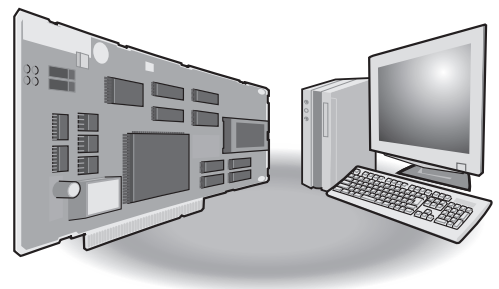


Network Interface Board

Model Q80BD/Q81BD CC-Link IE Controller Network Interface Board User's Manual

-Q80BD-J71GP21-SX
-Q80BD-J71GP21S-SX
-Q81BD-J71GP21-SX
-Q81BD-J71GP21S-SX



● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before using the product.)

Before using this product, read this manual and the relevant manuals introduced in this manual carefully and handle the product correctly with full attention to safety.

Note that these precautions apply only to this product. Refer to the user's manual of your CPU module for safety precautions on programmable controller systems.

In this manual, the safety instructions are ranked as "⚠ WARNING" and "⚠ CAUTION".



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



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

Note that failure to observe the ⚠ CAUTION level instructions may also lead to serious results depending on the circumstances.

Be sure to observe the instructions of both levels to ensure personal safety.

Please store this manual in a safe place for future reference. This manual must be forwarded to the end user.

[Design Precautions]



WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in a personal computer. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.
 - (2) The station to which the board is installed may be disconnected from the data link due to a data link error. If this occurs, the data output from the station and written to other stations before the error will be held until the station is reconnected to the network (until its data link is restarted). Provide a mechanism for data link status monitoring and error handling for each station that is connected to the data link system.
- For the operating status of each station after a communication failure, refer to MELSEC-Q CC-Link IE Controller Network Reference Manual for each network. Incorrect output or malfunction due to a communication failure may result in an accident.
- When changing data during operation, configure an interlock circuit in the program to ensure that the entire system will always operate safely. Configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Laser diodes are used in the optical transceivers of the CC-Link IE Controller Network. The laser class (IEC 60825-1: 2014, JIS C 6802: 2014) of these laser diodes is Class 1. Do not look directly at laser light. Doing so may harm your eyes.

[Design Precautions]



CAUTION

- Do not install the external power supply or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 in.) or more between them. Failure to do so may result in malfunction due to noise.

[Security Precautions]



WARNING

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

[Installation Precautions]

WARNING

- Shut off the external power supply for the system in all phases before installing the board to or removing it from the personal computer.
Failure to do so may result in electric shock or cause the board to fail or malfunction.
- Do not touch any connectors while power is on. Doing so may cause electric shock or malfunction.

[Installation Precautions]

CAUTION

- Use the board in an environment that meets the general specifications in this manual.
Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Do not directly touch any conductive parts and electronic components of the board.
Doing so may cause malfunction or failure of the board.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.
- Fix the board by tighten the board-fixing screws within the specified torque range.
Undertightening may cause drop of the component or wire, short circuit, or malfunction.
Overtightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction.
For the tightening torque of the board-fixing screws, refer to the manual supplied with the personal computer.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body.
Failure to do so may cause the board to fail or malfunction.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (☞ Section 2.5 Operating Environment). Failure to do so may cause a failure or malfunction.
- Securely insert the board into the PCI slot following the board installation instruction of the personal computer.
Incorrect insertion of the board may lead to a malfunction, failure or drop of the board.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.
- When installing the board, take care not to contact with other boards.
- Handle the board in a place where static electricity will not be generated.
Failure to do so may cause a failure or malfunction.

[Installation Precautions]



CAUTION

- The board is included in an antistatic envelope.
When storing or transporting it, be sure to put it in the antistatic envelope.
Failure to do so may cause a failure or malfunction.
- Do not drop or apply a strong impact to the board.
Doing so may cause a failure or malfunction.

[Wiring Precautions]



WARNING

- Shut off the external power supply for the system in all phases before installing the board or starting wiring.
Failure to do so may result in electric shock, damage to the product, or malfunction.
- After installation of the board and wiring, attach the cover on the module before turning it on for operation.
Failure to do so may result in electric shock.

[Wiring Precautions]



CAUTION

- Check the rated voltage and pin-out before wiring to the external power supply cable, and connect the cables correctly.
Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Place the communication cable and the external power supply cable connected to the board in a duct or clamp them.
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact.
- When disconnecting the cable from the board, do not pull the cable by the cable part.
Pulling the cable connected to the board may result in malfunction or damage to the board or cable.
- Prevent foreign matter such as dust or wire chips from entering the personal computer.
Such foreign matter may cause a fire, failure, or malfunction.
- Do not install the external power supply or communication cables together with the main circuit lines or power cables.
Keep a distance of 100mm (3.94 in.) or more between them. Failure to do so may result in malfunction due to noise.

[Wiring Precautions]



CAUTION

- Special skills and tools are required to connect the communication cable to the connector plug, which is an exclusive product.
When purchasing it, please contact your local Mitsubishi Electric sales office or representative.
Incomplete connection can result in a short, fire or malfunction.
- Securely plug the communication cable to the connector of the board.
Then, check for any incomplete connection.
Poor contact may cause an erroneous input or output.
- Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause a malfunction.
- Verify the pin-out and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause a failure or malfunction.
- Insert the wired external power supply cable into the external power supply cable connector until a click is heard.
Imperfect insertion may cause a failure or malfunction.
- Always ground the personal computer to the protective ground conductor.
Failure to do so may cause a malfunction.

[Startup and Maintenance Precautions]



WARNING

- Shut off all phases of the external power supply before cleaning the board or retightening the fixing screws. Failure to do so may result in an electric shock, or cause a failure or malfunction of the board.
- Shut off the external power supply for the system in all phases before installing the board to or removing it from the personal computer.
Failure to do so may result in electric shock or cause the board to fail or malfunction.
- Do not connect or disconnect any communication cable while power is on.
Doing so may result in a malfunction.

[Startup and Maintenance Precautions]



CAUTION

- Thoroughly read the manual and ensure the safety before performing program modification during operation, forced output, operation such as RUN, STOP and PAUSE.
An improper operation will result in mechanical damage or accidents.
- Do not disassemble or modify the board.
Doing so may cause failure, malfunction, injury, or a fire.
- Fix the board by tighten the board-fixing screws within the specified torque range. Undertightening may cause drop of the component or wire, short circuit, or malfunction. Overtightening may damage the screw and/or module, resulting in drop, short circuit, or malfunction.
For the tightening torque of the board-fixing screws, refer to the manual supplied with the personal computer.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body.
Failure to do so may cause the board to fail or malfunction.
- The board is included in an antistatic envelope.
When storing or transporting it, be sure to put it in the antistatic envelope.
Failure to do so may cause a failure or malfunction.
- The microprocessor built in the board will reach a high temperature during operation. Do not touch it directly when replacing the board.
Doing so may result in a failure, malfunction or injury.

[Disposal Precautions]



CAUTION

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

● CONDITIONS OF USE FOR THE PRODUCT ●

- (1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
- ("Prohibited Application")
- Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.
- Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

REVISIONS

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

Revision date	*Manual number	Description
APR., 2007	SH (NA)-080691ENG-A	First edition
Oct., 2007	SH(NA)-080691ENG-B	Addition Section 8.1.2, Appendix 3 Correction GENERIC TERMS AND ABBREVIATIONS, Section 1.2, Section 1.3, Section 2.5, Chapter 5, Section 8.1.1, Section 8.1.3, Section 8.2, Section 8.3, Section 9.2.1, Section 9.2.3, Section 10.2.1, Section 10.2.3, Chapter 15, Section 16.2, Section 16.3.1, Appendix 4 Section 8.1.2 changed to Section 8.1.3.
Jan., 2008	SH(NA)-080691ENG-C	"MELSECNET/G network system" (controller network) is changed to "CC-Link IE Controller Network" Correction SAFETY PRECAUTIONS, PRECAUTIONS FOR USE, INTRODUCTION, CONTENTS, MANUAL, HOW TO USE THIS MANUAL, GENERIC TERMS AND ABBREVIATIONS, PACKING LIST, CHAPTER 1, Section 1.1, Section 1.2, Section 1.3, Section 2.1, Section 2.2.2, Section 2.2.3, Section 2.3, Section 2.3.2, Section 2.4, Section 2.5, Section 2.6, CHAPTER 3, Section 3.1, Section 3.2, CHAPTER 4, Section 4.1, Section 4.2, Section 4.2.1, Section 5.1, CHAPTER 6, Section 6.1, Section 6.2, Section 6.2.1, Section 6.2.2, Section 6.3, Section 6.4, Section 6.4.1, Section 6.5, Section 6.5.1, Section 6.5.2, Section 6.5.3, Section 6.6, Section 6.6.1, Section 6.6.2, CHAPTER 7, Section 7.1, Section 7.2, Section 7.3, Section 7.3.3, Section 7.4, Section 7.5, Section 7.6, Section 7.7, Section 7.8, Section 7.9, Section 8.1, Section 8.1.1, Section 8.1.2, Section 8.1.3, Section 8.2, CHAPTER 9, Section 9.1, Section 9.1.1, Section 9.2, Section 9.2.1, Section 9.2.2, Section 9.2.3, Section 9.2.4, Section 9.3, Section 9.3.1, Section 9.3.2, Section 9.3.3, Section 9.4, Section 9.4.1, Section 9.4.6, Section 9.4.7, Section 9.4.8, Section 9.5.1, Section 9.5.3, Section 9.5.4, Section 10.1.1, Section 10.2.1, Section 10.3, Section 10.4, Section 10.5, CHAPTER 11, Section 11.1, Section 11.1.2, Section 11.2, Section 12.1, Section 12.4, Section 12.5, Section 12.6, Section 12.7, Section 12.8, Section 12.9, Section 13.1.1, Section 13.2, Section 13.2.1, Section 13.3, CHAPTER 14, Section 14.2, Section 14.2.1, Section 14.2.2, Section 14.2.3, Section 14.3, CHAPTER 15, Section 16.2, Section 16.3, Section 16.3.1, Section 16.4, Section 16.4.1, Section 16.4.2, Section 16.4.3, Section 16.4.4, Section 16.4.5, Section 16.4.6, Section 16.5.2, Section 16.5.3, Section 16.5.4, Section 16.7, APPENDICES Addition Section 9.4.7

Revision date	*Manual number	Description
May., 2008	SH(NA)-080691ENG-D	Addition Section 9.3.4 Correction Section 2.5, Section 2.6, Section 6.5.1, Section 6.5.2, Section 6.5.3, Section 6.6.1, Section 6.6.2, Section 7.1, Section 9.3.3, Section 9.4.1, Appendix 6.2
Sep., 2008	SH(NA)-080691ENG-E	Correction Section 2.5, Section 3.2, Section 7.1, Section 9.3.1, Section 9.4.1, Appendix 6.1
Oct., 2008	SH(NA)-080691ENG-F	Correction PRECAUTIONS FOR USE, GENERIC TERMS AND ABBREVIATIONS, Section 2.5, Section 9.4.6, Section 9.4.7, Section 11.1.2
Apr., 2009	SH (NA)-080691ENG-G	Addition Section 7.10, Section 9.4.9, Section 16.8 Correction SAFETY PRECAUTIONS, GENERIC TERMS AND ABBREVIATIONS, Section 2.2.2, Section 2.3.2, Section 4.2.1, CHAPTER 5, Section 6.5.1, Section 6.5.2, Section 6.5.3, Section 6.6.1, Section 6.6.2, CHAPTER 7, Section 7.1, Section 7.2, Section 7.5, Section 7.6, Section 7.7, Section 8.1.1, Section 8.1.3, Section 8.2, Section 8.3, Section 9.1.1, Section 9.2, Section 9.3.1, Section 9.3.3, Section 9.4.1, Section 9.4.6, Section 11.1.1, Section 11.1.2, Section 12.2, Section 12.6, Section 12.7, Section 14.3, CHAPTER 15, Section 16.4.3, Appendix 5.6, Appendix 6.1, Appendix 6.2, Appendix 6.4
Sep., 2009	SH (NA)-080691ENG-H	Addition Section 6.7, Section 14.1.4 Correction PRECAUTIONS FOR USE, Section 4.1, Section 6.1, Section 8.1.3, Section 9.4.5, Section 9.4.6, Section 12.4, Section 13.1.1, Section 14, Section 15.1, Appendix 2, Index Deletion Section 14.1 Section 14.2 and 14.3 are changed to Section 14.1 and 14.2.

Revision date	*Manual number	Description
May, 2010	SH(NA)-080691ENG-I	Addition CONDITIONS OF USE FOR THE PRODUCT Correction SAFETY PRECAUTIONS, MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 1.2, Section 2.5, Section 3.1, Section 3.2, Section 5.1.2, Section 6.2.1, Section 6.2.2, Section 6.3, Section 6.4, Section 6.4.2, Section 6.5.1, Section 6.5.2, Section 6.5.3, Section 6.6.1, Section 6.6.2, Section 6.7.1, Section 7.1, Section 7.2, Section 7.3.1 to 7.3.3, Section 8.1, Section 8.1.1, Section 8.1.3, Section 8.2, Section 8.3, Section 9.2.1, Section 9.2.3, Section 9.4.1, Section 9.4.2, Section 9.5.1, Section 10.2.1, Section 10.2.3, Section 11.1.2, CHAPTER 12, Section 12.3.3, Section 12.3.4, Section 12.9, Section 16.2, Section 16.4.5, Appendix 3.1, Appendix 3.2 Deletion Section 12.3.5, Section 12.3.6 Section 1.3 is changed to Appendix 4. Appendix 4 is changed to Appendix 7.
Jun., 2010	SH(NA)-080691ENG-J	Correction Section 2.6
Dec., 2010	SH(NA)-080691ENG-K	Correction Section 2.5

Revision date	*Manual number	Description
Jul., 2011	SH(NA)-080691ENG-L	Model addition Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX Addition Appendix 9.3, Appendix 9.4 Correction SAFETY PRECAUTIONS, PRECAUTIONS FOR USE, INTRODUCTION, MANUAL, HOW TO USE THIS MANUAL, GENERIC TERMS AND ABBREVIATIONS, PACKING LIST, CHAPTER 1, Section 1.1, Section 1.2, Section 2.1, Section 2.4, Section 2.5, Section 3.1, Section 3.2, Section 5.1.1, Section 6.1, Section 6.2.1, Section 6.3, Section 6.4.1, Section 6.4.2, Section 6.5.3, Section 6.6.1, Section 6.6.2, Section 7.9, Section 8.1.1, Section 8.1.2, Section 8.1.3, Section 9.2.1, Section 9.3.3, Section 9.4.1, Section 9.4.8, Section 10.2.1, Section 10.6, Section 10.7, Section 10.8, Section 10.9, CHAPTER 11, Section 11.2, Section 12.2, Section 13.1.4, Section 13.2, CHAPTER 14, Section 14.1, Section 14.2, Section 15.2, Section 15.3, Section 15.3.1, Section 15.4.2, Section 15.4.4, Section 15.4.5, Section 15.5.1, Section 15.6, Appendix 1, Appendix 2.1, Appendix 3.1, Appendix 3.4, Appendix 5, Appendix 5.1, Appendix 5.6, Appendix 7, Appendix 8 Deletion CHAPTER 11, Section 12.3 to Section 12.9, Section 15.1, Appendix 2.1.1, Appendix 2.1.2 CHAPTER 12 to 16 are changed to CHAPTER 11 to 15. Section 2.6 is changed to Appendix 4 and 7. Section 15.2 and 15.3 are changed to Section 15.1 and 15.2. Appendix 6 is changed to Appendix 3. Appendix 4 is changed to Appendix 6. Appendix 3 is changed to Appendix 8. Appendix 7 is changed to Appendix 9.
Jan., 2012	SH(NA)-080691ENG-M	Correction PRECAUTIONS FOR USE, Section 3.1 CHAPTER 5 is changed to Appendix 9, Appendix 9 is changed to Appendix 10
Mar., 2012	SH(NA)-080691ENG-N	Addition Appendix 11, Appendix 12 Correction Section 2.5, Section 7.1.1, Section 7.1.3, Section 7.2
Dec., 2012	SH(NA)-080691ENG-O	Correction SAFETY PRECAUTIONS, GENERIC TERMS AND ABBREVIATIONS, Section 2.5, Section 3.1, Section 3.2, Section 5.4, Section 7.1.2, Section 11.1.1, Section 11.3, Section 14.2, Section 14.3

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Sep., 2013	SH(NA)-080691ENG-P	Addition Section 3.4, Section 5.3.3, Section 5.3.4, Section 8.2.3, Section 14.2.1, Section 14.2.2, Section 14.3.3, Section 14.7.1, Section 14.7.2, Appendix 7.1, Appendix 7.2, Appendix 8, Appendix 10.3 Correction PRECAUTIONS FOR USE, HOW TO USE THIS MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 1.2, Section 2.5, Section 5.1 ~ 5.5, Section 6.7, Section 7.1 ~ 7.3, Section 8.2, Section 8.2.1, Section 8.2.4, Section 8.3.1, Section 8.4.6, Section 9.2.1, Section 9.2.3, CHAPTER 10, Section 12.1.4, Section 13.1.2, CHAPTER 14, Section 14.1, Section 14.2.3, Section 14.3, Section 14.3.2, Section 14.6, Section 14.9, Appendix 5, Appendix 9.1, Appendix 9.2, Appendix 10, Appendix 10.1, Appendix 10.2, Appendix 11, Appendix 11.2, Appendix 11.3 Section 5.2 is changed to Section 5.3, Section 5.6.1 and 5.6.2 are changed to Section 5.5.4 and 5.5.5, Section 5.7.1 is changed to Section 5.5.6, Section 7.1.1 is changed to Section 7.2, Section 7.1.3 is changed to Section 14.2.3, Appendix 4 is changed to Appendix 7, Appendix 5, 6, 7, 8, 9, 10, 11 and 12 are changed to Appendix 4, 5, 6, 9, 12, 13, 10 and 11 Deletion Section 5.6, Section 5.7, Section 7.1.2, Section 10.1, Section 10.2, Section 14.5.4
Jun., 2014	SH(NA)-080691ENG-Q	Correction Section 2.5, Section 7.1, Section 7.2, Section 8.2.1, Section 8.4.1, Section 9.1.1, Section 9.2, Section 9.3, Section 9.4, Section 9.6, Section 9.7, Section 9.9, Section 12.1, Section 14.1, Section 14.2.2, Section 14.2.3, Section 14.3.2, Appendix 3.1, Appendix 7.2, Appendix 9.2, Appendix 10.2, Appendix 10.3, Appendix 11 Section 9.9 to Section 9.11 are changed to Section 9.8 to Section 9.10 Deletion Section 9.8
Jan., 2015	SH(NA)-080691ENG-R	Correction Section 3.2, Section 8.3.4
Apr., 2015	SH(NA)-080691ENG-S	Correction Section 2.5, Section 7.2, Section 9.3, Section 9.4, Section 14.3.2
Sep., 2015	SH(NA)-080691ENG-T	Correction Section 2.5, Section 7.1, Section 14.2.3, Appendix 8

Revision date	*Manual number	Description
Sep., 2016	SH(NA)-080691ENG-U	Correction Section 2.5, Section 7.1, Section 7.2, Section 8.2.1, CHAPTER 9, Section 14.1, Section 14.2.3, Section 14.2.4, Appendix 8, Appendix 9.2, Appendix 10.1, Appendix 10.2, Appendix 11 Deletion Section 9.1 to Section 9.10, Appendix 10.1
Feb., 2017	SH(NA)-080691ENG-V	Correction Section 2.5, Section 14.3.2
Mar., 2017	SH(NA)-080691ENG-W	Correction Section 2.5
Sep., 2017	SH(NA)-080691ENG-X	Correction Section 2.5, Section 7.1, Section 14.2.3
Jan., 2018	SH(NA)-080691ENG-Y	Correction GENERIC TERMS AND ABBREVIATIONS, Section 11.3
Jun., 2019	SH(NA)-080691ENG-Z	Correction MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 2.5, Section 7.1, Appendix 10.1, Appendix 10.2, Appendix 11, Appendix 12.1, Appendix 13.1, Appendix 13.2, Appendix 13.3, Appendix 13.4
Feb., 2020	SH(NA)-080691ENG-AA	Correction Section 2.5
Sep., 2021	SH(NA)-080691ENG-AB	Correction Section 5.2, Appendix 12, Appendix 13.1, Appendix 13.2, Appendix 13.3, Appendix 13.4
Jan., 2022	SH(NA)-080691ENG-AC	Correction SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, MANUAL, GENERIC TERMS AND ABBREVIATIONS, Section 2.1, Section 2.5, Section 7.1, Section 7.2, Section 7.3, Section 14.2.1, Section 14.2.2, Section 14.2.4, Section 14.3.2, Appendix 7.2, Appendix 8, Appendix 12 Deletion PACKING LIST
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Sep., 2024	SH(NA)-080691ENG-AF	Correction Section 2.5, Section 7.1, Section 7.2.3, Section 8.2.1, Section 14.1, Section 14.2.2, Section 14.2.3, Section 14.2.4, Appendix 8, Appendix 9, Appendix 10.1, Appendix 10.2, Appendix 11, Appendix 11.3

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Apr., 2025	SH(NA)-080691ENG-AG	Correction RELEVANT MANUALS, Section 2.2.2, Section 2.3.2, Section 2.4, Section 2.5, Section 4.2.1, Section 4.3, Section 5.2, Section 5.3.4, Section 5.4.2, Section 5.5.1, Section 5.5.2, Section 5.5.3, Section 5.5.4, Section 5.5.5, Section 5.5.6, Section 6.1, Section 6.2, Section 6.3, Section 6.3.1, Section 6.3.2, Section 6.3.4, Section 6.3.5, Section 6.4, Section 6.5, Section 6.6, Section 6.7, Section 6.8, Section 6.9, Section 6.10, Section 11.2.1, Section 12.1.1, Section 12.1.2, Section 12.2, Section 12.1.3, CHAPTER 14, Section 14.1, Section 14.4.3, Section 14.7.2, Section 14.8, Appendix 1, Appendix 5, Appendix 6 Deletion HOW TO USE THIS MANUAL, Section 8.1 to Section 8.5, Section 13.1 to Section 13.2, Appendix 3
Feb., 2026	SH(NA)-080691ENG-AH	Correction Section 2.5, Section 14.2.3, Section 14.3.3

Japanese Manual Version SH-080690-AH

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PRECAUTIONS FOR USE

(1) Interlink transfer and routing functions

The CC-Link IE Controller Network board cannot be used as a relay station for the interlink transfer function or the routing function.

To use these functions, set a network module as a relay station.

(2) A personal computer equipped with PCI bus slot and PCI Express® slot

When CC-Link IE Controller Network board (Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX) supported with PCI bus is installed on a personal computer which has both PCI bus slot and PCI Express® slot, link refresh time may be long compared to when using a personal computer which has only PCI bus slot.

(3) Restrictions for functions depending on the personal computer or the operating system

There are some restrictions for the functions or supported version depending on the operating system or personal computer to be used.

☞ Section 2.5 Operating Environment

(4) Driver installation and updating

Do not install or update the driver other than the method written in the troubleshooting in this manual.

The consistency between the driver and utility cannot be identified, and CCLink IE Controller Network board may not operate properly.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric network interface boards.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX CC-Link IE Controller Network interface board to handle the product correctly.

Note that the menu names and operating procedures may differ depending on an operating system in use and its version. When reading this manual, replace the names and procedures with the applicable ones as necessary.

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RELEVANT MANUALS

The following manuals are relevant to this product.

Manual Name	Manual Number
Model Q80BD/Q81BD CC-Link IE Controller Network Interface Board User's Manual Explains the system configuration, specifications, functions, handling, wiring, and troubleshooting for Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX, Q80BD-J71GP21-SX, and Q80BD-J71GP21S-SX CC-Link IE Controller Network interface boards. (this manual)	SH-080691ENG
CC-Link IE Controller Network Interface Board User's Manual Explains the functions and operation methods for the CC IE Control utility.	SH-082712ENG
MELSEC Data Link Library Reference Manual Explains the programming, accessible devices and range, function specifications, sample programming and error code for MELSEC data link library.	SH-081035ENG

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations to describe the CC-Link IE Controller Network interface board.

Generic Term/ Abbreviation	Description
CC-Link IE Controller Network board	Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX CC-Link IE Controller Network interface board
CC-Link IE Controller Network board with external power supply function	Q80BD-J71GP21S-SX, Q81BD-J71GP21S-SX CC-Link IE Controller Network interface board
MELSECNET/H board	Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BDJ71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11 MELSECNET/H interface board
MELSECNET/H module	A Q series MELSECNET/H network module
Board WDT	A watchdog timer that monitors the operation of network board
Driver WDT	A watchdog timer that monitors the communication status between a network board and a personal computer, or operating status of a personal computer

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this manual.

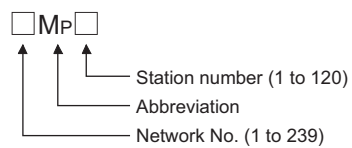
(1) Abbreviations for control station and normal station, and symbol format

This section explains abbreviations for control station and normal station, and symbol format to be used in this manual.

(a) Abbreviations

Abbreviation	Station status
MP	Control station
Ns	Normal station

(b) Symbol format



[Example]

- 1) Network No.3, control station and station number 6: 3MP6
- 2) Network No.5, normal station and station number 3: 5Ns3

CHAPTER 1 OVERVIEW

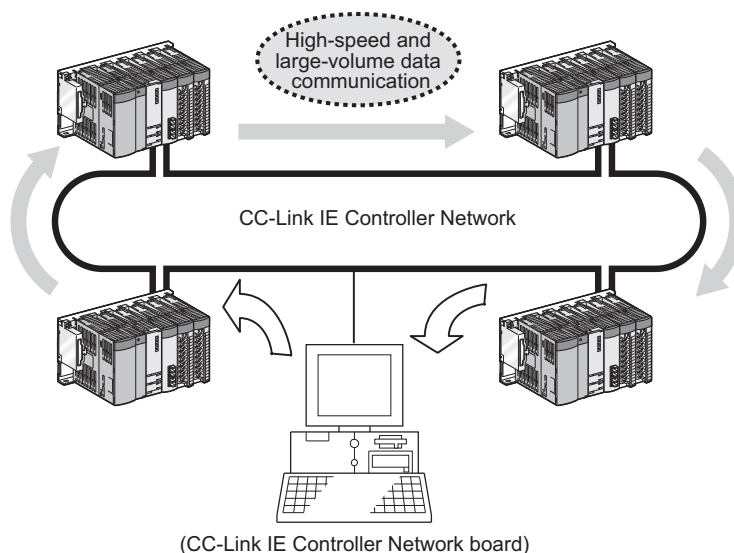
This manual explains the specifications, functions, preparatory procedures and setting, programming, and troubleshooting of the CC-Link IE Controller Network board. When applying program examples introduced in this manual to the actual system, it is necessary to perform a sufficient examination to make sure they don't cause any error in the system control.

For construction of the CC-Link IE Controller Network, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

1.1 Overview

The CC-Link IE Controller Network board allows connection of a personal computer to a CC-Link IE Controller Network, realizing high-speed and large-volume data communications between the computer and programmable controllers.



POINT

- (1) The CC-Link IE Controller Network is a system developed to improve the MELSECNET/H network system (PLC-to-PLC network), allowing communications of a larger data volume at a higher speed.
For details of the comparison between the CC-Link IE Controller Network board and the MELSECNET/H board, refer to the following Appendix.
☞ Appendix 3 Comparison with the MELSECNET/H Board
- (2) CC-Link IE Controller Network boards, MELSECNET/H boards, and MELSECNET/H modules cannot be mixed in the same network.
(Must be separated into different networks.)
 - CC-Link IE Controller Network board:
Used for CC-Link IE Controller Network
 - MELSECNET/H board or MELSECNET/H module:
Used for MELSECNET/H or MELSECNET/10

1.2 Features

The features of the CC-Link IE Controller Network board are shown below.

(1) Personal computer can be incorporated into CC-Link IE Controller Network.

By installing the CC-Link IE Controller Network board to a personal computer, the personal computer can be used as a control station or normal station of the CC-Link IE Controller Network.

(2) Universal PCI, PCI Express[®] are applicable.

(a) Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX

The following PCI slots are applicable.

- 5 V slot
- 3.3 V slot
- 64-bit slot
- PCI-X slot

(b) Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX

PCI Express[®] is applicable.

(3) Operation is easy.

To utilize the CC-Link IE Controller Network board, just install it to a personal computer and install the software package.

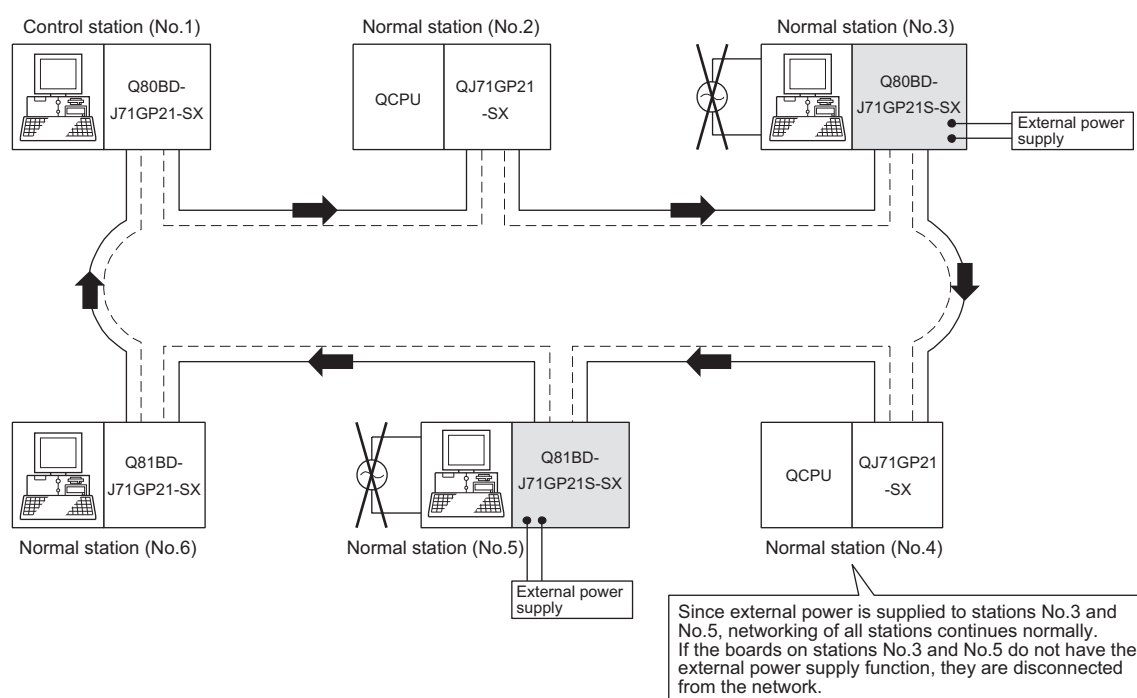
Using the CC IE Control utility, various settings such as channel numbers and station numbers can be configured easily.

(4) External power supply allows continuous network communication even during power-off of personal computer. (Function of the CC-Link IE Controller Network board with external power supply function)

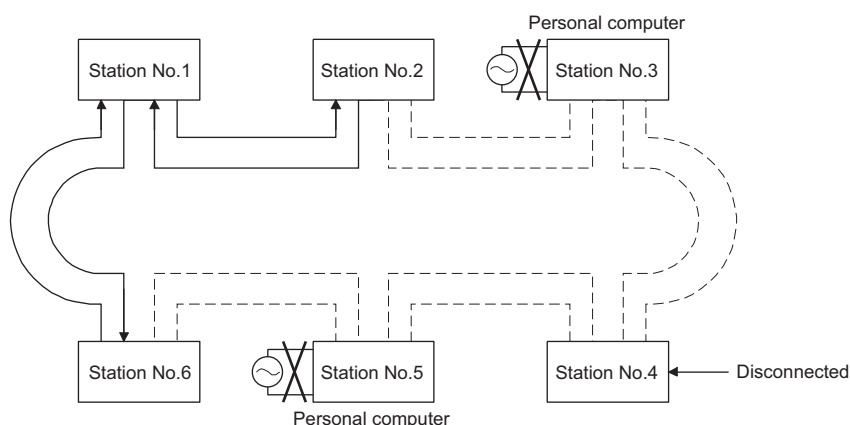
Since power is supplied externally, the CC-Link IE Controller Network board with external power supply function can continue network communication (baton passing) even if a personal computer is powered off and data link cannot be performed.

Therefore, a normally operating station connected between other stations with power-off computers will not be disconnected from the data link.

Another advantage is that the link scan time is stabilized since loopback can be also prevented.



When CC-Link IE Controller Network boards without the external power supply function are installed to station number 3 and 5, and if personal computers of these stations are powered off, station number 3, 4, and 5 will be disconnected from the network.



(5) Occupying one PCI bus slot

Any type of CC-Link IE Controller Network boards including those with external power supply occupies only one slot.

(6) Supporting event function

The event function monitors link devices using the CC-Link IE Controller Network board, and notifies events to the user program when the set conditions are met.

(7) Keeping application portability with MELSECNET/H board

By only changing settings such as the total number of boards (CC-Link IE Controller Network boards) installed to a personal computer and channel numbers, any existing user program created by a MELSECNET/H or MELSECNET/10 board can be utilized.

(8) Drivers are available for each OS.

Since various types of drivers are available, a system suitable to the user environment can be easily constructed.

For details on the compatible operating system, refer to Section 2.5.

(9) User programming functions are available.

With supported Microsoft® Visual Basic® and Microsoft® Visual C++® functions, remote control of programmable controllers and device reading/writing can be performed, and user programs can be created easily.

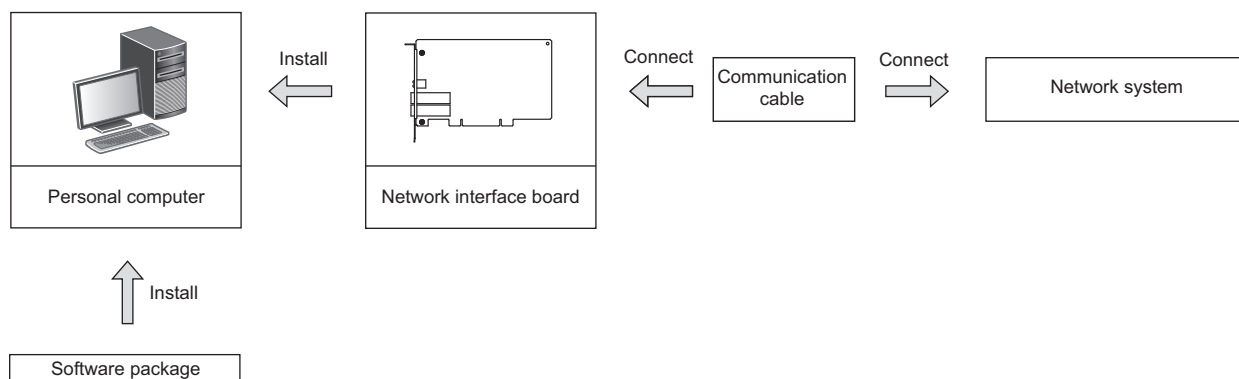
(10) Supporting Multiple CPU system

By specifying a logical station number with the CC IE Control utility, a multiple CPU system is accessible.

CHAPTER 2 SYSTEM CONFIGURATION

2.1 System Configuration Using CC-Link IE Controller Network Board

A system configuration where the CC-Link IE Controller Network board is installed to a personal computer is shown below.



Software package	Network interface board	Communication cable	Network system
SW1DNC-MNETG-B	Q80BD-J71GP21-SX Q80BD-J71GP21S-SX Q81BD-J71GP21-SX Q81BD-J71GP21S-SX	Optical fiber cable	CC-Link IE Controller Network

2.2 Single Network System

A single network system is a system that connects a control station and normal stations with optical fiber cables.

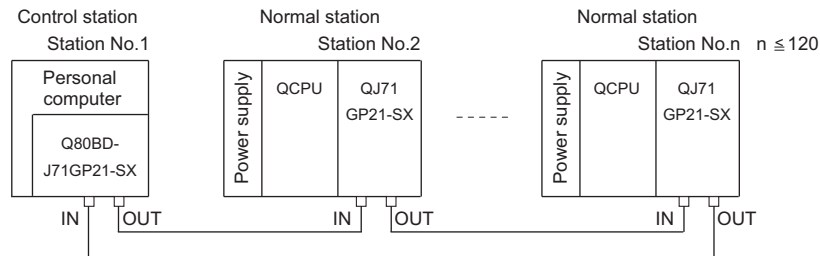
A total of 120 stations, 1 control station and 119 normal stations, can be connected.

A control station can be any station No.s. (One control station can be connected per network.)

In the system chart below, the station No.1 is set as the control station.

2.2.1 Configuration

A configuration example of a single network system is shown below.



2.2.2 Setting items

In a single network system, the following items are to be set when the CC-Link IE Controller Network board is used as a control station or a normal station.
CC-Link IE Controller Network board settings are configured in the CC IE Control utility.

Setting item		Control station	Normal station
Target board specification		○	○
Board		○	○
Channel No.		○	○
Operational setting	Network type	○	○
	Mode	○	○
	Network No.	○	○
	Group No.	△	△
	Station No.	○	○
Network range assignment	LB/LW settings	△	×
	LX/LY settings	△	×
	Specify reserved station	△	×
	Supplementary setting	△	×
Driver setting		△	△
Event setting		△	△
Target setting		△	△
Refresh parameter setting		△	△
Routing parameter		×	×

○ : Setting required △ : Set as necessary × : Setting not required

2.2.3 Available device ranges

The following device ranges can be used on the CC-Link IE Controller Network board.

Device	Available range	Remarks
LB	0 _H to 7FFF _H (32768 points)	The ranges for each CC-Link IE Controller Network board and network module need to be assigned in the parameter setting for the control station.
LW	0 _H to 1FFFF _H (131072 points)	
LX	0 _H to 1FFF _H (8192 points)	The ranges for each CC-Link IE Controller Network board and network module need to be assigned in the parameter setting for the control station.
LY	0 _H to 1FFF _H (8192 points)	

2.3 Multi-Network System

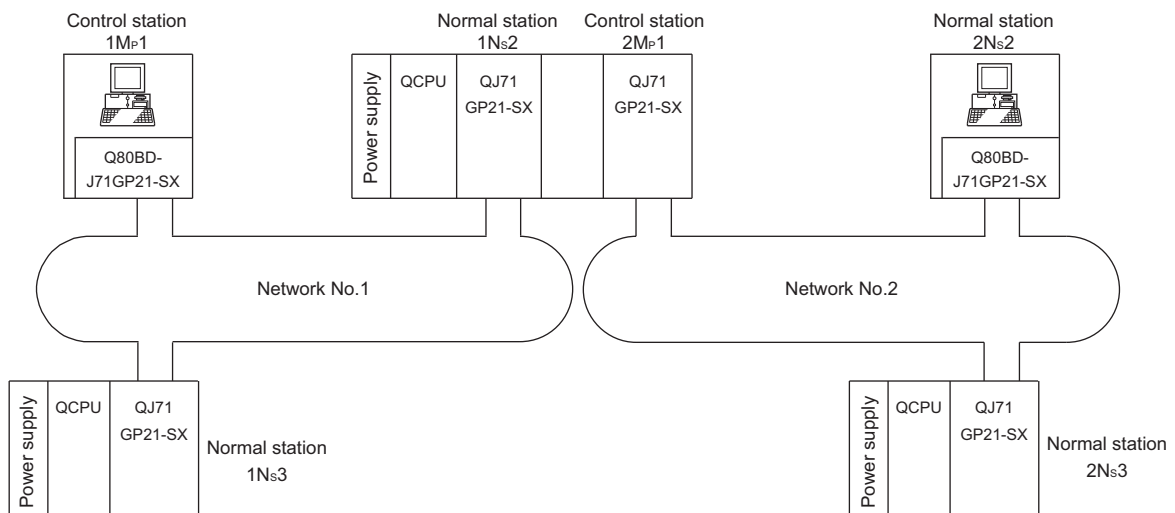
A multi-network system is composed of multiple networks that are connected by relay stations.

POINT

- (1) Any network No. can be set within the range of 1 to 239.
- (2) The CC-Link IE Controller Network board cannot be used as a relay station. Use a network module as a relay station.

2.3.1 Configuration

In the following example, two networks are connected.



2.3.2 Setting items

In a multi-network system, the following items are to be set when the CC-Link IE Controller Network board is used as a control station or a normal station.

CC-Link IE Controller Network board settings are configured in the CC IE Control utility.

Setting item		Control station	Normal station
Target board specification		○	○
Board		○	○
Channel No.		○	○
Operational setting	Network type	○	○
	Mode	○	○
	Network No.	○	○
	Group No.	△	△
	Station No.	○	○
Network range assignment	LB/LW settings	△	×
	LX/LY settings	△	×
	Specify reserved station	△	×
	Supplementary setting	△	×
Driver setting		△	△
Event setting		△	△
Target setting		△	△
Refresh parameter setting		△	△
Routing parameter		△	△

○ : Setting required △ : Set as necessary × : Setting not required

2.3.3 Available device range

The same device ranges as those of a single network system can be used.

☞ Section 2.2.3 Available device ranges.

2.4 Use in Multiple CPU System or Redundant CPU System

To access a multiple CPU system or redundant CPU system, the "Target setting" screen setting must be completed.

POINT

When a CC-Link IE Controller Network board with a serial number whose first five digits are 10091 or lower, or an SW1DNC-MNETG-B with the software Version 1.04E or earlier is used, the redundant CPU system cannot be accessed directly with the CC-Link IE Controller Network interface board.

Relay the MELSECNET/H network system to access the redundant CPU system.

