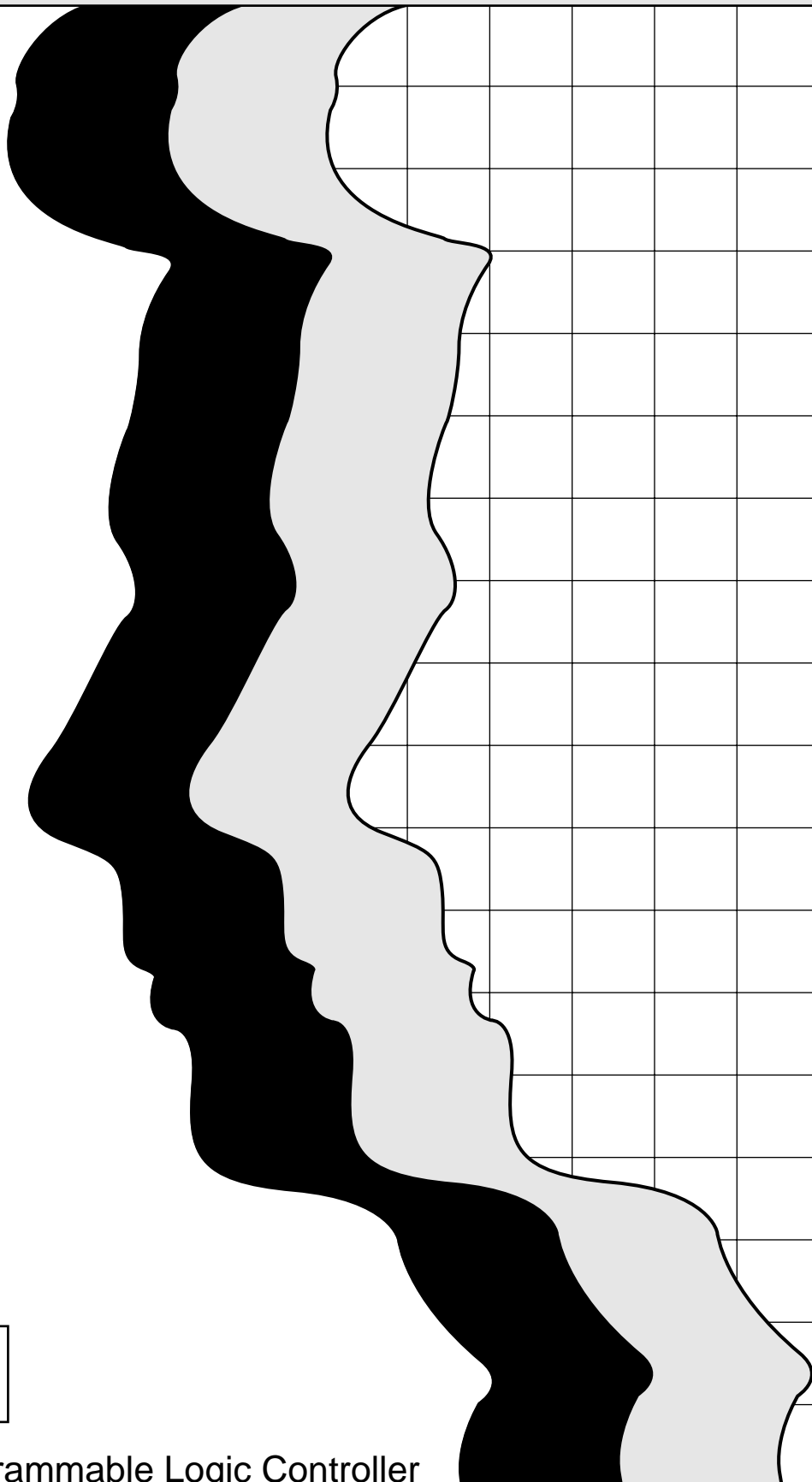# MITSUBISHI

Type A80BDE-J61BT11 CC-Link System Master/Local Interface Board

User's Manual (For SW3DNF-CCLINK)

MELSEC

Mitsubishi Programmable Logic Controller

• SAFETY PRECAUTIONS •

(Always read these instructions before using this equipment.)

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

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

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

⟨!⟩ DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the ⚠CAUTION level may lead to a serious consequence according to the circumstances. Always follow the instructions of both levels because they are important to personal safety.

Please store this manual in a safe place and make it accessible when required. Always forward it to the end user.

[DESIGN PRECAUTIONS]

⟨!⟩ DANGER

- For details on the operating status of each station when a communication problem occurs in the data link, see Chapter 6 of this manual.

- When performing the control of the IBM PC/AT compatible PC in operation (changing data), configure an interlock circuit in a user program so the safety of the overall system is always maintained.
  When performing other controls of the IBM PC/AT compatible PC in operation (changing program and operation status (status control)), read this manual carefully and confirm if the overall safety is maintained.
  Especially, when this control is performed to a remote IBM PC/AT compatible PC from an external device, problems that have occurred on the IBM PC/AT compatible PC side may not be able to immediately be handled if there is a data communication error.
  Define a troubleshooting agreement between external devices and the IBM PC/AT compatible PC for data communication error occurrences, as well as construct an interlock circuit in the user program.

- Do not write data into the "system area" of the buffer memory of intelligent function modules. Also, do not use any "prohibited to use" signals as an output signal to an intelligent function module from the I/F board (A80BDE-J61BT11).
  Writing data into the "system area" or outputting a signal for "prohibited to use" may cause a PLC system malfunction.

[DESIGN PRECAUTIONS]

◇ DANGER

- A failure in the I/F board may cause I/O to change to on status or off status.
  Establish a circuit to be observed externally for those I/O signals that may threaten to cause serious accident.

⚠ CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100mm (3.94 in.) or more from each other.
  Not doing so could result in noise that may cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Use the I/F board in an environment that meets the general specifications contained in this user's manual.
  Using this I/F board in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.

- Do not directly touch the conductive area or electronic components of the I/F board.
  Doing so may cause malfunction or failure in the I/F board.

- Fix the I/F board securely with the installation screws and tighten the installation screws within the specified torque range.
  If the screws are loose, it may cause short circuits or malfunction.
  If the screws are tightened too much, it may cause damage to the screws resulting in short circuits or malfunction.

[WIRING PRECAUTIONS]

⚠ CAUTION

- Switch all phases of the external power supply off when installing or placing wiring.
  Not doing so may cause electric shock, damage to the product or malfunction.

- When turning on the power and operating the module after installation and wiring are completed, always attach the terminal cover that comes with the product.
  There is a risk of electric shock if the terminal cover is not attached.

- Always ground the FG terminal on the IBM PC/AT compatible PC side using D type grounding (Class 3 grounding) or higher specifically for the IBM PC/AT compatible PC.
  There is a risk of malfunction.
  If a malfunction occurs even when the IBM PC/AT compatible PC is grounded, ground both the FG terminal for the IBM PC/AT compatible PC and the SLD terminal for the I/F board.

[WIRING PRECAUTIONS]

⚠ CAUTION

- Tighten the terminal screws within the range of specified torque.
  If the terminal screws are loose, it may cause short circuits or malfunction.
  If the terminal screws are tightened too much, it may cause damage to the screw and/or the I/F board, resulting in short circuits or malfunction.

- Be careful not to let foreign objects such as swarf or wire chips get inside the I/F board.
  They may cause fires, failure or malfunction.

- Be sure to fix communication cables or power cables leading from the I/F board by placing them in the duct or clamping them.
  Cables not placed in the duct or without clamping may hang or shift, allowing them to be accidentally pulled, which may cause damage to the I/F board and cable or malfunction due to bad cable contacts.

- When removing the communication cable or power supply cables from the I/F board, do not pull the cable.
  First loosen the screws where the cable is connected to the I/F board and then remove the cable.
  Pulling the cable that is connected to the I/F board may cause damage to the I/F board and cable or malfunction due to bad cable contacts.

[START UP AND MAINTENANCE PRECAUTIONS]

⚠ CAUTION

- Do not disassemble or modify each module.
  Doing so could cause failure, malfunction, injury or fire.

- Switch all phases of the external power supply off when mounting or removing the I/F board.
  Not doing so may cause failure or malfunction of the I/F board.

- Do not touch the terminal while the power is on.
  Doing so may cause malfunction.

- Switch all phases of the external power supply off when cleaning or retightening terminal screws or module installing screws.
  Not doing so may cause failure or malfunction of the I/F board.
  If the screws are loose, it may cause the short circuits or malfunction.
  If the screws are tightened too much, it may cause damages to the screws and/or the I/F board, resulting in short circuits or malfunction.

[DISPOSAL PRECAUTIONS]

⚠ CAUTION

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

REVISIONS

<u>Usage Precautions</u>

(1) When using the A80BDE-J61BT11 as a master board
Use the Windows NT 4.0 operating system when using the A80BDE-J61BT11 as a master board.

(2) When using the A80BDE-J61BT11 as a standby master station
Use the A80BDE-J61BT11 as a master station when using the A80BDE-J61BT11 as a standby master station.

(3) When using Windows NT 4.0
When using Windows NT 4.0, the installation and use of this product are possible only with Administrator privilege.

(4) Multi-thread communication
Multi-thread communication is not supported.

(5) Installation
When using the A80BDE-J61BT11 with an IBM PC/AT compatible PC that uses the A80BDE-J61BT13, uninstall SWnDNF-CCLINK provided with the A80BDE-J61BT13 first, and then install the SW3DNF-CCLINK provided with the A80BDE-J61BT11.

(6) Overwrite installation
When performing an overwrite installation, install the program in the same folder in which the previous program is installed.

(7) Start menu
After the utility software is uninstalled, the program name may still be displayed in the Start menu.
In this case, restart the IBM PC/AT compatible PC.

(8) Software versions of the CC-Link master and local modules
Use software of version "N" or later for the CC-Link master and local modules.
A module running software version "M" or earlier will not operate properly.

(9) Multiprocessor-based IBM PC/AT compatible PCs
Multiprocessor-based IBM PC/AT compatible PCs cannot be used because the driver does not support multiprocessor-based PCs.

INTRODUCTION

Thank you for purchasing the Model A80BDE-J61BT11 CC-Link system Master/Local Interface Board.
Please read this manual thoroughly to fully understand the functions and performances of the Model A80BDE-J61BT11 CC-Link System Master/Local Interface Board in order to use the product properly.
Please be sure to deliver this manual to the end users.

CONTENTS

<u>About Manuals</u>

The following manuals are also related to this product.
In necessary, order them by quoting the details in the tables below.

Related Manuals

Manual Name	Manual Number (Model Code)
CC-Link System Master/ Local Module type AJ61BT11/A1SJ61BT11 User's Manual 　　This Manual explains the system configuration, Performance specifications, functions, handling, wiring 　　and troubleshooting for the AJ61BT11 and A1SJ61BT11.　　　　　　　　　　(Sold separately)	IB-66721 (13J872)
CC-Link System Master/ Local Module type AJ61QBT11/A1SJ61QBT11 User's Manual 　　This Manual explains the system configuration, Performance specifications, functions, handling, wiring 　　and troubleshooting for the AJ61QBT11 and A1SJ61QBT11.　　　　　　　　　(Sold separately)	IB-66722 (13J873)
CC-Link System Master/ Local Module type QJ61BT11 User's Manual 　　This Manual explains the system configuration, Performance specifications, functions, handling, wiring 　　and troubleshooting for the QJ61BT11.　　　　　　　　　　　　　　　　　(Sold separately)	SH-080016 (13JL91)

The following lists the key items that represent the main usage of the I/F board by the purpose.
Please use the following key items to refer to the appropriate section of this manual.

(1) To learn about the features of the I/F board (Section 1.1)
    The features are described in Section 1.1.

(2) To learn about compatibility with existing software (Section 1.2)
    Compatibility with existing software is described in Section 1.2.

(3) To learn about the conformation to the EMC Directive (Chapter 2)
    Conformation to the EMC Directive is described in Chapter 2.

(4) To learn about the system configuration (Chapter 3)
    The system configuration using the I/F board is described in Chapter 3.

(5) To learn about the operating environment of the I/F board (Section 3.2.1)
    The operating environment of the I/F board is described in Section 3.2.1.

(6) To learn about specifications of the I/F board (Chapter 4)
    The specifications of the I/F board are described in Chapter 4.

(7) To learn about the functions of the I/F board (Chapter 5)
    The functions of the I/F board are described in Chapter 5.

(8) To learn about the data link processing time (Chapter 6)
    The data link processing time is described in Chapter 6.

(9) To learn about how to set parameters (Chapter 7)
    How to set parameters is described in Chapter 7.

(10) To learn about the I/F board settings (Chapter 8)
    The I/F board settings are described in Chapter 8.

(11) To learn about how to install and uninstall utility software (Section 8.4)
    How to install and uninstall utility software is described in Section 8.4.

(12) To learn about the utility software operating procedures (Chapter 9)
    The utility software operating procedures are described in Chapter 9.

(13) To learn about accessible devices and ranges (Chapter 10)
    The device specifications and the contents of the information stored in the system area are described in Chapter 10.

(14) To learn about how to use the functions (Chapter 11)

How to use the functions is described in Chapter 11.

(15) To learn about how to communicate with each station
(Chapters 12 to 15)

Some examples of communication between the master board and each station
are described in Chapters 12 to 15.

(16) To learn about the actions to take when the system does not
operate (Chapter 16)

The troubleshooting procedures are described in Chapter 16.

(17) To learn about the error descriptions (Sections 16.2.1 and 16.3.3)

The descriptions of errors are described in Sections 16.2.1 and 16.3.3.

This manual uses the following generic terms and abbreviations to describe the Model A80BDE-J61BT11 CC-Link System Master/Local Interface Board, unless otherwise specified.

Generic term/abbreviation		Description of generic term/abbreviation
CC-Link		Abbreviation for the Control and Communication Link System.
I/F board		Abbreviation for the Model A80BDE-J61BT11 CC-Link System Master/Local Interface Board.
Master board		Abbreviation for the I/F board when used as a master board.
Local board		Abbreviation for the I/F board when used as a local board.
Windows NT 4.0		Abbreviation for Windows NT Workstation 4.0 (English version).
Windows 95		Abbreviation for Windows 95 (English version).
Windows 98		Abbreviation for Windows 98 (English version).
Windows		Generic term for Windows 95, Windows 98, and Windows NT Workstation 4.0.
IBM PC/AT compatible PC		IBM PC/AT and compatible personal computer.
AnNCPU		Generic term for A0J2HCPU, A1SCPU, A1SCPU-S1, A1SCPUC24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1SJHCPU-S8, A1NCPU, A2CCPU, A2CCPUC24, A2CCPUC24-PRF, A2CJCPU, A2NCPU, A2NCPU-S1, A2SCPU, A2SCPU-S1, A2SHCPU, A2SHCPU-S1, A3NCPU, and A1FX.
AnACPU		Generic term for A2ACPU, A2ACPU-S1, A2ACPUP21/R21, A2ACPUP21/R21-S1, A3ACPUP21/R21, and A3ACPU
AnUCPU		Generic term for A2UCPU, A2UCPU-S1, A2ASCPU-S1, A2ASCPU-S30, A2USHCPU-S1, A3UCPU, and A4UCPU
QnACPU		Generic term for Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU, and Q4ARCPU.
ACPU		Generic term for AnNCPU, AnACPU, and AnUCPU.
QCPU	A mode	Generic term for Q02CPU-A, Q02HCPU-A, and Q06HCPU-A.
	Q mode	Generic term for Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU.
Master station		The station controlling the remote station, local station, and intelligent device station.
Local station		A station that has a CPU and can communication with the master station and local station.
Remote I/O station		A remote station that can only handle bit information. (AJ65BTB□-□□, AJ65BTC□-□□)
Remote station		General term for the remote I/O station and remote device station.
Intelligent device station		A slave station such as the AJ65BT-R2 in the CC-Link system that can perform transient transmission.
Master and local modules		General term for the AJ61QBT11, A1SJ61QBT11, AJ61BT11, A1SJ61BT11, and QJ61BT11.
Master module		General term when the AJ61QBT11, A1SJ61QBT11, AJ61BT11, A1SJ61BT11 and QJ61BT11 are used as master stations.
Remote module		General term for AJ65BTB □-□□, AJ65BTC □-□□, AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI, A852GOT, etc.
Intelligent module		A module such as the AJ65BT-R2 that can perform transient transmission.
Cyclic transmission		Function that periodically updates the contents of the remote I/O and remote register.
Transient transmission		Function that communicates data to the designated station when there is an access request from the PLC CPU.
SB		Special link relay
SW		Special link register
RX		Remote input
RY		Remote output
RWw		Remote register (write area)
RWr		Remote register (read area)

<u>Product Configuration</u>

The following shows a list of the product configuration of the I/F board.

Item name	Quantity
Model A80BDE-J61BT11 CC-Link System Master/Local Interface Board	1
Terminal resistor 110 Ω, 1/2 W (brown-brown-brown □)	2
Terminal resistor 130 Ω, 1/2 W (brown-orange-brown □)	2
Model SW3DNF-CCLINK CC-Link Utility Software Package	1 (Floppy disks: set of 5)
CC-Link System Master/Local Interface Board Type A80BDE-J61BT11 User's Manual (corresponding to SW3DNF-CCLINK) (this manual)	1
Software License Agreement	1

1 OVERVIEW

The term CC-Link is the abbreviation for Control and Communication Link.
Throughout this manual, it is referred to as CC-Link.
The CC-Link system connects distributed modules such as an I/O module and a
special functional module using dedicated cables so that these modules can be
controlled by the PLC CPU.

(1) By distributing each module to facility equipment such as a conveyor line and a
machine device, the entire system can be connected in the most efficient manner.

(2) The on/off information of input/output and numeric data handled by modules can
easily be sent and received at high speed.

(3) A simple distributed system can be configured by connecting multiple IBM PC/AT
compatible PCs and PLC CPUs.

(4) By connecting various devices made by Mitsubishi's partner manufacturers, the
system that can provide flexible solutions to meet a wide range of user needs may
be configured.
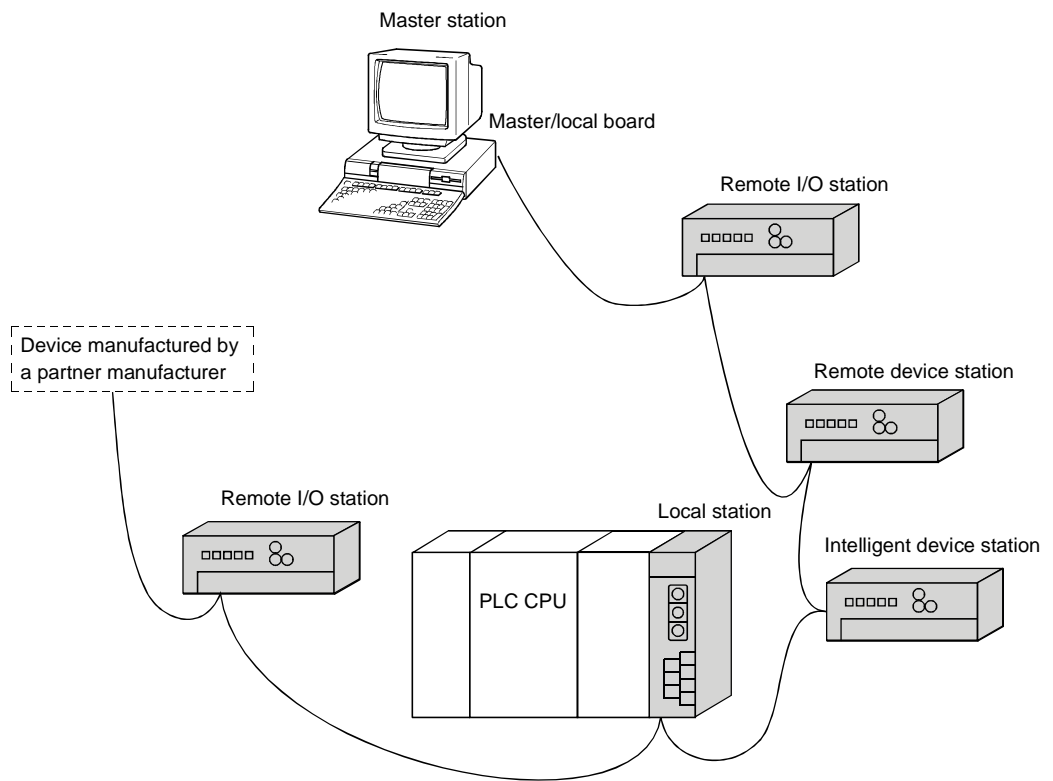
Master station ••••••••••••••••••• The station that controls the data link system.
Remote I/O station •••••••••••• A remote station that handles bit unit data only.
Remote device station •••••••• A remote station that handles bit unit and word unit
data.
Local station ••••••••••••••••••• A station having a PLC CPU and the ability to
communicate with the master and other local stations.
Intelligent device station •••••• A station that can perform transient transmission.

1.1 Features of the I/F Board

The features of the I/F board are as follows:

(1) IBM PC/AT compatible PCs can be incorporated into the CC-Link system.
     An IBM PC/AT compatible PC can be used as a master station, standby station, or local station by installing an I/F board on an IBM PC/AT compatible PC.
     By using the I/F board as the master station, it is possible to control remote I/O stations, remote device stations, intelligent device stations and local stations from the IBM PC/AT compatible PC.

(2) Using the PCI bus eliminates troublesome switch settings.
     Simply installing the I/F board on the PCI bus automatically executes the initial settings.

(3) Parameters can easily be set.
     The parameters necessary for the operation of the CC-Link system can easily be set with a utility program; thus, programming is simplified.

(4) It displays the test and monitoring information related to the CC-Link.
     The test status and monitoring status of the CC-Link system can be displayed on the IBM PC/AT compatible PC to facilitate the operation.

(5) It provides the functions that support user programming.
     It is possible to perform the remote control of remote I/O stations, remote device stations, intelligent device stations, and local stations, as well as reading and writing of devices using the functions that support Visual C++ and Visual Basic. Thus, user applications can easily be created.
     Example: Control of the input signal X and output signal Y of a remote I/O station
              Analogue voltage output control of a remote device station (analogue module)
              Communication control of an intelligent device station (RS-232C module)

(6) It provides the drivers for various operating systems.
     Various drivers are provided for easy system configuration according to the user environment.
     When using the I/F board as a master station
       Supported OS: Windows NT Workstation 4.0 (English version)

     When using the I/F board as a local station
       Supported OS: Windows 95 (English version)
                     Windows 98 (English version)
                     Windows NT Workstation 4.0 (English version)

1.2 Features of the CC-Link System

This section explains the features of the CC-Link.

(1)   Remote I/O station communication

The on/off status of a switch or indicator lamp is communicated using the remote input RX and remote output RY.
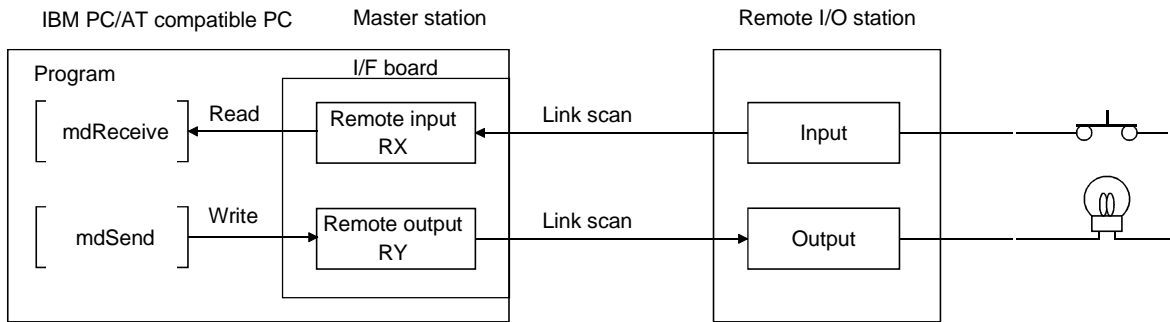
(2)   Remote device station communication

Handshaking signals with the remote device station (initial request, error occurred flag, etc.) are communicated using the remote input RX and remote output RY. The setting data to the remote device station are communicated using the remote registers RWw and RWr.
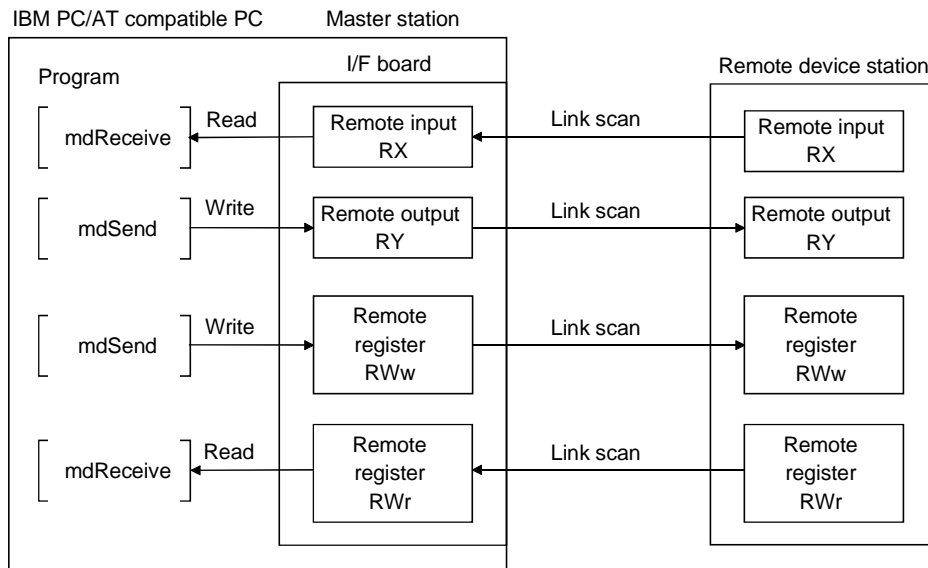
(3) Local station communication
The communication between the master station and the local station uses two types of transmission methods: cyclic transmission and transient transmission.

(a) Cyclic transmission
Data communication between stations can be performed in N : N mode using bit data (remote input RX and remote output RY) and word data (remote registers RWw and RWr).
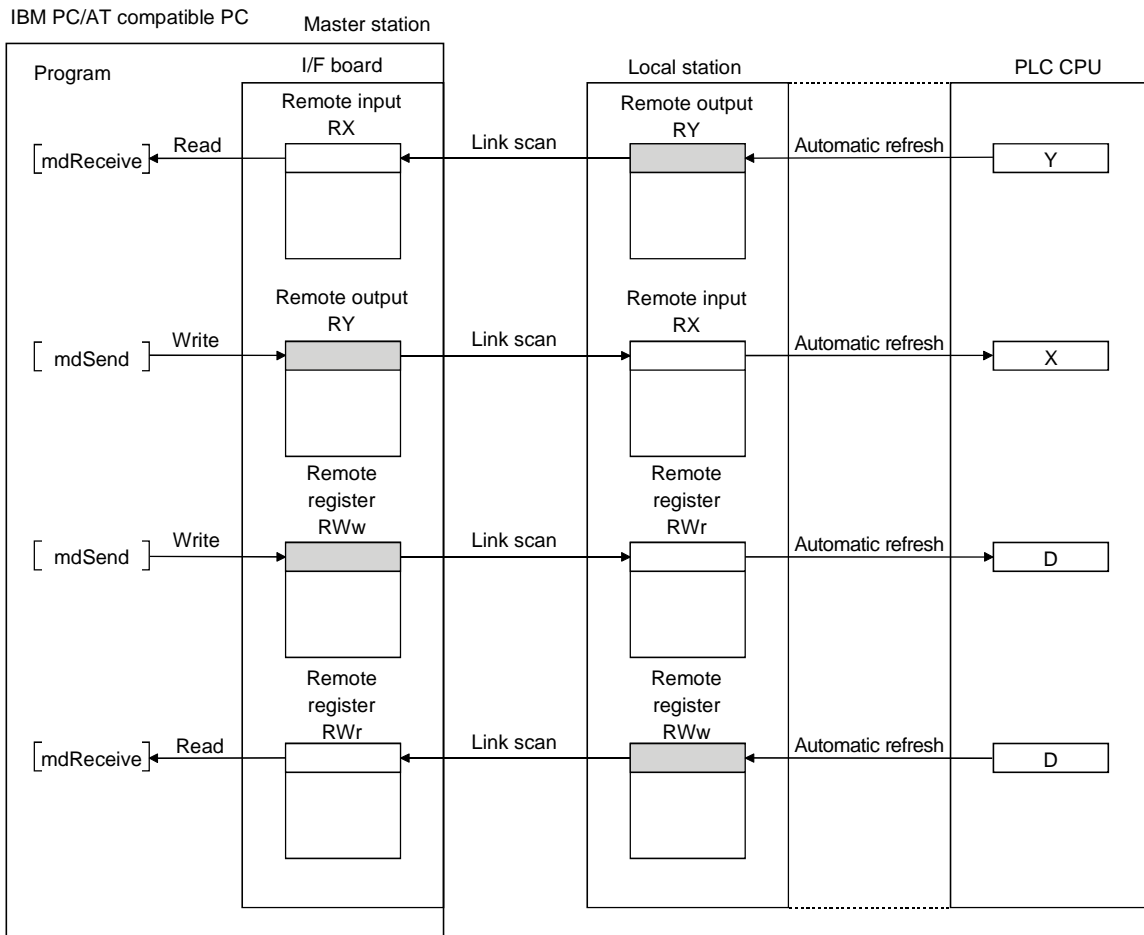
(b) Transient transmission
Read and write operations can be performed for the local station buffer memory and CPU device at an arbitrary timing (using the mdReceive and mdSend functions, respectively).
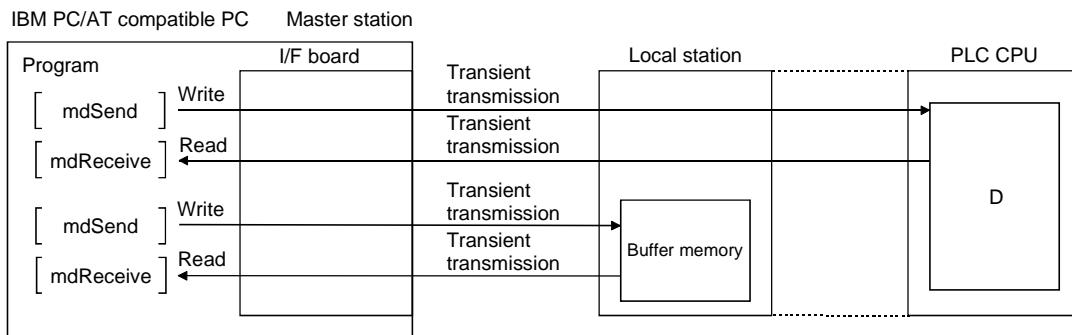
(4)   Intelligent device station communication

The communication between the master station and the intelligent device station uses two types of transmission methods: cyclic transmission and transient transmission.

(a)   Cyclic transmission

Handshaking signals with the intelligent device station (positioning start, positioning end, etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using the remote registers RWw and RWr.
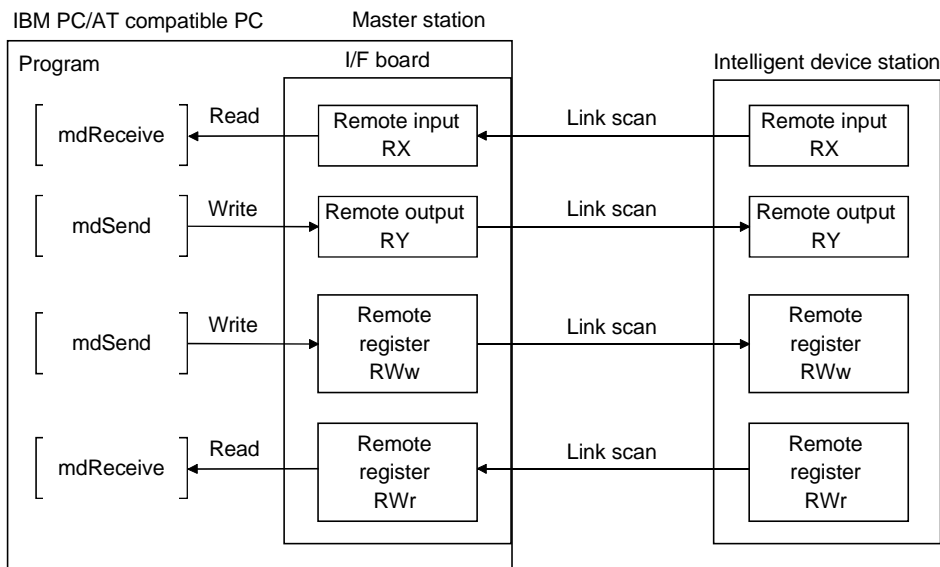
(b)   Transient transmission

Read and write operations can be performed for the intelligent device station buffer memory at an arbitrary timing (using the mdReceive and mdSend functions, respectively).
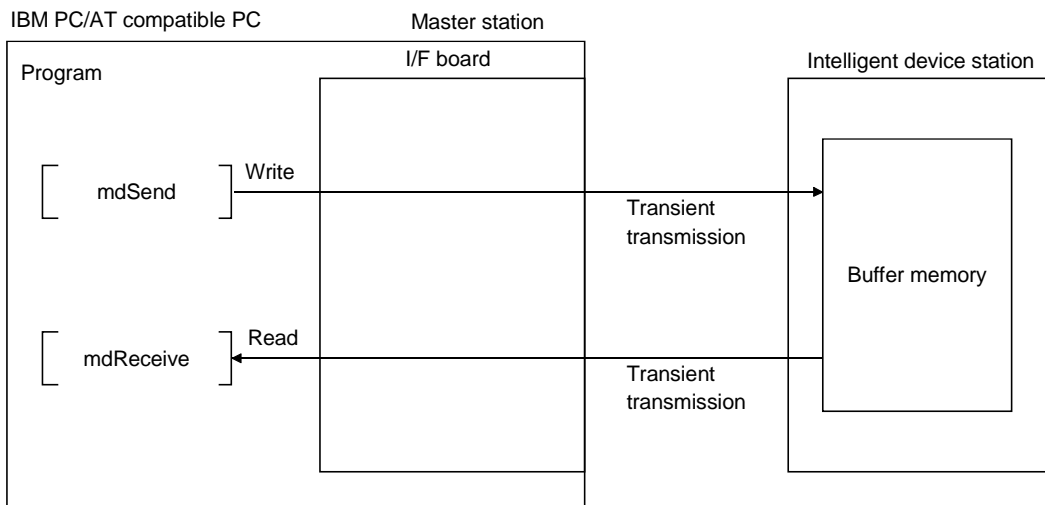
(5) System down prevention (Slave station disconnect function)

Even if a module system fails because of power failure or power off, it will not affect the communication with other normal modules since the system employs the bus connection method.

Also, for a module using a 2-piece terminal block, the module can be replaced during data link. However, if the cable is disconnected, the data link to all stations is disabled.
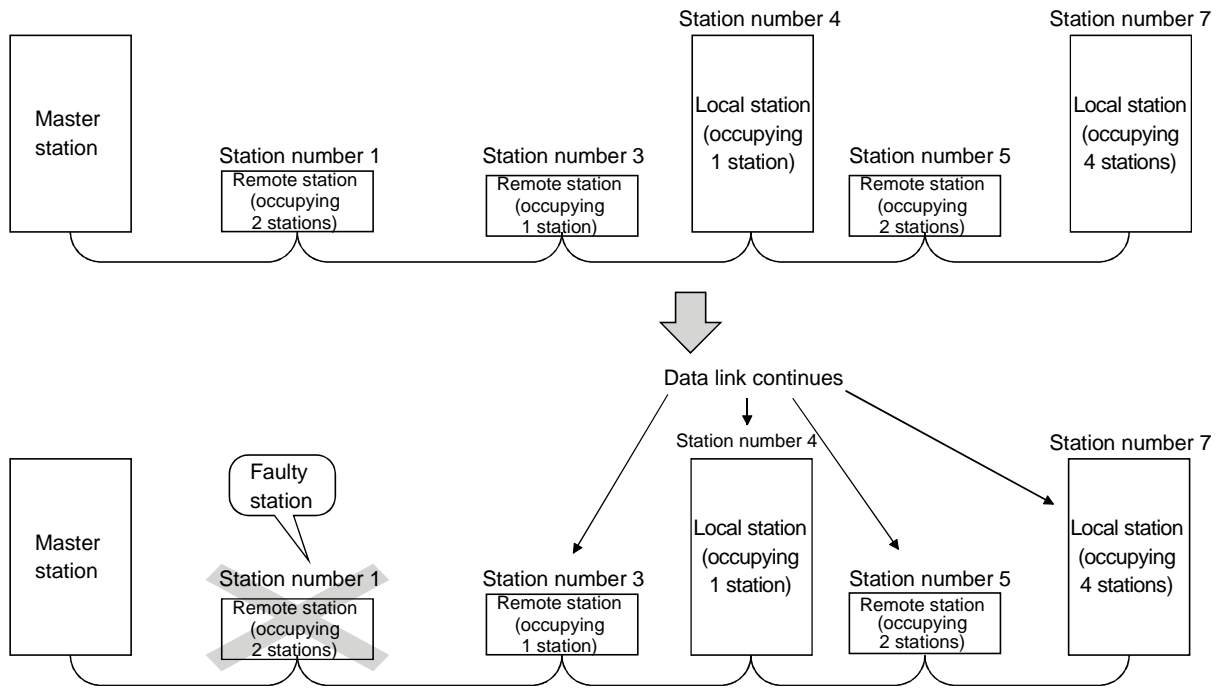
(6) Auto return function

When a module that has been disconnected from the link due to power off recovers and returns to the normal status, it will join the data link automatically.

(7) Input data status setting from a data-link faulty station

The data entered (received) from a data-link faulty station can be cleared, or the status immediately before the error can be restored.

(8) Standby master function

This function enables the data link to continue working by switching to a standby master station (backup station for the master station) if a malfunction occurs in the master station.

> **POINT**
>
> The IBM PC/AT compatible PC can be set as a standby master station only when the master station is also an IBM PC/AT compatible PC. If the master station is a PLC CPU, the IBM PC/AT compatible PC cannot be set as a standby master station.

Data link control
by the master station
Master station

Standby master station
Station number 1
Number of occupied stations: 1

Data link control
in progress

Remote I/O station
Station number 2
Number of occupied stations: 1

Remote I/O station
Station number 3
Number of occupied stations: 1

Standby

Cyclic communication   Cyclic communication   Cyclic communication

Master station is down→Data link control by the standby master station
Master station

Standby master station
Station number 1
Number of occupied stations: 1

Remote I/O station
Station number 2
Number of occupied stations: 1

Remote I/O station
Station number 3
Number of occupied stations: 1

Data link control
in progress

Cyclic communication   Cyclic communication   Cyclic communication

(9) Reserve station function

Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserve stations.

Stations that will be connected in the future

(Reserve station)
Station number 4

Master
station

Station number 1
Remote station
(occupying
2 stations)

Station number 3
Remote station
(occupying
1 station)

Local station
(occupying
4 stations)

Station number 8
Remote station
(occupying
2 stations)

(Reserve station)
Station number 9
Remote station
(occupying
1 station)
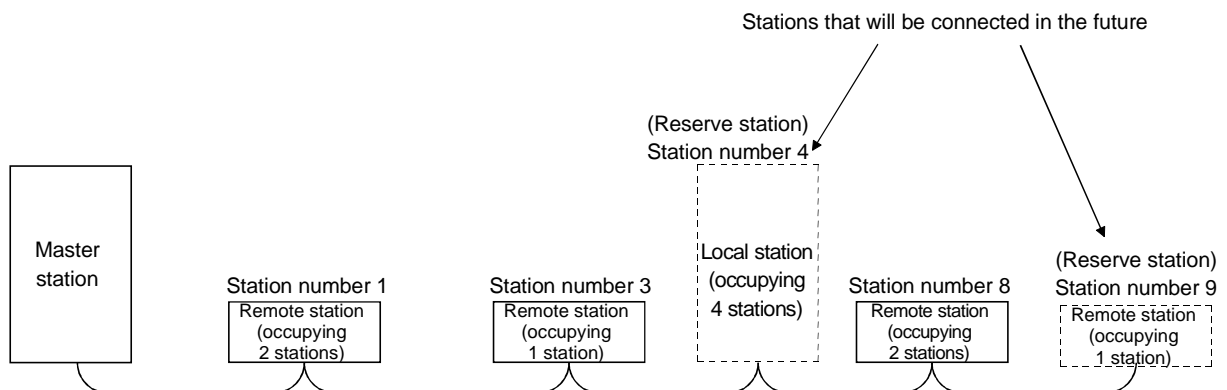
(10) Error invalid station function

By setting network parameters, a module that is powered off in the system configuration will not be treated as a "data link faulty station" by the master station and local station. However, exercise caution since errors are no longer detected.

Stations to be set as error invalid stations

Master station	Station number 1	Station number 3	Station number 4	Station number 5	Station number 7
	Remote station (occupying 2 stations)	Remote station (occupying 1 station)	Local station (occupying 1 station)	Remote station (occupying 2 stations)	Local station (occupying 4 stations)

This station does not become a data link faulty station.

Master station	Station number 1	Station number 3	Station number 4	Station number 5	Station number 7
	Remote station (occupying 2 stations)	Remote station (occupying 1 station)	Local station (occupying 1 station)	Remote station (occupying 2 stations)	Local station (occupying 4 stations)

(11) Data link stop/restart function

The data link can be stopped and restarted while it is being used.

(12) Duplicate station number check function

This function checks whether or not multiple number of modules having the same station number exist in the system when the master station is started.

(13) Transient transmission

In this method of transmission, a counterpart is specified and 1:1 communication is performed at an arbitrary timing.
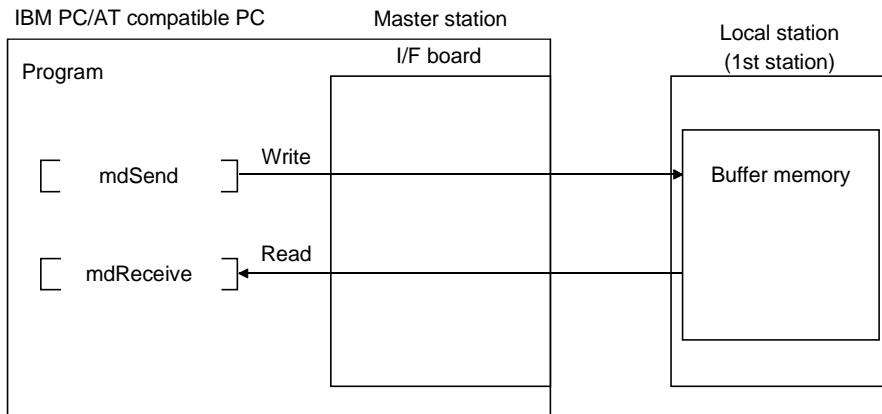
1.3 Combined Use with Existing Software

The following table lists with which existing software packages the SW3DNF-CCLINK can be used.

	SW3DNF-CCLINK	Remarks
SW0DNF-CCLINK	✕	Conventional software packages
SW1DNF-CCLINK	✕	
SW2DNF-CCLINK	✕	
SW0IVDWT-MNET10P	◯	
SW1IVDWT-MNET10P	◯	
SW1D5F-CSKP-E	✕	
SW2D5F-CSKP-E	◯	
SW2D5F-OLEX-E	◯	
SW2D5F-XMOP-E	◯	
SW2DNF-MNET10	◯	
SW3D5F-CSKP-E	◯	—
SW3D5F-OLEX-E	◯	
SW3D5F-XMOP-E	◯	
SW3DNF-MNET10	◯	
SW0DNF-ANU-B	◯	

◯ : Simultaneous operation possible ✕ : Simultaneous operation not possible

POINT

User program EXE files that have been generated using the MDFUNC32.LIB supplied with the conventional software packages must be linked again using the MDFUNC32.LIB supplied with the new driver software package.

2 EMC DIRECTIVE

2.1 Requirements for Compliance with the EMC Directive

The EMC Directive, one of the European Union's directives, is now being enforced. The EMC Directive regulates the "emission (electromagnetic interference)," which requires that a device must not emit strong electromagnetic waves to the surroundings, and the "immunity (electromagnetic sensitivity)," which requires that a device must have the ability to resist external electromagnetic waves.

Sections 2.1.1 through 2.1.4 describe the items to which special attention should be paid when configuring a machine device using the I/F board in order to conform to the EMC Directive.

Although we have made every effort to document this based on the requirements for the regulation as well as the standards we have researched, it does not guarantee the compliance of the entire machine device created according to the description of this document with the EMC Directive. The method to make such device conform to the EMC Directive and the decision on the conformity must be determined by the manufacturer of the machine device.

2.1.1 EMC directive

The standard for the EMC Directive is listed in the table below.
All test items were tested by installing each device on an IBM PC/AT compatible PC bearing a CE certification logo.

Specification	Test item	Test description	Standard values
EN50081-2 : 1995	EN55011 Radiated noise	Measure the electric wave released by the product.	30 M-230 MHz QP : 50 dBμV/m (3 m (9.84 ft) measurement) [1] 230 M-1000 MHz QP : 57 dBμV/m (3 m (9.84 ft) measurement)
	EN55011 Conduction noise	Measure the noise released by the product to the power line.	150 k-500 kHz QP: 79 dB, Mean: 66 dB [1] 500 k-30 MHz QP: 73 dB, Mean: 60 dB
prEN50052-2 : 1991	IEC801-2 Static electricity immunity	Immunity test by applying static electricity to the unit enclosure	4 kV contact discharge 8 kV air discharge
	IEC801-3 Radiated electromagnetic field	Immunity test by exposing the product to radiation from an electric field	10 V/m, 27 - 500 MHz
	IEC801-4 First transient burst noise	Immunity test by applying burst noise to the power line and signal line	2 kV
EN50082-2 : 1995	EN61000-4-2 Static electricity immunity	Immunity test by applying static electricity to the unit enclosure	4 kV contact discharge 8 kV air discharge
	EN61000-4-4 First transient burst noise	Immunity test by applying burst noise to the power line and signal line	2 kV
	ENV50140 Radiated electromagnetic field AM modulation	Immunity test by exposing the product to radiation from an electric field	10 V/m, 80-1000 MHz, 80 % AM modulation@1 kHz
	ENV50204 Radiated electromagnetic field Pulse modulation	Immunity test by exposing the product to radiation from an electric field	10 V/m, 900 MHz, 200 Hz pulse modulation, 50 % duty
	ENV50141 Conduction noise	Immunity test by inducting an electromagnetic field to the power line and signal line	10 Vrms, 0.15-80 MHz, 80 % AM modulation@1 kHz

[1] QP (Quasi-Peak): Quasi-peak value, Mean: Mean value

2.1.2 Installing devices in the control panel

Installing devices in the control panel has a considerable effect--not only securing safety but also shielding the noise generated from the IBM PC/AT compatible PC in the control panel.

(1) Control panel
(a) Use an electrically conductive control panel.
(b) Mask the coating when fastening the control panel's top or bottom panel with bolts, so that the surface contact can be provided.
(c) To ensure good electrical contact between the inside panel of the control panel and the control panel's main unit, mask the coating around the installation bolts connecting to the main unit so that conductivity can be secured in the largest surface area possible.
(d) Ground the control panel's main unit using a thick ground cable so that low impedance can be secured even at high frequency.
(e) Be sure the holes on the control panel are less than 10 cm (3.94 in.) in diameter. A hole larger than 10 cm (3.94 in.) may leak electric waves.

(2) Layout of the power supply cable and ground cable
The power supply cable and ground cable for an IBM PC/AT compatible PC should be laid out as follows:

(a) Specify a grounding point that enables the grounding of the control panel close to the power supply to the IBM PC/AT compatible PC. Ground the FG (frame ground) terminal of the IBM PC/AT compatible PC or the SLD (shield) terminal of the I/F board using the thickest, shortest cable possible (about 30 cm (11.81 in.) or less in length). Since the FG and SLD terminals function to ground the noise generated in the IBM PC/AT compatible PC, it is necessary to ensure the lowest possible impedance. Because the power line allows the noise to escape, it actually contains a great amount of noise. Therefore, shortening the wire length prevents the power line from functioning as an antenna.
Note: A long piece of conductive material may easily function as an antenna that emits more efficient noise.

(b) Twist the ground cable leading to the ground point with the power supply cable. By twisting it with the ground cable, the noise leaking from the power supply cable may be grounded at a higher rate. However, twisting the power supply cable with the ground cable may not be necessary if a noise filter is installed on the power supply cable.

2.1.3 Cables

Because the cable that runs from the control panel contains high frequency noise, it functions as an antenna outside the control panel and radiates noise. Thus, shielded cables should always be used for the cables that extend outside the control panel. Except for certain models, it is not mandatory to use a ferrite core. However, the noise radiated via the cable can be suppressed more effectively by mounting a ferrite core. The use of shielded cables is also effective in increasing the noise resistance. The signal lines for PLC input/output and special modules are designed to ensure a noise resistance level of 2 kV (IEC801-4/EN61000-4-4) if a shielded cable is used. If a shielded cable is not used, or if a shielded cable is not grounded properly, the noise resistance may drop below 2 kV.

Note: The EN50082-2 regulates the noise resistance based on the application of the signal line.
Signals related to control (process control)   : 2 kV
Signals not related to control (process control)) : 1 kV

The EN50082-2 does not define the meaning of "(signals) related to control." However, considering the original intent of the EMC Directive, any signal line that poses a possible danger to people or equipment, if incorrectly operated, shall be defined as a "signal related to control," and a high noise resistance is thus considered to be required.

(1)   Grounding procedure for shields

(a)   Perform shielding process at a location near the exit of the control panel. If the grounding point is far from the exit position, the portion of the cable after the grounding point will cause electromagnetic induction and generates high-frequency noise.

(b)   Use a grounding method that allows the shield to ground in a large area against the control panel. Alternatively, a clamping fixture as shown below may be used. When such clamping fixture is used, be sure to mask the coating on the internal wall of the control panel that makes contact with the clamping fixture.

Shield section

Screw

Clamping fixture

Coating mask
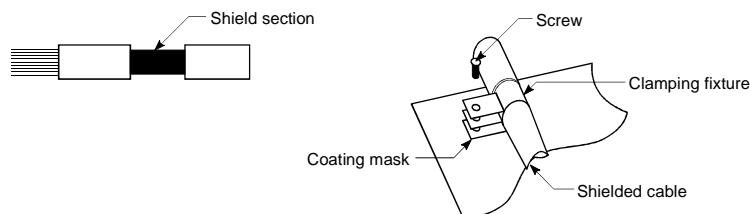
Shielded cable

Note: The method that solders a PVC electric wire to the shield section of the shielded cable and grounding is performed at that end, as shown below, increases high frequency impedance and losses the effect of the shield.

Shielded cable
PVC electric wire
Crimp contact
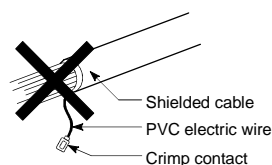
(2) Grounding procedure for the CC-Link dedicated cable

    (a) Always ground the CC-Link dedicated cable connected to the CC-Link master station, local station and remote station.
Since the CC-Link dedicated cable is a shielded cable, remove a part of the outer sheath. Then ground the exposed part of the shield indicated in the figure below using as wide a surface area as possible.
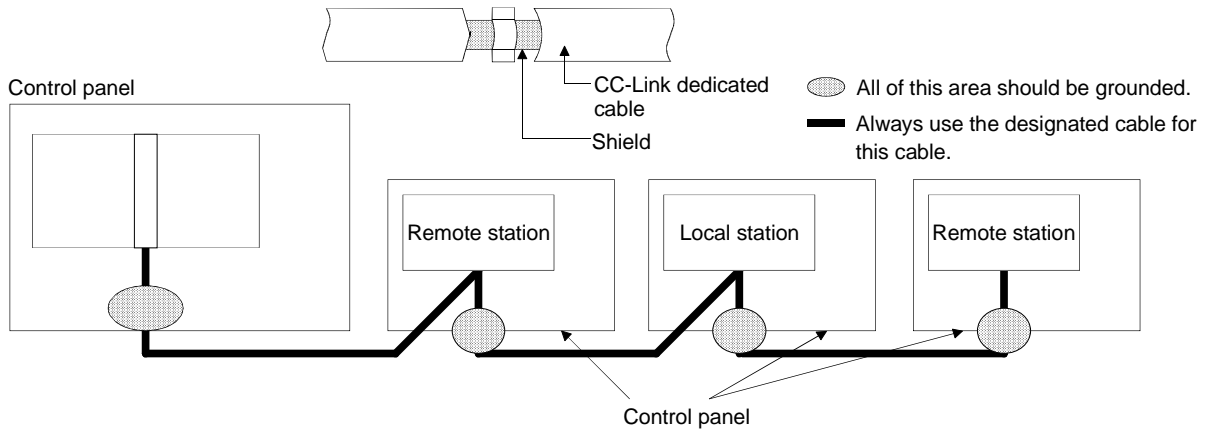
Furthermore, the grounding should be made within 30 cm (11.81 in.) of the board terminal area and at the position closest to the exit of the control panel.

    (b) Always use the designated cable for the CC-Link dedicated cable.

    (c) Do not use a ferrite core for the CC-Link dedicated cable coming from each module and board.

    (d) Ground both the FG terminal and SLD terminal of each module and board.
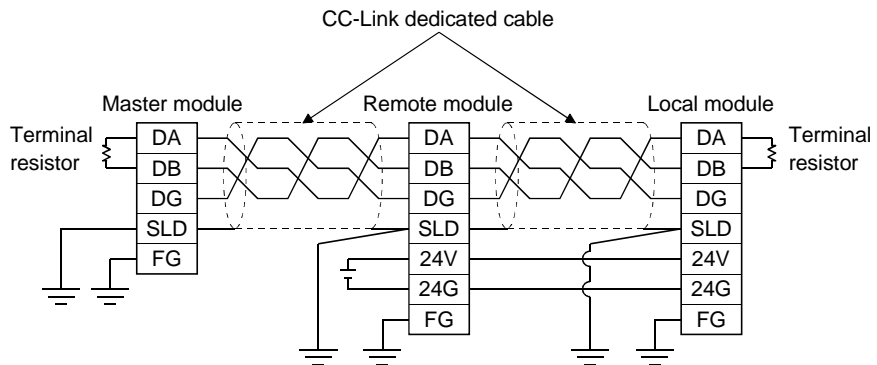
2.1.4 Noise filter (power supply line filter)

A noise filter is a component that has a considerable effect in preventing conductive noise. Except for a few models, the installation of a noise filter on the power supply line is not required. However, the installation of a noise filter can attenuate noise at a higher rate (a noise filter is effective for reducing noise emitted in the range below 10 MHz). Use a noise filter (double (type filter) equivalent to the models shown below.

Model	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3 A	6 A	3 A
Rated voltage	250 V		

The following explains the notes on installation of a noise filter:

(1)   Do not bundle the wires of the input and output sides of the noise filter. If they are bundled, noise on the output side will be inducted to the wire of the input side in which the noise has been removed by a filter.
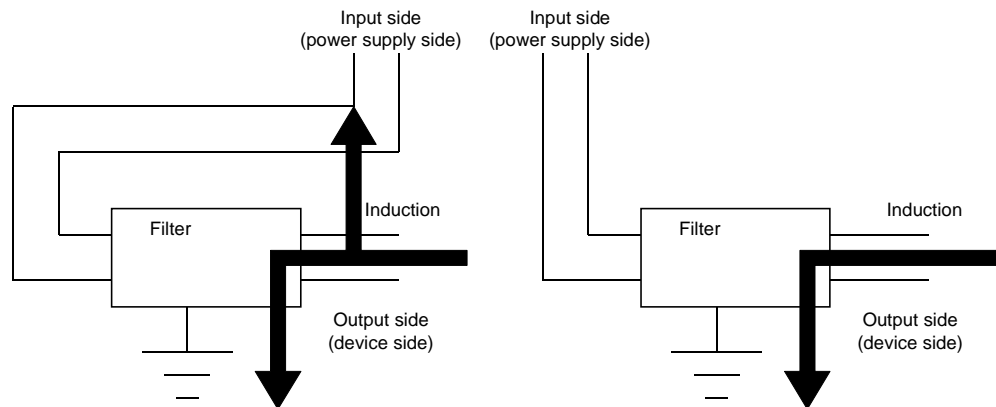
(2)   Ground the ground terminal of the noise filter to the control panel using as short wiring as possible (about 10 cm (3.94 in.)).

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3 SYSTEM CONFIGURATION

This chapter explains the system configuration of the CC-Link.

3.1 Overall Configuration

A total of 64 remote I/O stations, remote device stations, local stations, standby master stations, and intelligent device stations can be connected to a single master station. However, the following conditions must be satisfied:

(1) $\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$
a: Number of modules occupying 1 station c: Number of modules occupying 3 stations
b: Number of modules occupying 2 stations d: Number of modules occupying 4 stations

(2) $\{(16 \times A) + (54 \times B) + (88 \times C)\}$: ≤ 2304
A: Number of remote I/O stations: ≤ 64
B: Number of remote device stations: ≤ 42
C: Number of local stations, standby stations
   and intelligent device stations: ≤ 26

Master station

IBM PC/AT compatible PC

+

A80BDE-J61BT11

Terminal resistor (required)

Maximum 26

Local station — QJ61BT11
Local station — A1SJ61QBT11 / AJ61QBT11
Local station — A1SJ61BT11 / AJ61BT11
Local station — IBM PC/AT compatible PC + A80BDE-J61BT11 / A80BDE-J61BT13

CC-Link dedicated cable

Maximum 26 — Intelligent device station — RS-232C interface module AJ65BT-R2

Maximum 42 — Remote device station — Analog/digital converter AJ65BT-64AD

Maximum 64 — Remote I/O station — Remote I/O module AJ65BTB1-16D / AJ65BTC1-32D

Terminal resistor (required)   CC-Link dedicated cable

Total 64

3.2 Applicable Systems

This section describes applicable CPU modules and provides some precautions on the system configuration.

3.2.1 Applicable IBM PC/AT compatible PCs and number of boards that can be installed

(1) Applicable IBM PC/AT compatible PCs
The operating environment of the I/F board is shown below.

Item		Description	
		Used as a master station	Used as a local station
IBM PC/AT compatible PC main body		IBM PC/AT compatible PC with Pentium 133 MHz CPU or faster and Windows NT Workstation 4.0 installed, having one or more PCI bus slots	IBM PC/AT compatible PC with Pentium 133 MHz CPU or faster and Windows 95, Windows 98, or Windows NT Workstation 4.0 installed, having one or more PCI bus slots
	PCI bus specification	5 V DC, 32-bit bus Basic clock: 33MHz	
Operating system (OS)		Windows NT Workstation 4.0 (English version)	Windows 95 (English version), Windows 98 (English version), or Windows NT Workstation 4.0 (English version)
Programming language		Visual Basic Ver 5.0 (English version), Visual Basic Ver 6.0 (English version), Visual C++ Ver 5.0 (English version), and Visual C++ Ver 6.0 (English version)	
Required memory size		32 MB or more	
Hard disk space		15 MB or more	
Disk drive (required to install a driver)		3.5 inch (1.44 MB) floppy disk drive	

Caution

Multiprocessor-based IBM PC/AT compatible PCs cannot be used because of unsupported driver.

(2) Number of boards that can be used in one system
A maximum of 4 boards can be used (total number of A80BDE-J61BT11 and A80BDE-J61BT13 boards).

3.2.2 Notes on the system configuration

The system should be designed by considering the following in order to prevent erroneous inputs from the remote I/O modules:

(1) When powering on and off

Start the data link after turning on the power to the remote I/O modules. Turn off the power to the remote I/O modules after stopping the data link.

	Data link start	Data link stop

I/F board
(data link status)

Executing

Stopped

Remote I/O module
(power status)

ON

OFF
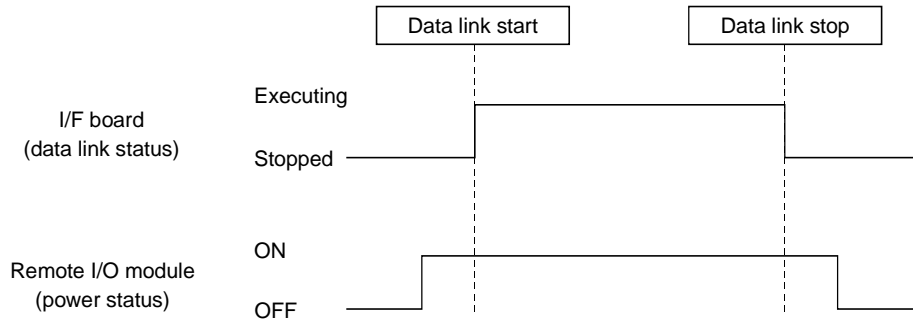
(2) During momentary power failure of the remote I/O modules

When a momentary power failure occurs in the power being supplied to the remote I/O modules (24 V DC), an erroneous input may occur.

[Cause for erroneous inputs due to a momentary power failure]

The remote I/O module hardware uses the power by internally converting the module power (24 V DC) to 5 V DC.

When a momentary power failure occurs in a remote I/O module, the following situation occurs:

(Time for the 5 V DC power in the remote I/O module to turn off)

> (Response time for input module on → off)

Thus, an erroneous input occurs when a refresh is performed within the time indicated by 1) in the figure below.

1)

Remote I/O module
(module power supply and input
external supply power)

Remote I/O module
(internal 5 V DC)

Input (Xn)

When the input external power supply turns off, the input (Xn)
turns off after the response time for the input module changes
from on to off.

