyclic transmission is set.

✓: User area ●: System area -: With no allocation

BFM No.	Remote input RX number	Number of occupied stations										
		Occupies 1 station				Occupies 2 stations			Occupies 3 stations		Occupies 4 stations	
		Expanded cyclic setting										
		Single	Double	Quadruple	Octuple	Single	Double	Quadruple	Single	Double	Single	Double
#120	RY00-0F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#121	RY10-1F	●	●	✓	✓	✓	✓	✓	✓	✓	✓	✓
#122	RY20-2F	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓
#123	RY30-3F	-	-	●	✓	●	✓	✓	✓	✓	✓	✓
#124	RY40-4F	-	-	-	✓	-	✓	✓	✓	✓	✓	✓
#125	RY50-5F	-	-	-	✓	-	●	✓	●	✓	✓	✓
#126	RY60-6F	-	-	-	✓	-	-	✓	-	✓	✓	✓
#127	RY70-7F	-	-	-	●	-	-	✓	-	✓	●	✓
#128	RY80-8F	-	-	-	-	-	-	✓	-	✓	-	✓
#129	RY90-9F	-	-	-	-	-	-	✓	-	●	-	✓
#130	RYA0-AF	-	-	-	-	-	-	✓	-	-	-	✓
#131	RYB0-BF	-	-	-	-	-	-	●	-	-	-	✓
#132	RYC0-CF	-	-	-	-	-	-	-	-	-	-	✓
#133	RYD0-DF	-	-	-	-	-	-	-	-	-	-	●
User area points		16	16	48	112	48	80	176	80	144	112	208
System area points		16	16	16	16	16	16	16	16	16	16	16
Total number of points		32	32	64	128	64	96	192	96	160	128	224
Buffer memory points (System area is included)		2	2	4	8	4	6	12	6	10	8	14

Caution

- RY for the upper word in the last station is occupied as the system area.
- When the TO instruction (or direct buffer memory specification) is executed, writing is invalid. When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.

7.2.15 [BFM#176 to 207] Remote register RWw

These remote register (RWw) buffer memory addresses store the word information received from the master station.
Read these buffer memory addresses using the FROM instruction (or direct buffer memory specification) to use the stored word information.

✓: Applicable -: With no allocation

BFM No.	Remote register number	Number of occupied stations										
		Occupies 1 station				Occupies 2 stations			Occupies 3 stations		Occupies 4 stations	
		Expanded cyclic setting										
		Single	Double	Quadruple	Octuple	Single	Double	Quadruple	Single	Double	Single	Double
#176	RWw00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#177	RWw01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#178	RWw02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#179	RWw03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#180	RWw04	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#181	RWw05	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#182	RWw06	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#183	RWw07	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#184	RWw08	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#185	RWw09	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#186	RWw0A	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#187	RWw0B	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#188	RWw0C	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#189	RWw0D	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#190	RWw0E	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#191	RWw0F	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#192	RWw10	-	-	-	✓	-	-	✓	-	✓	-	✓
#193	RWw11	-	-	-	✓	-	-	✓	-	✓	-	✓
#194	RWw12	-	-	-	✓	-	-	✓	-	✓	-	✓
#195	RWw13	-	-	-	✓	-	-	✓	-	✓	-	✓
#196	RWw14	-	-	-	✓	-	-	✓	-	✓	-	✓
#197	RWw15	-	-	-	✓	-	-	✓	-	✓	-	✓
#198	RWw16	-	-	-	✓	-	-	✓	-	✓	-	✓
#199	RWw17	-	-	-	✓	-	-	✓	-	✓	-	✓
#200	RWw18	-	-	-	✓	-	-	✓	-	-	-	✓
#201	RWw19	-	-	-	✓	-	-	✓	-	-	-	✓
#202	RWw1A	-	-	-	✓	-	-	✓	-	-	-	✓
#203	RWw1B	-	-	-	✓	-	-	✓	-	-	-	✓
#204	RWw1C	-	-	-	✓	-	-	✓	-	-	-	✓
#205	RWw1D	-	-	-	✓	-	-	✓	-	-	-	✓
#206	RWw1E	-	-	-	✓	-	-	✓	-	-	-	✓
#207	RWw1F	-	-	-	✓	-	-	✓	-	-	-	✓
Buffer memory points		4	8	16	32	8	16	32	12	24	16	32

Caution

- When the TO instruction (or direct buffer memory specification) is executed, writing is invalid. When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.

7.2.16 [BFM#304 to 335] Remote register RWr

Using these remote register (RWr) buffer memory addresses, the TO instruction (or direct buffer memory specification) sets the word information to be sent to the master station.

✓: Applicable -: With no allocation

BFM No.	Remote register number	Number of occupied stations										
		Occupies 1 station				Occupies 2 stations			Occupies 3 stations		Occupies 4 stations	
		Expanded cyclic setting										
		Single	Double	Quadruple	Octuple	Single	Double	Quadruple	Single	Double	Single	Double
#304	RWr00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#305	RWr01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#306	RWr02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#307	RWr03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#308	RWr04	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#309	RWr05	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#310	RWr06	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#311	RWr07	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
#312	RWr08	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#313	RWr09	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#314	RWr0A	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#315	RWr0B	-	-	✓	✓	-	✓	✓	✓	✓	✓	✓
#316	RWr0C	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#317	RWr0D	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#318	RWr0E	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#319	RWr0F	-	-	✓	✓	-	✓	✓	-	✓	✓	✓
#320	RWr10	-	-	-	✓	-	-	✓	-	✓	-	✓
#321	RWr11	-	-	-	✓	-	-	✓	-	✓	-	✓
#322	RWr12	-	-	-	✓	-	-	✓	-	✓	-	✓
#323	RWr13	-	-	-	✓	-	-	✓	-	✓	-	✓
#324	RWr14	-	-	-	✓	-	-	✓	-	✓	-	✓
#325	RWr15	-	-	-	✓	-	-	✓	-	✓	-	✓
#326	RWr16	-	-	-	✓	-	-	✓	-	✓	-	✓
#327	RWr17	-	-	-	✓	-	-	✓	-	✓	-	✓
#328	RWr18	-	-	-	✓	-	-	✓	-	-	-	✓
#329	RWr19	-	-	-	✓	-	-	✓	-	-	-	✓
#330	RWr1A	-	-	-	✓	-	-	✓	-	-	-	✓
#331	RWr1B	-	-	-	✓	-	-	✓	-	-	-	✓
#332	RWr1C	-	-	-	✓	-	-	✓	-	-	-	✓
#333	RWr1D	-	-	-	✓	-	-	✓	-	-	-	✓
#334	RWr1E	-	-	-	✓	-	-	✓	-	-	-	✓
#335	RWr1F	-	-	-	✓	-	-	✓	-	-	-	✓
Buffer memory points		4	8	16	32	8	16	32	12	24	16	32

Caution

- When the TO instruction (or direct buffer memory specification) is executed for writing to an area without assigned link points, writing is invalid. When the FROM instruction (or direct buffer memory specification) is executed for reading from an area without assigned link points, the reading operation results in "0" being read.

