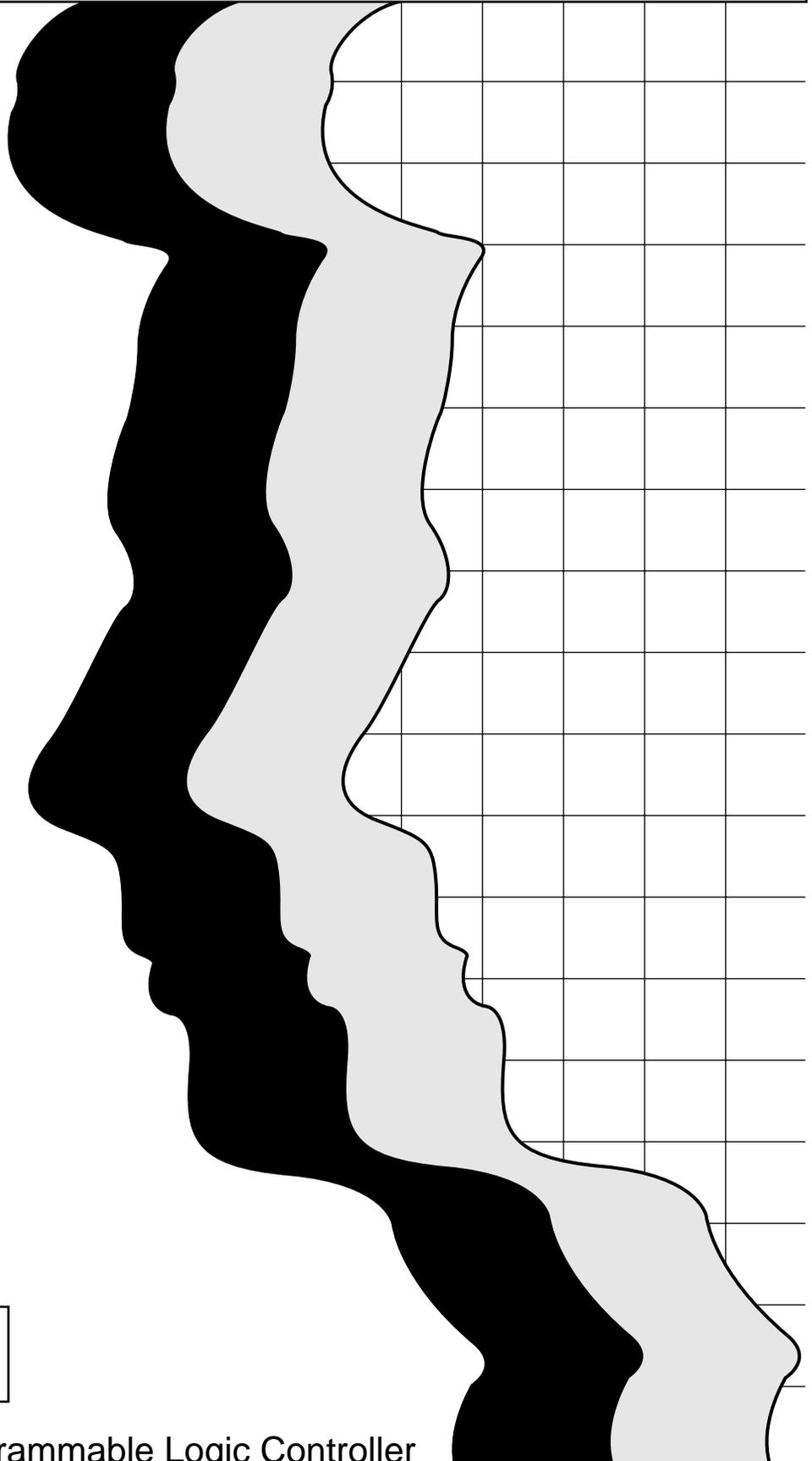


Type A80BDE-J61BT13 CC-Link Interface Board

User's Manual (For SW2DNF-CCLINK)



● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".



DANGER

Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



CAUTION

Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- When there is a communication error in the data link, the station where the communication is occurring changes to the following status.
Construct an interlock circuit in the sequence program so that the system will operate on the safety side using the communication status information.
There is the risk of an accident occurring due to output error or malfunctioning.
 - (1) All general purpose inputs from this I/F board (A80BDE-J61BT13) are turned off.
 - (2) All general purpose outputs from this I/F board are turned off.
- 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 100 mm (3.9 inch) or more from each other.
Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the I/F board in an environment as described in the general specifications listed in this operating manual.
If the board is used in an environment outside the ranges described in the general specifications, it may result in an electric shock, fire, malfunctioning, damage to or deterioration of the product.
- Do not directly touch the conductive area of the I/F board.
This will result in malfunctioning or failure of 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, this will lead to an error in operation.
If the screws are tightened too much, this will damage the screws and cause a short.

[WIRING PRECAUTIONS]

DANGER

- Always turn off all external power before performing installation, wiring or other work.
If all power is not turned off, there is a risk of electric shock, damage to the product, or malfunctioning.
- 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.

[WIRING PRECAUTIONS]

CAUTION

- Always ground the FG terminal on the PC side using D type grounding (Class 3 grounding) or higher specifically for the PC. Otherwise, there is a risk of malfunctioning.
If a malfunctioning occurs even when the PC unit is grounded, ground both the FG terminal for the PC unit and the SLD terminal for the I/F board.
- Tighten the terminal screws within the specified torque range.
If the terminal screws are loose, this will lead to a short or malfunctioning.
If the terminal screws are tightened too much, this will damage the screws and I/F board, causing a short or malfunctioning.
- Take care that foreign objects such as chips or wiring debris do not get inside the I/F board.
This can result in fire, failure or malfunctioning.
- Always house the communication cable and power cable connected to the I/F board in a duct or secure it using clamps.
If the cables are not housed in a duct or secured with clamps, the cable may dangle, move or be pulled inadvertently. This can cause damage to the I/F board or cable, or create a faulty contact with the cable which may lead to .
- When disconnecting the communication or power cable connected to the I/F board, do not grasp and pull the cable.
First loosen the screws where the cable is connected to the I/F board and then remove the cable.
If the cable is pulled while it is connected to the I/F board, this can cause damage to the I/F board or cable, or create a faulty contact with the cable and lead to malfunctioning.

[STARTING AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminal when the power is turned on.
This can cause malfunctioning.
- Always turn off all external power before doing any cleaning or re-tightening the terminal screws. If all power is not turned off, this can cause a failure or malfunctioning of the I/F board.
If the screws are loose, this can cause the terminal to drop, short or operate in error.
If the screws are tightened too much, this can damage the screws and I/F board, causing the terminal to drop, short or operate in error.

[STARTING AND MAINTENANCE PRECAUTIONS]

 **CAUTION**

- Do not dismantle or rebuild the I/F board.
This will result in breakdowns, malfunctioning, injury or fire.
- Always turn off all external power before installing or removing the I/F board.
If all power is not turned off, this will result in failure of the I/F board or malfunctioning.

[DISPOSAL PRECAUTION]

 **CAUTION**

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

Revisions

* The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Jan. 1999	IB(NA)-66895-A	First printing

This manual does not imply guarantee or implementation right for industrial ownership or implementation of other rights. Mitsubishi Electric Corporation is not responsible for industrial ownership problems caused by use of the contents of this manual.

Precautions when Using

(1) When using Windows NT 4.0

When using Windows NT 4.0, only a user with the Administrator privilege can install or use the board.

(2) Multi-thread communication

Multi-thread communication is not supported.

(3) Installation

Install the SW2DNF-CCLINK after uninstalling SW0DNF-CCLINK and SW1DNF-CCLINK.

(4) Overwrite installation

When performing an overwrite installation, install in the same folder where the previous program is installed.

(5) Start menu

When the software package is uninstalled, items may remain in the start menu. In this case, reboot the computer.

(6) Software version of the CC-Link master and local modules

For the CC-Link master and local modules, use software version "N" or later. A module running software version "M" or earlier will not run properly.

(7) Accessing the CN device for the FXCPU

CN devices for the FXCPU with numbers 200 or after cannot be accessed (read, write).

Introduction

Thank you for purchasing the A80BDE-J61BT13 Model CC-Link Interface Board.

Before using the equipment, please read this manual carefully to develop full familiarity with the functions and performance of the A80BDE-J61BT13 Model CC-Link Interface Board you have purchased, so as to ensure correct use.

Please forward a copy of this manual to the end user.

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About This Manual

The following are manuals related to this product.

Request for the manuals as needed according to the chart below.

Related Manuals

Manual Name	Manual No. (Type code)
CC-Link System Master/ Local 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)

How to Read the Manual

"How to Read the Manual" is listed according to the objective when using the I/F board. Refer to the following when using 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 correspondence to the EMC command (Chapter 2)**
Correspondence to the EMC command is described in Chapter 2.
- (4) To learn about the system configuration (Section 3.1 to Section 3.2)**
Configuration of a system using the I/F board is described.
- (5) To learn about the operating environment for the I/F board (Section 3.3)**
The operating environment for the I/F board is described in Section 3.3.
- (6) To learn about specifications and functions for the I/F board (Chapter 4)**
The specifications and functions for the I/F board are described in Chapter 4.
- (7) To learn about I/F board settings (Chapter 5)**
I/F board settings are described in Chapter 5.
- (8) When installing or uninstalling a software package (Chapter 6)**
How to install and uninstall a software packaged is described in Chapter 6.
- (9) To learn about utilities operating procedure (Chapter 7)**
The operating procedure for utilities is described in Chapter 7.
- (10) To learn about devices that can be accessed and range of access (Chapter 8)**
Device specifications and contents stored in the system-area information are described in Chapter 8.
- (11) To learn about how to use functions (Chapter 9)**
How to use functions is described in Chapter 9.
- (12) To learn about error contents (Chapter 10)**
The contents of errors is described in Chapter 10.
- (13) To learn about the actions to take when the system does not run (Chapter 11)**
How to troubleshoot is described in Chapter 11.

Abbreviations and General Terms Used in This Manual

Unless specifically noted, this manual uses the abbreviations and general terms listed below to explain the A80BDE-J61BT13 model CC-Link interface boards.

Abbreviation/general term	Description of the abbreviation/general term
I/F board	Abbreviation for the A80BDE-J61BT13 model CC-Link interface board
CC-Link	Abbreviation for the Control & Communication Link system
Windows NT 4.0	Abbreviation for Microsoft Windows NT Workstation 4.0 (English version)
Windows 95	Abbreviation for Microsoft Windows 95 (English version).
Windows 98	Abbreviation for Microsoft Windows 98 (English version).
Windows	General term for Microsoft Windows 95 (English version), Windows 98 (English version) and Windows NT Workstation 4.0 (English version).
IBM PC/AT compatible PC	An IBM PC/AT compatible PC.
AnNCPU	General term for A0J2HCPU, A1SCPU, A1SCPU-S1, A1SCPUC24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1SJHCPU-S8, A1NCPUC, A2CCPUC24, A2CCPUC24-PRF, A2CJCPU, A2NCPUC, A2NCPUC-S1, A2SCPU, A2SCPU-S1, A2SHCPU, A2SHCPU-S1 and A1FXCPU.
AnACPU	General term for A2ACPU, A2ACPU-S1, A2ACPUP21/R21, A2ACPUP21/R21-S1, A3ACPUP21/R21, A3NCPUC and A3ACPU.
AnUCPU	General term for A2UCPU, A2UCPU-S1, A2ASCPU-S1, A2ASHCPU-S1, A3UCPU and A4UCPU.
QnACPU	General term for Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU and Q4ARCPU.
ACPU	General term for AnNCPU, AnACPU and AnUCPU.
Master station	The station controlling the remote station, local station and intelligent device station
Local station	A station that has a CPU and can communicate 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 and AJ61BT11 and A1SJ61BT11.
Master module	General term when the AJ61QBT11, A1SJ61QBT11 and AJ61BT11 and A1SJ61BT11 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 specified station when there is an access request from the PLC CPU.
SB	Link special relay
SW	Link special register
RX	Remote input
RY	Remote output
RWw	Remote register (write area)
RWr	Remote register (read area)

Microsoft Windows, Microsoft Windows NT, Microsoft Visual Basic, Microsoft Visual C++ and MS-DOS are registered trademarks of the U.S. Microsoft Corporation.
Other company names or product names found in the text are trademarks or registered trademarks of each company.

Product Structure

The product structure for the I/F board is given in the table below.

Product name	Quantity
A80BDE-J61BT13 model CC-Link interface board	1
SW2DNF-CCLINK model CC-Link software package	1 (Floppy disks; set of 4)
A80BDE-J61BT13 model CC-Link interface board user's manual (this manual)	1
Software use agreement	1
Return envelope	1

Note

The terminal resistor is packaged with the CC-Link system master and local modules.

1. OVERVIEW

This manual explains the specifications for, and how to handle and monitor the A80BDE-J61BT13 model CC-Link interface board that is included in the CC-Link system, and loaded as an optional board in the PCI* bus of an IBM PC/AT compatible PC.

The A80BDE-J61BT13 is applicable to the following CC-Link system.

- Applicable to the CC-Link system local station(s).

* : PCI is the abbreviation for Peripheral Component Interconnect.

1.1 Features

The I/F board has the features described below.

- (1) **An IBM PC/AT compatible PC can be built into the CC-Link system.**

The I/F board can be installed in an IBM PC/AT compatible PC and that PC can be used as a local station.

- (2) **Using a PCI bus eliminates troublesome switch settings.**

Simply installing the board in the PCI bus automatically executes initial setting.

- (3) **Displays test and monitor information related to the CC-Link.**

Operation becomes easy since the CC-Link system testing and monitoring statuses can be displayed in the IBM PC/AT compatible PC.

- (4) **Various functions are available to accommodate user programming.**

By using various functions that are compatible with Visual C++ and Visual Basic, user applications to perform remote control for the PLC CPU as well as reading from and writing to devices can easily be created.

- (5) **Drivers for various operating systems are available.**

A variety of drivers are provided to make it easier to construct a system that is compatible with the user's environment.

Compatible operating systems :

- Windows 95 (English version)
- Windows 98 (English version)
- Windows NT Workstation 4.0 (English version)

1.2 Compatibility with Existing Software

Compatibility with existing software is indicated in the table below.

	SW2DNF-CCLINK	Remarks
SW1DNF-CCLINK	x	Earlier software package
SW1VDWT-MNET10P	O *1	
SW1D5F-CSKP-E	x	
SW2D5F-CSKP-E	O	-

O : Simultaneous operation possible x : Simultaneous operation not possible — : No combining

*1 : User program EXE files generated using the MDFUNC32.LIB of the earlier software package must be relinked using the MDFUNC32.LIB contained in the new driver software package.

2. EMC COMMAND

2.1 Requirements for EMC Command Compliance

EMC commands, which are among the European command sets, are now enforced.

The EMC commands regulate "emission (electromagnetic interference)," which requires that a device not emit strong electromagnetic waves externally, and "immunity (electromagnetic sensitivity)," which requires that a device have the ability to resist external electromagnetic waves.

The precautionary items when configuring a machine device using an I/F board to conform to EMC commands are described in sections 2.1.1 through 2.1.4.

Although we tried very hard to document these materials according to the requirements for regulation and the standards we have researched, the compatibility to the above commands of the entire device created according to the contents of this material, is not guaranteed. The methods to enable a device to conform to the commands and the compatibility must be determined by the manufacturer who produces the machine device.

2.1.1 EMC commands

The standards relating to EMC commands are listed in the table below:

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

*1 QP (Quasi-Peak) : Quasi-peak value, Mean: Average value

*2 The applicable test items are tested with the board installed in the PC.

2.1.2 Installation on the control panel

Installing devices on the control panel has a considerable effect not only in securing safety but also in shutting down the noise generated from the PC by the control panel.

(1) Control panel

- (a) Use an electrically conductive control panel.
- (b) When fastening/tightening the control panel's top or bottom panel with bolts, mask the coating so that surface contact is feasible.
- (c) To ensure the electrical contact between the inside panel of the control panel and the main control panel, mask any coating around the installation bolts connecting to the main unit to secure conductivity in the largest surface area possible.
- (d) Ground the control panel main unit using a thick ground cable so that a low impedance can be secured even with a high frequency.
- (e) Make the holes on the control panel 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 power supply cable and ground cable

The layout of power supply cable and ground cable for a PC should be set as described below.

- (a) Specify a grounding point that enables grounding of the control panel close to the power supply to the PC and ground the FG (frame ground) terminal of the 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 play a role in grounding the noise generated in the PC, it is necessary to ensure the lowest possible impedance. Because the power line is used to allow the noise to escape, it actually contains a great deal of noise. Therefore, shortening the wire length prevents the power line from becoming an antenna.

Note : A long conductive material can become an antenna that emits noise more efficiently.

- (b) Twist the ground cable leading to the ground point with the power supply cable. By twisting them with the ground cable, the noise leaking out of the power supply cable may be grounded at a higher rate. However, when a noise filter is installed to the power supply cable, twisting with the ground cable may not be necessary.

2.1.3 Cable

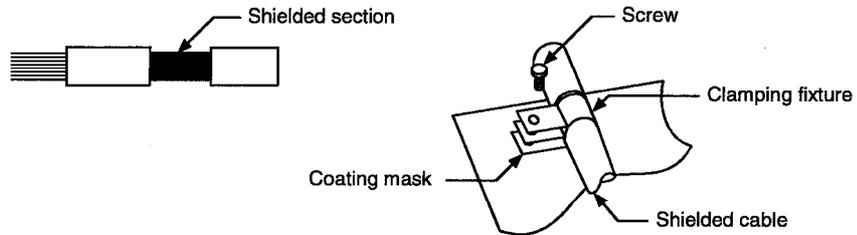
Because the cable that runs from the control panel contains high frequency noise, outside the control panel it acts as an antenna and radiates noise. Always use shielded cable for cable that runs outside the control panel.

Also, using a shielded cable is effective in raising noise resistance.

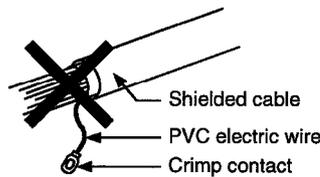
In the EN50082-2, the meaning of "(signals) related to control" is not defined. However, considering the original intent of the EMC command, the signal line that poses possible danger to person or equipment when the panel is incorrectly operated shall be defined as the "signal related to control," and it is conceivable that high noise resistance is mandatory.

(1) Grounding treatment for shields

- (a) Perform shielding processing at a position near the exit of the control panel. If the grounding point is far from the exit position, the cable portion after the grounding point will cause electromagnetic induction and generates high-frequency noise.
- (b) Use a grounding method that allows the shield a surface grounding in a large area against the control panel. A clamping fixture as shown below may alternatively be used. When such a fixture is used, mask the coating in the area inside the control panel where the fixture contacts.



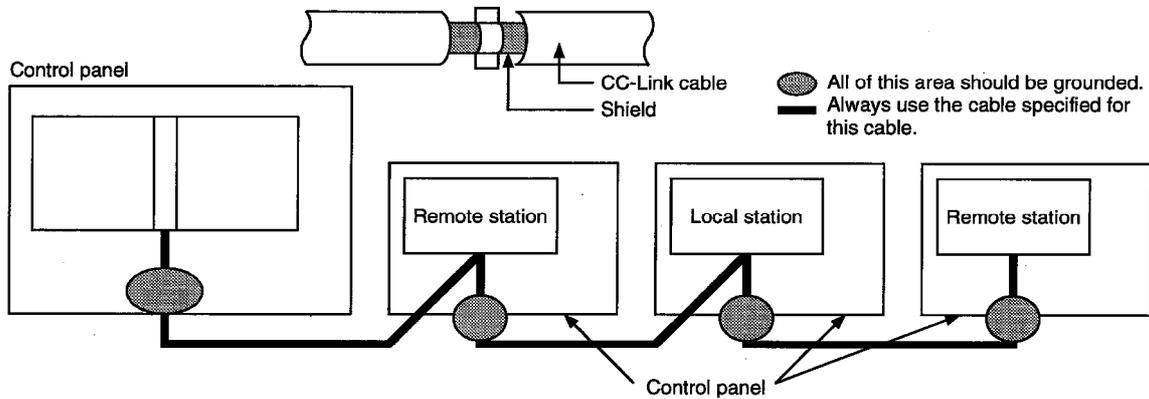
Note : The method shown below in which a PVC electric wire is soldered to the shield of the shielded cable and that end is grounded, increases the high frequency impedance and the effectiveness of the shield is lost.



(2) Grounding treatment for the CC-Link cable

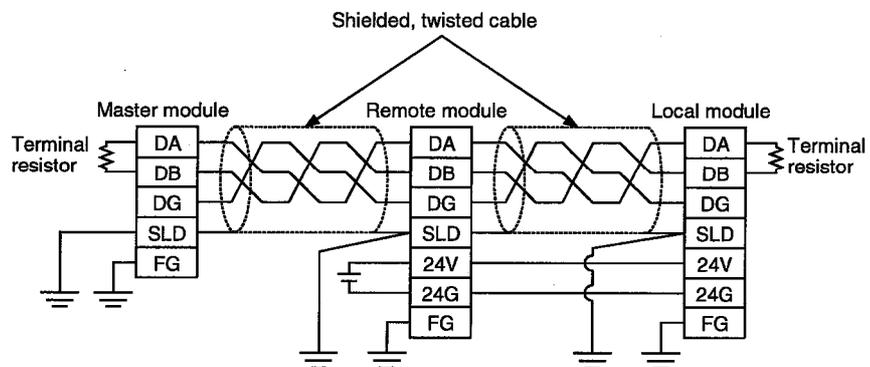
- (a) Always ground the twisted cable connected to the CC-Link master station, local station and remote station.

Since the twisted cable is a shielded cable, remove part of the outer sheath. Then ground the exposed part of the shield indicated in the figure below as wide a surface area as possible.



Also, ground within 30cm from the board terminal area in addition to grounding at the position closest to the exit of the control panel.

- (b) Always use the specified cable for the CC-Link cable.
- (c) For each module, do not use a ferrite core for the Link cable from the board.
- (d) For each module, ground both the FG terminal and SLD terminal of the board.



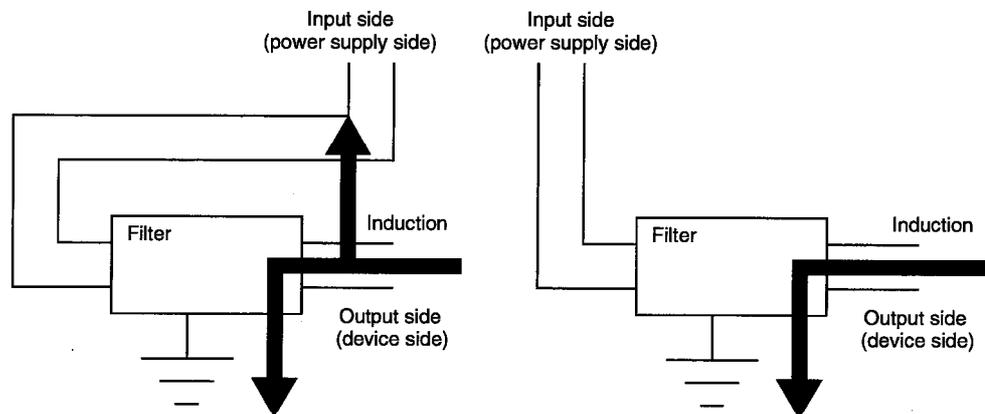
2.1.4 Noise filter (power supply line filter)

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

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

Precautions when installing a noise filter are noted below.

- (1) Do not bundle the wiring on the input and output side of the noise filter. If they are bundled, noise on the output side will be inducted to the wiring on the input side where the noise has been removed by a filter.



- (2) Ground the ground terminal for the noise filter to the control panel using as short wiring as possible (about 10cm (3.94 in.)).

3. SYSTEM CONFIGURATION

The configuration for a system using the I/F board is explained below.

3.1 System Configuration for A80BDE-J61BT13

The following indicates the system configuration when an I/F board is used.

The I/F board can be connected to a maximum of up to 26 modules per 1 master station.

However, the following conditions must be fulfilled.

(1) $\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$

a : Number of modules occupied by 1 station

b : Number of modules occupied by 2 stations

c : Number of modules occupied by 3 stations

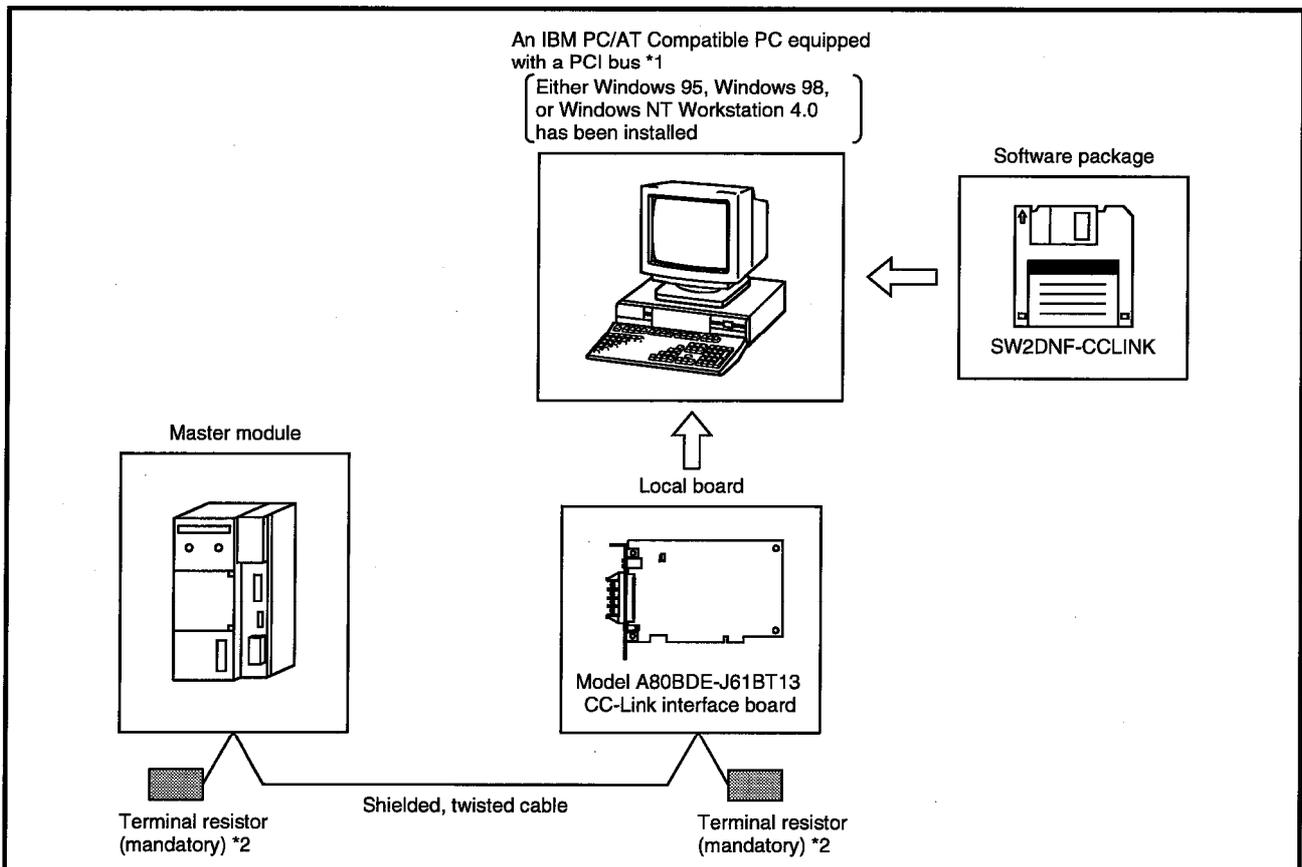
d : Number of modules occupied by 4 stations

(2) $\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$

A : Number of remote I/O stations ≤ 64

B : Number of remote device stations ≤ 42

C : The number of local stations, standby master stations and intelligent device stations ≤ 26



*1 : A multiprocessor PC cannot be used, since the drivers are not compatible.