2.5 Operating Environment

The following table shows the operating environment for the CC-Link IE Controller Network board and SW1DNC-MNETG-B.

Item	Description
Personal computer	Microsoft® Windows® supported personal computer
CPU	System requirements of the operating system must be met.
Required memory	
PCI bus specifications	For Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX • Compliant with PCI standard Rev.2.2 (3.3VDC/5VDC, 32-bit bus, Reference clock 33MHz)
PCI Express® bus specifications	For Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX • Compliant with PCI Express® standard Rev.1.1 (3.3VDC, Link width 1lane, Reference clock 100MHz)
Available hard disk capacity	1GB or more
OS (English version)	Windows Server® 2022 (Standard) Windows 11 (Home, Pro, Enterprise, Education, IoT Enterprise LTSC 2024) Windows Server 2019 (Standard) Windows Server 2016 (Standard) *1 Windows 10 (IoT Enterprise LTSC 2021, IoT Enterprise LTSC 2019*2, IoT Enterprise LTSC 2016*2) Windows 10 (Home, Pro, Enterprise, Education)*3
Programming language (English version)	Visual Basic® and Visual C++® in the following Visual Studio®: Visual Studio 2022, Visual Studio 2019, Visual Studio 2017, Visual Studio 2015*3

*1: Apply Windows Updates (KB4132216, KB4091664, KB4465659, and KB4534307). However, if KB4480977 is already applied, there is no need to apply KB4534307. If the above Windows Updates have been discontinued, please consult Microsoft Corporation.

*2: 64-bit version only

*3: Due to the end of support from Microsoft, function updates for the boards in this operating environment have been discontinued.

There are restrictions on the supported versions for the following operating systems and programming languages.

Item	Description
OS (English version)	When using any of the following operating systems, use SW1DNC-MNETG-B with the version 1.31H or earlier.
	Windows 8.1, Windows 8.1 (Pro, Enterprise)
	Windows Server 2012 R2 (Standard)
	Windows 8, Windows 8 (Pro, Enterprise)
	Windows Server 2012 (Standard)
	Windows 7 (Home Premium, Professional, Ultimate, Enterprise) *1
OS (English version)	Windows Server 2008 R2 (Standard, Enterprise) *1
	When using any of the following operating systems, use SW1DNC-MNETG-B with the version 1.18U or earlier.
	Windows Server 2008 (Standard(x86, x64), Enterprise(x86, x64))
	Windows Vista® (Home Basic, Home Premium, Business, Ultimate, Enterprise) *2
	Windows Server 2003 R2 (Standard(x86, x64), Enterprise(x86, x64)) SP2 or later
	Windows XP® (Professional) SP2 or later *2
OS (English version)	When using any of the following operating systems, use SW1DNC-MNETG-B with the version 1.15R or earlier.
	Windows 2000 (Professional)SP4 or later *3
Programming language (English version)	When using any of the following programming languages, use SW1DNC-MNETG-B with the version 1.31H or earlier.
	Visual Basic® and Visual C++® in the following development tools:
	Visual Studio 2013, Visual Studio 2012, Visual Studio 2010,
	Visual Studio 2008, Visual Studio 2005, Visual Studio.NET 2003,
	Visual Basic 6.0, Visual C++ 6.0

*1: Apply Service Pack1 and Security Update for Windows(KB3033929). Otherwise, use SW1DNC-MNETG-B with the version 1.18U or earlier.

*2: 32-bit version only

*3: Applicable to Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX only.

POINT

For the information on how to obtain SW1DNC-MNETG-B version 1,31H or earlier, refer to the following section.

➡ Appendix 7 Restrictions for Operating System

1

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8

CC IE Control
UTILITY

(1) Instructions for personal computer

(a) PCI standard

When a personal computer which is not compliant with the PCI or PCI Express® standard is used, troubles caused by failures such as a contact failure or operation error may occur.

For details of the number of boards that can be installed, installation slots, and occupied slots, refer to the performance specifications in  Section 3.2.

(b) Added operating environment

Operating environment	Supported version of SW1DNC-MNETG-B
Multiprocessor	Version 1.05F or later

(2) Instructions for operating system

(a) Supported version of SW1DNC-MNETG-B

Operating system	Supported version of SW1DNC-MNETG-B	
	Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX	Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX
Windows 11 (IoT Enterprise LTSC 2024)	(Not supported)	1.33K or later
Windows Server 2022, Windows 11 (Home, Pro, Enterprise, Education), Windows 10 (IoT Enterprise LTSC 2021)	1.32J or later	1.32J or later
Windows Server 2019, Windows Server 2016, Windows 10 (IoT Enterprise LTSC 2019, IoT Enterprise LTSC 2016)	1.28E or later	1.28E or later
Windows 10 (Home, Pro, Enterprise, Education)	1.22Y or later	1.22Y or later
Windows 8.1, Windows Server 2012 R2	1.17T to 1.31H	1.17T to 1.31H
Windows 8, Windows Server 2012	1.16S to 1.31H	1.16S to 1.31H
Windows 7 (64-bit version), Windows Server 2008 R2	1.12N to 1.31H	1.12N to 1.31H
Windows 7 (32-bit version)	1.11M to 1.31H	
Windows Server 2008 (64-bit version)	1.12N to 1.18U	1.12N to 1.18U
Windows Server 2008 (32-bit version)	1.11M to 1.18U	
Windows Vista	1.02C to 1.18U	
Windows Server 2003 R2 (64-bit version)	1.12N to 1.18U	
Windows Server 2003 R2 (32-bit version)	1.18U or earlier	
Windows XP	1.15R or earlier	(Not supported)
Windows 2000		

(b) User authority

Log on as a user having administrator authority.

- Installation and uninstallation are available only by the administrator's authority.
- The Usage of utilities is available only by the administrator's authority.

(c) .NET Framework 3.5

Installation of the .NET Framework 3.5 is required.

Enable the .NET Framework 3.5 (including .NET 2.0 or 3.0) in "Turn Windows features on or off" on the control panel.

(d) Upgrading and updating an operating system

The following upgrade and update of an operating system are not supported:

- Upgrade
- Major update (version upgrade)

Install SW1DNC-MNETG-B by following the procedure:

1. Uninstall SW1DNC-MNETG-B.
2. Upgrade or update the operating system.
3. Install SW1DNC-MNETG-B with the software version supporting the changed operating system.

(e) The functions cannot be used

If an attempt is made to use any of the following functions, this product may not operate normally.

- Activating the application with Windows compatible mode.
- Simplified user switch-over
- Remote desktop
- Power save mode (Hibernate, Sleep)
- Fast startup
- The language switching function set by Regional and Language Options
- Touch function
- Virtual environment such as Client Hyper-V
- Server Core Installation
- Tablet mode
- Virtual desktop
- Unified Write Filter
- Text cursor indicator

In the following cases, the screen of this product may not work properly.

- The size of the text and other items in the screen is other than 100% (96 DPI, 9 pt etc.).
- The resolution of the screen is changed in operation.
- The Windows theme is changed in operation.
- The multi-display is set.

Surrogate pair characters are not available.

Remarks

- When exiting the operating system, always shut down the computer.
- For the behavior when entering the power save mode, refer to the following section.
 Appendix 9 Behavior When Personal Computer Enters Power Save Mode or Fast Startup

(3) Instructions for user program

(a) Supported version of SW1DNC-MNETG-B

User program	Supported version of SW1DNC-MNETG-B
32-bit version user program ^{*1}	All versions
64-bit version user program ^{*2}	Version 1.12N or later

^{*1}: Programs can be created and executed on the 64-bit version operating system.

^{*2}: Programs can be created on the 32-bit version operating system, however, the programs cannot be executed.

(b) Language environment

User programs created in the Japanese environment work only in the Japanese environment.

User programs created in the English environment work only in the English environment.

(c) MELSEC data link library

For precautions when using MELSEC data link library, refer to the following manual.

 MELSEC Data Link Library Reference Manual.

CHAPTER 3 SPECIFICATIONS

This chapter explains general and performance specifications of CC-Link IE Controller Network board.

3.1 General Specifications

The following table shows the general specifications of CC-Link IE Controller Network board.

Item	Specification					
Operating ambient temperature	0 to 55 °C					
Storage ambient temperature	-25 to 75 °C					
Operating ambient humidity	5 to 95 % RH, non-condensing					
Storage ambient humidity						
Vibration resistance	—	Frequency	Constant acceleration	Half amplitude	Sweep count	IEC 61131-2: 2007 and JIS B 3502: 2011
	Under intermittent vibration	5 to 8.4 Hz	—	3.5 mm	10 times each in X, Y, and Z directions	
		8.4 to 150 Hz	9.8 m/s ²	—		
	Under continuous vibration	5 to 8.4 Hz	—	1.75 mm	—	
		8.4 to 150 Hz	4.9 m/s ²	—		
	Shock resistance	147 m/s ² , 3 shocks in each direction per axis, on 3 mutually perpendicular axes (total of 18 shocks)				
Operating atmosphere	No corrosive gases					
Operating altitude ^{*1}	0 to 2000 m					
Installation location	Inside a control panel					
Overvoltage category ^{*2}	II or less					
Pollution degree ^{*3}	2 or less					

*1: Do not use or store the board under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction.

*2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

*3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution degree 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

Remarks

The general specifications both CC-Link IE Controller Network board and a personal computer must be satisfied after installation.

3.2 Performance Specifications

Performance specifications of the CC-Link IE Controller Network board are shown below.

Item		Specification
Max. link points per network	LB	32K points (32768 points, 4K bytes)
	LW	128K points (131072 points, 256K bytes)
	LX	8K points (8192 points, 1K byte)
	LY	8K points (8192 points, 1K byte)
Max. link points per station	LB	Normal :16K points (16384 points, 2K bytes) Extended mode:32K points (32768 points, 4K bytes)
	LW	Normal : 16K points (16384 points, 32K bytes) Extended mode:128K points (131072 points, 256K bytes)
	LX	8K points (8192 points, 1K byte)
	LY	8K points (8192 points, 1K byte)
Transient transmission capacity		Up to 1920 bytes
Communications speed		1G bps
Number of stations per network		120 stations (Control station: 1; Normal station: 119)
Connection cable		Optical fiber cable (Multi-mode fiber)
Overall cable distance		66000 m (When 120 stations are connected)
Station-to-station distance (max.)		550 m (Core/clad = 50/125 (μm))
Max. number of networks		239
Max. number of groups		32
Transmission path		Duplex loop
Optical fiber specifications		1000BASE-SX(MMF) optical fiber cable
	Standard	IEC60793-2-10 Types A1a.1(50/125 μm multimode)
	Transmission loss (max.)	3.5 (dB/km) or less (λ = 850nm)
	Transmission band (min.)	500 (MHz • km) or more (λ = 850nm)
Connector specifications		Duplex LC connector
	Standard	IEC61754-20: Type LC connector
	Connection loss	0.3 (dB) or less
	Polished surface	PC (Physical Contact) polishing
Laser class (IEC 60825-1: 2014, JIS C 6802: 2014)		Class 1 laser product

Item		Specification			
		Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX	Q81BD-J71GP21-SX	Q81BD-J71GP21S-SX
Number of boards that can be installed		Up to 4*1			
Occupied slots		1 slot			
Installation slot		PCI bus slot or PCI-X slot (Half size)		PCI Express® x1, x2, x4, x8, x16 slot (Half size)	
External power supply*2	Voltage	No external power supply function	DC20.4 to DC31.2V	No external power supply function	DC20.4 to DC31.2V
	Current		0.27A		0.27A
	Connector		Connector set (accessory)		Connector set (accessory)
	Applicable cable size		0.50 to 1.25mm ² [AWG20-16]		0.50 to 1.25mm ² [AWG20-16]
	Allowable momentary power failure time		1ms (level PS1)		1ms (level PS1)
	Noise durability		Noise voltage 500Vp-p Noise width 1μs (by the noise simulator with noise frequency 25 to 60Hz)		Noise voltage 500Vp-p Noise width 1μs (by the noise simulator with noise frequency 25 to 60Hz)
Internal current consumption		1.10A (5VDC)		2.07A (3.3VDC)	
Weight		0.12kg	0.14kg	0.13kg	0.14kg

*1: This indicates the number of CC-Link IE Controller Network boards that can be installed to a personal computer, not including any other boards such as MELSECNET/H boards.
Note that it cannot exceed the number of physical PCI slots of the personal computer.

*2: Use the power complies with CLASS2.

3.3 Optical Fiber Cable Specifications

For optical fiber cables, refer to the following manual.

📖 MELSEC-Q CC-Link IE Controller Network Reference Manual

3.4 Buffer Memory

For buffer memory, refer to the following manual.

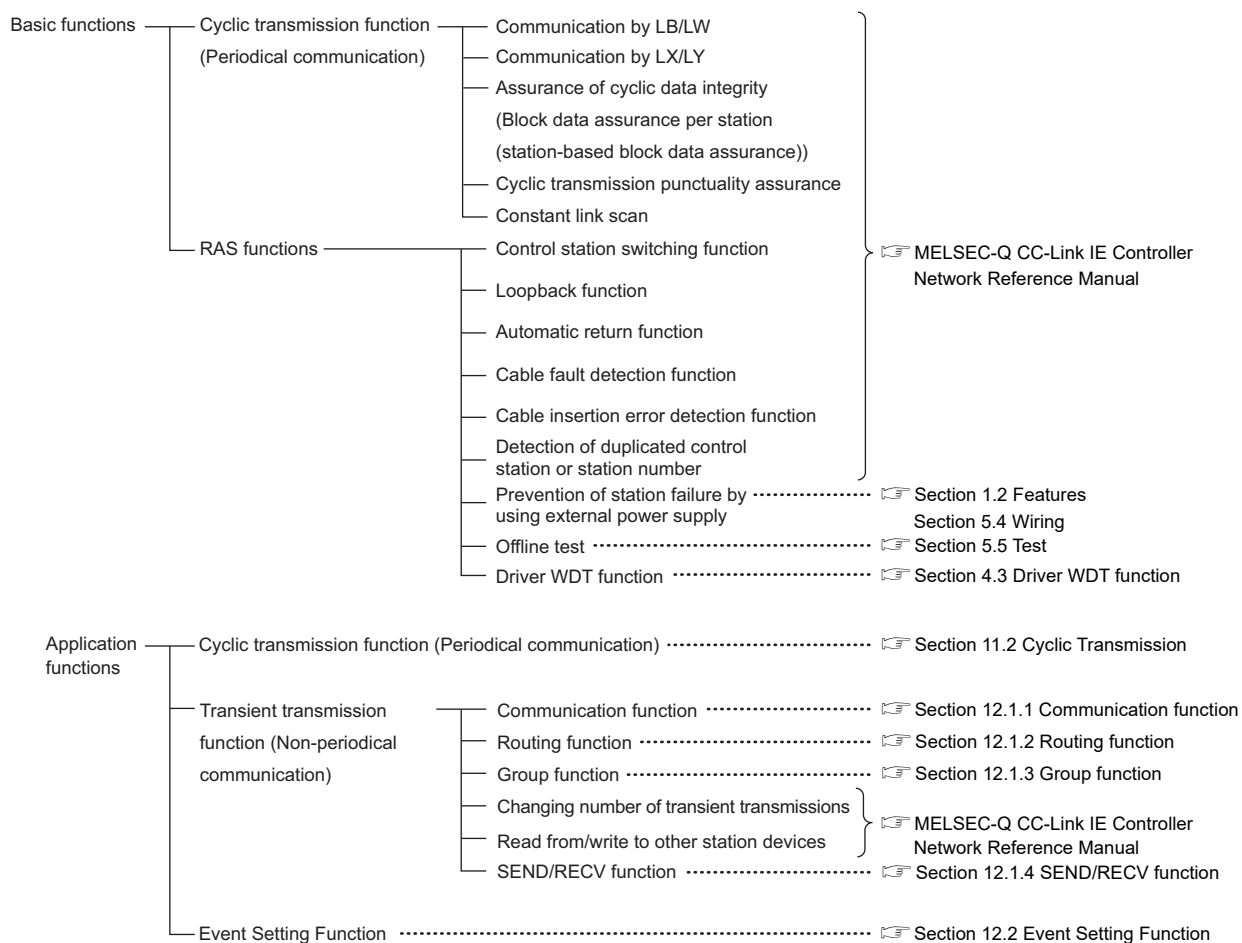
📖 MELSEC-Q CC-Link IE Controller Network Reference Manual

CHAPTER 4 FUNCTIONS

This chapter explains functions of the CC-Link IE Controller Network board.

4.1 Function List

The following lists the functions of the CC-Link IE Controller Network board.



4.2 Specifications on Cyclic Transmission Processing

This section explains the cyclic transmission processing using the CC-Link IE Controller Network board in the CC-Link IE Controller Network.

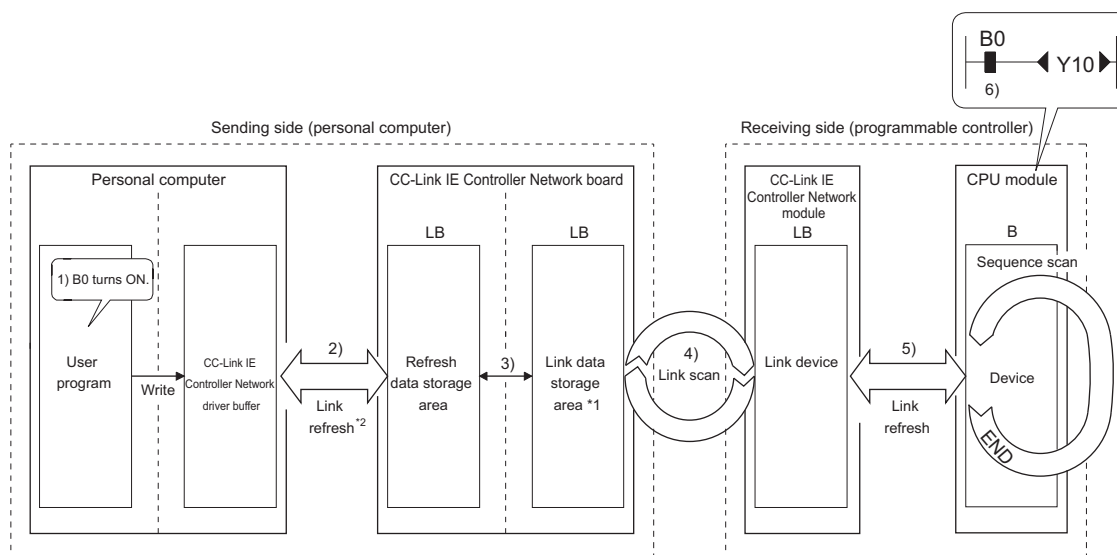
4.2.1 Cyclic transmission processing

(1) Cyclic transmission processing

Cyclic transmission is performed using the LB/LW/LX/LY devices of the CC-Link IE Controller Network board and the CC-Link IE Controller Network module.

The steps shown below are for the case of the link relay (B) on the personal computer side.

- 1) B0 on the sending side (personal computer) turns on.
- 2) By a link refresh, the B0 information is stored in the refresh data storage area (LB) of the CC-Link IE Controller Network board.
- 3) The B0 information in the refresh data storage area (LB) is stored in the link data storage area (LB).
- 4) By a link scan, the B0 information in the link data storage area (LB) is stored in a link device (LB) of the CC-Link IE Controller Network module on the receiving side.
- 5) By a link refresh, the B0 information is stored in a device (B) of the CPU module.
- 6) B0 of the receiving side CPU module turns on.



*1: If the CC-Link IE Controller Network board is a control station, configure settings on the "Network range assignment" screen of the CC IE Control utility.

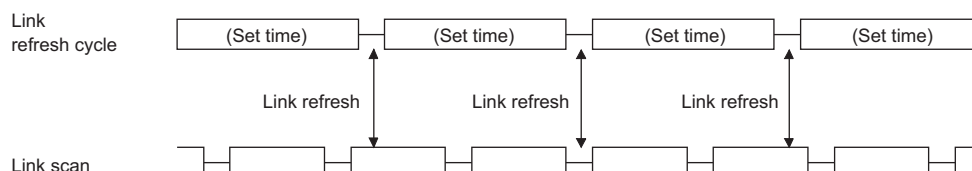
*2: Configure settings of refresh ranges on the "Refresh parameter setting" screen of the CC IE Control utility.

(2) Link scan and link refresh

Link scan is executed 'asynchronously' with the link refresh which is executed by the CC-Link IE Controller Network board driver.

Link refresh is executed at the interval of time set for "Link refresh cycle" on the "Driver setting" screen of the CC IE Control utility.

Link refresh time can be checked on the "Board detail information" screen.



POINT

- (1) The link refresh may not be executed in the set cycle because of such factors described below.
 - Performance of the personal computer CPU
 - Number of set refresh points
 - Number of installed CC-Link IE Controller Network boards
 - Other running applications
 - Other running boards
- (2) If the link refresh time exceeds the link refresh cycle set on the "Device setting" screen, perform any of the following measures.
 - Extend the link refresh cycle.
 - Decrease the refresh points.

☞ (5)(b) in this section How to decrease the refresh points
- (3) The link refresh time may be shortened by upgrading the version of CC IE Control utility or changing assignments of refresh parameters. If the shortened link refresh time effects the operation of the applications, perform the following measure.
 - Extend the link refresh cycle.

(3) When communication error or communication stop occurs on station

When a communication error station or a communication stop station is detected during data link, other stations hold the data received from the station immediately before the error occurrence.

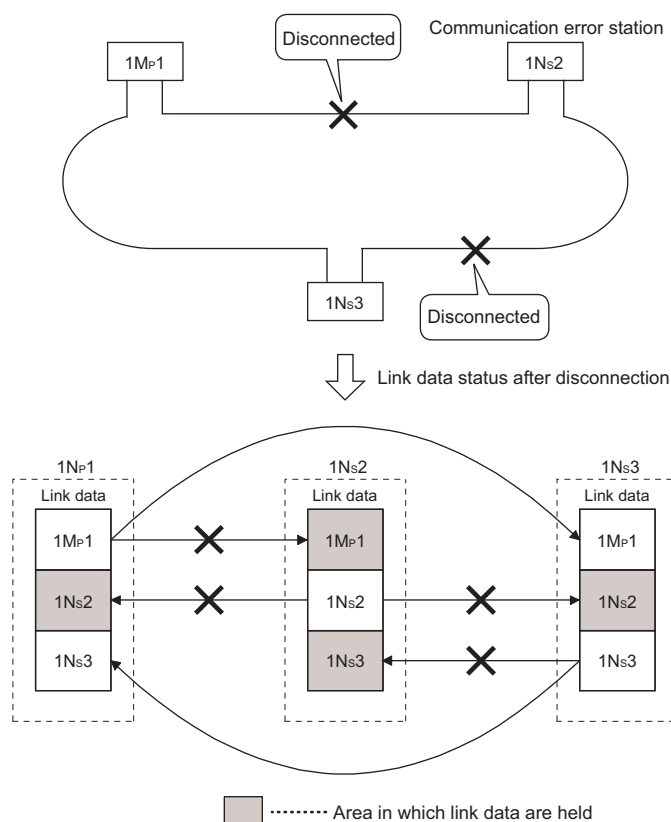
("Communication stop station" is a station to which a peripheral device has stopped cyclic transmission.)

(a) Normally communicating stations hold the data received from a communication error station or a communication stop station.

(b) A communication stop station holds the data received from other stations.

(Example)

When a communication error occurred in 1Ns2 due to cable disconnection



(4) SB/SW status when a communication error station/communication stop station occurs

The status of whether there are any communication error/stop stations on the network can be checked with the link special relay/register (SB/SW).

Use the link special relay and link special register shown in the following.

☞ Section 11.1.1 Interlock related signals

For interlock program examples, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

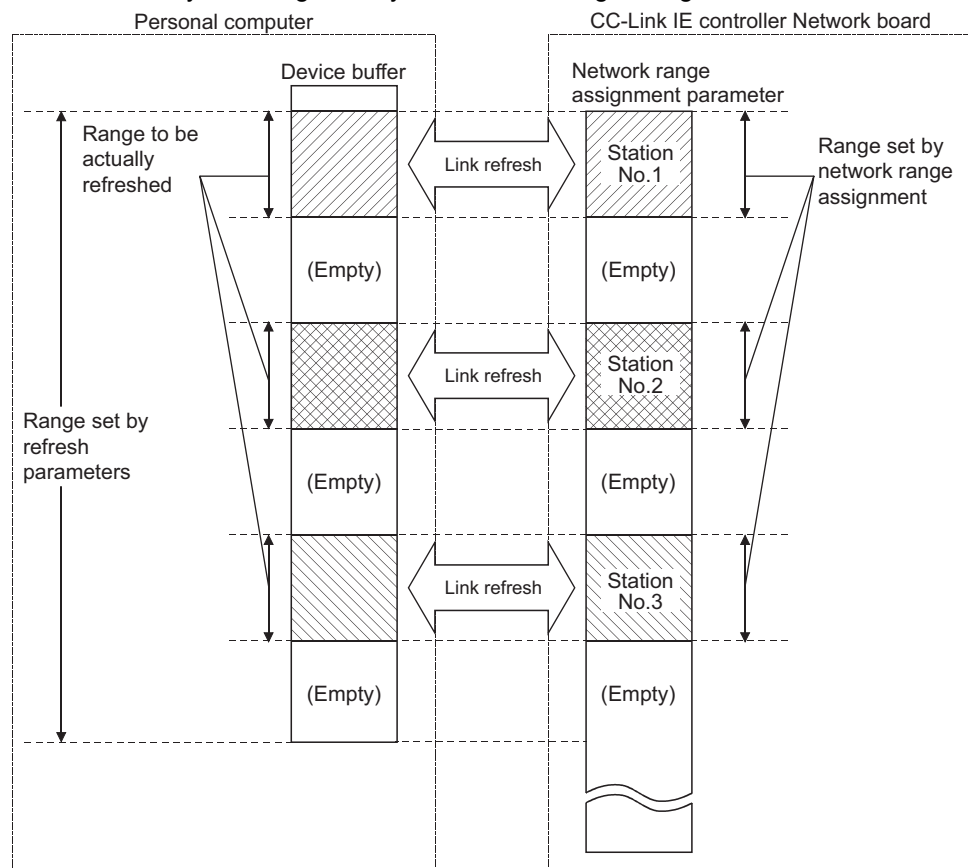
(5) Link refresh

The link refresh is executed between the refresh data storage area and the driver buffer.

In order to execute the link refresh, set the link refresh cycle and the refresh parameters in the CC IE Control utility.

(a) Concept of refresh range (points)

Within the range set on the "Refresh parameter setting" screen of the CC IE Control utility, the range set by the network range assignment is refreshed.



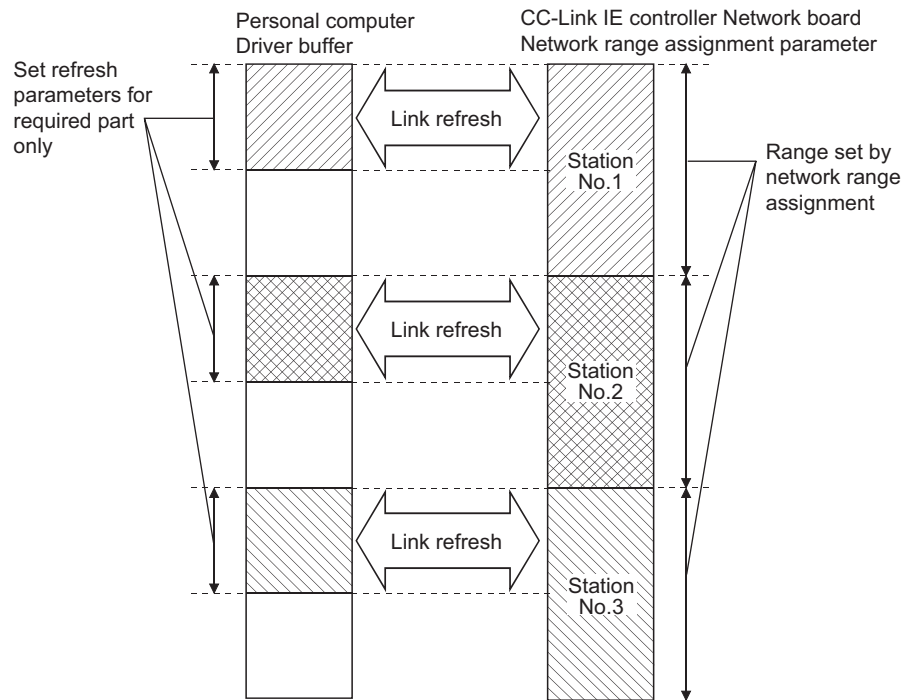
POINT

The range from the first to the last addresses is set as the initial setting of the refresh parameter. (Clicking the Default button on the "Refresh parameter setting" screen of the CC IE Control utility resets the setting to the initial setting.)

(b) How to decrease the refresh points

Up to 256 refresh ranges can be set for the CC-Link IE Controller Network board.

The refresh points can be decreased by setting only the ranges that need to be refreshed in the refresh parameter.



4.3 Driver WDT function

Driver WDT function monitors the operation of the software (operating system, driver) inside the hardware by the timer function on CC-Link IE Controller Network board. When the driver cannot reset the timer of the board within the specified driver WDT monitoring time, CC-Link IE Controller Network board detects driver WDT error. Driver WDT function detects driver operation delay due to the access error from the driver to CC-Link IE Controller Network board or system high load.

(1) Driver WDT settings

The driver WDT can be set on the "Driver setting" screen.

Remarks

The driver WDT function is set to invalid as a default.

(2) When the driver WDT error has occurred

The following shows the operation when driver WDT error has occurred.

- (a) CC-Link IE Controller Network board and the driver stop communication and are disconnected from the network in order to avoid an erroneous output.
- (b) RUN LED flicks and RD LED turns ON on the CC-Link IE Controller Network board.
- (c) "-28158 (9202H) Driver WDT error" occurs when accessing CC-Link IE Controller Network board from the application program in which the CC IE Control utility and MELSEC data link library function are used.

POINT

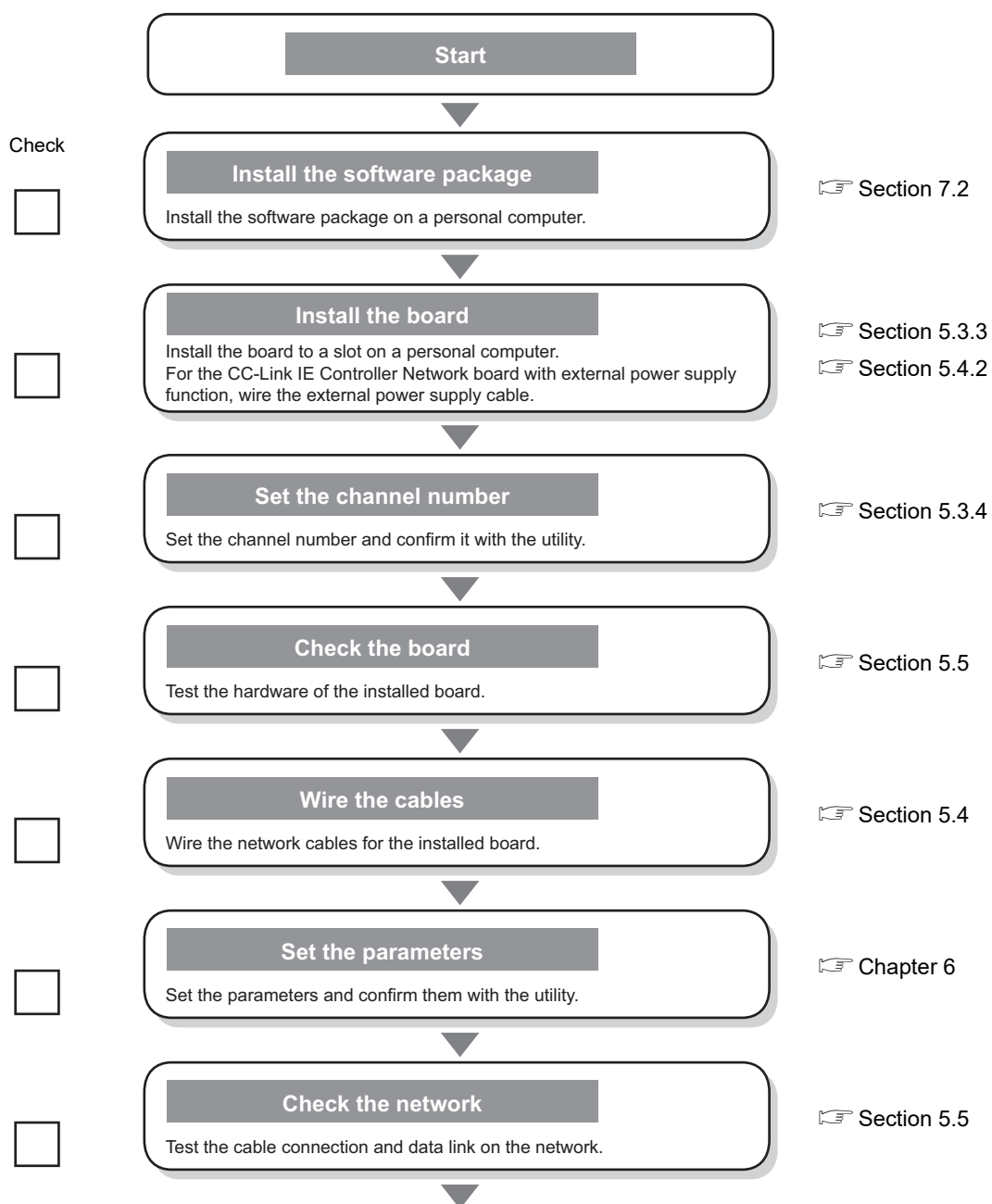
- When the multiple applications in which MELSEC data link library is used are executed, driver WDT error is returned to all the programs. However, only the CC-Link IE Controller Network board in which the driver WDT error has occurred is recognized as an error station on the network. When using driver WDT function, set the monitoring timer considering the margin of the personal computer load.
- For the troubleshooting, refer to the following chapter.
 Chapter 14 TROUBLESHOOTING

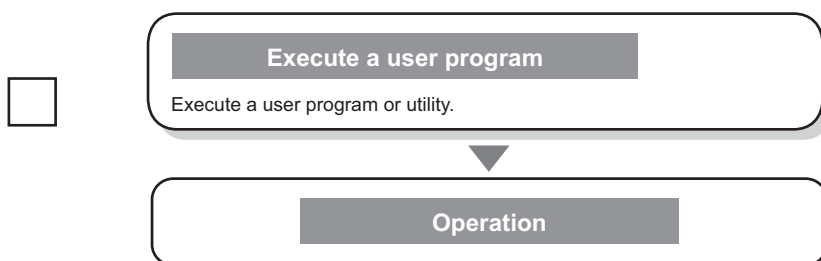
CHAPTER 5 PROCEDURES AND SETTINGS BEFORE OPERATION

This chapter explains the procedures and settings before operating the CC-Link IE Controller Network board.

5.1 Procedure before Operation

The following flowchart explains the procedure before operating the CC-Link IE Controller Network board.

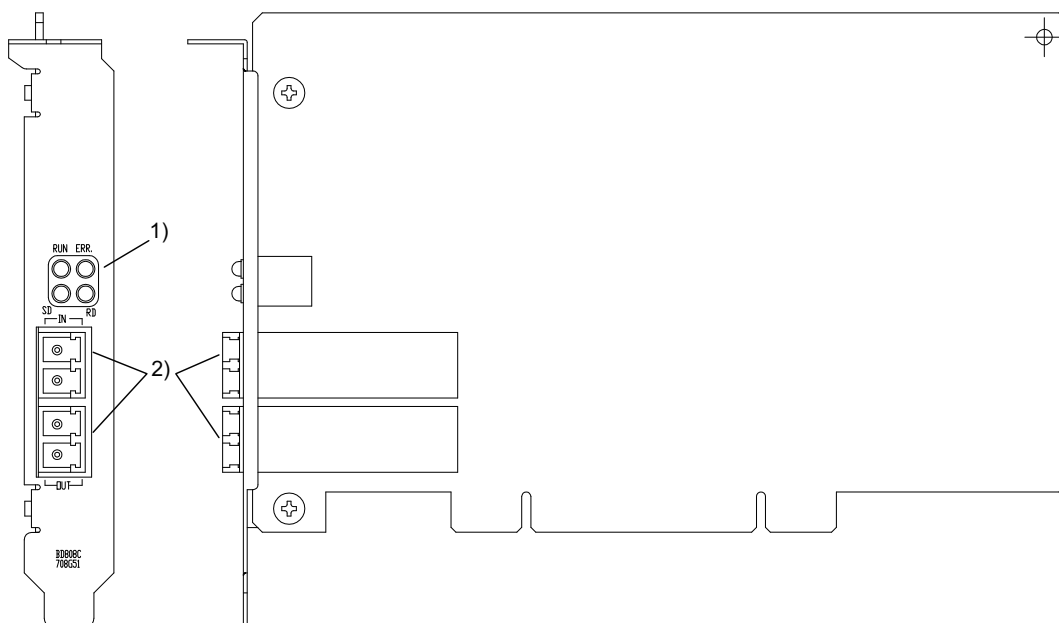




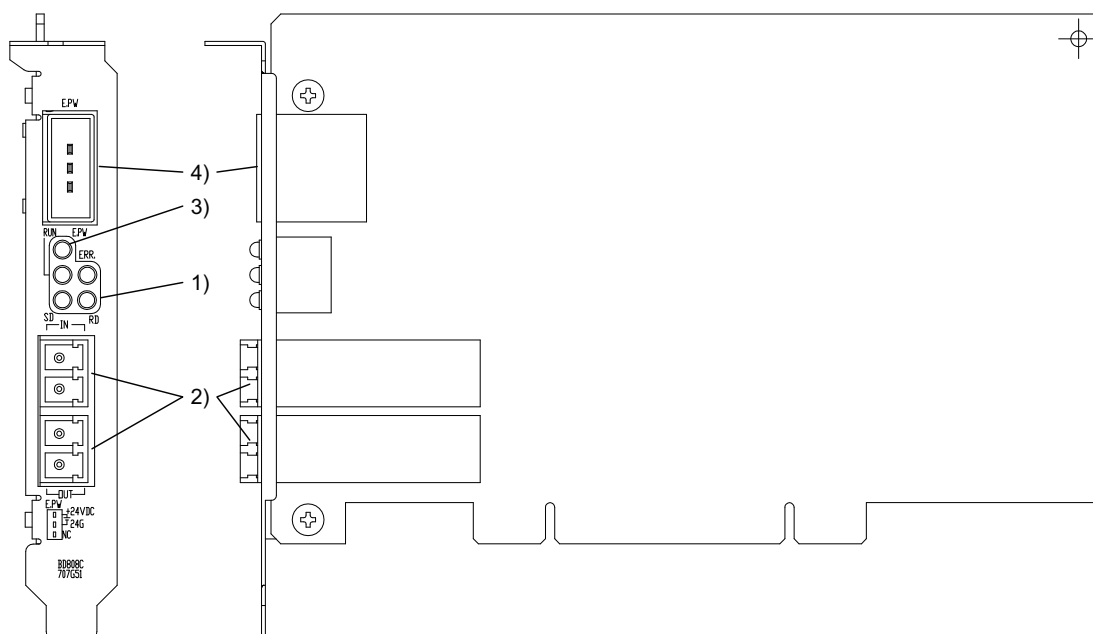
5.2 Part Names and Settings

This section explains each part name and setting of the CC-Link IE Controller Network board.