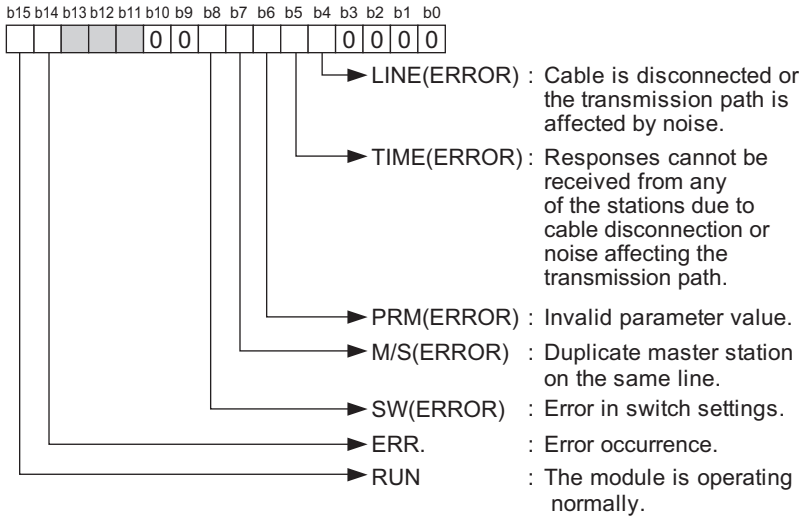
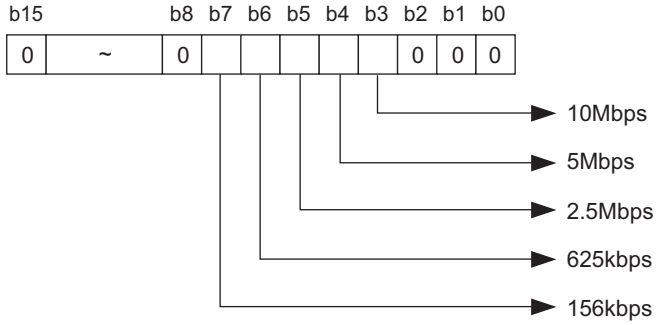
7.2.17 [BFM#512 to 543] Link special relay (SB)

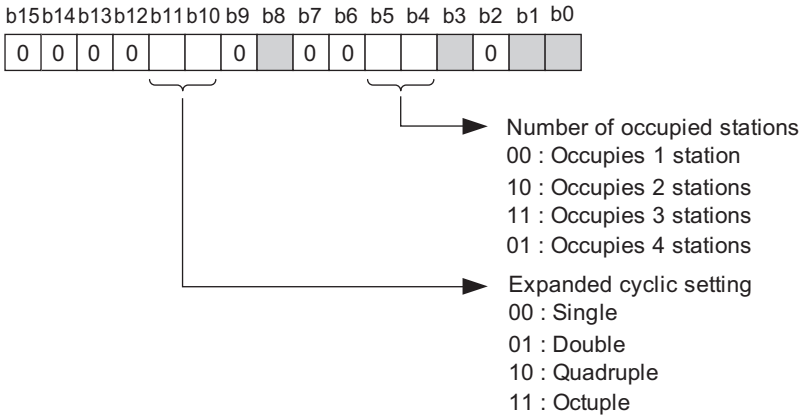
The data link status can be checked using these buffer memory addresses for bit information (link special relays SB).
The table below shows details for the link special relays (SB).

BFM No. (bit)	SB No.	Name	Description	Applicability (✓: Applicable, ×: Not applicable)	
				Online	Offline
#514(b0)	SB0020	Module status	Indicates the module access (module operation) status. OFF: Normal (Module is operating normally) ON: Abnormal (Module error has occurred)	✓	✓
#518 (b0)	SB0060	Host mode	Indicates the mode setting status of the transmission rate/ hardware test setting switch for the host. OFF: Online ON: Not online	✓	✓
#518 (b1)	SB0061	Host type	Indicates the type of the host station currently operating. OFF: Setting errors ON: Intelligent device station (station numbers 1 to 64)	✓	×
#518 (b6, b7)	SB0066 SB0067	Number of host occupied stations	Indicates the setting status of host occupied stations. Number of occupied stations / SB0066 / SB0067 1 station / OFF / OFF 2 stations / OFF / ON 3 stations / ON / ON 4 stations / ON / OFF	✓	×
#518 (b10)	SB006A	Switch setting status	Indicates the switch setting status. OFF: Normal ON: Setting error exists (the error code is stored in SW006A)	✓	×
#518 (b14)	SB006E	Host station operation status	Indicates the host data link operation status. OFF: Being executed ON: Not being executed	✓	×
#519 (b0)	SB0070	Master station information	Indicates the data link status. OFF: Data link control by the master station ON: Data link control by the standby master station	✓	×
#519 (b7)	SB0077	Parameter receive status	Indicates the parameter receive status from the master station. OFF: Receive complete ON: Receive not complete	✓	×
#519 (b8)	SB0078	Host station switch change detection	Detects changes to the host setting switch during data linking. OFF: No changes detected ON: Changes detected	✓	×
#521 (b0)	SB0090	Host line status	Indicates the line status of the host. OFF: Normal ON: Abnormal (line disconnection)	✓	×

7.2.18 [BFM#768 to 1279] Link special register (SW)

The operator can check the data link status using these buffer memory addresses for word information (link special registers SW).
The table below shows details of link special registers (SW).

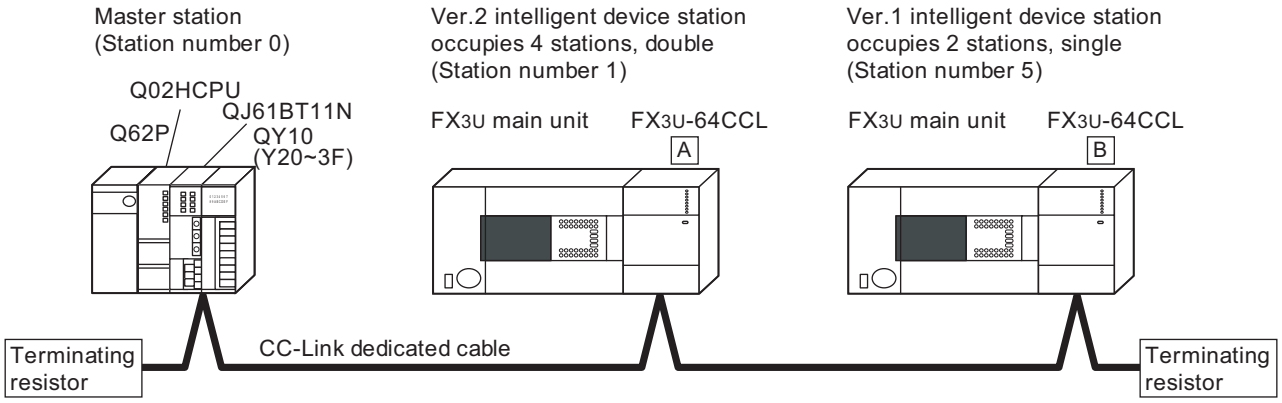
BFM No.	SW No.	Name	Description	Applicability (✓: Applicable, ×: Not applicable) Online	Offline
#856	SW0058	Module status	Details regarding the unit status are stored. 0: OFF 1: ON 	✓	✓
#857	SW0059	Transmission rate setting	Stores the contents of the transmission rate setting. 0: Cancel 1: Set  Stores the information that be comes valid when the 64CCL is started. (Changes to the rotary switch are not reflected after the 64CCL is started.)	✓	✓
#864	SW0060	Mode setting status	Stores the mode setting status. 0: Online 2: Offline 6: Hardware test Update timing: When SB0060 changes. Stores the information that be comes valid when the 64CCL is started. (Changes to the rotary switch are not reflected after the 64CCL is started.)	✓	✓
#865	SW0061	Host station number	Stores the station number of the host that is currently in operation. 1 to 64: Intelligent device station 0 or 65 or more: Errors in the setting Update timing: When SB0061 changes. Stores the information that be comes valid when the 64CCL is started. (Changes to the rotary switch are not reflected after the 64CCL is started.)	✓	✓

