MITSUBISHI

Type SW3D5F-CSKP-E Basic Communication Support Tool

Programming Manual

MELSEC

Mitsubishi Programmable Logic Controller

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

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

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

Please save this manual to make it accessible when required and always forward it to the end user.

[Design Instructions]

◇ DANGER

- ● Install a safety circuit outside of the PLC system that enables the system to operate normally even when data change or status control to an active PLC is attempted from a peripheral device.
  In addition, decide in advance the system countermeasures for a communication error due to cable disconnection during on-line operations to the PLC CPU from the peripheral device.

⚠ CAUTION

- ● Read the manual thoroughly for safety before connecting a peripheral device to an active CPU module for on-line operation (in particular, forced output and run status change).
  Erroneous operation may cause equipment damage or accidents.

REVISIONS

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

Print Date	＊ Manual Number	Revision
Sep., 1999	IB (NA)-0800015-A	First edition
Sep., 1999	IB (NA)-0800015-B	Correction Operating Instructions (3), Section 2.4 Addition Section 3.9
May,2000	IB (NA)-0800015-C	Correction Operating Instructions, CONTENTS, About Manuals, About the Generic Terms and Abbreviations, section 2.1, section 2.5 Addition Section 1.1, section 1.2, section 2.3, section 2.4, chapter 3
Jul., 2000	IB (NA)-0800015-D	Addition Chapter 5
Jun., 2001	IB (NA)-0800015-E	Addition Operating Instructions
Feb., 2002	IB (NA)-0800015-F	Correction Section 3.17, section 3.19, chapter 5 Addition Chapter 5
Dec., 2003	IB (NA)-0800015-G	Correction About the Generic Terms and Abbreviations

Japanese Manual Version IB-0800011-G

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

Operating Instructions

(1) Ethernet communication

(a) When the PLC CPU is accessed by Ethernet communication, functions may not be executed depending on the state of the PLC CPU.

1) When TCP/IP is used for protocol (both E71 and QE71)
Functions can be executed only when the PLC CPU for communication is running.
When the PLC CPU is not running, an attempt to execute the functions terminates in error.

2) When UDP/IP is used for protocol (E71 only)
Unless the PLC CPU is run once in advance, functions cannot be executed.
When the PLC CPU has not been run yet, an attempt to execute the function terminates in error.

(b) If the CPU goes down or the Ethernet module is reset during Ethernet communication, the communication loop will be cut off. In such a case, execute the loop close processing (mdClose), and then perform the reopen processing (mdOpen).

(c) If multiple personal computers are used to perform mdRandR (read from random devices) on a single E71 at the same time using TCP/IP, device specified by a different personal computer may be read. Please take one of the countermeasures listed below.

1) Limit the use of TCP/IP to one port only and use UDP/IP for other ports.
2) Perform mdReceive (batch reading from devices) by the block defined in mdRandR (read from random devices).
3) Synchronize the timing between the multiple personal computers that perform mdRandR (read from random devices).

(2) Access to bit devices

When a bit device is accessed via mdSend( ) and mdReceive( ), the leading device number must be set as shown in the following table.

Computer link communication (Only when using AJ71C24 or AJ71UC24)	Multiple of 16 (0, 16, 32...)
Ethernet communication (TCP/IP) (Only when using AJ71E71)	
Access to RX, RY and SB in the CC-Link card (local station)	
Miscellaneous	Multiple of 8 (0, 8, 16...)

(3) Restrictions on use of the FXCPU

(a) Access to (read from/write to) CN device (current value) number 200 and later of the FXCPU cannot be made.
(b) When the FXCPU is used, access to devices V, Z cannot be made.
(c) When the FXCPU is used, access to device TN (timer current value) number 199 and earlier can be made but access to number 200 and later cannot be made.

(4) Use of VB 4.0 and VC++ 4.2

When using VB 4.0 or VC++ 4.2, you cannot make CC-Link communication and CPU board communication.

(5) Multithreading communication

Multithreading communication cannot be made.

INTRODUCTION

Thank you for choosing the type SW3D5F-CSKP-E Basic Communication Support Tool.
Before using the Basic Communication Support Tool, carefully read the manual to familiarize yourself with its functions.
Please make this manual available to the end user.

CONTENTS

About Manuals

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

Related Manuals

Manual Name	Manual Number (Model Code)
Type SW3D5F-CSKP-E Basic Communication Support Tool Operating Manual This manual describes how to set up and use each utility for communication. (Packed with the product)	IB-0800014 (1LMS50)
Type A70BDE-J71QLP23/A70BDE-J71QLP23GE/A70BDE-J71QBR13/A70BDE-J71QLR23 MELSECNET/10 Interface Board User's Manual(For SW3DNF-MNET10) Describes the features, specifications, part names and setting of the MELSECNET/10 board, and the installation, uninstallation and others of the driver. (Packed with the product)	IB-0800035 (13JL93)
Type A80BDE-J61BT11 CC-Link System Master/Local Interface Board User's Manual (For SW3DNF-CCLINK) Describes the features, specifications, part names and setting of the CC-Link master board, and the installation, uninstallation and others of the driver. (Packed with the product)	IB-0800110 (13JR14)
Type A80BDE-J61BT13 CC-Link Interface Board User's Manual (For SW3DNF-CCLINK) Describes the features, specifications, part names and setting of the CC-Link local board, and the installation, uninstallation and others of the driver. (Packed with the product)	IB-0800036 (13JL94)
Type A80BDE-A2USH-S1 PLC CPU Board User's Manual (For SW0DNF-ANU-B) Describes the features, specifications, part names and setting of the CPU board, and the installation, uninstallation and others of the driver. (Packed with the product)	IB-0800087 (13JR08)

How to Use This Manual

"How to Use This Manual" is described by the purposes of using the functions of CSKP.
Refer to the following when using this manual.

(1) To know the function list (Chapter 1)
Chapter 1 gives a list of functions and explains what they will perform.

(2) To use the functions in VB and VC++ (Section 2.1)
Section 2.1 describes the ways of setting in VB and VC++ for use of the functions.

(3) To know the programming procedure (Section 2.2)
Check Section 2.2 which gives the programming procedure.

(4) To know the channels, station numbers and device types specified for the functions (Sections 2.3 to 2.5)
Sections 2.3 to 2.5 describes the channels, station numbers and device types.

(5) To know the details of each function (Chapter 3)
Chapter 3 gives the detailed explanation of each function.
Read this chapter before creating programs.

(6) To know how to use sample programs (Chapter 4)
When creating programs, refer to Chapter 4 where sample programs and their usages are given.

(7) To know the error codes displayed when using the functions (Chapter 5)
Chapter 5 provides the error codes returned when the functions are used.
When using the utilities, also read this chapter since error codes are returned.

(8) To know the accessible devices and ranges
Refer to the CSKP Operating Manual which gives the accessible devices and ranges.

About the Generic Terms and Abbreviations

Unless stated explicitly, this manual uses the generic and abbreviations names listed in the following table to discuss the Type SW3D5F-CSKP-E Basic Communication Support Tool.

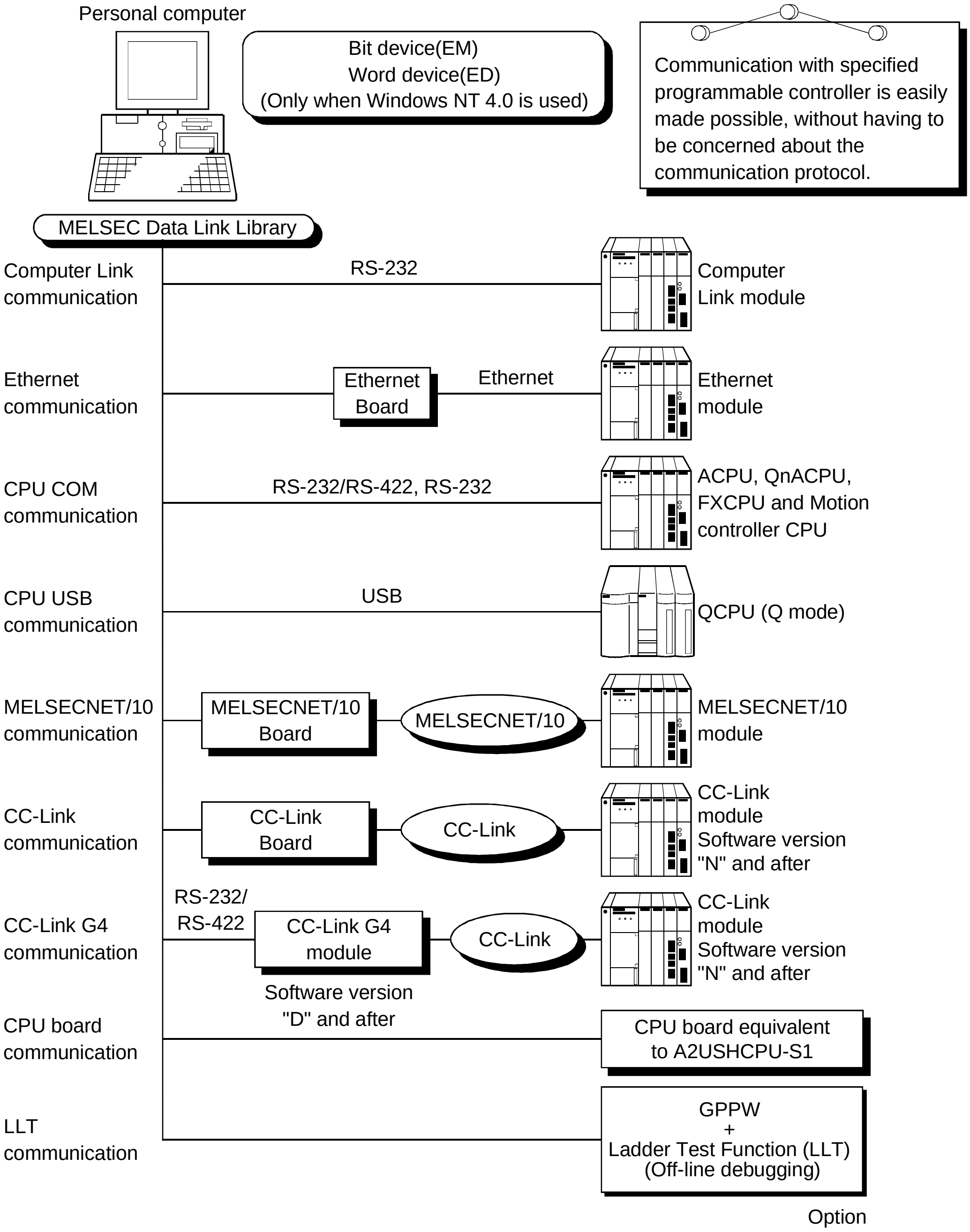
Generic/abbreviation name	Generic/abbreviation name definition
CSKP	Abbreviation for Type SW3D5F-CSKP-E Basic Communication Support Tool
Windows NT 4.0	Abbreviation for Microsoft Windows NT Workstation 4.0
Windows 95	Abbreviation for Microsoft Windows 95
Windows 98	Abbreviation for Microsoft Windows 98
Windows	Generic name for Microsoft Windows 95, Microsoft Windows 98, and Microsoft Windows NT Workstation 4.0
VB	Generic name for Microsoft Visual Basic 4.0, Visual Basic 5.0 and Visual Basic 6.0
VC++	Generic name for Microsoft Visual C++ 4.2, Visual C++ 5.0 and Visual C++ 6.0
Personal computer	Generic name for IBM PC/AT and its compatibles (DOS/V machines)
CC-Link G4 Module	Abbreviation for GPP Function Peripheral Connection Module Type AJ65BT-G4
GPPW	Abbreviation for GPP Function Software for Windows SW□D5C-GPPW-E/ SW□D5F-GPPW-E
Ladder Logic Test Tool (LLT)	Abbreviation for Ladder Logic Test Function Tool Software for Windows SW□D5C-LLT-E/ SW□D5F-LLT-E
MELSECNET/10 board	Abbreviation of Type A70BDE-J71QLP23/A70BDE-J71QLP23GE/A70BDE-J71QBR13/A70BDE-J71QLR23 MELSECNET/10 interface board
CC-Link board	Abbreviation of Type A80BDE-J61BT11 CC-Link system master/local interface board and Type A80BDE-J61BT13 CC-Link interface board
CPU board	Abbreviation of Type A80BDE-A2USH-S1 PLC CPU board
AnNCPU	Generic name for A0J2HCPU, A1SCPU, A1SCPU-S1, A1SCPUC24-R2, A1SHCPU, A1SJCPU, A1SJCPU-S3, A1SJHCPU, A1SJHCPU-S8, A1NCPU, A2CCPU, A2CCPUC24, A2CCPU24-PRF, A2CJCPU, A2NCPU, A2NCPU-S1, A2SCPU, A2SCPU-S1, A2SHCPU and A1FXCPU
AnACPU	Generic name for A2ACPU, A2ACPU-S1, A2ACPUP21/R21, A2ACPUP21/R21-S1, A3ACPUP21/R21, A3NCPU, A3ACPU
AnUCPU	Generic name for A2UCPU, A2UCPU-S1, A2ASCPU, A2ASCPU-S1, A2ASCPU-S30, A2USHCPU-S1, A3UCPU and A4UCPU
QnACPU	Generic name for Q2ACPU, Q2ACPU-S1, Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q3ACPU, Q4ACPU and Q4ARCPU
QCPU (A mode)	Generic name for Q02CPU-A, Q02HCPU-A and Q06HCPU-A
QCPU (Q mode)	Generic name for Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU
ACPU	Generic name for AnNCPU, AnACPU and AnUCPU
FXCPU	Generic name for FX0, FX0S, FX0N, FX1, FX2, FX2C, FX2N and FX2NC, Series
Motion controller CPU	Generic name for A171SHCPU, A172SHCPU, A273UHCPU and A273UHCPU-S3