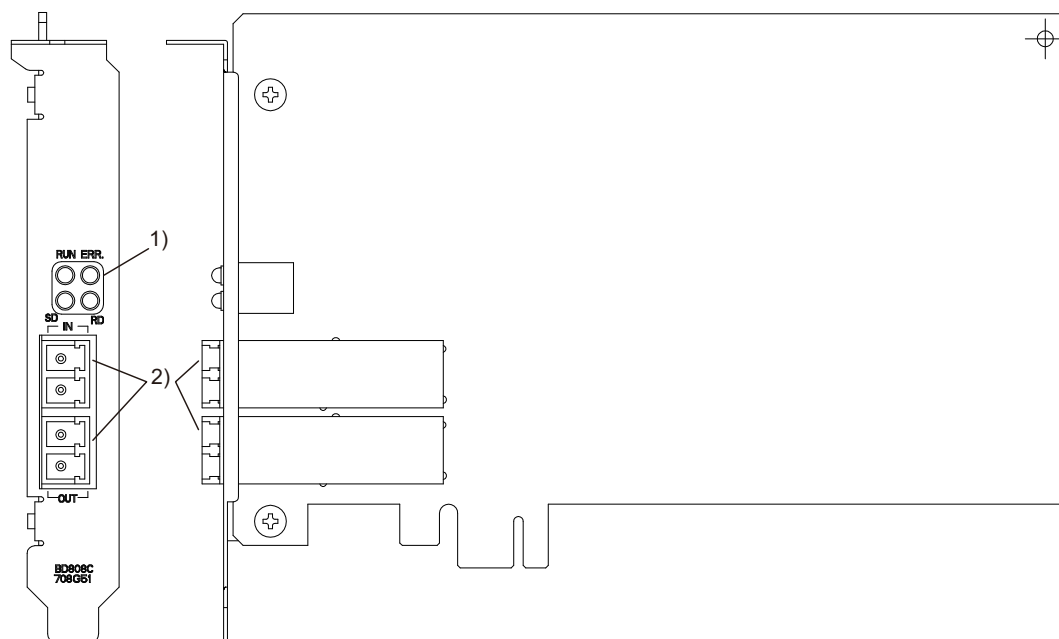
<Q80BD-J71GP21-SX>



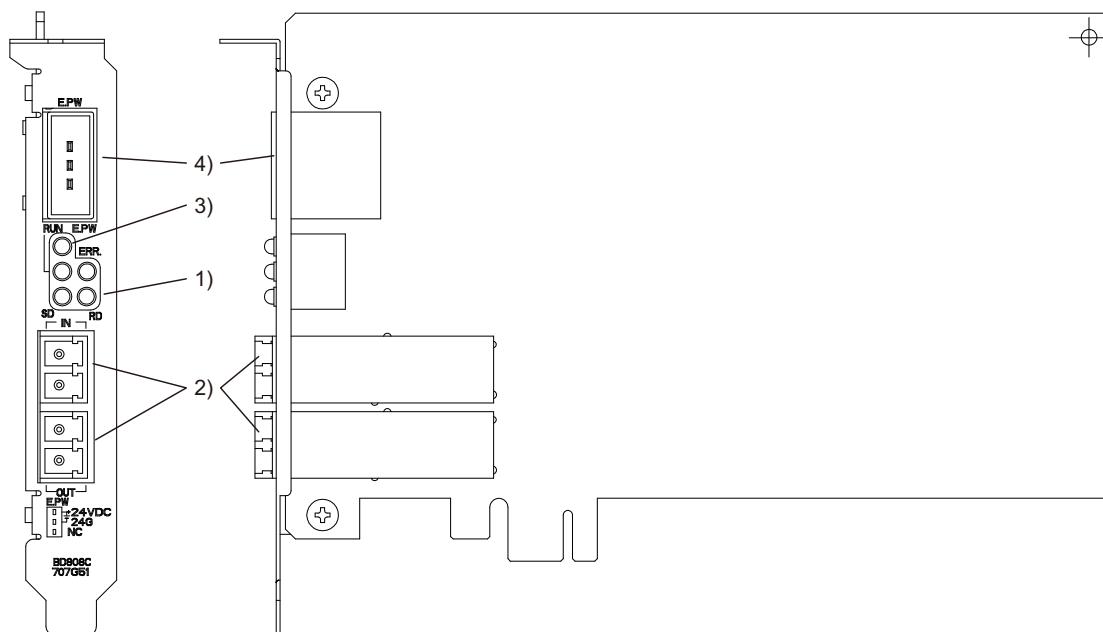
<Q80BD-J71GP21S-SX>

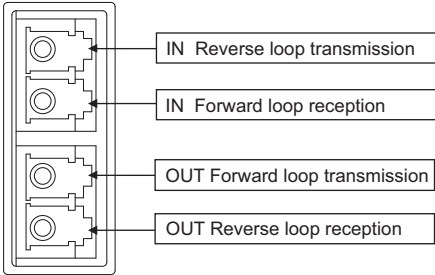
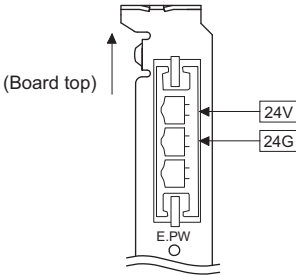


<Q81BD-J71GP21-SX>



<Q81BD-J71GP21S-SX>



No.	Name	Description
1)	Indicator LED	Indicates the operating status of the CC-Link IE Controller Network board. ☞ (1) in this section
2)	Optical fiber cable connector	Connector for connecting optical fiber cable The cable terminal is as shown below.  For wiring of an optical fiber cable, refer to the following section. ☞ Section 5.4 Wiring
3)	External power supply LED	Indicates the status of external power supply. ☞ (2) in this section
4)	External power supply cable connector	Connector for connecting external power supply cable The cable terminal is as shown below. 

(1) Indicator LED

Display the operating status of the CC-Link IE Controller Network board.

RUN ERR.
 
 
SD RD

(a) When the RUN LED is ON or OFF

The same LED display as a network module.

Name	Status	Description
RUN	ON	Operating normally
	OFF	One of the following error has occurred. • Board WDT error (Hardware error) • Board resetting (The driver is not started.)
ERR.	ON	Communication error Confirm the error displayed on "Select station network device status display" on the "CC-Link IE Controller Network diagnostics result" screen of CC IE Control utility.
	OFF	Operating normally
SD	ON	Sending data
	OFF	Data not sent
RD	ON	Receiving data
	OFF	Data not received

(b) When the RUN LED is flashing

An error which is peculiar to boards has occurred.

Refer to the troubleshooting and take appropriate measures.

Name	Status	Description
RUN	ON	One of the following error has occurred. (Check ERR.LED and RD LED.)
ERR.	ON	PCI bus error has occurred.
RD	ON	Driver WDT error has occurred.

(c) When checking channel number

The status is displayed as shown below according to the current channel number while opening the "Channel No. Setting" screen.

<151>	<152>	<153>	<154>
RUN ERR.     SD RD	RUN ERR.     SD RD	RUN ERR.     SD RD	RUN ERR.     SD RD

(2) External power supply

Display the status of external power supply.

E.PW



Name	Status	Description
E.PW	OFF	External power supply is not supplied.
	ON	External power supply is being supplied.

5.3 Installation

This section explains precautions for handling and installation environment of the CC-Link IE Controller Network board.

5.3.1 Handling precautions

The following explains precautions for handling the CC-Link IE Controller Network board.



WARNING

- Do not touch any connectors while power is on. Doing so may cause electric shock or malfunction.



CAUTION

- Do not directly touch any conductive parts and electronic components of the board. Doing so may cause malfunction or failure of the board.
- Do not disassemble or modify the board. Doing so may cause failure, malfunction, injury, or a fire.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the board to fail or malfunction.
- Handle the board in a place where static electricity will not be generated. Failure to do so may cause a failure or malfunction.
- The board is included in an antistatic envelope. When storing or transporting it, be sure to put it in the antistatic envelope. Failure to do so may cause a failure or malfunction.
- Do not drop or apply a strong impact to the board. Doing so may cause a failure or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter may cause a fire, failure, or malfunction.
- When disposing of this product, treat it as industrial waste.

The following is a security precaution.



WARNING

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

5.3.2 Installation environment

For installation of the personal computer in which the CC-Link IE Controller Network board is installed, refer to the manual for the personal computer.

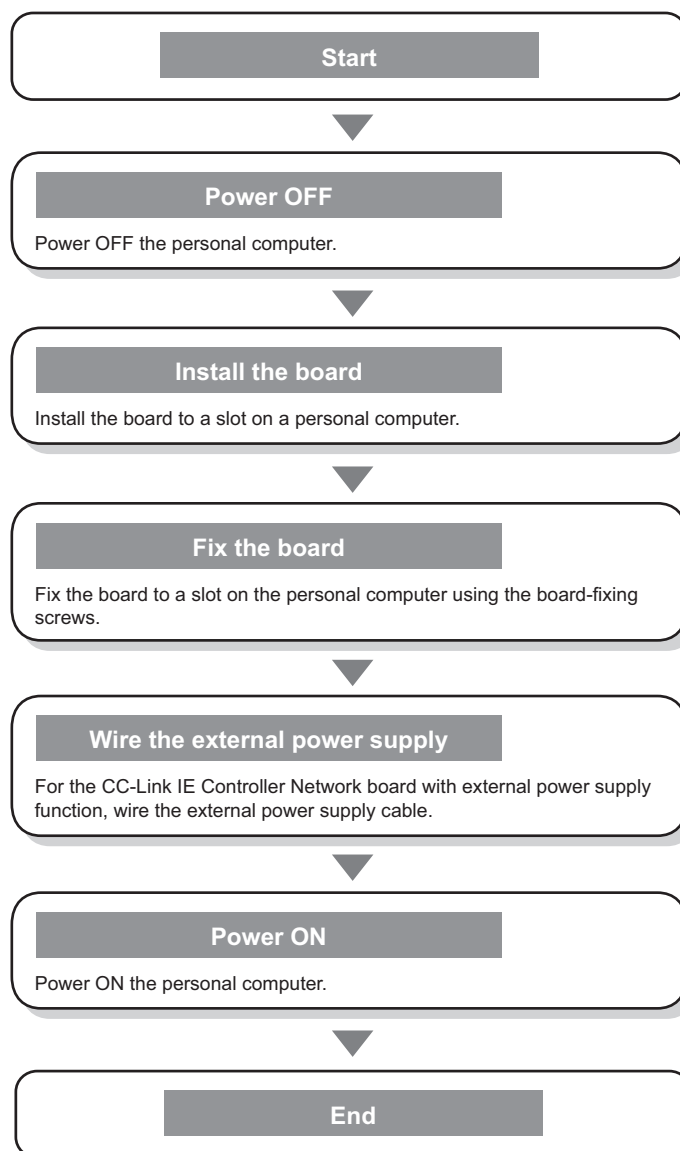


CAUTION

- Use the board in an environment that meets the general specifications in this manual.
Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Always ground the personal computer to the protective ground conductor.
Failure to do so may cause a malfunction.

5.3.3 Board installation

The following flowchart shows the board installation procedure.



➞ Section 5.4.2

**WARNING**

- Shut off the external power supply for the system in all phases before installing the board to or removing it from the personal computer. Failure to do so may result in electric shock or cause the board to fail or malfunction.

**CAUTION**

- Fix the board by tighten the board-fixing screws. Tighten the board-fixing screws within the specified torque range. Undertightening may cause drop of the component, short circuit, or malfunction. Overtightening may damage the screw and/or board, resulting in drop, short circuit, or malfunction. For the tightening torque of the board-fixing screws, refer to the manual supplied with the personal computer.
- Before handling the board, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the board to fail or malfunction.
- Install the board to a personal computer which is compliant with PCI standard or PCI Express® standard (➡ Section 2.5 Operating Environment). Failure to do so may cause a failure or malfunction.
- Securely insert the board into the PCI slot following the board installation instruction of the personal computer. Incorrect insertion of the board may lead to a malfunction, failure or drop of the board.
- When installing the board, take care not to get injured by an implemented component or a surrounding member.

5.3.4 Setting Channel Numbers

Channel number is set per board, and used to identify the board. The channel number can be set within the range of 151 to 154.

Channel numbers being set are used to specify the target boards in setting parameters and performing the MELSEC data link library function.

(1) Setting method

Channel No. is assigned to the CC-Link IE Controller network board installed in a personal computer in order of PCI slot number automatically. The desired channel No. can be assigned on the "Parameter setting" screen of CC IE Control utility.

(➡ Section 6.1)

5.4 Wiring

This section explains precautions for connecting cables to the CC-Link IE Controller Network board.

(1) Precautions for general wiring



WARNING

- Shut off the external power supply for the system in all phases before installing the board or starting wiring.
Failure to do so may result in electric shock, damage to the product, or malfunction.
- After installation of the board and wiring, attach the cover on the module before turning it on for operation.
Failure to do so may result in electric shock.



CAUTION

- When disconnecting the cable from the board, do not pull the cable by the cable part.
Pulling the cable connected to the board may result in malfunction or damage to the board or cable.
- Prevent foreign matter such as dust or wire chips from entering the personal computer.
Such foreign matter may cause a fire, failure, or malfunction.
- Always ground the personal computer to the protective ground conductor.
Failure to do so may cause a malfunction.

(2) Precautions for communication cable wiring



CAUTION

- Place the communication cable and the external power supply cable connected to the board in a duct or clamp them.
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact.
- Special skills and tools are required to connect the communication cable to the connector plug, which is an exclusive product.
When purchasing it, please consult your local Mitsubishi representative.
Incomplete connection can result in a short, fire or malfunction.
- Securely plug the communication cable to the connector of the board. Then, check for any incomplete connection.
Poor contact may cause an erroneous input or output.

Remarks

For optical fiber cables, refer to the following manual.

📖 MELSEC-Q CC-Link IE Controller Network Reference Manual

(3) Precautions for external power supply cable wiring



CAUTION

- Place the communication cable and the external power supply cable connected to the board in a duct or clamp them.
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the board or cables or malfunctions due to poor contact.
- Check the rated voltage and pin-out before wiring to the external power supply cable, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Do not install the external power supply or communication cables together with the main circuit lines or power cables.
Keep a distance of 100mm (3.94 in.) or more between them. Failure to do so may result in malfunction due to noise.
- Use a specified tool for crimping of the cable and contacting pin. Imperfect crimping may cause a malfunction.
- Verify the pin-out and fully insert the crimped contacting pin into the connector. Imperfect insertion may cause a failure or malfunction.
- Insert the wired external power supply cable into the external power supply cable connector until a click is heard. Imperfect insertion may cause a failure or malfunction.

5.4.1 Controller network system

The following explains precautions for connecting the optical fiber cables with the CC-Link IE Controller Network board.

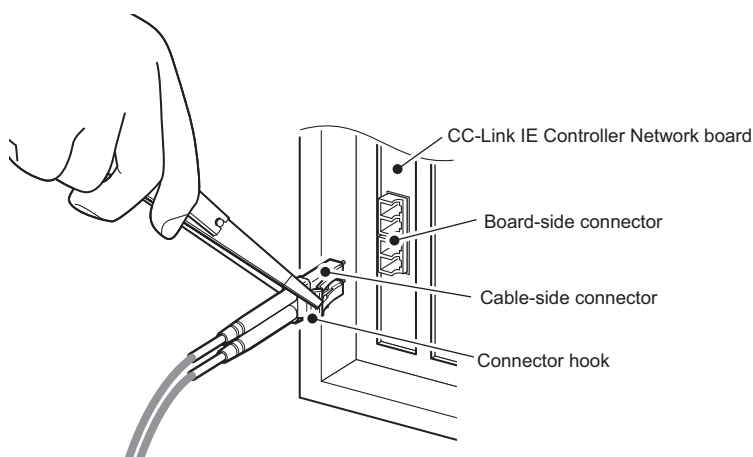
(1) Precautions for connection

- (a) Use the dedicated optical fiber cable shown below for the controller network system.

Type	Model name (maker)
Multi-mode fiber (GI)	QG series (Mitsubishi electric system & service Co., Ltd.)

- (b) When connecting an optical fiber cable to the CC-Link IE Controller Network board, the cable bend radius is restricted.
For details, check the specifications of the cable used.
- (c) When laying the optical fiber cables, do not touch the fiber cores of the cable-side and board-side connectors, and protect them from dirt and dust.
If oil from the hand, dirt or dust is attached to the core, it can increase transmission loss, causing a problem in data link.
- (d) When connecting or disconnecting an optical fiber cable, hold the connector part of the cable.
- (e) Make a full connection between the cable-side and board-side connectors until a "click" can be heard.
- (f) When installing the CC-Link IE Controller Network board to the personal computer, secure a space of around 10 mm (0.39 in.) to the right and left of the optical connector. Depending on the adjacent boards and installing slot position, connecting/disconnecting the optical cable may be difficult. In this case, use the following dedicated tool.

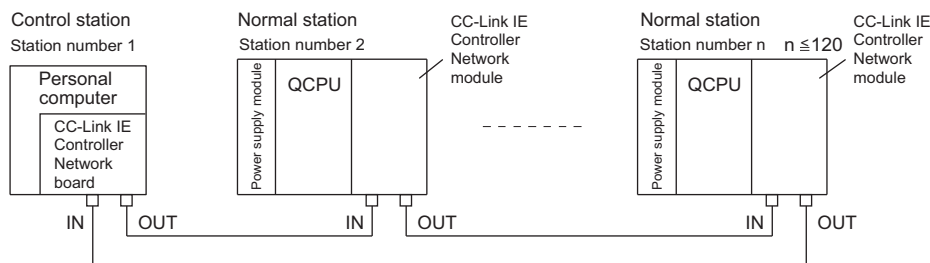
Model name	Maker
SCT-SLM	Mitsubishi electric system & service Co., Ltd.



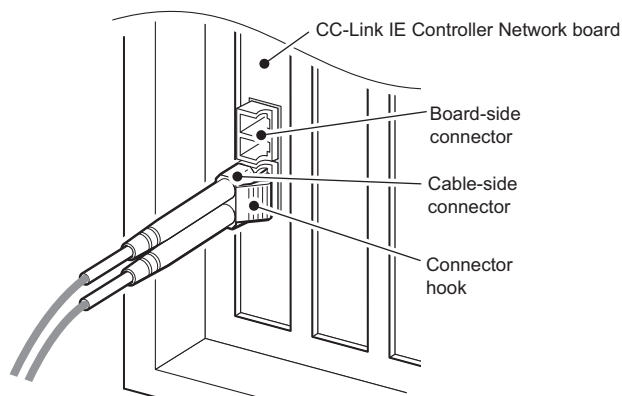
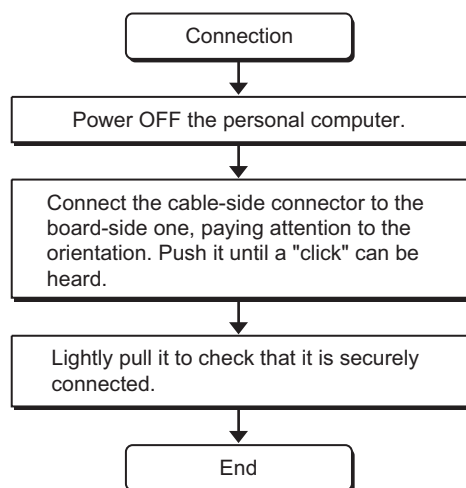
(2) Cable connection**(a) Connection method**

Connect an optical fiber cable between OUT and IN as shown below.

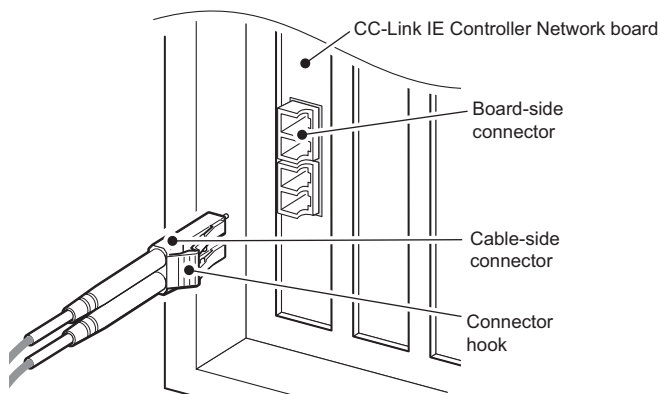
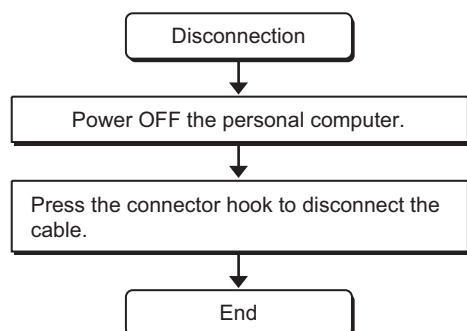
Note that there is no need to connect the cables in the order of station numbers.

**(b) Connecting the optical fiber cable**

The following shows the method for connecting the optical fiber cable.

**(c) Disconnecting the optical fiber cable**

The following shows the method for disconnecting the optical fiber cable.

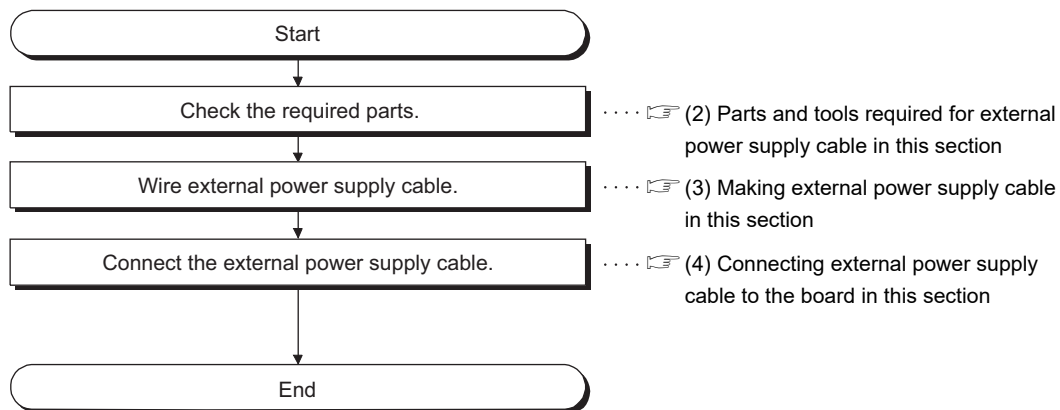


5.4.2 Wiring external power supply cable

This section explains the method for connecting external power supply cable to the CC-Link IE Controller Network board with external power supply function.

(1) Connection procedure

The following flowchart shows a procedure for connecting external power supply cable.



(2) Parts and tools required for external power supply cable

The following parts and tools are required for making external power supply cable.

(a) Connector set (accessories)

Check that the following parts are included with the attached connector set.

Type	Model name	Applicable wire size	Quantity
Connector	1-178288-3	—	1
Contact	175218-2	AWG#20-16	3 (Spare 1)

(b) Cable

Use an external power supply cable with heat-resistant vinyl sheath of 0.5 to 1.25 mm² [AWG#20-16].

(c) Tool

Use the following specified crimp tools.

Model	Applicable wire size	Inquiry
91558-1	AWG#20-16	TE Connectivity Ltd. www.te.com
1762956-1		

(3) Making external power supply cable

The following explains the method for making external power supply cable.

(a) Crimping a contacting pin

Using a crimp tool, crimp the cable and contacting pin.

Set the contacting pin and cable in the grooves of the crimp tool, squeeze the handle, and make them stick together tightly.

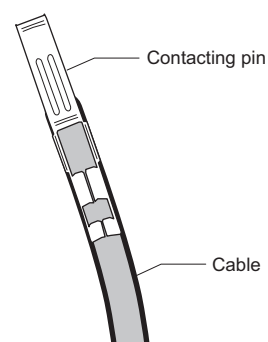
For details of the crimp, refer to the instruction of the tool.

A strip length of the cable should be 5 to 7 mm (1/5 to 2/7 in.)

(b) Check for a crimp

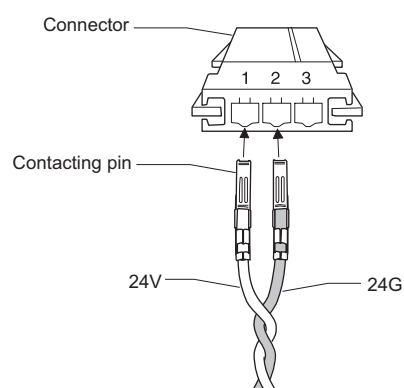
Check if the cable (including a part of the sheath) is evenly crimped to the contacting pin.

If the cable part is crimped but not the sheath part or the cable is stuck out, the cable cut or a malfunction may result.

**(c) Connecting to the connector**

According to the following pin-out, fully insert the crimped cable to the connector until a click is heard.

Pin No.	Description
1	24V
2	24G
3	Open

**(4) Connecting external power supply cable to the board**

Properly insert the wired external power supply cable to the external power supply cable connector of the CC-Link IE Controller Network board until a click is heard.

Keep the cable away from the main circuit cable, power cables and/or the load cables for any other than programmable controllers. Ensure a distance of 100 mm (3.94 in.) between them.

POINT

Be sure to twist the external power supply cable.

5.5 Test

Before executing data link, check the CC-Link IE Controller Network board and cables. Select a test item using the mode setting on the "Parameter setting" screen in the CC IE Control utility.

The CC-Link IE Controller Network board test has the following six types.

Item	Test type	Description	Reference
Board confirmation	Bus I/F test	Tests the hardware of the bus I/F function of the CC-Link IE Controller Network board.	Section 5.5.1
	H/W test	Tests the hardware in the CC-Link IE Controller Network board.	Section 5.5.2
	Self-loopback test	Tests the hardware of the CC-Link IE Controller Network board alone, including the send/receive circuit of the transmission system and cables.	Section 5.5.3
Network confirmation	Circuit test	Checks the cable connection status, line status, and parameter setting status of each station from the control station.	Section 5.5.4
	Station-to-station test	Checks the cable status connected between two stations (from OUT at the executing station to IN at the target station).	Section 5.5.5
	Communication test	Checks whether the transient transmission can be routed correctly between the own station and specified communication target.	Section 5.5.6

POINT

The test modes are equivalent to offline. The data link cannot be executed if one station is set to the test mode during data link. Set the mode to "Online" when performing data link.

5.5.1 Bus I/F test

This test checks the hardware of the Bus I/F function of the CC-Link IE Controller Network board.

- (1) On the "Parameter setting" screen of the CC IE Control utility, set the mode to "Bus I/F test".
- (2) The result is displayed on Test result field of the "Board detail information" screen.

If the test completes abnormally, please contact your local Mitsubishi Electric sales office or representative.

5.5.2 H/W test

This tests the hardware in the CC-Link IE Controller Network board.

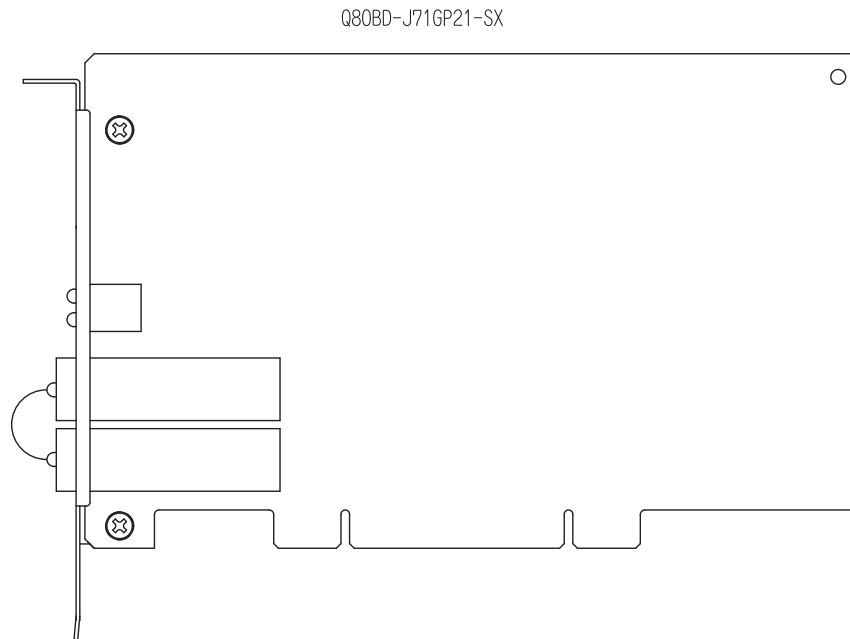
- (1) On the "Parameter setting" screen of the CC IE Control utility, set the mode to "H/W test".
- (2) The result is displayed on Test result field of the "Board detail information" screen.

If the test completes abnormally, please contact your local Mitsubishi Electric sales office or representative.

5.5.3 Self-loopback test

This tests the hardware of the CC-Link IE Controller Network board alone, including the send/receive circuit of the transmission system and cables.

- (1) **Connect optical fiber cables to the IN and OUT of the CC-Link IE Controller Network board.**



- (2) **On the "Parameter setting" screen of the CC IE Control utility, set the mode to "Self-loopback test".**
- (3) **The result is displayed on Test result field of the "Board detail information" screen.**
 If the test completes abnormally, replace the optical fiber cable and execute the test again.
 If it fails again, the CC-Link IE Controller Network board hardware may be faulty. Please contact your local Mitsubishi Electric sales office or representative, explaining a detailed description of the problem.

5.5.4 Circuit test

This test checks the cable connection status and line status in the network system and parameter setting status of each station from the control station.

The following explains a procedure for circuit test, assuming the executing station is the CC-Link IE Controller Network board and the target station as the CC-Link IE Controller Network module.

POINT

The circuit test can be executed only when the CC-Link IE Controller Network board is the control station.

When it is the normal station, execute the test from the control station in the network system to which the normal station is connected.

Remarks

This section explains CC-Link IE Controller Network board.

For the setting of network module, refer to the following manual.

 MELSEC-Q CC-Link IE Controller Network Reference Manual

(1) Check for the power discontinuity

Power OFF the personal computer.

Power OFF the module.

(2) Cable connection

Connect optical fiber cables to OUT and IN of each station.

(3) Power-ON

Power ON the personal computer.

Power ON the module.

(4) Test mode settings

- (a) Setting the executing station

Set as follows on the "Parameter setting" screen of the CC IE Control utility.

Network type: CC IE Control (Control station)

Mode: Circuit test

Station No.: Station number for the executing station

- (b) Setting the target station

In the network parameter of GX Works2, set the mode to Online.*¹

*1: If the CC-Link IE Controller Network board is the target station, set as follows on the "Parameter setting" screen of the CC IE Control utility.

Network type: CC IE Control (Normal station)

Mode: Online

Station No.: Station number for the target station

(5) Starting the test

Click the END button on the "Parameter setting" screen of the CC IE Control utility.

(6) Checking the test result

The result is displayed on Test result field of the "Board detail information" screen.

If the test completes abnormally, check the error cause on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility, process the error with following the troubleshooting.

Then, reexecute the circuit test.

5.5.5 Station-to-station test

This test checks the cable connected between two stations (from OUT at the executing station to IN at the target station).

The following explains a procedure for station-to station test, assuming the executing station is the CC-Link IE Controller Network board and the target station as the CC-Link IE Controller Network module.

Remarks

This section explains CC-Link IE Controller Network board.

For the setting of network module, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

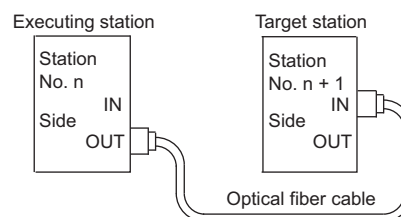
(1) Check for the power discontinuity

Power OFF the personal computer.

Power OFF the module.

(2) Cable connection

Connect an optical fiber cable to OUT at the executing station and IN at the target station.



(3) Power-ON

Power ON the personal computer.

Power ON the module.

(4) Test mode settings

(a) Setting the executing station

Set as follows on the "Parameter setting" screen of the CC IE Control utility.

Network type: CC IE Control (Control station)

Mode: Test between station

Station No.: Station number for the executing station

(b) Setting the target station

In the network parameter of GX Works2, set the mode to Online.*¹

*1: If the CC-Link IE Controller Network board is the target station, set as follows on the "Parameter setting" screen of the CC IE Control utility.

Network type: CC IE Control (Normal station)

Mode: Online

Station No.: Station number for the target station

(5) Starting the test

Click the **END** button on the "Parameter setting" screen of the CC IE Control utility.

(6) Checking the test result

The result is displayed on Test result field of the "Board detail information" screen.

If "Executing the Test between station normally." remains displayed after 10 seconds have elapsed, the result is normal.

If the test completes abnormally, the cable used for the station-to-station test is faulty. Replace the cable.

5.5.6 Communication test

Communication test is a test to check whether the transient transmission can be routed correctly between the own station and specified communication target.

Note that, however, this test cannot be used during the circuit test.

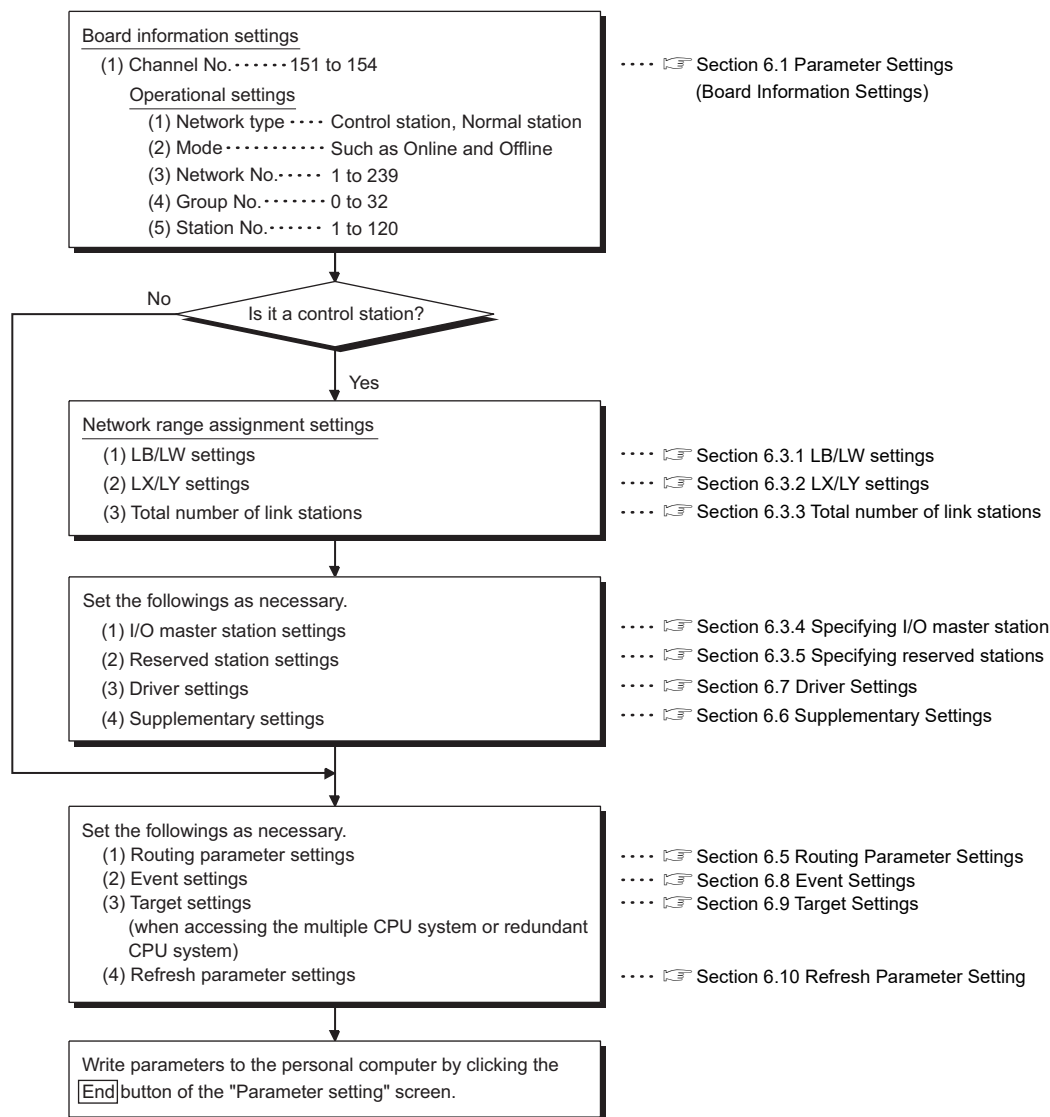
The following explains the procedure for a communication test.

- (1) Click the button on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility.
- (2) The "Communication test" screen is displayed.
- (3) Set items on the "Communication Test" screen, and click the button to execute the communication test.
- (4) When the communication test is completed, a communication test result is displayed. If an error occurs, perform the measure by following the error message.

CHAPTER 6 PARAMETER SETTINGS

It is necessary to set the parameters using the CC IE Control utility in order to operate the CC-Link IE Controller Network.

The following is a flow chart for setting parameters.



6.1 Parameter Settings (Board Information Settings)

This function is used to set a channel number, network type, and other settings of the CC-Link IE Controller Network board to be used.

The parameter settings are set on the "Parameter setting" screen in the CC IE Control utility.

(1) Target board specification

Select a number of CC-Link IE Controller Network boards to be installed in the personal computer.

(2) Board

Select the CC-Link IE Controller Network board whose parameters to be set.

(3) Channel No.

Select a channel number to be assigned to the CC-Link IE Controller Network board whose parameter is being set.

The channel numbers assigned to each CC-Link IE Controller Network board can be checked on the board list screen (start screen).

- 1) Valid setting range
151 to 154

For the channel number assignment of the CC-Link IE Controller Network board, refer to the following manual.

 CC-Link IE Controller Network Interface Board User's Manual

(4) Operational setting

Set a network number, station number, control station/normal station and group number of the CC-Link IE Controller Network board.

(a) Network No.

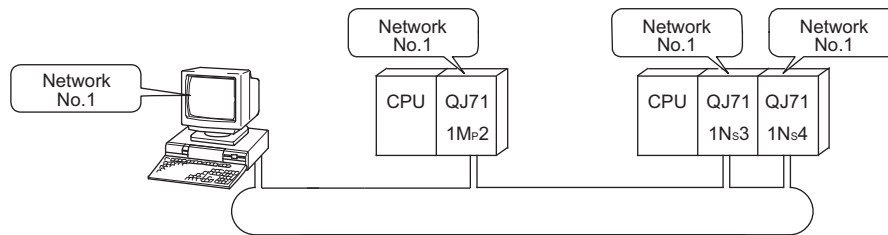
Set a network number of the network to which the CC-Link IE Controller Network board is connected.

1) Valid setting range

1 to 239

2) Precaution

Set a same network number to all devices that are connected to the same network.



(b) Group No.

Set a group number to perform transient transmissions in specified group.

The group number setting is set on the "Parameter setting" screen in the CC IE Control utility.

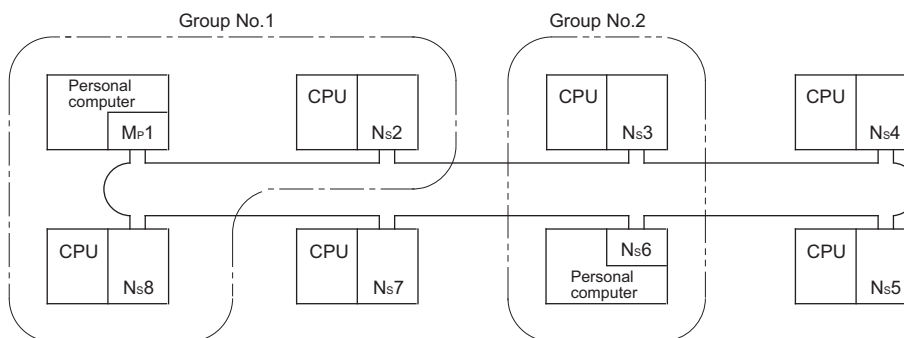
1) Valid setting range

0 : No group setting

1 to 32: Group setting is set

2) Precaution

Only one group number can be set to one station.



(c) Station No.

Set a station number of the CC-Link IE Controller Network board.

1) Valid setting range

1 to 120

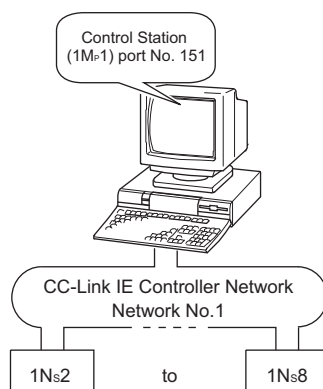
2) Precaution

Do not set a same station number in the same network.

6.2 Parameter Setting Example

The following shows the parameter setting example of the CC-Link IE Controller Network board.

(1) System example



(2) Setting screen

Settings for Control station (1M-1)

Item		Description
Target board specification		Board1
Board		1
Channel No.		151
Operational setting	Network type	CC IE Control(Control station)
	Mode	Online
	Network No.	1
	Group No.	0
	Station No.	1

6.3 Network Range Assignment Settings

This function is used to set cyclic transmission ranges of devices, LB, LW, LX, and LY, that can be sent by each station in a single network connected to the CC-Link IE Controller Network board.

The settings are required only for the control station.

The data of the network range assignment are sent from the control station to normal stations at start up of the network.

The network range assignment settings are set on the "Network range assignment" screen in the CC IE Control utility.

Item	Description	Reference
Total stations	Set a number of total stations in the network.	Section 6.3.3
Assignment method	Select the assignment method of LB/LW and LX/LY.	—
Switch screens	Select a target of the range assignment.	—
LB/LW settings (1)	Set the send ranges for each station in which LB/LW are used for the LB/LW communication.	Section 6.3.1
LB/LW settings (2)		
LX/LY settings (1)	Set the I/O ranges of LX/LY by blocks for the I/O master station used for the LX/LY communication, and between the I/O station and relevant station.	Section 6.3.2
LX/LY settings (2)		
Monitoring time	Set a value for monitoring time of link scan time. Use of default value for normal operations is recommended. Cannot link data if the link scan time exceeds the monitoring time.	—
Specify I/O master station	Set the I/O master station.	Section 6.3.4
Specify reserved station	Set the reserved station.	Section 6.3.5
Equal assignment	Set the send ranges for each station to which LB/LW and LX/LY are equally assigned.	Section 6.4
Supplementary setting	Set the constant link scan time, block data assurance per station, punctuality assurance, and maximum number of transients in one station.	Section 6.6

6.3.1 LB/LW settings

Set each station's send range in LB/LW to use it for the cyclic transmission.

(1) Setting "LB/LW settings (1)" and "LB/LW settings (2) separately"

LB/LW settings can be divided into "LB/LW settings (1)" and "LB/LW settings (2)".

Normally, setting only "LB/LW settings (1)" is enough for LB/LW communication.

Set "LB/LW settings (2)" in the following cases:

- When extending each station's send range without changing existing assignments
- When intentionally dividing each station's send range into two (e.g. within and outside the link refresh range)

POINT

- If "LB/LW settings (2)" is used, link scan time will be longer compared to using "LB/LW settings (1)" only.
- The LB/LW points for each station must be set to the maximum link points or less which are total points of "LB/LW settings (1)" and "LB/LW settings (2)".

(2) Extending the maximum link points for each station

Select extension mode in network type of parameter setting, the maximum link points for each station can be extended.

➡ Section 6.1 Parameter Settings (Board Information Settings)

Network type	Max. link points per station for LB/LW
CC IE Control (Control station)	LB:16K points, LW: 16K points
CC IE Control (Normal station)	
CC IE Control Extended mode (Control station)	LB:32K points, LW:128K points
CC IE Control Extended mode (Normal station)	

(3) Assuring 32-bit data integrity

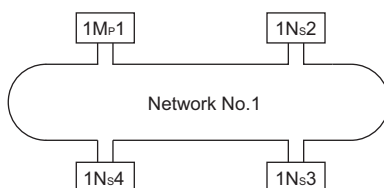
If settings are made with the following conditions 1) to 4) satisfied, 32-bit data integrity will be automatically assured.