BFM No.	SW No.	Name	Description	Applicability (✓: Applicable, ×: Not applicable)	
				Online	Offline
#866	SW0062	Module operating status	Stores the operation setting status of the module. 0: OFF 1: ON 	✓	✓
#872	SW0068	Host parameter status	Stores the parameter setting status. 0 : Normal Other than 0: Stores the error code (Refer to error code).	✓	×
#874	SW006A	Switch setting status	Stores the switch setting status. 0 : Normal Other than 0: Stores the error code (Refer to error code). Update timing: Updated individually without regard to link special relays (SB).	✓	✓
#877	SW006D	Max. link scan time	Stores the maximum value of the link scan time (in 1 ms units). Update timing: Updated individually without regard to link special relays (SB).	✓	×
#878	SW006E	Current link scan time	Stores the current value of the link scan time (in 1 ms units). Update timing: Updated individually without regard to link special relays (SB).	✓	×
#879	SW006F	Min. link scan time	Stores the minimum value of the link scan time (in 1 ms units). Update timing: Updated individually without regard to link special relays (SB).	✓	×
#912	SW0090	Line status	Stores the line status. 0: Normal 1: Data link cannot be performed (disconnected) Update timing: When SB0090 changes.	✓	×
#1096	SW0148	Parameter mode	Indicates in which mode the network is operating. 0: Remote net ver.1 mode 2: Remote net ver.2 mode	✓	×
#1097	SW0149	Host parameter mode	Indicates in which mode the host is operating. 0: Remote net ver.1 mode 2: Remote net ver.2 mode	✓	✓

8. Program Example

8.1 System configuration

The system configuration shown below explains the sample program.



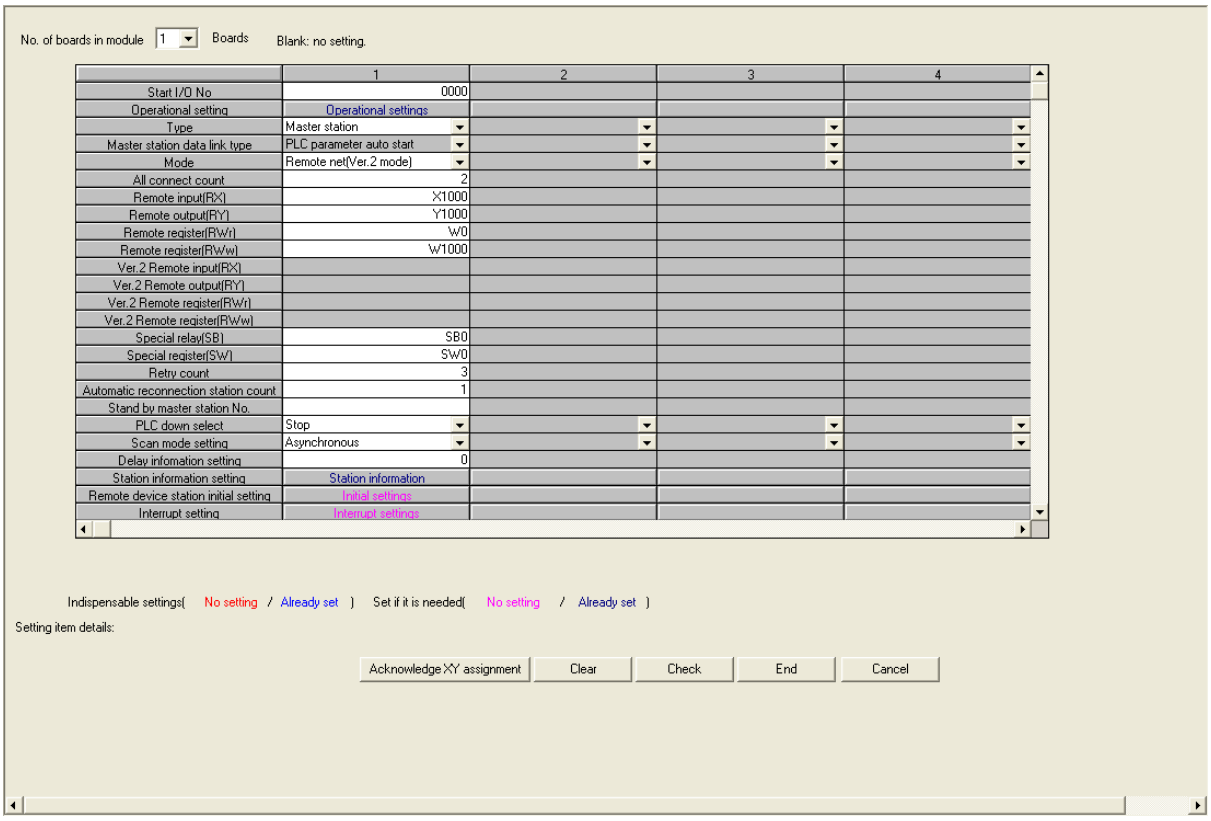
1) Preparation

a) Set the station number, mode, transmission and condition settings for the master station.

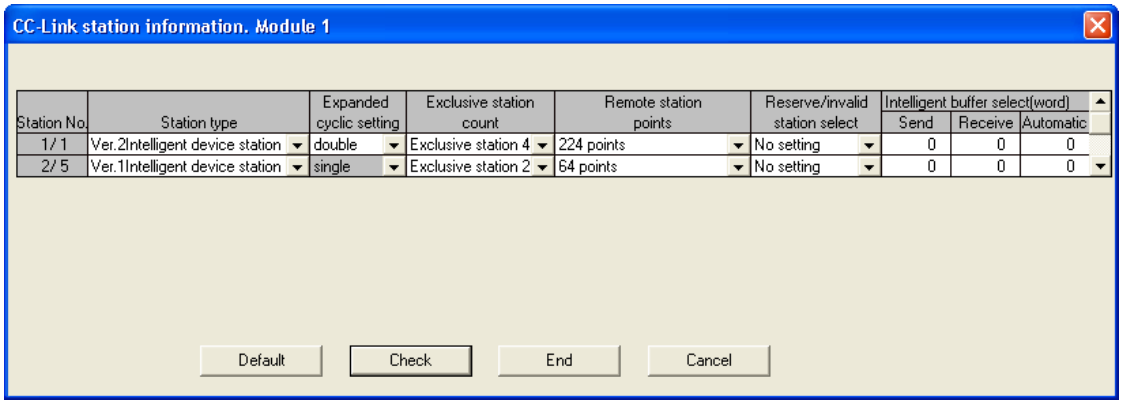
→ **For details, refer to the master unit manual.**

The settings, as shown in the following figure, are configured in GX Developer.