1. OVERVIEW

This chapter outlines the operation of the functions provided by the MELSEC Data Link Library.

1.1 General Description of MELSEC Data Link Library

The functions in the data link library are used for creating a user program that communicates with a PLC CPU.
Using these functions, the user can program communication procedures without being concerned about differences in hardware configurations and communication protocols at different stations.


Personal computer
Bit device(EM)
Word device(ED)
(Only when Windows NT 4.0 is used)
Communication with specified programmable controller is easily made possible, without having to be concerned about the communication protocol.
MELSEC Data Link Library
Computer Link communication
RS-232
Computer Link module
Ethernet communication
Ethernet Board
Ethernet
Ethernet module
CPU COM communication
RS-232/RS-422, RS-232
ACPU, QnACPU, FXCPU and Motion controller CPU
CPU USB communication
USB
QCPU (Q mode)
MELSECNET/10 communication
MELSECNET/10 Board
MELSECNET/10
MELSECNET/10 module
CC-Link communication
CC-Link Board
CC-Link
CC-Link module Software version "N" and after
CC-Link G4 communication
RS-232/ RS-422
CC-Link G4 module
Software version "D" and after
CC-Link
CC-Link module Software version "N" and after
CPU board communication
CPU board equivalent to A2USHCPU-S1
LLT communication
GPPW + Ladder Test Function (LLT) (Off-line debugging)
Option

1.2 List of Functions

The following functions are provided by the MELSEC Data Link Library of the CSKP.

Function name	Purpose	Reference
mdOpen	Opening communication line	Section 3.1
mdClose	Closing communication line	Section 3.2
mdSend	Batch writing to a device	Section 3.3
mdReceive	Batch reading from a device	Section 3.4
mdRandW	Writing to a random device	Section 3.5
mdRandR	Reading from a random device	Section 3.6
mdDevSet	Setting a bit device	Section 3.7
mdDevRst	Resetting a bit device	Section 3.8
mdTypeRead	Reading PLC CPU type	Section 3.9
mdControl	Remote RUN/STOP/PAUSE	Section 3.10
mdInit	Refreshing PC address	Section 3.11
mdBdRst	Resetting the local board	Section 3.12
mdBdModSet ＊2	Setting the mode for the local board	Section 3.13
mdBdModRead ＊2	Reading the mode set to the local board	Section 3.14
mdBdLedRead	Reading the states of LEDs on the local board	Section 3.15
mdBdSwRead	Reading the states of switches on the local board	Section 3.16
mdBdVerRead	Reading the version of the local board	Section 3.17
MdSend ＊1	Data sending (SEND)	Section 3.18
MdReceive ＊1	Data receiving (RECV)	Section 3.19

＊1 QnA dedicated instruction

＊2 Unusable when using CPU board.

2. MELSEC DATA LINK LIBRARY

This chapter describes how to make settings and code programs that use the MELSEC Data Link Library.

2.1 Setting to Use a Function

This section describes how to make settings when functions are used.

> POINT
>
> When using VB 4.0 or VC++ 4.2, you cannot make CC-Link communication and CPU board communication.

(1) If using Visual Basic 4.0

1) Start the Visual Basic 4.0, then select [File]-[Add File].

2) Select MDFUNC.BAS.
The file is stored at the following location during the installation:
<user-specified-directory>-<COMMON>-<INCLUDE>

(2) If using Visual Basic 5.0 and Visual Basic 6.0

1) Start the Visual Basic 5.0 or Visual Basic 6.0, then select [Project]-[Add Module].

2) Select "Existing" tab and then select "MDFUNC.BAS".
The file MDFUNC, BAS is stored at the following location during the installation:
<user -specified-directory>-<COMMON>-<INCLUDE>

(3) If using Visual C+ + 4.2

(a) In case of setting for Include File

1) Start the Visual C+ + 4.2 and select [Tools]-[Options].

2) Click the Directories tab, and then select “Include Files” as the directory to be displayed.

3) Double-click the item to be included.
The file MDFUNC.H is stored at the following location during the installation:
<user-specified-directory>-<COMMON>-<INCLUDE>

4) Add the following line to the top of the program:
```
# include<mdfunc.h>
```

(b) In case of setting for Library File

1) Start the Visual C+ + 4.2 and select [Tools]-[Options].

2) Click the Directories tab, and then select “Library File” as the directory to be displayed.
Then set the library file. Library file setting procedure is similar to the include file setting procedure explained in (a).

3) Open the workspace to be created and then choose [Build]-[Setting].

4) Click the Link tab, select “General” as the category, and “mdfunc32.lib“ as the object/library modules.

(4) If using Visual C+ + 5.0 and Visual C+ + 6.0

(a) In case of setting for Include File

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

2) Click the Directories tab, and then select “Include Files” as the directory to be displayed.

3) Double-Click the item to be included.
The file “MDFUNC.H“ is stored at the following location during the installation:
<user- specified-directory>-<COMMON>-<INCLUDE>

4) Add the following line to the top of the program:
# include<mdfunc.h>

(b) In case of setting for Library File

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

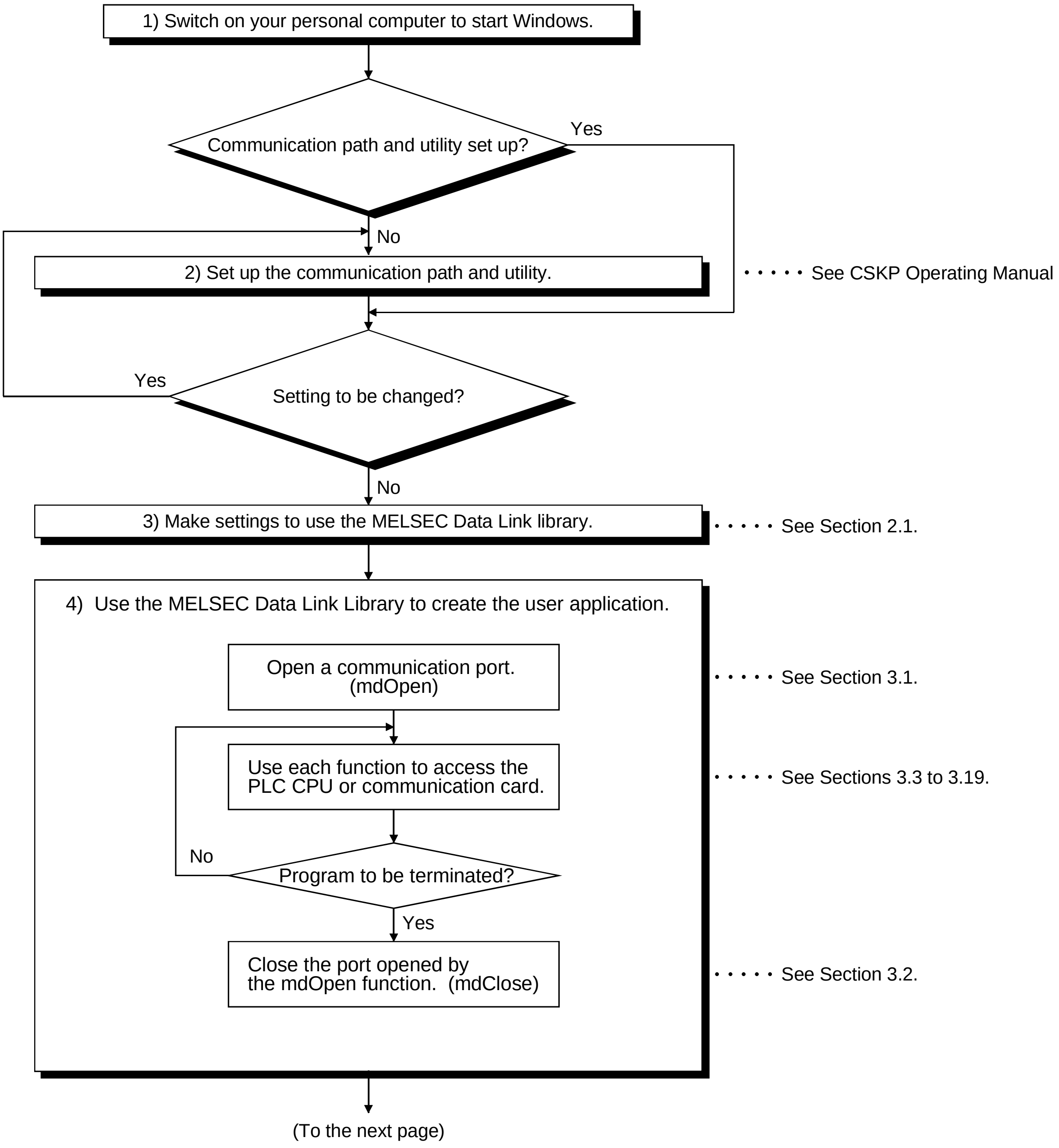
2) Click the Directories tab, and then select “Library Files” as the directory to be displayed.
Then set the library file.
Library file setting procedure is similar to the include file setting procedure explained in (a).

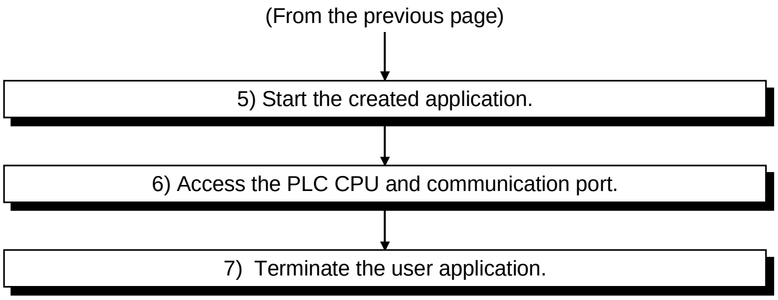
3) Open the workspace to be created and then choose [Project]-[Settings].

4) Click the link tab, select “General” as the category, and “mdfunc 32.lib”as the object /library modules.

2.2 Programming Procedure

This section describes how to code programs using the MELSEC Data Link Library. For descriptions, it assumes that CSKP has already been installed.


1) Switch on your personal computer to start Windows.
Communication path and utility set up?
Yes
No
2) Set up the communication path and utility.
• • • • • See CSKP Operating Manual
Yes
Setting to be changed?
No
3) Make settings to use the MELSEC Data Link library.
• • • • • See Section 2.1.
4) Use the MELSEC Data Link Library to create the user application.
Open a communication port. (mdOpen)
• • • • • See Section 3.1.
Use each function to access the PLC CPU or communication card.
• • • • • See Sections 3.3 to 3.19.
No
Program to be terminated?
Yes
Close the port opened by the mdOpen function. (mdClose)
• • • • • See Section 3.2.
(To the next page)



(From the previous page)

5) Start the created application.