- 1) The start device No. of LB is a multiple of 20H.
- 2) The points assigned per station in LB is a multiple of 20H.
- 3) The start device No. of LW is a multiple of 2.
- 4) The points assigned per station in LW is a multiple of 2.

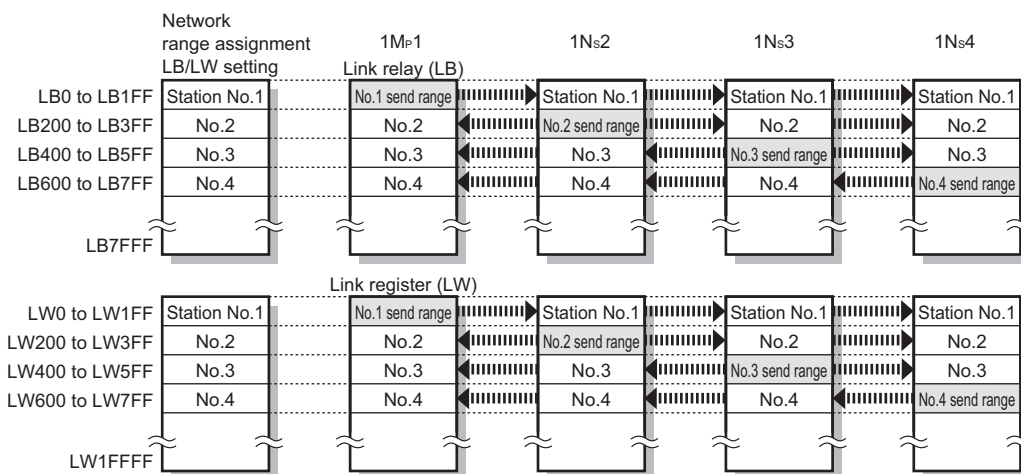
For details of the 32-bit data assurance, refer to the following manual.

➡ MELSEC-Q CC-Link IE Controller Network Reference Manual

(4) Setting example

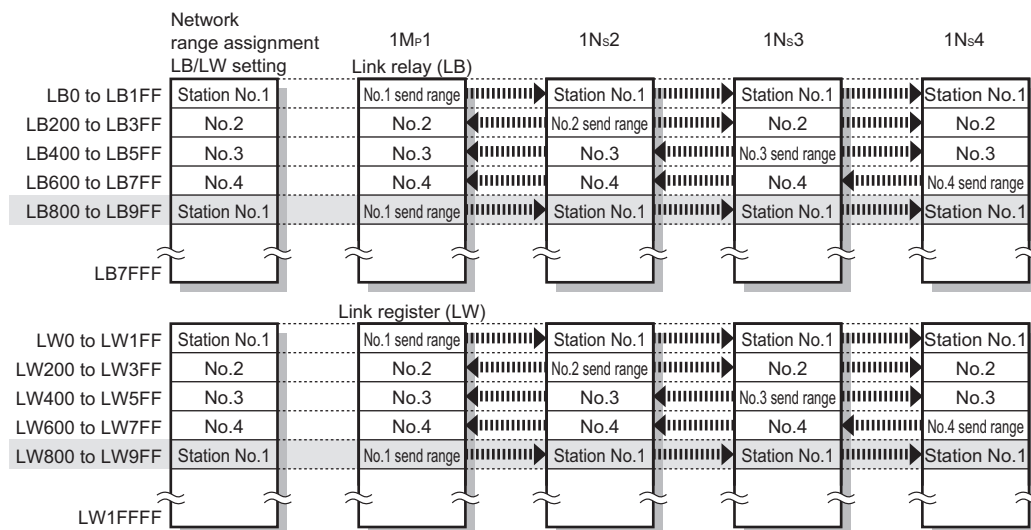


(a) When assigning 512 points to each station's send range in LB/LW ("LB/LW settings (1)")



Station No.	LB			LW		
	Points	Start	End	Points	Start	End
1	512	0000	01FF	512	00000	001FF
2	512	0200	03FF	512	00200	003FF
3	512	0400	05FF	512	00400	005FF
4	512	0600	07FF	512	00600	007FF

(b) When extending the send range of station No.1 to 1024 points without changing the assignment shown in (a). ("LB/LW settings (2)")



Station No.	LB			LW		
	Points	Start	End	Points	Start	End
1	512	0000	01FF	512	00000	001FF
2	—	—	—	—	—	—
3	—	—	—	—	—	—
4	—	—	—	—	—	—

—: No setting

6.3.2 LX/LY settings

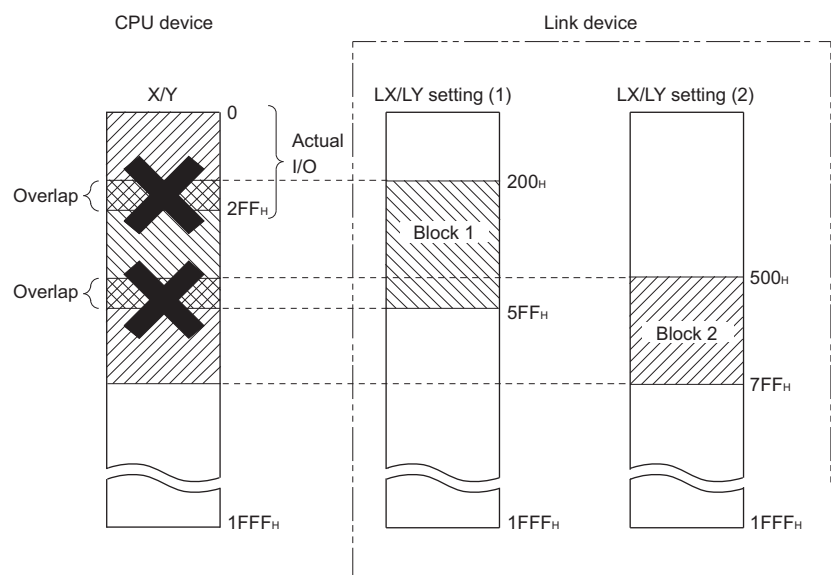
For each block, set an I/O master station and I/O ranges used in the cyclic transmission between the I/O master and relevant stations.

(1) Setting "LX/LY settings (1)" and "LX/LY settings (2)" separately

Set "LX/LY settings (1)" as block 1 and "LX/LY settings (2)" as block 2.

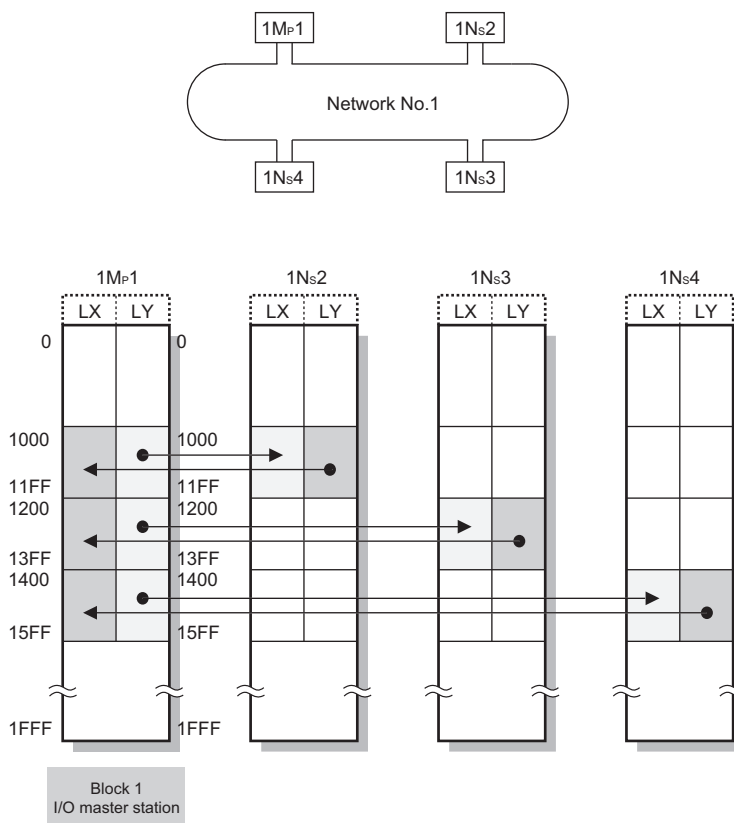
POINT

- The LX/LY points for each station must be set to the maximum link points (8192 points) or less which are total points of "LX/LY settings (1)" and "LX/LY settings (2)".
- Avoid duplication of the LX/LY settings for each station in "LX/LY settings (1)" and "LX/LY settings (2)".
- When a network module is set as an I/O master station, the ranges for block 1 and block 2 should not overlap with actual I/O numbers (I/O number range of the actually installed module) of installed CPU module.



(2) Setting example

The following example shows the I/O ranges of LX/LY for each station, when the station number 1 is set as the I/O master station in block 1, and 512 points are assigned to station number 2 to 4. ("LX/LY setting (1)")



Station No.	M station -> L station						M station <- L station					
	LY			LX			LX			LY		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
master1	—	—	—	—	—	—	—	—	—	—	—	—
2	512	1000	11FF	512	1000	11FF	512	1000	11FF	512	1000	11FF
3	512	1200	13FF	512	1200	13FF	512	1200	13FF	512	1200	13FF
4	512	1400	14FF	512	1400	15FF	512	1400	15FF	512	1400	15FF

—: No setting

6.3.3 Total number of link stations

Set the total number of link stations for a single network when "CC IE Control (Control station)" or "CC IE Control Extended mode (Control station)" is selected in the "Network type" field.

6.3.4 Specifying I/O master station

The I/O master station (control station) which is used for one-to-one communication by LX/LY, is specified in units of blocks. The I/O master station can be set regardless of the station types, control station and normal station.

Each of block 1 and block 2 has one I/O master station, which is set by the network range assignment of each block.

6.3.5 Specifying reserved stations

This function is used to reserve stations (stations not actually connected, but included in the total number of stations) to be connected afterward. The reserved stations are not recognized as faulty stations.

6.4 Equal Assignment Settings

This function is used to assign devices automatically in the network range.
The equal assignment settings are set on the "Equal assignment" screen in the CC IE Control utility.
The following shows the two types of equal assignment.

Assignment method	Description
Equal assignment	- Equal assignment of LB/LW The specified link device range can be equally assigned to the send ranges of the relevant stations. - Equal assignment of LX/LY The specified link device range can be equally assigned to the I/O ranges between the I/O master station and relevant stations.
Identical point assignment	- Identical point assignment of LB/LW Identical points are assigned to the LB/LW send ranges of each station. - Identical point assignment of LX/LY Identical points are assigned to the I/O ranges between the I/O master station and other stations.

6.5 Routing Parameter Settings

The transmission target and relay stations of the transient transmission are set in the routing parameter settings.

CC-Link IE Controller Network boards cannot be used as relay stations. (For relay stations, set the network modules controlled by the programmable controller CPU.)

The routing parameter settings are set on the "Routing parameter setting" screen in the CC IE Control utility.

POINT

For details of the routing function, refer to the following section.

 Section 12.1.2 Routing function

6.6 Supplementary Settings

The supplementary settings are included in the Network range assignment setting, and it is used to set more detailed settings.

Use the initial settings in general.

The supplementary settings (parameter settings) are required only for the control station.

The parameters are sent from the control station to normal stations at start up of the network.

The supplementary settings are set on the "Supplementary setting" screen in the CC IE Control utility.

6.7 Driver Settings

This function is used to set the refresh cycle of the cyclic transmission and monitoring time of the transient transmission.

The driver settings are set on the "Driver setting" screen in the CC IE Control utility.

6.8 Event Settings

This function is used to set the conditions for monitoring link device changes using the CC-Link IE Controller Network board to notify events to the user program.

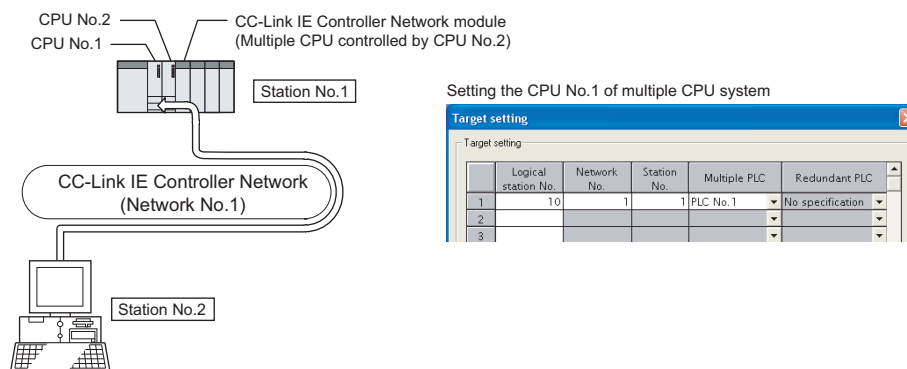
The event settings are set on the "Event setting" screen in the CC IE Control utility.

6.9 Target Settings

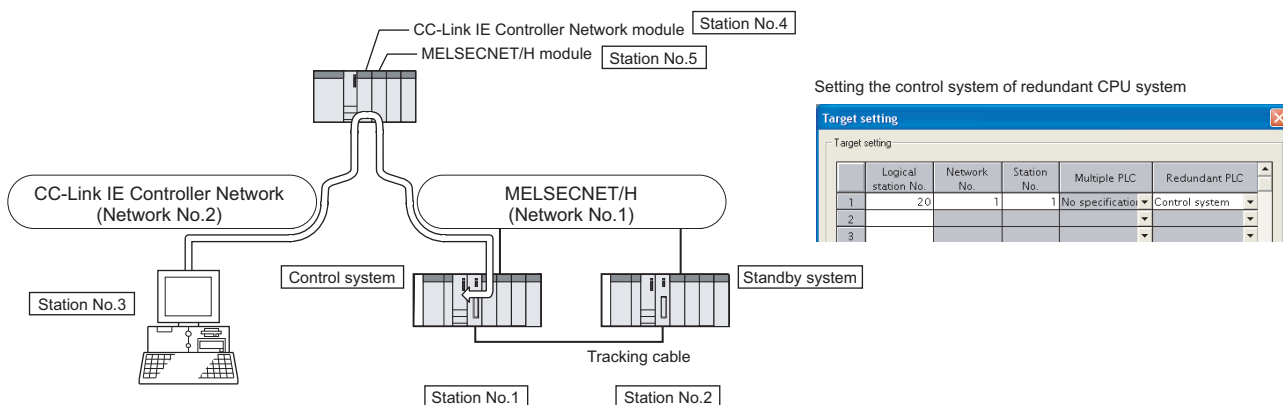
This function is used to set logical numbers for accessing the multiple CPU system or redundant CPU system.

The target settings are set on the "Target setting" screen in the CC IE Control utility.

(1) Setting example when accessing the multiple CPU system



(2) Setting example when accessing the redundant CPU system



POINT

When a CC-Link IE Controller Network board with a serial number whose first five digits are 10091 or lower, or an SW1DNC-MNETG-B with the software version 1.04E or earlier is used, the redundant CPU system cannot be accessed directly with the CC-Link IE Controller Network interface board.

Relay the MELSECNET/H network system to access the redundant CPU system.

6.10 Refresh Parameter Setting

The refresh parameters are designed to transfer link devices (LX, LY, LB, and LW) of CC-Link IE Controller Network board to the driver buffers (LX, LY, LB, and LW buffers) of a personal computer to be used in user programs.

The refresh parameter settings are set on the "Refresh parameter setting" screen of the CC IE Control utility.

POINT

- (1) Set only the link devices used for the personal computer side to the link refresh range. The link refresh time can be shortened by decreasing the link refresh points for the personal computer side.
- (2) If the network range assignment is changed, check the link refresh range as well.
- (3) When setting the refresh parameters, use the 1.08J or later version of CC IE Control utility.

(For checking versions  Appendix 5 Checking Serial Number and Function Version)

- If the parameter file set and written on the 1.07H or earlier version of CC IE Control utility is read by the 1.08J or later version, initial settings are set for the refresh parameters.
- If the parameter file set and written on the 1.08J or later version of CC IE Control utility is read by the 1.07H or earlier version, a file read error occurs.

Version to which parameter file is written	Version from which parameter file is read	
	1.07H or earlier	1.08J or later
1.07H or earlier	(No settings)	Initial values
1.08J or later	File read error	Set values

- (4) The refresh parameter settings are not required for SB/SW since the link device storage area is accessed directly when reading/writing SB/SW.

CHAPTER 7 INSTALLING AND UNINSTALLING SOFTWARE PACKAGES

This chapter explains about installing and uninstalling the software packages, and icons to be registered.

7.1 Installation and Uninstallation Precautions

The following are the precautions when installing and uninstalling the software package.

- Log on as a user having administrator authority.
- Make sure to close other applications running on Windows® (including resident software such as antivirus software) before installation and uninstallation.
- The installer may not work normally because the update program of operating system or other companies' software such as Windows® Update and Java update may start automatically. Please install the driver after changing the setting of the update program not to start automatically.
- Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver.
Or update the Windows® operating system.
- The language switching function of the operation system in Windows settings is not supported. The installation or uninstallation may not work normally if the language setting is changed.
- Enable the .NET Framework 3.5 (including .NET 2.0 or 3.0) in "Turn Windows features on or off" on the control panel.
- A network drive cannot be specified as the installation destination.
- When the parameters have been set with the utility installed, the parameters are initialized at installation. Save the parameters with the save file function before installing the utility.

Note that the board numbers and channel numbers which have been set may be changed after installation.

In this case, set the board numbers and channel numbers again.

For changing the board number, restart the personal computer after changing the channel number in "Channel No." on the "Parameter setting" screen.

For assigning the board numbers and channel numbers, refer to the following section.

☞ Section 6.1 Parameter Settings (Board Information Settings)(<Assigning channel numbers to the CC-Link IE Controller Network boards>, <Assigning board numbers in the CC IE Control utility>)

- When the software package has been installed in the environment that the creation of 8.3 filename is disabled, the software package may not be uninstalled. Enable the creation of 8.3 filename before installing the software package. For the method on how to check and change the status of 8.3 filename creation to enable/disable, refer to the website of Microsoft Corporation.
- In Windows Server 2016, apply Windows Updates (KB4132216, KB4091664, KB4465659, and KB4534307).

- When installing the software package, enable the user account control.
( Appendix 8)
- When the version of software package to be installed is Ver.1.30G or later, the software package the version of which is Ver.1.29F or earlier must be uninstalled in advance.

7.2 Installation

This section explains a procedure for installing software package.

7.2.1 Obtaining the software

Please contact your local Mitsubishi Electric sales office or representative.

7.2.2 Installation procedure

- 1) Save the obtained data for installation to the system drive, DVD, etc.
- 2) Start the installer.
Double-click "Setup.exe" in the "Disk1" folder.
- 3) By following the on-screen instructions, select or enter the necessary information.
(When the corrective action displayed on the screen is not effective
 Section 14.4.2)

7.2.3 When installation is completed normally

When the installation is completed normally, the following utilities etc. are registered.

(1) Utilities and manuals

When the installation is completed normally, the utilities and manuals shown below are registered in the "Start" of Windows.

Folder	Name	Description
MELSEC	CC IE Control Utility (Board)	Starts CC IE Control Utility. It is a utility to set boards and display the status.
MELSEC*1	Device Monitor Utility (Board)	Starts Device Monitor Utility. It is a utility to monitor devices and change the current value.
MELSOFT	e-Manual Viewer e-Manual Viewer Help	Displays MELSEC Data Link Library Reference Manual.

*1: Not registered in the MELSEC folder if already registered in the MELSOFT folder.

If Device Monitor Utility or e-Manual Viewer is previously installed, it is overwritten in the same folder.

POINT

- For the function and handling method, refer to the manual of the installed software package. The corresponding PDF manual is stored in the 'Manual' folder of the software package.
- In order to view the PDF manuals, Adobe Acrobat Reader is required. Adobe Acrobat Reader can be downloaded from the Adobe web site.
- The specifications of software package described in e-Manual, which are updated in e-Manual Viewer, may be different from the ones of installed software package.

(2) MELSEC Data Link Library

The MELSEC data link library is a library used to access own station link devices of a board and device memory of programmable controller CPUs of other stations using a board. The library is stored in the 'Common' folder in the folder where it is installed.

(3) Driver

When installing the board on the personal computer after the installation of the software package, the driver is installed automatically.

When the driver installation is completed normally, one of the following drivers will be displayed on the Device Manager screen of Windows.

Device	Driver
MELSECNET/G Device	"PCI MELSECNET/G Controller"
MELSEC CC-Link IE Control Device	"MELSEC CC-Link IE Control Controller"

(4) Service application

To prevent a personal computer entering the power save mode (hibernate, sleep), MELSECPowerManager is installed automatically.

For details of MELSECPowerManager, refer to the following section.

➞ Appendix 10

(5) Considerations for using other boards on a personal computer

Device Monitor Utility, MELSEC data link library, and MELSECPowerManager are used in common for the following software packages:

- SW1DNN-CCIETBDM-B
- SW1DNC-MNETG-B
- SW1DNC-CCIEF-B
- SW1DNC-CCBD2-B
- SW0DNC-MNETH-B

The newer software package data is validated when installing them on the same personal computer.

☒ POINT

- For the functions and handling methods of Device Monitor Utility and MELSEC data link library, refer to the manual that can be displayed from the menu in Device Monitor Utility.

7.2.4 When installation is aborted or failed

When the installation is aborted or failed, take corrective actions following the troubleshooting. (➞ Section 14.2)

7.3 Uninstallation

This section explains a procedure for uninstalling the software package.

7.3.1 Uninstallation procedure

- 1) Uninstall the software package from the control panel of Windows®.

POINT

- If the dialog box confirming the deletion of common files appears at uninstallation, make the setting to keep all common files.
If deleting common files, other applications may not operate normally.
- MELSECPowerManager may not be uninstalled depending on the installation state which affects the other installed software packages.
For details of MELSECPowerManager, refer to the following appendix.
 Appendix 10

7.3.2 When uninstallation is completed normally

When the uninstallation is completed normally, the icons registered in the "Start" of Windows® are deleted.

7.3.3 When uninstallation is failed

When the uninstallation is failed, take corrective actions following the troubleshooting.
( Section 14.2)

CHAPTER 8 CC IE CONTROL UTILITY

For screens and operation methods of the CC IE Control utility, refer to "CC-Link IE Controller Network Interface Board User's Manual".

POINT

For the function and handling method, refer to the manual of the installed software package.

Memo

[illegible]

CHAPTER 9 DEVICE MONITOR UTILITY

For the operation and setting method for the device monitor utility, refer to "MELSEC Data Link Library Reference Manual".

Memo

[illegible]

CHAPTER 10 MELSEC DATA LINK LIBRARY

This chapter explains the features of the functions provided by the library.

The functions are used when creating a user program that communicates with a programmable controller CPU.

With these functions, a user can communicate without being aware of hardware types or communication protocols on the target.

The following table shows the list of the functions in the MELSEC data link library that is provided with the software package.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSendEx	Batch writes devices. (Extended function ^{*2})
	Sends data. (SEND function) ^{*1} (Extended function ^{*2})
mdReceiveEx	Batch reads devices. (Extended function ^{*2})
	Receives data. (RECV function) ^{*1} (Extended function ^{*2})
mdRandWEx	Writes devices randomly. (Extended function ^{*2})
mdRandREx	Reads devices randomly. (Extended function ^{*2})
mdDevSetEx	Sets a bit device. (Extended function ^{*2})
mdDevRstEx	Resets a bit device. (Extended function ^{*2})
mdTypeRead	Reads the type of programmable controller CPU.
mdControl	Remote operation of programmable controller CPU.(RUN/STOP/PAUSE).
mdWaitBdEvent	Waits for an event occurrence.
mdBdRst	Resets the board.
mdBdModSet	Sets the mode of the board.
mdBdModRead	Reads the mode of the board.
mdBdLedRead	Reads the LED information of the board.
mdBdSwRead	Reads the switch status of the board.
mdBdVerRead	Reads the version information of the board.
mdInit	Refreshes the programmable controller device address.
mdSend	Batch writes devices.
	Sends data. (SEND function) ^{*1}
mdReceive	Batch reads devices.
	Receives data. (RECV function) ^{*1}
mdRandW	Writes devices randomly.
mdRandR	Reads devices randomly.
mdDevSet	Sets a bit device.
mdDevRst	Resets a bit device.

*1: Supported by the 1.08J or later version of SW1DNC-MNETG-B.

*2: A function in which the access range is extended according to the extension of the device points at the access target. It is accessible to all device numbers.
Use extended functions when creating a new program.

POINT

For details of the functions, refer to the following manual.

 MELSEC Data Link Library Reference Manual

CHAPTER 11 PROGRAMMING

11.1 Precautions on Programming

This section explains the precautions on creating programs using data on a network.

11.1.1 Interlock related signals

The following table shows a list of the interlock signal devices used in a user program. For details of other devices to check the operating status, setting status, and other functions of the own station and other stations, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

Assignment of link special relays (SB) and link special registers (SW)

Device	Name	Description	Device status	
			OFF (0)	ON (1)
SB0020	Board status of own station	Stores the communication status between CC-Link IE Controller Network board and personal computer.	Normal	Abnormal
SB0047	Baton pass status of own station	Stores a baton pass status of the own station. A transient transmission is possible even when the Baton pass status of own station (SB0047) is ON. If the status is abnormal, stores the cause of the abnormal status in the Baton pass status of own station (SW0047) and Cause of baton pass interruption (SW0048).	Normal	Abnormal
SB0049	Data link status of own station	Stores a data link status of the own station. If the status is abnormal, stores the cause of the abnormal status in the Cause of data link stop (SW0049).	Normal	Abnormal
SB00A0	Baton pass status of each station	Stores a baton pass status of each station. If an abnormal station is found, stores the station number to the Baton pass status of own station (SW00A7). Conditions: - Valid when the Baton pass status of own station (SB0047) is OFF. - If the Baton pass status of own station (SB0047) is ON (abnormal), the previous data is maintained. - Reserved stations, and the maximum station number and later are out of the subject.	All stations are normal.	Abnormal station(s) exists.

Device	Name	Description	Device status																																																																																																				
			OFF (0)	ON (1)																																																																																																			
SB00B0	Cyclic transmission status of each station	Stores a cyclic transmission status of each station. If a station that has not executed the cyclic transmission is found, the station number is stored to the Cyclic transmission status of each station (SW00B0 to SW00B7). Conditions: Same conditions as SB00A0.	All stations are executing Cyclic transmission.	Cyclic transmission not-executed station(s) exists.																																																																																																			
SW00A0 to 00A7	Baton pass status of each station	Stores a baton pass status of each station. <table><thead><tr><th></th><th>b15</th><th>b14</th><th>to</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>to</th><th>b1</th><th>b0</th></tr></thead><tbody><tr><td>SW00A0</td><td>16</td><td>15</td><td>to</td><td>10</td><td>9</td><td>8</td><td>7</td><td>to</td><td>2</td><td>1</td></tr><tr><td>SW00A1</td><td>32</td><td>31</td><td>to</td><td>26</td><td>25</td><td>24</td><td>23</td><td>to</td><td>18</td><td>17</td></tr><tr><td>SW00A2</td><td>48</td><td>47</td><td>to</td><td>42</td><td>41</td><td>40</td><td>39</td><td>to</td><td>34</td><td>33</td></tr><tr><td>SW00A3</td><td>64</td><td>63</td><td>to</td><td>58</td><td>57</td><td>56</td><td>55</td><td>to</td><td>50</td><td>49</td></tr><tr><td>SW00A4</td><td>80</td><td>79</td><td>to</td><td>74</td><td>73</td><td>72</td><td>71</td><td>to</td><td>66</td><td>65</td></tr><tr><td>SW00A5</td><td>96</td><td>95</td><td>to</td><td>90</td><td>89</td><td>88</td><td>87</td><td>to</td><td>82</td><td>81</td></tr><tr><td>SW00A6</td><td>112</td><td>111</td><td>to</td><td>106</td><td>105</td><td>104</td><td>103</td><td>to</td><td>98</td><td>97</td></tr><tr><td>SW00A7</td><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>120</td><td>119</td><td>to</td><td>114</td><td>113</td></tr></tbody></table> Numbers from 1 to 120 in the table indicate station numbers. Numbers for b8 to b15 of SW00A7 are 0 (fixed). Conditions: Same conditions as SB00A0.		b15	b14	to	b9	b8	b7	b6	to	b1	b0	SW00A0	16	15	to	10	9	8	7	to	2	1	SW00A1	32	31	to	26	25	24	23	to	18	17	SW00A2	48	47	to	42	41	40	39	to	34	33	SW00A3	64	63	to	58	57	56	55	to	50	49	SW00A4	80	79	to	74	73	72	71	to	66	65	SW00A5	96	95	to	90	89	88	87	to	82	81	SW00A6	112	111	to	106	105	104	103	to	98	97	SW00A7	0	0	to	0	0	120	119	to	114	113	Normal baton pass station	Abnormal baton pass station
	b15	b14	to	b9	b8	b7	b6	to	b1	b0																																																																																													
SW00A0	16	15	to	10	9	8	7	to	2	1																																																																																													
SW00A1	32	31	to	26	25	24	23	to	18	17																																																																																													
SW00A2	48	47	to	42	41	40	39	to	34	33																																																																																													
SW00A3	64	63	to	58	57	56	55	to	50	49																																																																																													
SW00A4	80	79	to	74	73	72	71	to	66	65																																																																																													
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SW00A6	112	111	to	106	105	104	103	to	98	97																																																																																													
SW00A7	0	0	to	0	0	120	119	to	114	113																																																																																													
SW00B0 to 00B7	Cyclic transmission status of each station	Stores a data link (cyclic transmission) status of each station. (including the own station) <table><thead><tr><th></th><th>b15</th><th>b14</th><th>to</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>to</th><th>b1</th><th>b0</th></tr></thead><tbody><tr><td>SW00B0</td><td>16</td><td>15</td><td>to</td><td>10</td><td>9</td><td>8</td><td>7</td><td>to</td><td>2</td><td>1</td></tr><tr><td>SW00B1</td><td>32</td><td>31</td><td>to</td><td>26</td><td>25</td><td>24</td><td>23</td><td>to</td><td>18</td><td>17</td></tr><tr><td>SW00B2</td><td>48</td><td>47</td><td>to</td><td>42</td><td>41</td><td>40</td><td>39</td><td>to</td><td>34</td><td>33</td></tr><tr><td>SW00B3</td><td>64</td><td>63</td><td>to</td><td>58</td><td>57</td><td>56</td><td>55</td><td>to</td><td>50</td><td>49</td></tr><tr><td>SW00B4</td><td>80</td><td>79</td><td>to</td><td>74</td><td>73</td><td>72</td><td>71</td><td>to</td><td>66</td><td>65</td></tr><tr><td>SW00B5</td><td>96</td><td>95</td><td>to</td><td>90</td><td>89</td><td>88</td><td>87</td><td>to</td><td>82</td><td>81</td></tr><tr><td>SW00B6</td><td>112</td><td>111</td><td>to</td><td>106</td><td>105</td><td>104</td><td>103</td><td>to</td><td>98</td><td>97</td></tr><tr><td>SW00B7</td><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>120</td><td>119</td><td>to</td><td>114</td><td>113</td></tr></tbody></table> Numbers from 1 to 120 in the table indicate station numbers. Numbers for b8 to b15 of SW00B7 are 0 (fixed). Conditions: Same conditions as SB00A0.		b15	b14	to	b9	b8	b7	b6	to	b1	b0	SW00B0	16	15	to	10	9	8	7	to	2	1	SW00B1	32	31	to	26	25	24	23	to	18	17	SW00B2	48	47	to	42	41	40	39	to	34	33	SW00B3	64	63	to	58	57	56	55	to	50	49	SW00B4	80	79	to	74	73	72	71	to	66	65	SW00B5	96	95	to	90	89	88	87	to	82	81	SW00B6	112	111	to	106	105	104	103	to	98	97	SW00B7	0	0	to	0	0	120	119	to	114	113	Normal cyclic transmission station	Abnormal cyclic transmission station
	b15	b14	to	b9	b8	b7	b6	to	b1	b0																																																																																													
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SW00B7	0	0	to	0	0	120	119	to	114	113																																																																																													

11.2 Cyclic Transmission

The link scan of the CC-Link IE Controller Network and the execution of the user program are operated asynchronously.

When using data more than 32 bits (double words) indicated below, new data and old data may be mixed in units of 16 bits (1 word) depending on the execution timing of a user program.

- Floating point data
- Current values and command speed of the positioning module.

CC-Link IE Controller Network provides the following functions for not mixing new data and old data.

- 32-bit data assurance

32-bit data are assured by link refreshing the link device whose conditions of 32-bit data assurance are satisfied.

For details, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

- Station-based block data assurance

Cyclic data are assured per station by handshaking between the personal computer and CC-Link IE Controller Network board, and executing the link refresh.

For details, refer to the following.

☞ Section 11.2.1 Station-based block data assurance

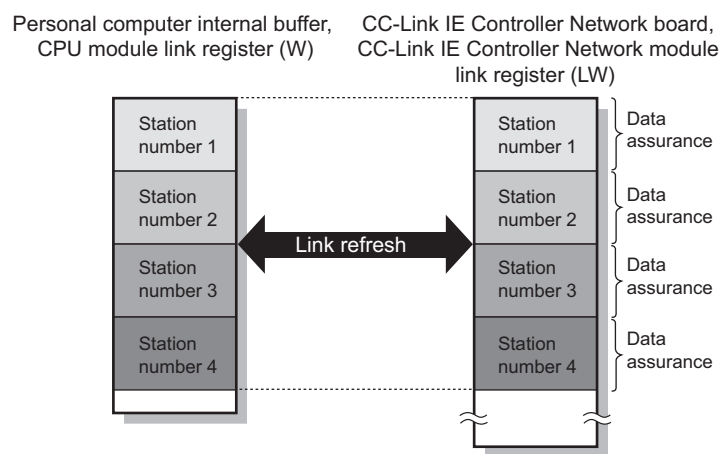
11.2.1 Station-based block data assurance

Block data are assured per station by handshaking between the personal computer and CC-Link IE Controller Network board, and executing the link refresh.

Station-based block data assurance (link data separation prevention by each station ^{*1}) is executed by the handshake of cyclic data.

This function can be set in the "Parameter setting (Supplementary setting)" screen of the CC IE Control utility, only when the CC-Link IE Controller Network board is the control station. (It cannot be set if the CC-Link IE Controller Network board is a normal station.)

By selecting [Block data assurance per station is available], an interlock is not needed for the link data between the setting stations.



*1: The separation prevention refers to a prevention of link data with double words (32 bits), such as the current value of the positioning module, from being separated to new data and old data in units of one word (16 bits) due to the refresh timing of cyclic transmission.

POINT

Station-based block data assurance is applied only to the link refresh process.
Set an interlock when using a direct access of link devices.

11.3 Link Special Relays (SB) and Link Special Registers (SW)

The information when linking data is stored in link special relays (SB) and link special registers (SW).

Faulty areas and causes of errors can be investigated by using and monitoring the information in a user program.

The following table shows the specific use for these devices.

For more details, refer to the following manual.

✎ MELSEC-Q CC-Link IE Controller Network Reference Manual

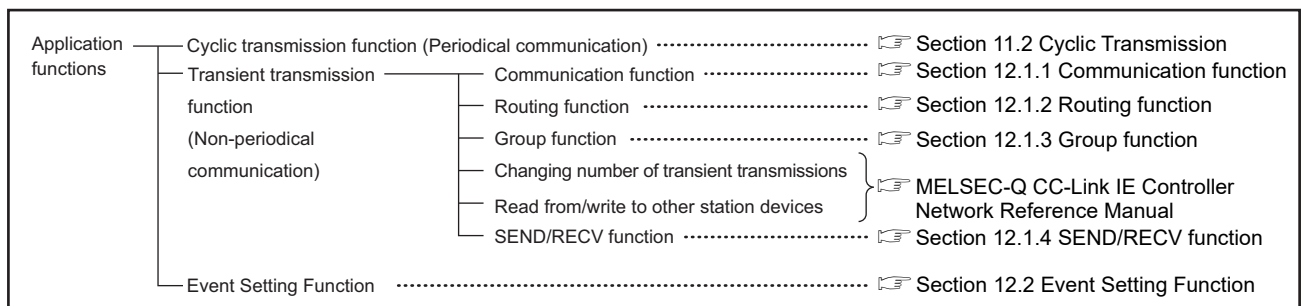
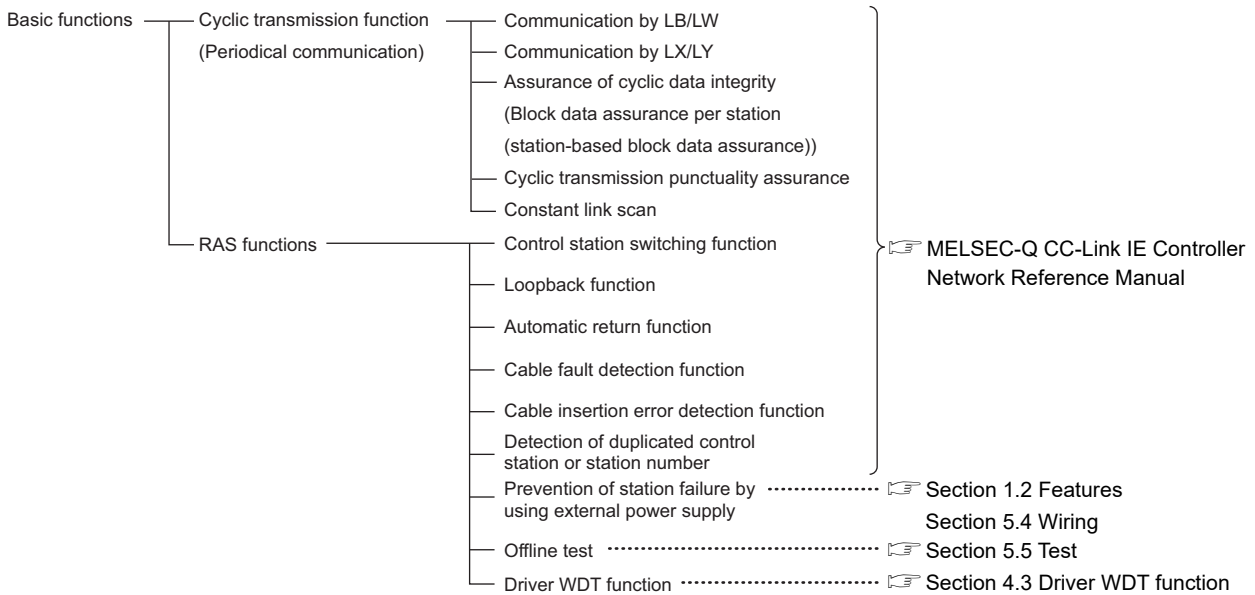
(1) Information on the own station

Item	SB	SW
Personal computer status of the own station (normal/abnormal)	SB004AH, SB004BH	SW004BH
External power supply status of the own station	SB0042H	—
Communication status between CC-Link IE Controller Network board and personal computer	SB0020H	SW0020H
Setting status of the CC-Link IE Controller Network board	SB0040H to 0044H, SB005CH, SB005DH, SB0060H SB00C0H	SW0040H to 0046H, SW0054H to 005DH, SW0063H, SW00C0H to 00C7H
Running status of the CC-Link IE Controller Network board	SB0047H to 0049H	SW0047H to 004AH

(2) Information on the entire network

Item	SB	SW
CPU and personal computer status of each station (normal/abnormal)	SB0100H SB0110H	SW0100H to 0107H, SW0110H to 0117H
CPU and personal computer operating status of each station (RUN/STOP)	SB00F0H	SW00F0H to 00F7H
Cyclic transmission status of each station	SB00B0H	SW00B0H to 00B7H
External power supply status of each station	SB0180H, SB0190H	SW0180H to 0187H SW0190H to 0197H
Communication mode	SB0060H	SW0063H
Setting status of the network	SB0054H to 0056H, SB005CH, 005DH, SB0060H, SB00C0H	SW0054H to 0057H, SW0059H to 005DH, SW00C0H to 00C7H
Running status of the network	SB00A0H	SW00A0H to 00A7H
Line status	SB0064H to 0065H	SW0064H, SW0065H, SW0068H to 006BH, SW0070H to 0071H, SW0080H to 0081H

CHAPTER 12 APPLICATION FUNCTIONS



12.1 Transient Transmission Function

This function performs data communication with other station's programmable controller when a request is made from the MELSEC Data Link Library.

Chapter 10 MELSEC DATA LINK LIBRARY

Communication can be made with programmable controllers on the same or other networks.

An access to other stations from the CC-Link IE Controller Network Device Monitor Utility is performed in transient transmission.

In the CC-Link IE Controller Network, data communication can be performed with other stations on the same network (where the own station is connected), as well as with stations on other networks.

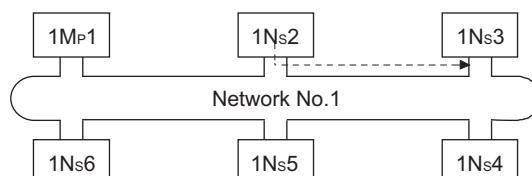
Note that the specification range of the target station number differs depending on the CPU module of the own station.