*2 : The terminal resistor comes with the master module.

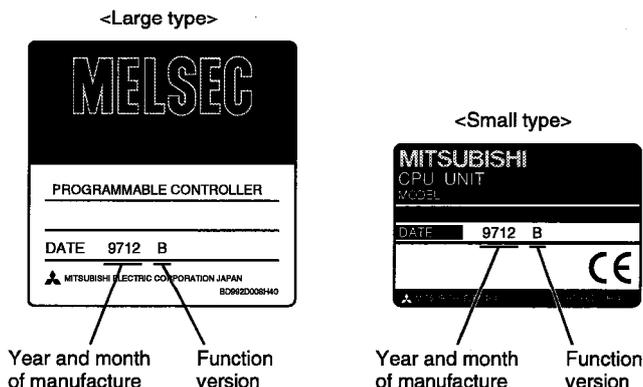
3.2 Applicable System

The CC-Link system master module which can use an I/F board is explained below.

The master module that can use an I/F board is the product with function version B or later and software version N or later.

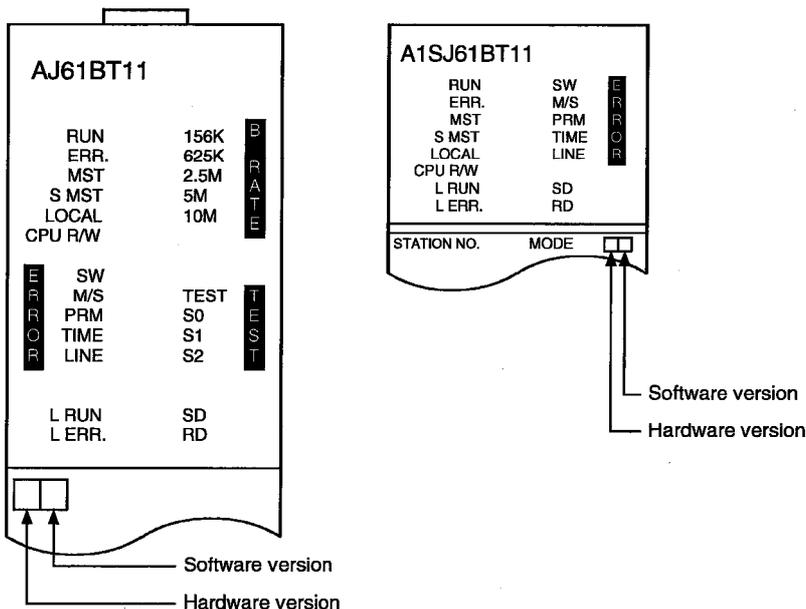
The product with earlier versions than those listed above cannot use an I/F board.

The function version is recorded in the DATE column of the rated plate.



*The function version is noted only on products with version B or later.

The software version is indicated on the module version tag located on the front of the module.



3.3 Operating Environment

The operating environment for the I/F board is shown below.

Item	Description
PC unit	PC with a Pentium 133MHz or higher, one or more PCI bus slots, and running Windows 95, Windows 98, or Windows NT Workstation 4.0
PCI bus specification	5VDC, 32 bit bus Basic clock: 33MHz
Operating system	Either of Windows 95 (English version), Windows 98 (English version), or Windows NT Workstation 4.0 (English version)
Programming language	Visual Basic Ver5.0 (English version), Visual C++ Ver5.0 (English version)
Required memory size	32MB or more
Hard disk space	20MB or more
Disk drive (required when installing the driver)	3.5 inch (1.44MB) floppy disk drive

Note

A multiprocessor PC cannot be used, since the drivers are not compatible.

4. SPECIFICATION

The performance specifications and functions of the I/F board are explained below.

4.1 General Specification

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

Item	Specification					
Usage ambient temperature	0 to 55°C					
Storage ambient temperature	-20 to 75°C					
Usage ambient humidity	10 to 90%RH, no condensation					
Storage ambient humidity	10 to 90%RH, no condensation					
Vibration durability	Conforming to JIS B 3501, IEC 1131-2	When there is intermittent vibration	Frequency	Acceleration	Amplitude	Sweep count 10 times in each direction X, Y, Z (80 minutes)
			10 to 57Hz	—	0.075mm (0.0030inch)	
		When there is continuous vibration	57 to 150Hz	9.8m/s ² {1G}	—	
			10 to 57Hz	—	0.035mm (0.0013inch)	
57 to 150Hz	4.9m/s ² {0.5G}	—				
Shock durability	Conforming to JIS B 3501, IEC1131-2 (147m/s ² {15G}, 3 times each in 3 directions)					
Usage environment	No corrosive gas					
Usage height	Less than 2000 m (less than 6562 ft.)					
Installation area	Within the control board					
Over-voltage category *1	Less than II					
Pollution level *2	Less than 2					

*1 Indicates the location where the device is connected from the public cable network to the device structure wiring area.

Category II applies to the devices to which the power is supplied from a fixed equipment.

Surge withstand voltage for devices with up to 300V of rated voltage is 2500V.

*2 This is an index which indicates the degree of conductive object generation in the environment
Pollution level 2 is when only non-conductive pollution occurs.

A temporary conductivity caused by condensation must be expected occasionally.

(2) General specifications of the I/F board after it has been installed conform to the IBM PC/AT compatible PC unit.

4.2 Performance Specifications

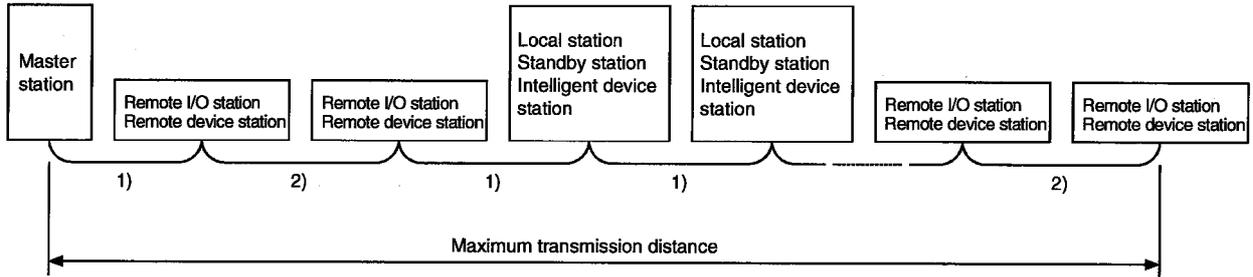
The following table indicates the performance specifications for the I/F board.

Item	Specification
Transmission speed	156kbps, 625kbps, 2.5Mbps, 5Mbps or 10Mbps can be selected
Maximum transmission distance	Differs depending on the transmission speed. (See Section 4.3)
Number of occupied stations	1 or 4 station(s) (switches depending on the setting)
Maximum number of link points per 1 system	Remote I/O (RX, RY) : 2048 Remote registers (RWw) : 256 (master station to local station) Remote registers (RWr) : 256 (local station to master station)
Number of link points per 1 station	Remote I/O (RX, RY) : 30 Remote registers (RWw) : 4 (master station to local station) Remote registers (RWr) : 4 (local station to master station)
Communication method	Polling method
Synchronous method	Frame synchronous method
Encoding method	NRZI method
Transmission path	Bus (RS485)
Transmission format	Conforms to HDLC
Error control system	CRC(X16+X12+X5+1)
Cable	Shielded, twisted cable (Section 4.4 Recommended cable)
RAS functions	<ul style="list-style-type: none"> • Automatic return function • Slave station separation function • Error detection using the link special relay and register • Data link status verification • On-line test (hardware test, line test) • Abnormal temperature detection • Watchdog timer error (WDT) detection
Number of boards that can be loaded	Maximum of 4
Loading slot	IBM PC/AT compatible PC PCI bus slot
Number of slots occupied	1 slot
Internal voltage consumption (5VDC)	0.4A
Weight	0.16kg (0.35 lb)

4.3 Total Extension Distance and Between-Station Distance in the CC-Link System

The following indicates the total extension distance and between-station distance in the CC-Link system.

- 1) Regardless of the transmission speed setting, the length of the cable must be "2m (6.56 ft.) or more" between master stations, local stations, as well as intelligent device stations and each of their previous and next stations, respectively.
- 2) When the transmission speed is 5Mbps or 10Mbps, it is necessary to note that the maximum transmission distance varies depending on the length of the cable between the remote I/O station and remote device station.

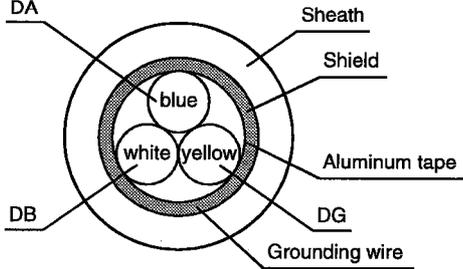


Transmission speed	1)	2)	Maximum transmission distance
156kbps	2m (6.56ft) or more	30 cm (11.81 in.) or more	1200 m (3937.2 ft)
625kbps		30 cm (11.81 in.) or more	600 m (1968.6 ft)
2.5Mbps		30 cm (11.81 in.) or more	200 m (656.2 ft)
5Mbps		60 cm (23.62 in.) or more	150 m (492.15 ft)
		30 to 59 cm (11.81 to 23.23 in.)	110 m (360.91 ft)
10Mbps		1 m (3.28 ft) or more	100 m (328.1 ft)
		60 to 99 cm (23.23 to 38.98 in.)	80 m (262.48 ft)
		30 to 59 cm (11.81 to 23.23 in.)	50 m (164.05 ft)

4.4 Twisted Cable Specifications

The following table indicates the specifications for the twisted cable that can be used with the CC-Link and the recommended cable.

The performance of the CC-Link cannot be guaranteed when cable other than the one recommended below is used.

Item	Specification
Model	FANC-SB 0.5 mm ² × 3
Cable type	Shielded, twisted cable
Conductor sectional area	0.5 mm ²
Conductor resistance (20 °C)	37.8Ω/km or less
Insulation resistance	10,000Ω-km or more
Dielectric withstand voltage	500VDC 1 minute
Electrostatic capacity (1kHz)	60nF/km or less
Characteristic impedance (1MHz)	100±15Ω
Cross-section	
Overall dimensions	7mm (0.28 in.)
Approximate weight	65kg/km

4.5 List of Functions

The following table lists the I/F board functions.

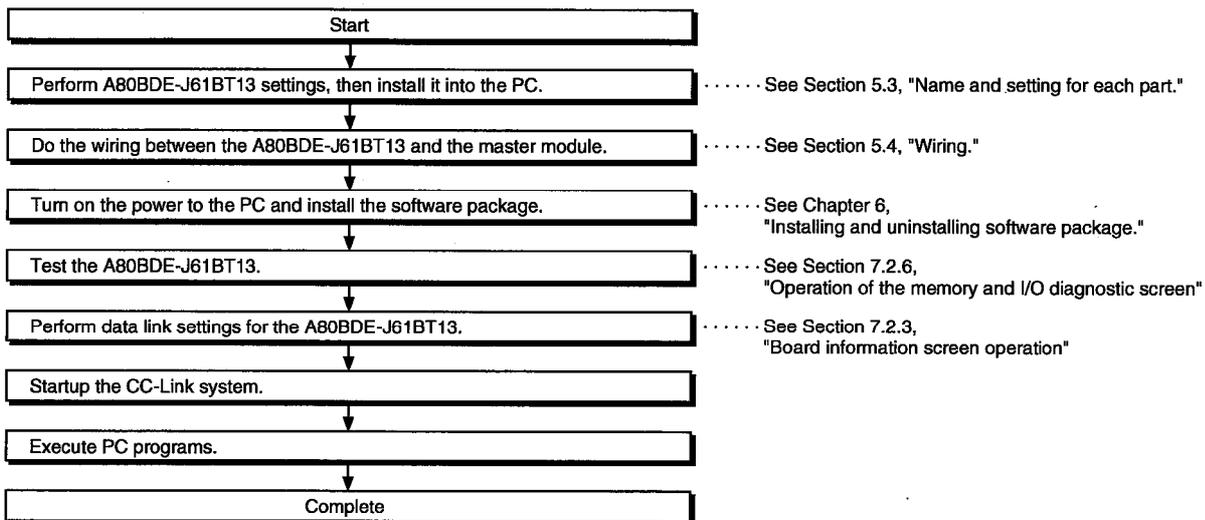
Name	Contents
Data communication function	(1) Communication for remote input (RX), remote output (RY), remote register (RWw, RWr) via the CC-Link is possible using the cyclic transmission function. <ul style="list-style-type: none"> • Number of link points per station <ul style="list-style-type: none"> Remote I/O (RX, RY) : 30 Remote register (RWw) : 4 Remote register (RWr) : 4 (2) Communication with the master station and intelligent device station is possible using the transient transmission function.
Test function	Tests can be performed and the hardware checked using the test mode setting.
RAS functions	Automatic return function, slave station separation function, verification of data link status, off-line test
Self-diagnostic function	<ul style="list-style-type: none"> • An error message is displayed according to the error code. • Contents of the fault detected are stored in the special relay or special register.

5. PROCEDURE AND SETTINGS UP TO THE POINT OF OPERATION

This section explains the operating procedure up to the point the I/F board is operated, as well as the names and setting for each part of the I/F board, wiring method and hardware testing.

5.1 Procedure Up to the Point of Operation

An outline of the procedure up to the point of I/F board operation is explained below.



Note

Setting on the master module side is mandatory in order to run the CC-Link system. Perform the settings for the master module side as required.

See the user manual for the master module regarding the master module settings.

5.2 Installation

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

5.2.1 Precautions when handling

The followings are precautions to be noted when handling the I/F board.

DANGER

- Do not touch the terminal or the connector while the power is turned on. Doing so may result in electric shock or cause malfunctioning.

CAUTION

- Fasten the I/F board securely using the installation screws and tighten the installation screws securely within the specified torque range. If the screws are loose, this may cause malfunctioning. If the screws are tightened too much, this could cause damage to the screws or module, leading to malfunctioning.
- Do not directly touch the conductive section of the I/F board. Doing so could result in malfunctioning or breakdown of the I/F board.
- Tighten the terminal screws within the specified torque range. If the terminal screws are loose, this may lead to a short or malfunctioning. If the terminal screws are tightened too much, this could cause damage to the screws or I/F board, leading to a short or malfunctioning.
- Handle the I/F board in a location where there is no static electricity. Static electricity could result in failure or malfunctioning.
- Take care that foreign objects such as chips or wiring debris do not get into the PC. This could result in fire, breakdowns or malfunctioning.
- Do not dismantle or rebuild the I/F board. This will result in failure, malfunctioning, injury or fire.
- Always turn off all external power before installing or removing the I/F board. If power is not turned off at all phases, there is a risk of electric shock or damage to the product.
- When discarding the product, handle it as an industrial waste.
- Do not drop the I/F board or subject it to strong impact. This will result in failure or malfunctioning of the board.

- (1) The tightening torque for the I/F board terminal screws and fixing screws should fall within the range indicated in the table below.

Screw locations	Tightening torque range
Terminal block terminal screws (M3.5 screw)	59 to 88 N·cm (6 to 9 kgf·cm)
Terminal block installation screws (M3.5 screw)	59 to 88 N·cm (6 to 9 kgf·cm)

5.2.2 Installation environment

See the instruction manual accompanying the PC unit regarding installation of the PC unit in which the I/F board is mounted.

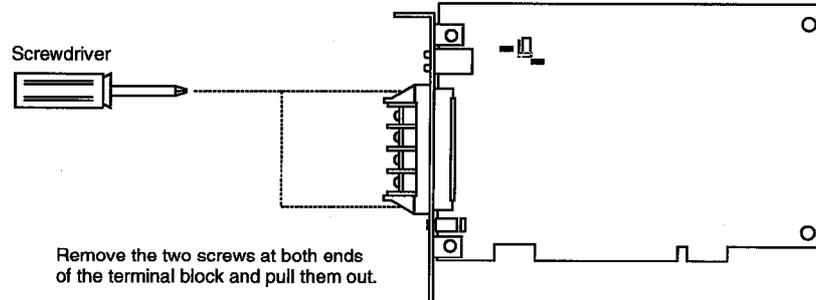
**CAUTION**

- Always ground the PC unit using grounding type D (Class 3 grounding). Otherwise, there is the risk of malfunctioning.
If there is an error in operation even when the PC unit is grounded, ground the FG terminal of the PC unit as well as the SLD terminal of the I/F board.

5.2.3 How to remove the terminal block

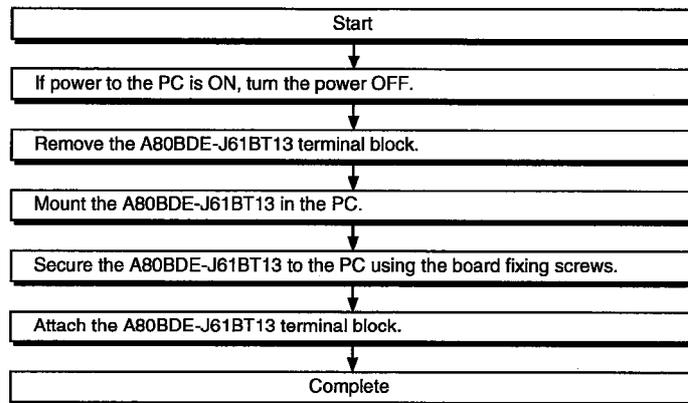
The I/F board uses a two-piece terminal block, so that the I/F board can be replaced without disconnecting the signal line to the terminal block.

The illustration below shows how to remove the block.



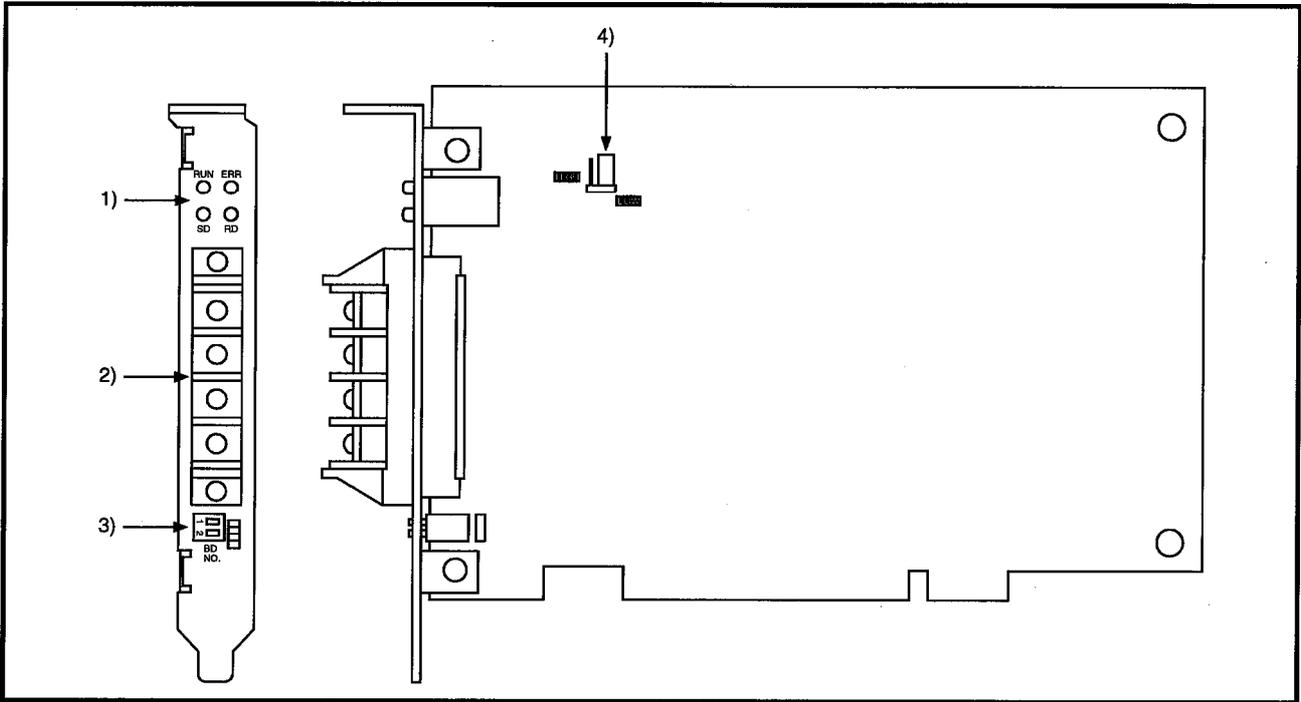
5.2.4 Procedure for mounting to the PC

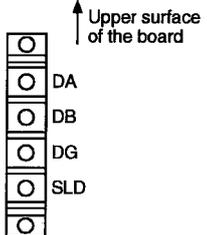
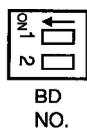
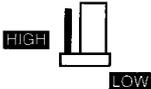
The following explains the procedure for mounting the I/F board to the PC.



5.3 Name and Setting for Each Part

This section explains the name and settings for each part of the I/F board.



Number	Name	Contents				
		LED nomenclature	Contents	ON	OFF	
1)	Operation display LED RUN ERR  SD RD 	RUN	Lights when the I/F board is running properly and turns off when a WDT error occurs	I/F board is normal	<ul style="list-style-type: none"> WDT error PC power is OFF 	
		ERR.	Lights when there is an error in the network communication status	Data link communication error	Data link communication normal	
		SD	Flashes when the data link is transmitting data	Flashes while the data link is transmitting		
		RD	Flashes when the data link is receiving data	Flashes while the data link is receiving		
2)	Terminal block for the data link 	Connect a twisted cable to perform the data link. (2-piece terminal block)				
3)	Channel number setting switch 	Sets the channel number for the I/F board.				
		Board number	Channel number	Switch		Notes
				1	2	
		0	81	OFF	OFF	Default setting
		1	82	ON	OFF	
		2	83	OFF	ON	
3	84	ON	ON			
Set the board number, so that there is no duplication when two or more I/F boards are installed.						
4)	Switch setting pin for abnormal temperature detection 	Sets the temperature at which to be detected when there is an abnormal temperature.				
		Setting	Contents	Notes		
		HIGH	Set the detect temperature at 55 °C.			
		LOW	Set the detect temperature at 45 °C.	Default setting		

5.4 Wiring

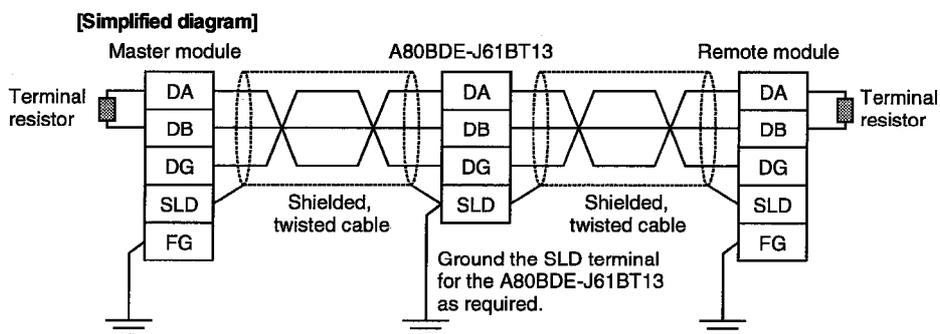
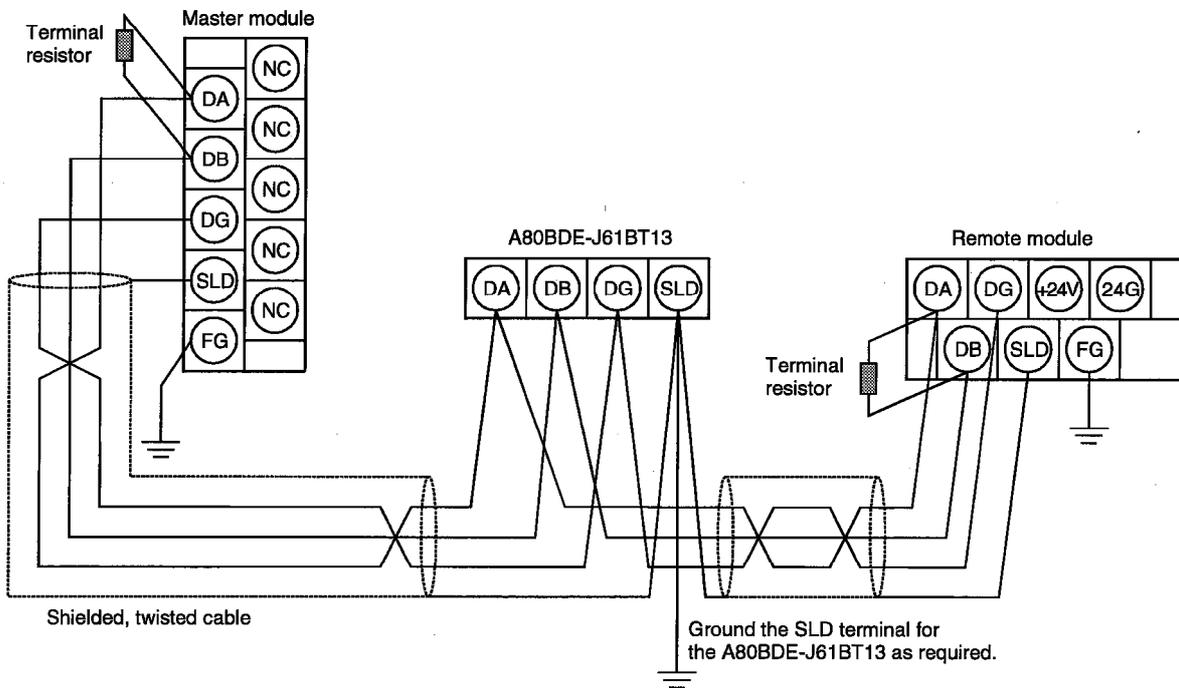
5.4.1 Precautions when handling the twisted cable

There is the risk of damage to the twisted cable if it is handled in an extreme fashion. Therefore, do not handle the cable in the following manner.