•Example 1 for the master station settings



•Example 2 for the master station settings



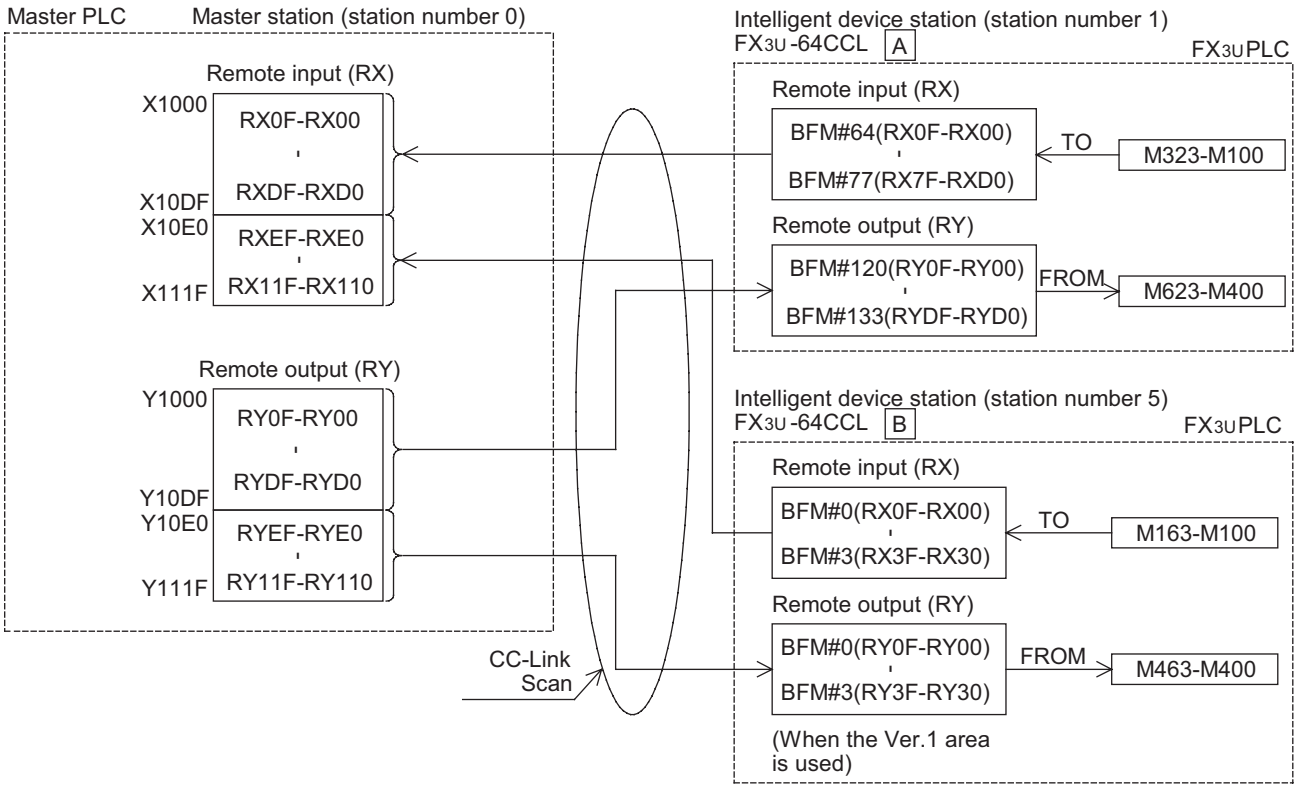
- When the setting of the 64CCL is the single setting, please set up the master station as a Ver.1 intelligent device station. When the setting of the 64CCL are the double setting, the quadruple setting, or the octuple setting, please set up the master station as a Ver.2 intelligent device station.

b) Set the station number, number of occupied stations/expanded cyclic transmission and transmission rate/hardware test for the 64CCL.

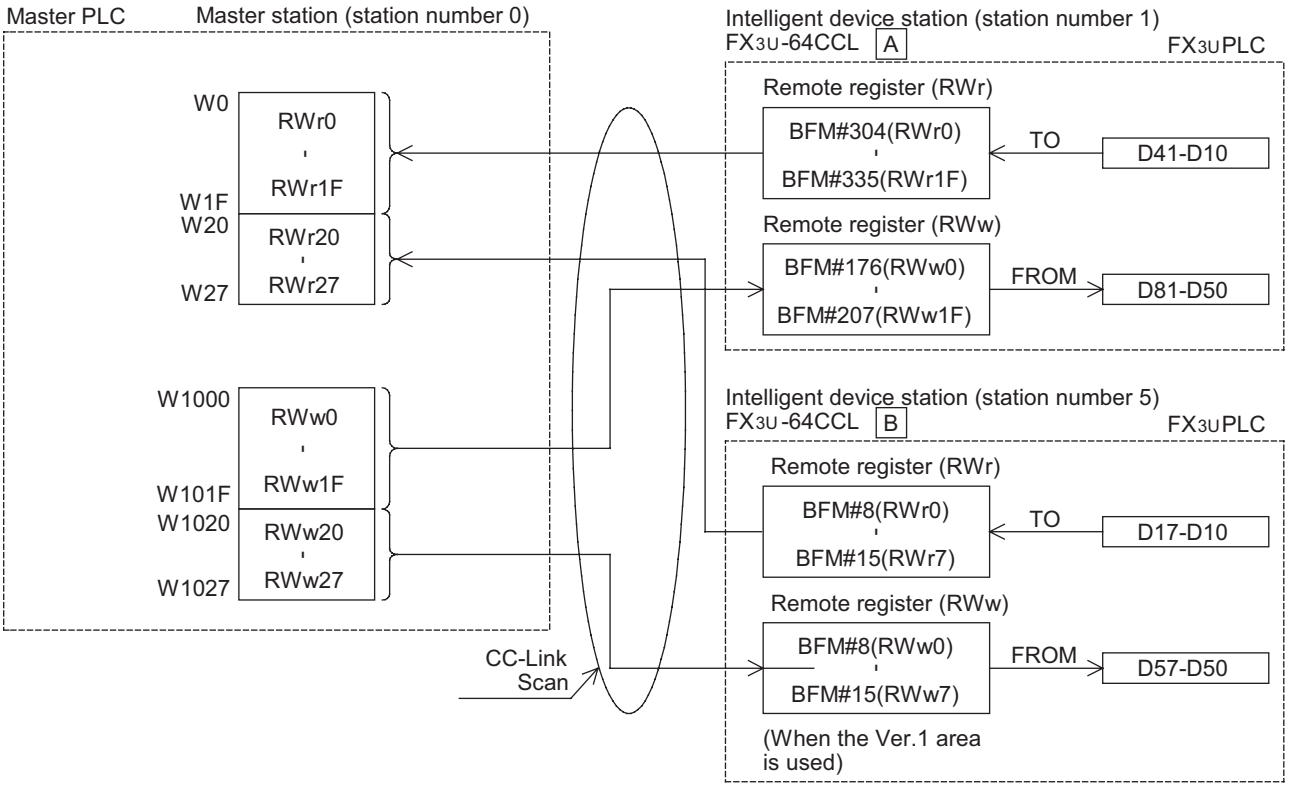
Item	64CCL settings "A" for station number 1	64CCL settings "B" for station number 5
Station number	No. 1 (rotary switch)	No. 5 (rotary switch)
Number of occupied stations / expanded cyclic setting	4 stations / double	2 stations / single
Transmission rate / hardware test setting	Align the transmission rate setting to match the setting in the master station.(rotary switch)	
Number of remote points and number assignment The number of points and assigned numbers are determined by the number of occupied stations/expanded cyclic transmission setting.	Number of remote points and numbers for "4 stations/ double" Remote input: RX00 to CF (208 points) User area Remote input: RXD0 to DF (16 points) System area Remote output: RY00 to CF (208 points) User area Remote output: RYD0 to DF (16 points) System area Remote register: RWr 00 to 1F (32 points) for write Remote register: RWw 00 to 1F (32 points) for read	Number of remote points and numbers for "2 stations/ single" Remote input: RX00 to 2F (48 points) User area Remote input: RX30 to 3F (16 points) System area Remote output: RY00 to 2F (208 points) User area Remote output: RY30 to 3F (16 points) System area Remote register: RWr 00 to 07 (8 points) for write Remote register: RWw 00 to 07 (8 points) for read

8.2 Communication data sequence

Communication through remote inputs and remote outputs is executed as follows in the sample program.