6) Access the PLC CPU and communication port.

7) Terminate the user application.

POINTS

- The communication line must be opened and closed only once by the mdOpen and mdClose functions at the start and end of the program.
  Communication performance deteriorates if line opening/closing takes place with each communication.
- When the PLC CPU and communication card are accessed again by the created user program, they can be accessed by the operations 5) to 7) only.

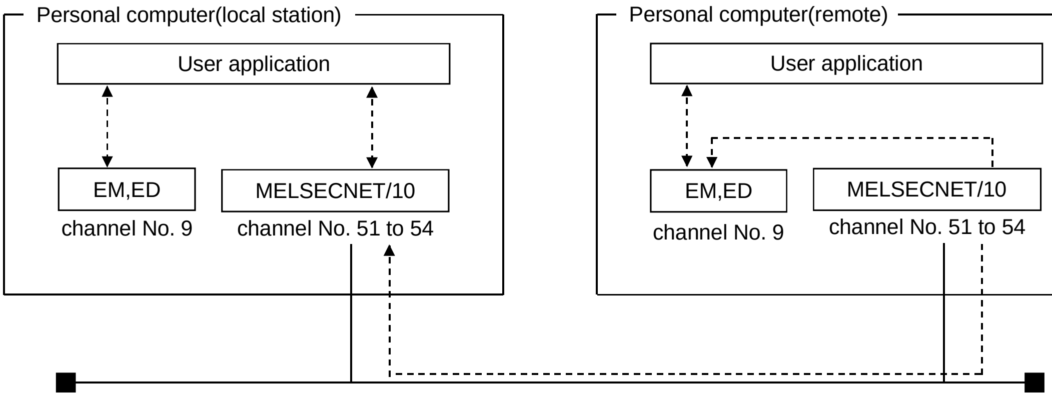
2.3 Channels

The following channels are used by the functions in the MELSEC data library.

No.	Channel name	Description
1	LLT	Used to communicate with the Ladder Logic Test Tool (LLT).
9	Shared device	Used to access a local station shared device (only when OS is Windows NT 4.0).
31 to 40	Comm. link (COM1 to COM10)	Used for access via the computer link module. Setting begins with 31 in ascending order of port numbers.
41 to 50	CPU COM (COM1 to COM10)	Used for communication by direct connection to the PLC CPU. Setting begins with 41 in ascending order of port numbers.
51 to 54	MELSECNET/10 (1 slot to 4 slot)	Used for communication via the MELSECNET/10 board. Setting begins with 51 in ascending order of port numbers.
61	ETHERNET	Used for communication via the Ethernet module.
71	AnU CPU board	Used for communication via the CPU board.
81 to 84	CC-Link (1 slot to 4 slot)	Used for communication via the CC-Link board. Set the BD No. DIP switches at the rear of the CC-Link card. Settings are made as follows by setting the switches SW1 and SW2. 81: OFF, OFF 82: ON, OFF 83: OFF, ON 84: ON, ON
91 to 100	CC-Link G4 (COM1 to COM10)	Used for communication via the CC-Link G4 Module. Setting begins with 91 in ascending order of port numbers.
141	CPU USB	Used for communication by direct connection to the USB port of the QCPU.

POINTS

- A shared device (EM, ED) can be set under Windows NT 4.0 with the Shared Device Utility.
  It cannot be set under Windows 95 and Windows 98.
  However, the Windows NT 4.0 shared devices (EM, ED) can be accessed from Windows 95 or Windows 98.
- When a shared device (EM, ED) in the other personal computer (remote) is accessed, the MELSECENET/10 channel must be specified for the communication channel.

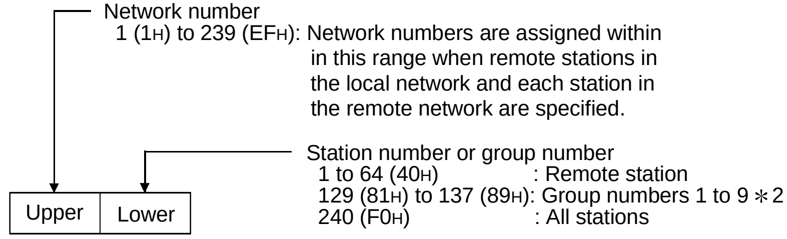


2.4 Station Number Setup

The table below shows how a station number is specified by functions.

Communication	Station number specification
Computer Link	Specifies a logical station number set by each utility.
Ethernet	
CPU COM	When a logical exchange number is specified by each utility, the logical exchange number method is specified. As follows when exchange number method is directly selected. Local station: 255(0xFF) Remote station: ∗1
CPU USB	
CC-Link G4	Specifies a logical station number set by a utility.
Shared Device	Local station: 255(0xFF) Remote station: ∗1
CPU board	Own station:255(0xFF) Other station: MELSECNET/10 ∗1
LLT	Local station: 255(0xFF)
MELSECNET/10	Local station: 255(0xFF) Remote station: ∗1
CC-Link	Local station: 255(0xFF) Remote station: 0 to 64(0x40) ∗3

∗ 1



Network number
1 (1H) to 239 (EFH): Network numbers are assigned within in this range when remote stations in the local network and each station in the remote network are specified.

Station number or group number
1 to 64 (40H) : Remote station
129 (81H) to 137 (89H): Group numbers 1 to 9 ∗2
240 (F0H) : All stations

∗ 2 Group numbers 1 to 9 (0x81 to 0x89) can be specified only when the SEND function (mdSend) function is used.

∗ 3 In CC-Link communication, the station number 64 cannot be specified for other than buffer memory access.

2.5 Device Type

Code numbers or device names can be specified as device types in the functions.

(1) Common device type
Command device type for all communication paths

Device type			Device
by code		by device name	
Decimal	Hexadecimal		
1	1H	DevX	X
2	2H	DevY	Y
3	3H	DevL	L
4	4H	DevM	M
5	5H	DevSM	Special M(SM), SB (Link Special B for MNET/10 and CC-Link)
6	6H	DevF	F
7	7H	DevTT	T (contact)
8	8H	DevTC	T (coil)
9	9H	DevCT	C (contact)
10	AH	DevCC	C (coil)
11	BH	DevTN	T (current value)
12	CH	DevCN	C (current value)
13	DH	DevD	D
14	EH	DevSD	Special D(SD), SW (Link Special W for MNET/10 and CC-Link)
15	FH	DevTM	T (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	DevCS	C (set value, sub 1)
18002	4652H	DevCS2	C (set value, sub 2)
18003	4653H	DevCS3	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	DevER1 to DevER256	ER(extended register)
23	17H	DevB	B
24	18H	DevW	W
25	19H	DevQSB	QnA link special relay (on QnACPU)

Device type			Device
by code		by device name	
Decimal	Hexadecimal		
26	1AH	DevSTT	Integrating timer (contact)
27	1BH	DevSTC	Integrating timer (coil)
28	1CH	DevQSW	QnA link special register (on QnACPU)
30	1EH	DevQV	QnA edge relay (on QnACPU)
33	21H	DevMRB	Local station random access buffer ＊1
35	23H	DevSTN	Integrating timer (current value)
36	24H	DevWw	Local station link register (for transmission) ＊1
37	25H	DevWr	Local link register (for reception) ＊1
40	28H	DevFS	S device of FXCPU
50	32H	DevSPB	Local station buffer memory ＊1
101	65H	DevMAIL	Acknowledging QnA SEND/RECV function arrival
102	66H	DevMAILNC	Not acknowledging QnA SEND/RECV function arrival
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 resistor
25001 to 25255	61A9H to 62A7H	DevLSB1 to DevLSB255	Direct link special resistor (network unit side)
28001 to 28255	6D61H to 6E5FH	DevLSW1 to DevLSW255	Direct link special resistor (network unit side)
29000 to 29255	7148H to 7247H	DevSPG0 to DevSPG255	Special direct buffer resistor
31000 to 31255	7918H to 7A17H	DevEM0 to DevEM255	EM (shared device)
32000 to 32255	7D00H to 7DFFH	DevED0 to DevED255	ED (shared device)

＊1 Dedicated device to access the buffer memory of a CC-Link board (own station) or CPU board (own station)

(2) Device type for access via the CC-Link board

This device type is a dedicated type for device access via the CC-Link board.
It cannot be used when a device is accessed via the CC-Link board.

Device type			Device
by code		by device name	
Decimal	Hexadecimal		
1	1H	DevX	Local station RX
2	2H	DevY	Local station RY
5	5H	DevSM	Local station SB (link special B for CC-Link)
14	EH	DevSD	Local station SW (link special W for CC-Link)
33	21H	DevMRB	Local station random access buffer
36	24H	DevWw	Local station link register (for transmission)
37	25H	DevWr	Local station link register (for reception)
50	32H	DevSPB	Local station buffer memory
32768	8000H	DevRBM	Remote station buffer memory ＊1
32800	8020H	DevRAB	Remote station random access buffer ＊1
32801	8021H	DevRX	Remote station RX ＊1
32802	8022H	DevRY	Remote station RY ＊1
32804	8024H	DevRW	Remote station link register ＊1
32867	8063H	DevSB	Remote station SB (link special B for CC-Link) ＊1
32868	8064H	DevSW	Remote station SW (link special W for CC-Link) ＊1

＊1 These devices cannot be used by the mdRandR, mdRandW, mdDevSet and mdDevRst functions.

2.6 Accessible Devices and Range

For details on accessible devices and ranges, see Chapter 11 in the CSKP Operating Manual.

3. MELSEC DATA LINK LIBRARY DETAILS

This chapter describes each function of the MELSEC Data Link Library in more detail. Functions beginning with the character string "mdBd " can be used only when the communication board is used.
In addition, the table at the upper right corner indicates whether the function can be used when the communication board is in use.

MNET/10	CC-Link	CPU
○	○	×

○: Can be used. ×: Cannot be used.

POINT

Only the functions described in Sections 3.1 to 3.11 can be used when communication does not use the communication board (computer link, Ethernet, and so on).
The other functions cannot be used.

3.1 mdOpen (communication line open)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function opens a communication line.

(2) Format

VB : ret% = mdOpen (chan&, mode%, path&)

Integer	ret	Returned value	OUT
Integer	chan	Communication line’s channel number	IN
Integer	mode	Dummy (-1)	IN
Long	path	Open line bus pointer	OUT

VC++ : ret = mdOpen (chan, mode, path);

short	ret;	Returned value	OUT
short	chan;	Channel path	IN
short	mode;	Dummy (-1)	IN
long	*path;	Open line bus pointer	OUT

(3) Explanation

- This function opens a communication channel through an initialization procedure appropriate for the channel.
- The ranges of the arguments are checked. If any error is found, the function returns an error code.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related function

mdClose( )

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.2 mdClose (communication line close)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function closes a communication line.

(2) Format

VB : ret% = mdClose (path&)

Integer	ret	Returned value	OUT
Long	path	Open line pointer	IN

VC++ : ret = mdClose (path);

short	ret;	Returned value	OUT
long	path;	Open line pointer	IN

(3) Explanation

This function closes an open channel in a way appropriate for the channel.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related function

mdOpen( )

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.3 mdSend (batch writing to devices)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function performs batch writing to a device.

(2) Format

VB : ret% = mdSend (path&, stno%, devtyp%, devno%, size%, data%(0))

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Head device number	IN
Integer	size	Size (bytes) of the data written	IN/OUT
Any	data(n)	Data written(single precision integer array)	IN

VC++ : ret = mdSend (path, stno, devtyp, devno, size, data);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Head device number	IN
short	*size;	Size (bytes) of the data written	IN/OUT
short	data[ ];	Data written (single precision integer array)	IN

(3) Explanation

- This function is used to write data to the specified device.
- The function checks the arguments.
  It also adds the head address and the size of the data written, both given by the arguments, to see if the sum of them indicates an address inside the memory allocated for the device.
- If the specified head address plus the size of the data written indicates an address outside the area in the memory allocated for the device, the function returns to the “size” field the maximum allowable size of the data written.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related functions

mdOpen( ), mdClose( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).
- For bit device access, the leading device number must be specified as shown below.