- (1) Crushing the cable.
- (2) Twisting the cable with extreme force.
- (3) Pulling the cable with extreme force. (greater than the allowable tension)
- (4) Stepping on the cable.
- (5) Placing objects on top of the cable.
- (6) Damaging the cable cover.

5.4.2 How to wire to each module

The following indicates how to wire the twisted cable for the master module, remote module and I/F board.



CAUTION

- Always ground the PC unit using grounding type D (Class 3 grounding). Otherwise, there is the risk of malfunctioning.
If there is an error in operation even when the PC unit is grounded, ground the FG terminal of the PC unit as well as the SLD terminal of the I/F board.

Point

Always connect the "terminal resistor" that comes with the master module to the modules at both ends for the data link. (Connect between DA and DB)

6. INSTALLING AND UNINSTALLING SOFTWARE PACKAGES

The following explains methods on how to install and uninstall software packages to run the board for each operating system.

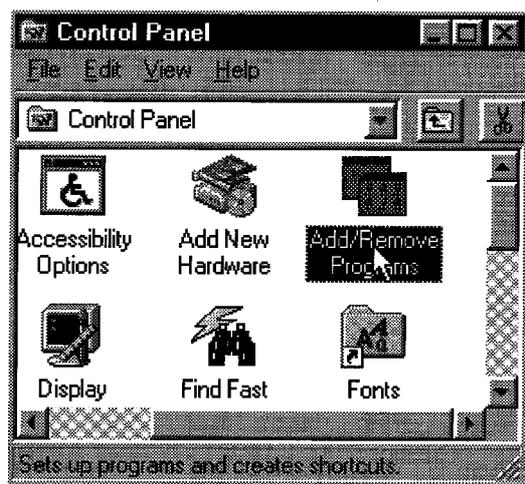
6.1 Installing and Uninstalling Software Packages for Windows 95/98/NT 4.0

The following explains methods on how to install and uninstall software packages for Windows 95/98/NT 4.0.

6.1.1 Installing software packages for Windows 95/98/NT 4.0

The following shows the installation procedure of software packages for Windows 95/98/NT 4.0.

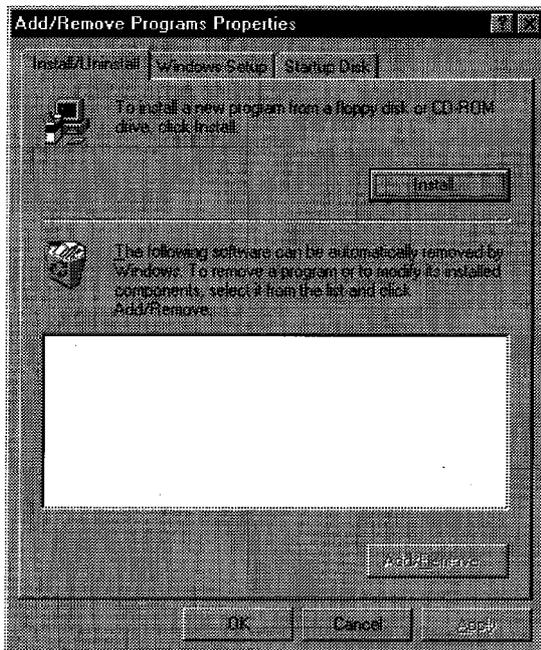
Point
(1) If operating system is Windows NT 4.0, log on as a user whose privilege is an administrator.
(2) Remove all applications that are included in the Start up menu, then restart Windows before installing.
(3) The floppy diskettes, 1/6 (first disk) to 4/6 (4th disk) are used for installation.
(4) Uninstall SW0DNF-CCLINK and SW1DNF-CCLINK before installing SW2DNF-CCLINK. Also, the utility setting needs to be configured again as all setting data using each utility is erased.
(5) The following method performs installation from "Add/Delete Applications" in the "Control Panel." The other method is to execute "SETUP.EXE". When "SETUP.EXE" is clicked, installation begins starting from the sixth item.



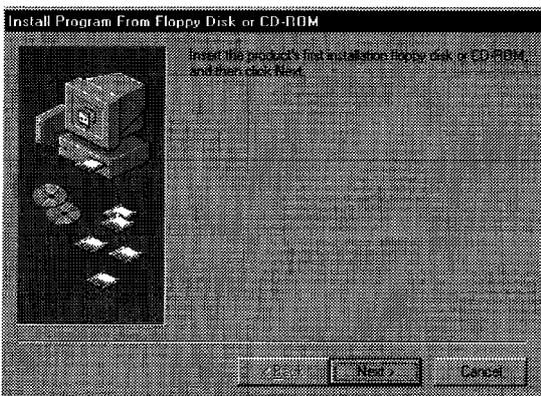
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1. Turn on the power to the PC and start Windows.
2. Open "Start" – "Setting" – "Control Panel".

(From the previous page)

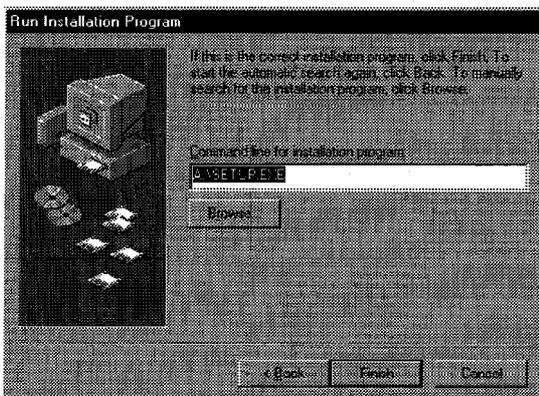


3. Open "Add/Delete Applications".



4. When the next screen is displayed, insert the 1/6 (first) floppy diskette into FDD. After inserting the floppy diskette, click the [Next (N)] button.

[Note] Note that SW0DNF-CCLINK and SW1DNF-CCLINK requires different sequences of the floppy diskettes used for installations.

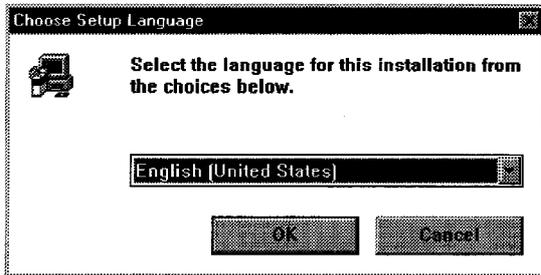


5. When the next screen is displayed, it indicates that "SETUP.EXE" is found. Click the [Exit] button, and start the installation. "If SETUP.EXE" was not found, click the [Browse (R)] button and change to the directory where "SETUP.EXE" is located.

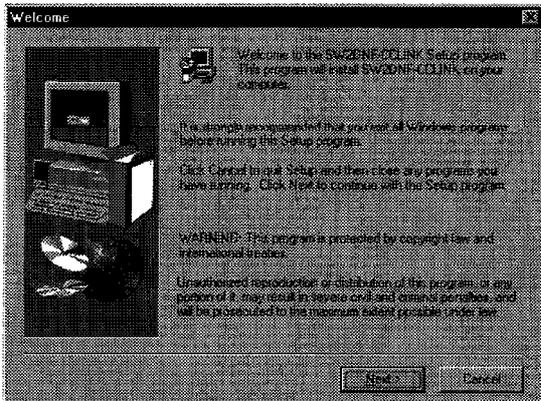


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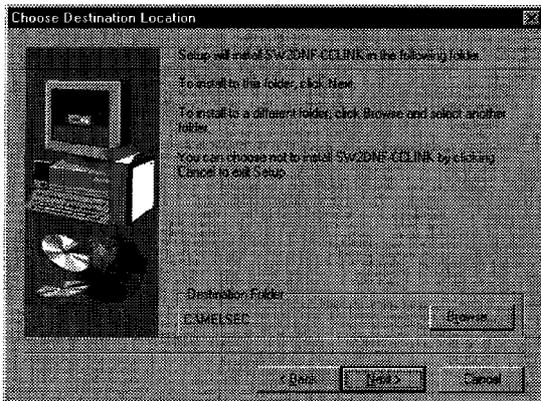
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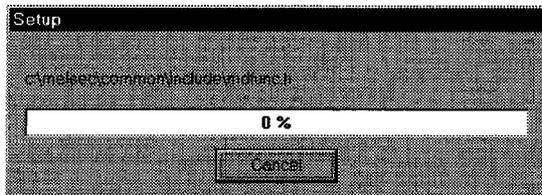
6. After a few moments, the screen similar to what shown left will be displayed. Select Japanese and click the [OK] button.



7. Verify the content, and click the [Next (N)] button.



8. Specify the installation destination folder. The default installation destination folder for SW2DNF-CCLINK is "C:\MELSEC". If the default is fine, click the [Next (N)] button. When changing the installation destination folder, click the [Browse (R)] button and change it.

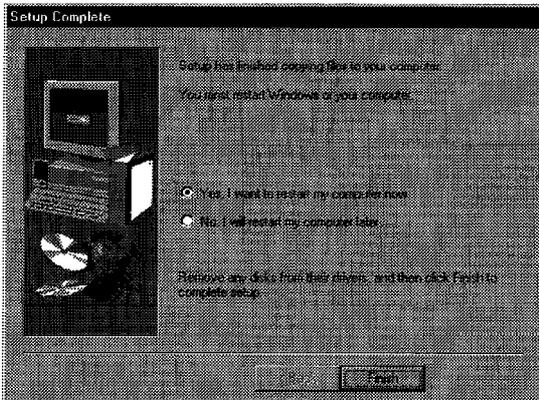


9. As the installation starts, follow the instructions and insert the floppy diskettes in order.



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(From the previous page)



10. When the dialog box shown left is displayed, it indicates that installation is completed.

To restart, verify that "Yes, shutdown the computer and restart now". is checked, then click the [Exit] button.

To restart later, check "No, restart later". and click the [Exit] button.

Point

When the installation fails to complete successfully, and if software packages can be uninstalled, execute uninstallation.

6.1.2 Icons to be registered

Installing the software packages will register the icons shown below.

The icons shown below are registered in [Start] – [Program] – [MELSEC].

- (1)  MELSEC CC-Link Utility

Starts CC-Link Utility.

- (2)  Error viewer (for Windows 95/Windows98 only)

Starts Error viewer.

Point

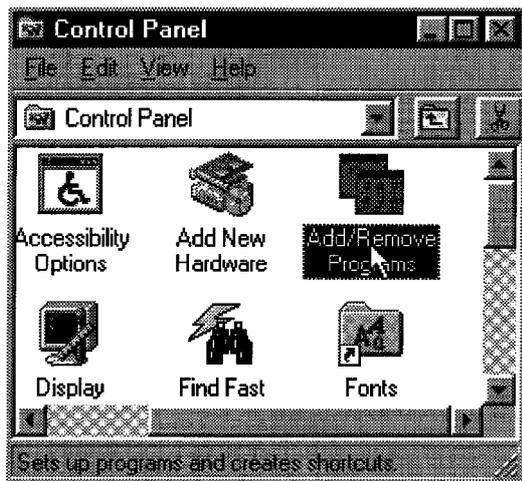
If other I/F board software packages are installed, the icon for the device monitor utilities may be registered.
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6.1.3 Uninstalling software packages for Windows 95/98/NT 4.0

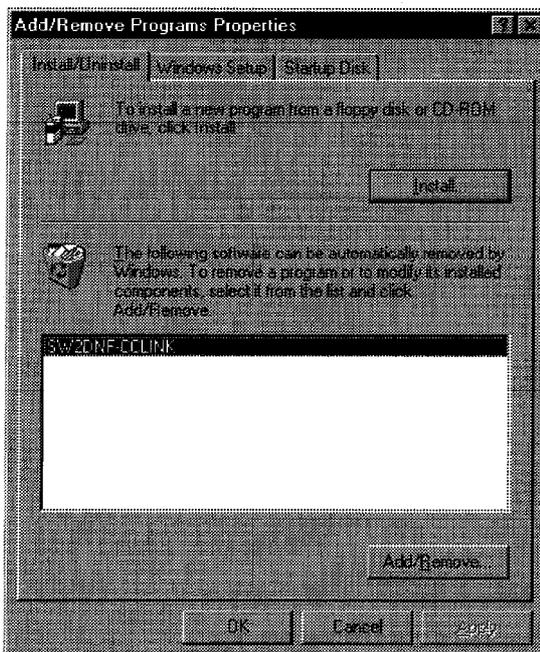
The following shows uninstallation method for the software packages.

Point

- Be sure to execute uninstallation from the control panel.
Do not directly start "UnInstaller.exe" that has been installed.



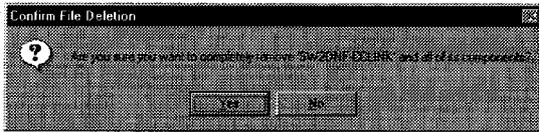
1. Select [Start] – [Settings] – [Control Panel] menu.
2. As control panel is displayed, double-click "Add/Delete Applications".



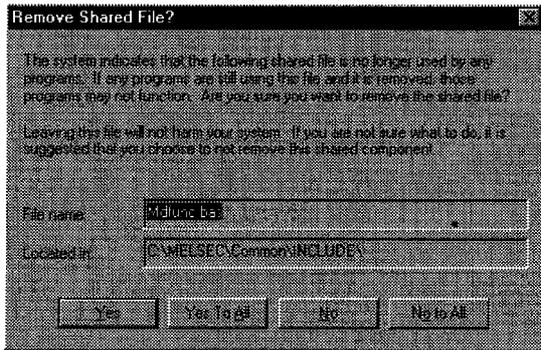
3. Select "SW2DNF-CCLINK", and click the [Add/Delete (R)] button.

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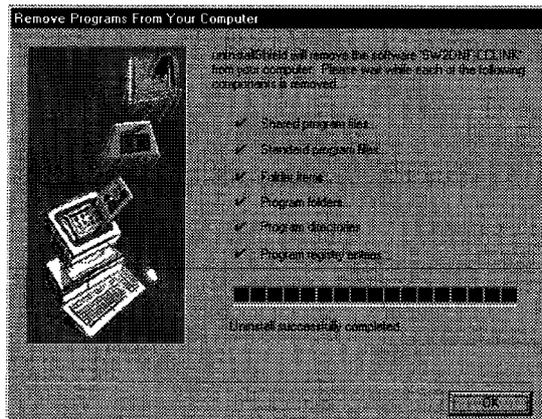


4. Clicking the [Yes (Y)] button starts uninstallation.



5. If the screen shown left is displayed, click [No to all (O)] button.

Clicking the [Yes (Y)] or [Yes to all (A)] button deletes common files for the MELSEC software packages group, and other software packages may not start normally.



6. Upon completing uninstallation, click the [OK] button.

7. UTILITY OPERATION

7.1 Utility Common Operations

The following explains the common operations for each utility.

7.1.1 Starting a utility

A utility can be started by clicking on menus 1) to 5) shown below found in the [Start] – [Program] – [MELSEC application] – [Basic communication support tools] menu.

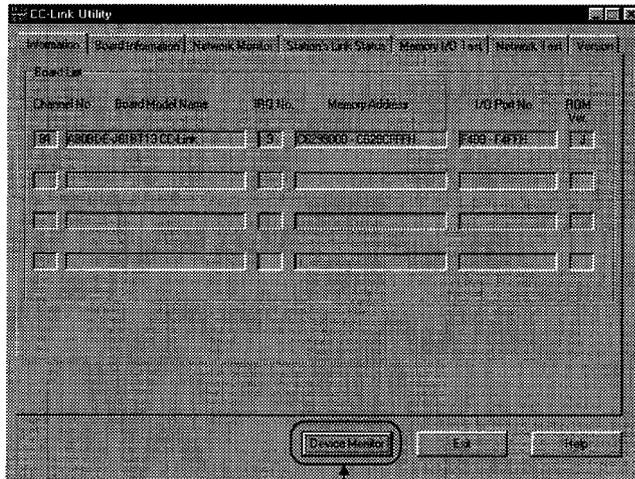


- 1) Starts the CC-Link utility.
- 2) Starts the error viewer.

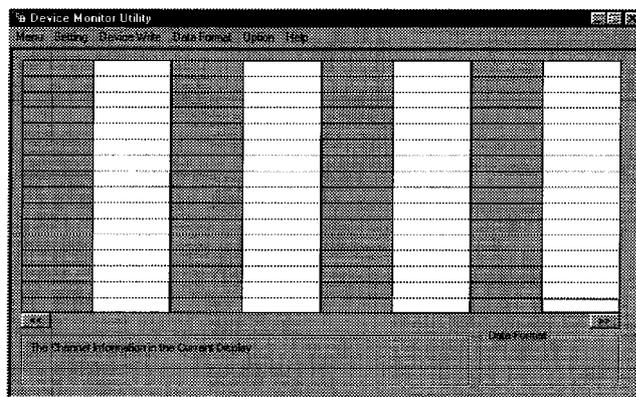
7.1.2 Starting the device monitoring utility

The following explains how to start the device monitoring utility from the CC-Link utility.

The device monitoring utility can be started by clicking on the [Device monitor (start)] button found at the bottom of the CC-Link utility screen.



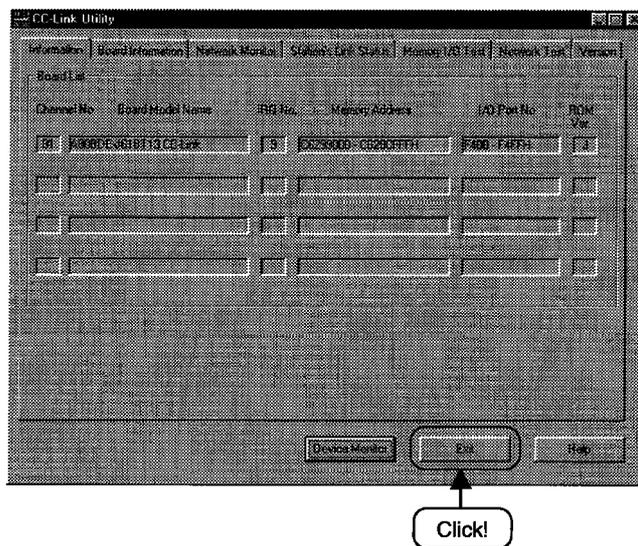
Click!



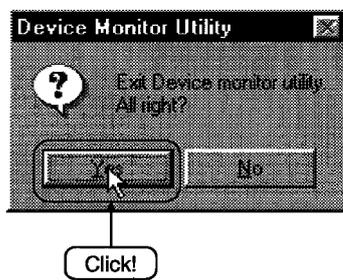
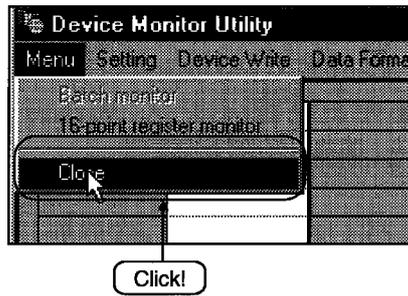
7.1.3 Ending a utility

The following explains how to end a utility.

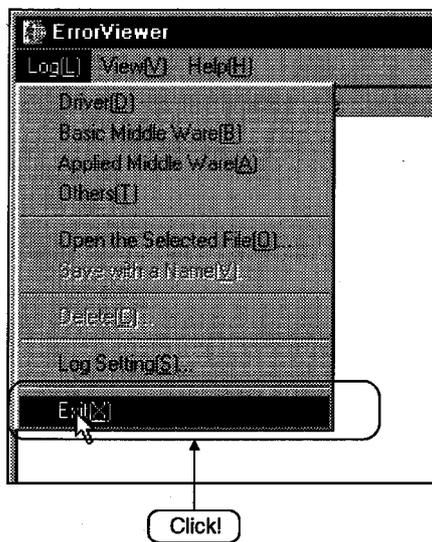
- (1) To end the utility, click the [Exit] button at the bottom of the utility screen.



- (2) To end the device utility, click [Menu] – [Close] from the menu bar.
When a dialog box is displayed, clicking the [Yes] button ends the device monitor utility.



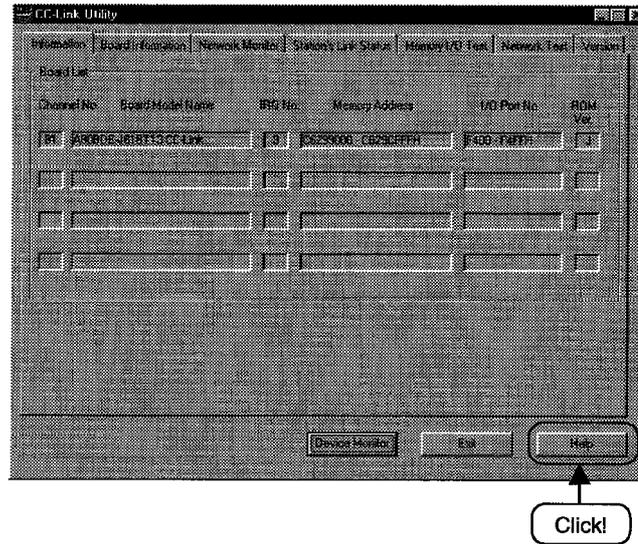
- (3) To end the error viewer, click [Log] – [Exit] menu from the menu bar.



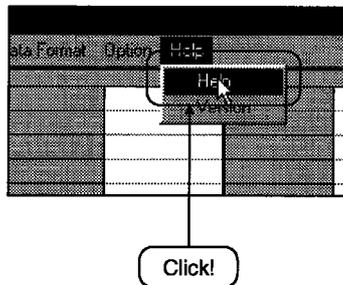
7.1.4 Displaying the help screen

The following explains how to display the utility's help screen.

- (1) To display the utility's help screen, click the [Help] button at the lower right-hand corner of the utility screen.



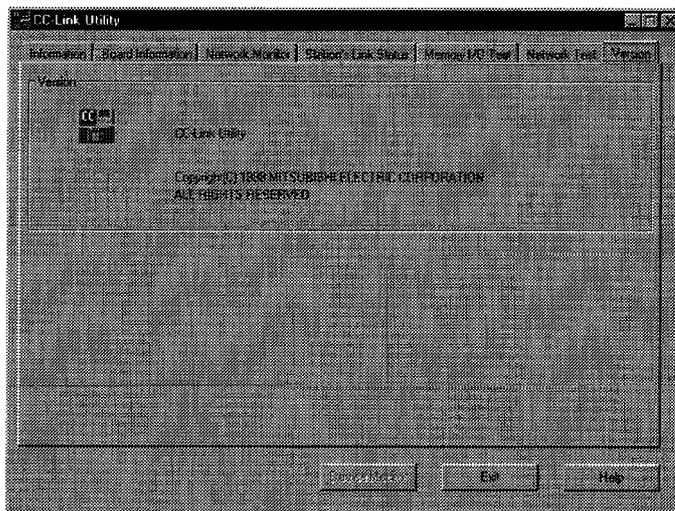
- (2) To display the help screen for the device monitor utility and error viewer, click [Help] – [Help] from the menu bar.



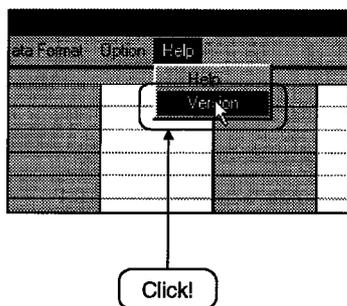
7.1.5 Verifying the version

The following explains how to verify the utility version.

- (1) To verify a utility's version, click the "Version" tab.



- (2) To display the help screen for the device monitor utility and error viewer, click [Help] - [Version] from the menu bar.

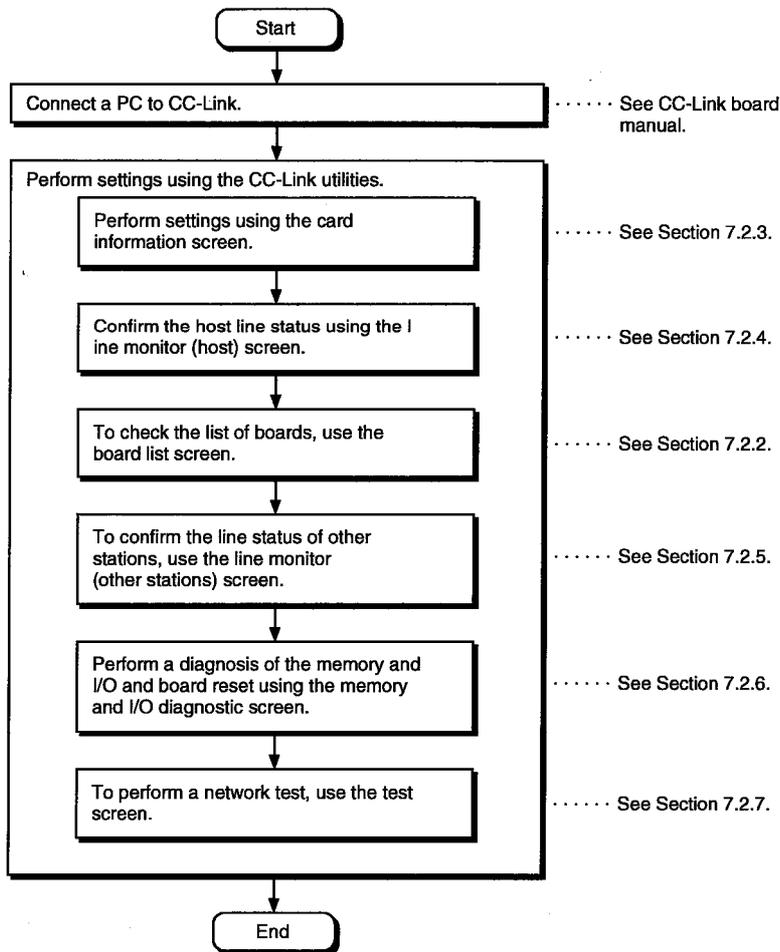


7.2 CC-Link Utility Operation

The following explains how to set and operate the CC-Link utilities.