3 - 4
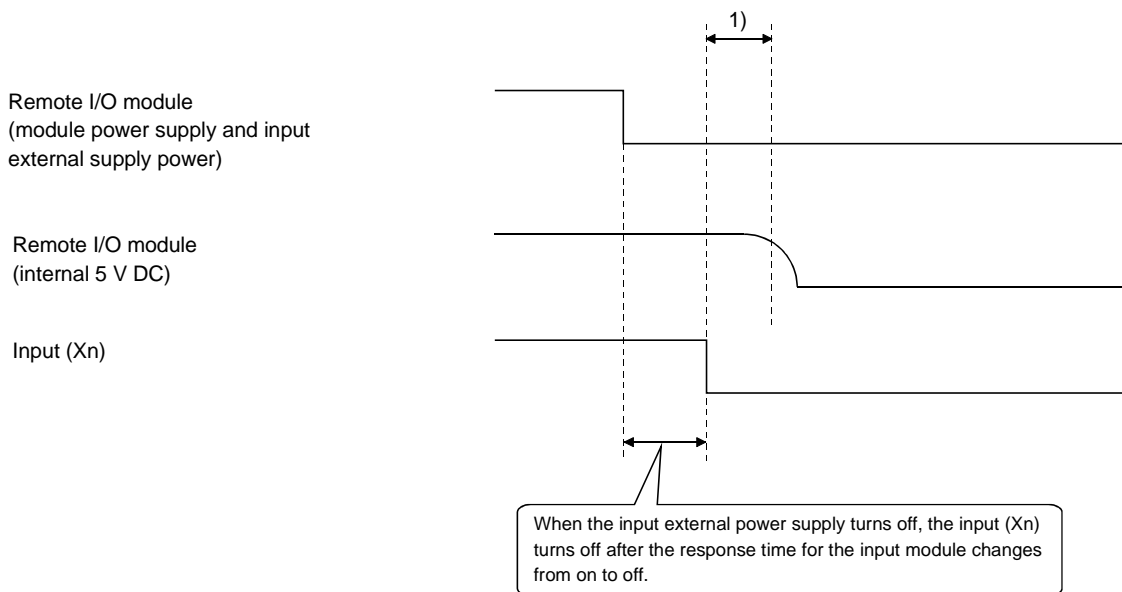
REMARK

When supplying power from a single power source to multiple remote I/O modules, select the proper type of cable and perform wiring by considering the voltage drop. Connections can be established if the receiving port voltage at the remote I/O module is within the specified range of the remote I/O module to be used.
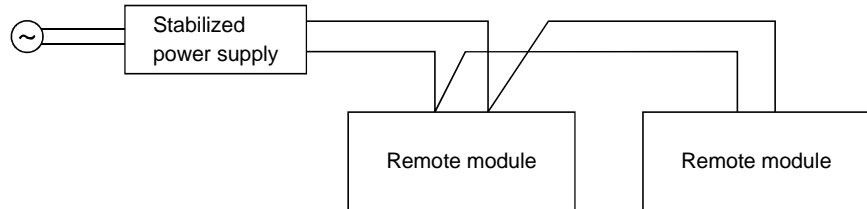
3.2.3 Equipment list

Table 3.1 lists the equipment that configures the CC-Link.

Table 3.1 Equipment list (1/3)

Product name	Model name	Description	Number of occupied stations	Station type
Master/local board for IBM PC/AT compatible PC	A80BDE-J61BT11	CC-Link master/local interface board for IBM PC/AT compatible PC (for PCI bus slot)	For a local station, 1 or 4 stations	Master station or local station
Master/local module	A1SJ61BT11	Master/local module for Q series		
	AJ61BT11	Master/local module for AnS series		
	A1SJ61QBT11	Master/local module for A series		
	AJ61QBT11	Master/local module for Q2AS series		
	QJ61BT11	Master/local module for QnA series		
Remote I/O module	AJ65BTB1-16D	1-line DC input 16-point module (sink/source shared) 24 V DC, 7 mA, 16 points/common	1 station	Remote I/O station
	AJ65BTB2-16D	2-line DC input 16-point module (sink/source shared) 24 V DC, 7 mA, 16 points/common		
	AJ65BTC1-32D	1-line DC input 32-point module (sink/source shared) 24 V DC, 7 mA, 32 points/common		
	AJ65BTB1-16T	1-line transistor output 16-point module (sink) 12/24 V DC, 0.5 A/point, 4 A/common, 8 points/common		
	AJ65BTB2-16T	2-line transistor output 16-point module (sink) 12/24 V DC, 0.5 A/point, 4 A/common, 8 points/common		
	AJ65BTC1-32T	1-line transistor output 32-point module (sink) 12/24 V DC, 0.1 A/point, 2 A/common, 32 points/common		
	AJ65BTB2-16R	2-line contact output 16-point module 24 V DC/240 V AC, 2 A/point, 8 A/common, 8 points/common		
	AJ65BTB1-16DT	I/O module Input: 1-line DC input 8 points (sink) 24 V DC, 7 mA, 8 points/common Output: 1-line transistor output 8 points (sink) 12/24 V DC, 0.5 A/point, 8 points/common		
	AJ65BTB2-16DT	I/O module Input: 2-line DC input 8 points (sink) 24 V DC, 7 mA, 8 points/common Output: 2-line transistor output 8 points (sink) 12/24 V DC, 0.5 A/point, 4 A/common, 8 points/common		
	AJ65BTB2-16DR	I/O module Input: 2-line DC input 8 points (sink/source shared) 24 V DC, 7 mA, 8 points/common Output: 2-line contact output 8 points 24 V DC/240 V AC, 2 A/point, 8 A/common, 8 points/common		
Compact type remote I/O module	AJ65SBTB1-8D	1-line DC input 8-point module (sink/source shared) 24 V DC, 7 mA, 8 points/common		
	AJ65SBTB1-16D	1-line DC input 16-point module (sink/source shared) 24 V DC, 7 mA, 16 points/common		
	AJ65SBTB1-16D1	1-line DC input 16-point module (sink/source shared) 24 V DC, 5 mA, 16 points/common, high-speed response type		
	AJ65SBTB1-32D	1-line DC input 32-point module (sink/source shared) 24 V DC, 7 mA, 32 points/common		

Table 3.1 Equipment List (2/3)

Product name	Model name	Description	Number of occupied stations	Station type
Compact type remote I/O module	AJ65SBTB1-32D1	1-line DC input 32-point module (sink/source shared) 24 V DC, 5 mA, 32 points/common, high-speed response type	1 station	Remote I/O station
	AJ65SBTC1-32D	1-line DC input 32-point module (sink/source shared) 24 V DC, 5 mA, 32 points/common		
	AJ65SBTC1-32D1	1-line DC input 32-point module (sink/source shared) 24 V DC, 5 mA, 32 points/common, high-speed response type		
	AJ65SBTC4-16D	2, 3, 4-line DC input 16-point module (sink/source shared) 24 V DC, 5 mA, 16 points/common		
	AJ65SBTW4-16D	Waterproof, 4-line DC input 16-point module (sink/source shared) 24 V DC, 5 mA, 16 points/common, waterproof type		
	AJ65SBTB1-8T	1-line transistor output 8-point module (sink) 12/24 V DC, 0.5 A/point, 2.4A/common, 8 points/common		
	AJ65SBTB1-16T	1-line transistor output 16-point module (sink) 12/24 V DC, 0.5 A/point, 3.6A/common, 16 points/common		
	AJ65SBTB1-32T	1-line transistor output 32-point module (sink) 12/24 V DC, 0.5 A/point, 4.8A/common, 32 points/common		
	AJ65SBTC1-32T	1-line transistor output 32-point module (sink) 12/24 V DC, 0.1 A/point, 32 points/common		

	AJ65SBTC1-32DT	I/O module
		  Input: 1-line DC input 16 points (sink)
		    24 V DC, 5 mA, 32 points/common
		  Output: 1-line transistor output 16 points (sink)
		    24 V DC, 0.1 A/point, 32 points/common		

	AJ65SBTC1-32DT1	I/O module, high-speed response type
		  Input: 1-line DC input 16 points (sink)
		    24 V DC, 5 mA, 32 points/common
		  Output: 1-line transistor output 16 points (sink)
		    24 V DC, 0.1 A/point, 32 points/common		

	AJ65SBTC4-16DT	I/O module
		  Input: 2, 3, 4-line DC input 8 points (sink)
		    24 V DC, 5mA, 16 points/common
		  Output: 2, 3, 4-line transistor output 8 points (sink)
		    24 V DC, 0.5 A/point, 16 points/common		

	AJ65SBTW4-16DT	I/O module, waterproof type
		  Input: Waterproof, 4-line DC input 8-point (sink)
		    24 V DC, 5 mA, 16 points/common
		  Output: Waterproof, 4-line transistor output 8-point (sink)
		    24 V DC, 0.5 A/point, 16 points/common		

Analog-digital converter module	AJ65BT-64AD	4-channel input Analog input : -10 V to +10 V, -20 mA to 20 mA Digital output : -2000 to +2000, 0 to +4000	2 stations	Remote device station
Digital-analog converter module	AJ65BT-64DAV	4-channel voltage output Digital input : -2000 to +2000 Analog output : -10 V to +10 V		
	AJ65BT-64DAI	4-channel current output Digital input: : 0 to +4000 Analog output : 4 mA to 20 mA		

Table 3.1 Equipment List (3/3)

Product name	Model name	Description	Number of occupied stations	Station type
High-speed counter module	AJ65BT-D62	24 bit binary, 5/12/24 V DC input type 200kPPS, 2-channel	4 stations	Remote device station
	AJ65BT-D62D	24 bit binary, 5/12/24 V DC input type 400kPPS, 2-channel		
	AJ65BT-D62D-S1	24 bit binary, differential input type 400kPPS, 2-channel		
Thermocouple temperature input unit	AJ65BT-68TD	For connecting thermocouple Temperature input 8 channels		
Platinum temperature measuring resistor Pt100 Temperature input unit	AJ65BT-64RD3	For connecting Pt100 (3 wire type) Temperature input 4 channels		
	AJ65BT-64RD4	For connecting Pt100 (4 wire type) Temperature input 4 channels		
ID interface module	AJ65BT-D32ID2	Number of readers/writers that can be connected is 2		
Graphic operation terminal	A852GOT-LWD/LBD	Monochrome liquid crystal type (2 colors) Resolution : 320 × 240 dots Number of touch keys : 300	2 or 4 stations	
	A852GOT-SWD/SBD	STN color liquid crystal type (8 colors) Resolution : 320 × 240 dots Number of touch keys : 300		
Communication module for CC-Link connection	A8GT-J61BT15	CC-Link I/F unit for GOT (for remote device station)		
RS-232C interface module	AJ65BT-R2	Computer link function RS-232C, 1-channel	1 station	Intelligent device station
Peripheral connecting module for GPP function	AJ65BT-G4	For reading/writing/monitoring/testing other station's sequencer PC on the master station, local station and MELSECNET.	1 station	
Positioning module	AJ65BT-D75P2-S3	For positioning control, pulse chain output 2 axes (independent, simultaneous dual axes) dual-axis linear interpolation, dual-axis arc interpolation)	4 stations	
Local board for IBM PC/AT compatible PC	A80BDE-J61BT13	CC-Link interface board for IBM PC/AT compatible PC (for PCI bus slot)	1 or 4 stations	Local station
Communication module for CC-Link connection	A8GT-J61BT13	CC-Link I/F unit for GOT (for intelligent device station)		

For products being offered by our partner manufacturers, see the CC-Link Catalog L (NA) 74108143E.

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4 SPECIFICATIONS

This chapter explains the specifications of the I/F board.

4.1 General Specifications

(1) The following table shows the general specifications of the I/F board.

Item	Specifications				
Operating ambient temperature	0 to 55 °C				
Storage ambient temperature	-20 to 75 °C				
Operating ambient humidity	10 to 90 % RH, No condensation				
Storage ambient humidity	10 to 90 % RH, No condensation				
Vibration resistance	Conforming to JIS B 3501, IEC 61131-2		Frequency	Acceleration	Amplitude	Sweep Count
		When there is intermittent vibration	10 to 57 Hz	---	0.075 mm	10 times each in X, Y and Z axis (80 minutes)
			57 to 150 Hz	9.8 m/s^2	---	
		When there is continuous vibration	10 to 57 Hz	---	0.035 mm	
			57 to 150 Hz	4.9 m/s^2	---	
Shock resistance	Conforming to JIS B3501, IEC 61131-2 (147 m/s^2, 3 times each in 3 directions XYZ)				
Operating environment	No corrosive gas present				
Operating height	2000 m(6562 ft) or less				
Installation area	On the control board				
Over-voltage category *1	II or less				
Pollution rate *2	2 or less				

*1: Indicates the distribution area where the device is assumed to be connected, from the public power distribution network to the local machine device.
   Category II is applied to the devices to which the power is supplied from a fixed equipment.
   The surge resistance voltage of a rated 300 V device is 2500 V.
*2: This is an index which indicates the occurrence rate of the conductive object in the environment where the device is used.
   Pollution rate II indicates that only non-conductive pollution may occur with a possibility of generating temporary conductivity due to accidental condensation.

(2) The general specifications after installing the I/F board should conform to those of the IBM PC/AT compatible PC.

4.2 Performance Specifications

Table 4.1 shows the performance specifications of the CC-Link.

Table 4.1 Performance specifications

Item	Specification
Transmission rate	Can select from 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps
Overall cable distance (maximum transmission distance)	Varies according to the transmission rate (See Section 4.2.1)
Maximum number of connected stations (master station)	64 (See Section 3.1 for the conditions for the number of connected stations)
Number of occupied stations (local station)	1 or 4 station(s) (The number of stations can be switched using the utility parameter setting.)
Maximum number of link points per system	Remote I/O (RX, RY) : 2048 points Remote register (RWw): 256 points (master station → remote station/local station/ intelligent device station/standby master station) Remote register (RWr) : 256 points (remote station/local station/ intelligent device station/standby master station → master station)
Remote station/local station/intelligent device station/standby master station Number of link points per link	Remote I/O (RX, RY) : 32 points (local station is 30 points) Remote register (RWw): 4 points (master station → remote station/local station/ intelligent device station/standby master station) Remote register (RWr) : 4 points (remote station/local station/intelligent device station/standby master station → master station)
Communication method	Polling method
Synchronous method	Frame synchronous method
Encoding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control system	CRC($X^{16} + X^{12} + X^5 + 1$)
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high performance cable ∗[1]
RAS function	• Auto return function • Slave station disconnect function • Error detection by the link special relay/register
Number of boards that may be used in one system	Maximum 4 ∗[2]
Loading slot	IBM PC/AT compatible PC PCI bus slot
Occupied slot	1 slot
5 V DC internal current consumption (A)	0.4
Weight (kg)	0.16

∗1: The CC-Link dedicated cable and CC-Link dedicated high performance cable cannot be used together.
∗2: This indicates the total number of A80BDE-J61BT11 and A80BDE-J61BT13 boards.

4.2.1 Overall cable distance

The following describes the relationship between the transmission rate and the overall cable distance:

(1) For a system consisting of only remote I/O stations and remote device stations

∗1 Cable length between remote I/O stations or remote device stations
∗2 Cable length between the master station and the adjacent stations

CC-Link dedicated cable (uses a terminal resistance of 110 Ω)

Transmission rate	Station-to-station cable length		Overall cable distance
	∗1	∗2	
156 kbps	30 cm (11.8 in.)or more	1 m (3.28 ft) or more	1200 m (3937.2 ft)
625 kbps			600 m (1968.6 ft)
2.5 Mbps			200 m (656.2 ft)
5 Mbps	30 cm (11.8 in.) to 59 cm (23.2 in.) ∗		110 m (360.9 ft)
	60 cm (23.6 in.) or more		150 m (492.1 ft)
10 Mbps	30 cm (11.8 in.) to 59 cm (23.2 in.) ∗		50 m (164.1 ft)
	60 cm (23.6 in.) to 99 cm (38.9 in.) ∗		80 m (262.4 ft)
	1 m (3.28 ft) or more		100 m (328.1 ft)

CC-Link dedicated high performance cable (uses a terminal resistance of 130 Ω)

Transmission rate		Station-to-station cable length		Overall cable distance
		∗1	∗2	
156 kbps		30 cm (11.8 in.) or more	1 m (3.28 ft) or more	1200 m (3937.2 ft)
625 kbps				900 m (2952.9 ft)
2.5 Mbps				400 m (1312.4 ft)
5 Mbps				160 m (524.9 ft)
10 Mbps	Number of connected stations: 1 to 32			100 m (328.1 ft)
	Number of connected stations: 33 to 48	30 cm (11.8 in.) to 39 cm (15.3 in.) ∗		80 m (262.4 ft)
		40 cm (15.7 in.) or more		100 m (328.1 ft)
	Number of connected stations: 49 to 64	30 cm (11.8 in.)to 39 cm (15.3 in.) ∗		20 m (65.6 ft)
		40 cm (15.7 in.) to 69 cm (27.1 in.) ∗		30 m (98.4 ft)
		70 cm (27.5 in.) or more		100 m (328.1 ft)

∗ The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the overall cable distance will be as indicated above.

(2) For a system consisting of remote I/O stations, remote device stations, local stations and intelligent device stations

Master station	Remote I/O station or remote device station	Remote I/O station or remote device station	Local station or intelligent device station	Local station or intelligent device station

*2　　　　　　*1　　　　　　*2　　　　　　*2

Overall cable distance
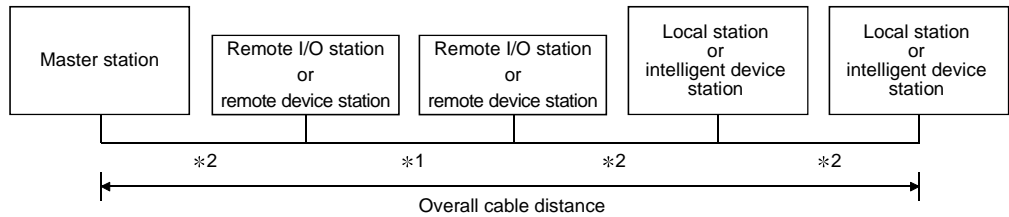
*1 Cable length between remote I/O stations or remote device stations

*2 Cable length between the master station or the local or intelligent device station and the adjacent stations

CC-Link dedicated cable (uses a terminal resistance of 110 Ω)

Transmission rate	Station-to-station cable length		Overall cable distance
	*1	*2	
156 kbps	30 cm (11.8 in) or more	1 m (3.28 ft) or more	1200 m (3937.2 ft)
625 kbps			600 m (1968.6 ft)
2.5 Mbps			200 m (656.2 ft)
5 Mbps	30 cm (11.8 in.) to 59 cm (23.2 in.)		110 m (360.9 ft)
	60 cm (236 in.) or more		150 m (492.1 ft)
10 Mbps	30 cm (11.8 in.) to 59 cm (23.2 in.) *		50 m (164.1 ft)
	60 cm (23.6 in.) to 99 cm (38.9 in.) *		80 m (262.4 ft)
	1 m (3.28 ft) or more		100 m (328.1 ft)

CC-Link dedicated high performance cable (uses a terminal resistance of 130 Ω)

Transmission rate	Station-to-station cable length		Overall cable distance
	*1	*2	
156 kbps	30 cm (11.8in.) or more	1 m (3.28 ft) or more	1200 m (3937.2 ft)
625 kbps			600 m (1968.6 ft)
2.5 Mbps			200 m (656.2 ft)
5 Mbps	30 cm (11.8 in.) to 59 cm (23.2 in.) *		110 m (360.9 ft)
	60 cm (23.6 in.) or more		150 m (492.1 ft)
10 Mbps	70 cm (27.5 in.) to 99 cm (38.9 in.) *		50 m (164.1 ft)
	1 m (3.28 ft) or more		80 m (262.4 ft)

* The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the overall cable distance will be as indicated above.

4.3 CC-Link Dedicated Cable Specifications

Use the CC-Link dedicated cable for the CC-Link system. If a cable other than the CC-Link dedicated cable is used, the performance of the CC-Link system cannot be guaranteed.

If you have any questions regarding the CC-Link dedicated cable, or if you wish to see its specifications, see the CC-Link Catalog L(NA)74108143E.

MEMO

5 FUNCTIONS

This chapter explains the functions of the I/F board, dividing them into four sections: "Basic Functions," "Functions for Improving System Reliability," "Useful Functions" and "Transient Transmission Function."

5.1 Function List

(1) Table 5.1 lists the basic functions.

Table 5.1 List of the basic functions

Item	Description	Reference section
Communication with remote I/O station	Performs the communication of on/off information with remote I/O station.	Section 5.2.1
Communication with remote device station	Performs the communication of on/off information and numeric data with remote device station.	Section 5.2.2
Communication with local station	Performs the communication of on/off information and numeric data with local station.	Section 5.2.3
Communication with intelligent device station	Performs communication with intelligent device station via cyclic transmission and transient transmission.	Section 5.2.4

(2) Table 5.2 lists the functions for improving system reliability.

Table 5.2 List of the functions for improving system reliability

Item	Description	Reference section
Slave station disconnect function	Disconnects modules that cannot continue data link because of power off, etc, and continues the data link with only the normal modules.	Section 5.3.1
Auto return function	When a module, which has been disconnected from data link because of power off, etc, returns to the normal status, it automatically joins the data link.	Section 5.3.2
Input data status setting from data link faulty station	Sets the status (clear/latch) of the input (reception) data from a station that became data link faulty because of power off, etc.	Section 5.3.3
Standby master function	Continues data link by switching to the standby master station when a problem occurs in the master station.	Section 5.3.4

(3) Table 5.3 lists the useful functions.

Table 5.3 List of the useful functions

Item	Description	Reference section
Remote net mode	Performs communication with all stations (remote stations, local stations, intelligent device stations, and standby master station).	Section 5.4.4
Reserved station function	By assigning modules that will be connected in the future as reserved stations, these will not be treated as data link faulty stations. If any of the connected modules is designated as a reserved station, it cannot perform data link.	Section 5.4.6
Error invalid station setting function	Prevents modules that will be powered off in the system configuration from being treated as data link faulty stations by setting network parameters.	Section 5.4.7
Data link stop/restart	Stops or restarts the data link that is being executed.	Section 5.4.10
Station number duplicate check function	Checks for duplicate modules having the same station number in the system.	Section 5.4.11

(4) Table 5.4 lists the transient transmission function.

Table 5.4 List of the transient transmission function

Item	Description	Reference section
Transient transmission	Designates an opposite station and communicates at an arbitrary timing	Section 5.5.1

5.2 Basic Functions

This section explains the basic functions of the I/F board.

5.2.1 Communication with remote I/O stations

The following explains an overview of the communication between the master station and a remote I/O station. In the communication with the remote I/O station, the on/off information of the switches and indicator lamps are communicated via the remote input RX and remote output RY.
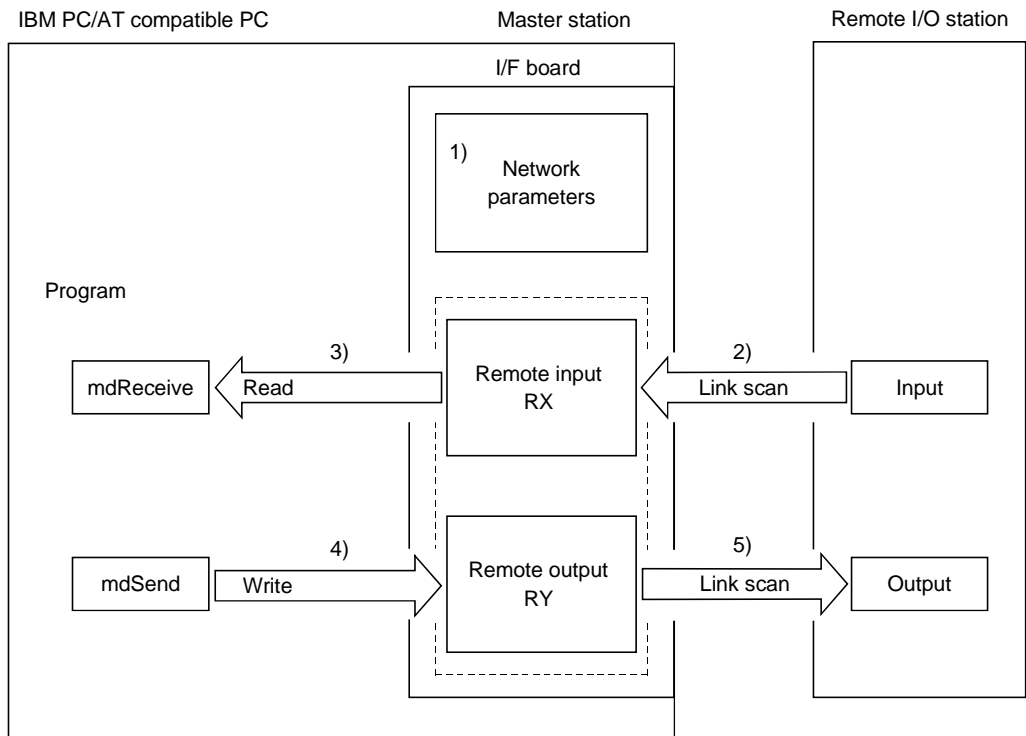
[Data link startup]
1)   When the IBM PC/AT compatible PC is powered on, the CC-Link system starts up in accordance with the network parameters set by the utility.

[Remote input]

2) The input status of each of the remote I/O stations is automatically stored (for each link scan) in the master station's "remote input RX" buffer memory.

3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.

IBM PC/AT compatible PC

Program

Master station

I/F board

Remote input RX

| RX0F to RX00 |
| RX1F to RX10 |
| RX2F to RX20 |
| RX3F to RX30 |
| RX4F to RX40 |
| to |
| RX7FF to RX7F0 |

mdReceive 3)

Remote I/O station (Station number 1: occupies 1 station)

X0F to X00

16-point module

Remote I/O station (Station number 2: occupies 1 station)

X0F to X00
X1F to X10

32-point module

2)
2)
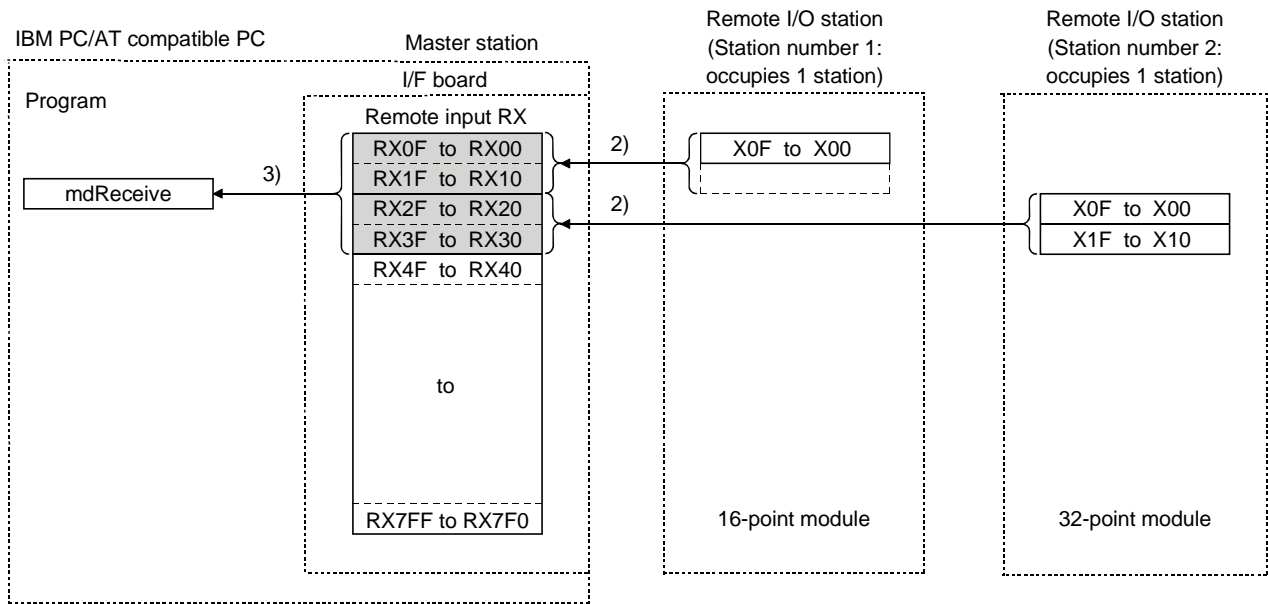
[Remote output]

4) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory.

5) The output status stored in the "remote output RY" buffer memory is output automatically (for each link scan) to the remote I/O stations.

IBM PC/AT compatible PC

Program

Master station

I/F board

Remote output RY

| RY0F to RY00 |
| RY1F to RY10 |
| RY2F to RY20 |
| RY3F to RY30 |
| RY4F to RY40 |
| RY5F to RY50 |
| RY6F to RY60 |
| RY7F to RY70 |
| RY8F to RY80 |
| to |
| RY7FF to RY7F0 |

mdSend 4)

Remote I/O station (Station number 3: occupies 1 station)

Y0F to Y00

16-point module

Remote I/O station (Station number 4: occupies 1 station)

Y0F to Y00
Y1F to Y10

32-point module

5)
5)
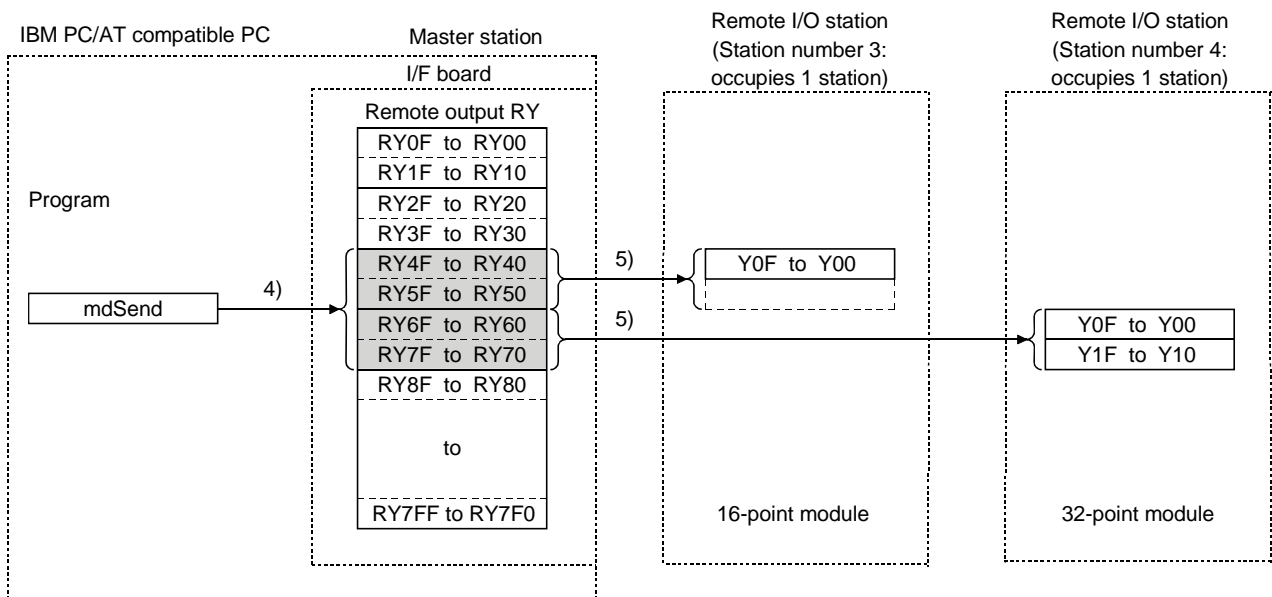
5.2.2 Communication with the remote device stations

This section explains an overview of the communication between the master station and the remote device station.

In the communication with the remote device station, the handshaking signals with the remote device station (initial data request flag, error reset request flag, etc.) are communicated using the remote input RX and remote output RY. Numeric data (averaging processing specification, digital output values, etc.) is communicated using the remote register RWw and remote register RWr.
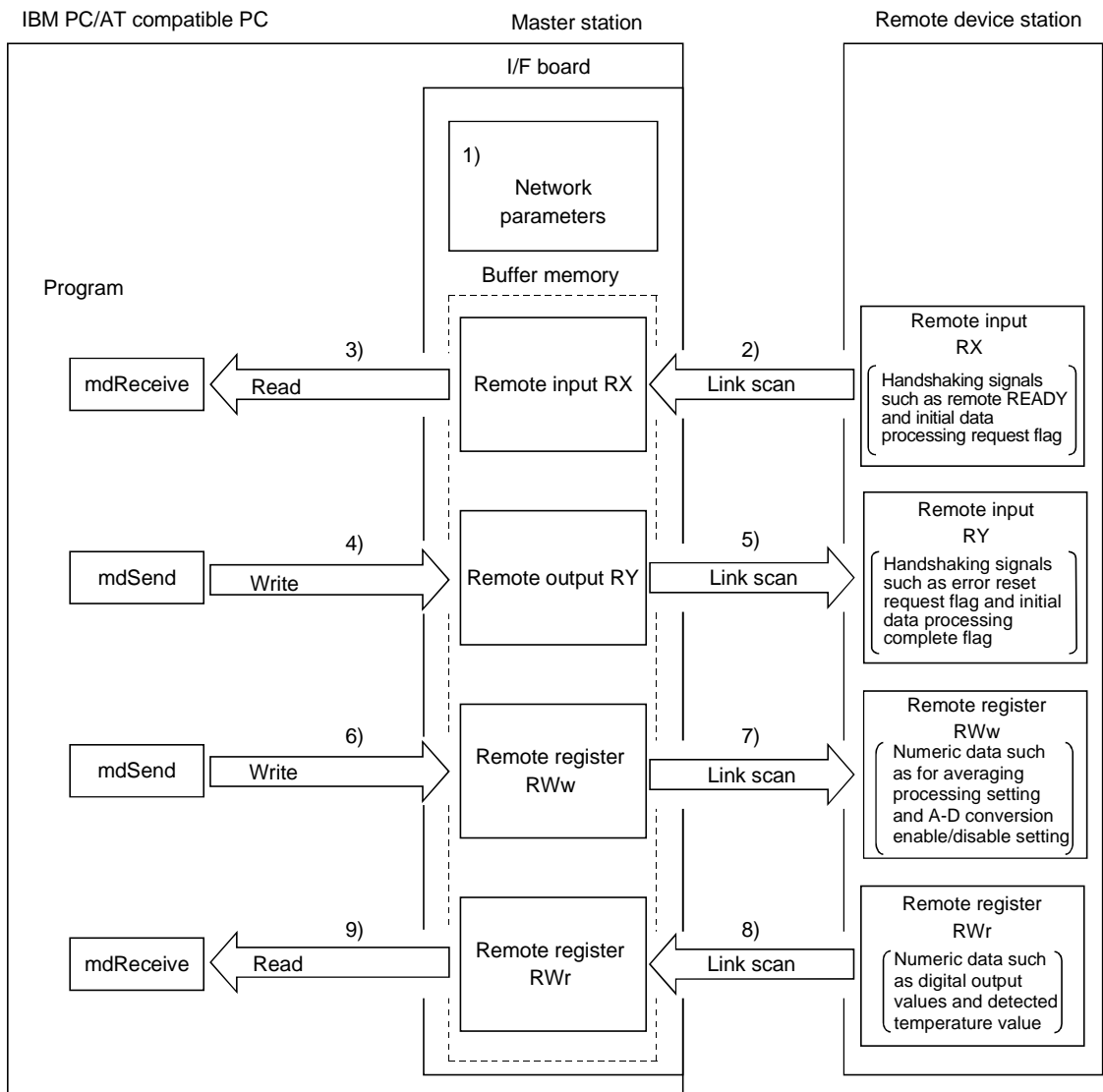
[Data link startup]
1) When the IBM PC/AT compatible PC is powered on, the CC-Link system starts up in accordance with the network parameters set by the utility.

[Remote input]
2) The remote input RX of each of the remote device stations is automatically stored (for each link scan) in the master station's "remote input RX" buffer memory.
3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.
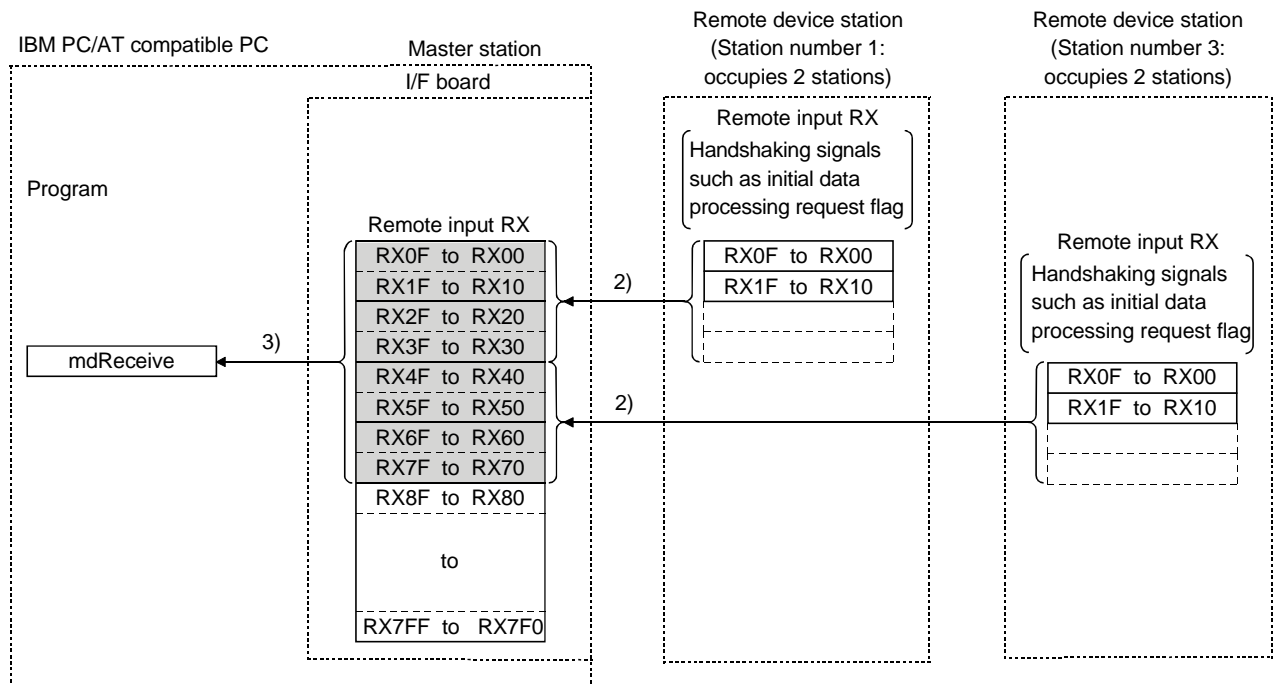
[Remote input RX when the AJ65BT-64DAV is set to station number 1]

Signal direction: AJ65BT-64DAV → Master module	
Device No.	Signal name
RX00 to RX17	Not used
RX18	Initial data processing request flag
RX19	Initial data setting complete flag
RX1A	Error status flag
RX1B	Remote READY
RX1C to RX1F	Not used

[Remote output]

4) The program uses the mdSend function to write the on/off information to the "remote output RX" buffer memory.

5) The remote output RY is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.
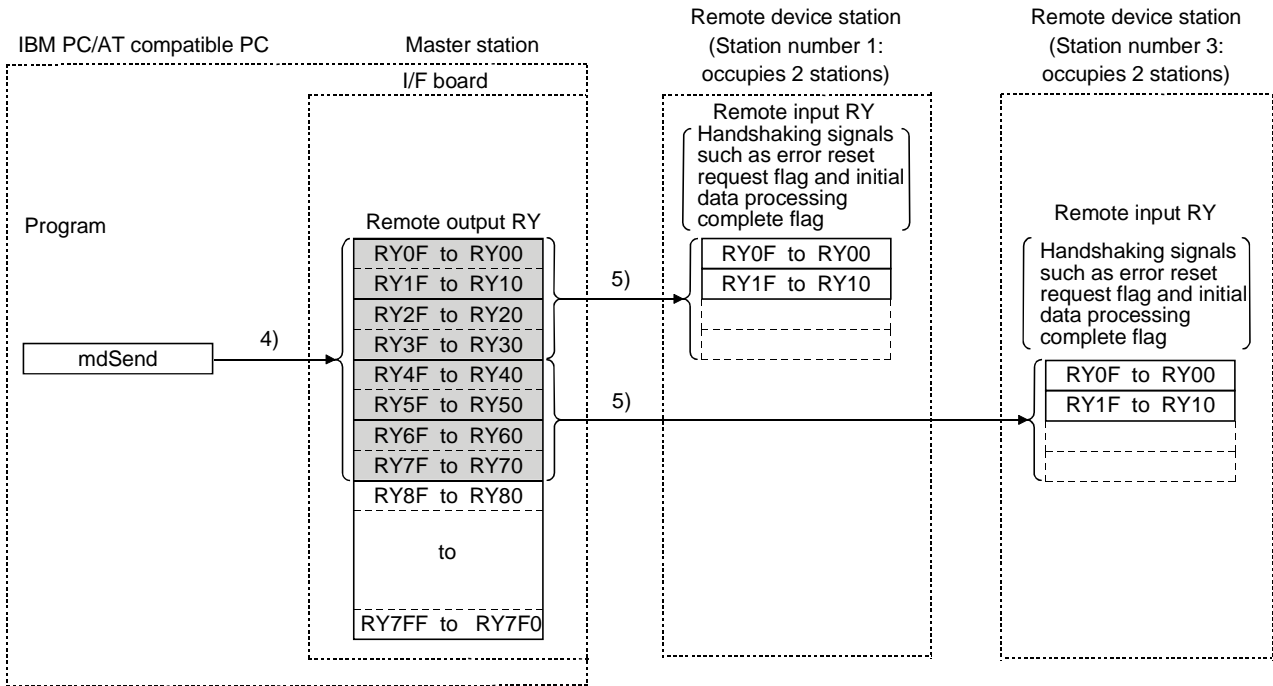
[Remote output RY when the AJ65BT-64DAV is set to station number 1]

Signal direction: Master module → AJ65BT-64DAV	
Device No.	Signal name
RY00	CH1 analog output enable signal
RY01	CH2 analog output enable signal
RY02	CH3 analog output enable signal
RY03	CH4 analog output enable signal
RY04	Selection of offset/gain values
RY05 to RY17	Not used
RY18	Initial data processing complete flag
RY19	Initial data setting request flag
RY1A	Error reset request flag
RY1B to RY1F	Not used

[Writing to the remote register RWw]

6) The program uses the mdSend function to write the transmission data to the "remote register RWw" buffer memory.

7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of each remote device station.
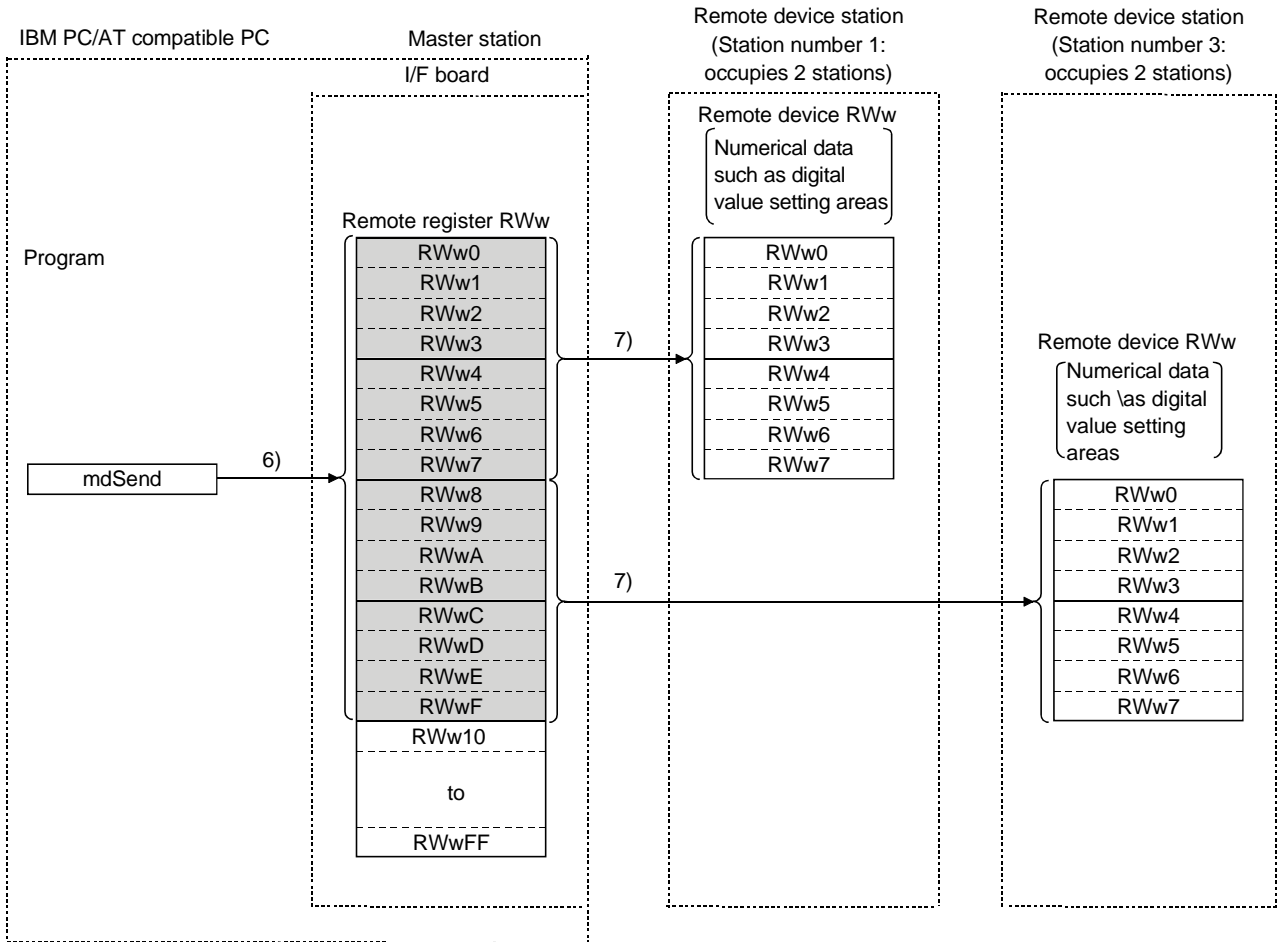
[Remote register RWw when the AJ65BT-64DAV is set to station number 1]

Signal direction: master module → AJ65BT-64	
Address	Description
RWw0	CH1 digital value setting area
RWw1	CH2 digital value setting area
RWw2	CH3 digital value setting area
RWw3	CH4 digital value setting area
RWw4	Analogue output enable/disable setting area
RWw5 to RWw7	Not used

[Reading from the remote register (RWr)]

8) The remote register RWr data of each of the remote device stations is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The program uses the mdReceive function to read the remote register RWr data of the remote device stations stored in the "remote register RWr" buffer memory.
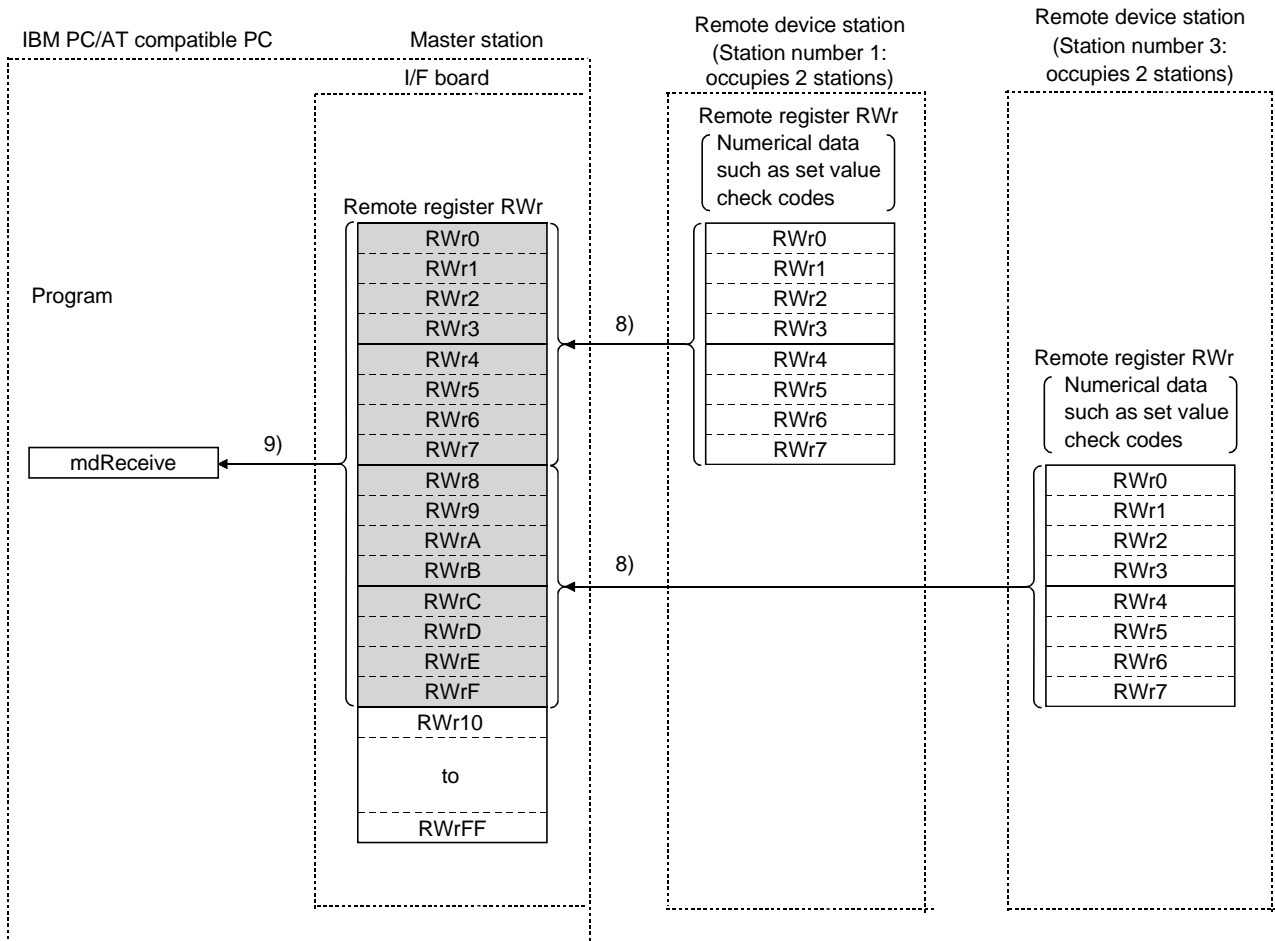
[Remote register RWr when the AJ65BT-64DAV is set to station number 1]

Signal direction: AJ65BT-64DAV → Master module	
Address	Description
RWr0	CH1 set value check code
RWr1	CH2 set value check code
RWr2	CH3 set value check code
RWr3	CH4 set value check code
RWr4	Error code
RWr5	Not used
RWr6	
RWr7	

5.2.3 Communication with the local stations

The following explains an overview of the communication between the master station and the local stations.

(1) Communication between the master station and the local stations by cyclic transmission

The data communication between PLC CPUs and IBM PC/AT compatible PCs can be performed in n:n mode using the remote input RX and remote output RY (bit information used in local station systems) as well as the remote register RWw and remote register RWr (word information for writing and reading used in local station systems).
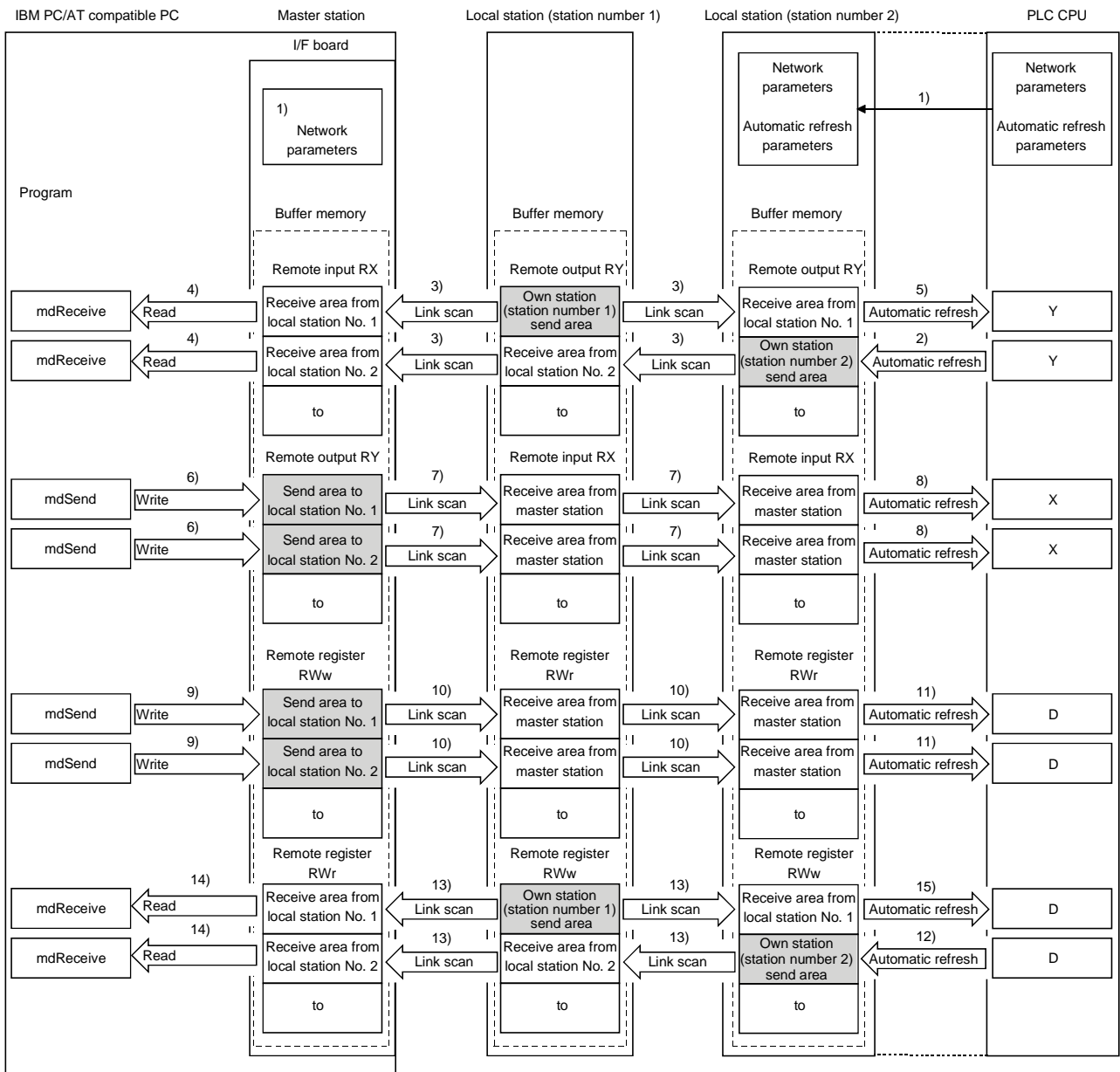
[Data link startup]

1) When the IBM PC/AT compatible PC is powered on, the CC-Link system automatically starts up in accordance with the network parameters set by the utility.

[On/off information from a local station to the master station or another local station]

2) The on/off information of the CPU device set with automatic refresh parameters is stored in the "remote output RY" buffer memory of a local station. The remote output RY is used as the output information to be used by the local station system.

3) The information in the "remote output RY" buffer memory of the local station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station and the "remote output RY" buffer memory of another local station.

4) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.
The remote input RX is used as the input information to be used by the local station systems.

5) The input status stored in the "remote output RY" buffer memory is stored in the CPU device set with automatic refresh parameters.

▯ ••••••••The last two bits cannot be used in the communication between the master station and the local stations.
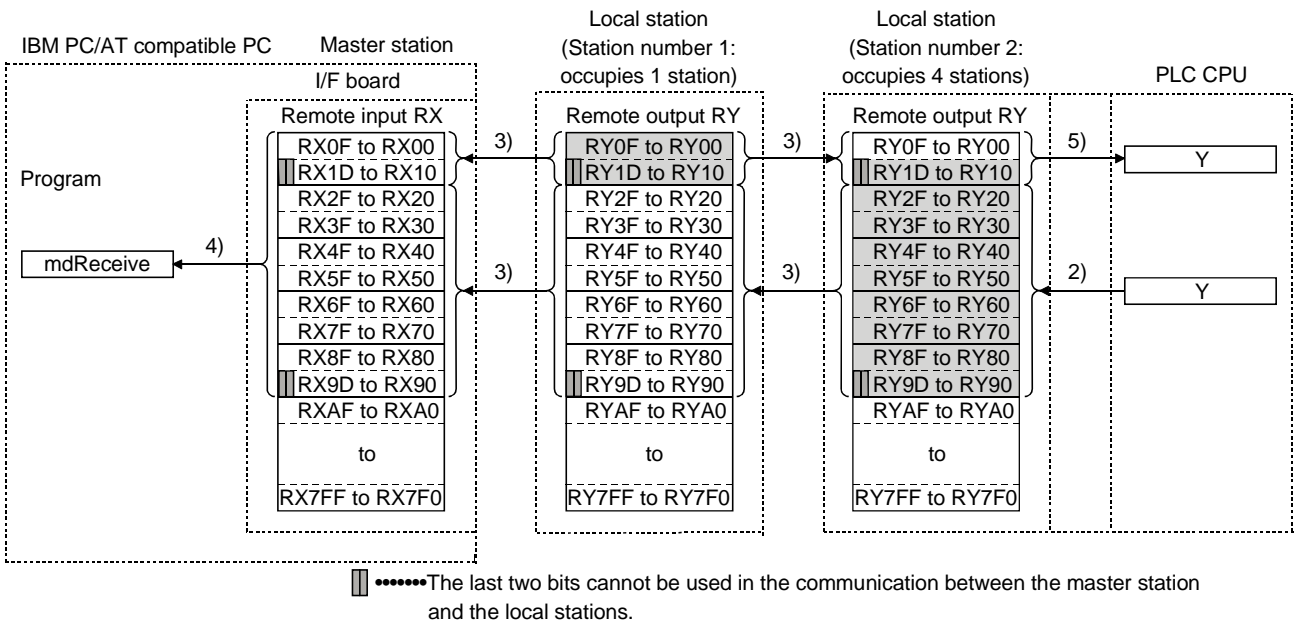
[On/off information from the master station to the local stations]

6) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory of the master station.

7) The information in the "remote output RY" buffer memory is automatically stored (for each link scan) in the "remote input RX" buffer memory of each of the local stations.

8) The input status stored in the buffer memory "remote input RX" is stored in the CPU device set with automatic refresh parameters.
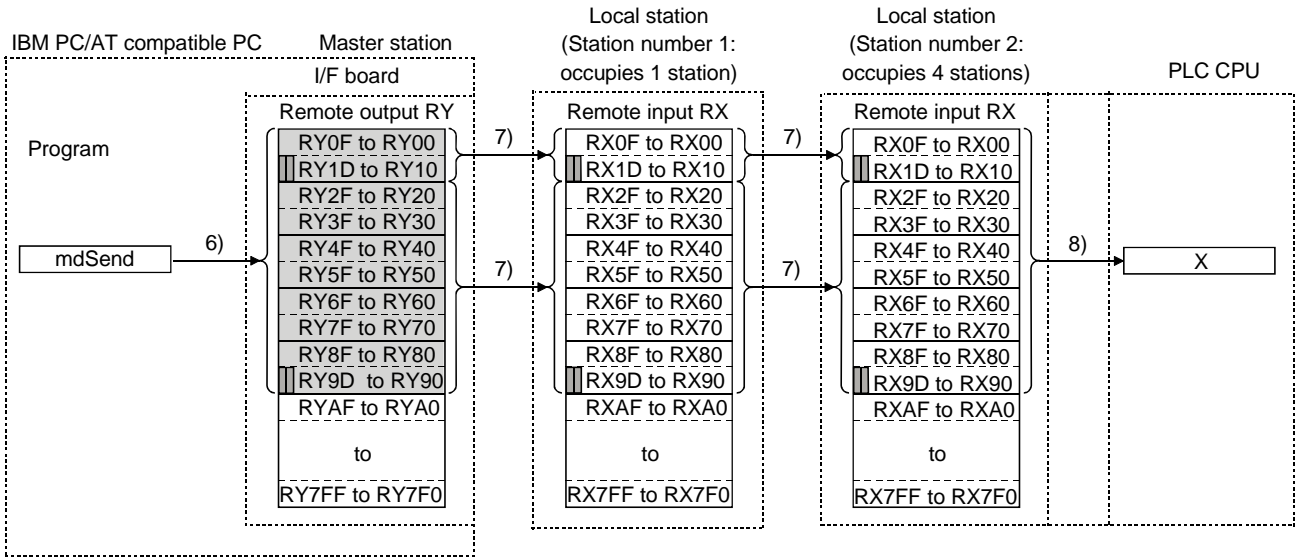
▮ ••••••••The last two bits cannot be used in the communication between the master station and the local stations.

[Word information from the master station to all local stations]

9) The program uses the mdSend function to write the word information to the "remote register RWw" buffer memory of the master station.
The remote register RWw is used as the word information for writing to be used by local station systems.

10) The information in the "remote register RWw" buffer memory is automatically stored (for each link scan) in the "remote registers RWr" of all local stations.
The remote register RWr is used as the word information for reading to be used by local station systems.

