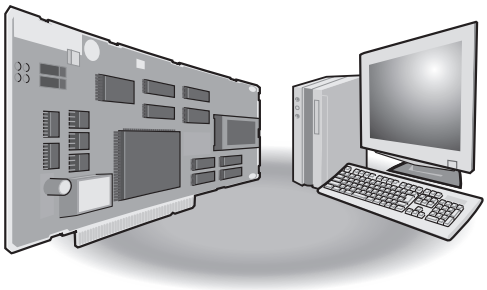
MITSUBISHI ELECTRIC

Mitsubishi PC Interface Board

MELSEC

MELSEC Data Link Library Reference Manual

-Q80BD-J61BT11N
-Q81BD-J61BT11
-Q80BD-J71LP21-25
-Q80BD-J71LP21S-25
-Q81BD-J71LP21-25
-Q80BD-J71LP21G
-Q80BD-J71BR11
-Q80BD-J71GP21-SX
-Q80BD-J71GP21S-SX
-Q81BD-J71GP21-SX
-Q81BD-J71GP21S-SX
-Q80BD-J71GF11-T2
-Q81BD-J71GF11-T2



●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

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

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

INTRODUCTION

Thank you for purchasing the PC interface board.

This manual describes the programming procedure and function specifications of the MELSEC data link library.
Before using this product, please read this manual and the related manuals carefully and develop familiarity with the functions and performance of the MELSEC data link library to handle the product correctly.

Please make sure that the end users read this manual.

RELATED MANUALS

The following are the manuals relevant to this product.
Refer to the following tables when ordering required manuals.

(1) Related manuals of CC-Link Ver.2 board

Manual name <Manual number (model code)>	Description
Type Q80BD-J61BT11N/Q81BD-J61BT11 CC-Link System Master/Local Interface Board User's Manual (For SW1DNC-CCBD2-B) <SH-080527ENG, 13JR77>	Overview of system configuration, specifications, functions, handling, wiring, and troubleshooting for type Q80BD-J61BT11N /Q81BD-J61BT11 CC-Link system master/local interface board.
MELSEC-L CC-Link System Master/Local Module User's Manual <SH-080895ENG, 13JZ41>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for L series master/local modules.
MELSEC-Q CC-Link System Master/Local Module User's Manual <SH-080394E, 13JR64>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for Q series master/local modules.
CC-Link System Master/Local Module Type AJ61BT11/A1SJ61BT11 User's Manual <IB-66721, 13J872>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for AJ61BT11 and A1SJ61BT11.
CC-Link System Master/Local Module Type AJ61QBT11/A1SJ61QBT11 User's Manual <IB-66722, 13J873>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for AJ61QBT11 and A1SJ61QBT11.

(2) Related manuals of MELSECNET/H board

Manual name <Manual number (model code)>	Description
MELSECNET/H Interface Board User's Manual (For SW0DNC-MNETH-B) <SH-080128, 13JR24>	Overview of system configuration, specifications, functions, handling, wiring, and troubleshooting for MELSECNET/H interface boards.
Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) <SH-080049, 13JF92>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for the MELSECNET/H network system.

(3) Related manuals of CC-Link IE Controller Network board

Manual name <Manual number (model code)>	Description
CC-Link IE Controller Network Interface Board User's Manual (For SW1DNC-MNETG-B) <SH-080691ENG, 13JZ02>	Overview of system configuration, specifications, functions, handling, wiring, and troubleshooting for CC-Link IE Controller Network interface board.
MELSEC-Q CC-Link IE Controller Network Reference Manual <SH-080668ENG, 13JV16>	Overview of system configuration, performance specifications, functions, handling, wiring, and troubleshooting for CC-Link IE Controller Network.

(4) Related manuals of CC-Link IE Field Network board

Manual name <Manual number (model code)>	Description
CC-Link IE Field Network Interface Board User's Manual (For SW1DNC-CCIEF-B) <SH-080980ENG, 13JZ58>	Overview of system configuration, specifications, functions, handling, wiring, and troubleshooting for CC-Link IE Field Network interface board.
MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual <SH-080917ENG, 13JZ47>	Overview of CC-Link IE Field Network, and specifications, procedures before operation, system configuration, installation, wiring, settings, functions, programming, and troubleshooting for MELSEC-Q series CC-Link IE Field Network master/local module.
MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual <SH-080972ENG, 13JZ54>	Overview of the CC-Link IE Field Network, and specifications, procedures before operation, system configuration, installation, wiring, settings, functions, programming, and troubleshooting for MELSEC-L series CC-Link IE Field Network master/local modules.
MELSEC-L CC-Link IE Field Network Head Module User's Manual <SH-080919ENG, 13JZ48>	Overview of specifications, procedures before operation, system configuration, installation, wiring, settings, and troubleshooting for head module.
CC-Link IE Field Network Ethernet Adapter Module User's Manual <SH-080939ENG, 13JZ50>	Overview of specifications, procedures before operation, system configuration, installation, wiring, settings, and troubleshooting for Ethernet adapter module.

Remark

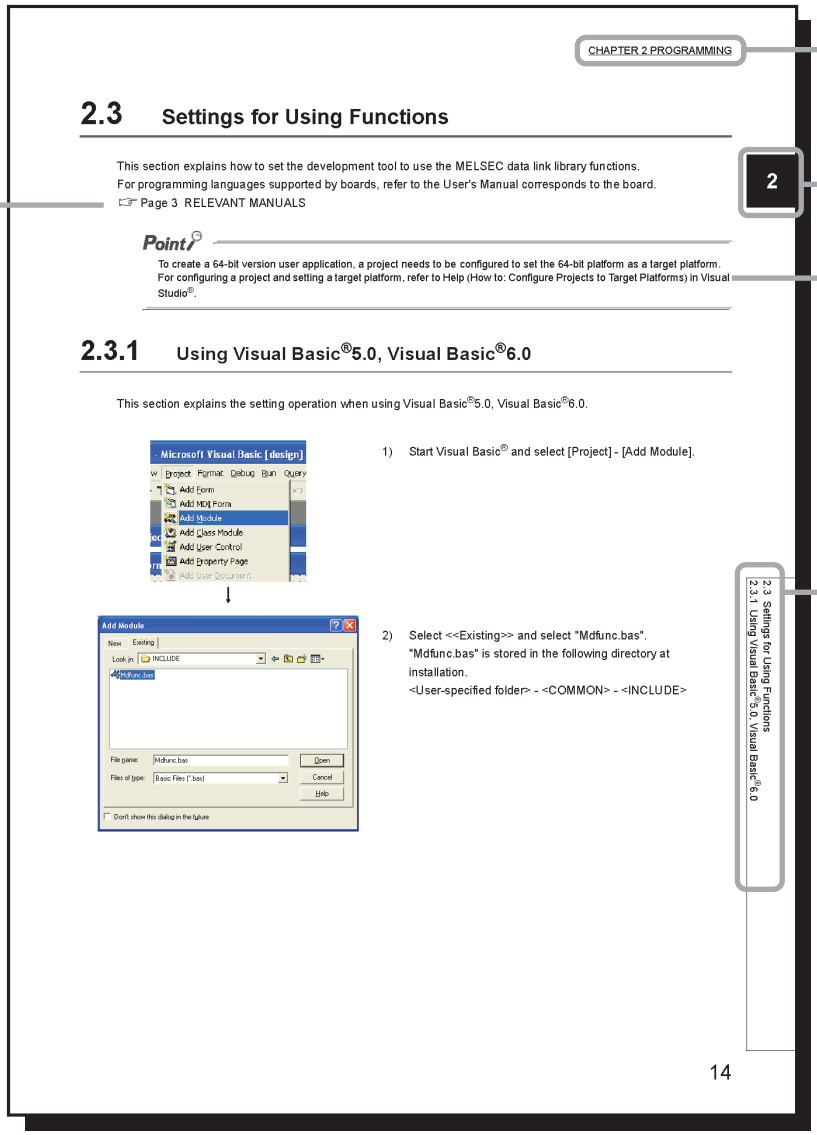
User's manuals of each type of boards are stored on the CD-ROM of the software package in a PDF file format.
Manuals in printed form are sold separately for a single purchase. Order a manual by quoting the manual number (model code) listed in the above table.

Memo

CONTENTS

HOW TO READ THIS MANUAL

In this manual, pages are organized and the symbols are used as shown below.
The following page illustration is for explanation purpose only, and the content is different from the actual page.



☞ shows reference pages.
📖 shows reference manuals.

The chapter of the current page is shown.

Point shows notes that requires attention.

Remark shows useful information.

The section of the current page is shown.

The following shows the symbols used in this manual with descriptions and examples.

Symbol	Description	Example
[ ]	Menu name on a menu bar	[Project]
<< >>	Tab name on a screen	<<Existing>> tab
" "	Screen name or item name on a screen	"Option" screen
	Button on a screen	button

TERMS

This manual uses the following terms unless otherwise specified.

Term	Description
Board	Generic term for PC interface boards supported by MELSEC data link library
Utility	Generic term for utility of PC interface board supported by MELSEC data link library
CC-Link Ver.2 board	Generic term for Q80BD-J61BT11N and Q81BD-J61BT11 CC-Link system master/local interface board
MELSECNET/H board	Generic term for Q80BD-J71LP21-25,Q81BD-J71LP21-25,Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, and Q80BD-J71BR11 MELSECNET/H interface board
CC-Link IE Controller Network board	Generic term for Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, and Q81BD-J71GP21S-SX CC-Link IE Controller Network interface board
CC-Link IE Field Network board	Generic term for Q80BD-J71GF11-T2 and Q81BD-J71GF11-T2 CC-Link IE Field Network interface board
GX Developer	Generic product name for SW8D5C-GPPW-E, SW8D5C-GPPW-EA, SW8D5C-GPPW-EV, and SW8D5C-GPPW-EVA
GX Works2	Generic product name for SWnDNC-GXW2-E and SWnDNC-GXW2-EA (n: version)
MX Component	Generic product name for SWnD5C-ACT-E and SWnD5C-ACT-EA (n: version)

CHAPTER 1 OVERVIEW

This chapter explains overview of the MELSEC data link library.

1.1 MELSEC Data Link Library

MELSEC data link library is a library used to access own station link devices of the board and device memory of other station's programmable controller CPU which uses the board.
With the MELSEC data link library, programs to access devices or device memories can be created easily without concern for communication routes.

1.2 Supported Boards

The following table shows the boards supported by the MELSEC data link library.

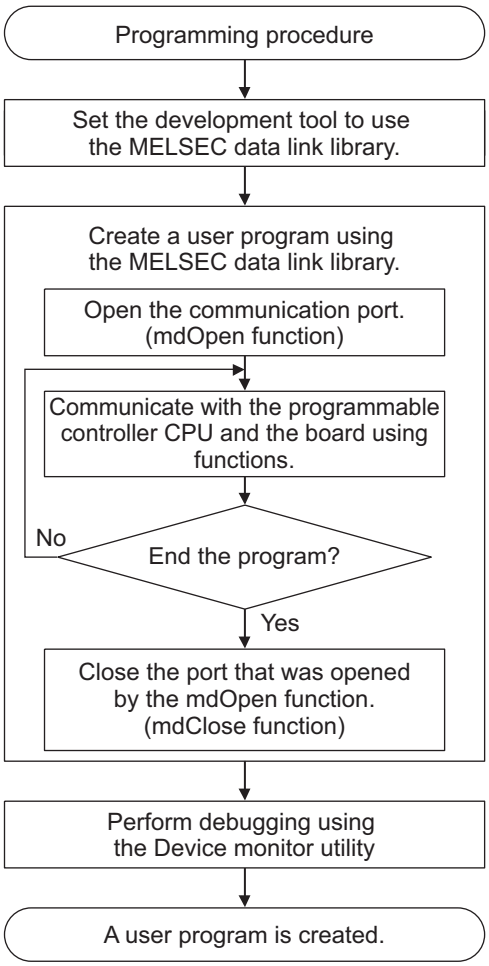
Board	Model Name
CC-Link Ver.2 board	Q80BD-J61BT11N, Q81BD-J61BT11
MELSECNET/H board	Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11
CC-Link IE Controller Network board	Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX
CC-Link IE Field Network board	Q80BD-J71GF11-T2, Q81BD-J71GF11-T2

CHAPTER 2 PROGRAMMING

This chapter explains how to use the MELSEC data link library.

2.1 Programming Procedure

The following flow chart shows the procedure to create a user program using the MELSEC data link library on the personal computer to which the software package is installed.



☞ Page 17, Section 2.3

📖 Refer to the user's manual of corresponding board.

2.2 Precautions when Using MELSEC Data Link Library

2.2.1 Precautions when programming

(1) Multi-thread communications

The MELSEC data link library cannot be accessed from multiple threads within the same process.
Access the MELSEC data link library with a single thread.

(2) Opening and closing of a communication line

Perform the opening and closing processes of a communication line (mdOpen, mdClose) only once at the beginning and the end of a user program. Repeating opening and closing processes for each communication causes deterioration of communication performance.

(3) Function execution time at the initial access

The MELSEC data link library obtains detailed information of the programmable controller at the initial access to the programmable controller CPU. Therefore, a longer function execution time is required for the initial function.

(4) Number of stations for other station accesses

When accessing other stations with the user program, limit the total number of access stations to 256 or less. The communication performance will be deteriorated if the total number of access stations is 257 or more.

(5) Forcible termination of user program

When the user program in which the MELSEC data link library operation is currently running is forcibly terminated, the following symptoms may occur.

- The application that is forcibly terminated cannot be ended.
- An error of MELSEC Data Link Library occurs in other application
- The forcible termination affects other Mitsubishi software packages (such as MX Component, GX Works2).

(6) Execution speed

The execution speed and the execution interval of the MELSEC data link library function may be extended temporarily by Windows® processes or other applications. Create programs considering these conditions.

(7) Static type variables

Do not specify any variables which are declared in static for output arguments of the MELSEC data link library functions.

(8) Service applications

The MELSEC data link library cannot be accessed from Windows® Service applications.
Access the MELSEC data link library from a user application.

(9) Board reset

When executing the mdBdRst function or mdBdModSet function using a user program, the board rest process of each function completes at the time when the value is returned.
Create a program which checks the returned value of the function.

(10)64-bit version user program

(a) Accessing CPU modules other than QCPU (Q mode) or RCPU modules

64-bit version user program cannot access CPU modules other than QCPU (Q mode) or RCPU modules. Use 32-bit version user program to access CPU modules other than QCPU (Q mode) or RCPU modules.

(b) Creating 64-bit version user program

To create 64-bit version user program, a project needs to be configured to set the 64-bit platform as a target platform. For configuring a project and setting a target platform, refer to Help (How to: Configure Projects to Target Platforms) in Visual Studio®.

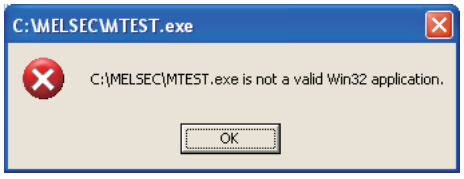
(c) Creating 64-bit version user program using Visual Basic®

.NET Framework 4.0 or .NET Framework compatible with .NET Framework 4.0 is required. Use Visual Studio® 2010 or later.

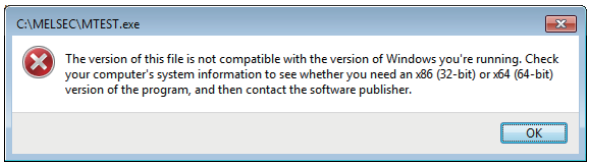
(d) Restriction when creating 64-bit version user programs

64-bit version user programs can be created on a 32-bit version operating system, however, the following dialog box appears and cannot be executed.

<When using Windows®XP (32-bit version)>



<When using Windows®7 (32-bit version)>



(11)/SAFESEH (Image has Safe Exception Handlers)

Do not use /SAFESEH (Image has Safe Exception Handlers) option. The project cannot be built normally.

(12)Influence of operating system and other applications

When the system resource of the operating system is insufficient due to the automatic start of the update program of the operating system or other applications, or the devices are accessed from other applications, "Board Driver I/F error 102 (0066H)" may occur during executing a MELSEC data link library function. Take the following measures as necessary.

- Retry process of a MELSEC data link library function
- Disable the automatic update of the operating system and other applications
- Stop other applications

(13)Device access when the cyclic data assurance is enabled

Use the batch write/batch read function (mdSendEx/mdSend/mdReceiveEx/mdReceive) to access devices when enabling the cyclic data assurance (32-bit data integrity assurance and block data assurance per station).
The cyclic data assurance (32-bit data integrity assurance and block data assurance per station) is not enabled while accessing the device by the random write/random read function (mdRandWEx/mdRandW/mdRandREx/mdRandR).

2.2.2 Precautions when accessing own station link devices and other station's programmable controller devices

It is necessary to establish an interlock depending on a link status between the own station and other station. Data are validated only when the following conditions are satisfied.

(1) MELSECNET/H

(a) Accessing to own station link devices (LX, LY, LB, LW)

Writing/reading data to/from the own station link devices are validated only when the bits of the own station handshaking status (SB47) and own station data link status (SB49) are OFF (normal communication), and the bit of the own station module status (SB20) is OFF (normal communication).
However, even if the above conditions are not satisfied, the processing of writing/reading data to/from the MELSECNET/H board ends normally.

(b) Other station transient access (remote operation and device access of other station's programmable controller CPU)

While the access is validated for the devices which check the link device accesses, the other station transient access can be performed when the bits of the handshake status in accessed station (the bits in the accessed station correspond to SW70 to 73 read from the own station) and OFF (normal communication) and the bits of the cyclic transmission status (the bits in the accessed station correspond to SW74 to 77 read from the own station) are OFF (cyclic transmission is being processed).

(2) CC-Link IE Controller Network

(a) Accessing to own station link devices (LX, LY, LB, LW)

Writing/reading data to/from the own station link devices are validated only when the bits of the own station handshaking status (SB47) and own station data link status (SB49) are OFF (normal communication), and the bit of the own station module status (SB20) is OFF (normal communication).
However, even if the above conditions are not satisfied, the processing of writing/reading data to/from the CC-Link IE Controller Network board ends normally.

(b) Other station transient access (remote operation and device access of other station's programmable controller CPU)

While the access is validated for the devices which check the link device accesses, the other station transient access can be performed when the bits of the handshake status in accessed station (the bits in the accessed station correspond to SWA0 to A7 read from the own station) and the bits of the data link status (the bits in the accessed station correspond to SWB0 to B7 read from the own station) are OFF (normal communication).

(3) CC-Link IE Field Network

(a) Accessing to own station link devices (RX, RY, RW)

Writing/reading data to/from the own station link devices are validated only when the bits of the own station handshaking status (SB47) and own station data link status (SB49) are OFF (normal communication). However, even if the above conditions are not satisfied, the processing of writing/reading data to/from the CC-Link IE Field Network board ends normally.

(b) Other station transient access (remote operation and device access of other station's programmable controller CPU)

While the access is validated for the devices which check the link device accesses, the other station transient access can be performed when the bits of the handshake status in accessed station (the bits in the accessed station correspond to SWA0 to A7 read from the own station) and the bits of the data link status (the bits in the accessed station correspond to SWB0 to B7 read from the own station) are OFF (normal communication).

2.3 Settings for Using Functions

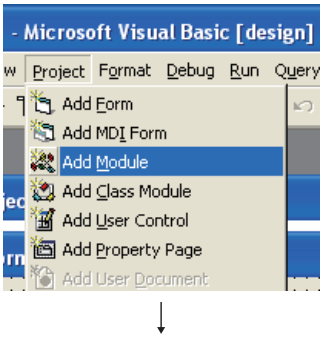
This section explains how to set the development tool to use the MELSEC data link library functions.
For programming languages supported by boards, refer to the user's manual corresponds to the board.
☞ Page 3 RELATED MANUALS

Point

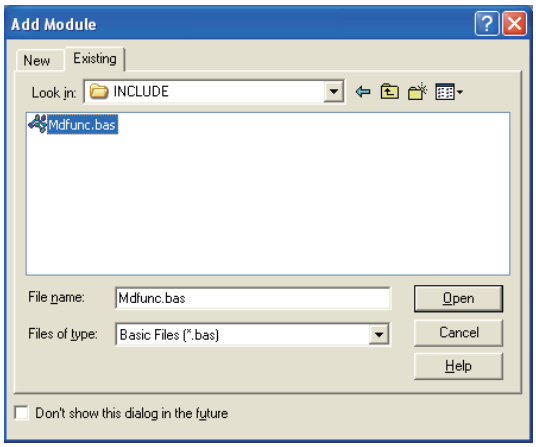
- To create a 64-bit version user application, a project needs to be configured to set the 64-bit platform as a target platform. For configuring a project and setting a target platform, refer to Help (How to: Configure Projects to Target Platforms) in Visual Studio®.
- When creating 64-bit version user programs using Visual Basic®, .NET Framework 4.0 or .NET Framework compatible with .NET Framework 4.0 is required. Use Visual Studio® 2010 or later as a development environment.

2.3.1 Using Visual Basic®5.0, Visual Basic®6.0

This section explains the setting operation when using Visual Basic®5.0 or Visual Basic®6.0.



1) Start Visual Basic® and select [Project] - [Add Module].

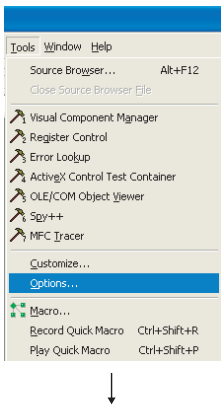


2) Select <<Existing>> and select "Mdfunc.bas".
"Mdfunc.bas" is stored in the following directory at installation.
<User-specified folder> - <COMMON> - <INCLUDE>

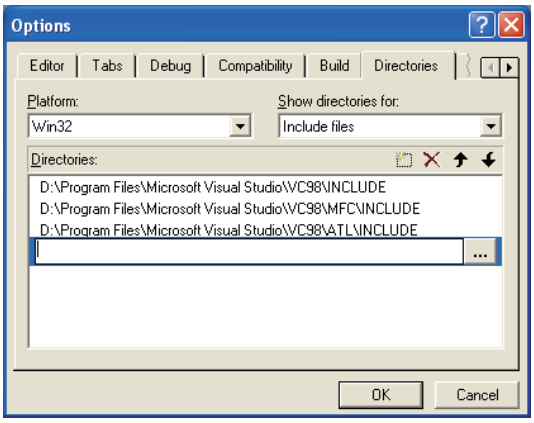
2.3.2 Using Visual C++®5.0, Visual C++®6.0

This section explains the setting operation when using Visual C++®5.0 or Visual C++®6.0.

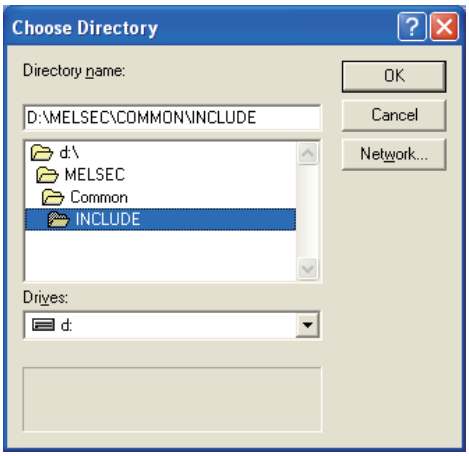
(1) Setting include files



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



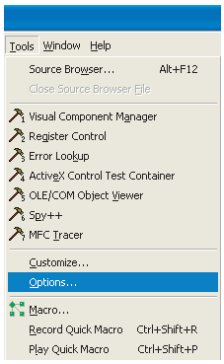
2) Select <<Directories>> and specify "Include files" for "Show directories for " .



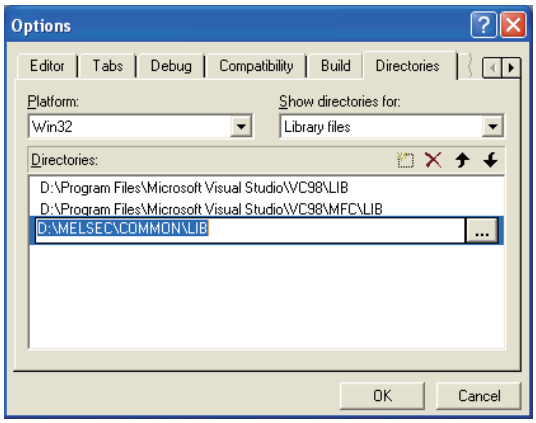
3) Double-click the item to be set and browse the folder containing include files.
"Mdfunc.h" is stored in the following directory at installation.
<User-specified folder> - <COMMON> - <INCLUDE>

4) Add #include<Mdfunc.h> at the beginning of the program.

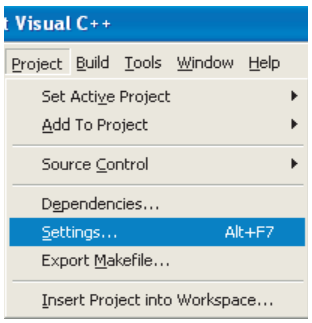
(2) Setting library files



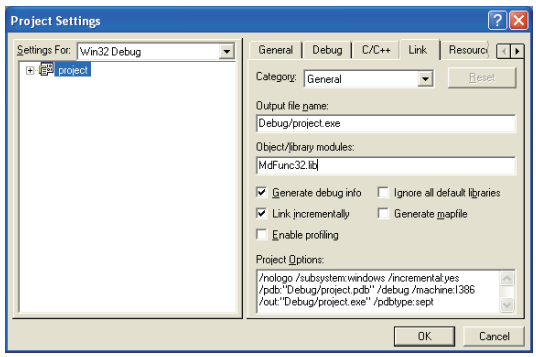
1) Start Visual C++® and select [Tools] - [Options].



2) Select <<Directories>> and specify "Library files" for "Show directories for". Browse the folder containing library files as in (1) on the previous page.
"Mdfunc32.lib" is stored in the following directory at installation.
<User-specified folder>-<COMMON>-<LIB>



3) Open the workspace to create a user application and select [Project] - [Settings].



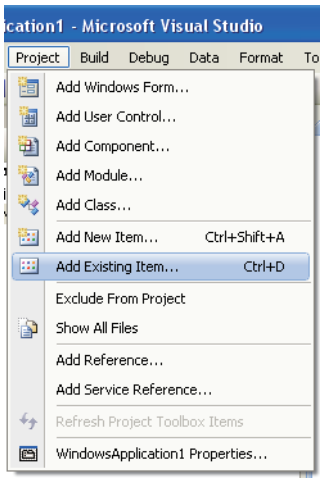
4) Select <<Link>> and specify "General" for the category, and enter "Mdfunc32.lib" in the "Object/library modules" field.

2.3.3 Using Visual Basic®.NET

This section explains the setting operation when using Visual Basic®.NET 2003, or when using Visual Basic® in Visual Studio® 2005, Visual Studio® 2008, Visual Studio® 2010, Visual Studio® 2012 or Visual Studio® 2013.