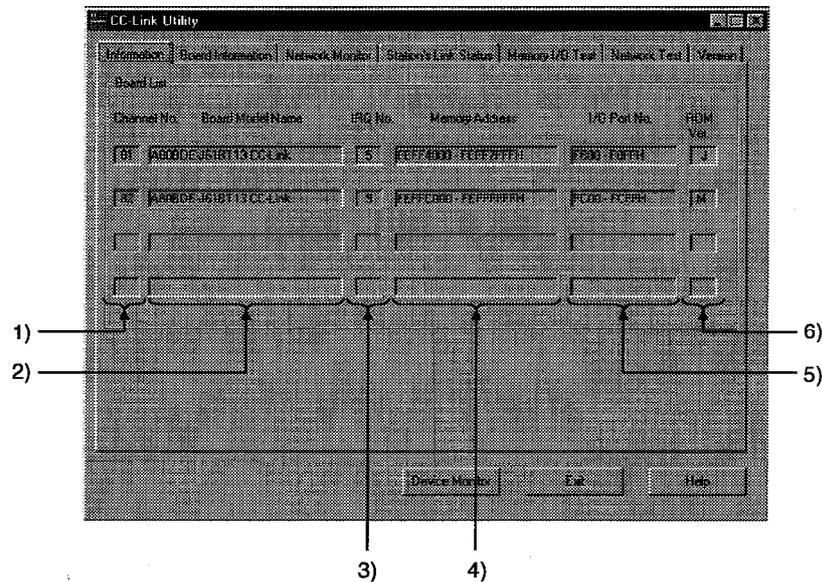
7.2.1 Operation procedure

The following explains the operation procedure for the CC-Link utilities.



7.2.2 Information screen

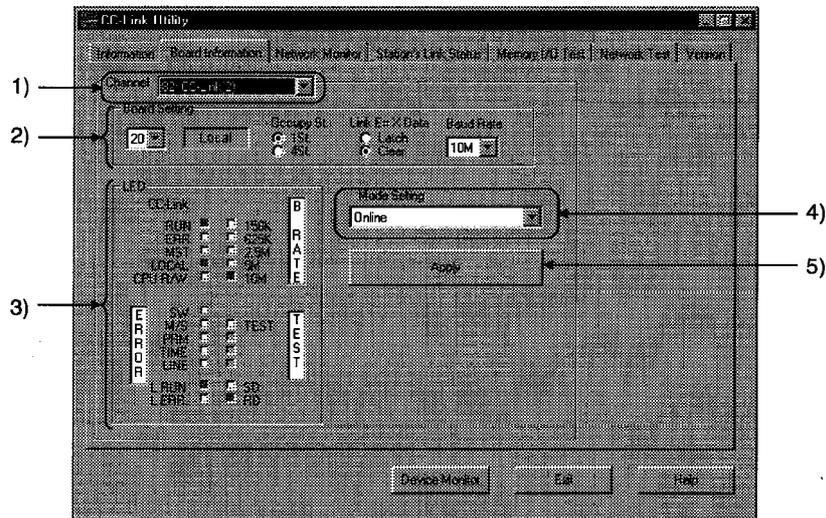
The board list screen displays the hardware information that is set for CC-Link board.



- 1) **Channel No.**
Displays the channel number.
- 2) **Board Model Name**
Displays the model of CC-Link board that is connected.
- 3) **IRQ No.**
Displays the IRQ number that CC-Link board uses.
- 4) **Memory Address**
Displays the range of dual-port memory that CC-Link board occupies.
- 5) **I/O Port No.**
Displays the ranges of I/O port that CC-Link board occupies.
- 6) **ROM Ver.**
Displays the ROM version of CC-Link board.

7.2.3 Operations on Board Information screen

The board information screen is used to set and to display various information about the installed CC-Link board.



Point
When switching screens, set the mode setting to "On-line" or "Off-line."

- 1) **Channel**
Sets a channel to be used.
- 2) **Board Setting**
Sets information on the host.

Item	Setting
Station number	Station 1 to 64
Number of stations occupied	1 station/4 stations
Data entered at fault	Retain/clear
Transmission speed	156k/625k/2.5M/5M/10Mbps

3) LED

Display present status of CC-Link board.

LED name	LED On
RUN	CC-Link system normal
ERR.	Communication abnormal
MST	Master station
LOCAL	Local station
CPU R/W	Communicating
SW	Switch setting error
M/S	Master station duplication error
PRM	Parameter error
TIME	Time over
LINE	Cable disconnection error
L RUN	Data link running
L ERR.	Communication error
156k	LED for the set baud rate lights up
625k	
2.5M	
5M	
10M	
TEST	Off-line test executing
SD	Data transmitting
RD	Data receiving

4) Mode setting

Perform the mode setting for the CC-Link board, and display the present mode status.

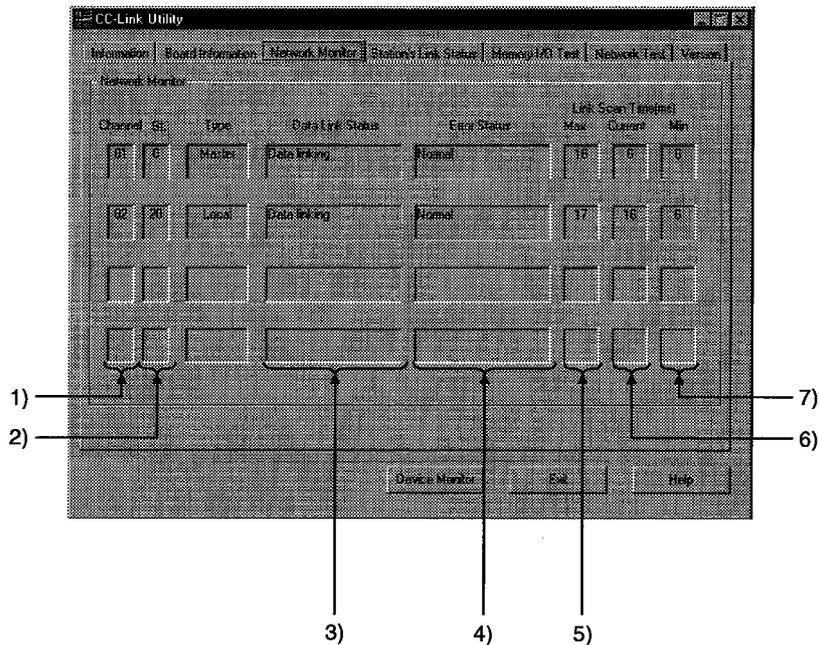
Mode	Data
Online (automatic return yes)	Used for normal communication
Offline	Becomes the state when not connected to the network.
H/W test mode	Executes a test of the A80BDE-J61BT13 hardware. [Procedure] Connect a terminal resistor between the terminal DA and DB. Set the mode setting to "H/W test mode" and press the "Apply" button.

5) "Apply" button

The contents of the setting with respect to the CC-Link board for the channel selected in 1) are updated.

7.2.4 Operatoins on Network Monitor screen

This screen monitors the line status of the host.



- 1) **Channel**
Displays the channel number.
- 2) **St.**
Displays the station number of the host.
- 3) **Data Link Status**
Monitors and displays the startup status of the data link.

Status	Contents
Initial status	Data link is in initial status.
No parameter	Parameters have not been received.
Data linking	The data link is being executed.
Data link stopping	The data link has stopped.
Disconnecting (Not poking)	There is not inquiry from the master station and the link is disconnected.
Disconnecting (Line Error)	The link is disconnected due to an error in the line.
Disconnecting	The link is disconnected due to other reasons.
Line testing	A line test is being performed.
Parameter Set testing	A test is being performed on the parameter settings from the master station.
Automatic returning	A return is automatically being processed.
Resetting	The board is being reset.

4) Error Status

Monitors and displays the error status.

Display	Contents
Normal	Normal status
Transmission Error	Error in communication path detected.
Parameter Error	Error in parameters detected.
CRC Error	CRC error detected.
Time Out Error	Timeout error detected.
Abort Error	An error in the CC-Link board (gate array) detected.
Setting Error	Error in the setting detected.
Other Error	Error arising from some other cause detected.

5) Link Scan Time (Max)

Displays the maximum value for the link scan time . (1ms unit)

6) Link Scan Time (Current)

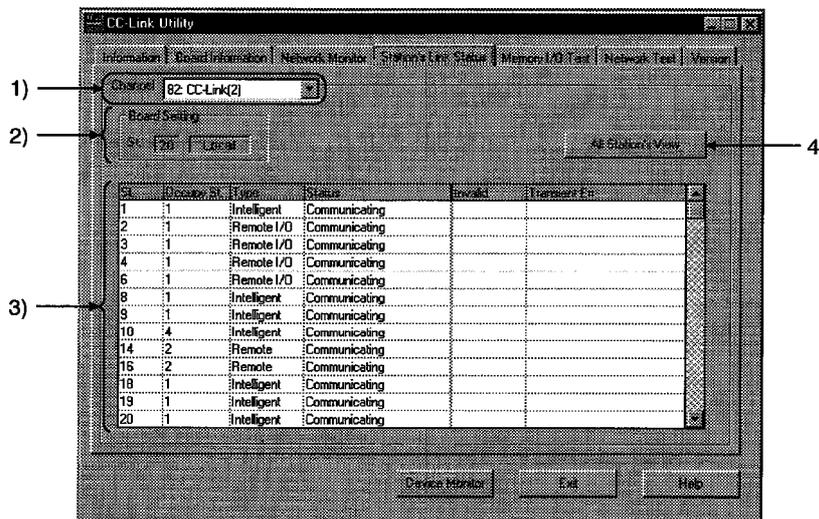
Displays the current value for the link scan time. (1ms unit)

7) Link Scan Time (Min)

Displays the minimum value for the link scan time. (1ms unit)

7.2.5 Operations on Station's Link Status screen

Displays the line status of another station.



Point
 The line monitor (other station) only monitors when the host status is "data linking."

- 1) **Channel**
Sets the channel to be used.
- 2) **Board Setting**
Displays information on the host.
- 3) **Other Station Status**
Displays the status of another station.

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	Contents
Remote Device	Remote device station
Remote I/O	Remote I/O station
Intelligent	Intelligent station, local station

Status Displays the status of another station.

Display	Contents
Communicating	Normal
Communication interrupted	Communication is stopped
Link error	There is a link error
WDT error	A watchdog timer error occurred
Fuse brake off	A station has blown a fuse
Repeated station	There are duplicate station numbers
Moved switch	Switch was changed

Invalid Displays the station with an error invalid setting.

Display	Contents
Invalid	There is a setting
(Free)	No setting

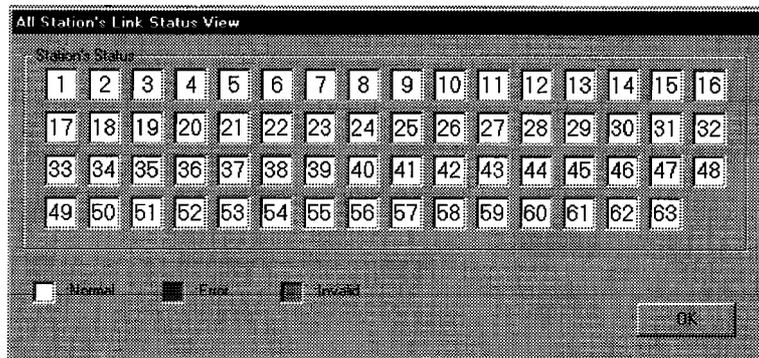
Transient Err Displays the status of a transient error.

Display	Contents
Transient Err	There is an error
(Free)	No error

4) **All Station's View**

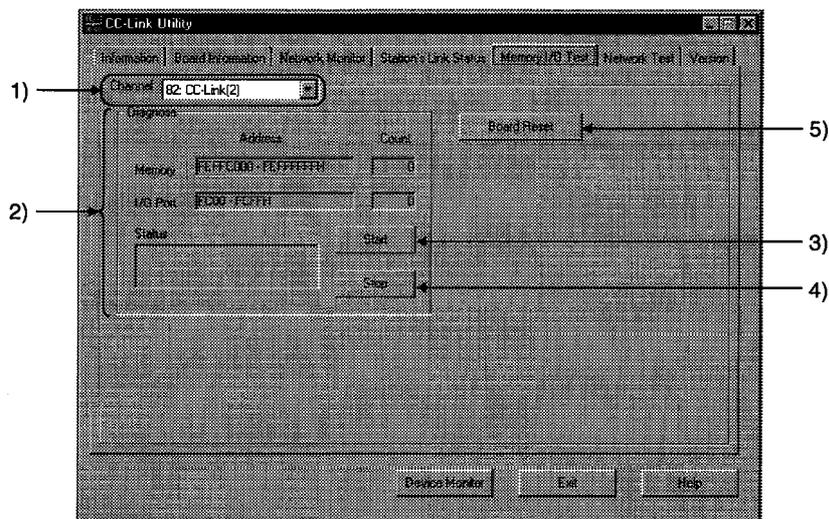
A list of communication status for other stations is displayed.

When a reserve station has been set in the data link parameter that is set in the master station, the reserve station is displayed as a normal communication station in the following list of other station communication statuses.



7.2.6 Operations on Memory I/O Test screen

Diagnoses the dual-port memory and I/O port used by the CC-Link board.



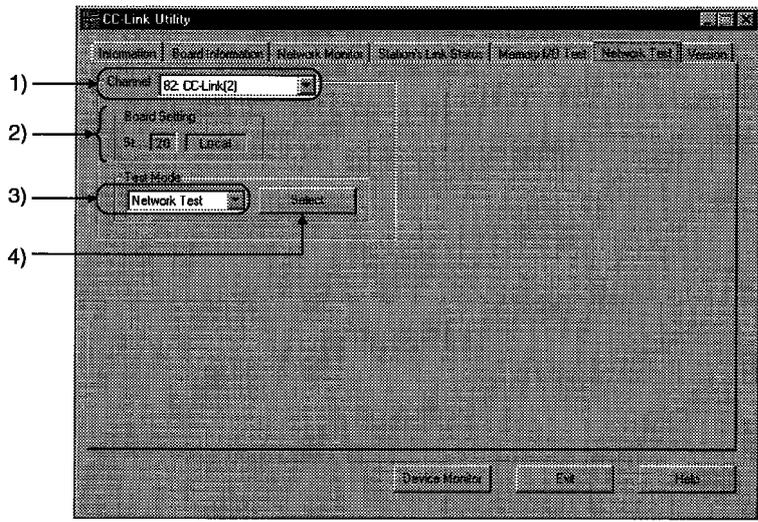
Point

- (1) Start the diagnostic operation after disconnecting the external cable.
- (2) To switch the screens during the diagnostic operation, click the "Stop" button to terminate the diagnosis and then switch screens.

- 1) **Channel**
Set the channel to be used.
- 2) **Diagnose**
Displays the address being diagnosed and number of the diagnosis and status.
- 3) **"Start" button**
Starts the memory and I/O diagnosis.
- 4) **"Stop" button**
Terminates the memory and I/O diagnosis.
- 5) **"Board Reset" button**
Resets the CC-Link board.

7.2.7 Operation of the test screen

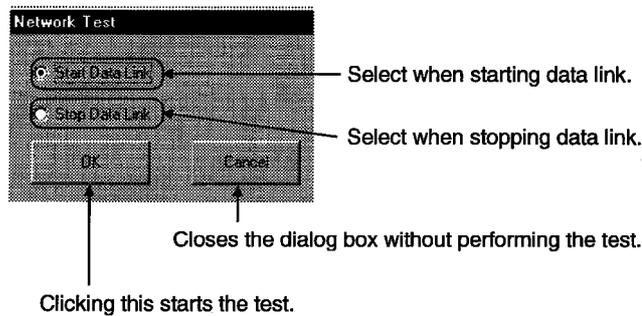
Tests the CC-Link board that is loaded.



- 1) **Channel**
Sets the channel to be used.
- 2) **Board Setting**
Displays information on the host.
- 3) **Test Mode**
Sets the items to be tested.

Test	Contents
Network Test	Performs a test for data link start and stop.

- 4) **"Select" button**
Clicking on the "select" button displays the following dialog box.



7.3 Device Monitor Utility Operation

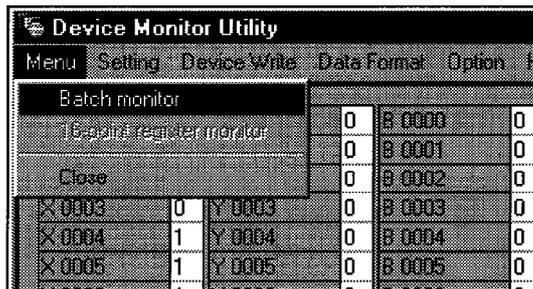
The following explains how to operate and set the device monitor utility.

7.3.1 Setting as batch monitoring

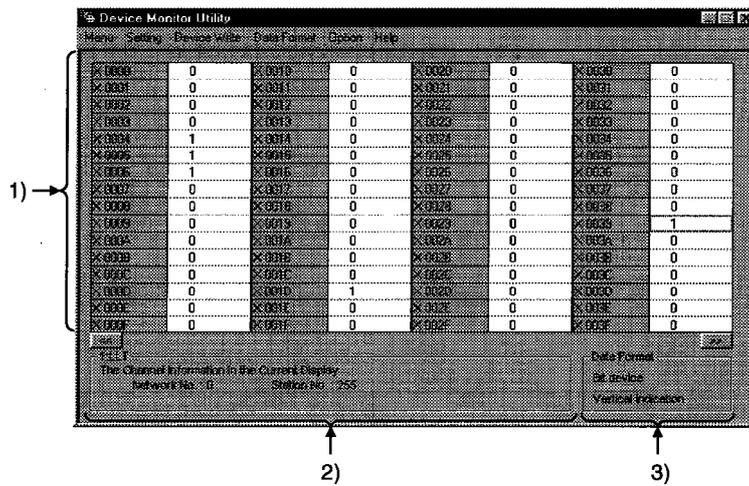
Monitors only one device that has been specified.

(1) Selecting the menu

Select [Menu] – [Batch monitor] from the menu bar.
(Selectable for 16-point register monitor only.)



(2) Display screen



1) Device information

Displays the current device status.
See Section 7.3.8 when the display form is changed.

2) Network status

Displays the network status currently set.
See Section 7.3.3 when the network is set.

3) Data Format

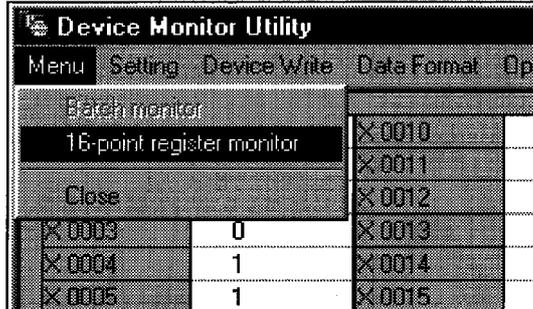
Shows a display form and device types being displayed (word device and bit device).
See Section 7.3.4 when the device type is changed.
And, see Section 7.3.8 when the display form is changed.

7.3.2 Setting as 16 point register monitor

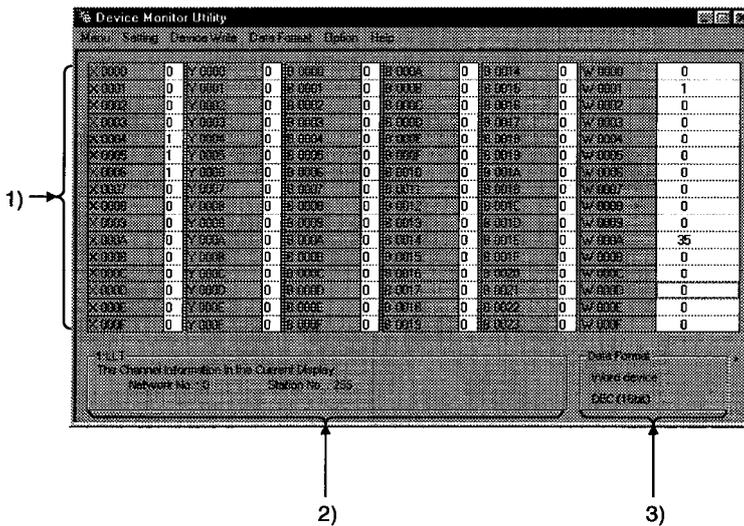
Monitors up to five bit devices and one word device simultaneously.

(1) Selecting the menu

Select [Menu] – [16 point register monitor] from the menu bar.
(Selectable at batch monitoring only.)



(2) Display screen

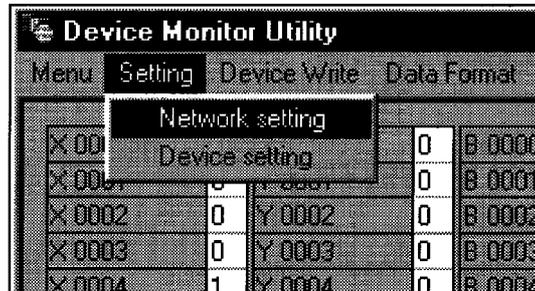


7.3.3 Setting the monitoring destination

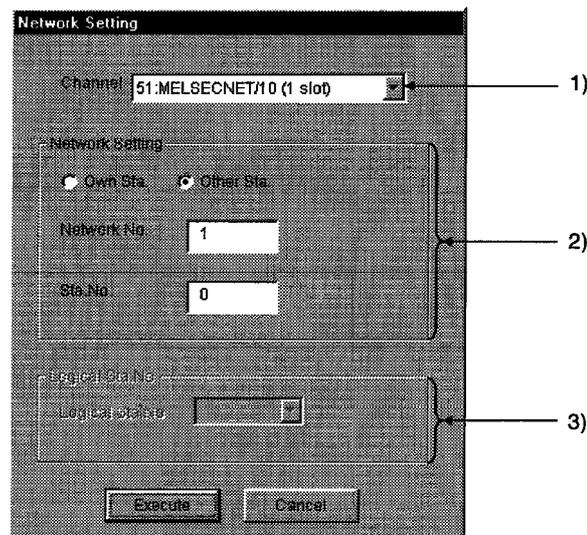
Sets the network to be used for device monitoring.
Set this when starting the device monitor utility.

(1) Selecting the menu

Select [Setting] – [Network setting] from the menu bar.



(2) Dialog box



1) Channel

Sets the channel to be used.

2) Network Setting

Sets the host and other stations along with network number and station number.

3) Logical Sta. No.

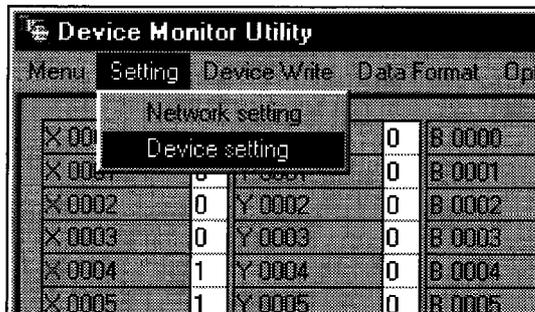
Sets the logical station number.

7.3.4 Setting the device to monitor

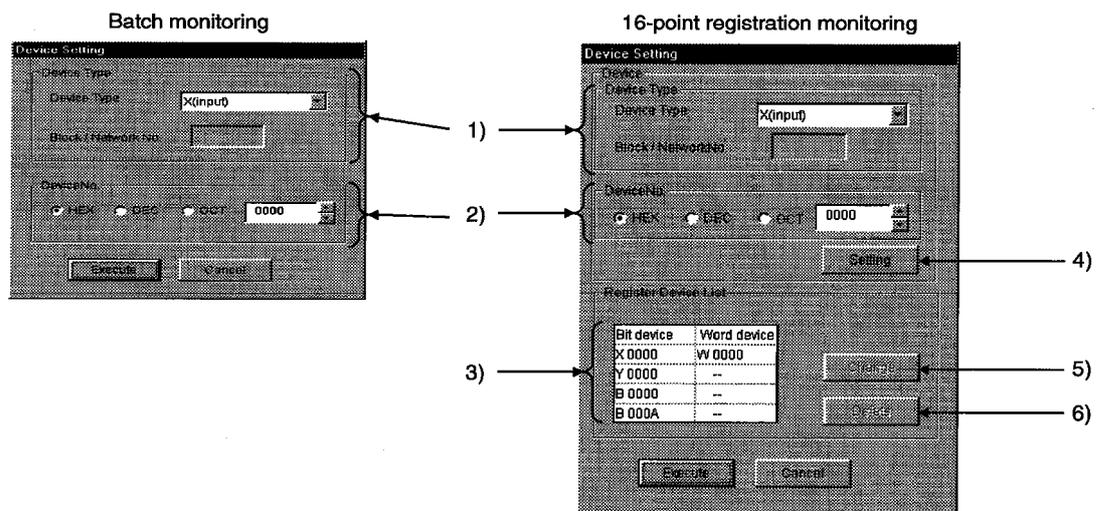
Set the device to perform monitoring.

(1) Selecting the menu

Select [Setting] – [Device setting] from the menu bar.



(2) Dialog box



1) Device Type

Sets the device type, block number, and network number to monitor.

2) Device No.

Sets the head number of device to monitor.
(HEX: Hexadecimal, DEC: Decimal)

3) Register Device List

Displays a list of the devices entered .

- 4) **Setting button**
Enters the data set in 1) and 2), and adds them to 3) (list of devices entered).

- 5) **Change button**
Selects the device to change, and click this button to change the entered data.

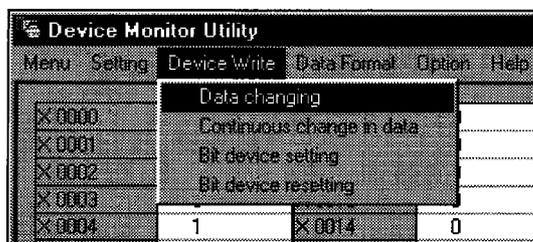
- 6) **Delete button**
Selects the device to be deleted, and click this button to delete from the list of devices entered.

7.3.5 Changing word device values

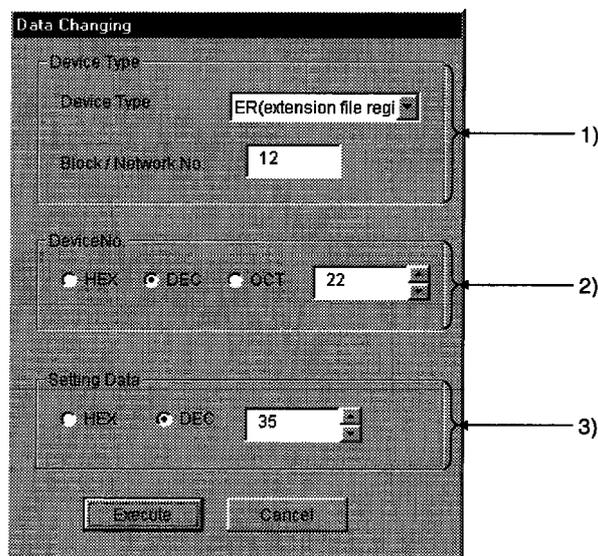
Changes the specified word device data.