11) The word information stored in the "remote register RWr" buffer memory is stored in the CPU device set with automatic refresh parameters.
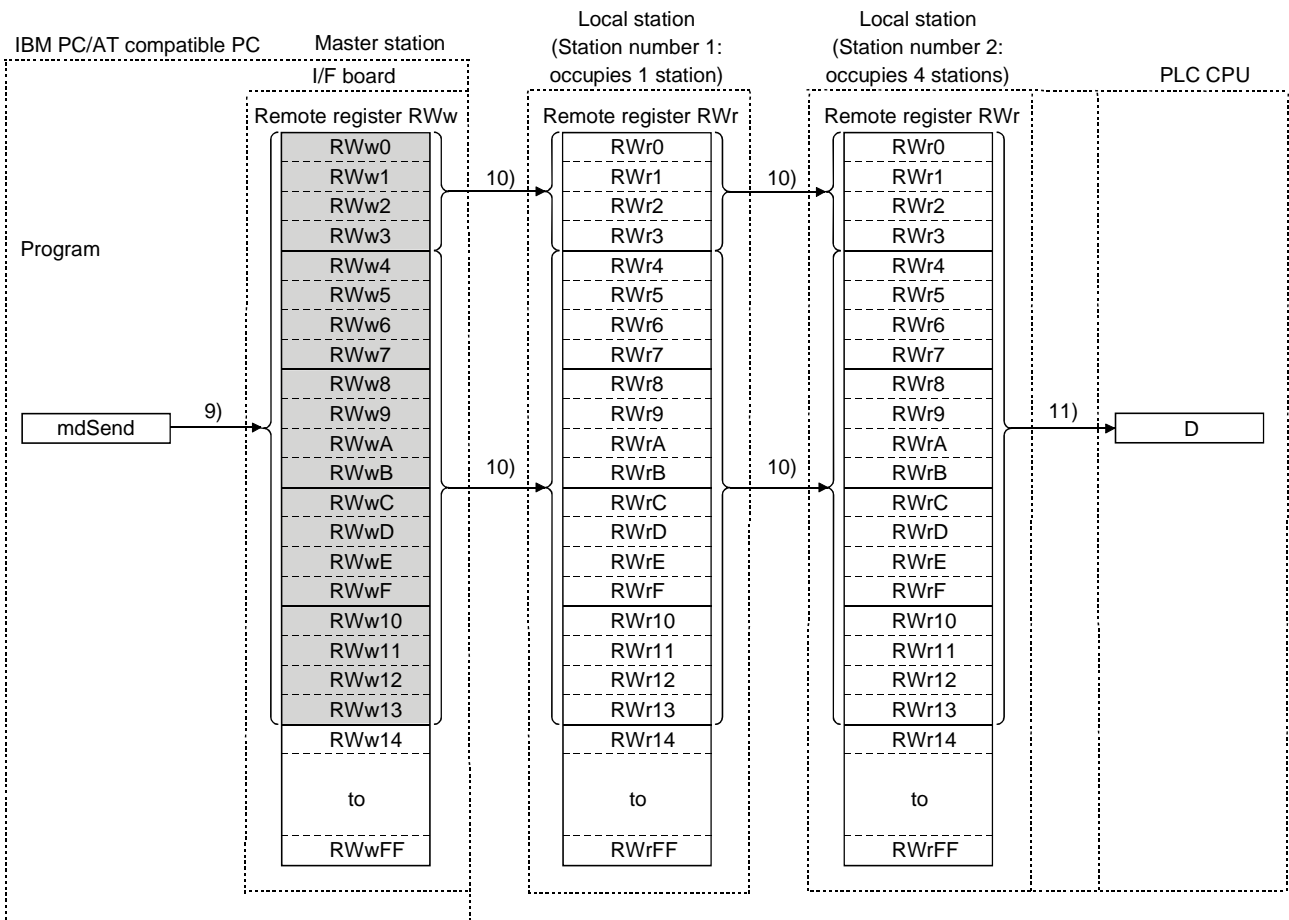
[Word information from a local station to the master station and another local station]

12) The word information set with automatic refresh parameters is stored in the "remote register RWw" buffer memory of a local station. However, it can only be stored in the area corresponding to the station number of the own station.

13) The information in the "remote register RWw" buffer memory is automatically stored (for each link scan) in the "remote register RWr" of the master station and the "remote register RWw" of another local station.

14) The program uses the mdReceive function to read the word information stored in the "remote register RWw" buffer memory.

15) The word information stored in the "remote register RWw" buffer memory is stored in the CPU device set with automatic refresh parameters.
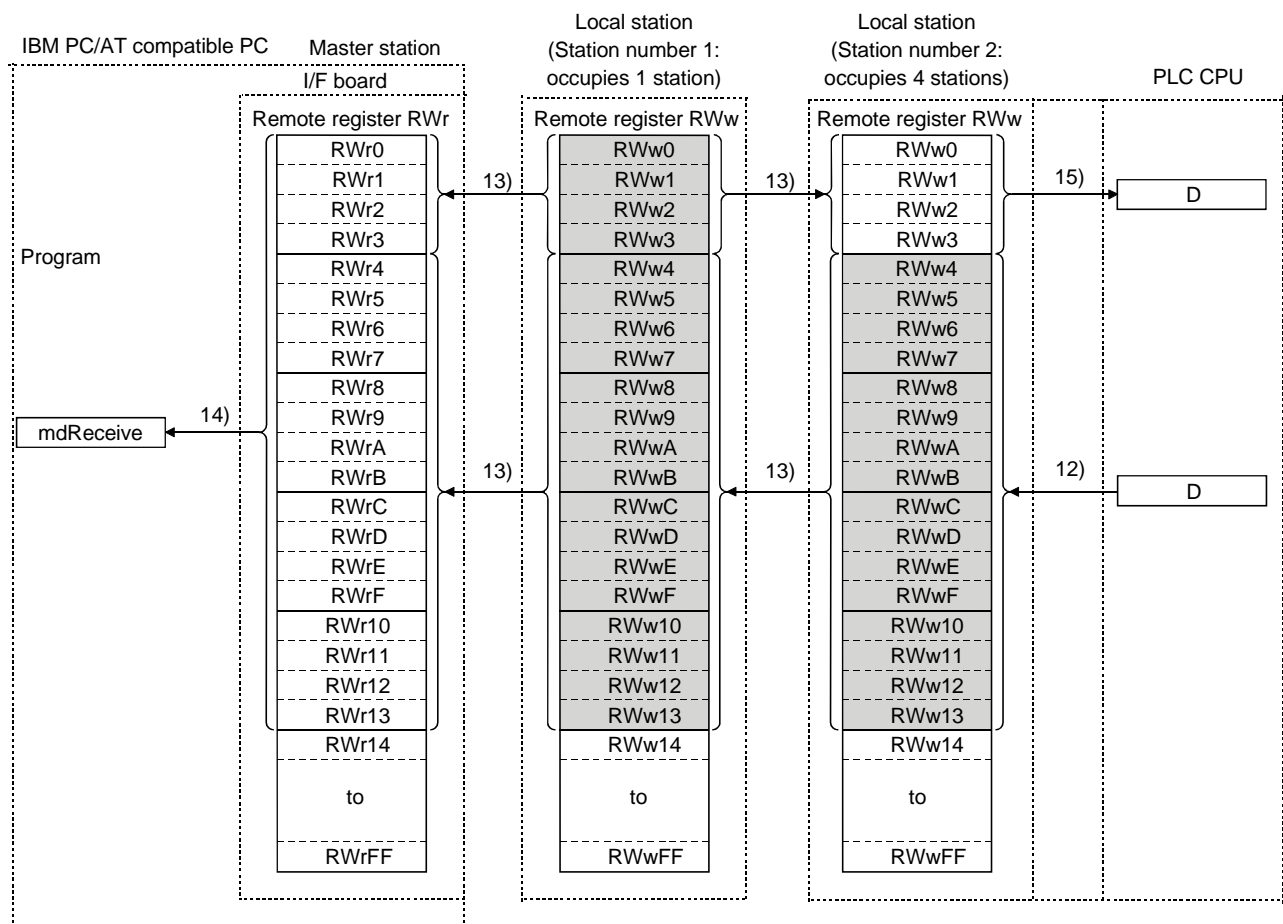
(2)   Communication between the master station and the local station by transient transmission

The transient transmission is a transmission method that sends and receives data in 1 : 1 mode by designating the opposite station at an arbitrary timing.

[When writing data to the buffer memory of the local station and the CPU device using the mdSend function]

1)   The program uses the mdSend function to write data from the master station to the designated buffer memory of the local station and a CPU device.

2)   When writing is completed, 0 is stored as return values.
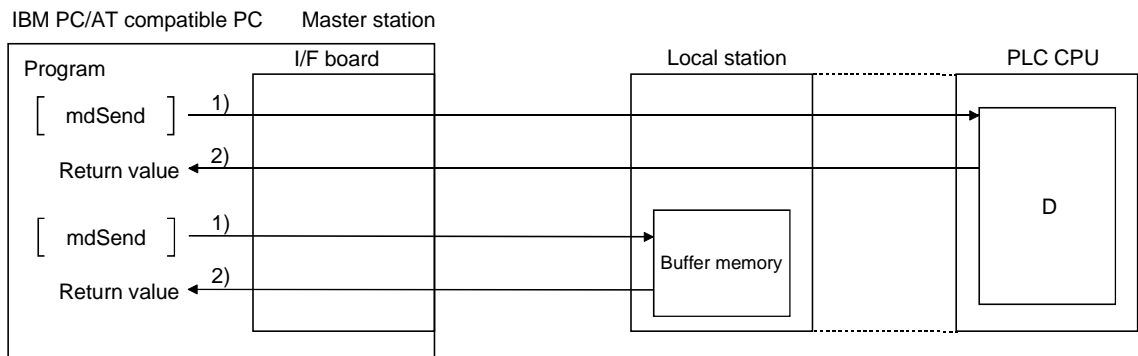
[When reading data from the buffer memory and CPU device in a local station using the mdReceive function]

1)   The program uses the mdReceive function to read data from the designated buffer memory of the local station and the CPU device to the variables of the program in the master station.

2)   When reading is completed, 0 is stored as return values.
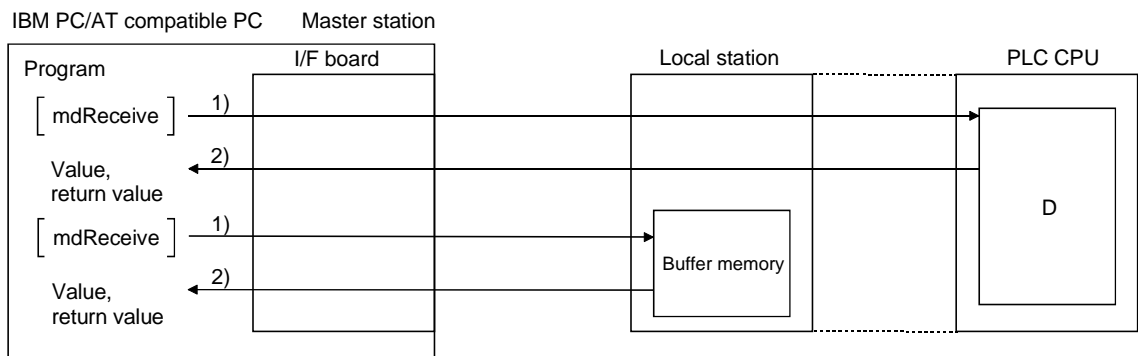
5.2.4 Communication with the intelligent device station

The following explains an overview of the communication between the master station and the intelligent device station.

(1)   Communication between the master station and the intelligent device station by cyclic transmission

Handshaking signals with the intelligent device station (positioning complete, positioning start. etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using the remote register RWw and remote register RWr.
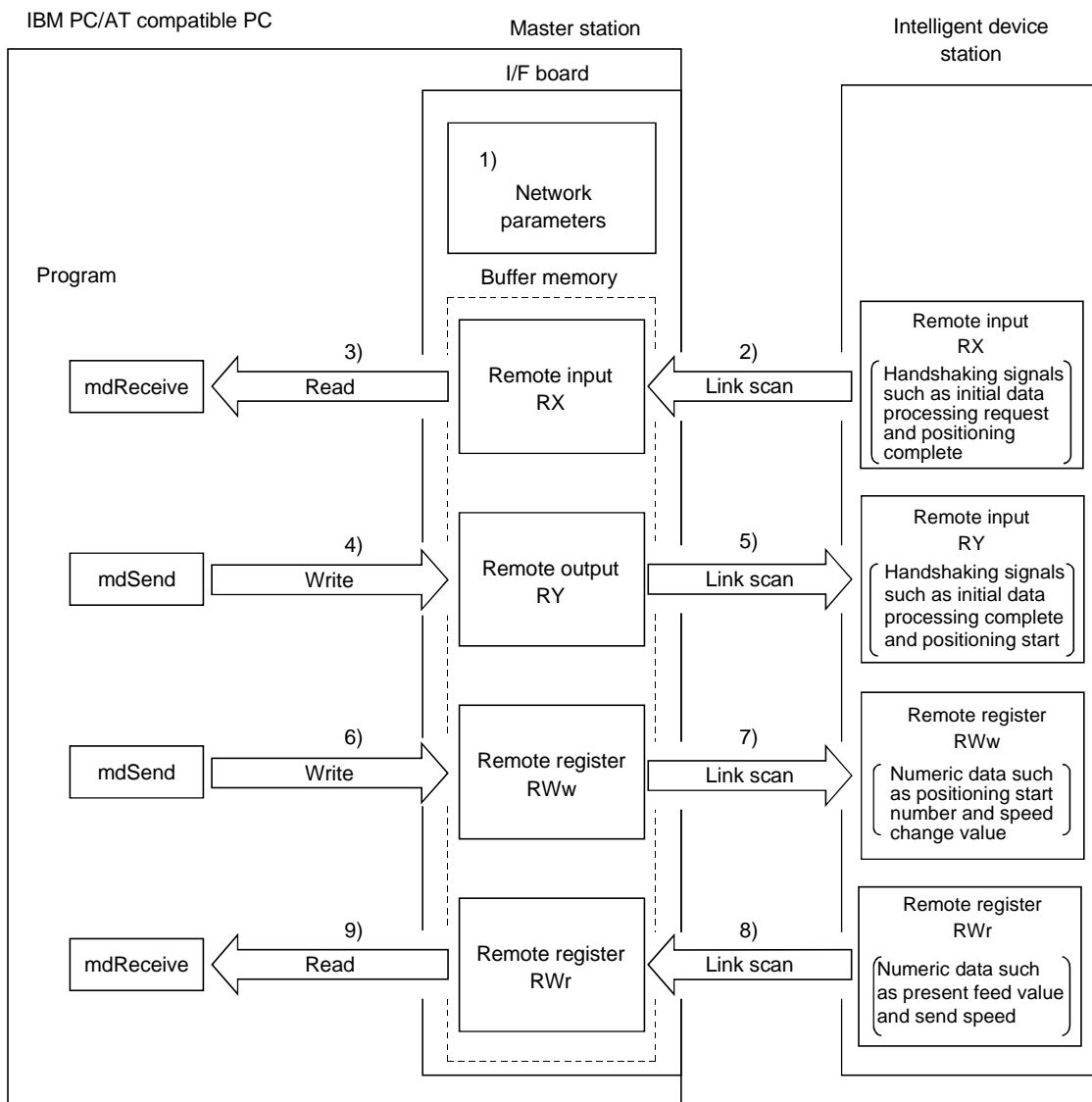
[Data link startup]

1) When the IBM PC/AT compatible PC is powered on, the CC-Link system automatically starts up in accordance with the network parameters set by the utility.

[Remote input]

2) The remote input RX of the intelligent device station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station.

3) The program uses the mdReceive function to read the input status stored in the "remote input RX" buffer memory.
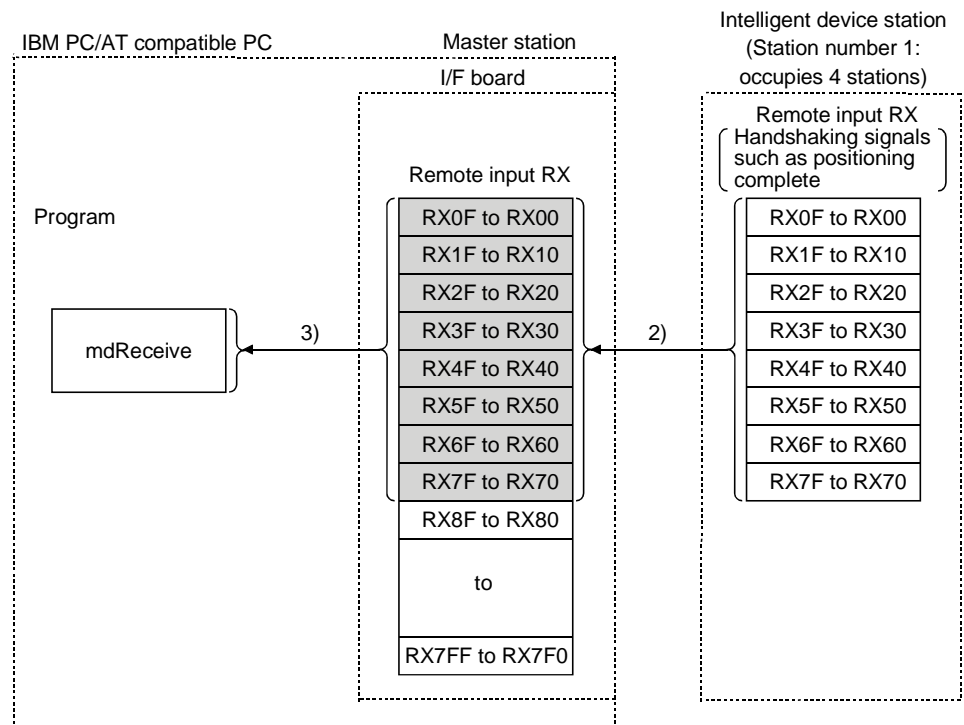
[Remote input RX when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Device No.	Signal name
RX00	D75P2 ready complete
RX01	Single-axis start complete
RX02	Dual-axes start complete
RX03	Use prohibited
RX04	Single-axis BUSY
RX05	Dual-axis BUSY
RX06	Use prohibited
RX07	Single-axis positioning complete
RX08	Dual-axis positioning complete
to	to

[Remote output]

4) The program uses the mdSend function to write the on/off information to the "remote output RY" buffer memory.

5) The remote output RY of the intelligent device station is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.
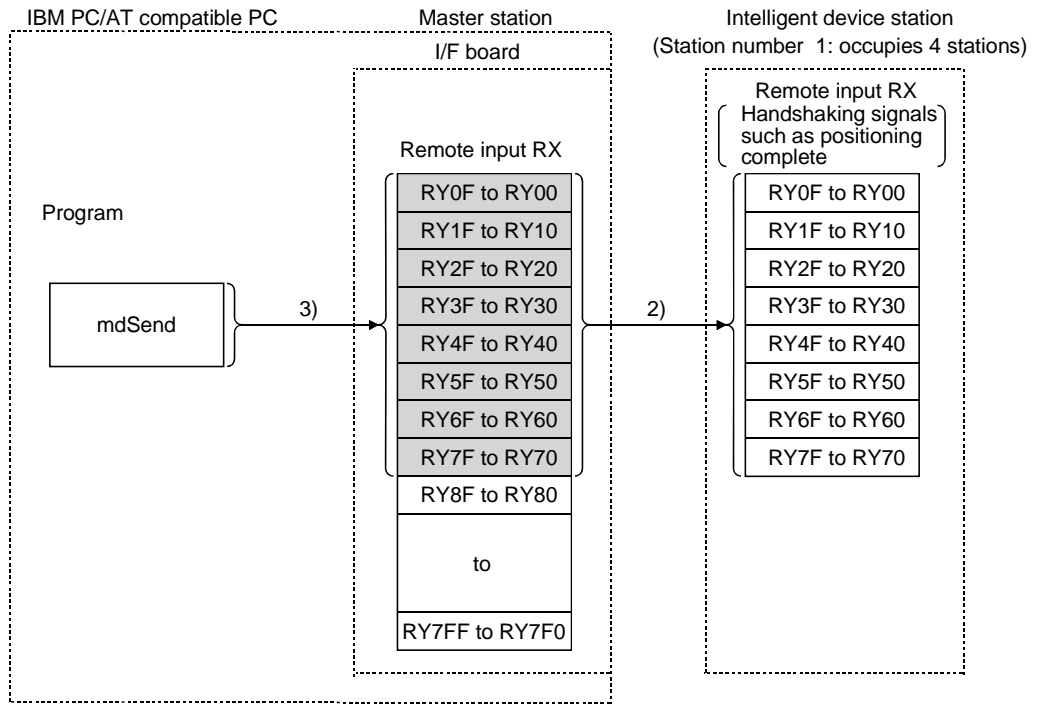
[Remote output RY when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Device No.	Signal name
RY01 • RY0F	Use prohibited
RY10	Single-axis positioning start
RY11	Dual-axis positioning start
RY12	Use prohibited
RY13	Single-axis stop
RY14	Dual-axis stop
to	to

[Writing to the remote register RWw]

6) The program uses the mdSend function to write the sending data to the "remote register RWw" buffer memory.

7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of the intelligent device station.
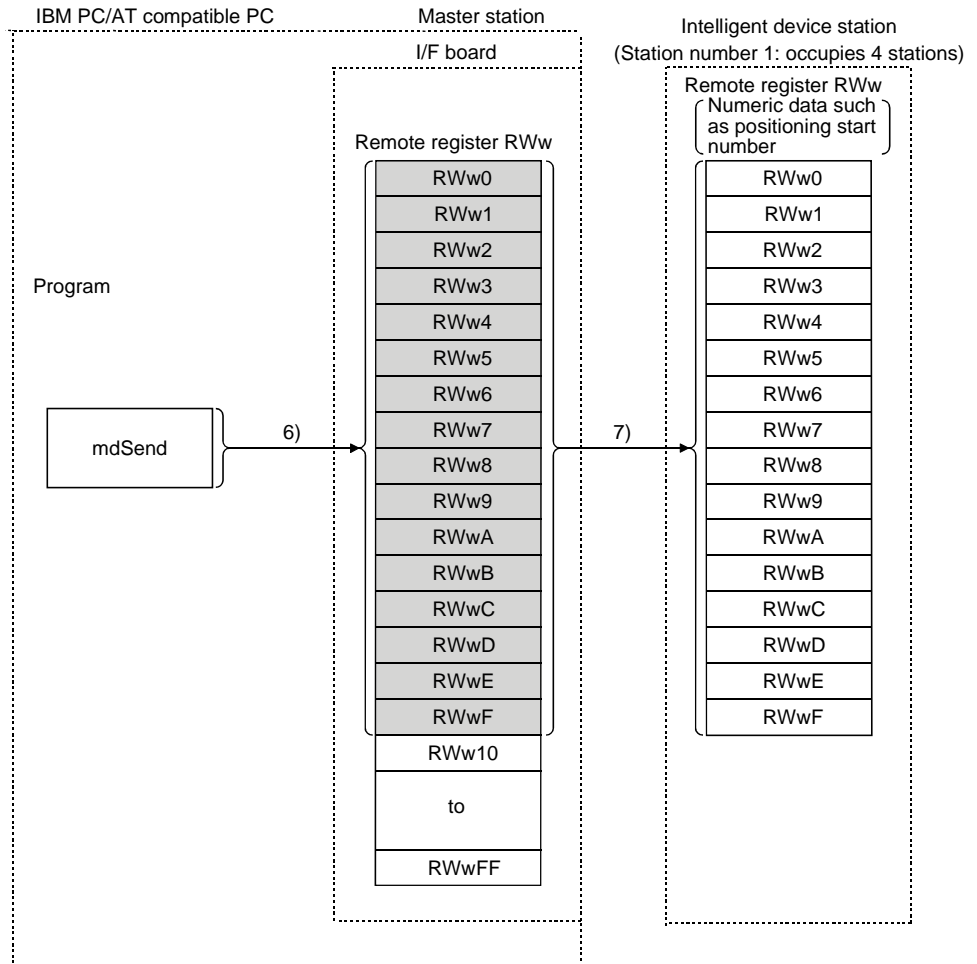
[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: Master module → AJ65BT-D75P2-S3	
Address	Description
RWw0	Single-axis positioning start number
RWw1	Single-axis override
RWw2	Single-axis new present value
RWw3	
RWw4	Single-axis new speed value
RWw5	
RWw6	Single-axis JOG speed
RWw7	
to	to

[Reading from the remote register RWr]

8) The remote register RWr data of the intelligent device station is automatically stored in the "remote register Rwr" buffer memory of the master station.

9) The program uses the mdReceive function to read the remote register RWr data of the intelligent device station stored in the "remote register RWr" buffer memory.
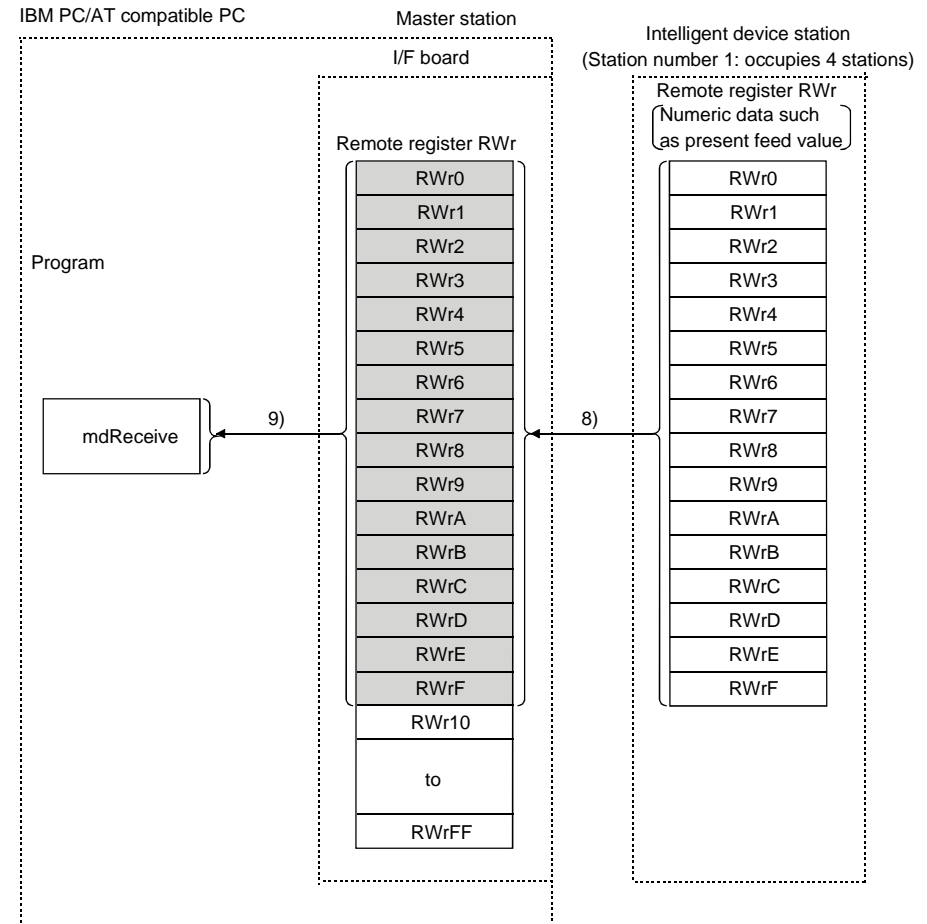
[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Address	Description
RWr0	Single-axis present feed value
RWr1	
RWr2	Single-axis feed speed
RWr3	
RWr4	Single-axis valid M code
RWr5	Single-axis error number
RWr6	Single-axis warning number
RWr7	Single-axis operating status
to	to

(2)   Communication between the master station and the intelligent device station by transient transmission

The transient transmission is a transmission method that sends and receives data in 1 : 1 mode by designating an opposite station at an arbitrary timing.

[When writing data to the buffer memory of the intelligent device station using the mdSend function]

1)   The program uses the mdSend function to write data from the master station to the designated buffer memory of the intelligent device station.

2)   When writing is completed, 0 is stored as a return value.
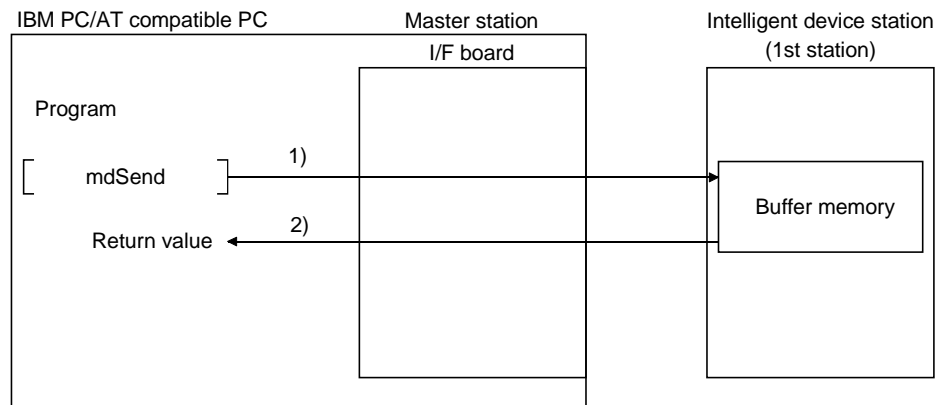
[When reading data from the buffer memory of the intelligent device station using the mdReceive function]

1)   The program uses the mdReceive function to read data from the designated buffer memory of the intelligent device station to the variables of the program in the master station.

2)   When reading is completed, 0 is stored as a return value.
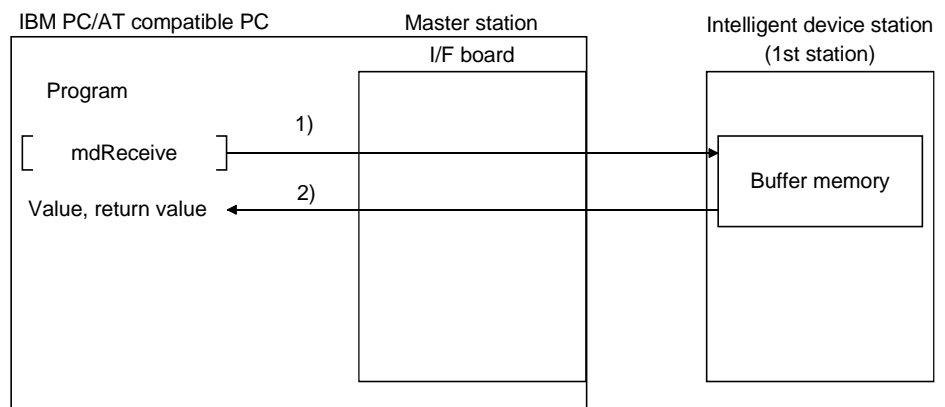
5.3 Functions for Improving System Reliability

This section explains how to use the functions for improving the reliability of the CC-Link system.

5.3.1 Disconnecting a data link faulty station and continuing the data link with only normal stations (slave station disconnect function)

This function disconnects any of the remote stations, local stations, intelligent device stations, and standby master station if it has become data link faulty due to power off or other cause, and continues the data link among normal remote stations, local stations, intelligent device stations, and standby master station (no setting is required).

Continues data link excluding faulty station
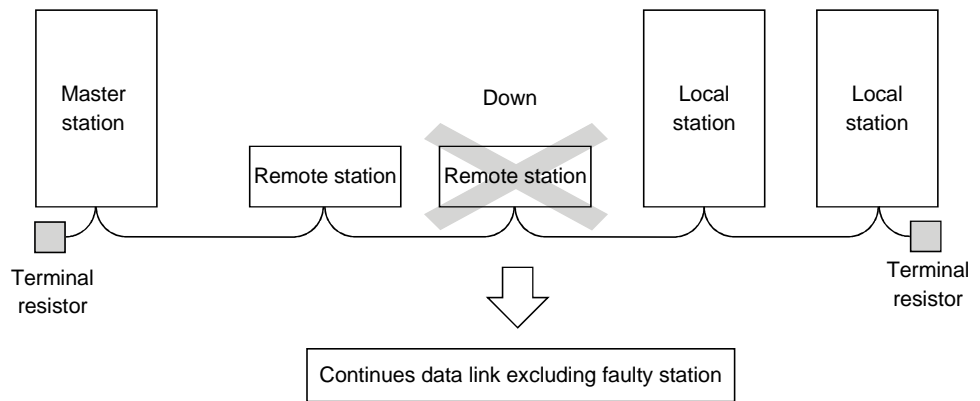
POINT

In the event of a cable breakdown, the data link cannot be performed because there is no terminal resistor.

5.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (auto return function)

This function allows any of the remote stations, local stations, intelligent device stations, and standby master station that has been disconnected from the data link due to power off or other cause to automatically reconnect to the data link when it returns to the normal status.

[Setting method]
Set the "number of auto return modules" of network parameters using the utility.
For more details on the setting, see Section 9.2.3.

5.3.3 Retaining the device status of a data link faulty station (setting the input data status from a data link faulty station)

This function sets the input (reception) data status from a data link faulty station.

(1) Target input (reception) data
The following shows the target buffer memory areas.
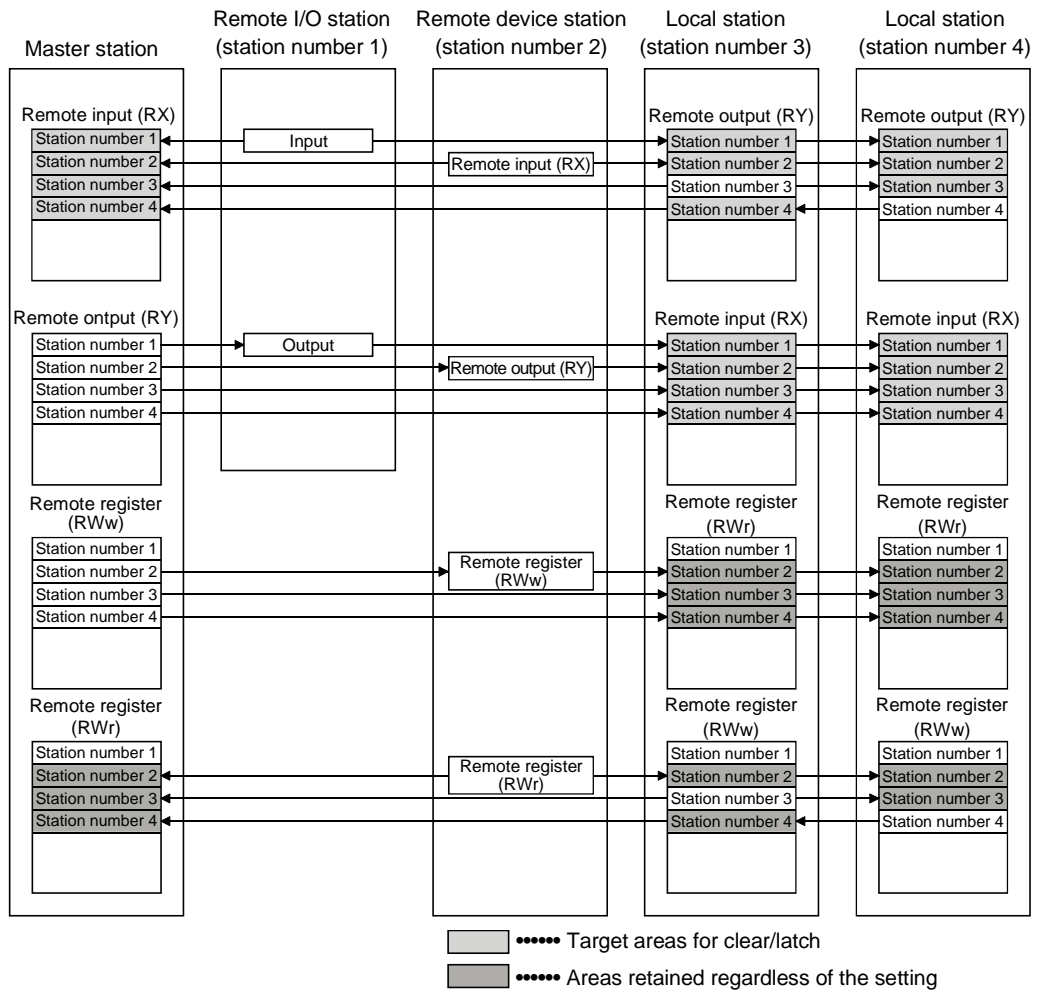
The remote input RX in the master station, and the remote input RX and remote output RY in the local stations will either clear or retain the data from faulty stations according to the setting. The remote register RWr in the master station and the remote registers RWw and RWr in the local stations retain data from faulty stations regardless of the setting.

POINT
When a data link faulty station is set as an error invalid station, the input data (remote input RX and remote output RY) from that station is retained regardless of the setting.

(2) Setting method
The input data status is set by the "Operation setting" in network parameters using the utility. For more details on the setting, see Section 9.2.3.

5.3.4 Continuing the data link even when the master station is faulty (standby master function)

This function enables the data link to continue by switching a faulty master station to a standby master station (i.e. a backup station for the master station).
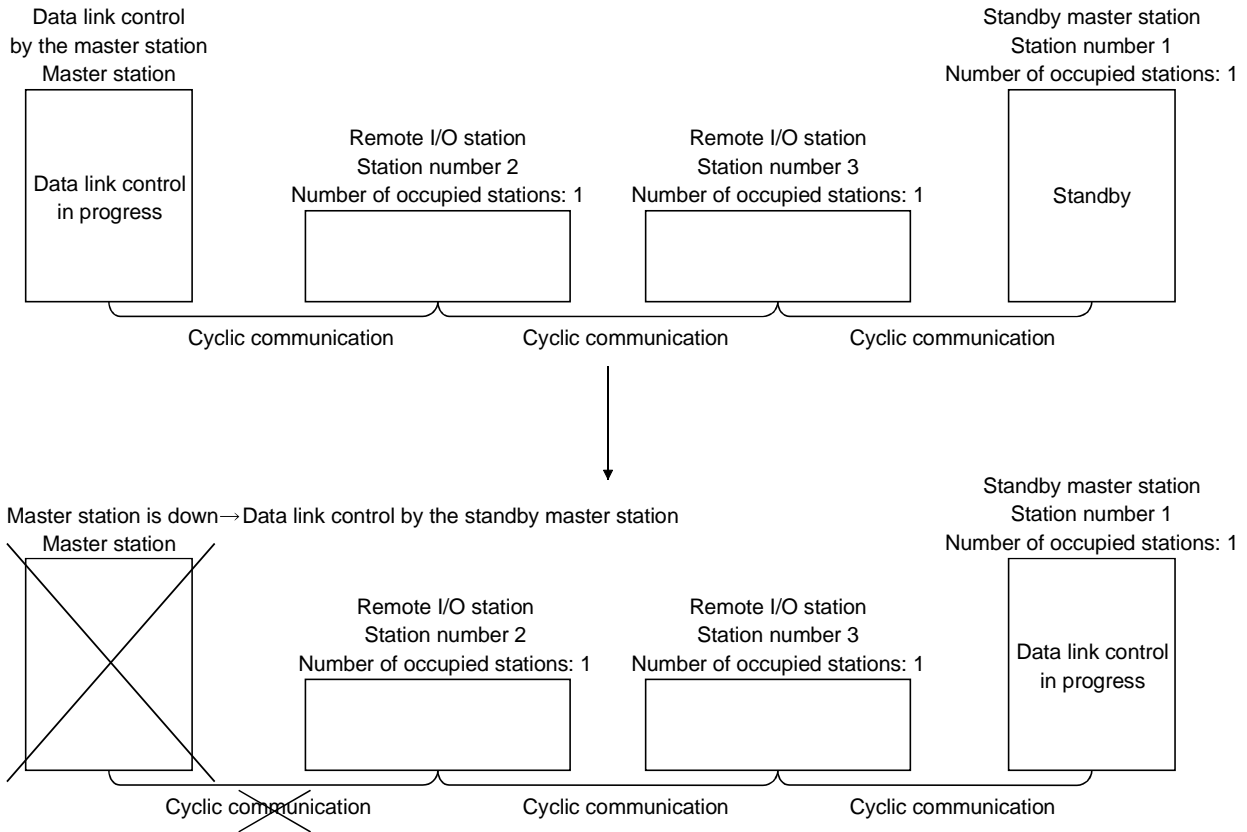
In this section, the above system configuration will be used in the explanation.

POINT

The IBM PC/AT compatible PC (with an I/F board) can be set as a standby master station only when the master station is also an IBM PC/AT compatible PC (with an I/F board).

The possible master station and standby master station combinations are shown in the table below.

Master station	Standby master station	
	IBM PC/AT compatible PC (I/F board)	PLC
IBM PC/AT compatible PC (I/F board)	○	○
PLC	×	○

○ : Setting allowed   × : Setting not allowed

(1) Overview of link data transmission when the standby master function is used

The following provides an overview of link data transmission when the standby master function is used.

(a) "Master station output" while the master station is controlling the data link
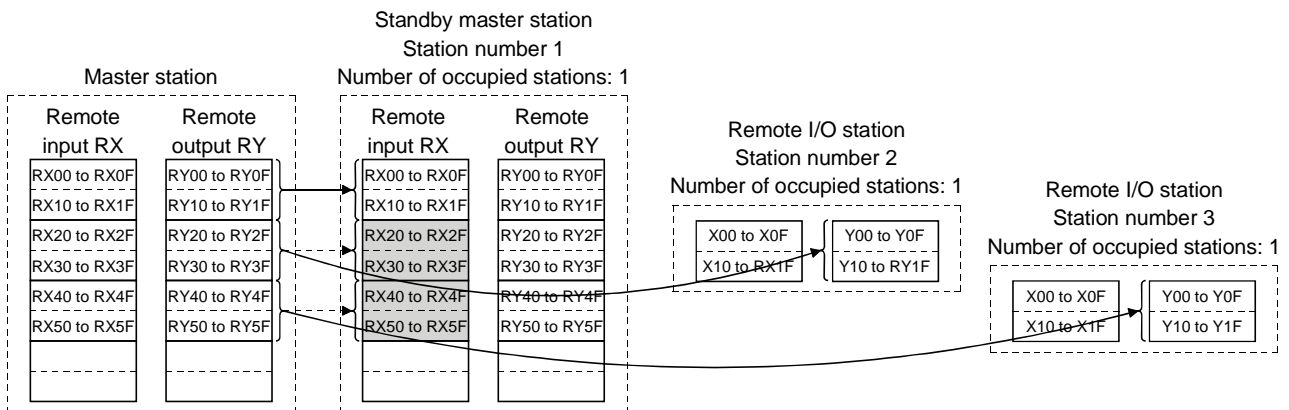
The master station data sent to the remote input RX in the standby master station (shown by the shaded areas in the figure above) is used as the output information when the master station becomes faulty; thus, it should be transferred to another device using a sequence program.

In addition, when the master station becomes faulty, the transferred data is transferred to the remote output RY of the standby master station using a sequence program.

(b) "Master station input" while the master station is controlling the data link
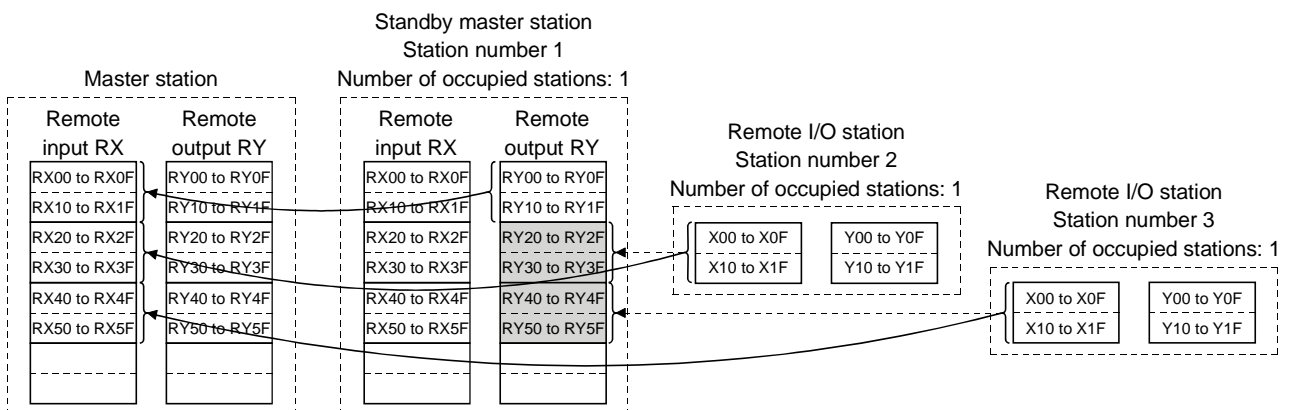
The remote I/O station data sent to the remote output RY of the standby master station is being used by the standby master station as the input information when the standby station operates as a local station; thus, it does not need to be transferred to another device.

(c) "Standby master station output" when the master station is down and the standby master station is controlling the data link
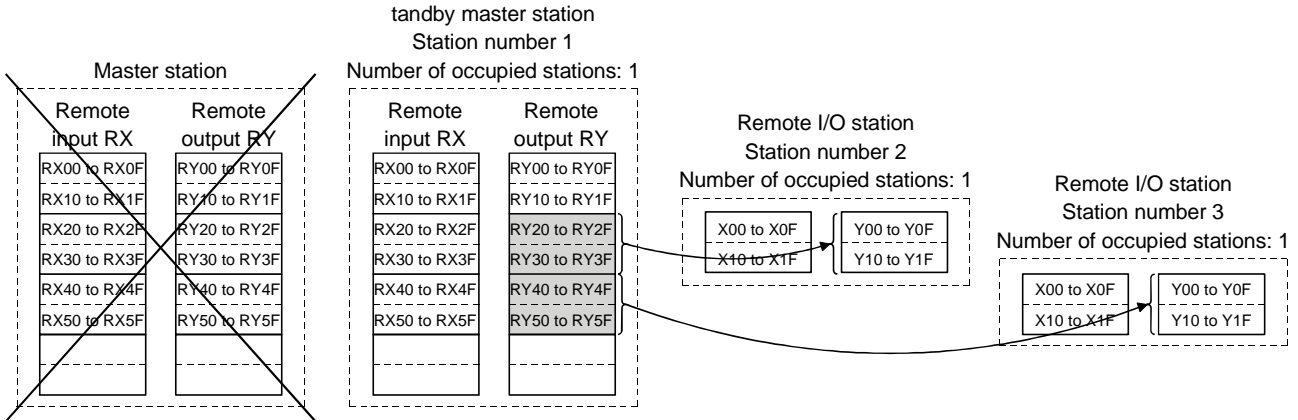
The data sent to the remote output RY of the standby master station by a sequence program is sent to the remote I/O stations as output information.

(d) "Standby master station input" when the master station is down and the standby master station is controlling the data link
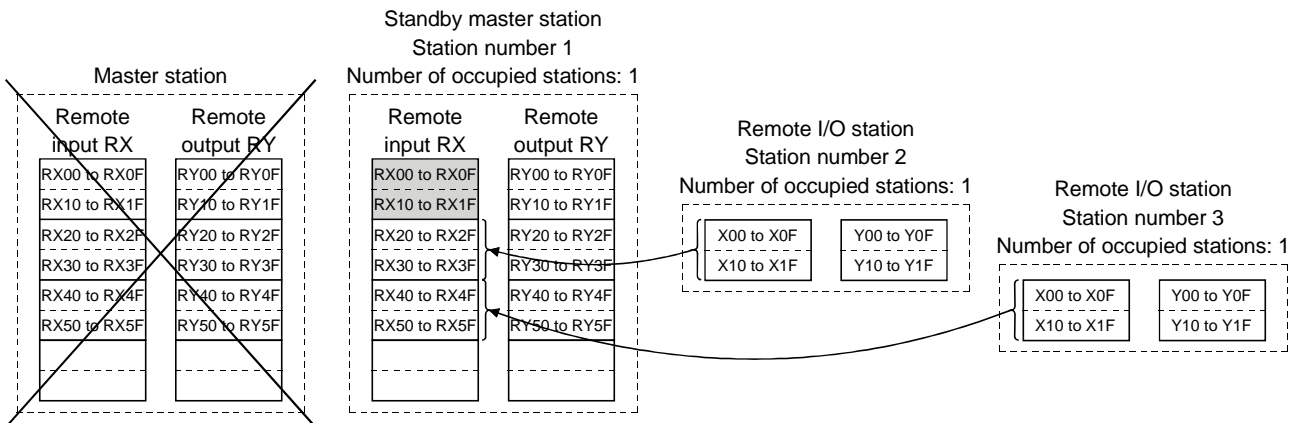
The data shown in the shaded areas in the standby master station is either input or retained according to the "Data link faulty station setting" in network parameters.

(2) Setting method

The setting is performed using the CC-Link utility.

For the detail on the setting method, see Section 9.2.3.

(a) Setting the master station

First set the I/F board as the master station on the Board Information screen.
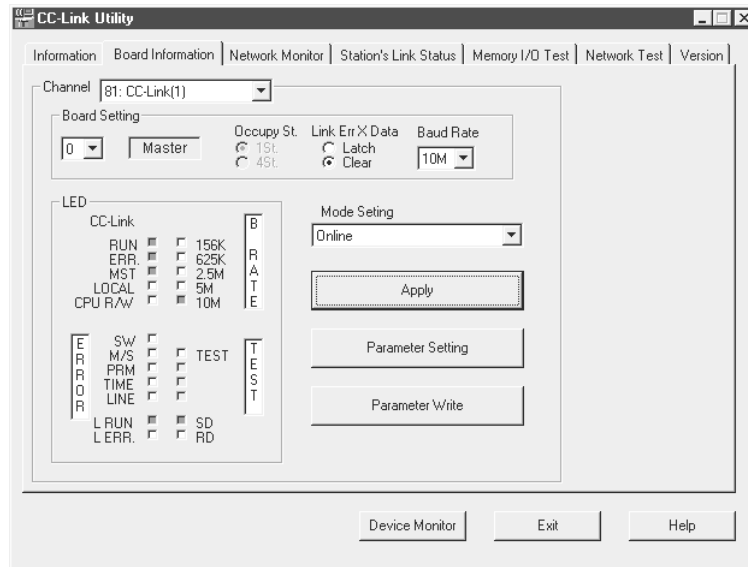
(b) Setting the standby master station

Specify the [Number of Connected modules], [Type], and [Occupy Station] on the Parameter Setting screen.

Set the [Standby master station] to 1 on the Auxiliary Setting screen.

<Parameter Setting screen>

<Auxiliary Setting screen>
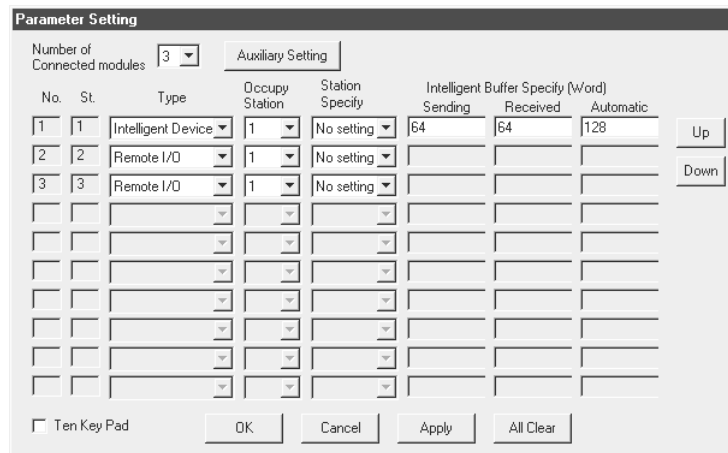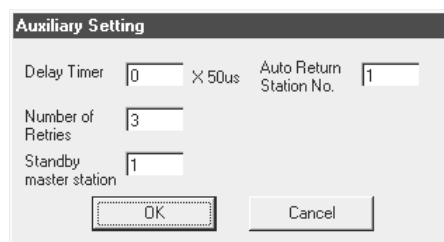
(3) Notes on using the standby master function

   (a) Only one standby master station is allowed in a single data link system.

   (b) The total number of stations can be no more than 64, including the standby master station. The number of stations that can be occupied by the standby master station is one or four.

   (c) Do not specify station number 64 for a system in which a standby master station exists.
   If it is used, station number 64 cannot communicate normally.

   (d) If any abnormality is detected at the master station in the initial status (before parameter communication starts), the switch to the standby master station will not be executed.

   (e) When the master station becomes faulty, the data link control will automatically be transferred to the standby master station, but the cyclic transmission data will not be transferred. Perform this transfer with a user program.
   Once permitted, the information before the detection of abnormality at the master station will be output to each station.

   (f) When the standby master station is controlling the data link, parameters cannot be updated.

   (g) If the terminal block of the master station is removed and then replaced in its original position without turning the power off while the master station is controlling the data link, both the master and standby master stations will attempt to operate as master stations and an error will occur. (The "ERR." LED will be lit.)

   (h) When an IBM PC/AT compatible PC is set as the master station, only another IBM PC/AT compatible PC can be specified as a standby master station. A PLC CPU cannot be specified as a standby master station.
   For more details, see Section 5.3.4.

(4) Special link relays/registers (SB and SW) related to the standby master function

The following explains the special link relays and registers related to the standby master function.

They are stored in the buffer memory.

(a) Special link relays (SB)

The special link relays (SB) relating to the standby master function are as follows:

The numeric values in parentheses in the number column indicate buffer memory addresses and bit locations.

Example: When the buffer memory address is 5E0H and the bit location is 0:
(5E0H, b0)

Table 5.5 List of special link relays related to the standby master function

Number	Name	Description	Applicability ($\bigcirc$ Applicable, $\times$ Not applicable)	
			Master station	Standby master station

SB0001
(5E0H,b1)
	Master station switching and data link startup	Switches the output information from the standby master station to the master station, and starts up the data link.
		  Off : Without switching direction
		  On : With switching direction
			$\times$	$\bigcirc$

SB0042
(5E4H,b2)
	Acknowledge status of master station switching and data link startup	Shows the acknowledge status of the data link startup switching direction from the standby master station to the master station.
		  Off : Not acknowledged
		  On : Direction acknowledged
			$\times$	$\bigcirc$

SB0043
(5E4H,b3)
	Complete status of master station switching and data link startup	Shows the complete status of the data link startup switching direction from the standby master station to the master station.
		  Off : Not complete
		  On : Switching complete
			$\times$	$\bigcirc$

SB0070
(5E7H,b0)
	Master station information	Shows the data link status.
		  Off: Data link control by the master station
		  On: Data link control by the standby master station
			$\bigcirc$	$\bigcirc$

SB0071
(5E7H,b1)
	Standby master station information	Indicates whether or not there is a standby master station.
		  Off: No standby master station
		  On: Standby master station exists
			$\bigcirc$	$\bigcirc$

(b) Special link registers (SW)

The following explains the special link registers (SW) related to the standby master function.

The numeric values in parentheses in the number column indicate buffer memory addresses.

Table 5.6 List of special link registers related to the standby master function

Number	Name	Description	Applicability ($\bigcirc$ Applicable, $\times$ Not applicable)	
			Master station	Standby master station

SW0043
(643H)
	Result of master station switching and data link startup	The execution result of the master station switching and data link startup direction by the SB0001 is stored.
		  0 : Normal
		  Other than 0 : An error code is stored. (See Section 16.3.5.)
			$\times$	$\bigcirc$

SW0073 (673H)	Standby master station number	Stores the station number of the standby master station. 1 to 63	$\bigcirc$	$\bigcirc$

(5) Program example when the standby master function is used

The following shows a program example when the standby master function is used.

```c
void                    Change_StanbyMaster()
{           short              Counter;              // General counter
            short              StNo;                 // Station number
            unsigned short     DevType;              // Device type
            short              DevNo;                // Device number
            short              Size;                 // Sending data size
            short              RecvBuf[10];          // Buffer for receiving
            unsigned short     ret;                  // Return value


//Turn on SB1 (switching request)
            StNo = 0xFF;               //Set the station number
            DevType = 5;               //Set the device type (SB: equivalent to special M)
            DevNo = 0x1;               //Set the device number
            ret = mdDevSet(path,StNo,DevType,DevNo);
            if(ret!=0)      {
                    printf("SBI ON processing failed, error code:%x\n",ret);
                    printf("Press any key\n");
                    getch();
                    mdClose(path);
                    exit(0);
            }


            for(Counter = 0;Counter < 100;Counter++){             // Confirm completion of switching
//Read SB (equivalent to special SM) 43)
                    Size = 2;                          // Set the size of sending data
                    StNo = 0xFF;                       // Set the station number
                    DevType = 5;                       // Set the device type (SB: equivalent to special M)
                    DevNo = 0x20;                      // Set the device number
                    ret = mdReceive(path,StNo,DevType,DevNo,&Size,&RecvBuf[0]);
                    if(ret!=0){
                            printf("mdReceive[SB43 read] processing failed, error code:%xYn";ret);
                            printf("Press any key\n");
                            getch();
                            mdClose(path);
                            exit(0);
                    }
                    if((RecvBuf[0] & 0x0800)!=0)             // Exit from the loop if SB43 is on
                            break;
                    Sleep(100);               // Wait for 100ms
            }
// Confirm the time-out
        if(Counter>=100){
                printf("[SB43]ON conformation timed out \n");
```

```
                                printf("Press any key\n");
                                getch();
                                mdClose(path);
                                exit(0);
                }
//Turn on SB1 (switching request)
                StNo = 0xFF;                    //Set the station number
                DevType = 5;                    //Set the device type (SB: equivalent to special M)
                DevNo = 0x1;                    //Set the device number
                ret=mdDevRst(path,StNo,DevType,DevNo);
                if(ret!=0)        {
                                printf("SBI ON processing failed, error code:%x\n",ret);
                                printf("Press any key\n");
                                getch();
                                mdClose(path);
                                exit(0);
                }

// Read SW (equivalent to special SD) 43 [switching result]
                Size = 2;                              // Set the size of sending data
                StNo = 0xFF;                           // Set the station number
                DevType = 14;                          // Set the device type (SD: equivalent to special D)
                DevNo=43;                              // Set the device number
                ret=mdReceive(path,StNo,DevType,DevNo,&Size,&RecvBuf[0]);
                if(ret!=0){
                                printf("mdReceive[SW43 read] processing failed, error code:%x\n",ret);
                                printf("Press any key\n");
                                getch();
                                mdClose(path);
                                exit(0);
                    }
                    if((RecvBuf[0] & 0x0800)!=0)                // Exit from the loop if SB43 is on
                            break;
                    Sleep(100);                     // Wait for 100ms
                }

                if(RecvBuf[0]!=0){                      // Exit when the switching result is abnormal
                        printf("Failed to switch to the standby master station\n");
                        printf("Press any key\n")
                        getch();
                        mdclose(path);
                        exit(0);
                }
}
```

POINT
Use the paths that are already obtained in other processing for the path parameters in the standby master switching sample program. (They correspond to the path values obtained by mdOpen.)

5.4 Useful Functions

This section explains some useful functions for the I/F board.

5.4.1 Creating a program that contains modules to be added in the future (reserved station function)

This function prevents any of the remote stations, local stations, intelligent device stations and standby master station that is not actually connected (but that will be connected in the future) from being treated as a "data link faulty station" by the master and local stations.

[Setting method]
Use the utility to specify reserved stations with the "Station information settings" of network parameters.
For more details on the setting, see Section 9.2.3.

5.4.2 Powering off a station in operation without detecting an error (error invalid station setting function)

By setting network parameter, this function prevents any of the remote stations, local stations, intelligent device stations and standby master station that is powered off in the system configuration from being treated as a "data link faulty station" by the master and local stations.

Note that if a station is set as an error invalid station, problems occurring in that station can no longer be detected.

In addition, the error invalid station settings cannot be changed while online because they are set with network parameters.
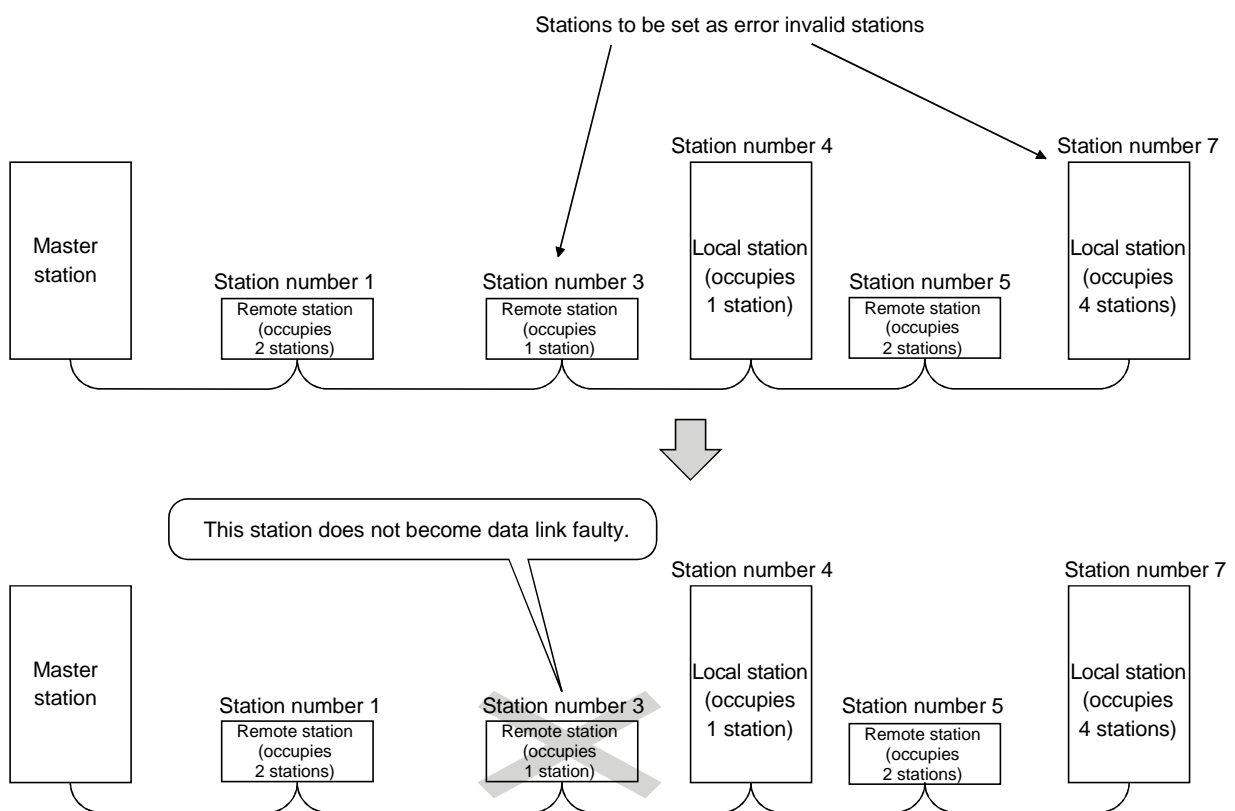

```
POINT
```
If any of the remote stations, local stations, intelligent device stations or standby master station that has been specified as an error invalid station is also "specified as a reserved station," the reserved station function overrides the error invalid station setting function.