Remark

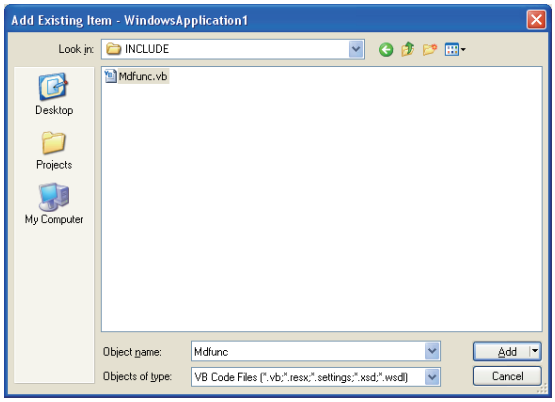
The screens of Visual Studio® 2008 Visual Basic® 2008 are used for the explanation in this section.
These screens are slightly different from other Visual Basic®.



1) Start Visual Basic®.

   For other than Visual Basic®.NET 2003:
   Select [Project] - [Add Existing Item].

   For Visual Basic®.NET 2003:
   Select [File] - [Add Existing Item].



2) On the "Add Existing Item" screen, select "Mdfunc.vb".
   "Mdfunc.vb" is stored in the following directory at installation.
   <User-specified folder> - <COMMON> - <INCLUDE>

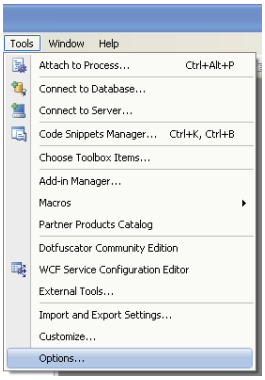
2.3.4 Using Visual C++®.NET 2003, Visual C++®2005, Visual C++®2008

This section explains the setting operation when using Visual C++®.NET 2003, or when using Visual C++® in Visual Studio® 2005, or Visual Studio® 2008.

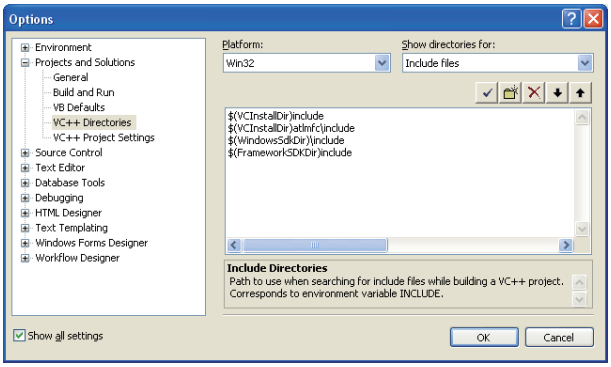
Remark

The screens of Visual C++® in Visual Studio® 2008 are used for the explanation in this section.
These screens are slightly different from other Visual C++®.

(1) Setting include files



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

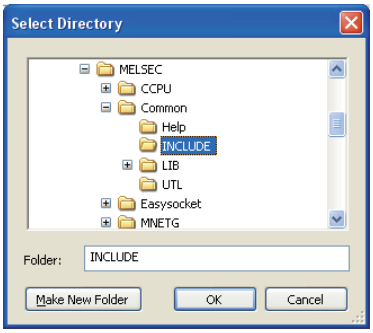


2) Select "VC++ Directories" in the folder area of the "Options" screen.

For other than Visual C++®.NET 2003:
Select "Projects and Solutions" - "VC++ Directories".

For Visual C++®.NET 2003:
Select "Projects" - "VC++ Directories".

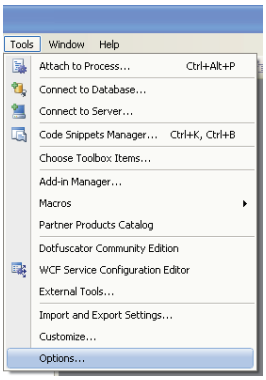
Specify "Include Files" for "Show directories for" and click .



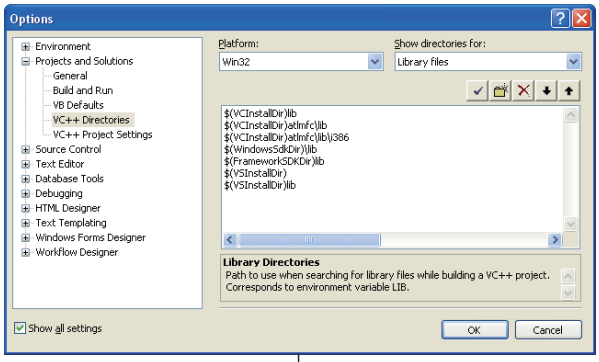
3) Browse the folder containing include files.
"Mdfunc.h" is stored in the following directory at installation.
<User-specified folder> - <COMMON> - <INCLUDE>

4) Add #include<Mdfunc.h> at the beginning of the program.

(2) Setting library files



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

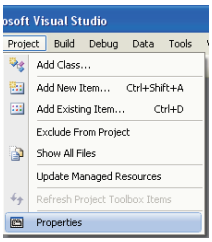


2) Select "VC++ Directories" in the folder area of the "Options" screen.

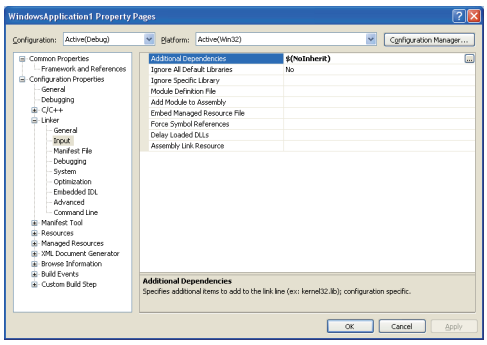
For other than Visual C++®.NET 2003:
Select "Projects and Solutions" - "VC++ Directories".

For Visual C++®.NET 2003:
Select "Projects" - "VC++ Directories".

Specify "Library files" for "Show directories for" , and browse the folder containing library files as in (1) on the previous page.
"Mdfunc32.lib" is stored in the following directory at installation.
For creating a 32-bit version user application
<User-specified folder> - <COMMON> - <LIB>
For creating a 64-bit version user application
<User-specified folder> - <COMMON> - <LIB>- <x64>



3) Open the project to create a user application and select [Project] - [project Properties].



4) Select [Configuration Properties] - [Linker] - "Input" in the folder area of the "Property Pages" screen.

Enter "MdFunc32.lib" in the "Additional Dependencies" field.

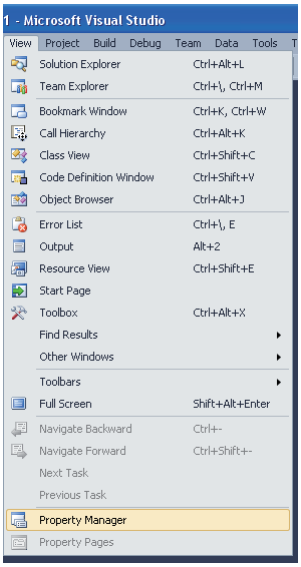
2.3.5 Using Visual C++®2010, Visual C++®2012

This section explains the setting operation when using Visual C++® in Visual Studio®2010, or Visual Studio® 2012.

Remark

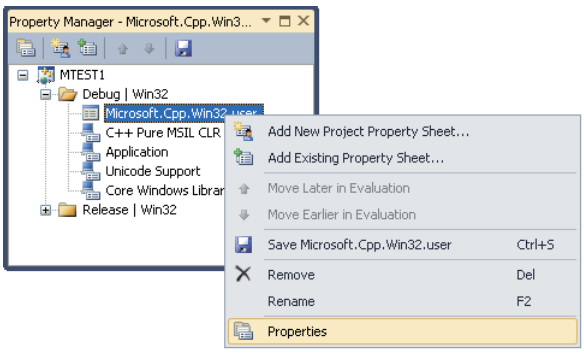
The screens of Visual C++® in Visual Studio® 2010 are used for the explanation in this section.
These screens are slightly different from other Visual C++®.

(1) Setting include files



1) Open the project to create a user application and select [View] - [Property Manager][*1].

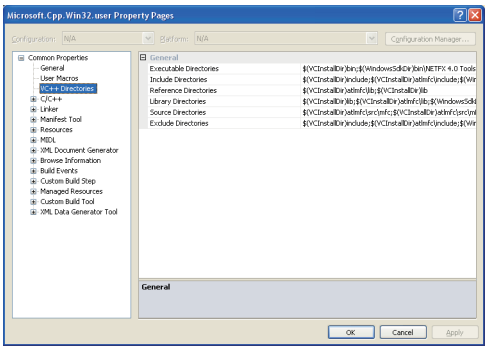
*1 : The menu configuration may differ depending on the development setting or customized setting.



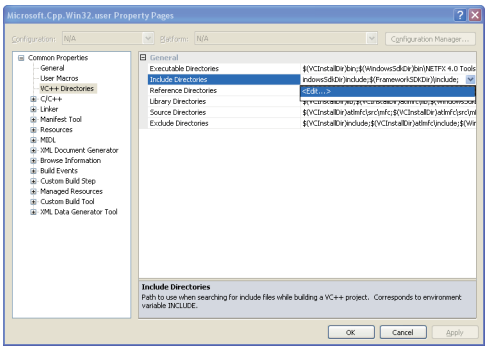
2) Right-click the user property sheet, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.

(To the next page)

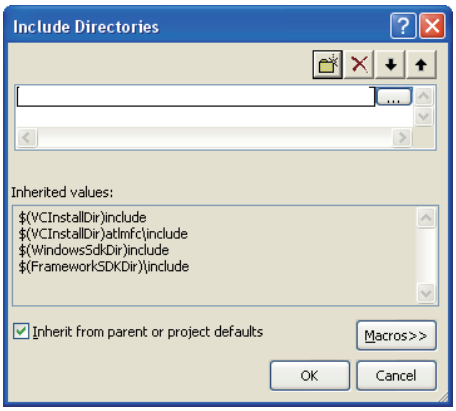
(From the previous page)



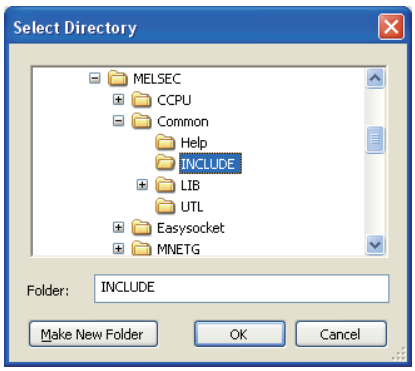
3) Select "Common Properties" - "VC++ Directories" on the "Property Pages" screen.



4) Select "Include Directories". Click the button and select "<Edit...>".



5) On the "Include Directories" screen, click the button, and then click .

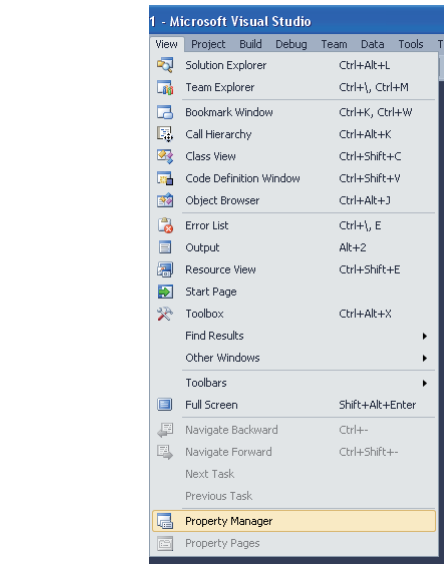


6) On the "Select Directory" screen, select the folder to which the include file is stored.

"Mdfunc.h" is stored in the following directory at installation.
<User-specified folder> - <COMMON> - <INCLUDE>

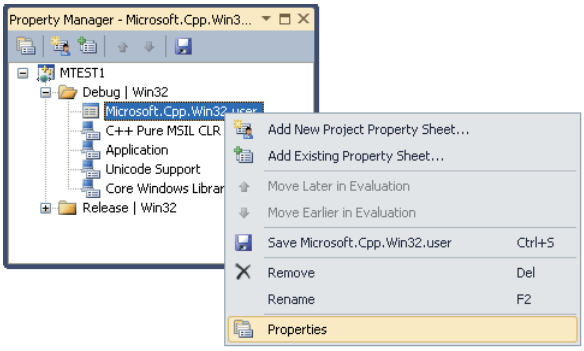
7) Add #include<Mdfunc.h> at the beginning of the program.

(2) Setting library files



1) Open the project to create a user application and select [View] - [Property Manager][*1].

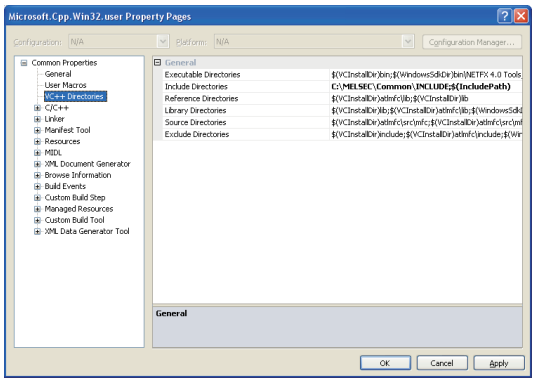
*1 : The menu configuration may differ depending on the development setting or customized setting.



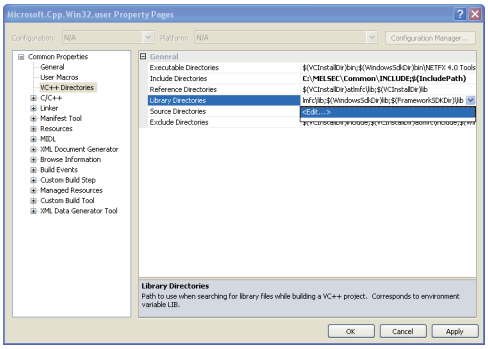
2) Right-click the user property sheet, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.

(To the next page)

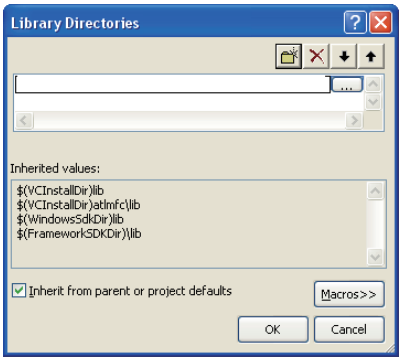
(From the previous page)



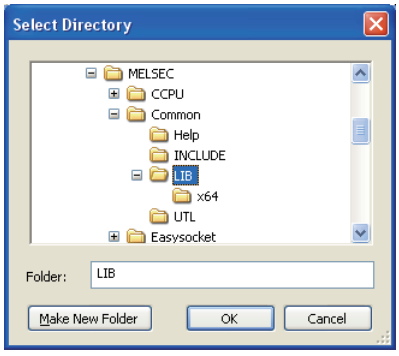
3) Select "Common Properties" - "VC++ Directories" on the "Property Pages" screen.



4) Select "Library Directories" . Click ▼ and select "<Edit...>".



5) On the "Library Directories" screen, click 📁, and then click ....



6) On the "Select Directory" screen, select the folder to which the library file is stored.

"Mdfunc32.lib" is stored in the following directory at installation.

For creating a 32-bit version user application

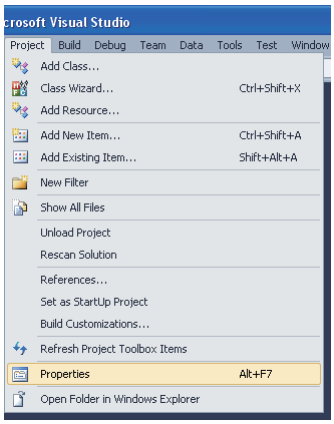
<User-specified folder> - <COMMON> - <LIB>

For creating a 64-bit version user application

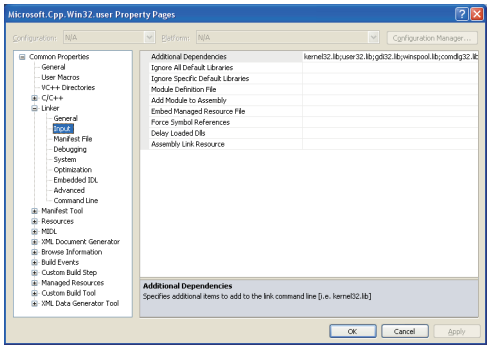
<User-specified folder> - <COMMON> - <LIB>- <x64>

(To the next page)

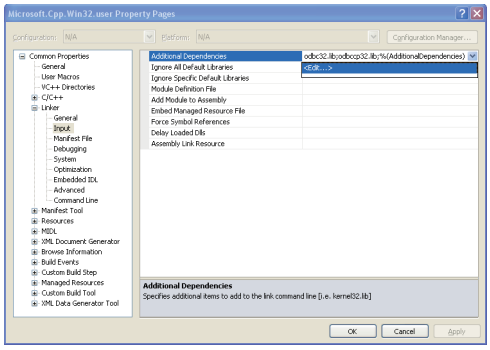
(From the previous page)



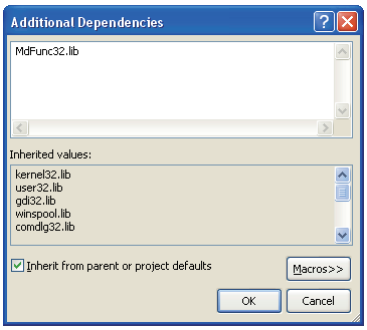
7) Open the project to create a user application and select [Project] - [Properties].



8) In the folder area of the "Property Pages" screen, select "Configuration Properties" - "Linker" - "Input".



9) Select "Additional Dependencies". Click ▼ and select "<Edit...>".

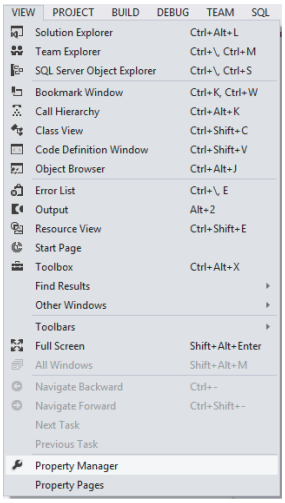


10) On the "Additional Dependencies" screen, enter "MdFunc32.lib".

When /SAFESEH (Image has Safe Exception Handlers) option is set to the linker option, the project cannot be built normally. For Visual Studio® 2012 Visual C++®, delete the /SAFESEH option following the procedure shown below because it is set as a default.

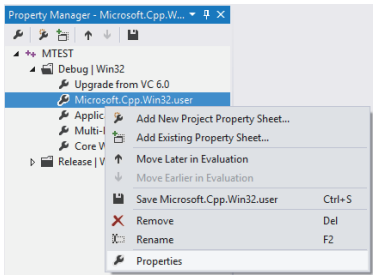
Remark

The screens of Visual Studio® 2012 Visual C++® are used for the explanation in this section.
These screens are slightly different from other Visual C++®.

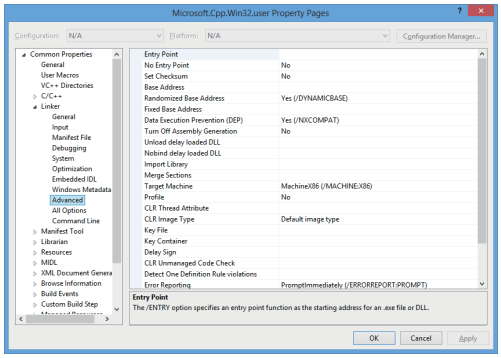


1) Open the project to create a user application and select [View] - [Property Manager]*1.

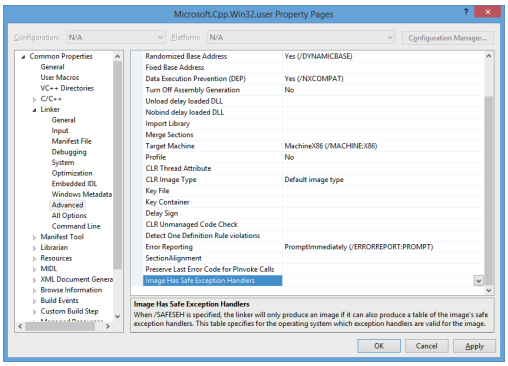
*1 : The menu configuration may differ depending on the development setting or customized setting.



2) Right-click the user property sheet, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.



3) Select "Common Properties" - "Linker" - "Advanced" on the "Property Pages" screen.



4) Select "Image Has Safe Exception Handlers". When the option has been set, delete it.

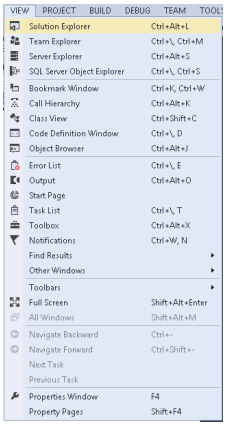
2.3.6 Using Visual C++®2013

This section explains the setting operation when using Visual C++® in Visual Studio®2013.

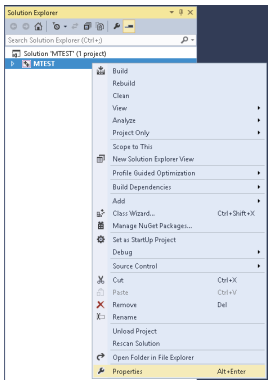
Remark

The screens of Visual C++® 2013 opened by converting the sample program "MTEST(VC)" on Windows® 8 Professional (x64) are used for the explanation in this section.

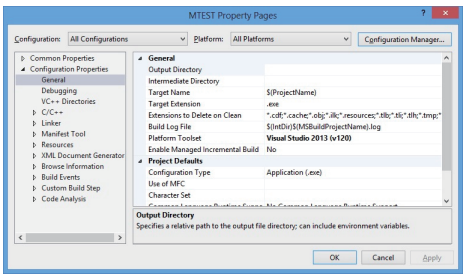
(1) Setting include files



1) Open the project to create a user application and select [VIEW] - [Solution Explorer].



2) Right-click the project in the Solution Explorer, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.

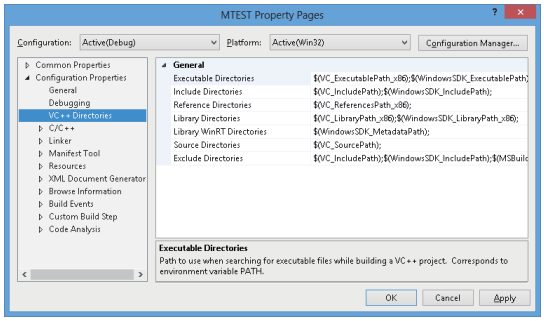


3) Select the configuration and the platform to be changed in the Configuration and the Platform.

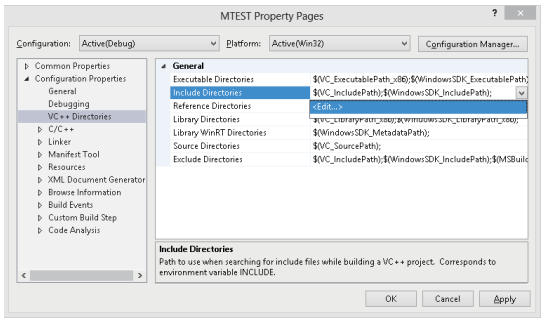
In case that there are multiple configurations and platforms, select "All Configurations" and "All Platforms" to change settings at a time.

(To the next page)

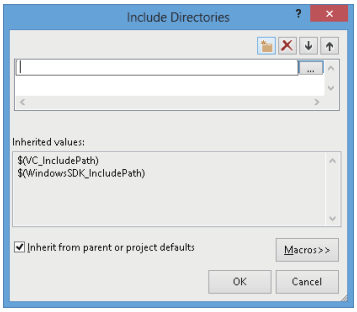
(From the previous page)



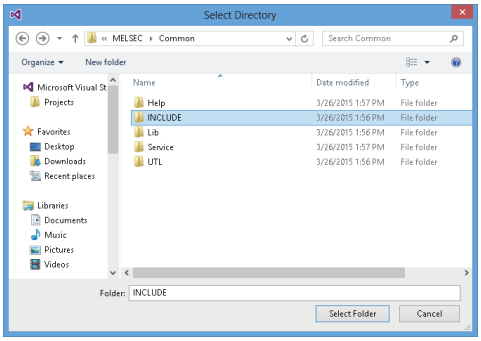
4) On the "Property Pages" screen, select <Configuration Properties> - <VC++ Directories>.



5) Select "Include Directories". Click the button and select "<Edit...>".



6) On the "Include Directories" screen, click the button, and then click ....

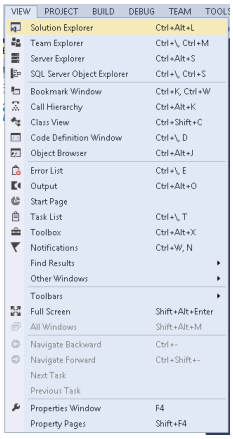


7) On the "Select Directory" screen, select the folder to which the include file is stored.

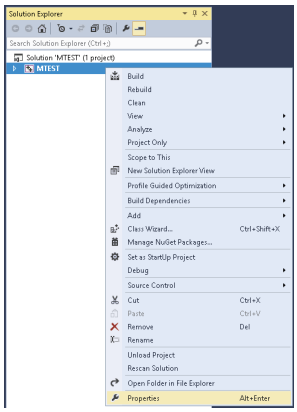
"Mdfunc.h" is stored in the following directory at installation.
<User-specified folder> - <COMMON> - <INCLUDE>

8) Add #include<Mdfunc.h> at the beginning of the program.

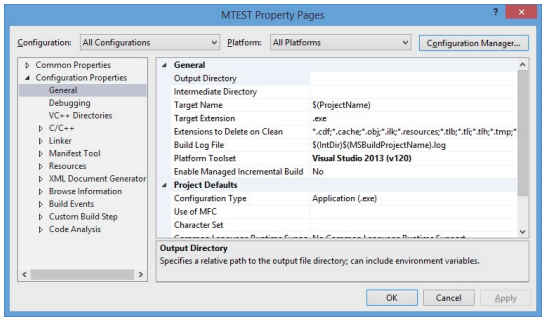
(2) Setting library files



1) Open the project to create a user application and select [VIEW] - [Solution Explorer].



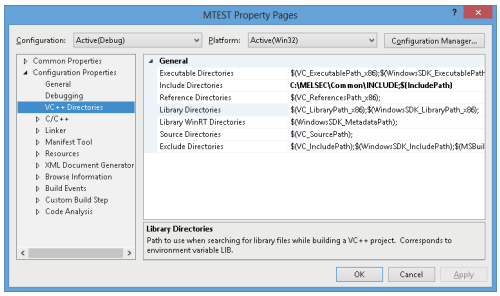
2) Right-click the project in the Solution Explorer, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.



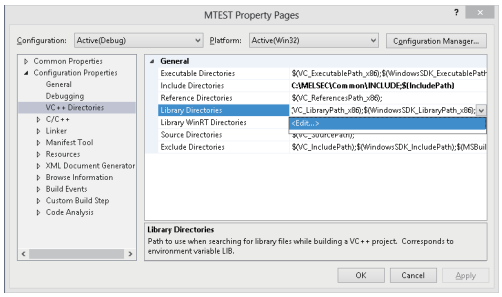
3) Select the configuration and the platform to be changed in the Configuration and the Platform.
In case that there are multiple configurations and platforms, select "All Configurations" and "All Platforms" to change settings at a time.