(1) Selecting the menu

Select [Device Write] – [Data changing] from the menu bar.



(2) Dialog box



1) Device Type

Sets the device type, block number, and network number to change the data.

2) Device No.

Sets the device number to change the data.

(HEX : Hexadecimal, DEC : Decimal)

3) Setting Data

Sets the data to be changed.

(HEX : Hexadecimal, DEC : Decimal)

DANGER

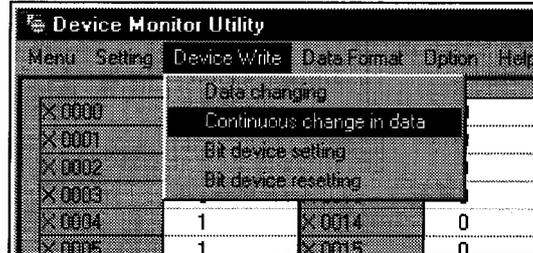
- Configure the interlock circuit over the sequence program so that the entire system works safely at all times for data change control to the PLC in operation. Also, decide on corrective actions for an event of data communication error between the PC and PLC CPU in use.

7.3.6 Changing word device values continuously

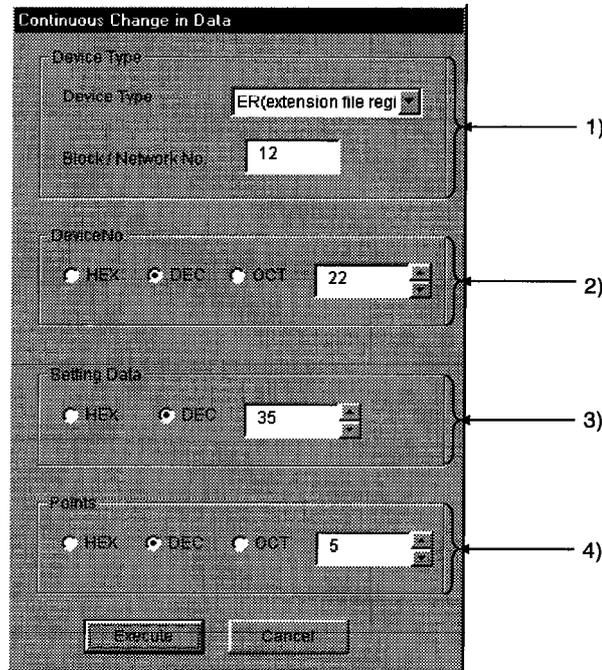
Change the specified word device data for the number of specified points being set.

(1) Selecting the menu

Select [Device Write] – [Continuous change in data] from the menu bar.



(2) Dialog box



1) Device Type

Sets the device type, block number, and network number to change the data.

2) Device No.

Sets the head address to change the data.
(HEX : Hexadecimal, DEC : Decimal)

3) Setting Data

Sets the data to be continuously changed.
(HEX : Hexadecimal, DEC : Decimal)

4) Points

Sets the number of points to perform continuous change of the data.

**DANGER**

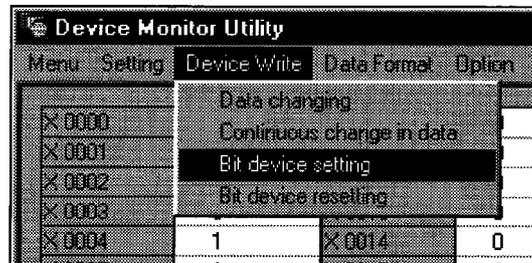
- Configure the interlock circuit over the sequence program so that the entire system works safely at all times for data change control to the PLC in operation. Also, decide on corrective actions for an event of data communication error between the PC and PLC CPU in use.

7.3.7 Tuning on/off a bit device

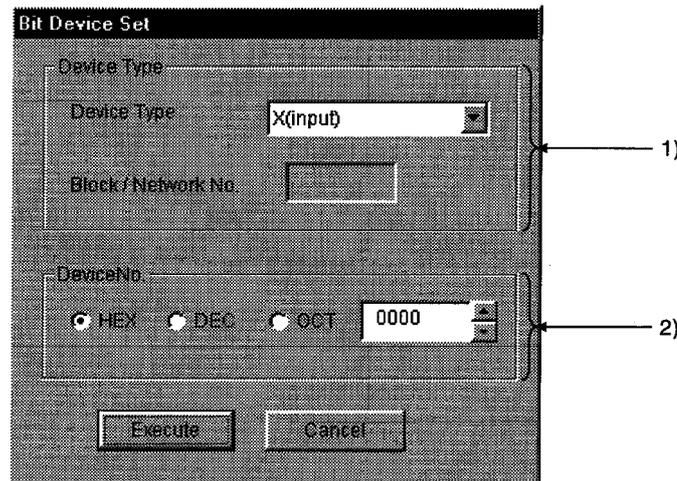
Turns on/off the specified bit device.

(1) Selecting the menu

Select [Device Write] – [Bit device Setting] from the menu bar.



(2) Dialog box



1) Device Type

Sets the bit device type, block number, and network number to turn on/off.

2) Device No.

Sets the bit device number to turn on/off.

(HEX : Hexadecimal, DEC : Decimal)

DANGER

- Configure the interlock circuit over the sequence program so that the entire system works safely at all times for data change control to the PLC in operation. Also, decide on corrective actions for an event of data communication error between the PC and PLC CPU in use.

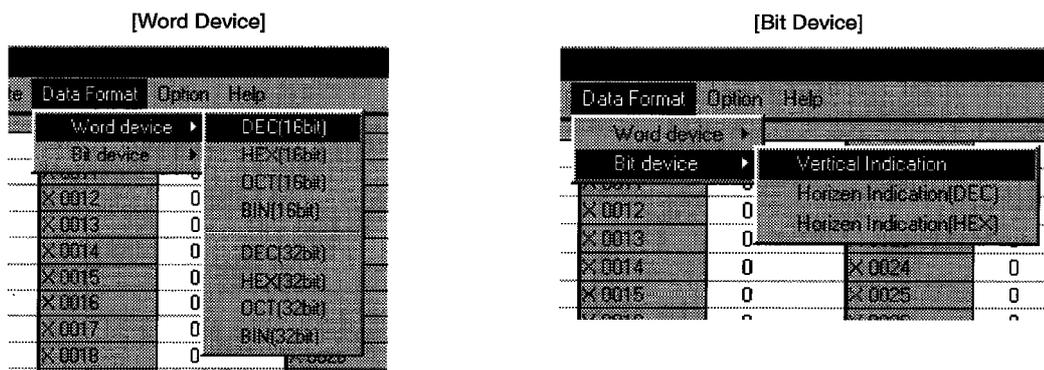
7.3.8 Switching the display form

Switches the display form for device monitor to the selected display form.
 The batch monitoring and 16 point entry monitor have different sets of selectable menu.

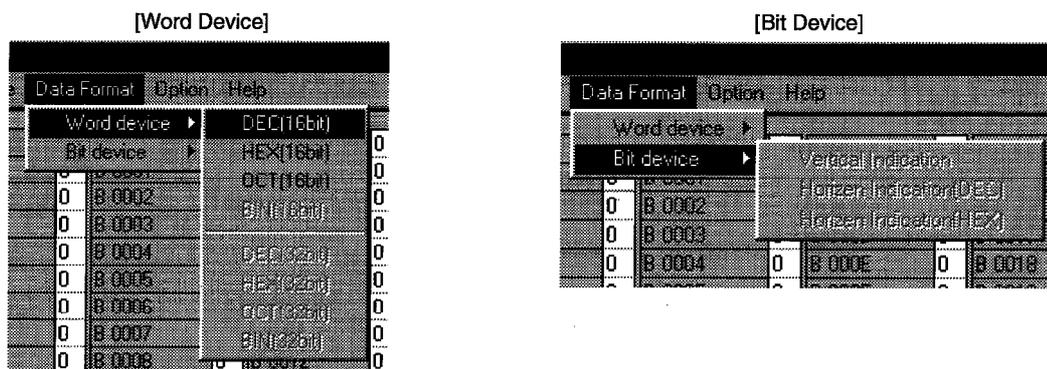
(1) **Selecting the menu**

Select [Display switch] – [Word device] from the menu bar.

(a) For batch monitoring

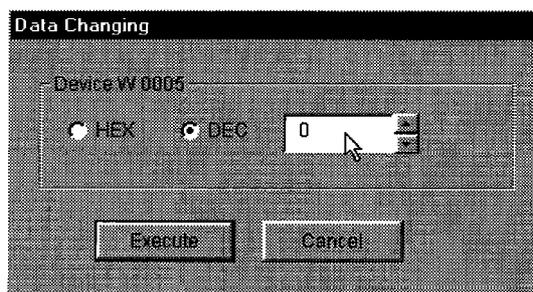
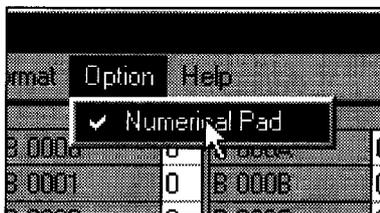


(b) For 16 point entry monitor

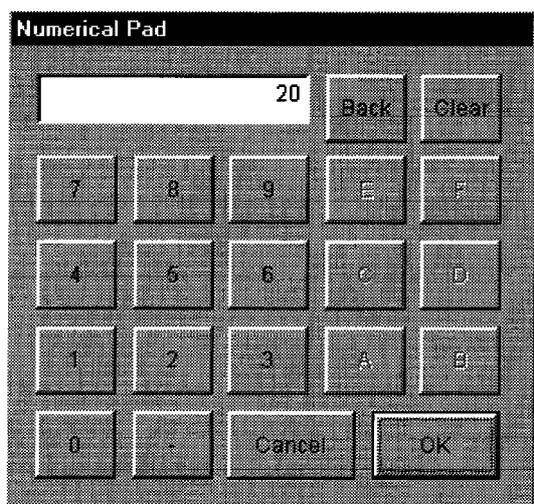


7.3.9 About the Numerical pad

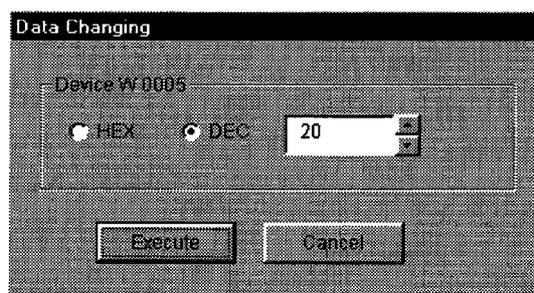
By choosing [Option]-[Numerical Pad] on the menu bar, you can use the numerical pad when setting the device value, etc.



1. Click the numerical input column.



- 2. As the Numerical Pad appears, enter the value with the buttons.
- 3. Click the "OK" button.



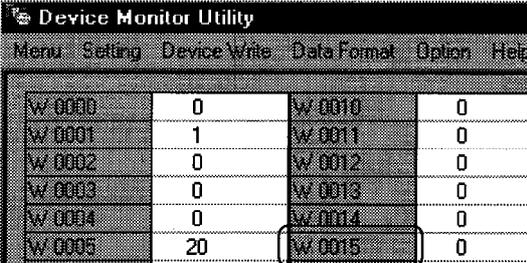
4. The value is entered.

7.3.10 Other operations

Changing data in word device and turning on/off a bit device can be performed by double-clicking the device number on the screen while monitoring.

(1) Word device

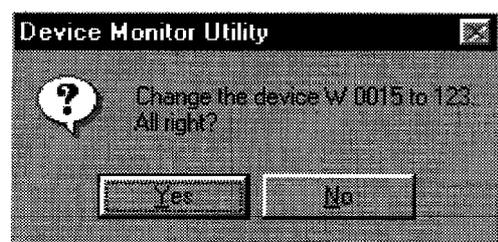
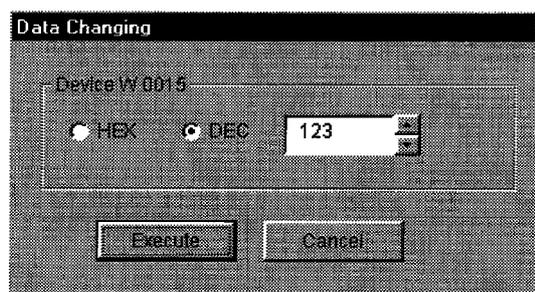
The following shows the operation for changing a word device. (Only when the display form is 16 bit.)



W 0000	0	W 0010	0
W 0001	1	W 0011	0
W 0002	0	W 0012	0
W 0003	0	W 0013	0
W 0004	0	W 0014	0
W 0005	20	W 0015	0

↑ Double click!

↑ Double-click!



↓
Data change complete

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

2. As the dialog box shown left is displayed, set any desirable value.

3. Click the [Run] button.

4. Select [Yes] in the dialog box shown left if the change is acceptable.

DANGER

- Configure the interlock circuit over the sequence program so that the entire system works safely at all times for data change control to the PLC in operation. Also, decide on corrective actions for an event of data communication error between the PC and PLC CPU in use.

(2) Bit device

The following shows the operation for turning on/off a bit device.

However, this is operable only when the display orientation is "Portrait."

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

Device Monitor Utility			
Menu	Setting	Device Write	Data Format
B 0000	0	B 0010	0
B 0001	0	B 0011	0
B 0002	0	B 0012	0
B 0003	0	B 0013	0
B 0004	0	B 0014	0
B 0005	0	B 0015	0

Double click!

↑ Double-click!

2. Select [Yes] in the dialog box shown left, if the change is acceptable.
Select [No] to cancel it.

The selected bit device is ON.

The selected bit device is OFF.

↓
Data change complete

⚠ DANGER

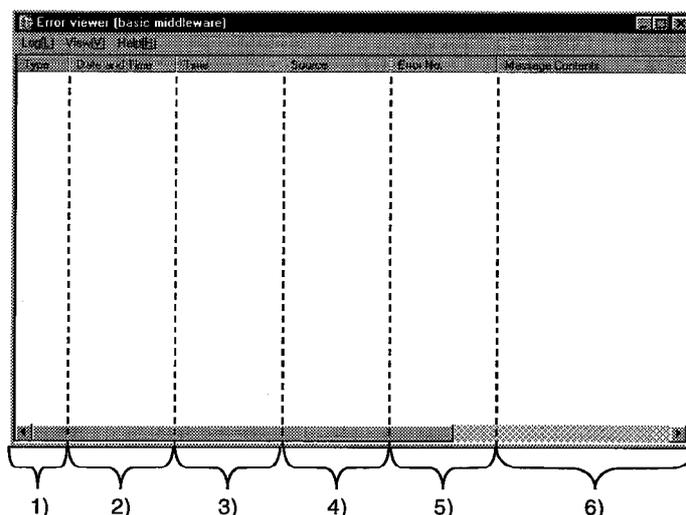
- Configure the interlock circuit over the sequence program so that the entire system works safely at all times for data change control to the PLC in operation. Also, decide on corrective actions for an event of data communication error between the PC and PLC CPU in use.

7.4 Error Viewer Operation

The following explains how to operate or set the error viewer.

7.4.1 Screen description

The following explains the error viewer screen.



1) Type

The error types are displayed by symbols shown below.



Normal message (Indicates comments that are generated from normal processing.)



Warning message (Messages that are generated to elicit attention even though it is not an error.)



Error message (Displays the error definitions that are generated from each module. For the lines with this symbol, double-click to see the detailed message contents, and remove the cause promptly.)

2) Date and Time

Displays the date an error occurred.

3) Time

Displays the time an error occurred.

4) Source

Displays the source of an error.

5) Error No.

Displays the number for an error.

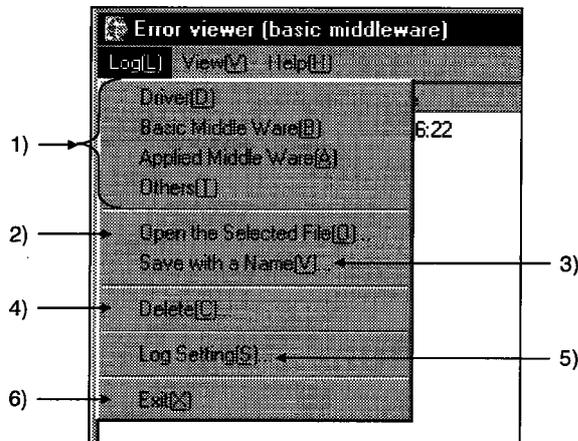
See the programming manual for details on error numbers.

6) Message Content

Displays the content of an error.

7.4.2 Log menu

The following explains the contents of log menu.



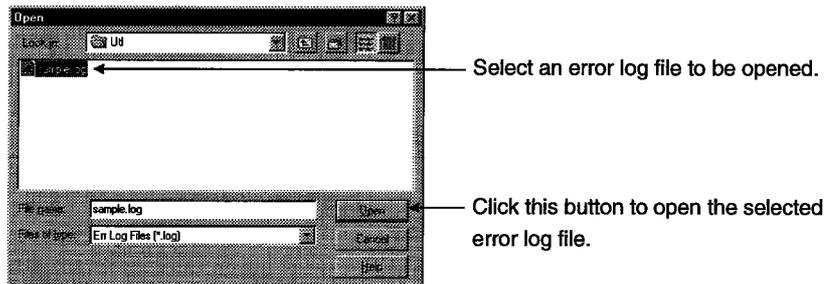
1) Selecting error-entry source type

Select the error-entry source type to be displayed in the error viewer.

- **Driver**..... Displays the messages generated by drivers such as common memory device.
- **Basic Middle Ware** Displays the messages generated by the common memory data server and tab control process.
- **Applied Middle Ware**.. Displays the messages generated by XMOP and OLEX.
- **Others** Displays the messages generated by the application packages.

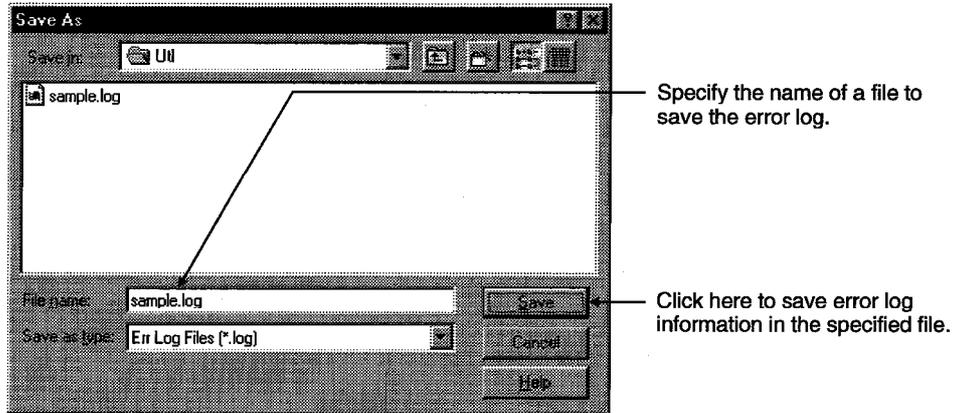
2) Open the Selected File

Open the error log file (*.ELF) using the dialog box shown below.



3) **Save with a Name**

Save the error log data of the error entry source (driver, etc. ...) currently being selected to the specified file using the dialog box shown below.

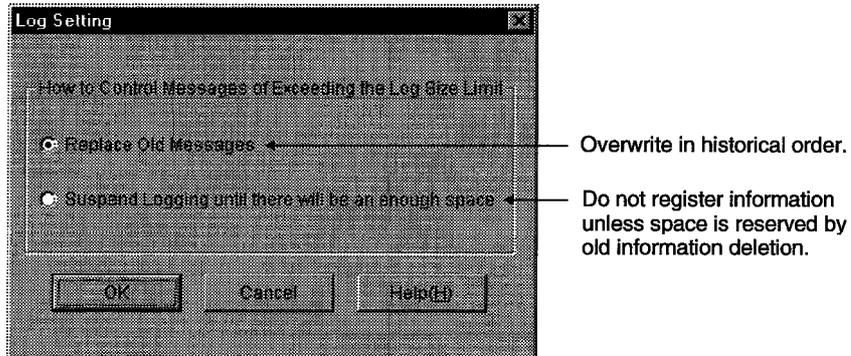


4) **Delete**

Erase the error log data of the error entry source (driver, etc. ...) currently being displayed. Perform operations according to direction displayed on the dialog box.

5) **Log setting**

Select processing method for which the number of error logs exceeds the number of maximum entry.

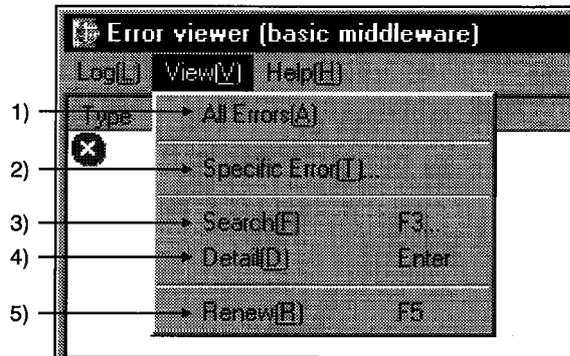


6) **Exit**

End the error viewer.

7.4.3 View menu

The following explains the contents of display menu.

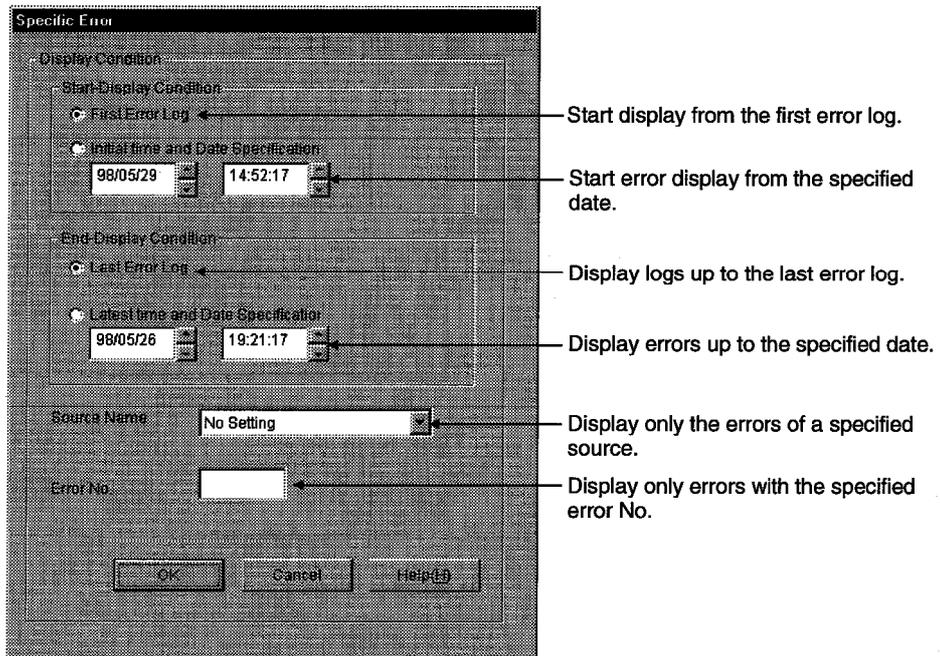


1) All Errors

Displays all the errors that occurred per type of error entry source.

2) Specific Error

Sets the errors displayed on the screen according to the conditions in the dialog box shown below.



Start display from the first error log.

Start error display from the specified date.

Display logs up to the last error log.

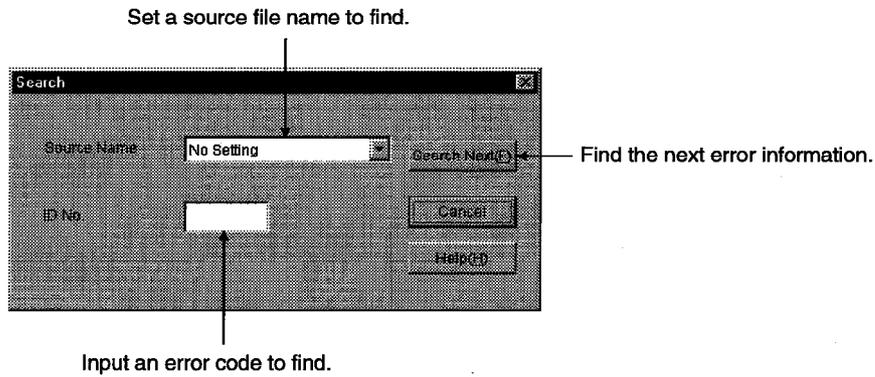
Display errors up to the specified date.

Display only the errors of a specified source.

Display only errors with the specified error No.

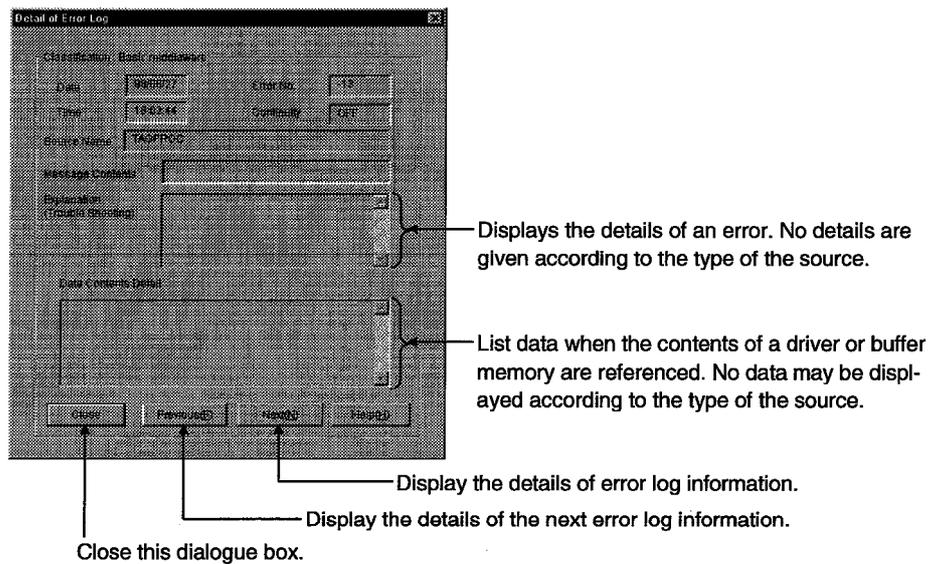
3) **Search**

Search error information of the source name and error code from the error log data currently being displayed using the dialog box shown below.