[Setting method]

Use the utility to specify error invalid stations with the "Station information settings" of network parameters.

For more details on the setting, see Section 9.2.3.

5.4.3 Checking operations for each station (data link stop/restart)

Line monitoring (own station and other stations) and network tests can be performed using the CC-Link utility.
For more details, see Section 9.2.

5.4.4 Station number duplicate check

This function checks whether or not multiple modules with the same station number exist in the system when the master station is started up.

1) When there is a duplicate station number, the "ERR." LED is lit, an error code is stored in the SW006A (switch setting status), and the SB006A turns on.
2) By correcting the switch setting to normal and restarting the data link, the "ERR." LED can be turned off and the data in the SW006A can be cleared.

5.5 Transient Transmission Functions

The following explains the transient transmission functions.

5.5.1 Performing transient transmission (functions)

The following functions can be used for transient transmission.

Target station	Instruction	Description
Master station, local station, intelligent device station	mdReceive	Reads data from the buffer memory of the designated station or the PLC CPU device of the designated station.
	mdSend	Writes data to the buffer memory of the designated station or the PLC CPU device of the designated station.
Local station	mdRandR	Reads data from the randomly specified CPU device of the specified station.
	mdRandW	Writes data to the randomly designated CPU device of the designated station.
	mdDevSet	Sets the CPU device (bit device) of the designated device.
	mdDevRst	Resets the CPU device (bit device) of the designated device.

REMARK

Transient transmission is performed only when these functions are executed to other stations.

6 DATA LINK PROCESSING TIMES

This chapter explains the data link processing times such as the link scan time and transmission delay time.

6.1 Link Scan Time

This section explains the CC-Link scan time and describes the calculation method.

[Link scan time (LS)]

$LS = BT\{29.4 + (NI \times 4.8) + (NW \times 9.6) + (N \times 32.4) + (ni \times 4.8) + (nw \times 9.6)\} + ST + F \ [\mu s]$

BT: Constant (transmission rate)

Transmission rate	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI :   The final station number among a, b and c
　　　　(This value includes the number of occupied stations but excludes reserved stations, and must be a multiple of 8.)
　　　　a: Total number of occupied stations for remote I/O stations
　　　　b: Total number of occupied stations for remote device stations
　　　　c: Total number of occupied stations for local stations, standby master station and intelligent device stations

NW: The final station number between b and c
　　　　(This value includes the number of occupied stations but excludes reserved stations, and must be a multiple of 8.)

Final station number	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
NI,NW	8	16	24	32	40	48	56	64

N: Number of connected stations (excluding reserved stations)
ni: $a + b + c$ (excluding reserved stations)
nw: $b + c$ (excluding reserved stations)
ST: Constant
　　　(Must be the largest value among 1) to 3) below. However, 2) is disregarded when b = 0 and 3) is disregarded when c = 0.)
　　　1) $800 + (a \times 15)$
　　　2) $900 + (b \times 50)$
　　　3) When $c \leq 26$: $1200 + (c \times 100)$
　　　　　When $c > 26$: $3700 + \{(c - 26) \times 25\}$
F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}
　　　Number of faulty stations $\times 48 \times BT \times$ (number of retries)

6

(Example) Using the following system configuration example when the
transmission rate is 10 Mbps (assuming that there is no faulty station
or transient transmission.)
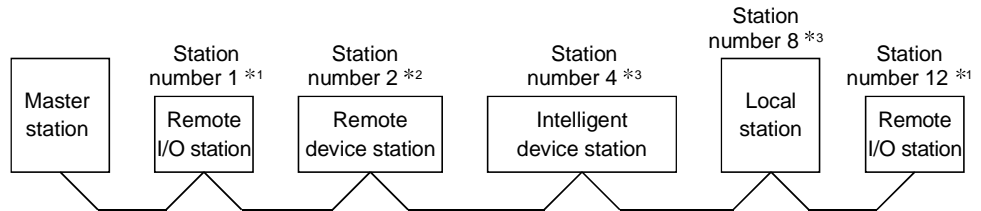
*1: Occupies 1 station   *2: Occupies 2 stations   *3: Occupies 4 stations

$BT = 0.8$
$NI = 12 \rightarrow 16$
$NW = 11 \rightarrow 16$
$N = 5$
$ni = 12$
$nw = 10$

$ST = 2000$
1) $800 + (2 + 15) = 830$
2) $900 + (2 + 50) = 1000$
3) $1200 + (8 + 100) = 2000$
$a = 2, b = 2, c = 8$

$$LS = 0.8\{29.4 + (16 \times 4.8) + (16 \times 9.6) + (5 \times 32.4) + (12 \times 4.8)$$
$$+ (10 \times 9.6)\} + 2000$$
$$= 2556.2 \text{ [µs]}$$
$$= 2.56 \text{ [ms]}$$

6.2 Cyclic Processing Time

The cyclic processing time indicates the transmission delay time (the time until data is transmitted).

6.2.1 Master station (I/F board) $\leftrightarrow$ remote I/O station

(1)   Master station (I/F board) (RX) $\leftarrow$ Remote I/O station (input)
      This indicates the time from the moment a signal is input to the remote I/O station until RX of the master station (I/F board) turns on (off).

[Formula]
LS $\times$ 2 + Remote I/O station response time [ms]   (Note 1)
        LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:
        LS $\times$ 2 + Remote I/O station response time [ms]
      = 3 $\times$ 2 + 1.5
      = 7.5 [ms]

(2)   Master station (I/F board) (RY) $\rightarrow$ Remote I/O station (output)
      This indicates the time from the moment RY of the master station (I/F board) turns on (off) until the remote I/O station output turns on (off).

[Formula]
LS $\times$ 3 + Remote I/O station response time [ms]   (Note 2)
        LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote I/O station response time is 1.5 ms:
        LS $\times$ 3 + Remote I/O station response time [ms]
      = 3 $\times$ 3 + 1.5
      = 10.5 [ms]

Note 1: When reading RX from the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

Note 2: When writing RY to the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

POINT

The own station access processing time of the md function varies depending on the performance of the IBM PC/AT compatible PC, load condition and other factors. The following shows an example of the processing time for an IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU.

Own station access processing time (IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU)

md function \ Access size	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.3 ms	0.7 ms	1.2 ms
Batch write (mdSend)	0.3 ms	0.4 ms	0.5 ms

6.2.2 Master station (I/F board) ↔ remote device station

(1)   Master station (I/F board) (RX) ← Remote device station (RX)

This indicates the time from the moment a signal is input to the remote device station until RX of the master station (I/F board) turns on (off).

[Formula]
LS × 2 + Remote device station processing time [ms]   (Note 1)
   LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote device station processing time is 1.5 ms:
   LS × 2 + Remote device station processing time [ms]
= 3 × 2 + 1.5
= 7.5 [ms]

(2)   Master station (I/F board) (RY) → Remote device station (RY)

This indicates the time from the moment RY of the master station (I/F board) turns on (off) until the remote device station output turns on (off).

[Formula]
LS × 3 + Remote device station processing time [ms]   (Note 2)
   LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote device station processing time is 1.5 ms:
   LS × 3 + Remote device station processing time [ms]
= 3 × 3 + 1.5
= 10.5 [ms]

Note 1: When reading RX from the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

Note 2: When writing RY to the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

POINT

The own station access processing time of the md function varies depending on the performance of the IBM PC/AT compatible PC, load condition and other factors. The following shows an example of the processing time for an IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU.

Own station access processing time (IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU)

md function Access size	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.3 ms	0.7 ms	1.2 ms
Batch write (mdSend)	0.3 ms	0.4 ms	0.5 ms

(3)   Master station (I/F board) (RWr) ← Remote device station (RWr)
This indicates the time from the moment a signal is input to the remote device station until RWr of the master station (I/F board) is changed.

[Formula]
LS × 2 + Remote device station processing time [ms]   (Note 3)
        LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote device station processing time is 1.5 ms:
        LS × 2 + Remote device station processing time [ms]
    = 3 × 2 + 1.5
    = 7.5 [ms]

(4)   Master station (I/F board) (RWw) → Remote device station (RWw)
This indicates the time from the moment RWw of the master station (I/F board) is changed until the data of the remote device station is changed.

[Formula]
LS × 3 + Remote device station processing time [ms]   (Note 4)
        LS: Link scan time (see Section 6.1)
(Example) When the link scan time is 3 ms and the remote device station processing time is 1.5 ms:
        LS × 3 + Remote device station processing time [ms]
    = 3 × 3 + 1.5
    = 10.5 [ms]

Note 3: When reading RWr from the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

Note 4: When writing RWw to the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

6.2.3 Master station (I/F board) ↔ local station (PLC)

(1)   Master station (I/F board) (RX) ← Local station (PLC) (RY)
   This indicates the time from the moment the local station's CPU device turns on
   (off) until RX of the master station (I/F board) turns on (off).

   [Formula]
   $LS \times 3 + SL$ [ms]   (Note 1)
         LS: Link scan time (see Section 6.1)
         SL: Local station sequence program scan time
   (Example) When the link scan time is 3 ms and the local station's sequence scan
         time is 10 ms:
            $LS \times 3 + SL$ [ms]
         $= 3 \times 3 + 10$
         $= 19$ [ms]

(2)   Master station (I/F board) (RY) → Local station (PLC) (RX)
   This indicates the time from the moment RY of the master station (I/F board)
   turns on (off) until the local station's CPU device turns on (off).

   [Formula]
   $LS \times 3 + SL$ [ms]   (Note 2)
         LS: Link scan time (see Section 6.1)
         SL: Local station's sequence program scan time
   (Example) When the link scan time is 3 ms and the local station's sequence scan
         time is 10 ms:
            $LS \times 3 + SL$ [ms]
         $= 3 \times 3 + 10$
         $= 19$ [ms]

Note 1: When reading RX from the I/F board with the md function, it is necessary
         to add the own station access processing time of the md function.

Note 2: When writing RY to the I/F board with the md function, it is necessary to
         add the own station access processing time of the md function.

(3)   Master station (I/F board) (RWr) ← Local station (PLC) (RWw)
This indicates the time from the moment data is set in the local station's CPU device until RWr of the master station (I/F board) is changed.

[Formula]
LS $\times$ 3 + SL [ms]   (Note 3)
   LS: Link scan time (see Section 6.1)
   SL: Local station's sequence program scan time
(Example) When the link scan time is 3 ms and the local station's sequence scan time is 10 ms:
LS $\times$ 3 + SL [ms]
= 3 $\times$ 3 + 10
= 19 [ms]

(4)   Master station (I/F board) (RWw) → Local station (PLC) (RWr)
This indicates the time from the moment RWw of the master station (I/F board) is changed until data is stored in the local station's CPU device.

[Formula]
LS $\times$ 3 + SL [ms]   (Note 4)
   LS: Link scan time (see Section 6.1)
   SL: Local station's sequence program scan time
(Example) When the link scan time is 3 ms and the local station's sequence scan time is 10 ms:
 LS $\times$ 3 + SL [ms]
= 3 $\times$ 3 + 10
= 19 [ms]

Note 3: When reading RWr from the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

Note 4: When writing RWw to the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

6.2.4 Master station (I/F board) ↔ intelligent device station

The transmission delay time between the master station (I/F board) and the intelligent device station varies depending on the type of intelligent device station used.
See the User's Manual for the intelligent device module to be used.

Notes

(1)   When reading RX and RWr from the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

(2)   When writing RY and RWw to the I/F board with the md function, it is necessary to add the own station access processing time of the md function.

POINT

The own station access processing time of the md function varies depending on the performance of the IBM PC/AT compatible PC, load condition and other factors. The following shows an example of the processing time for an IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU.

Own station access processing time (IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU)

md function Access size	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.3 ms	0.7 ms	1.2 ms
Batch write (mdSend)	0.3 ms	0.4 ms	0.5 ms

6.3 Transient Transmission Processing Time

This indicates the transient transmission processing time (the time from the moment an instruction is issued until a response is received).

6.3.1 Master station (I/F board) $\leftrightarrow$ local station (PLC)

(1)   Master station (I/F board) $\rightarrow$ Local station (PLC)

This indicates the time from the moment an instruction is issued by the master station (I/F board) until a response from the local station (PLC) is received.

[Formula]

$$OT + LS + (\text{number of request data} + 16)/72^{*1} \times LS + \alpha + SL + LS \times 2$$
$$+ (\text{number of response data} + 16)/16^{*1} \times LS + ß + bps \qquad [ms]$$

OT: Data transmission time between the IBM PC/AT compatible PC and the I/F board

The processing time varies depending on the performance of the IBM PC/AT compatible PC, load condition, and other factors. The following table shows an example of the processing time for an IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU.

Access size / md function	2 bytes	512 bytes	1024 bytes
Batch read (mdReceive)	0.4 ms	0.8 ms	1.3 ms
Batch write (mdSend)	0.4 ms	0.5 ms	0.6 ms

LS	: Link scan time (see Section 6.1)
SL	: Local station's sequence program scan time
Number of request data	: Number of write points [*2]
Number of response data	: Number of read points [*3]
α	: Constant (internal processing time of the sender)

		1 to 120 points	121 to 240 points	241 to 360 points	361 to 480 points
Master $\rightarrow$ Local	Read	LS	LS $\times$ 2	LS $\times$ 3	LS $\times$ 4
	Write	LS			
Local $\rightarrow$ Master	Read				
	Write	LS	LS $\times$ 2	LS $\times$ 3	LS $\times \times$ 4

ß	: Constant (internal processing time of the receiver)
	LS for the master station and local station
bps	: Constant

Transmission rate	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
bps	LS	LS $\times$ 2	LS $\times$ 4	LS $\times$ 6	LS $\times$ 7

*1: Round up below the decimal point
*2: When reading = 1 (LS)
*3: When writing = 1 (LS)

POINT

When performing a transient transmission using the md functions, the transient transmission is executed in several runs by dividing the number of request data into sizes inside the md functions that can be received by the opposite station. In addition, after the communication line is opened, the first md function performs extra transient transmission in order to obtain detailed information of the PLC.

6.3.2 Master station (I/F board) ↔ intelligent device station

(1)   Master station (I/F board) → Intelligent device station

This indicates the time from the moment an instruction is issued by the master station (I/F board) until a response from the intelligent device station is received.

[Formula]

$$OT + LS + (\text{number of request data} + 16)/72^{*1} \times LS + \alpha + LS \times 2$$
$$+ (\text{number of response data} + 16)/16^{*1} \times LS + ß + bps \qquad [ms]$$

OT: Data transmission time between the IBM PC/AT compatible PC and the I/F board

The processing time varies depending on the performance of the IBM PC/AT compatible PC, load condition, and other factors. The following table shows an example of processing time for an IBM PC/AT compatible PC equipped with a Pentium II (233 MHz) CPU.

Access size md function	2 bytes	512 bytes	1024 bytes
Batch read(mdReceive)	0.4 ms	0.8 ms	1.3 ms
Batch write (mdSend)	0.4 ms	0.5 ms	0.6 ms

LS   : Link scan time (see Section 6.1)
Number of request data   : Number of write points [*2]
Number of response data : Number of read points [*3]
α : Constant (internal processing time of the sender)

	1 to 120 points	121 to 240 points	241 to 360 points	361 to 480 points
Read	LS	LS × 2	LS × 3	LS × 4
Write	LS			

ß   : Constant (internal processing time of the receiver)
                                              ß = LS
bps   : Constant

Transmission rate	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
bps	LS	LS × 2	LS × 4	LS × 6	LS × 7

*1: Round up below the decimal point
*2: When reading = 1 (LS)
*3: When writing = 1 (LS)

POINT

When performing a transient transmission using the md functions, the transient transmission is executed in several runs by dividing the number of request data into sizes inside the md functions that can be received by the opposite station. In addition, after the communication line is opened, the first md function performs extra transient transmission in order to obtain detailed information of the PLC.

6.4 Station Status at Error

This section explains the status of each station at error.

6.4.1 Status of the master station and remote I/O station at error

Table 6.1 lists the status of the master station and remote I/O stations when an error occurs.

Table 6.1 Status of the master station and remote I/O station at error

Data link status				Master station				Remote I/O station	
				Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Input	Output
When the local station's PLC CPU is stopped (data link continues)				All points are set to off for only the receive area from the stopped local station *1	Continue	Continue	Continue	Continue	Continue
When data link for the entire system is stopped	Input data setting of the CC-Link utility at error	Master station	Clear	Clear	—	—	Latch	—	All points off
			Latch	Latch					
		Local station	Clear						
			Latch						
When a communication error (power off, etc.) occurs in a remote I/O station	Input data setting of the CC-Link utility at error	Master station	Clear	Clears the receive area from the remote I/O station having a communication error	Continue	Continue	Continue	—	All points off
			Latch	Retains the receive area from the remote I/O station having a communication error					
		Local station	Clear						
			Latch						
When a communication error (power off, etc.) occurs in a remote device station	Input data setting of the CC-Link utility at error	Master station	Clear	Clears the receive area from the remote device station having a communication error	Continue	Continue	Retains the receive area from the remote device station having a communication error	Continue	Continue
			Latch	Retains the receive area from the remote device station having a communication error					
		Local station	Clear						
			Latch						
When a communication error (power off, etc.) occurs in a local station	Input data setting of the CC-Link utility at error	Master station	Clear	Clears the receive area from the local station having a communication error	Continue	Continue	Retains the receive area from the local station having a communication error	Continue	Continue
			Latch	Retains the receive area from the local station having a communication error					
		Local station	Clear						
			Latch						

*1: This is because Yn0 (refresh direction) is turned off.

6.4.2 Status of the remote device station, local station, standby master station and intelligent device station at error

Table 6.2 lists the status of the remote device station, local station, standby master station and intelligent device station at error.

Table 6.2 Status of the remote device station, local station, standby master station and intelligent device station at error

Data link status				Remote device station				Local station, standby master station, intelligent device station			
				Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)
When the local station's PLC CPU is stopped (data link continues)				Continue	Continue	Continue	Continue	Continue	Treats the own station send area with all 0's. *1 When stopped, all points of only the receive area from the local station are set to off.	Continue	Continue
When data link for the entire system is stopped	Input data setting of the CC-Link utility at error	Master station	Clear	—	All points off	—	—				
			Latch								
		Local station	Clear					Clear	Clears the receive areas from other stations	Retains the receive areas from other stations	Latch
			Latch					Latch	Retains the receive areas from other stations		
When a communication error (power off, etc.) occurs in a remote I/O station	Input data setting of the CC-Link utility at error	Master station	Clear	Continue	Continue	Continue	Continue				
			Latch								
		Local station	Clear					Continue	Clears the receive area from the remote I/O station having a communication error	Continue	Continue
			Latch						Retains the receive area from the remote I/O station having a communication error		
When a communication error (power off, etc.) occurs in a remote device station	Input data setting of the CC-Link utility at error	Master station	Clear	—	—	—	—				
			Latch								
		Local station	Clear					Continue	Clears the receive area from the remote device station having a communication error	Retains the receive area from the remote device station having a communication error	Continue
			Latch						Retains the receive area from the remote device station having a communication error		

*1: This is because Yn0 (refresh direction) is turned off.

6 - 13

Data link status				Remote device station				Local station, standby master station, intelligent device station			
				Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)
When a communication error (power off, etc.) occurs in a local station	Input data setting of the CC-Link utility at error	Master station	Clear	Continue	Continue	Continue	Continue				
			Latch								
		Local station	Clear					Continue	Clears the receive area from the local station having a communication error	Retains the receive area from the local station having a communication error	Continue
			Latch						Retains the receive area from the local station having a communication error		

MEMO

7 PARAMETER SETTINGS

This chapter explains the parameter settings that are required to perform data link in the CC-Link system.

7.1 Parameter Setting Items

Table 7.1 lists the items to be set in the master station's buffer memory.
Each parameter is set using the CC-Link Utility.
For more details, see Section 9.2.

Important
Do no set station number 64 for a system in which a standby master station exists. If it is used, the station numbered 64 cannot communicate normally.

Table 7.1 Parameter setting items

| Setting item	Description	Reference section
Number of connected modules	Sets the total number of remote stations, local stations, intelligent device stations and standby master station that are connected to the master station (including reserved stations). Default value : 1 (module) Setting range : 1 to 64 (modules)	—
Number of retries	Sets the number of retries to be performed when a communication error occurs. Default value : 3 (times) Setting range : 1 to 7 (times)	—
Number of auto return modules	Sets the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan. Default value : 1 (module) Setting range : 1 to 10 (modules)	Section 5.3.2
Standby master station designation	Designates the station number of the standby master station. Default value : 0 (no standby master station designated) Setting range : 0 to 64 (0: No standby master station designated)	Section 5.3.4
Delay time setting	Sets the link scan interval. (Unit: 50 μs) Default value : 0 (not designated) Setting range : 0 to 100 (0: Not designated)	—
Reserved station designation	Designates the reserved station. Default value : Not designated Setting range : Not designated/designated	Section 5.4.2
Invalid station designation	Designates the error invalid station. Default value : Not designated Setting range : Not designated/designated	Section 5.4.3

7

Table 7.1 Parameter setting items

Setting item	Description	Reference section

Station information	Sets the type of the connected remote station, local station, intelligent device station and standby master station.
	
	Default value : Remote I/O station, occupies 1 station, station number 1
	Setting range
	
	  Station type : Remote I/O station, remote device station, intelligent station
	
	  Number of occupied stations : 1 to 4 (occupied stations)
	
	  Station number : 1 to 64
		—

Assignments of communication buffer and automatic update buffer	Designates the assignments of buffer memory sizes during transient transmission to the local station, standby master station and intelligent device station.
	  Default values
	  Send buffer size : 64 (words)
	  Receive buffer size : 64 (words)
	  Automatic update buffer size : 128 (words)
	Setting range
	  • Communication buffer : 64 to 4096 (words)
	      However, the total communication buffer size must be 4096 (words) or less.
	  • Automatic update buffer : 64 to 4096 (words)
	      However, the total automatic update buffer size must be 4096 (words) or less.
		—

7.2 Example of Parameter Settings

This section explains the parameter settings using the CC-Link Utility.
The explanations in this section are based on the following system configuration example.
For more details on the CC-Link Utility, see Section 9.2.
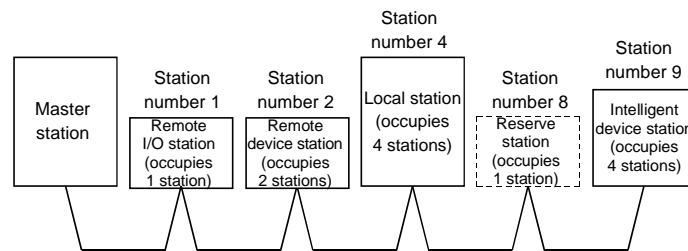
7.2.1 Master station network parameter settings

(1)   Set the network parameters according to the following procedure.
   (a)   Set the station type for [Board Setting].
      Example) Set the station type to Master (station number: 0).
            Default value : Local (station number: 1)
            Setting range : Master (station number: 0)
                         Local (station number: 1 to 64)
                         Standby Master (station number: 1 to 64)
   (b)   Set the input status of the data link faulty station for [Link Err X Data].
      Example) Set the status to Clear.
            Default value : Clear
            Setting range : Latch
                         Clear
   (c)   Set the CC-Link mode for [Mode Setting].
      Example) Set the mode to Online.
            Default value : Online
            Setting range : Online
                         Offline
                         Standalone unit hardware operation confirmation mode
   (d)   Set the total number of connected modules in the CC-Link system including reserved stations for [Number of Connected modules].
      Example) Set the number to 5 (modules).
            Default value : 1 (modules)
            Setting range : 1 to 64 (modules)
   (e)   Set the number of retries when a communication error occurs for [Number of Retries].
      Example) Set the number to 5 (times).
            Default value : 3 (times)
            Setting range : 1 to 7 (times)
   (f)   Set the number of modules that can return to system operation by a single link scan for [Auto Return Station No.].
      Example) Set the number to 2 (modules).
            Default value : 1 (module)
            Setting range : 1 to 10 (modules)

(g) Set the station number of the standby master station for [Standby master
     station designation].
     Example) Set the station number to 0 (no standby master station
              designated).
                Default value : 0 (No standby master station designated)
                Setting range : 0 to 64 (0: No standby master station designated)

(h) Set the link scan interval for [Delay Timer].
     Example) Set the interval to 10 (500 μs).
                Default value : 0 (Not designated)
                Setting range : 0 to 100 (unit: 50 μs)

(i) Set the station data in the [Parameter Setting].
     Example) Set the station data according to the system configuration
              designated in Section 7.2.
                Default value : No setting for the remote I/O station, occupying 1
                                  station, or reserved station/error invalid station
                Setting range : Type -   Remote I/O
                                              Remote Device
                                              Intelligent Device (including local
                                              station and standby master station)
                                  Occupy Station
                                        - 1 (Occupies 1 station)
                                           2 (Occupies 2 stations)
                                           3 (Occupies 3 stations)
                                           4 (Occupies 4 stations)
                                  Station Specify
                                        - Reserve
                                           Invalid (error invalid station)
                                           No setting
                                  Intelligent Buffer Specify (Word)
                                        - Sending: 64 to 4096
                                           Received: 64 to 4096
                                           Automatic: 128 to 4096

Parameter Setting

Number of Connected modules [5 ▼]   [Auxiliary Setting]

No.	St.	Type	Occupy Station	Station Specify	Intelligent Buffer Specify (Word) Sending	Received	Automatic	
1	1	Remote I/O ▼	1 ▼	No setting ▼				Up
2	2	Remote Device ▼	2 ▼	No setting ▼				Down
3	4	Intelligent Device ▼	4 ▼	No setting ▼	64	64	128	
4	8	Remote I/O ▼	1 ▼	Reserve ▼				
5	9	Intelligent Device ▼	4 ▼	No setting ▼	64	64	128	
		▼	▼	▼				
		▼	▼	▼				
		▼	▼	▼				
		▼	▼	▼				
		▼	▼	▼				

☐ Ten Key Pad   [OK]   [Cancel]   [Apply]   [All Clear]

7.2.2 Local station network parameter settings

(1)   Set the network parameters according to the following procedure.
   (a)   Set the station type for [Board Setting].
         Example)   Set the station type to Local.
                  Default value   :   Local (station number: 1)
                  Setting range   :   Master (station number: 0)
                                  Local (station number: 1 to 64)
                                  Standby Master (station number: 1 to 64)

   (b)   Set the number of occupied local stations for [Occupy St.].
         Example)   Set the number to 4 stations.
                  Default value   :   1 st.
                  Setting range   :   1 st.
                                  4 st.

   (c)   Set the input status of the data link faulty station for [Link Err X Data].
         Example)   Set the status to Clear.
                  Default value   :   Clear
                  Setting range   :   Latch
                                  Clear

   (d)   Set the CC-Link mode for [Mode setting].
         Example)   Set the mode to Online.
                  Default value   :   Online
                  Setting range   :   Online
                                  Offline
                                  Standalone unit hardware operation confirmation
                                  mode

MEMO
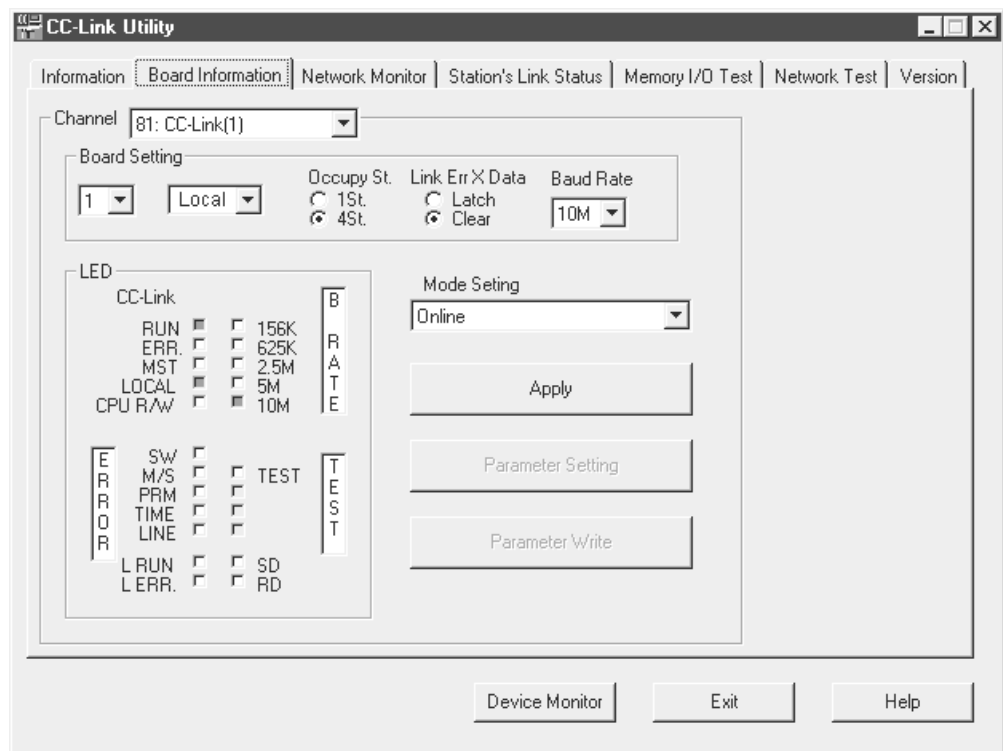
8 PROCEDURE BEFORE STARTING THE DATA LINK

This chapter explains the operating procedures required before starting the I/F board operation as well as the names and settings of the I/F board components, the wiring method, and how to perform hardware tests.

8.1 Procedures Before Operating the I/F Board

The following flowchart explains the procedures before operating the I/F board.

Start	
Perform I/F board setup.	•••••••••See Section 8.3, "Component Names and Settings."
Turn off the power of the IBM PC/AT compatible PC, if it is on	
Remove the terminal block of the I/F board.	
Mount the I/F board in the IBM PC/AT compatible PC.	
Fix the I/F board with the fastening screws of the IBM PC/AT compatible PC.	
Attach the terminal block of the I/F board.	
Perform the wiring between the I/F board and modules.	•••••••••See Section 8.6, "Wiring."
Turn on the power of the IBM PC/AT compatible PC and install the utility software.	•••••••••See Section 8.4, "Installing and Uninstalling the Utility Software."
Test the I/F board.	•••••••••See Section 9.2.7, "Operating the network test window."
Set up the data link of the I/F board.	•••••••••See Section 9.2, "Operating the Utility Software."
Start up the CC-Link system.	
Run the program of the IBM PC/AT compatible PC.	
Complete	

8

Caution

When using the I/F board as a local board, it is necessary to set up the master module in order to run the CC-Link system.
Perform the settings of the master module as needed.
For information on the settings of the master module, see the user's manual for the master module.

8.2 Installation

This section explains the handling precautions and installation environment of the I/F board.

8.2.1 Precautions on handling the I/F board

The following explains the handling precautions of the I/F board:

◇DANGER	• Do not touch the terminal or connector while the power is on. Doing so may cause electric shock or malfunction.

⚠CAUTION	• Fix the I/F board securely with the installation screws and tighten the installation screws within the specified torque range.
	  If the screws are loose, it may cause malfunction.
	  If the screws are tightened too much, it may cause damage to the screws resulting in malfunction.
	• Do not directly touch the conductive area or electronic components of the I/F board.
	  Doing so may cause malfunction or failure in the I/F board.
	• Tighten the terminal screws within the range of specified torque.
	  If the terminal screws are loose, it may cause short circuit or malfunction.
	  If the terminal screws are tightened too much, it may cause damage to the screws and /or the I/F board, resulting in short circuits or malfunction.
	• While handling the I/F board, be sure to keep it free of static electricity.
	  Static electric charges may damage the I/F board or result in malfunction.
	• Be careful not to let foreign objects such as swarf or wire chips get inside the IBM PC/AT compatible PC.
	  They may cause fires, failure or malfunction.
	• Do not disassemble or modify the I/F board.
	  Doing so could cause failure, malfunction, injury or fire.
	• Switch all phases of the external power supply off when mounting or removing the I/F board to or from the IBM PC/AT compatible PC.
	  Not doing so may cause failure or malfunction of the I/F board or IBM PC/AT compatible PC.
	• When disposing of this product, treat it as industrial waste.
	• Do not drop the I/F board or subject it to any excessive shock.
	  It may damage the I/F board or result in malfunction.

(1) Tighten the mounting screws and terminal screws of the I/F board using a torque within the following ranges.

Screw location	Clamping torque range
Terminal block terminal screws (M3.5 screws)	59 to 88 N·cm
Terminal block mounting screws (M3.5 screws)	59 to 88 N·cm

(2) See the instruction manual provided with the IBM PC/AT compatible PC for the clamping torque of the I/F board mounting screws.

8.2.2 Installation environment

See the instruction manual provided with the IBM PC/AT compatible PC for information on how to install the IBM PC/AT compatible PC in which the I/F board has been mounted.

⚠ CAUTION	• Always ground the IBM PC/AT compatible PC's main unit using a D-type grounding (Class 3 grounding) or higher. Otherwise, malfunction may occur. If a malfunction occurs even when the IBM PC/AT compatible PC's main unit has been grounded, ground both the FG terminal of the IBM PC/AT compatible PC's main unit and the SLD terminal of the I/F board.

8.2.3 Mounting and removing the terminal block

Since a 2-piece type terminal block is used, the I/F board can be replaced without disconnecting the signal line to the terminal block.
The following shows how to mount and remove the terminal block:

Screwdriver

Remove the two screws on both ends of the terminal block and pull the terminal block out.
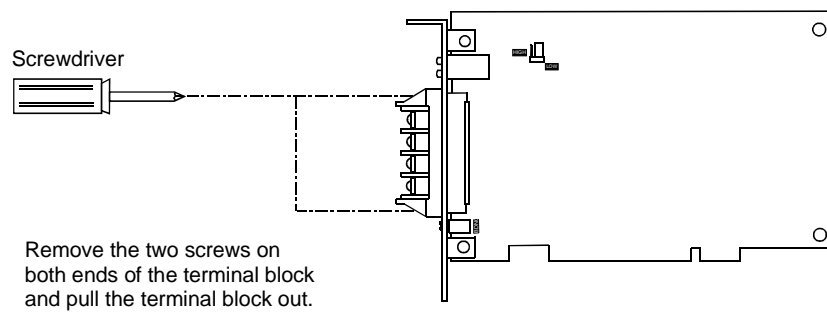
8.3 Component Names and Settings

This section explains the component names and settings of the I/F board.

No.	Name	Description				
1)	Operation display LEDs RUN ERR ○ ○ ○ ○ SD RD	LED name	Description	On	Off	
		RUN	Turns on when the I/F board functions normally and turns off when a WDT error occurs.	I/F board normal	• WDT error • The power of the IBM PC/AT compatible PC is off.	
		ERR.	Turns on when the network communication status is abnormal.	Data link communication error	Data link communication normal	
		SD	Flashes when data link data is sent.	Flashes during data link sending.		
		RD	Flashes when data link data is received.	Flashes during data link receiving.		
2)	Terminal block for data link Upper surface of the board DA DB DG SLD	Connects the CC-Link dedicated cable for data linking. (2-piece type terminal block)				

No.	Name	Description				
3)	Channel No. setting switch BD NO.	Sets the channel number of the I/F board.				
		Board No.	Channel No.	Switch		Remarks
				1	2	
		0	81	OFF	OFF	Default setting
		1	82	ON	OFF	
		2	83	OFF	ON	
		3	84	ON	ON	
		When mounting more than two I/F boards, do not use duplicate board numbers.				
4)	Temperature abnormality detection switching setting pin HIGH LOW	Sets the temperature to detect abnormal temperatures.				
		Setting	Description		Remarks	
		HIGH	Sets the detecting temperature at 55 °C			
		LOW	Sets the detecting temperature at 45 °C		Default setting	

8.4 Installing and Uninstalling the Utility Software

The following explains how to install and uninstall the utility software.

8.4.1 Installing the utility software

The following describes the preparation for installing the utility software and the utility software installation procedure.

┌───┐
│ ┌──────────┐   │
│ │ POINT   │   │
│ └──────────┘   │
│ (1) If the operating system in use is Windows NT 4.0, log on as a user with │
│   Administrator privilege.   │
│ (2) Remove all applications that are included in the Startup menu, and then restart │
│   Windows before installing the utility software.   │
│ (3) Use the floppy disks labeled as 1/5 (1st disk) through 5/5 (5th disk) for │
│   installation.   │
│ (4) Install SW3DNF-CCLINK after uninstalling SW0DNF-CCLINK, SW1DNF- │
│   CCLINK and SW2DNF-CCLINK.   │
│   The utility software setup needs to be performed again since all data set by │
│   each utility is erased.   │
│ (5) Install SW3DNF-CCLINK using "Add/Remove Programs" in "Control Panel." │
│   Or, execute "SETUP.EXE" by clicking "SETUP.EXE" to begin installation from │
│   Item 6.   │
└───┘

(1) Preparation for the installation (Required only when Windows 95 or 98 is used as an operating system)

The following explains the preparation procedure to be performed before installing SW3DNF-CCLINK.

1. Turn on the power to the IBM PC/AT compatible PC and start Windows.

2. When the window shown at the left is displayed, click the [Next>] button.

↓
(To the next page)

(From the previous page)
↓

3. When the window shown at the left is displayed, select "Search for the best driver for your device [Recommended]," and then click the [Next>] button.

↓

4. When the window shown at the left is displayed, check the "Specify a location" check box, and then enter "A:\US" to the search location. When the setting is complete, insert the floppy disk labeled as "5/5" (the 5th disk) into the floppy disk drive, and then click the [Next>] button.

↓

5. The system searches for a device driver file.
Click the [Next>] button.

↓

6. The operation is complete when the window shown at the left is displayed.
Click the [Finish] button.

(2)   Installing SW3DNF-CCLINK

Install SW3DNF-CCLINK according to the procedure below:

1. Turn on the power to the IBM PC/AT compatible PC and start Windows.
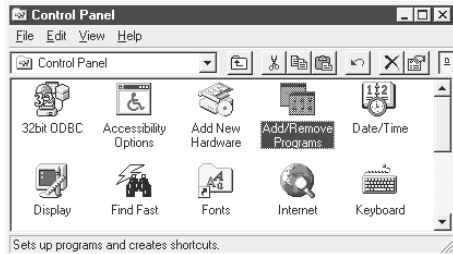
2. Click the Start button, point to Settings, and then click Control Panel.

3. Click "Add/Remove Programs."
   Click the [Install...] button.
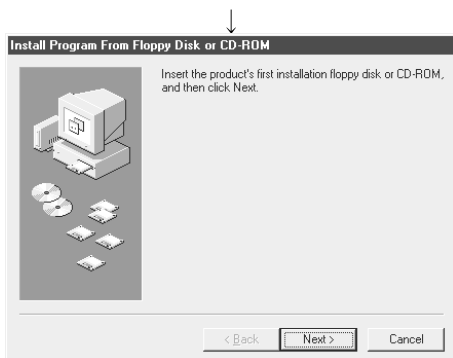
4. When the window shown at the left is displayed, insert the floppy disk labeled as 1/5 (the 1st disk) into the floppy disk drive.
   After inserting the floppy disk, click the [Next >] button.

(To the next page)

(From the previous page)

↓
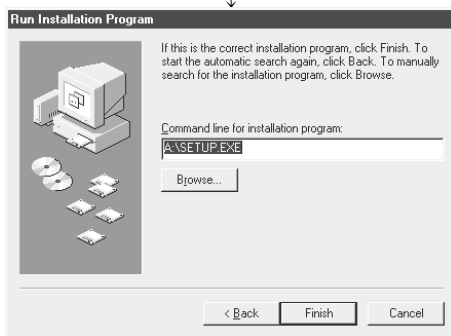
5. The window shown at the left is displayed to indicate that
   "SETUP.EXE" has been found. Click the [Finish] button and start the
   installation.
   If "SETUP.EXE" was not found, click the [Browse...] button and
   change to the directory where "SETUP.EXE" is located.

↓

6. After a few moments, the window shown at the left is displayed.
   Select "English (United States)" and click the [OK] button.

↓
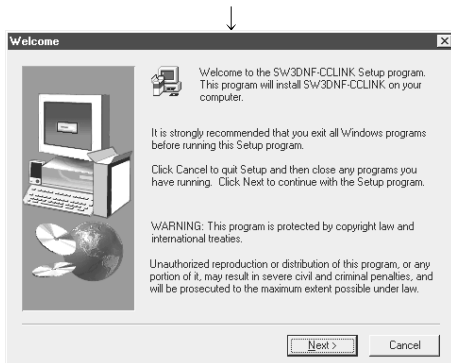
7. After verifying the contents of the screen display, click the [Next >]
   button.

↓
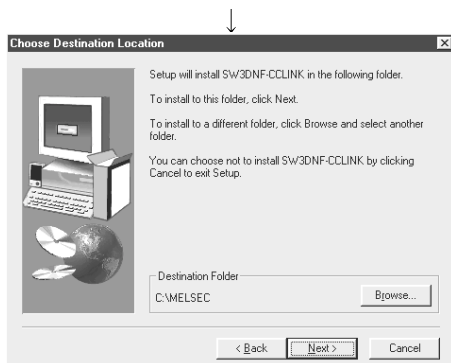
8. Designate the installation destination folder.
   The default installation destination folder for SW3DNF-CCLINK is
   "C:\ MELSEC."
   To select the default folder, click the [Next >] button.
   To change the installation destination folder, click the [Browse ...]
   button and change the folder.

↓

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(From the previous page)

↓

Setup

c:\melsec\cclink\sample\vb\project1.vbp

| 37 % |

Cancel
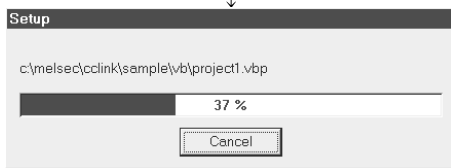
9. The installation will start. Insert the floppy diskettes in sequence
   according to the directions displayed on the screen.

↓

Setup Complete

Setup has finished copying files to your computer.

Before you can use the program, you must restart Windows or
your computer.

○ Yes, I want to restart my computer now.

○ No, I will restart my computer later.

Remove any disks from their drives, and then click Finish to
complete setup.

< Back   Finish
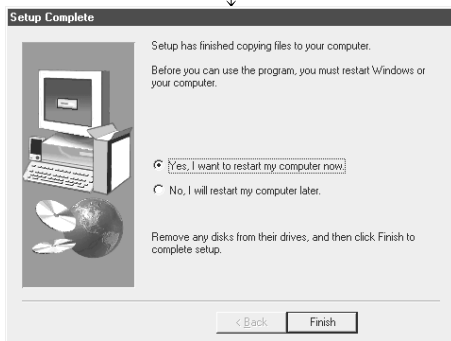
10. The dialog box shown at the left is displayed to indicate that the
    installation has successfully been completed.
    To restart, verify that "Yes, I want to restart my computer now." is
    checked, then click the [Finish] button.
    To restart later, check "No, I will restart my computer later." and
    click the [Finish] button.

POINT
(1) If the installation failed to complete successfully and it is possible to uninstall the utility software, execute the uninstall procedure.
(2) To reinstall the utility software, reinstall it after uninstalling it first.

8.4.2 Displayed icons

After the utility software is installed, the following icons are displayed by selecting the
Start button, pointing to Programs, and then to MELSEC.

(1) MELSEC CC-Link Utility
     Starts CC-Link Utility.

(2) Error Viewer (for Windows 95/Windows 98 only)
     Starts Error Viewer.

POINT
(1) If the utility software for other I/F boards is installed, the icon for the Device Monitor Utility may be displayed.
(2) If the utility software for other I/F board is installed, the icon for the Board Diagnostic Utility may be displayed. However, the Board Diagnostic Utility cannot be used for the A80BDE-J61BT11.

8.4.3 Uninstalling the utility software

This section describes how to uninstall the utility software.

> POINT
>
> Be sure to uninstall the utility software from Control Panel. Do not directly execute the "UnInstaller.exe" program that has been installed.

1. Select the Start button, point to Settings, and then click Control Panel.
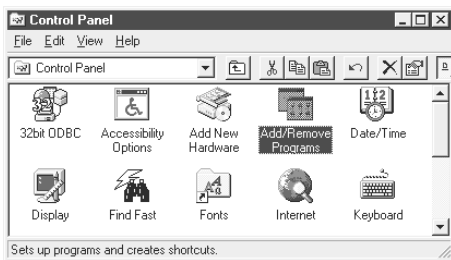
2. When Control Panel is displayed, double-click "Add/Remove Programs."

↓

3. Select "SW3DNF-CCLINK," and then click the [Add/Remove ...] button.

↓
(To the next page)

(From the previous page)

↓

Confirm File Deletion

(?) Are you sure you want to completely remove 'SW3DNF-CCLINK' and all of its components?

[Yes]   [No]
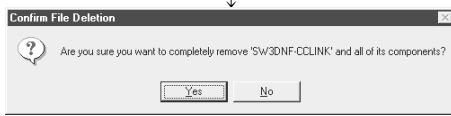
4. Click the [Yes] button to start the uninstall procedure.

↓

Remove Shared File?

The system indicates that the following shared file is no longer used by any programs. If any programs are still using this file and it is removed, those programs may not function. Are you sure you want to remove the shared file?

Leaving this file will not harm your system. If you are not sure what to do, it is suggested that you choose to not remove this shared component.

File name: SYSINFO.OCX

Located in: C:\WINDOWS\SYSTEM\

[Yes]   [Yes To All]   [No]   [No to All]

5. If the window shown at the left is displayed, click the [No to All] button.
Clicking the [Yes] or [Yes to All] button removes the shared files of the MELSEC utility software group and, as a result, other utility software may not function normally.

↓

Remove Programs From Your Computer

uninstallShield will remove the software 'SW3DNF-CCLINK' from your computer. Please wait while each of the following components is removed...

✔ Shared program files...
✔ Standard program files...
✔ Folder items...
✔ Program folders...
✔ Program directories...
✔ Program registry entries...

Uninstall successfully completed.

[OK]
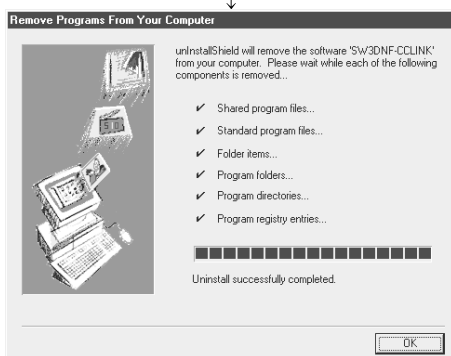
6. When the utility software has been uninstalled, click the [OK] button.

8.5 Checking the Board Status (Hardware Test)

The hardware test checks whether or not each module works properly by itself.
Always perform this hardware test before configuring the system.

Execute the hardware test according to the following procedure:

```
┌─────────────────────────────────┐
│             Start               │
└─────────────────────────────────┘
               │
               ▼
┌─────────────────────────────────┐
│ Connect the terminal resistor   │
│ supplied with the I/F board     │
│ between the DA and DB terminals │
│ of the I/F board.               │
└─────────────────────────────────┘
               │
               ▼
┌─────────────────────────────────┐
│ Select the "Module Standalone   │
│ Hardware Operation Check Mode"  │ ••••••• See Section 9.2.3
│ in the MELSEC CC-Link utility.  │
└─────────────────────────────────┘
               │
               ▼
```

The test result is displayed by the LED indicator lamps of the
CC-Link utility.
[When normal]
  The LEDs turn on in this order: "SW" → "M/S" → "PRM" → "TIME."

SW	●	○	○	○
M/S	○	●	○	○
PRM	○	○	●	○
TIME	○	○	○	●

Repeated

[When abnormal]
The error description of each check item is shown in the table below.
Replace the module if it becomes faulty.
(Check to verify again that the terminal resistor that comes with the
I/F board is connected between terminals DA and DB.)

Check item	LED status display	Description
Self-loop back test	"SW" is lit	Module error
ROM check	"M/S" is lit	ROM error
RAM check	"PRM" is lit	RAM error

```
               │
               ▼
┌─────────────────────────────────┐
│      The "RUN" LED turns off.   │
└─────────────────────────────────┘
               │
               ▼
┌─────────────────────────────────┐
│              End                │
└─────────────────────────────────┘
```

8.6 Connecting the Modules Using the CC-Link Dedicated Cable

This section explains how to connect the master board, master module, local module, standby master module, remote module and intelligent device module using CC-Link dedicated cables.

(1) CC-Link cables can be connected from any station number.

(2) Connect the supplied terminal resistors to both ends of each module.
Also, connect the terminal resistors between the "DA" and "DB" terminals.

(3) The master module can be connected at points other than both ends.

(4) A star connection is not allowed. For the T-branch connection, see Section 8.7, "T-branch Connection Using the CC-Link Dedicated Cable."

(5) The connection method is shown below.

⚠ CAUTION
- Always ground the IBM PC/AT compatible PC's main unit using a D-type grounding (Class 3 grounding) or higher.
Otherwise, malfunction may occur.
If a malfunction occurs even when the IBM PC/AT compatible PC's main unit has been grounded, ground both the FG terminal of the IBM PC/AT compatible PC's main unit and the SLD terminal of the I/F board.
- The CC-Link dedicated cable and CC-Link dedicated high performance cable cannot be used together. If they are used together, normal data transmission cannot be guaranteed.

---

8 - 15

[Simplified diagram]

POINT

(1) Connect the "terminal resistors" supplied with the master module at both ends of the CC-Link system.

(Connect the terminal resistors between "DA" and "DB.")

(2) Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire using a D-type grounding (Class 3 grounding) via "FG."

The SLD and FG are connected inside the module.

8.7 T-Branch Connection with the CC-Link Dedicated Cable

This section explains how to perform a T-branch connection using the CC-Link dedicated cable.

8.7.1 T-Branch system configuration
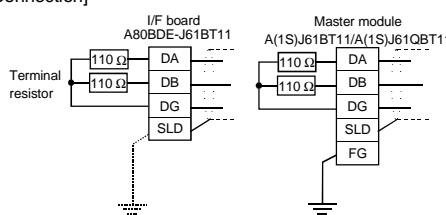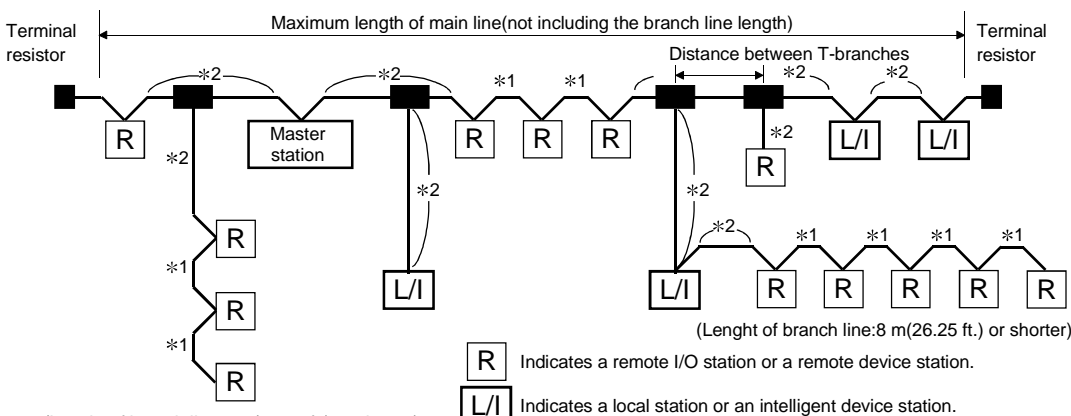
The following shows a system configuration using T-branch connection.
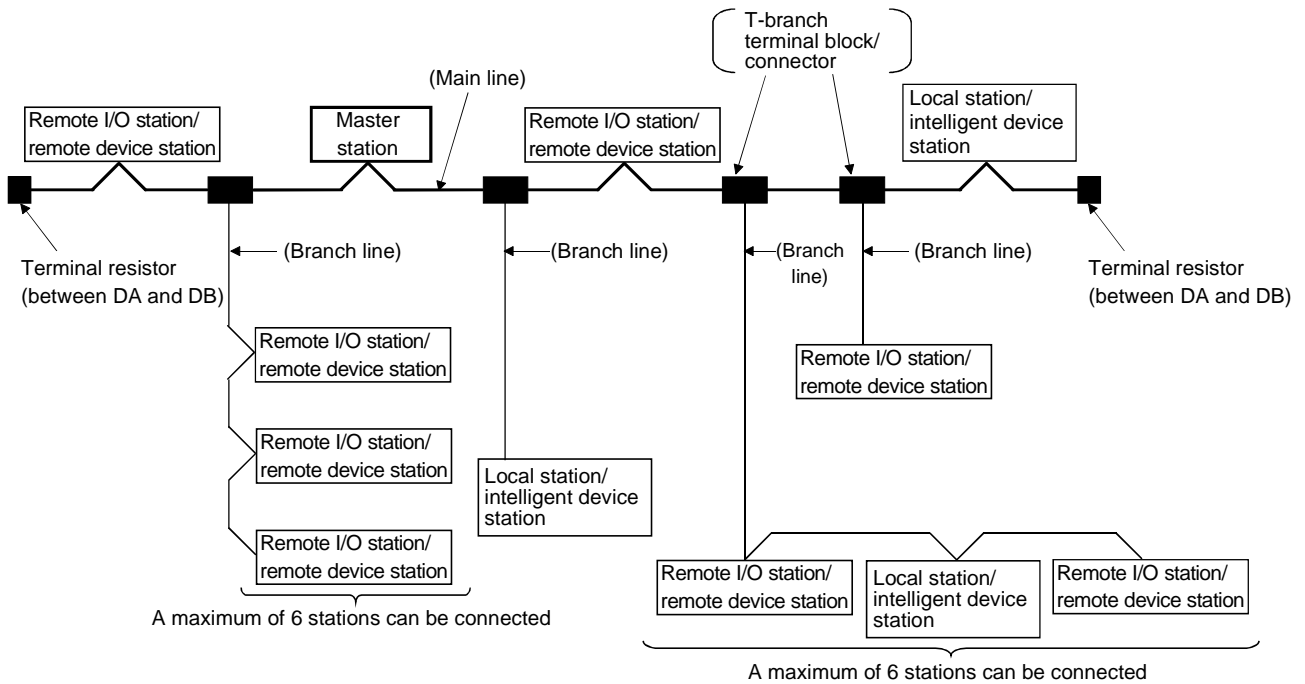
* The number of branch lines is determined by the branch line length per branch line and the overall branch line length.

8.7.2 T-Branch communication specifications list

The following explains the communication specifications for T-branch connection.
For communication specifications not listed below, see Section 4.2 Performance Specifications.

Item	Specification		Remarks
Transmission rate	625 kbps	156 kbps	10 M/5 M/2.5 Mbps are not allowed to use.
Maximum length of the main line	100 m (328.1 ft.)	500 m (1640.5 ft.)	Indicates the length of the cable between terminal resistors. The length of the T-branch cable (branch line length) is not included.
Maximum length of the main line	8 m (26.25 ft.)		Indicates the overall cable length per branch.
Overall branch line length	50 m (164.05 ft.)	200 m (656.2 ft.)	Indicates the overall length of the entire branch cable.
Maximum number of connected stations on the branch line	6 stations per branch		The total number of connected stations depends on the CC-Link specifications.
Connected cable	CC-Link dedicated cable (Example: FANC-SB, CSFV-SLAB, 100ZCLK-SB-20AWGX3C)		• The CC-Link dedicated high performance cable cannot be used (example: FANC-SBH). • Cables of different manufacturers cannot be used together. (See the cable catalogue for details on the manufacturers.)
Terminal resistor (connection method) (Only when the I/F board, A(1S)J61BT11 or A(1S)J61QBT11 is used as the master station. When the QJ61BT11 is used as the master station, connect the 110 Ω resistor that is supplied with the module. For the connection method, see Section 8.6.)	110 Ω ± 5 %, 1/2 W × 4 (Connect between DA and DG/DB and DG)...both ends [Connection] 		• Use a commercially available terminal resistor of 110 Ω ± 5 %, 1/2 W resistance. • 110 Ω and 130 Ω resistors that are supplied with the I/F board, master/local modules cannot be used.
T-branch terminal block/connector	• Terminal block: Off-the-shelf terminal block • Connector: Connector NECA4202 for the FA sensor (ICE947-5-2) comparable product is recommended.		• When wiring cables for the main line side, try not to remove the covering as much as possible.
Maximum length of main line, distance between T-branches, and length of cable between stations.	CC-Link dedicated cable(uses 110 (terminal resistor)		

CC-Link dedicated cable(uses 110 (terminal resistor)

Transmission rate	Maximum length of main line	Distance between T-branches	Length of cable between the remote I/O stations or remote device stations [1]	Length of cable between the master/local station or intelligent device station and the adjacent station(s) [2]
625 kbps	100 m (328.1 ft)	No limit	30 cm (11.8 in.) or longer	1 m (3.28 ft.) or longer ([1])/ 2 m (6.56 ft.) or longer ([2])
156 kbps	500 m (1640.5 ft)			

*1: The cable length of 1 m(3.28 ft.) or longer is for a system configured only with remote I/O stations and remote device stations.
*2: The cable length of 2 m(6.56 ft.) or longer is for a system configuration that contains local stations and intelligent device stations.

R Indicates a remote I/O station or a remote device station.

L/I Indicates a local station or an intelligent device station.

8.8 Utility Software Settings

This section explains the settings required for the I/F board.

8.8.1 Station number setting

The following explains how to set the station numbers for the master station, local station, standby master station, remote station and intelligent device station.
For details on the station number settings, see Section 9.2.3.

Specify the station numbers according to the following conditions:

(1) Assign sequential station numbers.
     Station numbers can be specified regardless of the order in which the stations are connected.
     For a module occupying two or more stations, specify the first station number.

(2) Specify unused station numbers as reserved stations.
     If unused station numbers are not specified as reserved stations, they will be handled as data link faulty stations (can be checked with special link registers SW0080 to SW0083).

(3) Specify unique station numbers.
     If duplicate station numbers are specified, an installation error occurs. (Error codes are stored in SW0069)

     [Setting example] One station was skipped when station numbers were specified.
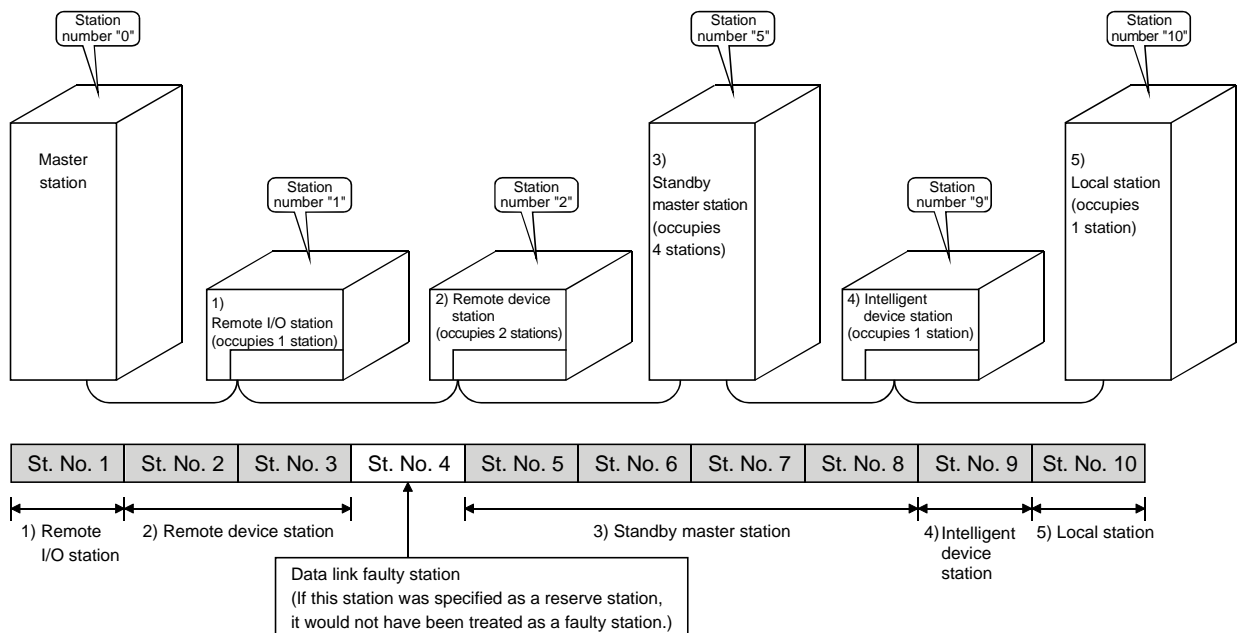
8.8.2 Transmission rate and mode settings

The transmission rate and mode settings are specified with the CC-Link Utility.
For details on the transmission rate/mode settings, see Section 9.2.3.