Target station	Own station (request source)	
	Universal model QCPU, LCPU, RCPUCPU	High Performance model QCPU
Station No. 1 to 64	○	○
Station No. 65 to 120	○	×*1

○: Available, ×: N/A

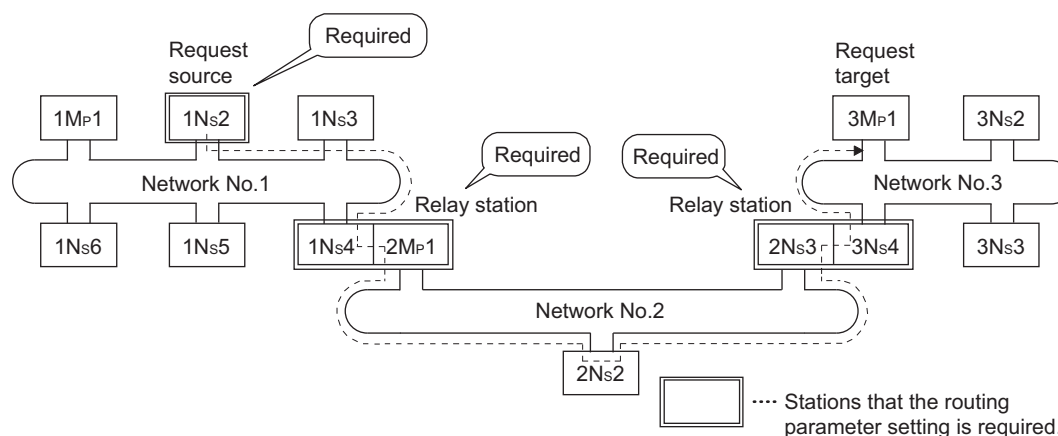
*1: When the own station is in multiple CPU system, it can access the station numbers 65 to 120 via the CC-Link IE Controller Network module under control of the High Performance model QCPU by connecting peripherals to the Universal model QCPU.

(a) Transient transmission to a station on the same network



(b) Transient transmission to a station on another network (routing function)

When accessing a station on another network, the routing parameter setting is required for the request source and the relay stations.



12.1.1 Communication function

(1) Supplementary setting

Set the execution conditions for the transient transmission.

(a) Constant scan

Set a time for constant link scan.

(b) Block data assurance per station

Set whether to guarantee cyclic data in station units.

When the "Block data assurance per station is available" checkbox is checked, link refresh is performed handshaking between the personal computer and the CC-Link IE Controller Network board.

(c) Punctuality is guaranteed.

When the "Punctuality is guaranteed" checkbox is checked, each station executes the transient transmission for the number of times specified in "Maximum No. of transients in one station", which keeps the link scan time constant.

(d) Maximum No. of transients in one station.

Set the number of transient transmissions that one station can be executed in one link scan.

Change the number of transient transmissions executed in one link scan as necessary. (See POINT below)

Setting item		Setting value	Initial value	Setting range
Constant scan			None	1 to 500 ms
Block data assurance per station			Checked	Checked/Unchecked
Transient transmission	Punctuality is guaranteed.		Checked	Checked/Unchecked
	Maximum No. of transients in one station.		2	1 to 10

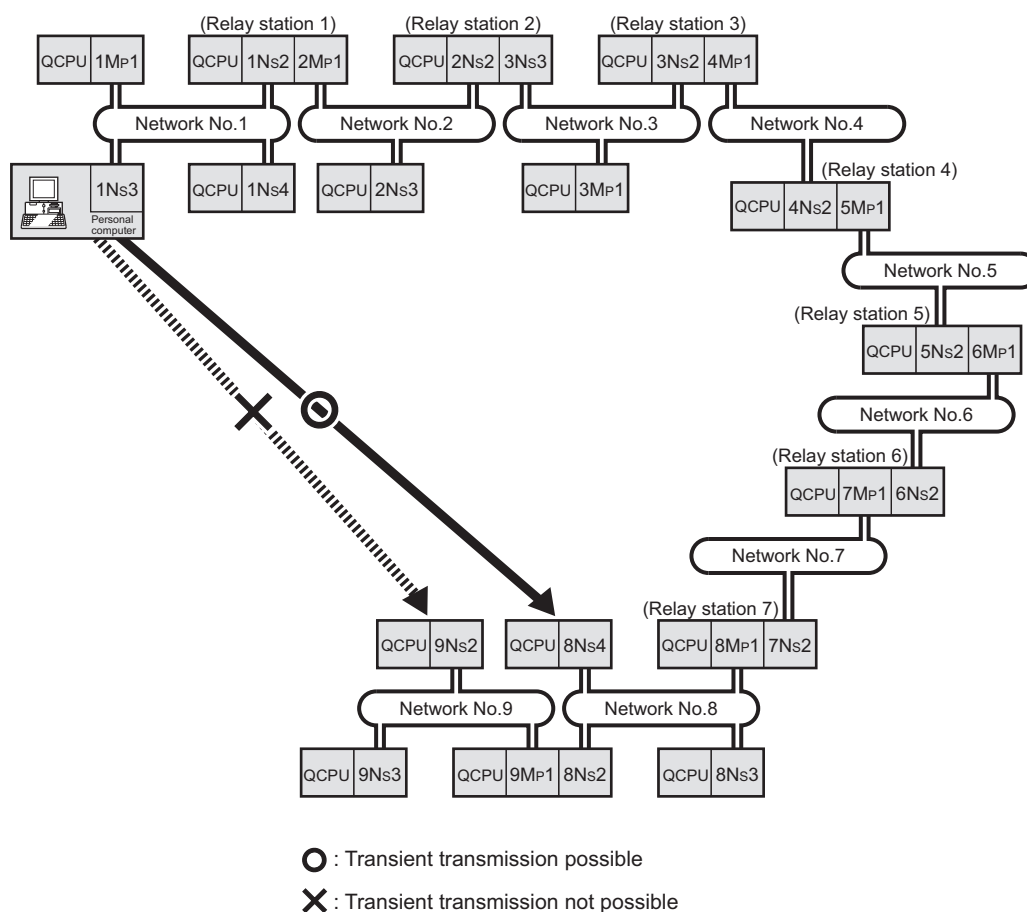
POINT

- (1) By increasing the number of transients, multiple transient instructions can be executed at the same time (in one link scan).
- (2) If the number of transients is increased and the transient request was issued in each station at the same time, the link scan time becomes temporarily longer and the cyclic transmission is also affected. Do not set unnecessarily large values.

(2) Transient transmission range

In a multiple network system of the CC-Link IE Controller Network, communication can be performed with a station in a maximum of eight networks away by setting the routing parameters.

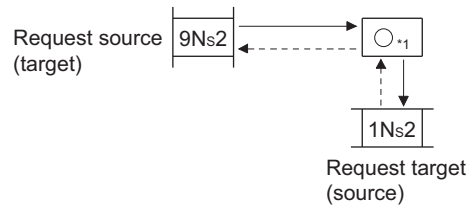
☞ Section 12.1.2 Routing function



[Transient transmission valid range]

The following table shows the valid ranges of transient transmission using the network configuration on the previous page.

In the table below, ◎, ○, and × indicate whether the transient transmission between the request source (destination) listed in the column at the left and the request destination (source) listed in the row at the bottom is possible. For example, the transient transmission from 9Ns2 of network number 9 to 1Ns2 of network number 1 is ○^{*1}.



Network No.1	1Mp1	Own station																	
	1Ns2	○	Own station																
	1Ns3	○	○	Own station															
	1Ns4	○	○	○	Own station														
Network No.2	2Mp1	○	Own station	○	○	Own station													
	2Ns2	○	○ ₊₁	○	○	○	Own station												
	2Ns3	○	○ ₊₁	○	○	○	○	Own station											
Network No.3	3Mp1	○	○	○	○	○	○ ₊₁	○	Own station										
	3Ns2	○	○	○	○	○	○ ₊₁	○	○	Own station									
	3Ns3	○	○	○	○	○	Own station	○	○	○	Own station								
.	.	.	.	.	.	.	.	.	.	.	.								
	.	.	.	.	.	.	.	.	.	.	.								
	.	.	.	.	.	.	.	.	.	.	.								
Network No.8	8Mp1	○	○	○	○	○	○	○	○	○		Own station							
	8Ns2	○	○	○	○	○	○	○	○	○		○	Own station						
	8Ns3	○	○	○	○	○	○	○	○	○		○	○	Own station					
	8Ns4	○	○	○	○	○	○	○	○	○		○	○	○	Own station				
Network No.9	9Mp1	○	○	○	○	○	○	○	○	○		○	Own station	○	○	Own station			
	9Ns2	×	○ ₊₁	×	×	○	○	○	○	○	○		○	○ ₊₁	○	○	○	Own station	
	9Ns3	×	○ ₊₁	×	×	○	○	○	○	○	○		○	○ ₊₁	○	○	○	○	Own station
Request source (target) \ Request target (source)		1Mp1	1Ns2	1Ns3	1Ns4	2Mp1	2Ns2	2Ns3	3Mp1	3Ns2	3Ns3		8Mp1	8Ns2	8Ns3	8Ns4	9Mp1	9Ns2	9Ns3
		Network No.1				Network No.2			Network No.3				Network No.8				Network No.9		

◎ : Possible

○ : Possible by setting the routing parameters

×

*1: The transient transmission is possible by specifying a network module close to the request source of the same programmable controller.

12.1.2 Routing function

The routing function allows the transient transmission to a station located on another network number in a multiple network system.

In order to execute the routing function, it is necessary to set the "routing parameters" to associate the network number of the request source and the station that functions as a relay station.

The following is the precautions on setting routing parameters.

(1) Transient transmission range

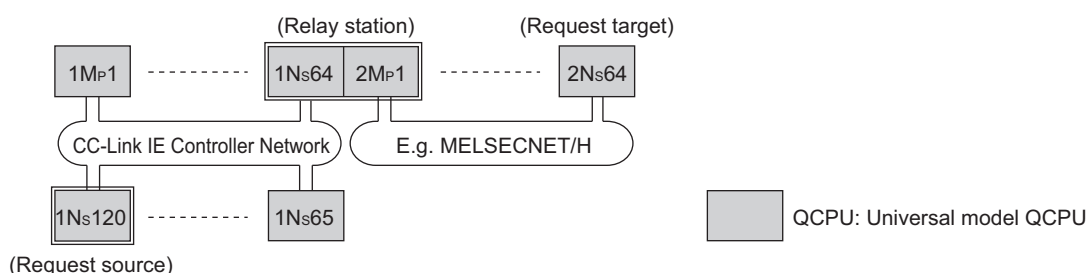
Communication can be made with a station on the eighth farthest network system.

(No. of relay stations: 7)

(2) Access conditions when the station number of request source, request target or relay station of the CC-Link IE Controller Network is 65 or higher

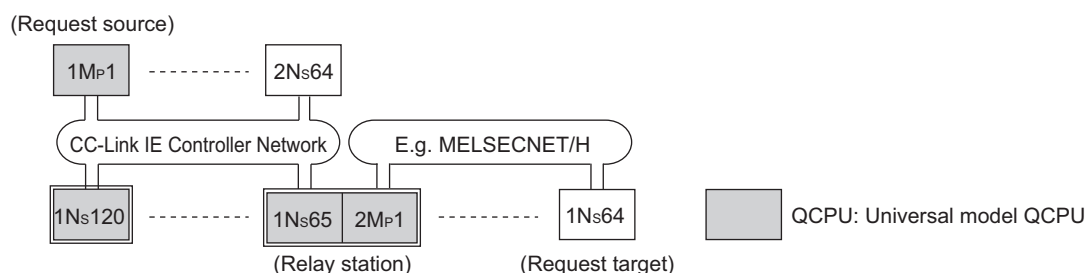
- 1) When the station number of the request source or request target is 65 or higher
Accessible with the following conditions

- The request source and request target are the Universal model QCPUs or CC-Link IE Controller Network board.
- The relay station of the CC-Link IE Controller Network is the Universal model QCPU.



- 2) When the relay station number of the CC-Link IE Controller Network is 65 or higher
Accessible with the following conditions

- The request source is the Universal model QCPU or CC-Link IE Controller Network board.
- The relay station of the CC-Link IE Controller Network is the Universal model QCPU.



POINT

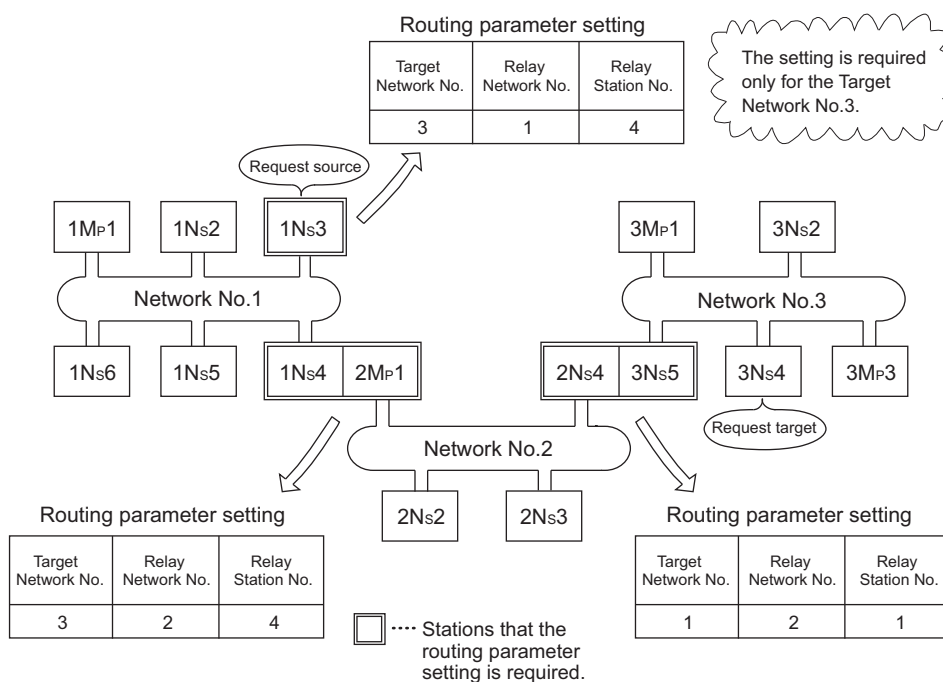
The CC-Link IE Controller Network board cannot be used as a relay station. Use the network module connected to the programmable controller CPU for the relay station.

(3) Stations that require routing parameter setting

- The setting is required for both the transient transmission request source and relay stations.
- For the relay stations, two routing settings are required: one from the request source to the request target, and the other from the request target back to the request source.
- The setting is not required for the request target.

In the example where the transient transmission is executed from 1Ns3 to 3Ns4 shown in the figure below, the setting is required for the three stations:

- Setting for 1Ns3 that requests the transient transmission
Specify (3) for the Target Network No., (1Ns4) for the Relay Station No., and (1) for the Relay Network No.
- Setting for 1Ns4 that functions as a relay station
Specify (3) for the Target Network No., (2Ns4) for the Relay Station No., and (2) for the Relay Network No. The return route setting is not required because it is specified in the setting for 2Ns4.
- Setting for 2Ns4 that function as a relay station
The route setting to the transfer target is not required because the own station is on the same network with the transfer target network No. (3). However, the return route setting is required. Specify (1), the transfer source network No., for the Target Network No., (2Mp1) for the Relay Station No., and (2) for the Relay Network No.



(4) Routing parameter setting

(a) Setting screen

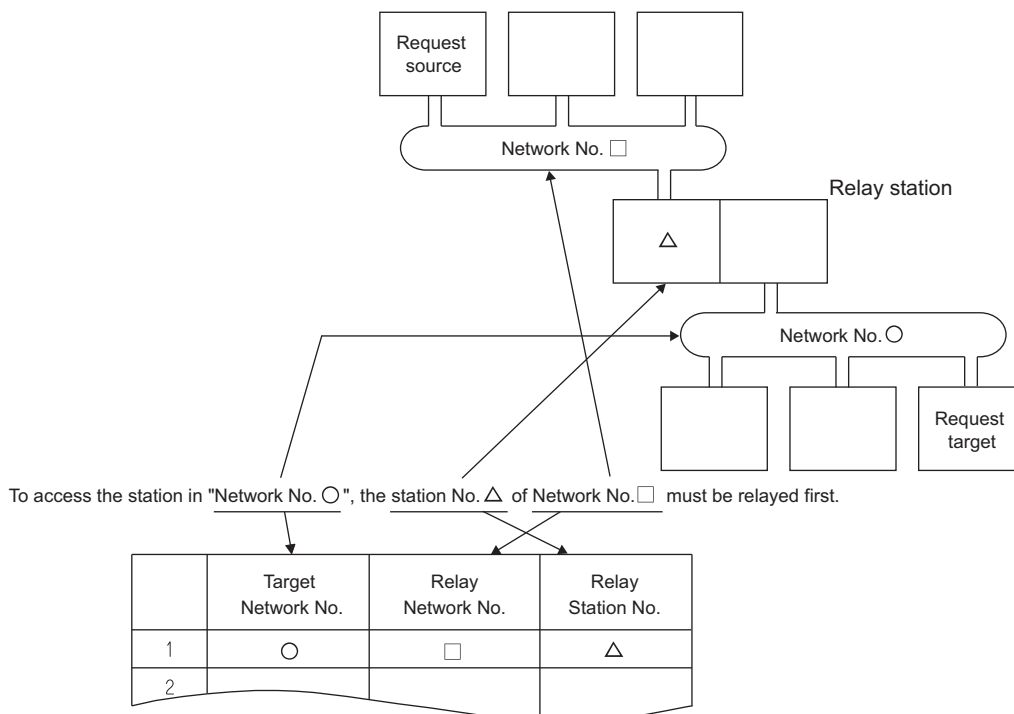
Up to 64 "Target Network No." can be set on the "Routing Parameter Setting" screen of the CC IE Control utility.

The same target network number cannot be set more than one (multiple). For this reason, the own station may become a request source, and up to 64 types of "Target Network No." can be used to access to other stations through the own station.

Setting item	Description	Valid setting range
Target network No.	Set a network No. of another network.	1 to 239
Relay network No.	Set a network No. of own network.	1 to 239
Relay station No.	Set a station No. of the relay station in own network.	1 to 120
Maximum size of transient transmission when relaying other networks.	Set the maximum transmission size of transient transmission.	960 words 480 words

(b) Setting method

Set the routing parameters according to the procedure described below.

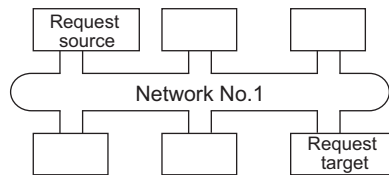


(5) Setting required stations and contents for different network system configurations

The stations and contents of the routing parameter setting for the transient transmission depend on the system configuration.

(a) Single network system

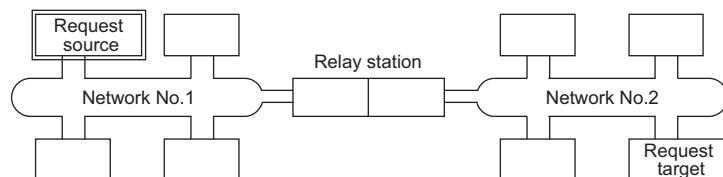
The routing parameter setting is not required for the transient transmission within the same network.



(b) Multiple network system: with two networks

Set the routing parameters only for the request source station.

The route to the request target (Network No.2) is set for the request source station.



(c) Multiple network system: with more than two networks

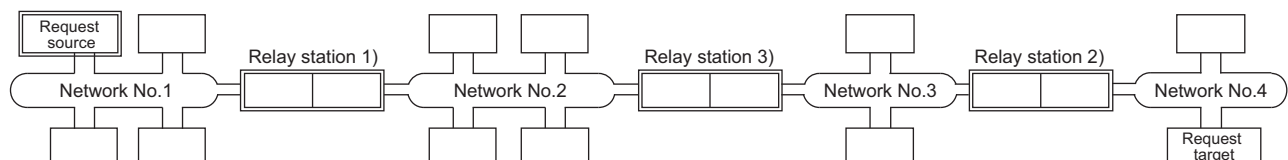
In the example below, the configuration with four networks is used.

Set the routing parameters for the request source station and the relay stations. The route to the request target (Network No.4) is set for the request source station.

The route to the request target (Network No.4) is set for the relay station 1) (the one which is the closest to the request source).

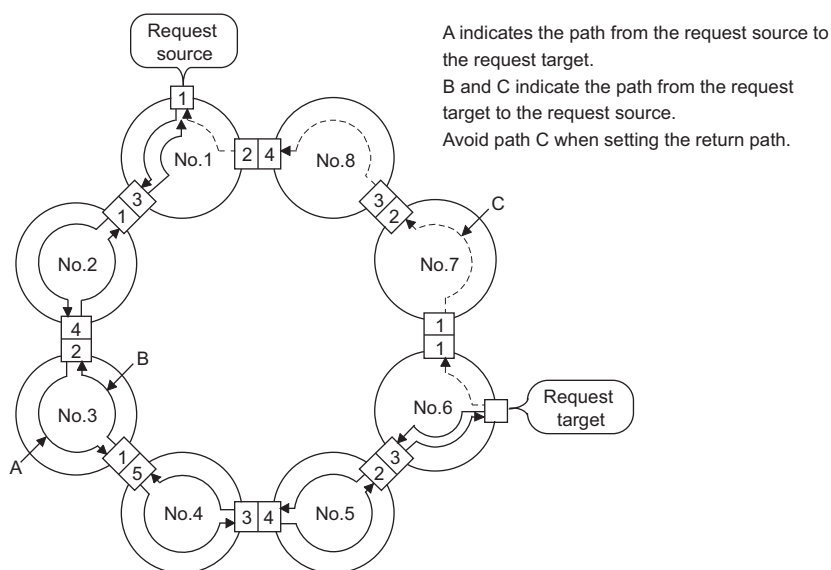
The route to the request source (Network No.1) is set for the relay station 2) (the one which is the closest to the request target).

The routes to both the request target (Network No.4) and the request source (Network No.1) are set for the relay station 3) (the one other than 1) and 2)).



POINT

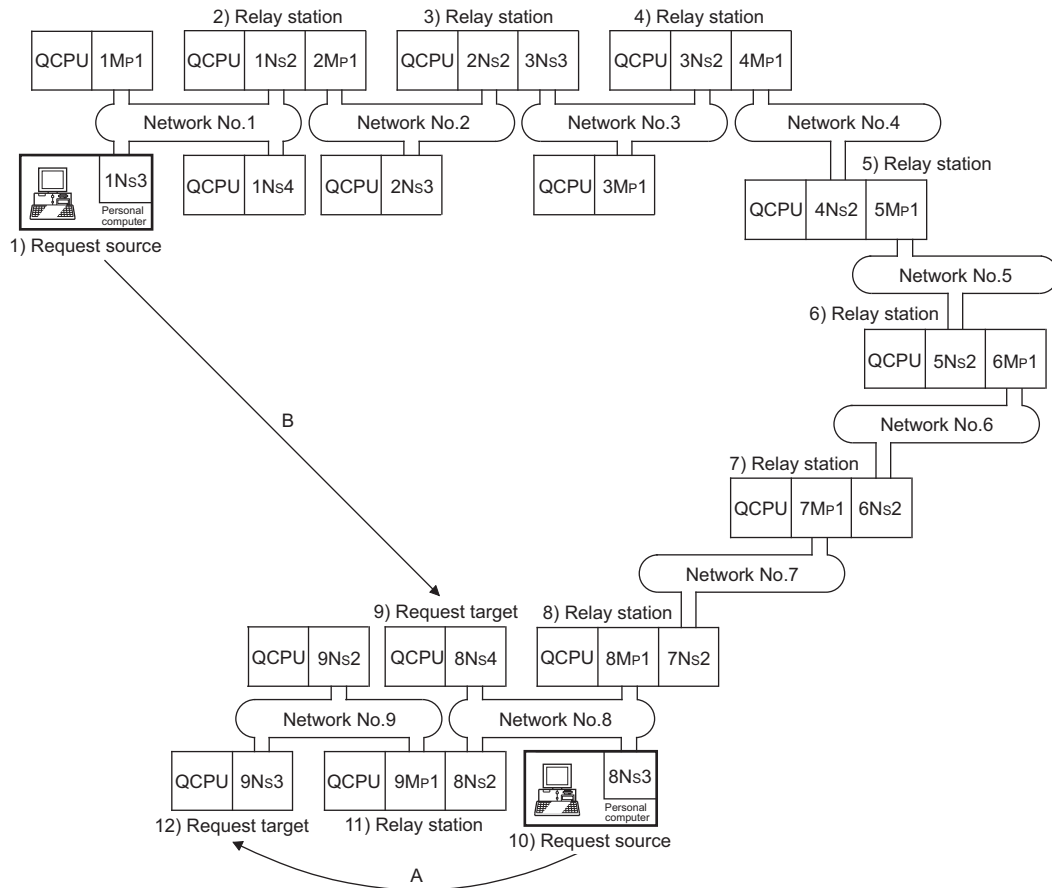
- (1) When networks are connected in a loop as shown in the figure below, make sure to set the routing parameters so that the same relay stations are routed for both the "route from the request source to the request target" and the "route back from the request target to the request source". Do not set the parameters so that the route to and from goes around the entire loop. Since the first relay station in the return path from the request target is determined by the station relayed in the forward path, data cannot be transferred to a station in the different path, which results in an error.



- (2) When transient transmission is performed to a remote network using the routing parameters, the amount of transmission data and the number of transmissions may affect the entire system since data is transferred through many networks. For example, in networks No.2 to 5 in the figure above, the link scan time may become temporarily longer and the transient transmission within the own station may be delayed because of the transient transmissions from other networks. When using the routing parameters, design the route considering the entire system.

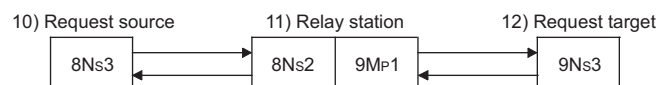
(6) Setting example

The routing parameter setting examples (A and B) are explained using the system configuration described in Section 12.1.1(2).



(a) Setting example A

The routing parameter setting is required for the request source 10).

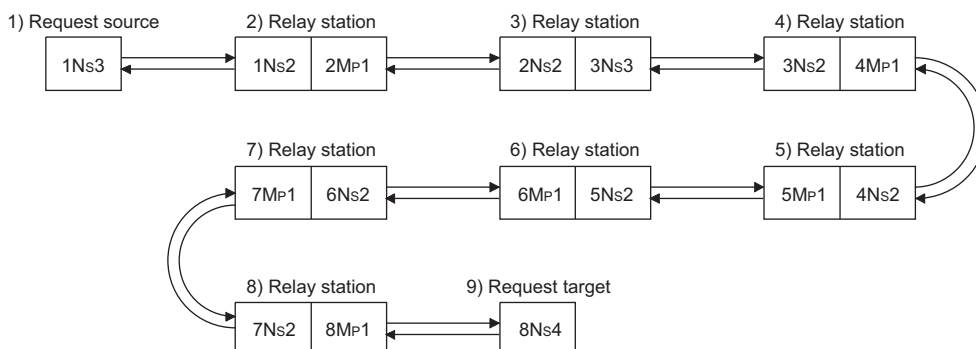


	No.	Target network No.	Relay network No.	Relay station No.
10) Request source	1	[9]	[8]	[2]

(b) Setting example B

The routing parameter setting is required for the request source1), relay station 2), relay station 3), relay station 4), relay station 5), relay station 6), relay station 7), and relay station 8).

In addition, two types of routing parameters can be set; one is for sending data from the request source to the request target (when sending a request), and the other for returning from the request target to the request source (when sending a response). Either setting or both settings must be required for each station.



	No.	Target network No.	Relay network No.	Relay station No.	
1) Request source	1	[8]	[1]	[2]	Used when sending a request
2) Relay station	1	[8]	[2]	[2]	Used when sending a request
3) Relay station	1	[8]	[3]	[2]	Used when sending a request
	2	[1]	[2]	[1]	Used when sending a response
4) Relay station	1	[8]	[4]	[2]	Used when sending a request
	2	[1]	[3]	[3]	Used when sending a response
5) Relay station	1	[8]	[5]	[2]	Used when sending a request
	2	[1]	[4]	[1]	Used when sending a response
6) Relay station	1	[8]	[6]	[2]	Used when sending a request
	2	[1]	[5]	[1]	Used when sending a response
7) Relay station	1	[8]	[7]	[2]	Used when sending a request
	2	[1]	[6]	[1]	Used when sending a response
8) Relay station	1	[1]	[7]	[1]	Used when sending a response

(7) Calculation of transmission delay time

The processing time to access a station on another network using the MELSEC Data Link Library functions in a multiple network system can be obtained by adding the following transmission delay factors.

$$\begin{aligned} (\text{Routing transmission delay time}) = & (\text{processing time from request source to relay station}) \\ & + (\text{processing time from relay station to request target}) \end{aligned}$$

(a) Processing time from request source to relay station

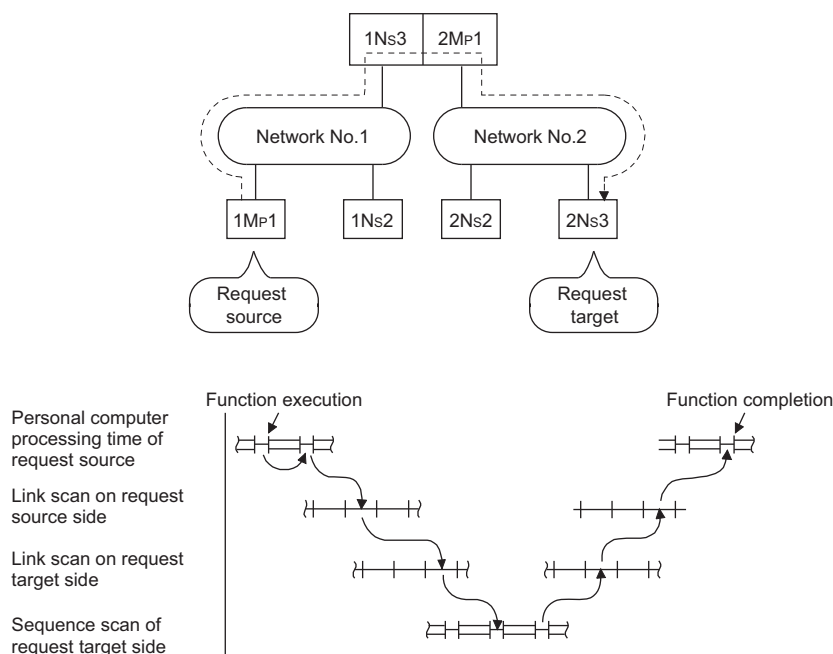
This is the transmission delay time from the request source (the station that executed the function) to the routing relay station. In the following example, it is the time required for the data to be transmitted from station 1Mp1 to station 1Ns3. For the calculation of translation delay time, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

(b) Processing time from relay station to request target

This is the transmission delay time from the relay station to the request target (the station to be accessed). In the following example, it is the time required for the data to be transmitted from station 2Mp1 to station 2Ns3. For the calculation of translation delay time, refer to the following manual.

☞ MELSEC-Q CC-Link IE Controller Network Reference Manual



Remarks

When more than two networks are relayed using the routing function, add the processing time from one relay station to the other relay station to the routing transmission delay time.

12.1.3 Group function

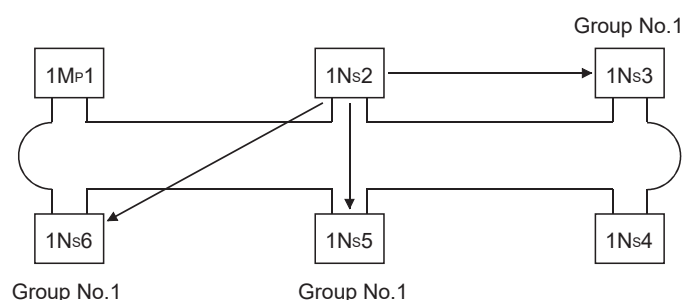
This function specifies transient transmission target stations as a group and transmits data to all stations in a group with a single transient transmission.

One network can be divided into up to 32 groups.

This function is used for the Network diagnostics on the CC-Link IE Controller Network board.

(1) Visual representation of the function

The following figure shows an example of the group function. When the transient transmission is executed specifying group No.1 by 1Ns2, all of the three stations, 1Ns3, 1Ns5, and 1Ns6, can read the data.



(2) Setting method

Set the group number of the CC-Link IE Controller Network board using the "Parameter setting" screen of the CC IE Control utility.

12.1.4 SEND/RECV function

The SEND/RECV function sends/receives data to/from other station's programmable controller using the MELSEC data link library function.

This function supports the SEND/RECV instruction of link dedicated instruction.

POINT

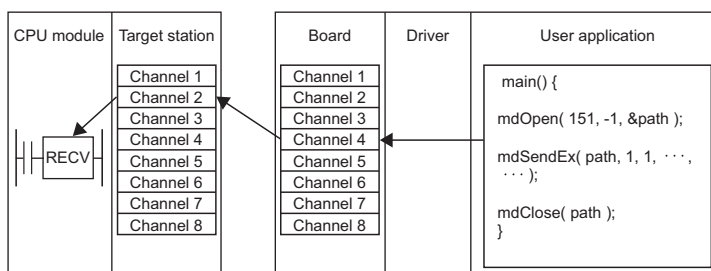
For details of the functions, refer to the following manual.

 MELSEC Data Link Library Reference Manual

(1) SEND function

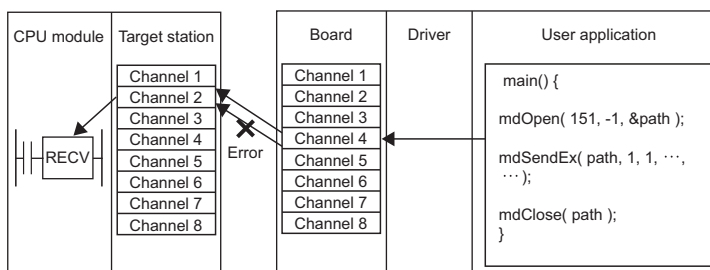
The SEND function sends data from the own station to the specified channel of the specified station using the mdSend/mdSendEx function.

Two execution types, "arrival acknowledgment" and "no arrival acknowledgment", are available for the SEND function. When sending data with "no arrival acknowledgment" execution type, all stations in group numbers can be specified as target stations.



POINT

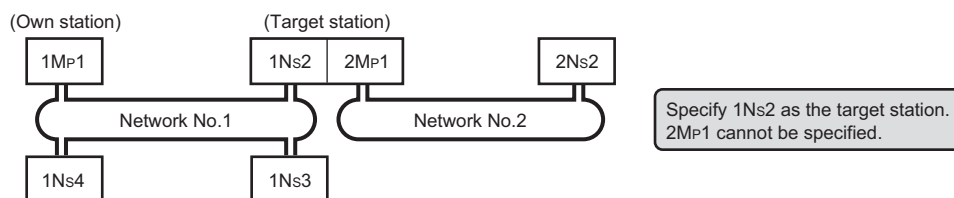
(1) An error occurs when data are sent to the same channel which is being used.



- (2) Only an even number byte can be specified for a send data size.
- (3) Logical station numbers cannot be specified.
- (4) Even if the process of data send is completed normally with "arrival acknowledgment" execution type, data may not be received when the target station is a board. For details, refer to the RECV function.

POINT

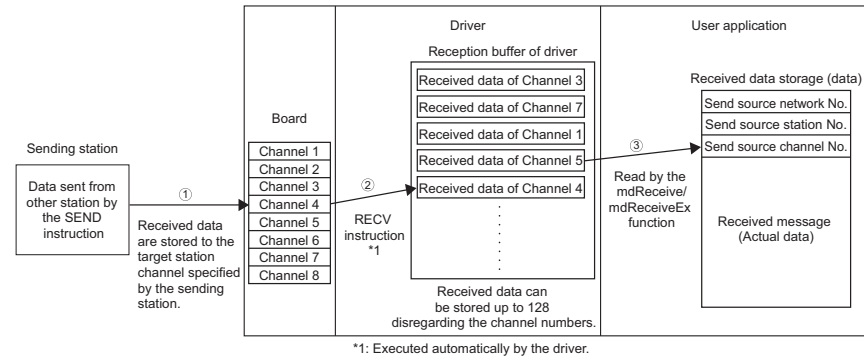
- (5) The multiple network modules are installed on the target station
Specify the network number and station number of the network module which is to be received request from the own station. Specify 1Ns2 in the following example. (2MP1 cannot be specified.)



(2) RECV function

The RECV function reads data received by the board from the other station using the mdReceive/mdReceiveEx function.

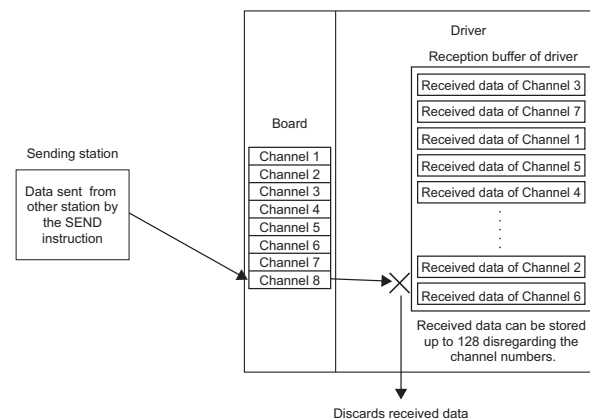
< RECV function overview >



- ① The board receives data sent from the other station by the SEND instruction/SEND function, and stores data to the target station channel specified at the sending side.
- ② After the board receives the data, the driver automatically executes the RECV instruction and stores the received data to the reception buffer of the driver. All data received and individually stored to channels of the board are stored to the one reception buffer of the driver which can store up to 128 of data.
- ③ Reads data of the specified channel number in the received order from the data stored in the reception buffer of the driver using mdReceive/mdReceiveEx function.

< Operation when 128 received data are already stored in the reception buffer of the driver >

When 128 received data are already stored in the reception buffer of the driver, the subsequent data are received by the board once, but the driver automatically discards those received data at the time of storage to the reception buffer of the driver. When the sending side sent data with "arrival acknowledgment" execution type, the process of send data is completed normally at the sending side, but data are discarded.



< Precautions for using RECV function >

- ① When receiving data to the multiple channels of the board, create a user program to read data from all channels that receive data.

If a channel from which data are not read exists in the channel from which data are received, the received data of the channel from which data are not read are accumulated in the reception buffer of the driver and all area of 128 data are occupied.

In this case, the received data of other channels cannot be read because the driver automatically discards subsequent data received by the board.

- ② When attempting data read by executing the mdReceive/mdReceiveEx function immediately after the send data completion at the sending station, an error, "71 (0047H): No reception data error", occurs because the driver has not completed the RECV function and thus the receive data have not yet stored to the reception buffer of the driver.

Retry the operation after waiting for a while.

- ③ When attempting data send consecutively, an error, "Channel busy (dedicated instruction) error", occurs at the sending station because the channel is being used by the driver and thus the sent data cannot be received.

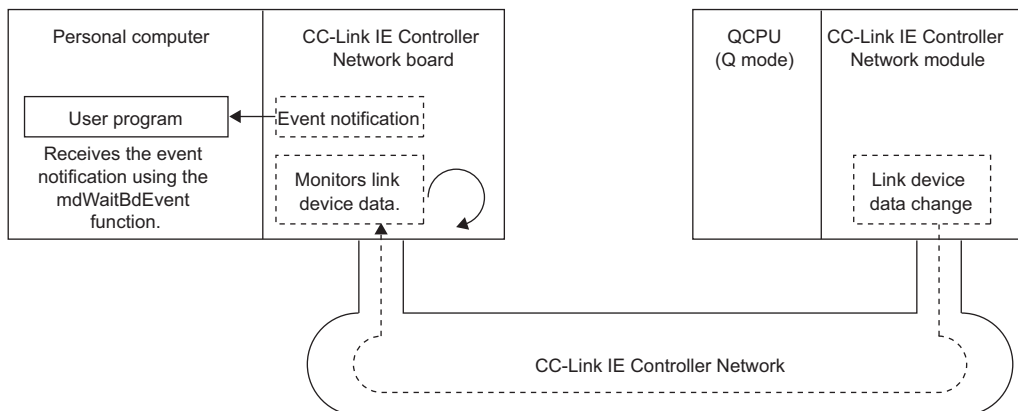
Follow the measures described below.

- (a) Retry the operation after waiting for a while.
- (b) Change the target station channel.

12.2 Event Setting Function

The event function monitors link devices using the CC-Link IE Controller Network board, and notifies events to the user program when the set conditions are met.

By using this function, the link devices can be monitored efficiently without reading link devices regularly by the user program.



The following shows the features of the event function.

- (1) The user program to read and check link devices regularly does not need to be created, since the event function monitors link devices using the CC-Link IE Controller Network board according to the specified event settings. The satisfaction of the event conditions is notified in the user program by performing the process that waits for the events issued from the CC-Link IE Controller Network board when the conditions are met, using the mdWaitBdEvent function of the MELSEC data link library. Therefore, the link devices can be monitored efficiently.
- (2) In the parameter for the detection condition of link devices, the maximum total of 4086 (64 x 64) points of bit devices can be monitored, since the maximum of 64 events can be set, and the maximum of 64 points can be registered per event when specifying bit devices.
- (3) The changes of word device values can be monitored.

☒ POINT

- (1) Events are notified every link refresh cycle.
The current value of the operating link refresh time can be checked on the "Board detail information" screen.
The link refresh cycle can be set on the "Driver setting" screen.
 - (2) Set the refresh parameter as link devices for monitoring are included in the refresh range. If they are not included in the refresh range, events are notified, but the devices for monitoring cannot be accessed.
 - (3) For details of the functions, refer to the following manual.
 MELSEC Data Link Library Reference Manual
-

CHAPTER 13 ERROR CODES

For error codes and error messages returned when errors occur, refer to the following manual.

☞ CC-Link IE Controller Network Interface Board User's Manual

For error codes of the MELSEC data link library functions, refer to the following manual.

☞ MELSEC Data Link Library Reference Manual

Memo

[illegible]

CHAPTER 14 TROUBLESHOOTING

This section explains the identification of the causes and corrective actions when an error occurred.

(1) Basic checking procedure

Check if there is the corresponding error symptom depending on the situation.

( Section 14.1)

If the corresponding error could not be found, check the cause by following the procedure shown below.