  <Specification by a multiple of 16 (0, 16, 32...)>
  - During computer link communication (Only when using AJ71C24 or AJ71UC24)
  - Ethernet communication (TCP/IP) (Only when using AJ71E71)
  - During access to CC-Link card (local station) RX, RY, and SB

  <Specification by a multiple of 8 (0, 8, 16...)>

  Other cases not covered above
- Be aware that writing data in a block to which an extended comment is assigned (extended file register) will erase the extended comment information.
- Be aware that wiring data in a block that overlaps with the Sub 2 and Sub 3 program setting areas (extended file register) will erase the Sub 2 and Sub 3 programs.

3.4 mdReceive (batch reading from devices)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function performs a batch reading from a device.

(2) Format

VB : ret% = mdReceive (path&, stno%, devtyp%, devno%, size%, data%(0))

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Head device number	IN
Integer	size	Size (bytes) of the data read	IN/OUT
Any	data(n)	Data read (single precision integer array)	OUT

VC++ : ret = mdReceive (path, stno, devtyp, devno, size, data);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Head device number	IN
short	*size;	Size (bytes) of the data read	IN/OUT
short	data[ ];	Data read (single precision integer array)	OUT

(3) Explanation

- This function is used to read data from the specified device.
- The function checks the arguments.
  It also adds the head address and the size of the data read, both given by the arguments, to see if the sum of them indicates an address inside the memory allocated for the device.
- If the specified head address plus the size of the data read indicates an address outside the area in the memory allocated for the device, the function returns to the “size” field the maximum allowable size of the data read.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related function

mdOpen( ), mdClose( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).
- For bit device access, the leading device number must be specified as shown below.
  <Specification by a multiple of 16 (0, 16, 32...)>
  - During computer link communication
    (Only when using AJ71C24 or AJ71UC24)
  - Ethernet communication (TCP/IP) (Only when using AJ71E71)
  - During access to CC-Link card (local station) RX, RY, and SB

  <Specification by a multiple of 8 (0, 8, 16...)>
  Other cases not covered above

3.5 mdRandW (write to random devices)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function is used to write data to randomly-specified devices.

(2) Format

VB : ret% = mdRandW (path&, stno%, dev%(0), buf%(0), bufsize%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	dev(n)	Randomly-specified device	IN
Any	buf(n)	Data written	OUT
Integer	bufsize	Dummy	IN

VC++ : ret = mdRandW (path, stno, dev, buf, bufsize);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	dev[ ];	Randomly-specified device	IN
short	buf[ ];	Data written	OUT
short	bufsize;	Dummy	IN

(3) Explanation

- This function is used to write data to randomly-specified devices.
  Randomly-specified device (dev[ ])

dev[0] ·····	Number of blocks	
dev[1] ·····	Device type	Block No. 1
dev[2] ·····	Head device number.	
dev[3] ·····	Number of points	
dev[4] ·····	Device type	Block No. 2
	⋮	

- The number of blocks should be specified with a number between 1 and 32767.

(4) Specifying method

Example: Setting M100 through M115 to OFF and writing 10, 200, 300, and 400

```
Randomly-specified device
dev[0]=2;  ·········· Number of specified ranges(M100 to M115, D10 to D13)
dev[1]=DevM; }
dev[2]=100;  }····· M100 and after
dev[3]=16;·········· for the total of 16 items(M100 to M115)
dev[4]=DevD; }
dev[5]=10;   }····· D10 and after
dev[6]=4;  ·········· for the total of 4 items(D10 to D13)

Data written
buf[0]=0;··········· All bits are set to OFF.
buf[1]=10;·········· Stores 10 in D10.
buf[2]=200;········· Stores 200 in D11.
buf[3]=300;········· Stores 300 in D12.
buf[4]=400;········· Stores 400 in D13.
```

(5) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(6) Related function

mdOpen( ), mdClose( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).
- Be aware that writing data in a block to which an extended comment is assigned (extended file register) will erase the extended comment information.
- Be aware that wiring data in a block that overlaps with the Sub 2 and Sub 3 program setting areas (extended file register) will erase the Sub 2 and Sub 3 programs.
- If an error happens when a random write operation is performed to “B” or “W” of the local station with the MELSECNET/10, the write operation to some of the blocks may be performed correctly while the write operation to the other blocks are performed incorrectly.

3.6 mdRandR (read from random devices)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function is used for reading data from randomly-specified devices.

(2) Format

VB : ret% = mdRandR (path&, stno%, dev%(0), buf%(0), bufsize%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	dev(n)	Randomly-specified device	IN
Any	buf(n)	Data read (single precision integer array)	OUT
Integer	bufsize	Data read storage area size (bytes)	IN

VC++ : ret = mdRandR (path, stno, dev, buf, bufsize);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	dev[ ];	Randomly-specified device	IN
short	buf[ ];	Data read(single precision integer array)	OUT
short	bufsize;	Data read storage area size (bytes)	IN

(3) Explanation

- This function is used for reading data from randomly-specified devices.
  Randomly-specified device (dev[ ])

```
dev[0] · · · · · Number of blocks
dev[1] · · · · · Device type            ┐
dev[2] · · · · · Head device number.    ├ Block No. 1
dev[3] · · · · · Number of points       ┘
dev[4] · · · · · Device type            ┐
                 ·                      ├ Block No. 2
                 ·                      ┘
```

- The number of blocks should be specified with a number between 1 and 32767.

(4) Specifying method

Example: Reading current values of M100 to M115, D10 to D13, M0 to M13, and T10.

```
Randomly-specified device
dev[0]=4;・・・・・・・・・・・ Number of specified ranges
                           (M100 to M115, D10 to D13, M0 to M13, T10)
dev[1]=DevM; ⎫
dev[2]=100;  ⎭・・・・・ M100 and after
dev[3]=16;・・・・・・・・・・ for the total of 16 items(M100 to M115)
dev[4]=DevD; ⎫
dev[5]=10;   ⎭・・・・・ D10 and after
dev[6]=4;・・・・・・・・・・・ for the total of 4 items(D10 to D13)
dev[7]=DevM; ⎫
dev[8]=0;    ⎭・・・・・ M0 and after
dev[9]=14;・・・・・・・・・・ for the total of 14 items(M0 to M13)
dev[10]=DevTN; ⎫
dev[11]=10;    ⎭・・・ T10 timer value, current value and after
dev[12]=1;・・・・・・・・・・ 1 item(T10)
```

bufsize value

(buf[0] to buf[6]=7)×2=14

Data read storage area

⬇ Read

```
Data read
buf[0]=0;・・・・・・・・・・All bits between M100 and M113 are OFF.
                        (16 pieces of bit information can be stored.)
buf[1]=10;・・・・・・・・・Current value of D10
buf[2]=200; ・・・・・・・Current value of D11
buf[3]=300; ・・・・・・・Current value of D12
buf[4]=400; ・・・・・・・Current value of D13
buf[5]=0x3FFF;・・・・All bits between M0 and M13 are ON.
buf[6]=10;・・・・・・・・・The current value of T10 is 10 (=1 sec).
```

(5) Returned value

Upon normal termination : The function returns 0.

Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).

3.7 mdDevSet (bit device set)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function sets a bit device.

(2) Format

VB : ret% = mdDevSet (path&, stno%, devtyp%, devno%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Specified device number	IN

VC++ : ret = mdDevSet (path, stno, devtyp, devno);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Specified device number	IN

(3) Explanation

- This function sets (ON) the specified bit device.
- Arguments are checked.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related functions

mdOpen( ), mdClose( ), mdDevRst( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).

3.8 mdDevRst (bit device reset)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function resets a bit device.

(2) Format

VB : ret% = mdDevRst (path&, stno%, devtyp%, devno%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Specified device number	IN

VC++ : ret = mdDevRst (path, stno, devtyp, devno);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Specified device number	IN

(3) Explanation

- This function resets (OFF) the specified bit device.
- The arguments are checked.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related functions

mdOpen( ), mdClose( ), mdDevSet( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When accessing the local station, specify 0xFF (255) as the station number. Specifying the actual station number will cause an error (-4).

3.9 mdTypeRead (PLC CPU type read)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function reads information on the type of the PLC CPU.

(2) Format

VB : ret% = mdTypeRead (path&, stno%, buf%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	buf	Type code	OUT

VC++ : ret = mdTypeRead (path, stno, buf);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	buf;	Type code	OUT

(3) Explanation

- This function reads information on the type of CPU in the specified PC.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

POINT

If the communication driver returns an error code, the function returns that error code as is.

PLC CPU type	Type Code			PLC CPU type	Type Code		
	CPU connection	LLT connection			CPU connection	LLT connection	
		SW3D5□ - LLT	SW4D5C-LLT			SW3D5□ - LLT	SW4D5C-LLT
Q02CPU	41$_H$	—	41$_H$	A2NCPU-S1	A2$_H$	85$_H$	A2$_H$
Q02HCPU	41$_H$	—	41$_H$	A2SCPU	A2$_H$	85$_H$	A2$_H$
Q06HCPU	42$_H$	—	42$_H$	A2SCPU-S1	A2$_H$	85$_H$	A2$_H$
Q12HCPU	43$_H$	—	43$_H$	A2SHCPU	A3$_H$	85$_H$	A3$_H$
Q25HCPU	44$_H$	—	44$_H$	A2ACPU	92$_H$	85$_H$	92$_H$
Q02CPU-A	141$_H$	—	141$_H$	A2ACPU-S1	93$_H$	85$_H$	93$_H$
Q02HCPU-A	141$_H$	—	141$_H$	A2ACPUP21/R21	92$_H$	85$_H$	92$_H$
Q06HCPU-A	142$_H$	—	142$_H$	A2ACPUP21/R21-S1	93$_H$	85$_H$	93$_H$
Q2ACPU	21$_H$	24$_H$	21$_H$	A2UCPU	82$_H$	85$_H$	82$_H$
Q2ACPU-S1	22$_H$	24$_H$	22$_H$	A2UCPU-S1	83$_H$	85$_H$	83$_H$
Q2ASCPU	21$_H$	24$_H$	21$_H$	A2ASCPU	82$_H$	85$_H$	82$_H$
Q2ASCPU-S1	22$_H$	24$_H$	22$_H$	A2ASCPU-S1	83$_H$	85$_H$	83$_H$
Q2ASHCPU	21$_H$	24$_H$	21$_H$	A2ASCPU-S30	84$_H$	85$_H$	84$_H$
Q2ASHCPU-S1	22$_H$	24$_H$	22$_H$	A2USHCPU-S1	84$_H$	85$_H$	84$_H$
Q3ACPU	23$_H$	24$_H$	23$_H$	A3NCPU	A3$_H$	85$_H$	A3$_H$
Q4ACPU	24$_H$	24$_H$	24$_H$	A3ACPU	93$_H$	85$_H$	93$_H$

PLC CPU type	Type Code			PLC CPU type	Type Code		
	CPU	LLT connection			CPU	LLT connection	
	connection	SW3D5□ - LLT	SW4D5C-LLT		connection	SW3D5□ - LLT	SW4D5C-LLT
Q4ARCPU	24H	24H	24H	A3ACPUP21/R21	93H	85H	93H
A0J2HCPU	98H	85H	98H	A3UCPU	84H	85H	84H
A1SCPU	98H	85H	98H	A4UCPU	85H	85H	85H
A1SCPU-S1	A2H	85H	A2H	A1FXCPU	A2H	85H	A2H
A1SCPUC24-R2	98H	85H	98H	FX0	8EH	8EH	8EH
A1SHCPU	A3H	85H	A3H	FX0S	8EH	8EH	8EH
A1SJCPU	98H	85H	98H	FX0N	8EH	8EH	8EH
A1SJCPU-S3	98H	85H	98H	FX1	F1H	F1H	F1H
A1SJHCPU	A3H	85H	A3H	FX2	8DH	8DH	8DH
A1SJHCPU-S8	A3H	85H	A3H	FX2C	8DH	8DH	8DH
A1NCPU	A1H	85H	A1H	FX2N	9EH	9EH	9EH
A2CCPU	9AH	85H	9AH	FX2NC	9EH	9EH	9EH
A2CCPUC24	9AH	85H	9AH	A171SHCPU	A3H	85H	A3H
A2CCPUC24-PRF	9AH	85H	9AH	A172SHCPU	A3H	85H	A3H
A2CJCPU	9AH	85H	9AH	A273UHCPU	84H	85H	84H
A2NCPU	A2H	85H	A2H	A273UHCPU-S3	84H	85H	84H

(a) When the E71 or QE71 uses TCP/IP, refer to the manual of the corresponding module.