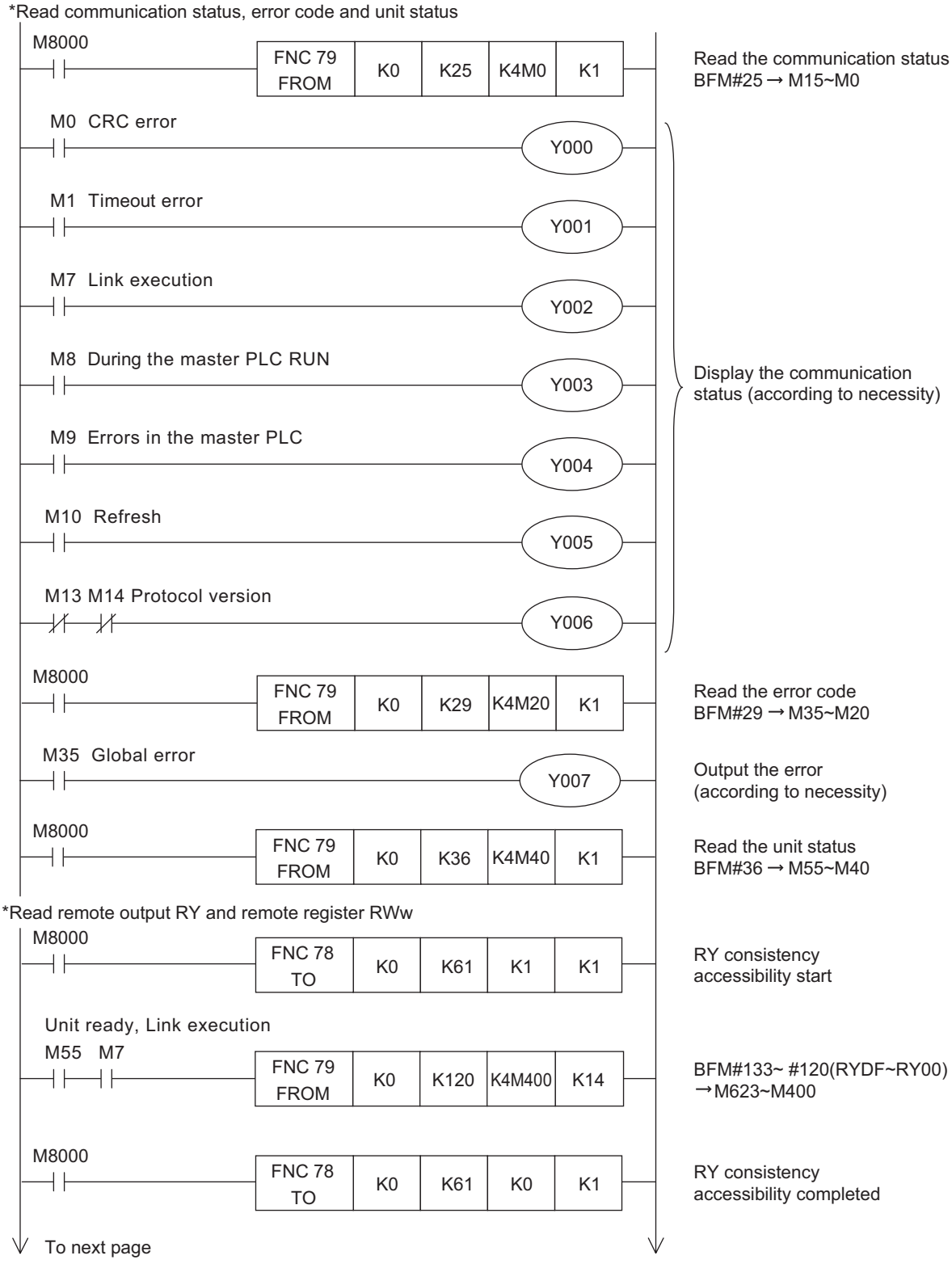
Communication through remote registers is executed as follows in the sample program.