1. Check if all the boards installed on a personal computer are displayed with the utility.
 - Check on the board list screen
 - Check on the Event Viewer screen ( Section 14.5.2)
 - Check on the Device Manager screen ( Section 14.5.3)
2. Check the LED display of the board.
 - Check the LED status ( Section 14.3)
3. Check the error occurring at the utility.
 - Check with test ( Section 5.5)
 - Check with CC-Link IE Controller network diagnostics
4. Check the access target device.
 - Check if the board operates as set to the parameter or program by checking whether the link devices perform communication, or transient send/receive performs normally with the device monitor utility.
( MELSEC Data Link Library Reference Manual)
5. Check the user program.
 - Check the arguments of the communication function
 - Check the returned values of the communication function
( MELSEC Data Link Library Reference Manual)

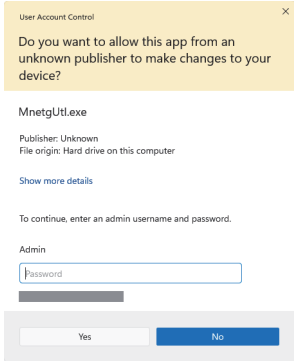
(2) When error cannot be solved

If the troubleshooting above does not help, refer to  Section 14.9.

14.1 Cause Determination Methods for Each Trouble

When a trouble occurs, refer to the table below for methods to determine the cause.

No.	Trouble description	Determination method/Action
1	The CC-Link IE Controller Network board did not normally operate at start-up. When executing a user program, system down (blue screen) or system reset occurred on the operating system.	Refer to Section 14.3.
2	Although the CC-Link IE Controller Network board, control station, and normal stations were connected, the data link failed.	Refer to the flowchart in Section 14.5.
3	An error occurred during data link. 1) An unexpected value is input to a specific link device (B, W, X, Y). 2) Data cannot be written or read even though device access was made using communication function in the user program. 3) Communications are occasionally disabled while the user program is executed.	Refer to the flowchart in Section 14.6.
4	The external power supply function did not correctly operate.	Refer to Section 14.7.
5	Action for Driver WDT error	Refer to Section 14.8.
6	The software is not normally installed.	Refer to Section 14.2.1.
7	The software is not normally uninstalled.	Refer to Section 14.2.2.
8	The driver is not normally installed. A " ! " mark is displayed next to the icon of the driver on the Device Manager screen.	Refer to Section 14.3.3.
9	Load of the PC CPU is heavy. • The application of high CPU utilization is in operation.	1) Start "Windows Task Manager", Windows® standard function, and select the application of high CPU utilization on the <<Performance>> or <<Processes>>. 2) Reduce the operation frequency (performance) of the application of high CPU utilization. 3) When interrupts from the CC-Link IE Controller Network board are frequent, reduce the frequency. For example, set a longer event occurrence interval using the event function.

No.	Trouble description	Determination method/Action
10	The user account control screen in which the password is required to be entered 	When the utility is activated, and if the following User Account Control screen is displayed requesting a selection of user with administration authority and password entry^{*1}, the user who is logging on to the system does not have an administrator authority. Log off the system and login again as a user with administrators authority, and activate the utility.
11	ACPU/QnACPU/QCPU (A mode) CPU modules cannot be accessed.	ACPU/QnACPU/QCPU (A mode) CPU modules cannot be accessed to the 64-bit version of user application. Use 32-bit version of user application.
12	Any of the following errors occurred at the completion of the parameter setting. • Duplication of station No. and control station setting of the own station (error code: E508H) • Own station No. duplication error (error code: E509H) • Duplication of the own station's control station setting (error code: E50AH)	When the operation settings of two or more boards are changed at the same time, an error of duplicated station number or duplicated control number may occur temporarily. Reset the board on which any of the errors described on the left is detected on the Board detail information screen.
13	The utility screen is not displayed properly. The operations of utility cannot be performed.	1) Check if the display settings on the [Device Manager] or other relevant functions are correct, and install an appropriate display driver. Or update the Windows® operating system. 2) Close the other applications. 3) Change the Hardware accelerator setting of the display setting.
14	The driver does not start up.	1) Install the board. 2) Check if the board is recognized normally on the "Device Manager" screen (➡ Section 14.3.3) 3) When the board is recognized normally on the Device Manager screen, check if an error has been occurred on the Event Viewer screen. (➡ Section 14.3.2)

*1: If only one user account with administrator authority is available, the User Account Control screen requests the password entry of its user only.

14.2 Troubleshooting of Installation/Uninstallation

The following explains the troubleshooting for error at installation or uninstallation.

14.2.1 Installation failed

When the installation is aborted or failed, reinstall the utility by the following procedure.

1. Check the installation/uninstallation precautions. (☞ Section 7.1)
2. Restart the personal computer.
3. If the utility can be uninstalled, uninstall it. (☞ Section 7.3)
After the uninstallation, restart the personal computer.
4. Install the utility again by following the installation procedure. (☞ Section 7.2)
(When the corrective action displayed on the screen is not effective ☞ Section 14.2.3)
5. If the personal computer does not operate normally after the reinstallaion, check if the personal computer has any problems.
 - Operating Environment ☞ Section 2.5
 - Checking personal computer and operating system ☞ Section 14.3.1

If the troubleshooting above does not help, refer to ☞ Section 14.9.

14.2.2 Uninstallation failed

When the uninstallation is failed, uninstall the utility after the reinstallation by the following procedure.

1. Check the installation/uninstallation precautions. (☞ Section 7.1)
If the creation of 8.3 filename is disabled, perform the operation (1) in this section.
2. Save the data for installation to the system drive, or insert an installation media to the drive.
3. Display the "Run" screen from the "Start" of Windows® or Quick Access Menu.
4. Append option "-A" and execute "Disk1\Setup.exe" in the installation data.
5. Install the utility again by following the installation procedure.
6. Perform the uninstallation.
7. If the utility cannot be uninstalled normally, check if the personal computer has any problems.
 - Operating Environment ☞ Section 2.5
 - Checking personal computer and operating system ☞ Section 14.3.1

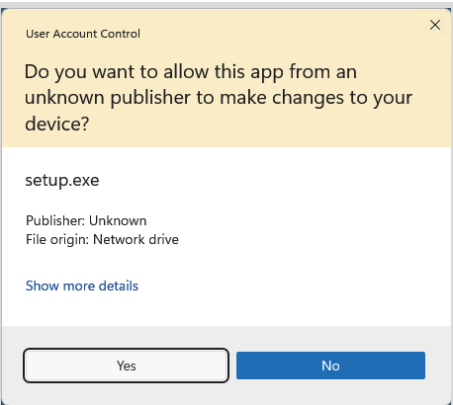
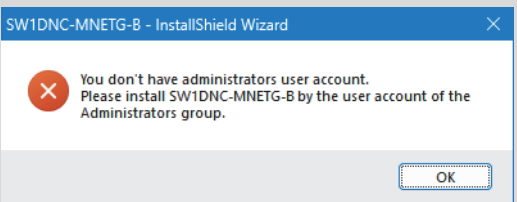
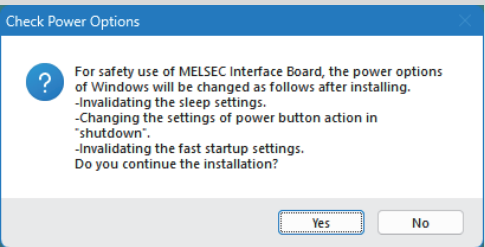
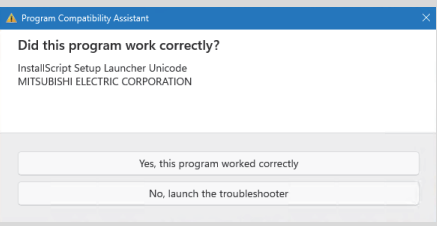
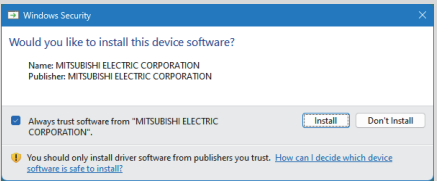
If the troubleshooting above does not help, refer to ☞ Section 14.9.

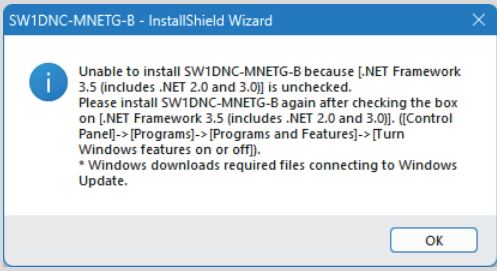
(1) Operation for the creation of 8.3 filename is disabled

1. Enable the creation of 8.3 filename.
2. Save the data for installation to the system drive, or insert an installation media to the drive.
3. Display the "Run" screen from the Start menu or Quick Access Menu of Windows®.
4. Append option "-G" and execute "Disk1\Setup.exe" in the installation data.
5. Perform the uninstallation.

14.2.3 When the corrective action displayed on the screen is not effective at installation

The following table shows the corrective actions when the screen is displayed.

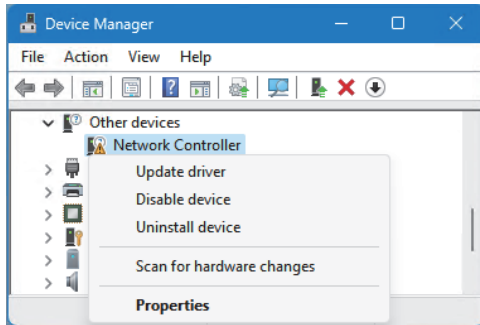
Screen	Corrective action
	This screen is displayed when user account control is enabled. Click the Yes button.
	This screen appears when the user account control is disabled and logging on as a user without the administrator authority. Check the user account control settings. (➡ Appendix 8 Windows User Account Control) Log off, and log on as a user with the administrator authority, then try again.
	Click the Yes button. MELSECPowerManager is installed and the Windows® Power Options settings are changed automatically. For details of MELSECPowerManager, refer to the following appendix. ➡ Appendix 10 MELSECPowerManager
	If this screen appears during or after the installation, click "Yes, this program worked correctly." If this screen appears when the installation is terminated, click the X button to close the screen. Do not select "No, launch the troubleshooter." An incorrect module may be installed.
	Confirm the publisher is "MITSUBISHI ELECTRIC CORPORATION", and click the Install button. This screen may be displayed a couple of times.

Screen	Corrective action
	The message is displayed when .NET Framework 3.5 (including .NET 2.0 and 3.0) is set to disabled. Reinstall the utility after searching the "Turn Windows features on or off" on the control panel and enabling the function of ".NET Framework 3.5 (including .NET 2.0 and 3.0)". The procedure when .NET Framework 3.5 (including .NET 2.0 and 3.0) is disabled is the same procedure as MELSOFT products. For details of the procedure, refer to the technical bulletin FA-A-0464.

14.2.4 When the driver is not installed

The driver is installed automatically when installing the board on the personal computer after installing the software package.

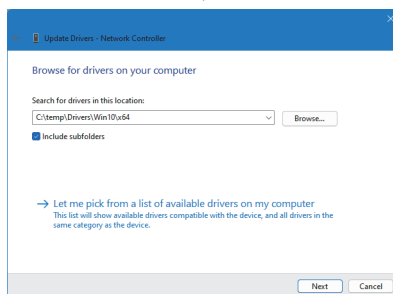
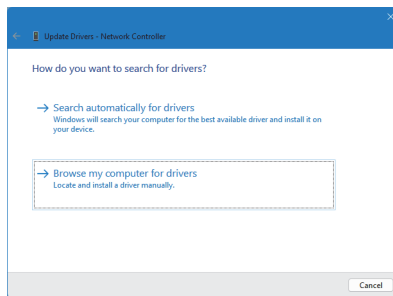
When the "Found New Hardware Wizard" screen is not displayed automatically after the board installation, update the driver on the "Device Manager" screen.



1) Open Windows Device Manager, and right-click any of the following then select "Update driver."

- "MELSECNET/G Device" - "PCI MELSECNET/G Controller"
- "MELSECNET/G Device" - "Network Controller"
- "MELSEC CC-Link IE Control Device" - "MELSEC CC-Link IE Control Controller"
- "MELSEC CC-Link IE Control Device" - "Network Controller"
- "Other devices" - "Network Controller"

2) Click "Browse my computer for drivers."



3) Set either of the following folders of software package for "Search for drivers in this location:."

- For 64-bit version operating system^{*1}: "\\Drivers\Win10\x64"
- For 32-bit version operating system^{*1}: "\\Drivers\Win10\x86"

4) Click the [Next] button.

^{*1}: The operating system can be checked by Windows system information. For details, refer to the Microsoft® Knowledge Base. support.microsoft.com/kb/827218 (As of July 2024)

(End)

If the troubleshooting above does not help, refer to Section 14.9

14.3 When CC-Link IE Controller Network Board did not Operate Normally

When the personal computer on which the board is installed is not started, or the system shut down or system reset is occurred, check the items following the procedure shown below.

1. Uninstall the board and check if the personal computer is started.
 - Checking personal computer and operating system  Section 14.4.1
2. After restarting the personal computer, check if there is any error.
 - Checking on Event Viewer screen  Section 14.3.2
3. Install the board and restart the personal computer.
 - Checking the board installation status  Section 5.3.3
 - Checking on Device Manager screen  Section 14.4.3

If the troubleshooting above does not help, refer to  Section 14.9.

After starting the personal computer on which the board is installed, check the items following the procedure written in Basic checking procedure. ( Chapter 14)

(1) The system shutdown occurred when driver is uninstalled or disabled

Do not uninstall or disable the driver on the "Device Manager" screen when the board is normally recognized.

If it is uninstalled or disabled, the operating system may shut down (blue screen).

14.3.1 Checking personal computer and operating system

Check if the personal computer or operating system have any problems.

Item	Corrective action
Is the power supply ensured?	Check the power outlet and power cable of the personal computer.
Does the board operate normally if uninstall the other optional boards?	• Change the installation location of the board. • Check the resource acquisition status of other board and change the resource on the BIOS setting screen or Device Manager screen. • Reinstall the driver of the other optional boards. • Replace the other optional boards.
Does the board operate normally on another personal computer?	• Reinstall the operating system after formatting HD. • Repair or replace the personal computer.

For the problem of the personal computer or operating system, contact the personal computer or operating system manufacturer.

14.3.2 Checking on Event Viewer screen

Check the operation of the board with Windows® Event Viewer screen.

Event logs related to the CC-Link IE Controller Network board are displayed as "AMnetg" or "Mccien" in the Source field on the Event Viewer screen.

(1) For error events

When an error occurs in a driver, the error description is displayed in the System Log field on the Event Viewer screen.

The following table explains actions for each error message.

POINT

When multiple errors occur, check the chronological order (time of occurrence) on the Event Viewer screen and handle the errors in the order.

Event ID.	Error message	Corrective action
257(0101 _H)	The I/F board was not found.	Check installed status of the CC-Link IE Controller Network board.
258(0102 _H)	There is no response from the hardware.	The board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.
259(0103 _H)	Too many boards were detected.	Remove the boards by the number exceeding the allowable number.
262(0106 _H)	Failed to link the device name.	Reinstall the OS.
264(0108 _H)	Failed to register the interrupt.	Reinstall the OS.
268(010C _H)	An error occurred during the receive process.	Check the personal computer program or programmable controller program which requests processing to the personal computer.
279(0117 _H)	An error occurred while the registry database is written.	- Restart the personal computer after installing SW1DNC-MNETG-B, and confirm that no error occurs. - Increase the system memory and/or disk capacity. - When the error has occurred at upgrading or updating the operating system with the software package installed, reinstall the software package.
280(0118 _H)	Own station received the request which was not processable from another station.	Check the personal computer program or programmable controller program which requests processing to the personal computer. When the communication route contains another station of the MELSEC iQ-R series, check that "Dynamic Routing" is set to "Disable".
282(011A _H)	Failed to map the I/O port.	The I/O port is overlapped with that of another resource. Remove the other option board.
286(011E _H)	Failed to allocate memory area for driver start.	Increase the memory.
287(011F _H)	No parameter or abnormal data	Set a parameter with the CC IE Control utility and reset the board.
288(0120 _H)	Driver WDT error occurred.	Refer to Driver WDT error. (Section 14.7.2)

Event ID.	Error message	Corrective action
291(0123H)	Failed to map the shared memory area.	- Remove another I/F board. - Change the I/O port address of another I/F board on the BIOS setting screen.
294(0126H)	The I/O port of the I/F board overlaps with that of another hardware.	- Remove another I/F board. - Change the I/O port address of another I/F board on the BIOS setting screen.
295(0127H)	Board WDT error occurred.	The board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.
296(0128H)	Clock stop error occurred in the board.	The board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.
297(0129H)	Target abort error occurred in the board.	The board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.
304(0130H)	Data parity error occurred in the board.	The board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.
305(0131H)	Entering sleep mode or hibernation mode, or fast startup is detected. The board is not operated normally because the sleep mode, hibernation mode, and fast startup is not supported by the board.	Change the power option not to enter the sleep mode, hibernation mode, or enabling fast startup and restart the personal computer.
307(0133H)	Link refresh error had occurred.	- Reset the board. - The memory may be insufficient. Please close other applications running. - Terminate the program and restart the personal computer. - Check the free space of the memory. - Check the board installation status. - The personal computer is faulty when other personal computers normally operate. Repair or replace the faulty personal computer. - When the same error occurs in another personal computer, replace the CC-Link IE Controller Network board. - Please contact your local Mitsubishi Electric service center or representative.
512(0200H)	PCI bus error occurred.	- When the same error occurs in another personal computer, replace the CC-Link IE Controller Network board. - The personal computer is faulty when other personal computers normally operate. Repair or replace the faulty personal computer.

Event ID.	Error message	Corrective action
539(021BH)	The breakdown of hardware was detected.	• Change the power option not to enter the sleep mode, hibernation mode, or enabling fast startup and restart the personal computer. • Restart the personal computer. If any of the above actions do not solve the error, the board may be a failure. Please contact your local Mitsubishi Electric sales office or representative.

*1: The event 256(0100H) may be registered to the log as an error when the versions of the driver and the application that are installed are different. Install the software package (SW1DNC-MNETG-B) whose version is the same as that of the installed driver.

(2) For information event

The following "information event logs" other than errors are displayed in the System Log field on the Event Viewer screen.

The corrective actions are not required for the following events.

Event No.	Description	Output timing
1024(0400H)	Driver started normally.	At driver startup
1025(0401H)	Board reset was executed.	At board reset (Except for board reset at driver startup)
1026(0402H)	Network range assignment was updated.	At parameter transmission by control station
1027(0403H)	State information was updated.	At driver operation log update

14.3.3 Checking on Device Manager screen

Check if the board is displayed on the Windows® Device Manager screen.

Item	Corrective action
Is the driver name of the board not displayed on the Device Manager screen?	The board or driver is not installed. - If the board is not installed, install the board. - If the board is already installed, check the board installation status and reinstall the board. - Reinstall the software package. - If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. - If the board does not operate normally on other personal computer, replace the board.
Is "!" displayed next to the icon on the Device Manager screen?	The driver installation failed, or the driver did not start normally. - Reinstall the software package. - Check the board installation status and reinstall the board. - If the board operates normally on other personal computer, the personal computer may have any problems. In this case, repair or replace the personal computer. - If the board does not operate normally on other personal computer, replace the board.
Is "Code 52" displayed on the "General" tab as the device status in the properties with "!" displayed next to the icon on the Device Manager screen?	The driver signature verification failed. Set the "Date & time" in the Windows settings, to the date after the "Original Install Date" of Windows, and then reinstall the software package. "Original Install Date" can be checked by running "systeminfo" at the command prompt.

If any of the above actions do not solve the error, refer to  Section 14.9.

Remarks

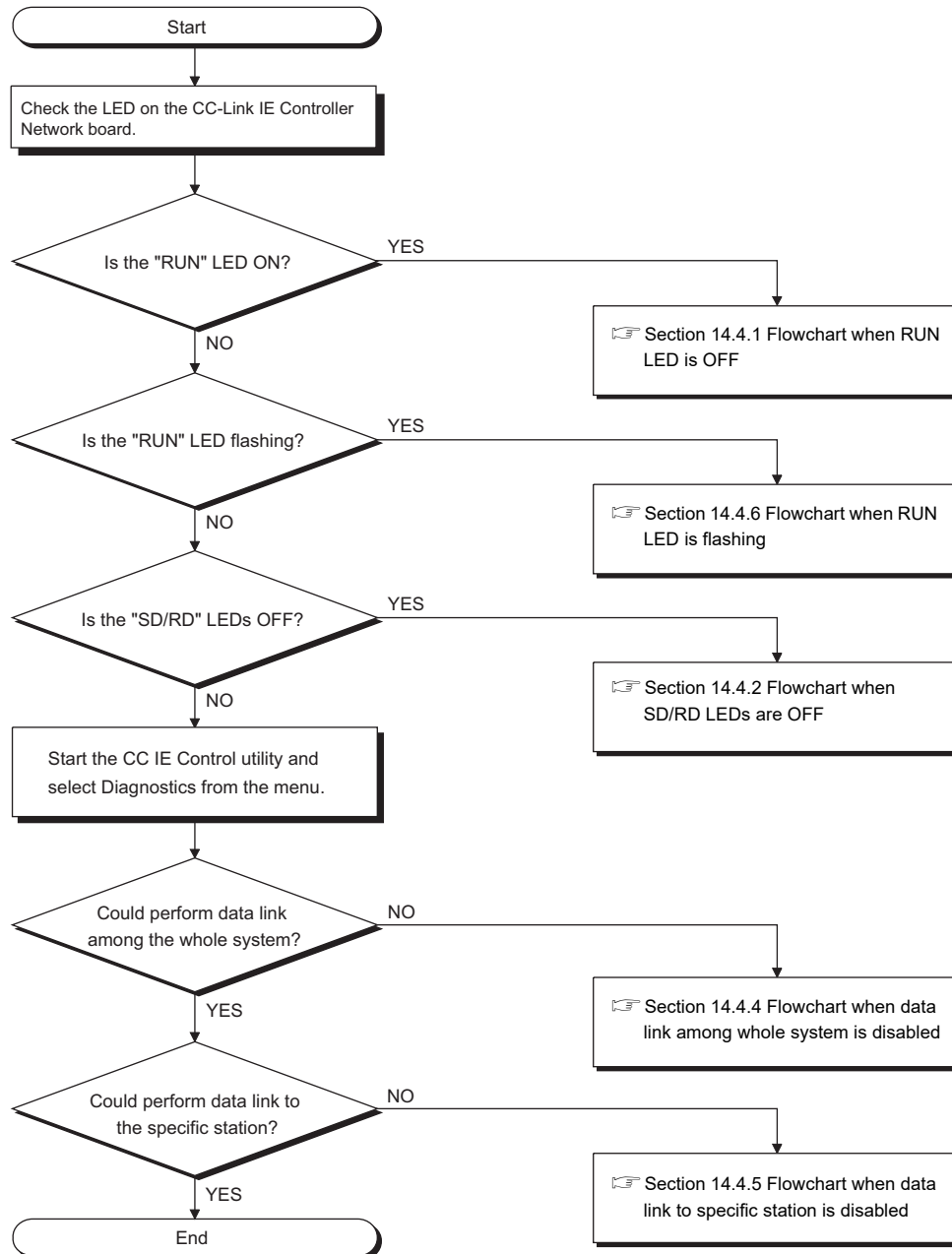
"?" is displayed next to the icon, however, the CC-Link IE Controller Network board is recognized normally.

POINT

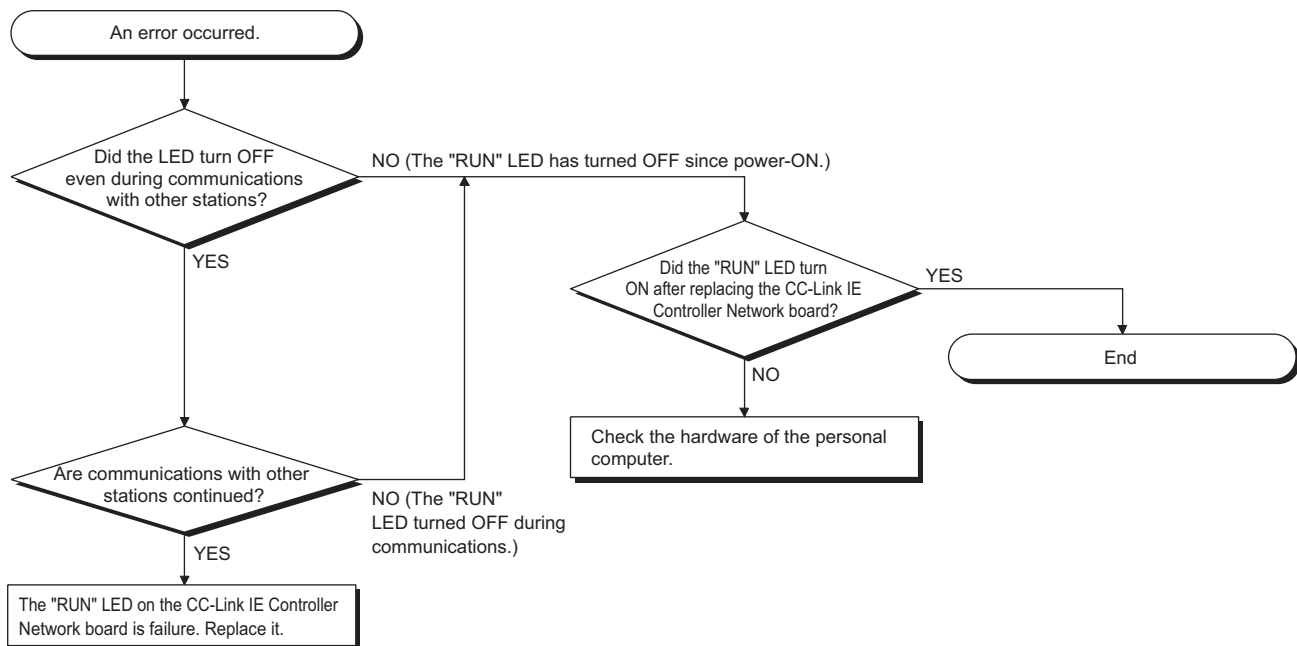
Do not uninstall or disable the driver of the board on the Device Manager when the board is normally recognized. If it is uninstalled or disabled, the operating system may shut down (blue screen).

14.4 Flowchart when Data Link Failed

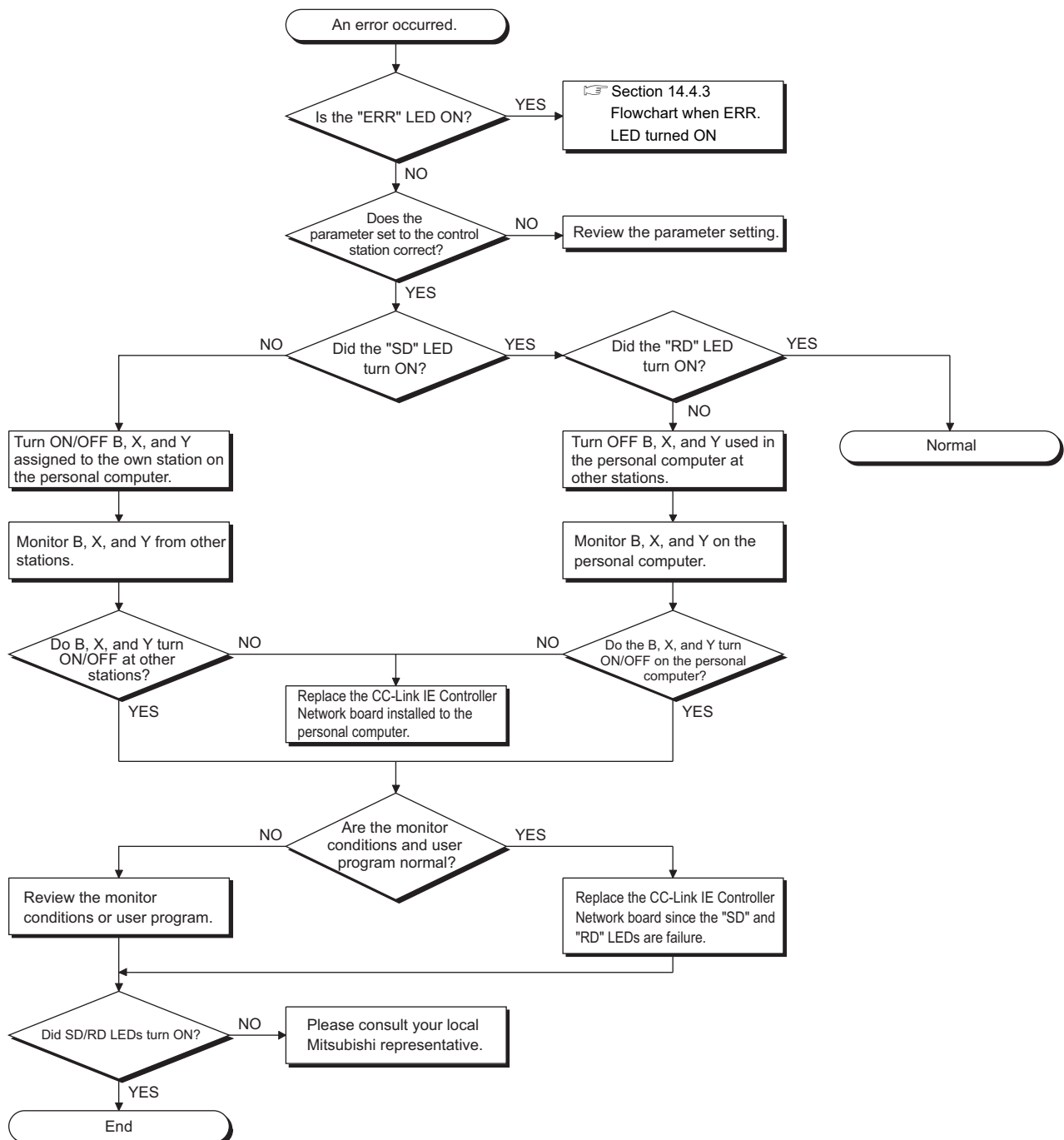
The following shows a check flowchart although the CC-Link IE Controller Network board, control station, and normal stations were connected, the data link failed.



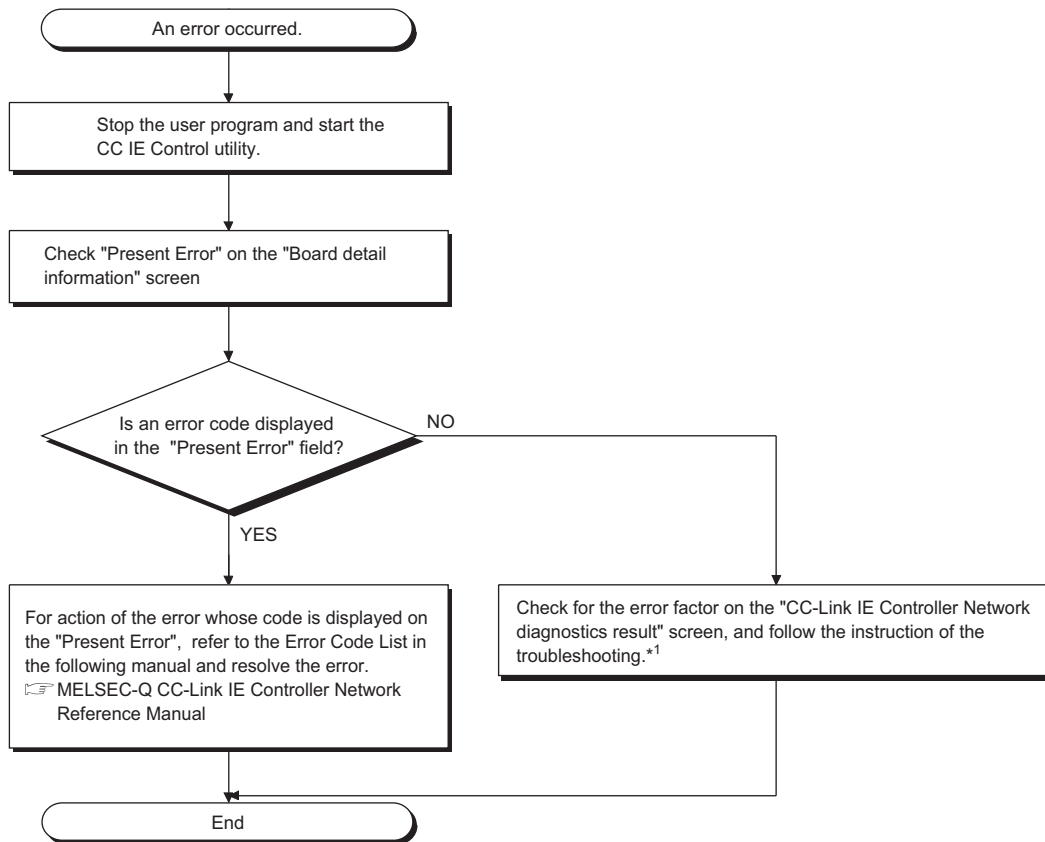
14.4.1 Flowchart when RUN LED is OFF



14.4.2 Flowchart when SD/RD LEDs are OFF



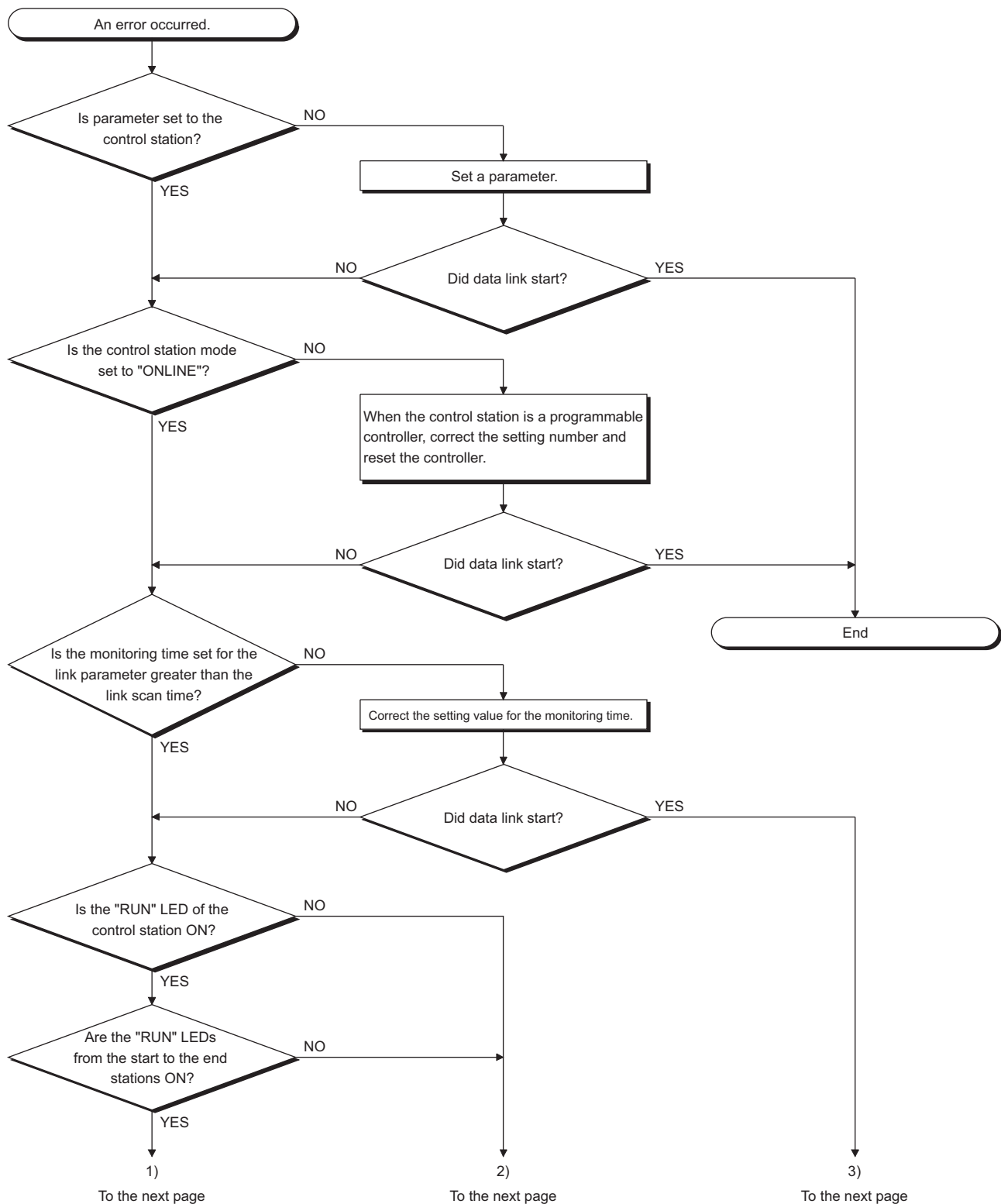
14.4.3 Flowchart when ERR. LED turned ON

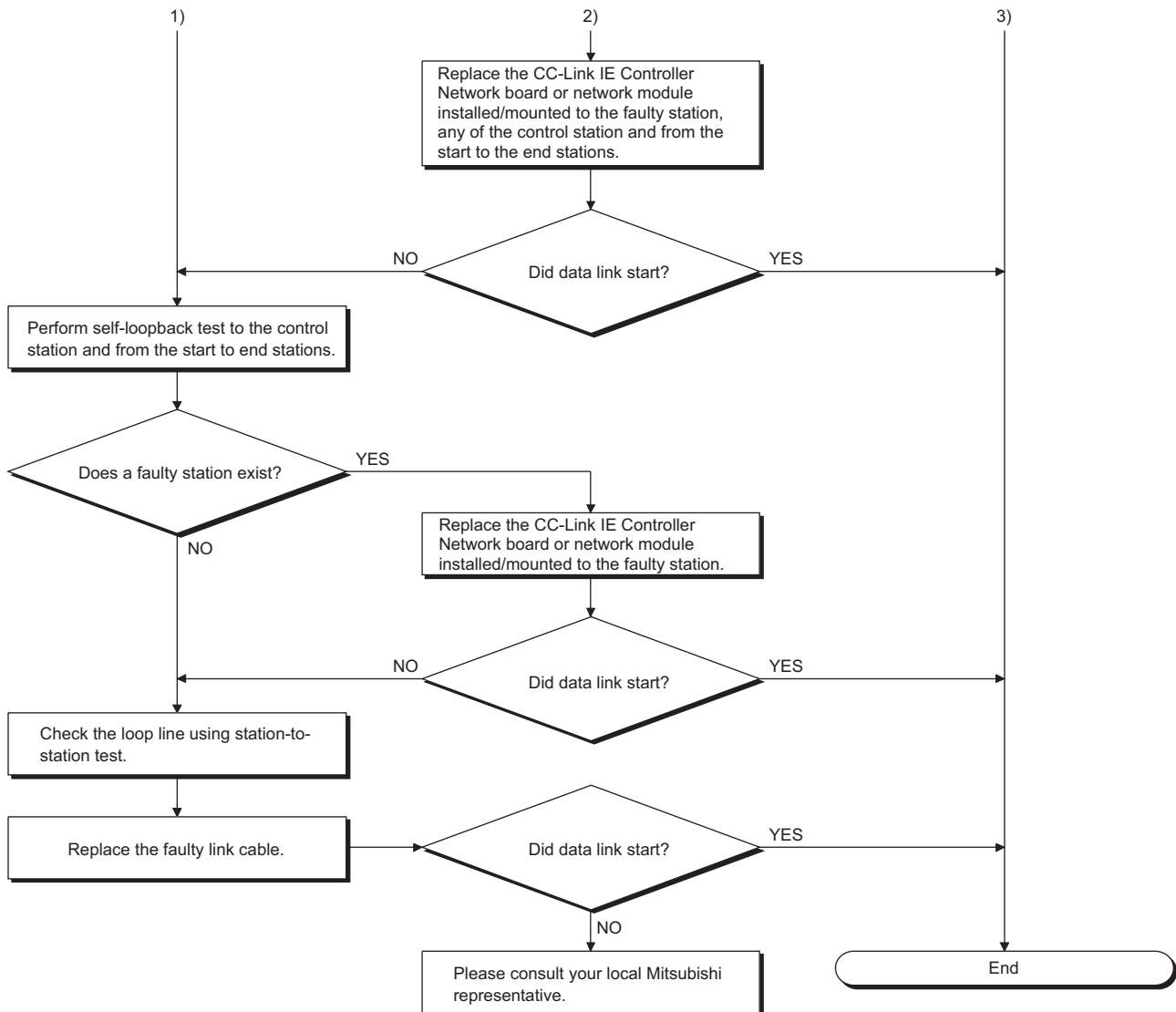


*1: For the troubleshooting of CC IE Controller Network diagnostics result, refer to the following manual.