4) **Details**

Displays detailed information on the error log currently being selected (pressing the Enter key after selecting a display item will display the same).



5) **Renew**

Updates the data currently being displayed.

8. ACCESSIBLE DEVICES AND RANGES

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

8.1 Accessible Devices

The following lists the devices that can be accessed during MELSECNET/10 communication.

8.1.1 Host (personal computer (local station equivalent))

Device		Accessible/not accessible
X	Batch	○
	Random	
Y	Batch	○
	Random	
SB	Batch	○
	Random	
SW	Batch	○
	Random	
B	Batch	○
	Random	
W	Batch	○
	Random	
RECV function for QnA	Batch	○
	Random	×
EM (shared device)	Batch	○
	Random	
ED (shared device)	Batch	○
	Random	

8.1.2 Other station

Device		Access destination						
		A1N	A0J2H A1S (-S1) A1SC24-R2 A1SH A1SJ (-S3) A1SJH (-S8) A2C (J) A2CC24 (-PRF) A2S (-S1) A2SH (-S1) A1FX	A2A (-S1) A2U (-S1) A2AS-S1 A2ASH-S1	A3N A3A A3U	A4U	Q2A (-S1) Q3A Q4A Q4AR Q2AS (-S1) Q2ASH (-S1)	Personal computer
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 (present value)	Batch	○	○	○	○	○	○	×
	Random							
C (present value)	Batch	○	○	○	○	○	○	×
	Random							
D	Batch	○	○	○	○	○	○	×
	Random							
Special D (SD), SW	Batch	○	○	○	○	○	○	×
	Random							
T (set value main)	Batch	○	○	○	○	○	○	×
	Random	×	×	×	×	×	×	×
T (set value sub 1)	Batch	×	×	○ *1	○	○	○	×
	Random			×	×	×	×	×
T (set value sub 2)	Batch	×	×	×	×	○	○	×
	Random					×	×	×
T (set value sub 3)	Batch	×	×	×	×	○	○	×
	Random					×	×	×

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

Device		Access destination						
		A1N	A0J2H A1S (-S1) A1SC24-R2 A1SH A1SJ (-S3) A1SJH (-S8) A2C (J) A2CC24 (-PRF) A2S (-S1) A2SH (-S1) A1FX	A2A (-S1) A2U (-S1) A2AS-S1 A2ASH-S1	A3N A3A A3U	A4U	Q2A (-S1) Q3A Q4A Q4AR Q2AS (-S1) Q2ASH (-S1)	Personal computer
C (set value main)	Batch	○	○	○	○	○	×	×
	Random	×	×	×	×	×		
C (set value sub 1)	Batch	×	×	○ *1	○	○	×	×
	Random			×	×	×		
C (set value sub 2)	Batch	×	×	×	×	○	×	×
	Random					×		
C (set value sub 3)	Batch	×	×	×	×	○	×	×
	Random					×		
A	Batch	○	○	○	○	○	×	×
	Random							
Z	Batch	○	○	○	○	○	○	×
	Random							
V (index register)	Batch	○	○	○	○	○	×	×
	Random							
R (file register)	Batch	×	○	○	○	○	○	×
	Random							
ER (extended file register)	Batch	×	○	○	○	○	○	×
	Random							
B	Batch	○	○	○	○	○	○	×
	Random							
W	Batch	○	○	○	○	○	○	×
	Random							
QnA link special relay (within QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
Retentive timer (contact)	Batch	×	×	×	×	×	○	×
	Random						×	
Retentive timer (coil)	Batch	×	×	×	×	×	○	×
	Random						×	
QnA link special register (within QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
QnA edge relay (within QnACPU)	Batch	×	×	×	×	×	○	×
	Random							
Host random-access buffer	Batch	×	×	×	×	×	×	×
	Random							
Retentive timer (present value)	Batch	×	×	×	×	×	○	×
	Random							
Host link register (for transmission)	Batch	×	×	×	×	×	×	×
	Random							
Host link register (for reception)	Batch	×	×	×	×	×	×	×
	Random							
Arrival acknowledgment for the QnA SEND function	Batch	×	×	×	×	×	○	○ *2
	Random						×	×

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

*2 : Accessible only when the operating system is Windows 95, 98 or NT 4.0.

Device		Access destination						
		A1N	A0J2H A1S (-S1) A1SC24-R2 A1SH A1SJ (-S3) A1SJH (-S8) A2C (J) A2CC24 (-PRF) A2S (-S1) A2SH (-S1) A1FX	A2A (-S1) A2U (-S1) A2AS-S1 A2ASH-S1	A3N A3A A3U	A4U	Q2A (-S1) Q3A Q4A Q4AR Q2AS (-S1) Q2ASH (-S1)	Personal computer
Arrival acknowledgment for the QnA SEND function	Batch	x	x	x	x	x	○	○ *1
	Random						x	x
Direct link input	Batch	x	x	x	x	x	○	x
	Random							
Direct link output	Batch	x	x	x	x	x	○	x
	Random							
Direct link relay	Batch	x	x	x	x	x	○	x
	Random							
Direct link register	Batch	x	x	x	x	x	○	x
	Random							
Direct link special relay (network module side)	Batch	x	x	x	x	x	○	x
	Random							
Direct link special register (network module side)	Batch	x	x	x	x	x	○	x
	Random							
EM	Batch	x	x	x	x	x	x	○ *2
	Random							x
ED	Batch	x	x	x	x		x	○ *2
	Random							x

*1 : Accessible only when the operating system is Windows 95, 98 or NT 4.0.

*2 : Accessible only when the SW2D5F-CSKP is operating on Windows NT 4.0.

8.2 Accessible Range

The range of access during CC-Link communication includes only the module master station and local station PLC for the CC-Link connected by the CC-Link board.

9. MELSEC DATA-LINK LIBRARY

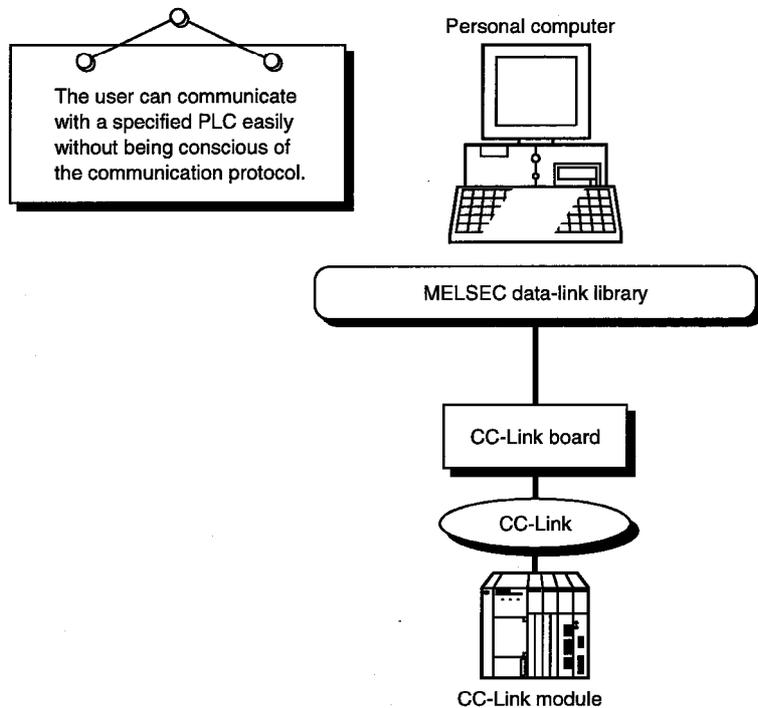
This chapter describes the functional overview of the functions included in the library.

Remark

The screen images shown in this manual are based on Windows 95.
There may be cases in which the actual screen images on Windows NT Workstation 4.0 and Windows 98 differ from those shown here.

9.1 Overview of the MELSEC Data-Link Library

These functions are used when creating a user program that communicates with a PLC CPU. With the functions, the user can perform communication without being conscious of the hardware type on the opposite side or the communication protocol.



9.2 Function List

The following table lists the functions comprising the MELSEC data-link library that is provided with the software package.

Function name	Description
mdOpen	Opens a communication line.
mdClose	Closes a communication line.
mdSend	Performs batch write of devices.
mdReceive	Performs batch read of devices.
mdRandW	Writes devices randomly.
mdRandR	Reads devices randomly.
mdDevSet	Sets a bit device.
mdDevRst	Resets a bit device.
mdTypeRead	Reads the type of PLC CPU.
mdControl	Remote RUN/STOP/PAUSE
mdInit	Refreshes the PLC device address.
mdBdRst	Resets the board itself.
mdBdModSet	Sets the board itself.
mdBdModRead	Reads the board itself.
mdBdLedRead	Reads the LED information of the board itself.
mdBdSwRead	Reads the switch status of the board itself.
mdBdVerRead	Reads the version information of the board itself.
mdSend *1	Sends data (SEND function).
mdReceive *1	Receives data (RECV function).

*1 : An instruction dedicated to the QnA.

Point

For details of the functions, see the HELP in the software package.

9.3 Settings for Using Functions

This section describes the setting procedure in order to use functions.

9.3.1 When using Visual Basic 5.0

The following describes the setting procedure when using Visual Basic 5.0.

1. Start Visual Basic 5.0 and select [Project] – [Add standard module] menu.
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>

9.3.2 When using Visual C++ 5.0

The following describes the setting procedure when using Visual C++ 5.0.

(1) When setting an include file

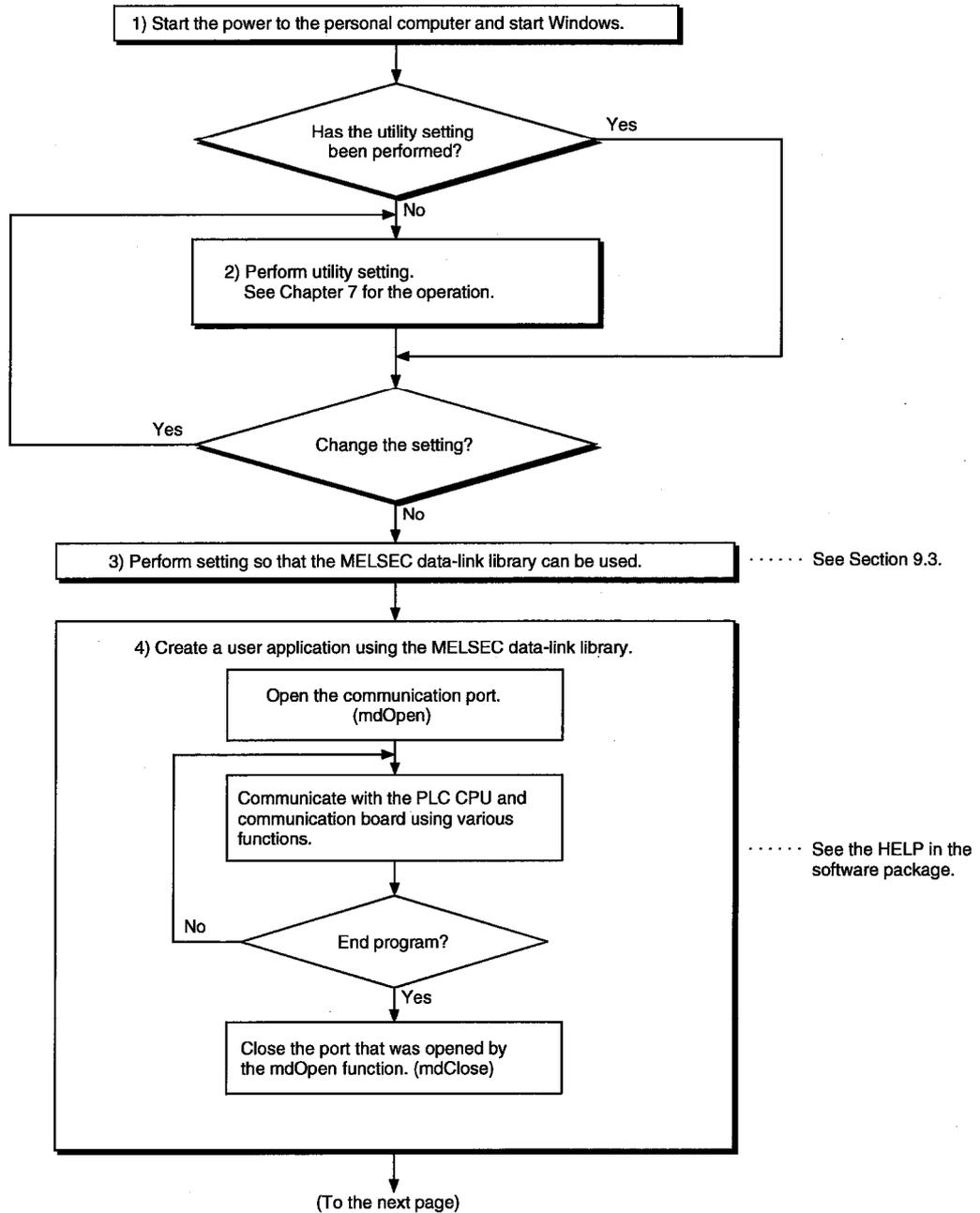
1. Start Visual C++ 5.0 and select [Tool] – [Option] menu.
2. Select the "Directory" tab and set the directory type to "Include files."
3. Double-click the item to set and reference the include file.
"MDFUNC.H" has been saved in the following directory during installation:
<User-specified folder> – <COMMON> – <INCLUDE>
4. Add "#include<mdfunc.h>" at the beginning of your program.

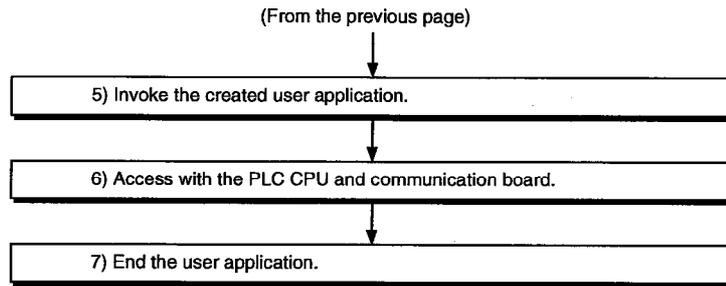
(2) When setting a library file

1. Start Visual C++ 5.0 and select [Tool] – [Option] menu.
2. Select the "Directory" tab and set the directory type to "Library files" in the same manner as in (1).
3. Open the workspace to create and select [Project] – [Set].
4. Select the "Link" tab, set "General" as the category, then type "mdfunc32.lib" in the object/library module field.

9.4 Procedure for Programming

The following describes the procedure for programming using the MELSEC data-link library. In this section, it is assumed that the CSKP has already been installed.



**Point**

Perform the processing for opening and closing a communication line (mdOpen / mdClose) only once at the beginning and end of a program.

Repeating opening and closing of a communication line for each transaction will degrade the communication performance.

When accessing the PLC CPU and communication board again with the user created application program, they can be accessed by performing steps 5) to 7) only.

9.5 Channel

The following is the channel used by the MELSEC data library:

Number	Channel name	Description
81 to 84	CC-Link (1st board to 4th board)	This is used when communication via the CC-Link board. This is set using the BD No. DIP switch on the back of the CC-Link board. The following will be set using the SW1 and SW2 settings. 81: OFF, OFF 82: ON, OFF 83: OFF, ON 84: ON, ON

9.6 Station Number Settings

The following lists the station numbers specified via functions.

Communication	Station number specification
CC-Link	Host: 255 (0xFF) Other station: 0 to 64(0x40) *3

9.7 Device Types

Either code number or device name can be specified for functions as the device type.

Device type			Device
Code specification		Device name specification	
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)
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 (present value)
12	CH	DevCN	C (present value)
13	DH	DevD	D
14	EH	DevSD	Special D (SD), SW (special W for MNET/10)
15	FH	DevTM	T (set value main)
16	10H	DevTS	T (set value sub 1)
16002	3E82H	DevTS2	T (set value sub 2)
16003	3E83H	DevTS3	T (set value sub 3)
17	11H	DevCM	C (set value main)
18	12H	DevTS	C (set value sub 1)
18002	4652H	DevTS2	C (set value sub 2)
18003	4653H	DevTS3	C (set 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	DevER to DevER256	ER (extension file register)
23	17H	DevB	B
24	18H	DevW	W
25	19H	DevQSB	QnA link special relay (within the QnACPU)
26	1AH	DevSTT	Retentive timer (contact)
27	1BH	DevSTC	Retentive timer (coil)
28	1CH	DevQSW	QnA link special register (within the QnACPU)
30	1EH	DevQV	QnA edge relay (within the QnACPU)

Device type			Device
Code specification		Device name specification	
Decimal	Hexadecimal		
33	21H	DevMRB	Host random access buffer *1
35	23H	DevSTN	Retentive timer (present value)
36	24H	DevWw	Host link register (for transmitting) *1
37	25H	DevWr	Host link register (for receiving) *1
40	28H	DevFS	FXCPU S-device
50	32H	DevSPB	Host buffer memory *1
101	65H	DevMAIL	Arrival acknowledgment for the QnA SEND/RECEIVE function
102	66H	DevMAILNC	No arrival acknowledgment for the QnA SEND/RECEIVE function
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	DevSPGO to DevSPG255	Special direct buffer register
31000 to 31255	7918H to 7A17H	DevEMO to DevEM255	EM (shared device)
32000 to 32255	7D00H to 7DFFH	DevEDO to DevED255	ED (shared device)

*1 : Dedicated device for accessing the buffer memory for the CC-Link board (host).

Point
 When accessing the host device shown in the table below with a function, it is necessary to specify a device that differs from the actual device.

Device type			Device
Code specification		Device name specification	
Decimal	Hexadecimal		
5	5H	DevSM	SB
14	EH	DevSD	SW
1	1H	DevX	RX
2	2H	DevY	RY
36	24H	DevWw	RWw
37	25H	DevWr	RWr

10. ERROR CODE

An error code is returned as the return value when a function is executed.

The error definition and corrective action that correspond to each error code are described.

Return value (HEX)	Error definition	Corrective action
0	Normal completion	
1	Driver not started The driver has not been started. The interrupt number/I/O address are overlapping with other board.	Correct the error occurred during driver startup. Check the board setting.
2	Board response error Time out has occurred while waiting for a response to the corrective action.	Check the operation status of the access station(s) and loading condition of the board(s). Retry in an application program.
65 (41)	Channel error An unregistered channel number was specified.	Check the channel number.
66 (42)	OPEN error The specified channel has already been opened.	Open only once.
67 (43)	CLOSE error The specified channel has already been closed.	Close only once.
68 (44)	PATH error A path other than the opened line was set.	Specify the station with an open path.
69 (45)	Processing code error An unsupported processing code was issued.	Use the supported processing code.
70 (46)	Station specification error The specified station is incorrect. A process that should have been requested to other station was requested to the host. Or, the station number corresponds to the host (0xFF) but the network number is not 0.	Correct the specification of the station number in the application program.
71 (47)	Reception data error (during RECV request) Data has not been received.	Wait until data is received.
72 (48)	Waiting for mode setting Mode setting has not been performed.	Perform mode setting.
73 (49)	Mode error Processing was requested to other station when the mode setting was not online.	Set the mode to online. Or, cancel the request.
	Interrupt number error The interrupt number is overlapping with other board.	Check the board setting.
	I/O address error The I/O address is overlapping with other board.	
77 (4D)	Memory error Enough memory could not be secured.	Terminate other application(s) currently running. Check if the system is operating normally. Reboot the system.
78 (4E)	Time out error during mode setting Mode setting was attempted but failed due to time out.	Restart after checking that the dual-port memory is not overlapping with other board. Hardware fault.
80 (50)	Unsuccessful mapping of common memory address.	Check if the common address is overlapping with other I/F board.
85 (55)	Channel number error (during RECV request) A channel number error.	Check the channel number used during the RECV request.
100 (64)	Accessing host board An access request was issued to the host board while the host board is being accessed.	Retry.
101 (65)	Routing parameter error The routing parameter is not set.	Correct the routing parameter.
102 (66)	Data transmission error Data transmission has failed.	Retry. Check if the system is operating normally. Reboot the system.

Return value (HEX)	Error definition	Corrective action
103 (67)	Data receiving error Data receiving has failed.	Retry. Check if the system is operating normally. Reboot the system.
129 (81)	Device type error The specified device type is invalid.	Check the device type.
130 (82)	Device number error The specified device number is out of range. When specifying the bit device, the device number is not a multiple of 8.	Check the device number.
131 (83)	Device points error The specified number of points is out of device range. When specifying the bit device, the device number is not a multiple of 8.	Check the size.
132 (84)	Number of bytes written error The specified number of bytes written is out of range.	Set a number of bytes written that is within the range.
133 (85)	Link parameter error The link parameter is corrupt. The total number of slave station is 0.	Reset the link parameter.
215 (D7)	Reception data length error The length of reception data or byte length is out of range.	Retry. Check the cable.
216 (D8)	Protocol error The communication procedure is abnormal. The requested code does not exist.	Check the cable.
217 (D9)	Address error The address is out of access range.	Check the request data.
219 (DB)	Write error Unable to write.	Check the request data.
224 (E0)	PC number error The destination station does not exist.	Correct the station number.
225 (E1)	Processing mode error A processing code that cannot be processed by the destination ACPU was set. (It is checked by the destination ACPU.)	Check the destination ACPU and processing code.
226 (E2)	Special module specification error The specified special module is not a module that can be processed.	Correct the Y number.
227 (E3)	Other data error Incorrect data was found in the address, head step or shift value of the request data.	Correct the request data.
228 (E4)	Link specification error A processing code that cannot be processed by the destination station was set. (It is checked by the destination link module.)	Check the destination station number and processing code.
232 (E8)	Remote error The keyword did not match for the remote RUN/STOP/PAUSE request. Check the destination station number and processing code.	Check the destination station number and processing code.
233 (E9)	Link time over The destination disconnected the link while processing.	Check the hardware of the special module.
234 (EA)	Special module BUSY Either the receive buffer is full at the destination due to transmission of general data, or preparation for receiving data has not been completed.	Check the hardware of the special module.
236 (EC)	Destination BUSY Either the receive buffer is full at the destination due to transmission of general data, or preparation for receiving data has not been completed.	Execute the request when the destination can receive data.
240 (F0)	Link error A request was issued to a disconnected link station.	Return the link.
241 (F1)	Special module bus error Processing preparation has not been completed for the specified special module.	Check the hardware of the special module.

Return value (HEX)	Error definition	Corrective action
242 (F2)	Special module time over No response from the specified special module.	Check the hardware of the special module.
	No response from the MELSECNET (II) board.	Check the hardware of the MELSECNET (II) board.
1280 (500)	Host board memory access error	Check the switch setting on the host board and move the memory address to the area that is not effected by other board. Change the memory access setting to 16 bit if it is set to 8 bit.
1281 (501)	Unable to access I/O port	Check the I/O port address setting. Perform a board self-loopback test and check the hardware.
16432 (4030)	The specified device type does not exist.	Check the specified device type.
16433 (4031)	The specified device number is out of range	Check the specified device number.
16448 (4040)	The module does not exist.	Do not issue a request that generated an error to the specified special module.
16449 (4041)	The number of device points is out of range.	Check the head address and number of access points and access within the existing range.
16450 (4041)	Corresponding module error	Check if the specified module is operating normally
16451 (4043)	The module does not exist at the specified location.	Check the head I/O number of the specified module.
40577 (9E81)	Device type error The device type specified for the destination station is invalid. (It is checked by the destination link module).	Check the device type.
40578 (9E82)	Device number error The device number specified for the destination station is out of range. When specifying the bit device, the device number is not a multiple of 8. (It is checked by the destination link module).	Check the device number.
40579 (9E83)	Devices points error The number of points specified for the destination station is out of range. When specifying the bit device, the device number is not a multiple of 8. (It is checked by the destination link module).	Check the size.
-1 (FFFF)	Path error The specified path is invalid.	Check the bus that was returned by the mdOpen function.
-2 (FFFE)	Device number error The specified device number is out of range. When specifying the bit device, the device number is not a multiple of 8.	Check the head device number for the specified device.
-3 (FFFD)	Device type error The specified device type is invalid.	Check if the device type used is in the device list.
-4 (FFFC)	CPU error An invalid station was specified.	Check the status of the communication station. Check the specified station number.
-5 (FFFB)	Size error The device number and size are over the device range. Access was attempted using an odd device. The device number and size are over the range for the same block.	Check the specified device size. Check the device number and size.
-6 (FFFA)	Number of block error The number of blocks specified in dev[0] for device random read/write is out of range.	Check the number of blocks specified in dev [0].
-8 (FFF8)	Channel number error The channel number specified in the mdOpen function is invalid.	Check the specified channel number.

Return value (HEX)	Error definition	Corrective action
-11 (FFF5)	Insufficient buffer area The read area size of the read data storage array variable is too small.	Check the read size and read data destination size.
-12 (FFF4)	Block error The specified block number of the extension file register is invalid.	Check the block number (device type) of the extension file register.
-13 (FFF3)	Write protect error The specified block number of the extension file register is overlapping with the write protect area of the memory cassette.	Check the block number (device type) of the extension file register. Check the write protect DIP switch of the accessed memory cassette.
-14 (FFF2)	Memory cassette error No memory cassette is loaded to the accessed CPU, or an incorrect memory cassette is loaded.	Check the accessed memory cassette.
-15 (FFF1)	Read area length error The read area size of the read data storage array variable is too small.	Check the read size and read data destination size.
-16 (FFF0)	Station number/network number error The station number/network number is out of range.	Check the specified station number/network number
-17 (FFEF)	All-station/group number specification error A function that does not support all-station specification/group-number specification was specified.	Check if all-station specification/group number specification is enabled for the function.
-18 (FFEE)	Remote instruction error A code that is not designated was specified.	Check the specified code.
-19 (FFED)	SEND/RECV channel number error The channel number specified with the SEND/RECV function is out of range.	Check the specified channel number.
-21 (FFEB)	Error in gethostbyname (*) An error occurred in the function, gethostbyname (*).	Check if the specified host name exists in the HOSTS file.
-24 (FFE8)	Time out error in select (*) A time out error occurred in the function, select (*).	Check if MGW server service has been started on the server machine.
-25 (FFE7)	Error in sendto (*) An error occurred in the function, sendto (*).	Check if normal Ethernet communication can be performed with the server machine.
-26 (FFE6)	Error in recvfrom (*) An error occurred in the function, recvfrom (*).	
-28 (FFE4)	Error response reception An error response was received.	
-29 (FFE3)	Reception data length over Too much data was received.	
-30 (FFE2)	Sequence number error The received sequence number is abnormal.	
-31 (FFE1)	DLL load error An attempt to load a DLL, which is necessary to execute the function, has failed.	Setup the package again.
-32 (FFE0)	Other task/thread is occupying the resource and the resource is not released within 30 seconds.	Retry. There may be a problem of insufficient memory. Terminate other application(s) currently running. Check if the system is operating normally. Reboot the system.
-33 (FFDF)	Incorrect access destination The setting for the communication destination is incorrect.	Check if the communication destination is correctly set by the utility.
-34 (FFDE)	Registry error An attempt to open the registry has failed.	