(To the next page)

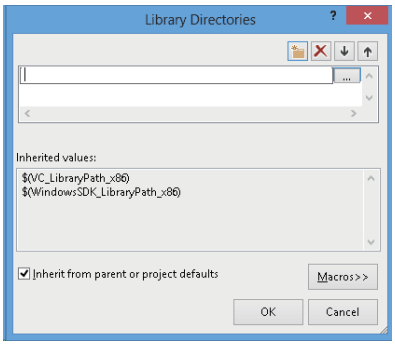
(From the previous page)



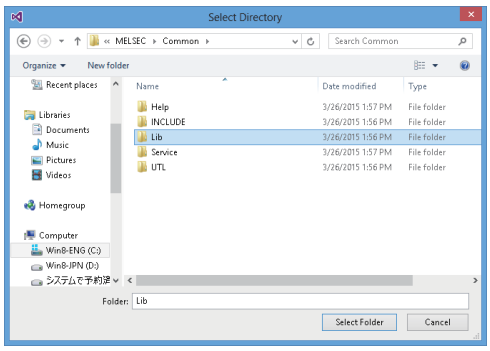
4) On the "Property Pages" screen, select <Configuration Properties> - <VC++ Directories>.



5) Select "Library Directories" . Click and select "<Edit...>".



6) On the "Library Directories" screen, click , and then click .

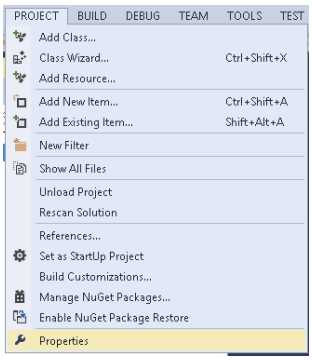


7) On the "Select Directory" screen, select the folder to which the library file is stored.

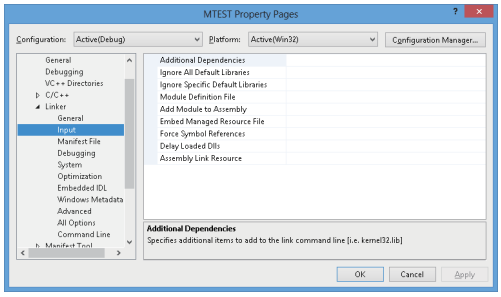
"Mdfunc32.lib" is stored in the following directory at installation.
For creating a 32-bit version user application
<User-specified folder> - <COMMON> - <LIB>
For creating a 64-bit version user application
<User-specified folder> - <COMMON> - <LIB>- <x64>

(To the next page)

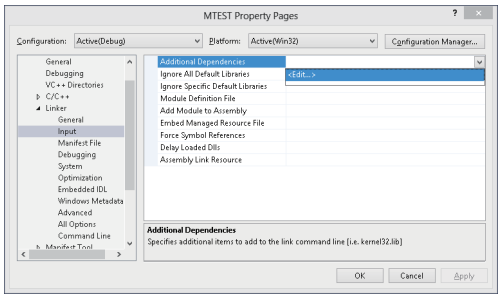
(From the previous page)



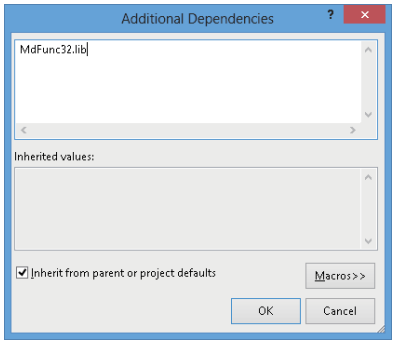
8) Open the project to create a user application and select [PROJECT] - [Properties].



9) In the folder area of the "Property Pages" screen, select "Configuration Properties" - "Linker" - "Input".



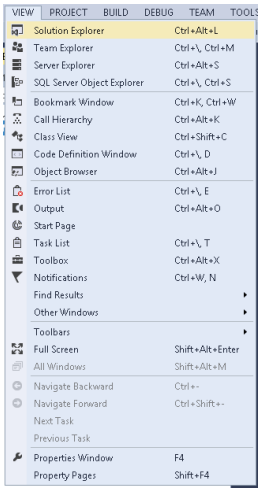
10) Select "Additional Dependencies". Click ⌄ and select "<Edit...>".



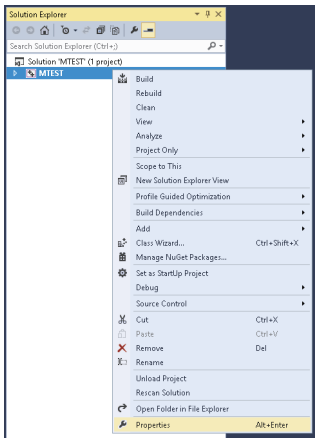
11) On the "Additional Dependencies" screen, enter "MdFunc32.lib".

(3) Setting platform and deleting linker option that are unnecessary

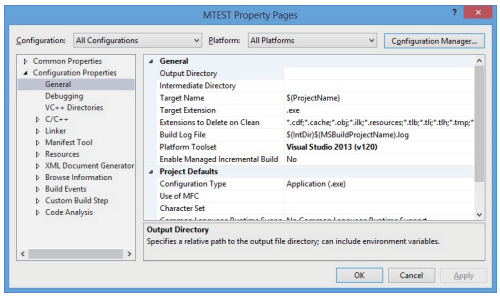
Set the platform by the following operations 1) to 5).
Also, delete unnecessary options by the following operations 6) to 7).
When using "Image Has Safe Exception Handlers" option, the project cannot be built normally.



1) Open the project to create a user application and select [VIEW] - [Solution Explorer].



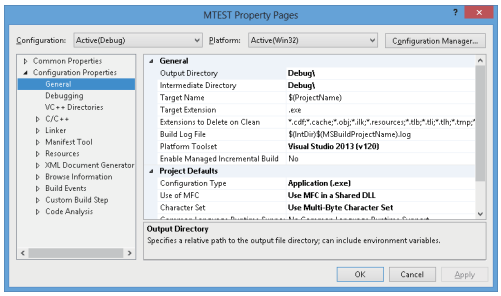
2) Right-click the project in the Solution Explorer, and select [Properties] from the shortcut menu.
The "Property Pages" screen is displayed.



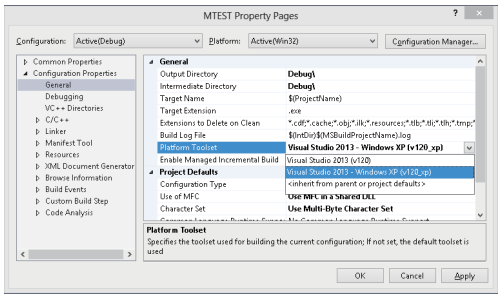
3) Select the configuration and the platform to be changed in the Configuration and the Platform.
In case that there are multiple configurations and platforms, select "All Configurations" and "All Platforms" to change settings at a time.

(To the next page)

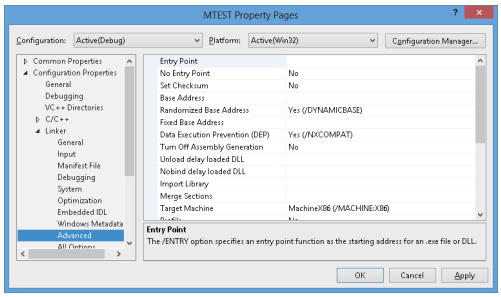
(From the previous page)



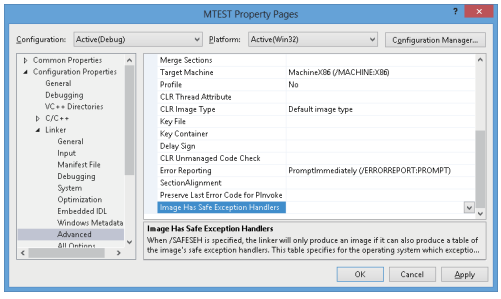
4) On the "Property Pages" screen, select <Configuration Properties> - <General>.



5) Select "Platform Toolset", click the button, and select "Visual Studio 2013 - Windows XP (v120_xp)".



6) On the "Property Pages" screen, select <Configuration Properties> - <Linker> - <Advanced>.



7) Select "Image Has Safe Exception Handlers", and check whether the option is not set. When the option has been set, delete it.

CHAPTER 3 ACCESSIBLE DEVICES AND RANGES

This chapter explains the devices and the ranges that can be accessed when communicating with each type of boards.

3.1 Access Target

The following table shows the accessible other stations.

Item			Model name[*1]
A series	CPU module	ACPU[*2]	A0J2HCPU, A1SCPU, A1SJCPU, A1SHCPU, A1SJHCPU, A1NCPU, A2CCPU, A2CJCPU, A2NCPU, A2NCPU-S1, A2SCPU, A2SHCPU, A3NCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A3UCPU, A4UCPU
		QCPU(A mode)	Q02CPU-A, Q02HCPU-A, Q06HCPU-A
QnA series	CPU module	QnACPU	Q2ACPU, Q2ASCPU, Q2ASHCPU, Q2ACPU-S1, Q2ASCPU-S1, Q2ASHCPU-S1, Q3ACPU, Q4ACPU, Q4ARCPU
Q series	CPU module	QCPU(Q mode)	• Basic model QCPU Q00JCPU, Q00CPU, Q01CPU • High Performance model QCPU Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU • Process CPU Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU • Redundant CPU Q12PRHCPU, Q25PRHCPU • Universal model QCPU Q03UDVCPU, Q03UDECPU, Q04UDHCPU, Q04UDEHCPU, Q04UDVCPU, Q06UDHCPU, Q06UDEHCPU, Q06UDVCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDEHCPU, Q13UDVCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDEHCPU, Q26UDVCPU, Q50UDEHCPU, Q100UDEHCPU
L series	CPU module	LCPU	L02SCPU, L02SCPU-P, L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT
	Head module		LJ72GF15-T2
iQ-R series	CPU module	RCPU	R04CPU, R08CPU, R16CPU, R32CPU, R120CPU
Ethernet adapter module			NZ2GF-ETB
Intelligent device station			AJ65BT-R2 (a slave station on the CC-Link system that can perform the transient transmission)
CC-Link IE Field remote device station			• Input module NZ2GF2B1-16D, NZ2GFCE3-16D, NZ2GFCE3-16DE, NZ2GFCM1-16D, NZ2GFCM1-16DE • Output module NZ2GF2B1-16T, NZ2GF2B1-16TE, NZ2GFCE3-16T, NZ2GFCE3-16TE, NZ2GFCM1-16T, NZ2GFCM1-16TE • Analog input module/Analog output module NZ2GF2B-60AD4, NZ2GF2B-60DA4 • Temperature control module NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4 • High-speed counter module NZ2GFCF-D62PD2
PC interface board	CC-Link Ver.2 board		Q80BD-J61BT11N, Q81BD-J61BT11
	MELSECNET/H board		Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11
	CC-Link IE Controller Network board		Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX
	CC-Link IE Field Network board		Q80BD-J71GF11-T2, Q81BD-J71GF11-T2

*1 : Cannot be accessed when using a product whose model name or version is not supported by the network. For the supported network of each product, refer to the manual of product.

*2 : For CC-Link IE Field network, only A2UCPU, A2UCPU-S1, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A3UCPU, and A4UCPU can be accessed.

Point

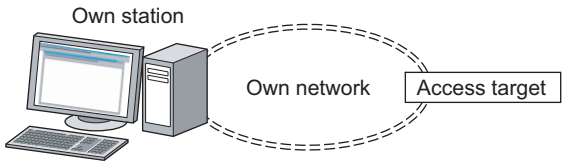
When accessing other than QCPU (Q mode) or RCPU, use 32-bit version user application.

3.2 Accessible Ranges

This section explains accessible ranges when communicating with boards.

3.2.1 Access target on own network

The following module, board, or own station can be accessed on the network connected to each board.



○: Accessible ×: Not accessible

Own station	Own network	Access target[*1]						
		RCPU	LCPU, Head module	Ethernet adapter module	QCPU (Q mode), PC interface board	ACPU, QnACPU, QCPU (A mode)	CC-Link IE Field remote devicestation	Intelligent device station
CC-Link Ver.2 board [*2]	CC-Link	○	○	×	○	○	○[*3]	×
MELSECNET/H board	MELSECNET/H	○	×	×	○	×	×	×
	MELSECNET/10	○	×	×	○	○	×	×
CC-Link IE Controller Network board	CC-Link IE Controller Network	○	×	×	○	×	×	×
CC-Link IE Field Network board	CC-Link IE Field Network	○	○	○	○	×	×	○[*3]

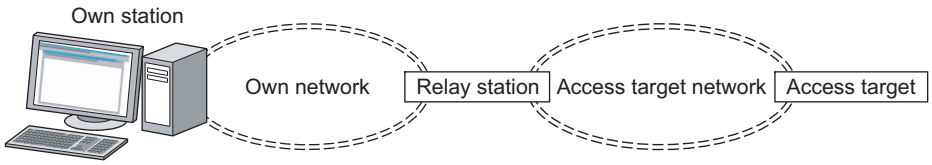
*1 : For details of access target, refer to ☞ Page 37, Section 3.1 Access Target.
*2 : When the own station number is 64, other station cannot be accessed. Only the own station can be accessed.
*3 : Only 32-bit version user application can be accessed.

For the accessible devices of each access target, refer to the following table.

Access target		Reference
Access to link devices or buffer memory of own station	PC interface board	Page 40, Section 3.3.1
Access to devices of other station module	QnACPU, QCPU (Q mode), LCPU, RCPU	Page 41, Section 3.3.2
	ACPU, QCPU (A mode)	Page 42, Section 3.3.3
	Ethernet adapter module, Head module	Page 43, Section 3.3.4
Access to other station buffer memory of CC-Link	CC-Link network module, CC-Link Ver.2 board, etc.	Page 43, Section 3.3.5
Access using the SEND function or the RECV function	QnACPU, QCPU (Q mode), LCPU, RCPU, PC interface board	Page 44, Section 3.3.6

3.2.2 Access target when connected via network

The following shows the accessibility when accessing via multiple networks.



The combination other than shown in the following table cannot be accessed.

Accessing the access target via multiple networks is not supported by CC-Link network.

○: Accessible ×: Not accessible

Own network	Relay station	Access target network	Access target*1				
			RCPU	LCPU, Head module, Ethernet adapter module	QCPU (Q mode), PC interface board	ACPU*3, QnACPU, QCPU (A mode)	CC-Link IE Field remote device station
CC-Link IE Controller Network	RCPU	CC-Link IE Controller Network	○	×	○	×	×
		CC-Link IE Field Network	○	○	○	×	×
CC-Link IE Field Network		CC-Link IE Controller Network	○	×	○	×	×
		CC-Link IE Field Network	○	○	○	×	×
MELSECNET/H, MELSECNET/10	QCPU (Q mode) *2	MELSECNET/10	×	×	×	○	×
CC-Link IE Controller Network, CC-Link IE Field Network		CC-Link IE Controller Network	○	×	○	×	×
		CC-Link IE Field Network	○	○	○	×	×
CC-Link IE Field Network	LCPU	CC-Link IE Field Network	○	○	○	×	×
MELSECNET/10	QnACPU ACPU QCPU (A mode)	MELSECNET/10	×	×	○	○	×

*1 : For details of access target, refer to ☞ Page 37, Section 3.1 Access Target.

*2 : When using a CPU module whose number of mountable network module is one, the CPU module cannot be set as a relay station.

*3 : For CC-Link IE Field network, A2UCPU, A2UCPU-S1, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A3UCPU, and A4UCPU can be accessed.

For the accessible devices of each access target, refer to the following table.

Access target		Reference
Access to devices of other station module	QnACPU, QCPU (Q mode), LCPU, RCPU	Page 41, Section 3.3.2
	ACPU, QCPU (Amode)	Page 42, Section 3.3.3
	Ethernet adapter module, Head module	Page 43, Section 3.3.4
Access using the SEND function or the RECV function	QnACPU, QCPU (Q mode), LCPU, RCPU, PC interface board	Page 44, Section 3.3.6

3.3 Accessible Devices

This section explains accessible devices for boards.
The table in this section divides the functions used for access into "Batch" and "Random" and indicates accessibility for each of these two categories.

Access type	Description
Batch	Batch write (mdSend, mdSendEx)
	Batch read (mdReceive, mdReceiveEx)
Random	Random write (mdRandW, mdRandWEx)
	Random read (mdRandR, mdRandREx)
	Bit set (mdDevSet, mdDevSetEx)
	Bit reset (mdDevRst, mdDevRstEx)

3.3.1 Access to link devices and buffer memory of own station

The following table shows the accessible devices when accessing a board (own station).

○: Accessible ×: Not accessible

Device		Access type	Access target			
			CC-Link Ver.2 board	MELSECNET/H board	CC-Link IE Controller Network board	CC-Link IE Field Network board
Link input	LX	Batch/Random	×	○	○	×
Link output	LY	Batch/Random	×	○	○	×
Link relay	LB	Batch/Random	×	○	○	×
Link register	LW	Batch/Random	×	○	○	×
Link special relay	SB	Batch/Random	○	○	○	○
Link special register	SW	Batch/Random	○	○	○	○
Remote input	RX	Batch/Random	○	×	×	○
Remote output	RY	Batch/Random	○	×	×	○
Remote register (for transmission)	RWw	Batch/Random	○	×	×	○
Remote register (for reception)	RWr	Batch/Random	○	×	×	○
Buffer memory	—	Batch/Random	○	×	○	○
Random access buffer	—	Batch/Random	○	×	×	×

3.3.2 Access to devices of QnA, Q, L, and R series module

The following table shows the accessible devices of QnACPU, QCPU (Q mode), LCPU, and RCPU on other station.

○: Accessible ×: Not accessible

Device		Access type	Access target*1	
			QnACPU, QCPU, LCPU	RCPU
Input	X	Batch/Random	○	○
Output	Y	Batch/Random	○	○
Latch relay	L	Batch/Random	○	○
Internal relay	M	Batch/Random	○	○
Special relay	SM	Batch/Random	○	○
Data register	D	Batch/Random	○	○
Special register	SD	Batch/Random	○	○
Annunciator	F	Batch/Random	○	○
Timer (contact, coil, current value)	T	Batch/Random	○	○
Long timer (contact, coil, current value)	LT	Batch/Random	×	○*2
Counter (contact, coil, current value)	C	Batch/Random	○	○
Long counter (contact, coil, current value)	LC	Batch/Random	×	○*2
Index register	Z	Batch/Random	○	○
Long index register	LZ	Batch/Random	×	○*2
Unit refresh register	RD	Batch/Random	×	○*2
File register	R, ZR	Batch/Random	○*3	○
Extended file register	ER	Batch/Random	○*3	○
Link relay	B	Batch/Random	○	○
Link register	W	Batch/Random	○	○
Link special relay	SB	Batch/Random	○	○
Link special register	SW	Batch/Random	○	○
Retentive timer (contact, coil, current value)	ST	Batch/Random	○	○
Long retentive timer (contact, coil, current value)	LST	Batch/Random	×	○*2
Edge relay	V	Batch/Random	○	×
Link direct device (link input, link output, link relay, link register, link special relay, link special register)	Jn\X Jn\Y Jn\B Jn\W Jn\SB Jn\SW	Batch/Random	○	○
Intelligent function module device	Un\G	Batch/Random	○	○

*1 : For details of access target, refer to ☞ Page 37, Section 3.1 Access Target.
*2 : Cannot be accessed from MELSECNET/H board.
*3 : Cannot be accessed with Q00JCPU.

3.3.3 Access to devices of A series module

The following table shows the accessible devices of ACPU or QCPU (A mode) on other station.

○: Accessible ×: Not accessible

Device		Access type	Access target				
			A1NCPU[*1]	A0J2HCPU, A1SCPU, A1SJCPU, A1SHCPU, A1SJHCPU, A2CCPU, A2CJCPU, A2NCPU, A2NCPU-S1, A2SCPU, A2SHCPU, A2ACPU, A2ACPU-S1[*1]	A3NCPU, A3ACPU[*1]	A2UCPU, A2UCPU-S1, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A3UCPU QCPU (A mode)	A4UCPU
Input	X	Batch/Random	○	○	○	○	○
Output	Y	Batch/Random	○	○	○	○	○
Latch relay	L	Batch/Random	○	○	○	○	○
Internal relay	M	Batch/Random	○	○	○	○	○
Special relay	M9000 to	Batch/Random	○	○	○	○	○
Data register	D	Batch/Random	○	○	○	○	○
Special register	D9000 to	Batch/Random	○	○	○	○	○
Annunciator	F	Batch/Random	○	○	○	○	○
Timer (contact, coil, current value)	T	Batch/Random	○	○	○	○	○
Timer (setting value main)		Batch	○	○	○	○	○
		Random	×	×	×	×	×
Timer (setting value sub1)		Batch	×	×	○	○	○
		Random			×	×	×
Timer (setting value sub2, sub3)		Batch			×	×	○
		Random					×
Counter (contact, coil, current value)	C	Batch/Random	○	○	○	○	○
Counter (setting value main)		Batch	○	○	○	○	○
		Random	×	×	×	×	×
Counter (setting value sub1)		Batch	×	×	○	○	○
		Random			×	×	×
Counter (setting value sub2, sub3)		Batch			×	×	○
		Random					×
Accumulator	A	Batch/Random	○	○	○	○	○
Index register	Z, V	Batch/Random	○	○	○	○	○
File register	R	Batch/Random	×	○	○	○	○
Extended file register	ER	Batch/Random	×	○	○	○	○
Link relay	B	Batch/Random	○	○	○	○	○
Link register	W	Batch/Random	○	○	○	○	○

*1 : Cannot be accessed from CC-Link IE Field Network board.

3.3.4 Access to Ethernet adapter module, Head module, and CC-Link IE Field remote device station

The following table shows the accessible Ethernet adapter module, Head module, and CC-Link IE Field remote device station via CC-Link and CC-Link IE Field Network.

○: Accessible ×: Not accessible

Device		Access type	Access target		
			Ethernet adapter module	Head module	CC-Link IE Field remote device station
Input	X	Batch/Random	○	○	×
Output	Y	Batch/Random	○	○	×
Special relay	SM	Batch/Random	○	○	×
Special register	SD	Batch/Random	○	○	×
Link register	W	Batch/Random	○	○	×
Link special relay	SB	Batch/Random	○	○	×
Link special register	SW	Batch/Random	○	○	×
Intelligent function module device	Un\G	Batch/Random	×	○	×
Buffer memory					○*1
Intelligent function module access device					×

*1 : When accessing via CC-Link IE Field Network, the buffer memory can be accessed only by the mdRemBufWriteEx function or the mdRemBufReadEx function.

3.3.5 Access to other station buffer memory of CC-Link

The following table shows the accessible buffer memory of CC-Link network module and CC-LinkVer.2 board.
The multiple CPU system (when the logical station is specified) cannot be accessed.

○: Accessible ×: Not accessible

Device		Access type	Accessibility
Link special relay	SB	Batch	○
Link special register	SW	Batch	○
Remote input	RX	Batch	○
Remote output	RY	Batch	○
Remote register	RW	Batch	○
Buffer memory	—	Batch	○
Random access buffer	—	Batch	○

Point

When the own station number is 64, other station cannot be accessed. Only the own station can be accessed.

3.3.6 Access using the SEND function or the RECV function

The same operation as device access, the SEND function and the RECV function execute Batch write (mdSend, mdSendEx) or Batch read (mdReceive, mdReceiveEx) with specified device type for each function.

○: Accessible ×: Not accessible

Device	Access type	Access target	
		CPU module (QnA/Q/L/R)	PC interface board
RECV function	Batch	—	○ (Own station)
SEND function(with arrival acknowledgment)	Batch	○	○
SEND function(without arrival acknowledgment)			

Point

- The SEND function and the RECV function are not supported by CC-Link.
- The SEND function and the RECV function are supported by SW1DNC-MNETG-B Version 1.08J or later.
- The SEND function and the RECV function are not supported by the following modules:
  - A series CPU module
  - Ethernet adapter module
  - Head module

CHAPTER 4 FUNCTIONS

This chapter explains the MELSEC data link library functions.

4.1 List of Functions

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

(1) List of the functions

Function name	Description	Remarks	Reference
mdOpen	Opens a communication line.	—	Page 56, Section 4.3.1
mdClose	Closes a communication line.	—	Page 57, Section 4.3.2
mdSendEx	Batch writes devices.	(Extended function*3)	Page 58, Section 4.3.3
	Sends data. (SEND function)*1*2		
mdReceiveEx	Batch reads devices.	(Extended function*3)	Page 62, Section 4.3.4
	Receives data. (RECV function)*1*2		
mdRandWEx	Writes devices randomly.	(Extended function*3)	Page 66, Section 4.3.5
mdRandREx	Reads devices randomly.	(Extended function*3)	Page 69, Section 4.3.6
mdDevSetEx	Sets a bit device.	(Extended function*3)	Page 73, Section 4.3.7
mdDevRstEx	Resets a bit device.	(Extended function*3)	Page 75, Section 4.3.8
mdRemBufWriteEx	Writes data to the buffer memory of a remote device station.*4 *5 *6	(Extended function*3)	Page 77, Section 4.3.9
mdRemBufReadEx	Reads data from the buffer memory of a remote device station.*4 *5 *6	(Extended function*3)	Page 79, Section 4.3.10
mdTypeRead	Reads the type of programmable controller CPU.	—	Page 81, Section 4.3.11
mdControl	Remote operation of programmable controller CPU. (RUN/STOP/PAUSE).	—	Page 86, Section 4.3.12
mdWaitBdEvent	Waits for an event occurrence.	—	Page 87, Section 4.3.13
mdBdRst	Resets the board.	—	Page 90, Section 4.3.14
mdBdModSet	Sets the mode of the board.	—	Page 91, Section 4.3.15
mdBdModRead	Reads the mode of the board.	—	Page 93, Section 4.3.16
mdBdLedRead	Reads the LED information of the board.	—	Page 95, Section 4.3.17
mdBdSwRead	Reads the switch status of the board.	—	Page 101, Section 4.3.18
mdBdVerRead	Reads the version information of the board.	—	Page 103, Section 4.3.19
mdInit	Initializes programmable controller information table	—	Page 106, Section 4.3.20

*1 : Applicable to CC-Link IE Controller Network boards and CC-Link IE Field Network boards.
*2 : Supported by the 1.08J or later version of CC-Link IE Controller Network board.
*3 : A function in which the access range is extended according to the extension of the device points at the access target. It is accessible to all device numbers.
Use extended functions when creating a new program.
*4 : Applicable to CC-Link IE Field Network boards.
*5 : The functions can be used for CC-Link IE Field Network board with a serial number whose first five digits are '15102' or higher, and SW1DNC-CCIEF-B Ver. 1.06G or later.
*6 : Applicable only for 32-bit version user application.

(2) List of conventional compatible functions

Conventional compatible functions are functions used for programs created conventionally.