(b) When access to the AnUCPU, QnACPU, QCPU (A mode), A273UHCPU or A273UHCPU-S3 is made from the C24 or E71, the AnACPU-equivalent code is returned. (92H, 93H, 94H)

(c) When access to the AnUCPU, QnACPU, QCPU (A mode), A273UHCPU or A273UHCPU-S3 is made from the AnNCPU or AnACPU used with the C24, E71 or UC24 via a network, the AnACPU-equivalent code is returned. (92H, 93H, 94H)

(d) When access to the AnUCPU, QCPU (A mode), A273UHCPU or A273UHCPU-S3 is made from the AnNCPU or AnACPU via a network in CPU COM communication, the AnACPU-equivalent code is returned. (92H, 93H, 94H)

(e) When access to the QnACPU or QCPU (A mode) is made from the CPU board, the AnACPU-equivalent code (92H, 93H, 94H) is returned to the QnACPU or the A4UCPU-equivalent code (85H) is returned to the QCPU (A mode).

(f) When access to the QCPU (A mode) is made from the UC24, the A4U-equivalent code (85H) is returned.

(g) When access to the QCPU (A mode) is made from the CC-Link G4 module, the A4UCPU-equivalent code (85H) is returned.

(h) As for QCPU(A mode), when ACPU accesses QCPU(A mode) by way of the netwpork for the exchange number method directly in then CPU COM communication and the CPU USB communication, code (85H) of the A4UCPU corresponding is returned.

3.10 mdControl (remote RUN/STOP/PAUSE)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function performs a remote RUN, STOP, or PAUSE.

(2) Format

VB : ret% = mdControl (path&, stno%, buf%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	buf	Specified code	IN

VC++ : ret = mdControl (path, stno, buf);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	buf;	Specified code	IN

(3) Explanation

- This function performs a remote RUN/STOP/PAUSE over the programmable controller CPU.
- The specified codes are as follows:

Instruction	Specified code
Remote RUN	0
Remote STOP	1
Remote PAUSE	2

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- When the access target CPU is any of the FX series other than the FX2N and FX2NC, you cannot use the mdControl function.
- In any of the following cases, an error is returned since remote PAUSE is not supported.
  - Ethernet communication
  - Computer link communication
  - The access target is any of the FX2N series, FX2NC series and Ladder Logic Test Tool (LLT).
- When TCP/IP is used for protocol, the mdControl function for E71 causes an error because remote run/stop to the local station is not supported.
- There are the following restrictions when the mdControl function is used via the MELSECNET/10 for computer link connection.
  1) When the C24 is used, an error is returned. (40H, 41 H)
  2) When the UC24 is used, an error is returned if any of the following CPUs is used as either the connection station CPU or the relay target CPU. (40 H, 41 H)
  AnNCPU, AnACPU, QnACPU, A171SHCPU, A172SHCPU (for CPU other than AnUCPU equivalent)

3.11 mdInit (PLC device address table refreshing)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function refreshes the PLC device address table.

(2) Format

VB : ret% = mdInit (path&)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN

VC++ : ret = mdInit (path);

short	ret;	Returned value	OUT
long	path;	Channel path	IN

(3) Explanation

This function refreshes the PLC device address table (MELSEC data link library internal data).

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

3.12 mdBdRst (local board reset)

MNET/10	CC-Link	CPU
○	○	×

(1) Function

This function resets the local board.

(2) Format

VB : ret% = mdBdRst(path&)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN

VC++ : ret = mdBdRst(path);

short	ret;	Returned value	OUT
long	path;	Channel path	IN

(3) Explanation

A local board is reset, and then data is read out from the register and set in the board again.

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- To any other application program that was accessing a remote station through the board reset, the function returns the board reset error code (9922 H).
- The MELSECNET/10 or CC-Link driver releases the SEND data transmitted from a remote station, then clears the buffer.
- After being reset and until a mode is set, the local board is disconnected from data links with networks.
  The CPU board is put in a STOP status after its own CPU is reset.

3.13 mdBdModSet (local board mode set)

MNET/10	CC-Link	CPU
○	○	×

(1) Function

This function sets a mode for the local board.

(2) Format

VB : ret% = mdBdModSet (path&, mode%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	mode	Mode	IN

VC++: ret = mdBdModSet (path, mode);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	mode;	Mode	IN

(3) Explanation

This function resets and then sets a mode for the local board.

(a) Mode:

MELSECNET/10	CC-Link
• Link mode 0: on-line (with automatic return) 2: off-line 3: forward loop test 4: reverse loop test 5: station-to-station test (master stations) 6: station-to-station test (slave stations) 7: self-loopback test 8: self-loopback test (internal) 9: hardware test	• Link mode 0: on-line (with automatic return) 2: off-line 3: Data link test 4: Remote station test 5: Setting parameter check mode 6: Single module H/W operation check 7: Setting not possible

(4) Returned value

Upon normal termination : The function returns 0.

Upon abnormal termination: The function returns a value other than 0. (See Chapter 5.)

(5) Related function

mdBdModRead( )

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.14 mdBdModRead (local board mode read)

MNET/10	CC-Link	CPU
○	○	×

(1) Function

This function reads the mode set to the local board.

(2) Format

VB : ret% = mdBdModRead (path&, mode%)

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	mode	Mode	OUT

VC++ : ret = mdBdModRead (path, mode);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	*mode;	Mode	OUT

(3) Explanation

This function reads the registry to find out the mode set to the local board.

(a) Mode:

MELSECNET/10	CC-Link
• Link mode 0: on-line (with automatic return) 2: off-line 3: forward loop test 4: reverse loop test 5: station-to-station test (master stations) 6: station-to-station test (slave stations) 7: self-loopback test 8: self-loopback test (internal) 9: hardware test	• Link mode 0: on-line (with automatic return) 2: off-line 3: Data link test 4: Remote station test 5: Setting parameter check mode 6: Single module H/W operation check 7: Setting not possible

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0. (See Chapter 5.)

(5) Related function

mdBdModSet( )

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.15 mdBdLedRead (local board LED read)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function reads the states of the LEDs on the local board.

(2) Format

VB : ret% = mdBdLedRead (path&, buf%(0))

Integer	ret	Returned value	OUT
Long	path	Open line pointer	IN
Integer	buf(n)	Data read	OUT

VC++ : ret = mdBdLedRead (path, buf);

short	ret;	Returned value	OUT
long	path;	Open line pointer	IN
short	buf[ ];	Data read	OUT

(3) Explanation

This function reads the states (lit/unlit) of the LEDs on the local board.

(a) MELSECNET/10 board

	Bit	Description	Remark
buf[0]	0	UNDER RUN forward loop	Lit: 0 Unlit: 1
	1	DATA forward loop	
	2	TIME forward loop	
	3	ABORT.IN-FR forward loop	
	4	OVER RUN forward loop	
	5	CRC forward loop	
	6	PRM error	
	7	M/S error	
	8	UNDER RUN reverse loop	
	9	DATA reverse loop	
	10	TIME reverse loop	
	11	ABORT.IN-FR reverse loop	
	12	OVER RUN reverse loop	
	13	CRC reverse loop	
	14	F.LOOP	
	15	R.LOOP	
buf[1]	0	T.PASS	Lit: 0 Unlit: 1
	1	D.LINK	
	2	S.MNG	
	3	MNG	
	4	SW error	
	5	DUAL	
	6	REMORT	
	7	PC	
	8	Disconnection in forward loop detected	
	9	Forward loop forcible error detected	
	10	Forward loop luminous energy alarm signal	
	11	Always 1	
	12	Disconnection in reverse loop detected	
	13	Reverse loop forced error detected	
	14	Reverse loop luminous energy alarm signal	
	15	Always 1	
buf[2]		Board operation status	Board abnormal: 0 Board operating: 1

(b) CC-Link board

	Bit	Description	Remark
buf[0]	0	RUN (Module normal run/error)	Lit: 1 Unlit: 0
	8	ERR (Communication error)	
buf[1]	0	CPU R/W (During communication)	
	8	SW (Switch setting error)	
buf[2]	0	M/S (Master station duplicate error)	
	8	PRM (Parameter error)	
buf[3]	0	TIME (Time over)	
	8	LINE (Cable disconnection error)	
buf[4]	0	L.RUN (During data link)	
	8	L.ERR (Data link error)	
buf[5]	0	SD (During data transmission)	
	8	RD (During data reception)	

(c) CPU board

		Description	Remark
buf[0]	00H	ERR LED status	Off: 0, On: 1, Flicker: 2
	01H	RUN LED status	
buf[1]	02H 03H	Indicator LED characters (First and second characters from left)	(Example) For "OPERATION ERROR", 'O"P"E"R"A"T"I"O"N" "E"R"R"O"R'NULL Data of less than 16 characters is saved as-is.
buf[2]	04H 05H	Indicator LED characters (Third and fourth characters from left)	
⋮	⋮	⋮	
buf[7]	0EH 0FH	Indicator LED characters (13th and 14th characters from left)	
buf[8]	10H 11H	Indicator LED characters (15th and 16th characters from left)	

(4) Returned value

Upon normal termination : The function returns 0.

Upon abnormal termination: The function returns a value other than 0. (See Chapter 5.)

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.16 mdBdSwRead (local board switch read)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function reads the states of switches on the local board.

(2) Format

```
VB : ret% = mdBdSwRead (path&, buf%(0))
      Integer  ret      Returned value                      OUT
      Long     path     Channel path                         IN
      Integer  buf(n)   Data read                           OUT

VC++ : ret = mdBdSwRead (path, buf);
      short    ret;     Returned value                      OUT
      long     path;    Channel path                         IN
      short    buf[ ];  Data read                           OUT
```

(3) Explanation

This function gives the information on the following by reading the states of switches on the local board: station number, board number, board identification, and I/O address.

(a) MELSECNET/10 and CC-Link card

	Switch values	Range	
		MELSECNET/10	CC-Link
buf[0]	Value set to station number switch	1 to 64	
buf[1]	Value set to group number switch	0 to 9	Fixed to 0
buf[2]	Value set to network number switch	1 to 239	Fixed to 0
buf[3]	Value set to board number switch	∗1	Fixed to 0
buf[4]	Value set to board identification switch	0 to 7	Fixed to 0
buf[5]	Value set to I/O address switch	Personal Computer ∗2	Fixed to 0

∗1 Value of upper two digits in 2-port address
e.g. “C8H” for C8000H

∗2 Value of I/O port address

(b) CPU board

	Bit	Description	Remarks
buf[0]	0	Latch Clear switch	OFF : 0 ON : 1
	1	Reserved	
	2	RUN switch	
	3	STOP switch	
	4	Reserved	
	5	Reset switch	
	6	Memory cassette ROM/RAM designation switch	
	7	WRP1 switch (0 to 16k bytes)	Not write protected : 0 Write protected : 1
	8	WRP2 switch (16 to 32k bytes)	
	9	WRP3 switch (32 to 48k bytes)	
	10	WRP4 switch (48 to 64k bytes)	
	11	WRP5 switch (64 to 80k bytes)	
	12	WRP6 switch (80 to 96k bytes)	
	13	WRP7 switch (96 to 112k bytes)	
	14	WRP8 switch (112 to 144k bytes)	
	15	WRP9 switch (144 to 448k bytes)	
buf[1]	0	Display reset switch	OFF : 0, ON : 1
	1 to 15	Unused	

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.17 mdBdVerRead (local board version read)

MNET/10	CC-Link	CPU
○	○	○

(1) Function

This function reads information on the version of the local board.