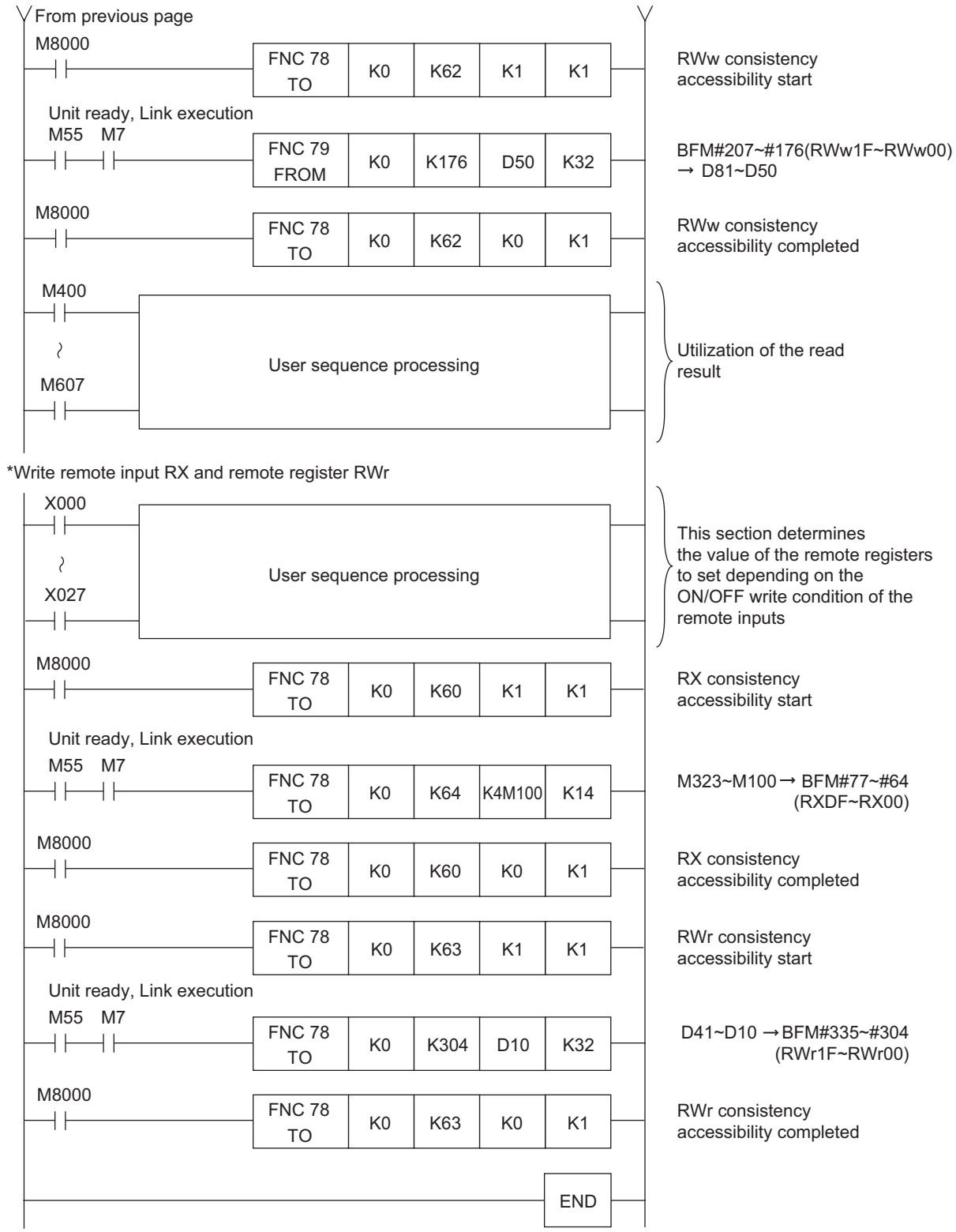


8.3 FX3G/FX3U/FX3UC PLC program example

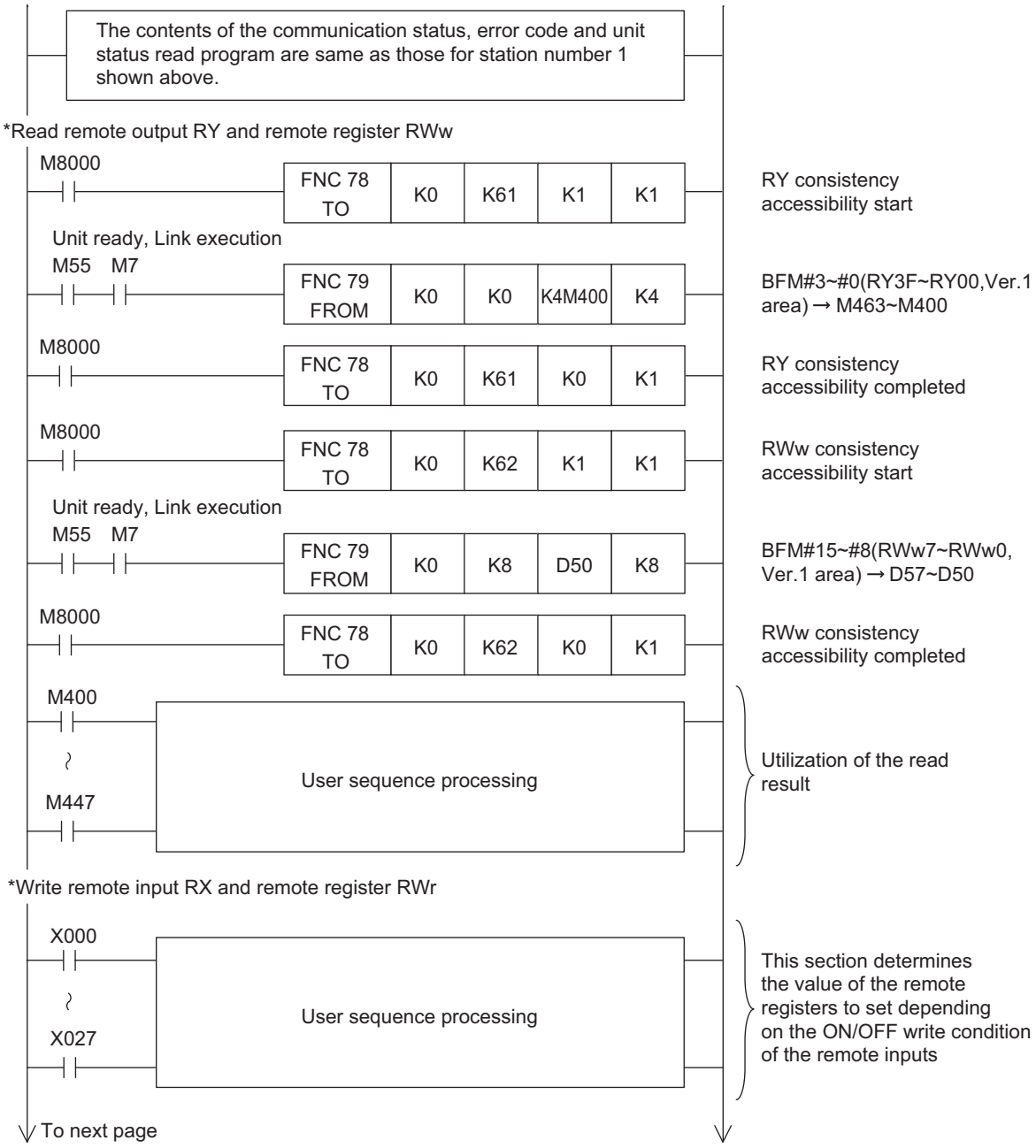
For programs in the master PLC, refer to the manual of the CC-Link master unit.

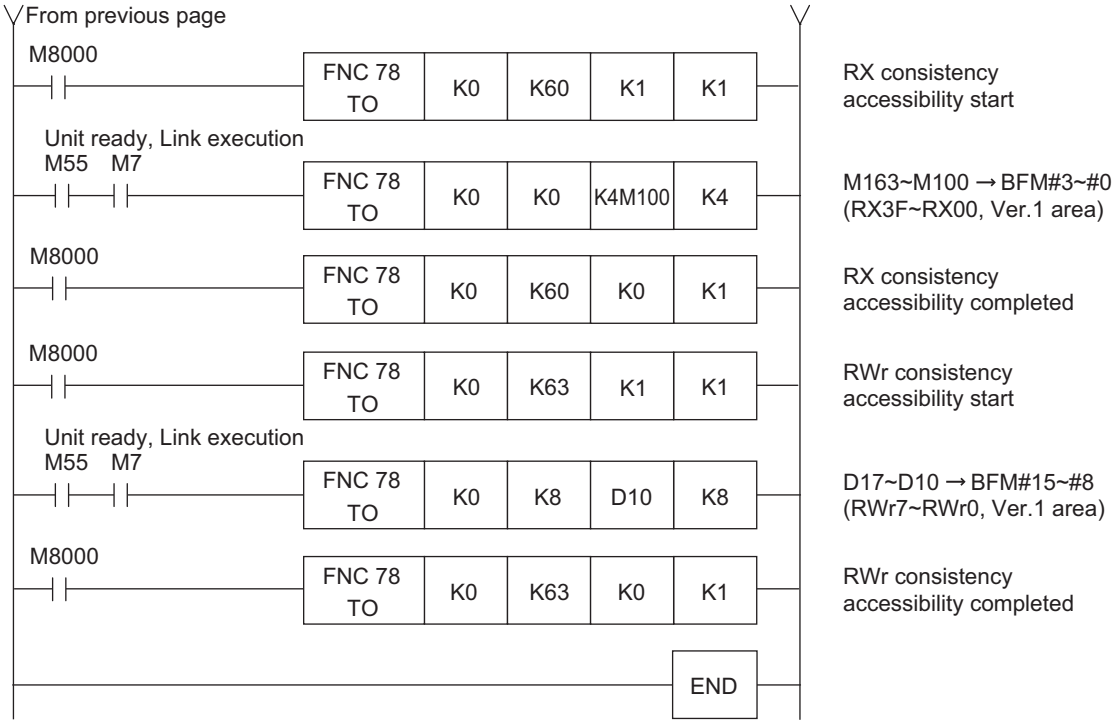
1) Sample program for station number 1




From previous page
M8000
FNC 78 TO K0 K62 K1 K1
RWw consistency accessibility start
Unit ready, Link execution
M55 M7
FNC 79 FROM K0 K176 D50 K32
BFM#207~#176(RWw1F~RWw00) → D81~D50
M8000
FNC 78 TO K0 K62 K0 K1
RWw consistency accessibility completed
M400
M607
User sequence processing
Utilization of the read result
*Write remote input RX and remote register RWr
X000
X027
User sequence processing
This section determines the value of the remote registers to set depending on the ON/OFF write condition of the remote inputs
M8000
FNC 78 TO K0 K60 K1 K1
RX consistency accessibility start
Unit ready, Link execution
M55 M7
FNC 78 TO K0 K64 K4M100 K14
M323~M100 → BFM#77~#64 (RXDF~RX00)
M8000
FNC 78 TO K0 K60 K0 K1
RX consistency accessibility completed
M8000
FNC 78 TO K0 K63 K1 K1
RWr consistency accessibility start
Unit ready, Link execution
M55 M7
FNC 78 TO K0 K304 D10 K32
D41~D10 → BFM#335~#304 (RWr1F~RWr00)
M8000
FNC 78 TO K0 K63 K0 K1
RWr consistency accessibility completed
END

2) Sample program for station number 5




From previous page
M8000
FNC 78 TO K0 K60 K1 K1
RX consistency accessibility start
Unit ready, Link execution
M55 M7
FNC 78 TO K0 K0 K4M100 K4
M163~M100 → BFM#3~#0 (RX3F~RX00, Ver.1 area)
M8000
FNC 78 TO K0 K60 K0 K1
RX consistency accessibility completed
M8000
FNC 78 TO K0 K63 K1 K1
RWr consistency accessibility start
Unit ready, Link execution
M55 M7
FNC 78 TO K0 K8 D10 K8
D17~D10 → BFM#15~#8 (RWr7~RWr0, Ver.1 area)
M8000
FNC 78 TO K0 K63 K0 K1
RWr consistency accessibility completed
END

9. Troubleshooting

This chapter describes major problems that may occur during the CC-Link system construction and lists the items to be checked and confirmed for troubleshooting.

→ **For details, refer to the master unit manual.**

9.1 Troubleshooting procedure

The table below lists the items to be checked and confirmed for each troubleshooting problems.