Function name	Description	Remarks	Reference
mdSend	Batch writes devices.	—	Page 107, Section 4.3.21
	Sends data. (SEND function)*1*2	—	
mdReceive	Batch reads devices.	—	Page 111, Section 4.3.22
	Receives data. (RECV function)*1*2	—	
mdRandW	Writes devices randomly.	—	Page 115, Section 4.3.23
mdRandR	Reads devices randomly.	—	Page 118, Section 4.3.24
mdDevSet	Sets a bit device.	—	Page 122, Section 4.3.25
mdDevRst	Resets a bit device.	—	Page 123, Section 4.3.26

*1 : Applicable to MELSECNET/H boards, CC-Link IE Controller Network boards, and CC-Link IE Field Network boards.
*2 : Supported by the 1.08J or later version of CC-Link IE Controller Network board.

Point

When using the conventional compatible functions, the accessible device numbers are from 0 to 32767.

4.2 Common Specifications of Functions

This section explains the definitions of arguments commonly used with the MELSEC data link library functions.

4.2.1 Specifying channel number

The following table shows the channels used with the MELSEC data link library.

Channel number	Channel name	Description
51	MELSECNET/H (1 slot)	MELSECNET/H board Channel number is set with MELSECNET/H utility.
52	MELSECNET/H (2 slot)	
53	MELSECNET/H (3 slot)	
54	MELSECNET/H (4 slot)	
81	CC-Link (1 slot)	CC-Link Ver.2 board Channel number is set with the channel number setting switch. The channels are set as follows according to the SW1 and SW2 settings: 81: Off, Off; 82: On, Off; 83: Off, On; 84: On, On
82	CC-Link (2 slot)	
83	CC-Link (3 slot)	
84	CC-Link (4 slot)	
151	CC-Link IE Controller Network (Channel No. 151)	CC-Link IE Controller Network board Channel number is set with CC IE Control utility.
152	CC-Link IE Controller Network (Channel No. 152)	
153	CC-Link IE Controller Network (Channel No. 153)	
154	CC-Link IE Controller Network (Channel No. 154)	
181	CC-Link IE Field Network (Channel No. 181)	CC-Link IE Field Network board Channel number is set with CC IE Field utility.
182	CC-Link IE Field Network (Channel No. 182)	
183	CC-Link IE Field Network (Channel No. 183)	
184	CC-Link IE Field Network (Channel No. 184)	

4.2.2 Specifying station numbers

The following tables show the station numbers specified in the MELSEC data link library.
For specifying network numbers and station numbers for extended functions, refer to☞ Page 50, Section 4.2.3.

(1) CC-Link Ver.2 board

Specification	Station number
Own station	255(FF$_H$)
Other station	0(00$_H$) to 63(3F$_H$)*1
The logical station number set with the utility	65(41$_H$) to 239(EF$_H$)

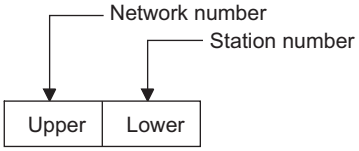
*1 : Station number 64 cannot be specified on the CC-Link Ver.2 board
Also, when the own station number is 64, other station cannot be specified. (Only the own station can be accessed.)

(2) MELSECNET/H board

Specification		Station number	
		Upper byte	Lower byte
Own station		255(FF$_H$)	
Other station	Station number	Network number*3 1(01$_H$) to 239(EF$_H$)	0(00$_H$)*4
			1(01$_H$) to 120(78$_H$)*5
			125(7D$_H$)*4
	Group number 1 to 32*1 *2		129(81$_H$) to 160(A0$_H$)
	All stations*1		240(F0$_H$)
The logical station number set with the utility		65(41$_H$) to 239(EF$_H$)	

*1 : All stations and group numbers can be specified when using the SEND function (mdSend) without arrival acknowledgment.
*2 : For MELSECNET/10 mode, only group numbers from 1 to 9 (129(81$_H$) to 137(89$_H$)) can be specified.
*3 : For specifying another station, set a network number in the upper byte of the station number.

<Setting a station number when another station is specified>



*4 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.
*5 : Station numbers from 65(41$_H$) to 120(78$_H$) can be specified when using CC-Link IE Controller Network.

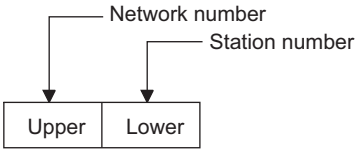
(3) CC-Link IE Controller Network board

Specification		Station number	
		Upper byte	Lower byte
Own station		255(FFH)	
Other station	Station number	Network number*2 1(01H) to 239(EFH)	0(00H)*3
			1(01H) to 120(78H)
			125(7DH)*3
	Group Number 1 to 32*1		129(81H) to 160(A0H)
	All stations*1		240(F0H)
The logical station number set with the utility		0(00H) to 239(EFH)	

*1 : All stations and group numbers can be specified when using the SEND function (mdSend) without arrival acknowledgment.

*2 : For specifying another station, set a network number in the upper byte of the station number.

<Setting a station number when another station is specified>



*3 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.

(4) CC-Link IE Field Network board

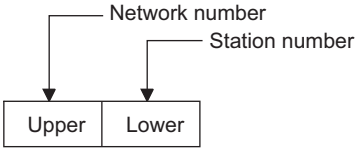
Specification		Station number	
		Upper byte	Lower byte
Own station		255(FFH)	
Other station	Station number	Network number.*3 1(01H) to 239(EFH)	0(00H)*4 to 120(78H)
			125(7DH)*4
	Group Number 1 to 32*1 *2		129(81H) to 160(A0H)
	All stations*1		240(F0H)
The logical station number set with the utility		0(00H) to 239(EFH)	

*1 : All stations and group numbers can be specified when using the SEND function (mdSend) without arrival acknowledgment.

*2 : Group numbers can be specified when using MELSECNET/H network or CC-Link IE Controller Network.

*3 : For specifying another station, set a network number in the upper byte of the station number.

<Setting a station number when another station is specified>



*4 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.

4.2.3 Specifying network numbers and station numbers for extended functions

The following tables show the network numbers and the station numbers used for extended functions in the MELSEC data link library. For specifying network numbers and station numbers for functions other than the extended functions, refer to ☞ Page 48, Section 4.2.2.

(1) For CC-Link Ver.2 board

Specification	Network numbers	Station number
Own station	0(00H)	255(FFH)
Other station		0(00H) to 63(3FH)*1
The logical station number set with the utility		65(41H) to 239(EFH)

*1 : Station number 64 cannot be specified on the CC-Link Ver.2 board.
Also, when the own station number is 64, other station cannot be specified. (Only the own station can be accessed.)

(2) For MELSECNET/H board

Specification		Network numbers	Station number
Own station		0(00H)	255(FFH)
Other station	Station number	1(01H) to 239(EFH)	0(00H)*1
			1(01H) to 120(78H)*2
			125(7DH)*1
The logical station number set with the utility		0(00H)	65(41H) to 239(EFH)

*1 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.
*2 : Station numbers from 65(41H) to 120(78H) can be specified when using CC-Link IE Controller Network.

(3) For CC-Link IE Controller Network board

Specification		Network numbers	Station number
Own station		0(00H)	255(FFH)
Other station	Station number	1(01H) to 239(EFH)	0(00H)*2
			1(01H) to120(78H)
			125(7DH)*2
	Group Number 1 to 32*1		129(81H) to160(A0H)
	All stations*1		240(F0H)
The logical station number set with the utility		0(00H)	0(00H) to 239(EFH)

*1 : All stations and group numbers can be specified when using the SEND function (mdSendEx) without arrival acknowledgment.
*2 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.

(4) For CC-Link IE Field Network board

Specification		Network numbers	Station number
Own station		0(00H)	255(FFH)
Other station	Station number	1(01H) to 239(EFH)	0(00H)*3 to120(78H)
			125(7DH)*3
	Group Number 1 to 32*1 *2		129(81H) to160(A0H)
	All stations*1		240(F0H)
The logical station number set with the utility		0(00H)	0(00H) to 239(EFH)

*1 : All stations and group numbers can be specified when using the SEND function (mdSendEx) without arrival acknowledgment.

*2 : Group numbers can be specified when using MELSECNET/H network or CC-Link IE Controller Network.

*3 : Access to the control station or master station (station number 0) specified with the network number on the network. When accessing the control station (operating as a control station) and the mater station (operating as a master station when using the submaster function), specify the station number.

4.2.4 Specifying device types

Device types specified in the MELSEC data link library can be either a code number or a device name.

(1) Link devices and buffer memory of own station

Device		Device type		
		Code specification		Device name specification
		Decimal	Hexadecimal	
Link input Remote input	LX RX	1	0001H	DevX
Link output Remote output	LY RY	2	0002H	DevY
Link special relay	SB	5	0005H	DevSM
Link special register	Sw	14	000EH	DevSD
Link relay	LB	23	0017H	DevB
Link register	LW	24	0018H	DevW
Remote register (for transmission)	RWw	36	0024H	DevWw
Remote register (for reception)	RWr	37	0025H	DevWr
Buffer memory	—	50	0032H	DevSPB
Random access buffer	—	33	0021H	DevMRB

(2) Devices of other station module

Device		Device type		
		Code specification		Device name specification
		Decimal	Hexadecimal	
Input	X	1	0001H	DevX
Output	Y	2	0002H	DevY
Latch relay	L	3	0003H	DevL
Internal relay	M	4	0004H	DevM
Special relay	SM	5	0005H	DevSM
Annunciator	F	6	0006H	DevF
Timer contact	T	7	0007H	DevTT
Timer coil	T	8	0008H	DevTC
Counter contact	C	9	0009H	DevCT
Counter coil	C	10	000AH	DevCC
Timer current value	T	11	000BH	DevTN
Counter current value	C	12	000CH	DevCN
Data register	D	13	000DH	DevD
Special register	SD	14	000EH	DevSD
Timer setting value main	T	15	000FH	DevTM
Timer setting value sub1	T	16	0010H	DevTS
Timer setting value sub2	T	16002	3E82H	DevTS2
Timer setting value sub3	T	16003	3E83H	DevTS3
Counter setting value main	C	17	0011H	DevCM
Counter setting value sub1	C	18	0012H	DevCS

Device		Device type		
		Code specification		Device name specification
		Decimal	Hexadecimal	
Counter setting value sub2	C	18002	4652H	DevCS2
Counter setting value sub3	C	18003	4653H	DevCS3
Accumulator	A	19	0013H	DevA
Index register	Z	20	0014H	DevZ
	V	21	0015H	DevV
File register *1	R	22	0016H	DevR
	ZR	220	00DCH	DevZR
Extended file register *1 *2	ER	22000 to 22256	55F0H to 56F0H	DevER0 to 256
Link relay	B	23	0017H	DevB
Link register	W	24	0018H	DevW
Link special relay	SB	25	0019H	DevQSB
Retentive timer contact	ST	26	001AH	DevSTT
Retentive timer coil	ST	27	001BH	DevSTC
Link special register	SW	28	001CH	DevQSW
Edge relay	V	30	001EH	DevQV
Retentive timer current value	ST	35	0023H	DevSTN
Long index register	LZ	38	0026H	DevLZ
Unit refresh register	RD	39	0027H	DevRD
Long Timer contact	LT	41	0029H	DevLTT
Long Timer coil	LT	42	002AH	DevLTC
Long Timer current value	LT	43	002BH	DevLTN
Long counter contact	LC	44	002CH	DevLCT
Long counter coil	LC	45	002DH	DevLCC
Long counter current value	LC	46	002EH	DevLCN
Long retentive timer contact	LST	47	002FH	DevSTT
Long retentive timer coil	LST	48	0030H	DevSTC
Long retentive timer current value	LST	49	0031H	DevSTN
Link direct device link input*1 *3	Jn\X	1001 to 1255	03E9H to 04E7H	DevLX1 to 255
Link direct device link output*1 *3	Jn\Y	2001 to 2255	07D1H to 08CFH	DevLY1 to 255
Link direct device link relay*1 *3	Jn\B	23001 to 23255	59D9H to 5AD7H	DevLB1 to 255
Link direct device link register*1 *3	Jn\W	24001 to 24255	5DC1 to 5EBFH	DevLW1 to 255
Link direct device link special relay*1 *3	Jn\SB	25001 to 25255	61A9H to 62A7H	DevLSB1 to 255
Link direct device link special register*1 *3	Jn\SW	28001 to 28255	6D61H to 6E5FH	DevLSW1 to 255
Intelligent function module device Buffer memory Intelligent function module access device *1 *4	Un\G	29000 to 29255	7148H to 7247H	DevSPG0 to 255

*1 : With the random read function (mdRandR, mdRandREx), execute normally even specifying devices that do not exist. With the random read function (mdRandR, mdRandREx), the function may complete normally if the specified devices do not exist. (The read data is error.)

*2 : Specify a block number (0 to 256) for the lower 3 digits of the code specification (decimal) and the numerical value of the device specification.

*3 : Specify a network number (1 to 255) for the lower 3 digits of the code specification (decimal) and the numerical value of the device specification.

*4 : Specify a value (start I/O number divided by 16) for the lower 3 digits of the code specification (decimal) and the numerical value of the device specification.

(3) Buffer memory of CC-Link other station

When accessing the buffer memory of CC-Link network module or other CC-Link Ver.2 board from CC-Link Ver.2 board, specify the following device type.

Device	Device type		
	Code specification		Device name specification
	Decimal	Hexadecimal	
Buffer memory*1	-32768	8000H	DevRBM
Random access buffer*1	-32736	8020H	DevRAB
Remote input*1	-32735	8021H	DevRX
Remote output*1	-32734	8022H	DevRY
Remote register*1	-32732	8024H	DevRW
Link special relay*1	-32669	8063H	DevSB
Link special register*1	-32668	8064H	DevSW

*1 : These devices can not be used for random write (mdRandW, mdRandWEx), random read (mdRandR, mdRandREx), bit set (mdDevSet, mdDevSetEx) and bit reset (mdDevRst, mdDevRstEx).

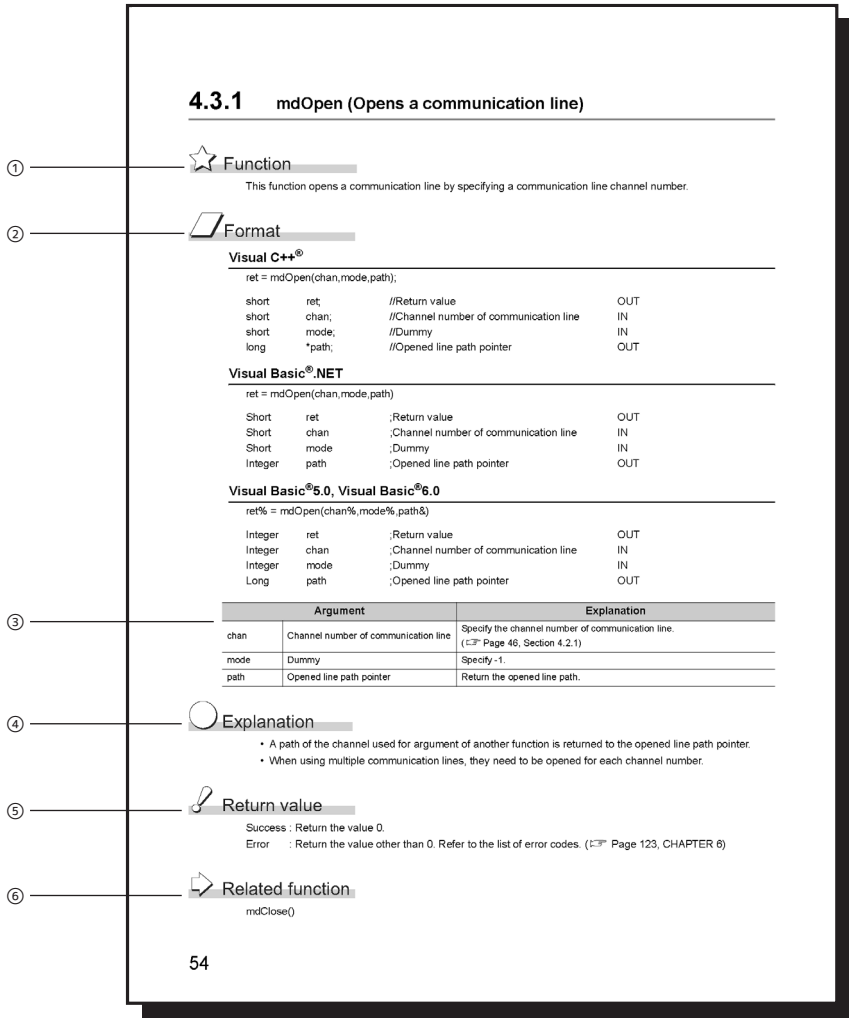
(4) The SEND function and the RECV function

The same operation as device access, the SEND function and the RECV function execute Batch write (mdSend, mdSendEx) or Batch read (mdReceive, mdReceiveEx) with specified device type for each function.

Device	Device type		
	Code specification		Device name specification
	Decimal	Hexadecimal	
RECV function	101	0065H	DevMAIL
SEND function (with arrival acknowledgment)			
SEND function (without arrival acknowledgment)	102	0066H	DevMAILNC

4.3 Function Details

The following shows the detailed specifications of the MELSEC data link library.
This section provides the description of the instructions in the layout as shown below.



① Indicates an description of the function.

② Indicates the description format in each programming language.

Item	Description
Visual C++®	A format for Microsoft ® Visual C++®
Visual Basic®.NET	A format for the following Visual Basic® • Visual Basic®.NET 2003 • Visual Studio® 2005 Visual Basic® • Visual Studio® 2008 Visual Basic® • Visual Studio® 2010 Visual Basic® • Visual Studio® 2012 Visual Basic® • Visual Studio® 2013 Visual Basic®
Visual Basic®5.0, Visual Basic®6.0	A format for the following Visual Basic® • Visual Basic® 5.0 • Visual Basic® 6.0

③ Describes arguments of the function.

④ Describes features of the function and details of arguments.

⑤ Indicates the return values.

⑥ Indicates related functions for programming.

4.3.1 mdOpen (opening communication lines)

Function

Open a communication line by specifying a channel number of communication line.

Format

Visual C++®

```
ret = mdOpen(chan,mode,path);

short   ret;    //Return value                          OUT
short   chan;   //Channel number of communication line  IN
short   mode;   //Dummy                                 IN
long    *path;  //Opened line path pointer              OUT
```

Visual Basic®.NET

```
ret = mdOpen(chan,mode,path)

Short   ret     ;Return value                          OUT
Short   chan    ;Channel number of communication line  IN
Short   mode    ;Dummy                                 IN
Integer path    ;Opened line path pointer              OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdOpen(chan%,mode%,path&)

Integer ret     ;Return value                          OUT
Integer chan    ;Channel number of communication line  IN
Integer mode    ;Dummy                                 IN
Long    path    ;Opened line path pointer              OUT
```

Argument		Description
chan	Channel number of communication line	Specify the channel number of communication line. (☞ Page 47, Section 4.2.1)
mode	Dummy	Specify -1.
path	Opened line path pointer	Return the opened line path.

Explanation

- A path of the channel used for argument of another function is returned to the opened line path pointer.
- When using multiple communication lines, opening for each channel number is necessary.

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdClose()

4.3.2 mdClose (closing communication lines)

Function

Close a communication line by specifying a communication line path.

Format

Visual C++®

```
ret = mdClose(path);

short   ret;    //Return value    OUT
long    path;   //Path of channel IN
```

Visual Basic®.NET

```
ret = mdClose(path)

Short   ret     ;Return value    OUT
Integer path    ;Path of channel IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdClose(path&)

Integer ret     ;Return value    OUT
Long    path    ;Path of channel IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)

Explanation

When using multiple communication lines, they need to be closed for each channel number.

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen()

4.3.3 mdSendEx (batch writing extended devices / SEND function)

(1) Batch writing extended devices

Function

Batch write data to the devices on the target station for the number of written data bytes from the start device number.

Format

Visual C++®

ret = mdSendEx(path,netno,stno,devtyp,devno,size,data);

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	devtyp;	//Device type	IN
long	devno;	//Start device number	IN
long	*size;	//Written byte size	IN/OUT
short	data[ ];	//Written data (single-precision integer array)	IN

Visual Basic®.NET

ret = mdSendEx(path,netno,stno,devtyp,devno,size,data(0))

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Start device number	IN
Integer	size	;Written byte size	IN/OUT
Short	data(n)	;Written data (single-precision integer array)	IN

Visual Basic®5.0, Visual Basic®6.0

ret% = mdSendEx(path&,netno%,stno%,devtyp%,devno%,size%,data%(0))

Long	ret	;Return value	OUT
Long	path	;Path of channel	IN
Long	netno	;Network number	IN
Long	stno	;Station number	IN
Long	devtyp	;Device type	IN
Long	devno	;Start device number	IN
Long	size	;Written byte size	IN/OUT
Any	data(n)	;Written data (single-precision integer array)	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
devtyp	Device type	Specify the type of device to which the data is written. (☞ Page 52, Section 4.2.4)
devno	Start device number	Specify the start device number of device to which the data is written. • Specify the start device number with a multiple of 8 for the access to a bit device (except for LTT, LTC, LSTT, and LSTC). • Specify the start device number with a multiple of 16 (0, 16, 32...) for the access to a bit device (RX, RY, SB) of CC-Link other station link device.
size	Written byte size	Specify the byte size to be written in even number. • When the specified byte size to be written exceeds the device range (-5: size error), the applicable size is returned to "size". • When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", specify the size in multiples of 4.
data	Written data (single-precision integer array)	Specify the data to be written in single-precision integer array.

Explanation

- When the specified written byte size exceeds the transient transmission size, data are divided inside the function and written.
- When accessing another station, the extended comment information will be deleted by writing data to the block (extended file register) to which the extended comment is assigned.
- When accessing another station, the sub2 and sub3 programs will be deleted by writing data to the block (extended file register) which overlaps with the setting areas of the sub2 and sub3 programs.
- When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", store the data to be written to "data" as follows:
  Example) When "devtyp" is LZ and "size" is 8

Array	Value
data(0)	Lower 1 word of LZ0
data(1)	Upper 1 word of LZ0
data(2)	Lower 1 word of LZ1
data(3)	Upper 1 word of LZ1

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdSend(), mdReceive(), mdReceiveEx()

(2) SEND function

Function

Send data to the specified channel number of the target station.

Format

Visual C++®

ret = mdSendEx(path,netno,stno,devtyp,devno,size,data);

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	devtyp;	//Device type	IN
long	devno;	//Channel number	IN
long	*size;	//Send byte size	IN/OUT
short	data[ ];	//Send data (single-precision integer array)	IN

Visual Basic®.NET

ret = mdSendEx(path,netno,stno,devtyp,devno,size,data(0))

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Channel number	IN
Integer	size	;Send byte size	IN/OUT
Short	data(n)	;Send data (single-precision integer array)	IN

Visual Basic®5.0, Visual Basic®6.0

ret% = mdSendEx(path&, netno%,stno%,devtyp%,devno%,size%,data%(0))

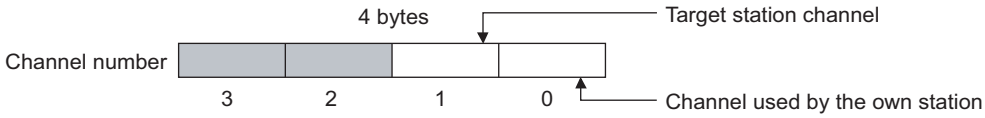
Long	ret	;Return value	OUT
Long	path	;Path of channel	IN
Long	netno	;Network number	IN
Long	stno	;Station number	IN
Long	devtyp	;Device type	IN
Long	devno	;Channel number	IN
Long	size	;Send byte size	IN/OUT
Any	data(n)	;Send data (single-precision integer array)	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3) Logical station numbers cannot be specified.
devtyp	Device type	Specify whether to send data with arrival acknowledgment or without arrival acknowledgment. • With arrival acknowledgment*1 : Specify 101(65H) • Without arrival acknowledgment: Specify 102(66H)
devno	Channel number	Specify a channel used by the own station and a target station channel. For details of specifying the channels, refer to Explanation shown below.
size	Send byte size	Specify the byte size of send data in even number. • Specify the byte size within the range of 2 to 1920. • When accessing via MELSECNET/10 network, specify the byte size within the range of 2 to 960.
data	Send data (single-precision integer array)	Specify the data to be written in single-precision integer array.

*1 : Do not specify all stations or group numbers for the station number when sending data with arrival acknowledgment.

Explanation

- This function supports the SEND instruction of the link dedicated instruction.
  For details of the functions , refer to the manuals of each board.
- The following explains how to specify the channel numbers.



Item	Description	
target station channel	Specify a target station channel. • MELSECNET/H board, CC-Link IE Controller Network board • CC-Link IE Field Network board	 1 to 8 1 to 2
channel used by the own station	Specify a channel used by the own station. • CC-Link IE Controller Network board • CC-Link IE Field Network board	 1 to 8 1 to 2

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdSend(), mdReceive(), mdReceiveEx()

4.3.4 mdReceiveEx (batch reading extended devices / RECV function)

(1) Batch reading extended devices

Function

Batch read data from the devices on the target station for the number of read data bytes from the start device number.

Format

Visual C++®

ret = mdReceiveEx(path,netno,stno,devtyp,devno,size,data);

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	devtyp;	//Device type	IN
long	devno;	//Start device number	IN
long	*size;	//Read byte size	IN/OUT
short	data[ ];	//Read data (single-precision integer array)	OUT

Visual Basic®.NET

ret = mdReceiveEx(path,netno,stno,devtyp,devno,size,data(0))

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Start device number	IN
Integer	size	;Read byte size	IN/OUT
Short	data(n)	;Read data (single-precision integer array)	OUT

Visual Basic®5.0, Visual Basic®6.0

ret% =mdReceiveEx(path&,netno%,stno%,devtyp%,devno%,size%,data%(0))

Long	ret	;Return value	OUT
Long	path	;Path of channel	IN
Long	netno	;Network number	IN
Long	stno	;Station number	IN
Long	devtyp	;Device type	IN
Long	devno	;Start device number	IN
Long	size	;Read byte size	IN/OUT
Any	data(n)	;Read data (single-precision integer array)	OUT

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
devtyp	Device type	Specify the type of device from which the data is read. (☞ Page 52, Section 4.2.4)
devno	Start device number	Specify the start device number of device range to be read. • Specify the start device number with a multiple of 8 for the access to a bit device (except for LTT, LTC, LSTT, and LSTC). • Specify the start device number with a multiple of 16 (0, 16, 32...) for the access to a bit device (RX, RY, SB) of CC-Link other station link device.
size	Read byte size	Specify the byte size to be read in even number. • When the specified byte size to be read exceeds the device range (-5: size error), the applicable size is returned to "size". • When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", specify the size in multiples of 4.
data	Read data (single-precision integer array)	Store the data being read.

Explanation

When the specified read byte size exceeds the transient transmission size, data are divided inside the function and read.

When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", the data is stored to "data" as follows:

Example) When "devtyp" is LZ and "size" is 8

Array	Value
data(0)	Lower 1 word of LZ0
data(1)	Upper 1 word of LZ0
data(2)	Lower 1 word of LZ1
data(3)	Upper 1 word of LZ1

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdReceive(), mdSend(), mdSendEx()

(2) RECV function

Function

Read data of the specified channel number from the data which are received by the own station.

Format

Visual C++®

ret = mdReceiveEx(path,netno,stno,devtyp,devno,size,data);

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	devtyp;	//Device type	IN
long	devno;	//Channel number	IN
long	*size;	//Receive byte size	IN/OUT
short	data[ ];	//Receive data (single-precision integer array)	OUT

Visual Basic®.NET

ret = mdReceiveEx(path,netno,stno,devtyp,devno,size,data(0))

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Channel number	IN
Integer	size	;Receive byte size	IN/OUT
Short	data(n)	;Receive data(single-precision integer array)	OUT

Visual Basic®5.0, Visual Basic®6.0

ret% = mdReceiveEx(path&, netno%,stno%,devtyp%,devno%,size%,data%(0))

Long	ret	;Return value	OUT
Long	path	;Path of channel	IN
Long	netno	;Network number	IN
Long	stno	;Station number	IN
Long	devtyp	;Device type	IN
Long	devno	;Channel number	IN
Long	size	;Receive byte size	IN/OUT
Any	data(n)	;Receive data(single-precision integer array)	OUT

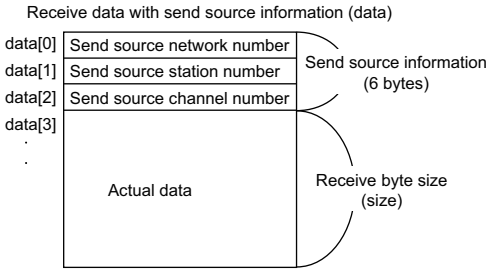
Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify 0(0H).
stno	Station number	Specify the own station (255(FFH)).
devtyp	Device type	Specify the RECV function(101(65H)).
devno	Channel number	Specify the own station channel number on which the received messages are stored. • CC-Link IE Controller Network board 1 to 8 • CC-Link IE Field Network board 1 to 2
size	Receive byte size	Specify the byte size of received data in even number. • Specify the byte size within the range of 2 to 1920. • When receiving the data which are transmitted by MELSECNET/H board with CC-Link IE Controller Network board or CC-Link IE Controller Network board, specify within the range of 2 to 960. The size of received actual data is received.
data	Receive data with send source information (single-precision integer array)	Received actual data and send source information are stored as single-precision integer array. Reserve an area for the specified receive byte size and send source information (6 bytes).

Explanation

This function supports the RECV instruction of the link dedicated instruction.
For details of the function, refer to the manuals of each board.

< Receive data with send source information (data) >

- Receive byte size and send source information (6 bytes) are stored in “receive data with send source information (data)”. Reserve an area for [receive byte size and send source information (6 bytes)] in “receive data with send source information (data)”.
- Data are stored in “receive data with send source information (data)” as shown below.



- Only the actual data with the specified receive byte size (size) is stored when the received actual data size is greater than the specified receive byte size (size).
- 125(7DH) is stored to the send source station number when the station number of the send source is 0.

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdReceive(), mdSend(), mdSendEx()

4.3.5 mdRandWEx (writing extended devices randomly)

Function

Write data to the devices on the target station specified with the randomly-specified devices.

Format

Visual C++®