The transmission rates that can be set vary depending on the overall distance.
For more details, see Section 4.2.1.

POINT
Use the same transmission rate for the master station, remote stations, local stations, intelligent device stations and standby master station. If any of the settings for at least one station is different, data link cannot be established normally.

MEMO

9 OPERATING THE UTILITY SOFTWARE

> **POINT**
>
> When Windows NT 4.0 is being used as an operating system (OS), log on as a user with Administrator privilege in order to use various utilities.

9.1 Operations Common to All Utility Software

This section explains the operations common to all utility software.

9.1.1 Starting a utility

Start a utility by clicking one of the following menus under the [Start] - [Programs] - [MELSEC] menus.

　　MELSEC CC-Link Utility　←——— Starts the CC-Link Utility.

　　ErrorViewer　←——————— Starts Error Viewer. *1
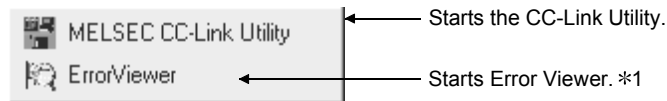
＊1: Error Viewer is available only when the operating system is either Windows 95 or 98.

9.1.2 Starting the device monitor utility

The following explains how to start the Device Monitor Utility from the CC-Link Utility.

The Device Monitor Utility can be started by clicking the [Device Monitor] button at the bottom of the CC-Link Utility window.

Channel No.	Board Model Name	IRQ No.	Memory Address	I/O Port No.	ROM Ver.
81	A80BDE-J61BT11 CC-Link	11	F3FBC000 - F3FBFFFFH	7800 - 78FFH	W

CC-Link Utility

Information | Board Information | Network Monitor | Station's Link Status | Memory I/O Test | Network Test | Version

Board List

Device Monitor   Exit   Help
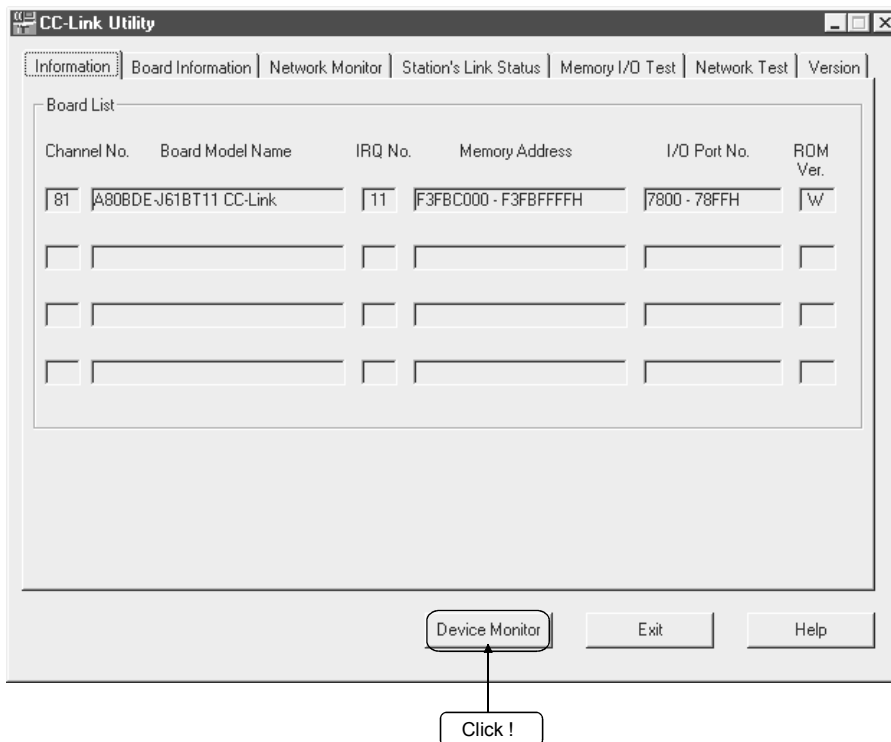
Click !

9.1.3 Quitting a utility

The following explains how to quite a utility.

(1) To quite a utility, click the [Exit] button at the bottom of the Utility window.
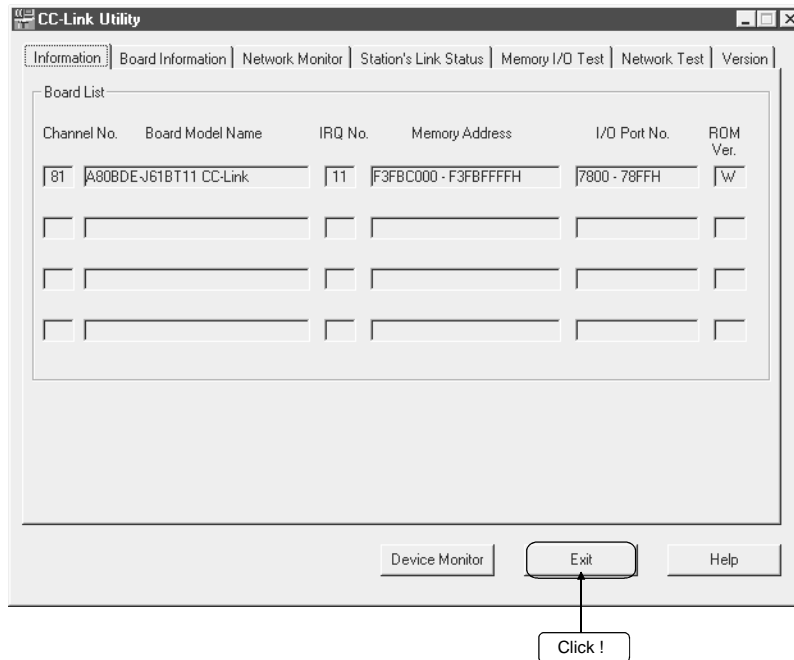
Click !

(2) To quite the Device Monitor Utility, click [Menu] - [Exit] on the menu bar.
When a dialog box is displayed, click the [Yes] button to quite the Device Monitor
Utility.
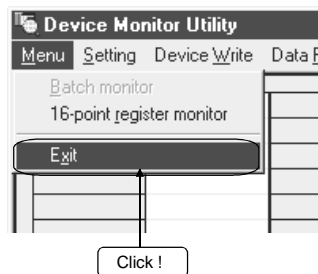
Click !

(3) To quite Error Viewer, click [Log] - [Exit] on the menu bar.
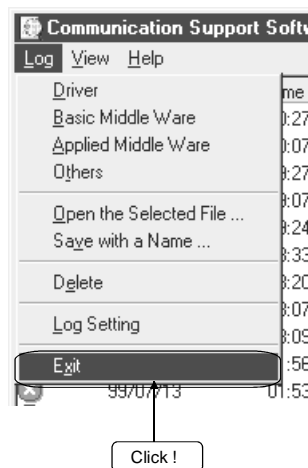
Click !

9.1.4 Displaying the help window

The following explains how to display the Utility Help window.

(1) To display the Utility Help window, click the [Help] button at the lower right corner of the Utility window.
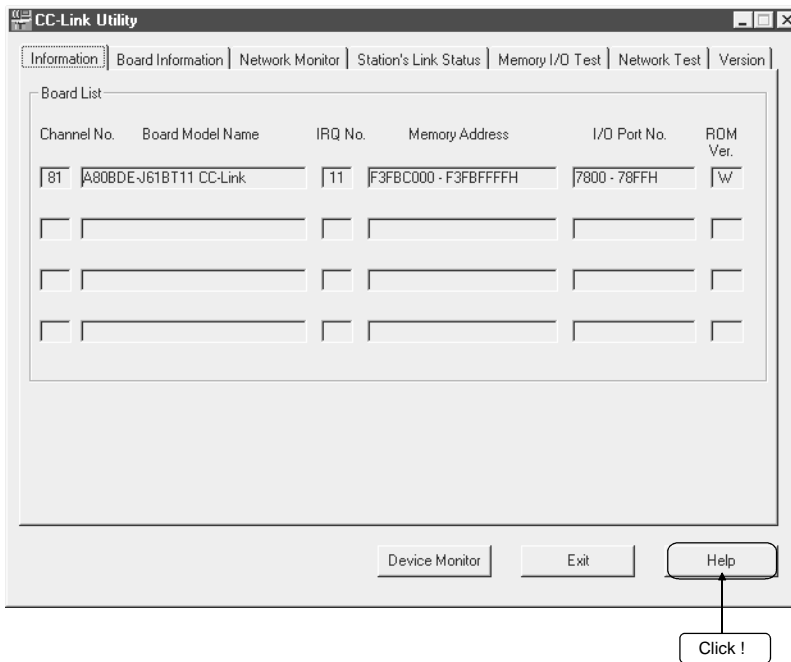
(2) To display the Help window for the Device Monitor Utility and Error Viewer, click [Help] - [Help] on the menu bar.
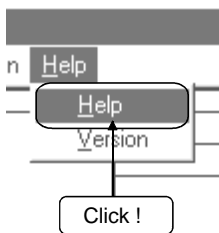
9.1.5 Verifying the version

The following explains how to verify the utility's version.

(1) To verify the utility's version, click the [Version] tab in the CC-Link Utility window.
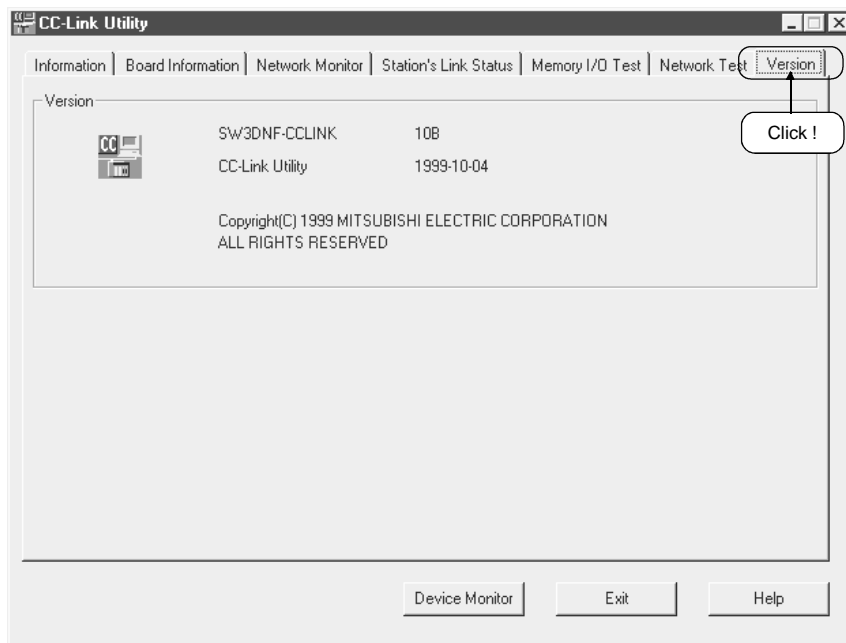
(2) To verify the version information for the Device Monitor Utility and Error Viewer, click [Help] - [Version] on the menu bar.
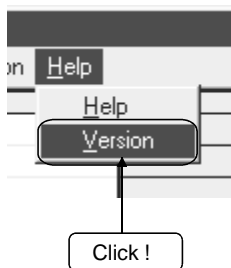
9.2 Operating the CC-Link Utility

This section explains how to operate the CC-Link Utility.

9.2.1 Operating procedure

The following shows the operating procedure of the CC-Link Utility.

```
                      ┌──────────────┐
                      │    Start     │
                      └──────┬───────┘
                             │
┌────────────────────────────────────────────┐
│ Connect an IBM PC/AT compatible PC to CC-Link. │•••••••••••••• See Section 8.1.
└────────────────────────────────────────────┘
                             │
┌──────────────────────────────────────────────────┐
│ Perform setup using the CC-Link Utility.          │
│   ┌──────────────────────────────────────────┐    │
│   │ Perform setup in the Board Information window. │•••••••••••••• See Section 9.2.3.
│   └──────────────────────────────────────────┘    │
│                    │                              │
│   ┌──────────────────────────────────────────┐    │
│   │ Check the line status of the own station │    │
│   │ in the Network Monitor window.            │•••••••••••••• See Section 9.2.4.
│   └──────────────────────────────────────────┘    │
│                    │                              │
│   ┌──────────────────────────────────────────┐    │
│   │ To check the list of boards, open the     │    │
│   │ Information window.                        │•••••••••••••• See Section 9.2.2.
│   └──────────────────────────────────────────┘    │
│                    │                              │
│   ┌──────────────────────────────────────────┐    │
│   │ To check the line status of other stations, │  │
│   │ open the Station's Line Status window.    │•••••••••••••• See Section 9.2.5.
│   └──────────────────────────────────────────┘    │
│                    │                              │
│   ┌──────────────────────────────────────────┐    │
│   │ To perform a memory I/O test and board    │    │
│   │ reset, open the Memory I/O Test window.   │•••••••••••••• See Section 9.2.6.
│   └──────────────────────────────────────────┘    │
│                    │                              │
│   ┌──────────────────────────────────────────┐    │
│   │ To perform a network test, open the       │    │
│   │ Network Test window.                       │•••••••••••••• See Section 9.2.7.
│   └──────────────────────────────────────────┘    │
└──────────────────────────────────────────────────┘
                             │
                      ┌──────────────┐
                      │     End      │
                      └──────────────┘
```

9.2.2 Operating the information window

The Information window displays the hardware information that is set up for the I/F board.
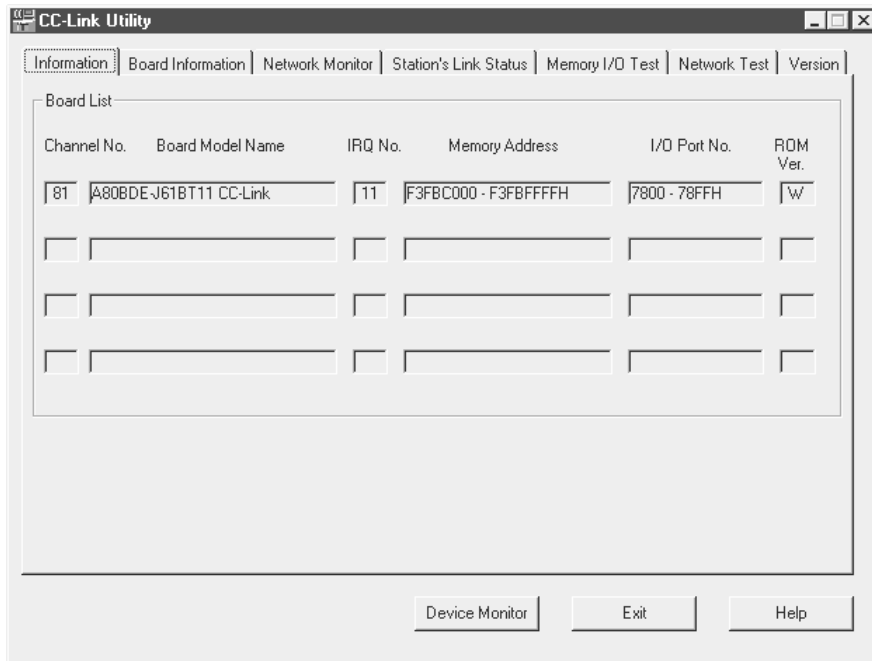
Item	Description
Channel No.	Displays the channel number.
Board Model Name	Displays the model of the I/F board that is connected.
IRQ No.	Displays the IRQ number used by the I/F board.
Memory Address	Displays the range of dual-port memory occupied by the I/F board.
I/O Port No.	Displays the range of I/O ports occupied by the I/F board.
ROM Ver.	Displays the ROM version of the I/F board.

9.2.3 Operating the board information window

The Board Information window is used to set up and display various information on the installed I/F board.

Important
Do not use station number 64 for a system in which a standby master station exists. If it is used, the station with station number 64 cannot communicate normally.

POINT
When switching windows, set the mode setting to "Online" or "Offline."

(1)   Board Information window

Item	Description		
Channel	Sets the channel to be used.		
Board Setting	Displays the information on the board (own station).		
		Item	Setting
		Channel	0: Master station
			1 to 64: Local station, standby master station
		Local station/standby master station setting	A standby master station can be selected only when the OS is Windows NT 4.0.
		Occupy St.	1 station/4 stations
		Link Err X Data	Latch/Clear
		Baud Rate	156 k/625 k/2.5 M/5 M/10 Mbps

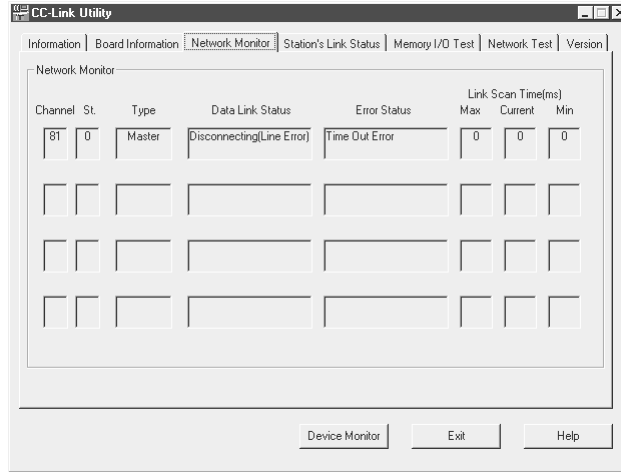| Item	Description
LED	Displays the current operation status of the I/F board. <table><tr><td>LED name</td><td>When LED is lit</td></tr><tr><td>RUN</td><td>CC-Link system normal</td></tr><tr><td>ERR.</td><td>Communication error</td></tr><tr><td>MST</td><td>Master station</td></tr><tr><td>LOCAL</td><td>Local station</td></tr><tr><td>CPU R/W</td><td>Communicating</td></tr><tr><td>SW</td><td>Switch setting error</td></tr><tr><td>M/S</td><td>Duplicate master station error</td></tr><tr><td>PRM</td><td>Parameter error</td></tr><tr><td>TIME</td><td>Time-out</td></tr><tr><td>LINE</td><td>Cable disconnection error</td></tr><tr><td>L RUN</td><td>Executing data link</td></tr><tr><td>L ERR.</td><td>Communication error</td></tr><tr><td>156 k</td><td rowspan="5">The LED for the set baud rate lights up</td></tr><tr><td>625 k</td></tr><tr><td>2.5 M</td></tr><tr><td>5 M</td></tr><tr><td>10 M</td></tr><tr><td>TEST</td><td>Executing off-line test</td></tr><tr><td>SD</td><td>Sending data</td></tr><tr><td>RD</td><td>Receiving data</td></tr></table>
Mode setting	Performs mode setting for the I/F board, and displays the present mode status. <table><tr><td>Mode</td><td>Description</td></tr><tr><td>Online (auto return enabled)</td><td>Used for normal communication.</td></tr><tr><td>Off line</td><td>Enters the state in which there is no connection to the network.</td></tr><tr><td>Hardware test</td><td>Performs the hardware test on the A80BDE-J61BT11. [Procedure] Connect a terminal resistor between the DA and DB terminals. Set the mode to "Hardware test" and press the [Apply] button.</td></tr></table>
[Apply] button	The contents of the setting corresponding to the I/F board selected with Channel are updated.
[Parameter Setting] button	Performs parameter settings. (Selectable only when setting the master station.) For more information, see (2) "Parameter Setting window" on the next page.
[Parameter Write] button	Transfer the parameters that have been set. (Selectable only when setting the master station.)

(2) Parameter setting window

Item		Description
Number of Connected modules		Sets the number of modules to be connected to the CC-Link system.
Auxiliary Setting		By clicking this button, the following dialogue box is displayed:
No.		Displays the numbers of modules set with the Number of Connected modules.
St.		Displays the station number of each module.
Occupy Station		Sets the number of occupied stations (one to four stations).
Type		Sets the type of station (Remote I/O, Remote Device, Intelligent Device).
Station Specify		Sets the status of each module. | Item	Description | |---|---| | Reserve | Sets as a reserve station. | | Invalid | Sets as an invalid station. | | No setting | No setting is performed. |
Intelligent Buffer Specify (Word)	Sending	Designates the send area (word units).
	Received	Designates the receive area (word units).
	Automatic	Designates the automatic update area (word units).
Ten Key Pad		If this option is checked, the ten-key pad can be used.
[OK] button		Updates and then exits the parameter settings.
[Cancel] button		Exits the parameter setting without updating.
[Apply] button		Updates the parameter settings.
[All Clear] button		Clears the parameter settings and returns the settings to the initial values.

9.2.4 Network monitor window operation

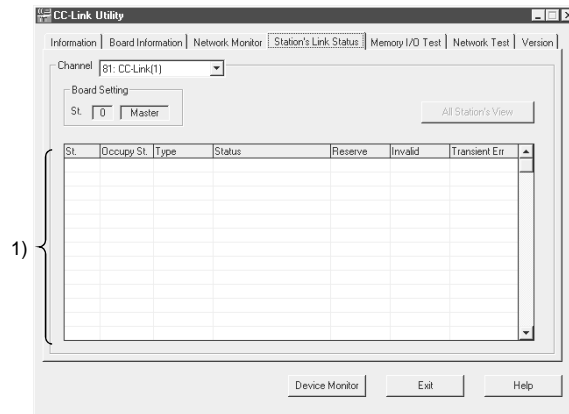The Network Monitor window is used to monitor the line status of the own station.

Item		Description
Channel		Displays the channel number.
St.		Displays the own station's station number.
Data Link Status		Monitors and displays the startup status of the data link. <table><tr><td>Status</td><td>Description</td></tr><tr><td>Initial status</td><td>Data link is in the initial status.</td></tr><tr><td>Waiting to receive parameters</td><td>Parameters have not been received yet.</td></tr><tr><td>Data linking</td><td>Executing data link.</td></tr><tr><td>Data link stopped</td><td>Data link has stopped.</td></tr><tr><td>Disconnecting (No Polling)</td><td>There is no inquiry from the master station and the link is being disconnected.</td></tr><tr><td>Disconnecting (Line Error)</td><td>Disconnecting the link due to a line error.</td></tr><tr><td>Disconnecting (Other)</td><td>Disconnecting the link due to other reasons.</td></tr><tr><td>Line test being performed</td><td>Performing a line test.</td></tr><tr><td>Parameter setting test being performed</td><td>Performing a parameter setting test from the master station.</td></tr><tr><td>Auto return being performed</td><td>Performing an auto return of a disconnected station.</td></tr><tr><td>Resetting</td><td>Resetting the board.</td></tr></table>
Error Status		Monitors and displays the error status. <table><tr><td>Display</td><td>Description</td></tr><tr><td>Normal</td><td>Normal status</td></tr><tr><td>Communication Path Error</td><td>An error was detected in a communication path.</td></tr><tr><td>Parameter Error</td><td>An error was detected in a parameter.</td></tr><tr><td>CRC Error</td><td>A CRC error was detected.</td></tr><tr><td>Time Out Error</td><td>A timeout error was detected.</td></tr><tr><td>Abort Error</td><td>An error was detected in the I/F board (gate array).</td></tr><tr><td>Setting Error</td><td>A setting error was detected.</td></tr><tr><td>Other Error</td><td>An error arising from some other cause was detected.</td></tr></table>
Link Scan Time [ms]	Max	The maximum value of the link scan time is displayed (1 ms units).
	Current	The current value of the link scan time is displayed (1 ms units).
	Min	The minimum value of the link scan time is displayed (1 ms units).
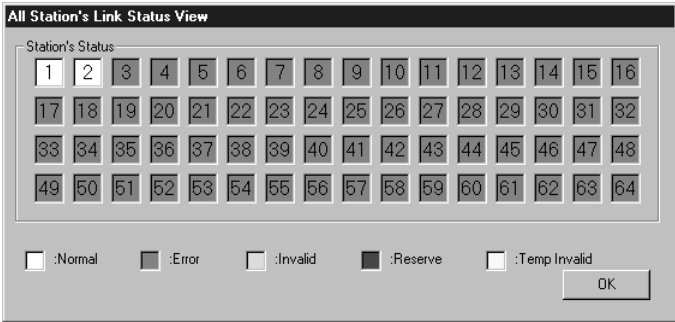
9.2.5 Operating the station's line status window

The Station's Line Status window displays the line status of other stations.

```
┌─────────────────────────────────────────────────────────────────┐
│   POINT                                                           │
│ The Station's Line Status is monitored only when the own station  │
│ status is "Data Linking."                                         │
└─────────────────────────────────────────────────────────────────┘
```


Item		Description
Channel		Sets the channel to be used.
Board Setting		Displays the own station's information.
1) (Status of Other Stations)	St.	Displays the station number that has been set.
	Occupy St.	Displays the number of stations occupied.
	Type	Displays the type of the station that is set. | Display	Description | |---|---|
Remote Device	Remote device station
Remote I/O	Remote I/O station
Intelligent Device	Intelligent station, local station	
	Status	Displays the status of other stations. | Display	Description | |---|---|
Communicating Normally	Normal
Communication Interrupted	Communication is stopped.
Link Error	A link error has occurred.
WDT Error	A watchdog timer error has occurred.
Fusing Error	There is a station in which a fuse has blown.
Duplicate Station No. Error	Duplicate station number exists.
Switch Changed	A switch has been changed.	
	Invalid	An error invalid station is set. | Display	Description | |---|---|
Invalid	An error invalid station is set.
(No display)	No setting	
	Transient Err	Displays the status of any transient errors. | Display	Contents | |---|---|
Transient Err	There is a transient error.
(No display)	No transient error	

Item	Description
All Station's Link Status View	A list of the communication status of other stations is displayed. When a reserved station has been set in a data link parameter that is set at the master station, that reserved station is displayed as a normal communication station in the following list of communication status of other stations. **All Station's Link Status View** Station's Status 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 □ :Normal □ :Error □ :Invalid ■ :Reserve □ :Temp Invalid OK

9.2.6 Operating the memory I/O test window

The Memory I/O Test window diagnoses the dual-port memory and I/O port used by the I/F board.

> **POINT**
> (1) Before starting a diagnostic operation, be sure to disconnect the external cable.
> (2) To switch windows during a diagnostic operation, click the [Stop] button to stop the diagnosis and then switch windows.
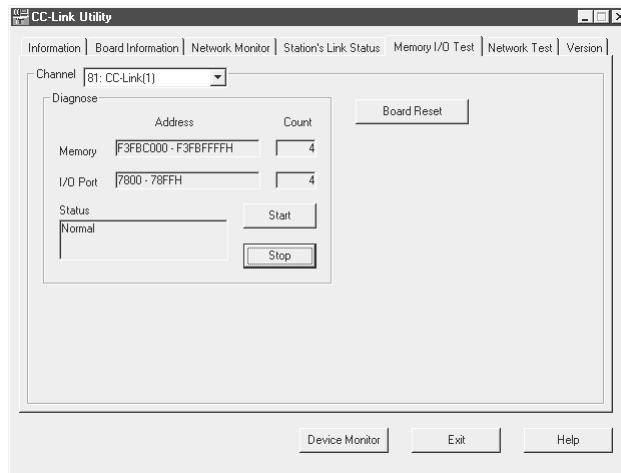
Item	Description
Channel	Sets the channel to be used.
Diagnose	Displays the address being diagnosed, the number of the diagnoses, and the status.
[Start] button	Starts the memory and I/O test.
[Stop] button	Ends the memory and I/O test.
[Board Reset] button	Resets the I/F board.
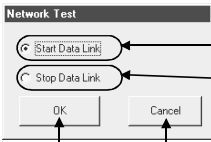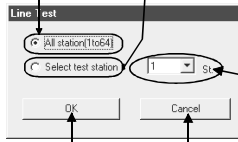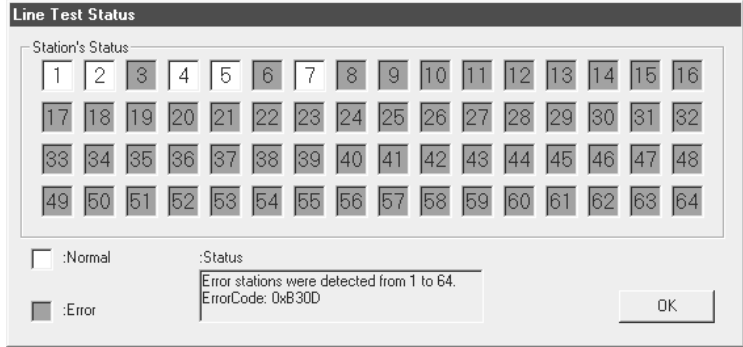
9.2.7 Operating the network test window

The Network Test window is used to test the installed I/F board.

> **POINT**
>
> When an error occurs in the Line Test, see the following items to check the error description and action to take.
> • Section 16.2.1, "Errors that may occur when executing functions"
> • Section 16.3.5, "Error codes stored in the special link registers"

Item	Description		
Channel	Sets the channel to be used.		
Board Setting	Displays the own station's information.		
Test Mode	Selects the test to be performed.		
		Item	Setting
		Network Test	Performs a data link start and stop test.
		Line Test	Checks whether the connected station is normal or abnormal.

Item	Description
[Select] button	When the [Select] button is clicked, the following dialogue box is displayed: <Network Test> Select this to start data link. Select this to stop data link. Click [Cancel] to close the dialog box without performing the test. Click [OK] to start the test. Test result <Line Test> Select this to perform the line test for all stations (stations 1 to 64). Select this to perform the line test by designating a station number. Designate the number of the station (stations 1 to 64) to be tested (only when a station is designated). Click [Cancel] to close the dialog box without performing the test. Click [OK] to start the test. CC-Link Utility Error stations were detected by line test. ErrorCode: 0xB30D OK Test result (of designated station) Test result (for all stations) Line Test Status Station's Status 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 ☐ :Normal :Status ☐ :Error Error stations were detected from 1 to 64. ErrorCode: 0xB30D OK

9.3 Device Monitor Utility

This section explains how to set up and operate the Device Monitor Utility.

> **POINT**
>
> In the Device Monitor Utility, the SB (link special relay) and SW (link special register) are displayed as the SM and SD, respectively.

9.3.1 Operating procedure

The following explains the operating procedure of the Device Monitor Utility.

Start

Select [Setting] - [Network Setting] from the menus and set the channel to be used. ············· See Section 9.3.4

Set the device to be monitored. ············· See Section 9.3.5.

Change the monitoring method, device value or data format as needed. ············· See Sections 9.3.2, 9.3.3, and 9.3.6 through 9.3.11.

End
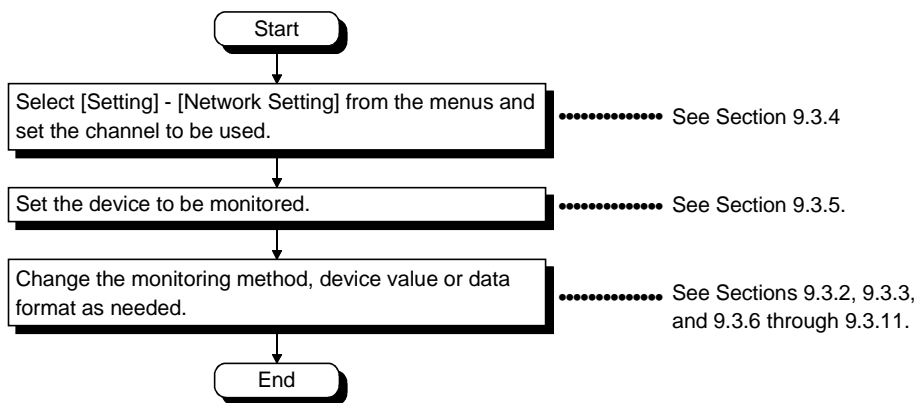
9.3.2 Setting the batch monitoring

Set the Device Monitor Utility so that it monitors only a single designated device.

(1)   Menu selection
Select [Menu] - [Batch Monitoring] on the menu bar.
(Selectable for 16-point entry monitor only.)

(2)   Display window

Item	Description
1) Device Information	Displays the current device status. To change the data format, see Section 9.3.9.
2) Network Status	Displays the status of the network that is currently set. To set up the network, see Section 9.3.4.
3) Data Format	Shows the data format and the type of the device being displayed (word device and bit device). To change the device type, see Section 9.3.5. To change the data format, see section 9.3.9.

9.3.3 Setting the 16-point entry monitor

Set the Device Monitor Utility so that it monitors up to five bit devices and one word device simultaneously.

(1) Menu selection
Select [Menu] - [16- Point Entry Monitor] on the menu bar.
(Selectable for batch monitoring only.)

(2) Display window

Item	Description
1) Device Information	Displays the current device status. To change the data format, see Section 9.3.9.
2) Network Status	Displays the status of the network that is currently set. To set up the network, see Section 9.3.4.
3) Data Format	Shows the data format and the type of the device being displayed (word device and bit device). To change the device type, see Section 9.3.5. To change the data format, see section 9.3.9.

9.3.4 Setting the monitoring destination

This section describes how to set up the network to be used when performing device monitoring.
The destination should be specified when starting the Device Monitor Utility.

(1)   Menu selection
Select [Setting] - [Network Setting] on the menu bar.

(2)   Dialog box
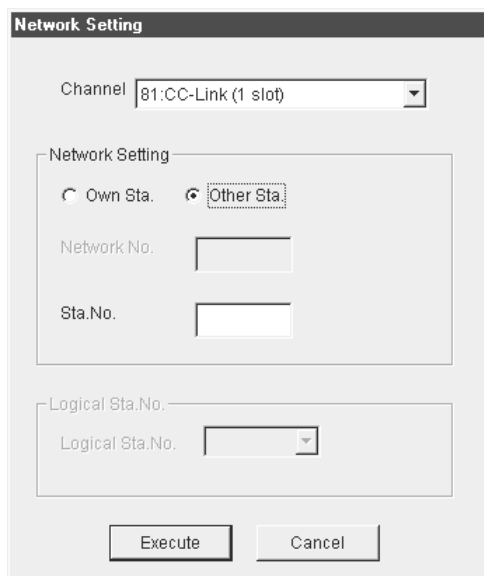
Item	Description
Channel	Set the channel to be used.
Network Setting	Set the own and other stations as well as the network number and station number.
Logical Sta. No.	Set the logical station number.

POINT

Do not designate a remote I/O station or an intelligent device station connected to the CC-Link as the monitor destination. If designated, an error will occur.

9.3.5 Setting the device to be monitored

This section describes how to set up the device to be monitored.

(1)   Menu selection
Select [Setting] - [Device setting] on the menu bar.

(2)   Dialog box

For batch monitoring   For 16-point entry monitoring

Item	Description
Device Type	Set the type and block/network number of the device to be monitored. To monitor the own station device of the I/F board, set as shown below: <table><tr><td>Own station device to be monitored</td><td>Device type to be designated</td></tr><tr><td>RX</td><td>X</td></tr><tr><td>RY</td><td>Y</td></tr><tr><td>SB</td><td>SM</td></tr><tr><td>SW</td><td>SD</td></tr><tr><td>RWw</td><td>Ww</td></tr><tr><td>RWr</td><td>Wr</td></tr><tr><td>Random access buffer</td><td>MRB</td></tr><tr><td>Buffer memory</td><td>SPB</td></tr></table>
Device No.	Set the head number of the device to be monitored. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Register Device List	Displays a list of registered devices.
[Setting] button	Registers the items set for Device Type and Device No., and then adds them to the Register Device List.
[Change] button	Selects the device to be changed. Click this button to change the registered data.
[Delete] button	Selects the device to be deleted. Click this button to delete the device from the Registered Device List.

POINT

The only devices that can be monitored by the 16-point entry monitoring are those that can be randomly accessed. If any device that does not allow random access is designated, a device type error (-3) will occur. For whether or not each device allows random access, see Chapter 10, "Accessible Devices and Ranges.

9.3.6 Changing word device values

The designated word device data can be changed as follows:

(1) Menu selection
Select [Device Write] - [Data Changing] on the menu bar.
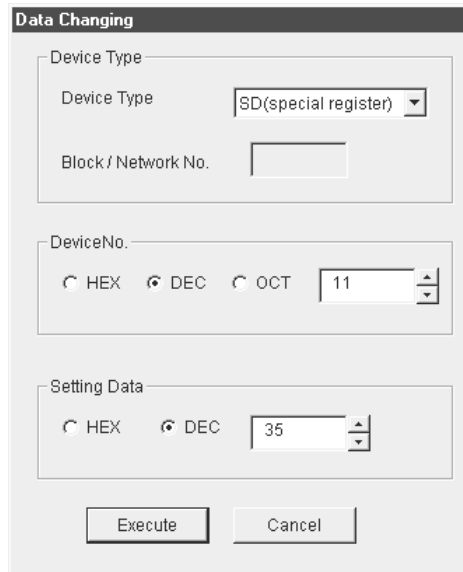
(2) Dialog box

Item	Description
Device Type	Sets the type and block/network number of the device for which data is to be changed.
Device No.	Sets the number of the device for which data is to be changed. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Setting Data	Sets the data to be changed. (HEX: Hexadecimal, DEC: Decimal)

⚠ DANGER	• Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the PLC during operation. Also, determine which corrective actions to take in the event of a data communication error between the IBM PC/AT compatible PC and PLC CPU in use.

9.3.7 Changing word device values continuously

The designated word device data can be changed to the designated data for the number of points set.

(1) Menu selection
Select [Device Write] - [Continuous Change in Data] on the menu bar.

(2) Dialog box
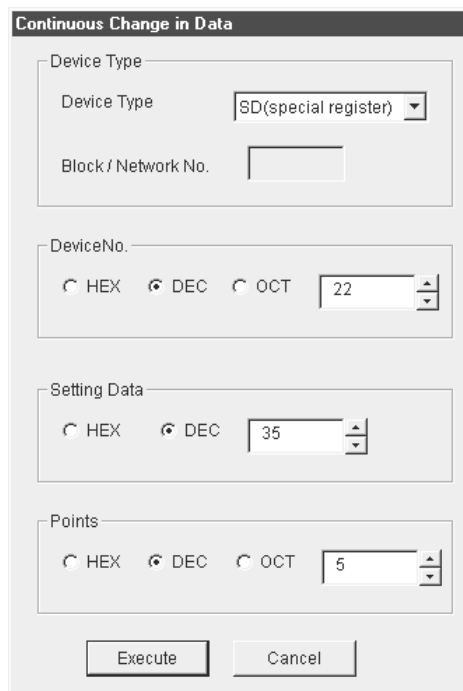
Item	Description
Device Type	Set the type and block/network number of the device for which data is to be changed.
Device No.	Set the head address of the device number to change data. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)
Setting Data	Set the data to be continuously changed. (HEX: Hexadecimal, DEC: Decimal)
Points	Set the number of points to perform continuos change of data. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

⚠ DANGER	• Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the PLC during operation. Also, determine which corrective actions to take in the event of a data communication error between the IBM PC/AT compatible PC and PLC CPU in use.

9.3.8 Switching a bit device on/off

The designated bit device can be switched on/off as follows:

(1)   Menu selection
Select [Device Write] - [Bit Device Set (Reset)] on the menu bar.

(2)   Dialog box
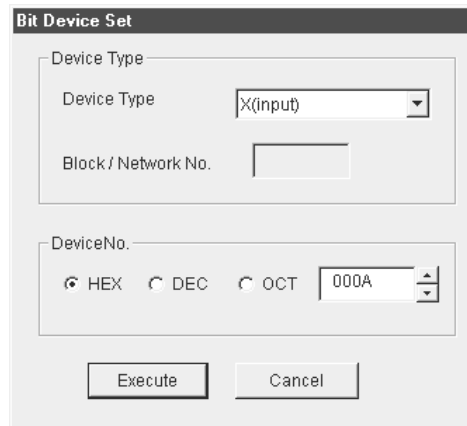
Item	Description
Device Type	Sets the type and block/network number of the bit device to be turned on/off.
Device No.	Sets the number of the bit device to be turned on/off. (HEX: Hexadecimal, DEC: Decimal, OCT: Octal)

⟨!⟩DANGER	• Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the PLC during operation. Also, determine which corrective actions to take in the event of a data communication error between the IBM PC/AT compatible PC and PLC CPU in use.

9.3.9 Switching the data format

The device monitoring display can be changed to the selected data format.
The batch monitoring and 16-point entry monitoring have different sets of selectable menus.

(1)   Menu selection
Select [Data Format] - [Word (Bit) Device] on the menu bar.

9.3.10 Numerical pad

The Numerical Pad can be used to set device values and other numeric values. To display the Numerical Pad, select [Options] - [Numerical Pad] on the menu bar.

1. Click the numeric value input field.
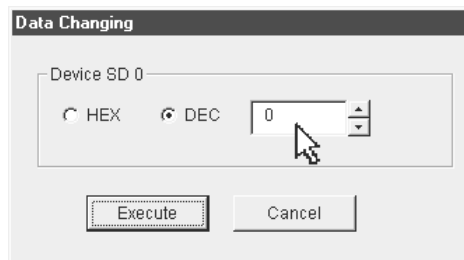
2. The Numerical Pad is displayed. Enter a desired value by pressing the corresponding buttons, and then click the [OK] button.
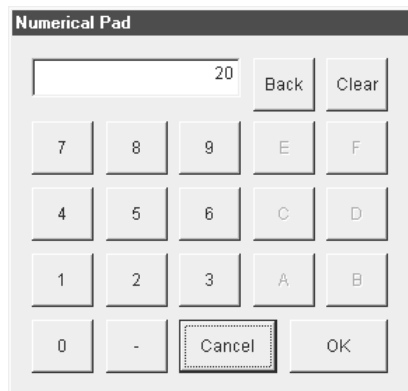
3. The value is entered in the system.

9.3.11 Other operations

By double-clicking a device number on the Device Monitor Utility window, the word device data can be changed or the bit device can be switched between on and off.

(1) Word device
The following explains how to change the word device.
(Note that this operation is enabled only when the data format is [DEC (16bit)].)

1. Double-click the number of the word device to be changed.

SD 20	0	SD 36
SD 21	0	SD 37
SD 22	0	SD 38
SD 23	0	SD 39
SD 24	0	SD 40
SD 25	0	SD 41
SD 26	0	SD 42

2. When the following Data Changing dialog box appears, set a desired value, and then click the [Execute] button.

Data Changing

Device SD 23

  ○ HEX   ⦿ DEC   [123] ▲▼

  [Execute]   [Cancel]
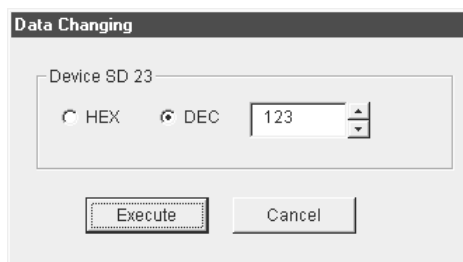
3. Select [Yes] in the dialog box shown below to change the word device.
Select [No] to cancel the change operation.
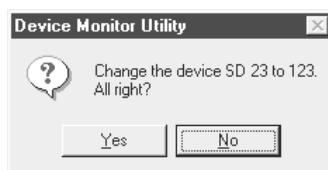
Device Monitor Utility ☒

(?) Change the device SD 23 to 123.
All right?

  [Yes]   [No]

⚠ DANGER • Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the PLC during operation. Also, determine which corrective actions to take in the event of a data communication error between the IBM PC/AT compatible PC and PLC CPU in use.

(2) Bit device
The following explains how to switch the bit device on/off.
Note that this operation is enabled only when the data format is [Vertical Indication].

1. Double-click the number of the bit device to be changed.

X 0014	0	X 0024
X 0015	0	X 0025
X 0016	0	X 0026
X 0017	0	X 0027
X 0018	0	X 0028
X 0019	0	X 0029
X 001A	0	X 002A

2. Select [Yes] in the dialog box shown below to change the bit device status.
Select [No] to cancel the change operation.
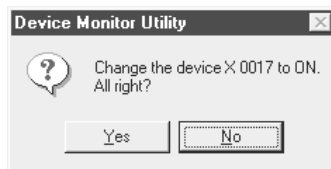
```
Device Monitor Utility          [X]

   (?)   Change the device X 0017 to ON.
         All right?

        [ Yes ]      [  No  ]
```

⟨!⟩DANGER	• Configure an interlock circuit in a sequence program so that the entire system works safely at all times when controlling the data change to the PLC during operation. Also, determine which corrective actions to take in the event of a data communication error between the IBM PC/AT compatible PC and PLC CPU in use.

9.4 Operating Error Viewer

This section explains how to set up and operate Error Viewer.

9.4.1 Window description

The following explains the Error Viewer window.
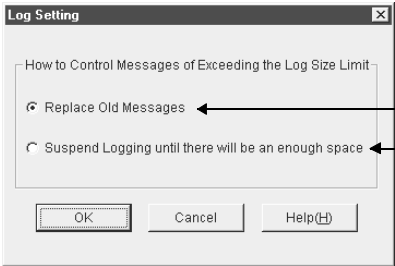
Item	Description
Type	Different error types are indicated by the symbols shown below. **(i)** : Normal messages (Indicates messages generated in normal processing.) **(!)** : Warning messages (Indicates messages generated to get the user's attention, although they do not represent any errors.) **(X)** : Error messages (Indicates the descriptions of errors generated in each module. Double-click the line showing this symbol to see a detailed message, and then promptly correct the cause of the error.)
Date and Time	Displays the date and time of error.
Time	Displays the time of error.
Source	Displays the source of error.
Error No.	Displays the error number.
Message Contents	Displays the details of error.

9.4.2 Log menu

This section explains the menu items of the Log menu.
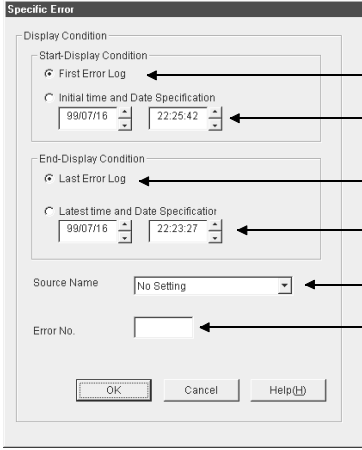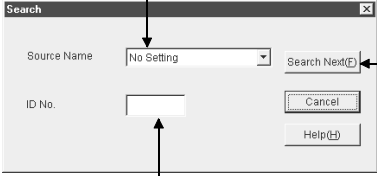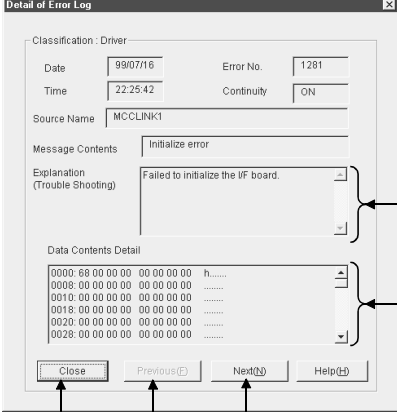
Item	Description
Error registration source type selections	Select the error registration source type to be displayed in Error Viewer. • Driver : Displays messages generated by drivers such as the common memory device. • Basic Middle Ware : Displays messages generated by the common memory data server and tag control process. • Applied Middle Ware : Displays messages generated by XMOP and OLEX. • Others : Displays messages generated by application packages.
Open the Selected File...	Opens the error log file (∗.ELF).
Save with a Name...	Saves the error log information of the error registration source (driver, etc.) that is currently being selected in the designated file.
Delete	Deletes the error log information of the error registration source (driver, etc.) that is currently being displayed. Perform operation by follow the directions displayed in the dialog box.
Log Setting	Select a processing method to be used when the number of error logs exceeds the maximum registration entries. Overwrites information, starting with the oldest message. No new registration entries will be made until enough space becomes available by deleting existing data.
Exit	Exits Error Viewer.

9.4.3 View menu

This section explains the menu items of the View menu.

Item	Description
All Errors	Displays all errors for each type of error registration source.
Specific Error	Sets the errors to be displayed on the screen according to the conditions specified in the Specific Error dialog box shown below. Displays errors from the first error log. Displays errors from the designated date. Displays errors until the last error log. Displays errors until the designated date. Displays errors having only the designated source name. Displays errors having only the designated error number.
Search	Searches the error information having the source name and error code from the error log data that is currently being displayed, using the Search dialog box shown below. (Pressing the F3 key will do the same search operation.) Specifies the name of the source to be searched. Searches the next error information. Inputs the error code to be searched.

Item	Description
Detail	Displays the detailed information on the error log that is currently being selected. (Pressing [Enter] after selecting a display item will do the same display operation.) Displays the details of the error. Details may not be displayed for some sources. Displays details when the contents of a driver or buffer memory are referenced. Details may not be displayed for some sources. Displays the details of the next error log information. Displays the details of the previous error log information. Closes this dialog box.
Renew	Updates the information currently being displayed.

MEMO

10 ACCESSIBLE DEVICES AND RANGES

This chapter explains the devices and ranges that can be accessed during CC-Link communication.

POINT

The term "Batch" in the following tables indicates Batch Read or Batch Write; the term "Random" indicates Random Read, Random Write, Bit Set, or Bit Reset.

10.1 Accessible Devices

The following lists the devices that can be accessed during CC-Link communication.

10.1.1 Own station (IBM PC/AT compatible PC)

Device		Accessibility
X (RX)	Batch	○
	Random	
Y (RY)	Batch	○
	Random	
SB	Batch	○
	Random	
SW	Batch	○
	Random	
Ww (RWw)	Batch	○
	Random	
Wr (RWr)	Batch	○
	Random	
SPB (Own station buffer memory)	Batch	○
	Random	
MRB (Own station random access buffer)	Batch	○
	Random	

10.1.2 Other station

Device		A1N	A0J2H A1S(-S1) A1SH A1SJ(-S3) A1SJH(-S8) A2C A2CJ(-S) A2N(-S1) A2S(-S1) A2SH(-S1)	A2A(-S1) A2U(-S1) A2AS (-S1/-S30) A2USH-S1 Q02(H)-A Q06H-A	A3N A3A A3U	A4U	Q2A(-S1) Q3A Q4A Q4AR Q2AS(-S1) Q2ASH(-S1) Q02(H) Q06H Q12H Q25H	IBM PC/AT compatible PC
X	Batch	○	○	○	○	○	○	×
	Random							
Y	Batch	○	○	○	○	○	○	×
	Random							
L	Batch	○	○	○	○	○	○	×
	Random							
M	Batch	○	○	○	○	○	○	×
	Random							
Special M (SM), SB	Batch	○	○	○	○	○	○	×
	Random							
F	Batch	○	○	○	○	○	○	×
	Random							
T (contact)	Batch	○	○	○	○	○	○	×
	Random						×	
T (coil)	Batch	○	○	○	○	○	○	×
	Random						×	
C (contact)	Batch	○	○	○	○	○	○	×
	Random						×	
C (coil)	Batch	○	○	○	○	○	○	×
	Random						×	
T (current value)	Batch	○	○	○	○	○	○	×
	Random							
C (current value)	Batch	○	○	○	○	○	○	×
	Random							
D	Batch	○	○	○	○	○	○	×
	Random							
Special D (SD), SW	Batch	○	○	○	○	○	○	×
	Random							
T (setting value main)	Batch	○	○	○	○	○	×	×
	Random	×	×	×	×	×		
T (setting value sub 1)	Batch	×	×	○ [1]	○	○	×	×
	Random			×	×	×		
T (setting value sub 2)	Batch	×	×	×	×	○	×	×
	Random					×		
T (setting value sub 3)	Batch	×	×	×	×	○	×	×
	Random					×		

∗1: A2A(-S1) cannot be accessed.

Device		A1N	A0J2H A1S(-S1) A1SH A1SJ(-S3) A1SJH(-S8) A2C A2CJ(-S) A2N(-S1) A2S(-S1) A2SH(-S1)	A2A(-S1) A2U(-S1) A2AS (-S1/-S30) A2USH-S1 Q02(H)-A Q06H-A	A3N A3A A3U	A4U	Q2A(-S1) Q3A Q4A Q4AR Q2AS(-S1) Q2ASH(-S1) Q02(H) Q06H Q12H Q25H	IBM PC/AT compatible PC
					Access destination			
C (setting value main)	Batch	○	○	○	○	○	×	×
	Random	×	×	×	×	×		
C (setting value sub 1)	Batch	×	×	○ *1	○	○	×	×
	Random			×	×	×		
C (setting value sub 2)	Batch	×	×	×	×	○	×	×
	Random					×		
C (setting value sub 3)	Batch	×	×	×	×	○	×	×
	Random					×		
A	Batch	○	○	○	○	○	×	×
	Random							
Z	Batch	○	○	○	○	○	○	×
	Random							
V (index register)	Batch	○	○	○	○	○	×	×
	Random							
R (file register)	Batch	×	○	○	○	○	○	×
	Random							
ER (extended file resister)	Batch	×	○	○	○	○	○	×
	Random							
B	Batch	○	○	○	○	○	○	×
	Random							
W	Batch	○	○	○	○	○	○	×
	Random							
Q/QnA link special relay (on Q/QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
Retentive timer (contact)	Batch	×	×	×	×	×	○	×
	Random						×	
Retentive timer (coil)	Batch	×	×	×	×	×	○	×
	Random						×	
Q/QnA link special register (on Q/QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
Q/QnA edge relay (on Q/QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
Own station random access buffer	Batch	×	×	×	×	×	×	×
	Random							
Retentive timer (current value)	Batch	×	×	×	×	×	○	×
	Random							
Own station link register (for sending)	Batch	×	×	×	×	×	×	×
	Random							
Own station link register (for receiving)	Batch	×	×	×	×	×	×	×
	Random							
S device of FXCPU	Batch	×	×	×	×	×	×	×
	Random							

*1: A2A(-S1) cannot be accessed.

Device		A1N	A0J2H A1S(-S1) A1SH A1SJ(-S3) A1SJH(-S8) A2C A2CJ(-S) A2N(-S1) A2S(-S1) A2SH(-S1)	A2A(-S1) A2U(-S1) A2AS (-S1/-S30) A2USH-S1 Q02(H)-A Q06H-A	A3N A3A A3U	A4U	Q2A(-S1) Q3A Q4A Q4AR Q2AS(-S1) Q2ASH(-S1) Q02(H) Q06H Q12H Q25H	IBM PC/AT compatible PC
				Access destination				
Own station buffer memory	Batch	×	×	×	×	×	×	×
	Random							
Q/QnA SEND function (with arrival acknowledgment)	Batch	×	×	×	×	×	×	×
	Random							
Q/QnA SEND function (without arrival acknowledgment)	Batch	×	×	×	×	×	×	×
	Random							
Direct link input	Batch	×	×	×	×	×	○	×
	Random						×	
Direct link output	Batch	×	×	×	×	×	○	×
	Random						×	
Direct link relay	Batch	×	×	×	×	×	○	×
	Random						×	
Direct link register	Batch	×	×	×	×	×	○	×
	Random						×	
Direct link special relay (network module side)	Batch	×	×	×	×	×	○	×
	Random						×	
Direct link special register (network module side)	Batch	×	×	×	×	×	○	×
	Random						×	
Special direct buffer register	Batch	×	×	×	×	×	○	×
	Random						×	
Other station buffer memory *1	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station random access buffer	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station RX *1	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station RY *1	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station link register	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station SB *1	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×
Other station SW *1	Batch	○	○	○	○	○	○	○
	Random	×	×	×	×	×	×	×

*1: Access to the CC-Link (intelligent device station) module's buffer memory installed in each CPU.

10.2 Accessible Ranges

The accessible ranges during CC-Link communication include only the master station in which the I/F board is installed, the local station PLC, the intelligent device station, and the IBM PC/AT compatible PC in which the I/F board is installed.

11

11 MELSEC DATA-LINK LIBRARY

This chapter explains an overview of the functions included in the MELSEC Data-Link Library.

REMARK

Note that the screens shown in this manual are Window 95 screens. Therefore, they may be slightly different from the screens for Windows NT Workstation 4.0 and Windows 98.

11.1 Overview of the MELSEC Data-Link Library

The functions provided by the MELSEC Data-Link Library are used when creating a user program that communicates with a PLC CPU. With these functions, the user can perform communications without worrying about the hardware type of the destination device or the communication protocol.

The user can easily communicate with a designated PLC without worrying about the communication protocol.

IBM PC/AT compatible PC

MELSEC Data-Link Library

I/F board

CC-Link

CC-Link module
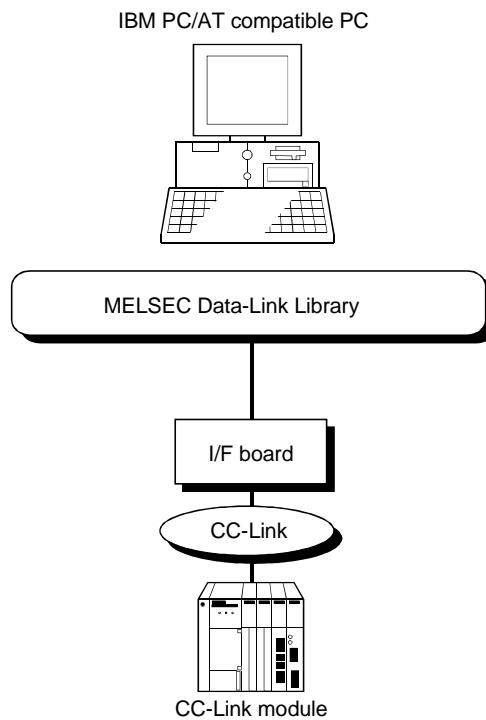
11.2 Function List

The following table lists the functions that are provided by the MELSEC Data-Link Library that comes with the utility software.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSend	Performs batch write of devices.
mdReceive	Performs batch read of devices.
mdRandW	Writes to devices randomly.
mdRandR	Reads from devices randomly.
mdDevSet	Sets a bit device.
mdDevRst	Resets a bit device.
mdTypeRead	Reads the PLC CPU type.
mdControl	Remote RUN/STOP/PAUSE
mdInit	Refreshes the PLC device address.
mdBdRst	Resets the own board.
mdBdModSet	Sets the mode of the own board.
mdBdModRead	Reads the mode of the own board.
mdBdLedRead	Reads the LED information of the own board.
mdBdSwRead	Reads the switch status of the own board.
mdBdVerRead	Reads the version information of the own board.

POINT

For details of the functions, see HELP for the MELSEC Communication Functions provided with the utility software.
HELP for the MELSEC Communication Functions can be found in the following directory (if the utility software is installed by designating the default installation directory).

```
C:\ ——— <MELSEC>
              └——— <DrvCommon>
                         └——— <Help> ——— Mdfunc.hlp
```

11.3 Settings for Using the Functions

This section explains the setting procedure for using the functions.

11.3.1 When using Visual Basic 5.0 or 6.0

The following shows the setup procedure when using Visual Basic 5.0 or 6.0:

1. Start Visual Basic 5.0 or 6.0 and select [Project] - [Add Standard Module] menus.

2. Select the [Existing Files] tab and select "MDFUNC.BAS."
   "MDFUNC.BAS" has been saved in the following directory during installation:
   <User-specified folder> - <COMMON> - <INCLUDE>

11.3.2 When using Visual C++ 5.0 or 6.0

The following shows the setup procedure when using Visual C++ 5.0 or 6.0:

(1) Setting up the include file

1. Start Visual C++ 5.0 or 6.0 and select the [Tool] - [Options] menus.

2. Select the [Directory] tab and set the directory type to "Include files."

3. Double-click the item to set and reference the include file.
   "MDFUNC.H" has been saved in the following directory during installation:
   <User-specified folder> - <COMMON> - <INCLUDE>

4. Add "#include<mdfunc.h>" at the beginning of your program.

(2) Setting up the library file

1. Start Visual C++ 5.0 or 6.0 and select the [Tool] - [Options] menus.

2. Select the [Directory] tab and set the directory type to "Library files" in the same manner as in (1) above.

3. Open the workspace to create and select [Project] - [Settings] menus.

4. Select the [Link] tab, set "General" as the category, and then type "mdfunc32.lib" in the object/library module field.

11.4 Programming Procedure

The following describes the programming procedure using the MELSEC Data-Link Library.
In this section, it is assumed that the utility software has already been installed.

1] Turn on the power of the IBM PC/AT compatible PC and start Windows.

Has the utility been set up? — Yes

No

2] Perform utility setup.
• See Chapter 9 for the setup procedure.

Change the settings? — Yes

No

3] Perform the setup required for the MELSEC Data-Link Library. ······ See Section 11.3.

4] Create a user application using the MELSEC Data-Link Library.

Open the communication port.
(mdOpen)

Access the PLC CPU and communication board using various functions.

End the program? — No

Yes

Close the port that was opened by the mdOpen function. (mdClose)

······ See HELP for the MELSEC Communication functions provided with the utility software.

(Continued on the next page)

(Continued from the previous page)

```
  5] Start the created user application.
```

```
  6] Access the PLC CPU and communication board.
```

```
  7] End the user application.
```

POINT
• Perform the processing for opening and closing a communication line (mdOpen / mdClose) only once at the beginning and end of a program. Repeatedly opening and closing a communication line for each transaction will degrade the communication performance.   • It is necessary to perform only steps 5] to 7] above to access the PLC CPU and communication board again using an application program that has already been created by the user.   • The functions get detailed PLC information at the initial execution when the corresponding devices are added. Therefore, the initial function execution time gets longer than usual.

11.5 Channels

The MELSEC Data-Link Library uses the following channels:

No.	Channel name	Description
81 to 84	CC-Link (1st to 4th boards)	These channels are used when communicating via the I/F board. They are set with the BD No. DIP switches on the back of the I/F board. The channels are set as follows according to the SW1 and SW2 settings: 81:Off, Off; 82: On, Off; 83: Off, On; 84: On, On

11.6 Station Number Settings

The following is a list of station numbers that are designated by the functions.

Communication	Station number designation
CC-Link	Own station: 255 (0xFF) Other station: 0 to 64 (0x40) *1

*1: Station number 64 cannot be designated in the CC-Link communication except for buffer memory access.

11.7 Device Types

A device type can be specified in the functions either by a code number or device name.