Return value (HEX)	Error definition	Corrective action
-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. There may be a problem of insufficient memory. Terminate other application(s) currently running. Check if the system is operating normally. Reboot the system.
-38 (FFDA)	Ethernet communication error An attempt to set for Ethernet communication has failed.	Retry. Check if the communication destination is correctly set by the utility.
-39 (FFD9)	COM communication setting error An attempt to set for COM communication has failed.	There may be a problem of insufficient memory. Terminate other application(s) currently running. Check if the system is operating normally. Reboot the system.
-41 (FFD7)	COM control error Control cannot be performed properly during COM communication.	Retry. Check if the system is operating normally. Reboot the system.
-42 (FFD6)	Close error Communication cannot be closed.	Reboot the system.
-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 for LLT communication has failed.	Retry. Check if the communication destination is correctly set by the utility. There may be a problem of insufficient memory. Terminate other application(s) currently running.
-45 (FFD3)	Ethernet control error Control cannot be performed properly during Ethernet communication.	Retry. Check if the system is operating normally.
-50 (FFCE)	Opened path maximum value over The number of open paths exceeds the maximum value (32).	Close several paths.
-51 (FFCD)	Exclusive control error An error occurred in the exclusive control.	Retry. Check if the system is operating normally.
-478 to -3839 (F101 to FE22)	See "QnA-Support MELSECNET/10 Network System Reference Manual" or "MELSECNET/10 Network System Reference Manual (Network between PCs)."	Same as left.
-2174 (F782)	Destination station number specification error The destination station number for the processing request is specifying the host.	Check the destination station number.
-24957 (9E83)	Device points error The number of points specified for the destination station is out of device range. When specifying the bit device, the device number is not a multiple of 8. (It is checked by the destination link module.)	Check the size.
-24958 (9E82)	Device number error The device number specified for the destination station is out of range. When specifying the bit device, the device number is not a multiple of 8. (It is checked by the destination link module.)	Check the device number.
-24959 (9E81)	Device type error The device type specified for the destination station is invalid. (It is checked by the destination link module.)	Check the device type.

Return value (HEX)	Error definition	Corrective action
-25056 (9E29)	Processing code error A processing code that cannot be processed by the destination station was set. (It is checked by the destination link module.)	Check the destination station number and processing code.
-26334 (9922)	Board reset error Other process has executed a board reset using the same channel while other station is being accessed.	Retry.
-26336 (9920)	Request error for other loop Routing to other loop was performed.	Change the routing destination to AnUCPU or QnACPU.
-28150 (920A)	Data link disconnecting error	A host link device was accessed while the data link is being disconnected.
-28156 (9204)	Dual-port hand-shake error	Remove other optional board.
-28158 (9202)	WDT error	Reset the board. Reboot the PC.

11. TROUBLESHOOTING

This chapter describes how to determine the cause of trouble that may occur during system construction as well as appropriate corrective actions.

11.1 When Performing Troubleshooting

Ideally occurrence of trouble should be kept to a minimum in order to startup the system effectively. However, once an error occurs, it is important that we identify the cause as quickly as possible. The followings are the three basic points that must be kept in mind when performing troubleshooting.

(1) Visual check

Check the following points.

- 1) Movement of the external device (status when stopped or during operation)
- 2) On/off status of power supply
- 3) Wiring condition (cable)
- 4) LED display status (power supply display LED)
- 5) Checks whether the PC is one suitable for the operating environment

After checking 1) through 5), connect the external device and check the operation of the user program.

(2) Confirming the error

Examine how the error status changes by the following operation.

- 1) Change the input status and check if the change can be read correctly using the test program.
- 2) Repeat on/off of output and check if the status of the external device changes accordingly.

(3) Narrowing the range

Based on the steps 1) and 2) above, deduce the range of error location as one of the following.

- 1) PC side or external device side
- 2) PC main body or board
- 3) Cable
- 4) User program

11.2 Troubleshooting Table by the Type of Error Occurring

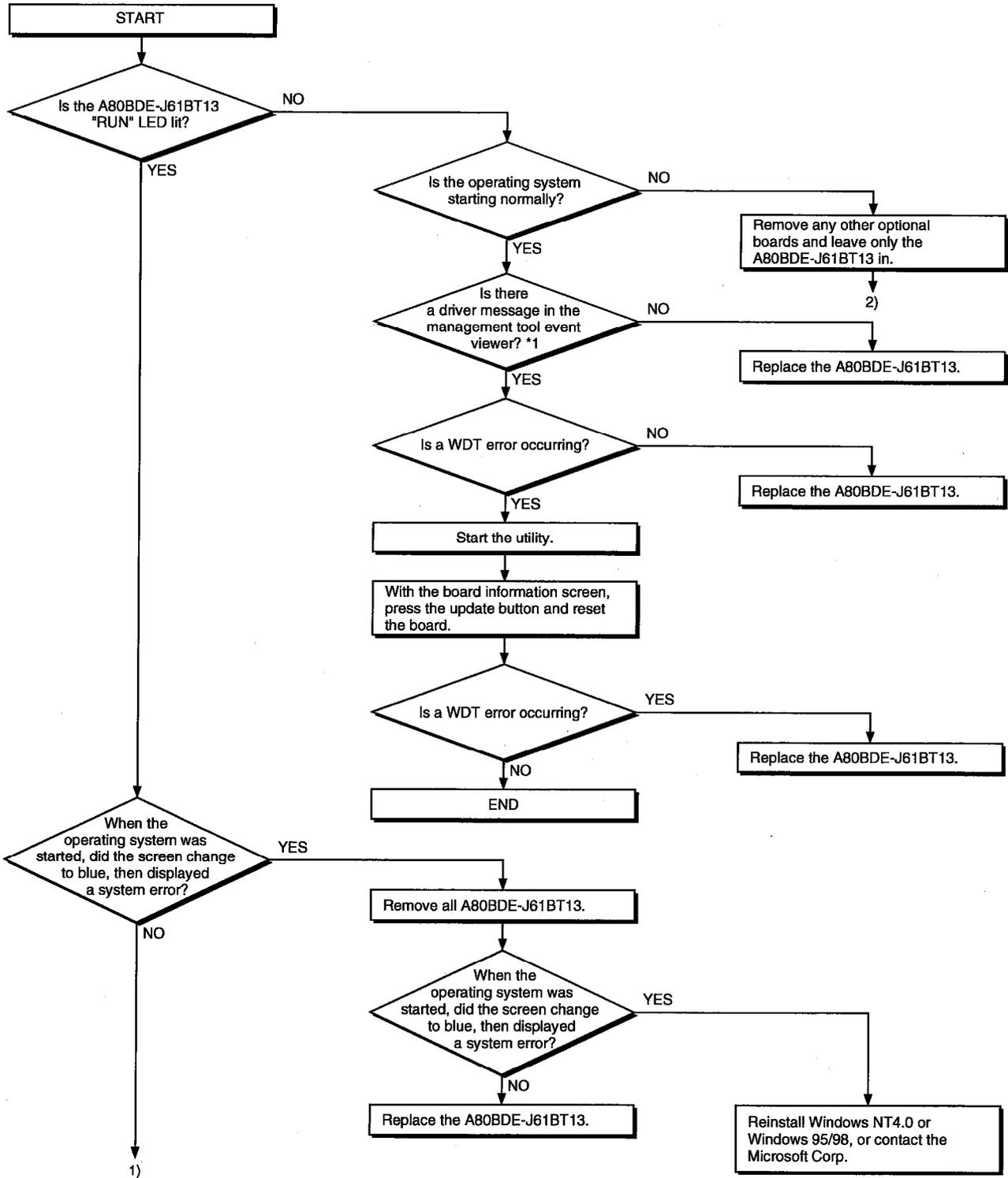
When trouble occurs, refer to the methods in Table 11.1 for determining the cause of the trouble.

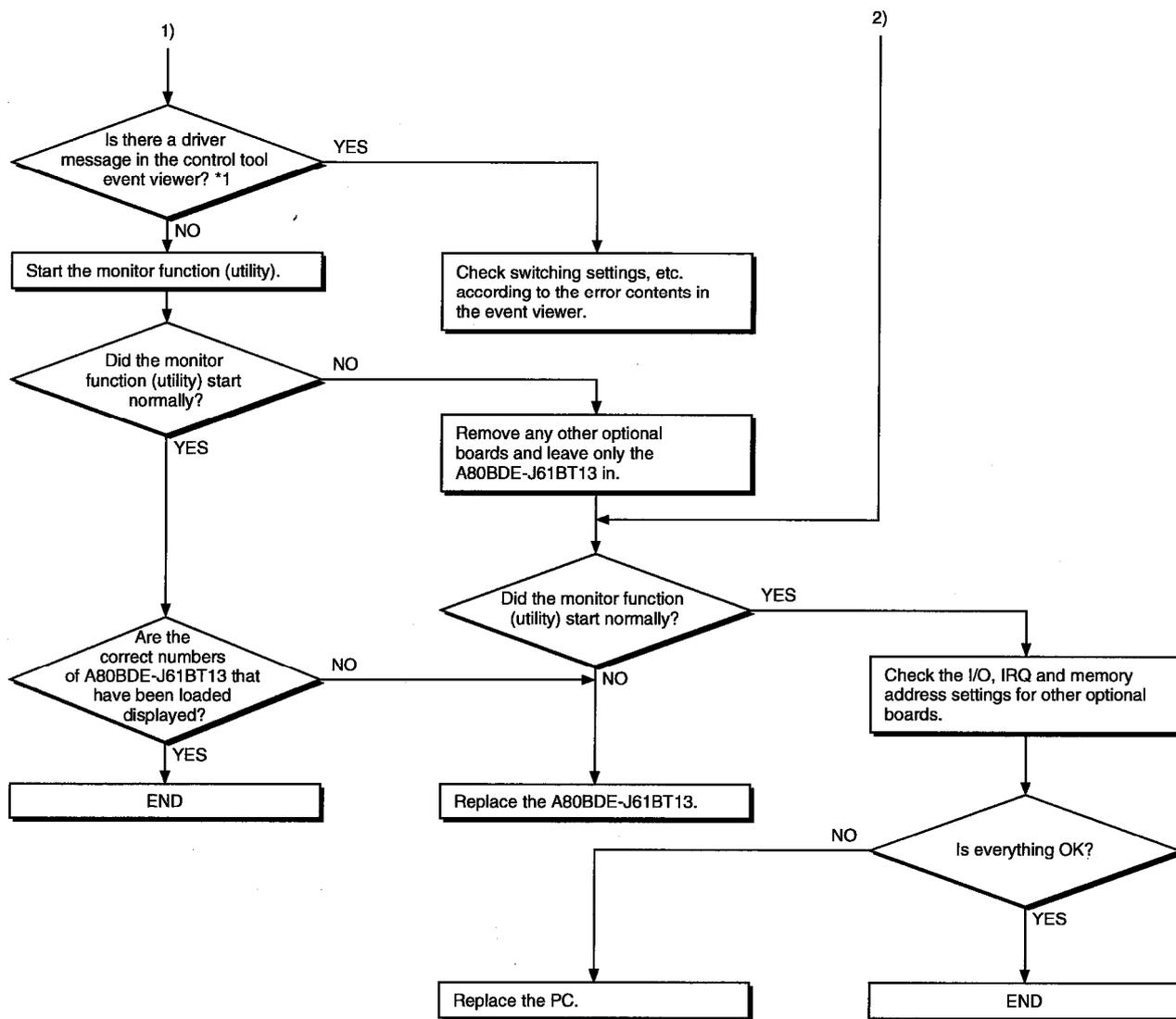
Table 11.1 Troubleshooting table by the type of error occurring

No.	[Error content]	[Cause determination method]
1	An I/F board did not operate normally upon startup.	See the flowchart found in Section 11.3 for when the board and PC do not operate.
2	There was no data linking although the master station and other station were connected to the I/F board.	See the flowchart found in Section 11.4 for when the data link could be completed.
3	When an error occurs during the data link 1) An unexpected value is entered in the special device. 2) The device is being accessed using a function in the user program, but data cannot be read or written. 3) Communication stops occasionally while the user program is executing. 4) The system goes down (blue screen) or resets while the user program is executing in Windows NT 4.0 or Windows 95/98.	See the flowchart found in Section 11.5 for when an error occurs during data linking.

11.3 Flowchart to Use when the Board or PC do not Operate

The following indicates a check procedure in the PC unit when the I/F board does not run normally during startup.





*1 : With Windows 95 or 98, check the driver message in the error viewer.

11.3.1 Table of error event messages that may occur during driver startup

The table below lists the errors displayed in the event viewer/error viewer.

Event ID (HEX)	Error content	Corrective action
256 (100)	The driver could not be executed because an error occurred during driver startup.	Reinstall the driver package. If the error occurs again, reinstall Windows NT 4.0 or Windows 95/98.
257 (101)	The I/F board could not be detected.	Check the installation status of the I/F board.
258 (102)	No response from hardware.	Replace the I/F board.
259 (103)	The number of boards detected exceeds the maximum number that can be loaded.	Remove boards until the number falls within the maximum limit.
262 (106)	An attempt to link the device name has failed.	Reinstall Windows NT 4.0 or Windows 95/98.
268 (10C)	An error occurred during receiving process. (The request packet is incorrect).	Check the PC and PLC program for which the processing is being requested to this PC.
279 (117)	An error occurred when writing to the registry.	Reinstall the software package.
280 (118)	A request that cannot be processed was received from other station. (A request for which a response request cannot be processed was received)	Check the PC and PLC program for which the processing is being requested to this PC.
282 (11A)	Mapping of the I/O port has failed.	The I/O port is overlapping with another resource. Remove other optional boards.
283 (11B)	The shared memory area of the I/F board is overlapping with other hardware.	Remove other optional boards.
284 (11C)	The I/F board IRQ is overlapping with other hardware.	Remove other optional boards.
285 (11D)	It is possible the I/F board will not operate normally, since it detected a temperature abnormality.	Install the PC in a location with a suitable temperature.
286 (11E)	Failed to secure the memory area required to start the driver.	Increase system memory.
288 (120)	A WDT error occurred.	Remove other optional boards.
289 (121)	Handshaking with the shared memory area has failed.	Reset the board. If the error occurs again, replace the board.
290 (122)	The board number of the I/F board is a duplicate.	Reset so there are no duplicate board numbers.
291 (123)	Failed in mapping the shared memory area.	Remove other optional boards.
293 (125)	Interrupt registration has failed.	Remove other optional boards.
294 (126)	The I/O port for the I/F board is overlapping with other hardware.	Remove other optional boards. *1

Event ID (HEX)	Error content		Corrective action
1281 (501)	Initiali- zation of the I/F board has failed.	DUMP value	Error contents (details)
		01h	There is no response from the hardware.
		02h	The IRQ or memory is overlapping. *2
		03h	There is no response from the hardware.
		04h	Handshaking with the shared memory area has failed.
		66h	There is no response from the hardware.
			Replace the I/F board.
			Remove other optional boards.
			Restart. If the error occurs again, replace the board.
			Replace the I/F board.

DUMP valueValue of the 1 byte at the head of the data contents details area

*1 : If this event error occurs in the Windows NT 4.0 event viewer, restart the PC that has the BIOS setup shown below after setting the "Plug & Play O/S" in [No] and "Reset Configuration Data" in [Yes] as in the following example.

Example)
BIOS Setup Utility

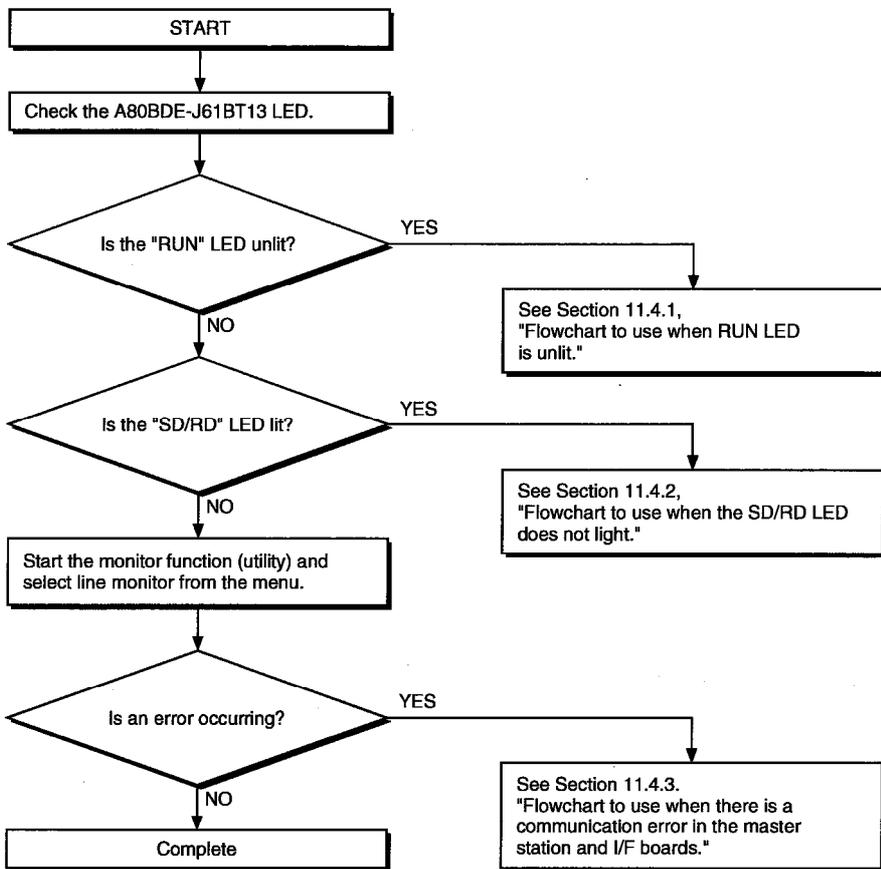
Set Plug & Play O/S : [YES] → [No]
Reset Configuration Data: [No] → [YES]

Then restart.

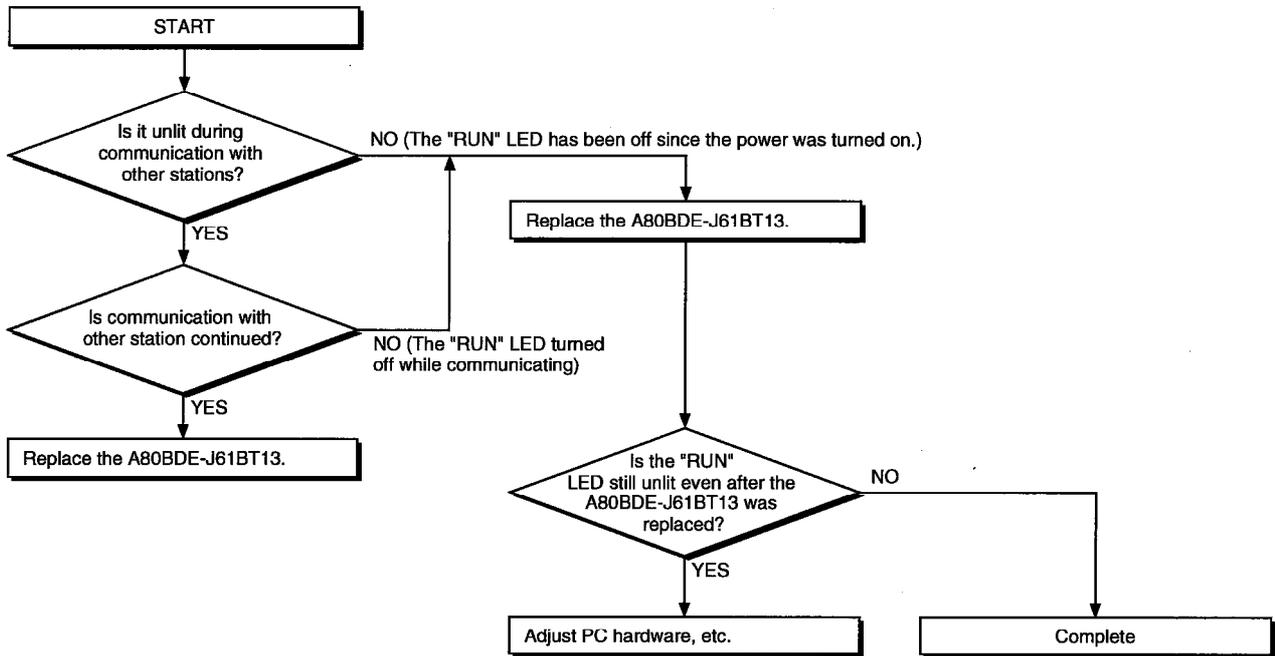
*2 : This event error may occur when the PCI bus controller is not operating correctly.
When the PC being used comes pre-installed with Windows 95/98, use the drivers for Windows 95/98 and the PCI bus controller that come in the PC unit.
If Windows 95/98 have been purchased separately, obtain the drivers for the PCI bus controller suggested by the PC manufacturer and install.

11.4 Flowchart to Use when the Data Link could not be Completed

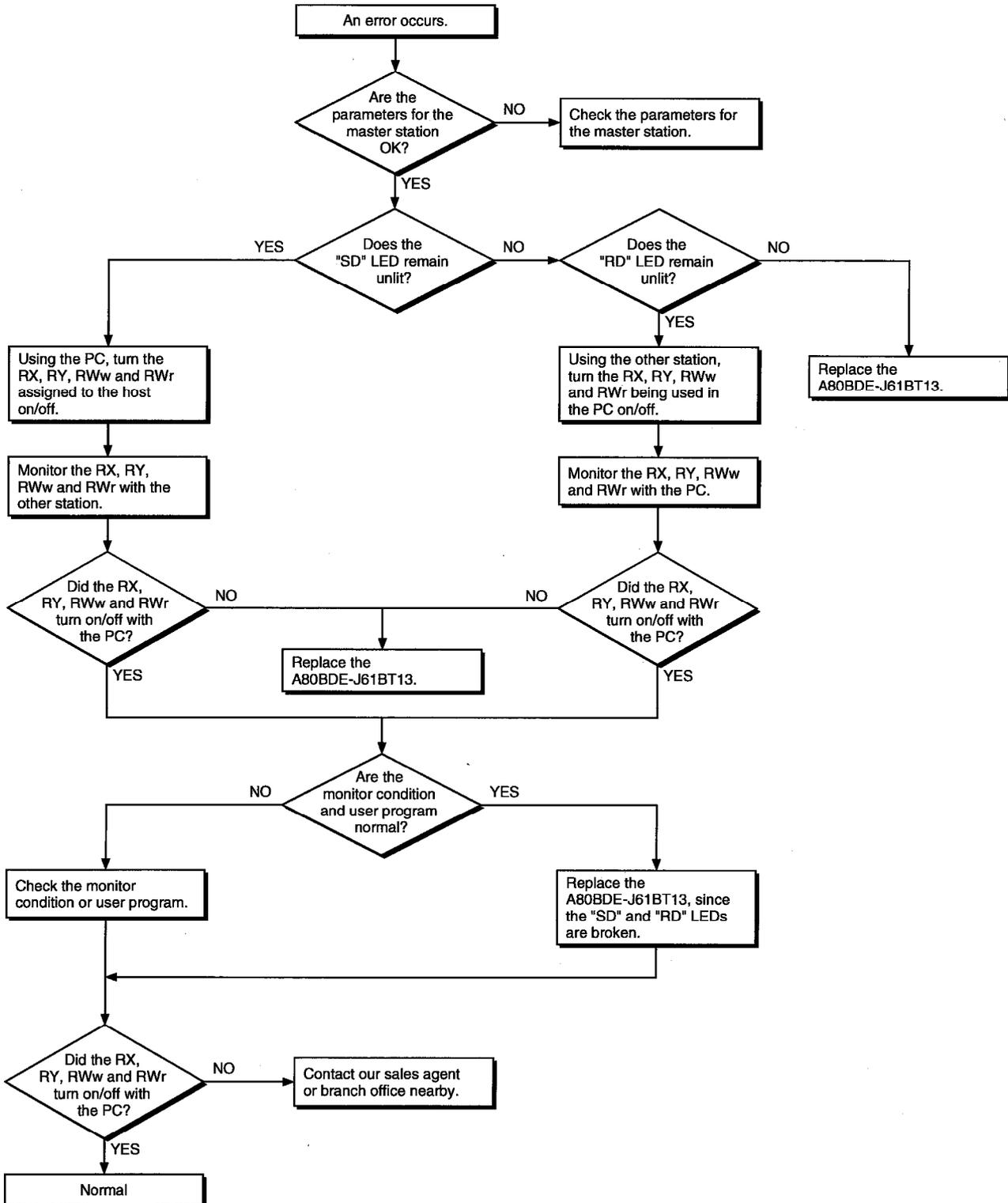
The following flowchart indicates when the data link could not be completed even though the I/F board was connected to another station.