```
ret = mdRandWEx(path,netno,stno,dev,buf,bufsize);

long    ret;     //Return value                              OUT
long    path;    //Path of channel                           IN
long    netno;   //Network number                            IN
long    stno;    //Station number                            IN
long    dev[ ];  //Randomly-specified device                 IN
short   buf[ ];  //Written data (single-precision integer array)  IN
long    bufsize; //Dummy                                     IN
```

Visual Basic®.NET

```
ret = mdRandWEx(path,netno,stno,dev(0),buf(0),bufsize)

Integer  ret     ;Return value                              OUT
Integer  path    ;Path of channel                           IN
Integer  netno   ;Network number                            IN
Integer  stno    ;Station number                            IN
Integer  dev(n)  ;Randomly-specified device                 IN
Short    buf(n)  ;Written data (single-precision integer array)  IN
Integer  bufsize ;Dummy                                     IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdRandWEx(path&,netno%,stno%,dev%(0),buf%(0),bufsize%)

Long  ret     ;Return value                              OUT
Long  path    ;Path of channel                           IN
Long  netno   ;Network number                            IN
Long  stno    ;Station number                            IN
Long  dev(n)  ;Randomly-specified device                 IN
Any   buf(n)  ;Written data (single-precision integer array)  IN
Long  bufsize ;Dummy                                     IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station.(☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station.(☞ Page 50, Section 4.2.3)
dev	Randomly-specified device	Specify the number of blocks, the device type, the start device number, and points of device to be written. For details, refer to Explanation shown on the next page.
buf	Written data (single-precision integer array)	Specify the data to be written to the array variable of buf[0] or later.
bufsize	Dummy	—

Explanation

- The number of transient transmissions performed inside of the function changes with the specified randomly-specified devices.
- A longer function processing time is required for the random write function as compared with the batch write function. Consider using the batch write function if a shorter function processing time is required.
- When accessing another station, the extended comment information will be deleted by writing data to the block (extended file register) to which the extended comment is assigned.
- When accessing another station, the sub2 and sub3 programs will be deleted by writing data to the block (extended file register) which overlaps with the setting areas of the sub2 and sub3 programs.
- If an error occurs when writing devices randomly to B or W of the own station in MELSECNET(II) or MELSECNET/10, blocks with errors may exist among blocks in which the write function is normally completed.

- The following explains how to specify the randomly-specified devices (dev).

Randomly-specified devices (dev)

dev[0] ····· Number of blocks
dev[1] ····· Device type of block number 1
dev[2] ····· Start device number of block number 1 — Block number 1
dev[3] ····· Points of block number 1
dev[4] ····· Device type of block number 2
dev[5] ····· Start device number of block number 2 — Block number 2
dev[6] ····· Points of block number 2
:
:

The number of blocks that can be specified is within 1 to 32767.

- The following shows an example when writing data to multiple devices.
Example) When all bits of M100 to M115 are set to OFF, and 10, 200, 300, and 400 are written to D10, D11, D12, and D13 respectively.

Randomly-specified devices (dev)

dev[0]=2; ····· Two specified ranges (M100 to M115, D10 to D13)
dev[1]=DevM; } ··· M100 and later
dev[2]=100; }
dev[3]=16; ····· 16 points (M100 to M115)
dev[4]=DevD; } ··· D10 and later
dev[5]=10; }
dev[6]=4; ····· 4 points (D10 to D13)

Written data (buf)

buf[0]=0; ····· All bits are OFF.
buf[1]=10; ····· Stores 10 to D10.
buf[2]=200; ····· Stores 11 to D200.
buf[3]=300; ····· Stores 12 to D300.
buf[4]=400; ····· Stores 13 to D400.

• The following shows an example when writing data to one of the double word devices (LZ, LTN, LCN, or LSTN).
Example) When writing 0x1 to LCN100 and 0x10000 to LCN101

```
Randomly-specified devices (dev)
        dev[0]=1; ····· One specified range (LCN100 to LCN101)
        dev[1]=DevLCN;
        dev[2]=100;     } ···LCN100 and later
        dev[3]=2; ·····2 points (LCN100 to LCN101)

Written data (buf)
        buf[0]=0x1;····· Lower 1 word of LCN100.
        buf[1]=0x0;····· Upper 1 word of LCN100.
        buf[2]=0x0;····· Lower 1 word of LCN101.
        buf[3]=0x1;····· Upper 1 word of LCN101.
```

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRandREx()

4.3.6 mdRandREx (reading extended devices randomly)

Function

Read the device specified with the randomly-specified devices from the target station.

Format

Visual C++®

```
ret = mdRandREx(path,netno,stno,dev,buf,bufsize);
```

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	dev[ ];	//Randomly-specified device	IN
short	buf[ ];	//Read data (single-precision integer array)	OUT
long	bufsize;	//Number of bytes of read data	IN

Visual Basic®.NET

```
ret = mdRandREx(path,netno,stno,dev(0),buf(0),bufsize)
```

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	dev(n)	;Randomly-specified device	IN
Integer	dev(n)	;Randomly selected device	IN
Short	buf(n)	;Read data (single-precision integer array)	OUT
Integer	bufsize	;Number of bytes of read data	IN

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdRandREx(path&,netno%,stno%,dev%(0),buf%(0),bufsize%)
```

Long	ret	;Return value	OUT
Long	path	;Path of channel	IN
Long	netno	;Network number	IN
Long	stno	;Station number	IN
Long	dev(n)	;Randomly-specified device	IN
Any	buf(n)	;Read data (single-precision integer array)	OUT
Long	bufsize	;Number of bytes of read data	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
dev	Randomly-specified device	Specify the number of blocks, the device type, the start device number, and points of device to be read. For details, refer to Explanation shown on the next page.
buf	Read data (single-precision integer array)	Store the read data to the array variable of buf[0] or later. For details of checking the read data, refer to Explanation shown on the next page.
bufsize	Number of bytes of read data	Specify the number of bytes of read data. For details of values to be specified, refer to Explanation shown on the next page.

Explanation

- The number of transient transmissions performed inside of the function changes with the specified randomly selected devices.
- A longer function processing time is required for the random read function as compared with the batch read function. Consider using the batch read function if a shorter function processing time is required.
- The following explains how to specify the randomly-specified devices (dev).

Randomly-specified devices (dev)

dev[0]……Number of blocks
dev[1]……Device type of block number 1
dev[2]……Start device number of block number 1 — Block number 1
dev[3]……Points of block number 1
dev[4]……Device type of block number 2
dev[5]……Start device number of block number 2 — Block number 2
dev[6]……Points of block number 2
:
:

The number of blocks that can be specified is within 1 to 32767.

- The following shows an example when reading multiple devices.

  Example) When reading the values of M100 to M115, D10 to D13, M0 to M13, and the current value of T10.

  M100 to M115 All bits are OFF.
  D10 to D13 10 for D10, 200 for D11, 300 for D12, and 400 for D13
  M0 to M13 All bits are ON.
  Current value of T10 10 (1 second) for the current value of T10
  Note that the above values are presumed values in the current status of the target devices.

Randomly-specified devices (dev)

```
dev[0]=4;          Four specified ranges
                    (M100 to M115, D10 to D13, M0 to M13, T10)
dev[1]=DevM;       }
dev[2]=100;        } ··· M100 and later
dev[3]=16;         16 points (M100 to M115)
dev[4]=DevD;       }
dev[5]=10;         } ··· D10 and later
dev[6]=4;          4 points (D10 to D13)
dev[7]=DevM;       }
dev[8]=0;          } ··· M0 and later
dev[9]=14;         14 points (M0 to M13)
dev[10]=DevTN;     }
dev[11]=10;        } ··· Current and later values of T10 timer
dev[12]=1;         1 point (T10)
```

Number of bytes of read data (bufsize)

Specify the number of bytes of array variable buf[ ] which stores the read data.
(buf[0] to buf[6] = 7) x 2 = 14 bytes
Enter "14" for this example.

Read data (buf)

```
buf[0]=0; ····· All bits of M100 to M115 are OFF
                (16 points 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 of M0 to M13 are ON
buf[6]=10; ····· Current value of T10 is 10 (1 second).
```

• The following shows an example when reading data from one of the double word devices (LZ, LTN, LCN, or LSTN).
Example) When reading current values of LCN100 and LCN101
(LCN100 is 0x1 and LCN101 is 0x10000)

Randomly-specified devices (dev)

dev[0]=1; One specified range (LCN100 to LCN101)
dev[1]=DevLCN; } LCN100 and later
dev[2]=100; }
dev[3]=2; … 2 points (LCN100 to LCN101)

Number of bytes of read data (bufsize)

Specify the number of bytes of array variable buf[ ] which stores the read data.
(buf[1] to buf[4] = 4) x 2 = 8 bytes
Enter "8" for this example.

Read data (buf)

buf[0]=0x1; …… Lower 1 word of LCN100.
buf[1]=0x0; …… Upper 1 word of LCN100.
buf[2]=0x0; …… Lower 1 word of LCN101.
buf[3]=0x1; …… Upper 1 word of LCN101.

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRandWEx()

4.3.7 mdDevSetEx (setting extended bit devices)

Function

Set the specified bit device on the target station (to ON).

Format

Visual C++®

```
ret = mdDevSetEx(path,netno,stno,devtyp,devno);

long    ret;    //Return value              OUT
long    path;   //Path of channel           IN
long    netno;  //Network number            IN
long    stno;   //Station number            IN
long    devtyp; //Device type               IN
long    devno;  //Specified device number   IN
```

Visual Basic®.NET

```
ret = mdDevSetEx(path,netno,stno,devtyp,devno)

Integer  ret    ;Return value              OUT
Integer  path   ;Path of channel           IN
Integer  netno  ;Network number            IN
Integer  stno   ;Station number            IN
Integer  devtyp ;Device type               IN
Integer  devno  ;Specified device number   IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdDevSetEx(path&,netno%,stno%,devtyp%,devno%)

Long  ret    ;Return value              OUT
Long  path   ;Path of channel           IN
Long  netno  ;Network number            IN
Long  stno   ;Station number            IN
Long  devtyp ;Device type               IN
Long  devno  ;Specified device number   IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
devtyp	Device type	Specify the type of device to be set (ON). (☞ Page 52, Section 4.2.4)
devno	Specified device number	Specify the device number of device to be set (ON).

Explanation

This function is a dedicated function for bit devices such as link relays (B) and internal relays (M).

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdDevRstEx()

4.3.8 mdDevRstEx (resetting extended bit devices)

Function

Reset the specified bit device on the target station (to OFF).

Format

Visual C++®

```
ret = mdDevRstEx(path,netno,stno,devtyp,devno);

long    ret;    //Return value                OUT
long    path;   //Path of channel             IN
long    netno;  //Network number              IN
long    stno;   //Station number              IN
long    devtyp; //Device type                 IN
long    devno;  //Specified device number     IN
```

Visual Basic®.NET

```
ret = mdDevRstEx(path,netno,stno,devtyp,devno)

Integer  ret    ;Return value                OUT
Integer  path   ;Path of channel             IN
Integer  netno  ;Network number              IN
Integer  stno   ;Station number              IN
Integer  devtyp ;Device type                 IN
Integer  devno  ;Specified device number     IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdDevRstEx(path&,netno%,stno%,devtyp%,devno%)

Long  ret    ;Return value                OUT
Long  path   ;Path of channel             IN
Long  netno  ;Network number              IN
Long  stno   ;Station number              IN
Long  devtyp ;Device type                 IN
Long  devno  ;Specified device number     IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
devtyp	Device type	Specify the type of device to be reset (OFF). (☞ Page 52, Section 4.2.4)
devno	Specified device number	Specify the device number of device to be reset (OFF).

Explanation

This function is a dedicated function for bit devices such as link relays (B) and internal relays (M).

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdDevSetEx()

4.3.9 mdRemBufWriteEx (writing data to buffer memory of remote device station)

Function

Write data to the buffer memory of a target station (remote device station of CC-Link IE Field Network).

Format

Visual C++®

```
ret = mdRemBufWriteEx (path,netno,stno,offset,size,data);

long    ret;    //Return value                              OUT
long    path;   //Path of channel                          IN
long    netno;  //Network number                           IN
long    stno;   //Station number                           IN
long    offset; //Offset                                   IN
long    *size;  //Written byte size                        IN
short   data[]; //Written data (single-precision integer array)  IN
```

Visual Basic®.NET

```
ret = mdRemBufWriteEx (path,netno,stno,offset,size,data(0))

Integer   ret     ;Return value                             OUT
Integer   path    ;Path of channel                          IN
Integer   netno   ;Network number                           IN
Integer   stno    ;Station number                           IN
Integer   offset  ;Offset                                   IN
Integer   size    ;Written byte size                        IN
Short     data(n) ;Written data (single-precision integer array)  IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
offset	Offset	Specify the start address of the remote device station buffer memory to be written.
size	Written byte size	Specify the byte size to be written in even number (2 to 480).
data	Written data (single-precision integer array)	Specify the data to be written in single-precision integer array.

Explanation

- This function writes data only to the buffer memory of the remote device station on a CC-Link IE Field Network.
  Data cannot be written to the buffer memory of an intelligent function module controlled by a CC-Link IE Field Network Head module.
  When writing data to an intelligent function module controlled by a CC-Link IE Field Network Head module, use mdSendEx/mdSend function.
- Be sure that the write byte size from offset does not exceed the buffer memory range of the remote device station. Failure to do so may cause a timeout error.
  For the buffer memory range of a remote device station, refer to the manuals of each remote device station.
- This function is applicable only for 32-bit version user application.

Return value

Success: Return the value 0.
Error: Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRemBufReadEx()

4.3.10 mdRemBufReadEx (reading data from buffer memory of remote device station)

Function

Read data from the buffer memory of a target station (remote device station of CC-Link IE Field Network).

Format

Visual C++®

ret = mdRemBufReadEx (path,netno,stno,offset,size,data);

long	ret;	//Return value	OUT
long	path;	//Path of channel	IN
long	netno;	//Network number	IN
long	stno;	//Station number	IN
long	offset;	//Offset	IN
long	*size;	//Read byte size	IN
short	data[];	//Read data (single-precision integer array)	OUT

Visual Basic®.NET

ret = mdRemBufReadEx (path,netno,stno,offset,size,data(0))

Integer	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Integer	netno	;Network number	IN
Integer	stno	;Station number	IN
Integer	offset	;Offset	IN
Integer	size	;Read byte size	IN
Short	data(n)	;Read data (single-precision integer array)	OUT

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
netno	Network number	Specify the network number of target station. (☞ Page 50, Section 4.2.3)
stno	Station number	Specify the station number of target station. (☞ Page 50, Section 4.2.3)
offset	Offset	Specify the start address of the remote device station buffer memory to be read.
size	Read byte size	Specify the byte size to be read in even number (2 to 480).
data	Read data (single-precision integer array)	Specify the data to be read in single-precision integer array.

Explanation

- This function reads data only from the buffer memory of the remote device station on a CC-Link IE Field Network.
  Data cannot be read from the buffer memory of an intelligent function module controlled by a CC-Link IE Field Network Head module.
  When reading data from an intelligent function module controlled by a CC-Link IE Field Network Head module, use mdSendEx/mdSend function.
- Be sure that the read byte size from offset does not exceed the buffer memory range of the remote device station. Failure to do so may cause a timeout error.
  For the buffer memory range of a remote device station, refer to the manuals of each remote device station.
- This function is applicable only for 32-bit version user application.

Return value

Success: Return the value 0.
Error: Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRemBufWriteEx()

4.3.11 mdTypeRead (reading model names of CPU)

Function

Read a model name codeof the CPU on the target station.

Format

Visual C++®

```
ret = mdTypeRead(path,stno,buf);

short   ret;    //Return value          OUT
long    path;   //Path of channel       IN
short   stno;   //Station number        IN
short   *buf;   //Model name code       OUT
```

Visual Basic®.NET

```
ret = mdTypeRead(path,stno,buf)

Short   ret     ;Return value           OUT
Integer path    ;Path of channel        IN
Short   stno    ;Station number         IN
Short   buf     ;Model name code        OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdTypeRead(path&,stno%,buf%)

Integer ret     ;Return value           OUT
Long    path    ;Path of channel        IN
Integer stno    ;Station number         IN
Integer buf     ;Model name code        OUT
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2)
buf	Model name code	Return the model name code of CPU being read. For details of the model name code of CPU being read, refer to Explanation shown on the next page.

Explanation

The following table shows the model name codes and corresponding model names.

• MELSEC iQ-R series

Model name code (Hexadecimal)	Model name
4800H	R04CPU
4801H	R08CPU
4802H	R16CPU
4803H	R32CPU
4804H	R120CPU

• MELSEC-L series

Model name code (Hexadecimal)	Model name
0541H	L02CPU
0543H	L02SCPU
0544H	L06CPU
0545H	L26CPU
0548H	L26CPU-BT
0549H	L02CPU-P
054AH	L26CPU-PBT
054BH	L26CPU-P
054CH	L02SCPU-P
054DH	L06CPU-P
0641H	LJ72GF15-T2

• MELSEC-Q series

Model name code (Hexadecimal)	Model name
0041H	Q02CPU, Q02HCPU
0042H	Q06HCPU
0043H	Q12HCPU
0044H	Q25HCPU
0049H	Q12PHCPU
004AH	Q25PHCPU
004BH	Q12PRHCPU
004CH	Q25PRHCPU
004DH	Q02PHCPU
004EH	Q06PHCPU
0141H	Q02CPU (A mode), Q02HCPU (A mode)
0142H	Q06HCPU (A mode)
0250H	Q00JCPU
0251H	Q00CPU
0252H	Q01CPU
0260H	Q00UJCPU
0261H	Q00UCPU
0262H	Q01UCPU

Model name code (Hexadecimal)	Model name
0263H	Q02UCPU
0266H	Q10UDHCPU
0267H	Q20UDHCPU
0268H	Q03UDCPU
0269H	Q04UDHCPU
026AH	Q06UDHCPU
026BH	Q13UDHCPU
026CH	Q26UDHCPU
02E6H	Q10UDEHCPU
02E7H	Q20UDEHCPU
02E8H	Q03UDECPU
02E9H	Q04UDEHCPU
02EAH	Q06UDEHCPU
02EBH	Q13UDEHCPU
02ECH	Q26UDEHCPU
02EDH	Q50UDEHCPU
02EEH	Q100UDEHCPU
0366H	Q03UDVCPU
0367H	Q04UDVCPU
0368H	Q06UDVCPU
036AH	Q13UDVCPU
036CH	Q26UDVCPU
2010H	Q172CPU, Q172CPUN, Q172CPUN-T
2012H	Q172HCPU
2011H	Q173CPU, Q173CPUN, Q173CPUN-T
2013H	Q173HCPU
2014H	Q172DCPU
2015H	Q173DCPU
2018H	Q172DSCPU
2019H	Q173DSCPU

• MELSEC-QnA series

Model name code (Hexadecimal)	Model name
0021H	Q2ACPU, Q2AHCPU, Q2ASCPU, Q2ASHCPU
0022H	Q2ACPU-S1, Q2AHCPU-S1, Q2ASCPU-S1, Q2ASHCPU-S1
0023H	Q3ACPU
0024H	Q4ACPU, Q4ARCPU

• MELSEC-A series

Model name code (Hexadecimal)	Model name
0082H	A2UCPU, A2USCPU
0083H	A2UCPU-S1, A2USCPU-S1
0084H	A3UCPU, A2USHCPU-S1
0085H	A4UCPU
0092H	A2ACPU
0093H	A2ACPU-S1

Model name code (Hexadecimal)	Model name
0094H	A3ACPU
0098H	A0J2HCPU, A1SCPU, A1SJCPU
009AH	A2CCPU, A2CJCPU
00A0H	A0J2CPU
00A1H	A1CPU, A1NCPU
00A2H	A2CPU, A2NCPU, A2SCPU
00A3H	A3CPU, A3NCPU, A1SHCPU, A1SJHCPU, A2SHCPU, A2SH1CPU
00A4H	A3HCPU, A3MCPU

• Others

Model name code (Hexadecimal)	Model name
0090H	Q80BD-J71GF11-T2, Q81BD-J71GF11-T2 Q80BD-J71GP21-SX, Q80BD-J71GP21S-SX, Q81BD-J71GP21-SX, Q81BD-J71GP21S-SX Q80BD-J71LP21-25, Q81BD-J71LP21-25, Q80BD-J71LP21S-25, Q80BD-J71LP21G, Q80BD-J71LP21GE, Q80BD-J71BR11 Q80BD-J61BT11N, Q81BD-J61BT11
0642H	NZ2GF-ETB

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.12 mdControl (remote RUN/STOP/PAUSE)

Function

Remotely operate a CPU on the target station. (Remote RUN/STOP/PAUSE)

Format

Visual C++®

```
ret = mdControl(path,stno,buf);

short   ret;    //Return value      OUT
long    path;   //Path of channel   IN
short   stno;   //Station number     IN
short   buf;    //Command code      IN
```

Visual Basic®.NET

```
ret = mdControl(path,stno,buf)

Short   ret     ;Return value       OUT
Integer path    ;Path of channel    IN
Short   stno    ;Station number     IN
Short   buf     ;Command code       IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdControl(path&,stno%,buf%)

Integer ret     ;Return value       OUT
Long    path    ;Path of channel    IN
Integer stno    ;Station number     IN
Integer buf     ;Command code       IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station.(☞ Page 48, Section 4.2.2)
buf	Command code	Specify the command code (remote RUN/STOP/PAUSE) for remote operation of CPU. For details, refer to Explanation shown below.

Explanation

The following table shows the command codes and the corresponding descriptions.

Command code	Description
0	Remote RUN
1	Remote STOP
2	Remote PAUSE

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.13 mdWaitBdEvent (waiting for event occurrence)

Function

Wait an occurrence of event until the time out.

Format

Visual C++®

ret = mdWaitBdEvent(path, eventno, timeout, signaledno, details);

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	eventno[ ];	//Waiting event number	IN
long	timeout;	//Timeout value	IN
short	*signaledno;	//Driven event number	OUT
short	details[4];	//Event detail information	OUT

Visual Basic®.NET

ret = mdWaitBdEvent(path, eventno(0), timeout, signaledno, details(0))

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	eventno(n)	;Waiting event number	IN
Integer	timeout	;Timeout value	IN
Short	signaledno	;Driven event number	OUT
Short	details(4)	;Event detail information	OUT

Visual Basic®5.0, Visual Basic®6.0

ret% = mdWaitBdEvent(path&,eventno%(0),timeout&,signaledno%,details%(0))

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	eventno(n)	;Waiting event number	IN
Long	timeout	;Timeout value	IN
Integer	signaledno	;Driven event number	OUT
Integer	details(4)	;Event detail information	OUT

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
eventno	Waiting event number	Specify the event number of event to wait. (Use the event number set in the utility.)
timeout	Timeout value	Specify the time until time out to wait the event.
signaledno	Driven event number	Return the occurred event number.
details	Event detail information	Store the bit pattern or device value when the conditions of device are satisfied. Reserve the variable for 4 words.

Explanation

- This function waits the occurrence of the event specified by the waiting event number on the specified channel for a period of time out.

Timeout value	Description
-1	Indefinitely waiting
0	No wait
0 to 2147483647($7FFFFFFF_H$)	Millisecond waiting

- Waiting event number (eventno) is specified as follows.

```
Waiting event (eventno)
        eventno[0]      Number of waiting events (1 to 64)
        eventno[1]      Waiting event number (0 to 63)·····1st event
        eventno[2]      Waiting event number (0 to 63)·····2nd event
          :
        eventno[64]     Waiting event number (0 to 63)·····64th event
```

- The following is an example when waiting the multiple events simultaneously.
  Example) When waiting the event No. 1, No. 5, and No. 12 simultaneously.

```
Waiting event (eventno)
        eventno[0]=3;     Number of waiting events (3)
        eventno[1]=1;     Waiting event number (1) ····· 1st event
        eventno[2]=5;     Waiting event number (5) ····· 2nd event
        eventno[3]=12;    Waiting event number (12)····· 3rd event
```

  When the No. 5 interrupt event occurs, 5 is returned to "signaledno".

- Values stored to the event detail information (details) are as follows depending on whether the specified device of the occurred event condition is a bit device or a word device.

  ①Bit device

  A bit pattern which indicates the condition-satisfied device is stored to the event detail information.