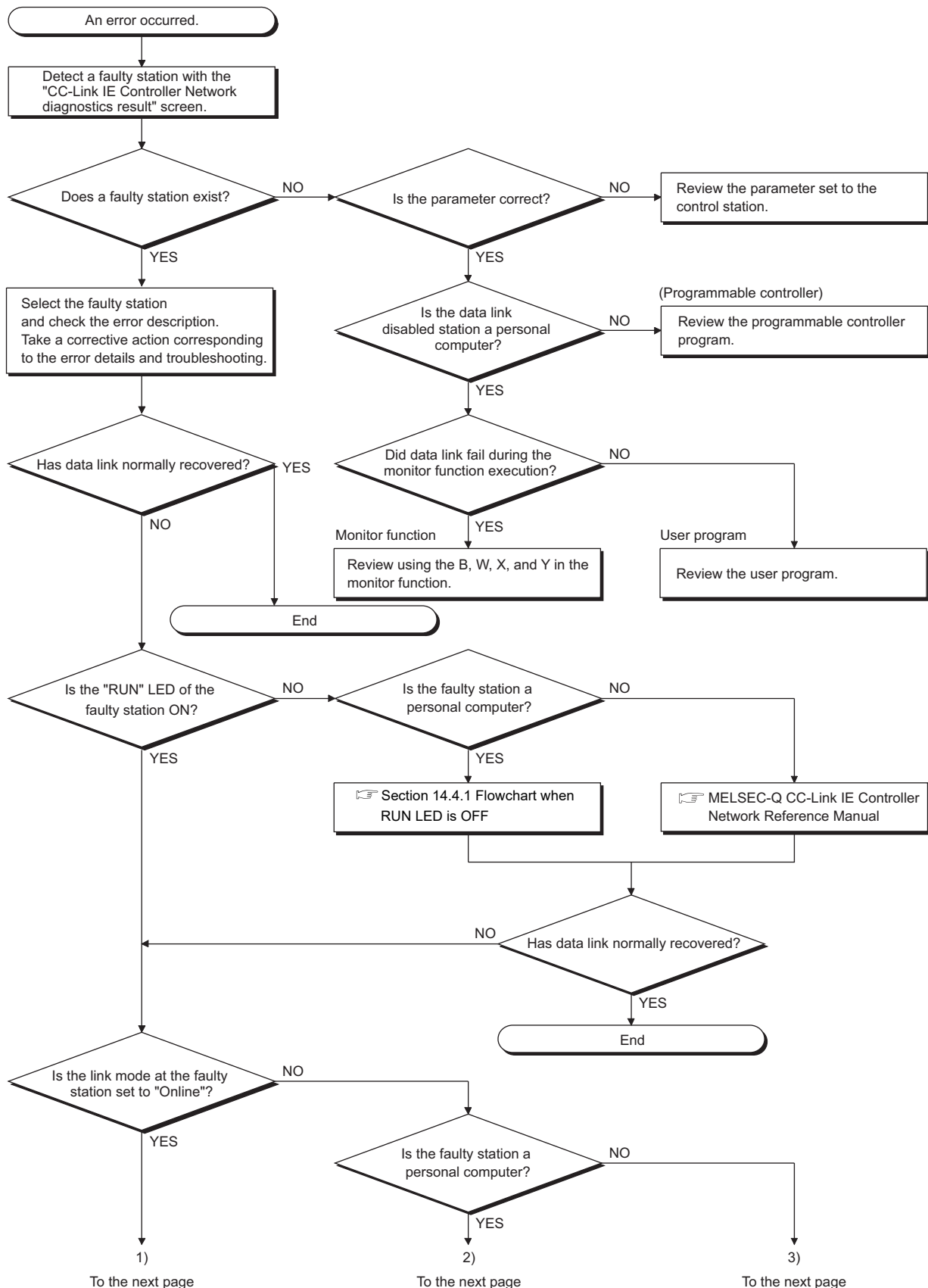
☞ MELSEC-Q CC-Link IE Controller Network Reference Manual

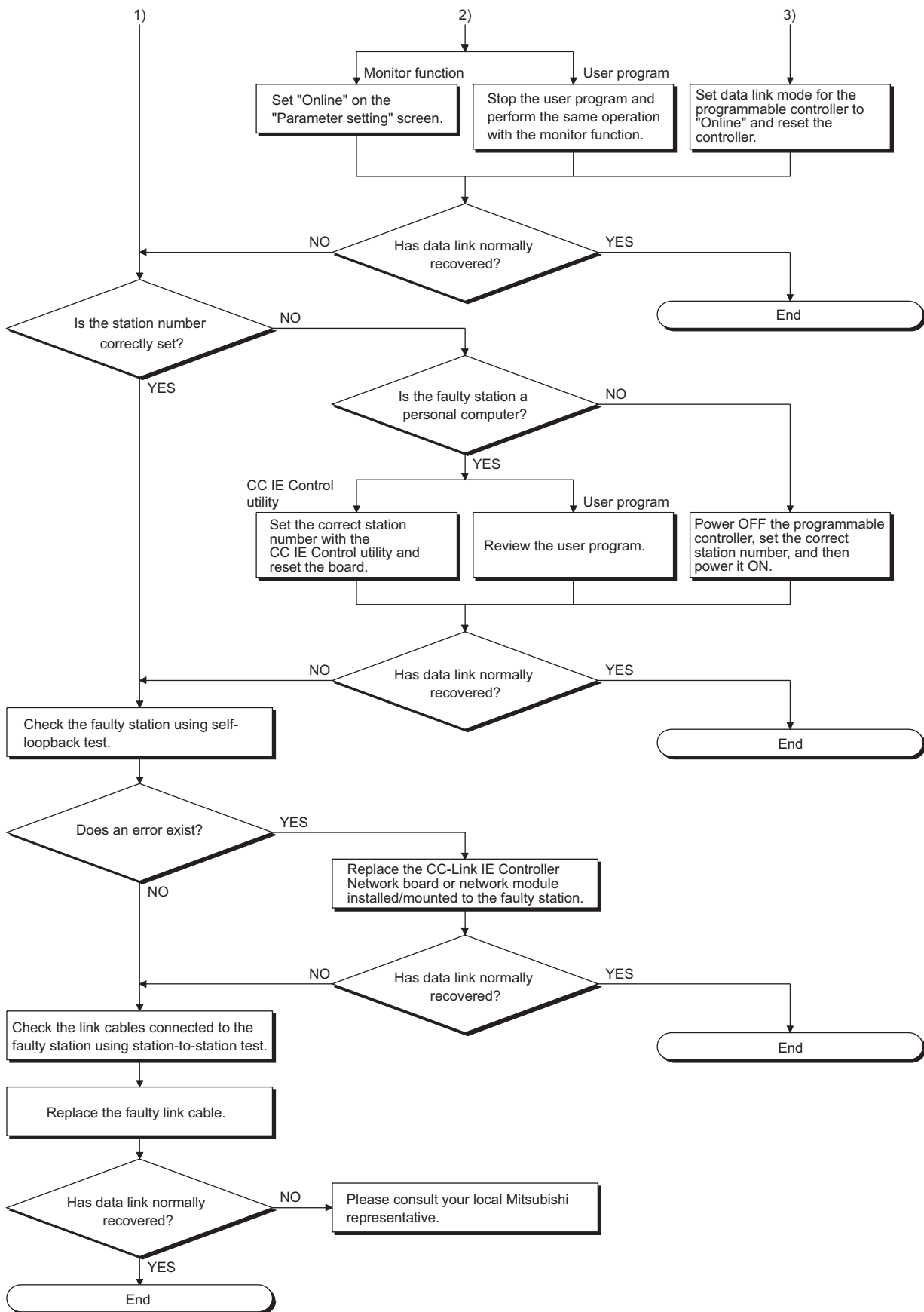
14.4.4 Flowchart when data link among whole system is disabled



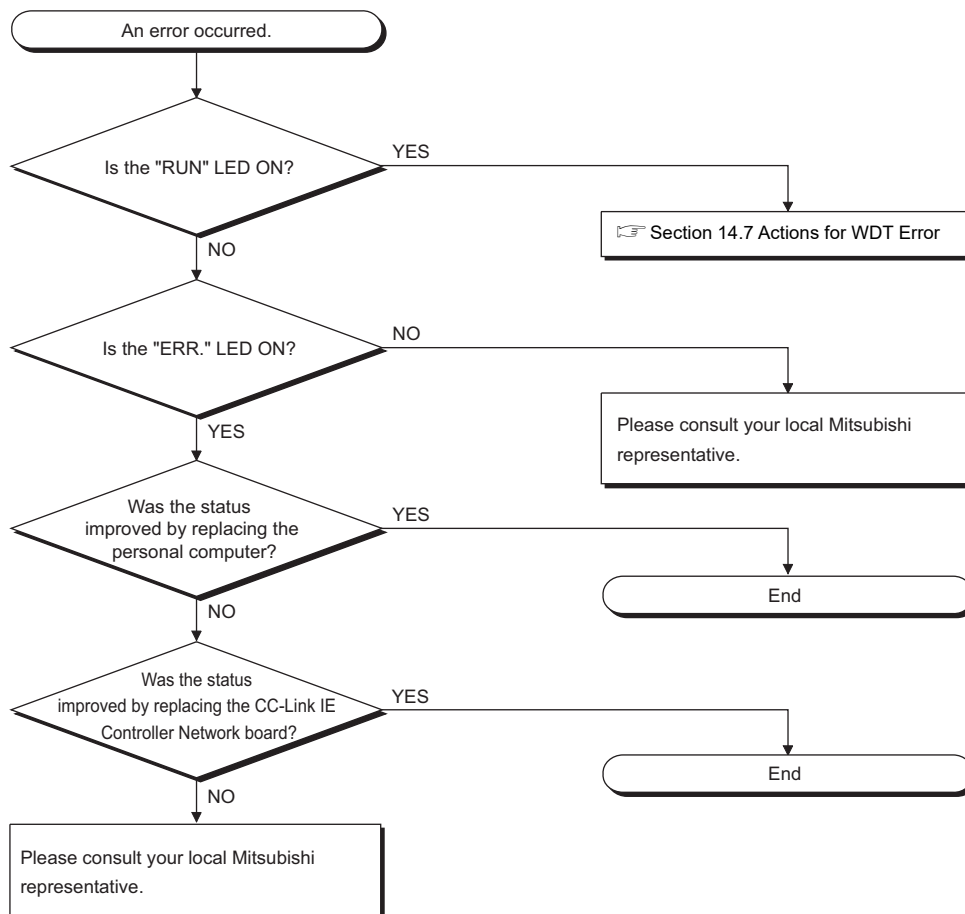


14.4.5 Flowchart when data link to specific station is disabled





14.4.6 Flowchart when RUN LED is flashing



14.5 Flowchart for Error during Data Link

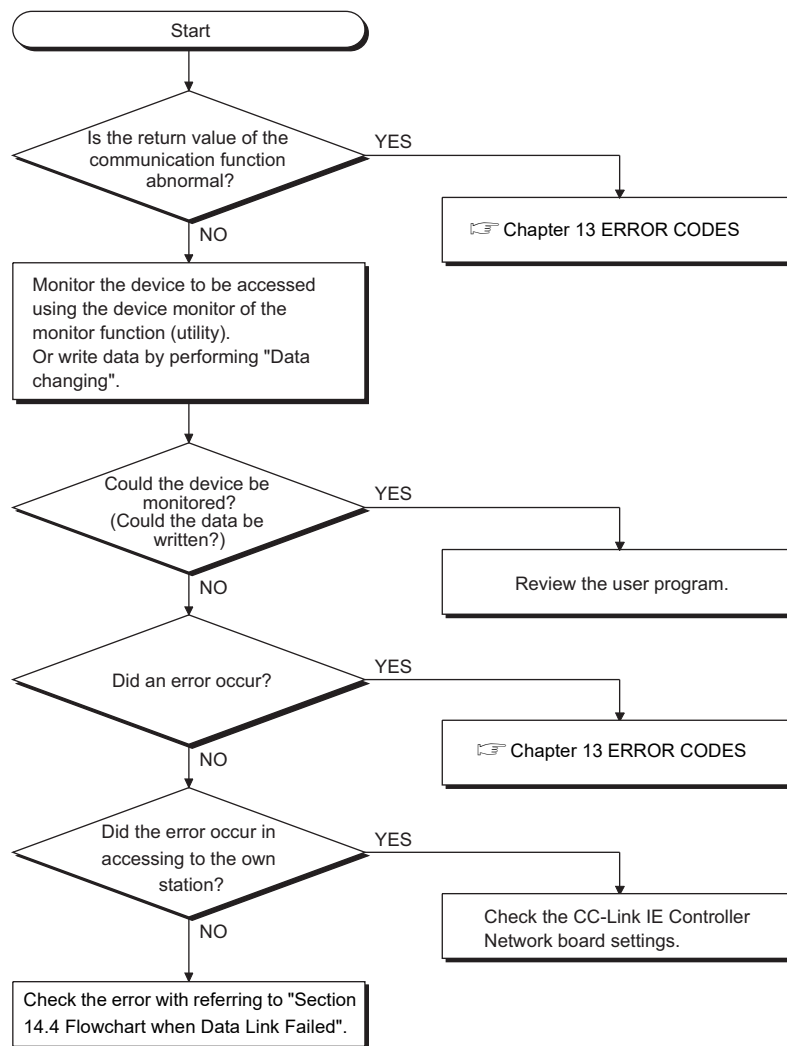
This section explains actions for an error during data link.

14.5.1 Flowchart when specific link device is not updated to the expected value

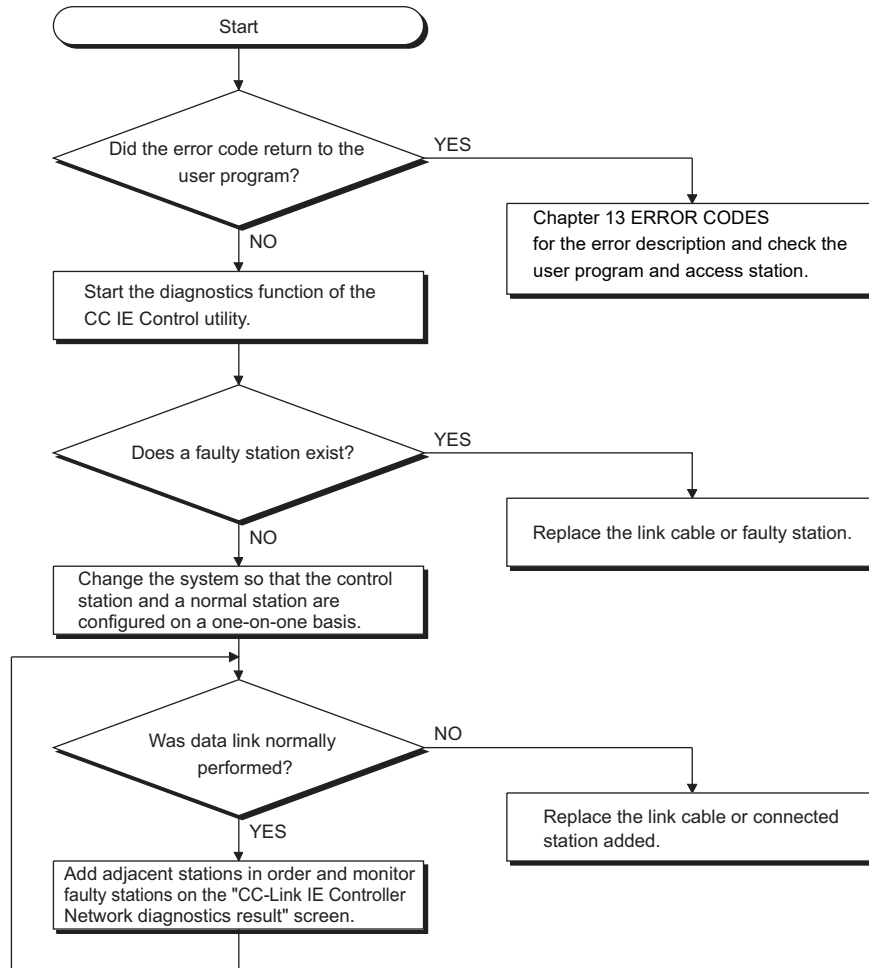
Check the followings.

- (1) Check for link faulty station with the network monitor of the Diagnostics function.**
- (2) Check the parameter assignment range at the control station.**
- (3) Check the device range used in the sequence program at the programmable controller.**
- (4) Check argument data of the communication function accessing the specific link device in the user program.**

14.5.2 Flowchart when data cannot be written or read with user program



14.5.3 Flowchart when communications are occasionally disabled during user program execution



14.6 When External Power Supply Function did not Correctly Operate

When the external power supply does not operate properly, check the following items.

Item	Corrective action
Is the LED of external power supply OFF?	Review the wiring of the external power supply cable. Inset the connectors and contacts until they click. (☞ Section 5.5.2)
Is the voltage output to the connector of the external power supply cable?	- Set the voltage between the pins of the connector (cable side) is within the range of the specification (☞ Section 3.2). - Check the external power supply.

If any of the above actions do not solve the error, refer to ☞ Section 14.9.

14.7 Actions for WDT Error

14.7.1 Board WDT error

When the board WDT error occurred, check the following items.

Item	Corrective action
Is the board installed properly?	Check the board installation status.
Does the board operate on other personal computer?	- After formatting the HD, install the operating system again. - Repair or replace the personal computer.

If any of the above actions do not solve the error, refer to  Section 14.9.

14.7.2 Driver WDT error

When the driver WDT error occurred, check the following items.

Item	Corrective action
Has the error occurred due to the system overload temporarily? ^{*1}	- Reset the board. - Restart the personal computer.
Is the same error occurred repeatedly? (Is the system overloaded constantly?)	- Remove the factor of system overload. - Disable the driver WDT function or increase the driver WDT monitoring time.

^{*1} A driver WDT error may occur when the system is overloaded temporarily due to the following factors.

- Windows® start processing at the personal computer startup
- Operation of a device driver such as a graphic board
- Operation of other software applications

If any of the above actions do not solve the error, refer to  Section 14.9.

14.8 Measures for Slow Personal Computer Operation

This section explains the probable causes and corrective measures when the operation of a personal computer becomes slow.

(1) Probable causes for slow personal computer operation

The following shows the probable causes for slow personal computer operation when the processing time for the link refresh is increased in the total processing capacity.

- The link refresh cycle is short.
- There are many refresh points.
- The processing capacity of a personal computer is low.

(2) Corrective measures

The following shows the measures when the operation of a personal computer becomes slow.

- Extend the link refresh cycle on the "Driver setting" screen of the CC IE Control utility.
- Decrease the refresh points on the "Refresh parameter setting" screen of the CC IE Control utility.

☞ Section 4.2.1 Cyclic transmission processing (5) (b)

14.9 Information Required for Inquiries

When the troubleshooting cannot solve the problem, or a board failure occurs, please contact your local Mitsubishi Electric service center or representative. Inform the following conditions and situations when inquiring the problems.

(1) Product information

Item	Condition/Situation	Reference
Product version	Board Model: Rating plate : _____ Product information : _____	Appendix 12
	Utility Model:SW1DNC-MNETG-() Version:_____	
Personal computer	Personal computer name Manufacturer: Personal computer name:	Section 2.5
	CPU (Example: Intel® Core™2 Duo Processor 3GHz)	
	Memory size	
	Operating system (Example: Windows® 11 Professional)	
Other option boards	Existence (If exist, type, the number of boards and so on)	—
	Situation checked with disconnecting other option boards	—

(2) Failure content

Item	Condition/Situation
Failure description	(Example: The LINK LED does not turn on even though the computer is turned on.)
Occurrence frequency	
Occurrence condition	If the failure occurs only in the specific case, inform the occurrence condition noticed.
Troubleshooting result	Inform the following descriptions. - The result of troubleshooting performed - The situation when checking with other boards or computers. (Example: Event ID 295 "The Board WDT error had occurred." error is displayed on the event viewer when the personal computer is started. It also occurs when mounting the problem board with another computer. Other boards mounted with the computer works properly.)

APPENDICES

Appendix 1 Precautions for Accessing Redundant CPU System

This section explains precautions for accessing a redundant CPU system using the CC-Link IE Controller Network board.

Access to redundant CPU system

(1) Redundant CPU specification

When the system (control system, standby system, system A, system B) of the Redundant CPU is specified to access the Redundant CPU, the Logical station No. set on the "Target setting" screen of the CC IE Control utility is used for access.

POINT

When a CC-Link IE Controller Network board with a serial number whose first five digits are 10091 or lower, or an SW1DNC-MNETG-B with the software version 1.04E or earlier is used, the redundant CPU system cannot be accessed directly with the CC-Link IE Controller Network interface board.

Relay the MELSECNET/H network system to access the redundant CPU system.

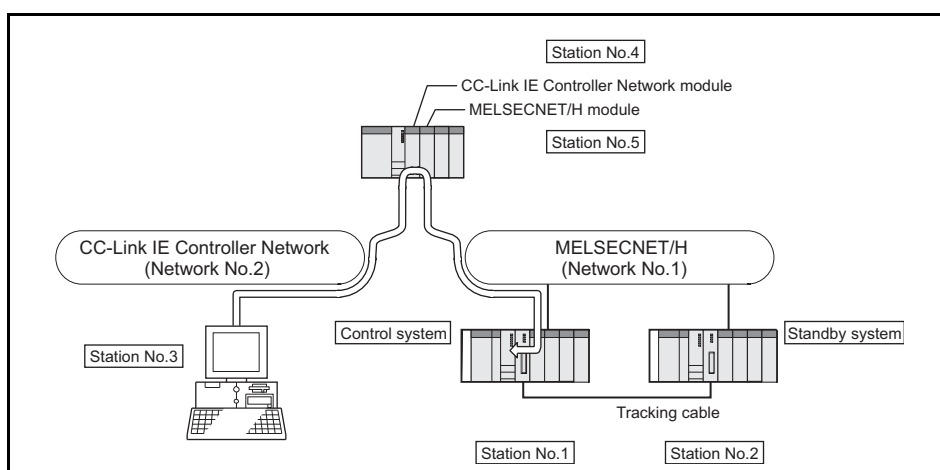
(2) Operation at occurrence of system switching

When system switching occurs during access to the Redundant CPU, access to the Redundant CPU set for the Logical station No. is continued.

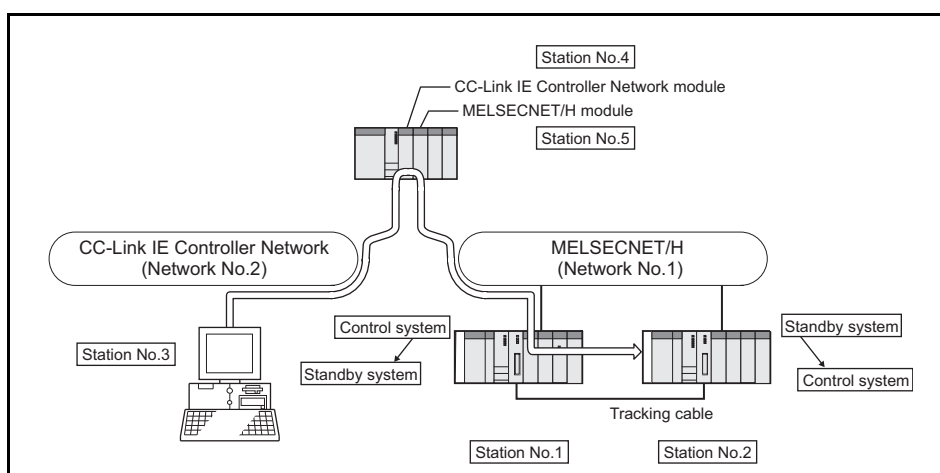
(Example) When the following Logical station No.66 was specified for access

Logical station No.66
 Network No.: 1
 Station No.: 1
 Multiple PLC: Not specified
 Redundant PLC: Control system

Before system switching



After system switching



POINT

To check which system in the Redundant CPU system is being accessed by the CC-Link IE Controller Network board, create a program to monitor the following special relays.

(1) When checking which system is being accessed, System A or System B

SM1511	System A identification flag	- Identifies System A/System B of a redundant system. - Remains ON/OFF even if the tracking cable is disconnected while the redundant system is running.		
			System A	System B
SM1512	System B identification flag	At the time of TRK.CABLE ERR.(Error code: 6120) occurrence (System not determined.)		
		SM1511	ON	OFF
		SM1512	OFF	ON

(2) When checking the operation system status

SM1515	Control/Standby system status	- Indicates the CPU module operation status - Remains ON/OFF even if the tracking cable is disconnected while the redundant system is running.		
			Control system	Standby system
SM1516		At the time of TRK.CABLE ERR.(Error code: 6120) occurrence (System not determined.)		
		SM1515	ON	OFF
		SM1516	OFF	ON

(3) Retry processing for error that occurs during system switching processing

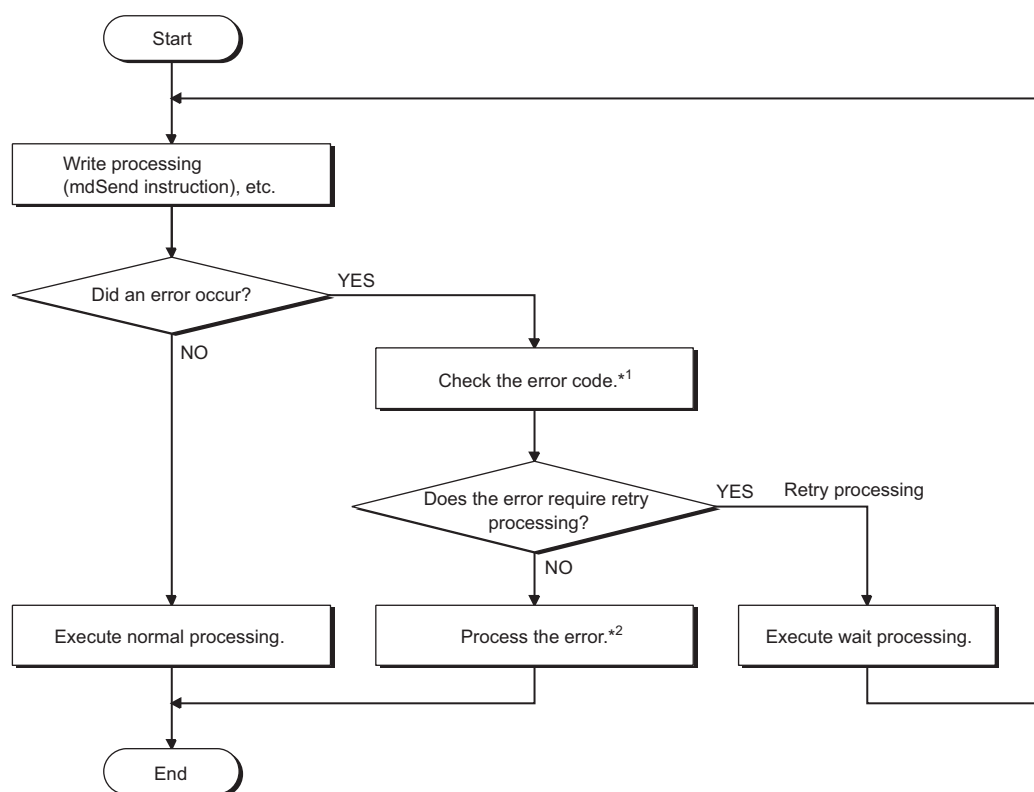
When the MELSEC data link library is used to access the Redundant CPU during system switching being processed by the Redundant CPU, a system switching error (error code: 4248_H), CPU starting error (error code: 4004_H), other system CPU module error (error code: 4245_H), access destination illegal error (error code: FFDF_H) or similar error occurs.

In this case, create a user program that checks the error code and performs retry processing as necessary.

(a) The following indicates the functions that result in error if executed during system switching.

	Functions that result in error by system switching
MELSEC data link library	mdDevSetEx, mdDevRstEx, mdRandREx, mdRandWEx, mdReceiveEx, mdSendEx, mdControl, mdDevRst, mdDevSet, mdRandR, mdRandW, mdReceive, mdSend, mdTypeRead

(b) The following example gives a flowchart for error occurrence at batch write.



*1: For the details and corrective action of the error code, refer to "Error code returned to request source during communication with CPU module" in the "QCPU User's Manual (Hardware Design, Maintenance and Inspection)".

*2: Execute retry processing as required depending on the system specifications.

(4) Automatic switching of communication path

When a communication error occurs during access to the Redundant CPU connected via MELSECNET/H, the communication path is automatically switched to continue access to the control system.

Hereinafter, this automatic switching of the communication path is referred to as path switching.

The following describes the path switching conditions, checking method of path switching occurrence, and access examples of path switching.

(a) Path switching conditions

When access is being processed under the following conditions, access to the Redundant CPU is continued by path switching even though a communication error occurs.

	Conditions for continued access
Operation mode	Backup mode, Separate mode
Redundant CPU specification	Control system, Standby system, System A, System B

Note, however, that if a tracking error^{*1} had already occurred at a start of communication, access to the control system is not continued by path switching even if tracking is recovered after that.

^{*1}: Includes the status in which either Redundant CPU is powered OFF or reset.

(b) Checking method of path switching occurrence and access examples of path switching

1) Checking method of path switching occurrence

When the system is communicating with the redundant system specified, whether communication is continued by path switching due to communication error occurrence can be estimated.

Create a program that monitors the following special relay and special registers to check the occurrence of path switching.

<Special relay and special registers to be monitored and estimated possibility of path switching>

SM1600 ^{*1}	SD1590 ^{*2}	SD1690 ^{*2}	Possibility of path switching	Reference
OFF	Either one is other than 0		Since a system switching request from the network module was detected, path switching may have been executed.	2) Fig. 1
ON	0	0	Since other system error occurred, path switching may have been executed.	2) Fig. 2
ON	Either one is other than 0		Since other system error occurred or a system switching request from the network module was detected, path switching may have been executed.	2) Fig. 2 2) Fig. 1

*1: Even if SM1600 is ON, path switching does not occur when the CPU is not accessed via the tracking cable.

*2: When using SM1600, SD1590, and SD1690 to estimate the occurrence of path switching for the Redundant CPU connected via MELSECNET/H, check the following items on the Redundant settings in the network parameter of GX Developer.

- Issue system switch in Cable disconnection timeout
- Issue system switch in communication error

Check the following based on the statuses of the above special relay and special registers, and remove the error cause.

- Check the Redundant CPU for an error.
- Check the tracking cable status and whether the tracking cable is correctly connected.
- Check both the relevant network module and the network where that relevant network module is connected for an error.

2) Access examples of path switching

The following shows examples of path switching during access to the control system.

<When system switching occurs due to communication error>

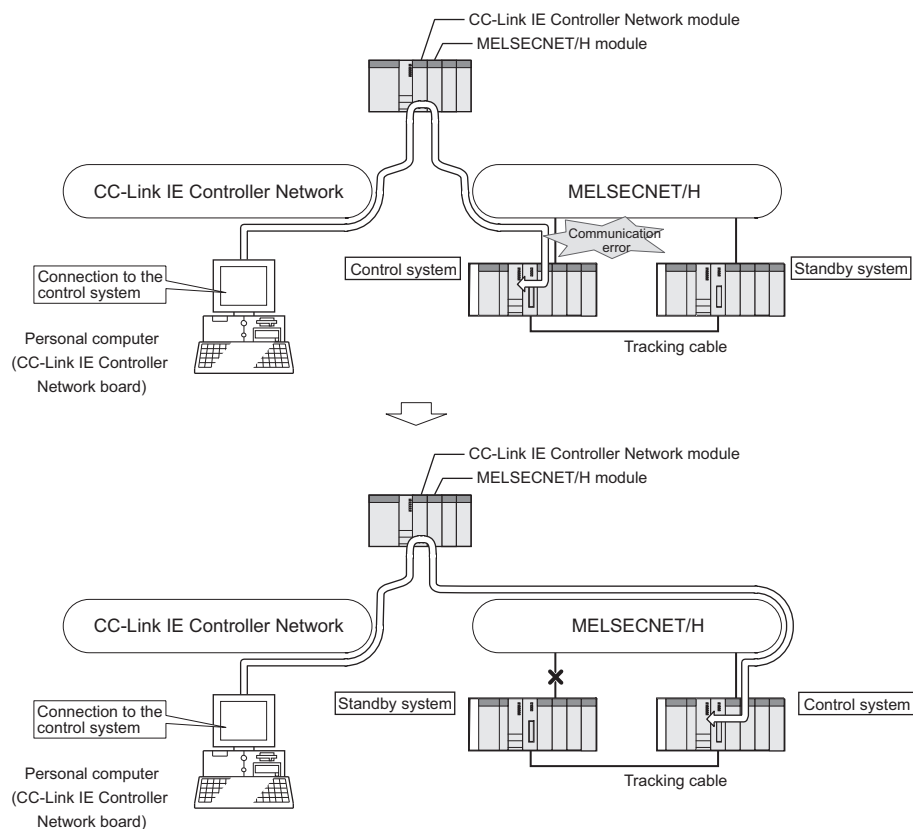


Figure 1 Path switching example 1

<When system switching occurs due to standby system error>

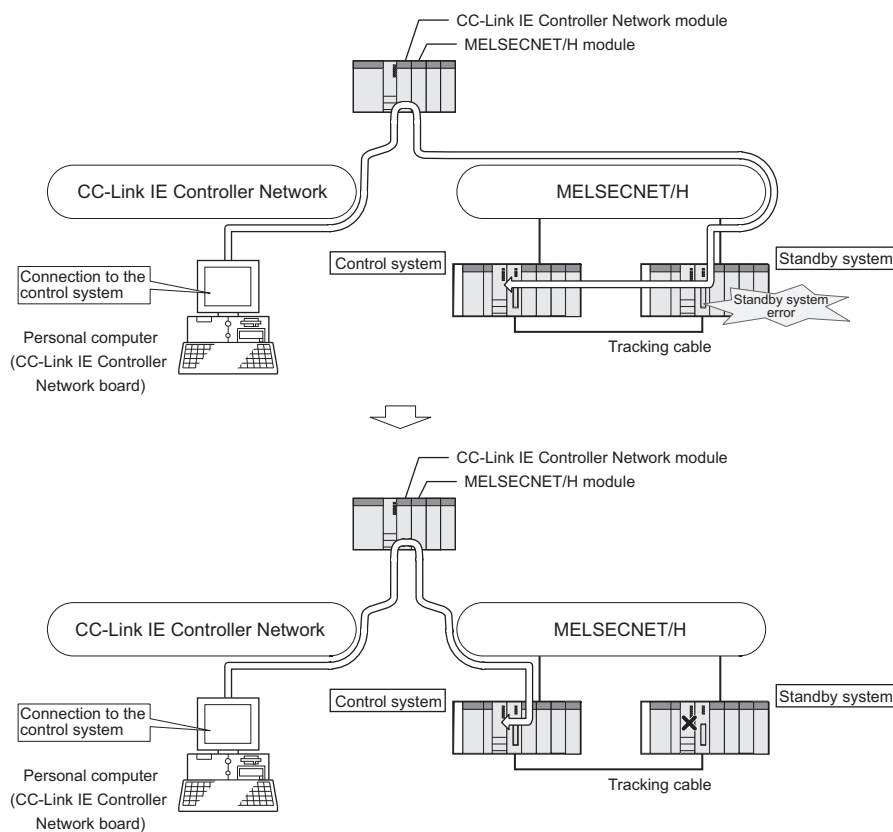


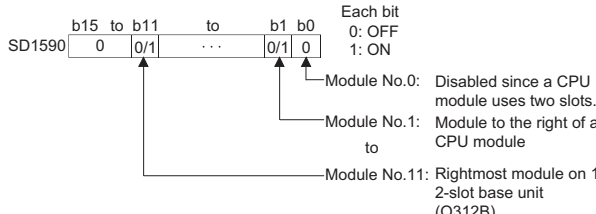
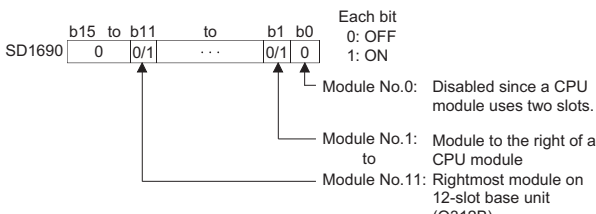
Figure 2 Path switching example 2

POINT

- Path switching is not executed when a communication to the Redundant CPU specified at Logical station No. is faulty at communication start^{*1} (A communication error occurs.)
When a communication is faulty, refer to (4)(b) Checking method of path switching occurrence and access examples of path switching in this section and clear the communication disturbance.
- ^{*1}: First communication after execution of the mdOpen function in the MELSEC data link library (communications using the mdReceiveEx, mdSendEx, mdDevRstEx, mdDevSetEx, mdRandREx, mdRandWEx, mdReceive, mdSend, mdControl, mdDevRst, MdDevSet, mdRandR, mdRandW or mdTypeRead function).
- If other station access (including the programmable controller CPU other than the Redundant CPU) is made to 257 or more stations simultaneously, communication path may not be automatically switched.

Remarks

The following table explains details of the special relay and special registers to be monitored when estimating the occurrence of path switching.

No.	Name	Description	Description details
SM1600	Other system error flag	OFF: No error ON: Error	- Turns ON when an error occurs by redundant system error check. (Turns ON when any of bits for SD1600 turns ON.) - Remains OFF when no errors are present.
SD1590	No. of module for which system switching request is issued from the network module in own system	No. of module for which system switching request is issued from the network module in own system	- Any of the following bits turns on corresponding to the No. of the module for which system switching request is issued from the network module in own system. - Turned OFF by the system after the error of the relevant module is resolved by the user.  - For No. of module for which system switching request is issued from the network module in another system, refer to SD1690.
SD1690	No. of module for which system switching request is issued from the network module in another system	No. of module for which system switching request is issued from the network module in another system	- Any of the following bits turns on corresponding to the No. of the module for which system switching request is issued from the network module in another system. - Turned OFF by the system after the error of the relevant module is resolved by the user.  - For No. of module for which system switching request is issued from the network module in own system, refer to SD1590.

Appendix 2 Network Status at Power ON/OFF and Board Reset During Data Linking

Appendix 2.1 Network status at power ON/OFF

(1) Without the external power supply function

When a CC-Link IE Controller Network board without the external power supply function (Q80BD-J71GP21-SX, Q81BD-J71GP21-SX) is used, the network status varies depending on the ON/OFF status of the personal computer as shown below.

(a) When the system is started

No.	Time frame	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
1	Personal computer power OFF - Before CC-Link IE Controller Network board driver start-up	ON	Loopback occurred	Error	Error	Normal
2	CC-Link IE Controller Network board driver in operation	ON	Loopback occurred	Error	Error	Normal ^{*4}
3	After CC-Link IE Controller Network board driver start-up	ON	Normal	Normal	Normal	Normal

(b) When the system is shut down

No.	Time frame	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
4	Personal computer power OFF	OFF	Loopback occurred	Error	Error	Normal ^{*4}

(c) When the personal computer is restarted (Restarting Windows®)

No.	Time frame	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
5	Personal computer shut down - Driver completion	ON	Normal	Normal	Normal	Normal
6	Driver completion - Before personal computer restart					
7	Personal computer restart - Before CC-Link IE Controller Network board driver start-up					
8	CC-Link IE Controller Network board driver in operation	ON	Normal ^{*5}	Normal ^{*5}	Normal ^{*5}	Normal ^{*4}
9	After CC-Link IE Controller Network board driver start-up	ON	Normal	Normal	Normal	Normal

*1: The status can be checked on the <<Monitor detail>> tab on the "Logging" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers.

*2: The status can be checked on the board list (Start-up) screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Baton pass status of each station (SW00A0 to SW00A7)".

*3: The status can be checked at the "Select station network device status display" on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Cyclic transmission status of each station (SW00B0 to SW00B7)".

*4: When a CC-Link IE Controller Network board is reconnected/disconnected to the CC-Link IE Controller Network, the all station error may occur for the circuit control period^{*6} (Normal value: 50ms, Worst value: 100ms). If the all station error occurs, an error is detected in the communication status (baton pass status) and the data link status (cyclic transmission status) of all station.

*5: Since the board is reset during the driver operation, a brief loopback occur. An error is also detected in the communication status (baton pass status) and the data link status (cyclic transmission status).

*6: The circuit control period is a period to reconstruct the data link when the CC-Link IE Controller Network board is reconnected/disconnected (such as when the cable is disconnected or the power is turned from OFF to ON).

(2) With the external power supply function

When a CC-Link IE Controller Network board with the external power supply function (Q80BD-J71GP21S-SX, Q81BD-J71GP21S-SX) is used, the network status varies depending on the ON/OFF status of the external power supply and personal computer as shown below.

POINT

The following explains the network status when the external power supply is being supplied.

When the external power supply is not being supplied, refer to (1) in this section because the network status is the same status as the external power supply function is not applied.

(a) When the system is started

No.	Time frame	External power supply	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
1	External power supply OFF - External power supply ON	OFF	OFF	Loopback occurred	Error	Error	Error
2	External power supply ON - Before personal computer start-up (power-ON)	ON	OFF				
3	Personal computer start-up (power-ON) - Before CC-Link IE Controller Network board driver start-up	ON	ON				
4	CC-Link IE Controller Network board driver in operation	ON	ON	Loopback occurred	Error	Error	Normal ^{*4}
5	After CC-Link IE Controller Network board driver start-up	ON	ON	Normal	Normal	Normal	Normal

(b) When the system is shut down

No.	Time frame	External power supply	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
6	Personal computer power OFF (External power supply ON)	ON	OFF	Normal	Normal	Error	Normal
7	Personal computer power OFF (External power supply OFF)	OFF	OFF	Loopback occurred	Error	Error	Normal ^{*4}

(c) When the personal computer is restarted (Restarting Windows®)

No.	Time frame	External power supply	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
8	Personal computer shut down - Driver completion	ON	ON	Normal	Normal	Normal	Normal
9	Driver completion - Before personal computer restart						
10	Personal computer restart - Before CC-Link IE Controller Network board driver start-up						
11	CC-Link IE Controller Network board driver in operation	ON	ON	Normal ^{*5}	Normal ^{*5}	Normal ^{*5}	Normal ^{*4}
12	After CC-Link IE Controller Network board driver start-up	ON	ON	Normal	Normal	Normal	Normal

(d) When the system is shut down (Powering ON again after powering OFF the personal computer)

No.	Time frame	External power supply	Personal computer power	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
13	Personal computer power OFF - Before personal computer power ON	ON	OFF	Normal	Normal	Error	Normal
14	Personal computer power ON - Before CC-Link IE Controller Network board driver start-up	ON	ON				
15	CC-Link IE Controller Network board driver in operation	ON	ON	Normal ^{*5}	Normal ^{*5}	Error	Normal ^{*4}
16	After CC-Link IE Controller Network board driver start-up	ON	ON	Normal	Normal	Normal	Normal

- *1: The status can be checked on the <<Monitor detail>> tab on the "Logging" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers.
- *2: The status can be checked on the board list (Start-up) screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Baton pass status of each station (SW00A0 to SW00A7)".
- *3: The status can be checked at the "Select station network device status display" on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Cyclic transmission status of each station (SW00B0 to SW00B7)".
- *4: When a CC-Link IE Controller Network board is reconnected/disconnected to the CC-Link IE Controller Network, the all station error may occur for the circuit control period*⁶ (Normal value: 50ms, Worst value: 100ms). If the all station error occurs, an error is detected in the communication status (baton pass status) and the data link status (cyclic transmission status) of all station.
- *5: Since the board is reset during the driver operation, a brief loopback occur. An error is also detected in the communication status (baton pass status) and the data link status (cyclic transmission status).
- *6: The circuit control period is a period to reconstruct the data link when the CC-Link IE Controller Network board is reconnected/disconnected (such as when the cable is disconnected or the power is turned from OFF to ON).