11.4.1 Flowchart to use when RUN LED is unlit



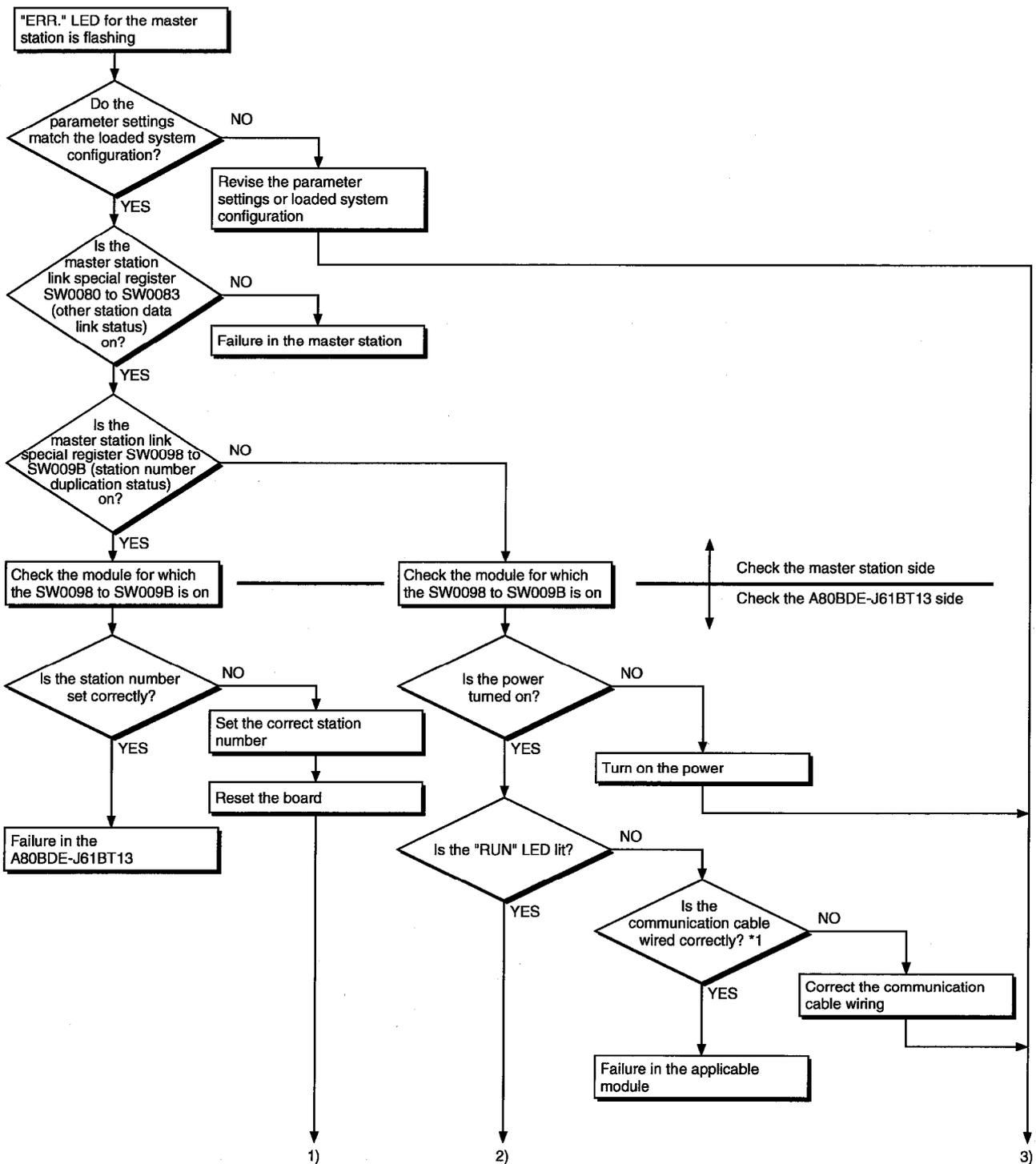
11.4.2 Flowchart to use when SD/RD LED does not turn on

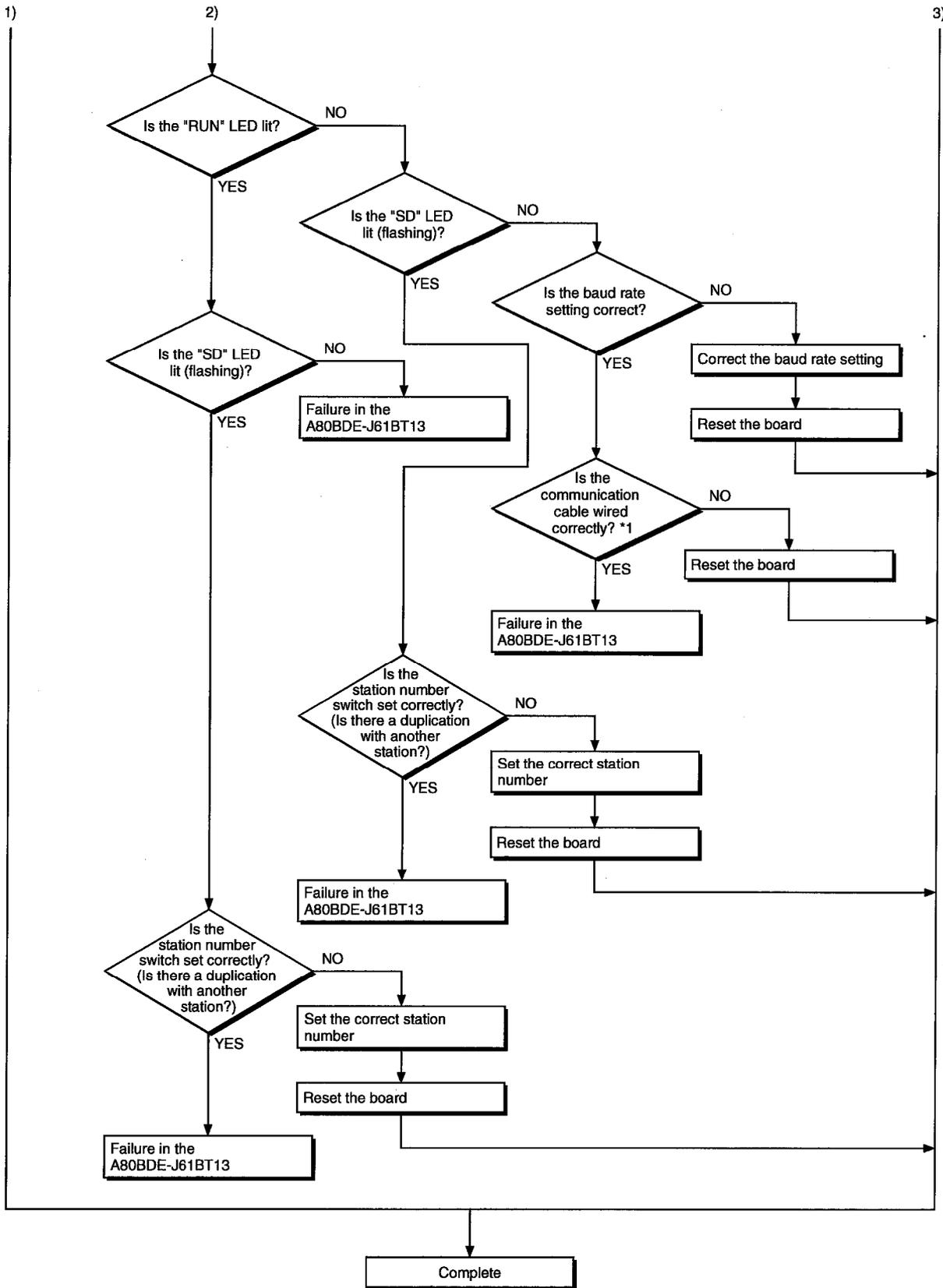


11.4.3 Flowchart to use when there is a communication error between the master station and I/F board

When a station number duplicate bit turns on in the link special register SW0098 to SW009B (station number duplicate status), check the I/F board of the relevant station number using the following procedure.

Troubleshooting flowchart when the "ERR." LED for the master station is flashing

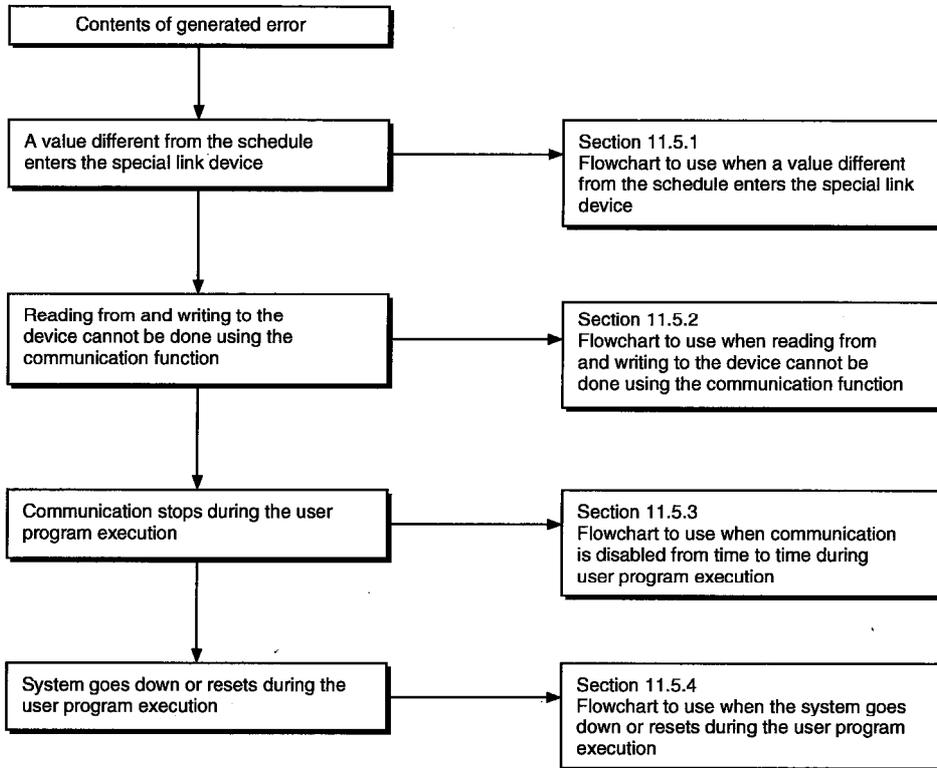




*1 : Check for shorts, reversed connection, broken connection, terminal resistor, FG connection, total extended distance, and distance between stations

11.5 Flowchart to Use when an Error Occurs During Data Linking

The following flowchart indicates when an error occurs during data linking is shown.

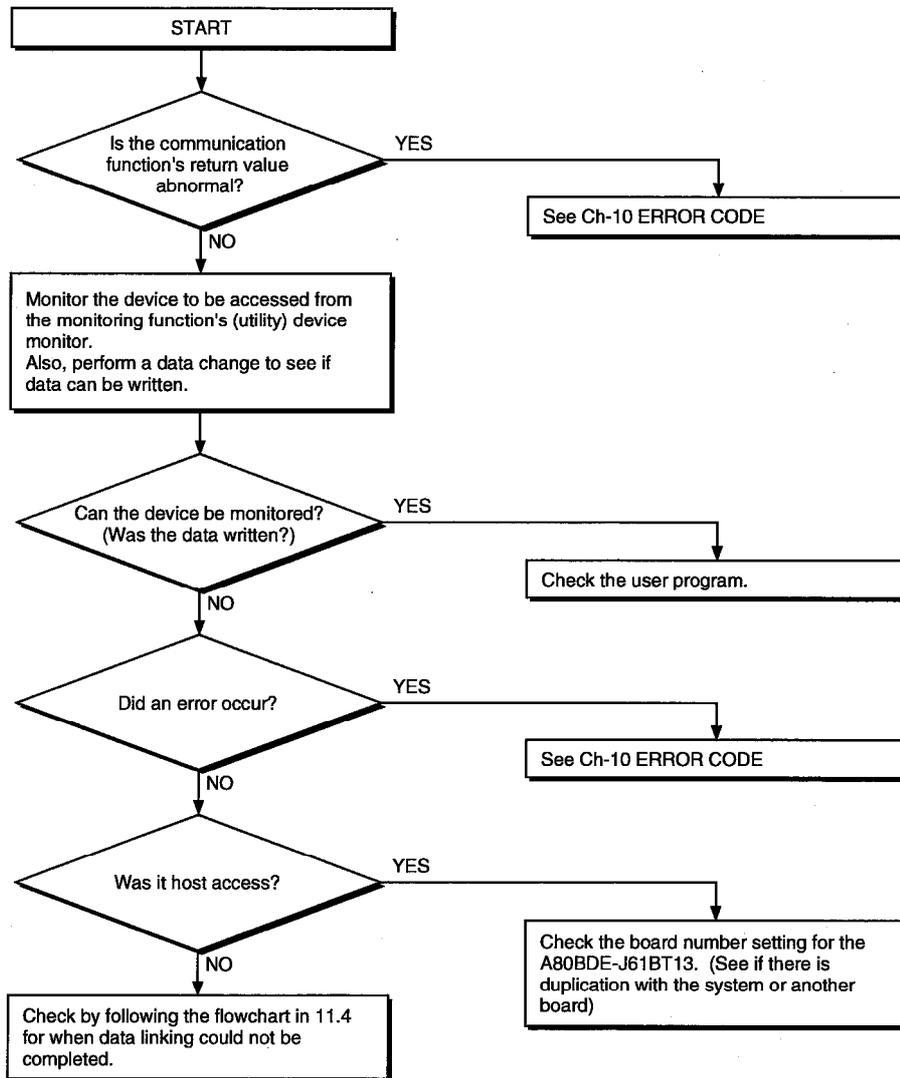


11.5.1 Flowchart to use when unexpected value is input to specific link device

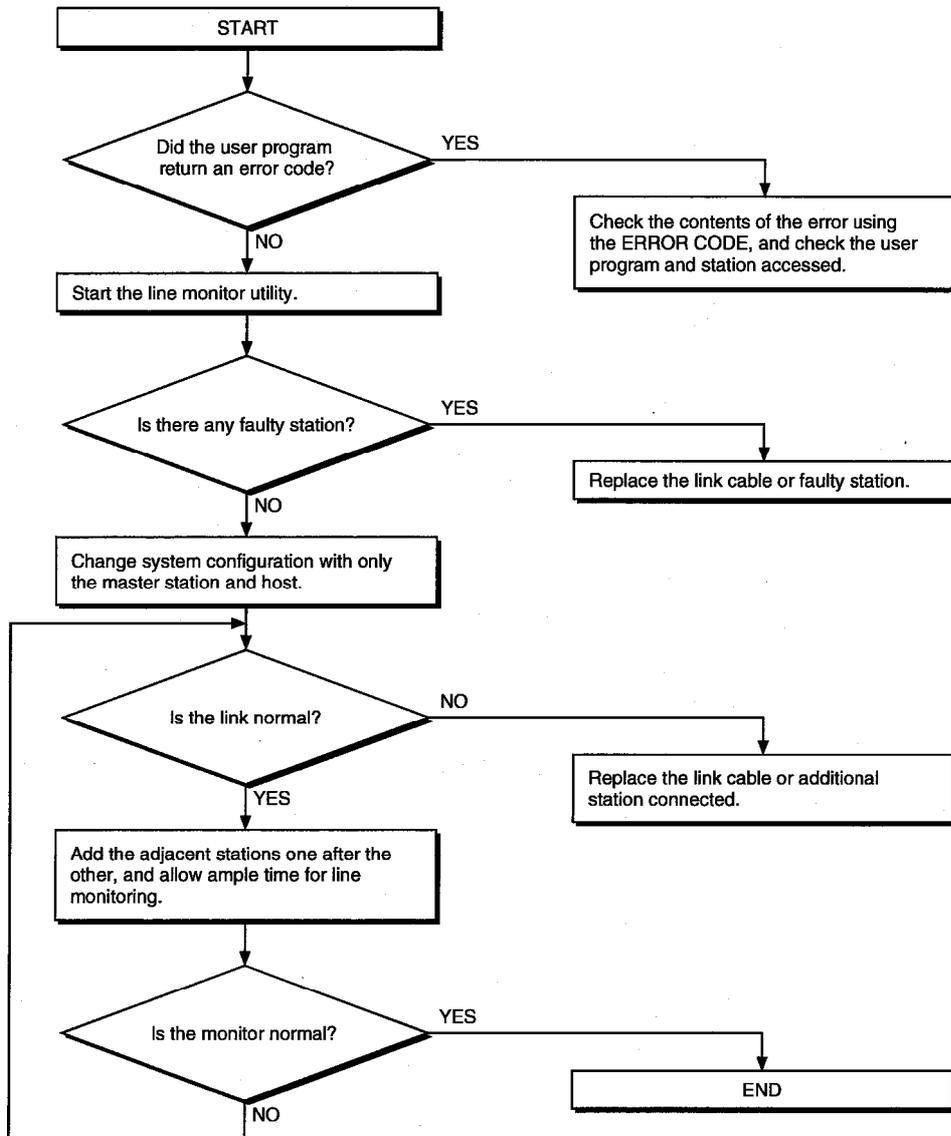
Check the following items.

- 1) Check for a station with link error using the network monitor in the monitoring function.
- 2) Check the link parameter assignment range at the master station.
- 3) Check the device range used in the PLC program at the PLC.
- 4) Check, in the user program, argument data for the communication function accessing the specific link device.

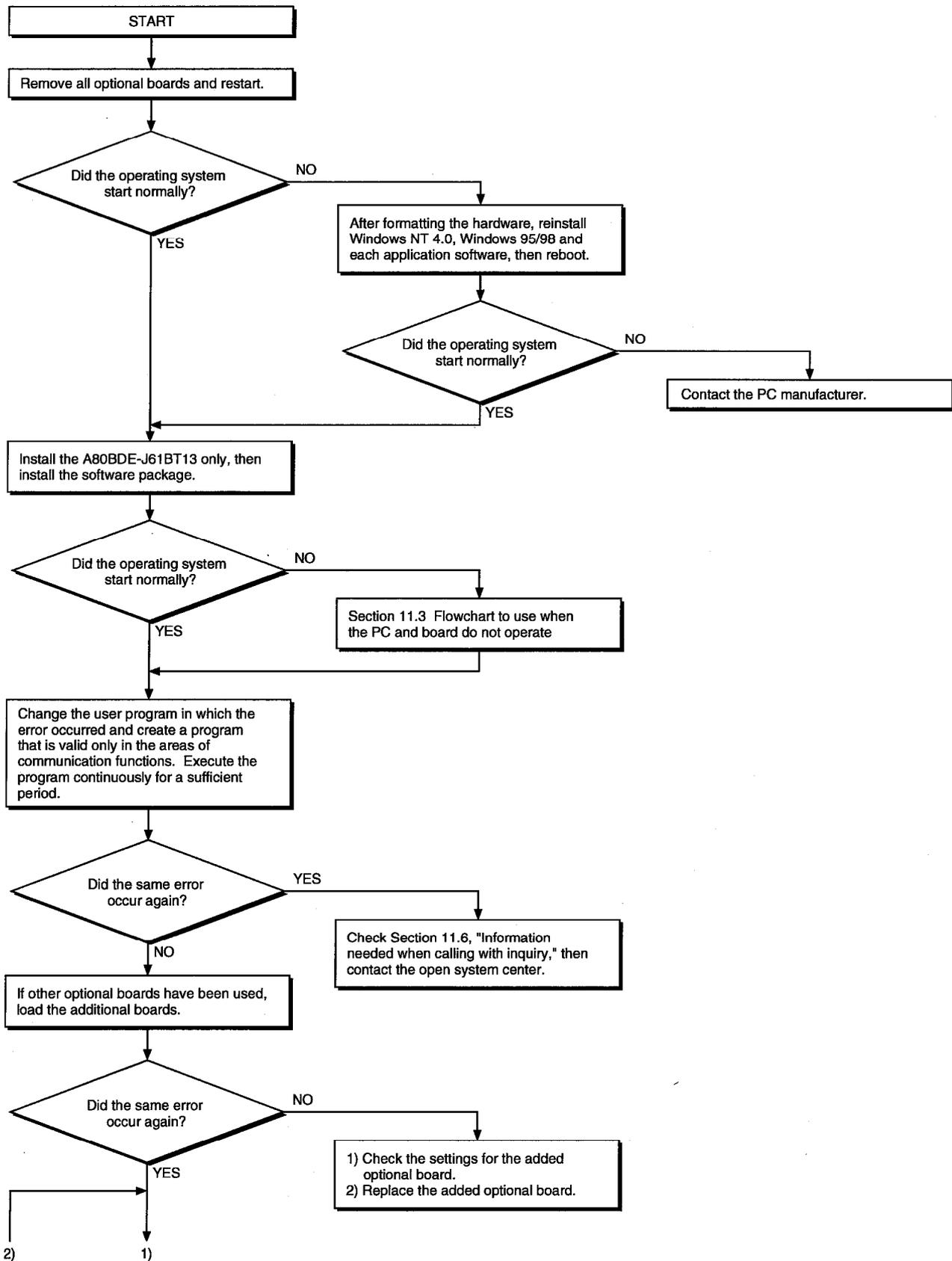
11.5.2 Flowchart to use when reading from and writing to the device cannot be done using the communication function

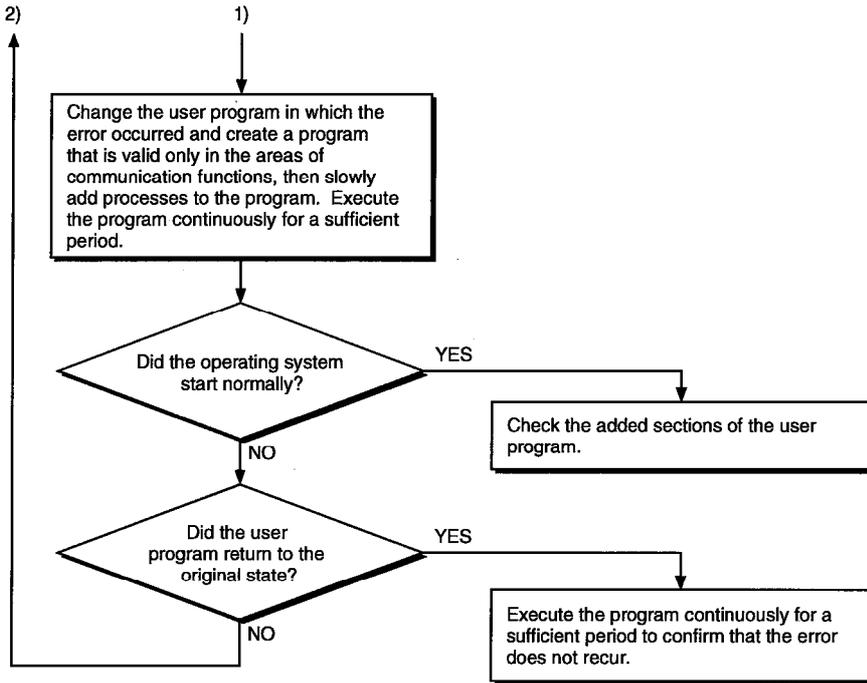


11.5.3 Flowchart to use when communication is disabled from time to time during user program execution



11.5.4 Flowchart to use when the system goes down or resets during the user program execution





11.6 Information Needed when Calling with Inquiry

The following conditions and status must be reported when calling us with an inquiry regarding a damaged board.

(1) Error state (be specific)

Example) The system does not start during the startup process after turning on the power, displaying a "board Not response" message.

(2) PC manufacturer, PC name/model

(3) Main memory capacity, hard disk capacity, CPU model

(4) OS name : Windows NT Workstation 4.0, Windows 95/98

(5) Position of installation slot, number of boards installed

(6) Use of optional boards made by other companies.

(7) When optional boards made by other companies are installed, have the following items for each board available.

- Board model
- Board manufacturer
- Memory address (head address and occupied size)
- I/O address (head address and occupied size)
- IRQ number, DMA number

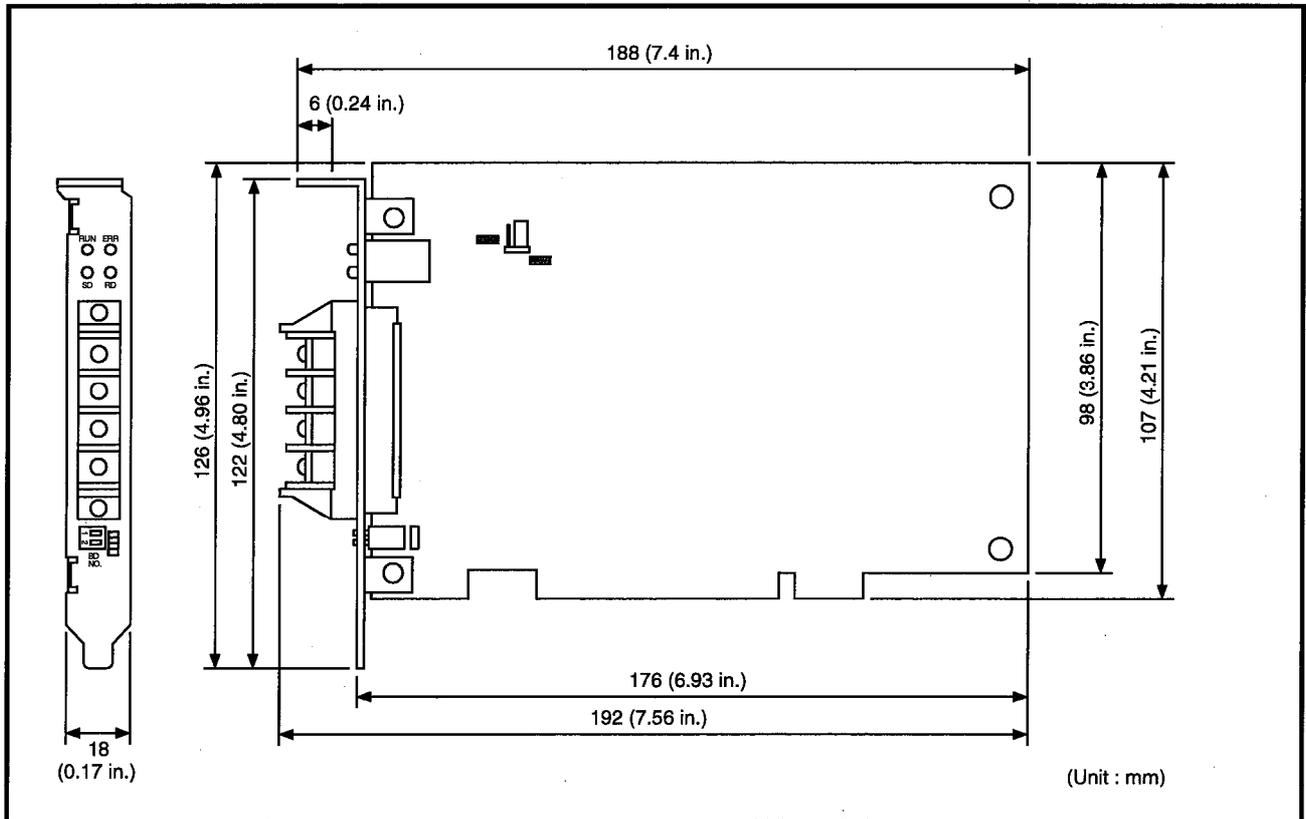
(8) Whether a comparison check in another PC has been done

(9) Switch setting

(10) Details of the CC-Link driver error registered in the event viewer (for Windows NT 4.0) or the error viewer (Windows 95/98)

APPENDIX

Appendix 1 External Dimensions



Type A80BDE-J61BT13 CC-Link Interface Board

User's Manual (For SW2DNF-CCLINK)

MODEL	A80BDE-BT-SW2-U-E
MODEL CODE	13JL82
IB(NA)-66895-A(9901)MEE	

 **MITSUBISHI ELECTRIC CORPORATION**

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Specifications subject to change without notice.