  - 1 is set to the bits that correspond to the condition-satisfied device.
  - 1 is set to the first bit at the condition satisfaction because device points cannot be specified with the CC-Link IE Field Network board.
  - 0 is set to the bits other than the corresponding bits when the device point is less than 64.

```
Event detail information (details)
        details[0]  1st to 16th point    bit0: 1st point····· bit15: 16th point
        details[1]  17th to 32nd point   bit0: 17th point····· bit15: 32nd point
        details[2]  33rd to 48th point   bit0: 33rd point····· bit15: 48th point
        details[3]  49th to 64th point   bit0: 49th point····· bit15: 64th point
```

②Word device

Device values at the condition satisfaction are stored to the event detail information.

Event detail information (details)	
details[0]	Device value when the condition is satisfied.
details[1]	0
details[2]	0
details[3]	0

③RECV function (CC-Link IE Field Network board)

The information on received data is stored to the event detail information.

Event detail information (details)	
details[0]	Receive channel (1 to 2)
details[1]	0
details[2]	0
details[3]	0

- When the event does not occur within the timeout time, a timeout error is returned as a return value.

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

Point

- If the data link is not executed properly, an event does not occur.
- When the device assigned by "Network range assignment" is not used, an event does not occur.
- This function returns immediately if the event has already occurred when it is called.
- Create a program to avoid calling this function from multiple processes with specifying same event number of the same channel number simultaneously. If executed, "Event number registration overlap error -63 (FFC1H)" of return value is returned to the process that called this function later.
- Lengthen the occurrence interval of the event up to extent where the user program can process satisfactorily.
- This function returns "The event is not set error -67 (FFBDH)" of return value if executed without the event setting.
- When the board or the master station (control station) is reset during the execution of this function, the function returns "Event initialization error -66 (FFBEH)" of return value.
- When multiple or more events occur simultaneously, either of events is detected first.
  When this function is executed again, the other events are detected.
- When the events whose number is the same occur multiple times, "Execution result of this function" and "Value details[ ] stored" of "Bit device" and "Word device" are as follows.
  ①Bit device
  This function ends normally.
  "Logical add in the bit pattern of each driven event" is stored in "details[ ]".
  ②Word device
  This function returns "The driven event overlapped. -70(FFBAH)".
  The device value when the condition of the event that occurred first is satisfied is stored in "details[0]".
- This function is a dedicated function for CC-Link IE Controller Network board and CC-Link IE Field Network board.
  If channel path of another board is specified, an error occurs.
  (☞ Page 133, CHAPTER 6)

4.3.14 mdBdRst (resetting board)

Function

Reset a board.

Format

Visual C++®

```
ret = mdBdRst(path);

short   ret;    //Return value    OUT
long    path;   //Path of channel IN
```

Visual Basic®.NET

```
ret = mdBdRst(path)

Short   ret     ;Return value    OUT
Integer path    ;Path of channel IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdRst(path&)

Integer ret     ;Return value    OUT
Long    path    ;Path of channel IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)

Explanation

- The board is reset to the current settings with the utility function.
  (The same process as that of the board reset operation of the utility function.)
- The board reset error (9922_H) which notifies the board reset is returned to other applications accessing the reset board.

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.15 mdBdModSet (setting modes of board)

Function

Change the modes of a board temporarily.

Format

Visual C++®

```
ret = mdBdModSet(path,mode);

short   ret;    //Return value      OUT
long    path;   //Path of channel   IN
short   mode;   //Mode              IN
```

Visual Basic®.NET

```
ret = mdBdModSet(path,mode)

Short   ret     ;Return value       OUT
Integer path    ;Path of channel    IN
Short   mode    ;Mode               IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdModSet(path&,mode%)

Integer ret     ;Return value       OUT
Long    path    ;Path of channel    IN
Integer mode    ;Mode               IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
mode	Mode	Specify the code corresponding to the mode to be executed. For details of modes and the corresponding codes, refer to Explanation shown on the next page.

Explanation

- The board is reset when this function is executed.
- Reset the board or restart the personal computer to recover the mode set in the utility.
- The following table shows the modes and the corresponding codes.

Code	Description			
	CC-Link Ver.2	MELSECNET/H	CC-Link IE Controller Network	CC-Link IE Field Network
0000H	Online(with automatic return)	Online(with automatic return)	Online	Online(normal mode)
0001H	—	—	—	Online(high-speed mode)*1
0002H	Offline	Offline	Offline	Offline
0003H	Data link test	Forward loop test*2	—	—
0004H	Remote station test	Reverse loop test*2	—	—
0005H	Setting parameter check mode	Station-to-station test (executing stations)*2	Station-to-station test*2	—
0006H	Hardware test	Station-to-station test (target stations)*2	Loop test*2	Loop test*1*3
0007H	Not applicable	Self-loopback test*2	Self-loopback test*2	Self-loopback test*3
0008H	—	Self-loopback test (internal)*2	—	—
0009H	—	Hardware test*2	Hardware test*2	Hardware test*3
000EH	—	—	Bus interface test*2	Bus interface test*4
0010H	—	—	—	Memory test*4

*1 : Cannot be set when the target board is local station.
*2 : For the test method and check method of the test result, refer to the manuals of each board.
*3 : For the test method, refer to the manuals of each board.
For the test result, check with the values of the link special relays/link special registers of each board.
*4 : Check the test result with the return value.

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdBdModRead()

4.3.16 mdBdModRead (reading modes of board)

Function

Read the mode in which the board is currently operating.

Format

Visual C++®

```
ret = mdBdModRead(path,mode);

short   ret;    //Return value      OUT
long    path;   //Path of channel   IN
short   *mode;  //Mode              OUT
```

Visual Basic®.NET

```
ret = mdBdModRead(path,mode)

Short   ret     ;Return value       OUT
Integer path    ;Path of channel    IN
Short   mode    ;Mode               OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdModRead(path&,mode%)

Integer ret     ;Return value       OUT
Long    path    ;Path of channel    IN
Integer mode    ;Mode               OUT
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
mode	Mode	Return the corresponding code to the mode being read. For details of codes being read, refer to Explanation shown on the next page.

Explanation

- When the mdBdModSet( ) function is executed and the mode of the board is changed temporarily, the mode set in the utility is read instead of the currently operating mode.
- The following table shows the modes and the corresponding codes.

Code	Description			
	CC-Link Ver.2	MELSECNET/H	CC-Link IE Controller Network	CC-Link IE Field Network
0000H	Online(with automatic return)	Online(with automatic return)	Online	Online(normal mode)
0001H	—	—	—	Online(high-speed mode)
0002H	Offline	Offline	Offline	Offline
0003H	Data link test	Forward loop test	—	—
0004H	Remote station test	Reverse loop test	—	—
0005H	Setting parameter check mode	Station-to-station test (executing stations)	Station-to-station test	—
0006H	Hardware test	Station-to-station test (target stations)	Loop test	Loop test
0007H	Not applicable	Self-loopback test	Self-loopback test	Self-loopback test
0008H	—	Self-loopback test (internal)	—	—
0009H	—	Hardware test	Hardware test	Hardware test
000EH	—	—	Bus interface test	Bus interface test
0010H	—	—	—	Memory test

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdBdModSet()

4.3.17 mdBdLedRead (read LED information of the board)

Function

Read the LED information of the board.

Format

Visual C++®

```
ret = mdBdLedRead(path,buf);

short   ret;    //Return value      OUT
long    path;   //Path of channel   IN
short   buf[ ]; //Read data          OUT
```

Visual Basic®.NET

```
ret = mdBdLedRead(path,buf(0))

Short   ret     ;Return value       OUT
Integer path    ;Path of channel    IN
Short   buf(n)  ;Read data          OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdLedRead(path&,buf%(0))

Integer ret     ;Return value       OUT
Long    path    ;Path of channel    IN
Integer buf(n)  ;Read data          OUT
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
buf	Read data	Store the LED information being read. For details of stored LED information, refer to Explanation shown on the next page.

Explanation

The following table shows the LED information.

When the LED is flashing, the status at read is stored. For details of the LED, refer to the manual of each board.

CC-Link Ver.2 Board

Element	Bit	LED	Description	Note
buf[0]	b15-9	RESERVE	—	—
	b8	ERR	Display the detection status of communication error for all stations. 1: Detected 0: Not detected	ON:1 OFF:0
	b7-1	RESERVE	—	—
	b0	RUN	Display the operating status of board. 1: Operating normally 0: Board WDT error	ON:1 OFF:0
buf[1]	b15-1	RESERVE	—	—
	b0	SW	Display the detection status of switch setting error. 1: Detected 0: Not detected	ON:1 OFF:0
buf[2]	b15-9	RESERVE	—	—
	b8	PRM	Display the detection status of parameter error. 1: Detected 0: Not detected	ON:1 OFF:0
	b7-1	RESERVE	—	—
	b0	M/S	Display the detection status of master station duplication error. 1: Detected 0: Not detected	ON:1 OFF:0
buf[3]	b15-9	RESERVE	—	—
	b8	LINE	Display the detection status of cable disconnection error. 1: Detected 0: Not detected	ON:1 OFF:0
	b7-1	RESERVE	—	—
	b0	TIME	Display the error detection status when the data link monitoring timer is operated. 1: Detected 0: Not detected	ON:1 OFF:0
buf[4]	b15-9	RESERVE	—	—
	b8	L.ERR	Display the detection status of communication error. 1: Detected 0: Not detected	ON:1 OFF:0
	b7-1	RESERVE	—	—
	b0	L.RUN	Display the data link execution status. 1: Data link in operation 0: No data link	ON:1 OFF:0
buf[5]	b15-9	RESERVE	—	—
	b8	RD	Display the data reception status. 1: Data are being received. 0: Data not received.	ON:1 OFF:0
	b7-1	RESERVE	—	—
	b0	SD	Display the data sending status. 1: Data are being transmitted. 0: Data not transmitted.	ON:1 OFF:0

MELSECNET/H Board

Element	Bit	LED	Description	Note
buf[0]	b15	R.LOOP OVER	Display the detection status of data import delay error on the reverse loop side. 1: Detected 0: Not detected	ON:1 OFF:0
	b14	F.LOOP CRC	Display the detection status of code check error on the forward loop side. 1: Detected 0: Not detected	
	b13	R.LOOP CRC	Display the detection status of code check error on the reverse loop side. 1: Detected 0: Not detected	
	b12	F.LOOP	Display the detection status of loop line error on the forward loop side. 1: Detected 0: Not detected	
	b11	R.LOOP	Display the detection status of loop line error on the reverse loop side. 1: Detected 0: Not detected	
	b10	F.LOOP RD	Display the data reception status on the forward loop side. 1: Data are being received. 0: Data not received.	
	b9	R.LOOP RD	Display the data reception status on the reverse loop side. 1: Data are being received. 0: Data not received.	
	b8	F.LOOP SD	Display the data sending status on the forward loop side. 1: Data are being transmitted. 0: Data not transmitted.	
	b7	R.LOOP SD	Display the data sending status on the reverse loop side. 1: Data are being transmitted. 0: Data not transmitted.	
	b6	S.MNG	Display the station type. 1: Operating as a sub control station 0: Other than sub control station	
	b5	MNG	Display the station type. 1: Operating as a control station. 0: Other than control station	
	b4	D.LINK	Display the data link status (cyclic transmission status). 1: Data link in operation 0: No data link	
	b3	T.PASS	Display the baton pass status. 1: Baton pass in progress 0: No baton pass	
	b2	PRM.E.	Display the detection status of parameter error. 1: Detected 0: Not detected	
	b1	SW.E.	Display the detection status of switch setting error. 1: Detected 0: Not detected	
	b0	RUN	Display the operating status of board. 1: Operating normally 0: Hardware error or Board WDT error	

Element	Bit	LED	Description	Note
buf[1]	b15-10	RESERVE	—	—
	b9	M/S.E.	Display the detection status of station number or control station duplication error on the same network. 1: Detected 0: Not detected	ON:1 OFF:0
	b8	F.LOOP UNDER	Display the error detection status when the internal processing of send data is not performed on the forward loop side at regular intervals. 1: Detected 0: Not detected	
	b7	R.LOOP UNDER	Display the error detection status when the internal processing of send data is not performed on the reverse loop side at regular intervals. 1: Detected 0: Not detected	
	b6	F.LOOP DATA	Display the error detection status when the error data whose size is 2K bytes or more is received on the forward loop side. 1: Detected 0: Not detected	
	b5	R.LOOP DATA	Display the error detection status when the error data whose size is 2K bytes or more is received on the reverse loop side. 1: Detected 0: Not detected	
	b4	F.LOOP TIME	Display the error detection status when the data link monitoring timer is operated on the forward loop side. 1: Detected 0: Not detected	
	b3	R.LOOP TIME	Display the error detection status when the data link monitoring timer is operated on the reverse loop side. 1: Detected 0: Not detected	
	b2	F.LOOP AB.IF	Display the error detection status when receiving "1" more than specified number of times continuously, or the received data length is too short on the forward loop side. 1: Detected 0: Not detected	
	b1	R.LOOP AB.IF	Display the error detection status when receiving "1" more than specified number of times continuously, or the received data length is too short on the reverse loop side. 1: Detected 0: Not detected	
	b0	F.LOOP OVER	Display the detection status of data import delay error on the forward loop side. 1: Detected 0: Not detected	

CC-Link IE Controller Network

Element	Bit	LED	Description	Note
buf[0]	b15	EXT.PW	Display the external power supply status of CC-Link IE Controller Network module with external power supply function. 1: External power supply is being supplied. 0: External power supply is not supplied.	ON:1 OFF:0
	b7-14	RESERVE	—	—
	b6	RD	Display the data reception status. 1: Data are being received. 0: Data not received.	ON:1 OFF:0
	b5	D.LNK	Display the data link status (cyclic transmission status). 1: Data link in operation 0: No data link	
	b4	PRM	Display the detection status of parameter error. 1: Detected 0: Not detected	
	b3	ERR.	Display the error detection status. 1: Detected 0: Not detected	
	b2	SD	Display the data sending status. 1: Data are being transmitted. 0: Data not transmitted.	
	b1	MODE	Display the operating mode. 1: Operating in online mode 0: Operating in offline mode	
	b0	RUN	Display the operating status of board. 1: Operating normally 0: Hardware error or Board WDT error	
buf[1]	B15-0	RESERVE	—	—

CC-Link IE Field Network

Element	Bit	LED	Description	Note
buf[0]	b15-12	RESERVE	—	—
	b11	LNK2	Display the link status of PORT2. 1: Linkup in progress 0: Linkdown in progress	ON:1 OFF:0
	b10	LNK1	Display the link status of PORT1. 1: Linkup in progress 0: Linkdown in progress	
	b9	LER2	Display the frame loss status of PORT2. 1: Frame loss occurring 0: No frame loss	
	b8	LER1	Display the frame loss status of PORT1. 1: Frame loss occurring 0: No frame loss	
	b7	MODE	Display the operating mode. 1: Operating in online mode 0: Operating in offline mode	
	b6	RD	Display the network reception status. 1: Data are being received. 0: Data not received.	
	b5	SD	Display the network sending status. 1: Data are being transmitted. 0: Data not transmitted.	
	b4	L.ERR	Display the detection status of communication error. 1: Detected 0: Not detected	
	b3	ERR.	Display the detection status of network board error. 1: Detected 0: Not detected	
	b2	D.LINK	Display the data link status (cyclic transmission status). 1: Data link in operation 0: No data link	
	b1	MST	Display the station type. 1: Operating as the master station. 0: Other than master station	
	b0	RUN	Display the operating status of board. 1: Operating normally 0: A board WDT error is occurring or the board is resetting.	
buf[1]	B15-0	RESERVE	—	—

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.18 mdBdSwRead (reading switch status of the board)

Function

Read a board switch status (such as station number setting, board number setting, board identification, and I/O address setting information).

Format

Visual C++®

```
ret = mdBdSwRead(path,buf);

short   ret;    //Return value    OUT
long    path;   //Path of channel IN
short   buf[ ]; //Read data       OUT
```

Visual Basic®.NET

```
ret = mdBdSwRead(path,buf(0))

Short   ret     ;Return value    OUT
Integer path    ;Path of channel IN
Short   buf(n)  ;Read data       OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdSwRead(path&,buf%(0))

Integer ret     ;Return value    OUT
Long    path    ;Path of channel IN
Integer buf(n)  ;Read data       OUT
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
buf	Read data	Store the board switch status being read. For details of the stored switch status, refer to Explanation shown on the next page.

Explanation

The board switch status (such as station number setting, board number setting, board identification, I/O address setting information) is read.

Element	Item	Description			
		CC-Link Ver.2	MELSECNET/H	CC-Link IE Controller Network	CC-Link IE Field Network
buf[0]	Setting value of station number	0 to 64 (0:master station)	1 to 64	1 to 120	0 to 120
buf[1]	Setting value of group number	0 fixed	MNET/10 mode 0 to 9 MNET/H mode 0 to 32	0 to 32	0 fixed
buf[2]	Setting value of network number	0 fixed	1 to 239	1 to 239	1 to 239
buf[3]	RESERVE	0 fixed	0 fixed	0 fixed	0 fixed
buf[4]	RESERVE	0 fixed	0 fixed	0 fixed	0 fixed
buf[5]	RESERVE	0 fixed	0 fixed	0 fixed	0 fixed

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.19 mdBdVerRead (read version information of the board)

Function

Read the version information of the board.

Format

Visual C++®

```
ret = mdBdVerRead(path,buf);

short   ret;    //Return value      OUT
long    path;   //Path of channel   IN
short   buf[ ]; //Read data          OUT
```

Visual Basic®.NET

```
ret = mdBdVerRead(path,buf(0))

Short   ret     ;Return value       OUT
Integer path    ;Path of channel    IN
Short   buf(n)  ;Read data          OUT
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdBdVerRead(path&,buf%(0))

Integer ret     ;Return value       OUT
Long    path    ;Path of channel    IN
Integer buf(n)  ;Read data          OUT
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
buf	Read data	Store the version information of board being read. For details of the stored version information, refer to Explanation shown on the next page.

Explanation

The following table shows the details of the version information.

Offset (word)	Item	Description							
		CC-Link Ver.2		MELSECNET/H	CC-Link IE Controller Network		CC-Link IE Field Network	
00H	Fixed value	'S', 'G' fixed		'S', 'G' fixed	'S', 'G' fixed		'S', 'G' fixed	
01H	Checksum	Sum of 02H to 0FH		Sum of 02H to 0FH	Sum of 02H to 0FH		Sum of 02H to 0FH	
02H	Software version	'A' to 'ZZ'		'0A' to '9Z'	'0A' to '9Z'		'0A' to '9Z'	
03H to 05H	Date	Date year / month / day Example)2010/2/1 '1' '0' '0' '2' '0' '1'		Date year / month / day Example)2010/2/1 '1' '0' '0' '2' '0' '1'	Date year / month / day Example)2010/2/1 '1' '0' '0' '2' '0' '1'		Date year / month / day Example)2010/2/1 '1' '0' '0' '2' '0' '1'	
06H to 07H	Reservation area (4 bytes)	000H fixed		000H fixed	000H fixed		000H fixed	
08H to 0FH	Software model name (16 bytes)	'QJ61BT11N'		'QJ71LP21-25' 'QJ71LP21S-2' 'QJ71LP21G' 'QJ71BR11'	'QJ71GP21-SX' 'QJ71GP21S-SX'		'QJ71GF11-T2'	
10H to 17H	Hardware model name (16 bytes)	'Q80BD-J61BT11N' 'Q81BD-J61BT11'		'Q80BD-J71LP21-25' 'Q81BD-J71LP21-25' 'Q80BD-J71LP21S-25' 'Q80BD-J71LP21G' 'Q80BD-J71LP21GE' 'Q80BD-J71BR11'	'Q80BD-J71GP21' 'Q80BD-J71GP21S' 'Q81BD-J71GP21' 'Q81BD-J71GP21S'		'Q80BD-J71GF11-T2' 'Q81BD-J71GF11-T2'	
18H	2 port memory possession size	0200H(512K bytes)		0080H(128K bytes)	0180H(384K bytes)		0080H(128K bytes)	
19H	2 port attribute	0080H fixed		0080H fixed	0080H fixed		0080H fixed	
1AH	Applicable offset	0000H fixed		0000H fixed	0000H fixed		0000H fixed	
1BH to 1FH	Machine classification (10 bytes)	1BH (L)	Function version ('A', 'B'...)	0000H fixed	1BH (L)	Function version ('A', 'B'...)	1BH (L)	Function version ('A', 'B'...)
		1BH (H)	Major version of CC-Link (0002H)		1BH (H)	0000H fixed	1BH (H)	0000H fixed
		1CH (L)	Minor version of CC-Link (0000H)		1CH to 1FH	0000H fixed	1CH to 1FH	0000H fixed
		1CH (H)	0000H fixed					
		1DH to 1FH	0000H fixed					

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.20 mdInit (initializing programmable controller information table)

Function

Reflesh a programmable controller device address table which is the internal data of the MELSEC data link library.

Format

Visual C++®

```
ret = mdInit(path);

short   ret;    //Return value    OUT
long    path;   //Path of channel IN
```

Visual Basic®.NET

```
ret = mdInit(path)

Short   ret     ;Return value    OUT
Integer path    ;Path of channel IN
```

Visual Basic®5.0, Visual Basic®6.0

```
ret% = mdInit(path&)

Integer ret     ;Return value    OUT
Long    path    ;Path of channel IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)

Explanation

Programmable controller device information acquired at the initial access to the programmable controller CPU is discarded.

After the execution of the mdInit function, programmable controller device information is reacquired at the initial access to the programmable controller CPU.

Therefore, after the execution of the mdInit function, a longer function execution time is required at the initial access.

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose()

4.3.21 mdSend (batch writing devices / SEND function)

(1) Batch writing devices

Function

Batch write data to the devices on the target station for the number of written data bytes from the start device number.

Format

Visual C++®

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

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	devtyp;	//Device type	IN
short	devno;	//Start device number	IN
short	*size;	//Written byte size	IN/OUT
short	data[ ];	//Written data (single-precision integer array)	IN

Visual Basic®.NET

ret = mdSend(path,stno,devtyp,devno,size,data(0))

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	devtyp	;Device type	IN
Short	devno	;Start device number	IN
Short	size	;Written byte size	IN/OUT
Short	data(n)	;Written data (single-precision integer array)	IN

Visual Basic®5.0, Visual Basic®6.0

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

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Start device number	IN
Integer	size	;Written byte size	IN/OUT
Integer	data(n)	;Written data (single-precision integer array)	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2)
devtyp	Device type	Specify the type of device to which the data is written. (☞ Page 52, Section 4.2.4)
devno	Start device number	Specify the start device number of device to which the data is written. • Specify the start device number with a multiple of 8 for the access to a bit device (except for LTT, LTC, LSTT, and LSTC). • Specify the start device number with a multiple of 16 (0, 16, 32...) for the access to a bit device (RX, RY, SB) of CC-Link other station link device.
size	Written byte size	Specify the byte size to be written in even number. • When the specified byte size to be written exceeds the device range (-5: size error), the applicable size is returned to "size". • When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", specify the size in multiples of 4.
data	Written data (single-precision integer array)	Specify the data to be written in single-precision integer array.

Explanation

- When the specified written byte size exceeds the transient transmission size, data are divided inside the function and written.
- When accessing another station, the extended comment information will be deleted by writing data to the block (extended file register) to which the extended comment is assigned.
- When accessing another station, the sub2 and sub3 programs will be deleted by writing data to the block (extended file register) which overlaps with the setting areas of the sub2 and sub3 programs.
- When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", store the data to be written to "data" as follows:
  Example) When "devtyp" is LZ and "size" is 8

Array	Value
data(0)	Lower 1 word of LZ0
data(1)	Upper 1 word of LZ0
data(2)	Lower 1 word of LZ1
data(3)	Upper 1 word of LZ1

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdSendEx(), mdReceive(), mdReceiveEx()

(2) SEND function

Function

Send data to the specified channel number on the target station.

Format

Visual C++®

```
ret = mdSend(path,stno,devtyp,devno,size,data);
```

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	devtyp;	//Device type	IN
short	devno;	//Channel number	IN
short	*size;	//Send byte size	IN/OUT
short	data[ ];	//Send data (single-precision integer array)	IN

Visual Basic®.NET