Appendix 2.2 Network status at board reset

The network status when the board reset from the utility or board reset from MELSEC data link library (mdBdRst function, mdBdModSet function) is executed during data linking is shown below.

No.	Time frame	Loop status ^{*1}	Communication status (baton pass status) ^{*2}	Data link status of own station (cyclic transmission status) ^{*3}	Data link status other than own station (cyclic transmission status) ^{*3}
1	Before board reset	Normal	Normal	Normal	Normal
2	During board reset	Normal ^{*5}	Normal ^{*5}	Normal ^{*5}	Normal ^{*5}
3	After board reset	Normal	Normal	Normal	Normal

- *1: The status can be checked on the <<Monitor detail>> tab on the "Logging" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers.
- *2: The status can be checked on the board list (Start-up) screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Baton pass status of each station (SW00A0 to SW00A7)".
- *3: The status can be checked at the "Select station network device status display" on the "CC-Link IE Controller Network diagnostics result" screen of the CC IE Control utility, on the Network diagnostics of GX Developer connected to other station's programmable controller or at special registers "Cyclic transmission status of each station (SW00B0 to SW00B7)".
- *4: When a CC-Link IE Controller Network board is reconnected/disconnected to the CC-Link IE Controller Network, the all station error may occur for the circuit control period^{*6} (Normal value: 50ms, Worst value: 100ms). If the all station error occurs, an error is detected in the communication status (baton pass status) and the data link status (cyclic transmission status) of all station.
- *5: Since the board is reset during the driver operation, a brief loopback occur. An error is also detected in the communication status (baton pass status) and the data link status (cyclic transmission status).
- *6: The circuit control period is a period to reconstruct the data link when the CC-Link IE Controller Network board is reconnected/disconnected (such as when the cable is disconnected or the power is turned from OFF to ON).

Appendix 3 Comparison with the MELSECNET/H Board

This section explains the comparison of functions between the CC-Link IE Controller Network board and the MELSECNET/H board as well as utility functions provided with the boards.

Appendix 3.1 Comparison of boards

The following describes the comparison of functions between the CC-Link IE Controller Network board and the MELSECNET/H board.

(1) Comparison of the cyclic transmission functions

Function	CC-Link IE Controller Network board	MELSECNET/H board
Cyclic communication function by LB/LW	○	○
Cyclic communication function by LX/LY	○	○
Interlink transfer	×	×
Link data consistency function	○	○
Punctuality guarantee function	○	×
Constant link scan function	○	○
Low-speed cyclic transmission function	×	○

(2) Comparison of the transient transmission functions

Function	CC-Link IE Controller Network board	MELSECNET/H board
Number of transient transmissions	○	○
Group function	×	○
Routing function	○	○
Read from/write to other station devices	○	○

(3) Comparison of the RAS functions

Function	CC-Link IE Controller Network board	MELSECNET/H board
Control station switching function	○	○
Optical cable insertion error detection function	○	×
Optical cable fault detection function	○	×
Automatic return function	○	○
Loopback function	○ ^{*1}	○ ^{*1}
Down station prevention function with external power supply	○	○
Transient transmission during CPU module error	○	○
Error detection time check of transient transmission	○	○
Detection of duplicated station No./control station at power-on	○	○
Driver WDT function	○	○

^{*1}: On the CC-Link IE Controller Network board, the own station is in the disconnected status between PC start-up (power-ON) and CC-Link IE Controller Network board driver start-up. (Loopback occurs.) After CC-Link IE Controller Network board driver start-up, a connection returns and normal data link is established.
On the MELSECNET/H board, after PC start-up (power-ON), normal data link is continued without executing loopback at other stations.

(4) Comparison of the diagnostics functions

Function	CC-Link IE Controller Network board	MELSECNET/H board
Hardware test	○	○
Self-loopback test	○	○
Circuit test	○	×
Station-to-station test	○	○
Network test	○	○
Communication test	○	○

(5) Comparison of the additional functions

Function	CC-Link IE Controller Network board	MELSECNET/H board
Visibility of system status	○	×
Event function	○	×
Cyclic transmission stop/restart and link refresh stop	○	○
Reserved station specification function	○	○
Simplified duplexing of network	×	○
Multiplex transmission	×	○

Appendix 3.2 Comparison of MELSECNET utilities

The following describes the comparison of the utility functions between the CC-Link IE Controller Network board and the MELSECNET/H board.

Function	CC-Link IE Controller Network board	MELSECNET/H board
Operation information monitoring function	○	○
Communication test function	○	×
Link startup/stop function	○	×
Detailed information monitoring function	○	○
Error history logging function	○	○
Memory diagnostics function	○	○
Channel number confirmation function	○	○
Driver setting function	○	○
Routing parameter setting function	○	○
Event setting function	○	×
Network range assignment setting function	○	○
Target setting function	○	○
Save file function	○	×
Load file function	○	×

Appendix 3.3 Comparison of device monitor utilities

The following describes the comparison of the Device monitor utility functions between the CC-Link IE Controller Network board and the MELSECNET/H board.

Function	CC-Link IE Controller Network board	MELSECNET/H board
Batch monitor function	○	○
16-point register monitor function	○	○
Monitor target setting function	○	○
Monitor device setting function	○	○
Word device value change function	○	○
Word device value continuous change function	○	○
Bit device ON/OFF function	○	○
Display format change function	○	○
Numerical pad function	○	○

Appendix 3.4 Precautions for replacing programs

The following table explains modifications required when utilizing MELSECNET/H user programs.

Item	Description
Channel No.	A modification of the argument for opening a communication line (mdOpen) is required since the channel numbers are changed from 51 to 54 to 151 to 154.
Own board access	Change the read data contents of own board mode setting (mdBdModSet), own board mode read (mdBdModRead), own board LED read (mdBdLedRead), own board switch status read (mdBdSwRead), and own board version read (mdBdVerRead).

Appendix 3.5 Precautions for setting parameters

The following describes precautions when utilizing MELSECNET/H parameter settings.

Item	Description
Low-speed cyclic transmission	The CC-Link IE Controller Network board does not have this function. Assign the low-speed cyclic transmission range to the LB/LW setting (2).
Multiplex transmission	The CC-Link IE Controller Network board does not have this function. The high-speed communication can be realized without using the multiplex transmission function on the CC-Link IE Controller Network board since the link scan time is shorter than that of the MELSECNET/H board.
Reserved station specification	When a station that is specified as a reserved station exists in the network, the transient transmission can be performed to the relevant station. Therefore, the following functions can be performed to the relevant station. • Checking the error description with the CC-Link IE Controller Network diagnostics function • Writing parameters from another station when incorrect parameters are set • Monitoring other stations using GX Developer • Link dedicated instruction When disconnecting a station that is specified as a reserved station from the network, set the mode of the relevant station to "Offline".
Link points	For link points per network and link points per station, set the link points within the range of CC-Link IE Controller Network board specifications. (☞ Section 3.2 Performance Specifications)

Appendix 3.6 Comparison of the data link library functions

The following table explains the comparison of the MELSEC data link library functions which can be used both CC-Link IE Controller Network and MELSECNET/H software packages.

Function name	Function	CC-Link IE Controller Network	MELSECNET/H
mdOpen	Opens a communication line.	○	○
mdClose	Closes a communication line.	○	○
mdSendEx	Batch writes devices. (Extended function)	○	○ ^{*1}
	Sends data. (SEND function) ^{*1} (Extended function)	○ ^{*2}	×
mdReceiveEx	Batch reads devices. (Extended function)	○	○ ^{*1}
	Receives data. (RECV function) ^{*1} (Extended function)	○ ^{*2}	×
mdRandWEx	Writes devices randomly. (Extended function)	○	○ ^{*1}
mdRandREx	Reads devices randomly. (Extended function)	○	○ ^{*1}
mdDevSetEx	Sets a bit device. (Extended function)	○	○ ^{*1}
mdDevRstEx	Resets a bit device. (Extended function)	○	○ ^{*1}
mdTypeRead	Reads the type of programmable controller CPU.	○	○
mdControl	Remote operation of programmable controller CPU. (RUN/STOP/PAUSE).	○	○
mdWaitBdEvent	Waits for an event occurrence.	○	×
mdBdRst	Resets the board.	○	○
mdBdModSet	Sets the mode of the board.	○	○
mdBdModRead	Reads the mode of the board.	○	○
mdBdLedRead	Reads the LED information of the board.	○	○
mdBdSwRead	Reads the switch status of the board.	○	○
mdBdVerRead	Reads the version information of the board.	○	○
mdInit	Refreshes the programmable controller device address.	○	○
mdSend	Batch writes devices.	○	○
	Sends data. (SEND function)	○ ^{*2}	○
mdReceive	Batch reads devices.	○	○
	Receives data. (RECV function)	○ ^{*2}	○
mdRandW	Writes devices randomly.	○	○
mdRandR	Reads devices randomly.	○	○
mdDevSet	Sets a bit device.	○	○
mdDevRst	Resets a bit device.	○	○

* 1: Supported by the 1.15R or later version of SW0DNC-MNETH-B.

* 2: Supported by the 1.08J or later version of SW1DNC-MNETG-B.

Appendix 4 Combinations with Existing Software

There is no restriction when using CC-Link IE Controller Network board with other MELSEC interface boards or MELSOFT products on the same personal computer. For the restrictions of the applicable operating environment or applicable access target, refer to the manual of each product.

9

DEVICE MONITOR
UTILITY

10

MELSEC DATA LINK
LIBRARY

11

PROGRAMMING

12

APPLICATION
FUNCTIONS

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A

APPENDICES

I

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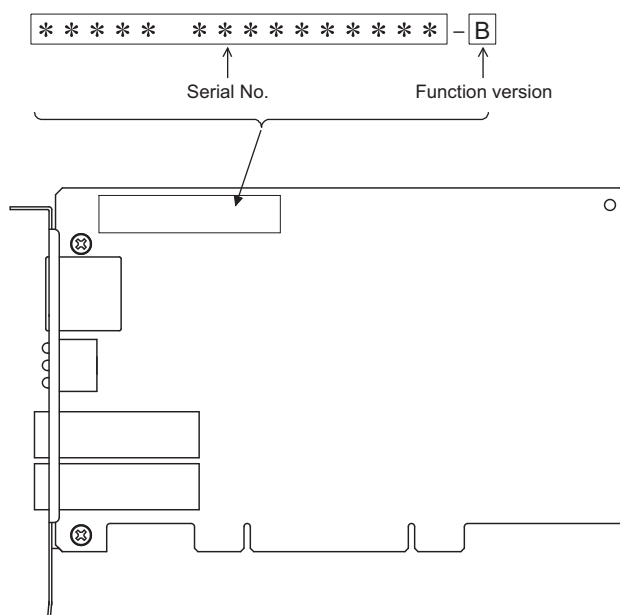
Appendix 5 Checking Serial Number and Function Version

This section explains how to check serial number, the function version, and ROM version of the CC-Link IE Controller Network board and the SW1DNC-MNETG-B version.

(1) Checking serial number, function version, and ROM version of CC-Link IE Controller Network board

(a) Checking serial number and function version

The function version of the CC-Link IE Controller Network board can be checked at "Serial" section as shown below.



(b) Checking ROM version

The ROM version of the CC-Link IE Controller Network board can be viewed on the "Board detail information" screen in the CC IE Control utility.

(2) Checking SW1DNC-MNETG-B version

To check the SW1DNC-MNETG-B version, select "Version information" from the system menu on the board list screen (start screen) of the CC IE Control utility.

Appendix 6 New and Improved Functions

Appendix 6.1 Change of hardware function

The following table shows the new and the improved functions in the CC-Link IE Controller Network board.

New and improved function	First five digits of the serial number	Software version of SW1DNC-MNETG-B
Redundant CPU System support ( Appendix 1)	10092 or higher (function version D or later)	1.05F or later
Network type "CC IE Control Extended mode"	12052 or higher	1.11M or later

Appendix 6.2 Update of software package

For details of the updated version of software and the functions which are added or changed, please contact your local Mitsubishi Electric sales office or representative.

(1) Obtaining the updated version

Please contact your local Mitsubishi Electric sales office or representative.

(2) Installation

- 1) Save the obtained data for installation to the system drive, CD, etc.
- 2) Start the installer.
Double-click "Setup.exe" in the "Disk1" folder.
- 3) By following the on-screen instructions, select or enter the necessary information.

POINT

When the version of software package to be installed is Ver.1.30G or later, the software package the version of which is Ver.1.29F or earlier must be uninstalled in advance.

For the precautions when installing the software package, refer to  Section 7.1.

(3) Manual

For the function and handling method of the updated version of software package, refer to the corresponding manual. The manual is stored in the 'Manual' folder of the software package.

After the installation, the manual can be displayed by clicking the Manual button in CC IE Control Utility.

Appendix 7 Restrictions for Operating System

For the following applicable operating systems, use SW1DNC-MNETG-B with the supported version.

The following version of software and manuals are provided continuously.

OS	Supported version	
	SW1DNC-MNETG-B	Manual number
Windows 8.1 Windows Server 2012 R2 Windows 8 Windows Server 2012 Windows 7 Windows Server 2008 R2	1.31H	SH-080691ENG-AE
Windows Server 2008 Windows Vista Windows Server 2003 R2 Windows XP	1.18U	SH-080691ENG-S
Windows 2000	1.15R	SH-080691ENG-O

Do not use a function added by a version newer than the support version.

(1) Obtaining the supported version

Please contact your local Mitsubishi Electric sales office or representative.

(2) Installation

- 1) Save the obtained data for installation to the system drive, CD, etc.
- 2) Start the installer.
Double-click "Setup.exe" in the "SW1DNC-MNETG-B_(each version)" folder.
- 3) By following the on-screen instructions, select or enter the necessary information.

(3) Manual

For the function and handling method, refer to the corresponding manual.

The manual is stored in the 'Manual' folder of the software package.

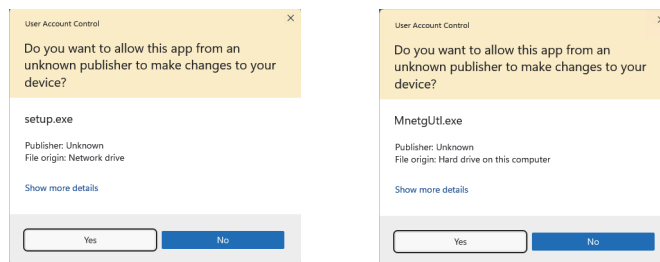
Appendix 8 Windows User Account Control

The user account control (UAC) is provided to protect the system from being destroyed (e.g. prevention of start-up of a program which will execute an unintended operation).

Appendix 8.1 Confirmation message

When the user account control function is enabled, a message for the user account control appears at the following timings:

- Installing/uninstalling a software package
- Starting CC IE Control Utility



When a message appears, click the [Yes] button.

Appendix 8.2 Methods for displaying a message

If a software package cannot be installed or if a message for the user account control does not appear when starting CC IE Control Utility, enable the user account control setting by the following procedures.

(1) Method for enabling the user account control function

- 1) Select [System and Security] - [Change User Account Control settings] in the control panel of Windows.
- 2) Set the slide bar to an item other than "Never notify" and click the [OK] button.

(2) Method for setting the local security policy

- 1) Open the "Local Security Policy" screen on Windows.
It appears by entering 'secpol.msc' in the "Run" screen that appears by pressing the Windows key + [R].
- 2) Select [Local Policies] - [Security Options] in the "Local Security Policy" screen.
- 3) Set the following policies:

Policy	Security setting
User Account Control: Detect application installations and prompt for elevation	Enable
User Account Control: Run all administrators in Admin Approval Mode	Enable
User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode	Prompt for consent for non-Windows binaries

Appendix 9 Behavior When Personal Computer Enters Power Save Mode or Fast Startup

CC-Link IE Controller Network board does not support the power save mode (hibernate, sleep) and fast startup. The following explains the behavior of the personal computer when the personal computer enters each mode.

Appendix 9.1 Behavior when the personal computer enters the power save mode (hibernate, sleep)

(1) Behavior when entering the hibernation/sleep mode

The following explains the behavior of the board when the power save mode (hibernate, sleep) is entered on the personal computer.

- The CC-Link IE Controller Network board stops its operation and is disconnected from the network.
- The board is not reconnected even after the personal computer returns from the power save mode (hibernate, sleep).
- After the personal computer returns from the power save mode (hibernate, sleep), "-28141(9213H) : System sleep error" occurs when accessing CC-Link IE Controller Network board from the CC IE Control utility or an application program, which includes MELSEC data link library function.

(2) Corrective action

When the personal computer is set to enter the power save mode (hibernate, sleep), the setting is changed by MELSECPowerManager.

For details of MELSECPowerManager, refer to the following section.

 Appendix 10

Appendix 9.2 Behavior when the fast startup function is enabled

(1) Behavior when the fast startup function is enabled

The following explains the behavior of the board when the fast startup function is enabled.

- The board is not reconnected even after the fast startup.
- After the fast startup, "-28141(9213H) : System sleep error" occurs when accessing CC-Link IE Controller Network board from the CC IE Control utility or an application program, which includes MELSEC data link library function.

(2) Corrective action

When the fast startup function is enabled on the personal computer, the setting is changed by MELSECPowerManager.

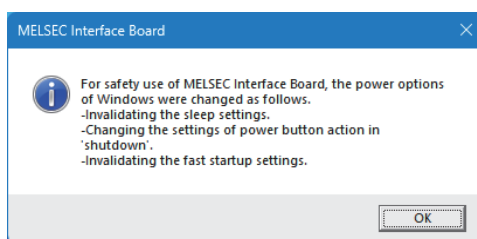
For details of MELSECPowerManager, refer to the following section.

➡ Appendix 10

Appendix 10 MELSECPowerManager

MELSECPowerManager is a service application which monitors the Windows® Power Options settings every 30 seconds to prevent the personal computer from entering the power save mode (hibernate, sleep) or fast startup.

When a personal computer is set to enter the power save mode (hibernate, sleep) or the fast startup function is enabled, the following message is displayed and the setting is changed by MELSECPowerManager.



Appendix 10.1 Installing MELSECPowerManager

MELSECPowerManager is installed automatically when the software package is installed to a personal computer.

The operation starts after the personal computer is restarted.

Appendix 10.2 Uninstalling MELSECPowerManager

MELSECPowerManager is uninstalled automatically when the software package is uninstalled.

However, it is not uninstalled when another software package of MELSEC network interface board is installed to the personal computer.

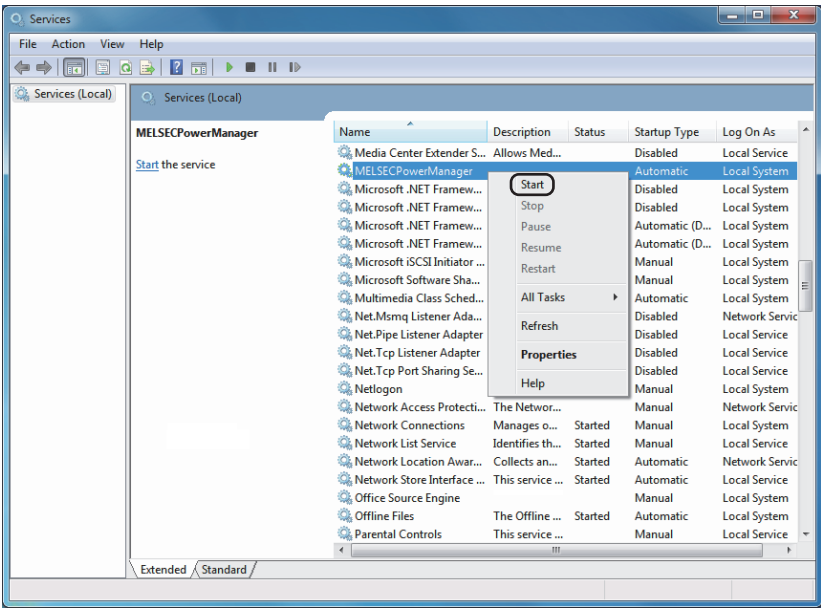
Uninstall all software packages for MELSEC network interface board installed on the personal computer to uninstall MELSECPowerManager.

Appendix 10.3 Checking MELSECPowerManager

MELSECPowerManager can be checked by selecting [Windows Tools] - [Services] in Windows.
Check that "MELSECPowerManager" is displayed and "Running" is displayed under "Status."

 POINT

- When MELSECPowerManager is disabled, the personal computer may enter the power save mode (hibernate, sleep) automatically depending on the settings on the personal computer. Do not disable MELSECPowerManager because the CC-Link IE Controller Network board does not function normally if the personal computer enters the power save mode (hibernate, sleep). For the behavior of the board when the personal computer enters the power save mode (hibernate, sleep), or the fast startup function is enabled, refer to the following appendix.
 Appendix 9 Behavior When Personal Computer Enters Power Save Mode or Fast Startup
- If MELSECPowerManager is disabled accidentally, right-click "MELSECPowerManager" on the "Services (Local)" screen and select "Start" from the menu.



Appendix 11 EMC AND LOW VOLTAGE DIRECTIVE

In each country, laws and regulations concerning electromagnetic compatibility (EMC) and electrical safety are enacted.

For the products sold in the European countries, compliance with the EU's EMC Directive has been a legal obligation as EMC regulation since 1996, as well as the EU's Low Voltage Directive as electrical safety regulation since 1997. Manufacturers who recognize their products are compliant with the EMC and Low Voltage Directives are required to attach a "CE marking" on their products in European countries. In some other countries and regions, manufacturers are required to make their products compliant with applicable laws or regulations and attach a certification mark on the products as well (such as UK Conformity Assessed (UKCA) marking in the UK, and Korea Certification (KC) marking in South Korea).

Each country works to make their regulatory requirements consistent across countries based on international standards. When the requirements are consistent, measures to comply with the EMC and electrical safety regulations become common across countries. The UK and South Korea have enacted EMC regulations whose requirements are consistent with those of the EMC Directive. The UK has also enacted electrical safety regulations whose requirements are consistent with those of the Low Voltage Directive. In this section, the requirements of the EMC and Low Voltage Directives are described as examples of those of the EMC and electrical safety regulations.

Appendix 11.1 Measures to comply with the EMC Directive

The EMC Directive sets requirements for emission (conducted and radiated electromagnetic interference emitted by a product) and immunity (the ability of a product not to be influenced by externally generated electromagnetic interference).

This section describes the precautions for machinery constructed with this product to comply with the EMC Directive.

These precautions are based on the requirements of the EMC Directive and the harmonized standards. However, they do not guarantee that the entire machinery constructed according to the descriptions complies with the EMC Directive.

The manufacturer of the machinery must determine the testing method for compliance and declare conformity to the EMC Directive.

(1) EMC Directive related standards

The standards applicable to the EMC Directive are listed below.

All test items were tested by installing each device on a personal computer bearing a CE certification logo.

(a) Emission requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2: 2007	CISPR16-2-3 Radiated emission ^{*1}	The electromagnetic wave which the product emits to the external space is measured.	30M to 230MHz, QP: 40dBμV/m (measured at 10m distance) ^{*2} 230M to 1000MHz, QP: 47dBμV/m (measured at 10m distance)
	CISPR16-2-1, CISPR16-1-2 Conducted emission ^{*1}	The noise level which the product emits to the power line is measured.	0.15M to 0.5MHz, QP: 79dB, Mean: 66dB ^{*2} 0.5M to 30MHz, QP: 73dB, Mean: 60dB

^{*1}: The tests were conducted with the product installed in a control panel.

^{*2}: QP: Quasi-Peak value, Mean: Average value

(b) Immunity requirements

Standard	Test item	Test description	Value specified in standard
EN61131-2: 2007	EN61000-4-2 Electrostatic discharge immunity ^{*1}	An electrostatic discharge is applied to the enclosure of the equipment.	8kV Air discharge 4kV Contact discharge
	EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity ^{*1}	An electric field is radiated to the product.	80% AM modulation @1kHz 80M to 1000MHz: 10V/m 1.4G to 2.0GHz: 3V/m 2.0G to 2.7GHz: 1V/m
	EN61000-4-4 Fast transient burst immunity ^{*1}	Burst noise is applied to power lines and signal lines.	- AC/DC power, I/O power, and AC I/O (unshielded) lines: 2kV - DC I/O, analog, and communication lines: 1kV
	EN61000-4-5 Surge immunity ^{*1}	Lightning surge is applied to power lines and signal lines.	- AC power, AC I/O power, and AC I/O (unshielded) lines: 2kV CM, 1kV DM - DC power and DC I/O power lines: 0.5kV CM, 0.5kV DM - DC I/O, AC I/O (shielded), analog, and communication lines: 1kV CM
	EN61000-4-6 Conducted RF immunity ^{*1}	High-frequency noise is applied to power lines and signal lines.	0.15M to 80MHz, 80% AM modulation @1kHz, 10Vrms
	EN61000-4-8 Power-frequency magnetic field immunity ^{*1}	The product is immersed in the magnetic field of an induction coil.	50/60Hz, 30A/m
	EN61000-4-11 Voltage dips and interruption immunity ^{*1}	Power voltage is momentarily interrupted.	0%, 0.5 period, starting at zerocrossing 0%, 250/300 period (50/60Hz) 40%, 10/12 period (50/60Hz) 70%, 25/30 period (50/60Hz)

^{*1}: The tests were conducted with the product installed in a control panel.

(2) Installation in a control panel

This ensures safety as well as effective shielding of electromagnetic noise emitted from a personal computer.

(a) Control panel

- Use a conductive control panel.
- Mask off an area used for grounding when securing the top or bottom plate to the control panel using bolts.
- To ensure electrical contact between inner plates and the control panel, mask off the bolt installation areas of each inner plate so that conductivity can be ensured in the largest area.
- Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.
- Keep the diameter of the holes on the control panel to 10 cm or less. If the diameter is larger than 10 cm, electromagnetic wave may leak. In addition, because electromagnetic wave leaks through a clearance between the control panel and its door, reduce the clearance as much as possible. Use of EMI gaskets (sealing the clearance) can suppress undesired radiated emissions.

The tests were conducted by Mitsubishi Electric Corporation using a control panel having damping characteristics of 37 dB (maximum) and 30 dB (average) (measured at 3 m distance, 30 to 300 MHz).

(b) Power cable and ground cable

The power supply cable and ground cable for a personal computer should be laid out as follows:

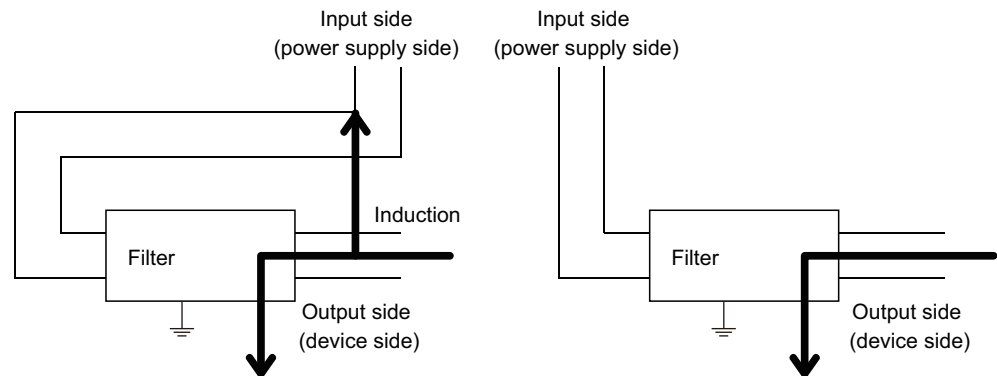
- Provide a ground point to the control panel near the power of a personal computer. Ground the FG terminal of the personal computer to the ground point with the thickest and shortest ground cable possible (a thickness at least 2 mm², a length of 30 cm or shorter).
- Twist the ground cable extended from the ground point with the power cable so that larger amount of noise generated from the power cable is absorbed to the ground. Note that if a noise filter is attached to the power cable, twisting may not be required.

(3) Noise filter (power supply line filter)

A noise filter is effective for reducing conducted noise in the 10 MHz or less frequency band. (Use of a noise filter can suppress noise.)

The following are the installation precautions.

- Do not bundle the cables on the input side and output side of the noise filter. If bundled, the noise on the output side is induced into the filtered cable on the input side.



Noise will be induced when the input and output cables are bundled.

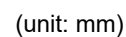
Separately install the input and output cables.

- Ground the ground terminal of the noise filter to the ground point of the control panel with the shortest cable possible (approximately 10 cm).

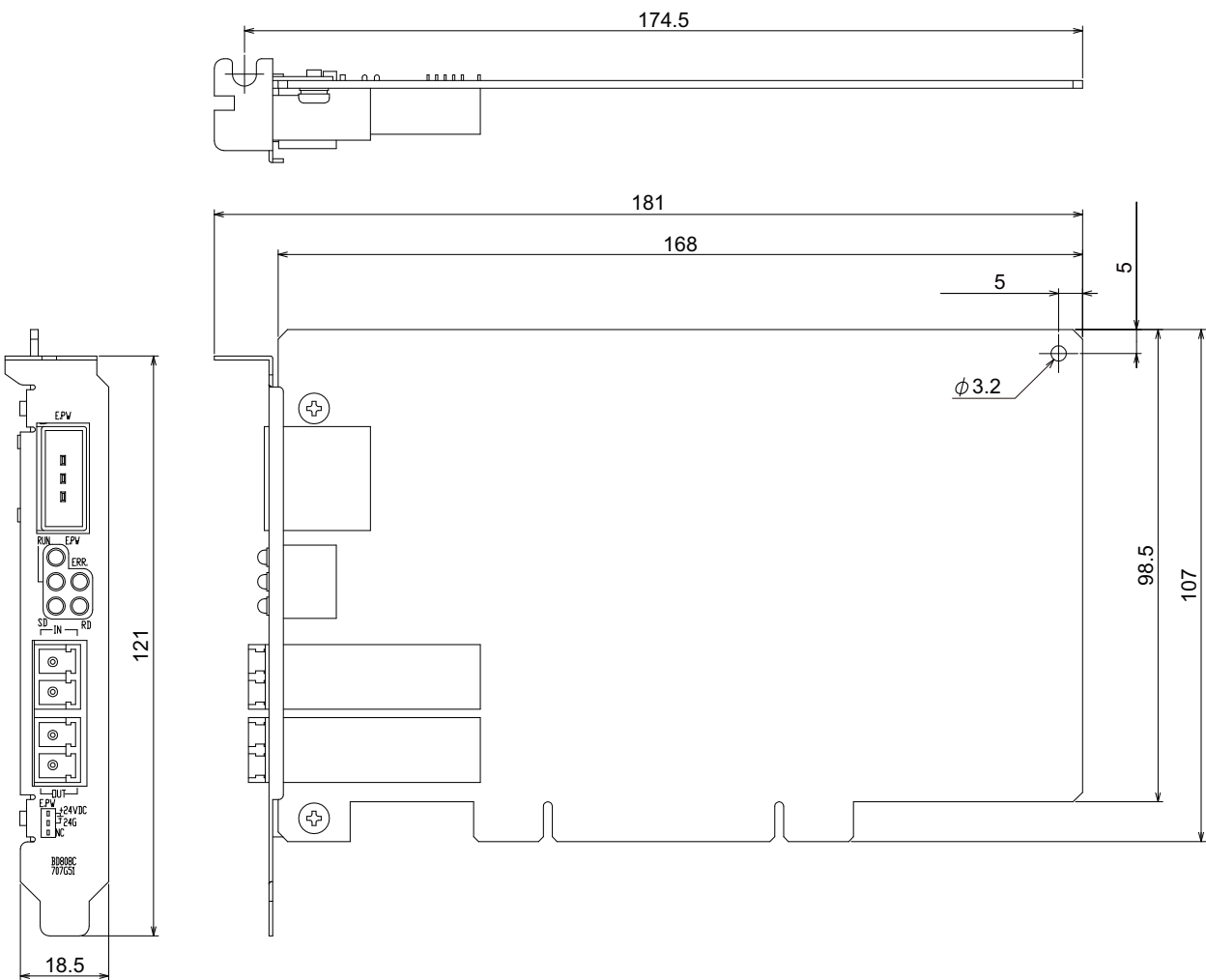
Appendix 11.2 Measures to comply with the Low Voltage Directive

This board is out of the requirement for conformance to the Low Voltage Directive, since it does not use the power supply in the range of 50 to 1000 VAC and 75 to 1500 VDC.

Appendix 12.1 Q80BD-J71GP21-SX



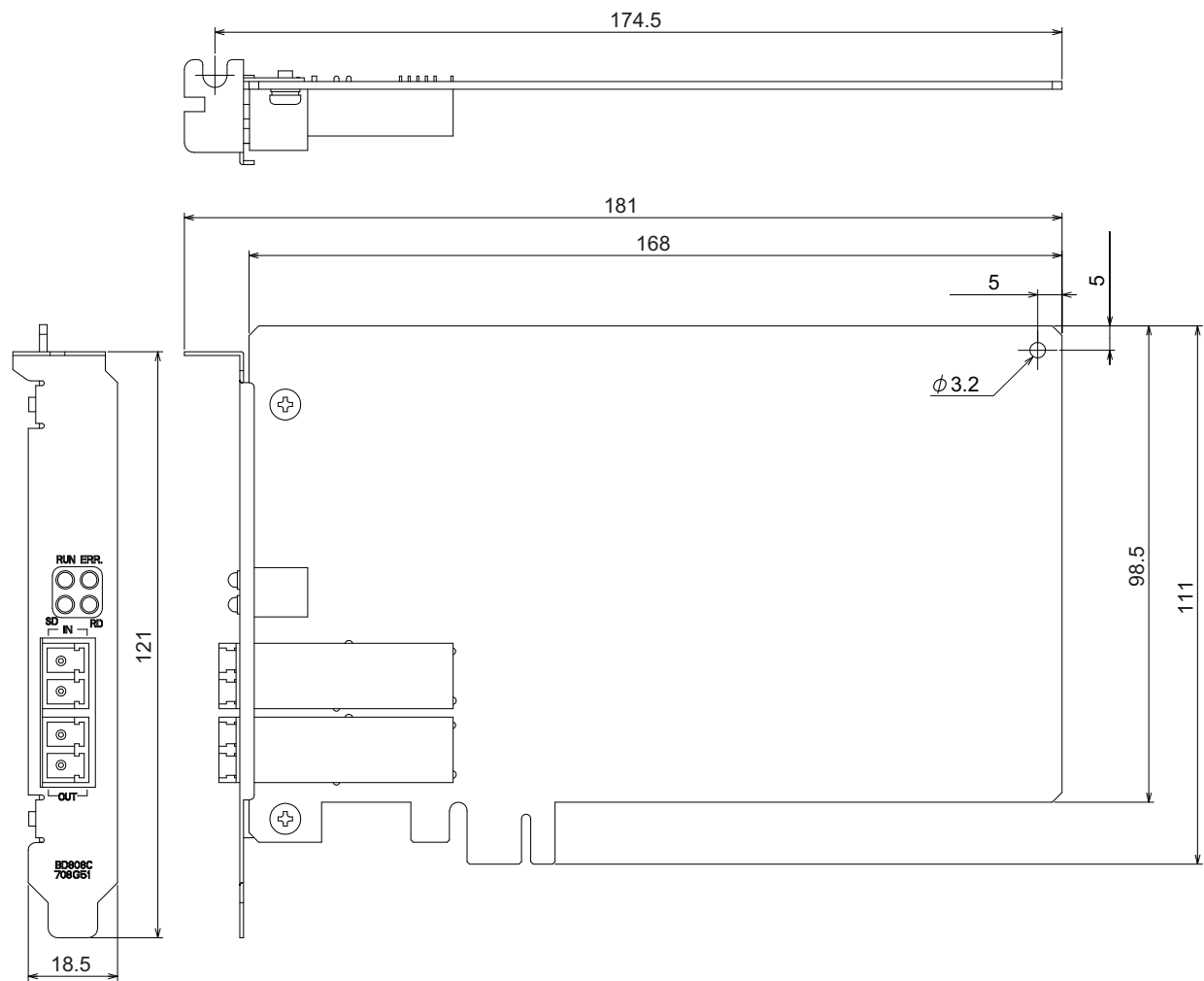
Appendix 12.2 Q80BD-J71GP21S-SX



(unit: mm)

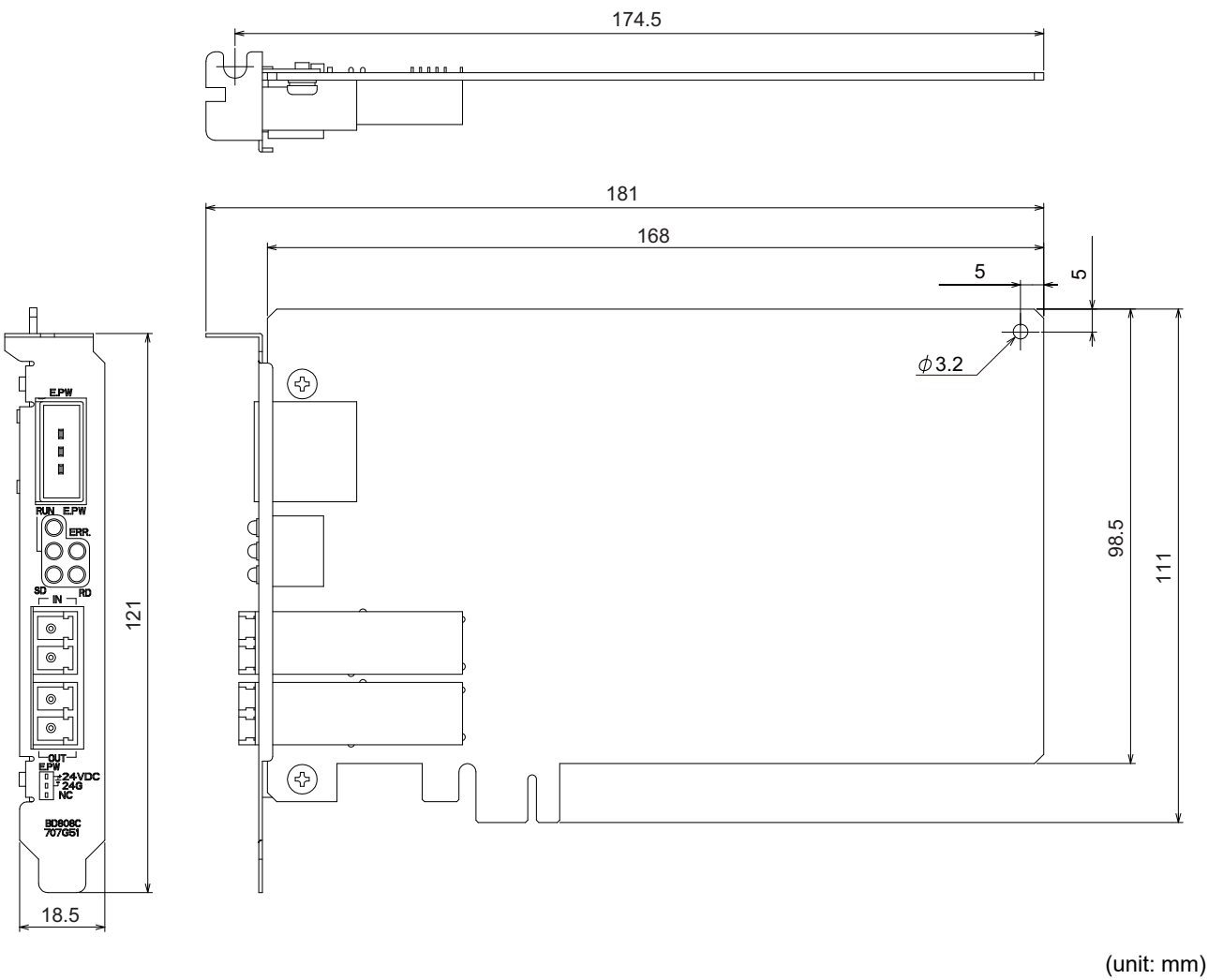
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10	MELSEC DATA LINK
11	LIBRARY
12	PROGRAMMING
13	APPLICATION
14	FUNCTIONS
15	ERROR CODES
16	TROUBLESHOOTING
A	APPENDICES
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Appendix 12.3 Q81BD-J71GP21-SX



(unit: mm)

Appendix 12.4 Q81BD-J71GP21S-SX



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11	PROGRAMMING
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[illegible]

Warranty

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

1. Gratis Warranty Term and Gratis Warranty Range

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

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

[Gratis Warranty Term]

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

[Gratis Warranty Range]

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

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

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

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

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

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

5. Changes in product specifications

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

INFORMATION AND SERVICES

For further information and services, please contact your local Mitsubishi Electric sales office or representative.
Visit our website to find our locations worldwide.

MITSUBISHI ELECTRIC Factory Automation Global Website

Locations Worldwide

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TRANSLATION OF THE ORIGINAL INSTRUCTIONS

SH(NA)-080691ENG-AH(2602)KWIX

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