(2) Format

VB : ret% = mdBdVerRead (path&, buf%(0))

Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	buf(n)	Data read	OUT

VC++ : ret = mdBdVerRead (path, buf);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	buf[ ];	Data read	OUT

(3) Explanation

This function reads information on the version of the local board.

Data read	Description	Details		
		MELSECNET/10	CC-Link	CPU
00H	Password	Fixed to S or G		
01H	Check sum	Total from 04H to 1FH		
02H	Software version	'A' to 'ZZ'		
03H to 05H	Date (year, month, day)	(Example) July 10, 1998 → '9' '8' '0' '7' '1' '0'		0000H fixed
06H, 07H	Reserved area (4 bytes)	—		0000H fixed
08H to 0FH	Software type (16 bytes)	"J71QLP23" "J71QBR13"	"J61BT13"	0000H fixed
10H to 17H	Hardware type (16 bytes)	"A70BD-J71QLP23" "A70BD-J71QBR13"	"A80BD-J61BT13"	"A80BD-A2USH-S1"
18H	2-port memories occupied size	1000H (4K) bytes	4000H (16K) bytes	0000H fixed
19H	2-port attribute	0080H fixed ＊1		0000H fixed
1AH	Available offset	0000H fixed		
1BH to 1FH	Hardware classification (10-bytes)	Personal computer: "A70BD", "A80BD"		0000H fixed

＊1 0080H: complete 2-port type

(4) Returned value

Upon normal termination : The function returns 0.

Upon abnormal termination: The function returns a value other than 0. (See Chapter 5.)

POINT

If the communication driver returns an error code, the function returns that error code as is.

3.18 mdSend (SEND function)

MNET/10	CC-Link	CPU
○	×	×

(1) Function

This function is used to send data.

(2) Format

VB : ret% = mdSend (path&, stno%, devtyp%, devno%, size%, data%(0))

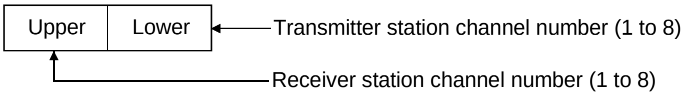
Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Channel number	IN
Integer	size	Size (1 to 960 bytes) of the data sent	IN/OUT
Any	data(n)	Data written (single precision integer array)	IN

VC++ : ret = mdSend (path, stno, devtyp, devno, size, data);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Channel number	IN
short	*size;	Size (1 to 960 bytes) of the data sent	IN/OUT
short	data[ ];	Data written (single precision integer array)	IN

(3) Explanation

- This function supports the RECV instruction, an exclusive instruction for the QnA MELSECNET/10 network system.
- As the device type, specify 101 for “arrival acknowledgement required” or 102 for “arrival acknowledgement not required”.
- Specify the channel number as follows.


Upper
Lower
Transmitter station channel number (1 to 8)
Receiver station channel number (1 to 8)

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related functions

mdOpen( ), mdClose( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- An error will occur if a transmission is instructed specifying a channel currently in use.
- The size (number of bytes) of the data sent should be an even number.

3.19 mdReceive (RECV function)

MNET/10	CC-Link	CPU
○	×	×

(1) Function

This function is used to receive data.

(2) Format

VB : ret% = mdReceive (path&, stno%, devtyp%, devno%, size%, data%(0))

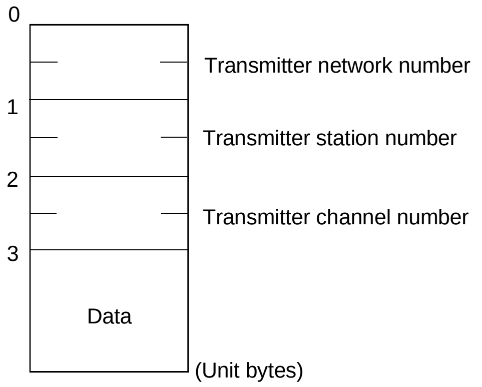
Integer	ret	Returned value	OUT
Long	path	Channel path	IN
Integer	stno	Station number (See Section 2.4.)	IN
Integer	devtyp	Device type	IN
Integer	devno	Channel number	IN
Integer	size	Size (bytes) of the data received	IN/OUT
Any	data(n)	Data received (single precision integer array)	OUT

VC++ : ret = mdReceive (path, stno, devtyp, size, data);

short	ret;	Returned value	OUT
long	path;	Channel path	IN
short	stno;	Station number (See Section 2.4.)	IN
short	devtyp;	Device type	IN
short	devno;	Channel number	IN
short	*size;	Size (bytes) of the data received	IN/OUT
short	data[ ];	Data received (single precision integer array)	OUT

(3) Explanation

- This function supports the RECV instruction, an exclusive instruction for the QnA MELSECNET/10 network system.
- Specify 101 as the device type.
- Specify FFh as the station number.
- Specify the channel number as follows.
  number for the channel used for receiving data (1 to 8)
- The data received is stored in the receiving buffer as follows.


0
1
2
3
Transmitter network number
Transmitter station number
Transmitter channel number
Data
(Unit bytes)

(4) Returned value

Upon normal termination : The function returns 0.
Upon abnormal termination: The function returns a value other than 0.
(See Chapter 5.)

(5) Related functions

mdOpen( ), mdClose( )

POINTS

- If the communication driver returns an error code, the function returns that error code as is.
- Up to 128 pieces of received data can be stored [the total for all receiving channels (No.1 to 8)].
  Any further data cannot be recorded in the receive data buffer.

MEMO

4. SAMPLE PROGRAM

This chapter provides sample programs in the VB and VC+ +.

4.1 Visual Basic Sample Program

This is a sample program to read the data register (D) of PLC CPU through a computer link channel.
This sample program was created using Visual Basic 4.0 (32-bit version).

(1) How to use

When a form is loaded, mdOpen is implemented through the computer link channel.
When you click the "Read Test" button on the display, mdReceive executes, and when it succeeds in a readout, the readout data is indicated in the Read Data indication column.
When the "End" button is clicked, mdClose executes to close the test program.
If an error occurs when a function is executed, an error message with an error code is indicated.
Eliminate the error cause, consulting Chapter 5.
If an error occurs when the "Read Test" button is clicked, clear the Read Data indication column.
Before executing this test program, assign the information to the logic code 0 using the computer link utility (See CSKP Operating Manual).
In addition, carry out testing after confirming that the communication is in a normal condition.

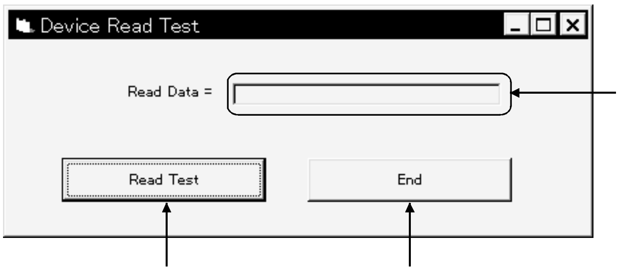
(2) Listing of sample files

Sample files are installed in the following folders by default:

C:\MELSEC\COMMON\SAMPLE\VB\DemoPro. vbp	Project file
C:\MELSEC\COMMON\SAMPLE\VB\Demo. frm	Source file
C:\MELSEC\COMMON\SAMPLE\VB\Mdfunc. bas	Header file

In addition, when an Ethernet channel is used, a sample file of the ladder program for the sequencer CPU for mounting an Ethernet unit is installed below the C:\MELSEC\COMMON\SAMPLE\GPP\ folder.
(For further details, see Ethernet Unit Manual)

(3) Screen



Readout data is indicated in this area.

Readout execution button

Closing button

(4) Program

```
' '**********************************************************************
'          MELSEC Communication Function Test Program
'**********************************************************************

'Definition
'** you replace the comment for computer link and
'** use the comment for other communications.
'** You change the logical station number.
'** This program reads the data for device type D0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'Computer link(COM1)
Const CHAN_UC24QC24 = 31          'channel number for Computer link(COM1)
Const MODE_DUMMY = -1             'mode(dummy) (select -1)
Const STNO_LOGIC = 0              'logical station number(0)
Const DEVTYPE_D = 13              'device name (D)
Const DEVNO_0 = 0                 'device number
Const SIZE_2_BYTES = 2            '2 bytes

'** If you want to test the program for Ethernet Communication,
'** you replace the comment for Ethernet Communication and
'** use the comment for other communications.
'** You change the logical station number.
'** This program reads the data for device type D0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'Ethernet Communication
'Const CHAN_ETHERNET = 61         'channel number for Ethernet Communication
'Const MODE_DUMMY = -1            'mode(dummy) (select -1)
'Const STNO_LOGIC = 0             'logical station number(0)
'Const DEVTYPE_D = 13             'device name (D)
'Const DEVNO_0 = 0                'device number
'Const SIZE_2_BYTES = 2           '2 bytes

'** If you want to test the program for PLC COM Communication,
'** you replace the comment for PLC COM Communication and
'** use the comment for other communications.
'** You change the network number and the station number.
'** This program reads the data for device type D0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'PLC COM Communication(COM1)
'Const CHAN_CPUCOM = 41           'channel number for PLC COM Communication
'Const MODE_DUMMY = -1            'mode(dummy) (select -1)
'Const STNO_SELFSTATION = 255 'local station number(network number and staton number,or stationnumber)
'Const DEVTYPE_D = 13             'device name (D)
'Const DEVNO_0 = 0                'device number
'Const SIZE_2_BYTES = 2           '2 bytes

'** If you want to test the program for MELSECNET(ll) Communication,
'** you replace the comment for MELSECNET(ll) Communication and
'** use the comment for other communications.
'** You change the station number.
'** This program reads the data for device type W0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'MELSECNET(ll) Communication
'Const CHAN_MNET2 = 21            'channel number for MELSECNET(ll) Communication
'Const MODE_DUMMY = -1            'mode(dummy) (select -1)
'Const STNO_SELFSTATION = 255 'local station number
'Const DEVTYPE_W = 24             'device name (W)
```

```
'Const DEVNO_0 = 0                'device number
'Const SIZE_2_BYTES = 2           '2 bytes

'** If you want to test the program for MELSECNET/10 Communication,
'** you replace the comment for MELSECNET/10 Communication and
'** use the comment for other communications.
'** You change the network number and the station number.
'** This program reads the data for device type W0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'MELSECNET/10 Communication
'Const CHAN_MNET10 = 51           'channel number for MELSECNET/10 Communication
'Const MODE_DUMMY = -1            'mode(dummy) (select -1)
'Const STNO_SELFSTATION = 255 'local station number(network number and staton number)
'Const DEVTYPE_W = 24             'device name (W)
'Const DEVNO_0 = 0                'device number
'Const SIZE_2_BYTES = 2           '2 bytes

'** If you want to test the program for Shared device Communication,
'** you replace the comment for Shared device Communication and
'** use the comment for other communications.
'** You change the network number and the station number.
'** This program reads the data for device type ED0.
'** If you want to execute read for other device,
'** prease refer the programing manual and change the device name,device number.
'Shared device Communication
'Const CHAN_EMED = 9              'channel number for Shared device Communication
'Const MODE_DUMMY = -1            'mode(dummy) (select -1)
'Const STNO_SELFSTATION = 255 'local station number(network number and staton number,or stationnumber)
'Const DEVTYPE_ED = 32000         'device name (ED0)
'Const DEVNO_0 = 0                'device number
'Const SIZE_2_BYTES = 2           '2 bytew

'common parameter
Dim Path As Long                  'opend loop path pointer
Dim Buf(128) As Integer           'read dat (single precision)

Private Sub EndBtn_Click()
  'local parameter
  Dim Ret As Integer              'returan value

  'close the channel
  Ret = mdClose(Path)
  If (Ret <> 0) Then
    MsgBox "Channel Close Error : " & "Error Code = " & Ret
  End If
  End

End Sub

Private Sub Form_Load()
  'local parameter
  Dim Chan As Integer             'channel number
  Dim Mode As Integer             'mode
  Dim Ret As Integer              'return value

  'open the chanel
  '** open the computer link,
  '** If you want to execute open for other communicaton,
  '** prease change the channel number.
  Chan = CHAN_UC24QC24
  Mode = MODE_DUMMY
```

```
    Ret = mdOpen(Chan, Mode, Path)
    If (Ret <> 0) And (Ret <> 66) Then
        MsgBox "Channel Open Error : " & "Error Code = " & Ret
        End
    End If

End Sub


Private Sub ReadBtn_Click()
    'local parameter
    Dim Stno As Integer                'station number
    Dim Devtyp As Integer              'device name
    Dim Devno As Integer               'device number
    Dim size As Integer                'date size (bytes)
    Dim Ret As Integer                 'returan value

    'read the chanel
    Stno = STNO_LOGIC
    Devtyp = DEVTYPE_D
    Devno = DEVNO_0
    size = SIZE_2_BYTES

    Ret = mdReceive(Path, Stno, Devtyp, Devno, size, Buf(0))
    If Ret = 0 Then
        'show data
        RdDat.Caption = Buf(0)
    Else
        MsgBox "Read Error : " & "Error Code = " & Ret
        'clear
        RdDat.Caption = " "
    End If

End Sub
```

(5) In case it is used through other channels

Change to the channel and the information on the device for testing the constant-declaration area, and execute after changing an argument value to a function in the program.