Problem	Checkpoint	Action
64CCL cannot be linked.	Is external power supply (24V) supplied?	The POWER LED display is checked.
	Is there an error in the station number setting, the number of occupied stations / expanded cyclic setting, or transmission rate / hardware test setting?	The following description is checked. Check the error code BFM#29 b0-b2. Check the switch setting status (SW006A). Check the master station setting
	Can the master station carry out link stop?	The LED display of the master station is checked.
	Is it a reserved station?	The setting of the master station is checked.
	Is the CC-Link cable wired correctly?	Cable wiring is checked.
Master station cannot receive data stored in the remote inputs (RX) or remote registers (RWr) of the 64CCL.	Is the 64CCL performing data link?	Use the following method: Check the LED display of the unit. Check the station data link status of the master station (SW0080).
	Is data being written to the correct addresses of the remote inputs (RX) or remote registers (RWr)?	Check the sequence program.
	Is it a reserved station?	Check the parameters.
	Are there any station numbers that are overlapped?	Check the station number setting.
Master station cannot turn ON/OFF remote outputs (RY) of 64CCL, or cannot write data to remote registers (RWw) of 64CCL.	Is the 64CCL performing data link?	Use the following method: Check the LED display of the unit. Check the station data link status of the master station (SW0080).
	Is data being read from the correct addresses of the remote outputs (RY) or remote registers (RWw)?	Check the sequence program.
	Is it a reserved station?	Check the parameters.
	Are there any station numbers that are overlapped?	Check the station number setting.

9.2 LED status check

The table below describes details for the LED statuses.

LED display	Color	Status	Status
POWER	Green	OFF	Power is not being supplied from the external power supply.
		ON	Power is being supplied from the external power supply.
RUN	Green	OFF	64CCL has failed.
		ON	Under 64CCL normal operation.
ERR.	Red	OFF	No errors.
		ON	Error in the settings, error in the parameter details, error with the communication, errors with the hardware.
L RUN	Green	OFF	Offline.
		ON	Data link is being executed.
L ERR.	Red	OFF	No communication error.
		Flicker	The switch setting was changed after start. There is no terminating resistor. Influence from noise.
		ON	There is a data linking error. There is a setting error.
SD	Green	OFF	Data is not being sent.
		ON	Data is being sent.
RD	Green	OFF	Data is not being received.
		ON	Data is being received.

The POWER, RUN, L RUN, SD and RD LEDs are ON while the data link status is normal.

→ **For details on troubleshooting by LED, refer to the master unit manual.**

When the RUN LED does not light up and the hardware test is not set, the hardware may have an error.
For repair, contact your local Mitsubishi Electric distributor.

9.3 Troubleshooting by error code

1) Error codes detected by the 64CCL.
BFM#29 stores the error code detected by the 64CCL.

→ **For details error code, refer to Subsection 7.2.8**

2) The error code on the CC-Link network
The error code stored in the link special register (SW) is shown below.

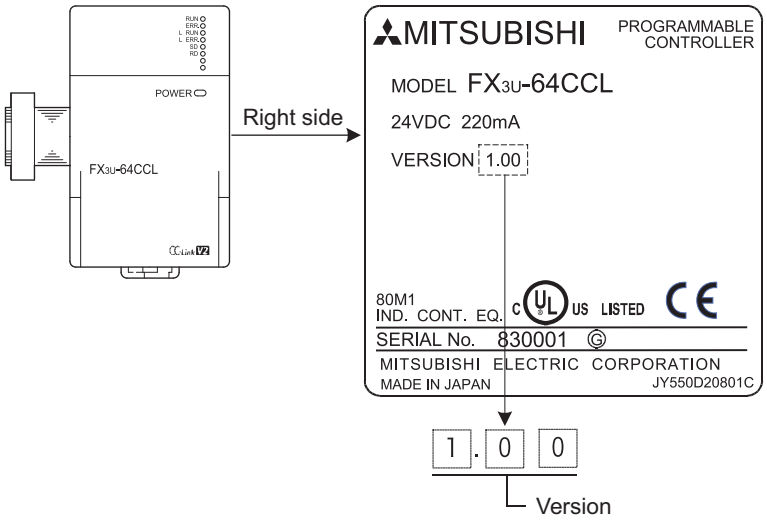
Error code (hexadecimal)	Error definition	The cause of the error occurrence (details)	Error corrective action
B110	Transient data can not be received.	A line error has occurred.	Check the line.
B111	Transient data receiving order error	A line error has occurred.	Check the line.
B112	Transient data length error	A line error has occurred.	Check the line.
B113	Transient data ID error	A line error has occurred.	Check the line.
B115	Link error	A line error has occurred.	Check the line.
B201	Corresponding station error during sending	A data link error occurred at the corresponding station during transient transmission.	Check the communication status of other stations, whether or not a temporary error invalid station is specified, or if the corresponding station is stopped.
B771	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then retransmit (transient overloaded status).
BBC1	transmission rate/hardware test switch error	The transmission rate/hardware test switch is outside the setting range.	The transmission rate/hardware test switch is modified.
BBC2	Station number setting error	The station number switch setting of the module is set to a value other than "1 to 64". Alternatively, the final station number is set to a value greater than 64.	Check the station number and the number of occupied stations for the module.
4B03	Corresponding related error	• The specified route is not supported by the specified CPU unit version. • The communication target CPU is not mounted.	Check whether the specified route is supported.

Appendix A: Version Information

Appendix A-1 Version information

Appendix A-1-1 Version check method

The 64CCL version is shown as "VERSION" on the label attached to the right side of the module as seen from the front.



Appendix A-1-2 Version upgrade history

The table below shows the version upgrade history for the 64CCL.

Version	Contents of version upgrade
Ver.1.00	First product

Appendix B: Differences with FX2N-32CCL

This appendix describes the major differences between the 64CCL and the FX2N-32CCL.

Appendix B-1 Differences with FX2N-32CCL

	FX2N-32CCL	FX3U-64CCL
CC-Link applicable version	Ver.1.00	Ver.2.00 (Ver.1.10 also supported.)
Station type	Remote device station	Intelligent device station
Data area	RX: BFM#0 to #7 RY: BFM#0 to #7 RWw: BFM#8 to #23 RWr: BFM#8 to #23	RX: BFM#0 to #7 (Expanded cyclic setting: single) BFM#64 to #87 RY: BFM#0 to #7 (Expanded cyclic setting: single) BFM#120 to #143 RWw: BFM#8 to #23 (Expanded cyclic setting: single) BFM#176 to #239 RWr: BFM#8 to #23 (Expanded cyclic setting: single) BFM#304 to #367

- The FX2N-32CCL supports only CC-Link Ver. 1.00. The 64CCL supports CC-Link Ver. 1.10 and CC-Link Ver. 2.00.
- The FX2N-32CCL operates as a remote device station. The 64CCL operates as an intelligent device station. The station type set in the master station is different.
- In the FX2N-32CCL (CC-Link Ver. 1.00), remote inputs (RX) and remote outputs (RY) are allocated to BFM #0 to #7, and remote registers (RWr and RWw) are allocated to BFM #8 to #23. The 64CCL holds not only the buffer memory area compatible with the FX2N-32CCL but also the expanded area (BFM #64 to #87, #120 to #143, #176 to #239 and #304 to #367) to support CC-Link Ver. 2.00.
- In the 64CCL, only the expanded area is available when the expanded cyclic transmission is set to "double", "quadruple" or "octuple".
- Either the area compatible with the FX2N-32CCL (BFM #0 to #23) or expanded area is available when the expanded cyclic transmission is set to "single".
- Several settings and statuses are added to the buffer memory area #24 to #31. For details, refer to the following page and to Section 7.2.

Appendix B-2 List of buffer memory compatible with FX2N-32CCL

The table below describes BFM #0 to #31 , which are compatible with the FX2N-32CCL.