(1) Device types when the I/F board is used

The following table shows the CC-Link dedicated device types when the I/F board is used to access devices.

Device type			Device
Code designation		Device name designation	
Decimal	Hexadecimal		
1	1н	DevX	Own station RX
2	2н	DevY	Own station RY
5	5н	DevSM	Own station SB (link special B for CC-Link)
14	Eн	DevSD	Own station SW (link special W for CC-Link)
33	21н	DevMRB	Own station random access buffer
36	24н	DevWw	Own station link register (for sending)
37	25н	DevWr	Own station link register (for receiving)
50	32н	DevSPB	Own station buffer memory
32768	8000н	DevRBM	Other station buffer memory ＊1
32800	8020н	DevRAB	Other station random access buffer ＊1
32801	8021н	DevRX	Other station RX ＊1
32802	8022н	DevRY	Other station RY ＊1
32804	8024н	DevRW	Other station link register ＊1
32867	8063н	DevSB	Other station SB (link special B for CC-Link) ＊1
32868	8064н	DevSW	Other SW (link special W for CC-Link) ＊1

＊1: Cannot be used with the mdRandR, mdRandW, mdDevSet and mdDevRst functions.

(2) Common device types

The following table lists the device types common to all communication paths.

Device type			Device
Code designation		Device name designation	
Decimal	Hexadecimal		
1	1H	DevX	X
2	2H	DevY	Y
3	3H	DevL	L
4	4H	DevM	M
5	5H	DevSM	Special M (SM), SB (link special B for MNET/10 and CC-Link)
6	6H	DevF	F
7	7H	DevTT	T (contact)
8	8H	DevTC	T (coil)
9	9H	DevCT	C (contact)
10	AH	DevCC	C (coil)
11	BH	DevTN	T (current value)
12	CH	DevCN	C (current value)
13	DH	DevD	D
14	EH	DevSD	Special D (SD), SW (link special W for MNET/10 and CC-Link)
15	FH	DevTM	T (setting value main)
16	10H	DevTS	T (setting value sub 1)
16002	3E82H	DevTS2	T (setting value sub 2)
16003	3E83H	DevTS3	T (setting value sub 3)
17	11H	DevCM	C (setting value main)
18	12H	DevCS	C (setting value sub 1)
18002	4652H	DevCS2	C (setting value sub 2)
18003	4653H	DevCS3	C (setting value sub 3)
19	13H	DevA	A
20	14H	DevZ	Z
21	15H	DevV	V (index register)
22	16H	DevR	R (file register)
22001 to 22256	55F1H to 56F0H	DevER1 to DevER256	ER (extension file register)
23	17H	DevB	B
24	18H	DevW	W
25	19H	DevQSB	Q/QnA link special relay (on Q/QnACPU)
26	1AH	DevSTT	Retentive timer (contact)
27	1BH	DevSTC	Retentive timer (coil)
28	1CH	DevQSW	Q/QnA link special register (on Q/QnACPU)
30	1EH	DevQV	Q/QnA edge relay (on Q/QnACPU)

Device type			Device
Code designation		Device name designation	
Decimal	Hexadecimal		
35	23H	DevSTN	Retentive timer (current value)
40	28H	DevFS	S-device of FXCPU
101	65H	DevMAIL	Q/QnA SEND function (with arrival acknowledgment) and RECV function
102	66H	DevMAILNC	Q/QnA SEND function (without arrival acknowledgment)
1001 to 1255	3E9H to 4E7H	DevLX1 to DevLX255	Direct link input
2001 to 2255	7D1H to 8CFH	DevLY1 to DevLY255	Direct link output
23001 to 23255	59D9H to 5AD7H	DevLB1 to DevLB255	Direct link relay
24001 to 24255	5DC1H to 5EBFH	DevLW1 to DevLW255	Direct link register
25001 to 25255	61A9H to 62A7H	DevLSB1 to DevLSB255	Direct link special relay (network module side)
28001 to 28255	6D61H to 6E5FH	DevLSW1 to DevLSW255	Direct link special register (network module side)
29000 to 29255	7148H to 7247H	DevSPG0 to DevSPG255	Special direct buffer register
31000 to 31255	7918H to 7A17H	DevEM0 to DevEM255	EM (shared device)
32000 to 32255	7D00H to 7DFFH	DevED0 to DevED255	ED (shared device)

12 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS

This chapter explains the procedures ranging from module setup, parameter settings, programming to final operation check, using a system configuration example.

12.1 Configuring a System

In this example, a system consisting of a master station and two remote I/O stations as shown below is used.
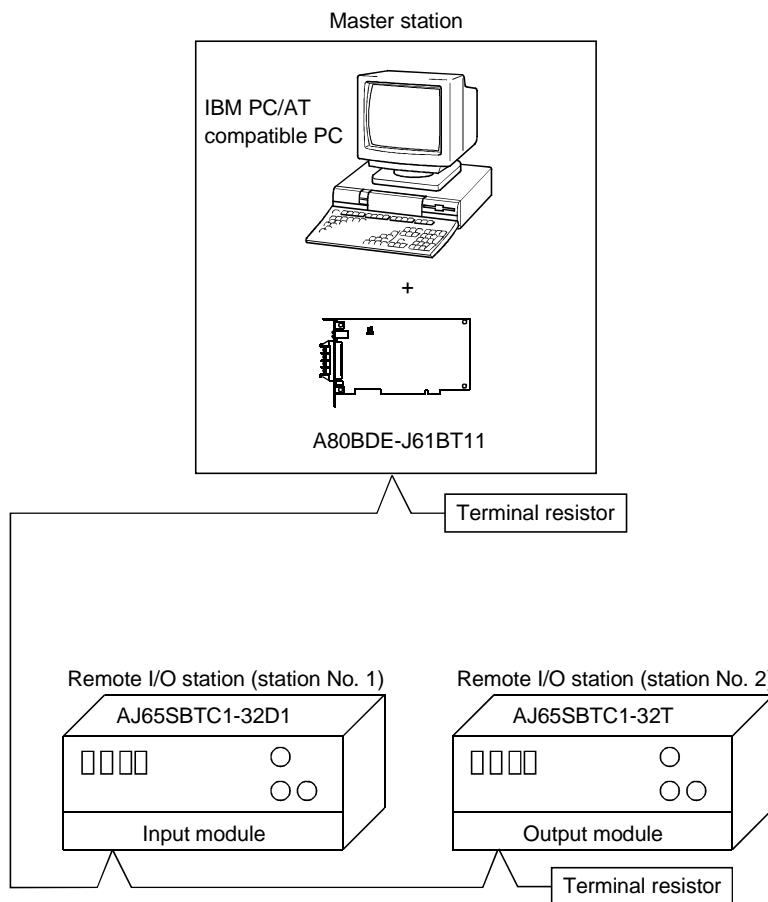
12.1.1 Setting up the master station

The settings of the master station utility are shown below:
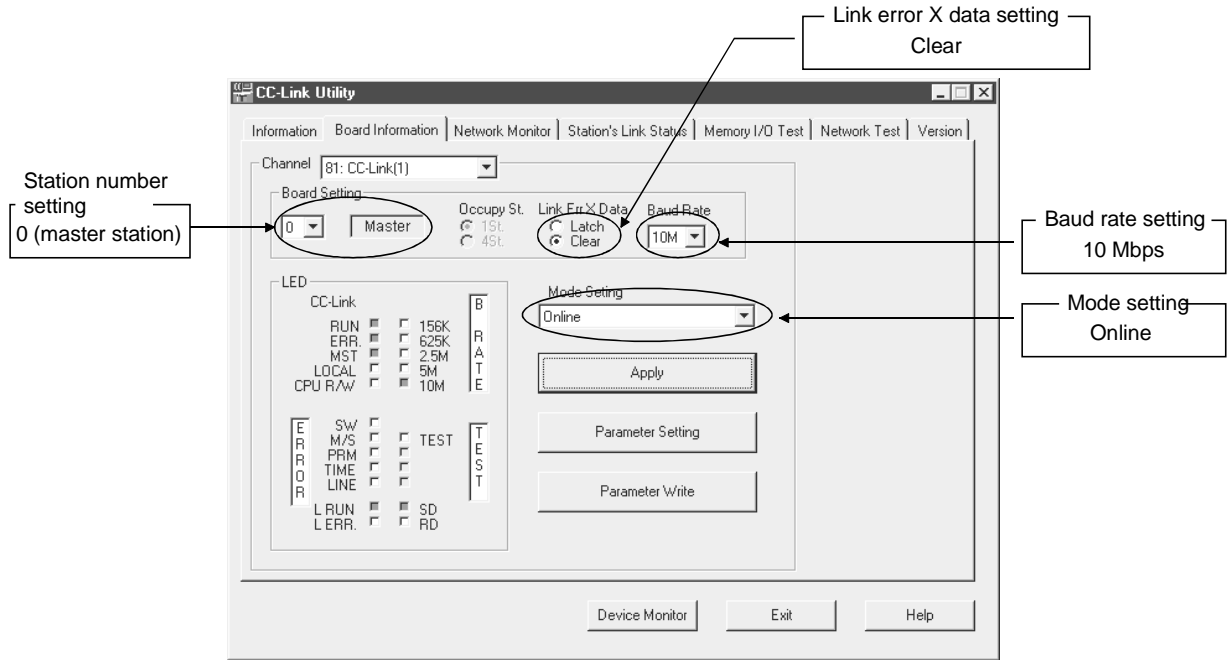
12.1.2 Setting up the remote I/O stations

The settings of the remote I/O station switches are shown below:

Station No. setting switch

Module	Station No.	No. of tens			No. of units			
		40	20	10	8	4	2	1
AJ65SBTC1-32D1	1	OFF	OFF	OFF	OFF	OFF	OFF	ON
AJ65SBTC1-32T	2	OFF	OFF	OFF	OFF	OFF	ON	OFF

Baud rate/mode setting switch

4 (10 Mbps/online)

Setting value	Setting switch status			Baud rate
	4	2	1	
4	ON	OFF	OFF	10 Mbps

12.2 Setting the Parameters

This section explains how to set the network parameters for the master station.

(1) Setting the network parameters

Set the network parameters as shown below using the attached parameter setting checklist.

Item	Setting range	Setting value
Operation setting	Input data latch/clear Default: Clear	Latch/(clear)
Type	Master Local Standby master Default: Local	(Master) Local Standby master
Mode setting	Online (remote net mode) Offline Module standalone hardware operation check Default: Online (remote net mode)	(Online (remote net mode)) Offline Module standalone hardware operation check
Number of connected modules	1 to 64 Default: 1	2 modules
Number of retries	1 to 7 Default: 3	3 times
Auto return station No.	1 to 10 Default: 1	1 station
Standby master station	0 to 64 (0: No standby master station designated) Default: 0	0
Delay timer	0 to 100 (0: Not designated) Default: 0	0

(2) Example of network parameter settings
An example of network parameter settings is shown below:

\<Parameter Setting window\>

\<Auxiliary Setting window\>

12.3 Creating a Program

This section describes the program that controls remote I/O stations. The following diagram shows the relationship between the devices of the PLC CPU and the inputs/outputs of the remote I/O stations.
The shaded areas indicate the devices that are actually used.
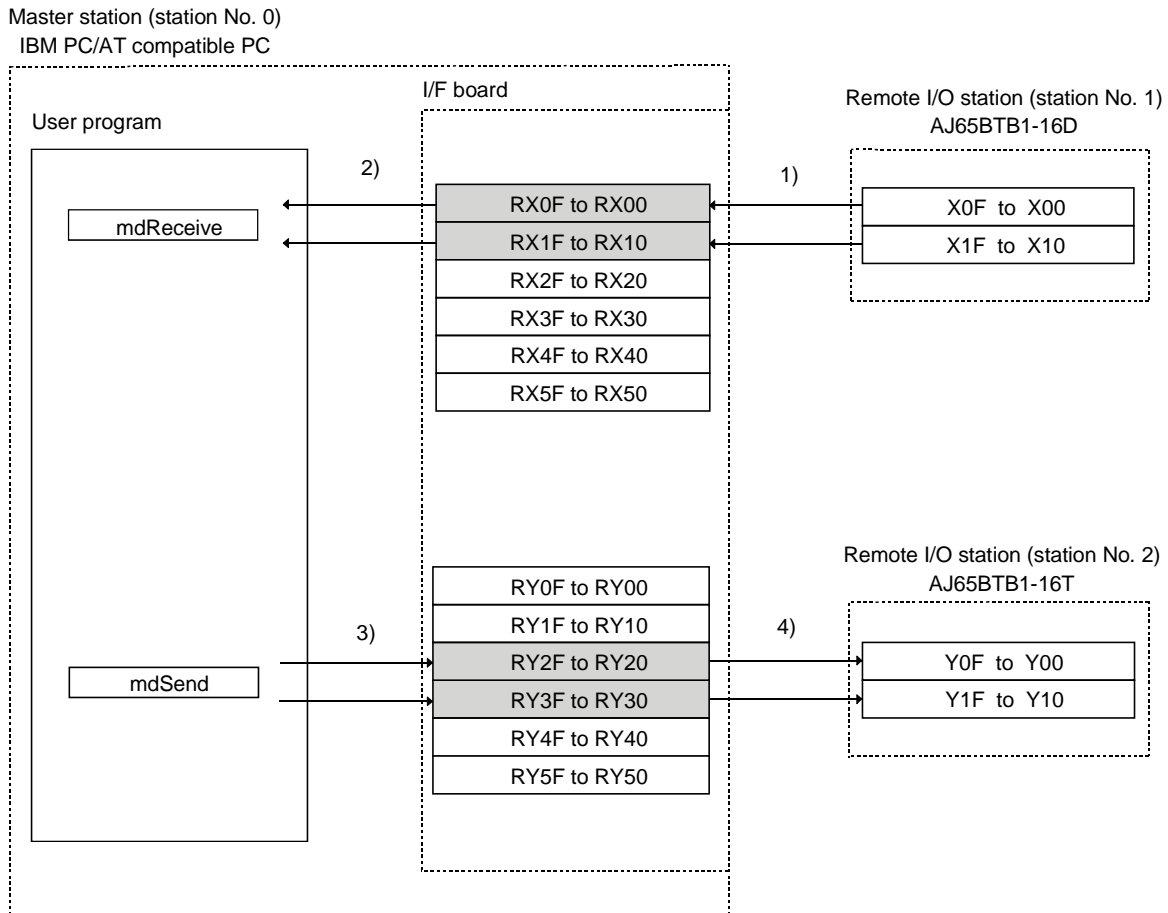
1) The X inputs of the remote I/O are stored in the RX inputs of the I/F board by link refresh.

2) The RX inputs of the I/F board are read by the user program.
   Arguments to be set: Station number = FF (own station)
   Device type = 1 (own station RX)
   Device number = 0

3) The user programs writes to the RY outputs of the I/F board.
   Arguments to be set: Station number = FF (own station)
   Device type = 2 (own station RY)
   Device number = 2F

4) The RY outputs of the I/F board are output to the remote I/O by link refresh.

12.4 Executing the Data Link

To start the data link, first turn on the power to the remote I/O stations, and then the master station.

12.4.1 Confirming the operation with the LED displays

The following shows the LED display status of both the master and remote I/O stations when the data link is being executed normally.

(1) LED displays of the master station

Be sure that the LED displays show the following status:

The I/F board is normal.

The master station is set.

The baud rate is set to 10 Mbps.

Sending data

Receiving data

The data link is being executed normally.
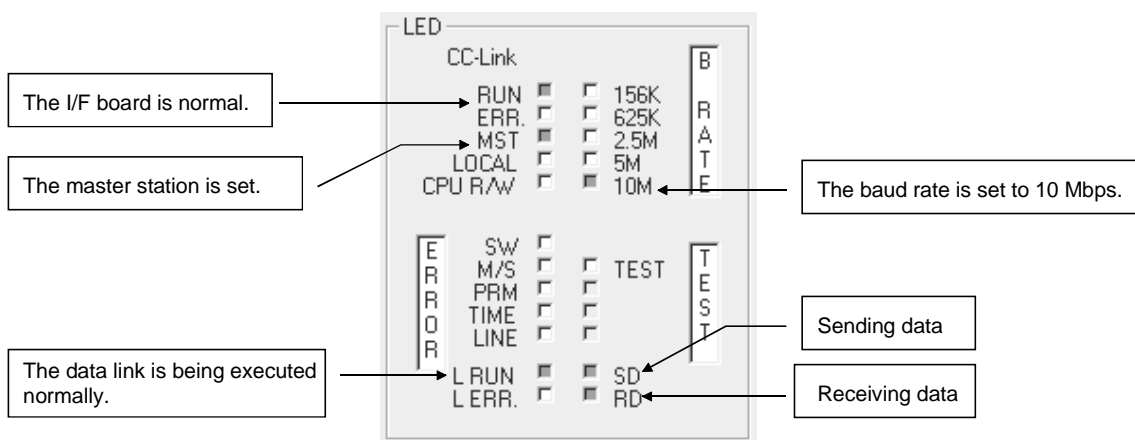
(2) LED displays of the remote I/O station

Be sure that the LED display shows the following status:

AJ65SBTC1-32D1
AJ65SBTC1-32T

●́ : On   ○ : Off

24 V DC is being supplied.

The data link is being executed normally
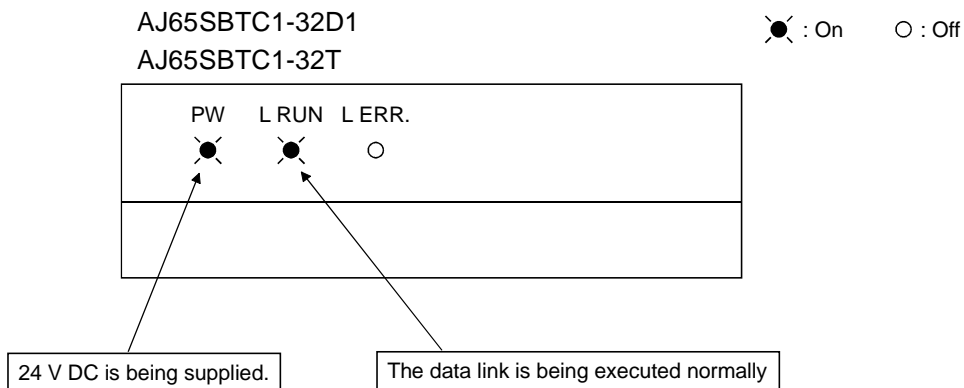
12.4.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
With the sample program, both input and output operations can be performed.

When the input X0 (RX0) in 1) is turned on, the output YF (RY2F) in 2) turns on.
When the input X0 (RX0) in 1) is turned off, the output YF (RY2F) in 2) turns off.
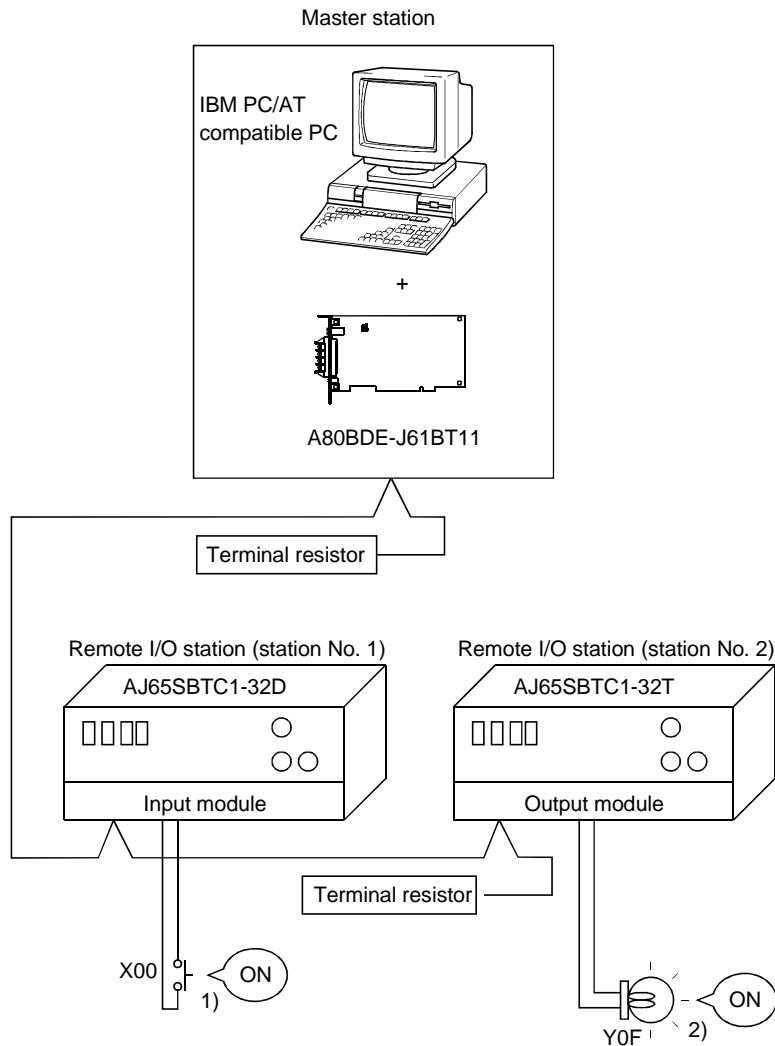
POINT
The sample program can be found in the CCLINK\SAMPLE directory under the SW3DNF-CCLINK utility software installation directory (the default installation directory is C:\MELSEC).

13 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATION

This chapter explains the procedures ranging from module setup, parameter settings, programming to final operation check, using a system configuration example.

13.1 Configuring a System

In this example, a system consisting of a master station and only one remote I/O station as shown below is used.
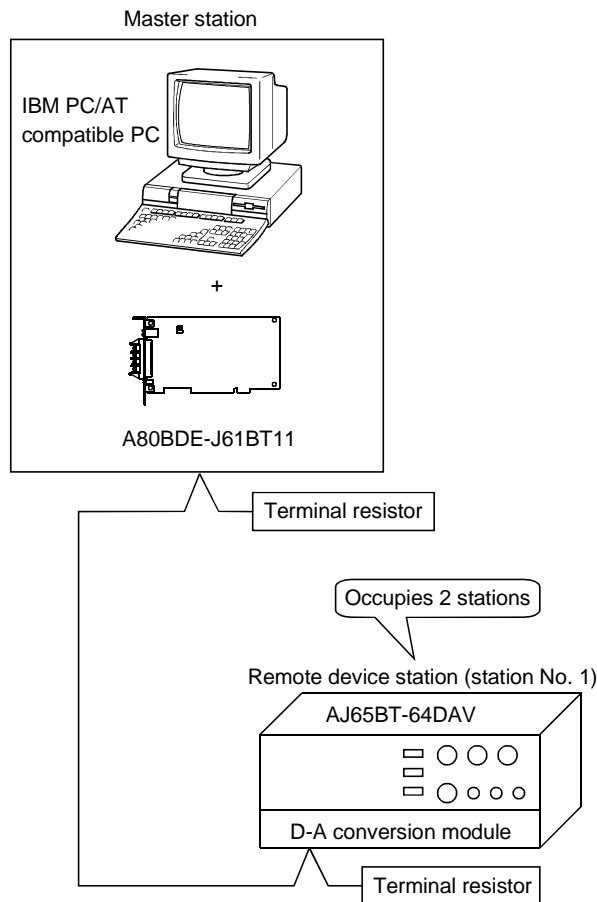
13.1.1 Setting up the master station

The settings of the master station utility are shown below:
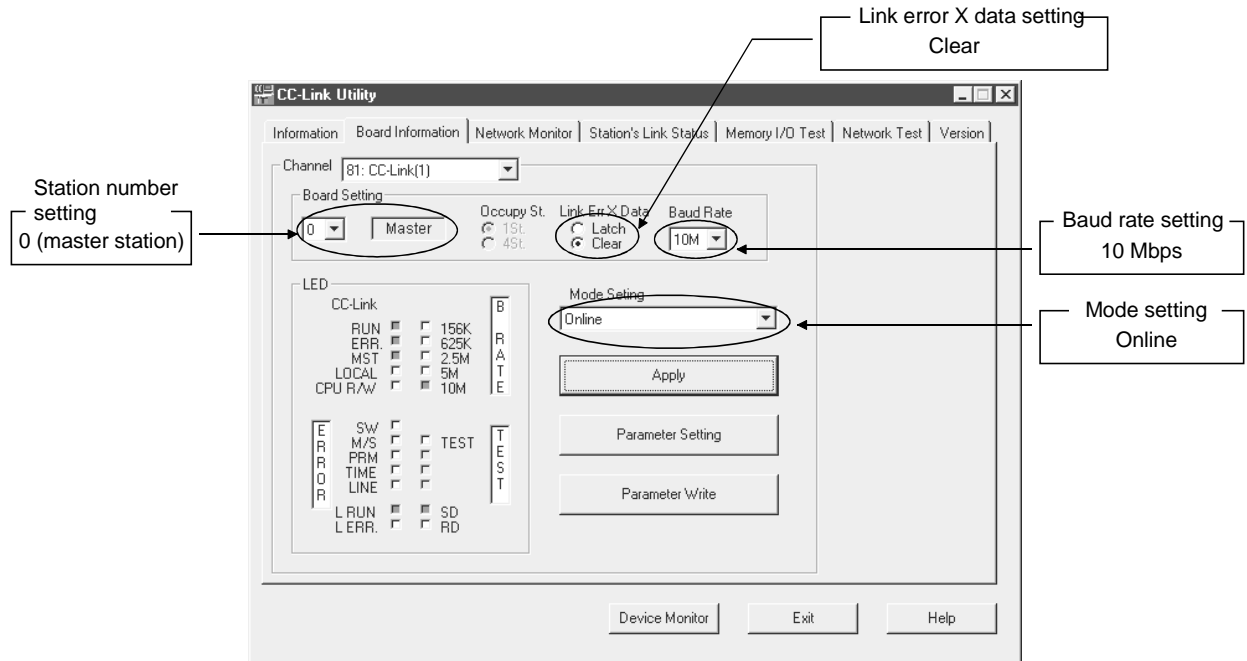
13.1.2 Setting up the remote device station

The settings of the remote device station switches are shown below:

13.2 Setting the Parameters

This section explains how to set the network parameters for the master station.

(1) Setting the network parameters

Set the network parameters as shown below using the attached parameter setting checklist and station information setting checklist.

Item	Setting range	Setting value
Operation setting	Input data latch/clear Default: Clear	Latch/clear
Type	Master Local Standby master Default: Local	Master Local Standby master
Mode setting	Online (remote net mode) Offline Module standalone hardware operation check Default: Online (remote net mode)	Online (remote net mode) Offline Module standalone hardware operation check
Number of connected modules	1 to 64 Default: 1	1 module
Number of retries	1 to 7 Default: 3	3 times
Auto return station No.	1 to 10 Default: 1	1 station
Standby master station	0 to 64 (0: No standby master station designated) Default: 0	0
Delay timer	0 to 100 (0: Not designated) Default: 0	0

Station Information Setting Checklist

No.	Type	Occupy Station	Station Specify	Intelligent Buffer Specify (Word)		
				Sending	Received	Automatic
1	Remote Device	2	No setting			

(2) Example of network parameter settings
An example of network parameter settings is shown below:

\<Parameter Setting window\>

\<Auxiliary Setting window\>

13.3 Creating a Program

This section describes the program that controls a remote device station.
The following diagram shows the relationship among the devices of the PLC CPU, the remote inputs/outputs of the remote device station and the remote registers.
The shaded areas indicate the devices that are actually used.
For detailed information on each remote device station, see the user's manual for each module.
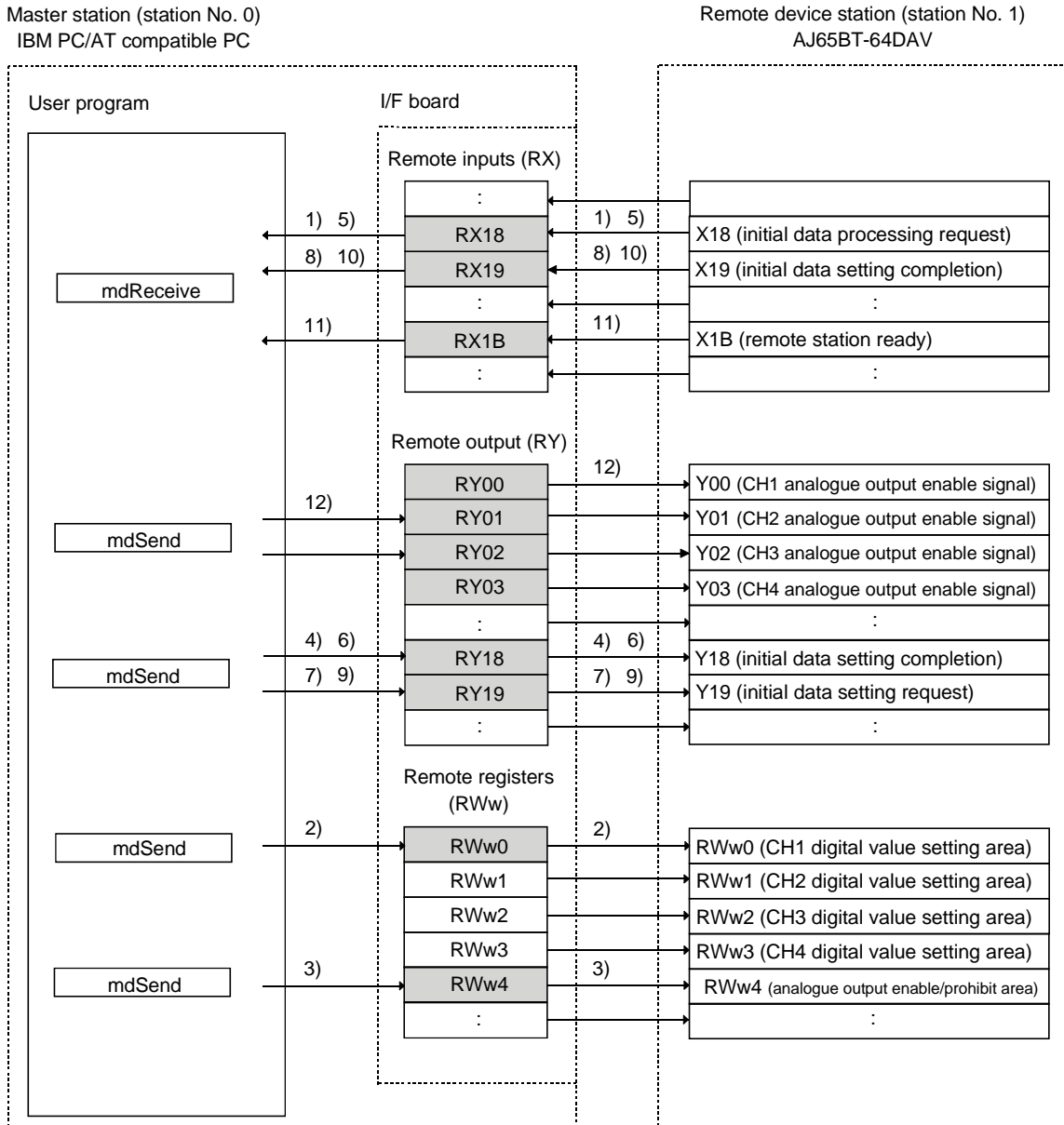
1) When the power to the remote device station (AJ65BT-64DAV) is turned on
   or the reset switch is pressed, the initial data processing request (RX18) turns
   on. The initial data processing request (RX18) is read by the user program.

2) When the digital value is written to the remote register RWw0 by the user
   program, it is written to the CH1 digital value setting area (RWw0) of the
   AJ65BT-64DAV.

3) Data is written to the analogue output enable/prohibit area (RWw4) by the
   user program.

4) When the remote output (RY18) is turned on by the user program, the initial
   data setting complete (RY18) of the AJ65BT-64DAV turns on.

5) The AJ65BT-64DAV turns off the initial data setting request (RY18).

6) The initial data setting complete (RX18) is turned off by the user program.

7) The initial data setting request (RY19) is turned on by the user program.

8) The AJ65BT-64DAV turns on the initial data setting complete (RX19).

9) The initial data setting request (RY19) is turned off by the user program.

10) The AJ65BT-64DAV turns off the initial data setting complete (RX19).

11) The remote station ready (RX1B) of the AJ65BT-64DAV turns on.

12) The analogue output enable signals (RY0 to RY3) of all channels are turned
    on by the user program.
    The voltage is output by the AJ65BT-64DAV.

13.4 Executing the Data Link

To start the data link , first turn on the power to the remote device station, and then the master station.

13.4.1 Confirming the operation with the LED displays

The following shows the LED display status of both the master station and remote device station when the data link is being executed normally.

(1) LED displays of the master station
   Be sure that the LED displays show the following status:

The I/F board is normal.

The master station is set.

The baud rate is set to 10 Mbps.

The data link is being executed normally.

Sending data

Receiving data

(2) LED displays of the remote device station
    Be sure that the LED displays show the following status:

AJ65BT-64DAV

24 V DC is being supplied.

The module is running normally.

The data link is being executed normally.

Sending data.

Receiving data.

: On   ○ : Off
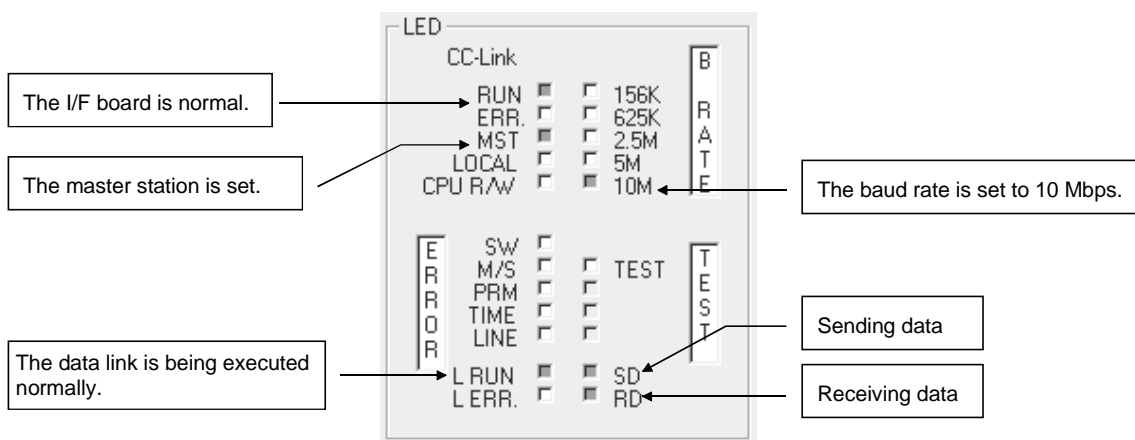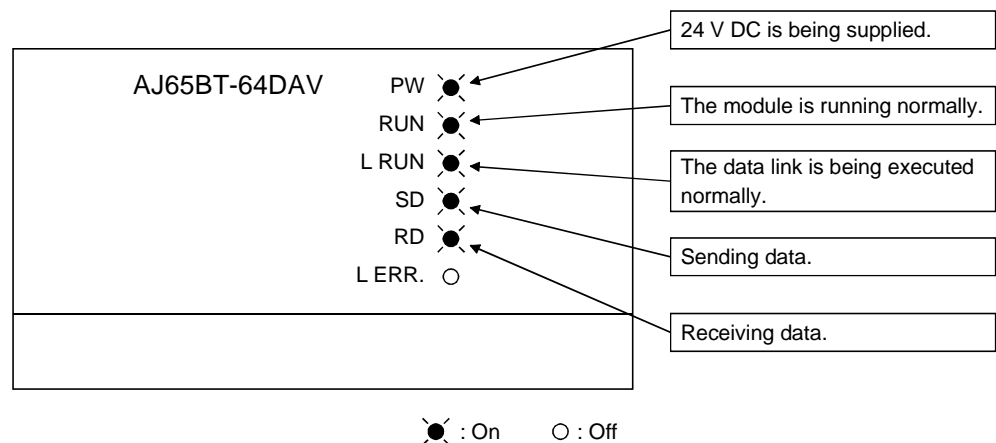
13.4.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
With the sample program, an analogue voltage is output by setting the digital value to 300.
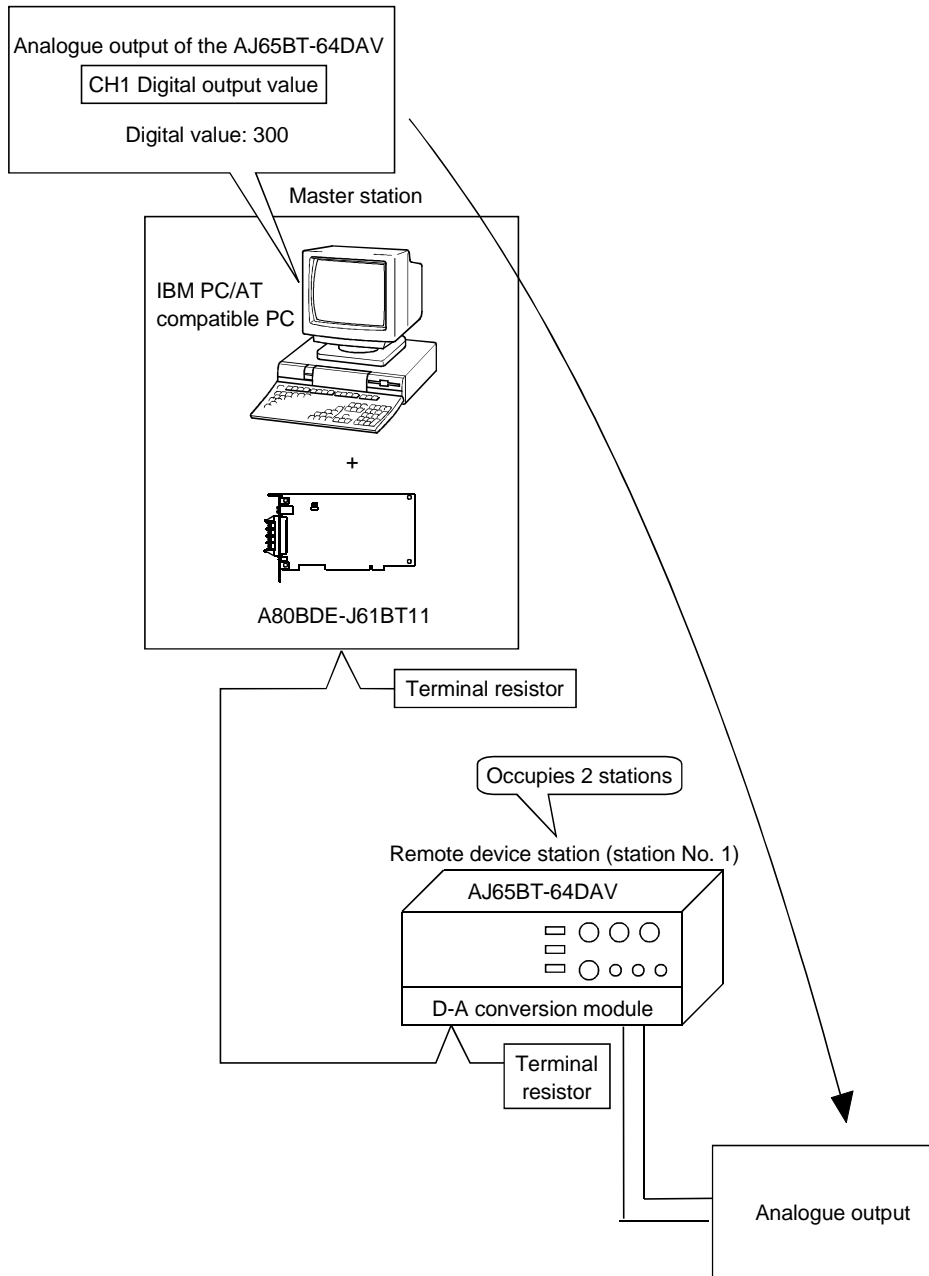
Analogue output of the AJ65BT-64DAV

CH1 Digital output value

Digital value: 300

Master station

IBM PC/AT compatible PC

+

A80BDE-J61BT11

Terminal resistor

Occupies 2 stations

Remote device station (station No. 1)

AJ65BT-64DAV

D-A conversion module

Terminal resistor

Analogue output

POINT

The sample program can be found in the CCLINK\SAMPLE directory under the
SW3DNF-CCLINK utility software installation directory (the default installation
directory is C:\MELSEC).

14 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATION (AJ65BT-R2)

This chapter explains the procedures ranging from module setup, parameter settings, programming to final operation check, using a system configuration example.

14.1 Configuring a System

In this example, a system consisting of a master station and one intelligent device station (AJ65BT-R2) as shown below is used.

14
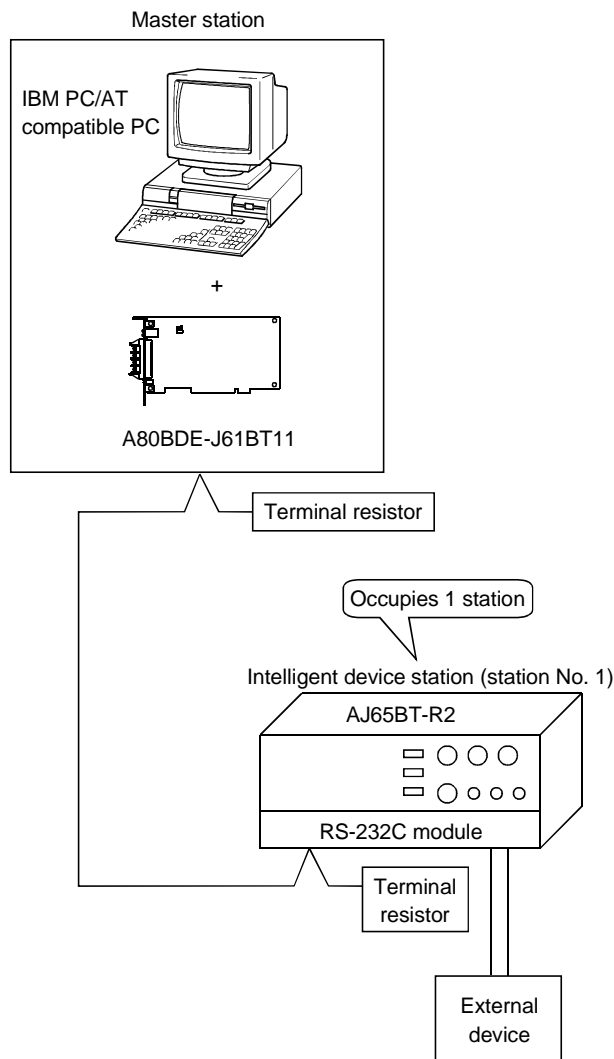
14.1.1 Setting up the master station

The settings of the master station utility are shown below:

14.1.2 Setting up the intelligent device station

The settings of the intelligent device station switches are shown below:

Baud rate/mode setting switch

4 (10 Mbps/online)

Station No. setting switch

Module	×10	×1
AJ65BT-R2	0	1

RS-232C transmission specification setting switches

Set according to the transmission specification of the external device.

14.2 Setting the Parameters

This section explains how to set the network parameters for the master station.

(1) Setting the network parameters

Set the network parameters as shown below using the attached parameter setting checklist and station information setting checklist.

Item	Setting range	Setting value
Operation setting	Input data latch/clear Default: Clear	Latch/clear
Type	Master Local Standby master Default: Local	Master Local Standby master
Mode setting	Online (remote net mode) Offline Module standalone hardware operation check Default: Online (remote net mode)	Online (remote net mode) Offline Module standalone hardware operation check
Number of connected modules	1 to 64 Default: 1	1 module
Number of retries	1 to 7 Default: 3	3 times
Auto return station No.	1 to 10 Default: 1	1 station
Standby master station	0 to 64 (0: No standby master station designated) Default: 0	0
Delay timer	0 to 100 (0: Not designated) Default: 0	0

Station Information Setting Checklist

No.	Type	Occupy Station	Station Specify	Intelligent Buffer Specify (Word)		
				Sending	Received	Automatic
1	Intelligent Device	1	No setting	64	64	128

(2) Example of network parameter settings
An example of network parameter settings is shown below:

<Parameter Setting window>

<Auxiliary Setting window>

14.3 Creating a Program

This section describes the program that controls the intelligent device station.
The following three procedures are explained separately:

- Initialization procedure••••••See Section 14.3.1
- Sending procedure•••••••••See Section 14.3.2
- Receiving procedure••••••••See Section 14.3.3

14.3.1 Initialization procedure

The following diagram shows the relationships among the user program of the IBM
PC/AT compatible PC and the remote inputs/outputs and AJ65BT-R2 buffer memory
of the intelligent device station.
The shaded areas indicate the devices that are actually used.
For detailed information on the intelligent device station, see the Type AJ65BT-R2 CC-
Link System RS-232C Interface Module User's Manual.
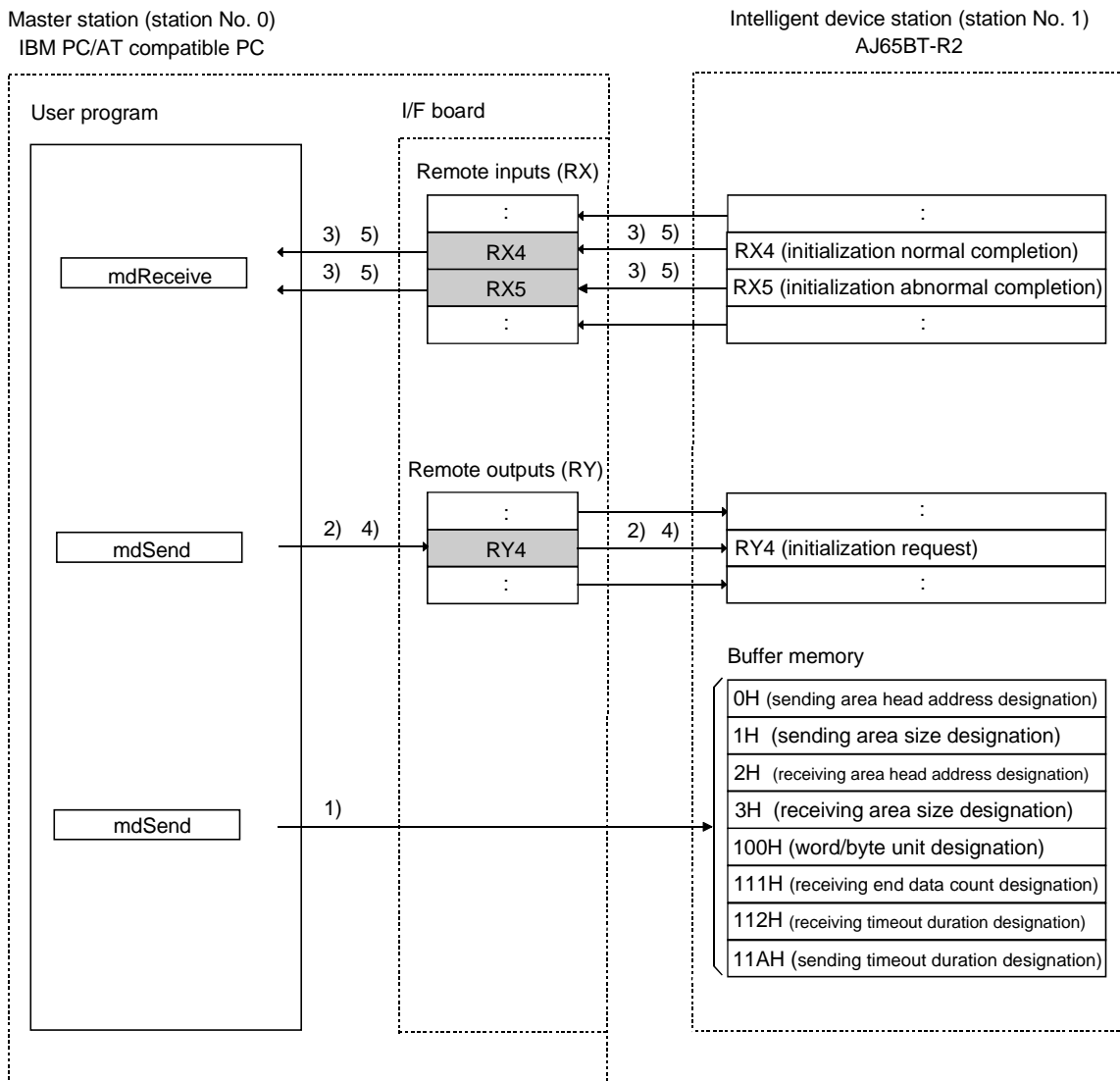
1) The initial setting values for sending and receiving are written to the buffer memory of the AJ65BT-R2 by the user program.
Arguments to be set: Word/byte unit designation = 0
Sending area head address designation = 200H
Sending area size designation = 200H
Receiving area head address designation = 400H
Receiving area size designation = 200H
Sending timeout duration designation = 0

2) The initialization request (RY4) is turned on by the user program.

3) If the initialization is normal, the AJ65BT-R2 turns on the initialization request normal completion signal (RX4). If the initialization is abnormal, the AJ65BT-R2 turns on the initialization request abnormal completion signal (RX5).

4) The initialization request signal (RY4) is turned off by the user program.

5) The AJ65BT-R2 turns off both the initialization normal completion signal (RX4) and initialization abnormal completion signal (RX5).

14.3.2 Sending procedure

The following diagram shows the relationships among the user program of the IBM
PC/AT compatible PC and the remote inputs/outputs and AJ65BT-R2 buffer memory
of the intelligent device station.
The shaded areas indicate the devices that are actually used.
For detailed information on each remote device station, see the user's manual for each
module.
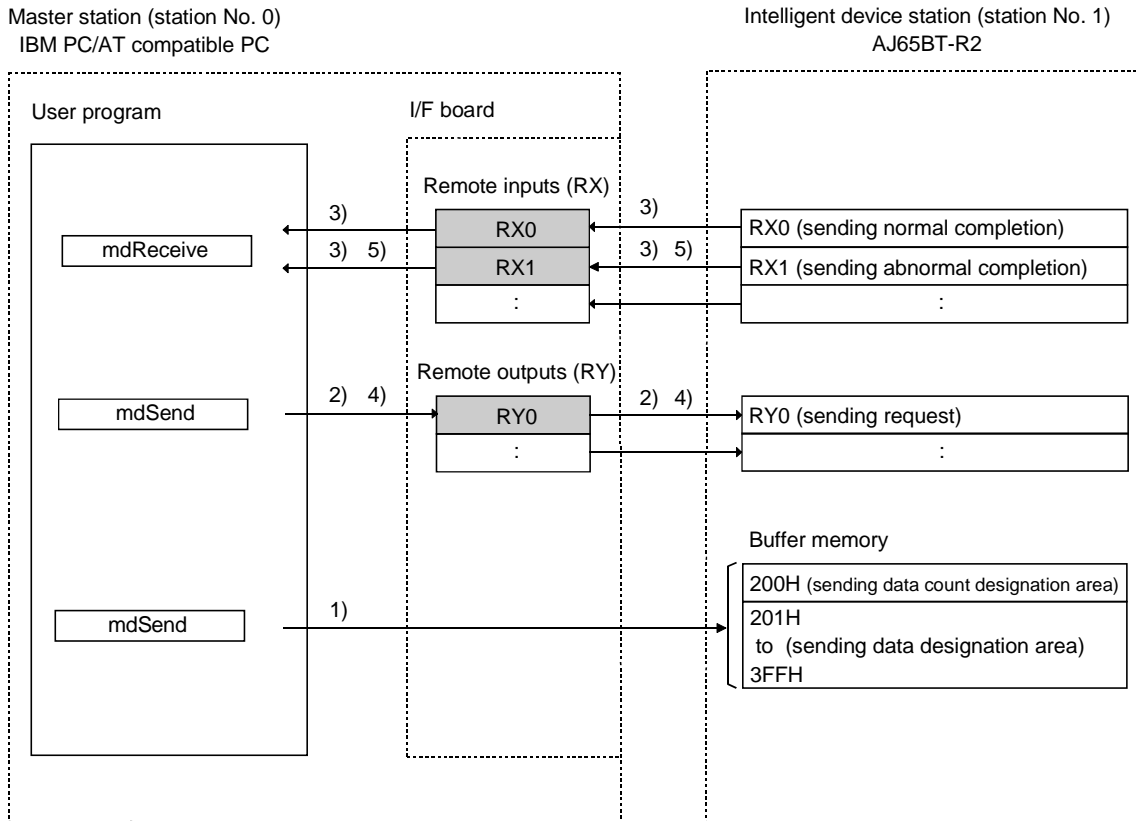
1) The sending data is written to the sending area of the AJ65BT-R2's buffer
    memory by the user program.

2) Data is sent to the external device when the sending request (RY0) is turned
    on by the user program.

3) If the sending is normal, the AJ65BT-R2 turns on the sending normal
    completion (RX0). If the sending is abnormal, the AJ65BT-R2 turns on the
    sending abnormal completion (RX1).

4) The sending request (RY0) is turned off by the user program.

5) The AJ65BT-R2 turns off either the sending normal completion (RX0) or
    sending abnormal completion (RX1).

14.3.3 Receiving procedure

The following diagram shows the relationships among the user program of the IBM
PC/AT compatible PC and the remote inputs/outputs and AJ65BT-R2 buffer memory
of the intelligent device station.
The shaded areas indicate the devices that are actually used.
For detailed information on each intelligent device station, see the user's manual for
each module.
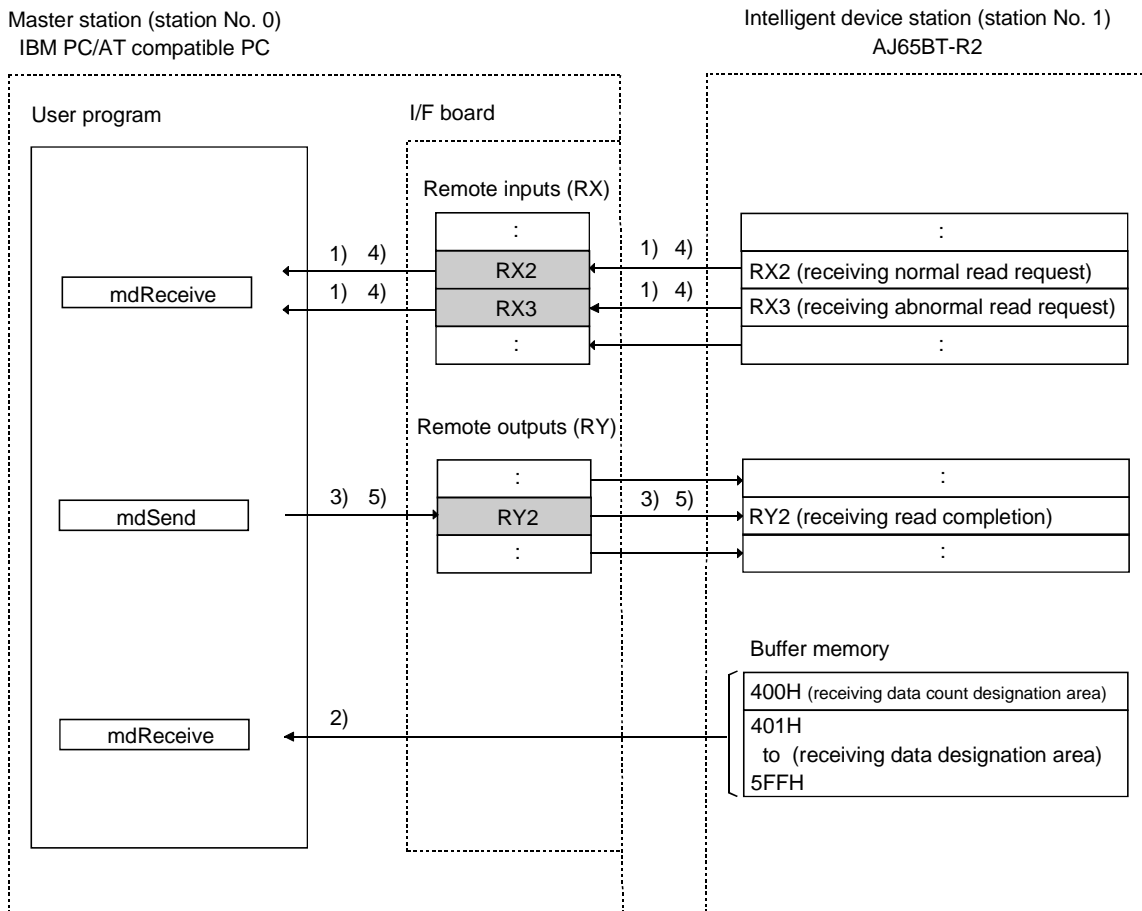
1) The AJ65BT-R2 turns on either the receiving normal read request (RX2) or
    receiving abnormal read request (RX3) upon receiving data.

2) The receiving data is read by the user program.

3) The receiving read completion signal (RY2) is turned on by the user program.

4) The AJ65BT-R2 turns off either the receiving normal read completion signal
    (RX2) or receiving abnormal read completion signal (RX3).

5) The receiving read completion signal (RY2) is turned off by the user program.

14.4 Executing the Data Link

To start the data link , first turn on the power to the intelligent device station, and then the master station.

14.4.1 Confirming the operation with the LED displays

The following shows the LED display status of the master station and intelligent device station when the data link is being executed normally.

(1) LED displays of the master station
Be sure that the LED displays show the following status:

(2) LED displays of the remote device station
Be sure that the LED displays show the following status:

$\bullet$: On   ○ : Off
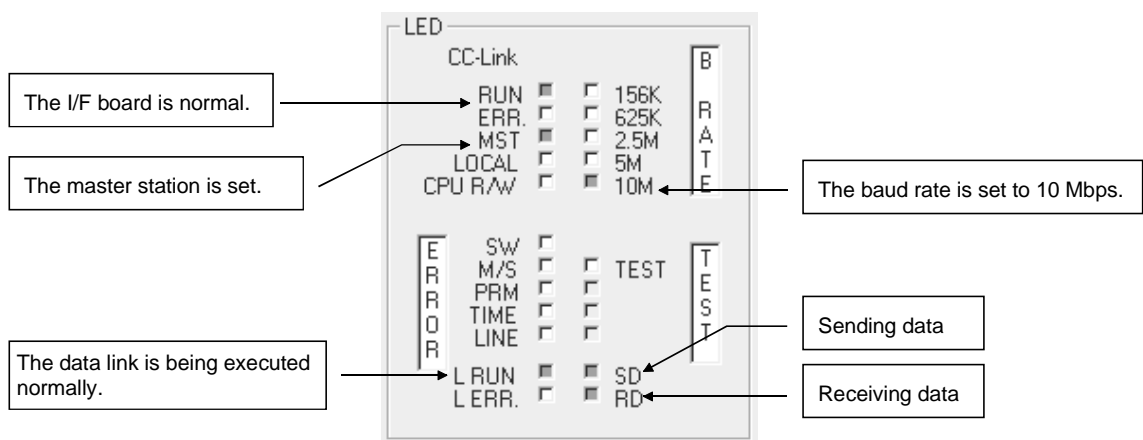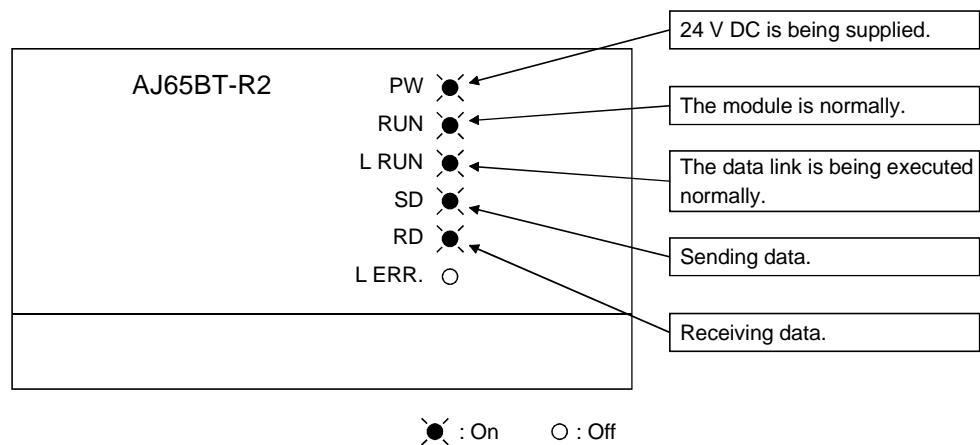
14.4.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
With the sample program, initialization, transmission and receiving can be performed.

POINT

The sample program can be found in the CCLINK\SAMPLE directory under the
SW3DNF-CCLINK utility software installation directory (the default installation
directory is C:\MELSEC).

MEMO

15 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATION (AJ65BT-D75P2-S3)

This chapter explains the procedures ranging from module setup, parameter settings, programming to final operation check, using a system configuration example.

15.1 Configuring a System

In this example, a system consisting of a master station and one intelligent device station (AJ65BT-D75P2-S3) as shown below is used.