4.2 Visual C++ Sample Program

This sample program is capable of reading the data register of PLC CPU in an Ethernet channel.

(1) How to use

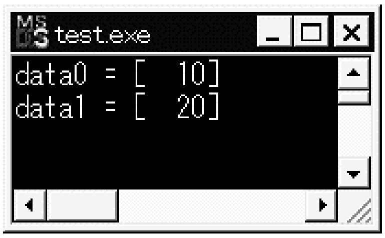
This sample program operates by creating the execution module with VC++.
When the program is executed, it implements mdOpen through the Ethernet channel.
After that, the program is implemented, and the readout data is indicated in the screen if the readout is successful.
Then, mdClose executes to close the program.
If an error occurs when a function is implemented, an error message with an error code is indicated.
Eliminate the error cause, consulting Chapter 5.
Before executing this test program, assign information to the logical station number 0 with the Ethernet utility (refer to the CSKP Operating Manual).
Also, confirm in advance that communication condition is normal.

(2) Listing of sample files

Sample files are installed in the following folder by default:
C:\MELSEC\COMMON\SAMPLE\VC\SmpE71.C   Source file
In addition, when an Ethernet channel is used, a sample file of the ladder program forthe sequencer CPU for mounting an Ethernet unit is installed below the C:\MELSEC\COMMON\SAMPLE\VB\GPP\ folder.
(For further details, see Ethernet Unit Manual)

(3) Screen

A sample output is indicated when a sample program is implemented.
Readout data is indicated as shown in the following screen.



```
data0 = [   10]
data1 = [   20]
```

(4) Program

```
/*****************************************************************
* MELSEC Communication Function Test Program       *
* <FileName>SmpE71.c                               *
*                                                  *
* This program is sample for Ethernet communication.  *
*                                                  *
*****************************************************************/

/********************************************
*           Include                         *
********************************************/
#include <stdio.h>
#include <windows.h>                          /* Windows                        */
#include "mdfunc.h"                           /* MELSEC Data Link Library       */

/********************************************
*           Definition                      *
********************************************/
#define        CHSN_ETHERNET        61        /* channel number for Ethernet communication */
#define        MODE_DUMMY           -1        /* mode(dummy) (select -1) */
#define        STNO_ROGIC           0         /* logical station number    */
#define        DEVTYPE_D            13        /* device name (D)                */
#define        DEVNO_0              0         /* device number             */
#define        SIZE_R_BYTES   4               /* bytes for read data            */
#define        DATA_INITIAL   0               /* initial data for read eria*/


/****************************************************************************
* You can read PLC data that logical station number is 0.            *
* You have to set the logical station number.                        *
* The logical station number should be set in the Ethernet Utility. *
****************************************************************************/
void main()
{
        /* mdopen parameter        */
        long    path;                         /* opened loop path pointer                          */
        short   chan;                         /* channel number for selected communication         */
        short   mode;                         /* mode (dummy) (select -1)                          */
        short   oret;                         /* return value      from function of mdopen         */

        /* mdreceive parameter     */
        short   stno;                         /* station number                                    */
        short   devtyp;                       /* device name                                       */
        short   devno;                        /* device number                                     */
        short   size;                         /* data size (bytes)                                 */
        short   data[2];                      /* read data (single precision)                      */
        short   rret;                         /* return value      from function for mdreceive     */

        /* mdclose parameter       */
        short   cret;                         /* return value      from function for mdclose       */
```

```
    /* set mdopen parameter     */
    chan    = CHSN_ETHERNET;                /* channel number foor Ethernet communication       */
    mode    = MODE_DUMMY;                   /* mode (dummy)                                     */
    /* open the channel         */
    oret = mdOpen( chan, mode, &path );
    if( oret != 0 ){
        /* In case of error, it responds the error.         */
        printf( "mdopen error[%04x]\n", oret );
    }else{

        /* In case of success, it resumes next.             */
        /* set mdreceive parameter                          */
        stno    = STNO_ROGIC;               /* logical station number                           */
        devtyp  = DEVTYPE_D;                /* device name (D)                                  */
        devno   = DEVNO_0;                  /* device number 0 and 1                            */
        size    = SIZE_R_BYTES;             /* 4 bytes                                          */
        data[0] = DATA_INITIAL;             /* Initialize                                       */
        data[1] = DATA_INITIAL;             /* Initialize                                       */
        /* It reads the data for selected device type.                                          */
        rret = mdreceive( path, stno, devtyp, devno, &size, &data );
        if( rret != 0 ){
            /* In case of error, it responds the error.*/
            printf( "mdreceive error[%04x]\n", rret );
        }else{
            /* show data that is received from PLC*/
            printf( "data0 [%4x]\n", data[0] );     /* show data No.1 */
            printf( "data1 [%4x]\n", data[1] );     /* show data No.2 */
        }

        /* open the channel*/
        cret = mdclose( path );
        if( cret != 0 ){
            /* In case of error, it responds the error.*/
            printf( "mdclose error[%04x]\n", cret );
        }
    }
}
```

(5) In case it is used through other channels

Change to the channel and the information on the device for testing the constant-declaration area, and execute after changing an argument value to a function in the program.

MEMO

5. ERROR CODES

This chapter summarizes the error codes issued when the MELSEC Data Link Library is used.

POINT

(1) When the return code issued is not listed in the following table, refer to the error code list included in the CPU, module or interface (I/F) board manual.

(2) The processes for the error codes may differ according to the system (PLC CPU, unit) settings.
Select the correct process for the error code that matches the system settings from the processes shown below.
Note that if the process for the error code is inappropriate, the entire system could malfunction.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
1	Driver not started Driver not started yet. Interrupt number or I/O address identical to that in the other card.	Correct the error at the start of driver. Check the settings on the card.
2	Board reply error Time-out in waiting for a replay to be made for processing.	Check whether the board has been mounted firmly. Check whether the destination (for communication) has been set correctly with the utility.
65 (41H)	Channel error The specified channel number has not been registered yet.	Specify a correct channel number.
66 (42H)	OPEN error A specified channel has already been opened.	Open the channel only once.
67 (43H)	CLOSE error A specified channel has already been closed.	Close the channel only once.
68 (44H)	PATH error A line has not been opened yet for a specified path.	Specify a number used in opening the path.
69 (45H)	Processing code error A processing code not supported has been issued.	Use a processing code supported.
70 (46H)	Station number specification error A specified station number is not correct. A processing request for a remote station has been made for a local station or a station number is for the local station (0xFF) but the network number is not 0.	Correct the station number of an application program.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
71 (47H)	Received data error (at RECV request) Data has not been received yet.	Wait for data reception.
72 (48H)	Mode setting wait No mode has been set yet.	Set the mode.
73 (49H)	Mode error A request has been issued to a remote station even though the set mode is not ON-LINE.	Set the mode to ON-LINE or cancel the request.
	Interrupt number error An interrupt number is the same as that of the other board.	Check the settings for the board.
	I/O address error An I/O address is the same as that of the other board.	
77 (4DH)	Memory reservation error Memory cannot be reserved.	Because the cause may be memory shortage, close other applications. Check that the system is operating normally. Restart the system.
78 (4EH)	Mode setting time-out error Though mode setting has been attempted, the mode could not be set for time-out.	Check if 2-port memory is used by the other board, and then restart the system. When the same error recurs, a hardware (H/W) error is assumed.
80 (50H)	Failed to map a shared memory address	Check whether a shared memory address is the same as that of the other board.
85 (55H)	Channel number error (at RECV request) Channel number error Alternatively, the Ethernet module has been set to online change disable.	Check a channel number when a RECV request has been issued. Alternatively, check to see if the DIP switch of the connected Ethernet module is set to online change disable or not.
100 (64H)	A local station board is being accessed. An access request has been issue for a local station being accessed.	Retry.
101 (65H)	Routing parameter error No routing parameter has been specified.	Correct the routing parameter.
102 (66H)	Data transmission error Data transmission failed.	Retry. Confirm that the system is operating normally. Restart the system.
103 (67H)	Data reception error Data reception failed.	
128 (80H)	Read byte error The specified number of bytes to be read is not within a range.	Specify the number of bytes within a range.
129 (81H)	Device type error The specified device type is invalid.	Check the device type.
130 (82H)	Device number error A specified device number is not within a range. A device number is not a multiple of 8 when a bit device is specified.	Check the device number.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
131 (83H)	Device count error A specified count is not within a device range. A count is not a multiple of 8 when a bit device is specified.	Check the size.
132 (84H)	Write byte error The specified number of bytes to be written is not within a range.	Specify the number of bytes within a range.
133 (85H)	Link parameter error The link parameter has been damaged. The total number of substations specified in the link parameter has been reset to 0.	Specify the link parameter again.
135 (87H)	Remote RUN/STOP/PAUSE specification error A specified RUN, STOP or PAUSE value is not a value from 0 to 2.	Specify a value from 0 to 2.
136 (88H)	Random write specification error A specified random write value is not a value from 0 to 2.	
137 (89H)	Processing cancelled The next processing request has been issued before the preceding processing is complete.	Terminate the preceding processing, then make a request again.
210 (D2H)	Disabled in the RUN state A sequence P shift request has been issued in the RUN state.	Stop the CPU, then make a request again.
212 (D4H)	Processing cancelled A new request has been issued in the RUN state.	Review the request.
215 (D7H)	Received data length error The received data length or received byte length is not within a range.	Retry. Check the cable.
	Request data buffer length over The length of requested data exceeded a request data area.	Reduce the request data size.
216 (D8H)	Protocol error The protocol is invalid. There is no request code.	Check the cable.
217 (D9H)	Address error The address is not within an access range.	Check the request data.
219 (DBH)	Write error No data can be written.	
224 (E0H)	PCNO. error There is no requested destination (station).	Correct the station number.
225 (E1H)	Processing mode error A requesting ACPU has issued a processing code that cannot be handled. (The requesting ACPU checks the processing code.)	Review the processing code of the requesting ACPU.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
226 (E2H)	Special module specification error A specified special module is not a module that can be handled.	Correct the YNO.
227 (E3H)	Other data error Data (such as request data address, leading step, number of shifts, etc.) is invalid.	Correct the request data.
228 (E4H)	Link specification error A requesting station has issued a processing code that cannot be handled. (The requesting link module checks the processing code.)	Check the requesting station number and processing code.
232 (E8H)	Remote error A keyword specified in the remote RUN/STOP/PAUSE request is not consistent.	Searches for a source that performed a remote stop/pause operation to a destination ACPU.
233 (E9H)	Link time-over A requesting station has disconnected a link during processing.	Restore the link.
234 (EAH)	Special module BUSY In general data transmission, the receive buffer of a destination is full or it is not ready for data reception.	Check the special module hardware.
236 (ECH)	Destination BUSY In general data transmission, the receive buffer of a destination is full or it is not ready for data reception.	Make a request when the destination is ready for data reception.
240 (F0H)	Link error A request has been issued to a station whose link has been disconnected.	Restore the link.
241 (F1H)	Special module bus error A specified special module is not ready for processing.	Check the special module hardware.
242 (F2H)	Special module time-over A specified special module does not reply.	Check the special module hardware.
1280 (500H)	Local memory access error in the local board	Check the switch settings on the local board, and then change the memory address to an address range (area) which is not influenced by the other board. When 8-bit memory access has been set, change it to 16-bit memory access.
1281 (501H)	I/O card access disabled	Check the I/O port address. Conduct the self loop-back test of the card to check the hardware.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
4110 (100EH)	DLL non-load error	Recheck the whole system configuration. Exit the program and restart the PC. Setup the package again. Consult with the dealer regarding the problem.
8204 (200CH)	Request cancel	
8205 (200DH)	Drive name error	
8206 (200EH)	First step error	
8207 (200FH)	Parameter type error	
8208 (2010H)	File name error	
8209 (2011H)	Registering/release/set status error	
8210 (2012H)	Detailed condition division error	
8211 (2013H)	Step condition error	
8212 (2014H)	Bit device condition error	
8213 (2015H)	Parameter setting error	
8215 (2017H)	Keyword error	
8216 (2018H)	Read/write flag error	
8217 (2019H)	Refresh method error	
8218 (201AH)	Buffer access method error	
8219 (201BH)	Start mode/stop mode error	
8220 (201CH)	Written clock data error	
8221 (201DH)	Online data write error	
8223 (201FH)	Trace time error	
8224 (2020H)	First I/O number error	
8225 (2021H)	First address error	
8226 (2022H)	Pattern error	