BFM No.	Read/ Write	Description	Read (FROM instruction)	Write (TO instruction)	Explanation (compatibility etc.)
#0	R/W	Remote RX, RY	RY00-0F	RX00-0F	FX2N-32CCL compatible area
#1	R/W	Remote RX, RY	RY10-1F	RX10-1F	
#2	R/W	Remote RX, RY	RY20-2F	RX20-2F	
#3	R/W	Remote RX, RY	RY30-3F	RX30-3F	
#4	R/W	Remote RX, RY	RY40-4F	RX40-4F	
#5	R/W	Remote RX, RY	RY50-5F	RX50-5F	
#6	R/W	Remote RX, RY	RY60-6F	RX60-6F	
#7	R/W	Remote RX, RY	RY70-7F	RX70-7F	
#8	R/W	Remote register	RWw0	RWr0	
#9	R/W	Remote register	RWw1	RWr1	
#10	R/W	Remote register	RWw2	RWr2	
#11	R/W	Remote register	RWw3	RWr3	
#12	R/W	Remote register	RWw4	RWr4	
#13	R/W	Remote register	RWw5	RWr5	
#14	R/W	Remote register	RWw6	RWr6	
#15	R/W	Remote register	RWw7	RWr7	
#16	R/W	Remote register	RWw8	RWr8	
#17	R/W	Remote register	RWw9	RWr9	
#18	R/W	Remote register	RWwA	RWrA	
#19	R/W	Remote register	RWwB	RWrB	
#20	R/W	Remote register	RWwC	RWrC	
#21	R/W	Remote register	RWwD	RWrD	
#22	R/W	Remote register	RWwE	RWrE	
#23	R/W	Remote register	RWwF	RWrF	
#24	R	Transmission rate set value	Rotary switch setting value	Writing is impossible.	The rotary switch setting information is stored. Several settings are added to the settings available for the FX2N-32CCL.
#25	R	Communication status	Communication status stage		The communication status is stored. Several settings are added to the settings available for the FX2N-32CCL.
#26	R	CC-Link model code	H0101		The CC-Link model code is stored.
#27	R	Set value of host station number	Rotary switch setting value		The rotary switch setting information is stored.
#28	R	Number of occupied stations, expanded cyclic set value	Rotary switch setting value		The rotary switch setting information is stored. Several settings are added to the settings available for the FX2N-32CCL.
#29	R	Error code	Error code		Error information is stored. Several settings are added to the settings available for the FX2N-32CCL.
#30	R	FX Series model code	K7160		The model code K7160 of 64CCL is stored. (The model code of FX2N-32CCL is K7040.)
#31	R	Not available	----		----

Appendix B-3 [BFM#25] Communication status comparison table

BFM#25 the difference in 64CCL and FX2N-32CCL of the communication status is as follows.

BFM#25 Communication status				
bit	**Description of 64CCL**		**Explanation of 64CCL**	**BFM#25 of FX2N-32CCL**
0	CRC error	Information for the 64CCL	0 : The receive data does not have a CRC error. 1 : The receive data has a CRC error. This bit turns ON when there is a discrepancy with the CRC value due to unwanted noise or other disruptions affecting the transmission path.	Mentioned similar
1	Timeout error		0 : Normal 1 : Timeout error This error occurs when the next refresh is not given during the execution of a current refresh. This bit turns ON when the transmission data send time exceeds the fixed time for normal reception completion. The line may be shut down, the system may go down, or the power may be turned OFF.	Mentioned similar
2	Reserved		0 (Not used)	Reserved
3	Reserved		0 (Not used)	Reserved
4	Reserved		0 (Not used)	Reserved
5	Reserved		0 (Not used)	Reserved
6	Reserved		0 (Not used)	Mentioned similar
7	Link execution		0 : Link non-execution*1 1 : Link execution (L RUN is ON) This bit is ON during data link with the master station.	Mentioned similar
8	Master PLC RUN status	Information for the master station	0 : During STOP 1 : During RUN This bit is ON when the PLC connected to the master station is in RUN mode. This bit operates only during normal data link operation.	Mentioned similar
9	Master PLC error status		0 : Normal 1 : Abnormal This bit turns ON when the PLC connected to the master station has an error. The status is only valid when the master station CPU's designated operation condition is shown as "resuming." For details, refer to the master unit manual.	Reserved
10	Refresh		0 : With no refresh 1 : With refresh	Reserved
11	Reserved		0 (Not used)	Reserved
12	Reserved		0 (Not used)	Reserved
14 13	Protocol version		The CC-Link protocol version is stored. 00 : Ver.1 01 : Ver.2	Reserved
15	Reserved		0 (Not used)	Reserved

*1. When "Link execution (bit 7)" is OFF, the "Master PLC RUN status (bit 8)", "Master PLC error status (bit 9)" and "Refresh (bit 10)" bits hold their final values from the link execution.

Appendix B-4 [BFM#29] Error code comparison table

BFM#29 The difference in 64CCL and FX2N-32CCL of the error status is as follows.

BFM#29 Error code			
bit	**Description of 64CCL**	**Explanation of 64CCL**	**BFM#29 of FX2N-32CCL**
0	Station number setting error	OFF: No errors in the setting ON: The rotary switch is set outside the allowable setting range. Communication state: Stop Action: Please check the setting of the rotary switch.	Error in setting of station No. set switch
1	Transmission rate setting error		Error in setting of baud rate set switch
2	Occupied station, expanded cyclic setting error		Reserved
3	Reserved	0 (Not used)	Reserved
4	Station number change error	OFF: No setting change ON: This bit turns ON when the rotary switch setting is changed after the 64CCL is started, and turns OFF when the rotary switch is returned to its previous setting. Communication state: Continuation Action: Please check the setting of the rotary switch.	Error in change of station No. set switch
5	Transmission rate change error		Error in change of baud rate set switch
6	Occupied station, expanded cyclic setting change error		Reserved
7	Reserved	0 (Not used)	Reserved
8	Errors in internal communication power supply	OFF: No error ON: Inside communication power supply error Communication state: Stop Action: For repair, contact your local Mitsubishi Electric distributor.	External 24 V is not supplied.
9	Hardware error	OFF: No error ON: Hardware error Communication state: Stop Action: For repair, contact your local Mitsubishi Electric distributor.	Reserved
10	Module status	OFF: Normal ON: Abnormal (SB0020) Data cannot be transferred normally to/from the main unit. Communication state: Stop	Reserved
11	Host station operation status	OFF: Normal ON: Abnormal (BFM#25 b0, 1) Communication state: Continuation or stop	Reserved
12	Transient transmission status	OFF: No error ON: Error(SB0094) Communication state: Continuation or stop	Reserved
13	Reserved	0 (Not used)	Reserved
14	BFM accessibility error	OFF: No error ON: The executed TO instruction specifies an unavailable area or unassigned remote I/O (RX/RY) area or remote register (RWw/RWr) area. Communication state: Continuation Action: Please check the PLC program. To reset this bit, write "K0" to BFM #29.	Reserved
15	Global error	OFF: No error ON: One of the bits BFM#29 b0-b14 turns on. Action: Please check the applicable error definition.	Reserved

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.
   a) Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
   b) Failure caused by unapproved modifications, etc., to the product by the user.
   c) 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.
   d) Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
   e) Relay failure or output contact failure caused by usage beyond the specified Life of contact (cycles).
   f) 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.
   g) Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
   h) 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 of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user or third person by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, 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
3/2008	A	First Edition
6/2008	B	• The access function description for the FX3U/FX3UC main unit via another station QCPU (Q mode) (Section 1.1, Subsection 2.4.2, Subsection 2.4.3, etc.) is added. • FX3G Series PLC was added. • Errors are corrected.

FX3U-64CCL

USER'S MANUAL

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MODEL	FX3U-64CCL-U-E
MODEL CODE	09R718

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(MEE)
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Specifications are subject to change without notice.