15
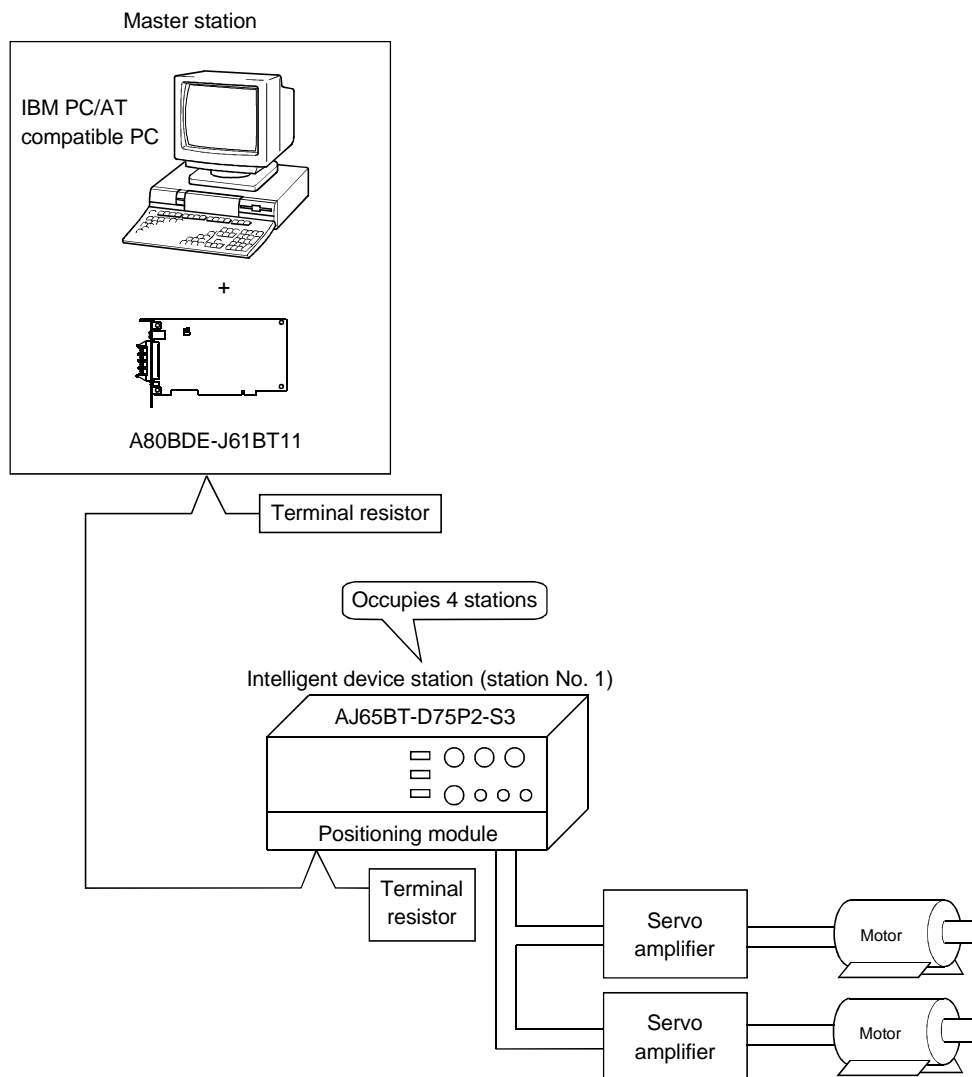
15.1.1 Setting up the master station

The settings of the master station utility are shown below:
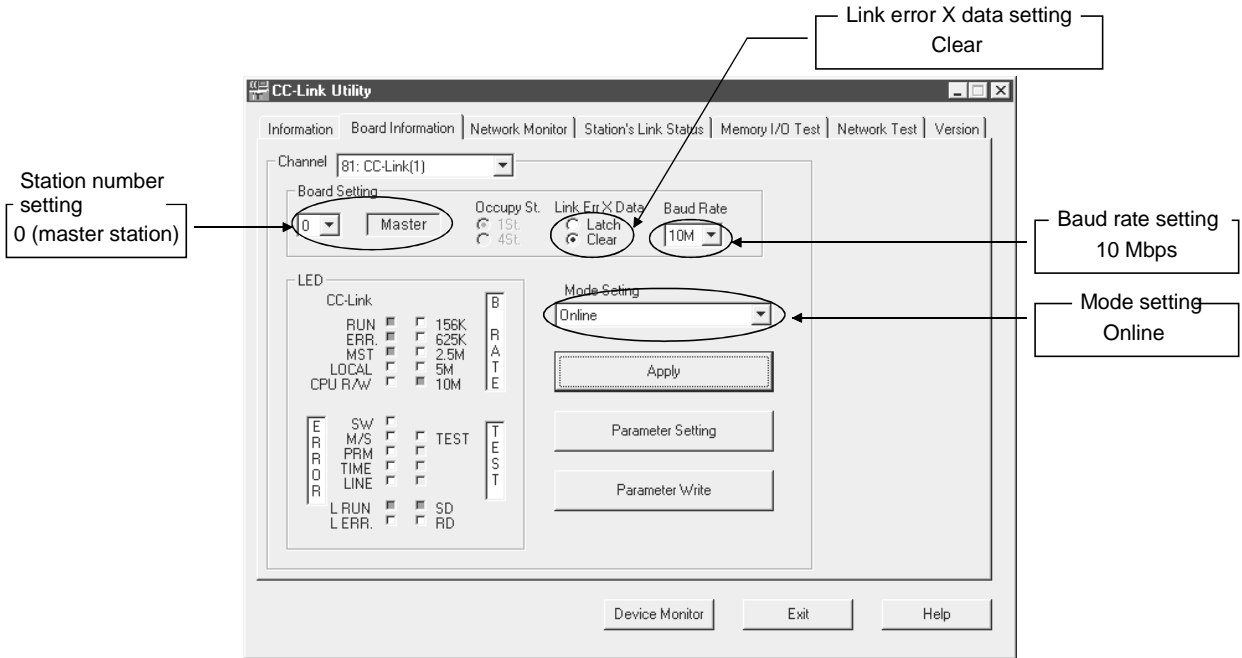
15.1.2 Setting up the intelligent device station (AJ65BT-D75P2-S3)

The settings of the intelligent device station (AJ65BT-D75P2-S3) switches are shown below:

15.2 Setting the Parameters

This section explains how to set the network parameters for the master station.

(1) Setting the network parameters

Set the network parameters as shown below using the attached parameter setting checklist and station information setting checklist.

Item	Setting range	Setting value
Operation setting	Input data latch/clear Default: Clear	Latch / clear
Type	Master Local Standby master Default: Local	Master Local Standby master
Mode setting	Online (remote net mode) Offline Module standalone hardware operation check Default: Online (remote net mode)	Online (remote net mode) Offline Module standalone hardware operation check
Number of connected modules	1 to 64 Default: 1	1 module
Number of retries	1 to 7 Default: 3	3 times
Auto return station No.	1 to 10 Default: 1	1 station
Standby master station	0 to 64 (0: No standby master station designated) Default: 0	0
Delay timer	0 to 100 (0: Not designated) Default: 0	0

Station Information Setting Checklist

St.	Type	Occupy Station	Station Specify	Intelligent Buffer Specify (Word)		
				Sending	Received	Automatic
1	Intelligent Device	4	No setting	64	64	128

(2) Example of network parameter settings
An example of network parameter settings is shown below:

<Parameter Setting window>

<Auxiliary Setting window>

15.3 Creating a Program

This section describes the program that controls the intelligent device station.
The following four procedures are explained separately.

- Initialization procedure•••••••••••••••See Section 15.3.1
- Home position return procedure••See Section 15.3.2
- Positioning procedure••••••••••••••••••See Section 15.3.3
- JOG operation procedure•••••••••••••See Section 15.3.4

> POINT
>
> Set parameters and perform positioning settings in advance with the AD75P. If a
> user program is used to perform reading and writing from/to the buffer memory, the
> communication time delay may occur and the user program becomes complicated.

15.3.1 Initialization procedure

The following diagram shows the relationships among the user program of the IBM
PC/AT compatible PC and the remote inputs/outputs and AJ65BT-D75P2-S3 buffer
memory of the intelligent device station.
The shaded areas indicate the devices that are actually used.
For detailed information on the intelligent device station, see the Type AJ65BT-D75P2-
S3 Positioning Module User's Manual.
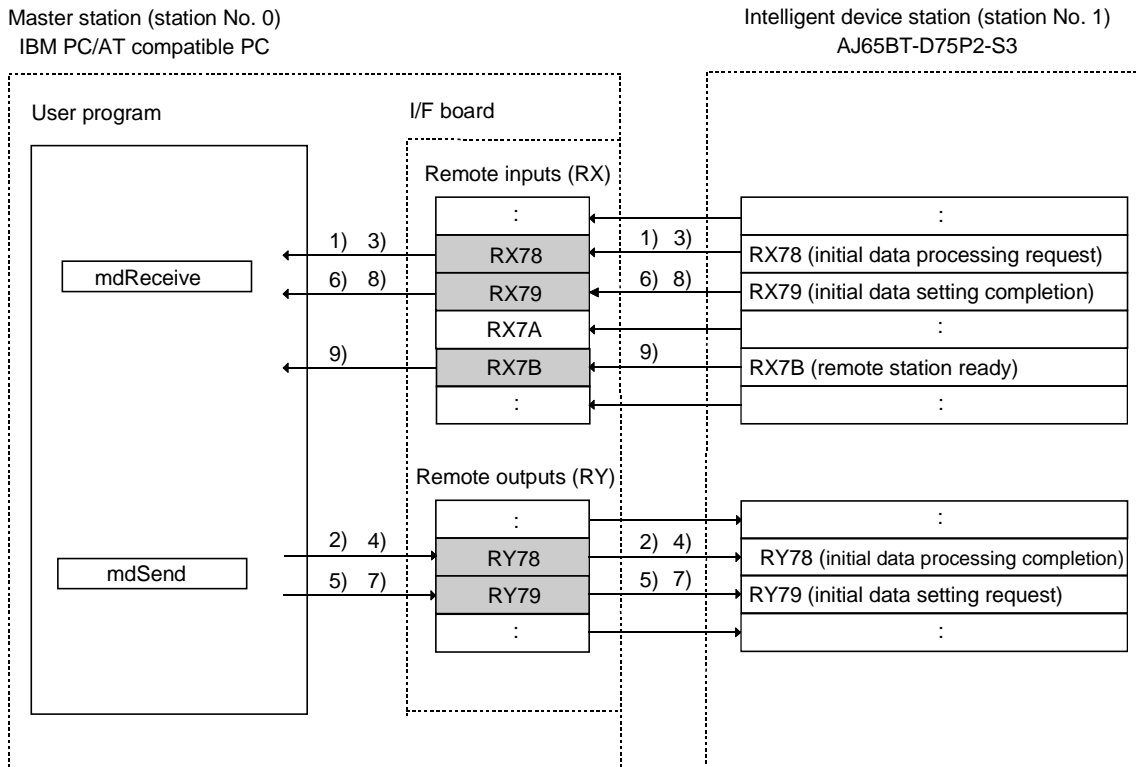
1) When the intelligent device station (AJ65BT-D75P2-S3) is powered on or the reset switch is pressed, the initial data processing request (RX78) turns on. The initial data processing request (RX78) is read by the user program.

2) The initial data processing completion (RY78) is turned on by the user program.

3) The AJ65BT-D75P2-S3 turns off the initial data processing request (RX78).

4) The initial data processing completion (RY78) is turned off by the user program.

5) The initial data setting request (RY79) is turned on by the user program.

6) The AJ65BT-D75P2-S3 turns on the initial data setting completion (RX79).

15.3.2 Home position return procedure

The following diagram shows the relationships among the user program of the IBM PC/AT compatible PC, and the remote inputs/outputs, remote registers and AJ65BT-D75P2-S3 buffer memory of the intelligent station.

The shaded areas indicate the devices that are actually used.

For detailed information on the intelligent device station, see the Type AJ65BT-D75P2-S3 Positioning Module User's Manual.

1) The initial data setting request flag (RY79) is turned on by the user program.

2) The AJ65BT-D75P2-S3 turns on the initial data setting completion (RX79).

3) The start number is written to the single-axis positioning start number (RWw0) by the user program.

4) The start number is written to the dual-axis positioning start number (RWw1) by the user program.

5) The initial data setting request flag (RY79) is turned off by the user program.

6) The AJ65BT-D75P2-S3 turns off the initial data setting completion (RX79).

7) The AJ65BT-D75P2-S3 turns on the remote station ready (RX7B).

8) The single-axis servo on (RY20) is turned on by the user program.

9) The dual-axis servo on (RY40) is turned on by the user program.

10) The single-axis positioning start (RY10) is turned on by the user program. The home position return operation will start.

11) The dual-axis positioning start (RY11) is turned on by the user program. The home position return operation will start.

Parameters set in the sample program

	For home position return	
	Basic parameters	Extended parameters
Axis 1	Home position return method: 5 (counting system 2 (zero-point signal is not used)) Home position return direction: 0 (forward direction) Home position address: 0 Home position return speed: 2000 Creep speed: 1000 Home position return retry: 0 (no retry)	Home position return dwell time: 0 Displacement setting after near-point dog: 1000 Home position return acceleration time selection: 0 Home position return deceleration time selection: 0 Home position shift amount: 0 Home position return torque limit value: 300 Speed designation at home position shift: 0 Dwell time setting at home position retry: 0
Axis 2	Home position return method: 5 (counting system 2 (zero-point signal is not used)) Home position return direction: 0 (forward direction) Home position address: 0 Home position return speed: 2000 Creep speed: 1000 Home position return retry: 0 (no retry)	Home position return dwell time: 0 Displacement setting after near-point dog: 1000 Home position return acceleration time selection: 0 Home position return deceleration time selection: 0 Home position shift amount: 0 Home position return torque limit value: 300 Speed designation at home position shift: 0 Dwell time setting at home position retry: 0

15.3.3 Positioning procedure

The following diagram shows the relationships among the user program of the IBM PC/AT compatible PC and the remote inputs/outputs, remote registers and AJ65BT-D75P2-S3 buffer memory of the intelligent device station.
The shaded areas indicate the devices that are actually used.
For detailed information on the intelligent device station, see the Type AJ65BT-D75P2-S3 Positioning Module User's Manual.
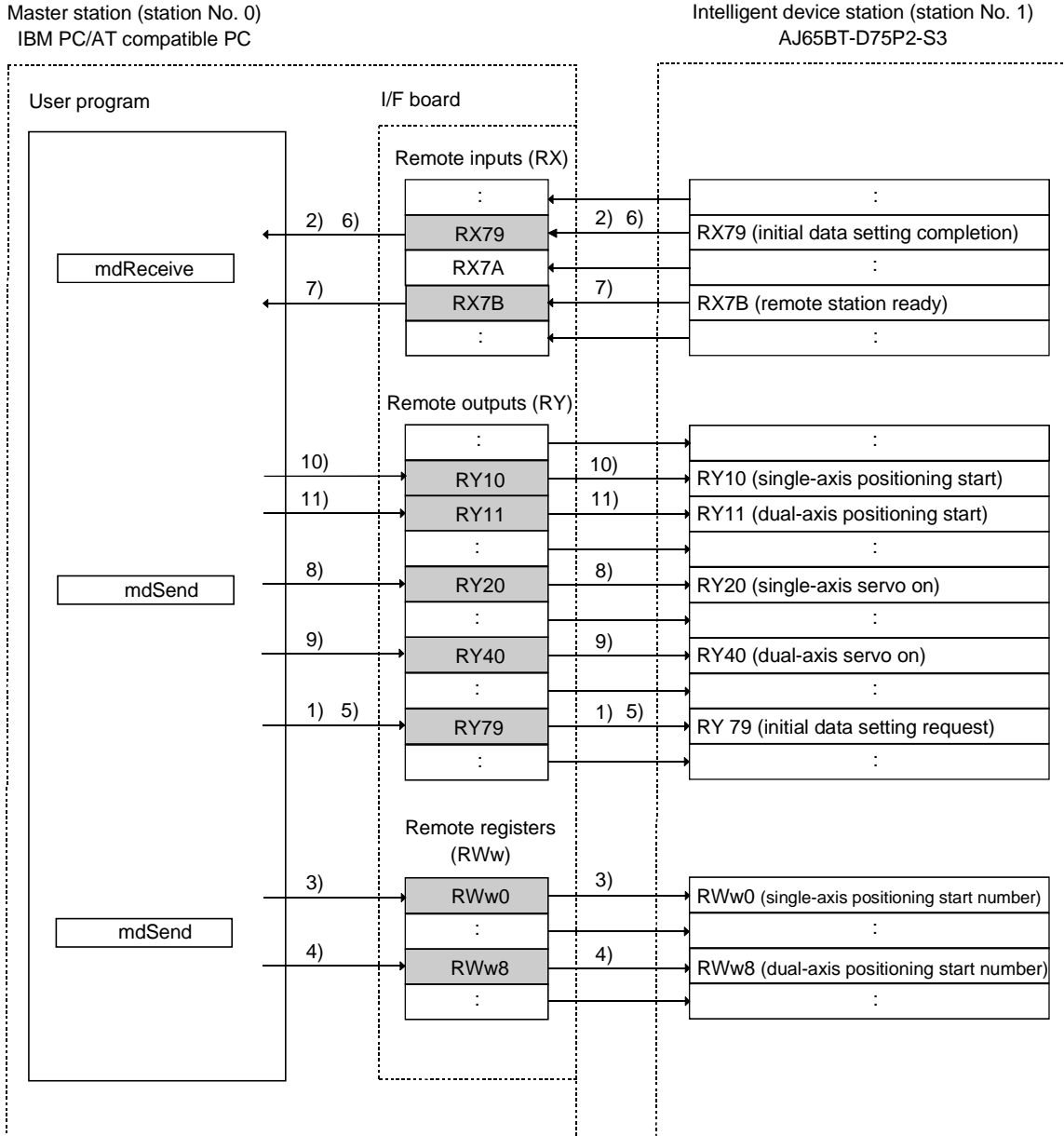

1)   The single-axis servo on (RY20) is turned on by the user program.

2)   The dual-axis servo on (RY40) is turned on by the user program.

3) The start number is written to the single-axis positioning start number (RWw0) by the user program.

4) The start number is written to the dual-axis positioning start number (RWw1) by the user program.

5) The single-axis positioning start (RY10) is turned on by the user program. The home position return operation will start.

6) The dual-axis positioning start (RY11) is turned on by the user program. The home position return operation will start.

7) Axis 1 starts the positioning operation, and the AJ65BT-D75P2-S3 turns on the single-axis axis operation completion (RX1) and single-axis BUSY (RX4).

8) Axis 2 starts the positioning operation, and the AJ65BT-D75P2-S3 turns on the dual-axis operation completion (RX2) and dual-axis BUSY (RX5).

9) The AJ65BT-D75P2-S3 turns off the single-axis BUSY (RX4) when Axis 1 completes the positioning operation.

10) The AJ65BT-D75P2-S3 turns off the dual-axis BUSY (RX5) when Axis 2 completes the positioning operation.

11) The single-axis positioning start (RY10) is turned off by the user program.

12) The dual-axis positioning start (RY11) is turned off by the user program.

13) The AJ65BT-D75P2-S3 turns off the positioning start (RX1).

14) The AJ65BT-D75P2-S3 turns off the positioning start (RX2).

15) The single-axis servo on (RY20) is turned off by the user program.

16) The dual-axis servo on (RY40) is turned off by the user program.

Parameters set in the sample program

		For home position return
Axis 1	No. 1	Positioning identifier setting: 0x200 (INC linear 1) M code setting: 0 Dwell time: 0 Command speed: 0x30D40 (20000) Positioning address: 1000 Arc address: 0
Axis 2	No. 1	Positioning identifier setting: 0x200 (INC linear 1) M code setting: 0 Dwell time: 0 Command speed: 0x30D40 (20000) Positioning address: 1000 Arc address: 0

15.3.4 JOG operation procedure

The following diagram shows the relationships among the user program of the IBM PC/AT compatible PC and the remote inputs/outputs and remote registers of the intelligent device station.

The shaded areas indicate the devices that are actually used.

For detailed information on the intelligent device station, see the Type AJ65BT-D75P2-S3 Positioning Module User's Manual.
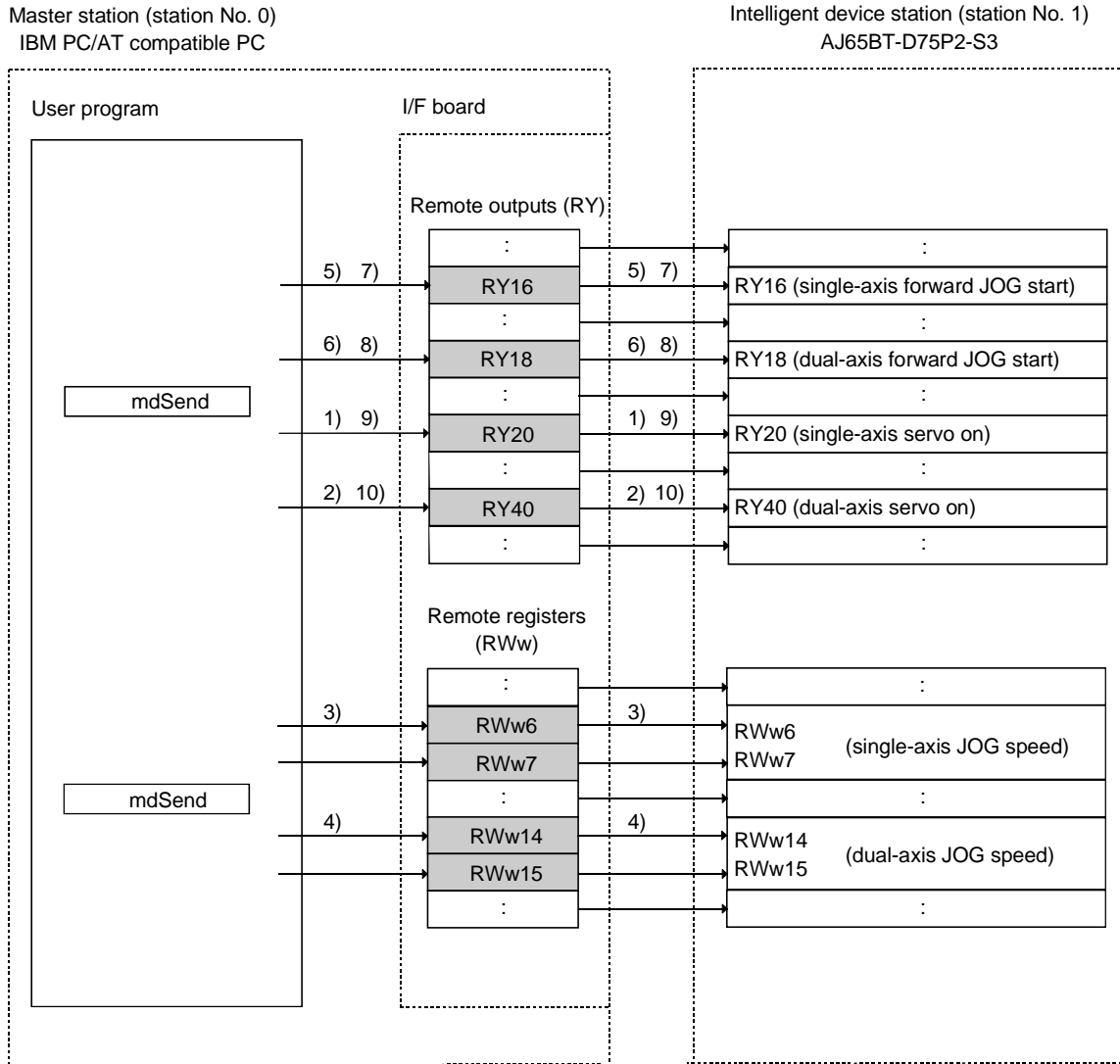
1) The single-axis servo on (RY20) is turned on by the user program.

2) The dual-axis servo on (RY40) is turned on by the user program.

3) The JOG speeds are written to the single-axis JOG speeds (RWw6 and RWw7) by the user program.

4) The JOG speeds are written to the dual-axis JOG speeds (RWw14 and RWw15) by the user program.

5) The single-axis forward JOG start (RY16) is turned on by the user program. The JOG operation will start.

6) The dual-axis forward JOG start (RY18) is turned on by the user program. The JOG operation will start.

7) When the single-axis JOG operation is stopped, the single-axis forward JOG start (RY16) is turned off by the user program. The JOG operation will stop.

8) When the dual-axis JOG operation is stopped, the dual-axis forward JOG start (RY18) is turned off by the user program. The JOG operation will stop.

9) The single-axis servo on (RY20) is turned off by the user program.

10) The dual-axis servo on (RY40) is turned off by the user program.

15.4 Executing the Data Link

To start the data link , first turn on the power to the intelligent device station, and then the master station.

15.4.1 Confirming the operation with the LED displays

The following shows the LED display status of the master station and the intelligent device station when the data link is being executed normally.

(1) LED displays of the master station

Be sure that the LED displays show the following status:

| The I/F board is normal. |

| The master station is set. |

| The baud rate is set to 10 Mbps. |

| Sending data |

| The data link is being executed normally. |

| Receiving data |

```
LED
     CC-Link                    B
     RUN  ■   □ 156K            R
     ERR. □   □ 625K            A
     MST  ■   □ 2.5M            T
     LOCAL □  □ 5M              E
     CPU R/W □ ■ 10M

   E  SW  □                     T
   R  M/S □   □ TEST            E
   R  PRM □   □                 S
   O  TIME □  □                 T
   R  LINE □  □
      L RUN ■  ■ SD
      L ERR. □  ■ RD
```

(2) LED displays of the remote device station

Be sure that the LED displays show the following status:

| 24 V DC is being supplied. |

| The module is normal. |

| The data link is being executed normally. |

| Sending data. |

| Receiving data. |

```
AJ65BT-D75P2-S3      PW   ●
                     RUN  ●
                     L RUN ●
                     SD   ●
                     RD   ●
                     L ERR. ○
```

`●` : On   ○ : Off

15 - 13
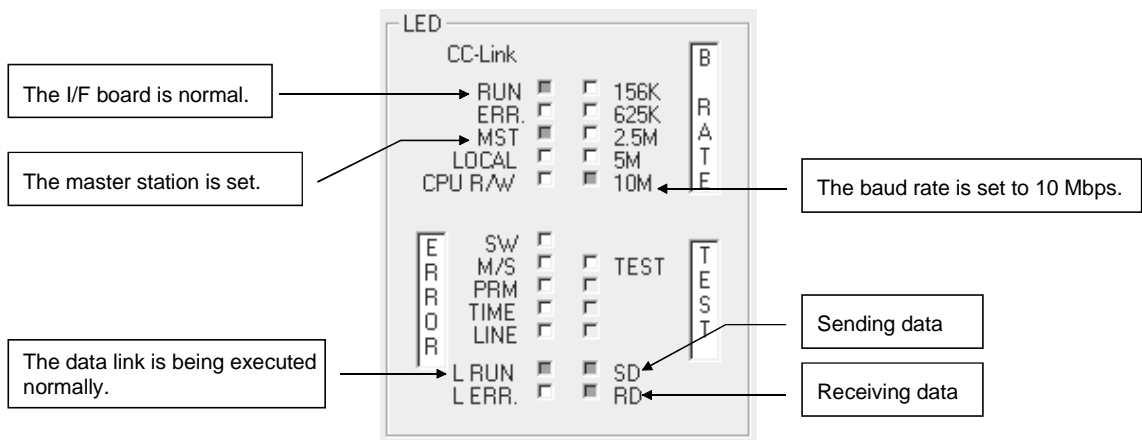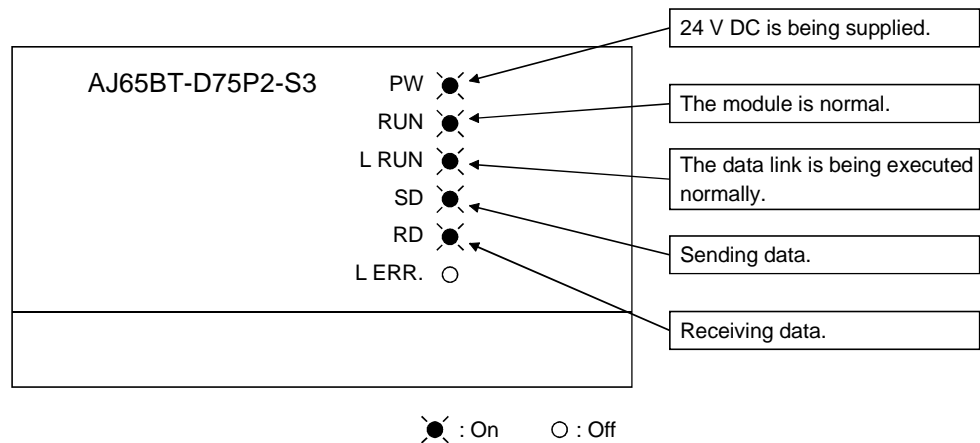
15.4.2 Confirming the operation with a user program

Using a user program, confirm that the data link is being executed normally.
With the sample program, initialization, home position return, positioning and JOG
operation can be performed.
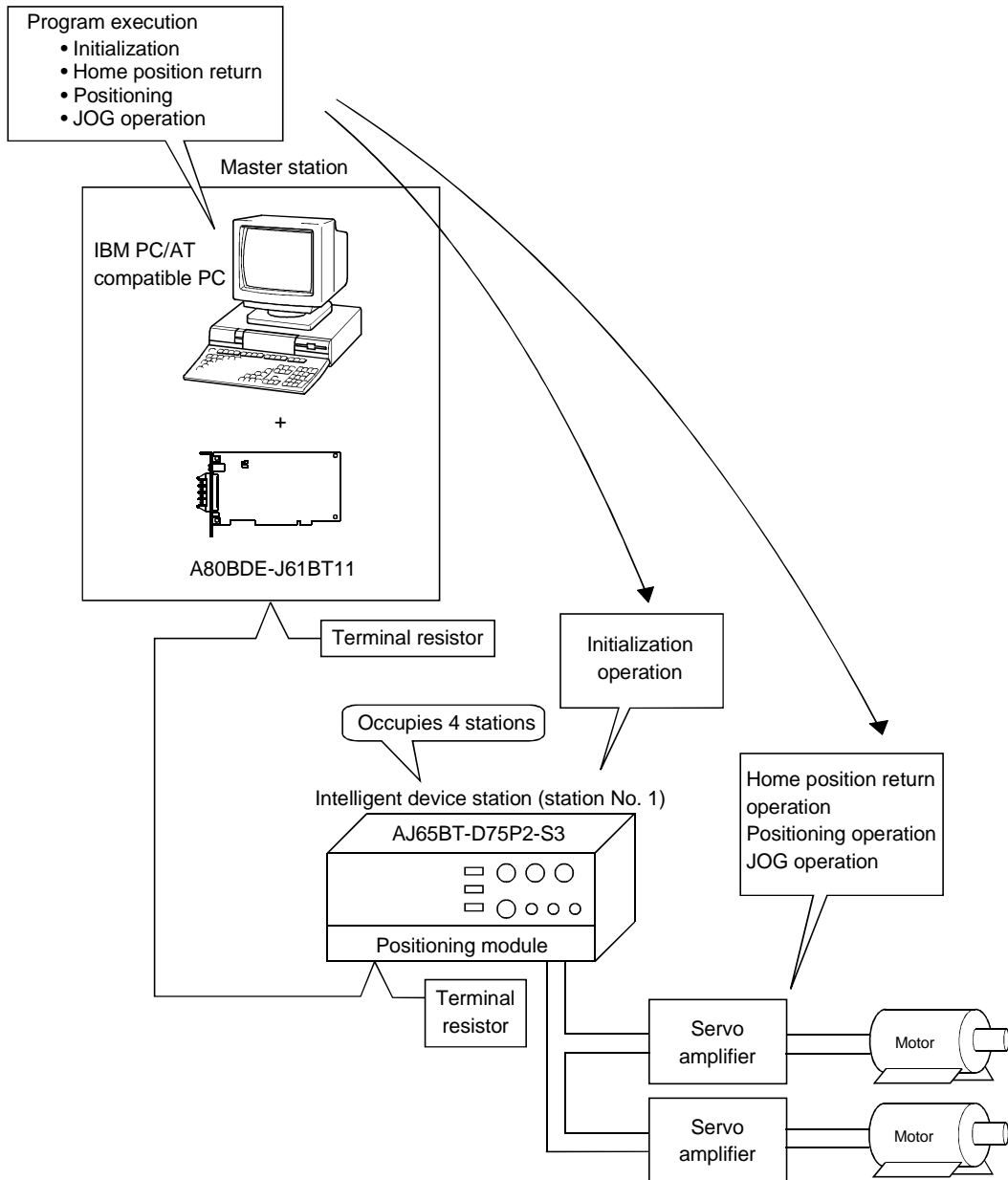
POINT

The sample program can be found in the CCLINK\SAMPLE directory under the
SW3DNF-CCLINK utility software installation directory (the default installation
directory is C:\MELSEC).

16 TROUBLESHOOTING

This chapter describes the details of the problems that may occur in the CC-Link System. It presents a list of check items and corrective actions to take for possible problems.

16.1 Hardware Troubleshooting

16.1.1 Verification of problem occurrence

If a problem occurs when starting up the I/F board, check the appropriate procedure for checking the cause of the problem according to Table 16.1 below.

Table 16.1 Troubleshooting flow by the problem occurrence type

No.	Error description	See the following section
1	The system is not operating normally when the I/F board is started up.	See Section 16.1.2, "Troubleshooting flow when the board and IBM PC/AT compatible PC are not operating."
2	Errors are displayed on event viewer/error Viewer.	See Section 16.1.3, "List of messages of error events that may occur when starting the driver."

16

16.1.2 Troubleshooting flow when the board and IBM PC/AT compatible PC are not operating

The following shows a flowchart for checking the I/F board in the standalone IBM PC/AT compatible PC when the I/F board was not operating normally at startup.

START

Is the "RUN" LED on the A80BDE-J61BT11 lit?

NO → Has the operating system started up normally?

NO → Remove other optional board(s) and leave only the A80BDE-J61BT11.

YES → Is a driver message displayed on event viewer of the management tool? *1

NO → 2) Replace the A80BDE-J61BT11.

YES → Did a WDT error occur?

NO → Replace the A80BDE-J61BT11.

YES → Start the utility.

Click the [Apply] button in the Board Information window and reset the board.

Did a WDT error occur?

YES → Replace the A80BDE-J61BT11.

NO → E N D

YES (from RUN LED) → Did the screen display turn blue when starting up the operating system and a system error displayed?

YES → Remove all A80BDE-J61BT11 boards.

Did the screen display turn blue when starting up the operating system and a system error displayed?

YES → Reinstall Windows NT 4.0 or Windows 95/98, or call Microsoft Technical Support.

NO → Replace the A80BDE-J61BT11.

NO → 1)

1)

2)

Is a driver message displayed on event viewer of the management tool? *1

YES

NO

Start the monitor function (utility).

Check switch and other settings according to the error description in event viewer.

Did the monitor function (utility) start normally?

NO

YES

Remove other optional board(s) and leave only the A80BDE-J61BT11.

Did the monitor function (utility) start normally?

YES

NO

Is the correct number of installed A80BDE-J61BT11 boards displayed?

NO

Check the I/O, IRQ and memory address settings of other optional board(s).

YES

E N D

Replace the A80BDE-J61BT11.

NO

Normal?

YES

Replace the IBM PC/AT compatible PC.

E N D

*1: If Windows 95/98 is used, check the driver message in error viewer.

16.1.3 List of messages of error events that may occur when starting the driver

Table 16.2 lists the error messages that are displayed in event viewer/error viewer.

Table 16.2 List of error displayed in event viewer/error viewer

Event ID (HEX)	Error description	Corrective action
256 (100)	The driver could not be executed because an error occurred when starting the driver.	Reinstall the driver software. If the error persists, reinstall Windows 95/98 or Windows NT 4.0.
257 (101)	The I/F board could not be detected.	Check the installation status of the I/F board.
258 (102)	There was no response from hardware.	Replace the I/F board.
259 (103)	The number of boards detected exceeded the maximum number of boards that can be loaded.	Remove excessive boards.
262 (106)	An attempt to link a device name has failed.	Reinstall Windows 95/98 or Windows NT 4.0.
268 (10C)	An error occurred during reception processing. (The request packet is invalid.)	Check the programs of the IBM PC/AT compatible PC and PLC that requested the processing to this IBM PC/AT compatible PC.
269 (10D)	An error occurred during transmission processing.	
279 (117)	An error occurred while writing to the registry.	Reinstall the utility software.
280 (118)	A request that could not be processed was received from other station. (A request for which a response request could not be processed was received.)	Check the programs of the IBM PC/AT compatible PC and PLC that requested the processing to this IBM PC/AT compatible PC.
282 (11A)	The mapping of the I/O port has failed.	The I/O port is also used by another resource. Remove other optional board(s).
283 (11B)	The shared memory area of the I/F board is also used by other hardware.	Remove other optional board(s).
284 (11C)	The IRQ of the I/F board is also used by other hardware.	Remove other optional board(s).
285 (11D)	The I/F board detected a temperature abnormality; thus it may not operate normally.	Install the IBM PC/AT compatible PC in a location maintained at a proper temperature.
286 (11E)	Failed to allocate enough memory area to start the driver.	Increase the system memory.
288 (120)	A WDT error occurred.	Remove other optional board(s).
289 (121)	Handshaking with the shared memory area has failed.	Reset the board. If the error persists, replace the board.
290 (122)	Duplicate I/F board number.	Do not use duplicate board numbers.
291 (123)	The mapping of the shared memory area has failed.	Remove other optional board(s).
293 (125)	An attempt to perform interrupt registration has failed.	Remove other optional board(s).
294 (126)	The I/O port of the I/F board is also used by other hardware.	Remove other optional board(s). ＊1

Event ID (HEX)	Error description			Corrective action
1281 (501)	Initialization of the I/F board has failed.	DUMP value	Error description (details)	—
		01h	There was no response from hardware.	Replace the I/F board.
		67h 68h	Duplicate IRQ or memory assignment. ＊2	Remove other optional board(s).
		03h	There was no response from hardware.	Replace the I/F board.
		04h 21h	Handshaking with the shared memory area has failed.	Restart. If the error persists, replace the board.
		66h	There was no response from hardware.	Replace the I/F board.

DUMP value•••••Value of the first 1 byte in the detailed data description area

＊1: If this event error is displayed in Windows NT 4.0 Event Viewer on an IBM PC/AT compatible PC that has the BIOS setup values shown below, restart the system after setting the "Plug & Play O/S" to [No] and "Reset Configuration Data" to [Yes] as in the following example.

    Example)
    BIOS Setup Utility

    Set the following:

    Plug & Play O/S   : [YES]   → [No]
    Reset Configuration Data : [No]   → [YES]

    Then, restart.

＊2: This event error may occur when the PCI bus controller is not functioning correctly. If an IBM PC/AT compatible PC preinstalled with Windows 95/98 is used, use the Windows 95/98 and PCI bus controller driver supplied with the IBM PC/AT compatible PC.
    If Windows 95/98 was purchased separately, obtain the PCI bus controller driver supplied by the PC manufacturer and install it.
    This error may also occur if the USB driver is not functioning correctly. In this case, reinstall the USB driver and make sure that it functions correctly.

16.2 Programming Troubleshooting

16.2.1 Error codes when executing functions

When an error occurs during the execution of a function, the error code that is returned will be used as a return value.

The table 16.3 lists the error description and corrective actions to take for each of the return values:

Table 16.3 List of error codes when executing functions

Return value (HEX)	Error description	Corrective action
0	Normal completion	—
1	Driver not started The driver has not been started. The same interrupt number and I/O address as those of another board are used.	Correct the error occurred when starting the driver. Check the board settings.
2	Board response error A timeout has occurred while waiting for a response to the corrective action.	Review the operation status and board loading conditions of the access station. Retry with an application program.
65 (41)	Channel error An unregistered channel number was designated.	Check the channel number.
66 (42)	Already open error The designated channel has already been open.	Open only once.
67 (43)	Already closed error The designated channel has already been closed.	Close only once.
68 (44)	Path error A path other than for an open line was set.	Set the path to the station number that has an open line.
69 (45)	Processing code error An unsupported processing code was issued.	Use supported processing codes.
70 (46)	Station number designation error The designated station number is incorrect. A process that should have been requested to other station was requested to own station. Or, the station number corresponds to own station (0xFF) but the network number is not 0.	Correct the designation of the station numbers in an application program.
71 (47)	Receiving data error (when RECV is requested) Data has not been received.	Wait until data is received.
77 (4D)	Memory allocation error Sufficient memory could not be allocated.	End all other application programs that are currently running. Check if the system is operating normally. Restart the system.
78 (4E)	Timeout error during mode setting Mode setting was attempted but failed due to timeout.	Make sure that the dual-port memory is not used by another board, and restart. Hardware failure.
79 (4F)	Software setting data error Argument parameters were not set correctly during software setting.	Check the contents of the argument parameters in the software setting data.
81 (51)	Startup source channel response error (when SEND is requested) A response error when SEND is requested is abnormal.	Retry. Check if the system is operating normally. Restart the system.
85 (55)	Channel number error (when RECV is requested) Channel number error.	Check the channel number used when RECV is requested.

Return value (HEX)	Error description	Corrective action
100 (64)	Accessing own station board or requesting SEND An access request was issued to the own station board while accessing the own station board.	Retry.
101 (65)	Routing parameter error The routing parameters are not set.	Correct the routing parameters.
102 (66)	Data sending error Data sending has failed.	Retry. Check if the system is operating normally. Restart the system.
103 (67)	Data receiving error Data receiving has failed.	Retry. Check if the system is operating normally. Restart the system.
129 (81)	Device type error The designated device type is invalid.	Check the device type.
130 (82)	Device number error The designated device number is out of range. A device number other than a multiple of 8 was designated for bit device designation.	Check the device number.
131 (83)	Number of device points error The designated number of points is out of device range. A device number other than a multiple of 8 was designated for bit device designation.	Check the size.
132 (84)	Number of write bytes error The designated number of bytes to be written was out of range.	Set the number of bytes to be written within the range.
133 (85)	Link parameter error The link parameters are corrupted. The total number of slave stations is 0 in a link parameter. Link parameter's fixed pattern is corrupted. Link parameter's sum check is corrupted.	Reset the link parameters.
136 (88)	Random write designation error A value other than 0 to 2 was designated for random read.	Correct the setting value to 0 to 2.
215 (D7)	Receiving data length error Receiving data length or byte length exceeds the range.	Retry. Check the cable.
	The request data buffer length exceeded the limit The request data length exceeded the request data area.	Make the request data smaller.
224 (E0)	PC number error The request destination is not found.	Correct the station number.
225 (E1)	Processing mode error A processing code that could not be processed by the request destination's ACPU was set. (This is checked by the request destination's ACPU.)	Review the request destination's ACPU and processing codes.
227 (E3)	Other data error Data such as the address, head step or number of shifts of the request data was incorrect.	Correct the request data.
228 (E4)	Link designation error A processing code that could not be processed by the request destination station was set. (This is checked by the request destination's link module.)	Check the request destination's station number and processing codes.

Return value (HEX)	Error description	Corrective action
1280 (500)	Own board memory access error	Check the switch settings of the own board and move the memory address to an area that is not affected by other board. Change the memory access setting to 16 bits if it is set to 8 bits.
1281 (501)	Cannot access the I/O port	Check the I/O port address setting. Perform a self-loopback test of the board and check hardware.
16386 (4002)	A request that could not be processed was received.	Change the request destination.
16432 (4030)	The designated device type does not exist.	Check the designated device type.
16433 (4031)	The designated device number is out of range.	Check the designated device number.
16448 (4040)	A module does not exist.	Do not issue the request that generated the error to the designated special module.
16449 (4041)	The number of device points is out of range.	Check the head address and number of access points, and access the devices within the existing range.
16450 (4042)	Corresponding module is abnormal.	Check if the designated module is operating normally.
16451 (4043)	A module does not exist at the designated location.	Check the start I/O number of the designated module.
40577 (9E81)	Device type error The device type designated for the request destination station is invalid. (This is checked by the request destination's link module).	Check the device type.
40578 (9E82)	Device No. error The device number designated for the request destination station is out of range. A device number other than a multiple of 8 was designated for bit device designation. (This is checked by the request destination's link module).	Check the device number.
40579 (9E83)	Error in the number of devices points The number of points set for the destination station is out of range. A device number other than a multiple of 8 was designated for bit device designation. (This is checked by the request destination's link module).	Check the size.
-1 (FFFF)	Bus error The designated bus is invalid.	Check the bus that was returned by the mdOpen function.
-2 (FFFE)	Device number error The designated device number is out of range. When a bit device was designated, the device number was not a multiple of 8.	Check the head device number for the designated device.
-3 (FFFD)	Device type error The designated device type is invalid.	Check if the device type used is found in the device list.
-4 (FFFC)	CPU error An invalid station was designated.	Check the status of the communication station. Check the designated station number.

Return value (HEX)	Error description	Corrective action
-5 (FFFB)	Size error The device number and size exceeded the device range. Access was attempted using an odd numbered device. The device number and size exceeded the range for the same block.	Check the designated device size. Check the device number and size.
-6 (FFFA)	Number of blocks error The number of blocks designated in dev[0] for device random read/write is out of range.	Check the number of blocks designated in dev[0].
-8 (FFF8)	Channel number error The channel number designated in the mdOpen function is invalid.	Check the designated channel number.
-11 (FFF5)	Insufficient buffer area The read area size for read data storage array variables is too small.	Check the read size and read data storage destination size.
-12 (FFF4)	Block error The block number of the designated extension file register is invalid.	Check the block number (device type) of the extension file register.
-13 (FFF3)	Write protect error The block number of the designated extension file register duplicates with the write protect area of the memory cassette.	Check the block number (device type) of the extension file register. Check the write protection DIP switch of the access destination's memory cassette.
-14 (FFF2)	Memory cassette error No memory cassette is installed in the accessed CPU, or an incorrect memory cassette is loaded.	Check the memory cassette of the access destination.
-15 (FFF1)	Read area length error The read area size for read data storage array variables is too small.	Check the read size and read data storage destination size.
-16 (FFF0)	Station number/network number error The station number/network number is out of range.	Check the designated station number/network number.
-17 (FFEF)	All-station/group number designation error All-station/group number was designated for a function that does not support all-station/group number designation.	Check if the function supports all-station/group number designation.
-18 (FFEE)	Remote designation error An undesignated code was designated.	Check the designated code.
-19 (FFED)	SEND/RECV channel number error The channel number designated with the SEND/RECV function is out of range.	Check the designated channel number.
-21 (FFEB)	Error occurred in gethostbyname ( ) An error occurred in the gethostbyname ( ) function.	Check if the designated host name exists in the HOSTS file.
-24 (FFE8)	Timeout error occurred in select ( ) A timeout error occurred in the select ( ) function.	Check if the MGW server service has been started in the server machine.
-25 (FFE7)	Error occurred in sendto ( ) An error occurred in the sendto ( ) function.	Check if normal Ethernet communication can be performed with the server machine.
-26 (FFE6)	Error ocurred in recvfrom ( ) An error occurred in the recvfrom ( ) function.	
-28 (FFE4)	Abnormal response received An abnormal response was received.	
-29 (FFE3)	Receiving data length error Too much data was received.	

Return value (HEX)	Error description	Corrective action
-30 (FFE2)	Sequence number error The received sequence number is abnormal.	Check if normal Ethernet communication can be performed with the server machine.
-31 (FFE1)	DLL load error An attempt to load a DLL required to execute functions has failed.	Set up the utility software again.
-32 (FFE0)	Another task/thread is occupying the resource and the resource is not released within 30 seconds.	Retry. Memory may be insufficient. Close all other applications that are currently running. Check if the system is operating normally. Restart the system.
-33 (FFDF)	Invalid access destination error The setting for the communication destination is invalid.	Check if the communication destination is correctly set by the utility.
-34 (FFDE)	Registry error An attempt to open the registry has failed.	
-35 (FFDD)	Registry read error An attempt to read from the registry has failed.	Check if the communication destination is correctly set by the utility.
-36 (FFDC)	Registry write error An attempt to write to the registry has failed.	
-37 (FFDB)	Communication initialization setting error An attempt to perform initial setting for communication has failed.	Retry. Memory may be insufficient. Close all other applications that are currently running. Check if the system is operating normally. Restart the system.
-38 (FFDA)	Ethernet communication error An attempt to set an Ethernet communication has failed.	Retry. Check if the communication destination is correctly set by the utility. Memory may be insufficient. Close all other applications that are currently running. Check if the system is operating normally. Restart the system.
-39 (FFD9)	COM communication setting error An attempt to set a COM communication has failed.	
-41 (FFD7)	COM control error Control cannot be performed properly in COM communication.	Retry. Check if the system is operating normally. Restart the system.
-42 (FFD6)	Close error Communication cannot be closed.	
-43 (FFD5)	ROM operation error A TC setting value was written to the CPU during ROM operation.	Change the TC setting value during RAM operation.
-44 (FFD4)	LLT communication setting error An attempt to set an LLT communication has failed.	Retry. Check if the communication destination is correctly set by the utility. Memory may be insufficient. Close all other applications that are currently running.
-45 (FFD3)	Ethernet control error Control cannot be performed properly in Ethernet communication.	Retry. Check if the system is operating normally.

Return value (HEX)	Error description	Corrective action
-46 (FFD2)	USB open error Initialization and opening of the USB port failed.	Memory may be insufficient. Close all other applications that are currently running. Check if the system is operating normally. Restart the system.
-47 (FFD1)	Random read condition unsatisfied error Random read cannot be performed because the random read condition is not satisfied.	Conditioned random read is set from a software such as GPPW. Wait until the conditions are satisfied. Clear the condition settings.
-50 (FFCE)	Maximum open path value error The number of open paths exceeds the maximum value (32).	Close several paths.
-51 (FFCD)	Exclusive control error An exclusive control error occurred.	Retry. Check if the system is operating normally.
-16386 to -20222 (B102 to BFFE)	See Section 16.3.5, "Error codes stored in the link special registers."	See Section 16.3.5.
-18560 (B780)	A transient request was issued to a remote I/O station.	Check the request destination station.
-18575 (B771)	Other station's dedicated device was accessed to own station.	Check the device type.
-24957 (9E83)	Number of device points error The number of points set for the request destination station is out of device range. When a bit device was designated, the number of points was not a multiple of 8. (This is checked by the request destination's link module.)	Check the size.
-24958 (9E82)	Device number error The device number designated for the request destination station is out of device range. When a bit device was designated, the device number was not a multiple of 8. (This is checked by the request destination's link module.)	Check the device number.
-24959 (9E81)	Device type error The device type designated for the request destination station is invalid. (This is checked by the request destination's link module.)	Check the device type.
-25056 (9E29)	Processing code error A processing code that could not be processed by the request destination station was set. (This is checked by the request destination's link module.)	Check the request destination station number and processing codes.
-26333 (9923)	The ROM version of the I/F board does not support the QCPU (Q mode).	Access a CPU other than a QCPU (Q mode). Use the I/F board (ROM version "W" or later) packed with SW3DNF-CCLINK or later.
-26334 (9922)	Board reset error Another process that used the same channel executed a board reset while accessing other station.	Retry.
-26336 (9920)	Request error for another loop Routing to another loop was performed.	Change the routing request destination to an AnUCPU or QnACPU.
-28150 (920A)	Device access error of the data link interrupted station Attempt was made to access the device ranges of a data link interrupted station of the own station devices RX, RY, RWw and RWr, as well as a reserved station.	Data can be read and written, but the validity of the data is not guaranteed.
-28151 (9209)	APS NO error Invalid response data was received.	Change the device that requested the processing.
-28156 (9204)	Dual-port memory handshake error	Remove other optional board(s).
-28158 (9202)	WDT error	Reset the board. Restart the IBM PC/AT compatible PC.

16.3 CC-Link System Troubleshooting

This chapter describes the details of the problems that may occur in the CC-Link System. It presents a list of check items and procedures for possible problems.

16.3.1 Verification of problem occurrence

The following shows the details of check items and procedures for possible problems.

Table 16.4 List of check items when a problem occurs

Description of problem	Check item	Check procedure
The entire system cannot perform data link.	Are there any disconnected cables?	• Check the cable connection visually or with a line test. • Check the line status (SW0090).
	Are terminal resistors connected to the terminal stations of the CC-Link system?	Connect the supplied terminal resistors to the terminal stations at both ends of the CC-Link system.
	Are the correct terminal resistors connected?	Connect the terminal resistors that match the cable type used to the terminal stations located at both ends of the CC-Link system. (See Section 4.3.)
	Has an error occurred in the I/F board?	Check the error code of the I/F board and take a necessary corrective action.
	Are the CC-Link parameters set for the I/F board?	Check the contents of the parameters for the I/F board.
	Has an error occurred in the master station?	• Check the own station parameter status (SW0068). • Check the switch setting status (SW006A). • Check the installation status (SW0069). • Check to see if the "ERR." LED on the master station is flashing. (See Section 16.3.2.)
Cannot receive inputs from a remote I/O station.	Is the corresponding remote I/O station performing data link?	• Check the LED displays on the corresponding remote I/O station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote input RX (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).

Description of problem	Check item	Check procedure
Cannot receive inputs from a remote I/O station.	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot output data from a remote I/O station.	Is the corresponding remote I/O station performing data link?	• Check the LED displays on the corresponding remote I/O station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	• Check the parameters. • Check the total number of all stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot receive the remote input RX of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).

Description of problem	Check item	Check procedure
Cannot receive the remote input RX of a remote device station.	Is data read from the correct address of the remote input RX (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot turn on/off the remote output RY of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of remote output RY (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).

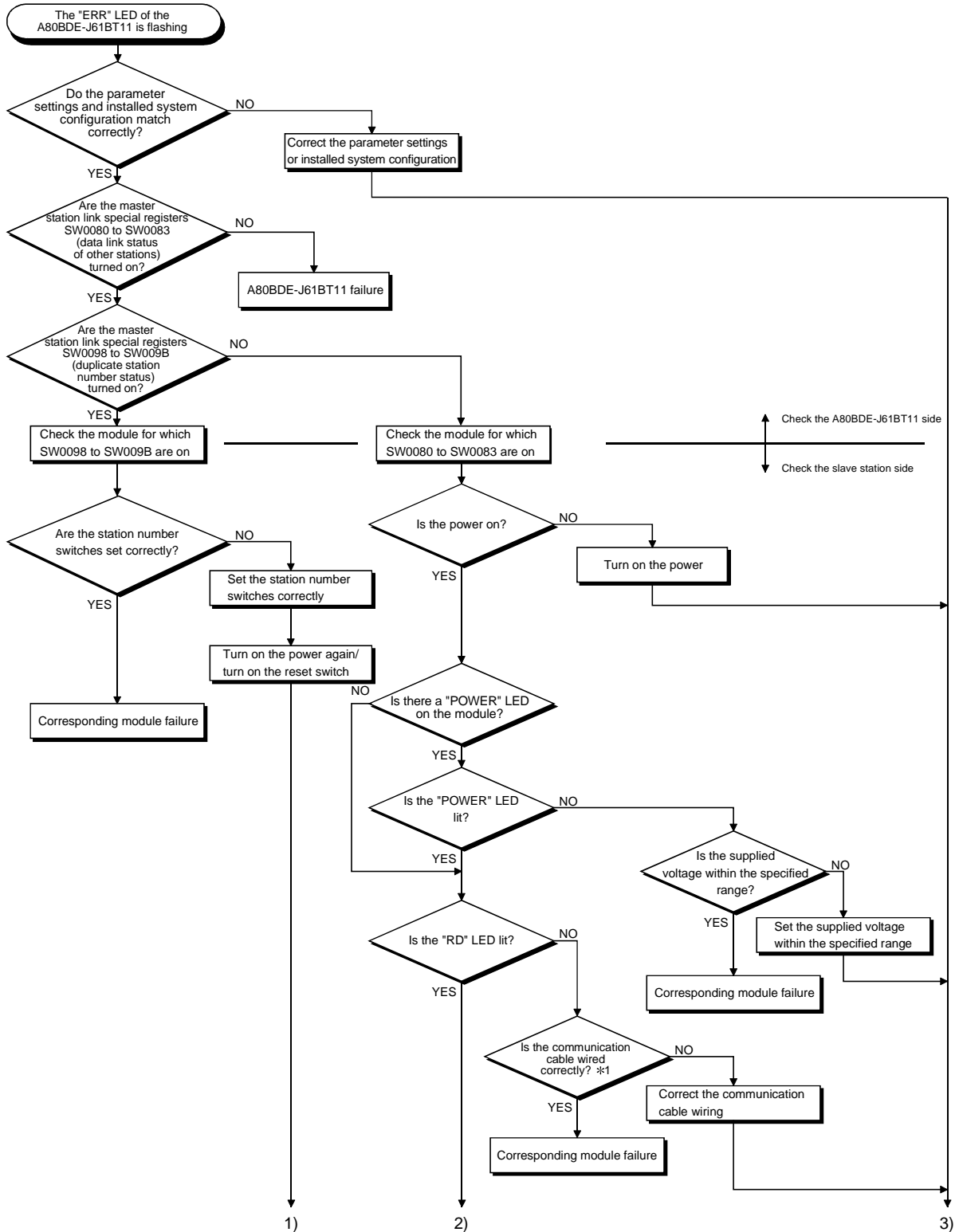| Description of problem	Check item	Check procedure
Data cannot be received by the remote register RWr of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote register RWr (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot write data to the remote register RWw of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED displays on the corresponding remote device station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data read from the correct address of the remote register RWw (buffer memory)?	Check the user program.
	Is the correct master station's parameter information area (CPU internal parameters, default parameters) being used?	Check the parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).

Description of problem	Check item	Check procedure
Cannot write data to the remote register RWw of a remote device station.	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot communicate from the master station (remote output RY) to a local station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory) of the master station?	Check the user program.
	Is data read from the correct address of the remote input RX (buffer memory) of the local station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot communicate from a local station (remote output RY) to the master station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote output RY (buffer memory) of the local station?	Check the user program.
	Is data read from the correct address of the remote input RX (buffer memory) of the master station?	Check the user program.
	Is the corresponding local station number recognaized bu the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).

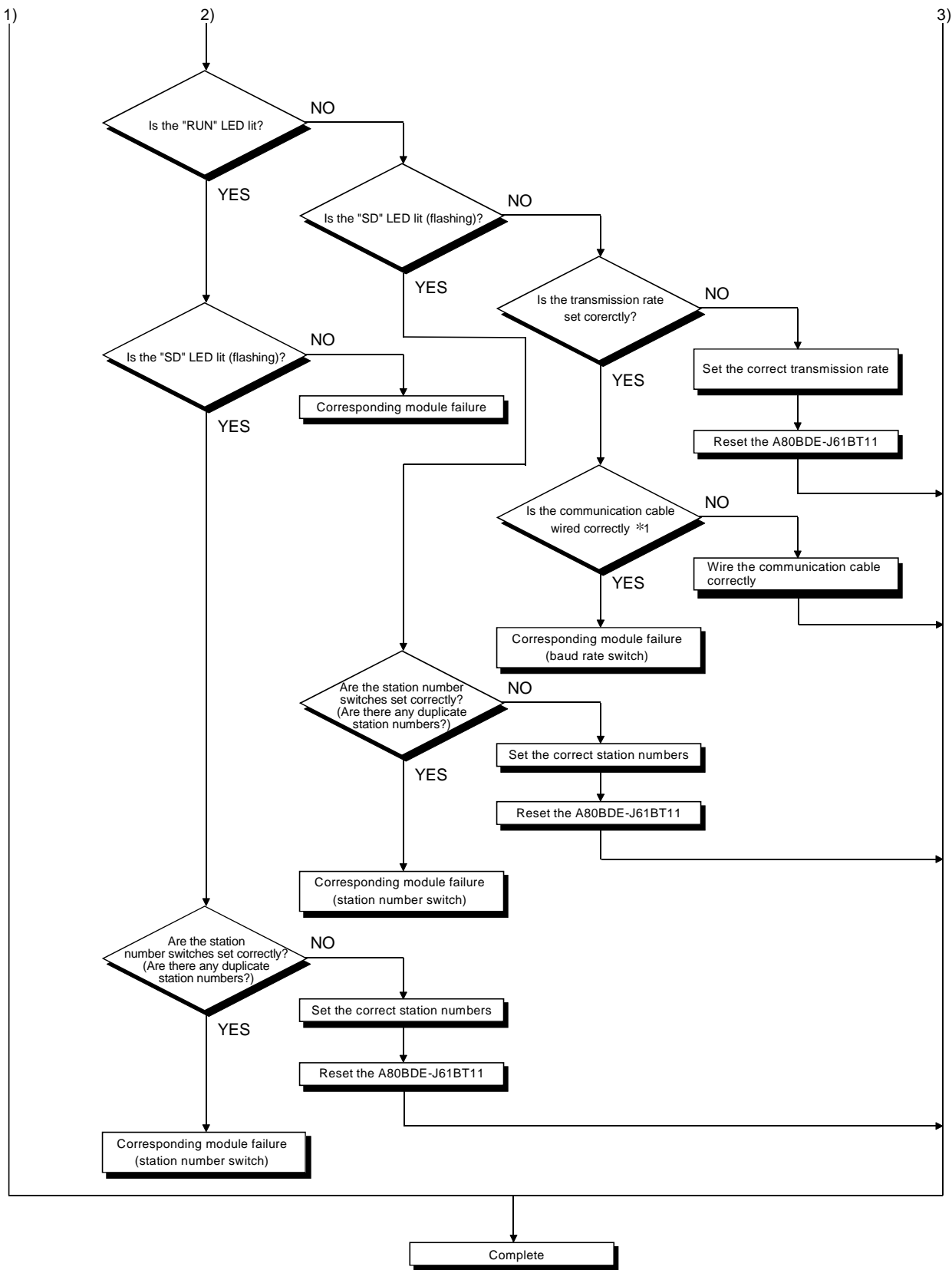| Description of problem	Check item	Check procedure
Cannot communicate from a local station (remote output RY) to the master station (remote input RX).	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot communicate from the master station (remote register RWw) to a local station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083).
	Is data written to the correct address of the remote register RWw (buffer memory) of the master station?	Check the user program.
	Is data read from the correct address of the remote register RWr (buffer memory) of the local station?	Check the user program.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot communicate from a local station (remote register RWw) to the master station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED displays on the corresponding local station. • Check the communication status of the master station with other stations (SW0080 to SW0083)
	Is data written to the correct address of the remote register RWw (buffer memory) of the local station?	Check the user program.
	Is data read from the correct address of the remote register RWr (buffer memory) of the master station?	Check the user program.
	Is the corresponding local station number recognaized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the maximum communication station number (SW0071). • Check the number of connected modules (SW0072).

Description of problem	Check item	Check procedure
Cannot communicate from a local station (remote register RWw) to the master station (remote register RWr).	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station designation status (SW0074 to SW0077).
	Are there any duplicate station numbers?	• Check the station number setting. • Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B).
	Do the settings match?	• Check the installation status (SW0069). • Check the station number duplicate status (SW0098 to SW009B). • Check the installation/parameter matching status (SW009C to SW009F).
Cannot stop data link.	Is the data link stop (SB0002) turned on?	Check the user program.
	Has an error occurred?	Check the data link stop result (SW0045).
Cannot restart data link.	Is the data link restart (SB0000) turned on?	Check the user program.
	Has an error occurred?	Check the data link restart result (SW0041).
	Is the corresponding station disconnected?	• Check the cable connection visually or with a line test. • Check the parameters (for local station). • Check the operation status of the PLC CPU in the corresponding station.
The remote station/local station/intelligent device station/standby master station does not start up.	Do the parameters for the number of modules and station information match the settings of the modules that do not start up?	Check the parameters.
	Are there any duplicate station numbers?	Check the station number setting.
Faulty stations cannot be detected.	Is the station set as an error invalid station?	Check the parameters.
	Are there any duplicate station numbers?	Check the station number setting.
Faulty stations are generated depending on the transmission rate.	Can the faulty station be identified using the communication status of other stations (SW0080 to SW0083)?	• Check the switch settings for the faulty station. • Check that the cable is properly wired. • Check that the shield of the cable is grounded. • Connect the terminal resistors that match the cable type used to the terminal stations at both ends of the CC-Link system.
	Can communication be performed normally if the transmission rate is reduced to a lower speed such as 156 kbps?	
The remote device station is not operating normally.	Are there any errors in the initial settings of the remote device station?	• Check the parameters. • Check the user program.
When multiple remote stations are powered off at the same time at 156 kbps, the "L RUN" LED goes off temporarily.	What is the setting for the number of retries?	• Increase the transmission rate. • Reduce the number of retries.

16.3.2 Troubleshooting flow when the "ERR" LED on the master station is flashing
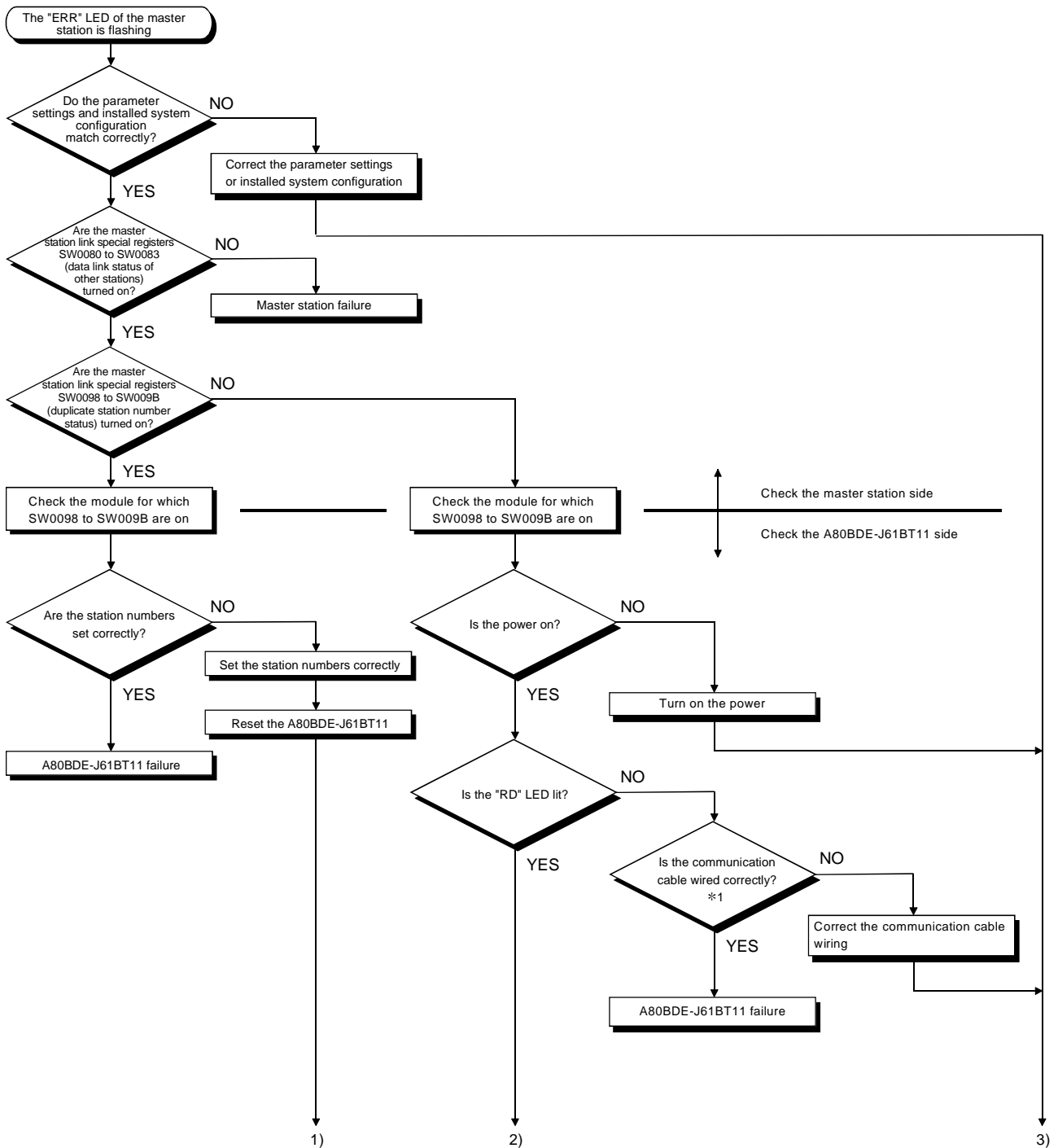
(1) When the I/F board is used as the master board

∗1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.
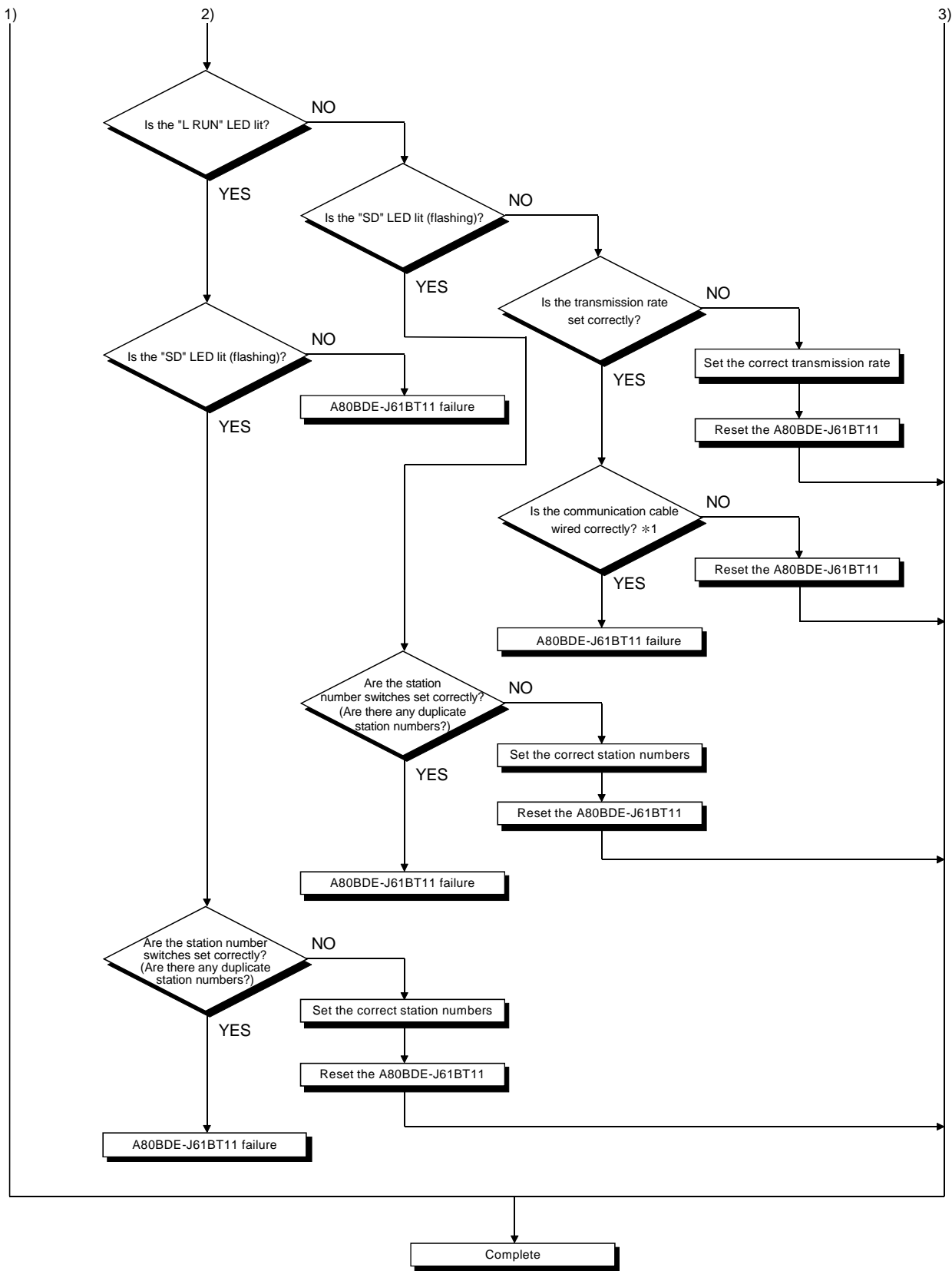
1)   2)   3)

Is the "RUN" LED lit? — NO

YES

Is the "SD" LED lit (flashing)? — NO

YES

Is the "SD" LED lit (flashing)? — NO

YES

Corresponding module failure

Is the transmission rate set corerctly? — NO

YES

Set the correct transmission rate

Reset the A80BDE-J61BT11

Is the communication cable wired correctly *1 — NO

YES

Wire the communication cable correctly

Corresponding module failure (baud rate switch)

Are the station number switches set correctly? (Are there any duplicate station numbers?) — NO

YES

Set the correct station numbers

Reset the A80BDE-J61BT11

Corresponding module failure (station number switch)

Are the station number switches set correctly? (Are there any duplicate station numbers?) — NO

YES

Set the correct station numbers

Reset the A80BDE-J61BT11

Corresponding module failure (station number switch)

Complete

*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

(2)　When the I/F board is used as a local board

```
            ┌─────────────────────────┐
            │ The "ERR" LED of the     │
            │ master station is        │
            │ flashing                 │
            └────────────┬─────────────┘
                         │
                    ◇ Do the parameter          NO
                      settings and installed  ──────→ ┌──────────────────────────┐
                      system configuration            │ Correct the parameter    │
                      match correctly? ◇               │ settings or installed    │
                         │ YES                         │ system configuration     │
                                                       └──────────────────────────┘
```

Are the master station link special registers SW0080 to SW0083 (data link status of other stations) turned on?

NO → Master station failure

Are the master station link special registers SW0098 to SW009B (duplicate station number status) turned on?

NO →

Check the module for which SW0098 to SW009B are on

Check the module for which SW0098 to SW009B are on

Check the master station side

Check the A80BDE-J61BT11 side

Are the station numbers set correctly?

NO → Set the station numbers correctly → Reset the A80BDE-J61BT11

YES → A80BDE-J61BT11 failure

Is the power on?

NO → Turn on the power

YES

Is the "RD" LED lit?

NO → Is the communication cable wired correctly? *1

NO → Correct the communication cable wiring

YES → A80BDE-J61BT11 failure

1)　　　　　　　　　2)　　　　　　　　　3)

*1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

1)   2)   3)

Is the "L RUN" LED lit? ──NO──┐

│YES

          Is the "SD" LED lit (flashing)? ──NO──┐

          │YES

Is the "SD" LED lit (flashing)? ──NO──┐

│YES

          A80BDE-J61BT11 failure

                    Is the transmission rate set correctly? ──NO──┐

                    │YES

                              Set the correct transmission rate

                              Reset the A80BDE-J61BT11

                    Is the communication cable wired correctly? ∗1 ──NO──┐

                    │YES

                              Reset the A80BDE-J61BT11

                    A80BDE-J61BT11 failure

          Are the station number switches set correctly? (Are there any duplicate station numbers?) ──NO──┐

          │YES

                    Set the correct station numbers

                    Reset the A80BDE-J61BT11

          A80BDE-J61BT11 failure

Are the station number switches set correctly? (Are there any duplicate station numbers?) ──NO──┐

│YES

          Set the correct station numbers

          Reset the A80BDE-J61BT11

A80BDE-J61BT11 failure

Complete

∗1: Check for short circuits, reversed connections, disconnections, terminal resistors, FG connections, overall distance, and distance between stations.

16.3.3 List of link special relays (SBs)

The data link status can be checked by the bit information (link special relays: SBs).

Table 16.5 List of link special relays (SBs)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000	Data link restart	Restarts the data link that was stopped by SB0002. Off: Restart not directed On: Restart directed	○	×	×
SB0001	Master station switching and data link startup	Switches the output information from the standby master station to the master station and starts data link. Off: Switching not directed On: Switching directed (can be used for the standby master station)	×	×	×
SB0002	Data link stop	Stops own station's data link. (Use SB0000 for restart.) However, when the master station executes this, the entire system will stop. Off: No stop directed On: Stop directed	○	○	×
SB0004	Temporary error invalid station request	Sets the stations designated by SW0003 to SW0007 as temporary error invalid stations. Off: Not requested On: Requested	○	×	×
SB0005	Temporary error invalid station cancel request	Cancels the temporary error invalid stations designated by SW0003 to SW0007. Off: Not requested On: Requested	○	×	×
SB0009	Parameter setting test request	Reads the parameter information for the actual system configuration and sets it in the parameter information area. Off: Not requested On: Requested	○	×	×
SB0020	Module status	Indicates the buffer access status. Off: Not requested On: Requested	○	○	○
SB0040	Data link restart acknowledgement status	Indicates the data link restart direction acknowledgement status. Off: Not acknowledged On: Startup direction acknowledged	○	○	×
SB0041	Data link restart completion status	Indicates the data link restart direction acknowledgement completion status. Off: Not complete On: Startup complete	○	○	×
SB0042	Acknowledgement status of master station switching and data link startup	Indicates the acknowledgement status of the data link startup and switching direction from the standby master station to the master station Off: Not acknowledged On: Direction acknowledged (can be used for the standby master station)	×	×	×
SB0043	Completion status of master station switching and data link startup	Indicates the acknowledgement completion status of the data link startup and switching direction from the standby master station to the master station Off: Not complete On: Switching complete (can be used for the standby master station)	×	×	×

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0044	Data link stop acknowledgement status	Indicates the data link stop direction acknowledgement status. Off: Not acknowledged On: Stop direction acknowledged	○	○	×
SB0045	Data link stop completion status	Indicates the data link stop instruction acknowledgement completion status. Off: Not complete On: Stop complete	○	○	×
SB0048	Temporary error invalid station acknowledgement status	Indicates the acknowledgement status of the temporary error invalid station request direction. Off: Not acknowledged On: Direction acknowledged	○	×	×
SB0049	Temporary error invalid station completion status	Indicates the acknowledgement completion status of the temporary error invalid station request direction. Off: Not complete On: Temporary error invalid station established	○	×	×
SB004A	Temporary error invalid station cancel acknowledgement status	Indicates the acknowledgement status of the temporary error invalid station cancel request instruction. Off: Not acknowledged On: Direction acknowledged	○	×	×
SB004B	Temporary error invalid station cancel completion status	Indicates the acknowledgement completion status of the temporary error invalid station cancel request direction. Off: Not complete On: Temporary error invalid station cancellation complete	○	×	×
SB0060	Mode	Indicates the "Mode Setting" status of the CC-Link Utility. Off: Online (0) On: Other than Online (0)	○	○	○
SB0061	Station type	Indicates the "Own Station Setting" status of the CC-Link Utility. Off: Master (station number 0) On: Local (station numbers 1 to 64)	○	○	×
SB0062	Standby master station designation status	Indicates the designation status of the standby master station. Off: Not designated On: Designated	○	×	×
SB0065	Input data status of data link faulty station	Indicates the "Link Err X Data" setting status of the CC-Link Utility. Off: Clear On: Latch	○	○	×
SB0066	Number of occupied stations	Indicates the "Occupy St." setting status of the CC-Link Utility. Off: 1 station On: 4 stations	×	○	×
SB006A	Switch setting status	Indicates the "Own Station Setting" status of the CC-Link Utility. Off: Normal On: Setting error exists (error code is stored in SW006A)	○	○	○
SB006D	Parameter setting status	Indicates the "Parameter Setting" status of the CC-Link Utility. Off: Normal On: Setting error exists (error code is stored in SW0068)	○	×	×
SB006E	Own station operation status	Indicates the operation status of the own station data link. Off: Data link being executed On: Data link not executed	○	○	×
SB0070	Master station data link status	Indicates the data link status. Off: Data link by the master station On: Data link by the standby master station	○	○	×
SB0071	Standby master station presence information	Indicates whether or not a standby master station exists. Off: Standby master station does not exist On: Standby master station exists	○	○	×

Number	Name	Description	Availability ($\bigcirc$: Available, $\times$: Not available)		
			Online		Offline
			Master station	Local station	
SB0074	Reserved station designation status	Indicates the reserved station designation status by the "Parameter Setting" of the CC-Link Utility. (SW0074 to SW0077) Off: Not designated On: Designated	$\bigcirc$	$\bigcirc$	$\times$
SB0075	Error invalid station designation status	Indicates the error invalid station designation status by the "Parameter Setting" of the CC-Link Utility. (SW0078 to SW007B) Off: Not designated On: Designated	$\bigcirc$	$\bigcirc$	$\times$
SB0076	Temporary error invalid station setting information	Indicates whether or not a temporary error invalid station is set. (SW007C to SW007F) Off: Not set On: Set	$\bigcirc$	$\bigcirc$	$\times$
SB0077	Parameter receiving status	Indicates the parameter receiving status from the master station. Off: Reception complete On: Reception not complete	$\times$	$\bigcirc$	$\times$
SB0078	Own station switch change status	Detects changes in the CC-Link Utility during data linking. Off: No change detected On: Change detected	$\bigcirc$	$\bigcirc$	$\times$
SB0080	Other station data link status	Indicates the data link status with other stations. (SW0080 to SW0083) Off: All stations are normal On: Faulty station exists	$\bigcirc$	$\bigcirc$	$\times$
SB0081	Other station watchdog timer error status	Indicates of a watchdog timer error status in other stations. (SW0084 to SW0087) Off: No error On: Error occurred	$\bigcirc$	$\bigcirc$	$\times$
SB0082	Other station fusing status	Indicates whether or not a fuse has blown in other stations. (SW0088 to SW008B) Off: No fusing On: Fusing occurred	$\bigcirc$	$\bigcirc$	$\times$
SB0083	Other station switch change status	Detects changes in the setting switches of other stations during data linking. (SW008C to SW008F) Off: No change On: Change detected.	$\bigcirc$	$\bigcirc$	$\times$
SB0090	Own station line status	Indicates the line status of own station. Off: Normal On: Abnormal (disconnected)	$\times$	$\bigcirc$	$\times$
SB0094	Transient transmission error status	Indicates whether or not a transient transmission error occurred. (SW0094 to SW0097) Off: No error On: Error occurred	$\bigcirc$	$\bigcirc$	$\times$
SB0095	Master station transient transmission status	Indicates the transient transmission status of the master station. Off: Normal On: Abnormal	$\times$	$\bigcirc$	$\times$

16.3.4 List of link special registers (SWs)

The data link status can be checked by the word information (link special registers: SWs).

Table 16.6 List of link special registers (SWs)

Number	Name	Description	Online Master station	Online Local station	Offline
			Availability (○: Available, ×: Not available)		
SW0003	Multiple temporary error invalid station designation	Selects whether or not multiple temporary error invalid stations are designated. 00: Designates multiple stations indicated by SW0004 to SW0007. 01 to 64: Designates a single station from 1 to 64. * Designate the station number of a temporary error invalid station.	○	×	×
SW0004 • SW0005 • SW0006 • SW0007	Temporary error invalid station designation *1	Designates a temporary error invalid station. 0: Does not designate as a temporary error invalid station. 1: Designates as a temporary error invalid station. b15 b14 b13 b12 to b3 b2 b1 b0 SW0004: 16 15 14 13 to 4 3 2 1 SW0005: 32 31 30 29 to 20 19 18 17 SW0006: 48 47 46 45 to 36 35 34 33 SW0007: 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers.	○	×	×
SW0009	Monitor time setting	Sets the response monitor time when a dedicated instruction is used. Default value: 5 (seconds) Setting range: 0 to 360 (seconds) * The setting of 360 seconds will be used if a value outside of the above setting range is specified.	○	○	×
SW000A	CPU monitor time setting	Sets the CPU response monitor time when the CPU is accessed with a dedicated instruction or via the AJ65BT-G4. Default value: 5 (seconds) Setting range: 0 to 3600 (seconds) * The setting of 3600 seconds will be used if a value outside of the above setting range is specified. (Note) Set this in the CC-Link master or local station that is connected to the target CPU.	○	○	×
SW0020	Module status	Indicates the module status. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	○	○
SW0041	Data link restart result	Stores the execution result of the data link restart direction by SB0000. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	○	×
SW0043	Master station switching and data link startup result	Indicates the execution result of the switching direction. Stores the execution result of the master station switch and data link startup direction by SB0001. 0: Normal (can be used for the standby master station) Other than 0: Stores an error code (see Section 16.3.5).	×	×	×
SW0045	Data link stop result	Stores the execution result of the data link stop direction by SB0002. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	○	×
SW0049	Temporary error invalid station request result	Stores the execution result of the temporary error invalid station's request direction by SB0004. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	×	×
SW004B	Temporary error invalid station cancel request result	Stores the execution result of the temporary error invalid station's cancel request direction by SB0005. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	×	×

*1: Only the bit for the head station number is turned on.

Number	Name	Description	Online Master station	Online Local station	Offline
			Availability (○: Available, ×: Not available)		
SW0060	Mode setting status	Stores the "Mode Setting" status of the CC-Link Utility. 0: Online (remote net mode) 2: Offline 6: Module standalone hardware operation check	○	○	○
SW0061	Station number setting status	Stores the "Own Station Setting" status of the CC-Link Utility. 0: Master station 1 to 64: Local station	○	○	○
SW0062	Condition setting status	Stores the setting status of the CC-Link Utility. 0: Off 1: On b15 b8 b7 b6 b5 b4 b3 b2 b1 b0 [0] to [0 0 0 0 _ _ _ 0 0] — Type — Link Err X Data — Occupy St. Setting status table: 		Setting status ON	Setting status OFF
Type	Master station/local station	Standby master station
Link Err X Data	Clear	Latch
Occupy St.	1 station	4 stations		○	○	○
SW0064	Number of retries setting status	Stores the setting status of the number of retries designation at the time of an error response. 1 to 7 (times)	○	×	×
SW0065	Auto return station number setting status	Stores the setting status of the number of auto return stations during one link scan. 1 to 10 (stations)	○	×	×
SW0066	Delay timer setting status	Stores the setting status of the scan interval delay timer. 0 to 100 (ms)	○	×	×
SW0067	Parameter information	Stores the parameter information area to be used. 1: Buffer memory (data link started by Yn6) 2: E²PROM (data link started by Yn8)	○	×	○
SW0068	Own station parameter status	Stores the parameter setting status. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	×	×
SW0069	Installation status *2	Stores the duplicate station number and parameter matching with each station. 0: Normal Other than 0: Stores an error code (see Section 16.3.5). * Details are stored in SW0098 to 9B and SW009C to 9F.	○	×	×
SW006A	CC-Link Utility setting status	Stores the setting status of the CC-Link Utility 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	○	×
SW006D	Maximum link scan time	Stores the maximum value of the link scan time (in 1 ms units).	○	○	×
SW006E	Current link scan time	Stores the current value of the link scan time (in 1 ms units).	○	○	×
SW006F	Minimum link scan time	Stores the minimum value of the link scan time (in 1 ms units).	○	○	×

*2: This is checked and stored only at link startup.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0070	Total number of stations	Stores the last station number set in the "Parameter Setting" of the CC-Link Utility. 1 to 64 (stations)	○	×	×
SW0071	Maximum communication station number	Stores the maximum station number that is performing data link. 1 to 64 (stations)	○	×	×
SW0072	Number of connected modules	Stores the number of modules that are performing data link. 1 to 64 (stations)	○	×	×
SW0073	Standby master station number	Stores the station number of the standby master station. 1 to 63 (stations)	○	○	×
SW0074 • SW0075 • SW0076 • SW0077	Reserved station designation status [1]	Stores the reserved station designation status. 0: Other than reserved station 1: Reserved station b15 b14 b13 b12 to b3 b2 b1 b0 SW0074 16 15 14 13 to 4 3 2 1 SW0075 32 31 30 29 to 20 19 18 17 SW0076 48 47 46 45 to 36 35 34 33 SW0077 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×
SW0078 • SW0079 • SW007A • SW007B	Error invalid station designation status [1]	Stores the error invalid station designation status. 0: Other than error invalid station 1: Error invalid station b15 b14 b13 b12 to b3 b2 b1 b0 SW0078 16 15 14 13 to 4 3 2 1 SW0079 32 31 30 29 to 20 19 18 17 SW007A 48 47 46 45 to 36 35 34 33 SW007B 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×
SW007C • SW007D • SW007E • SW007F	Temporary error invalid station designation status [1]	Stores the temporary error invalid station designation status. 0: Other than temporary error invalid station 1: Temporary error invalid station b15 b14 b13 b12 to b3 b2 b1 b0 SW007C 16 15 14 13 to 4 3 2 1 SW007D 32 31 30 29 to 20 19 18 17 SW007E 48 47 46 45 to 36 35 34 33 SW007F 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×
SW0080 • SW0081 • SW0082 • SW0083	Other station data link status [3]	Stores the data link status of each station. 0: Normal 1: Data link error occurred b15 b14 b13 b12 to b3 b2 b1 b0 SW0080 16 15 14 13 to 4 3 2 1 SW0081 32 31 30 29 to 20 19 18 17 SW0082 48 47 46 45 to 36 35 34 33 SW0083 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×

[1]: Only the bit for the head station number is turned on.

[3]: The number of bits that equals to the number of occupied stations are turned on.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0084 • SW0085 • SW0086 • SW0087	Watchdog timer error status in other stations *[1]	Stores the watchdog timer error status of each station. 0: Normal 1: Watchdog timer error occurred 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0084	16	15	14	13	to	4	3	2	1
SW0085	32	31	30	29	to	20	19	18	17
SW0086	48	47	46	45	to	36	35	34	33
SW0087	64	63	62	61	to	52	51	50	49 | Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×
SW0088 • SW0089 • SW008A • SW008B	Other station fusing status *[3]	Stores the blown fuse occurrence status of each station. 0: Normal 1: Abnormal 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0088	16	15	14	13	to	4	3	2	1
SW0089	32	31	30	29	to	20	19	18	17
SW008A	48	47	46	45	to	36	35	34	33
SW008B	64	63	62	61	to	52	51	50	49 | Numbers 1 to 64 in the above table indicate the station numbers.	○	×	×
SW008C • SW008D • SW008E • SW008F	Other station switch change status *[1]	Stores the switch change status of other stations performing data link. 0: No change 1: Change occurred. 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW008C	16	15	14	13	to	4	3	2	1
SW008D	32	31	30	29	to	20	19	18	17
SW008E	48	47	46	45	to	36	35	34	33
SW008F	64	63	62	61	to	52	51	50	49 | Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×
SW0090	Own station line status	Stores the line status of own station. 0: Normal 1: Abnormal (disconnected)	×	○	×
SW0094 • SW0095 • SW0096 • SW0097	Transient transmission error status *[1]	Stores a transient transmission error status of each station. 0: Normal 1: Abnormal 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0094	16	15	14	13	to	4	3	2	1
SW0095	32	31	30	29	to	20	19	18	17
SW0096	48	47	46	45	to	36	35	34	33
SW0097	64	63	62	61	to	52	51	50	49 | Numbers 1 to 64 in the above table indicate the station numbers.	○	○	×

*1: Only the bit for the head station number is turned on.

*3: The number of bits that equals to the number of occupied stations are turned on.

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0098 • SW0099 • SW009A • SW009B	Station number duplicate status *4	Stores the station number duplicate status when the head station number of each module is not duplicated. 0: Normal 1: Duplicate station number (head station number only) 　　　　　b15 b14 b13 b12 to b3 b2 b1 b0 SW0098　16　15　14　13　to　4　3　2　1 SW0099　32　31　30　29　to　20　19　18　17 SW009A　48　47　46　45　to　36　35　34　33 SW009B　64　63　62　61　to　52　51　50　49 Numbers 1 to 64 in the above table indicate the station numbers.	○	×	×
SW009C • SW009D • SW009E • SW009F	Installation/parameter matching status *4	Stores the matching status between the installed station and parameter settings. 0: Normal Installation 1: Mismatching error Installation　　　　　　Parameters Remote device station ←→ Remote I/O station Local station ← Remote I/O station 　　　　　　　　Remote device station 　　　　　b15 b14 b13 b12 to b3 b2 b1 b0 SW009C　16　15　14　13　to　4　3　2　1 SW009D　32　31　30　29　to　20　19　18　17 SW009E　48　47　46　45　to　36　35　34　33 SW009F　64　63　62　61　to　52　51　50　49 Numbers 1 to 64 in the above table indicate the station numbers.	○	×	×
SW00B9	E^2PROM registration status	Stores the status of the parameter registration to E^2PROM. 0: Normal Other than 0: Stores an error code (see Section 16.3.5).	○	×	×

*1: Only the bit for the head station number is turned on.

*3: The number of bits that equals to the number of occupied stations are turned on.

*4: Only the bit for the head station number is turned on. In addition, this is checked and stored only at link startup.

The update timing of the data in a link special register (SW) differs depending on the link register number.

Table 16.7 lists the update timings of the link special registers.

Table 16.7 Update timings of the link special registers

Link special register	Data update timing	Link special register	Data update timing
SW0041	Updated individually regardless of the SB.	SW0071	Updated individually regardless of the SB. (Updated after each station reaches a stable condition.)
SW0045		SW0072	
SW0060	When the SB0060 changes.	SW0074 to SW0077	When the SB0074 changes.
SW0061	When the SB0061 changes.	SW0078 to SW007B	When the SB0075 changes.
SW0062	Updated individually regardless of the SB.	SW0080 to SW0083	When the SB0080 changes.
SW0067		SW0088 to SW008B	Updated individually regardless of the SB.
SW0068		SW0090	When the SB0090 changes.
SW0069		SW0098 to SW009B	Updated individually regardless of the SB.
SW006A		SW009C to SW009F	
SW006D		SW00B4 to SW00B7	
SW006E		SW00B8	
SW006F		SW00B9	
SW0070		—	—

16.3.5 Error codes stored in the link special registers

Table 16.8 lists the error codes that are stored in the link special registers (SWs).

Table 16.8 Error code list

Error code (hexadeci-mal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B110	Cannot receive messages.	A line error has occurred.	Check the line.	○	○
B111	Message data receiving order error	A line error has occurred.	Check the line.	○	○
B112	Message data length error	A line error has occurred.	Check the line.	○	○
B113	Message data ID error	A line error has occurred.	Check the line.	○	○
B114	Link error	A line error has occurred.	Check the line.	○	○
B115	Link error	A line error has occurred.	Check the line.	○	○
B116	Abnormal head bit	A line error has occurred.	Check the line.	○	○
B201	Corresponding station error during sending	A data link error occurred in the corresponding station during transient transmission.	Check the communication status of other stations, whether or not a temporary error invalid station is designated, or if the own station is stopped.	○	○
B301	Processing request error during link stop	A line test request was issued while the link was stopped.	Perform a line test during link startup.	○	○
B302	Designated station number setting error	The designated station number exceeded the maximum communication station number during temporary error invalid request/temporary error invalid cancel request.	Designate a station number that is no greater than the maximum communication station number.	○	×
B303	Designated station number not set error	The designated station numbers were not set during temporary error invalid request/temporary error invalid cancel request.	Set station numbers to designate. (SW0003, SW0004 to SW0007)	○	×
B304	Line test error station detected	When a line test was performed, an error was detected in a local station.	Verify that the local station is operational and that the cable is not disconnected.	○	×
B306	Designated station number setting error	A station number other than the head station was designated by a temporary error invalid request/temporary error invalid cancel request.	Designate the head station by a temporary error invalid request/temporary error invalid cancel request.	○	○
B307	All stations data link error	All stations were in data link error status when either of the following requests was made: • SB0000 (data link restart) • SB0002 (data link stop)	Request again after the data link becomes normal.	○	○
B308	Station number setting error (installation status)	The station number of the slave station is outside of the range between 1 and 64.	Set the station number of the slave station within the range between 1 and 64.	○	×
B309	Duplicate station number error	A duplicate station number was specified for the connected module (including the number of occupied stations). However, this excludes the duplicate head station numbers.	Check the module station number.	○	×
B30A	Installation/parameter mismatching error	The station types of the module are different from the parameter settings. Example) <table><tr><td>Connected module</td><td>Parameter setting</td></tr><tr><td>Remote device</td><td>Remote I/O</td></tr><tr><td rowspan="2">Intelligent device</td><td>Remote I/O</td></tr><tr><td>Remote device</td></tr></table>	Set the correct parameters.	○	×

Error code (hexadeci-mal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B30B	Installation/parameter mismatching error	The contents of the installation status and network parameters do not match.	Match the contents of the installation status and network parameters.	○	×
B30C	Standby master station designation error	Master station switching was directed to a station other than the standby master station.	Designate the station number of the standby master station.	○	○
B30D	Temporary error invalid station designation error	A temporary error invalid station was designated before the link was started.	Designate a temporary error invalid station during data link.	○	×
B384	Station number setting error (parameter)	The station number was set to a value "other than 1$_H$ to 40$_H$ " with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the station number within the range from "1$_H$ to 40$_H$."	○	×
B385	Total number of stations error (parameter)	The total number of occupied stations set with a station information parameter (addresses 20$_H$ to 5F$_H$) exceed "64."	Set a value of "64 or less."	○	×
B386	Number of occupied stations setting error (parameter)	The number of all occupied stations was set to "0" with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the occupied station number between "1 and 4."	○	×
B387	Use prohibited area write error	A write operation was performed to a use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○
B388	Station type setting error	The station type was set to a value "other than 0 to 2" with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the parameter within the range from "0 to 2."	○	×
B389	Use prohibited area write error	A write operation was performed to a use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○
B38B	Remote device station setting error (parameter)	The number of remote device stations was set to "43 stations or more" with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the number of remote device stations to "42 stations or less. "	○	×
B38C	Intelligent device station setting error (parameter)	The number of intelligent device stations (including local stations) was set to "27 stations or more" with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the number of intelligent device stations to "26 stations or less."	○	×
B38D	Invalid station designation error (parameter)	The invalid station designation parameter (addresses 14$_H$ to 17$_H$) was set to a value "other than module's head station number" or "station number not specified in the parameter." <Example of other than head station number> A bit other than for station number 5 was on for a module occupying 4 stations (station numbers 5 to 8).	Set the "module's head station number. " Do not designate any of the stations not specified with a parameter.	○	×
B38E	Communication buffer assignment error	The total size of the communication buffer set with a station information parameter (addresses 20$_H$ to 5F$_H$) exceeded 4 k words.	Set the total size of the communication buffer to 4 k words or less.	○	○
B38F	Automatic update buffer assignment error	The total size of the automatic update buffer set with a station information parameter (addresses 20$_H$ to 5F$_H$) exceeded 4 k words.	Set the total size of the automatic update buffer to 4 k words or less.	○	○

Error code (hexadeci-mal)	Error description	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B390	Standby master station designation error (parameter)	The standby master station designation parameter (address 4$_H$) was set to a value "other than 1 to 64."	Set the standby master station to a value within the range from "1 to 64."	○	○
B391	Number of retries setting error (parameter)	The number of retries setting parameter (address 2$_H$) was set to a value "other than 1 to 7."	Set a value within the range from "1 to 7."	○	×
B394	Number of auto return stations setting error (parameter)	The number of auto return stations setting parameter (address 3$_H$) was set to a value "other than 1 to 10."	Set a value within the range from "1 to 10."	○	×
B396	Station number duplicate error (parameter)	A duplicate station number was set with a station information parameter (addresses 20$_H$ to 5F$_H$).	Set the parameter so that station numbers are not duplicated.	○	×
B397	Station data setting error (parameter)	The station information parameter (addresses 20$_H$ to 5F$_H$) setting does not satisfy the following condition: $(16 \times 4) + (54 \times B) + (88 \times C) \leq 2304$ A: Number of remote I/O stations B: Number of remote device stations C: Number of intelligent device stations (including local stations)	Set the parameter so that it satisfies the condition shown at the left.	○	×
B398	Number of occupied stations setting error (parameter)	The number of occupied stations in a station information parameter (addresses 20$_H$ to 5F$_H$) was set to a value "other than 1 to 4."	Set a value within the range from "1 to 4."	○	×
B399	Number of connected modules setting error (parameter)	The number of connected modules parameter (address 1$_H$) was set to a value "other than 1 to 64."	Set a value within the range from "1 to 64."	○	×
B39A	Standby master station designation error (installation status)	The condition setting switch for the station number not specified with a parameter is designated for the standby master station.	Check the parameter or condition setting switch.	×	○
B39B	Reserved station designation error (parameter)	All stations were set as reserved stations with a parameter.	Check the parameter's reserved station setting.	○	×
B401	Parameter change error	A parameter change was executed during a transient request.	Change the parameter after all transient requests are completed or before any are requested.	○	○
B404	Response error	A response from the requesting station was not returned within the monitor time period.	Set a longer monitor time setting value. If an error persists, check the requesting module and cables.	○	○

Error code (hexadeci-mal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B405	Transient target station error	A transient request was issued to a remote I/O station or remote device station.	Set the target station to a local station or intelligent device station.	○	○
B406	RY simultaneous on error	A request was issued without turning RY on/RY off before the response is completed.	Always turn RY off and then issue a request after the response is completed.	○	○
B407	Transient communication number mismatch error	The numbers for request data and response data do not match.	Check the line.	○	○
B510	Sending channel in use (own station)	The selected channel is already in use.	The same channel cannot be used at the same time. Change the channel number or try not to use the same channel at the same time.	○	○
B511	Receiving channel in use	The channel of the target station is already in use.	Execute the mdSend instruction after a while. Check to see if more than one request is made to the channel of the target station from own station and/or multiple stations.	○	○
B512	Arrival wait timeout	The arrival monitor time has exceeded (when the resend count is 0) or the mdReceive instruction was executed when the mdReceive instruction execution request flag was not turned on.	Increase the arrival monitor time if this error occurred in the mdReceive instruction and when another station was executing the SEND instruction (mdSend instruction in case of the I/F board). Increase the arrival monitor time when own station was executing an instruction. If the error persists, check the network and target station.	○	○
B513	Number of retries exceeded	The number of retries exceeded the set number.	Increase the arrival monitor time. If the error persists, check the network and target station.	○	○
B515	Channel number error	A channel number is out of the setting range.	Set the channel of own station and target station to "1 or 2."	○	○
B519	Resend count error	The number of resends is out of the setting range.	Set a value in the range from "0 to 15 (times)."	○	○
B51A	Arrival monitor time error	The arrival monitor time is out of the setting range.	Set a value in the range from "0 to 32767 (seconds)."	○	○
B520	Target station number error	"Other than 0" is set for the target station number.	Set the target station number to "0."	○	○
B524	Target station CPU error	The target station's CPU is faulty.	Check the target station's CPU.	○	○
B601	Access code setting error	Nonexistent access code/attribute was set.	Set the correct access code/attribute.	○	○
B602	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient transmission overload status).	○	○
B603	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient transmission overload status).	○	○

Error code (hexadeci- mal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B604	Line test in progress	A transient transmission was performed while a line test was in progress.	Wait a while and then resend.	○	×
B605	Cannot access the communication buffer.	Access to the communication buffer failed.	Wait a while and then resend.	○	○
B607	Target station CPU error	There is an error in the target station's CPU.	Check the target CPU.	○	○
B771	Transient request overload error	There are too many transient requests to the corresponding station (when the requesting station is the AJ65BT-G4, A8GT-J61BT13 or I/F board).	Wait a while and then resend (transient transmission overloaded status).	○	○
B774	Transient request error	The target station was not an intelligent device station (when the requesting station is the A8GT-J61BT13 or I/F board).	Check if the target station is an intelligent device station.	○	○
B778	Response timeout	A response was not received from the requested station (when the requesting station is the A8GT-J61BT13 or I/F board).	Check the requested module and cables.	○	○
B780	Module mode setting error	A transient transmission was executed even though the target station was set in the I/O mode.	Set the target station in the intelligent mode.	○	○
B801	Access code setting error	An access code/attribute that does not exist was set.	Set the correct access code/ attribute.	○	○
B802	Access code error	An access code that does not exist was used.	Use the correct access code.	○	○
B803	Number of data points error	The number of data points is out of range.	Set the number of data points to a value in the range from "1 to 960 bytes."	○	○
B804	Attribute definition error	The attribute definition was invalid.	Review the attribute definition.	○	○
B805	Number of data error	The number of data is out of rage.	Set the number of data to a value in the range from "1 to 100" when writing, and "1 to 160" when reading.	○	○
B807	Address definition error	The address was not a multiple of 16 when a bit device was accessed.	Set the address to a multiple of 16 when accessing a bit device.	○	○
B80D	Setting range error	The combination of the set address and number of points exceeded the valid processing range.	Set so that the number of processing points does not exceed the device range.	○	○
B814	File register capacity setting error	The file register capacity was not set.	Set the file register capacity.	○	○
B815	Module mode setting error	A transient transmission was executed even though the target station was set in the I/O mode.	Change it to the intelligent mode.	○	○
B901	E^2PROM error	When a parameter registration request (YnA) to E^2PROM was executed, the E^2PROM was faulty or the write limit (10,000 times) was exceeded.	Replace the module.	○	×
B902	Data link startup error with E^2PROM parameters	A data link startup request (Yn8) using an E^2PROM parameter was executed even though the parameter has not been registered in the E^2PROM.	Register the parameter to E^2PROM with a parameter registration request (YnA).	○	×
B903	Transient request error	A transient request was issued to a station that has not allocated a communication buffer area.	Allocate a communication buffer area with a parameter.	○	○

Error code (hexadecimal)	Error description	Cause of error (details)	Corrective action	Detectability	
				Master station	Local station
B904	Communication buffer size setting error	The communication buffer size of the corresponding station was out of range when a dedicated instruction was executed.	Set the communication buffer size of the corresponding station within the range.	○	○
B905	Transient data length error	The transient data was longer than the communication buffer size of the corresponding station when a dedicated instruction was executed.	Make the communication buffer size of the corresponding station larger than the transient data length.	○	○
BA19	Corresponding station error	The corresponding station that is being tested stopped communication during line test.	Check the cable and the corresponding station.	○	×
BA1B	All stations error	All stations stopped communications during line test.	Check the cables.	○	×
BBC1	Mode setting error (switch)	The mode setting switch of a local station is not set to "1."	Set the switch to "1."	×	○
BBC2	Station number setting error (switch)	The station number setting switch of the module is set to a value "other than 0 to 64."	Set the switch to a value within the range from "0 to 64."	○	○
BBC3	Transmission rate setting error (switch)	The station number setting switch of the module is set to a value "other than 0 to 4."	Set the rate to a value within the range from "0 to 4."	○	○
BBC4	Station type change error (station number)	Tried to change from the master station (0) to a local station (1 to 64) or a local station to the master station by resetting the module (Yn4).	Execute the change by resetting the PLC CPU.	○	○
BBC5	Master station duplicate error	A master station already exists.	Review the station number setting switch.	○	×
BBC6	Mode change error	Tried to change from mode 0 or 2 to the test mode by resetting the module (Yn4).	Execute the change by resetting the PLC CPU.	○	○
BBC7	Module error	The module is faulty.	Replace the module.	○	○
BFFE	CPU monitor timer timeout	The CPU monitor timer timed out.	Check the operation of the target station.	○	○

16.4 Required Items when Making an Inquiry

When making an inquiry after determining that the board is faulty, please provide us with the following information:

(1) Trouble description (in specific)
    Example) When starting up after powering on, the message "board Not response" is displayed and the board does not start.

(2) Manufacturer, type and model name of your IBM PC/AT compatible PC

(3) Main memory capacity, hard disk capacity and CPU model name

(4) Operating system name: Windows NT Workstation 4.0, Windows 95/98

(5) The slot position where the board is installed and the number of installed boards

(6) Whether or not other manufacturer's optional boards are used

(7) If other manufacturer's optional boards are installed, please provide us with the following information for each board:
    • Board model name
    • Board manufacturer
    • Memory address (head address and occupied size)
    • I/O address (head address and occupied size)
    • IRQ number and DMA number

(8) Whether or not you have checked the faulty board with another IBM PC/AT compatible PC

(9) Switch settings

(10) The detailed error descriptions of the CC-Link driver registered in Event Viewer (for Windows NT 4.0) or Error Viewer (for Windows 95/98)

MEMO

APPENDIX

Appendix 1 External Dimension Diagram

(Unit: mm (in.))
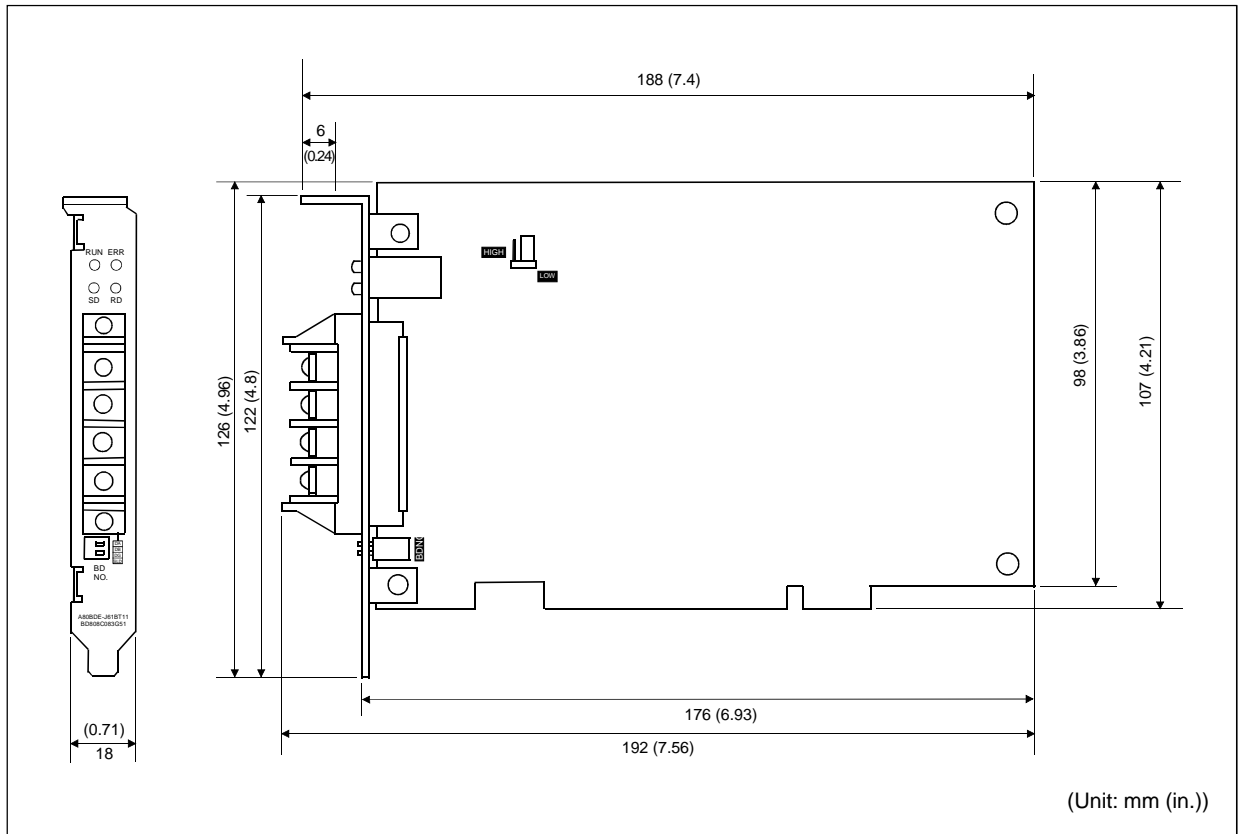
Appendix 2 Dealing with the Year 2000 Problems

The problems regarding the year 2000 include recognizing the years 1999 and 2000, and date adjustment for leap years.
The following table shows how the year 2000 is handled.

Utility software name	Operating Systems					
	Windows 95		Windows 98		Windows NT 4.0	
	A	B	A	B	A	B
SW3DNF-CCLINK	○ *1	○	○ *1	○	○	○

A : Normal year transition   B : Automatic adjustment of dates for leap years
○ : Countermeasure not   × : Countermeasure required
   required

*1: <IBM PC/AT compatible PCs that support the year 2000>
    No countermeasures are required.

  <IBM PC/AT compatible PCs that do not support the year 2000>
    If the system is continuously being operated when the year changes from 1999 to 2000, the date change and date adjustments for leap years are performed normally.
    However, if the system is reset or powered on again after the start of the year 2000, the date may become incorrect depending on the model.
    If a log is recorded in Error Viewer when such date data error occurs (for example, if a driver error has occurred), it is recorded with a wrong date.

  Countermeasure: Reset the date using the setting utility in the BIOS or "Date and Time" in Control Panel of Windows 95/98 when starting up the IBM PC/AT compatible PC for the first time after the start of the year 2000.

Appendix 3 Setting Checklists

The following checklists are used to set the parameters required to configure a CC-Link system.
Please make a copy of these checklists and use them as needed.

Appendix 3.1 Parameter setting checklist

(1) For the board information window

Parameter setting checklist (for the board information window)

Item	Setting range	Setting value
Channel	81: CC-Link (1st board) to 84: CC-Link (4th board) Default: 81 (CC-Link (1st board))	81: CC-Link (1st board) 82: CC-Link (2nd board) 83: CC-Link (3rd board) 84: CC-Link (4th board)
Station No.	0 to 64 Default: 1	
Type	Master Local Standby master Default: Local	Master station Local station Standby master station
Link Err X data	Latch/clear Default: Clear	Latch/clear
Baud rate	156 k/625 k/2.5 M/10 Mbps Default: 10 Mbps	156 k/625 k/2.5 M/10 Mbps
Mode setting	Online (remote net mode) Offline Module standalone hardware operation check Default: Online (remote net mode)	Online (remote net mode) Offline Module standalone hardware operation check

(2) For the parameter setting window

Parameter setting checklist (for the parameter setting window)

Item		Setting range	Setting value
Number of connected modules		1 to 64 Default: 1	Module
Type		Remote I/O Remote Device Intelligent Default: Remote I/O	Remote I/O Remote device Intelligent
Occupy station		1 to 4 Default: 1	Station
Station specify		Reserve Invalid No setting Default: No setting	Reserve Invalid No setting
Intelligent buffer specify (word)	Sending	64 to 4096 (word unit) Default: 64	
	Receiving	64 to 4096 (word unit) Default: 64	
	Automatic	128 to 4096 (word unit) Default: 128	
Delay timer		0 to 100 (0: Not designated) Default: 0	$\times$ 50 μs
Number of retries		1 to 7 Default: 3	Times
Standby master station		0 to 64 (0: No standby master station designated) Default: 0	
Auto return St. No.		1 to 10 Default: 1	Modules

Appendix 3.2 Station information setting checklist

Station information setting checklist

No.	Type	Occupy Station	Station Specify	Intelligent Buffer Specify (Word)		
				Sending	Receiving	Automatic
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						

No.	Type	Occupy Station	Occupy Station	Intelligent Buffer Specify (Word)		
				Sending	Receiving	Automatic
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						

Appendix 3.3 Device assignment checklist

Device assignment checklist

No.	RX	RY	RWw	RWr
1	RX00 to RX1F→	RY00 to RY1F→	RWw0 to RWw3→	RWr0 to RWr3→
2	RX20 to RX3F→	RY20 to RY3F→	RWw4 to RWw7→	RWr4 to RWr7→
3	RX40 to RX5F→	RY40 to RY5F→	RWw8 to RWwB→	RWr8 to RWrB→
4	RX60 to RX7F→	RY60 to RY7F→	RWwC to RWwF→	RWrC to RWrF→
5	RX80 to RX9F→	RY80 to RY9F→	RWw10 to RWw13→	RWr10 to RWr13→
6	RXA0 to RXBF→	RYA0 to RYBF→	RWw14 to RWw17→	RWr14 to RWr17→
7	RXC0 to RXDF→	RYC0 to RYDF→	RWw18 to RWw1B→	RWr18 to RWr1B→
8	RXE0 to RXFF→	RYE0 to RYFF→	RWw1C to RWw1F→	RWr1C to RWr1F→
9	RX100 to RX11F→	RY100 to RY11F→	RWw20 to RWw23→	RWr20 to RWr23→
10	RX120 to RX13F→	RY120 to RY13F→	RWw24 to RWw27→	RWr24 to RWr27→
11	RX140 to RX15F→	RY140 to RY15F→	RWw28 to RWw2B→	RWr28 to RWr2B→
12	RX160 to RX17F→	RY160 to RY17F→	RWw2C to RWw2F→	RWr2C to RWr2F→
13	RX180 to RX19F→	RY180 to RY19F→	RWw30 to RWw33→	RWr30 to RWr33→
14	RX1A0 to RX1BF→	RY1A0 to RY1BF→	RWw34 to RWw37→	RWr34 to RWr37→
15	RX1C0 to RX1DF→	RY1C0 to RY1DF→	RWw38 to RWw3B→	RWr38 to RWr3B→
16	RX1E0 to RX1FF→	RY1E0 to RY1FF→	RWw3C to RWw3F→	RWr3C to RWr3F→
17	RX200 to RX21F→	RY200 to RY21F→	RWw40 to RWw43→	RWr40 to RWr43→
18	RX220 to RX23F→	RY220 to RY23F→	RWw44 to RWw47→	RWr44 to RWr47→
19	RX240 to RX25F→	RY240 to RY25F→	RWw48 to RWw4B→	RWr48 to RWr4B→
20	RX260 to RX27F→	RY260 to RY27F→	RWw4C to RWw4F→	RWr4C to RWr4F→
21	RX280 to RX29F→	RY280 to RY29F→	RWw50 to RWw53→	RWr50 to RWr53→
22	RX2A0 to RX2BF→	RY2A0 to RY2BF→	RWw54 to RWw57→	RWr54 to RWr57→
23	RX2C0 to RX2DF→	RY2C0 to RY2DF→	RWw58 to RWw5B→	RWr58 to RWr5B→
24	RX2E0 to RX2FF→	RY2E0 to RY2FF→	RWw5C to RWw5F→	RWr5C to RWr5F→
25	RX300 to RX31F→	RY300 to RY31F→	RWw60 to RWw63→	RWr60 to RWr63→
26	RX320 to RX33F→	RY320 to RY33F→	RWw64 to RWw67→	RWr64 to RWr67→
27	RX340 to RX35F→	RY340 to RY35F→	RWw68 to RWw6B→	RWr68 to RWr6B→
28	RX360 to RX37F→	RY360 to RY37F→	RWw6C to RWw6F→	RWr6C to RWr6F→
29	RX380 to RX39F→	RY380 to RY39F→	RWw70 to RWw73→	RWr70 to RWr73→
30	RX3A0 to RX3BF→	RY3A0 to RY3BF→	RWw74 to RWw77→	RWr74 to RWr77→
31	RX3C0 to RX3DF→	RY3C0 to RY3DF→	RWw78 to RWw7B→	RWr78 to RWr7B→
32	RX3E0 to RX3FF→	RY3E0 to RY3FF→	RWw7C to RWw7F→	RWr7C to RWr7F→
33	RX400 to RX41F→	RY400 to RY41F→	RWw80 to RWw83→	RWr80 to RWr83→
34	RX420 to RX43F→	RY420 to RY43F→	RWw84 to RWw87→	RWr84 to RWr87→
35	RX440 to RX45F→	RY440 to RY45F→	RWw88 to RWw8B→	RWr88 to RWr8B→
36	RX460 to RX47F→	RY460 to RY47F→	RWw8C to RWw8F→	RWr8C to RWr8F→
37	RX480 to RX49F→	RY480 to RY49F→	RWw90 to RWw93→	RWr90 to RWr93→
38	RX4A0 to RX4BF→	RY4A0 to RY4BF→	RWw94 to RWw97→	RWr94 to RWr97→
39	RX4C0 to RX4DF→	RY4C0 to RY4DF→	RWw98 to RWw9B→	RWr98 to RWr9B→
40	RX4E0 to RX4FF→	RY4E0 to RY4FF→	RWw9C to RWw9F→	RWr9C to RWr9F→
41	RX500 to RX51F→	RY500 to RY51F→	RWwA0 to RWwA3→	RWrA0 to RWrA3→
42	RX520 to RX53F→	RY520 to RY53F→	RWwA4 to RWwA7→	RWrA4 to RWrA7→
43	RX540 to RX55F→	RY540 to RY55F→	RWwA8 to RWwAB→	RWrA8 to RWrAB→
44	RX560 to RX57F→	RY560 to RY57F→	RWwAC to RWwAF→	RWrAC to RWrAF→

No.	RX	RY	RWw	RWr
45	RX580 to RX59F→	RY580 to RY59F→	RWwB0 to RWwB3→	RWrB0 to RWrB3→
46	RX5A0 to RX5BF→	RY5A0 to RY5BF→	RWwB4 to RWwB7→	RWrB4 to RWrB7→
47	RX5C0 to RX5DF→	RY5C0 to RY5DF→	RWwB8 to RWwBB→	RWrB8 to RWrBB→
48	RX5E0 to RX5FF→	RY5E0 to RY5FF→	RWwBC to RWwBF→	RWrBC to RWrBF→
49	RX600 to RX61F→	RY600 to RY61F→	RWwC0 to RWwC3→	RWrC0 to RWrC3→
50	RX620 to RX63F→	RY620 to RY63F→	RWwC4 to RWwC7→	RWrC4 to RWrC7→
51	RX640 to RX65F→	RY640 to RY65F→	RWwC8 to RWwCB→	RWrC8 to RWrCB→
52	RX660 to RX67F→	RY660 to RY67F→	RWwCC to RWwCF→	RWrCC to RWrCF→
53	RX680 to RX69F→	RY680 to RY69F→	RWwD0 to RWwD3→	RWrD0 to RWrD3→
54	RX6A0 to RX6BF→	RY6A0 to RY6BF→	RWwD4 to RWwD7→	RWrD4 to RWrD7→
55	RX6C0 to RX6DF→	RY6C0 to RY6DF→	RWwD8 to RWwDB→	RWrD8 to RWrDB→
56	RX6E0 to RX6FF→	RY6E0 to RY6FF→	RWwDC to RWwDF→	RWrDC to RWrDF→
57	RX700 to RX71F→	RY700 to RY71F→	RWwE0 to RWwE3→	RWrE0 to RWrE3→
58	RX720 to RX73F→	RY720 to RY73F→	RWwE4 to RWwE7→	RWrE4 to RWrE7→
59	RX740 to RX75F→	RY740 to RY75F→	RWwE8 to RWwEB→	RWrE8 to RWrEB→
60	RX760 to RX77F→	RY760 to RY77F→	RWwEC to RWwEF→	RWrEC to RWrEF→
61	RX780 to RX79F→	RY780 to RY79F→	RWwF0 to RWwF3→	RWrF0 to RWrF3→
62	RX7A0 to RX7BF→	RY7A0 to RY7BF→	RWwF4 to RWwF7→	RWrF4 to RWrF7→
63	RX7C0 to RX7DF→	RY7C0 to RY7DF→	RWwF8 to RWwFB→	RWrF8 to RWrFB→
64	RX7E0 to RX7FF→	RY7E0 to RY7FF→	RWwFC to RWwFF→	RWrFC to RWrFF→

MEMO

WARRANTY

Please confirm the following product warranty details before starting use.

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 dealer or Mitsubishi Service Company. Note that if repairs are required at a site overseas, on a detached island or remote place, expenses to dispatch an engineer shall be charged for.

[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 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 possible 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 chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses, lost profits incurred to the user by Failures of Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, and compensation for damages to products other than Mitsubishi products and other duties.

5. Changes in product specifications

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

6. Product application

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

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

Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application shall be possible.

When considering use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected and for which a particularly high reliability is required in terms of safety and control system, please consult with Mitsubishi and discuss the required specifications.

Type A80BDE-J61BT11 CC-Link System Master/Local Interface Board

User's Manual (For SW3DNF-CCLINK)

MODEL	A80BD-BT11-SW3-U-E
MODEL CODE	13JR14
IB(NA)-0800110-A(0003)MEE	

When exported from Japan, this manual does not require application to the Ministry of International Trade and Industry for service transaction permission.

Specifications subject to change without notice.