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
8227 (2023H)	SFC block number error	Recheck the whole system configuration. Exit the program and restart the PC. Setup the package again. Consult with the dealer regarding the problem.
8228 (2024H)	SFC step number error	
8229 (2025H)	Step number error	
8230 (2026H)	Data error	
8231 (2027H)	System data error	
8232 (2028H)	TC set value number error	
8233 (2029H)	Clear mode error	
8234 (202AH)	Signal flow error	
8235 (202BH)	Version administration error	
8236 (202CH)	Module has been registered	
8237 (202DH)	PI type error	
8238 (202EH)	PI No error	
8239 (202FH)	PI number error	
8240 (2030H)	Shift error	
8241 (2031H)	File type error	
8242 (2032H)	Specified module error	
8243 (2033H)	Error check flag error	
8244 (2034H)	Step RUN-operation error	
8245 (2035H)	Step RUN data error	
8246 (2036H)	Step RUN-time error	
8247 (2037H)	Program RUN inside writing error to E^{2}ROM	
8248 (2038H)	Clock data read/write error	

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
8249 (2039H)	Trace non-completion	Recheck the whole system configuration. Exit the program and restart the PC. Setup the package again. Consult with the dealer regarding the problem.
8250 (203AH)	Registration clearness flag error	
8251 (203BH)	Operation error	
8252 (203CH)	The number of station error	
8253 (203DH)	The number of repeat error	
8254 (203EH)	The acquisition data selection error	
8255 (203FH)	The number of SFC cycle error	
8258 (2042H)	The scheduled time setting error	
8259 (2043H)	Function count error	
8260 (2044H)	System information error	
8262 (2046H)	Function number error	
8263 (2047H)	RAM operation error	
8264 (2048H)	Boot former ROM forwarding failure	
8265 (2049H)	Boot former transfer mode specification error	
8266 (204AH)	Not enough memory	
8267 (204BH)	Backup drive (former boot drive) ROM error	
8268 (204CH)	Block size error	
8269 (204DH)	RUN-time detaching error	
8270 (204EH)	Module has already registered	
8271 (204FH)	Password registration data full error	
8272 (2050H)	Password unregistration error	
8273 (2051H)	Remote password error	

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
8274 (2052H)	IP address error	Recheck the whole system configuration. Exit the program and restart the PC. Setup the package again. Consult with the dealer regarding the problem.
8275 (2053H)	Error (argument when requesting) outside time-out value range	
8276 (2054H)	Instruction cast undetection	
8277 (2055H)	Trace execution type error	
8278 (2056H)	Version error	
16432 (4030H)	The specified device type does not exist.	Check the specified device type.
16433 (4031H)	A specified device number is not within a range.	Check the specified device number.
16448 (4040H)	A specified module does not exist.	Don't issue an error request to a specified special module.
16449 (4041H)	The number of device points is not within a range.	Check the leading address and number of access points for access within a range.
16450 (4042H)	A target module has a fault.	Check whether the specified module is operating normally.
16451 (4043H)	A module dose not exist in the specified position.	Check the leading I/O number of a specified module.
40577 (9E81H)	Device type error A device type for a requesting station is invalid. (The requesting station checks the device type.)	Check the device type.
40578 (9E82H)	Device number error A device number specified for a requesting station is not within a range. When a bit device is specified, the device number is not a multiple of 8. (The requesting station checks the number of points.)	Check the device number.
40579 (9E83H)	Device point count error The number of device points specified for a requesting station is not within a range. When a bit device is specified, the number of device points is not a multiple of 8. (The requesting station checks the number of device points.)	Check the size.
-1 (FFFFH)	Path error A specified path is invalid. A specified communication line is down in a shared device server.	Use the path returned by the mdOpen function. When this error occurs in the shared device server, check the communication line itself.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
-2 (FFFE$_H$)	Device number error A specified device number is not within a range. When a bit device is specified, the device number is not a multiple of 8.	Check the leading device number of a specified device.
-3 (FFFD$_H$)	Device type error A specified device type is invalid.	Check whether the specified device type is included in a list of device types.
-4 (FFFC$_H$)	CPU error An invalid station has been specified.	Check the status of a communicating station. Check the specified station number.
-5 (FFFB$_H$)	Size error The total of device number and size is not within a range. Access has been attempted in odd bytes.	Check the specified size.
-6 (FFFA$_H$)	Block count error The number of blocks specified in dev[0] (for random reading or writing of devices) is not within a range.	Check the number of blocks specified in dev[0].
-8 (FFF8$_H$)	Channel number error The channel number specified in the mdOpen function is invalid.	Check the specified channel number.
-11 (FFF5$_H$)	Buffer area shortage The read area size specified in the read data storage array variable is too small.	Check the read size and read data storage size.
-12 (FFF4$_H$)	Block error A specified block number of the extended file register is invalid.	Check the extended file register block number (device type).
-13 (FFF3$_H$)	Write protect error A specified block number of the extended file register is overlapping the write-protect area of the memory cassette.	Check the extended file register block number (device type). Check the write-protect DIPswitch of the memory cassette to be accessed.
-14 (FFF2$_H$)	Memory cassette error The memory cassette on the accessed CPU has not been mounted or an invalid memory cassette has been mounted.	Check the memory cassette to be accessed.
-15 (FFF1$_H$)	Read area length error The read area size specified in the read data storage array variable is too small.	Check the read size and read data storage size.
-16 (FFF0$_H$)	Station number, network number or logical station number error. A specified station number, network number or logical station number is not set within the range, or set incorrectly.	Check the specified station number, network number or logical station number.
-17 (FFEF$_H$)	Option (all stations or group number) specification error The option "All stations" or "Group number" has been specified for a function where the option is not available.	Check whether the option "All stations" or "Group number" is available with the function.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
-18 (FFEEH)	Remote specification error A specified code is not available.	Check the specified code.
-19 (FFEDH)	SEND/RECV channel number error A channel number specified for the SEND/RECV function is not within a range.	Check the specified channel number.
-31 (FFE1H)	DLL load error The DLL necessary for function execution failed.	Set up the package again.
-32 (FFE0H)	A resource is being occupied by another task or thread, and it cannot be released within 30 seconds.	Confirm that the resource is not being occupied by the other task or thread.
-33 (FFDFH)	Access invalid error A specified destination for communication is not correct.	Check whether a correct destination for communication has been set with the utility. Check whether the destination is correct. (Refer to the CSKP Operating Manual for details.)
-34 (FFDEH)	Registry open error Registry open processing failed.	Check whether a correct destination for communication has been set with the utility.
-35 (FFDDH)	Registry read error Registry reading failed.	
-36 (FFDCH)	Registry write error Registry writing failed.	
-37 (FFDBH)	Communication initialization error Initialization for communication failed.	Retry. Because memory shortage is assumed, terminate other applications. Check whether the system is operating normally. Restart the system.
-38 (FFDAH)	Ethernet communication setting error Failed to make settings for Ethernet communication.	Retry. Check whether a correct destination for communication has been set with the utility. Because memory shortage is assumed, terminate the other applications. Check whether the system is operating normally. Restart the system.
-39 (FFD9H)	COM communication setting error Failed to make settings for COM communication.	
-41 (FFD7H)	COM control error Failed to control COM communication.	Retry. Check whether the system is operating normally. Restart the system.
-42 (FFD6H)	Close error Failed to close communication.	

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
-43 (FFD5H)	ROM operation error TO set value was written to the CPU during ROM operation.	Change the TO set value during ROM operation.
-44 (FFD4H)	LLT communication setting error Setting for making LLT communication failed.	Retry. Check the utility for correct setting of the communication target. Since memory may be insufficient, exit from the other running applications. Check whether the system is operating properly. Restart the system.
-45 (FFD3H)	Ethernet control error Proper control cannot be exercised for Ethernet communication.	Retry. Check whether the system is operating properly. Restart the system.
-46 (FFD2H)	USB open error The USB port initialization or opening failed.	Since memory may be insufficient, exit from the other running applications. Check whether the system is operating properly. Restart the system.
-47 (FFD1H)	Random read condition error Random read cannot be performed because the random read condition does not hold.	Conditioned random read setting has been made from software such as GPPW. Wait until the condition holds or clear the condition setting.
-48 (FFD0H)	TEL error.	Recheck the whole system configuration. Exit the program and restart the PC. Setup the package again. Consult with the dealer regarding the problem.
-50 (FFCEH)	Open path upper-limit over The number of open paths has exceeded the upper limit (32)	Close some paths.
-51 (FFCDH)	Exclusive control error An exclusive control error occurred	Retry. Check whether the system is operating normally.
-478 to –3839 (F101H to FE22H)	Refer to the QnA MELSECNET/10 Network System Reference Manual or MELSECNET/10 Network System Reference Manual (PC-PC network) for details.	
-2174 (F782H)	Destination station number specification error A specified station number for a destination is for a local station.	Correct the specified station number.
-24957 (9E83H)	Number of device points The specified number of device points for a destination is not within a range. When a bit device is specified, the number of bit devices is not a multiple of 8. (The destination link module checks the number of device points.)	Check the size.

Error code A value enclosed by parentheses is hexadecimal.	Error description	Action to be taken
-24958 (9E82H)	Device number error A specified device number for a destination is not within a range. When a bit device is specified, the device number is not a multiple of 8. (The destination link module checks the device number.)	Check the device number.
-24959 (9E81H)	Device type error The device type specified for a destination is invalid. (The destination link module checks the device type.)	Check the device type.
-25056 (9E20H)	Processing code error A specified processing code cannot be handled by a request processing station. (The destination checks the processing code.)	Check the destination station number and processing code.
-26333 (9923H)	ROM version of the CC-Link board is incompatible with the QCPU (Q mode).	Access the CPU that is not the QCPU (Q mode). Use the CC-Link board (ROM version "W" or later) packed with SW3DNF-CCLINK or later.
-26334 (9922H)	Board reset error A board has been reset by the other process using the same channel while the other station is being accessed.	Retry.
-26336 (9920H)	Other loop request error A routing request has been issued to the other loop.	Change the destination (to which the routing request is to be issued) to AnUCPU or QnACPU.
-28150 (920AH)	Data link disconnection error	A local station link device has been accessed while the data link is disconnected.
-28156 (9204H)	2-port memory handshake error	Remove the other option board(s).
-28158 (9202H)	WDT error	Reset the board. Restart the personal computer.

MEMO

Type SW3D5F-CSKP-E Basic Communication Support Tool Programming Manual

MODEL	SW3D5F-CSKP-E-P-E
MODEL CODE	1LMS51
IB(NA)-0800015-G(0312)MEE	

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : 1-8-12, OFFICE TOWER Z 14F HARUMI CHUO-KU 104-6212,JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.