```
ret = mdSend(path,stno,devtyp,devno,size,data(0))
```

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	devtyp	;Device type	IN
Short	devno	;Channel number	IN
Short	size	;Send byte size	IN/OUT
Short	data(n)	;Send data (single-precision integer array)	IN

Visual Basic®5.0, Visual Basic®6.0

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

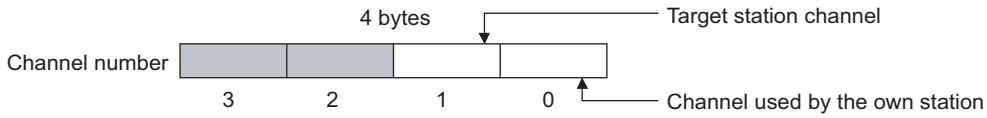
Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Channel number	IN
Integer	size	;Send byte size	IN/OUT
Any	data(n)	;Send data (single-precision integer array)	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2) Logical station numbers cannot be specified.
devtyp	Device type	Specify whether to send data with arrival acknowledgment or without arrival acknowledgment. • With arrival acknowledgment *1 : Specify 101(65H) • Without arrival acknowledgment : Specify 102(66H)
devno	Channel number	Specify a channel used by the own station and a target station channel. For details of specifying the channels, refer to Explanation shown below.
size	Send byte size	Specify the byte size of send data in even number. • Specify the byte size within the range of 2 to 1920. • When receiving the data which are transmitted by MELSECNET/H board with CC-Link IE Controller Network board or CC-Link IE Controller Network board, specify within the range of 2 to 960. • When accessing via MELSECNET/10 network, specify the byte size within the range of 2 to 960.
data	Send data (single-precision integer array)	Specify the data to be written in single-precision integer array.

*1 : Do not specify all stations or group numbers for the station number when sending data with arrival acknowledgement.

Explanation

- This function supports the SEND instruction of the link dedicated instruction.
  For details of the functions , refer to the manuals of each board.
- The following explains how to specify the channel numbers.



Item	Description	
Target station channel	Specify a target station channel. MELSECNET/H board, CC-Link IE Controller Network board CC-Link IE Field Network board	 1 to 8 1 to 2
Channel used by the own station	Specify a channel used by the own station. MELSECNET/H board, CC-Link IE Controller Network board CC-Link IE Field Network board	 1 to 8 1 to 2

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdSend(), mdReceive(), mdReceiveEx()

4.3.22 mdReceive (batch read devices / RECV function)

(1) Batch reading devices

Function

Batch read data from the devices on the target station for the number of read data bytes from the start device number.

Format

Visual C++®

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

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	devtyp;	//Device type	IN
short	devno;	//Start device number	IN
short	*size;	//Read byte size	IN/OUT
short	data[ ];	//Read data (single-precision integer array)	OUT

Visual Basic®.NET

ret = mdReceive(path,stno,devtyp,devno,size,data(0))

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	devtyp	;Device type	IN
Short	devno	;Start device number	IN
Short	size	;Read byte size	IN/OUT
Short	data(n)	;Read data (single-precision integer array)	OUT

Visual Basic®5.0, Visual Basic®6.0

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

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Start device number	IN
Integer	size	;Read byte size	IN/OUT
Integer	data(n)	;Read data (single-precision integer array)	OUT

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2)
devtyp	Device type	Specify the type of device from which the data is read. (☞ Page 52, Section 4.2.4)
devno	Start device number	Specify the start device number of device range to be read. • Specify the start device number with a multiple of 8 for the access to a bit device (except for LTT, LTC, LSTT, and LSTC). • Specify the start device number with a multiple of 16 (0, 16, 32...) for the access to a bit device (RX, RY, SB) of CC-Link other station link device.
size	Read byte size	Specify the byte size to be read in even number. • When the specified byte size to be read exceeds the device range (-5: size error), the applicable size is returned to "size". • When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", specify the size in multiples of 4.
data	Read data (single-precision integer array)	Store the data being read.

Explanation

When the specified read byte size exceeds the transient transmission size, data are divided inside the function and read.

- When a double word device (LZ, LTN, LCN, or LSTN) is specified to "devtyp", the data is stored to "data" as follows:

  Example) When "devtyp" is LZ and size is 8

Array	Value
data(0)	Lower 1 word of LZ0
data(1)	Upper 1 word of LZ0
data(2)	Lower 1 word of LZ1
data(3)	Upper 1 word of LZ1

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdReceiveEx(), mdSend(), mdSendEx()

(2) RECV function

Function

Read data of the specified channel number from the data which are received by the own station.

Format

Visual C++®

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

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	devtyp;	//Device type	IN
short	devno;	//Channel number	IN
short	*size;	//Receive byte size	IN/OUT
short	data[ ];	//Receive data (single-precision integer array)	OUT

Visual Basic®.NET

ret = mdReceive(path,stno,devtyp,devno,size,data(0))

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	devtyp	;Device type	IN
Short	devno	;Channel number	IN
Short	size	;Receive byte size	IN/OUT
Short	data(n)	;Receive data (single-precision integer array)	OUT

Visual Basic®5.0, Visual Basic®6.0

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

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	devtyp	;Device type	IN
Integer	devno	;Channel number	IN
Integer	size	;Receive byte size	IN/OUT
Integer	data(n)	;Receive data (single-precision integer array)	OUT

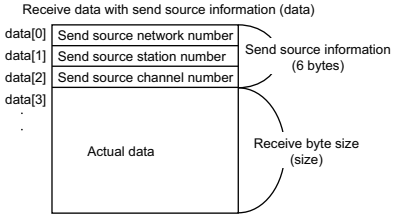
Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the own station (255(FF$_H$)).
devtyp	Device type	Specify the RECV function(101(65$_H$)).
devno	Channel number	Specify the own station channel number on which the received messages are stored. • MELSECNET/H board, CC-Link IE Controller Network board 1 to 8 • CC-Link IE Field Network board 1 to 2
size	Receive byte size	Specify the byte size of received data in even number. • Specify the byte size within the range of 2 to 1920. • When accessing via MELSECNET/10 network, specify the byte size within the range of 2 to 960. • When receiving the data which are transmitted by MELSECNET/H board with CC-Link IE Controller Network board or CC-Link IE Controller Network board, specify within the range of 2 to 960. • The size of actual received data is received.
data	Receive data with send source information (single-precision integer array)	Received actual data and send source information are stored as single-precision integer array. Reserve an area for the specified receive byte size and send source information (6 bytes).

Explanation

This function supports the RECV instruction of the link dedicated instruction.
For details of the function, refer to the manuals of each board.

< Receive data with send source information (data) >

- Receive byte size and send source information (6 bytes) are stored in “receive data with send source information (data)”. Reserve an area for [receive byte size and send source information (6 bytes)] in “receive data with send source information (data)”.
- Data are stored in “receive data with send source information (data)” as shown below.



- Only the actual data with the specified receive byte size (size) is stored when the received actual data size is greater than the specified receive byte size (size).
- 125(7D$_H$) is stored to the send source station number when the station number of the send source is 0.

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdReceiveEx(), mdSend(), mdSendEx()

4.3.23 mdRandW (writing devices randomly)

Function

Write data to the devices on the target station specified with the randomly-specified devices.

Format

Visual C++®

```
ret = mdRandW(path,stno,dev,buf,bufsize);
```

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	dev[ ];	//Randomly-specified device	IN
short	buf[ ];	//Written data (single-precision integer array)	IN
short	bufsize;	//Dummy	IN

Visual Basic®.NET

```
ret = mdRandW(path,stno,dev(0),buf(0),bufsize)
```

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	dev(n)	;Randomly-specified device	IN
Short	buf(n)	;Written data (single-precision integer array)	IN
Short	bufsize	;Dummy	IN

Visual Basic®5.0, Visual Basic®6.0

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

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	dev(n)	;Randomly-specified device	IN
Any	buf(n)	;Written data (single-precision integer array)	IN
Integer	bufsize	;Dummy	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2)
dev	Randomly-specified device	Specify the number of blocks, the device type, the start device number, and points of device to be written. For details, refer to Explanation shown on the next page.
buf	Written data (single-precision integer array)	Specify the data to be written in single-precision integer array.
bufsize	Dummy	—

Explanation

- The number of transient transmissions performed inside of the function changes with the specified randomly-specified devices.
- A longer function processing time is required for the random write function as compared with the batch write function. Consider using the batch write function if a shorter function processing time is required.
- When accessing another station, the extended comment information will be deleted by writing data to the block (extended file register) to which the extended comment is assigned.
- When accessing another station, the sub2 and sub3 programs will be deleted by writing data to the block (extended file register) which overlaps with the setting areas of the sub2 and sub3 programs.
- If an error occurs when writing devices randomly to B or W of the own station in MELSECNET(II) or MELSECNET/10, blocks with errors may exist among blocks in which the write function is normally completed.

- The following explains how to specify the randomly-specified devices (dev)

Randomly-specified devices (dev)

dev[0]……Number of blocks
dev[1]……Device type of block number 1
dev[2]……Start device number of block number 1 — Block number 1
dev[3]……Points of block number 1
dev[4]……Device type of block number 2
dev[5]……Start device number of block number 2 — Block number 2
dev[6]……Points of block number 2
:
:

The number of blocks that can be specified is within 1 to 32767.

- The following shows an example when writing data to multiple devices.
  Example) When all bits of M100 to M115 are set to OFF, and 10, 200, 300, and 400 are written to D10, D11, D12, and D13 respectively

Randomly-specified devices (dev)

dev[0]=2; …… Two specified ranges (M100 to M115, D10 to D13)
dev[1]=DevM; } …M100 and later
dev[2]=100; }
dev[3]=16;…… 16 points (M100 to M115)
dev[4]=DevD; } …D10 and later
dev[5]=10; }
dev[6]=4; …… 4 points (D10 to D13)

Written data (buf)

buf[0]=0; ……All bits are OFF.
buf[1]=10; ……Stores 10 to D10.
buf[2]=200; ……Stores 11 to D200.
buf[3]=300; ……Stores 12 to D300.
buf[4]=400; ……Stores 13 to D400.

- The following shows an example when writing data to one of the double word devices (LZ, LTN, LCN, or LSTN).
  Example) When writing 0x1 to LCN100 and 0x10000 to LCN101

```
Randomly-specified devices (dev)
        dev[0]=1; ·····  One specified range (LCN100 to LCN101)
        dev[1]=DevLCN;
        dev[2]=100;      } ···LCN100 and later
        dev[3]=2; ·····2 points (LCN100 to LCN101)

Written data (buf)
        buf[0]=0x1; ····· Lower 1 word of LCN100.
        buf[1]=0x0; ····· Upper 1 word of LCN100.
        buf[2]=0x0; ····· Lower 1 word of LCN101.
        buf[3]=0x1; ····· Upper 1 word of LCN101.
```

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRandR()

4.3.24 mdRandR (reading devices randomly)

Function

Read the device specified with the randomly-specified devices from the target station.

Format

Visual C++®

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

short	ret;	//Return value	OUT
long	path;	//Path of channel	IN
short	stno;	//Station number	IN
short	dev[ ];	//Randomly-specified device	IN
short	buf[ ];	//Read data (single-precision integer array)	OUT
short	bufsize;	//Number of bytes of read data	IN

Visual Basic®.NET

ret = mdRandR(path,stno,dev(0),buf(0),bufsize)

Short	ret	;Return value	OUT
Integer	path	;Path of channel	IN
Short	stno	;Station number	IN
Short	dev(n)	;Randomly-specified device	IN
Short	buf(n)	;Read data (single-precision integer array)	OUT
Short	bufsize	;Number of bytes of read data	IN

Visual Basic®5.0, Visual Basic®6.0

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

Integer	ret	;Return value	OUT
Long	path	;Path of channel	IN
Integer	stno	;Station number	IN
Integer	dev(n)	;Randomly-specified device	IN
Any	buf(n)	;Read data (single-precision integer array)	OUT
Integer	bufsize	;Number of bytes of read data	IN

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station. (☞ Page 48, Section 4.2.2)
dev	Randomly-specified device	Specify the number of blocks, the device type, the start device number, and points of device to be read. For details, refer to Explanation shown on the next page.
buf	Read data (single-precision integer array)	Store the data being read.
bufsize	Number of bytes of read data	Specify the number of bytes of read data.

Explanation

- The number of transient transmissions performed inside of the function changes with the specified randomly-specified devices.
- A longer function processing time is required for the random read function as compared with the batch read function. Consider using the batch read function if a shorter function processing time is required.
- The following explains how to specify the randomly-specified devices (dev).

Randomly-specified devices (dev)

dev[0] ····· Number of blocks
dev[1] ····· Device type of block number 1
dev[2] ····· Start device number of block number 1 — Block number 1
dev[3] ····· Points of block number 1
dev[4] ····· Device type of block number 2
dev[5] ····· Start device number of block number 2 — Block number 2
dev[6] ····· Points of block number 2
:
:

The number of blocks that can be specified is within 1 to 32767.

• The following shows an example when reading multiple devices.

Example) When reading the values of M100 to M115, D10 to D13, M0 to M13, and the current value of T10.

M100 to M115 All bits are OFF.

D10 to D13 10 for D10, 200 for D11, 300 for D12, and 400 for D13

M0 to M13 All bits are ON.

Current value of T10 10 (1 second) for the current value of T10

Note that the above values are presumed values in the current status of the target devices.

Randomly-specified devices (dev)

```
dev[0]=4;          Four specified ranges
                    (M100 to M115, D10 to D13, M0 to M13, T10)
dev[1]=DevM;       }
dev[2]=100;        }…M100 and later
dev[3]=16;         16 points (M100 to M115)
dev[4]=DevD;       }
dev[5]=10;         }…D10 and later
dev[6]=4;          4 points (D10 to D13)
dev[7]=DevM;       }
dev[8]=0;          }…M0 and later
dev[9]=14;         14 points (M0 to M13)
dev[10]=DevTN;     }
dev[11]=10;        }…Current and later values of T10 timer
dev[12]=1;         1 point (T10)
```

Number of bytes of read data (bufsize)

Specify the number of bytes of array variable buf[ ] which stores the read data.

(buf[0] to buf[6] = 7) x 2 = 14 bytes

Enter "14" for this example.

Read data (buf)

```
buf[0]=0;…… All bits of M100 to M115 are OFF
            (16 points 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 of M0 to M13 are ON
buf[6]=10; …… Current value of T10 is 10 (1 second).
```

- The following shows an example when reading data from one of the double word devices (LZ, LTN, LCN, or LSTN).
  Example) When reading the current values of LCN100 and LCN101
  (LCN100 is 0x1 and LCN101 is 0x10000)

```
Randomly-specified devices (dev)
        dev[0]=1;              One specified range (LCN100 to LCN101)
        dev[1]=DevLCN;  }      LCN100 and later
        dev[2]=100;     }
        dev[3]=2;          ... 2 points (LCN100 to LCN101)

Number of bytes of read data (bufsize)
        Specify the number of bytes of array variable buf[ ] which stores the read data.
        (buf[1] to buf[4] = 4) x 2 = 8 bytes
        Enter "8" for this example.

Read data (buf)
        buf[0]=0x1; ..... Lower 1 word of LCN100.
        buf[1]=0x0; ..... Upper 1 word of LCN100.
        buf[2]=0x0; ..... Lower 1 word of LCN101.
        buf[3]=0x1; ..... Upper 1 word of LCN101.
```

Return value

Success : Return the value 0.
Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdRandW()

4.3.25 mdDevSet (setting bit devices)

Function

Set the bit devices on the target station (to ON).

Format

Visual C++®

```
ret = mdDevSet(path,stno,devtyp,devno);

short   ret;    //Return value                OUT
long    path;   //Path of channel             IN
short   stno;   //Station number               IN
short   devtyp; //Device type                  IN
short   devno;  //Specified device number      IN
```

Visual Basic®.NET

```
ret = mdDevSet(path,stno,devtyp,devno)

Short   ret     ;Return value               OUT
Integer path    ;Path of channel            IN
Short   stno    ;Station number             IN
Short   devtyp  ;Device type                IN
Short   devno   ;Specified device number    IN
```

Visual Basic®5.0, Visual Basic®6.0

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

Integer ret     ;Return value               OUT
Long    path    ;Path of channel            IN
Integer stno    ;Station number             IN
Integer devtyp  ;Device type                IN
Integer devno   ;Specified device number    IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station.(☞ Page 48, Section 4.2.2)
devtyp	Device type	Specify the type of device to be set (ON). (☞ Page 52, Section 4.2.4)
devno	Specified device number	Specify the device number of device to be set (ON).

Explanation

This function is a dedicated function for bit devices such as link relays (B) and internal relays (M).

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdDevRst()

4.3.26 mdDevRst (resetting bit devices)

Function

Reset the specified bit device on the target station (to OFF).

Format

Visual C++®

```
ret = mdDevRst(path,stno,devtyp,devno);

short   ret;    //Return value              OUT
long    path;   //Path of channel           IN
short   stno;   //Station number            IN
short   devtyp; //Device type               IN
short   devno;  //Specified device number   IN
```

Visual Basic®.NET

```
ret = mdDevRst(path,stno,devtyp,devno)

Short   ret     ;Return value              OUT
Integer path    ;Path of channel           IN
Short   stno    ;Station number            IN
Short   devtyp  ;Device type               IN
Short   devno   ;Specified device number   IN
```

Visual Basic®5.0, Visual Basic®6.0

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

Integer ret     ;Return value              OUT
Long    path    ;Path of channel           IN
Integer stno    ;Station number            IN
Integer devtyp  ;Device type               IN
Integer devno   ;Specified device number   IN
```

Argument		Description
path	Path of channel	Specify the path of channel whose communication line is opened. (Use the path which is returned when executing mdOpen.)
stno	Station number	Specify the station number of target station.(☞ Page 48, Section 4.2.2)
devtyp	Device type	Specify the type of device to be reset (OFF). (☞ Page 52, Section 4.2.4)
devno	Specified device number	Specify the device number of device to be reset (OFF).

Explanation

This function is a dedicated function for bit devices such as link relays (B) and internal relays (M).

Return value

Success : Return the value 0.

Error : Return the value other than 0. Refer to the list of error codes. (☞ Page 133, CHAPTER 6)

Related function

mdOpen(), mdClose(), mdDevSet()

CHAPTER 5 SAMPLE PROGRAMS

This chapter explains the sample programs that are included on the CD-ROM of the software package.
Sample programs are provided as a reference for creating user application programs.
Use sample programs on a user's own responsibility.

5.1 Sample Programs for CC-Link Ver.2 Board

Sample programs are stored on the user-specified folder that is specified when installing the software package to a personal computer.

- <User-specified folder> - <CCBD2> - <Sample>

5.1.1 Description of sample programs

(1) Sample Programs for MELSEC data link library

The following sample programs are stored as examples of functions.

(a) Reading device data

A sample program for reading device D0 of a master station.
Folder name: MDFunction\(folder for programming language)\DEMO

(b) Testing MELSEC data link library in general

A sample program for the MELSEC data link library in general.
Folder name: MDFunction\(folder for programming language)\MTEST*1

*1 : The sample programs for Visual Studio® 2012 Visual Basic® or Visual Studio® 2013 Visual Basic® are stored in MTEST2 folder.

Point

Sample programs for MTEST folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- MSFlexGrid is used in the sample program. If MSFlexGrid is not installed, a warning occurs, however, the operation of sample program is not affected.

Sample programs for MTEST2 folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- A warning occurs because a controller created by the Visual basic® 6.0 is used for this sample program. However, there is no effect for the operation of the sample program.

(2) Sample programs for checking data link of CC-Link Ver.2 board

The following sample programs are stored as program examples to check whether the data link between the master station and each station is executed properly.

For details, refer to the following manual.

Type Q80BD-J61BT11N/Q81BD-J61BT11 CC-Link System Master/Local Interface Board User's Manual (For SW1DNC-CCBD2-B)

(a) Communication between a master station and a remote station

A sample program to read/write the remote I/Os for the remote I/O station.

Folder name: MasterStation\RemoteIO

(b) Communication between a master station and a remote device station

A sample program to perform the digital/analog conversion for AJ65BT-64DAV.

Folder name: MasterStation\RemoteDevice

(c) Communication between a master station and a local station

A sample program for communications between a master and a local station.

Folder name: MasterStation\Datalink, LocalStation\Datalink

(d) Communication between a master station and an intelligent device station (AJ65BT-R2)

A sample program to perform the initialization, transmission and reception of AJ65BT-R2.

Folder name: MasterStation\R2

(e) Communication between a master station and an intelligent device station (AJ65BT-D75P2-S3)

A sample program to perform the initialization, positioning, origin point return and JOG operation of AJ65BT-D75P2-S3.

Folder name: MasterStation\PositioningSystem

5.1.2 Programming language

Sample programs are stored on the following folders for each programming language to be used.

(1) NETVB folder

Sample programs for the following Visual Basic®.

- Visual Basic®.NET 2003
- Visual Studio® 2005 Visual Basic®
- Visual Studio® 2008 Visual Basic®
- Visual Studio® 2010 Visual Basic®
- Visual Studio® 2012 Visual Basic®
- Visual Studio® 2013 Visual Basic®

Sample programs are created in Visual Basic®.NET 2003 project format.

Convert the project when using Visual Basic® other than Visual Basic®.NET 2003.

Remark

"Mdfunc.vb" is not included in the sample program. Add "Mdfunc.vb" before using the sample program.
(For the setting method ☞ Page 20, Section 2.3.3)

(2) VB folder

Sample programs for Visual Basic®5.0 and Visual Basic®6.0.

Remark

"Mdfunc.bas" is not included in the sample program. Add "Mdfunc.bas" before using the sample program.
(For the setting method ☞ Page 17, Section 2.3.1)

(3) VC folder

Sample programs for the following Visual C++®.

- Visual C++®5.0
- Visual C++®6.0
- Visual C++®.NET 2003
- Visual Studio® 2005 Visual C++®
- Visual Studio® 2008 Visual C++®
- Visual Studio® 2010 Visual C++®
- Visual Studio® 2012 Visual C++®
- Visual Studio® 2013 Visual C++®

Sample programs are created in Visual C++®5.0 project format.

Convert the project when using Visual C++® other than Visual C++®5.0.

Remark

An include file and a library file are not included in the sample program. Set an include file and a library file before using the sample program
(For the setting method ☞ Page 18, Section 2.3.2, Page 21, Section 2.3.4, Page 23, Section 2.3.5)

5.2 Sample Programs for MELSECNET/H Board

Sample programs are stored in the user-specified folder that is specified when installing the software package to a personal computer.

- <User-specified folder> - <MNETH> - <SAMPLES>

5.2.1 Description of sample programs

(1) Sample Programs for MELSEC data link library

The following sample programs are stored as examples of functions.

(a) Reading device data

A sample program for reading device D0 of network number 1 and station number 1.

Folder name: (folder for programming language)\DEMO

(b) Testing MELSEC data link library in general

A sample program for the MELSEC data link library in general.

Folder name: (folder for programming language)\MTEST*1

*1 : The sample programs for Visual Studio® 2012 Visual Basic® or Visual Studio® 2013 Visual Basic® are stored in MTEST2 folder.

Point

Sample programs for MTEST folder of NetVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- MSFlexGrid is used in the sample program. If MSFlexGrid is not installed, a warning occurs, however, the operation of sample program is not affected.

Sample programs for MTEST2 folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- A warning occurs because a controller created by the Visual basic® 6.0 is used for this sample program. However, there is no effect for the operation of the sample program.

5.2.2 Programming language

Sample programs are stored on the following folders for each programming language to be used.

(1) NetVb folder

Sample programs for the following Visual Basic®.

- Visual Basic®.NET 2003
- Visual Studio® 2005 Visual Basic®
- Visual Studio® 2008 Visual Basic®
- Visual Studio® 2010 Visual Basic®
- Visual Studio® 2012 Visual Basic®
- Visual Studio® 2013 Visual Basic®

Sample programs are created in Visual Basic®.NET 2003 project format.

Convert the project when using Visual Basic® other than Visual Basic®.NET 2003.

Remark

"Mdfunc.vb" is not included in the sample program. Add "Mdfunc.vb" before using the sample program.
(For the setting method ☞ Page 20, Section 2.3.3)

(2) VB folder

Sample program for Visual Basic® 5.0 and Visual Basic® 6.0.

Remark

"Mdfunc.bas" is not included in the sample program. Add "Mdfunc.bas" before using the sample program.
(For the setting method ☞ Page 17, Section 2.3.1)

(3) VC folder

Sample program for the following Visual C++®.

- Visual C++®5.0
- Visual C++®6.0
- Visual C++®.NET 2003
- Visual Studio® 2005 Visual C++®
- Visual Studio® 2008 Visual C++®
- Visual Studio® 2010 Visual C++®
- Visual Studio® 2012 Visual C++®
- Visual Studio® 2013 Visual C++®

Sample programs are created in VisualC++®5.0 project format.

Convert the project when using Visual C++® other than Visual C++® 5.0.

Remark

An include file and a library file are not included in the sample program. Set an include file and a library file before using the sample program.
(For the setting method ☞ Page 18, Section 2.3.2, Page 21, Section 2.3.4, Page 23, Section 2.3.5)

5.3 Sample Programs for CC-Link IE Controller Network Board

Sample programs are stored on the user-specified folder that is specified when installing the software package to a personal computer.

- <User-specified folder> - <MNETG> - <SAMPLES>

5.3.1 Description of sample programs

(1) Sample Programs for MELSEC data link library

The following sample programs are stored as examples of functions.

(a) Reading device data

A sample program for reading device D0 of network number 1 and station number 1.
Folder name: (folder for programming language)\DEMO

(b) Testing MELSEC data link library in general

A sample program for the MELSEC data link library in general.

Folder name: (folder for programming language)\MTEST*1

*1 : The sample programs for Visual Studio® 2012 Visual Basic® or Visual Studio® 2013 Visual Basic® are stored in MTEST2 folder.

Point

Sample programs for MTEST folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- MSFlexGrid is used in the sample program. If MSFlexGrid is not installed, a warning occurs, however, the operation of sample program is not affected.

Sample programs for MTEST2 folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- A warning occurs because a controller created by the Visual basic® 6.0 is used for this sample program. However, there is no effect for the operation of the sample program.

5.3.2 Programming language

Sample programs are stored on the following folders for each programming language to be used.

(1) NETVB folder

Sample programs for the following Visual Basic®.

- Visual Basic® .NET 2003
- Visual Studio® 2005 Visual Basic®
- Visual Studio® 2008 Visual Basic®
- Visual Studio® 2010 Visual Basic®
- Visual Studio® 2012 Visual Basic®
- Visual Studio® 2013 Visual Basic®

Sample programs are created in Visual Basic®.NET 2003 project format.

Convert theproject when using Visual Basic® other than Visual Basic®.NET 2003.

Remark

"Mdfunc.vb" is not included in the sample program. Add "Mdfunc.vb" before using the sample program.
(For the setting method ☞ Page 20, Section 2.3.3)

(2) VB folder

Sample programs for Visual Basic®6.0.

Remark

"Mdfunc.bas" is not included in the sample program. Add "Mdfunc.bas" before using the sample program.
(For the setting method ☞ Page 17, Section 2.3.1)

(3) VC folder

Sample programs for the following Visual C++®.

- Visual C++®6.0
- Visual C++®.NET 2003
- Visual Studio® 2005 Visual C++®
- Visual Studio® 2008 Visual C++®
- Visual Studio® 2010 Visual C++®
- Visual Studio® 2012 Visual C++®
- Visual Studio® 2013 Visual C++®

Sample programs are created in VisualC++®6.0 project format.

Convert the project when using Visual C++® other than Visual C++® 6.0.

Remark

An include file and a library file are not included in the sample program. Set an include file and a library file before using the sample program.
(For the setting method ☞ Page 18, Section 2.3.2, Page 21, Section 2.3.4, Page 23, Section 2.3.5)

5.4 Sample Programs for CC-Link IE Field Network Board

Sample programs are stored on the user-specified folder that is specified when installing the software package to a personal computer.

- <User-specified folder> - <CCIEF> - <SAMPLES>

5.4.1 Description of sample programs

(1) Sample Programs for MELSEC data link library

The following sample programs are stored as examples of functions.

(a) Reading device data

A sample program for reading device D0 of network number 1 and station number 1.

Folder name: (folder for programming language)\DEMO

(b) Testing MELSEC data link library in general

A sample program for the MELSEC data link library in general.

Folder name: (folder for programming language)\MTEST*1

*1 : The sample programs for Visual Studio® 2012 Visual Basic® or Visual Studio® 2013 Visual Basic® are stored in MTEST2 folder.

Point

Sample programs for MTEST folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- MSFlexGrid is used in the sample program. If MSFlexGrid is not installed, a warning occurs, however, the operation of sample program is not affected.

Sample programs for MTEST2 folder of NETVB

- This sample program cannot be used as a 64-bit version user application. In order to use this sample program on a 64-bit version operating system, select "x86" for "Target CPU", and build the program as a 32-bit version user application.
- A warning occurs because a controller created by the Visual basic® 6.0 is used for this sample program. However, there is no effect for the operation of the sample program.

5.4.2 Programming language

Sample programs are stored on the following folders for each programming language to be used.

(1) NETVB folder

Sample programs for the following Visual Basic®.

- Visual Basic®.NET 2003
- Visual Studio® 2005 Visual Basic®
- Visual Studio® 2008 Visual Basic®
- Visual Studio® 2010 Visual Basic®
- Visual Studio® 2012 Visual Basic®
- Visual Studio® 2013 Visual Basic®

Sample programs are created in Visual Basic®.NET 2003 project format.

Convert the project when using Visual Basic® other than Visual Basic®.NET 2003.

Remark

"Mdfunc.vb" is not included in the sample program. Add "Mdfunc.vb" before using the sample program.
(For the setting method ☞ Page 20, Section 2.3.3)

(2) VC folder

Sample programs for the following Visual C++®.

- Visual C++®.NET 2003
- Visual Studio® 2005 Visual C++®
- Visual Studio® 2008 Visual C++®
- Visual Studio® 2010 Visual C++®
- Visual Studio® 2012 Visual C++®
- Visual Studio® 2013 Visual C++®

Sample programs are created in VisualC++®.NET 2003 project format.

Convert the project when using Visual C++® other than Visual C++® .NET 2003.

Remark

An include file and a library file are not included in the sample program. Set an include file and a library file before using the sample program.
(For the setting method ☞ Page 21, Section 2.3.4, Page 23, Section 2.3.5)

CHAPTER 6 ERROR CODES

The following table shows the errors and the corrective actions that correspond to the error code.
When an error whose error code is not described in the following table occurs, consult your local Mitsubishi representative.

Error Code (HEX)	Error description	Corrective action
1 (0001H)	Driver not started The driver is not started.	• Check the channel number. • Check the driver operating condition with Device Manager. • Check the error of event viewer. • Check the board settings. • Reinstall the software package.
2 (0002H)	Time-out error • Timeout during waiting for the response of process • A CPU module other than QCPU (Q mode) or RCPU is accessed from the 64-bit version user application. • The consistency between the board and the software package cannot be identified. • When accessing to the buffer memory of the remote device station, the offset values or offset + write/read byte size out of the range of the target station buffer memory is specified. • When the own station number is 64 on the CC-Link Ver.2 board, a request was made to other station.	• Check the status of the network, operation status of the access station(s), and mounting condition of the module(s). • Check the mounting condition of the board. • Check the Target Setting of the utility. • Check the Transient Timeout Monitoring Time of the utility. • Retry the operation. • When accessing CPU modules other than QCPU (Q mode) or RCPU, use the 32-bit version user application. • When this error has occurred while executing the RECV function with CC-Link IE Field Network board, use SW1DNC-CCIEF-B version 1.04E or later. • Check if the offset values or offset + write/read byte size is within the range of the buffer memory of the target station. • When requesting to other station by using CC-Link Ver.2 board, set a station number other than 64 to the own station number.
66 (0042H)	Channel-opened error Specified channel is already opened.	• Open the channel only once. • Since the correct value is stored to the path, this error can be regarded as normal status.
68 (0044H)	Path error • The specified path is invalid. • No board exists at the specified path.	• Check the path. • Check the driver operating condition with Device Manager. • Check the mounting condition of the board.
69 (0045H)	Unsupported function execution error • A function which is not supported by the target station was executed. • A function which is not supported by the specified channel is executed.	• Check the path of channel, network number, and station number. • Check if the function is supported by the target station.
70 (0046H)	Station number error • The specified station number is incorrect. • A process that should be requested to other station was requested to the own station, or the station number corresponds to the own station (255FFH) but the network number is not 0. • A CPU module other than QCPU (Q mode) or RCPU is accessed from the 64-bit version user application.	• Check the network number and station number. • When accessing CPU modules other than QCPU (Q mode) or RCPU, use the 32-bit version user application.

Error Code (HEX)	Error description	Corrective action
71 (0047H)	No reception data error(when RECV function) • Data is not received. • With the RECV function of CC-Link IE Controller Network board or CC-Link IE Field Network board, the data over 960 bytes has been received from MELSECNET/H.	• Check the channel number. • Check whether the data is sent on the sending station with the SEND function. • Check if the sent data using the SEND function of MELSECNET/H board exceeds 960 bytes. • When the receive station is CC-Link IE Controller Network board, restart a personal computer of the receive station. • Retry the operation.
77 (004DH)	Memory reservation error/resource memory shortage error Enough memory could not be reserved.	• There is a possibility of a memory shortage. Terminate other application(s) currently running. • Exit the program and restart the personal computer. • Increase the minimum working set size of the personal computer. (☞ Page 141, Appendix 1)
85 (0055H)	SEND/RECV channel number error The channel number specified with the SEND/RECV function is incorrect.	• Check the channel number.
100 (0064H)	Board H/W resource busy The next processing cannot be executed because of the insufficient resource on the board.	• Retry the operation. • If the error occurs repeatedly, please consult your local Mitsubishi representative.
101 (0065H)	Routing parameter error The routing parameter is not set correctly.	• Check the routing parameter. • Check the specified network number.
102 (0066H)	Board Driver I/F error • An attempt to send request data to the board driver is failed. • The system resource of the operating system is insufficient. For details, refer to ☞ Page 14, Section 2.2.1 (12).	• Retry the operation. • Check with the function such as event log whether Windows® is operating normally. • Exit the program and restart the personal computer. • Check the mounting condition of the board.
103 (0067H)	Board Driver I/F error • An attempt to receive response data from the board driver is failed. • The consistency between the board and the software package cannot be identified.	• Retry the operation. • Check with the function such as event log whether Windows® is operating normally. • Exit the program and restart the personal computer. • When this error has occurred while executing the SEND function with CC-Link IE Field Network board, use SW1DNC-CCIEF-B version 1.04E or later.
133 (0085H)	Parameter error A parameter set on the board is incorrect.	• Reset the board. • Correct the parameter.
4096 to 16383 (1000H to 3FFFH)	MELSEC data link library internal error	• Exit the program and restart the personal computer. • Reinstall the software package. • Consult your local Mitsubishi representative.
16384 to 20479 (4000H to 4FFFH)	Error detected by the access target CPU	• Refer to the user's manual of the access target CPU module.
16432 (4030H)	Device error The specified device type does not exist.	• Specify a device type described in the device type list. • Check if the device number is validated on the programmable controller CPU of the target station.
16433 (4031H)	Device error • The specified device number is out of the range. • The start I/O number of the specified devices is invalid. • The block number of the specified device is invalid.	• Check the device number. • Check the block number (device type) and the start I/O number of the specified device. • Check with the programmable controller CPU on the target station whether the specified device, the block number, and the start I/O number are valid.

Error Code (HEX)	Error description	Corrective action
16512 (4080H)	Request data error • The process was requested with a 64-bit version user application to a CPU module other than QCPU (Q mode) or RCPU module.	• Check the content of specified request data. • When accessing a CPU module other than QCPU (Q mode) or RCPU module, use 32-bit version user application.
18944 (4A00H) 18945 (4A01H)	Link-related error • The network of the number set to the routing parameters does not exist. • The network is not supported by the target CPU. • The network number or station number of the target station is incorrect.	• Check the routing parameter settings. • Exchange the CPU with a CPU which supports the network. • Check the network number and station number.
19202 (4B02H)	The request is not for a CPU module.	• Perform the operation for a module for which the specific function can be executed.
-1 (FFFFH) (FFFFFFFFH)	Path error The specified path is invalid.	• Use the path that was returned by the mdOpen function. • Use a path of the communication line that supports the function.
-2 (FFFEH) (FFFFFFFEH)	Start device number error • The specified start device number is out of the range. • When specifying a bit device, the start device number is not multiples of 8. • The set of start device number and points in the same block that is specified for the device random read/write, is over the device range.	• Check the start device number. • When specifying a bit device, specify a start device number in multiples of 8. • Check the device number and points. • Check if the specified device is validated on the programmable controller CPU of the target station.
-3 (FFFDH) (FFFFFFFDH)	Device type error The specified device type is invalid.	• Specify a device type described in the device type list. • Check if the specified device is validated on the programmable controller CPU of the target station.
-5 (FFFBH) (FFFFFFFBH)	Size error • The set of start device number and size is over the device range. • An access was attempted with odd number bytes.	• Check the device size. • Check the start device number and size. • Specify even number bytes.
-6 (FFFAH) (FFFFFFFAH)	Number of blocks error The number of blocks specified for the device random read/write is out of the range.	• Check the number of blocks.
-8 (FFF8H) (FFFFFFF8H)	Channel number error The channel number specified in the mdOpen function is invalid.	• Check the channel number.
-12 (FFF4H) (FFFFFFF4H)	Block number error The block number of the specified file register is invalid.	• Check the block number (device type) of the file register. • Check if the specified device is valid on the programmable controller CPU of the target station.
-13 (FFF3H) (FFFFFFF3H)	Write protect error The block number of the specified extension file register is overlapping with the write protect area of the memory cassette.	• Check the block number (device type) of the extension file register. • Check the write protect switch of the memory cassette on the programmable controller CPU of the target station.
-16 (FFF0H) (FFFFFFF0H)	Network number and station number error The specified network number or station number is out of the range.	• Check the network number and the station number.

Error Code (HEX)	Error description	Corrective action
-17 (FFEFH) (FFFFFFEFH)	All station specification and group number specification error • All stations or group number was specified for a function other than the SEND function. • The device type with arrival acknowledgment was specified when using the SEND function with all station specification and group number specification.	• Check the network number and station number. • Check if the function supports all station specification and group number specification. • The device type without arrival acknowledgment when using the SEND function with all station specification and group number specification.
-18 (FFEEH) (FFFFFFEEH)	Remote command code error A command code which is not valid for mdControl was specified.	• Check the command code.
-19 (FFEDH) (FFFFFFEDH)	SEND/RECV channel number error The channel number specified for the SEND/RECV function is out of the range.	• Check the channel number.
-31 (FFE1H) (FFFFFFE1H)	DLL load error An attempt to load DLL required to execute the function failed.	• Reinstall the software package.
-32 (FFE0H) (FFFFFFE0H)	Resource time-out error • The user program was forcibly terminated. • The resource is not freed within the transient timeout monitoring time because other tasks and threads are occupying the resource.	• Close the user program correctly. • Retry the operation. • There is a possibility of a memory shortage. Terminate other application(s) currently running. • Exit the program and restart the personal computer.
-33 (FFDFH) (FFFFFFDFH)	Incorrect access target error The communication target specified by the network number and the station number is a model which is not supported.	• Check whether an unsupported communication target is specified by the network number and the station number. • Check the Target Setting of the utility. • Update the software package.
-34 (FFDEH) (FFFFFFDEH)	Registry access error	• Reinstall the software package.
-35 (FFDDH) (FFFFFFDDH)		
-36 (FFDCH) (FFFFFFDCH)		
-37 (FFDBH) (FFFFFFDBH)	Communication initialization setting error The initial setting for communication is failed.	• Retry the operation. • There is a possibility of a memory shortage. Terminate other application(s) currently running. • Exit the program and restart the personal computer. • Check the memory availability.
-42 (FFD6H) (FFFFFFD6H)	Close error The communication cannot be closed.	• Retry the operation. • Exit the program and restart the personal computer.
-43 (FFD5H) (FFFFFFD5H)	ROM operation error A TC setting value was written to the CPU during ROM operation.	• Change the TC setting value during RAM operation.
-61 (FFC3H) (FFFFFFC3H)	Number of events error The number of events which is specified in the mdWaitBdEvent function to set the user application to wait is out of the range.	• Check the number of events that sets the user application to wait.

Error Code (HEX)	Error description	Corrective action
-62 (FFC2H) (FFFFFFC2H)	Event number error The event number which is specified in the mdWaitBdEvent function to set the user application to wait is out of the range.	• Check the event number that sets the user application to wait.
-63 (FFC1H) (FFFFFFC1H)	Event number overlapped registration error The event number which is specified in the mdWaitBdEvent function to set the user application to wait is overlapped.	• Specify the event numbers, that set the user application to wait, not to overlap.
-64 (FFC0H) (FFFFFFC0H)	Timeout time error The timeout time specified in the mdWaitBdEvent function is out of the range.	• Check the time-out value.
-65 (FFBFH) (FFFFFFBFH)	Event wait time-out error The event did not occur within the timeout time.	• Retry the operation.
-66 (FFBEH) (FFFFFFBEH)	Event initialization error The board or the master station (control station) was reset during the execution of the mdWaitBdEvent function.	• Retry the operation.
-67 (FFBDH) (FFFFFFBDH)	No event setting error The event setting of the event number which is specified in the mdWaitBdEvent function to set the user application to wait does not exist.	• Set the event number that sets the user application to wait in the utility.
-69 (FFBBH) (FFFFFFBBH)	Unsupported function execution error • A function which is not supported by the software package or the driver was executed.	• Check if the function is supported by the software package or the driver.
-70 (FFBAH) (FFFFFFBAH)	Event overlapped occurrence error The event with the same event number occurred multiple times.	• Set the interval of the event occurrence longer enough for the user program to process.
-71 (FFB9H) (FFFFFFB9H)	Remote device station access error Failed to access to the buffer memory of a remote device station.	• Check if the target station is remote device station of CC-Link IE Field Network. • Check the network number and station number. • Check if the offset values or offset + write/read byte size is within the range of the buffer memory of the target station.
-257 (FEFFH) (FFFFFEFFH) to -4096 (F000H) (FFFFF000H)	Errors detected in the MELSECNET/H and MELSECNET/10 network system	• Refer to the MELSECNET/H and MELSECNET/10 Network System Reference Manuals.
-2174 (F782H) (FFFFF782H)	Transient data target station number error • The target station number is incorrect. • The target station number is 0.	• Check the target station number, and perform the operation again. • If the error occurs after performing the above corrective action, please consult your local Mitsubishi representative.
-4097 (EFFFH) (FFFFEFFFH) to -8192 (E000H) (FFFFE000H)	Errors detected in the CC-Link IE Controller network system	• Refer to the CC-Link IE Controller Network System Reference Manuals.

Error Code (HEX)	Error description	Corrective action
-7656 (E218H) (FFFFE218H) -7672 (E208H) (FFFFE208H)	Transient data target station number error • The target station number is incorrect. • The target station number is 0.	• Check the target station number, and perform the operation again. • If the error occurs after performing the above corrective action, please consult your local Mitsubishi representative.
-8193 (DFFFH) (FFFFDFFFH) to -12288 (D000H) (FFFFD000H)	Errors detected in the CC-Link IE Field network system	• Refer to the CC-Link IE Field Network Board and CC-Link IE Field Network Master/Local Module User's Manual.
-11683 (D25DH) (FFFFD25DH)	Transient data improper • The data over 960 bytes has been sent from MELSECNET/H board to CC-Link IE Field Network board.	• Check if the sent data using the SEND function of MELSECNET/H board exceeds 960 bytes.
-11746 (D21EH) (FFFFD21EH)	Station number error • The specified station number is incorrect. • A process that should be requested to other station was requested to the own station. Or, the station number corresponds to the own station (255(FFH)) but the network number is not 0.	• Check the network number and station number.
-12128 (D0A0H) (FFFFD0A0H)	Transient data send response wait time-out error	• .Check if the own station or the target station is disconnected. • Check if an unsupported communication target is specified with the network number and the station number.
-12289 (CFFFH) (FFFFCFFFH) to -16384 (C000H) (FFFFC000H)	Errors detected in the Ethernet network system	• Refer to the Ethernet Interface Module User's Manual.
-16385 (BFFFH) (FFFFBFFFH) to -20480 (B000H) (FFFFB000H)	Errors detected in the CC-Link system	• Refer to the CC-Link system master/local board and CC-Link system master/local module user's manual.
-18560 (B780H) (FFFFB780H)	Module mode setting error A transient transmission was executed to the remote I/O station.	• Check the network number and the station number.
-18572 (B774H) (FFFFB774H)	Transient unsupported error A transient request was transmitted to the station that is not an intelligent device station.	• Check the network number and the station number. • Specify the station number for the intelligent device station. • Check the device type
-25056 (9E20H) (FFFF9E20H)	Processing code error • A processing code that cannot be processed by the request destination station was set. (Request destination link module check) • The process was requested with a 64-bit version user application to a CPU module other than QCPU (Q mode) or RCPU module.	• Check the request destination station number and the processing code. • Do not execute the function other than mdTypeRead to the other station board. • When accessing a CPU module other than QCPU (Q mode) or RCPU module, use 32-bit version user application.

Error Code (HEX)	Error description	Corrective action
-26334 (9922H) (FFFF9922H)	Reset error • Reset was executed by another task that uses the same channel when accessing to the own station or the other station. • Reset was executed when monitoring with the utility.	• Retry the operation.
-26336 (9920H) (FFFF9920H)	Routing request error on routing function unsupported station A routing to another loop was requested to the station which does not support the routing function.	• Check the Routing Parameter Setting.
-28138 (9216H) (FFFF9216H)	Unsupported block data assurance per station Reset or restart was performed to the CC-Link Ver.2 Board of which ROM version is 1A and the function "block data assurance per station" is enabled.	• Replace it with the ROM version 2B or later board. • Disable the block data assurance per station.
-28139 (9215H) (FFFF9215H)	Link refresh error Link refresh processing did not operate normally.	• Reset the board. • The memory may be insufficient. Close other applications running. • Terminate the program and restart the personal computer. • Check the free space of the memory. • Check the board installation status. • The personal computer is faulty when other personal computers normally operate. Repair or replace the faulty personal computer. • When the same error occurs on other personal computers, replace the board. • Consult your local Mitsubishi service center or representative.
-28140 (9214H) (FFFF9214H)	Incorrect mode setting error An incorrect mode was specified when setting the mode.	• Check the mode.
-28141 (9213H) (FFFF9213H)	System sleep error Entering sleep mode, hibernation mode, or fast startup was detected.	• Exit the program and restart the personal computer. • Change the setting of the power option to prevent the system from entering sleep mode, hibernation mode, or fast startup.
-28142 (9212H) (FFFF9212H)	Mode error A request which cannot be used in the currently set mode was executed.	• Check if the parameters are set. • Check the currently set mode.
-28143 (9211H) (FFFF9211H) -28144 (9210H) (FFFF9210H)	Hardware self-diagnosis error An error was detected by the hardware self-diagnosis.	• Check the system log of event viewer, and take a corrective action on the registered error. • Exit the program and restart the personal computer. • Take anti-noise measures for a personal computer. • Put the connector in and out after turning off the personal computer. • Check the mounting condition of the board. • A personal computer error is suspected if the board operates normally on other personal computers. Repair or replace the personal computer. • When the same error occurs on other personal computers, replace the board. • Consult your local Mitsubishi representative.
-28150 (920AH) (FFFF920AH)	Data link disconnected device access error An access was attempted to the device ranges of own station devices RX, RY, RWw, RWr which are assigned to the data link interrupted station or the reserved station.	• Check the specified device start number and size, or the device range of the parameter on the master station. The data write/read function can be performed even when this error occurs, but the function of the data security is not guaranteed.

Error Code (HEX)	Error description	Corrective action
-28151 (9209H) (FFFF9209H)	Abnormal data reception error An incorrect response data was received.	• Check for errors in the target station and on the programmable controller CPU in the target station. If they are normal, request a process again. • Check the network status by referring to the manuals of each product.
-28158 (9202H) (FFFF9202H)	Driver WDT error Driver WDT error is occurring. A driver WDT error may occur from the temporary system overload by the following factors. • Windows® activation process when starting the personal computer • Operation of a device driver such as a graphic board • Operation of other software applications	• Reset the board. • Restart the personal computer. • Remove the factor of system overload. • Clear "Use driver WDT function" with the utility to disable WDT. Or, extend the Driver WDT monitoring time. By changing the graphic board, an environment in which a driver WDT error does not occur may be created.
-28622 (9032H) (FFFF9032H)	Channel busy (dedicated instruction) error The channel specified for "Channel used by the own station" or "Target station channel" is being used by another instruction.	• Wait for a little while, and retry it. • Change the setting of "Channel used by the own station" or "Target station channel" in the control data.
-28634 (9026H) (FFFF9026H)	Hardware self-diagnosis error An board error was detected by the hardware self-diagnosis.	• Check the system log of event viewer, and take a corrective action on the registered error. • Exit the program and restart the personal computer. • Check the mounting condition of the board. • A personal computer error is suspected if the board operates normally on other personal computers. Repair or replace the personal computer. • When the same error occurs on other personal computers, replace the board. • Consult your local Mitsubishi representative.
-28636 (9024H) (FFFF9024H)		

Remark

When an error code is returned as a return value of the extended function (☞ Page 45, Section 4.1), the error codes from -1 to -28636 will be an 8-digit value (FFFFFFFFH to FFFF9024H) in the hexadecimal format as described in the table.

APPENDIX

Appendix 1 Method for Increasing Minimum Working Set Size of Personal Computer

The following explains the method and sample programs for increasing the minimum working set size of the personal computer when an error with code 77($004D_H$) occurs due to the execution of the MELSEC data link library function.
The personal computer board driver runs using the minimum working set size in the memory area reserved in the user program. Some user programs may use a larger size for the minimum working set. Therefore, if the minimum working set size for the personal computer board driver cannot be reserved, an error code 77 is returned.
In this situation, increase the minimum working set size in the user program before executing the MELSEC data link library function. (☞ Page 142, Appendix 1.2)
The minimum working set size of 200KB is reserved at startup of the personal computer.

When applying the sample programs introduced in this manual to the actual system, ensure the applicability and confirm that they will not cause system control problems.

Appendix 1.1 Processing overview of sample program

① Obtain the user program ID with the GetCurrentProcessID function.
② Using the ID obtained in step ①, obtain the user program handle with the OpenProcess function.
③ The current minimum and maximum working set sizes can be obtained by executing the GetProcessWorkingSetSize function.
④ Set a size larger than the minimum working set obtained in step ③ and execute the SetProcessWorkingSetSize function.
⑤ Release the user program handle with the CloseHandle function.

Appendix 1.2 Sample programs

(1) When setting with Visual Basic®
(An example when the minimum working set size is 1MB and the maximum working set size is 3MB)

When programming with Visual Basic®5.0 or Visual Basic®6.0, change the type definition of variables (id, ph, wkmin, wkmax) from Integer to Long.

```
Dim id As Integer          'User program ID variable
Dim ph As Integer          'User program handle variable
Dim wkmin As Integer    'Minimum working set variable
Dim wkmax As Integer   'Maximum working set variable
Dim bret As Boolean     'Return value
'Obtain the user program ID
id = GetCurrentProcessID()
'Open the user program handle
'PROCESS_SET_QUOTA = 256,PROCESS_QUERY_INFORMATION = 1024
ph = OpenProcess(256 + 1024,False,id)
'Obtain the maximum working set size and the minimum working set size for the user program
bret = GetProcessWorkingSetSize(ph,wkmin,wkmax)
'Set the minimum working set size to 1MB(1 * 1024 * 1024 = 1048576)
wkmin = 1048576
'Set the maximum working set size to 3MB(3 * 1024 * 1024 = 3145728)
wkmax = 3145728
'Change the maximum working set size and the minimum working set size for the user program
bret = SetProcessWorkingSetSize(ph,wkmin,wkmax)
'Close the user program handle
bret = CloseHandle(ph)
```

The set sizes shown here are reference sizes. Adjust the sizes according to your system.

(2) When setting with Visual C++®
(An example when the minimum working set size is 1MB and the maximum working set size is 3MB)

```
#define  ERROR     -1
short ChangeWorkingSetSize()
{
DWORD    dwProcessId;    /*User program ID variable*/
HANDLE    hProcess;        /*User program handle variable*/
DWORD    dwMinimumWorkingSetSize;    /*Minimum working set variable*/
DWORD    dwMaximumWorkingSetSize;   /*Maximum working set variable*/

/*Obtain the user program ID*/
dwProcessId = GetCurrentProcessId();

/*Open the user program handle*/
hProcess = OpenProcess(PROCESS_SET_QUOTA+PROCESS_QUERY_INFORMATION,FALSE,dwProcessId);
if(hProcess == NULL){
   /*Error end*/
   return(ERROR);
}

/*Obtain the maximum working set size and the minimum working set size for the user program */
if(GetProcessWorkingSetSize(hProcess,&dwMinimumWorkingSetSize,&dwMaximumWorkingSetSize)==0){
   /*Error end*/
   CloseHandle(hProcess);
   return(ERROR);
}

/*Set the minimum working set size to 1MB*/
dwMinimumWorkingSetSize = 1 * 1024 * 1024;
/*Set the maximum working set size to 3MB*/
dwMaximumWorkingSetSize = 3 * 1024 * 1024;

/*Change the maximum working set size and the minimum working set size for the user program */
if(SetProcessWorkingSetSize(hProcess,dwMinimumWorkingSetSize,dwMaximumWorkingSetSize)==0){
   /*Error end*/
   CloseHandle(hProcess);
   return(ERROR);
}

/*Close the user program handle*/
CloseHandle(hProcess);
/*Normal return*/
return(0);
}
```

The set sizes shown here are reference sizes. Adjust the sizes according to your system.

REVISIONS

*The manual number is written at the bottom left of the back cover.

Print date	*Manual number	Revision
Jul., 2011	SH-081035ENG-A	First edition
Apr., 2012	SH-081035ENG-B	Addition Section 5.1.1, Section 5.1.2, Section 5.2.1, Section 5.2.2, Section 5.3.1, Section 5.3.2, Section 5.4.1, Section 5.4.2 Correction TERMS, Section 2.1.1, Section 3.1.1, Section 3.1.2, Section 3.1.4, Section 3.2.1, Section 3.2.2, Section 3.2.3, Section 3.2.4, Section 5.1, Chapter 6
Dec., 2012	SH-081035ENG-C	Correction TERMS, Section 3.1.1, Section 3.1.2, Section 3.1.3, Section 3.1.4, Section 4.3.9, Section 4.3.14, Section 4.3.17, Chapter 6
Sep., 2013	SH-081035ENG-D	Addition Section 3.3, Section 3.3.1 to Section 3.3.6 Correction RELATED MANUALS, Section 2.2.1, Section 2.3.3, Section 2.3.5, Section 3.1, Section 3.2, Section 3.2.1, Section 3.2.2, Section 4.2.2, Section 4.2.3, Section 4.2.4, Section 4.3, Section 4.3.3, Section 4.3.4, Section 4.3.9, Section 4.3.15, Section 4.3.19, Section4.3.20, Section 5.1.2, Section 5.2.2, Section 5.3.2, Section 5.4.2, Chapter 6 Delete Section 3.1.1 to Section 3.1.4, Section 3.2.3, Section 3.2.4
Jan., 2014	SH-081035ENG-E	Correction RELATED MANUALS, TERMS, Section 1.2, Section 2.2.1, Section 2.3, Section 3.1, Section 4.3.9, Section 4.3.13, Section 4.3.17, Chapter 6
Jun., 2014	SH-081035ENG-F	Addition Section 4.3.9, Section 4.3.10 Correction Section 2.2.1, Section 3.1, Section 3.2.1, Section 3.2.2, Section 3.3.2, Section 3.3.4, Section 3.3.6, Section 4.1, Section 4.2.4, Section 4.3.3, Section 4.3.4, Section 4.3.5, Section 4.3.6, Section 4.3.11, Section 4.3.15, Section 4.3.16, Section 4.3.21, Section 4.3.22, Section 4.3.23, Section 4.3.24, Chapter 6 Section 4.3.9 to Section 4.3.24 are changed to Section 4.3.11 to Section 4.3.26
Apr., 2015	SH-081035ENG-G	Addition Section 2.3.6 Correction Section 2.3.3, Section 3.2.1, Section 3.2.2, Section 3.3.2, Section 4.2.2, Section 4.2.3, Section 4.3, Section 5.1.1, Section 5.1.2, Section 5.2.1, Section 5.2.2, Section 5.3.1, Section 5.3.2, Section 5.4.1, Section 5.4.2, Chapter 6
Sep., 2015	SH-081035ENG-H	Correction Section 2.2.1, Chapter 6

Japanese Manual Version SH-081034-H

Warranty

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

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.
[Gratis Warranty Term]
The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.
[Gratis Warranty Range]

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

2. Onerous repair term after discontinuation of production

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

3. Overseas service

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

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

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

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

SH(NA)-081035ENG-H(1509)KWIX
MODEL: MD-FUNC-LIB-R-E
MODEL CODE: 13JV25

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN