B-1698(0)

Automation Organizer WindO/I-NV4

External Device Setup Manual

Confirm that the delivered product is what you have ordered. Read this manual to make sure of correct operation.

SAFETY PRECAUTATIONS

- Be certain to read the INSTRUCTION SHEET and the WindO/I-NV4 User's manual carefully before performing installation, wiring, or maintenance work, or operating the HG2G-5T.
- The HG2G-5T has been manufactured with careful regard to quality. However, if you intend to use this product in applications where failure of this equipment may result in damage to property or injury, ensure that it used in conjunction with appropriate fail-safe backup equipment.
- In this manual, safety precautions are categorized in order of importance to Warning and Caution:

⚠ WARNING	Warning notices are used to emphasize that improper operation may cause severe personal injury or death.
⚠ CAUTION	Caution notices are used where inattention might cause personal injury or damage to equipment.

⚠ WARNING

- The HG2G-5T is not intended to be used for applications which require high reliability and safety, such as medical equipment, nuclear equipment, railways, aircraft, and vehicles. The HG2G-5T cannot be used for these applications. For other applications which require high reliability in function and precision, provide a failsafe design and redundant design for the entire system including the HG2G-5T.
- Turn off the power to the HG2G-5T before installation, removal, wiring, maintenance, and inspection of the HG2G-5T. Failure to turn power off may cause electrical shock or fire hazard.
- Special expertise is required to install, wire, configure, and operate the HG2G-5T. People without such expertise must not use the HG2G-5T.
- The HG2G-5T uses an LCD (liquid crystal display) as a display device. The liquid inside the LCD is harmful to the skin. If the LCD is broken and the liquid attaches to your skin or clothes, wash the liquid off using soap, and consult a doctor immediately.
- Emergency and interlocking circuits must be configured outside of the HG2G-5T.
- Do not use the HG2G-5T's internal touch switches for an emergency circuit. If the HG2G-5T failed, the external equipment connected to the HG2G-5T will no longer be protected, and serious injury to operators and equipment damage may be caused.

CAUTION

- Prevent the HG2G-5T from falling while moving or transporting, otherwise damage or malfunction of the HG2G-5T will result.
- Use the product within the environmental limits given in the catalog and manual. Use of the product in high-temperature or high-humidity environments, or in locations where it is exposed to condensation, corrosive gas or large shock loads can create the risk of electrocution and fire.
- The HG2G-5T is designed for use in pollution degree 2. Use the HG2G-5T in environments of pollution degree 2. (based on the IEC60664-1 rating)
- Install the HG2G-5T according to the instructions. Improper installation will result in falling, failure, electrical shock, fire hazard, or malfunction of the HG2G-5T.
- Prevent metal fragments or wire chips from dropping inside the HG2G-5T housing. Ingress of such fragments and chips may cause fire hazard, damage, and malfunction.
- Use a power supply of the rated value. Using a wrong power supply may cause fire hazard.
- The HG2G-5T uses “PS2 of EN61131” as DC power supply. (based on the IEC/EN61131 rating)
- Use wire of a proper size to meet the voltage and current requirements.
- When exporting the HG2G-5T to Europe, use an EN60127 (IEC60127) approved fuse on the power line outside the HG2G-5T.
- When exporting the HG2G-5T to Europe, use an EU-approved circuit protector.
- Make sure of safety before starting and stopping the HG2G-5T. Incorrect operation of the HG2G-5T may cause mechanical damage or accidents.
- Use the HG2G-5T in a local area network if you download, upload or monitor the project data via the Ethernet port.
- The touch panel of the HG2G-5T is made of glass, and will break if exposed to excessive shock. Take due care when handling it.
- When more than one button is pressed at the same time, due to the detection characteristics of an analog type touch panel, only the gravity center of the pressed area is sensed and the unit assumes that only one button is pressed. Thus, don't operate the MICRO/I by pressing more than one button simultaneously.
- The screen becomes blank when the backlight is burnt out; however, the touch panel remains enabled. Incorrect touch panel operation will occur when operating the touch panel when the backlight appears to be turned off but is actually burnt out. Note that this erroneous operation may result in damage.
- Do not push hard or scratch the touch panel and protection sheet with a hard object such as a tool, because they are damaged easily.
- At temperatures over the rated operating temperature, the clock accuracy is affected. Adjust the clock before use.
- For applications which require clock accuracy, adjust the clock periodically.
- Do not install the HG2G-5T in areas subjected to strong ultraviolet rays, since ultraviolet rays may impair the quality of the LCD.
- Do not attempt to disassemble, repair or modify the HG2G-5T. This can create the risk of fire or electrocution.
- When disposing of the HG2G-5T, do so as an industrial waste.
- Do not switch off the power or pull out the USB flash drive while it is being accessed, as this may result in destruction of the stored data. If the data on the USB flash drive is corrupted, format the USB flash drive.

Revision history

August 2015: First Edition

Caution

- The contents of this manual and the WindO/I-NV4 application are subject to change without notice.
- IDEC Corporation accepts no responsibility for circumstances arising from the use of this manual or the WindO/I-NV4 application.
- Please contact your vendor or IDEC Corporation with any problems regarding the operation of this product.

Trademarks

Symbols Used in this Document

This manual uses the following symbols to facilitate description.

Symbols

	......	Information that requires special attention. Failure to operate the product in accordance with the information provided can lead to serious injury or damage.
	......	Information relating to requests or material to reference in the use of a function.
	......	Useful information relating to a function.
☞	......	Indicates the chapter and page of related reference information.
OK	......	Screen buttons are indicated by **bold** text or by using the actual graphic icon.
SHIFT, [A]	......	Keyboard keys are indicated by the keyboard inscription in capital letters or enclosed in square brackets.
****	......	Controls are indicated by **bold** text.

Abbreviations, Generic Terms, and Terminology Used in this Manual

Item	Description
HG4G	The name is short for MICRO/I HG4G-CJT22*F-B.
HG3G	The name is short for MICRO/I HG3G-*JT22*F-*.
HG2G-S	The name is short for MICRO/I HG2G-S*2**F-*.
HG2G-5S	The name is short for MICRO/I HG2G-5ST22*F-*.
HG2G-5F	The name is short for MICRO/I HG2G-5FT22TF-*.
HG2G-5T	The name is short for MICRO/I HG2G-5T*22TF-*.
HG4G/3G	The format used to refer to HG4G and HG3G.
HG2G-5F/-5T/-5S/-S	The format used to refer to HG2G-5F, HG2G-5T, HG2G-5S and HG2G-S.
MICRO/I	Generic term for programmable display device.
External device	Generic term used to refer to a PLC or micro computer that is connected to and communicates with the MICRO/I or Touch.
Device Address	Memory that is capable of storing values in unit of bits or words loaded on the MICRO/I or Touch and external device.
System Area	Device area that is pre-allocated for exchanging screen management, error information, and clock data between the MICRO/I or Touch and external device.
Device Link Communication	A communication method that performs communication with the external device according to the setting of the screen and without a program.
DM Link Communication	A communication method that reads to or writes from the MICRO/I or Touch device from a computer or microcomputer board.
User Communication	A communication method which performs communication with external devices such as barcode readers and inverters.
External Device Communication	Generic term used to refer to Device Link Communication and DM Link Communication.
Sub Host Communication	A communication method that performs communication with external device according to the set device address list and without a program.
O/I Link	A connection format that enables connections of up to 16 units of MICRO/I with high-speed communication of 115200bps.
O/I Link Master	The MICRO/I unit that is directly connected to external device on the O/I Link network.
O/I Link Slave	The MICRO/I units that are not directly connected to external device on the O/I Link network.
WindO/I-NV4	Integrated configuration software application for creating projects of the MICRO/I.
Project	Data including image data required for operating the MICRO/I, which is created with WindO/I-NV4.
Manager	WindO/I-NV4 provides tools to manage pictures, text and script etc. With the Managers, you can create and manage them in your project.
Setup	Generic term used to refer to the common settings in the project.
Project Settings	Basic settings of operation in the Setup settings.
Alarm Log	A function where the MICRO/I collects log data of alarms.
Data Log	A function where the MICRO/I collects value of device addresses.
Script	A script is an executable list of commands created by a simple programming language.
Text Group	A group of 32 texts maximum that is in order to dynamically switch the character displayed on the MICRO/I according to the value of the device address.
Windows Font	Text fonts that can be displayed on the Windows OS on which the WindO/I-NV4 is running.
Stroke Font	A glyph's outline is defined by the vertices of individual strokes and stroke's profile. Scalable fonts scale easily without jagged edges. Under font settings, “Stroke” is a stroke-based font.
Maintenance Communication	Communications between the WindO/I-NV4 and MICRO/I using a dedicated protocol.
Device Monitor	A special Popup Screen on the MICRO/I on which value of the device address can be displayed or changed.

Item	Description
Pass-Through	A function that enables maintenance of the external device via the MICRO/I.
System Screen	Pre-allocated screen dedicated for performing initial setting of the MICRO/I, self-diagnosis, and clearing the log data etc.
External Memory Device	The generic term for an SD memory card and a USB flash drive.
NV Metafile	A graphic data file that integrates drawings created on the WindO/I-NV4 edit screen.
Window	Screens that are loaded on to the Base Screen, including Popup Screen and Device Monitor.
Internal Device	The generic term for internal device addressing on the MICRO/I such as internal relays, registers, etc.
Keep Device	The generic term for internal device not initialized at the start of operation. Even after the power is turned off, the values are retained by the battery.
Drawings	Define as as non functional content (i.e. shape, picture, text).
Parts	Define as functional content (i.e. button, pilot lamp, commands, etc.)
Object	Define as combination of Drawings and Parts placed on WindO/I-NV4 edit screen.
Touch Switch	A part that operates a function by pressing parts that have been placed on the screen.
Standard Keypad	Keypad that is displayed when operating Numerical and Character Input parts when **Standard** is selected under **Type** in the **Keypad** menu for Numerical and Character Input parts.

Contents

Chapter 3 O/I Link Communication

Chapter 4 DM Link Communication

Chapter 5 Modbus

Chapter 6 Communication with Multiple External Devices

Chapter 7 Communication Cables

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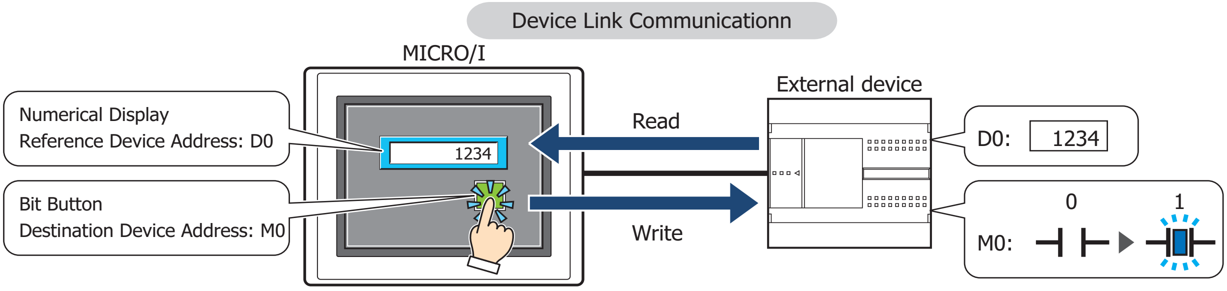
Chapter 1 Device Link Communication

1 Overview

Device Link Communication refers to the communication protocol used for communication with the MICRO/I, via the CPU Unit[*1] or PLC Link Unit[*1] Programming Port of the external device connected to the MICRO/I.
The MICRO/I continuously reads the value of device of external device addresses on the currently displayed screen, and external devices (such as relays and registers) on the screens are updated with the latest data at all times.
When a button is pressed or a command is executed in the MICRO/I screen, the value is written to the external device address.



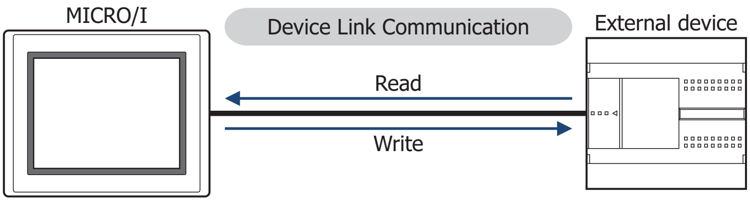
For details regarding the Command Method Communication, refer to Chapter 2 “Chapter 2 Connection to External Devices” on page 2-1.

● Connection Types

There are two basic types of connections. 1:1 Communication, where an external device is connected to a MICRO/I; and 1:N Communication, where multiple external devices are connected to a MICRO/I.

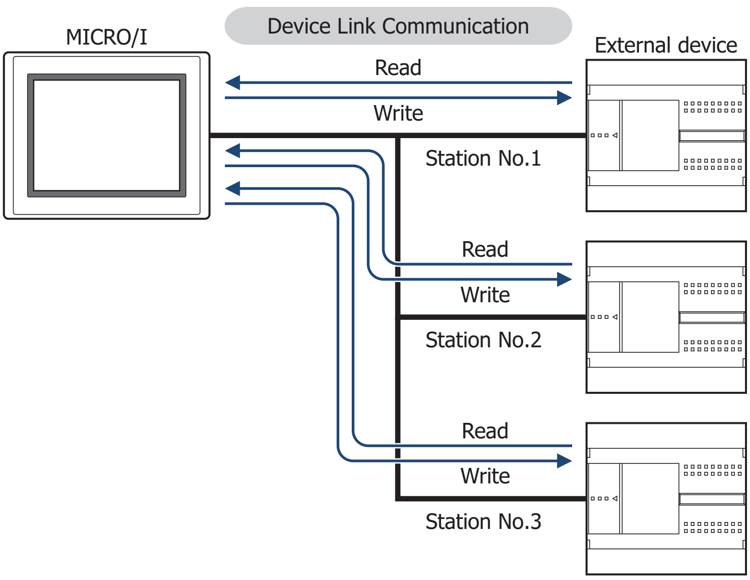
■ 1:1 Communication

The MICRO/I is connected to a single external device.



■ 1:N Communication

The MICRO/I is connected to multiple external devices.



*1 Unit names vary based on the manufacturer of the external device.

2 Settings

You need to setup MICRO/I using WindO/I-NV4 in order for it to be able to communicate with the external devices.

Device Link Communication setting is set on the Project Settings dialog box displayed by clicking **Project** under **System Setup** on the **Configuration** tab in WindO/I-NV4. For detail refer to WindO/I-NV4 User's Manual. Match the settings for the items in the following table to those of the external devices that you will be using.

Project Settings dialog box

Tab Name	Setting Name	Description
System	Start Time (sec)	This is the time delay until the MICRO/I sends a communication command after the power is turned on. Set this option if the external device is turned on after the MICRO/I, or some time is required until the communication port of external devices can be used.
	Use System Area	When **Use System Area** is selected, set the device address for System Area.
	Use System Areas 3, 4	
	Watch Dog	When **Watch Dog** is selected, set the **Device Address** and the **Time** for the write interval.
	Device Address	
	Time (sec)	
Communication Interface	Interface Configuration	Select the interface used for the Device Link Communication.
	Function	Select the Function to be used. The details of **External Device Communication 1** to the **External Device Communication 4** are configured on the Communication Driver tab. For details about O/I Link Communication, refer to Chapter 3 "O/I Link Communication" on page 3-1.
	Baud Rate	The settings vary based on the external device used. Refer to Chapter 2 "Connection to External Devices" on page 2-1.
	Data Bits	
	Stop Bits	
	Parity	
	Flow Control	
	Serial Interface	
Communication Driver	Manufacturer	Select the manufacturer and the communication driver from the list of compatible External Devices given in Chapter 2 "Connection to External Devices" on page 2-1 that corresponds to the one you will be using.
	Communication Driver	
	Connection	
	Transmission Wait (x10 msec)	The settings vary based on the external device used. For detail refer to Chapter 2 "Connection to External Devices" on page 2-1. If there is no setting given for the transmission wait, set it to 0.
	Time Out (x100 msec)	This is the time that the MICRO/I will wait for a reply from the External Device after it sends a communication command. When this time elapses, the MICRO/I will send the command again. (Default: 20) Give careful consideration to the value that you will use before changing this setting.
	Retry Cycles	If communication errors occur despite trying the number set here, an error is displayed on the screen and the error information is set in the system area. (Default: 5)
	(Other setting)	The settings vary based on the external device used. For detail refer to Chapter 2 "Connection to External Devices" on page 2-1 for your External Device.

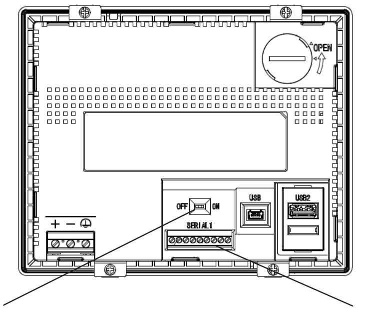
Tab Name	Setting Name	Description
Communication Driver Network	Station Number	This number is used to distinguish an external device when set to a device address.
	IP Address	This option is IP address of each external devices.
	Port Number	This option is Port Number of each external devices.
	(Other setting)	These items vary based on the Communication Driver. You can see some items if the selected Communication Driver has any setting items. Refer to each manual for the external device.

3 Important Points Regarding Wiring

Take note of the following points when connecting an External Device to the MICRO/I.

- Depending on the environment, connect a shield wire to the FG terminal on either the External Device side or the MICRO/I side.
- When using the RS422/485 interface of Serial Interface (SERIAL1), use a twisted-pair cable so that the + and - signals are paired.
- When using RS422/485 interface, setting the Terminating Resistor Selector Switch ON inserts a 100-Ohm. Use it if necessary. Refer to the setting of the Terminating Resistor Selector Switch as below.

HG2G-5T



Terminating Resistor Selector Switch Serial Interface (SERIAL1)

Chapter 2 Connection to External Devices

1 IDEC

Selecting **OpenNet**,**MICROSmart**,**SmartAXIS Pro/Lite(RS232C/485)** as the Communication Driver allows your to use the 1:N Communication function and Pass-through function. However, SmartAXIS Pro/Lite does not support the Pass-through function. Selecting **OpenNet**,**MICROSmart**,**SmartAXIS Pro/Lite(Ethernet)** as the Communication Driver allows you to use 1:N Communication function only.

- Pass-through function (☞ Chapter 26 “Pass-Through Function” in the WindO/I-NV4 User’s Manual)
- 1:N Communication function (☞ Chapter 6 “Communication with Multiple External Devices” on page 6-1)

1.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	**Flow Control**	**Communication Driver**
OpenNet Controller				
FC3A-CP2	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-10)	ER	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
MICROSmart				
FC4A-C10R2	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-10)		
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC4A-C16R2 FC4A-C24R2	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-10)		
	FC4A-PC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC4A-D20K3 FC4A-D20S3 FC4A-D20RK1 FC4A-D20RS1 FC4A-D40K3 FC4A-D40S3	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-10)		
	FC4A-HPC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-HPC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC4A-HPH1 +FC4A-PC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-HPH1 +FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)

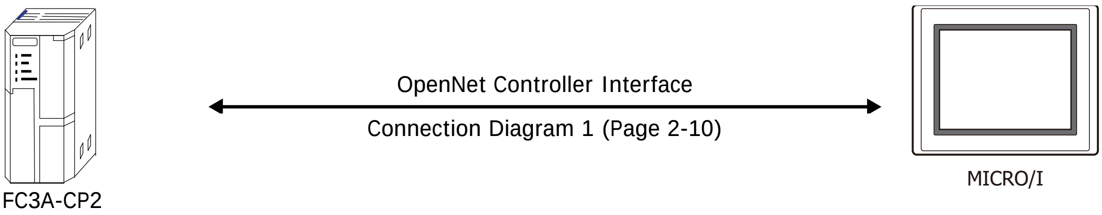
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MICROSmart Pentra				
FC5A-C10R2 FC5A-C16R2 FC5A-C24R2 FC5A-C10R2C FC5A-C16R2C FC5A-C24R2C	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-10)		
	FC4A-PC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC5A-SIF2	RS232C Connection Diagram 4 (Page 2-11)		
	FC5A-SIF4	RS422/485 2-wire Connection Diagram 2 (Page 2-10)		
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC5A-D16RK1 FC5A-D16RS1 FC5A-D32K3 FC5A-D32S3	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-10)		
	FC4A-HPC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-HPC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC4A-HPH1 +FC4A-PC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-HPH1 +FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC5A-SIF2	RS232C Connection Diagram 4 (Page 2-11)		
	FC5A-SIF4	RS422/485 2-wire Connection Diagram 2 (Page 2-10)		
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC5A-D12K1E FC5A-D12S1E	Not required (connects to CPU unit)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
	FC4A-HPC1	RS232C Connection Diagram 1 (Page 2-10)	ER	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
	FC4A-HPC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC4A-HPH1 +FC4A-PC1	RS232C Connection Diagram 1 (Page 2-10)	ER	
	FC4A-HPH1 +FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)	None	
	FC5A-SIF2	RS232C Connection Diagram 4 (Page 2-11)		
	FC5A-SIF4	RS422/485 2-wire Connection Diagram 2 (Page 2-10)		

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
SmartAXIS Pro/Lite				
FT1A-H24RA FT1A-H24RC FT1A-B24RA FT1A-B24RC FT1A-H40RKA FT1A-H40RSA FT1A-H40RC FT1A-B40RKA FT1A-B40RSA FT1A-B40RC FT1A-H48KA FT1A-H48SA FT1A-H48KC FT1A-H48SC FT1A-B48KA FT1A-B48SA FT1A-B48KC FT1A-B48SC	Not required (connects to CPU unit)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
	FT1A-PC1	RS232C Connection Diagram 3 (Page 2-11)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
	FT1A-PC2	RS422/485 2-wire Connection Diagram 5 (Page 2-11)		
	FT1A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-10)		

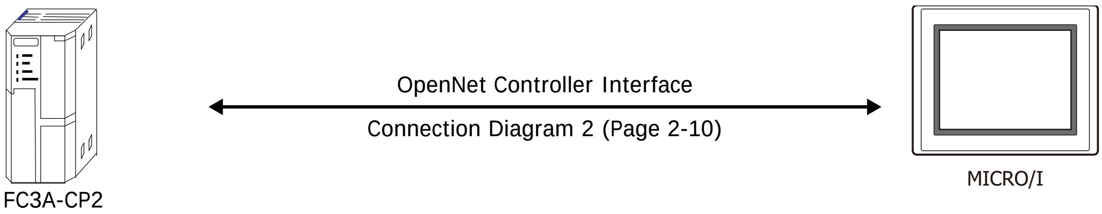
1.2 System Configuration

This is the system configuration for the connection of IDEC PLCs to the MICRO/I.

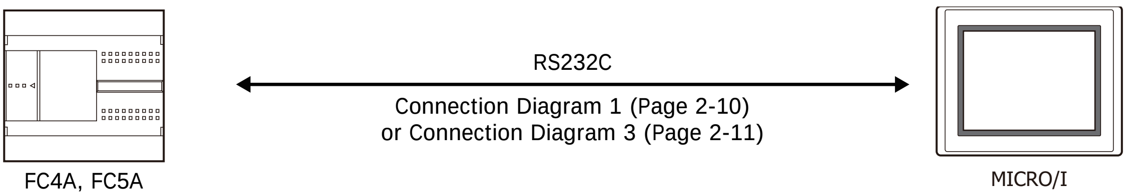
● OpenNet Controller (Connects to RS232C port of the CPU unit)



● OpenNet Controller (Connects to RS485 port of the CPU unit)

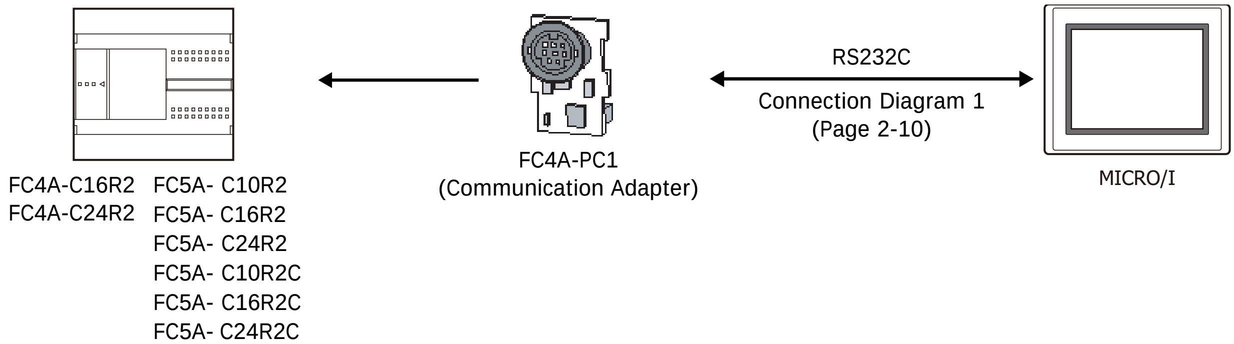


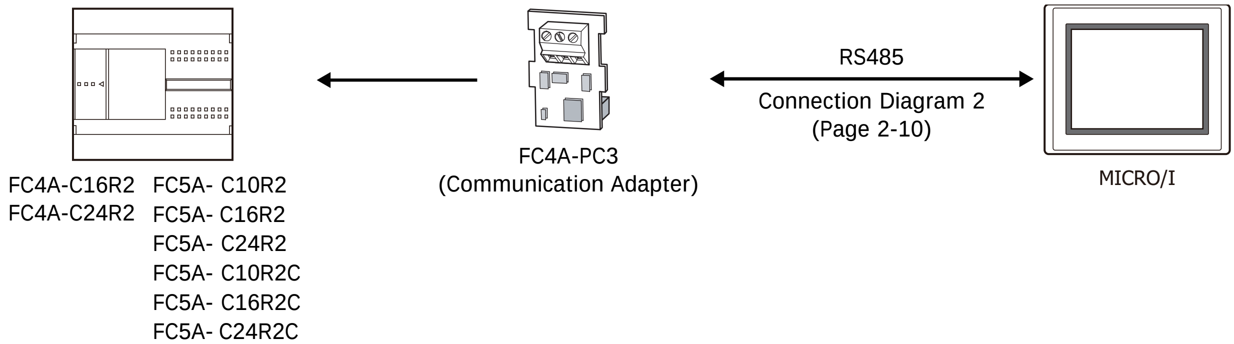
● MICROSmart, MICROSmart Pentra (Connects to the communication port1)

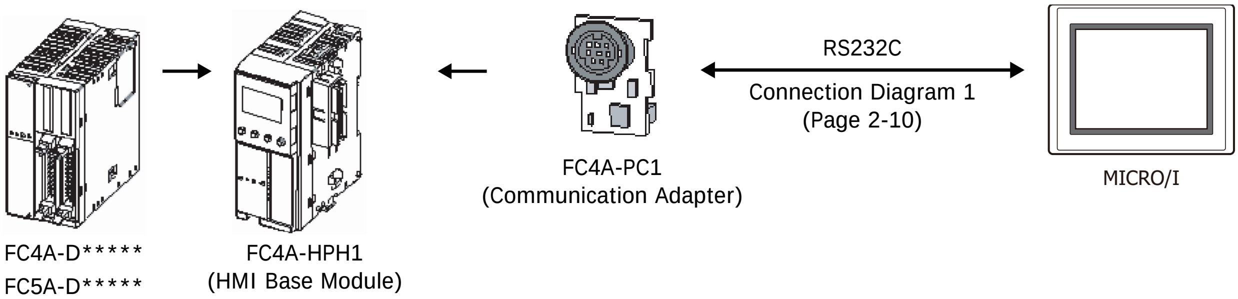


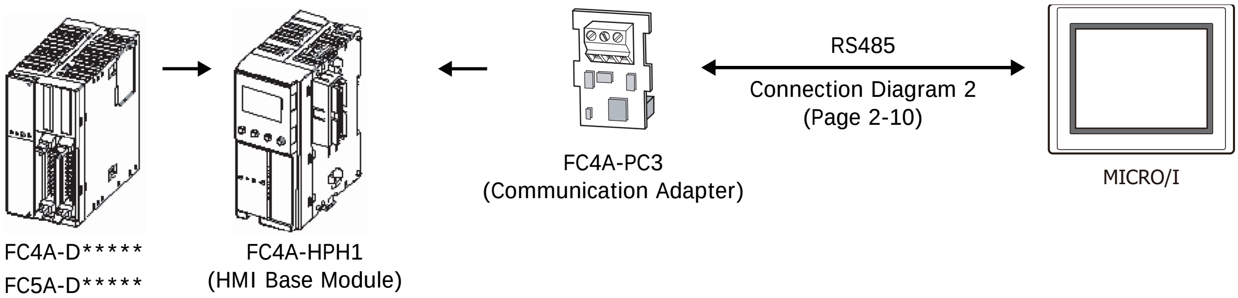
FC5A-D12K1E and FC5A-D12S1E can not be connected to the MICRO/I with RS232C cable because they don't have built-in RS232C port.

● MICROSmart, MICROSmart Pentra (Connects to the communication port 2)

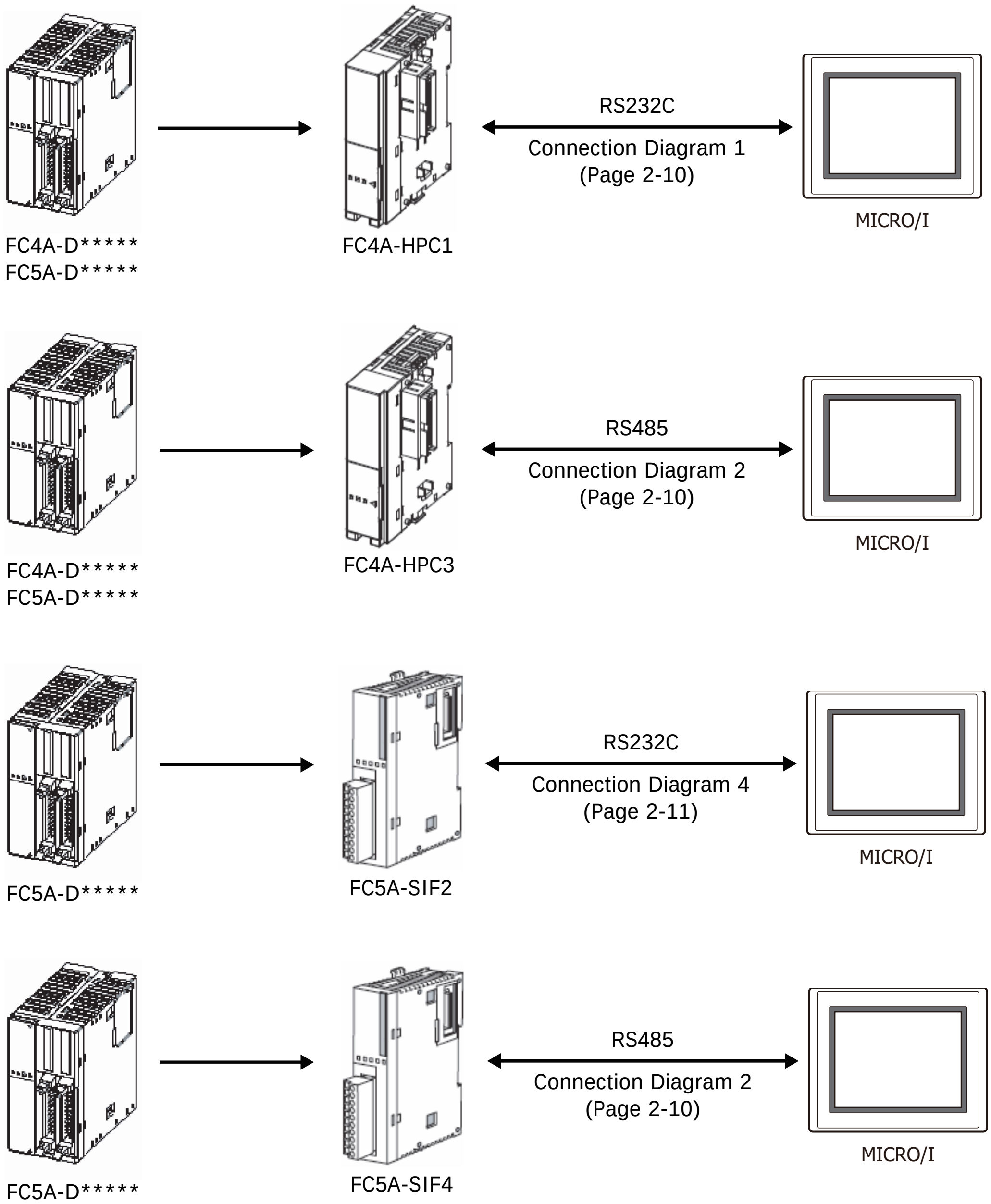




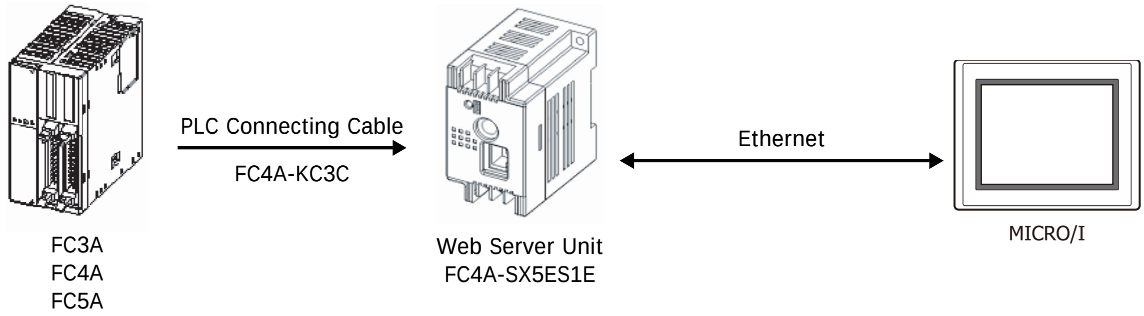




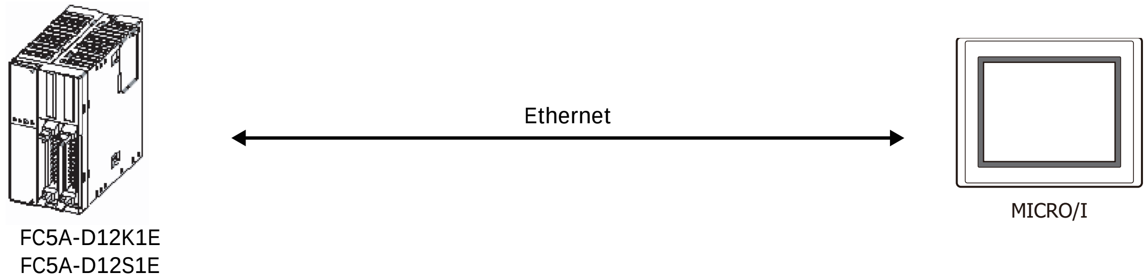
● MICROSmart, MICROSmart Pentra (Connects to the Communication Module)



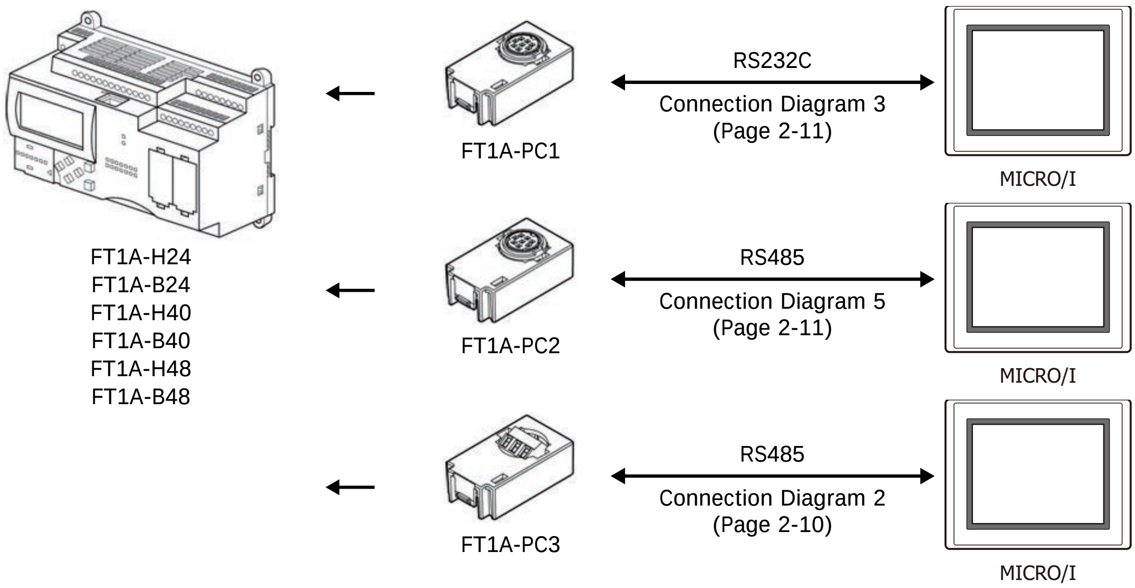
● OpenNet Controller/MICROSmart/MICROSmart Pentra (Connects to Web Server Unit)



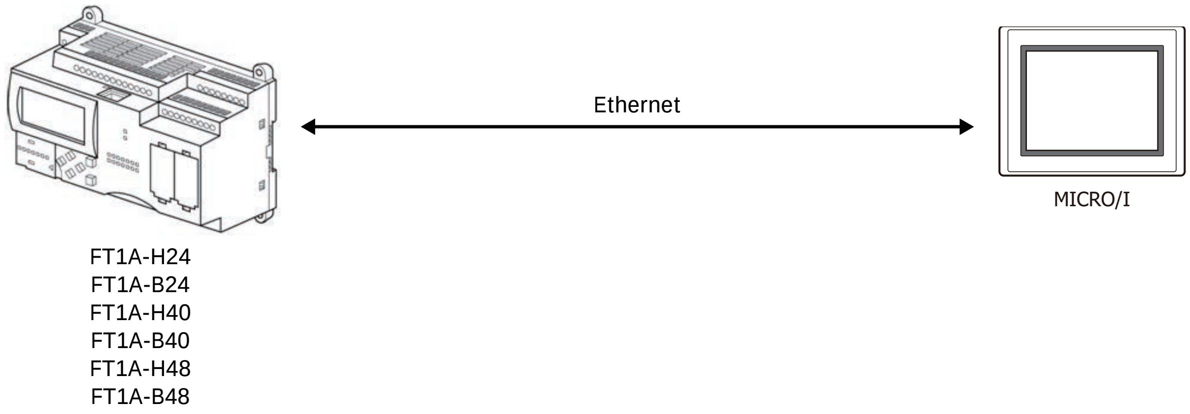
● MICROSmart Pentra (FC5A-D12K1E, FC5A-D12S1E)



● SmartAXIS Pro/Lite (Connects to the Communication cartridge)



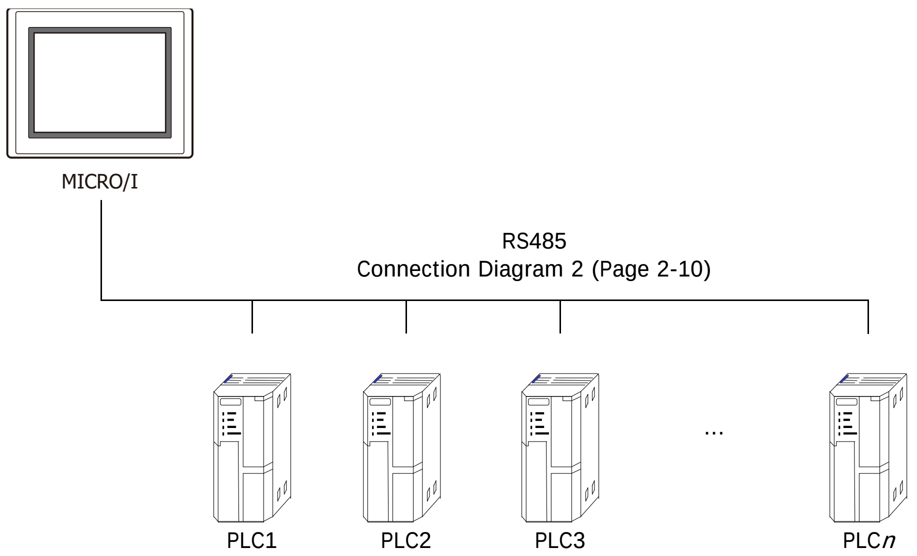
● SmartAXIS Pro/Lite



● 1:N Communication-OpenNet Controller, MICROSmart, MICROSmart Pentra, SmartAXIS Pro/Lite

The 1:N communication can be established by using the following connections.

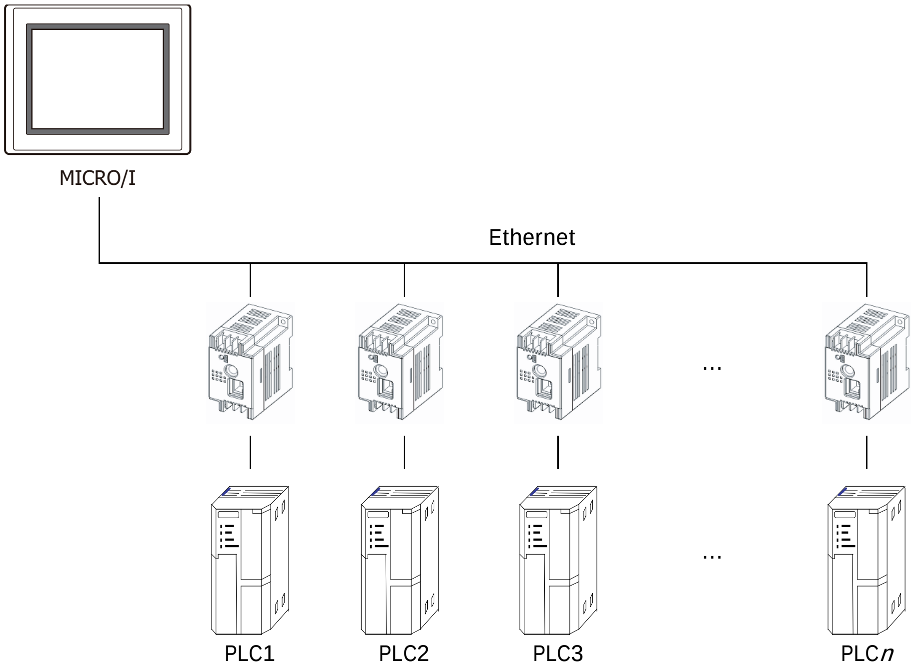
- OpenNet Controller (Connects to RS485 port of the CPU unit)
- MICROSmart, MICROSmart Pentra (Connects to Port 2)
- MICROSmart, MICROSmart Pentra (Connects to Communication module)
- SmartAXIS Pro/Lite (Connects to Communication cartridge)



● 1:N Communication - OpenNet Controller, MICROSmart, MICROSmart Pentra, SmartAXIS Pro/Lite (Connects to Web Server Unit)

The 1:N communication can be established by using the following connections.

- OpenNet Controller (Connects to the Web Server Unit)
- MICROSmart, MICROSmart Pentra (Connects to the Web Server Unit)
- MICROSmart Pentra FC5A-D12K1E, FC5A-D12S1E (Do not use the Web Server Unit)
- SmartAXIS Pro/Lite (Do not use the Web Server Unit)



- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

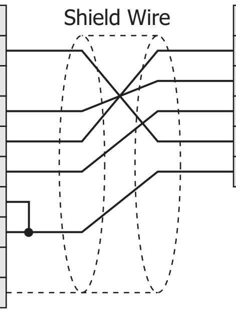
1.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: OpenNet Controller, MICROSmart, MICROSmart Pentra (RS232C port)

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
RS	1
ER	2
SD	3
RD	4
DR	5
SG	6
SG	7
+5V	8
Shield	Cover



HG2G-5T:
Terminal block

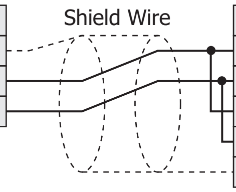
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

In case of HG2G-5T, a connection cable (part number: HG9Z-XC275) is available.
Refer to Chapter 7 "1.1 External devices/PLC connection cable: FC2A-KP1C, HG9Z-XC275" on page 7-1 about the connection diagram of HG9Z-XC275.

● Connection Diagram 2: OpenNet Controller, MICROSmart, MICROSmart Pentra (RS485 port)
MICROSmart, MICROSmart Pentra (FC5A-SIF4)
SmartAXIS Pro/Lite (FT1A-PC3)

PLC(RS422/485):
Terminal block

Name	Pin No.
SG	
A	
B	



HG2G-5T:
Terminal block

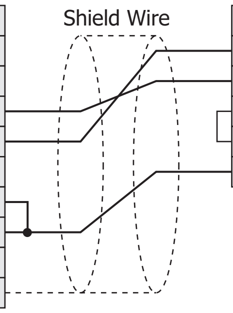
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: MICROSmart/MICROSmart Pentra (RS232C Port 1) SmartAXIS Pro/Lite (FT1A-PC1)

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
NC	1
NC	2
SD	3
RD	4
NC	5
SG	6
SG	7
NC	8
Shield	Cover



HG2G-5T:
Terminal block

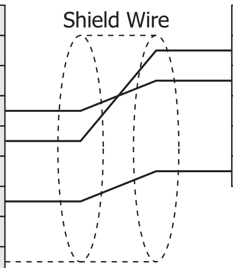
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

In case of HG2G-5T, a connection cable (part number: HG9Z-XC275) is available.
Refer to Chapter 7 "1.1 External devices/PLC connection cable: FC2A-KP1C, HG9Z-XC275" on page 7-1 about the connection diagram of HG9Z-XC275.

● Connection Diagram 4: MICROSmart/MICROSmart Pentra (FC5A-SIF2)

PLC(RS232C): Terminal block

Name	Pin No.
RS(RTS)	
ER(DTR)	
SD(TxD)	
RD(RxD)	
DR(DSR)	
SG(SG)	
NC	
FE	
FE	
FE	



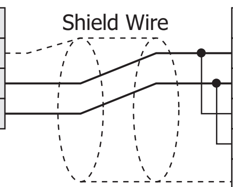
HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 5: SmartAXIS Pro/Lite (FT1A-PC2)

PLC(RS422/485):
Mini DIN 8-pin Connector

Name	Pin No.
SG	7
A	2
B	1



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

In case of HG2G-5T, a connection cable (part number: HG9Z-XC275) is available.
Refer to Chapter 7 "1.1 External devices/PLC connection cable: FC2A-KP1C, HG9Z-XC275" on page 7-1 about the connection diagram of HG9Z-XC275.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

1.4 Environment Settings

● OpenNet Controller and MICROSmart

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	Baud Rate	9600 bps
	Data Bits	7 bits
	Stop Bits	1 stop bits
	Parity	Even
Communication Driver Network	Slave Number*1	0

Set the Special Internal Relay M8014 of OpenNet Controller to ON if you connect OpenNet Controller to MICRO/I.

● OpenNet Controller, MICROSmart/MICROSmart Pentra (Connects to Web Server Unit)

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address for MICRO/I.
	Subnet Mask	Set the subnet mask for MICRO/I.
	Default Gateway	Set the default gateway for MICRO/I.
Communication Driver Network	IP Address	Set the IP address for Web Server Unit.
	Port Number	Set the port number for Web Server Unit.

Set the Special Internal Relay M8014 of OpenNet Controller to ON if you connect OpenNet Controller to MICRO/I.

● MICROSmart Pentra (FC5A-D12K1E, FC5A-D12S1E)

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address for MICRO/I.
	Subnet Mask	Set the subnet mask for MICRO/I.
	Default Gateway	Set the default gateway for MICRO/I.
Communication Driver Network	IP Address	Set the IP address for FC5A.
	Port Number	Set the port number for FC5A.

*1 Set a decimal number for the Slave Number of MICRO/I.

1.5 Usable Device Addresses

● OpenNet Controller/MICROSmart (Connects to the Web Server Unit)

Bit Device

Device Name	Device Type		Address Number Range	Read/Write	Address Numeral System
	MICRO/I	PLC			
Internal Relay (Bit)	M	M	0 to 2557, 8000 to 8317	R/W	*1
Input (Bit)	I	I	0 to 627	R	*1
Output (Bit)	Q	Q	0 to 627	R/W	*1
Timer (Contact)	T	T	0 to 255	R	Decimal
Counter (Contact)	C	C	0 to 255	R	Decimal
Shift Register (Bit)	R	R	0 to 255	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read/Write	Address Numeral System
	MICRO/I	PLC			
Data Register	D	D	0 to 49999	R/W	Decimal
Input (Word)	WI	I	0 to 620	R	Decimal*2
Output (Word)	WQ	Q	0 to 620	R/W	Decimal*2
Internal Relay (Word)	WM	M	0 to 2540, 8000 to 8300	R/W	Decimal*2
Timer (Current)	TC	T	0 to 255	R	Decimal
Counter (Current)	CC	C	0 to 255	R	Decimal
Timer (Preset)	TP	T	0 to 255	R/W	Decimal
Counter (Preset)	CP	C	0 to 255	R/W	Decimal
Link Register	L	L	100 to 1317	R/W	*1
Shift Register (Word)	WR	R	0 to 240	R	Decimal*3
Error Register	E	-	0 to 5	R/W	Decimal

Set the Special Internal Relay M8014 of OpenNet Controller to ON if you connect OpenNet Controller to MICRO/I.

Usage limitations may exist for PLC devices depending on the operating conditions. Refer to the PLC manual to confirm performance under your actual operating conditions.

*1 Set the ones place of this address number in octal.
*2 Set this address number in multiples of 20.
*3 Set this address number in multiples of 16.

2 Mitsubishi Electric

Selecting **MELSEC-Q(CPU)**, **MELSEC-FX(CPU)**, **MELSEC-FX2N(CPU)** or **MELSEC-FX3U(CPU)** for the Communication Driver allows you to use the Pass-through function.
Selecting **MELSEC-Q/QnA(Ethernet)**, **MELSEC-FX3U(Ethernet)** or **MELSEC-FX(LINK)** for the Communication Driver allows you to use the 1:N Communication.

- Pass-through function (Chapter 26 “Pass-Through Function” in the WindO/I-NV4 User’s Manual)
- 1:N Communication function (Chapter 6 “Communication with Multiple External Devices” on page 6-1)

2.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC-A				
A1N A2N A3N	AJ71C24 AJ71C24-S3/-S6/-S8 AJ71UC24	RS232C Connection Diagram 1 (Page 2-26)	ER	MELSEC-AnN(LINK)
		RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
A1SH	A1SJ71C24-R2 A1SJ71UC24-R2	RS232C Connection Diagram 3 (Page 2-26)	ER	
	A1SJ71C24-R4 A1SJ71UC24-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
A2CCPUC24	Not required (Connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-26)	ER	
A0J2 A0J2H	A0J2-C214-S1	RS232C Connection Diagram 1 (Page 2-26)		
		RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
A2A A3A A2U A3U A4U	AJ71C24-S6/-S8 AJ71UC24	RS232C Connection Diagram 1 (Page 2-26)	ER	MELSEC-AnA(Link)
		RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
A2US A2USH-S1	A1SJ71C24-R2 A1SJ71UC24-R2	RS232C Connection Diagram 3 (Page 2-26)	ER	
	A1SJ71C24-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC-QnA				
Q4ACPU Q4ARCPU Q3ACPU Q2ACPU-S1 Q2ACPU	AJ71QC24N-R2 AJ71QC24N	RS232C Connection Diagram 1 (Page 2-26)	ER	MELSEC-Q/QnA (LINK)
	AJ71QC24N-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
		RS422/485 4-wire Connection Diagram 9 (Page 2-28)		
	AJ71QE71N3-T AJ71QE71N-B2 AJ71QE71N-B5	Ethernet	-	MELSEC-Q/QnA (Ethernet)
Q2ASHCPU-S1 Q2ASHCPU Q2ASCPU-S1 Q2ASCPU	A1SJ71QC24N-R2 A1SJ71QC24N	RS232C Connection Diagram 3 (Page 2-26)	ER	MELSEC-Q/QnA (LINK)
		RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
	A1SJ71QE71N3-T A1SJ71QE71N-B2 A1SJ71QE71N-B5	Ethernet	-	MELSEC-Q/QnA (Ethernet)
MELSEC-Q				
Q00CPU Q01CPU Q00UJCPU Q00UCPU Q01UCPU Q02UCPU	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-27) Connection Diagram 7 (Page 2-28)	ER	MELSEC-Q/QnA (LINK)
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00UJCPU Q00UCPU Q01UCPU Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU Q10UDHCPU Q13UDHCPU Q20UDHCPU Q26UDHCPU Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q10UDEHCPU Q13UDEHCPU Q20UDEHCPU Q26UDEHCPU Q50UDEHCPU Q100UDEHCPU	QJ71C24N-R2	RS232C Connection Diagram 3 (Page 2-26)	ER	
	QJ71C24N	RS422/485 4-wire Connection Diagram 2 (Page 2-26)	None	
Q02CPU Q02HCPU	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-27) Connection Diagram 7 (Page 2-28)	ER	MELSEC-Q (CPU)

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
Q00JCPU Q00CPU Q01CPU Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00UJCPU Q00UCPU Q01UCPU Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU Q10UDHCPU Q13UDHCPU Q20UDHCPU Q26UDHCPU Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q10UDEHCPU Q13UDEHCPU Q20UDEHCPU Q26UDEHCPU Q50UDEHCPU Q100UDEHCPU	QJ71E71-100 QJ71E71-B5 QJ71E71-B2	Ethernet	-	MELSEC-Q/QnA (Ethernet)
Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q10UDEHCPU Q13UDEHCPU Q20UDEHCPU Q26UDEHCPU Q50UDEHCPU Q100UDEHCPU	Not required (connects to CPU unit)			

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC-FX				
FX1 FX2 FX2C	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)	None	MELSEC-FX(CPU)
FX0 FX0N (FX1N) FX0S FX1S	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
FX1NC FX2NC	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)		MELSEC-FX2N(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
FX1N	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX1N-232-BD*1	RS232C Connection Diagram 5 (Page 2-27)	ER	
	FX1N-422-BD*1	RS422/485 4-wire Connection Diagram 4 (Page 2-27)	None	
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX1N-CNV-BD + FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
FX2N	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX2N-232-BD*1	RS232C Connection Diagram 5 (Page 2-27)	ER	
	FX2N-422-BD*1	RS422/485 4-wire Connection Diagram 4 (Page 2-27)	None	
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX2N-CNV-BD + FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
FX3UC FX3U	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)		MELSEC-FX3UC(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX3U-232ADP or FX3U-CNV-BD + FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-28)		
	FX3U-ENET-L*2	Ethernet	-	MELSEC-FX3U(Ethernet)

*1 These are communication boards.
*2 When connecting with MELSEC-FX3UC, FX2NC-CNV-IF or FX3UC-1PS-5V is required.

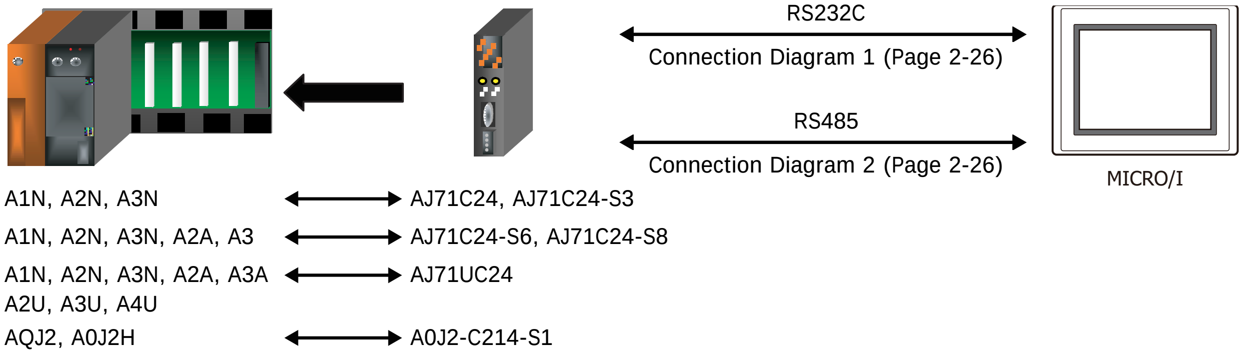
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FX3G	Not required (connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-27)	None	MELSEC-FX3UC(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-29)		
	FX3G-CNV-ADP + FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
FX1S FX1N	FX1N-232-BD	RS232C Connection Diagram 8 (Page 2-28)		MELSEC-FX(LINK)
	FX1N-CNV-BD + FX2NC-232ADP			
	FX1N-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
	FX1N-CNV-BD + FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
FX2N	FX2N-232-BD	RS232C Connection Diagram 8 (Page 2-28)		
	FX2N-CNV-BD + FX2NC-232ADP			
	FX2N-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
	FX2N-CNV-BD + FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
FX1NC FX2NC	FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-28)		
	FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
FX3U	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-28)		
	FX3U-CNV-BD + FX3U-232ADP			
	FX3U-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
	FX3U-CNV-BD + FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		

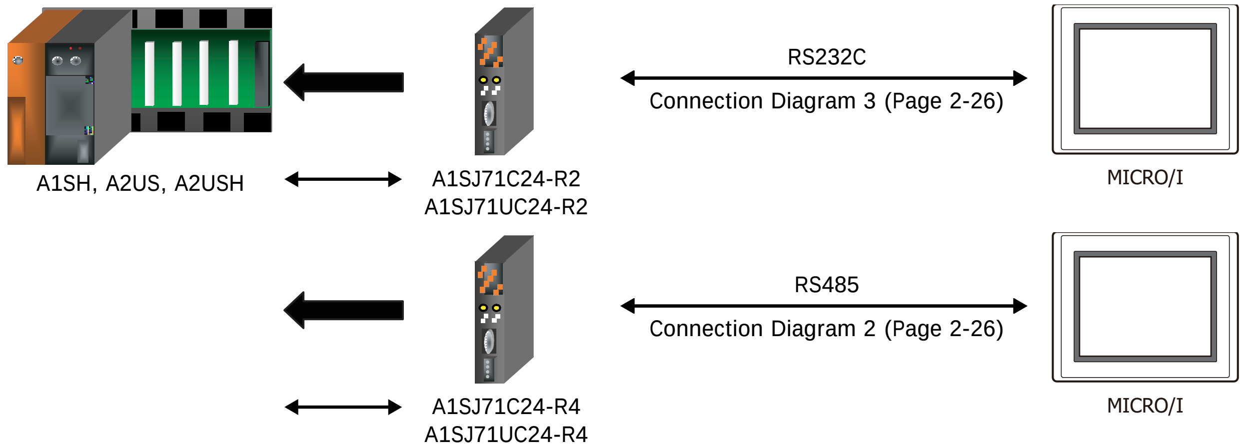
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FX3UC	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-28)	None	MELSEC-FX(LINK)
	FX3U-232ADP			
	FX3U-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
	FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
FX3G	FX3G-232-BD	RS232C Connection Diagram 8 (Page 2-28)		
	FX3G-CNV-ADP + FX3U-232ADP			
	FX3G-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		
	FX3G-CNV-ADP + FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-29)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-29)		

2.2 System Configuration

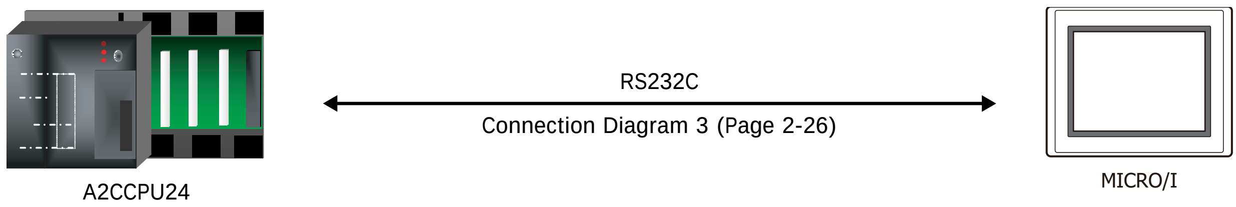
This is the system configuration for the connection of Mitsubishi Electric PLCs to the MICRO/I.

● MELSEC-A Series (Connects to the Computer Link Unit)

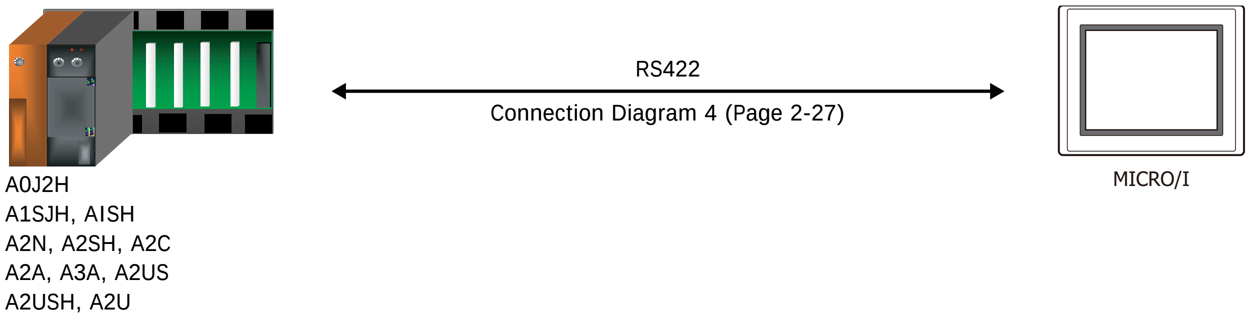




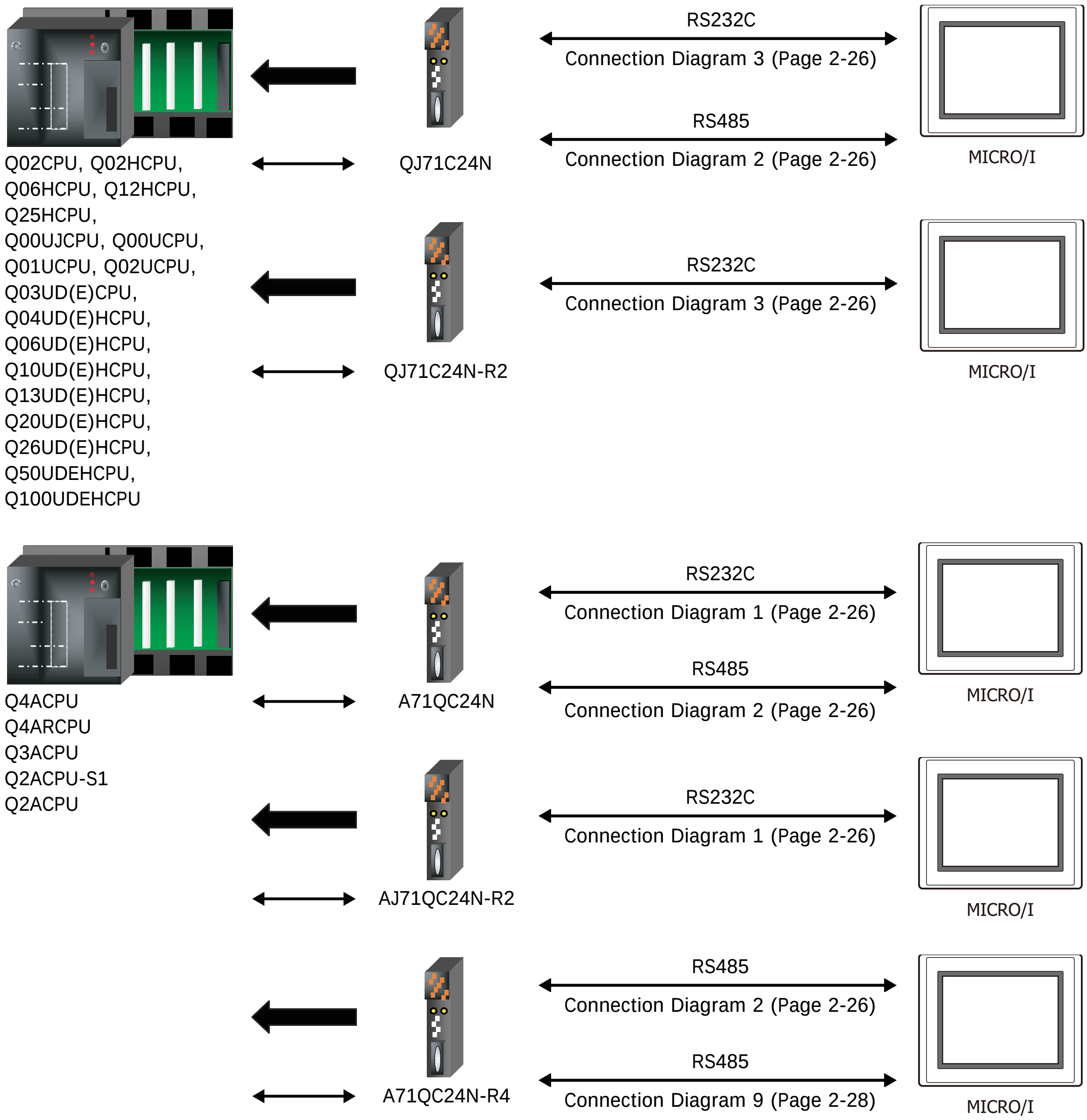
● MELSEC-A Series (Connects to the CPU Unit Link Interface)

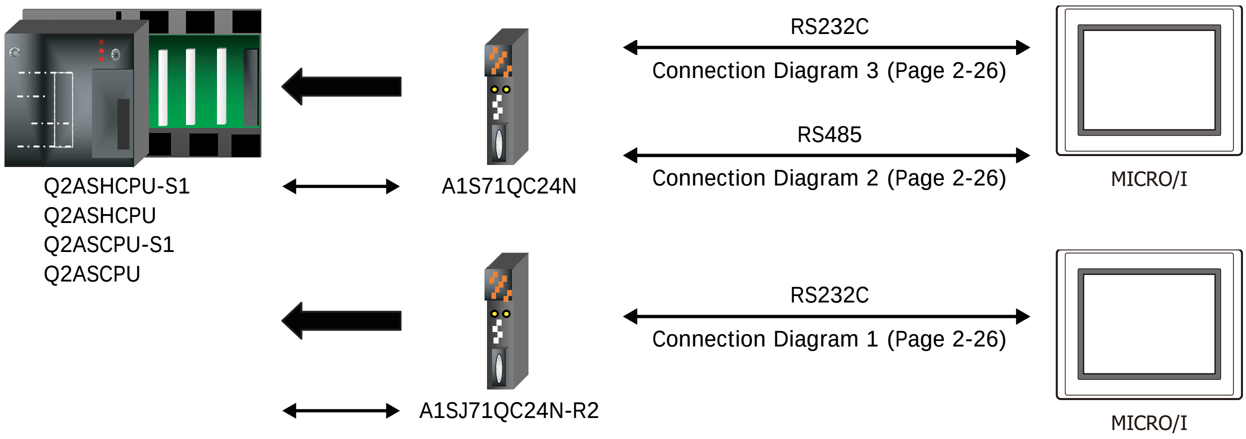


● MELSEC-A Series (Connects to the CPU Unit Programming Port)

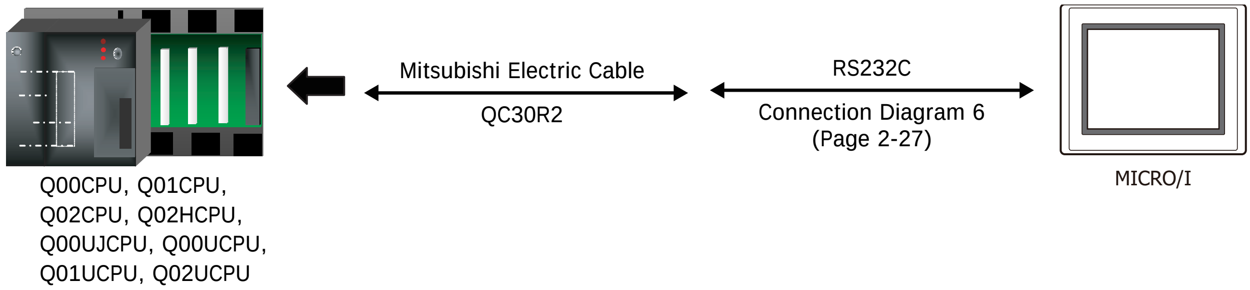


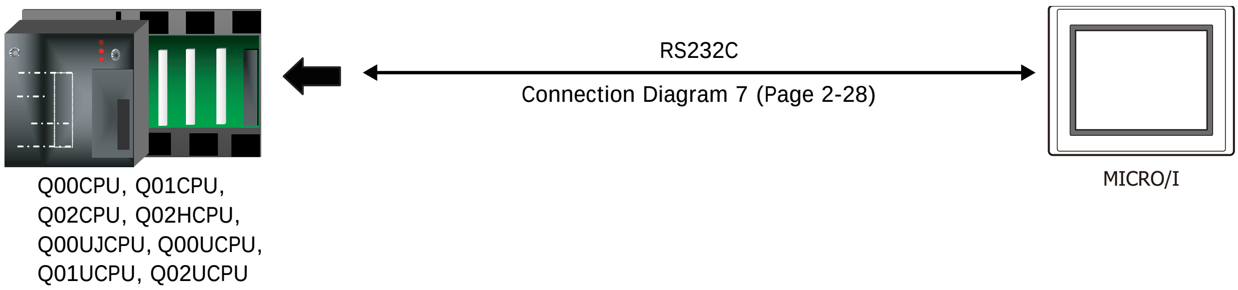
● MELSEC-Q/QnA Series (Connects to the Computer Link Unit)



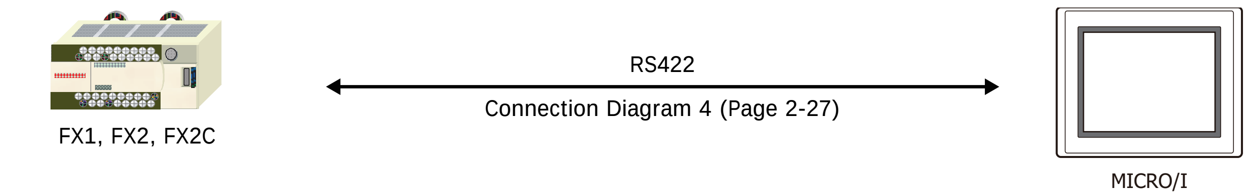


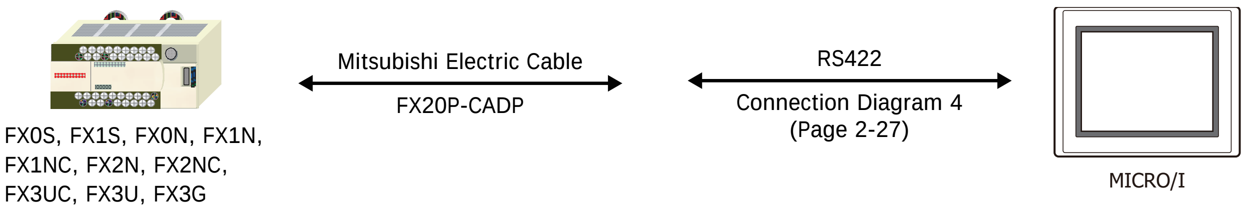
● MELSEC-Q Series (Connects to the CPU Unit Programming Port)

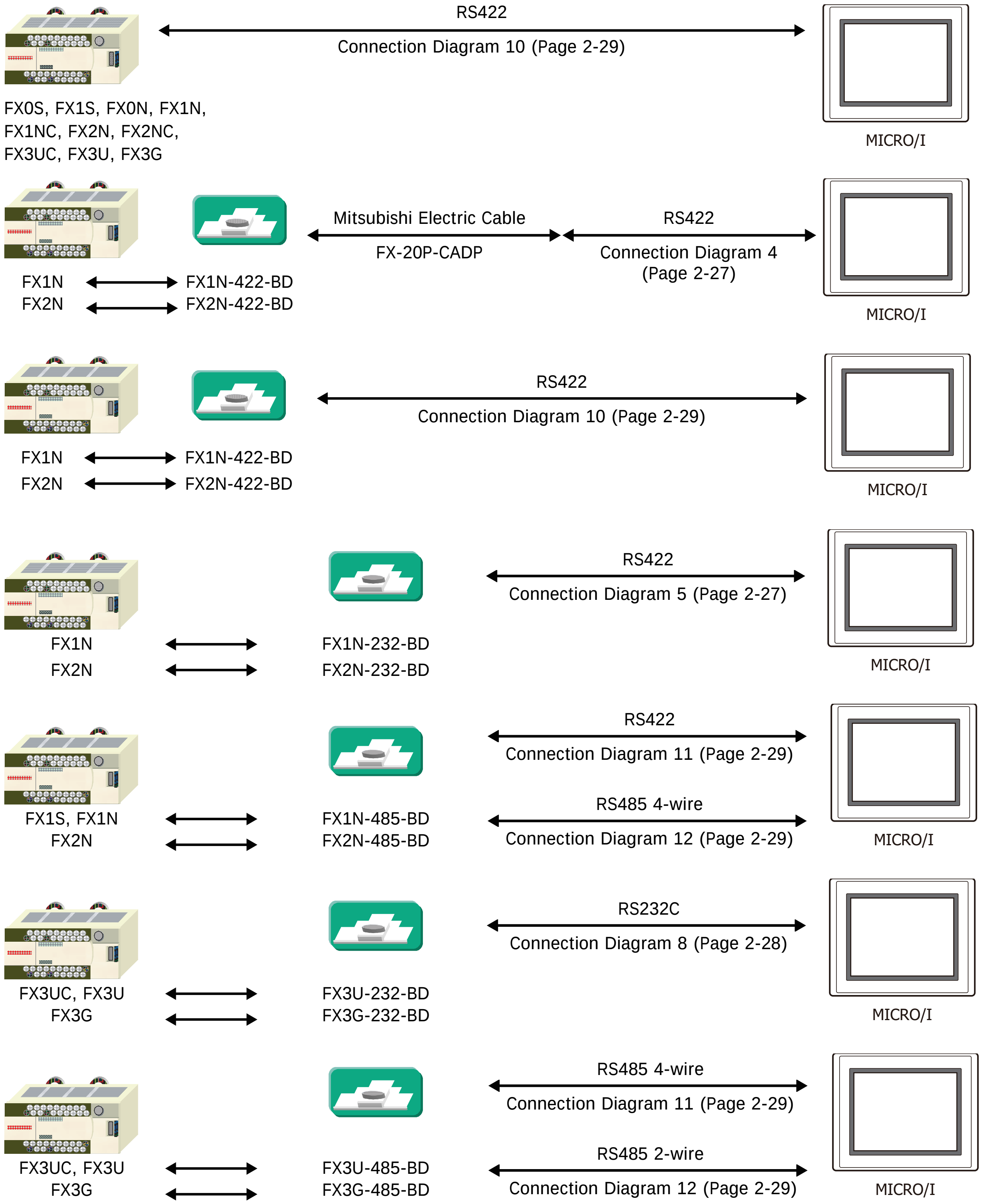




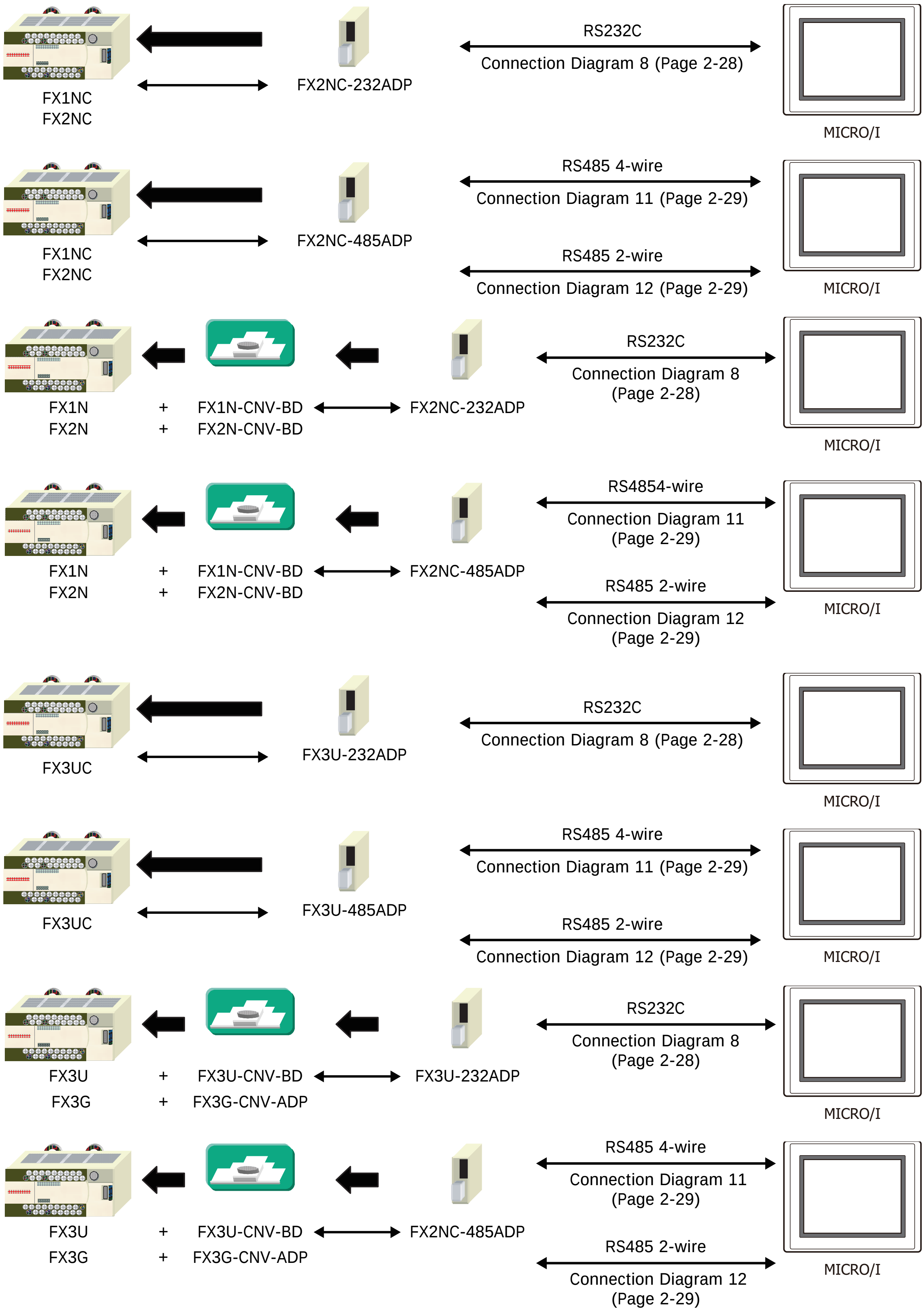
● MELSEC-FX Series (Connects to the CPU Unit Programming Port)



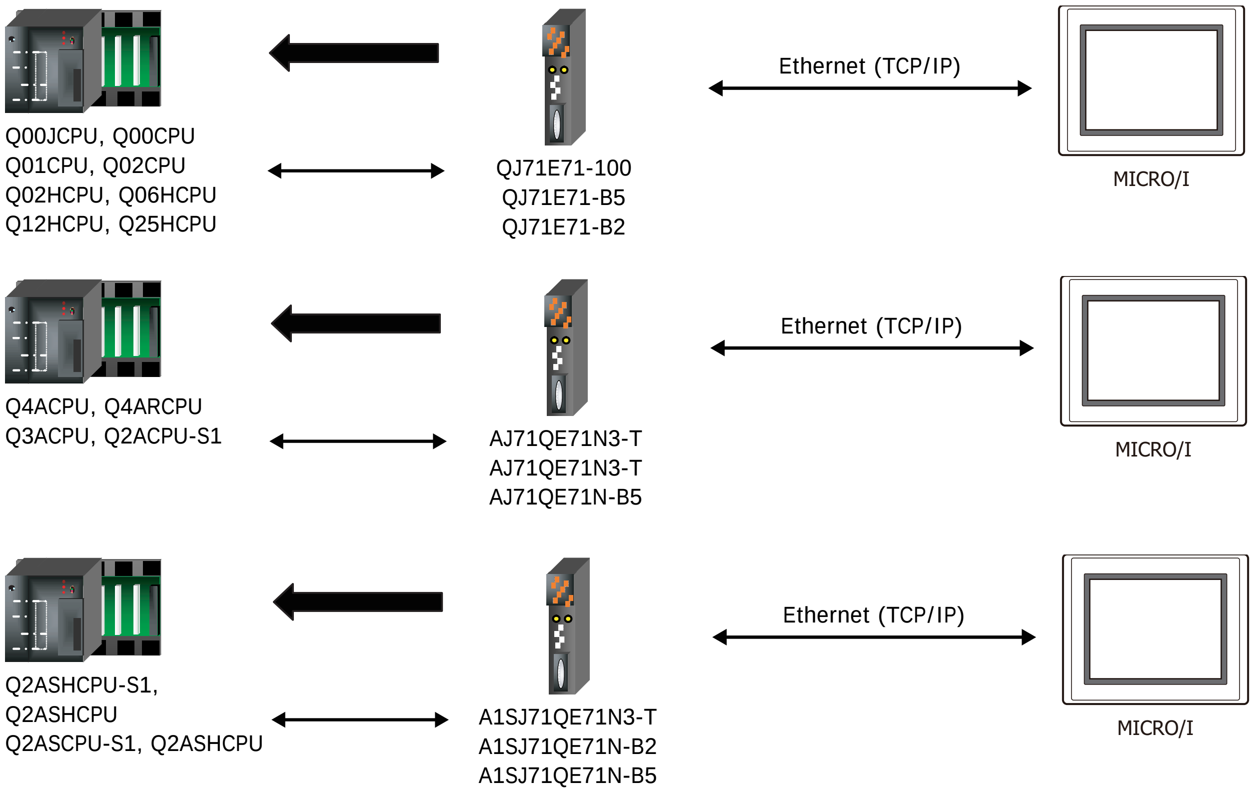



RS422
Connection Diagram 10 (Page 2-29)
FX0S, FX1S, FX0N, FX1N,
FX1NC, FX2N, FX2NC,
FX3UC, FX3U, FX3G
MICRO/I
Mitsubishi Electric Cable
FX-20P-CADP
RS422
Connection Diagram 4
(Page 2-27)
FX1N
FX2N
FX1N-422-BD
FX2N-422-BD
MICRO/I
RS422
Connection Diagram 10 (Page 2-29)
FX1N
FX2N
FX1N-422-BD
FX2N-422-BD
MICRO/I
RS422
Connection Diagram 5 (Page 2-27)
FX1N
FX2N
FX1N-232-BD
FX2N-232-BD
MICRO/I
RS422
Connection Diagram 11 (Page 2-29)
RS485 4-wire
Connection Diagram 12 (Page 2-29)
FX1S, FX1N
FX2N
FX1N-485-BD
FX2N-485-BD
MICRO/I
RS232C
Connection Diagram 8 (Page 2-28)
FX3UC, FX3U
FX3G
FX3U-232-BD
FX3G-232-BD
MICRO/I
RS485 4-wire
Connection Diagram 11 (Page 2-29)
RS485 2-wire
Connection Diagram 12 (Page 2-29)
FX3UC, FX3U
FX3G
FX3U-485-BD
FX3G-485-BD
MICRO/I

● MELSEC-FX Series (Connects to FX2NC-232ADP/485ADP, FX3U-232ADP/485ADP)

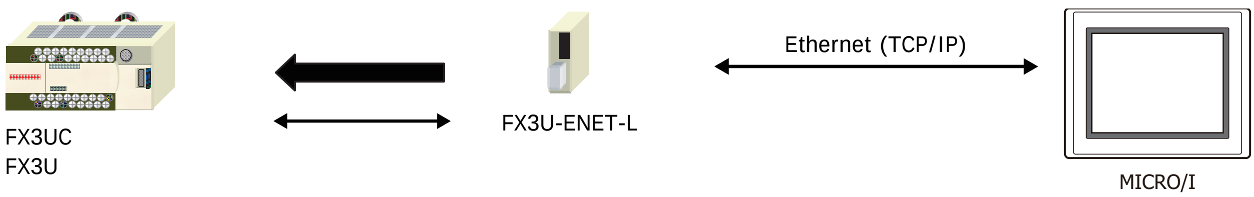


● MELSEC-Q/QnA Series (Connects to the Ethernet Unit)



- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

● MELSEC-FX Series (Connects to the Ethernet Unit)

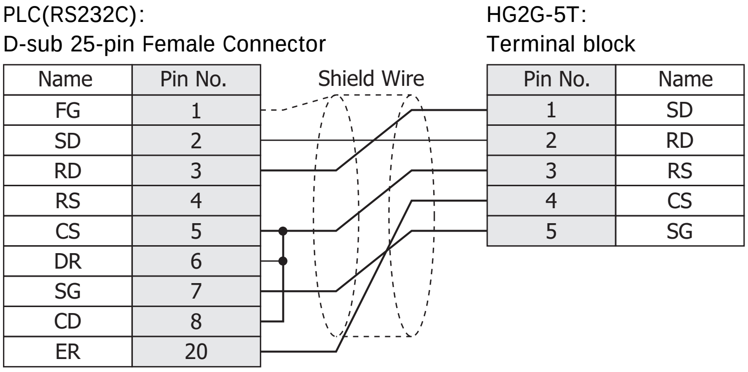


When connecting with MELSEC-FX3UC, FX2NC-CNV-IF or FX3UC-1PS-5V is required.

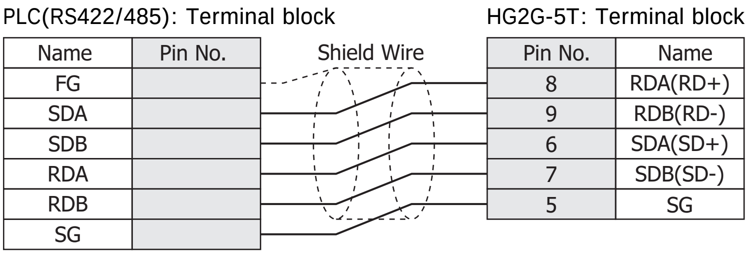
2.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

- Connection Diagram 1: Computer Link Unit (RS232C)

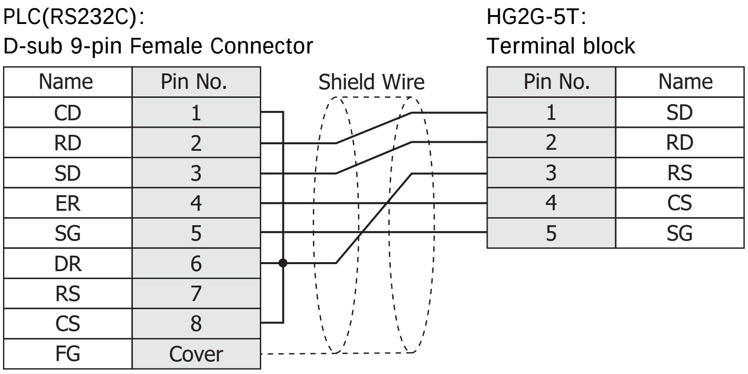


- Connection Diagram 2: Computer Link Unit (RS485)



- There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.
- When using the QJ71C24 Serial Communication Unit, connect a terminator resistor in accordance with the instruction manual.

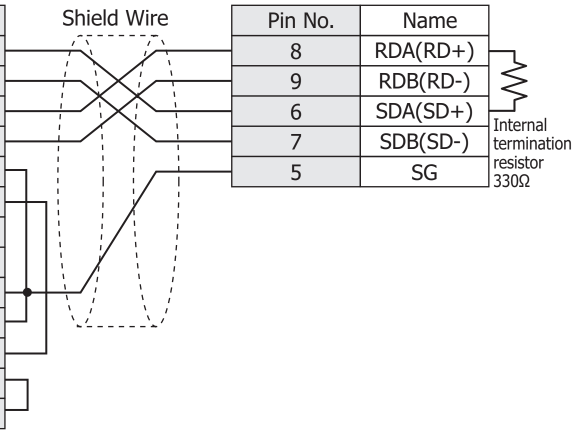
- Connection Diagram 3: Computer Link Unit (RS232C)



● Connection Diagram 4: PLC, 2-port Adapter

PLC(RS422/485):
D-sub 25-pin Female Connector

Name	Pin No.
RD+	2
RD-	15
SD+	3
SD-	16
CS+	4
CS-	17
RS+	5
RS-	18
SG	7
SG	8
Vcc	13
	20
	21



HG2G-5T:
Terminal block

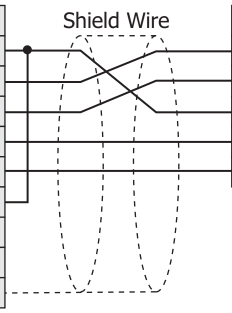
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: FX2N-232-BD

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8
FG	Cover



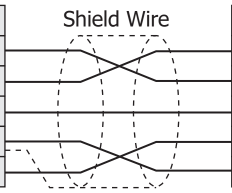
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: MELSEC-Q (Mitsubishi Electric Cable QC30R2)

PLC(RS232C):
D-sub 9-pin Female Connector
(cable side)

Name	Pin No.
RXD	2
TXD	3
DTR	4
GND	5
DSR	6



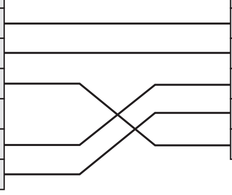
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 7: MELSEC-Q (CPU Unit Programming Port)

PLC(RS232C):
Mini DIN 6-pin Connector

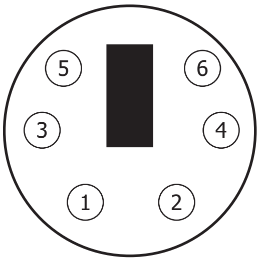
Name	Pin No.
RXD(RD)	1
TXD(SD)	2
SG	3
	4
DSR(DR)	5
DTR(ER)	6



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

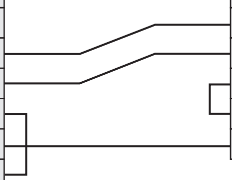
Pin Assignment of Mini DIN 6-pin plug on the side of the MELSEC-Q series



● Connection Diagram 8: FX2NC-232ADP/FX3U-232ADP/FC3U-232-BD

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RD(RXD)	2
SD(TXD)	3
ER(DTR)	4
SG(GND)	5
DR(DSR)	6
NC	7
NC	8
NC	9



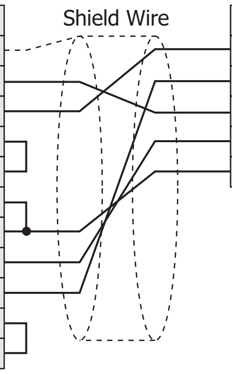
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 9: Computer Link Unit (RS485)

PLC(RS422/485):
D-sub 25-pin Male Connector

Name	Pin No.
FG	1
RDA	2
SDA	3
DSRA	4
DTRA	5
SG	7
SG	8
RDB	15
SDB	16
DSRB	17
STRB	18



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

● Connection Diagram 10: MELSEC-FX Series CPU (RS485)

PLC(RS422/485):
Mini DIN 8-pin Connector

HG2G-5T:
Terminal block

Name	Pin No.	Pin No.	Name
SDA	7	8	RDA(RD+)
SDB	4	9	RDB(RD-)
RDA	2	6	SDA(SD+)
RDB	1	7	SDB(SD-)
SG	3	5	SG
SG	6		
Shield	Cover		

- In case of HG2G-5T, a connection cable (part number: HG9Z-XC275) is available.
  Please do not use the communication cables (part number: FC2A-KP1C and HG9Z-XC275) with FX3U and FX3UC-32-MT-LT of the MELSEC-FX Series described in this manual because the Mini DIN Connector interferes with the housing of the PLC.
- There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 11: FX1N/FX2N/FX3U/FX3G-485-BD, FX2NC/FX3U-485ADP (4-wire)

PLC(RS422/485): Terminal block

HG2G-5T: Terminal block

Name	Pin No.	Pin No.	Name
SDA		8	RDA(RD+)
SDB		9	RDB(RD-)
RDA		6	SDA(SD+)
RDB		7	SDB(SD-)
SG		5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 12: FX1N/FX2N/FX3U/FX3G-485-BD, FX2NC/FX3U-485ADP (2-wire)

PLC(RS422/485): Terminal block

HG2G-5T: Terminal block

Name	Pin No.	Pin No.	Name
SDA		8	RDA(RD+)
SDB		9	RDB(RD-)
RDA		6	SDA(SD+)
RDB		7	SDB(SD-)
SG		5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

2.4 Environment Settings

● MELSEC-A Series: Connecting to the Computer Link Unit or CPU Unit Link Interface

<table>
<tr><th colspan="2">Item</th><th colspan="2">Setting</th></tr>
<tr><td colspan="2">Interface</td><td>RS232C</td><td>RS485</td></tr>
<tr><td colspan="2" rowspan="2">Transmission Control Protocol</td><td colspan="2">Format 4 protocol mode</td></tr>
<tr><td>Set the mode setting switch to 4.</td><td>Set the mode setting switch to 8.</td></tr>
<tr><td>Station Number*1</td><td rowspan="5">Use the same settings as for the MICRO/I.</td><td colspan="2">Set using the Station Number setting switch.</td></tr>
<tr><td>Baud Rate</td><td colspan="2">1200, 2400, 4800, 9600 or 19200 bps
(set using the Transmission Specifications setting switch)</td></tr>
<tr><td>Data Bits</td><td colspan="2">7 or 8 bits (set using the Transmission Specifications setting switch)</td></tr>
<tr><td>Stop Bits</td><td colspan="2">1 or 2 stop bits (set using the Transmission Specifications setting switch)</td></tr>
<tr><td>Parity</td><td colspan="2">None, Odd or Even (set using the Transmission Specifications setting switch)</td></tr>
<tr><td colspan="2">Checksum</td><td colspan="2">Yes (set using the Transmission Specifications setting switch)</td></tr>
<tr><td colspan="2">Write During RUN</td><td colspan="2">Possible (set using the Transmission Specifications setting switch)</td></tr>
<tr><td colspan="2">Transmission Side Termination Resistor</td><td>No</td><td>Yes (set using the Transmission Specifications setting switch)</td></tr>
<tr><td colspan="2">Receive Side Termination Resistor</td><td>No</td><td>Yes (set using the Transmission Specifications setting switch)</td></tr>
<tr><td colspan="2">Computer Link/Multi Drop Selection</td><td colspan="2">Computer Link (set using the Transmission Specifications setting switch)
Note: Only set if this item is present.</td></tr>
</table>

For details, refer to the Link Unit manual.

● MELSEC-A Series: Connecting to the Programming Port or 2-port Adapter

<table>
<tr><th colspan="2">Item</th><th>Setting</th></tr>
<tr><td colspan="2">Interface</td><td>RS422</td></tr>
<tr><td>Baud Rate</td><td rowspan="4">Use the same settings as for the MICRO/I.</td><td>9600 bps</td></tr>
<tr><td>Data Bits</td><td>8 bits</td></tr>
<tr><td>Stop Bits</td><td>1 stop bits</td></tr>
<tr><td>Parity</td><td>Odd</td></tr>
</table>

When connecting CPU unit for the connection, the PLC program scan time will increase when it starts communicating with the MICRO/I. Check it under your actual operating conditions.

*1 Set a decimal number for the Station Number on MICRO/I.

● MELSEC-Q/QnA Series: Connecting to the Computer Link Unit

<table>
<tr><th colspan="2">Item</th><th>Setting</th></tr>
<tr><td colspan="2">Interface</td><td>RS232C or RS422</td></tr>
<tr><td colspan="2">Communication protocol</td><td>MC Protocol (Format 4)</td></tr>
<tr><td>Station Number*1</td><td rowspan="5">Use the same settings as for the MICRO/I.</td><td>0</td></tr>
<tr><td>Baud Rate</td><td>1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps</td></tr>
<tr><td>Data Bits</td><td>7 or 8 bits</td></tr>
<tr><td>Stop Bits</td><td>1 or 2 stop bits</td></tr>
<tr><td>Parity</td><td>None, Odd or Even</td></tr>
<tr><td colspan="2">Checksum Code</td><td>Yes</td></tr>
<tr><td colspan="2">Write During RUN</td><td>Possible</td></tr>
</table>

For details, refer to the Q-compatible Serial Communication Unit user manual (Basic).

● MELSEC-Q00CPU/Q01CPU: Connecting to the Programming Port

Select **Use Serial Communication** in the parameter setting of MELSEC-Q00CPU/Q01CPU.

<table>
<tr><th colspan="2">Item</th><th>Setting</th></tr>
<tr><td>Station Number*2</td><td rowspan="5">Use the same settings as for the MICRO/I.</td><td>0</td></tr>
<tr><td>Baud Rate</td><td>19200, 38400, 57600 or 115200 bps</td></tr>
<tr><td>Data Bits</td><td>8 bits</td></tr>
<tr><td>Stop Bits</td><td>1 stop bits</td></tr>
<tr><td>Parity</td><td>Odd</td></tr>
<tr><td colspan="2">Checksum Code</td><td>Yes</td></tr>
</table>

● MELSEC-Q02CPU: Connecting to the Programming Port

Item	Setting
Baud Rate	9600, 19200, 38400, 57600 or 115200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Odd

*1 Set a decimal number for the Station Number on MICRO/I.
Setup the PLC settings in **I/O allocation** of the GX Developer.
*2 Set a decimal number for the Station Number on MICRO/I.

● MELSEC-FX Series: Using Communication Driver MELSEC-FX(CPU), MELSEC-FX2N(CPU), MELSEC-FX3UC(CPU)

Item		Setting
Interface		RS232C or RS422
Baud Rate*1	Use the same settings as for the MICRO/I.	9600, 19200, 38400, 57600 or 115200 bps
Data Bits		7 bits
Stop Bits		1 stop bits
Parity		Even

- When connecting CPU unit for the connection, the PLC program scan time will increase when it starts communicating with the MICRO/I. Check it under your actual operating conditions.
- To connect MELSEC-FX series PLC and MICRO/I, check the following two things.
  - Unchecked the communication setting by the programming software.
  - D8120 must be 0.
    If the PLC is MELSEC-FX3U or MELSEC-3UC, check the follows:
    If MICRO/I connects to CH1 on the PLC, D8400 must be 0.
    If MICRO/I connects to CH2 on the PLC, D8420 must be 0.

● MELSEC-FX Series: Using Communication Driver MELSEC-FX(LINK)

Item		Setting
Interface		RS232C or RS422
Baud Rate*2	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits		7 or 8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Protocol		Special protocol communication
Sum check		Enable
Transmission Control Protocol		With Type 4 (CR, LF)
Station No.*3		00 to 0F

In the case of FX1S, FX1N, and FX1NC, there must be an interval time of two scan times or more otherwise the command cannot be received after sending data for a command from an external device. Confirm the scan time of PLC and set the transmission wait for MICRO/I.
Example: If the PLC scan time is 10 msec, set the transmission wait for the MICRO/I to 20 msec or more.

*1 The communication speed settings varies based on the PLC model. For details, refer to the PLC manual.
*2 The communication speed settings varies based on the PLC model. For details, refer to the FX Series User's Manual (Communication Control Edition).
*3 Set a decimal number for the Station Number on MICRO/I.

● MELSEC-Q/QnA: Connecting to Ethernet Unit

MICRO/I settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Setting Name	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of PLC.
	Port Number	Set the port number of PLC to communicate with MICRO/I.

This communication driver does not support MELSECNET/H and MELSECNET/10 network.

PLC Settings

Set the same settings as MICRO/I to IP Address and Local station Port No.

Item			setting	notes
Network parameter	Network type		Ethernet	*1
	Starting I/O No.		0020	*2
	Network No.		1	*2
	Total stations		-	-
	Group No.		0	*2
	Station No.		1	*2
	Mode		On line	*1
Operation Setting	Communication data code		Binary code	*1
	Initial Timing		Always wait for OPEN	*1
	IP Address	Input format	Decimal	*2
		IP address	Set IP address of PLC	*2
	Send frame setting		Ethernet	*1
	Enable Write at RUN time		Check mark (enable)	*1
	TCP Existence confirmation setting		Use the Keep Alive	*1
Open Setting	Protocol		TCP/IP	*1
	Open system		Impassive open	*1
	Fixed buffer		Send	*1
	Fixed buffer communication		Procedure exist	*1
	Pairing open		No pairs	*1
	Existence confirmation		No confirm	*1
	Local station Port No.		Set an arbitrary port number	*2*3
	Destination IP address		-	-
	Dest. Port No.		-	-

For details, refer to the Q Corresponding Ethernet Interface Module User's Manual or Q Corresponding Ethernet Interface Module User's Manual.

*1 The setting of the above-mentioned is recommended.
*2 Set it according to the environment.
*3 MICRO/I is set by the decimal number though PLC is set by the hexadecimal number.

● MELSEC-FX: Connecting to Ethernet Unit

MICRO/I settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Setting Name	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of CPU Unit or Link Unit.
	Port Number	Set the port number of CPU Unit or Link Unit in.

PLC Settings

Ethernet Operation Setting

Item	Setting
Received data code setting	Binary code
Initial Timing	Always wait for OPEN (Communication possible during STOP)
IP Address	Set IP address of PLC
Send frame setting	Ethernet (V2.0)
TCP Existence confirmation setting	Use the Keep Alive

Open Setting

Item	Setting
Connection	Use 3 or 4
Protocol	TCP/IP
Open system	Impassive open (MC)
Existence confirmation	No confirm
Local station Port No. (Decimal)	Set an arbitrary port number 1025 to 5548 or 5552 to 65534 (Default: 1025)

2.5 Usable Device Addresses

● MELSEC-AnA (Link)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 1FFF	R	*1
Output Relay	Y	Y	0 to 1FFF	R/W	*1
Internal Relay	M	M	0 to 8191	R/W	
Link Relay	B	B	0 to 1FFF	R/W	*1
Latch Relay	L	L	0 to 8191	R/W	
Timer (contact)	TS	T	0 to 2047	R	
Timer (coil)	TC	T	0 to 2047	R/W	
Counter (contact)	CS	C	0 to 1023	R	
Counter (coil)	CC	C	0 to 1023	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 2047	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 1FF0	R	*1*2
Output Relay	WY	Y	0 to 1FF0	R/W	*1*2
Internal Relay	WM	M	0 to 8176	R/W	*2
Link Relay	WB	B	0 to 1FF0	R/W	*1*2
Latch Relay	WL	L	0 to 8176	R/W	*2
Timer (current value)	TN	T	0 to 2047	R	
Counter (current value)	CN	C	0 to 1023	R	
Data Register	D	D	0 to 8191	R/W	
Link Register	W	W	0 to 1FFF	R/W	*1
Annunciator	WF	F	0 to 2032	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special register	SD	SD	9000 to 9255	R	
File register	R	R	0 to 8191	R/W	
Expansion file register	ER	ZR	0 to 58191	R/W	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-AnN (LINK)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 7FF	R	*1
Output Relay	Y	Y	0 to 7FF	R/W	*1
Internal Relay	M	M	0 to 2047	R/W	
Link Relay	B	B	0 to 3FF	R/W	*1
Latch Relay	L	L	0 to 2047	R/W	
Timer (contact)	TS	T	0 to 255	R	
Timer (coil)	TC	T	0 to 255	R/W	
Counter (contact)	CS	C	0 to 255	R	
Counter (coil)	CC	C	0 to 255	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 255	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 7F0	R	*1*2
Output Relay	WY	Y	0 to 7F0	R/W	*1*2
Internal Relay	WM	M	0 to 2032	R/W	*2
Link Relay	WB	B	0 to 3F0	R/W	*1*2
Latch Relay	WL	L	0 to 2032	R/W	*2
Timer (current value)	TN	T	0 to 255	R	
Counter (current value)	CN	C	0 to 255	R	
Data Register	D	D	0 to 1023	R/W	
Link Register	W	W	0 to 3FF	R/W	*1
Annunciator	WF	F	0 to 240	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special register	SD	SD	9000 to 9255	R	
File register	R	R	0 to 8191	R/W	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-AnA (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 7FF	R	*1
Output Relay	Y	Y	0 to 7FF	R/W	*1
Internal Relay	M	M	0 to 8191	R/W	
Link Relay	B	B	0 to 7FF	R/W	*1
Latch Relay	L	L	0 to 8191	R/W	
Timer (contact)	TS	T	0 to 2047	R	
Timer (coil)	TC	T	0 to 2047	R/W	
Counter (contact)	CS	C	0 to 1023	R	
Counter (coil)	CC	C	0 to 1023	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 2047	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 7F0	R	*1*2
Output Relay	WY	Y	0 to 7F0	R/W	*1*2
Internal Relay	WM	M	0 to 8176	R/W	*2
Link Relay	WB	B	0 to 7F0	R/W	*1*2
Latch Relay	WL	L	0 to 8176	R/W	*2
Timer (current value)	TN	T	0 to 2047	R	
Counter (current value)	CN	C	0 to 1023	R	
Data Register	D	D	0 to 6143	R/W	
Link Register	W	W	0 to FFF	R/W	*1
Annunciator	WF	F	0 to 2032	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special Register	SD	SD	9000 to 9255	R	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-AnN (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 7FF	R	*1
Output Relay	Y	Y	0 to 7FF	R/W	*1
Internal Relay	M	M	0 to 2047	R/W	
Link Relay	B	B	0 to 3FF	R/W	*1
Latch Relay	L	L	0 to 2047	R/W	
Timer (contact)	TS	T	0 to 255	R	
Timer (coil)	TC	T	0 to 255	R/W	
Counter (contact)	CS	C	0 to 255	R	
Counter (coil)	CC	C	0 to 255	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 255	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 7F0	R	*1*2
Output Relay	WY	Y	0 to 7F0	R/W	*1*2
Internal Relay	WM	M	0 to 2032	R/W	*2
Link Relay	WB	B	0 to 3F0	R/W	*1*2
Latch Relay	WL	L	0 to 2032	R/W	*2
Timer (current value)	TN	T	0 to 255	R	
Counter (current value)	CN	C	0 to 255	R	
Data Register	D	D	0 to 1023	R/W	
Link Register	W	W	0 to 3FF	R/W	*1
Annunciator	WF	F	0 to 240	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special Register	SD	SD	9000 to 9255	R	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-AnU (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 1FFF	R	*1
Output Relay	Y	Y	0 to 1FFF	R/W	*1
Internal Relay	M	M	0 to 8191	R/W	
Link Relay	B	B	0 to 1FFF	R/W	*1
Latch Relay	L	L	0 to 8191	R/W	
Timer (contact)	TS	T	0 to 2047	R	
Timer (coil)	TC	T	0 to 2047	R/W	
Counter (contact)	CS	C	0 to 1023	R	
Counter (coil)	CC	C	0 to 1023	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 2047	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 1FF0	R	*1*2
Output Relay	WY	Y	0 to 1FF0	R/W	*1*2
Internal Relay	WM	M	0 to 8176	R/W	*2
Link Relay	WB	B	0 to 1FF0	R/W	*1*2
Latch Relay	WL	L	0 to 8176	R/W	*2
Timer (current value)	TN	T	0 to 2047	R	
Counter (current value)	CN	C	0 to 1023	R	
Data Register	D	D	0 to 8191	R/W	
Link Register	W	W	0 to 1FFF	R/W	*1
Annunciator	WF	F	0 to 2032	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special Register	SD	SD	9000 to 9255	R	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples a multiplier of 16.

● MELSEC-A1S/A2C (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 1FF	R	*1
Output Relay	Y	Y	0 to 1FF	R/W	*1
Internal Relay	M	M	0 to 2047	R/W	
Link Relay	B	B	0 to 3FF	R/W	*1
Latch Relay	L	L	0 to 2047	R/W	
Timer (contact)	TS	T	0 to 255	R	
Timer (coil)	TC	T	0 to 255	R/W	
Counter (contact)	CS	C	0 to 255	R	
Counter (coil)	CC	C	0 to 255	R/W	
Special Internal Relay	SM	SM	9000 to 9255	R	
Annunciator	F	F	0 to 255	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 1F0	R	*1*2
Output Relay	WY	Y	0 to 1F0	R/W	*1*2
Internal Relay	WM	M	0 to 2032	R/W	*2
Link Relay	WB	B	0 to 3F0	R/W	*1*2
Latch Relay	WL	L	0 to 2032	R/W	*2
Timer (current value)	TN	T	0 to 255	R	
Counter (current value)	CN	C	0 to 255	R	
Data Register	D	D	0 to 1023	R/W	
Link Register	W	W	0 to 3FF	R/W	*1
Annunciator	WF	F	0 to 240	R/W	*2
Special Internal Relay	WSM	SM	9000 to 9240	R	*2
Special Register	SD	SD	9000 to 9255	R	
File Register	R	R	0 to 8191	R/W	

- File Register is not available when Memory Cassettes is used.
- File Register is tested with the CPU Unit: MELSEC-A1S/A1SH/A1SJH/A2SH/A2C. Don't use the File Register with expect these CPU Unit.
- When File Register is used, restart MICRO/I after changing PLC parameter.

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

- MELSEC-Q/QnA (Link)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Internal Relay	M	M	0 to 32767	R/W	
Input Relay	X	X	0 to 1FFF	R	*1
Output Relay	Y	Y	0 to 1FFF	R/W	*1
Link Special Relay	SB	SB	0 to 7FF	R/W	*1
Link Relay	B	B	0 to 7FFF	R/W	*1
Latch Relay	L	L	0 to 32767	R/W	
Timer (contact)	TS	T	0 to 8191	R	
Timer (coil)	TC	T	0 to 8191	R/W	
Counter (contact)	CS	C	0 to 8191	R	
Counter (coil)	CC	C	0 to 8191	R/W	
Special Relay	SM	SM	0 to 2047	R	
Annunciator	F	F	0 to 32767	R/W	
Retentive Timer (contact)	SS	ST	0 to 2047	R	
Retentive Timer (coil)	SC	ST	0 to 2047	R/W	
Step Relay	S	S	0 to 32767	R/W	
Edge Relay	V	V	0 to 32767	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 1FF0	R	*1*2
Output Relay	WY	Y	0 to 1FF0	R/W	*1*2
Internal Relay	WM	M	0 to 32752	R/W	*2
Link Special Relay	WSB	SB	0 to 7F0	R/W	*1*2
Link Relay	WB	B	0 to 7FF0	R/W	*1*2
Latch Relay	WL	L	0 to 32752	R/W	*2
Timer (current value)	TN	T	0 to 8191	R	
Counter (current value)	CN	C	0 to 8191	R	
Data Register	D	D	0 to 25599	R/W	
Link Register	W	W	0 to 24FF	R/W	*1
File register	R	R	0 to 32767	R/W	
Annunciator	WF	F	0 to 32752	R/W	*2
Special Relay	WSM	SM	0 to 2032	R	*2
Special register	SD	SD	0 to 2047	R	
Edge Relay	WV	V	0 to 32752	R/W	*2
Step Relay	WS	S	0 to 32752	R/W	*2
Retentive Timer (current value)	SN	ST	0 to 2047	R/W	
Special Link Register	SW	SW	0 to 7FF	R/W	*1
Ext File Register	ZR	ZR	0 to FFFF	R/W	*1

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-Q (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Internal Relay	M	M	0 to 32767	R/W	
Input Relay	X	X	0 to 1FFF	R	*1
Output Relay	Y	Y	0 to 1FFF	R/W	*1
Link Special Relay	SB	SB	0 to 7FF	R/W	*1
Link Relay	B	B	0 to 1FFF	R/W	*1
Latch Relay	L	L	0 to 32767	R/W	
Annunciator	F	F	0 to 32767	R/W	
Step Relay	S	S	0 to 8191	R/W	
Edge Relay	V	V	0 to 32767	R/W	
Timer (contact)	TS	T	0 to 23087	R	
Timer (coil)	TC	T	0 to 23087	R/W	
Counter (contact)	CS	C	0 to 23087	R	
Counter (coil)	CC	C	0 to 23087	R/W	
Retentive Timer (contact)	SS	ST	0 to 23087	R	
Retentive Timer (coil)	SC	ST	0 to 23087	R/W	
Special Relay	SM	SM	0 to 2047	R	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 1FF0	R	*1*2
Output Relay	WY	Y	0 to 1FF0	R/W	*1*2
Internal Relay	WM	M	0 to 32752	R/W	*2
Link Relay	WB	B	0 to 7FF0	R/W	*1*2
Latch Relay	WL	L	0 to 32752	R/W	*2
Annunciator	WF	F	0 to 32752	R/W	*2
Edge Relay	WV	V	0 to 32752	R/W	*2
Step Relay	WS	S	0 to 8176	R/W	*2
Timer (current value)	TN	T	0 to 23087	R	
Counter (current value)	CN	C	0 to 23087	R	
Retentive Timer (current value)	SN	ST	0 to 23087	R/W	
Data Register	D	D	0 to 25983	R/W	
Link Register	W	W	0 to 657F	R/W	
Special Relay	WSM	SM	0 to 2032	R	*2
Link Special Relay	WSB	SB	0 to 7F0	R/W	*1*2
Special Register	SD	SD	0 to 2047	R	
Special link Register	SW	SW	0 to 7FF	R/W	
File Register	R	R	0 to 32767	R/W	
Extend file Register	ZR	ZR	0 to 131072	R/W	

*1 Set this address number in hexadecimal.
*2 Set this address number in multiples of 16.

● MELSEC-FX (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 337	R	*1
Output Relay	Y	Y	0 to 337	R/W	*1
Internal Relay	M	M	0 to 1535	R/W	
Timer (contact)	TS	T	0 to 255	R	
Counter (contact)	CS	C	0 to 255	R	
State	S	S	0 to 999	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 320	R	*1*2
Output Relay	WY	Y	0 to 320	R/W	*1*2
Internal Relay	WM	M	0 to 1520	R/W	*2
Timer (current value)	TN	T	0 to 255	R	
Counter (current value)	CN	C	0 to 199	R	
32-Bit Counter (current value)	DCN	C	2000 to 2551	R	*3
Data Register	D	D	0 to 999	R/W	
State	WS	WS	0 to 976	R/W	*2

*1 Set this address number in octal.
*2 Set this address number in multiples of 16.
*3 This device is a 32-bit device. The first three digits indicate the address number in decimal, and the last digit indicates whether the data is an upper or a lower word of 32-bit data in binary.

● MELSEC-FX2N (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 337	R	*1
Output Relay	Y	Y	0 to 337	R/W	*1
Internal Relay	M	M	0 to 3071	R/W	
Timer (Relay)	TS	T	0 to 255	R	
Counter (Relay)	CS	C	0 to 255	R	
Special Int. Relay	SM	SM	8000 to 8255	R	
State	S	S	0 to 999	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 360	R	*1*2
Output Relay	WY	Y	0 to 360	R/W	*1*2
Internal Relay	WM	M	0 to 3056	R/W	*2
Timer (current value)	TN	T	0 to 255	R	
Counter (current value)	CN	C	0 to 199	R	
32-Bit Counter (current value)	DCN	C	2000 to 2551	R	*3
Data Register	D	D	0 to 7999	R/W	
State	WS	S	0 to 976	R/W	*2
Special Int. Relay	WSM	SM	8000 to 8240	R	*2
Special Register	SD	SD	8000 to 8255	R	

*1 Set this address number in octal.
*2 Set this address number in multiples of 16.
*3 This device is a 32-bit device. The first three digits indicate the address number in decimal, and the last digit indicates whether the data is an upper or a lower word of 32-bit data in binary.

● MELSEC-FX3UC (CPU)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 377	R	*1
Output Relay	Y	Y	0 to 377	R/W	*1
Internal Relay	M	M	0 to 7679	R/W	
Timer (Relay)	TS	T	0 to 511	R	
Counter (Relay)	CS	C	0 to 255	R	
Special Internal Relay	SM	SM	8000 to 8511	R	
State	S	S	0 to 4095	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 to 360	R	*1*2
Output Relay	WY	Y	0 to 360	R/W	*1*2
Internal Relay	WM	M	0 to 7664	R/W	*2
Timer (current value)	TN	T	0 to 511	R	
Counter (current value)	CN	C	0 to 199	R	
32-bit counter (current value)	DCN	C	2000 to 2551	R/W	*3
Data Register	D	D	0 to 7999	R/W	
State	WS	S	0 to 4080	R/W	*2
Special Internal Relay	WSM	SM	8000 to 8496	R	*2
Special Data Register	SD	SD	8000 to 8511	R	
Extended Register	R	R	0 to 32767	R/W	

*1 Set this address number in octal.
*2 Set this address number in multiples of 16.
*3 This device is a 32-bit device. The first three digits indicate the address number in decimal, and the last digit indicates whether the data is an upper or a lower word of 32-bit data in binary.

● MELSEC-FX (LINK)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Int. Relay	M	M	0 to 7679	R/W	Decimal
Input Relay	X	X	0 to 377	R/W	Octal
Output Relay	Y	Y	0 to 377	R/W	Octal
Timer Relay (contact)	TS	T	0 to 511	R/W	Decimal
Counter Relay (contact)	CS	C	0 to 255	R/W	Decimal
Special Internal Relay	SM	SM	8000 to 8511	R/W	Decimal
State	S	S	0 to 4095	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Register	D	D	0 to 7999	R/W	Decimal
Input Relay (word)	WX	X	0 to 360	R/W	Octal*1
Output Relay (word)	WY	Y	0 to 360	R/W	Octal*1
Int. Relay (word)	WM	M	0 to 7664	R/W	Decimal*1
Timer (Current Value)	TN	T	0 to 511	R/W	Decimal
Counter (Current Value)	CN	C	0 to 199	R/W	Decimal
State (word)	WS	S	0 to 4080	R/W	Decimal*1
Special Internal Relay (word)	WSM	M	8000 to 8496	R/W	Decimal*1
Special Data Register	SD	D	8000 to 8511	R/W	Decimal
32-bit counter (current value)	DCN	C	2000 to 2511	R/W	*2
Extended Register	R	R	0 to 32767	R/W	Decimal

*1 Set this address number in hexadecimal.
*2 This is a 32-bit device address. The first three digits indicate the address number in decimal, and the last digit indicates whether the data is an upper or a lower word of 32-bit data in binary.

● MELSEC-Q/QnA (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Special Relay (bit)	SM	SM	000000 to 002047	R	Decimal
Input Relay (bit)	X	X	000000 to 001FFF	R	Hexadecimal
Output Relay (bit)	Y	Y	000000 to 001FFF	R/W	Hexadecimal
Internal Relay (bit)	M	M	000000 to 475135	R/W	Decimal
Latch Relay (bit)	L	L	000000 to 475135	R/W	Decimal
Annunciator (bit)	F	F	000000 to 475135	R/W	Decimal
Edge Relay (bit)	V	V	000000 to 475135	R/W	Decimal
Link Relay (bit)	B	B	000000 to 073FFF	R/W	Hexadecimal
Timer (contact)	TS	TS	000000 to 475135	R	Decimal
Timer (coil)	TC	TC	000000 to 475135	R/W	Decimal
Retentive Timer (contact)	SS	SS	000000 to 475135	R	Decimal
Retentive Timer (coil)	SC	SC	000000 to 475135	R/W	Decimal
Counter (contact)	CS	CS	000000 to 475135	R	Decimal
Counter (coil)	CC	CC	000000 to 475135	R/W	Decimal
Link Special Relay (bit)	SB	SB	000000 to 0007FF	R/W	Decimal
Step Relay (bit)	S	S	000000 to 008191	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Special Register	SD	SD	000000 to 002047	R	Decimal
Data Register	D	D	000000 to 029695	R/W	Decimal
Link Register	W	W	000000 to 0073FF	R/W	Hexadecimal
Timer (current value)	TN	TN	000000 to 029695	R	Decimal
Retentive Timer (current value)	SN	SN	000000 to 029695	R/W	Decimal
Counter (current value)	CN	CN	000000 to 029695	R	Decimal
Special Link Register	SW	SW	000000 to 0007FF	R/W	Hexadecimal
File Register	R	R	000000 to 032767	R/W	Decimal
Extend file Register	ZR	ZR	000000 to 0FE7FF	R/W	Hexadecimal
Special Relay (word)	WSM	SM	000000 to 002032	R	Decimal*1
Input Relay (word)	WX	X	000000 to 001FF0	R	Hexadecimal*1
Output Relay (word)	WY	Y	000000 to 001FF0	R/W	Hexadecimal*1
Internal Relay (word)	WM	M	000000 to 475120	R/W	Decimal*1
Latch Relay (word)	WL	L	000000 to 475120	R/W	Decimal*1
Annunciator (word)	WF	F	000000 to 475120	R/W	Decimal*1
Edge Relay (word)	WV	V	000000 to 475120	R/W	Decimal*1
Link Relay (word)	WB	B	000000 to 073FF0	R/W	Hexadecimal*1
Link Special Relay (word)	WSB	SB	000000 to 0007F0	R/W	Hexadecimal*1
Step Relay (word)	WS	S	000000 to 008176	R/W	Decimal*1

*1 Set this address number in multiples of 16.

● MELSEC-FX (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Int. Relay	M	M	0 to 7679	R/W	Decimal
Input Relay	X	X	0 to 377	R	Octal
Output Relay	Y	Y	0 to 377	R/W	Octal
Timer Relay (contact)	TS	T	0 to 511	R	Decimal
Counter Relay (contact)	CS	C	0 to 255	R	Decimal
Special Internal Relay	SM	SM	8000 to 8511	R	Decimal
State	S	S	0 to 4095	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Register	D	D	0 to 7999	R/W	Decimal
Input Relay (word)	WX	X	0 to 360	R	Octal
Output Relay (word)	WY	Y	0 to 360	R/W	Octal
Int. Relay (word)	WM	M	0 to 7664	R/W	Decimal
Timer (Current Value)	TN	T	0 to 511	R	Decimal
Counter (Current Value)	CN	C	0 to 199	R	Decimal
State (word)	WS	S	0 to 4080	R/W	Decimal
Special Internal Relay (word)	WSM	M	8000 to 8496	R	Decimal
Special Data Register	SD	D	8000 to 8511	R	Decimal
32-bit counter (current value)	DCN	C	2000 to 2511	R	*1
Extended Register	R	R	0 to 32767	R/W	Decimal

*1 This device is a 32-bit device. The first three digits indicate the address number in decimal, and the last digit indicates whether the data is an upper or a lower word of 32-bit data in binary.

3 OMRON

3.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
SYSMAC C				
C500 C500F C1000H C2000 C2000H	C120-LK201-V1	RS232C Connection Diagram 1 (Page 2-58)	ER	SYSMAC C series
	C120-LK202-V1	RS422/485 4-wire Connection Diagram 2 (Page 2-58)	None	
	C500-LK201-V1	RS232C Connection Diagram 1 (Page 2-58)	ER	
		RS422/485 4-wire Connection Diagram 2 (Page 2-58)	None	
	C500-LK203	RS232C Connection Diagram 1 (Page 2-58)	ER	
		RS422/485 4-wire Connection Diagram 3 (Page 2-59)	None	
C1000HF	C500-LK203	RS232C Connection Diagram 1 (Page 2-58)	ER	
		RS422/485 4-wire Connection Diagram 3 (Page 2-59)	None	
C200HS	C200H-LK201	RS232C Connection Diagram 1 (Page 2-58)	ER	
	C200H-LK202	RS422/485 4-wire Connection Diagram 2 (Page 2-58)	None	
C200HE C200HG C200HX	C200H-LK201	RS232C Connection Diagram 1 (Page 2-58)	ER	
	C200H-LK202	RS422/485 4-wire Connection Diagram 2 (Page 2-58)	None	
	C200HW-COM02/COM04 /COM05/COM06	RS232C Connection Diagram 6 (Page 2-59)		
	C200HW-COM03/COM06	RS422/485 4-wire Connection Diagram 7 (Page 2-59)		
C120 C120F	C120-LK201-V1	RS232C Connection Diagram 1 (Page 2-58)	ER	SYSMAC C series
	C120-LK202-V1	RS422/485 4-wire Connection Diagram 2 (Page 2-58)	None	
C20H C28H C40H C60H	Not required (connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-59)		
C200HE-CPU42 C200HG-CPU43/63 C200HX-CPU44/64	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-59)		
CPM1 CPM1A CPM2A	CPM1-CIF01	RS232C Connection Diagram 5 (Page 2-59)		
	CPM1-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-60)		
C200HS-CPU21/23/31/33 CQM1H	Not required (connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-59)		
CPM2A	Not required (connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-59)		

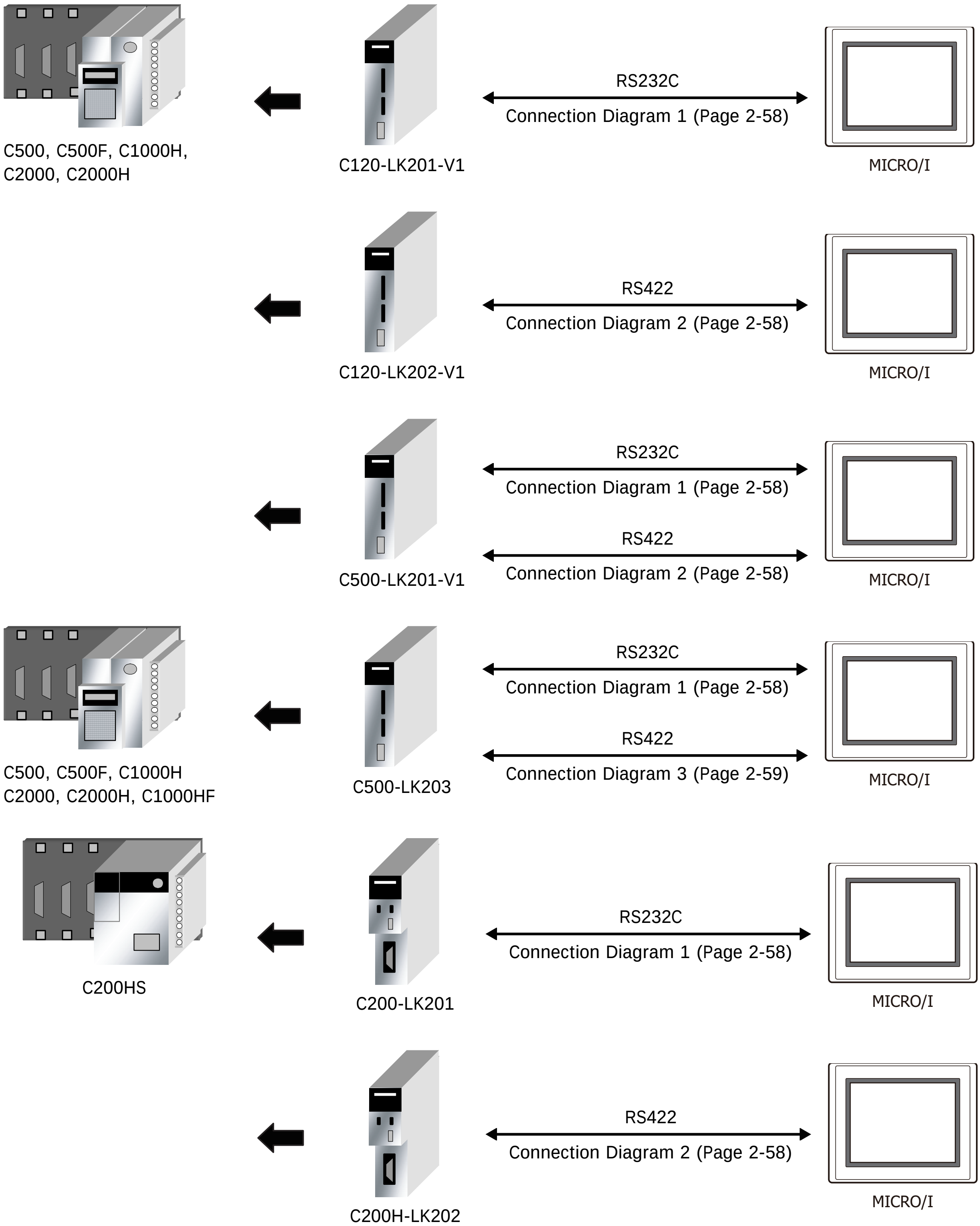
<table>
<tr><th rowspan="2">CPU unit</th><th rowspan="2">Link unit</th><th colspan="3">WindO/I-NV4 Settings</th></tr>
<tr><th>Interface</th><th>Flow Control</th><th>Communication Driver</th></tr>
<tr><td colspan="5">SYSMAC CS1</td></tr>
<tr><td rowspan="4">CS1G
CS1H</td><td>Not required
(connects to CPU unit)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td><td rowspan="3">None</td><td rowspan="3">SYSMAC CS1 series</td></tr>
<tr><td>CS1W-SCB41 (port1)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CS1W-SCB41 (port2)</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CS1W-ENT01
CS1W-ENT11
CS1W-ENT21</td><td>Ethernet</td><td>-</td><td>SYSMAC CS1/CJ series(Ethernet)</td></tr>
<tr><td colspan="5">SYSMAC CJ1</td></tr>
<tr><td rowspan="6">CJ1M
CJ1H
CJ1G</td><td>Not required
(connects to CPU unit)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td><td rowspan="5">None</td><td rowspan="5">SYSMAC CS1 series</td></tr>
<tr><td>CJ1W-SCU21-V1</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU31-V1</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port1)</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port2)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CJ1W-ETN21</td><td>Ethernet</td><td>-</td><td>SYSMAC CS1/CJ series(Ethernet)</td></tr>
<tr><td colspan="5">SYSMAC CJ2</td></tr>
<tr><td rowspan="6">CJ2M-CPU11/12/13/14/15
CJ2H-CPU64/65/66/67/68</td><td>Not required
(connects to CPU unit)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td><td rowspan="5">None</td><td rowspan="5">SYSMAC CS1 series</td></tr>
<tr><td>CJ1W-SCU21-V1</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU31-V1</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port1)</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port2)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CJ1W-ETN21</td><td>Ethernet</td><td>-</td><td>SYSMAC CS1/CJ series(Ethernet)</td></tr>
<tr><td rowspan="8">CJ2M-CPU31/32/33/34/35</td><td>CP1W-CIF01</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td><td rowspan="6">None</td><td rowspan="6">SYSMAC CS1 series</td></tr>
<tr><td>CP1W-CIF11</td><td>RS422/485 4-wire
Connection Diagram 8 (Page 2-60)</td></tr>
<tr><td>CJ1W-SCU21-V1</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU31-V1</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port1)</td><td>RS422/485 4-wire
Connection Diagram 7 (Page 2-59)</td></tr>
<tr><td>CJ1W-SCU41-V1(port2)</td><td>RS232C
Connection Diagram 6 (Page 2-59)</td></tr>
<tr><td>Ethernet port on the CPU Unit</td><td rowspan="2">Ethernet</td><td rowspan="2">-</td><td rowspan="2">SYSMAC CS1/CJ series(Ethernet)</td></tr>
<tr><td>CJ1W-ETN21</td></tr>
</table>

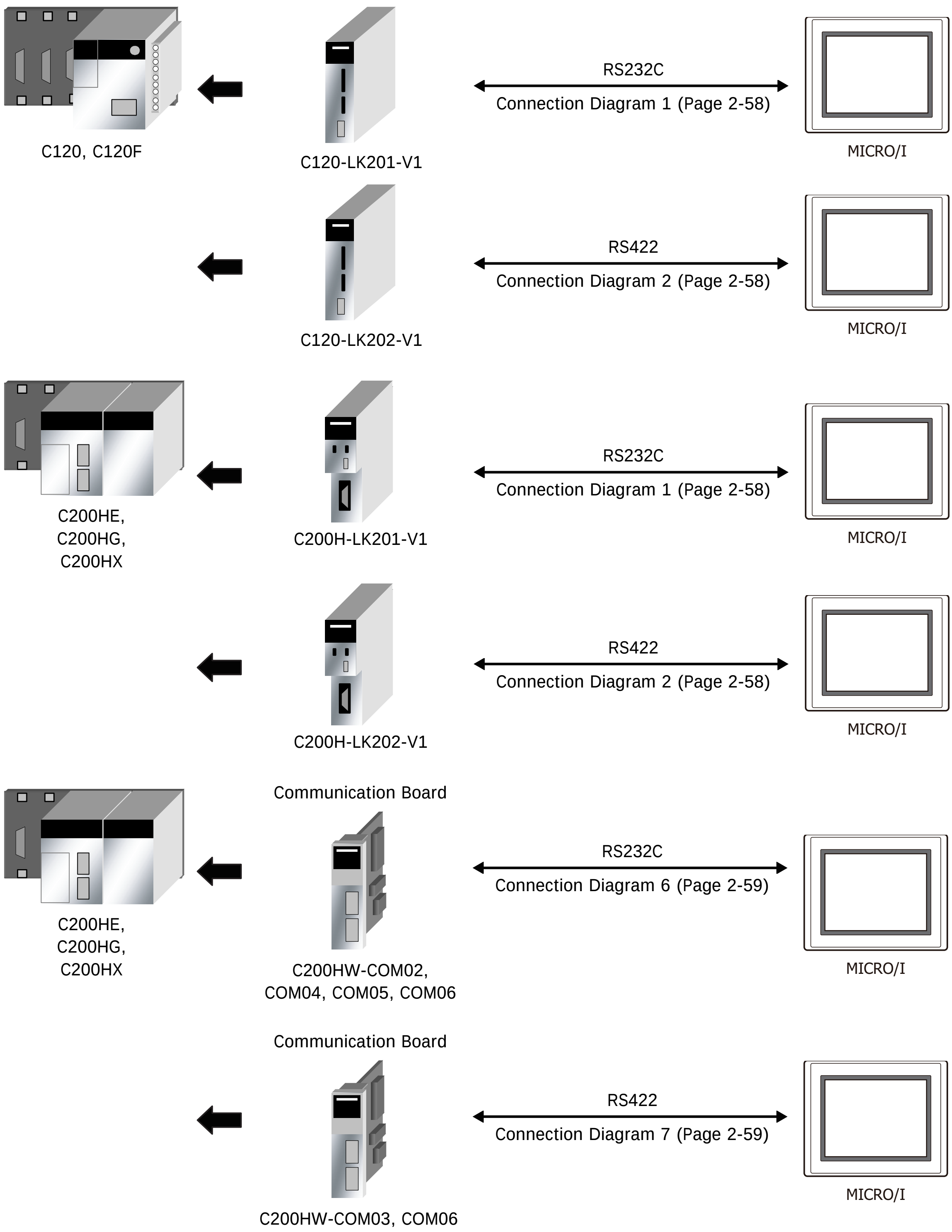
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
CJ2H-CPU64/65/66/67/68-EIP	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-59)	None	SYSMAC CS1 series
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-59)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-59)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-59)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-59)		
	Ethernet port on the CPU Unit	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
	CJ1W-ETN21			
SYSMAC CP1				
CP1E-N14/N20	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-59)	None	SYSMAC CS1 series
CP1E-NA20/N30/N40/N60	Not required (connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-59)		
	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-59)		
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-60)		
CP1L-L14/20 CP1L-M30/40/60 CP1L-EL20 CP1L-EM20/30/40	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-59)		
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-60)		
CP1H-Y20D/X40/XA20	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-59)		SYSMAC CS1 series
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-60)		
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-59)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-59)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-59)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-59)		
	CJ1W-ETN21	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)

3.2 System Configuration

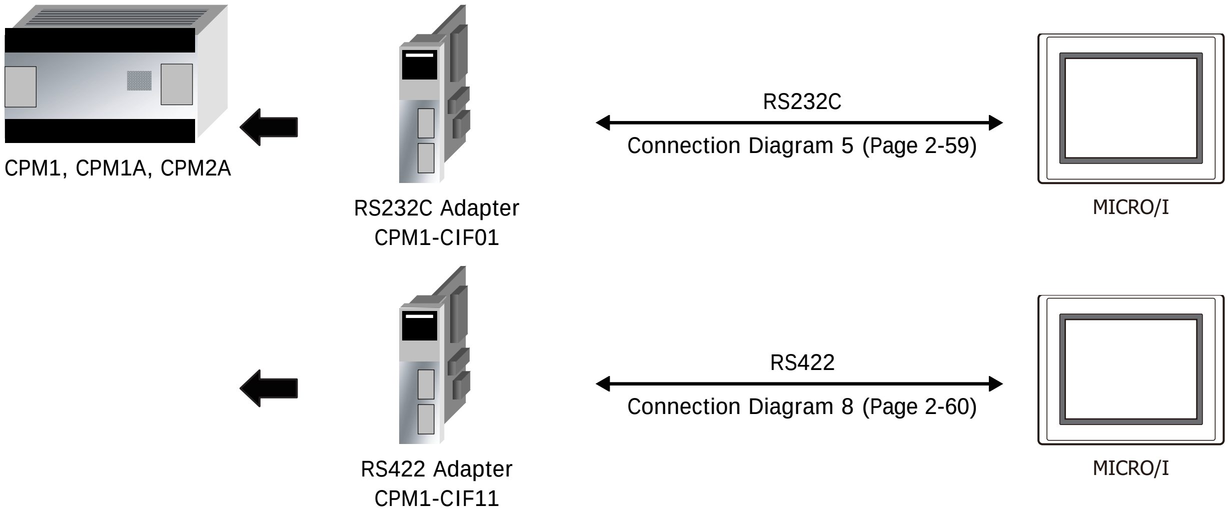
This is the system configuration for the connection of OMRON PLCs to the MICRO/I

● SYSMAC C series (Connects to the PLC Link Unit)

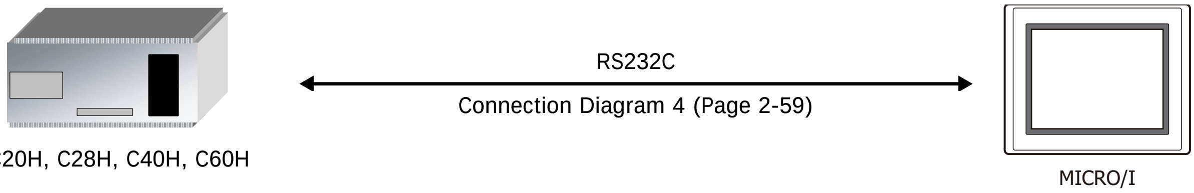


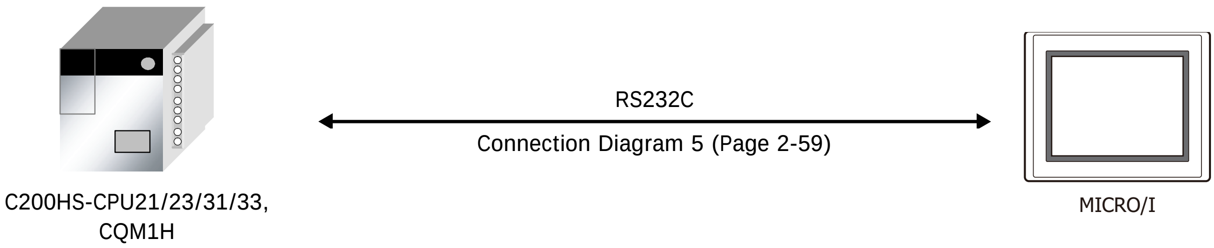


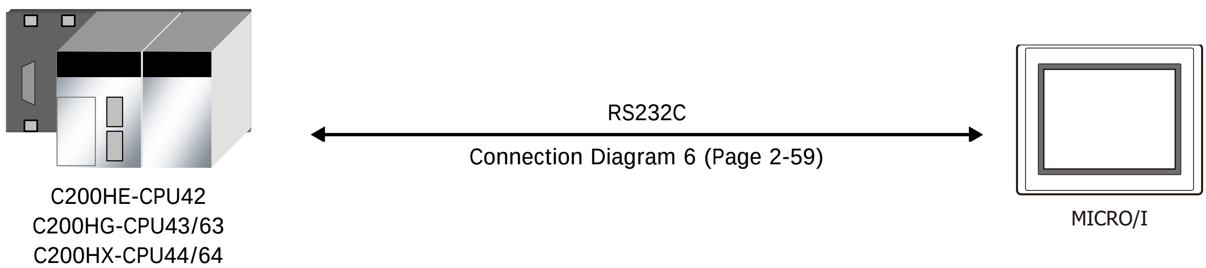
You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.



● SYSMAC C series (Connects to the Link Interface on the CPU Unit)

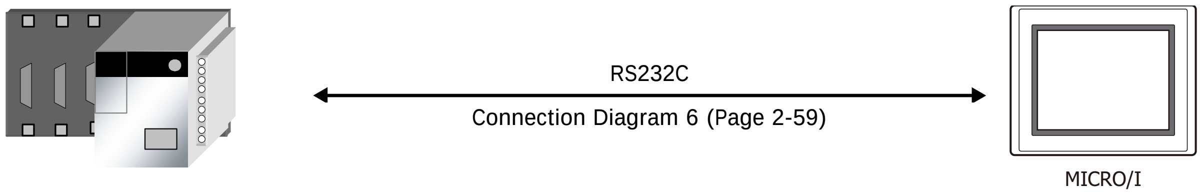






You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

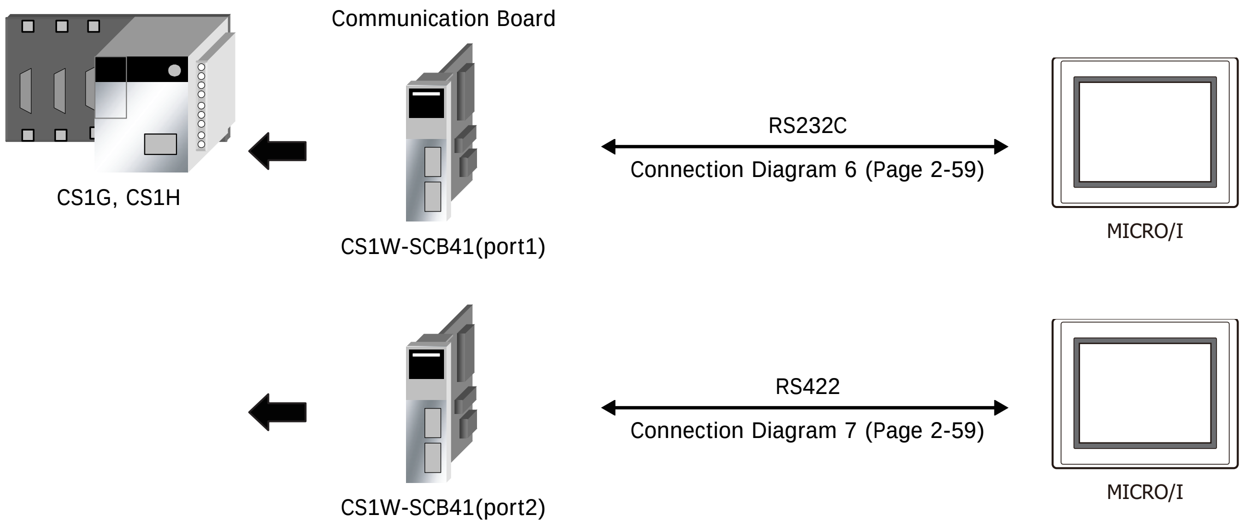
● SYSMAC CS/CJ/CP series (Connects to RS232C Port on the CPU Unit)



You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

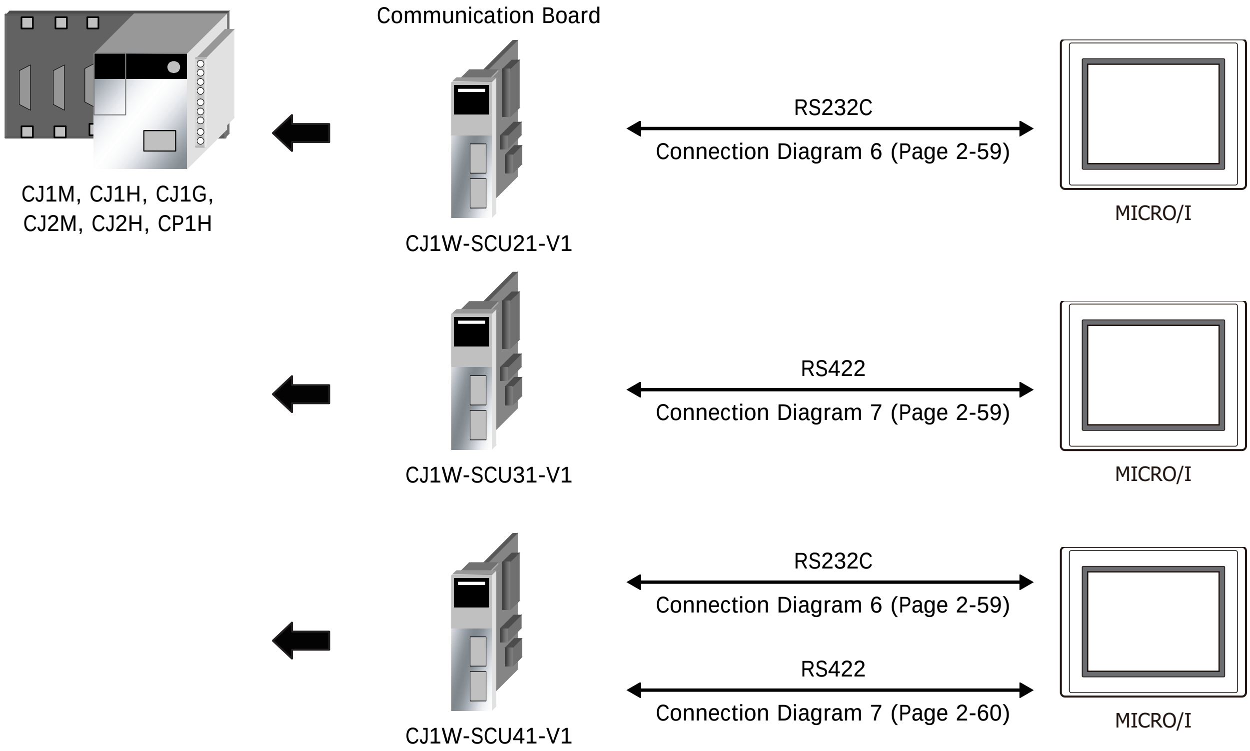
● SYSMAC CS/CJ/CP series (Connects to the Ethernet Communication Unit)

SYSMAC CS1 series



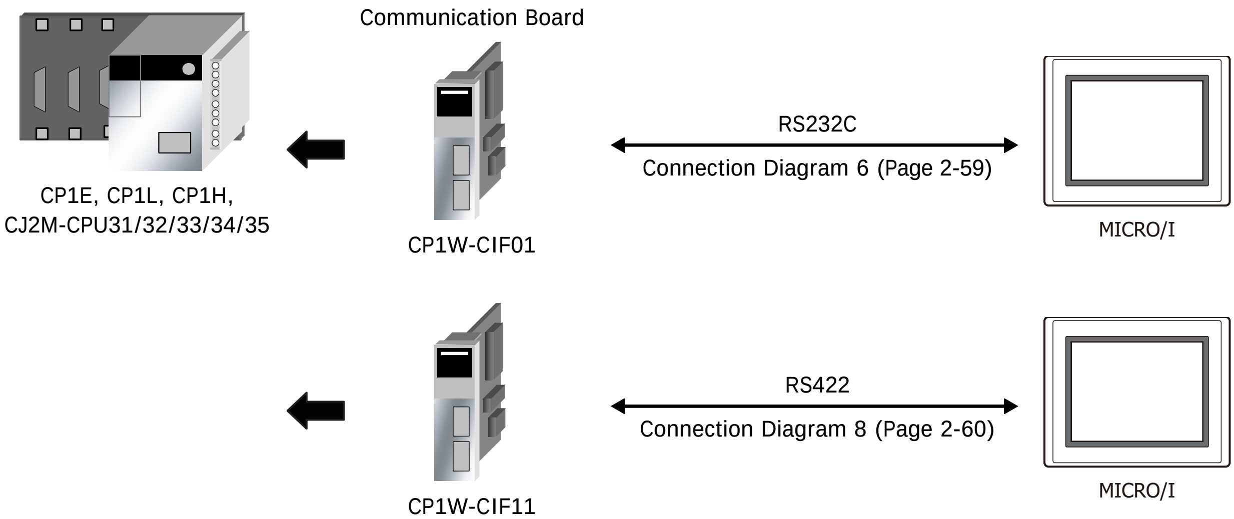
You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

SYSMAC CJ/CP series



You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

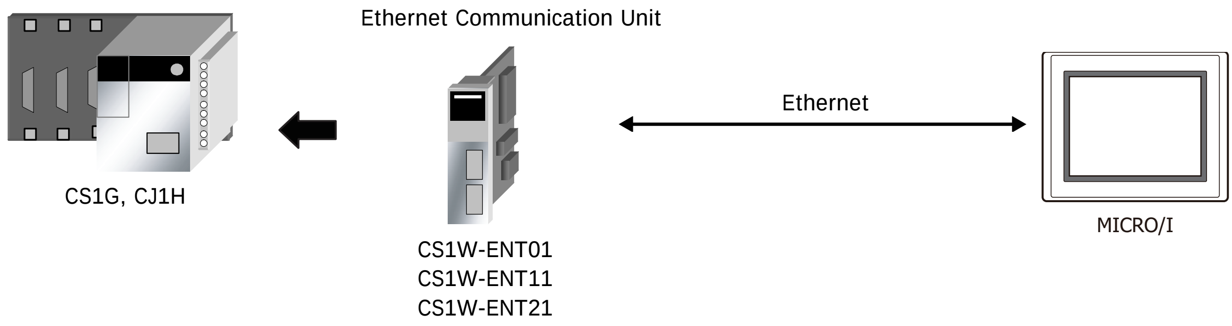
SYSMAC CJ/CP series



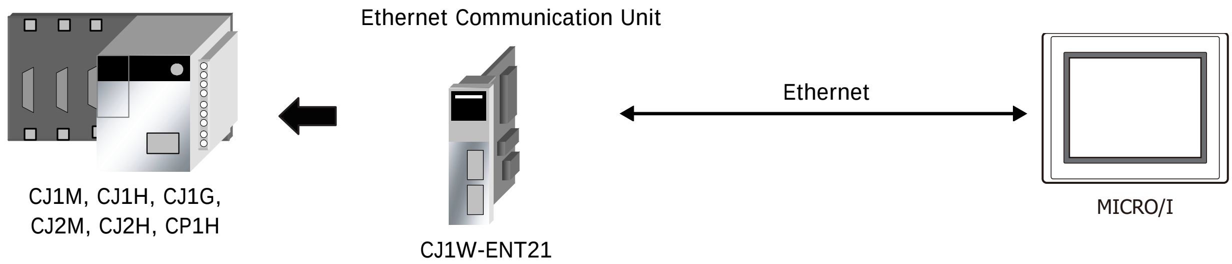
You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

● SYSMAC CS/CJ/CP series (Connects to the Ethernet Communication Unit)

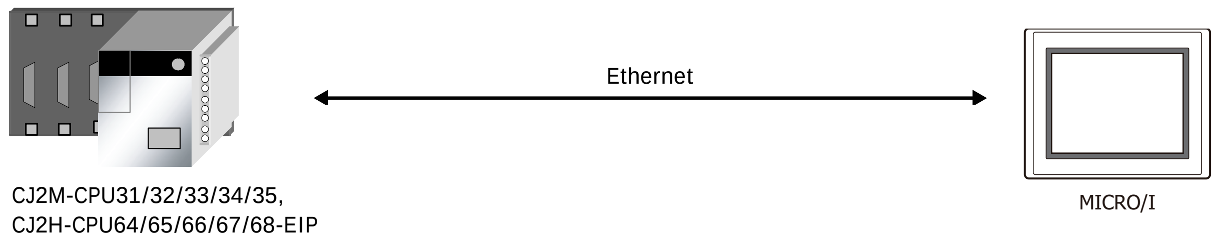
SYSMAC CS1 series



SYSMAC CJ1/CJ2 series



SYSMAC CJ2 series

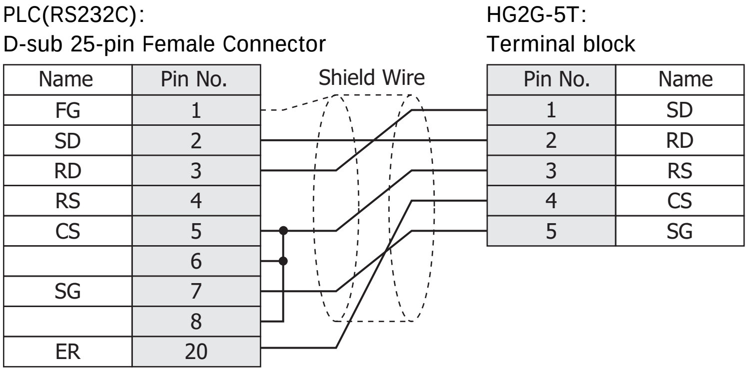


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

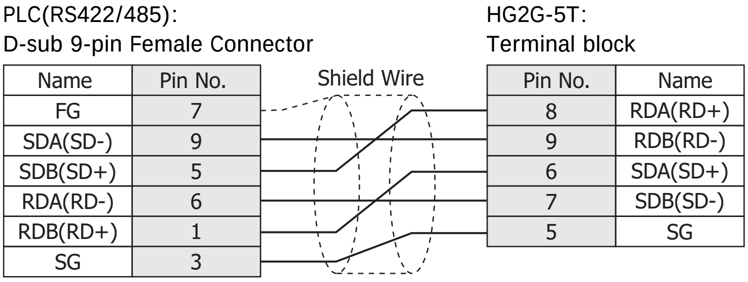
3.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: RS232C Link Unit



● Connection Diagram 2: RS422 Link unit



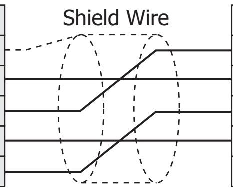
We recommend that you switch on the termination resistor on the PLC Link Unit side for long-distance transmission.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: RS422 Link unit

PLC(RS422/485):
D-sub 9-pin Female Connector

Name	Pin No.
FG	7
SDA(SD-)	9
SDB(SD+)	5
RDA(RD-)	6
RDB(RD+)	1



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

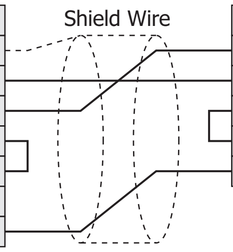
We recommend that you switch on the termination resistor on the PLC Link Unit side for long-distance transmission.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

● Connection Diagram 4: CPU Unit Link Interface

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
DR	6
SG	7



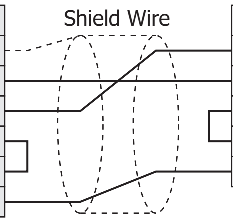
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 5: CPU Unit Link Interface

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
SG	9



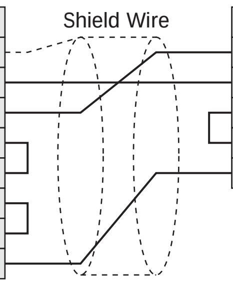
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: PLC (RS232C) Interface

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
DR	7
ER	8
SG	9



HG2G-5T:
Terminal block

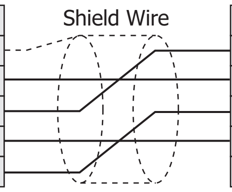
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

2 Connection to External Devices

● Connection Diagram 7: RS422 Communication Board

PLC(RS422/485):
D-sub 9-pin Female Connector

Name	Pin No.
FG	Hood
SDA(SD-)	1
SDB(SD+)	2
RDA(RD-)	6
RDB(RD+)	8



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

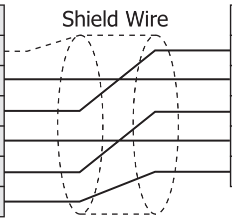
We recommend that you switch on the termination resistor on the PLC Link Unit side for long-distance transmission.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 8: RS422 Adaptor

PLC(RS422/485): Terminal block

Name	Pin No.
FG	
SDA(SD-)	
SDB(SD+)	
RDA(RD-)	
RDB(RD+)	
SG	



HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

We recommend that you switch on the termination resistor on the PLC Link Unit side for long-distance transmission.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

3.4 Environment Settings

● PLC Link Unit Settings

Use the rotary switches and DIP switches on the Link Unit.

Item		Setting	
Interface		RS232C	RS485
Transmission Control Protocol		1:N	
Command Level		Levels 1, 2 and 3 are valid	
Baud Rate	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600 or 19200 bps	
Transmission Code		7 or 8 bit ASCII	
Stop Bits		1 or 2 stop bits	
Unit No.*1		0 to 31 (Decimal)	
Parity		Even or Odd	
CTS Switch		0V (always on)	
Synchronization Switch		Internal	
Termination Resistor		----------	Yes

- For details, refer to the Link Unit manual.
- Select using Register Command or not on the Communication Driver tab in the Project Settings dialog box.

● CPU Unit RS232C Link Interface Settings

Write the RS232C Interface setting item for the System Settings Area using a peripheral tool (such as Proconn).

System Settings Area		Item	Setting
C20H/28H/40H/60H	CQM1H C200HS/C200HE/ C200HG/C200HX		
DM0920	DM6645	Standard/Individual Setting*2	Same setting as the MICRO/I
		Mode	PLC Link Mode
DM0921	DM6646	Communication parameters for when the previous item is set to Individual.	Use the same settings as for the MICRO/I.
DM0922	DM6647	Transmission Delay	0 msec
		RS/CS presence	None
DM0923	DM6648	Unit No.	Same setting as the MICRO/I

For CQM 1 and C200HS, turns the setting switch number 5 on the CPU Unit to OFF.

- For details, refer to the Link Unit manual.
- Select using Register Command or not on the Communication Driver tab in the Project Settings dialog box.

*1 Set a decimal number for the Unit No. on MICRO/I.
*2 Standard settings are as follows:
Baud Rate: 9600 bps
Data Bits: 7 bits
Stop Bits: 2 stop bits
Parity: Even

● CPU Unit RS232C Link Interface Settings (SYSMAC CS1 series)

Write the RS232C Interface setting items for the System Settings Area using a peripheral tool (such as Proconn).

Channel	Item	Setting
160	Optional/Initial Setting*1	Set to 1 for Optional Setting.
	Serial Communication mode	Set to PLC Link.
	Data Bits	Use the same settings as for the MICRO/I.
	Stop Bits	
	Parity	
161	Port Communication Speed	Use the same settings as for the MICRO/I.
162	In the case of No Protocol Mode	Do not set.
163	Unit No.	Set to the same as the MICRO/I PLC Link Station Number.
164	In the case of No Protocol Mode	Do not set.

- For details, refer to the PLC manual.
- For the SYSMAC CS1 series, turns the setting switch number 5 on the CPU Unit to OFF to enable you to make your own communication settings.

● C200Hα(Communication Board) Settings

Write the Communication Board setting items for the System Settings Area using a peripheral tool (such as Proconn).

System Settings Area		Item	Setting
Port A	Port B		
DM6555	DM6550	Standard Setting/Individual Setting*1	Same setting as the MICRO/I.
		Mode	PLC Link Mode
DM6556	DM6551	Communication parameters for when the previous item is set to Individual.	Same setting as the MICRO/I.
DM6557	DM6552	Transmission Delay	0 msec
DM6558	DM6553	Unit No.	Same setting as the MICRO/I.

Set DIP switch SW1 to the 4 (4-wire).

- Set DIP switch SW2 to ON to turn the termination resistor setting ON.
- For details, refer to the Communication Board manual.
- Select using Register Command or not on the Communication Driver tab in the Project Settings dialog box.

*1 Initial settings are as follows:
Baud Rate: 9600 bps
Data Bits: 7 bits
Stop Bits: 2 stop bits
Parity: Even

● SYSMAC CS1 series (Communication Board) Settings

Write the Communication Board setting items for the System Settings Area using a peripheral tool (such as Proconn).

System Settings Area		Item	Setting
Port 1	Port 2		
DM32000	DM32010	Optional/Initial Setting[*1]	Set to 1 for Optional Setting.
		Serial Communication mode	Set to PLC Link.
		Data Bits	Use the same settings as for the MICRO/I.
		Stop Bits	
		Parity	
DM32001	DM32011	Port Communication Speed	Use the same settings as for the MICRO/I.
DM32002	DM32012	Transmission Delay setting	Default: 0 msec
		Delay time setting	
DM32003	DM32013	CTS control	Set to 0 for no
		Unit No.	Use the same settings as for the MICRO/I.

Set DIP switch SW1 to the 4 (4-wire).

Set DIP switch SW2 to ON to turn the termination resistor setting ON. For details, refer to the Communication Board manual.

● CPU unit (CPM1/1A/2A)

Connect via CPM1-CIF01(RS232C)/CIF11(RS422).

Item	Setting
Port	RS232C or RS422
Baud Rate	9600 bps
Data Bits	7 bits
Stop Bits	2 stop bits
Parity	Even

Select using Register Command or not on the Communication Driver tab in the Project Settings dialog box.
For details, refer to the PLC manual.

*1 Initial settings
Baud Rate: 9600bps
Data Bits: 7 bits
Stop Bits: 2 stop bits
Parity: Even

● SYSMAC CS1/CJ series (Ethernet Communication Unit) Settings

Set the following items on Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of Ethernet Communication Unit.
	Port Number	Set the port number of Ethernet Communication Unit.
	FINS Network Address	Set the network address which is set in the Etherent Communication Unit.
	FINS Node Address	Set the node address which is set in the Ethernet Communication Unit.
	MICRO/I Port Number	Set the port number of MICRO/I.If you set "0", the port number of MICRO/I is set automatically.
Communication Driver	HMI FINS Network Address	Set the network address of the MICRO/I.
	HMI FINS Node Address	Set the node address of the MICRO/I.

The communication settings are fixed. For details, refer to the Ethernet Communication Unit manual.

3.5 Usable Device Addresses

● SYSMAC C (Communication Driver: SYSMAC C series)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input/Output Internal Relay	R	CIO	0 to 99915, 120000 to 614315	R/W	*1
Link Relay	LR	LR	0 to 19915	R/W	*1
Holding Relay	HR	HR	0 to 51115	R/W	*1
Auxiliary Memory Relay	AR	AR	0 to 95915	R	*1
Timer (contact)	TIMC	TC	0 to 2047	R	
Counter (contact)	CNTC	TC	0 to 4095	R	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input/Output Internal Relay	WR	CIO	0 to 999, 1200 to 6143	R/W	
Link Relay	WLR	LR	0 to 199	R/W	
Holding Relay	WHR	HR	0 to 511	R/W	
Auxiliary Memory Relay	WAR	AR	0 to 959	R	
Timer (current value)	TIMN	TC	0 to 2047	R	
Counter (current value)	CNTN	TC	0 to 4095	R	
Data Memory	DM	DM	0 to 9999	R/W	

With a Bit Write operation, the word data is first read from the PLC, and a logic operation (AND or OR) is performed on the relevant bit before writing it to the PLC to ensure that the values of other bits in the same channel are preserved. However, be certain that the PLC does not modify the data in the channel during the time that the MICRO/I is writing the data.

*1 The last two digits indicate the bit number (0 to 15).

● SYSMAC CS1 series (Communication Driver: SYSMAC CS1 series)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Core I/O	CIO	CIO	0 to 614315	R/W	*1
Work Area	WR	WR	0 to 51115	R/W	*1
Holding Bit	HR	HR	0 to 51115	R/W	*1
Auxiliary Bit	AR	AR	0 to 95915	R	*1
Timer (Contact)	TIMC	TIMC	0 to 4095	R	
Counter (Contact)	CNTC	CNTC	0 to 4095	R	
Task Bit	TK	TK	0 to 31	R	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Core I/O	WCIO	CIO	0 to 6143	R/W	
Work Area	WWR	WR	0 to 511	R/W	
Holding Bit	WHR	HR	0 to 511	R/W	
Auxiliary Bit	WAR	AR	0 to 959	R	
Timer (Present value)	TIMN	TIM	0 to 4095	R	
Counter (Present value)	CNTN	CNT	0 to 4095	R	
Data Memory	DM	DM	0 to 32767	R/W	
Expansion Data Memory (Bank 0)	EM0	EM0	0 to 32767	R/W	
Expansion Data Memory (Bank 1)	EM1	EM1	0 to 32767	R/W	
Expansion Data Memory (Bank 2)	EM2	EM2	0 to 32767	R/W	
Expansion Data Memory (Bank 3)	EM3	EM3	0 to 32767	R/W	
Expansion Data Memory (Bank 4)	EM4	EM4	0 to 32767	R/W	
Expansion Data Memory (Bank 5)	EM5	EM5	0 to 32767	R/W	
Expansion Data Memory (Bank 6)	EM6	EM6	0 to 32767	R/W	
Expansion Data Memory (Bank 7)	EM7	EM7	0 to 32767	R/W	
Expansion Data Memory (Bank 8)	EM8	EM8	0 – 32767	R/W	
Expansion Data Memory (Bank 9)	EM9	EM9	0 to 32767	R/W	
Expansion Data Memory (Bank A)	EMA	EMA	0 to 32767	R/W	
Expansion Data Memory (Bank B)	EMB	EMB	0 to 32767	R/W	
Expansion Data Memory (Bank C)	EMC	EMC	0 to 32767	R/W	
Task Area (Status)	TKS	TKS	0 to 31	R	
Index Register	IR	IR	0 to 15	R	
Data Register	DR	DR	0 to 15	R	

- The usable address number range of the Expansion Data Memory varies based on the CPU model. For details, refer to the manual for SYSMAC CS1 series.
- The Task Bit is 1 when the cycle execution task is in the executable state, and 0 when it is in the unexcited or standby states.
- The Task Area (Status) indicates the following states.
  0: Never started
  1: In the stopped state after starting once
  2: Starting

*1 The last two digits indicate the bit number (0 to 15).

● SYSMAC CS1/CJ Ethernet (Communication Driver: SYSMAC CS1/CJ series(Ethernet))

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Core I/O	CIO	CIO	0 to 614315	R/W	*1
Work Area	WR	WR	0 to 51115	R/W	*1
Holding Bit	HR	HR	0 to 51115	R/W	*1
Auxiliary Bit	AR	AR	0 to 95915	R	*1
Timer (Contact)	TIMC	TIMC	0 to 4095	R	
Counter (Contact)	CNTC	CNTC	0 to 4095	R	
Task Bit	TK	TK	0 to 31	R	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Core I/O	WCIO	CIO	0 to 6143	R/W	
Work Area	WWR	WR	0 to 511	R/W	
Holding Bit	WHR	HR	0 to 511	R/W	
Auxiliary Bit	WAR	AR	0 to 959	R	
Timer (Present value)	TIMN	TIM	0 to 4095	R/W	
Counter (Present value)	CNTN	CNT	0 to 4095	R/W	
Data Memory	DM	DM	0 to 32767	R/W	
Expansion Data Memory (Bank 0)	EM0	EM0	0 to 32767	R/W	
Expansion Data Memory (Bank 1)	EM1	EM1	0 to 32767	R/W	
Expansion Data Memory (Bank 2)	EM2	EM2	0 to 32767	R/W	
Expansion Data Memory (Bank 3)	EM3	EM3	0 to 32767	R/W	
Expansion Data Memory (Bank 4)	EM4	EM4	0 to 32767	R/W	
Expansion Data Memory (Bank 5)	EM5	EM5	0 to 32767	R/W	
Expansion Data Memory (Bank 6)	EM6	EM6	0 to 32767	R/W	
Expansion Data Memory (Bank 7)	EM7	EM7	0 to 32767	R/W	
Expansion Data Memory (Bank 8)	EM8	EM8	0 – 32767	R/W	
Expansion Data Memory (Bank 9)	EM9	EM9	0 to 32767	R/W	
Expansion Data Memory (Bank A)	EMA	EMA	0 to 32767	R/W	
Expansion Data Memory (Bank B)	EMB	EMB	0 to 32767	R/W	
Expansion Data Memory (Bank C)	EMC	EMC	0 to 32767	R/W	
Expansion Data Memory (Bank D)	EMD	EMD	0 to 32767	R/W	
Expansion Data Memory (Bank E)	EME	EME	0 to 32767	R/W	
Expansion Data Memory (Bank F)	EMF	EMF	0 to 32767	R/W	
Expansion Data Memory (Bank 10)	EM10	EM10	0 to 32767	R/W	
Expansion Data Memory (Bank 11)	EM11	EM11	0 to 32767	R/W	
Expansion Data Memory (Bank 12)	EM12	EM12	0 to 32767	R/W	
Expansion Data Memory (Bank 13)	EM13	EM13	0 to 32767	R/W	
Expansion Data Memory (Bank 14)	EM14	EM14	0 to 32767	R/W	
Expansion Data Memory (Bank 15)	EM15	EM15	0 – 32767	R/W	
Expansion Data Memory (Bank 16)	EM16	EM16	0 to 32767	R/W	

*1 The last two digits indicate the bit number (0 to 15).

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Expansion Data Memory (Bank 17)	EM17	EM17	0 to 32767	R/W	
Expansion Data Memory (Bank 18)	EM18	EM18	0 to 32767	R/W	
Task Area (Status)	TKS	TKS	0 to 31	R	
Index Register	IR	IR	0 to 151	R/W	
Data Register	DR	DR	0 to 15	R/W	

In SYSMAC CS1/CJ Ethernet, Index Register is defined as a 32bit device and all 32bits are available. This register is originally 32bit device in OMRON PLC, but only lower 16bits are available in SYSMAC CS1 series Communication Driver. This is different from SYSMAC CS1 series Communication Driver.

- The usable address number range of the Expansion Data Memory varies based on the CPU model. For details, refer to the manual for SYSMAC CS1 series.
- The Task Bit is 1 when the cycle execution task is in the executable state, and 0 when it is in the unexcited or standby states.
- The Task Area (Status) indicates the following states.
  0: Never started
  1: In the stopped state after starting once
  2: Starting

4 Allen-Bradley

4.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings			
		Interface	Flow Control	Communication Driver	
PLC-5					
All PLC-5 models that can be connected to 1770-KF2	1770-KF2	RS232C Connection Diagram 2 (Page 2-73)	None	PLC-5(Half Duplex)	
		RS422/485 4-wire Connection Diagram 3 (Page 2-73)			
All PLC-5 models	Not required (connects to CPU unit)	RS232C Connection Diagram2(Page 2-73)			
		RS422/485 4-wire Connection Diagram 4 (Page 2-74)			
SLC 500					
SLC5/03 SLC5/04 SLC5/05	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-73)	None	MicroLogix/ SLC 500 (Full Duplex)	SLC 500 (Half Duplex)
MicroLogix					
MicroLogix 1000 MicroLogix 1200	Not required (connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-74)	None	MicroLogix/ SLC 500 (Full Duplex)	-
MicroLogix 1100	Not required (connects to CPU unit)	RS232C Connection Diagram 8 (Page 2-75)			
MicroLogix 1500	Not required (connects to Mini DIN connector on CPU unit)	RS232C Connection Diagram 5 (Page 2-74)			
	Not required (connects to D-sub connector on CPU unit)	RS232C Connection Diagram 6 (Page 2-74)			

If your existing project is using "SLC 500" with Ver.2.30 or earlier, "SLC 500(Half Duplex)" will appear to the Protocol setting with Ver.2.40 or later. SLC 500(Half Duplex) Communication Driver is merged into the MicroLogix/SLC 500(Full Duplex) Communication Driver.
WindO/I-NV4 still provides the SLC 500(Half Duplex) Communication Driver for the existing projects, but it's recommended to use the MicroLogix/SLC 500(Full Duplex) Communication Driver if you create a new project.
Some address format between MicroLogix/SLC 500(Full Duplex) and SLC 500(Half Duplex) are slight different.

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
ControlLogix				
ControlLogix 5550, ControlLogix 5555	Not required (connects to CPU unit)	RS232C Connection Diagram 7(Page 2-74)	None	Logix DF1(Full Duplex)
CompactLogix				
1768 CompactLogix, 1769 CompactLogix	Not required (connects to CPU unit)	RS232C Connection Diagram 7 (Page 2-74)	None	Logix DF1(Full Duplex)
FlexLogix				
1794-L33, 1794-L34	Not required (connects to CPU unit)	RS232C Connection Diagram 7 (Page 2-74)	None	Logix DF1(Full Duplex)

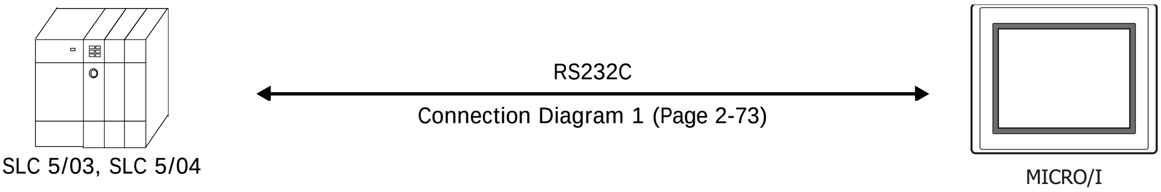
CPU unit	Link unit	WindO/I-NV4 Settings	
		Interface	Communication Driver
ControlLogix			
ControlLogix5550, ControlLogix5555	1756-ENBT, 1756-EN2T	Ethernet	Ethernet/IP
CompactLogix			
1769 CompactLogix	Not required (connects to CPU unit)	Ethernet	Ethernet/IP
PLC-5			
PLC-5	1785-ENET	Ethernet	Ethernet/IP
PLC-5E	Not required (connects to CPU unit)		
SLC 500			
SLC5/05	Not required (connects to CPU unit)	Ethernet	Ethernet/IP
SLC5/03, SLC5/04, SLC5/05	1761-NET-ENI		
MicroLogix			
MicroLogix 1000, MicroLogix 1100, MicroLogix 1200, MicroLogix 1500	1761-NET-ENI	Ethernet	Ethernet/IP
MicroLogix 1100	Not required (connects to Built-in Ethernet port on CPU unit)*1		

*1 To connect the Ethernet port on MicroLogix 1100, check the firmware version. MICRO/I supports version 4 or later. (The latest firmware is on the Allen-Bradley web site.)

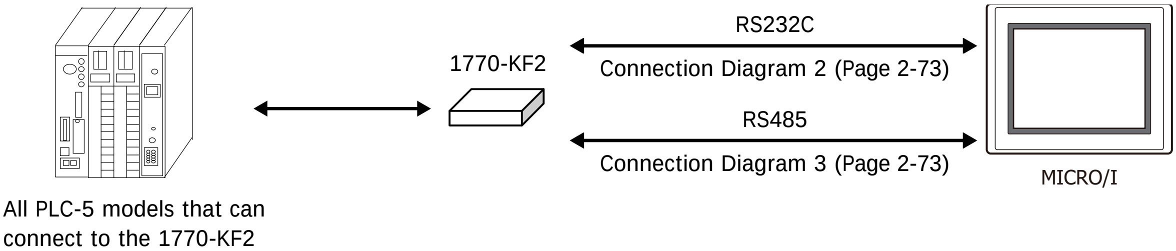
4.2 System Configuration

This is the system configuration for the connection of Allen-Bradley PLCs to MICRO/I.

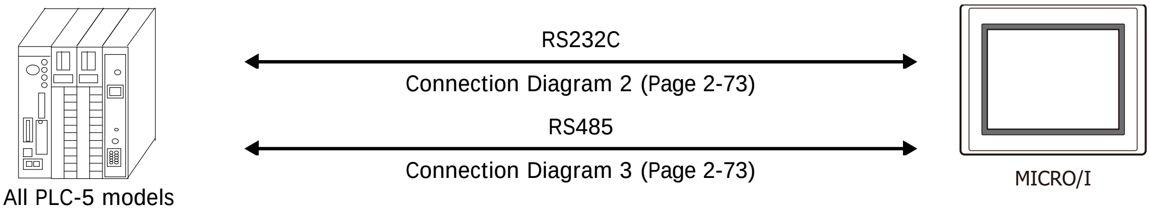
● SLC 500 (Connects to the CPU Channel 0 serial port)



● PLC-5 (Connects to Interface Module)

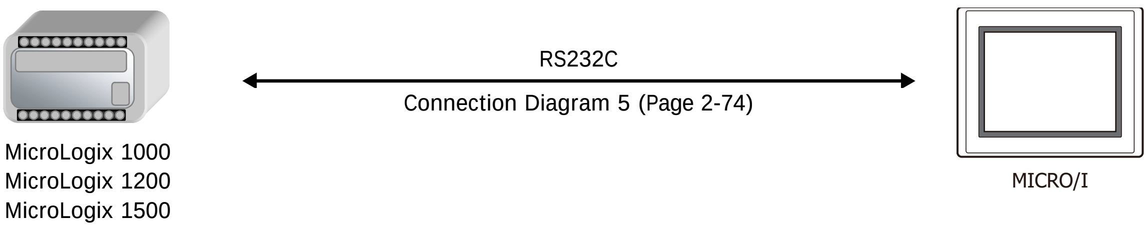


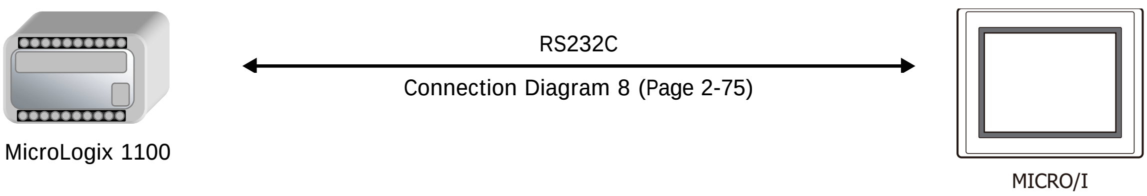
● PLC-5 (Connects to CPU Unit)



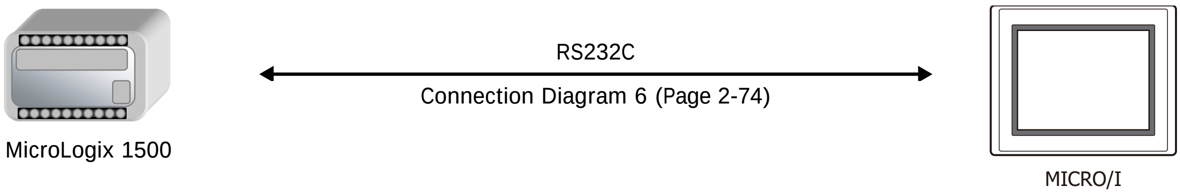
Connect to the CPU Channel 0 serial port.

● MicroLogix 1000/1100/1200/1500 (Connects to Mini DIN Connector on CPU Unit)

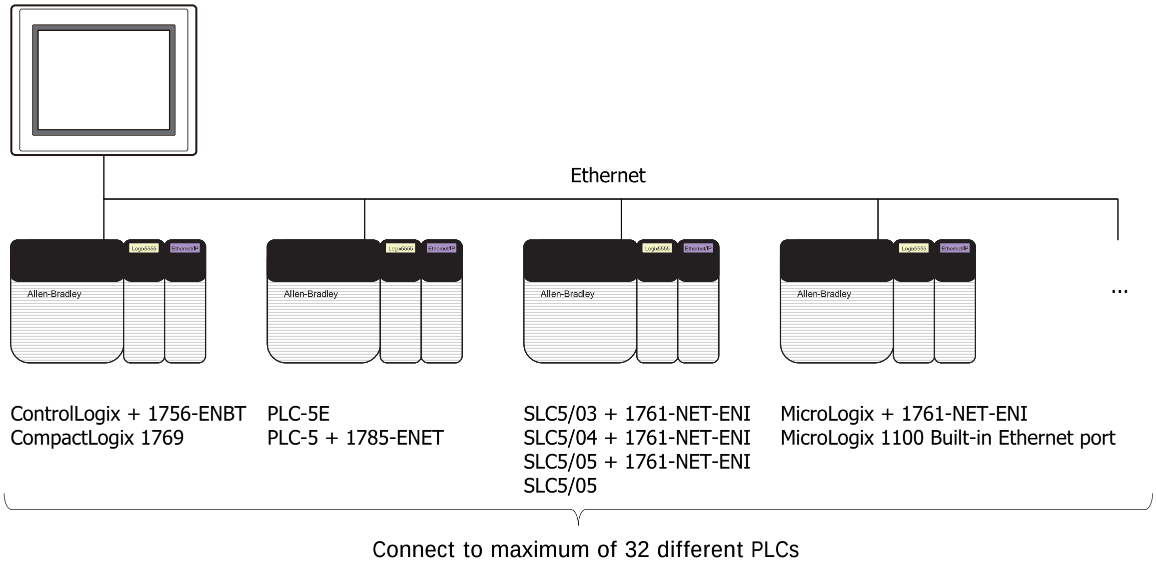




● MicroLogix 1500 (Connects to D-sub 9-pin Connector on CPU Unit)

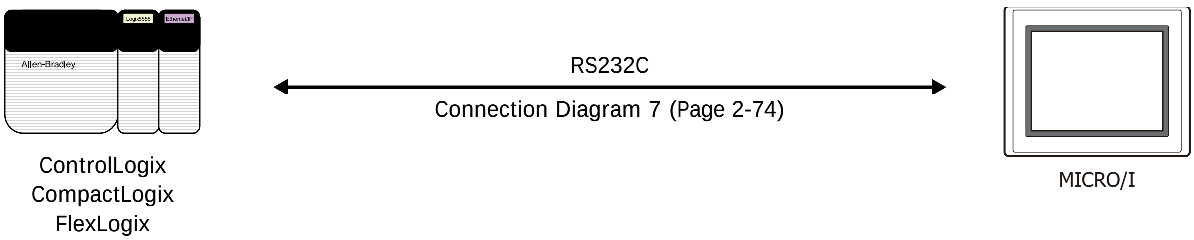


● Ethernet/IP (Connects to MicroLogix, PLC-5, SLC 500, ControlLogix, CompactLogix)



- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

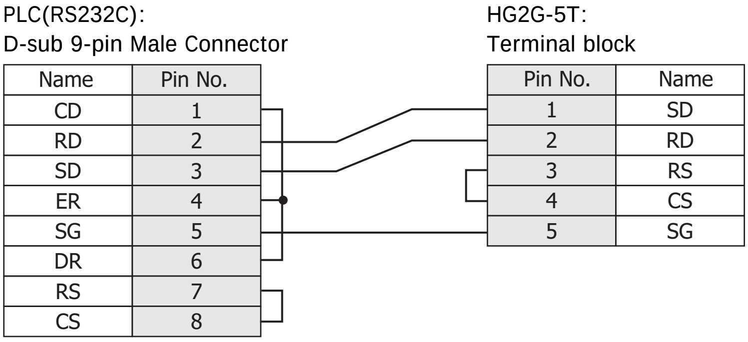
● Control Logix, CompactLogix, FlexLogix (CPU Unit)



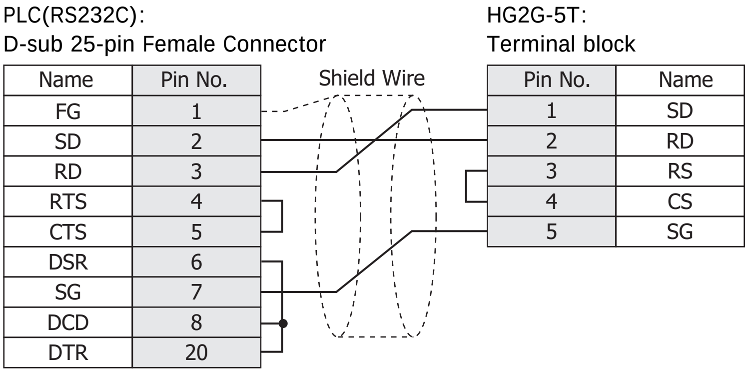
4.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

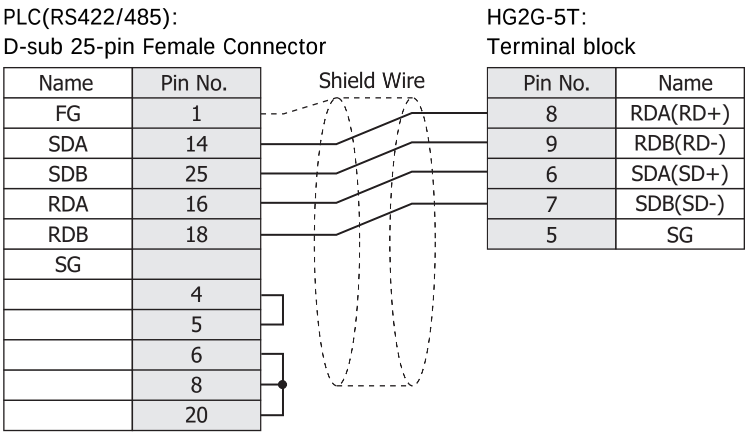
● Connection Diagram 1: SLC 500 (RS232C)



● Connection Diagram 2: Interface Module (RS232C) and PLC-5 (RS232C)



● Connection Diagram 3: Interface Module (RS422)

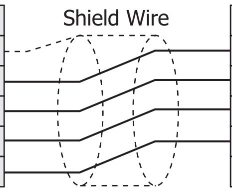


There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 4: PLC-5 (RS422)

PLC(RS422/485):
D-sub 25-pin Female Connector

Name	Pin No.
FG	1
SDB	14
SDA	2
RDB	16
RDA	3



HG2G-5T:
Terminal block

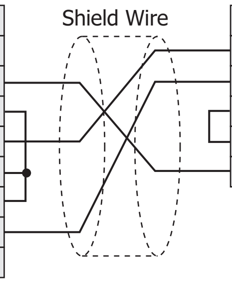
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: MicroLogix 1000/1200/1500 (Mini DIN Connector)

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
24V	1
GND	2
RTS	3
RXD	4
DCD	5
CTS	6
TXD	7
GND	8



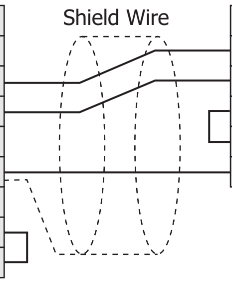
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: MicroLogix 1500 (D-sub 9-pin Connector)

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RXD	2
TXD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8



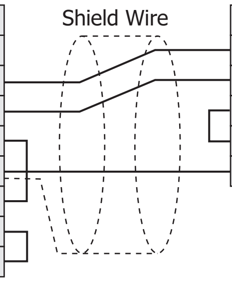
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 7: ControlLogix/CompactLogix/FlexLogix

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RXD	2
TXD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8



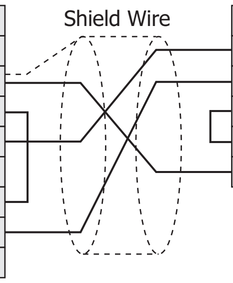
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 8: MicroLogix 1100 (Mini DIN Connector)

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
B(+)	1
GND	2
RTS	3
RXD	4
NC	5
CTS	6
TXD	7
A(-)	8



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

4.4 Environment Settings

● MicroLogix, SLC 500 (Full Duplex)

Item	Setting
Baud Rate*1*2	1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits*2	8 bits
Stop Bits*1*2	1 stop bits
Parity*1*2	None or Even
Flow Control	None
Serial Interface	RS232C
Driver*1	DF1 Full-Duplex*3
Control Line*1	No Handshaking*3
Error Detection*1	CRC*3
Embedded Response*1	Auto Detect
Duplicate Packet Detect*1	Enable
Node Address*1*2*4	0 to 254 (Decimal)

● SLC 500 (Half Duplex)

Item	Setting
Interface	RS232C
Baud Rate*1*2	1200, 2400, 4800, 9600 or 19200 bps
Data Bits*2	8 bits
Stop Bits*1*2	1 stop bits
Parity*1*2	None or Even
Driver*1	DF1 Half-Duplex Slave*3
Duplicate Detect*1	Disabled*3
Error Detect*1	BCC*3
Control Line*1	No Handshaking*3
Node Address*1*2*4	0 to 254 (Decimal)

*1 Select using RSLogix software (set Chan0 to System of Controller-Channel Configuration).
*2 The setting for this item must match the setting on the MICRO/I Series unit.
*3 Be certain to select as indicated.
*4 Select the MICRO/I Node Address using the Node Address (MICRO/I) under Project Settings in WindO/I-NV4.

● PLC-5

Item	Setting
Interface*1*2	RS232C or RS485 4-wire
Baud Rate*3*4	1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits*3*4	8 bits
Stop Bits*3*4	1 stop bits
Parity*3*4	None or Even
Communication Protocol*3	Half duplex*5
Channel 0 Protocol*3	DF1 Slave*5
Duplicate Detect*3	OFF*5
Error Detect*3	BCC*5
Control Line*3	No Handshaking*5
Network Link*1	Data highway plus
PLC-5 Processor Station Address*4*6	00 to 77 (Octal)
1770-KF2 Node Number*1*4*7	00 to 77 (Octal)

Setting the Station Address using WindO/I-NV4.
When using the 1770-KF2 Module, select **Use 1770-KF2** on the Communication Driver tab in the Project Settings dialog box, and set **Station Address (1770-KF2)** and **Station Address (PLC5)**.
In case of direct connection to PLC5 Processor Module, clear **Use 1770-KF2**. Instead select “Station Address (1770-KF2)”. These numbers are to be set using octal for the PLC-5 and 1770-KF2, but hexadecimal for the WindO/I-NV4.

*1 When using the 1770-KF2 Module, select this setting using the 1770-KF2 Module DIP switch.
*2 In the case of a direct connection to the PLC-5 Processor Module, select this setting using the PLC-5 Processor Module DIP switch.
*3 When using the 1770-KF2 Module, select this setting using the DIP switch on 1770-KF2 Module. In case of a direct connection to the PLC-5 Processor Module, select using the 6200 Programming Software (Channel 0 configuration).
*4 The setting for this item must match the setting on the MICRO/I Series unit.
*5 Be certain to select as indicated.
*6 This setting is required regardless of whether 1770-KF2 Module is used or not. When using the 1770-KF2 Module, select this setting using the DIP switch on PLC-5 Processor, and in the case of a direct connection to the PLC-5 Processor Module, select using the 6200 Programming Software (Channel 0 configuration).
*7 This option is only necessary if you use Interface Module.

● Ethernet/IP (ControlLogix, CompactLogix, PLC-5, SLC 500, MicroLogix)

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	Interface	Ethernet
	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of communicated PLC.
	Port Number	Set the port number of communicated PLC.
	Product	Set the product of communicated PLC. (For ControlLogix or CompactLogix, select **Logix**.)
	Slot Number	Set the CPU slot number of communicated PLC.

● ControlLogix, CompactLogix, FlexLogix

Item	Setting
Baud Rate*1	1200, 2400, 4800, 9600 or 19200 bps
Data Bits*1	8 bits
Stop Bits*1	1 stop bits
Parity*1	None or Even
Flow Control	None
Serial Interface	RS232C
Protocol	DF1 Point to Point*2
Control Line	No Handshaking*2
Error Detection	BCC or CRC
Embedded Response	Auto Detect
Duplicate Packet Detect	Enable
Station Address*1 *3	0 to 254 (Decimal)

*1 The setting for this item must match the setting on the MICRO/I Series unit.
*2 Be certain to select as indicated.
*3 Select the MICRO/I Station Address using the **Station Address (MICRO/I)** on the Communication Driver tab in the Project Settings dialog box. Set the Station Address for the destination PLC to **Slave Numbe**r on **Communication Driver Network** tab..

4.5 Usable Device Addresses

MICRO/I supports the following device types and range.
WindO/I-NV4 supports the device address format as same as MicroLogix, SLC 500, PLC-5 programming software along with the standard device address format of WindO/I-NV4.

■ Allen-Bradley device address format

This device address format is same as the device address format of Allen-Bradley's software.
(Some part of the format is deferent. Refer to the following.)

■ WindO/I-NV4 device address format

File Number, Element and Bit Number are separated by some delimiters in device address format of Allen-Bradley's software. However, WindO/I-NV4 device address format does not contain delimiters. It is remove some delimiters from Allen-Bradley's device address format.

● MicroLogix, SLC 500 (Full Duplex)

Bit Device

Device Name	Device Type		Address Number Range		Read/ Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Output	O	O	0 to 1625515	1	R	Decimal
Input	I	I	0 to 1625515	1	1	Decimal
Binary	B	B	300000 to 325515, 900000 to 25525515	2	R/W	Decimal
Timer Enable Bit	TEN	T(EN)	4000 to 4255, 9000 to 255255	3	R	Decimal
Timer Timing Bit	TTT	T(TT)	4000 to 4255, 9000 to 255255	3	R	Decimal
Timer Done Bit	TDN	T(DN)	4000 to 4255, 9000 to 255255	3	R	Decimal
Counter Up Enable Bit	CCU	C(CU)	5000 to 5255, 9000 to 255255	3	R	Decimal
Counter Down Enable Bit	CCD	C(CD)	5000 to 5255, 9000 to 255255	3	R	Decimal
Counter Done Bit	CDN	C(DN)	5000 to 5255, 9000 to 255255	3	R	Decimal
Counter Overflow Bit	COV	C(OV)	5000 to 5255, 9000 to 255255	3	R	Decimal
Counter Underflow Bit	CUN	C(UN)	5000 to 5255, 9000 to 255255	3	R	Decimal
Counter Update Accumulator	CUA	C(UA)	5000 to 5255, 9000 to 255255	3	R	Decimal
Control Enable Bit	REN	R(EN)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Queue Bit	REU	R(EU)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Asynchronous Bit Done Bit	RDN	R(DN)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Synchronous Done Bit	REM	R(EM)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Error Bit	RER	E(ER)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Unload Bit	RUL	R(UL)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Running Bit	RIN	R(IN)	6000 to 6255, 9000 to 255255	3	R	Decimal
Control Found Bit	RFD	R(FD)	6000 to 6255, 9000 to 255255	3	R	Decimal

For details about the address notation, refer to " Expression of Device Address Format" on page 2-80.

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	I 2.12/6 1 to 2 digits Bit number 1 to 3 digits Word number 1 to 2 digits Slot number	I 201206 2 digits Bit number 3 digits Word number 1 to 2 digits Slot number	I:2.12/6
2	B 10:123/5 1 to 2 digits Bit number 1 to 3 digits Element number 1 to 3 digits File number	B 1012305 2 digits Bit number 3 digits Element number 1 to 3 digits File number	B10:123/5
3	TEN 12:123 1 to 3 digits Element number 1 to 3 digits File number	TEN 12123 3 digits Element number 1 to 3 digits File number	TEN12:123

A communication error occurs if you specify a file or element that is not allocated to the MicroLogix 1200 or SLC 500 data table map.

Word Device

Device Name	Device Type		Address Number Range		Read/Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Output	WO	O	0 to 16255	1	R	Decimal
Input	WI	I	0 to 16255	1	R	Decimal
Status	S	S	2000 to 2065	2	R	Decimal
Bit	WB	B	3000 to 3255, 9000 to 255255	2	R/W	Decimal
Timer (Preset Value)	TP	T(P)	4000 to 4255, 9000 to 255255	2	R/W	Decimal
Timer (Accumulated Value)	TA	T(A)	4000 to 4255, 9000 to 255255	2	R/W	Decimal
Counter (Preset Value)	CP	C(P)	5000 to 5255, 9000 to 255255	2	R/W	Decimal
Counter (Accumulated Value)	CA	C(A)	5000 to 5255, 9000 to 255255	2	R/W	Decimal
Control (Number of characters specified to be sent or received)	RLEN	R(LEN)	6000 to 6255, 9000 to 255255	2	R/W	Decimal
Control (Number of characters actually sent or received)	RPOS	R(POS)	6000 to 6255, 9000 to 255255	2	R/W	Decimal
Integer	N	N	7000 to 7255, 9000 to 255255	2	R/W	Decimal
Float Point	F	F	80000 to 82551, 90000 to 2552551	3	R/W	Decimal
Long Word	L	L	90000 to 2552551	3	R/W	Decimal
ASCII	A	A	9000 to 255255	2	R/W	Decimal
String LEN	STL	ST	9000 to 255255	2	R	Decimal
String DATA	ST	ST	900000 to 25525540	4	R/W	Decimal

For details about the address notation, refer to “ Expression of Device Address Format” on page 2-81.

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	WI 12.10 1 to 3 digits Word number 1 to 2 digits Slot number	WI 12010 3 digits Word number 1 to 2 digits Slot number	I:12.10
2	WB 123:255 1 to 3 digits Element number 1 to 3 digits File number	WB 123255 3 digits Element number 1 to 3 digits File number	B123:255
3	F 123:255_0, F 123:255_1 1 digit 0: Lower Word 1: Upper Word 1 to 3 digits Element number 1 to 3 digits File number	F 1232550, F 1232551 1 digit 0: Lower Word 1: Upper Word 3 digits Element number 1 to 3digits File number	F123:255
	WindO/I-NV4 uses 32 bit device as the divided 2 word device. Therefore, the last one digit shows that the device is upper word or lower word.		
4	ST 123:255/40 1 to 2 digits DATA number 1 to 3 digits Element number 1 to 3 digits File number	ST 12325540 2 digits DATA number 3 digits Element number 1 to 3 digits File number	ST123:255.DATA[40]

- Floating Point (F) and Long Word (L) are 32-bit devices. When you write to these devices, please be sure to write a high word and low word simultaneously. If you write only high word or only low word, 0 will be written into the other word.
- String LEN stores the number of characters written when a string is written from the String DATA start address (DATA[0]) of each element. If the address to write is not from the start, the value of String LEN is not updated.
- When writing a string from a Character Input, the NULL terminating character is written at the end of the string. The NULL is automatically set by the MICRO/I. Be aware that this is not only for Allen-Bradley driver. This is the specification of Character Input.
- A communication error occurs if you specify a file or element that is not allocated to the MicroLogis1200 or SLC 500 data table map.

WO, WI, WB is same devices as O, I, B. They are used as word devices.

● SLC 500 (Half Duplex)

Bit Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Timer (done)	TDN	T	4000 to 4255, 10000 to 255255	1	R	Decimal
Timer (timing)	TT	T	4000 to 4255,10000 to 255255	1	R	Decimal
Timer (enable)	EN	T	4000 to 4255, 10000 to 255255	1	R	Decimal
Counter (done)	CDN	C	5000 to 5255, 10000 to 255255	1	R	Decimal
Counter (up enable)	CU	C	5000 to 5255, 10000 to 255255	1	R	Decimal
Counter (down enable)	CD	C	5000 to 5255, 10000 to 255255	1	R	Decimal
Counter (overflow)	OV	C	5000 to 5255, 10000 to 255255	1	R	Decimal
Counter (underflow)	UN	C	5000 to 5255, 10000 to 255255	1	R	Decimal
Counter (high-speed counter update)	UA	C	5000 to 5255, 10000 to 255255	1	R	Decimal

For details about the address notation, refer to " Expression of Device Address Format".

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	SLC 500 programming software
1	TDN 4:12 1 to 3 digits Element number 1 to 3 digits File number	TDN 4012 3 digits Element number 1 to 3 digits File number	TDN4:12

Word Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Input	WI	I	0 to 301	1	R	Decimal
Output	WO	O	0 to 301	1	R	Decimal
Bit	WB	B	3000 to 3255, 10000 to 255255	2	R/W	Decimal
Timer (accumulated value)	TA	T	4000 to 4255, 10000 to 255255	2	R	Decimal
Counter (accumulated value)	CA	C	5000 to 5255, 10000 to 255255	2	R	Decimal
Timer (preset value)	TP	T	4000 to 4255, 10000 to 255255	2	R/W	Decimal
Counter (preset value)	CP	C	5000 to 5255, 10000 to 255255	2	R/W	Decimal
Integer*1	N	N	7000 to 7255, 10000 to 255255	2	R/W	Decimal
ASCII	A	A	10000 to 255255	2	R/W	Decimal

For details about the address notation, refer to " Expression of Device Address Format".

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	SLC 500 programming software
1	WI 30.1 1 digit Word number 1 to 2 digits Slot number	WI 301 1 digit Word number 1 to 2 digits Slot number	I30.1
2	N 255:255 1 to 3 digits Element number 1 to 3 digits File number	N 255255 3 digits Element number 1 to 3 digits File number	N255:255

- You cannot directly write to inputs and outputs.
- A communication error occurs if you specify a file or element that is not allocated to the SLC 500 data table map.

The input and output addresses are made up of the slot number and the word number.

- The address makeup is as follows:
  Bottom digit: Word number
  2nd and 3rd digits from the bottom: Slot number
- If the module in the slot has 16 or fewer points, the word number is 0, and if it is a 32-point module, the word number is 0 for the lower word (bit 0 to bit 15) and 1 for the upper word (bit 16 to bit 31).
- In the case of a rack-type controller, the slot number is attributed as is, and in the case of a package-type controller, it is as follows.
  Package-type controller: 0
  Left slot of the expansion rack: 1
  Right slot of the expansion rack: 2
  Example: Address specification with SLC 500: I: 1.0
  Address specification with WindO/I-NV4: I1 0

*1 Allocate the System Area above the file number 7 integer file. It will not operate with file number 10 and above. You must construct an area above the SLC 500 data table file that corresponds to the System Area Address set by WindO/I-NV4.

● PLC-5 (Half Duplex)

Bit Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Input	I	I	0 to 27717	1	R/W	Octal
Output	O	O	0 to 27717	1	R/W	Octal
Bit	B	B	300000 to 9999915	2	R	Decimal
Timer (complete)	TDN	T	3000 to 99999	3	R	Decimal
Timer (timing)	TT	T	3000 to 99999	3	R	Decimal
Timer (enable)	EN	T	3000 to 99999	3	R	Decimal
Counter (complete)	CDN	C	3000 to 99999	3	R	Decimal
Counter (up enable)	CU	C	3000 to 99999	3	R	Decimal
Counter (down enable)	CD	C	3000 to 99999	3	R	Decimal
Counter (overflow)	OV	C	3000 to 99999	3	R	Decimal
Counter (underflow)	UN	C	3000 to 99999	3	R	Decimal

For details about the address notation, refer to “ Expression of Device Address Format”.

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	PLC-5 programming software
1	I 277/17 1 to 2 digits Terminal number 1 digit Group number 1 to 2 digits Rack number	I 27717 2 digits Terminal number 1 digit Group number 1 to 2 digits Rack number	I:277/17
2	B 3:12/15 1 to 2 digits Bit number 1 to 3 digits Element number (or Word number) 1 to 3 digits File number	B 301215 2 digits Bit number 3 digits Element number (or Word number) 1 to 3 digits File number	B3:12/15
	With the PLC-5, addresses can be specified with word and bit units, or with bit units only (i.e. there are two ways), while with WindO/I-NV4 you must specify addresses using word and bit units.		
3	TDN 4:12 1 to 3 digits Element number (or Word number) 1 to 3 digits File number	TDN 4012 3 digits Element number (or Word number) 1 to 3 digits File number	TDN4:12

Word Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
Input	WI	I	0 to 277	1	R	Octal
Output	WO	O	0 to 277	1	R/W	Octal
Bit	WB	B	3000 to 99999	2	R/W	Decimal
Timer (current value)	TA	T	3000 to 99999	2	R	Decimal
Counter (current value)	CA	C	3000 to 99999	2	R	Decimal
Timer (preset value)	TP	T	3000 to 99999	2	R/W	Decimal
Counter (preset value)	CP	C	3000 to 99999	2	R/W	Decimal
Integer	N	N	3000 to 99999	2, 3	R/W	Decimal
BCD	D	D	3000 to 99999	2	R/W	Decimal
ASCII	A	A	3000 to 99999	2	R/W	Decimal

For details about the address notation, refer to " Expression of Device Address Format".

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	PLC-5 programming software
1	WI 277 1 digit Group number 1 to 2 digits Rack number	WI 277 1 digit Group number 1 to 2 digits Rack number	I:277
2	N 40:45 1 to 3 digits Element number (or Word number) 1 to 3 digits File number	N 40045 3 digits Element number (or Word number) 1 to 3 digits File number	N40:45
3	System Area should assigned using a file number 9 or less. It does not work with file number 10 or more. Construct an area in the PLC-5 data table file that corresponds to the System Area Address selected by WindO/I-NV4.		

● Ethernet/IP

If you select Ethernet/IP as Communication Driver, the driver contains some PLCs devices. Therefore, the following devices name may be not same as devices name for each PLC. For details regarding wiring, refer to " Cross reference table of devices name" on page 2-88.

Bit Device

Device Name	Device Type		Address Number Range		Read/Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
SLC/MicroLogix Input	SI	I	0 to 1625515	1	R	Decimal
SLC/MicroLogix Output	SO	O	0 to 1625515	1	R	Decimal
PLC-5 Input	PI	I	0 to 27717	2	R	Decimal
PLC-5 Output	PO	O	0 to 27717	2	R/W	Decimal
Binary	B	B	0 to 99999915	3	R/W	Decimal
Timer Enable bit	TEN	TEN	0 to 999999	4	R	Decimal
Timer Timing Bit	TTT	TTT	0 to 999999	4	R	Decimal
Timer Done Bit	TDN	TDN	0 to 999999	4	R	Decimal
Counter Up Enable Bit	CCU	CCU	0 to 999999	4	R	Decimal
Counter Down Enable Bit	CCD	CCD	0 to 999999	4	R	Decimal
Counter Done Bit	CDN	CDN	0 to 999999	4	R	Decimal
Counter Overflow Bit	COV	COV	0 to 999999	4	R	Decimal
Counter Underflow Bit	CUN	CUN	0 to 999999	4	R	Decimal
Counter Update Accumulator	CUA	CUA	0 to 999999	4	R	Decimal
Control Enable Bit	REN	REN	0 to 999999	4	R	Decimal
Control Queue Bit	REU	REU	0 to 999999	4	R	Decimal
Control Aynchronous Done Bit	RDN	RDN	0 to 999999	4	R	Decimal
Control Synchronous Done BIt	REM	REM	0 to 999999	4	R	Decimal
Control Error Bit	RER	RER	0 to 999999	4	R	Decimal
Control Unload Bit	RUL	RUL	0 to 999999	4	R	Decimal
Control Running Bit	RIN	RIN	0 to 999999	4	R	Decimal
Control Found Bit	RFD	RFD	0 to 999999	4	R	Decimal

For details about the address notation, refer to " Expression of Device Address Format".

<u>Expression of Device Address Format</u>

Notation	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	SI 2:12/6 1 to 2 digits Bit number 1 to 3 digits Word number 1 to 2 digits File number	SI 201206 2 digits Bit number 3 digits Word number 1 to 2 digits Slot number	I:2/12.6
2	PI 277/17 1 to 2 digits Terminal number 1 digit Group number 1 to 2 digits Rack number	PI 27717 2digits Terminal number 1 digit Group number 1 to 2 digits Rack number	I:277/17
3	B 10:123/5 1 to 2 digits Bit number 1 to 3 digits Element number 1 to 3 digits File number	B 1012305 2 digits Bit number 3 digits Element number 1 to 3 digits File number	B10:123/5
4	TEN 12:123 1 to 3 digits Element number 1 to 3 digits File number	TEN 12123 3digits Element number 1 to 3 digits File number	TEN12:123

Word Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
SLC/MicroLogix Input (Word)	SWI	I	0 to 16255	1	R	Decimal
SLC/MicroLogix Output (Word)	SWO	O	0 to 16255	1	R	Decimal
PLC-5 Input (Word)	PWI	I	0 to 277	2	R	Decimal
PLC-5 Output (Word)	PWO	O	0 to 277	2	R/W	Decimal
Status	S	S	2000 to 2026	3	R	Decimal
Timer (Preset Value)	TP	TP	0 to 999999	3	R/W	Decimal
Timer (Accumulated Value)	TA	TA	0 to 999999	3	R/W	Decimal
Counter (Preset Value)	CP	CP	0 to 999999	3	R/W	Decimal
Counter (Accumulated Value)	CA	CA	0 to 999999	3	R/W	Decimal
Control LEN	RLEN	RLEN	0 to 999999	3	R/W	Decimal
Control POS	RPOS	RPOS	0 to 999999	3	R/W	Decimal
Bit (Word)	WB	WB	0 to 999999	3	R/W	Decimal
Integer	N	N	0 to 999999	3	R/W	Decimal
Float/REAL	F	F	0 to 9999991	4	R/W	Decimal
Long/DINT	L	L	0 to 9999991	4	R/W	Decimal
Ascii	A	A	0 to 999999	3	R/W	Decimal
BCD	BCD	BCD	0 to 999999	3	R/W	Decimal
SINT	SINT	SINT	0 to 999999	3	R/W	Decimal
String LEN	STL	ST	0 to 999999	3	R	Decimal
String DATA	ST	ST	0 to 99999940	5	R/W	Decimal

For details about the address notation, refer to " Expression of Device Address Format".

Expression of Device Address Format

<table>
<tr><th>Notation</th><th>Allen-Bradley</th><th>WindO/I-NV4</th><th>MicroLogix 1200 programming software</th></tr>
<tr><td>1</td><td>SWI 12:10
1 to 3 digits Word number
1 to 2 digits Slot number</td><td>SWI 12010
3 digits Word number
1 to 2 digits Slot number</td><td>I:12/10</td></tr>
<tr><td>2</td><td>PWI 277
1 digit Group number
1 to 2 digits Rack number</td><td>PWI 277
1 digit Group number
1 to 2 digits Rack number</td><td>I:277</td></tr>
<tr><td>3</td><td>WB 123:255
1 to 3 digits Element number
1 to 3 digits File number</td><td>WB 123255
3 digits Element number
1 to 3 digits File number</td><td>B123:255</td></tr>
<tr><td rowspan="2">4</td><td>F 123:255_0, F 123:255_1
1 digit 0: Lower word
1: Upper word
1 to 3 digits Element number
1 to 3 digits File number</td><td>F 1232550, F 1232551
1 digit 0: Lower word
1: Upper word
3 digits Element number
1 to 3 digits File number</td><td rowspan="2">F123:255</td></tr>
<tr><td colspan="2">WindO/I-NV4 uses 32 bit device as the divided 2 word device. Therefore, the last one digit shows that the device is upper word or lower word.</td></tr>
<tr><td>5</td><td>ST 123:255/40
1 to 2 digits DATA number
1 to 3 digits Element number
1 to 3 digits File number</td><td>ST 12325540
2 digits DATA number
3 digits Element number
1 to 3 digits File number</td><td>ST123:255.DATA[40]</td></tr>
</table>

- Floating Point (F) and Long Word (L) are 32-bit devices. When you write to these devices, please be sure to write a high word and low word simultaneously. If you write only high word or only low word, 0 will be written into the other word.
- String LEN stores the number of characters written when a string is written from the String DATA start address (DATA[0]) of each element.
  If the address to write is not from the start, the value of String LEN is not updated.
- When writing a string from a Character Input, the NULL terminating character is written at the end of the string.
- A communication error occurs if you specify a file or element that is not allocated to the MicroLogis1200 or SLC 500 data table map.

WO, WI, WB is same devices as O, I, B. They are used as word devices.

Cross reference table of devices name

Bit Device

Device Name	Device Type	MicroLogix SLC 500	PLC-5	ControlLogix CompcatLogix
SLC/MicroLogix Input	SI	Input (Bit)		
SLC/MicroLogix Output	SO	Output (Bit)		
PLC-5 Input	PI		Input (Bit)	
PLC-5 Output	PO		Output (Bit)	
Binary	B	Binary	Binary	
Timer Enable bit	TEN	Timer Enable bit	Timer Enable bit	
Timer Timing Bit	TTT	Timer Timing Bit	Timer Timing Bit	
Timer Done Bit	TDN	Timer Done Bit	Timer Done Bit	
Counter Up Enable Bit	CCU	Counter Up Enable Bit	Counter Up Enable Bit	
Counter Down Enable Bit	CCD	Counter Down Enable Bit	Counter Down Enable Bit	
Counter Done Bit	CDN	Counter Done Bit	Counter Done Bit	
Counter Overflow Bit	COV	Counter Overflow Bit	Counter Overflow Bit	
Counter Underflow Bit	CUN	Counter Underflow Bit	Counter Underflow Bit	
Counter Update Accumulator	CUA	Counter Update Accumulator		
Control Enable Bit	REN	Control Enable Bit		
Control Queue Bit	REU	Control Queue Bit		
Control Aynchronous Done Bit	RDN	Control Aynchronous Done Bit		
Control Synchronous Done BIt	REM	Control Synchronous Done BIt		
Control Error Bit	RER	Control Error Bit		
Control Unload Bit	RUL	Control Unload Bit		
Control Running Bit	RIN	Control Running Bit		
Control Found Bit	RFD	Control Found Bit		

Word Device

Device Name	Device Type	MicroLogix SLC 500	PLC-5	ControlLogix CompactLogix
SLC/MicroLogix Input (Word)	SWI	Input (Word)		
SLC/MicroLogix Output (Word)	SWO	Output (Word)		
PLC-5 Input (Word)	PWI		Input (Word)	
PLC-5 Output (Word)	PWO		Output (Word)	
Status	S	Status	Status	
Timer (Preset Value)	TP	Timer (Preset Value)	Timer (Preset Value)	
Timer (Accumulated Value)	TA	Timer (Accumulated Value)	Timer (Accumulated Value)	
Counter (Preset Value)	CP	Counter (Preset Value)	Counter (Preset Value)	
Counter (Accumulated Value)	CA	Counter (Accumulated Value)	Counter (Accumulated Value)	
Control LEN	RLEN	Control LEN		
Control POS	RPOS	Control POS		
Bit (Word)	WB	Bit (Word)	Bit (Word)	
Integer	N	Integer	Integer	INT
Float/REAL	F	Float		REAL
Long/DINT	L	Long		DINT
Ascii	A	Ascii	Ascii	
BCD	BCD		BCD	
SINT	SINT			SINT
String	ST	String		

● Logix DF1 (Full Duplex)

Word Device

Device Name	Device Type		Address Number Range		Read/Write	Address Numeral System
	MICRO/I	PLC	Range	Notation		
INT	INT	INT	0 to 999999	1	R/W	Decimal
REAL	REAL	REAL	0 to 9999991	2	R/W	Decimal
DINT	DINT	DINT	0 to 9999991	2	R/W	Decimal
SINT	SINT	SINT	0 to 999999	1	R/W	Decimal

For details about the address notation, refer to “ Expression of Device Address Format”.

Expression of Device Address Format

Notation	Allen-Bradley	WindO/I-NV4	ControlLogix programming software
1	INT 40:45 1 to 3 digits Element number 1 to 3 digits File number	INT 40045 3 digits Element number 1 to 3 digits File number	N40:45
2	REAL 123:255_0, REAL 123:255_1 1 digit 0: Lower word 1: Upper word 1 to 3 digits Element number 1 to 3 digits File number	REAL 1232550, REAL 1232551 1 digit 0: Lower word 1: Upper word 3 digits Element number 1 to 3 digits File number	REAL123:255
	WindO/I-NV4 uses 32 bit device as the divided 2 word device. Therefore, the last one digit shows that the device is upper word or lower word.		

- Floating Point (F) and Long Word (L) are 32-bit devices. When you write to these devices, please be sure to write a high word and low word simultaneously. If you write only high word or only low word, 0 will be written into the other word.
- A communication error occurs if you specify a file or element that is not allocated to the MicroLogis1200 or SLC 500 data table map.

4.6 How to set Device Address for ControlLogix and CompactLogix series

In ControlLogix and CompactLogix series, a device address is set with a tag name. However, you have to set with a device type and an address number that is the same format as MicroLogix, SLC 500 and PLC-5 because WindO/I-NV4 can not operate a tag name directly.
You have to attach each tag name to a device type and device address at that time. This is called mapping.

● Mapping

The following work is done in RSLogix 5000 software.

1. Define some tags to communicate with MICRO/I in **Controller Tags**
2. Select **Logic**, and then **Map PLC/SLC Messages...** from the main menu on the RSLogix 5000 software.
3. Attach File Number to each tag name in **PLC3,5/SLC Mapping** dialog box.

● Selecting the device address in WindO/I-NV4

Set the tag type to a device type, and set the File Number and the array number to an address number.

● The process to select device address

1 Define some tags on the RSLogix 5000 software.

Tag name	Data Type	Array
Tag_A	INT	[10]
Tag_B	SINT*1	[10]
Tag_C	DINT	[10]
Tag_D	REAL	[10]

2 Do mapping tag to File Number.

Tag name	Data Type	Array		File Number
Tag_A	INT	[10]	→	1
Tag_B	SINT	[10]	→	2
Tag_C	DINT	[10]	→	3
Tag_D	REAL	[10]	→	4

3 Set a device address in the WindO/I-NV4.

```
0 : INT 1 : 0
│    │  │   └── Array Number
│    │  └────── File Number
│    └───────── Device Type (Tag type)
└────────────── External Device ID
```

*1 Defines the SINT type's tag with couple of byte.

● Example for WindO/I-NV4

The setting example uses Allen-Bradley device address format. The External Device ID is 0 in the example.

Tag name	Data Tyde	Array		File Number
Tag_A	INT	[10]	→	1
Tag_B	SINT	[10]	→	2
Tag_C	DINT	[10]	→	3
Tag_D	REAL	[10]	→	4

Example1: Set an array number 0 in Tag_A.
0: INT 1:0
Example2: Set an array number 5 in Tag_B.
0: SINT 2:5
Example3: Set a lower word on array number 3 in Tag_C.
0: DINT 3:3_0
Example4: Set an upper word on array number 9 in Tag_D.
0: REAL 4:9_1

Need to set upper word or lower word in WindO/I-NV4 when use 32-bit device.
Add “_0” after array number when use lower word, “_1” after array number when use upper word.

5 SIEMENS

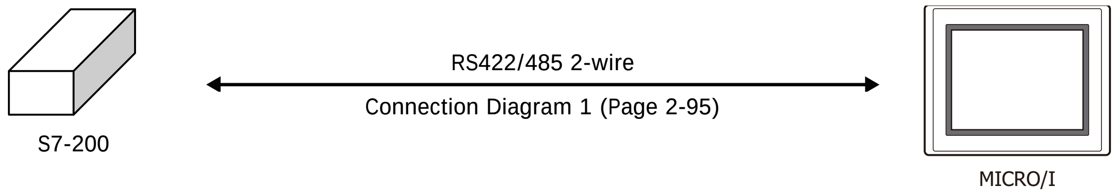
5.1 Connection Table

<table>
<tr><th rowspan="2">CPU unit</th><th rowspan="2">Link Unit</th><th colspan="3">WindO/I-NV4 Settings</th></tr>
<tr><th>Interface</th><th>Flow Control</th><th>Communication Driver</th></tr>
<tr><td colspan="5">S7-200</td></tr>
<tr><td>CPU212
CPU214
CPU215
CPU216
CPU221
CPU222
CPU224
CPU224XP
CPU226 CPU226XM</td><td>Not required
(connects to CPU unit directly)</td><td>RS422/485 2-wire
Connection Diagram 1 (Page 2-95)</td><td>None</td><td>S7-200(PPI)</td></tr>
<tr><td colspan="5">S7-300</td></tr>
<tr><td rowspan="2">CPU 313
CPU 314
CPU 315
CPU 315-2DP
CPU 316
CPU 318</td><td rowspan="2">CP-340
CP-341</td><td>RS232C
Connection Diagram 2 (Page 2-95)</td><td rowspan="3">None</td><td rowspan="2">S7-300 3964(R)/RK512</td></tr>
<tr><td>RS422/485 4-wire
Connection Diagram 3 (Page 2-96)</td></tr>
<tr><td>CPU 313
C-2PtP</td><td>Not required
(connects to CPU unit directly)</td><td>RS422/485 2-wire
Connection Diagram 4 (Page 2-96)</td><td>S7-MPI</td></tr>
<tr><td colspan="5">S7-400</td></tr>
<tr><td rowspan="2">CPU 412
CPU 414
CPU 416
CPU 416F-2
CPU 417</td><td rowspan="2">CP-440
CP-441</td><td>RS232C
Connection Diagram 2 (Page 2-95)</td><td rowspan="2">None</td><td rowspan="2">S7-300 3964(R)/RK512</td></tr>
<tr><td>RS422/485 4-wire
Connection Diagram 3 (Page 2-96)</td></tr>
<tr><td colspan="5">S7-1200</td></tr>
<tr><td>CPU1211C
CPU1212C
CPU1214C</td><td>Not required
(Connects to CPU unit)</td><td>Ethernet</td><td>-</td><td>S7-1200(Ethernet)</td></tr>
</table>

5.2 System Configuration

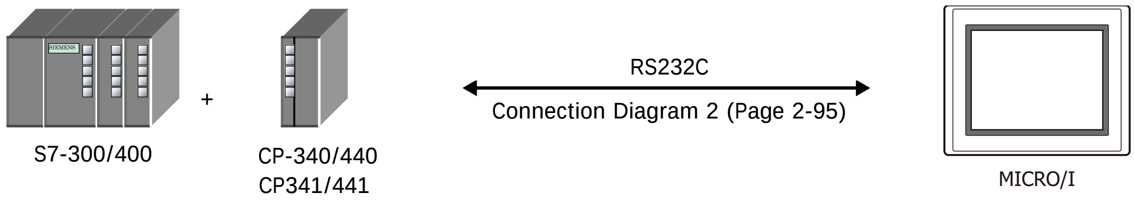
This is the system configuration for the connection of SIEMENS PLCs to MICRO/I.

● S7-200

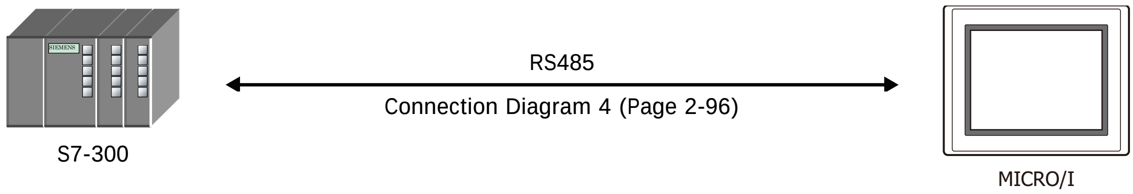


Connects to Serial port of CPU unit.

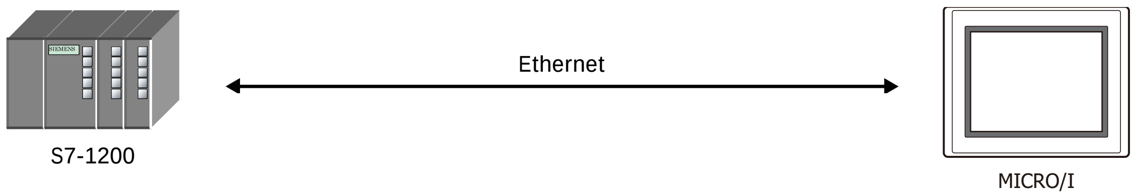
● S7-300/400 (CP-340, CP-341)



● S7-300 (MPI Interface)



● Connection to the Ethernet port for S7-1200



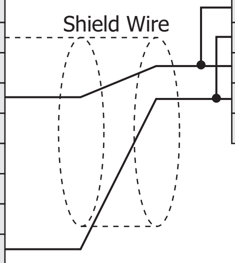
5.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: S7-200 (RS485)

PLC(RS422/485):
D-sub 9-pin Male Connector

Name	Pin No.
FG	
LC	1
LC	2
SIG-B	3
NC	4
LC	5
+5V	6
+24V	7
SIG-A	8
NC	9



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

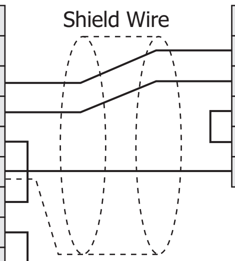
It is also possible to connect multiple PLCs and multiple MICRO/Is on the same network. Short-circuit the RDA and SDA of MICRO/I, and then connect to SIG-B of PLC. Short-circuit the RDB and SDB of MICRO/I, and then connect to SIG-A of PLC.
Refer to S7-200 manual for restrictions when using multi-drops.
When using multiple PLCs to communicate to multiple MICRO/Is, it will take extra time to establish communication between PLCs and OIs.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 2: S7-300/400 + Communication Interface (RS232C)

PLC(RS232C):
D-sub 9-pin Female Connector

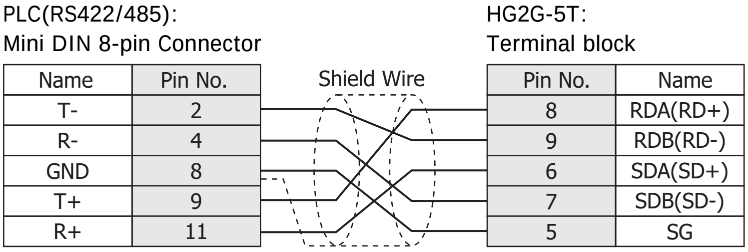
Name	Pin No.
DCD	1
RXD	2
TXD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8
RI	9



HG2G-5T:
Terminal block

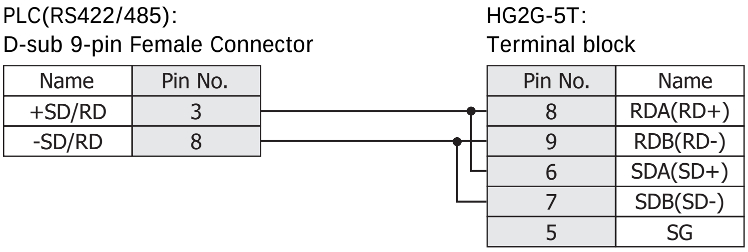
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: S7-300/400 + Communication Interface (RS422/485)



There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

● Connection Diagram 4: S7-300 MPI Interface (RS485)



There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

5.4 Environment Settings

● S7-200

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Items	Details
PLC Address	1 to 126 (Decimal) (0 to 7e (Hexadecimal)) Set the value to same value as ADDRESS (PLC) in WindO/I-NV4.
Highest Address (Highest Station Address)	1 to 126 (Decimal) (0 to 7e (Hexadecimal)) Set the value to same value as HSA in WindO/I-NV4.
Baud Rate	9600 or 19200 bps Set the value to same value as Baud Rate in WindO/I-NV4.
HG Address	0 to 126 (Decimal) (0 to 7e (Hexadecimal)) Set the value as ADDRESS (HG) in WindO/I-NV4.
Data Bits	8 bits Set the value in WindO/I-NV4.
Stop Bits	1 stop bits Set the value in WindO/I-NV4.
Parity	EVEN Set the value in WindO/I-NV4.

- Set the communication port that communicates with MICRO/I to PPI/Slave mode. Please make sure to set SMB30 or SMB130 values to 0 in order to select proper communication port settings. Refer to the manual of S7-200 for details.
- We checked the following problems in some versions of S7-200.
  When S7-200 is set as the master and the address of S7-200 is the same as HSA, token path does not work correctly. This problem can be solved by setting HSA as a larger value than Address actually used.
  This problem does not occur when one MICRO/I is connected to one S7-200 PLC.

● S7-300/400 with Communication Module

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS232C
Baud Rate		1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits		8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
BCC		Enable or Disable
Priority		Low

- MICRO/I type performs communication based on 3964 (R) and RK512 protocol.
- CP340 is supporting only the 3964 and 3964R protocol. Therefore when using CP340, it is necessary to construct the program to realize RK512 protocol in PLC. This is programmed using the function blocks FB2 and FB3, in SIEMENS PLC.
- CP341 is supporting 3964 (R) and RK512 protocol, please choose RK512 by setup PLC.

The program of CP340 refers to a sample program. Downloading from our Web site is possible.

● S7-300 with MPI Interface

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS422/485 2-wire
Baud Rate		19200 or 187500 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Even
HG Node Address	It should not be duplicated to other node addresses.	1 to 126 (Default: 1)
PLC Node Address	Use the same settings as for the MICRO/I.	1 to 126 (Default: 2)
Maximum MPI Address		1 to 126 (Default: 31)

● Connecting with the S7-1200 via Ethernet

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Setting Name	Details
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of PLC.
	Port Number	Set the port number of PLC to communicate with MICRO/I.

5.5 Usable Device Addresses

● S7-200

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Variable memory	V	V	0 to 102397	R/W	*1
Process-image-input-register	I	I	0 to 157	R	*1
Process-image-output-register	Q	Q	0 to 157	R/W	*1
Bit memory	M	M	0 to 317	R/W	*1
Special Memory	SM	SM	0 to 5497	R	*1
Timer (Bit)	T	T	0 to 255	R	Decimal
Counter (Bit)	C	C	0 to 255	R	Decimal
Sequential control relay	S	S	0 to 317	R/W	*1

- The device type (V, I, Q, M, SM, S) which include a period in the address number in S7-200 are displayed without a period in WindO/I-NV4. For example, V10.1 is displayed with V101 in WindO/I-NV4.
- AC (Accumulator registers) and L (Local memory) of PLC Devices can not use in MICRO/I.

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Variable memory	VW	VW	0 to 10238	R/W	*2
Timer (Current Value)	TW	T	0 to 255	R/W	Decimal
Counter (Current Value)	CW	C	0 to 255	R/W	Decimal
Process-image-input-register	IW	IW	0 to 14	R	*2
Process-image-output-register	QW	QW	0 to 14	R/W	*2
Bit memory	MW	MW	0 to 30	R/W	*2
Special Memory	SMW	SMW	0 to 548	R	*2
Analog input	AIW	AIW	0 to 62	R	*2
Analog output	AQW	AQW	0 to 62	R/W	*2
Sequential control relay	SW	SW	0 to 30	R/W	*2
High speed counter	HC	HC	0 to 51	R	*3

- The device type (V, I, Q, M, SM, S) which include a period in the address number in S7-200 are displayed without a period in WindO/I-NV4. For example, V10.1 is displayed with V101 in WindO/I-NV4.
- AC (Accumulator registers) and L (Local memory) of PLC Devices can not use in MICRO/I.
- The value of High speed counter which is a double word value is divided into two, and is treated as WORD device in MICRO/I.
  The higher word is written by adding 0 to the lowest digit of the address, the lower word is written by adding 1 to the lowest digit of the address. For example, the lower word of HC1 is written as HC11 in MICRO/I. If you read in a double word value, The lowest digit of the address write 0. For example, HC2 is written as HC20 in MICRO/I.

*1 All digits except the last digit are in decimal and the last digit is in octal.
*2 Only even number can be specified.
*3 All digits except the last digit are in decimal and the last digit is in binary.

● S7-300/400 with Communication Module

When using CP-341/441, following device addresses can be read and written.
When using CP-340/440, only a data block (DB) can be read and written.

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Bit)	I	I	0 to 1277	R	*1
Output (Bit)	Q	Q	0 to 1277	R	*1
Memory (Bit)	M	M	0 to 2557	R	*1

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Word)	IW	IW	0 to 126	R	*2
Output (Word)	QW	QW	0 to 126	R	*2
Bit Memory (Word)	MW	MW	0 to 254	R	*2
Timer cell	T	T	0 to 127	R	Decimal
Counter cell	C	C	0 to 63	R	Decimal
Data Block	DB	DB	1000 to 255510	R/W	*2*3

- When MICRO/I accesses the data block which is not configured in the PLC, communication error occurs. Configure the data blocks by using the PLC software.
- Endian type is different between MICRO/I and S7-300. Do not use a bit in word device and 32-bt word devices.

*1 All digits except the last digit are in decimal and the last digit is in octal.
*2 Only an even number can be specified.
*3 The address number format is as follows.

DB 255 510
- 510: 3 digits Address number 0 to 510
- 255: 3 digits Data Block number 1 to 255

● S7- 300 with MPI Interface

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Bit)	I	I	0 to 10237	R	*1
Output (Bit)	Q	Q	0 to 10237	R/W	*1
Memory (Bit)	M	M	0 to 163837	R/W	*1

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Word)	IW	IW	0 to 1022	R	*2
Output (Word)	QW	QW	0 to 1022	R/W	*2
Bit Memory (Word)	MW	MW	0 to 16382	R/W	*2
Timer cell	T	T	0 to 2047	R	Decimal
Counter cell	C	C	0 to 2047	R	Decimal
Data Block	DB	DB	1000 to 255510	R/W	*2*3

- When MICRO/I accesses the data block which is not configured in the PLC, communication error occurs. Configure the data blocks by using the PLC software.
- Endian type is different between MICRO/I and S7-300. Do not use a bit in word device and 32-bt word devices.

*1 All digits except the last digit are in decimal and the last digit is in octal.
*2 Only an even number can be specified.
*3 The address number format is as follows.

DB 255 510

3 digits Address number 0 to 510

3 digits Data Block number 1 to 255

● S7- 1200

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Bit)	I	I	0 to 10237	R/W	*1
Output (Bit)	Q	Q	0 to 10237	R/W	*1
Internal Relay (Bit)	M	M	0 to 40957	R/W	*1

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Word)	IW	I	0 to 1022	R/W	*2
Output (Word)	QW	Q	0 to 1022	R/W	*2
Internal Relay (Word)	MW	M	0 to 4094	R/W	*2
Data Block	DB	DB	10000 to 999998	R/W	*2*3

When MICRO/I accesses the data block which is not configured in the PLC, communication error occurs. Configure the data blocks by using the PLC software.

- Select **Standard** as **Block access** when you create a new Data Block.
- **Data Type** in Data Block must be **Word**.
- Only Global Data Block can be accessed.

*1 All digits except the last digit are in decimal and the last digit is in octal.
*2 Only an even number can be specified.
*3 The first two digits indicate the Data Block number, and the last four digits indicate the address number.

6 KEYENCE

6.1 Connection Table

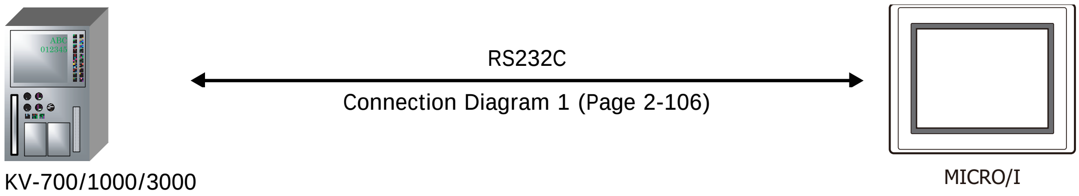
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
KV-700, 1000, 3000, 5000				
KV-700 KV-1000 KV-3000	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-106)	None	KV-3000/5000
KV-700 KV-1000 KV-3000 KV-5000 KV-5500	KV-L20R KV-L20V KV-L21V	RS232C(PORT1) Connection Diagram 2 (Page 2-106)		
		RS232C(PORT2) Connection Diagram 3 (Page 2-106)		
		RS422/485 4-wire Connection Diagram 4 (Page 2-107)		
		RS422/485 2-wire Connection Diagram 5 (Page 2-107)		
	KV-LE20A KV-LE20V KV-LE21V	Ethernet	-	KV (Ethernet)
KV-5000 KV-5500	Not required (connects to Ethernet port)			
Conventional KV				
KV-10, 16, 20, 40 KV-80	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-106)	None	KV/KZ
Visual KV*1				
KV-10 KV-16, 24, 40	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-106)	None	KV/KZ
KV Nano				
KV-N14 KV-N24 KV-N40 KV-N60	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-106)	None	KV-3000/5000
	KV-N10L	RS232C Connection Diagram 2 (Page 2-106)		
	KV-N11L	RS422/485 4-wire Connection Diagram 6 (Page 2-107)		

*1 MICRO/I does not support all device addresses of the Visual KV series.

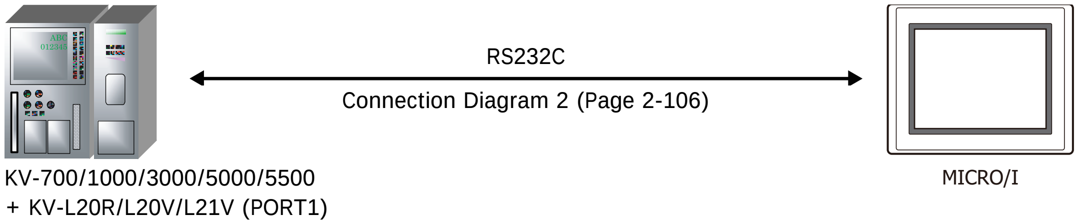
6.2 System Configuration

This is the system configuration for the connection of KEYENCE PLCs to the MICRO/I.

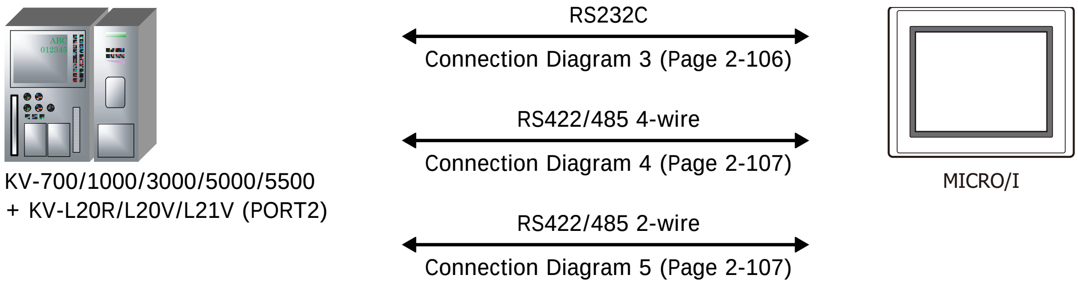
● Connects to the CPU unit modular connector for KV-700/1000/3000



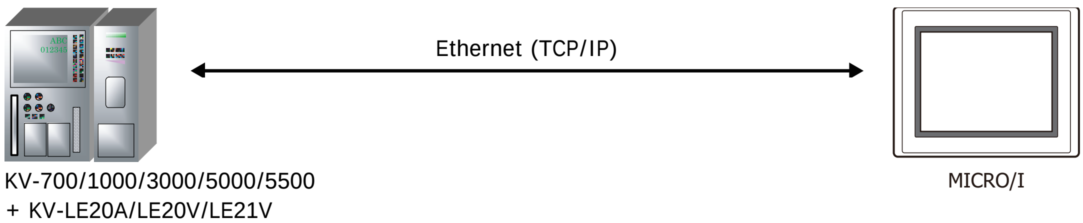
● Connects to the D-sub 9-pin Male Connector for KV-L20R/L20V/L21V



● Connects to the terminal block for KV-L20R/L20V/L21V

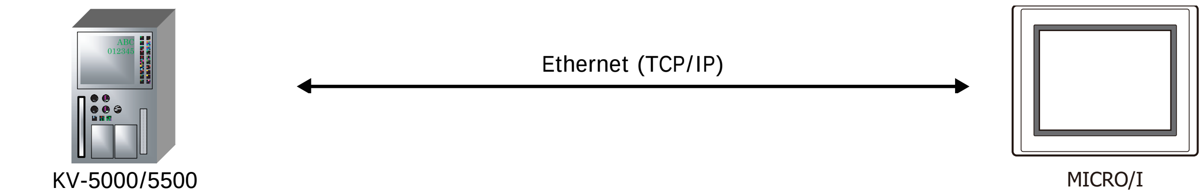


● Connects to the Ethernet port for KV-LE20A/LE20V/LE21V



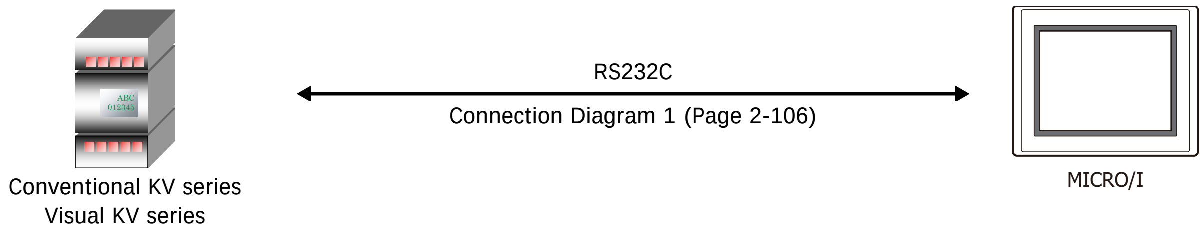
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

● Connects to the Ethernet port for KV-5000/5500

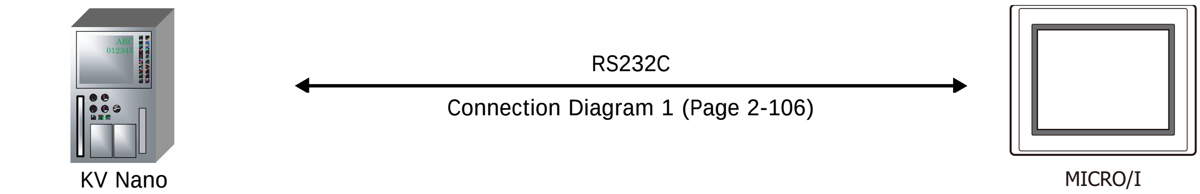


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

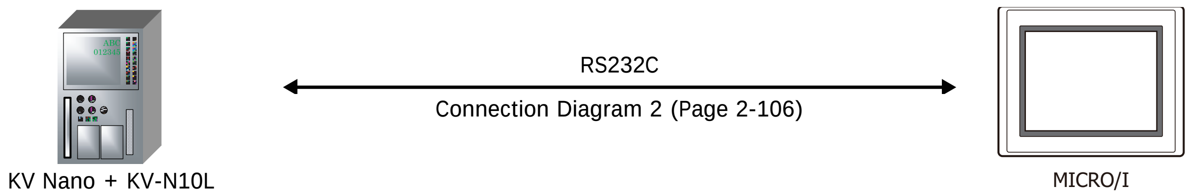
● Connects to the CPU unit modular connector for Conventional KV series and Visual KV series

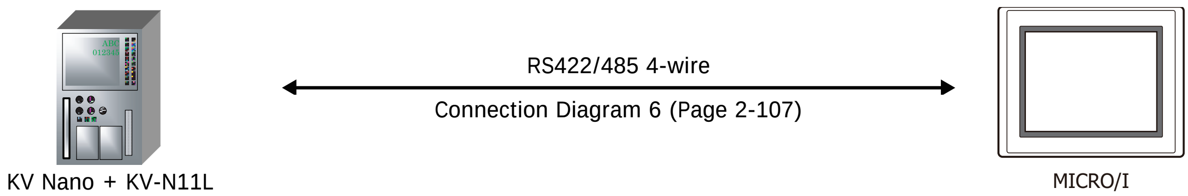


● Connects to the CPU unit modular connector for KV Nano



● Connects to KV Nano + KV-N10L/N11L





6.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: KV-700/1000/3000, Conventional KV, Visual KV and KV Nano

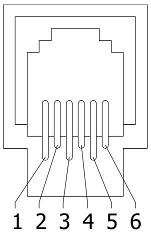
PLC(RS232C): Modular Connector

Name	Pin No.
RD	3
SG	4
SD	5

HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

Connector Pin Layout for PLC side Modular jack



● Connection Diagram 2: KV-700/1000/3000/5000/5500 + KV-L20R/L20V/L21V (PORT1)
KV Nano + KV-N10L

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8
	9

HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: KV-700/1000/3000/5000/5500 + KV-L20R/L20V/L21V(PORT2-RS232C)

PLC(RS232C): Terminal block

Name	Pin No.
SG	1
	2
SD	3
	4
RD	5

HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 4: KV-700/1000/3000/5000/5500 + KV-L20R/L20V/L21V(PORT2 RS422/485 4-wire)

PLC(RS422/485): Terminal block

Name	Pin No.
SDB(+)	5
SDA(-)	3
RDB(+)	4
RDA(-)	2
SG	1

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: KV-700/1000/3000/5000/5500 + KV-L20R/L20V/L21V (PORT2 RS485 2-wire)

PLC(RS422/485): Terminal block

Name	Pin No.
S/R(+)	5
S/R(-)	3
S/R(+)	4
S/R(-)	2
SG	1

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 6: KV Nano + KV-N11L

PLC(RS422/485): Terminal block

Name	Pin No.
SDB(+)	2
SDA(-)	1
RDB(+)	4
RDA(-)	3
SG	5

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

6.4 Environment Settings

● KV-700, Conventional KV series, Visual KV series

Item	Setting
Interface	RS232C
Baud Rate	9600 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Even

- For details, refer to the PLC manual.
- When performing communication with the CPU unit for KV-700, check the Connect CPU Unit (Enable)/ Link Unit (Disable) check box on the Communication Driver tab in the Project Settings dialog box.

● KV-1000/3000

Item	Setting
Interface	RS232C
Baud Rate	9600, 19200, 38400, 57600 or 115200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Even

- See the operation manual of PLC for more information.
- When setting the baud rate to less than 4800 bps, communications was executed at a baud rate of 9600 bps.
- When performing communication with he CPU unit for KV-1000/3000, select the **Connect CPU Unit(Enable)/Link Unit(Disable)** on the **Communication Drive** tab in the **Project Settings** dialog box.

● KV-700/1000/3000/5000/5500 + KV-L20R/L20V/L21V, KV Nano, KV Nano + KV-N10L/N11L

Item	Setting
Interface	RS232C, RS422/485 2-wire or RS422/485 4-wire
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Even

- See the operation manual of the PLC for more information.
- When performing communication with a Serial Communication Unit or the KV Nano, clear the **Connect CPU Unit(Enable)/Link Unit(Disable)** on the **Communication Driver** tab in the **Project Settings** dialog box.
- When communicating with the KV Nano, set the KV Nano port operation mode to KV mode (PLC link).

● Environment settings for connection to the KV-5000/5500/LE20A/LE20V/LE21V

MICRO/I settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver	Protocol	TCP/IP, UDP/IP
Communication Driver Network	IP Address	Set the IP address of PLC.
	PORT	Set the port number of PLC to communicate with MICRO/I.

PLC Settings

Set the following items on the PLC. Apply the same settings as for the MICRO/I.

Item	Setting
IP Address	Set the IP address to PLC.
PORT	Set the arbitrary port number.

For details, refer to the PLC manual.

6.5 Usable Device Addresses

● KV700/1000/3000/5000/5500/KV Nano (RS233C, RS422/485)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
CPU Input Relay	X	X	0 to 999F	R	
CPU Output Relay	Y	Y	0 to 999F	R/W	
Spec. Internal Relay	M	M	0 to 15999	R/W	
Exp. /Spec. Internal Relay	R	R	0 to 99915	R/W	
Link Relay	B	B	0 to 3FFF	R/W	
Exp Int. Relay	MR	MR	0 to 99915	R/W	
Latch Relay	LR	LR	0 to 99915	R/W	
Control Relay	CR	CR	0 to 3915	R/W	
Work Relay	VB	VB	0 to 3FFF	R/W	
Timer (Relay)	T	T	0 to 3999	R/W	
Counter (Relay)	C	C	0 to 3999	R/W	
High-speed counter comparator (Relay)	CTC	CTC	0 to 3	R/W	

Do not perform a set operation, as a communication error will occur.

Only a reset action is possible for a High-speed counter comparator (Relay).

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Memory	DM	DM	0 to 65534	R/W	
Exp Data Memory E	EM	EM	0 to 65534	R/W	
Exp Data Memory F	FM	FM	0 to 32767	R/W	
File register	ZF	ZF	0 to 131071	R/W	
Link Register	W	W	0 to 3FFF	R/W	
Temporary Memory	TM	TM	0 to 511	R/W	
Timer (Current)	TC	TC	0 to 39991	R/W	*1
Timer (Preset)	TS	TS	0 to 39991	R/W	*1
Counter (Current)	CC	CC	0 to 39991	R/W	*1
Counter (Preset)	CS	CS	0 to 39991	R/W	*1
High-speed counter (Current)	CTH	CTH	0 to 11	R/W	*1
High-speed counter comparator (Preset)	CTCS	CTCS	0 to 31	R/W	*1
Digital Trimmer	AT	AT	0 to 71	R	
Index Register	Z	Z	1 to 12	R/W	
Control Memory	CM	CM	0 to 11998	R/W	
Work Memory	VM	VM	0 to 59999	R/W	

*1 This is a 32-bit device.

● KV3000/5000/5500 (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
CPU Input Relay	X	X	0 to 999F	R	
CPU Output Relay	Y	Y	0 to 999F	R/W	
Spec. Internal Relay	M	M	0 to 15999	R/W	
Exp. /Spec. Internal Relay	R	R	0 to 99915	R/W	
Link Relay	B	B	0 to 3FFF	R/W	
Exp Int. Relay	MR	MR	0 to 99915	R/W	
Latch Relay	LR	LR	0 to 99915	R/W	
Control Relay	CR	CR	0 to 3915	R/W	
Work Relay	VB	VB	0 to 3FFF	R/W	
Timer (Relay)	T	T	0 to 3999	R/W	
Counter (Relay)	C	C	0 to 3999	R/W	
High-speed counter comparator (Relay)	CTC	CTC	0 to 3	R/W	

Do not perform a set operation, as a communication error will occur.

Only a reset action is possible for a High-speed counter comparator (Relay).

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Memory	DM	DM	0 to 65534	R/W	
Exp Data Memory E	EM	EM	0 to 65534	R/W	
Exp Data Memory F	FM	FM	0 to 32767	R/W	
File register	ZF	ZF	0 to 131071	R/W	
Link Register	W	W	0 to 3FFF	R/W	
Temporary Memory	TM	TM	0 to 511	R/W	
Timer (Current)	TC	TC	0 to 39991	R/W	*1
Timer (Preset)	TS	TS	0 to 39991	R/W	*1
Counter (Current)	CC	CC	0 to 39991	R/W	*1
Counte (Preset)	CS	CS	0 to 39991	R/W	*1
High-speed counter (Current)	CTH	CTH	0 to 11	R/W	*1
High-speed counter comparator (Preset)	CTCS	CTCS	0 to 31	R/W	*1
Digital Trimmer	AT	AT	0 to 71	R	
Index Register	Z	Z	1 to 12	R/W	
Control Memory	CM	CM	0 to 11998	R/W	
Work Memory	VM	VM	0 to 59999	R/W	

*1 This is a 32-bit device.

2 Connection to External Devices

● Conventional KV series and Visual KV series

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Internal Utility Relay	M	-	1000 to 1915, 3000 to 15915	R/W	Decimal
Basic Input Relay	X	-	0 to 215	R	Decimal
Basic Output Relay	Y	-	500 to 615	R/W	Decimal
Extension Input Relay	SX	-	100 to 415	R	Decimal
Extension Output Relay	SY	-	600 to 915	R/W	Decimal
Timer (Contact)	T	T	0 to 249	R	Decimal
Counter (Contact)	C	C	0 to 249	R	Decimal
Special Internal Relay	SM	-	2000 to 2915	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Memory	D	DM	0 to 9999	R/W	Decimal
Temporary Memory	TM	TM	0 to 31	R/W	Decimal
Timer (Current)	TC	T	0 to 249	R/W	Decimal
Counter (Current)	CC	C	0 to 249	R/W	Decimal
Timer (Preset)	TS	T	0 to 249	R/W	Decimal
Counter (Preset)	CS	C	0 to 249	R/W	Decimal

- Basic Input Relay (X) addresses 100 and higher, as well as Basic Output Relay (Y) addresses 600 and higher, are only available when using the Conventional KV series KV-40/80 models.
- MICRO/I does not support all device addresses of the Visual KV series.

7 Hitachi

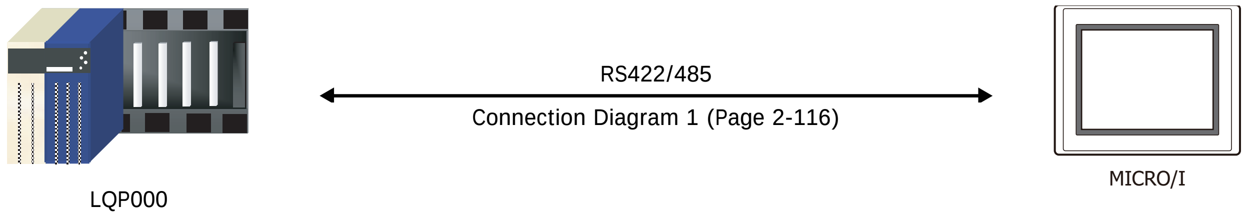
7.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
S10mini				
S10mini	Not required (built into the CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-116)	None	S10mini
	LQE160	RS232C Connection Diagram 2 (Page 2-116)		
	LQE165	RS422/485 4-wire Connection Diagram 3 (Page 2-116)		
	LQE560	RS232C Connection Diagram 2 (Page 2-116)		
	LQE565	RS422/485 4-wire Connection Diagram 3 (Page 2-116)		
S10V				
LQP510	Not required (built into the CPU unit)	RS232C Connection Diagram 2 (Page 2-116)	None	S10mini
		RS422/485 4-wire Connection Diagram 3 (Page 2-116)		
	LQE560	RS232C Connection Diagram 2 (Page 2-116)		
	LQE565	RS422/485 4-wire Connection Diagram 3 (Page 2-116)		

7.2 System Configuration

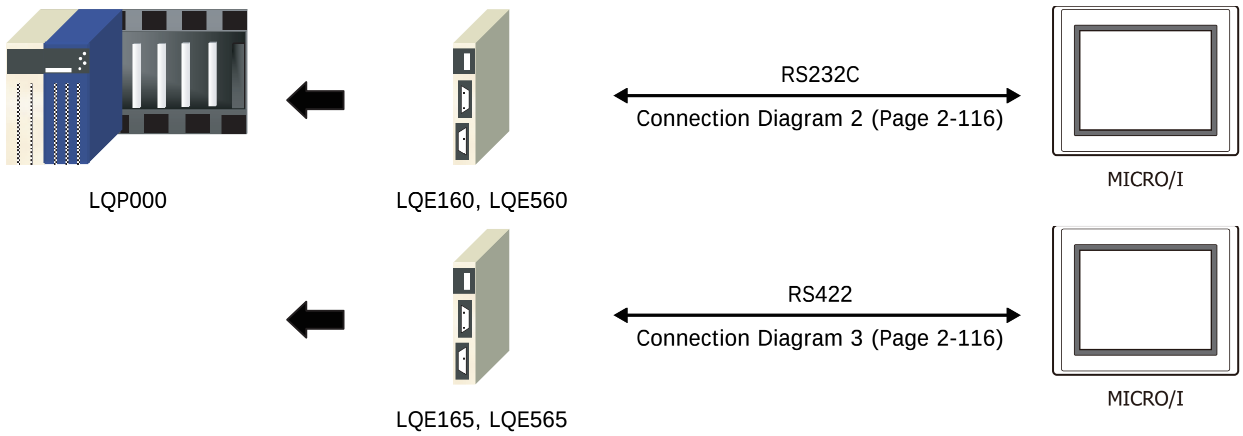
This is the system configuration for the connection of Hitachi PLC to the MICRO/I.

● S10mini (LQP000) (Connects to RS232C port on CPU unit)

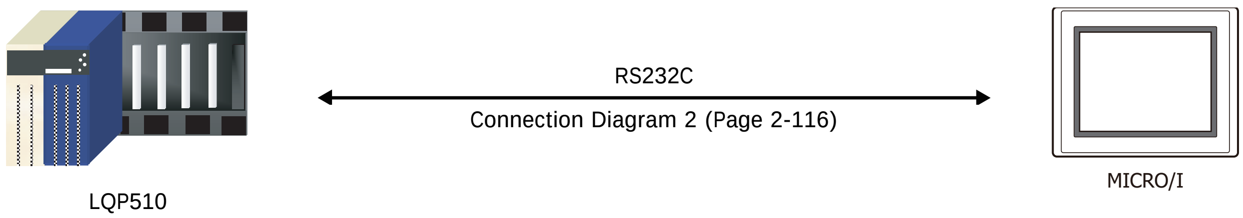


It connects with RS232C port of a CPU unit.

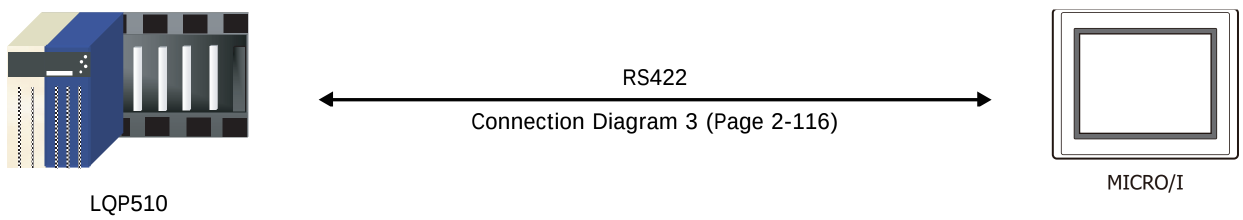
● S10mini Communication module



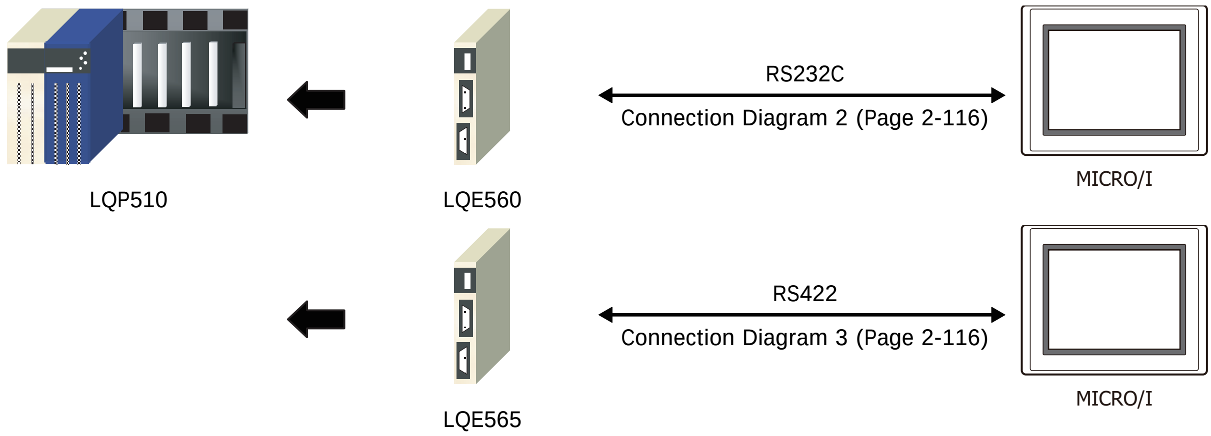
● S10V RS232C Port on CPU Unit



● S10V RS422 Port on CPU Unit



● S10V Communication Module



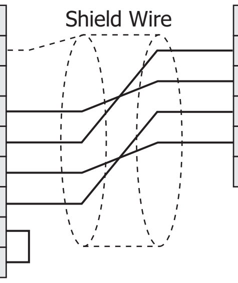
7.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: S10mini (RS422/485)

PLC(RS422/485):
D-sub 9-pin Male Connector

Name	Pin No.
FG	
NC	1,2,3
UTXL	7
UTXH	4
URXL	6
URXH	8
	5
	9



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

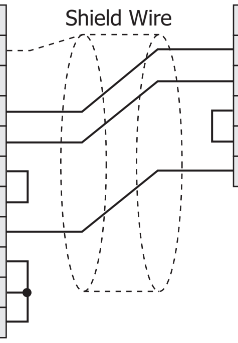
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 2: S10min, S10V (RS232C)

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
FG	
NC	9
RD	2
SD	3
ER	4
DR	6
SG	5
RS	7
CS	8
CD	1



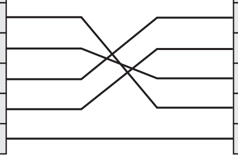
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: S10V (RS422/485)

PLC(RS422/485):
D-sub 9-pin Male Connector

Name	Pin No.
RD-L	1
RD-H	2
SD-H	3
SD-L	4
SG	5



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

7.4 Environment Settings

● S10mini, S10V

Item	Setting
Interface	RS232C or RS422/485 4-wire
Baud Rate	19200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Odd

For details, refer to the PLC manual.

7.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 7FF	R/W	
Output Relay	Y	Y	0 to 7FF	R/W	
Internal Relay	R	R	0 to 7FF	R/W	
Global Link	G	G	0 to FFF	R/W	
System Register	S	S	0 to BFF	R	
E Word	BEW	EW	400 to FFF	R/W	
Event	E	E	0 to FF	R/W	
Keep Relay	K	K	0 to 1FF	R/W	
On-Delay Timer (contact)	T	T	0 to 1FF	R	
One Shot Timer (contact)	U	U	0 to 7F	R	
Up/Down Counter (contact)	C	C	0 to 3F	R	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	XW	X	0 to 7F0	R/W	
Output Relay	YW	Y	0 to 7F0	R/W	
Internal Relay	RW	R	0 to 7F0	R/W	
Global Link	GW	G	0 to FF0	R/W	
System Register	SW	S	0 to BF0	R	
E Word	EW	EW	400 to FF0	R/W	
Event	WE	E	0 to F0	R/W	
Keep Relay	KW	K	0 to 1F0	R/W	
On-Delay Timer (contact)	TW	T	0 to 1F0	R	
One Shot Timer (contact)	UW	U	0 to 70	R	
Up/Down Counter (contact)	CW	C	0 to 30	R	
On-Delay Timer (elapsed value)	TC	T	0 to 1FF	R	
On-Delay Timer (setup value)	TS	T	0 to 1FF	R/W	
One Shot Timer (elapsed value)	UC	U	0 to 7F	R	
One Shot Timer (setup value)	US	U	0 to 7F	R/W	
Up/Down Counter (elapsed value)	CC	C	0 to 3F	R	
Up/Down Counter (setup value)	CS	C	0 to 3F	R/W	
Work Register	FW	FW	0 to BFF	R/W	
Data Register	DW	DW	0 to FFF	R/W	

When you use word device as bit device, the bit position reverses the order, as shown in the example.

Example: Specified address	Read address
DW 0-0	DW 0-15
DW 0-1	DW 0-14
:	:
DW 0-14	DW 0-1
DW 0-15	DW 0-0

8 JTEKT (Toyoda)

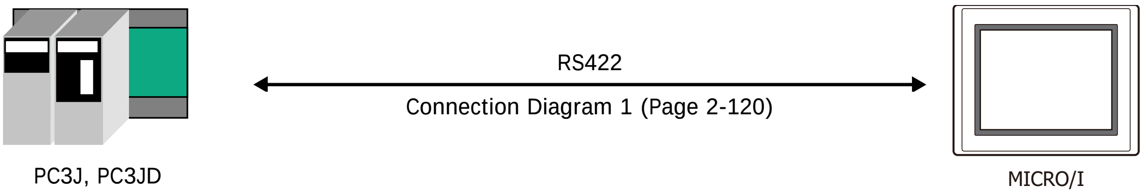
8.1 Connection Table

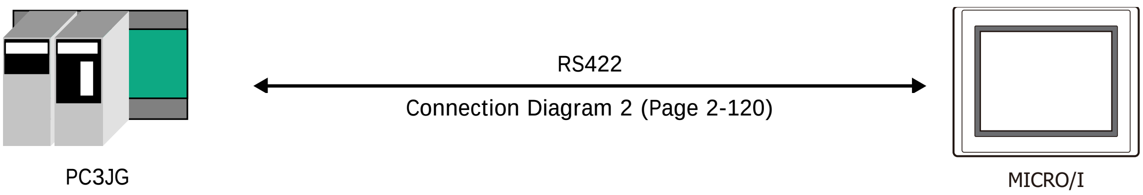
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
TOYOPUC-PC2J				
PC2J	Not required (connects to Built-in Link)	RS422/485 2-wire Connection Diagram 1 (Page 2-120)	None	TOYOPUC-PC3J
TOYOPUC-PC3J				
PC3J PC3JD	Not required (connects to Built-in Link)	RS422/485 2-wire Connection Diagram 1 (Page 2-120)	None	TOYOPUC-PC3J
PC3JG	Not required (connects to Built-in Link)	RS422/485 2-wire Connection Diagram 2 (Page 2-120)		

8.2 System Configuration

This is the system configuration for the connection of JTEKT (Toyoda) PLCs to the MICRO/I.

● TOYOPUC-PC3J series (uses to the Built-in Link)



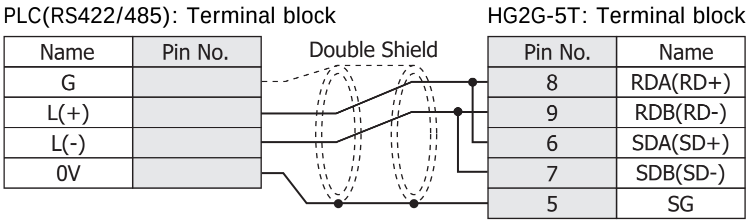


It connects with the Built-in Link port of a CPU unit.

8.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

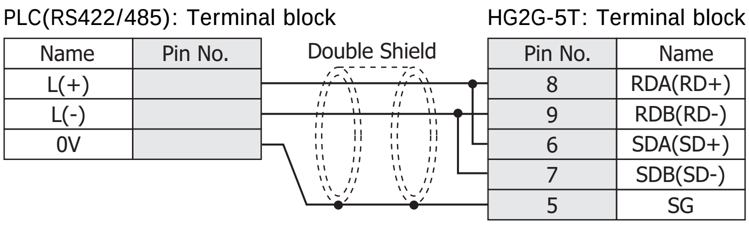
● Connection Diagram 1: TOYOPUC-PC3J, PC3JD (Built-in Link)



Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 2: TOYOPUC-PC3JG (Built-in Link)



Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

8.4 Environment Settings

● TOYOPUC-PC3J

Item	Setting
Interface	RS422/485 2-wire
Station No.	0 to 37 (Octal)*1
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400 or 57600 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	Even

- Configure the communication conditions of PC3J in the built-in standard link parameters.
- When the built-in standard link parameters are not set, the link acts as the computer link for below settings.

Communication Speed:	19200bps
Data Bits:	8 bit
Stop Bits:	1 stop bit
Parity:	Even
Station No.:	0

- For details, refer to JTEKT TOYOPUC PC3J CPU MODULE OPERATION MANUAL.

*1 Although a Station No. is in octal for PC3J, configure it in hexadecimal on WindO/I-NV4.
For example, when you set 37 on PC3J, set 1F on WindO/I-NV4.

8.5 Usable Device Addresses

● TOYOPUC-PC3J

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 7FF	R/W	
Output Relay	Y	Y	0 to 7FF	R/W	
Internal relay	M	M	0 to 7FF	R/W	*1
Keep-relay	K	K	0 to 2FF	R/W	*1
Link relay	L	L	0 to 7FF	R/W	*1
Special relay	V	V	0 to FF	R/W	*1
Edge detection	P	P	0 to 1FF	R/W	*1
Timer contact	T	T	0 to 1FF	R	*1
Counter contact	C	C	0 to 1FF	R	*1
Internal relay	P3M	M	0 to 7FF	R/W	
Keep-relay	P3K	K	0 to 2FF	R/W	
Link relay	P3L	L	0 to 7FF	R/W	
Special relay	P3V	V	0 to FF	R/W	
Edge detection	P3P	P	0 to 1FF	R/W	
Timer contact	P3T	T	0 to 1FF	R	
Counter contact	P3C	C	0 to 1FF	R	
Internal relay	P2M	M	0 to 7FF	R/W	
Keep-relay	P2K	K	0 to 2FF	R/W	
Link relay	P2L	L	0 to 7FF	R/W	
Special relay	P2V	V	0 to FF	R/W	
Edge detection	P2P	P	0 to 1FF	R/W	
Timer contact	P2T	T	0 to 1FF	R	
Counter contact	P2C	C	0 to 1FF	R	
Internal relay	P1M	M	0 to 7FF	R/W	
Keep-relay	P1K	K	0 to 2FF	R/W	
Link relay	P1L	L	0 to 7FF	R/W	
Special relay	P1V	V	0 to FF	R/W	
Edge detection	P1P	P	0 to 1FF	R/W	
Timer contact	P1T	T	0 to 1FF	R	
Counter contact	P1C	C	0 to 1FF	R	
Extended input	EX	EX	0 to 7FF	R/W	
Extended output	EY	EY	0 to 7FF	R/W	
Extended Internal relay	EM	EM	0 to 1FFF	R/W	
Extended keep-relay	EK	EK	0 to FFF	R/W	
Extended link relay	EL	EL	0 to 1FFF	R/W	
Extended special relay5	EV	EV	0 to FFF	R/W	
Extended edge detection	EP	EP	0 to FFF	R/W	
Extended timer contact	ET	ET	0 to 7FF	R	
Extended counter contact	EC	EC	0 to 7FF	R	
Extended input	GX	GX	0 to FFFF	R/W	*2
Extended output	GY	GY	0 to FFFF	R/W	*2
Extended Internal relay	GM	GM	0 to FFFF	R/W	*2

*1 Parameter-set program No. in “Link parameter” is an objective of command processing. When the built-in standard link parameters are not set, Probram1 is an objective of command processing.
*2 These devices are available in the case of a PC3JG mode.

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input	WX	X	0 to 7F	R/W	
Output	WY	Y	0 to 7F	R/W	
Internal relay	WM	M	0 to 7F	R/W	*1
Keep-relay	WK	K	0 to 2F	R/W	*1
Link relay	WL	L	0 to 7F	R/W	*1
Timer contact	WT	T	0 to 1F	R	*1
Counter contact	WC	C	0 to 1F	R	*1
Present value register	N	N	0 to 1FF	R	*1
Data register	D	D	0 to 2FFF	R/W	*1
Link register	R	R	0 to 7FF	R/W	*1
Special register	S	S	0 to 3FF	R/W	*1
File register	B	B	0 to 1FFF	R/W	*1*2
Internal relay	P3WM	M	0 to 7F	R/W	
Keep-relay	P3WK	K	0 to 2F	R/W	
Link relay	P3WL	L	0 to 7F	R/W	
Timer contact	P3WT	T	0 to 1F	R	
Counter contact	P3WC	C	0 to 1F	R	
Present value register	P3N	N	0 to 1FF	R	
Data register	P3D	D	0 to 2FFF	R/W	
Link register	P3R	R	0 to 7FF	R/W	
Special register	P3S	S	0 to 3FF	R/W	
File register	P3B	B	0 to 1FFF	R/W	*2
Internal relay	P2WM	M	0 to 7F	R/W	
Keep-relay	P2WK	K	0 to 2F	R/W	
Link relay	P2WL	L	0 to 7F	R/W	
Timer contact	P2WT	T	0 to 1F	R	
Counter contact	P2WC	C	0 to 1F	R	
Present value register	P2N	N	0 to 1FF	R	
Data register	P2D	D	0 to 2FFF	R/W	
Link register	P2R	R	0 to 7FF	R/W	
Special register	P2S	S	0 to 3FF	R/W	
File register	P2B	B	0 to 1FFF	R/W	*2
Internal relay	P1WM	M	0 to 7F	R/W	
Keep-relay	P1WK	K	0 to 2F	R/W	
Link relay	P1WL	L	0 to 7F	R/W	
Timer contact	P1WT	T	0 to 1F	R	
Counter contact	P1WC	C	0 to 1F	R	
Present value register	P1N	N	0 to 1FF	R	
Data register	P1D	D	0 to 2FFF	R/W	
Link register	P1R	R	0 to 7FF	R/W	
Special register	P1S	S	0 to 3FF	R/W	
File register	P1B	B	0 to 1FFF	R/W	*2
Extended input	WEX	EX	0 to 7F	R/W	

*1 Parameter-set program No. in “Link parameter” is an objective of command processing. When the built-in standard link parameters are not set, Probram1 is an objective of command processing.
*2 When CPU operation mode is division mode, File register is not available.

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Extended output	WEY	EY	0 to 7F	R/W	
Extended internal relay	WEM	EM	0 to 1FF	R/W	
Extended keep-relay	WEK	EK	0 to FF	R/W	
Extended link relay	WEL	EL	0 to 1FF	R/W	
Extended timer contact	WET	ET	0 to 7F	R	*1
Extended counter contact	WEC	EC	0 to 7F	R	*1
Extended present value register	EN	EN	0 to 7FF	R	
Extended data register	U	U	0 to 7FFF	R/W	
Extended special register	ES	ES	0 to 7FF	R/W	
Extended setup value register	H	H	0 to 7FF	R/W	
Extended input	WGX	GX	0 to FFF	R/W	*3
Extended output	WGY	GY	0 to FFF	R/W	*3
Extended internal relay	WGM	GM	0 to FFF	R/W	*3
Extended Buffer register 0	EB0	EB	0 to 7FFF	R/W	*3
Extended Buffer register 1	EB1	EB	8000 to FFFF	R/W	*3
Extended Buffer register 2	EB2	EB	10000 to 17FFF	R/W	*3
Extended Buffer register 3	EB3	EB	18000 to 1FFFF	R/W	*3

Depending on the type of CPU operation mode of PC3J that you will be using, the there are limits to the areas that can be used within the device ranges given above. For details, refer to the PLC manual.

*1 Parameter-set program No. in "Link parameter" is an objective of command processing. When the built-in standard link parameters are not set, Probram1 is an objective of command processing.
*3 These device address are available in the case of a PC3JG mode.

9 TOSHIBA MACHINE

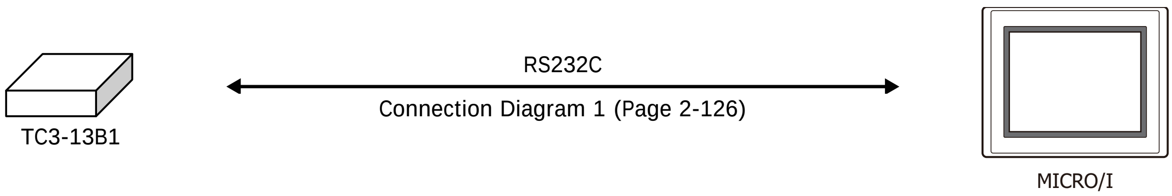
9.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	**Flow Control**	**Communication Driver**
TC200				
TC3-13B1	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-126)	ER	TC200
TCmini				
TC03-01 TC03-02	Not required (connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-126)	ER	TC200
		RS422/485 2-wire Connection Diagram 3 (Page 2-126)	None	

9.2 System Configuration

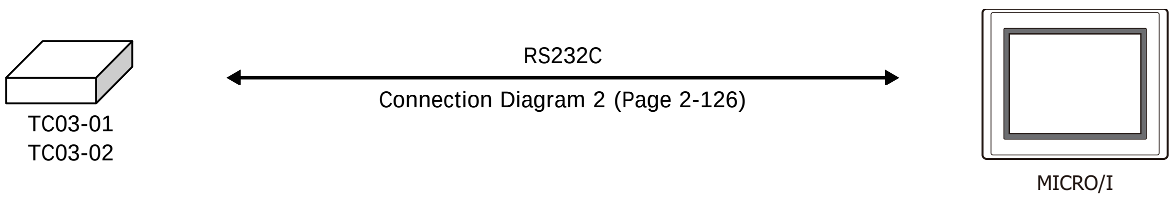
This is the system configuration for the connection of TOSHIBA MACHINE PLCs to the MICRO/I.

● TC200

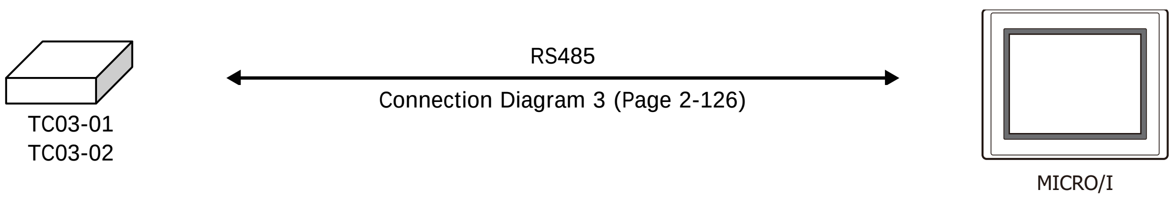


Connects to Serial port of CPU unit.

● TCmini (Connects to the RS232C Port)



● TCmini (Connects to the RS-TCm485 Port)



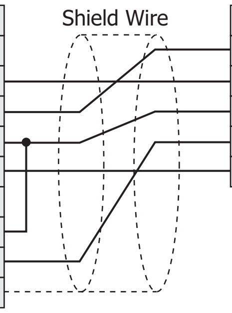
9.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: TC200 (RS232C)

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
SD	2
RD	3
DR	4
SG	5
ER	6
CS	7
RS	8
FG	



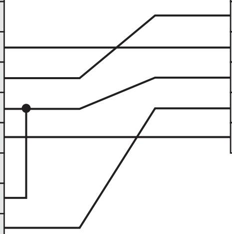
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: TCmini (RS232C)

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
CI	1
SD	2
RD	3
DR	4
SG	5
ER	6
CS	7
RS	8
CD	9



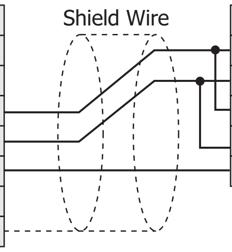
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: TCmini (RS485)

PLC(RS422/485):
RJ45 Connector

Name	Pin No.
TDA	1
TDB	2
RDA(A)	3
RDB(B)	4
GND	5
P5V	6
FG	7



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

9.4 Environment Settings

● TC200

Items	Details
Interface	RS232C
PC No.*1	0 to 63 (Set same as MICRO/I)
Baud Rate	9600 bps
Data Bits	8 bits
Stop Bits	2 stop bits
Parity	None

9.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to F7F	R	
Output Relay	Y	Y	0 to F7F	R/W	
Internal Relay	R	R	0 to 77F	R/W	
Latch Relay	L	L	0 to 7F	R/W	
Exp.Int.Relay1	G	G	0 to F7F	R/W	
Exp.Int.Relay2	H	H	0 to F7F	R/W	
Spec. Aid Relay	A	A	0 to 16F	R/W	
Timer (Relay)	T	T	0 to 37F	R	
Counter (Relay)	C	C	0 to 37F	R	
Sift Register	S	S	0 to 7F	R/W	
Edge Relay	E	E	0 to 77F	R/W	

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	WX	X	0 -F7	R	
Output Relay	WY	Y	0 to F7	R/W	
Internal Relay	WR	R	0 to 77	R/W	
Latch Relay	WL	L	0 to 7	R/W	
Exp.Int.Relay1	WG	G	0 to F7	R/W	
Exp.Int.Relay2	WH	H	0 to F7	R/W	
Spec. Aid Relay	WA	A	0 to 16	R/W	
Tim/Cnt.(Current Value)	P	P	0 to 77F	R	
Tim/Cnt.(Preset Value)	V	V	0 to 77F	R/W	
General Register1	D	D	0 to F7F	R/W	
General Register2	B	B	0 to F7F	R/W	
Sift Register	WS	S	0 to 7	R/W	
Edge Relay	WE	E	0 to 77	R/W	
Timer Relay (Word)	WT	T	0 to T77	R	
Counter Relay (Word)	WC	C	0 to 77	R	

*1 Set a decimal number for the PC No.

10 GE Fanuc Automation

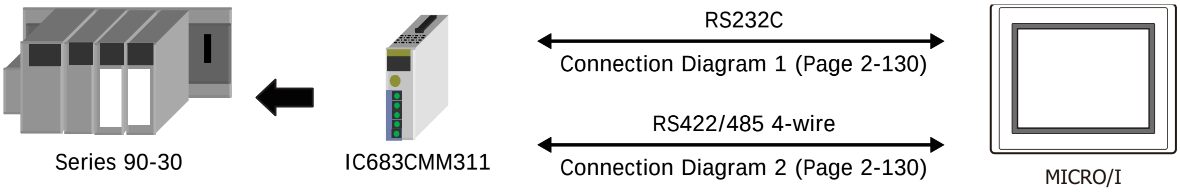
10.1 Connection Table

<table>
<tr><th rowspan="2">CPU unit</th><th rowspan="2">Link unit</th><th colspan="3">WindO/I-NV4 Settings</th></tr>
<tr><th>Interface</th><th>Flow Control</th><th>Communication Driver</th></tr>
<tr><td colspan="5">Series90-30</td></tr>
<tr><td rowspan="2">CPU331
CPU341
CPU350
CPU351
CPU352
CPU360
CPU363
CPU364
CPU374</td><td rowspan="2">IC693CMM311</td><td>RS232C
Connection Diagram 1 (Page 2-130)</td><td rowspan="3">None</td><td rowspan="3">Series 90(SNP-X)</td></tr>
<tr><td>RS422/485 4-wire
Connection Diagram 2 (Page 2-130)</td></tr>
<tr><td>CPU311
CPU313
CPU323
CPU331
CPU341
CPU350
CPU351
CPU352
CPU360
CPU363
CPU364
CPU374</td><td>Not required
(connects to CPU (Power Supply) unit directly)</td><td>RS422/485 4-wire
Connection Diagram 3 (Page 2-131)</td></tr>
<tr><td colspan="5">VersaMax</td></tr>
<tr><td>Nano</td><td rowspan="4">Not required
(connects to CPU unit)</td><td rowspan="2">RS232C
Connection Diagram 4 (Page 2-131)</td><td rowspan="4">None</td><td rowspan="4">Series 90(SNP-X)</td></tr>
<tr><td>Micro (14point)</td></tr>
<tr><td rowspan="2">Micro (23, 28point)</td><td>RS232C
Connection Diagram 4 (Page 2-131)</td></tr>
<tr><td>RS422/485 4-wire
Connection Diagram 3 (Page 2-131)</td></tr>
</table>

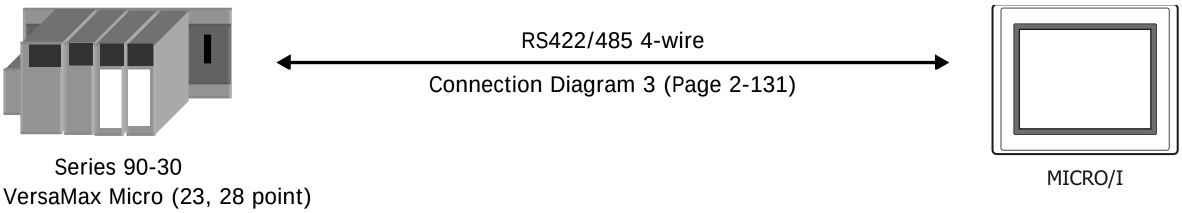
10.2 System Configuration

This is the system configuration for the connection of GE Fanuc PLCs to MICRO/I screens.

● Series 90-30 (Connects to Communication Coprocessor Module (CMM))

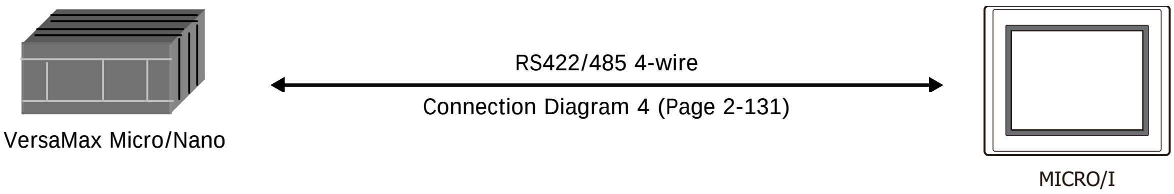


● Series 90-30, VersaMax Micro (Connects to Serial Port on CPU unit)



Connects to Serial port on Series 90-30 PLC Power Supply.
Connects to Serial port 2 on VersaMax Micro PLC.

● VersaMax Micro/Nano (Connects to Serial Port 1)

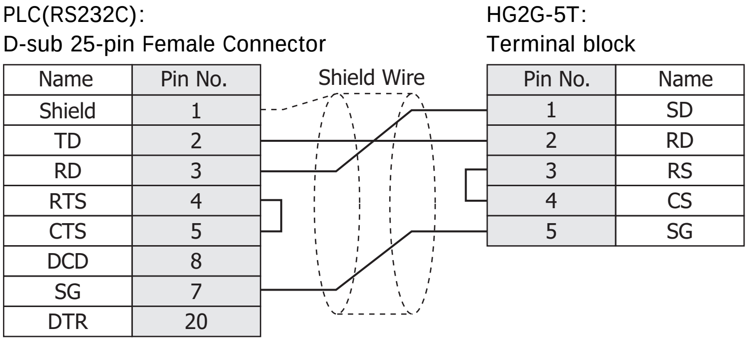


Connects to Serial port 1(RS232C) on VersaMax Micro/Nano PLC.

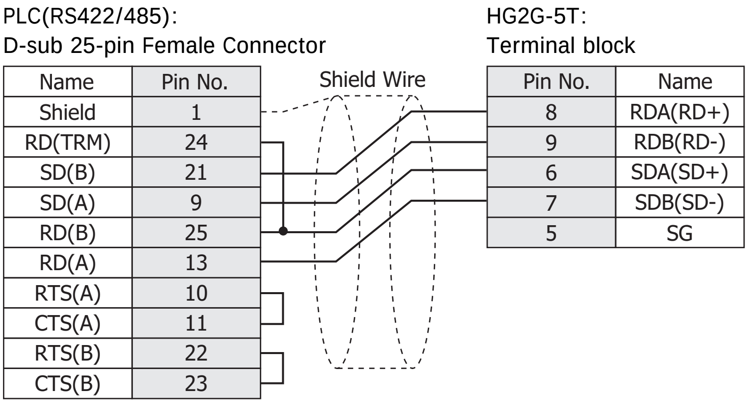
10.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: Series 90-30 Communication Coprocessor Module (CMM) (RS232C)



● Connection Diagram 2: Series 90-30 Communication Coprocessor Module (CMM)(RS422/485)



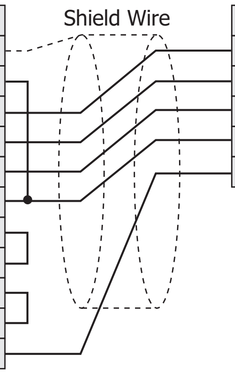
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: PLC (RS485)

PLC(RS422/485):
D-sub 15-pin Female Connector

Name	Pin No.
Shield	1
RD(TRM)	9
SD(B)	13
SD(A)	12
RD(B)	11
RD(A)	10
RTS(A)	6
CTS(A)	15
RTS(B)	14
CTS(B)	8
SG	7



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

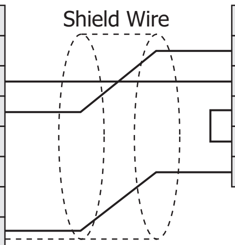
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 4: PLC (RS232C)

PLC(RS232C):
RJ-45 8-pin modular connector

Name	Pin No.
+5V	2
TXD	5
RXD	6
RTS	8
CTS	7
DTR	3
GND	1
DCD	4



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

10.4 Environment Settings

● Series 90-30 Communication Coprocessor Module (CMM)

Item		Setting
Interface	Set to the same setting as the MICRO/I	RS232C or RS485 4-wire
Baud Rate		1200, 2400, 4800, 9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Flow Control		None
Configuration Mode		SNP Only
SNP Enable		Yes
SNP Mode		Slave

- Do not set SNP ID for the PLC. If you set it, MICRO/I will not communicate with PLC.
- For details, refer to the manual of Series 90-30 PLC.

● Series 90-30 CPU Module

Item		Setting
Interface	Set to the same setting as the MICRO/I	RS485 4-wire
Baud Rate		1200, 2400, 4800, 9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even

- Do not set SNP ID for the PLC. If you set it, MICRO/I will not communicate with PLC.
- For details, refer to the manual of Series 90-30 PLC.

● VersaMax Micro/Nano

Item		Setting
Interface	Set to the same setting as the MICRO/I	RS232C (Port 1) or RS485 4-wire (Port 2)
Baud Rate		1200, 2400, 4800, 9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Port Mode		SNP
Port Type		Slave

- Do not set SNP ID for the PLC. If you set it, MICRO/I will not communicate with PLC.
- For details, refer to the manual of Series VersaMax Micro/Nano.

10.5 Usable Device Addresses

The types of devices supported by the MICRO/I and their ranges are shown below.

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Discrete Inputs	I	%I	1 to 12288	R	Decimal
Discrete Outputs	Q	%Q	1 to 12288	R/W	Decimal
Internal Coils	M	%M	1 to 12288	R/W	Decimal
Temporary Coils	T	%T	1 to 256	R/W	Decimal
Discrete Globals	G	%G	1 to 7680	R/W	Decimal
System Status References S	S	%S	1 to 128	R	Decimal
System Status References SA	SA	%SA	1 to 128	R/W	Decimal
System Status References SB	SB	%SB	1 to 128	R/W	Decimal
System Status References SC	SC	%SC	1 to 128	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Discrete Inputs	WI	%I	1 to 12273	R	Decimal[*1]
Discrete Outputs	WQ	%Q	1 to 12273	R/W	Decimal[*1]
Internal Coils	WM	%M	1 to 12273	R/W	Decimal[*1]
Temporary Coils	WT	%T	1 to 241	R/W	Decimal[*1]
Discrete Globals	WG	%G	1 to 7665	R/W	Decimal[*1]
System Status References S	WS	%S	1 to 113	R	Decimal[*1]
System Status References SA	WSA	%SA	1 to 113	R/W	Decimal[*1]
System Status References SB	WSB	%SB	1 to 113	R/W	Decimal[*1]
System Status References SC	WSC	%SC	1 to 113	R/W	Decimal[*1]
Register Memory	R	%R	1 to 16384	R/W	Decimal[*1]
Analog Inputs	AI	%AI	1 to 8192	R/W	Decimal[*1]
Analog Outputs	AQ	%AQ	1 to 8192	R/W	Decimal[*1]

The device addresses vary based on the PLC model. For details, refer to the manual for the PLC which you use.

*1 Set this device using a multiplier of 16.

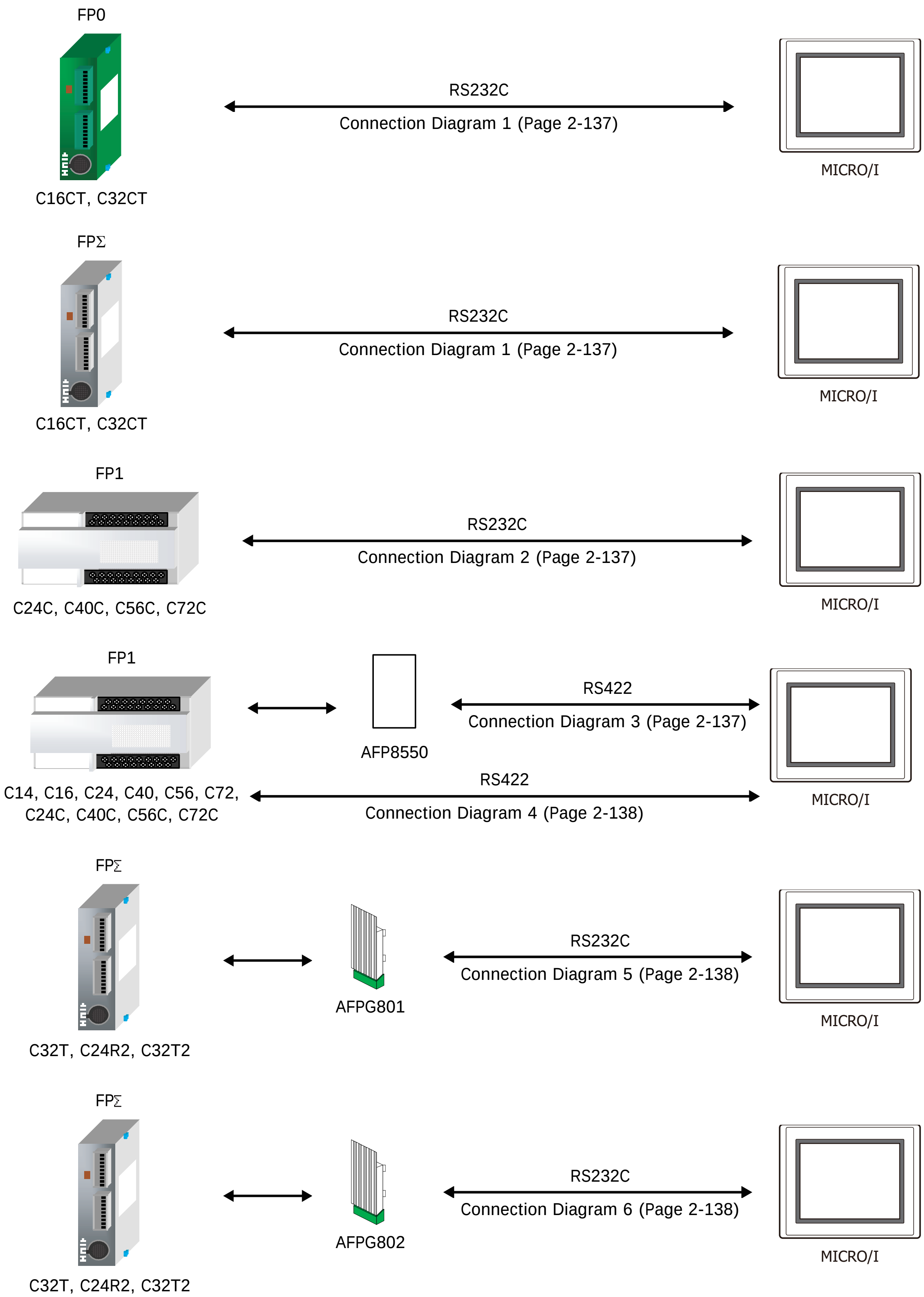
11 Panasonic

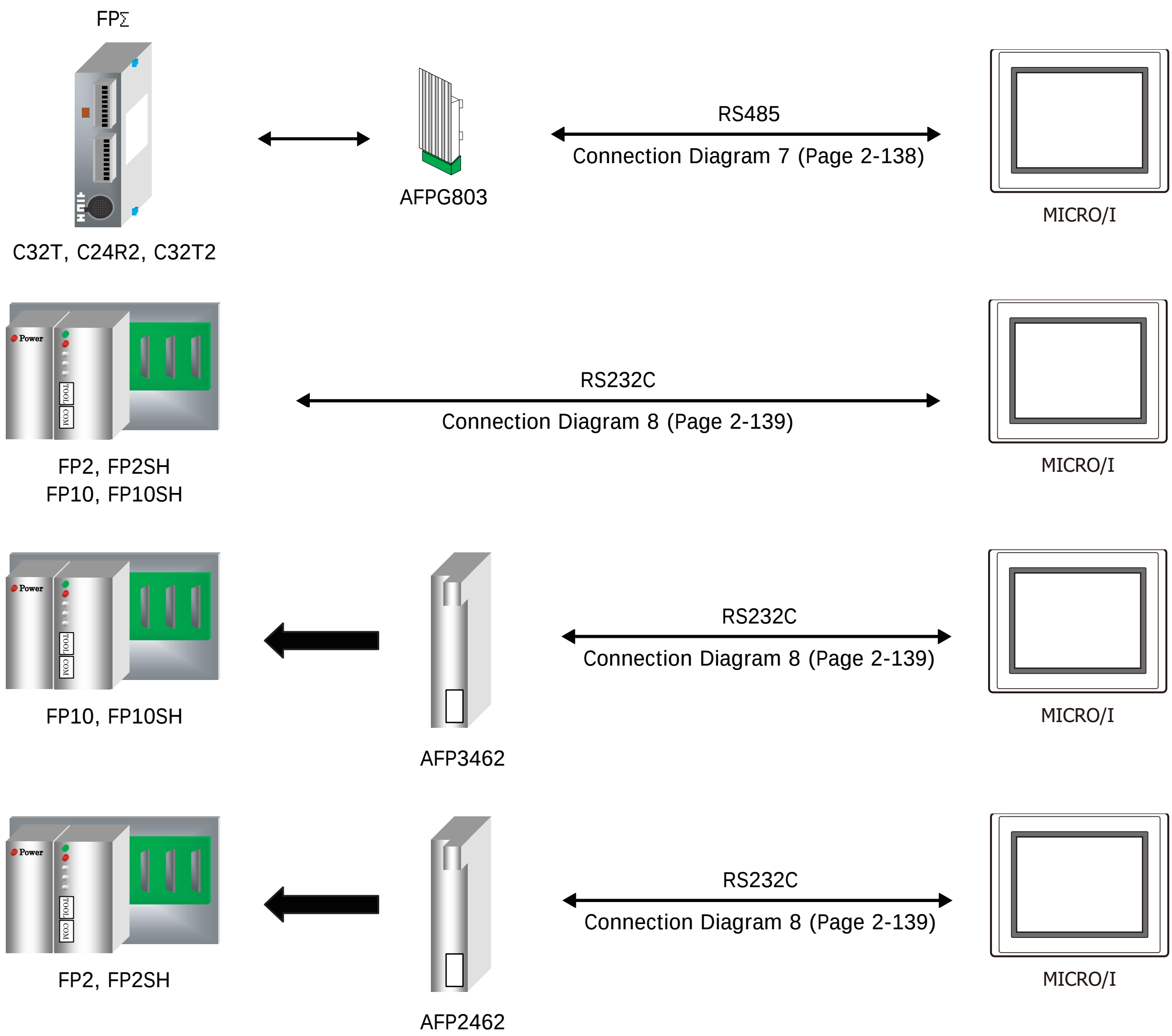
11.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FP Series				
FP0	Not required (Connects to CPU unit directly)	RS232C Connection Diagram 1 (Page 2-137)	None	MEWNET
FP1	Not required (Connects to RS232C Port)	RS232C Connection Diagram 2 (Page 2-137)	ER	
	Not required (Connects to CPU unit directly)	RS232C (AFP8550) Connection Diagram 3 (Page 2-137)		
	Not required (Connects to CPU unit directly)	RS422/485 4-wire Connection Diagram 4 (Page 2-138)	None	
FPΣ	Not required (Connects to CPU unit directly)	RS232C Connection Diagram 1 (Page 2-137)		
	Used Communication cassette AFPG801	RS232C Connection Diagram 5 (Page 2-138)	ER	
	Used Communication cassette AFPG802	RS232C Connection Diagram 6 (Page 2-138)	None	
	Used Communication cassette AFPG803	RS422/485 2-wire Connection Diagram 7 (Page 2-138)		
FP10 FP10SH	Not required (Connects to Tool Pot or Com Port)	RS232C Connection Diagram 8 (Page 2-139)		
	AFP3462			
FP2 FP2SH	Not required (Connects to Com Port)			
	AFP2462			

11.2 System Configuration

This is the system configuration for the connection of Panasonic PLCs to the MICRO/I.





FPΣ
C32T, C24R2, C32T2
AFPG803
RS485
Connection Diagram 7 (Page 2-138)
MICRO/I
FP2, FP2SH
FP10, FP10SH
RS232C
Connection Diagram 8 (Page 2-139)
MICRO/I
FP10, FP10SH
AFP3462
RS232C
Connection Diagram 8 (Page 2-139)
MICRO/I
FP2, FP2SH
AFP2462
RS232C
Connection Diagram 8 (Page 2-139)
MICRO/I

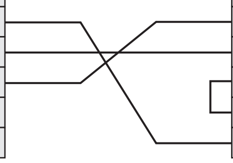
11.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: FP0, FPΣ

PLC(RS232C):
Mini DIN 5-pin Connector

Name	Pin No.
SG	1
SD	2
RD	3
	4
+5V	5



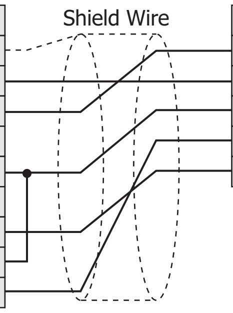
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: FP1 (RS232C Port)

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
DR	6
SG	7
CD	8
ER	9



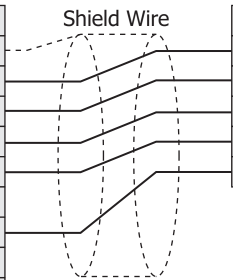
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: FP1 (AFP8550)

PLC(RS232C):
D-sub 25-pin Male Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
DR	6
SG	7
CD	8
ER	20



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

This figure shows the connection diagram when using the cable (AFP8550) from Panasonic.
The AFP8550 has a D-sub male connector. Use a D-sub female connector when you make a communication cable.

● Connection Diagram 4: FP1

PLC(RS422/485):
Mini DIN 8-pin Connector

Name	Pin No.
+5V	8
TXDA	2
TXDB	5
RXDA	3
RXDB	6
SG	1
RTS	7

HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: FPΣ- Communication cassette (AFPG801)

PLC(RS232C): Terminal block

Name	Pin No.
SD	
RD	
RS	
CS	
SG	

HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: FPΣ- Communication cassette (AFPG802)

PLC(RS232C): Terminal block

Name	Pin No.
SD	
RD	
SG	

HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 7: FPΣ- Communication cassette (AFPG803)

PLC(RS422/485): Terminal block

Name	Pin No.
+	
-	
E	

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

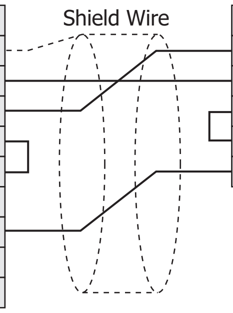
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 8: FP2, FP2SH, FP10, FP10SH

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
FG	1
SD	2
RD	3
RS	4
CS	5
	6
SG	7
	8
ER	9



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

11.4 Environment Settings

● FP0 and FP1 (Tool port on CPU unit)

Items	Details
Interface	RS232C or RS422 4-wire
Slave Address	01 to 99 (Decimal)*1
Baud Rate	9600 or 19200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Odd
Flow Control	None or ER

● FP1 (RS232C port on CPU unit)

Items	Details
Interface	RS232C
Slave Address	01 to 99 (Decimal)
Baud Rate	1200, 2400, 4800, 9600 or 19200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

● FPΣ(Tool port on CPU unit or communication cassette)

Items	Details
Interface	RS232C or RS485 2-wire
Slave Address	01 to 99 (Decimal)
Baud Rate	2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

● FP10 and FP10SH (tool port on CPU unit).

Items	Details
Interface	RS232C
Slave Address	1 to 32 (Decimal)
Baud Rate	9600 or 19200 bps
Data Bits	7 or 8 bits
Stop Bits	1 stop bits
Parity	Odd
Flow Control	None or ER

*1 There are some models that don’t support Slave Address up to 99.

● FP2, FP2SH, FP10 and FP10SH (Communication port on CPU unit)

Items	Details
Interface	RS232C
Slave Address	1 to 32 (Decimal)
Baud Rate	2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

● FP10 and FP10SH (Computer Communication Unit)

Items	Details
Interface	RS232C
Slave Address	1 (Decimal)
Baud Rate	2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

● PLC FP2 and FP2SH (Computer Communication Unit)

Items	Details
Interface	RS232C
Slave Address	1 (Decimal)
Baud Rate	4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 stop bits
Parity	Odd
Flow Control	None or ER

11.5 Usable Device Addresses

Types of devices supported by the MICRO/I and their ranges are shown below.

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input	X	X	0 to 511F	R	*1
Output	Y	Y	0 to 511F	R/W	*1
Internal Relay	R	R	0 to 886F	R/W	*1
Special Internal relay	RE	R	9000 to 910F	R	*1
Link Relay	L	L	0 to 639F	R/W	*1
Timer	T	T	0 to 3071	R	Decimal
Counter	C	C	0 to 3071	R	Decimal
Error alarm relay	E	E	0 to 2047	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input	WX	WX	0 to 00511	R	Decimal
Output	WY	WY	0 to 00511	R/W	Decimal
Internal Relay	WR	WR	0 to 00886	R/W	Decimal
Special Internal relay	WRE	WR	900 to 00910	R	Decimal
Link Relay	WL	WL	0 to 00639	R/W	Decimal
Timer, Counter (Elapsed value)	EV	EV	0 to 03071	R	Decimal
Timer, Counter (Set value)	SV	SV	0 to 03071	R/W	Decimal
Data register	DT	DT	0 to 99999	R/W	Decimal
Link data register	LD	LD	0 to 08447	R/W	Decimal
File register	FL	FL	0 to 32764	R/W	Decimal*2

The device ranges may differ depending on the PLC model. For details, Please refer to PLC Manual for supported memory ranges of the PLC.

*1 The first three digits are in decimal, and the last digit is in binary.
*2 In FP2SH, the contents of a bank 0 are read or written.

12 YASKAWA Electric

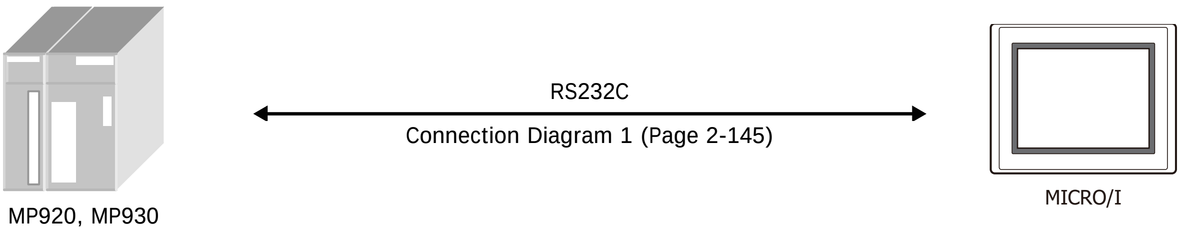
12.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
Machine Controller				
MP920 MP930	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-145)	ER	MP920-RTU
	217IF	RS422/485 4-wire Connection Diagram 2 (Page 2-145)	None	
		RS422/485 2-wire Connection Diagram 3 (Page 2-146)		
MP2300	217IF-01	RS232C Connection Diagram 1 (Page 2-145)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-146)	None	
		RS422/485 2-wire Connection Diagram 5 (Page 2-146)		
MP2200 MP2300	218IF-01	Ethernet	-	MP2000 (Ethernet)
	218IF-02			
MP2310 MP2300S	Not required (Connects to CPU unit)			
	218IF-01			
	218IF-02			
MP2400	Not required (Connects to CPU unit)			

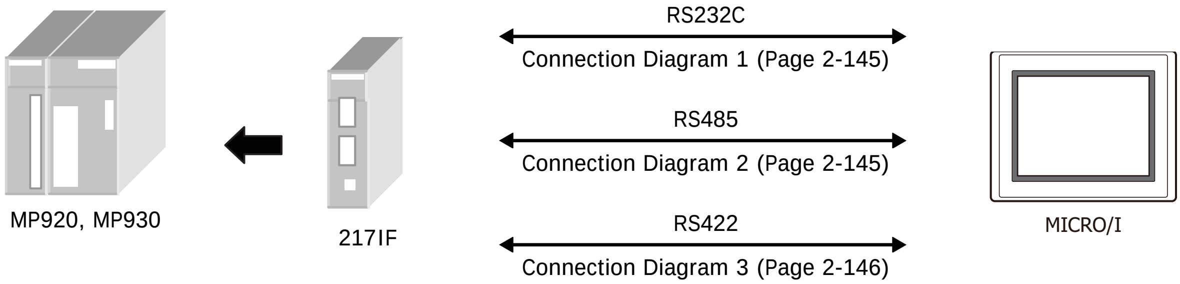
12.2 System Configuration

This is the system configuration for the connection of YASKAWA Electric PLCs to the MICRO/I.

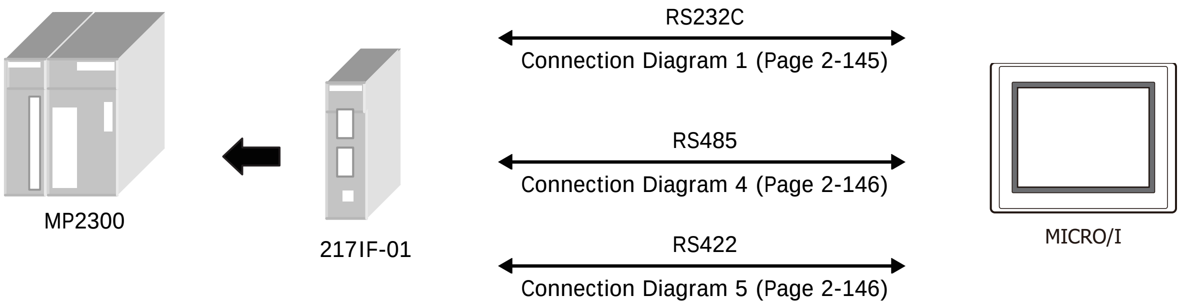
● MP920/930 (Connects to RS232C port on CPU Unit)



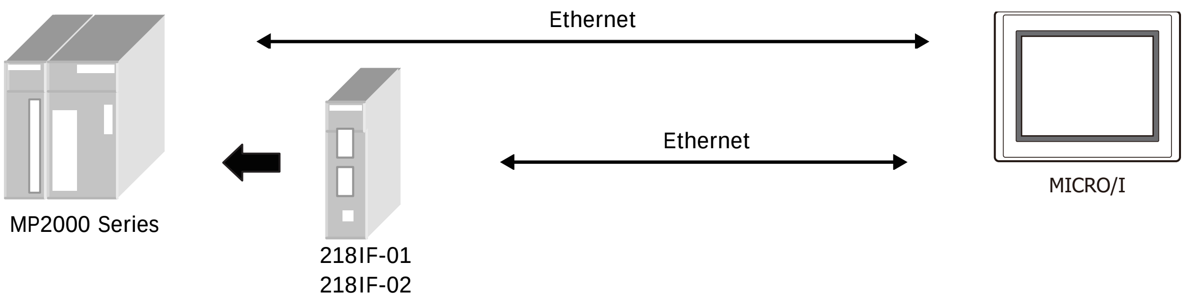
● MP920/930 (217IF)



● MP2300 (217IF-01)



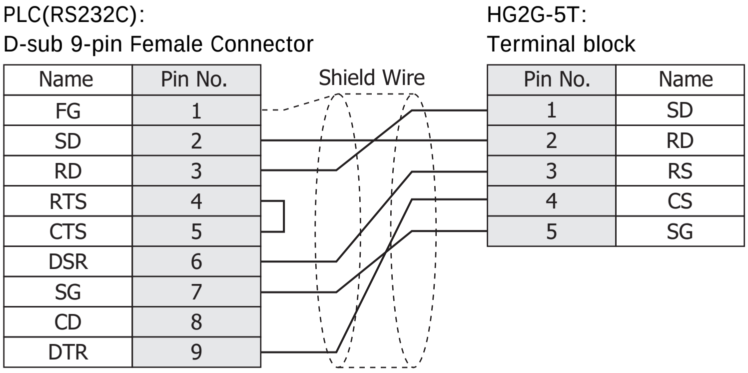
● MP2000 Series (Ethernet)



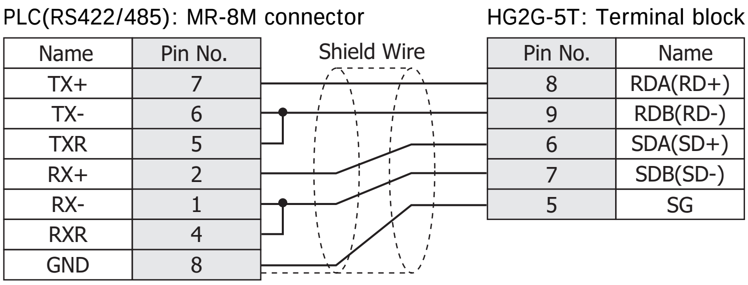
12.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: MP920/930/2300 (217IF, 217IF-01)



● Connection Diagram 2: MP920/930 (217IF)



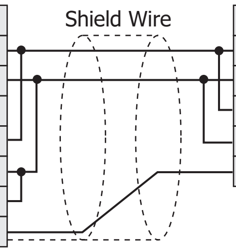
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: MP920/930 (217IF)

PLC(RS422/485):
MR-8M connector

Name	Pin No.
TX+	7
TX-	6
TXR	5
RX+	2
RX-	1
RXR	4
GND	8



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

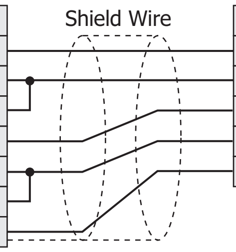
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 4: MP2300 (217IF-01)

PLC(RS422/485):
MDR14-pin Connector

Name	Pin No.
TX+	1
TX-	2
TXR	11
RX+	3
RX-	4
RXR	7
GND	14



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

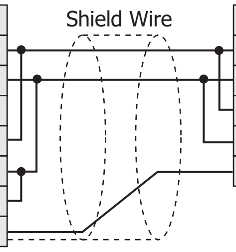
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: MP2300 (217IF-01)

PLC(RS422/485):
MDR14-pin Connector

Name	Pin No.
TX+	1
TX-	2
TXR	11
RX+	3
RX-	4
RXR	7
GND	14



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

12.4 Environment Settings

● MP920/930/2300

Items	Details
Interface	RS232C or RS422/485
Protocol	MEMOBUS RTU
Slave Address	1 to 63 (Decimal)
Baud Rate	9600 or 19200 bps
Data Bits	8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

- It is necessary to set up transmission form by the rudder program.
- Please set up the head register by the side of the PLC as follows. Moreover, please give offset of each register as 0.

Module detailed setup

Setup of a slave Interface register:	Head REG
reading of an Inputs Status:	IW0000
reading of an Inputs Registers:	IW0000
reading/writing of a Coil:	MW00000
reading/writing of a Holding Registers:	MW00000

● Connecting with the MP2000 series via Ethernet

MICRO/I settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of PLC.
	Port Number	Set the port number of PLC. (Default: 10001)
	MICRO/I Port Number	Set the port number of MICRO/I. If you set "0", the port number of MICRO/I is set automatically.

PLC Settings

Item		Setting
Transmission Parameters	IP Address	Set the IP address of PLC.
	Subnet Mask	Set the subnet mask of PLC.
	Default Gateway	Set the default gateway of PLC.
Connection Parameters	Local Port	Set the port number of PLC.
	Node IP Address	Set the IP address of MICRO/I.*1
	Node Port	Set the port number of MICRO/I.*2
	Connect Type	Set the TCP.
	Protocol Type	Select "Extended MEMOBUS" protocol.
	Code	Set the BIN.

Please set up the head register by the side of the PLC as follows. Moreover, please give offset of each register as 0.

Module detailed setup

Setup of a slave Interface register:	Head REG
reading of an Inputs Status:	IW0000
reading of an Inputs Registers:	IW0000
reading/writing of a Coil:	MW00000
reading/writing of a Holding Registers:	MW00000

*1 If the **Node IP Address** is set to **0.0.0.0**, the connection is set in the **Unpassive Open mode**. Any nodes in the network can access to the controller.

*2 To set the connection mode to **Unpassive Open mode**, set 0 to **Node Port**.

12.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Coil	MB	MW	0 to 4095F	R/W	*1
Inputs Status	IB	IW	0 to FFFFF	R	Hexadecimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Holding Registers	MW	MW	0 to 65535	R/W	Decimal
Inputs Registers	IW	IW	0 to FFFF	R	Hexadecimal

*1 Upper four digits: Register Number (decimal)
The lowest digit: Bit Number (hexadecimal)

4095 F
Bit Number
Register Number

13 KOYO ELECTRONICS INDUSTRIES

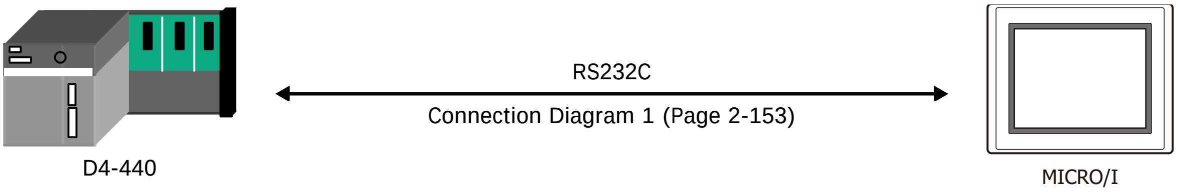
13.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
DirectLogic 05				
DL05	D0-ECOM D0-ECOM100	Ethernet	-	DirectLogic (Ethernet)
DirectLogic 06				
DL06	D0-ECOM D0-ECOM100	Ethernet	-	DirectLogic (Ethernet)
DirectLogic 205				
D2-240 D2-250 D2-250-1 D2-260	D2-ECOM D2-ECOM-F D2-ECOM100	Ethernet	-	DirectLogic (Ethernet)
D2-240 (Port2) D2-250 (Port1, 2) D2-260 (Port1, 2)	Not required (connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-153)	None	DirectLogic 205/405
DirectLogic 405				
D4-430 D4-440	Not required (connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-153)	None	DirectLogic 205/405
		RS422/485 4-wire Connection Diagram 2 (Page 2-153)		
D4-440	D4-DCM	RS232C Connection Diagram 1 (Page 2-153)		
D4-430 D4-440 D4-450	D4-DCM	RS232C Connection Diagram 1 (Page 2-153)		
	D4-ECOM D4-ECOM-F D4-ECOM100	Ethernet	-	DirectLogic (Ethernet)

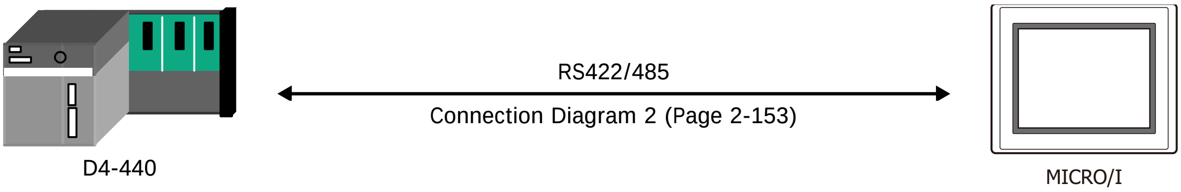
13.2 System Configuration

This is the system configuration for the connection of KOYO ELECTRONICS INDUSTRIES PLCs to the MICRO/I.

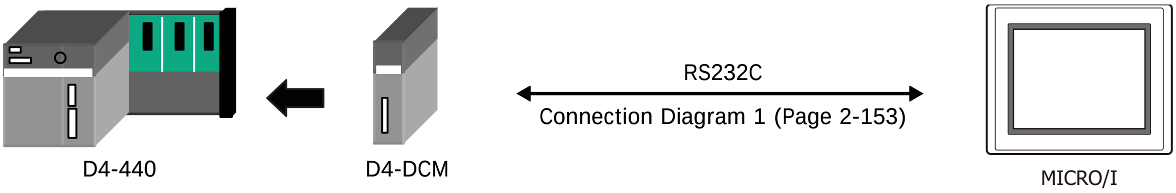
● DirectLogic 405 (Connects to RS232C port on CPU unit)



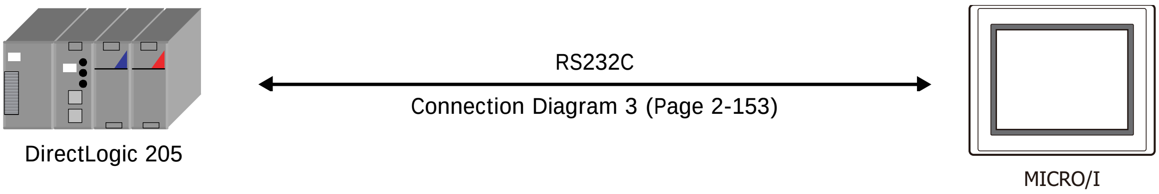
● DirectLogic 405 (Connects to RS422 port on CPU unit)



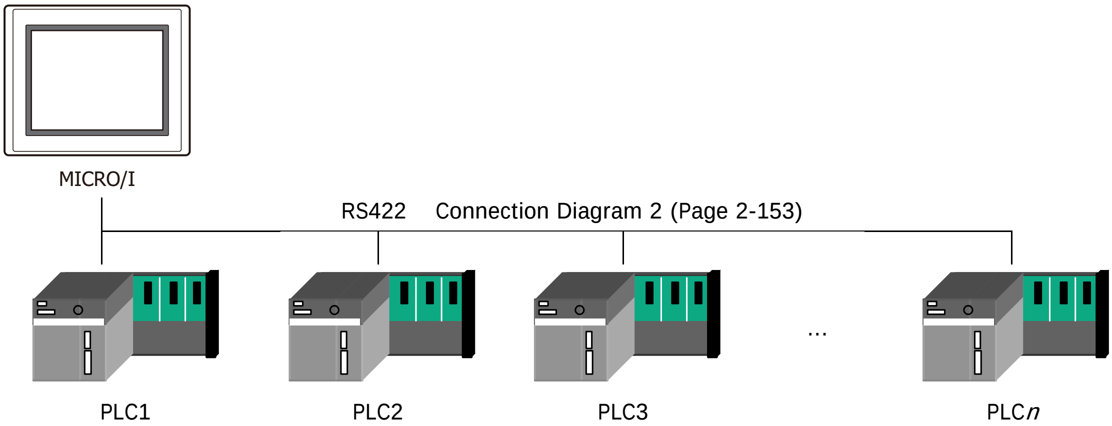
● DirectLogic 405 (Connects to RS232C port on DATA COMMUNICATIONS MODULE)



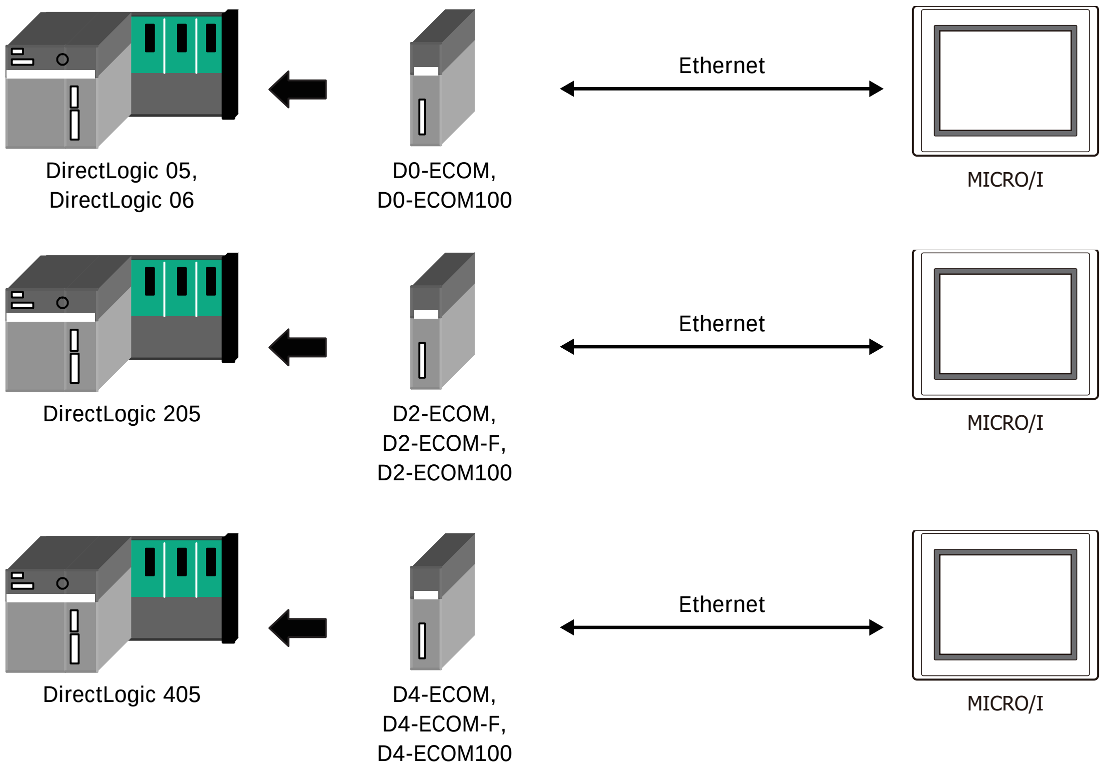
● DirectLogic 205 (Connects to RS232C port on CPU unit)



● DirectLogic 405
(Connects to the general-purpose RS422 communication port on the CPU unit)



● DirectLogic Series (Ethernet)



- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

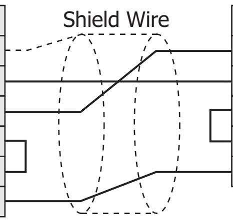
13.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: DirectLogic 405 (Connects to CPU unit RS232C port)
D4-DCM (Connects to DATA COMMUNICATIONS MODULE RS232C port)

PLC(RS232C):
D-sub 25-pin Female Connector

Name	Pin No.
FG	Cover
TXD	2
RXD	3
RTS	4
CTS	5
SG	7



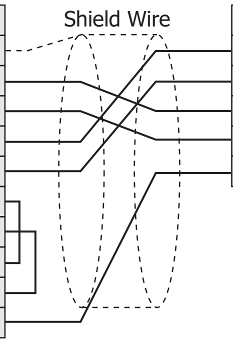
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: DirectLogic 405 (Connects to CPU unit RS422 port)

PLC(RS422/485):
D-sub 25-pin Female Connector

Name	Pin No.
Shield	Cover
RXD+	9
RXD-	10
TXD+	14
TXD-	16
CTS+	11
CTS-	23
RTS+	19
RTS-	18
SG	7



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

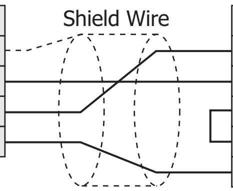
Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: DirectLogic 205 (Connects to CPU unit RS232C port)

PLC(RS232C):
6-pin modular Connector

Name	Pin No.
FG	6
TXD	4
RXD	3
SG	1



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

13.4 Environment Settings

● D4-440 CPU Unit Communication port

Items		Details
Interface		RS232C or RS422
Data representation		Hexadecimal mode
Slave Address	Set to the same setting as the MICRO/I	1 to 90 (Decimal).
Baud Rate		9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		None or Odd
Flow Control		ER

● D4-DCM DATA COMMUNICATIONS MODULE

Items		Details
Interface		RS232C
Data representation		Hexadecimal mode
Slave Address	Set to the same setting as the MICRO/I	1 to 90 (Decimal)
Baud Rate		9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		None or Odd
Flow Control		ER

● DirectLogic 205 CPU Unit Communication port

Items		Details
Interface		RS232C
Data representation		Hexadecimal mode
Slave Address	Set to the same setting as the MICRO/I	1 to 90 (Decimal)
Baud Rate		9600 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		None or Odd
Flow Control		ER

● Ethernet Unit on DirectLogic

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of Ethernet unit.
	Port Number	Set the port number of Ethernet unit.

13.5 Usable Device Addresses

● DirectLogic 405

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Bit)	X	X	0 to 1777	R	Octal
Output Points (Bit)	Y	Y	0 to 1777	R/W	Octal
Control Relays (Bit)	C	C	0 to 3777	R/W	Octal
Stages (Bit)	S	S	0 to 1777	R/W	Octal
Timer Status (Bit)	TS	T	0 to 377	R	Octal
Counter Status (Bit)	CS	CT	0 to 377	R	Octal
Remote In (Bit)	GX	GX	0 to 3777	R/W	Octal
Remote Out (Bit)	GY	GY	0 to 3777	R/W	Octal
Special Relays (Bit)	SP	SP	0 to 777	R	Octal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Word)	XW	V	40400 to 40477	R	Octal
Output Points (Word)	YW	V	40500 to 40577	R/W	Octal
Control Relays (Word)	CW	V	40600 to 40777	R/W	Octal
Stages (Word)	SW	V	41000 to 41077	R/W	Octal
Remote In (Word)	GXW	V	40000 to 40177	R/W	Octal
Remote Out (Word)	GYW	V	40200 to 40377	R/W	Octal
Special Relays (Word)	SPW	V	41200 to 41237	R	Octal
Timer Values	TV	V	0 to 377	R/W	Octal
Counter Values	CV	V	1000 to 1377	R/W	Octal
Data Registers	D	V	1400 to 7377	R/W	Octal
System Parameters1	SR1	V	700 to 777	R	Octal
System Parameters2	SR2	V	7400 to 7777	R	Octal
Ext Registers	ER	V	10000 to 37777	R/W	Octal

- We confirm the address number range of D4-440 only. The usable address number range varies based on the PLC model. For details, refer to the PLC manual.
- The Bit Write operation on the MICRO/I depends on the state of **Bit Write operation will write to a byte.** checkbox in the **Communication Driver** tab on the Porject Settings dialog box. Note the following points: (Byte refers to 8 bits.)
  Check: When executing Bit Write, all other bits in the byte are turned off.
  Unchecked: When executing Bit Write, all other bits are not changed.

During Bit Write operation, the MICRO/I reads the byte data including the designated bit from the PLC, performs logical AND or OR operation with the designated bit, and writes the result into the PLC, therefore all other bits in the byte are not changed.

● DirectLogic 205

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Bit)	X	X	0 to 1777	R	Octal
Output Points (Bit)	Y	Y	0 to 1777	R/W	Octal
Control Relays (Bit)	C	C	0 to 3777	R/W	Octal
Stages (Bit)	S	S	0 to 1777	R/W	Octal
Timer Status (Bit)	TS	T	0 to 377	R	Octal
Counter Status (Bit)	CS	CT	0 to 377	R	Octal
Remote In (Bit)	GX	GX	0 to 3777	R/W	Octal
Remote Out (Bit)	GY	GY	0 to 3777	R/W	Octal
Special Relays (Bit)	SP	SP	0 to 777	R	Octal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Word)	XW	V	40400 to 40477	R	Octal
Output Points (Word)	YW	V	40500 to 40577	R/W	Octal
Control Relays (Word)	CW	V	40600 to 40777	R/W	Octal
Stages (Word)	SW	V	41000 to 41077	R/W	Octal
Remote In (Word)	GXW	V	40000 to 40177	R/W	Octal
Remote Out (Word)	GYW	V	40200 to 40377	R/W	Octal
Special Relays (Word)	SPW	V	41200 to 41237	R	Octal
Timer Values	TV	V	0 to 377	R/W	Octal
Counter Values	CV	V	1000 to 1377	R/W	Octal
Data Registers	D	V	1400 to 7377	R/W	Octal
System Parameters1	SR1	V	400 to 777	R	Octal
System Parameters2	SR2	V	7400 to 7777	R	Octal
Ext Registers	ER	V	10000 to 35777	R/W	Octal

- We confirm the address number range of DirectLogic 205 only. The usable address number range varies based on the PLC model. For details, refer to the PLC manual.
- The Bit Write operation on the MICRO/I depends on the state of **Bit Write operation will write to a byte.** checkbox in the **Communication Driver** tab on the Porject Settings dialog box. Note the following points: (Byte refers to 8 bits.)

  Check: When executing Bit Write, all other bits in the byte are turned off.

  Unchecked: When executing Bit Write, all other bits are not changed.

During Bit Write operation, the MICRO/I reads the byte data including the designated bit from the PLC, performs logical AND or OR operation with the designated bit, and writes the result into the PLC, therefore all other bits in the byte are not changed.

● DirectLogic (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Bit)	X	X	0 to 1777	R	Octal
Output Points (Bit)	Y	Y	0 to 1777	R/W	Octal
Control Relays (Bit)	C	C	0 to 3777	R/W	Octal
Special Relays (Bit)	SP	SP	0 to 777	R	Octal
Timers (Bit)	T	T	0 to 377	R	Octal
Counters (Bit)	CT	CT	0 to 377	R	Octal
Stages (Bit)	S	S	0 to 1777	R/W	Octal
Remote Input (Bit)	GX	GX	0 to 3777	R/W	Octal
Remote Output (Bit)	GY	GY	0 to 3777	R/W	Octal

With a Bit Write operation, the word data is first read from the PLC, and a logic operation (AND or OR) is performed on the relevant bit before writing it to the PLC to ensure that the values of other bits in the same channel are preserved. However, be certain that the PLC does not modify the data in the channel during the time that the MICRO/I is writing the data.

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Points (Word)	VX	V	40400 to 40477	R	Octal
Output Points (Word)	VY	V	40500 to 40577	R/W	Octal
Control Relays (Word)	VC	V	40600 to 40777	R/W	Octal
Special Relays (Word)	VSP	V	41200 to 41237	R	Octal
Timers (Word)	VT	V	41100 to 41117	R	Octal
Counters (Word)	VCT	V	41140 to 41157	R	Octal
Stages (Word)	VS	V	41000 to 41077	R/W	Octal
Timer Current Values	TA	V	0 to 377	R/W	Octal
Counter Current Values	CA	V	1000 to 1377	R/W	Octal
Data Words	V	V	400 to 777 1200 to 7577 10000 to 35777	R/W	Octal
System parameters	VSYS	V	700 to 777 7400 to 7777 36000 to 37777	R	Octal
Remote Input (Word)	VGI	V	40000 to 40177	R/W	Octal
Remote Output (Word)	VGY	V	40200 to 40377	R/W	Octal

14 FANUC

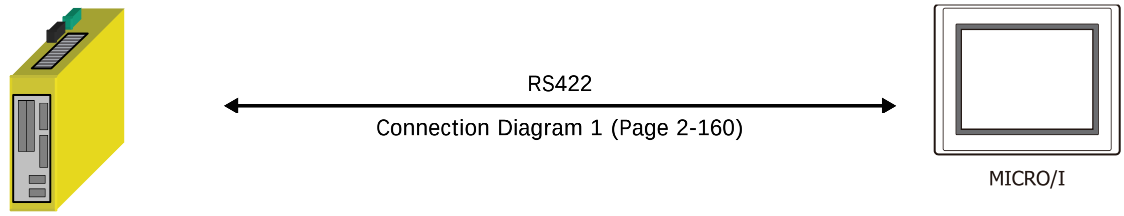
14.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
Power Mate				
Power Mate-MODEL D	Not required	RS422/485 4-wire Connection Diagram 1 (Page 2-160)	None	Power Mate-MODEL D /Series 16i
Series				
16i 160i 18i 180i 30i 31i 32i	Not required	RS232C Connection Diagram 2 (Page 2-160)	None	Power Mate-MODEL D /Series 16i

14.2 System Configuration

This is the system configuration for the connection of FANUC PLCs to the MICRO/I.

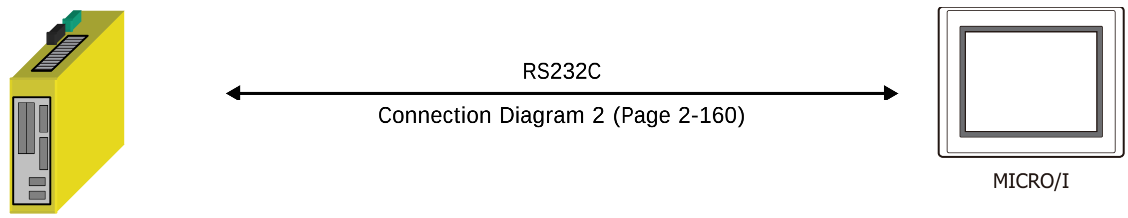
● Power Mate-MODEL D



Power Mate-MODEL D

A touch-panel connection module (FANUC A20B-2902-0470) is needed for Power Mate-MODEL D.

● Series 16i/160i/18i/180i/30i/31i/32i



Series 16i/160i/18i/180i/30i/31i/32i

A touch-panel connection module is needed for Series 16i, 160i, 18i, 180i, 30i, 31i, 32i.
For details, please contact FANUC LTD.

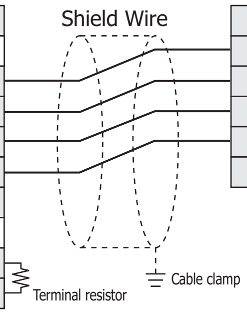
14.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: Power Mate-MODEL D

PLC(RS422/485): PCR-E20FS
(HONDA TSUSHIN KOGYO CO., LTD.)

Name	Pin No.
JD14	
SDA	4
SDB	3
RDA	2
RDB	1
0V	11
JD15	
RDB	1
RDA	2



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

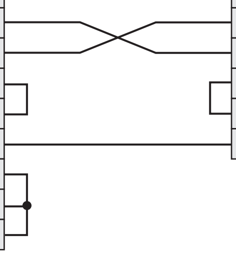
- Connect a terminus unit to JD15 by the side of Power Mate. For details of a terminus unit, refer to the manual of Power Mate-MODEL D.
- FG terminal of the main part of a motion controller should perform the 3rd-sort grounding.
- Ground a shield by the cable clamp.
- Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 2: Series 16i, 160i, 18i, 180i, 30i, 31i, 32i

PLC(RS232C): PCR-E20FS
(HONDA TSUSHIN KOGYO CO., LTD.)

Name	Pin No.
SD	11
RD	1
RS	15
CS	5
SG	8
DR	3
CD	7
ER	13



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

14.4 Environment Settings

● Power Mate-MODEL D

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS422 4-wire
Slave Address		0
Baud Rate		19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Even

● Series 16i/160i/18i/180i/30i/31i/32i

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS232C
Slave Address		0
Baud Rate		19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Even

14.5 Usable Device Addresses

● Power Mate-MODEL D, Series 16i/160i/18i/180i/30i/31i/32i

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	0 to 99997	R/W	*1
Output Relay	Y	Y	0 to 99997	R/W	*1
Int. Relay	R	R	0 to 99997	R/W	*1
Keep Relay	K	K	0 to 99997	R/W	*1
Expansion Relay	E	E	0 to 99997	R/W	*1

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	XW	X	0 to 9998	R/W	Decimal*2
Output Relay	YW	Y	0 to 9998	R/W	Decimal*2
Int. Relay	RW	R	0 to 9998	R/W	Decimal*2
Keep Relay	KW	K	0 to 9998	R/W	Decimal*2
Timer	T	T	0 to 9998	R/W	Decimal*2
Counter	C	C	0 to 9998	R/W	Decimal*2
Data Table	D	D	0 to 9998	R/W	Decimal*2
Expansion Relay	EW	E	0 to 9998	R/W	Decimal*2

The device type and the address number range vary based on the PLC model. For details, refer to the PLC manual.

*1 The first four digits are in decimal and the last digit is in octal.
*2 This external device address is handled with two address numbers as one device address in WindO/I-NV4. Therefore, you can specify an even address number only.

15 Yokogawa Electric

15.1 Connection Table

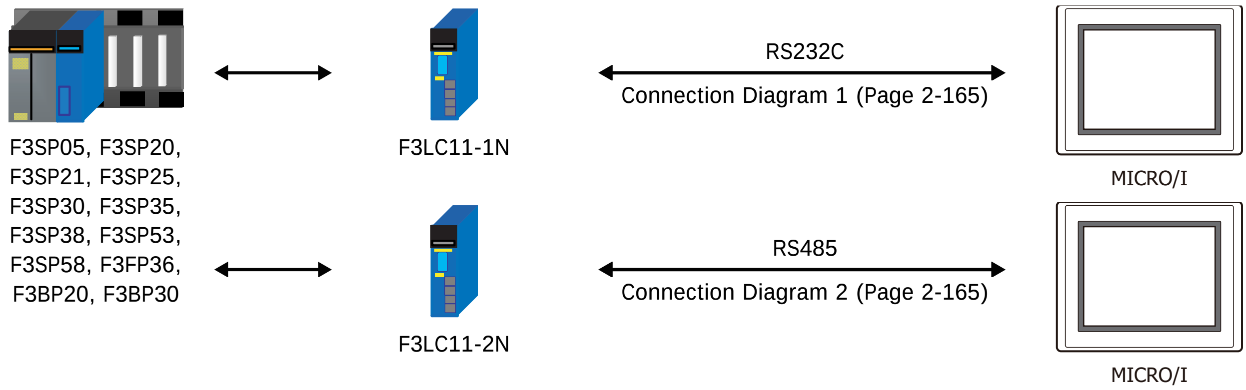
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Contro	Communication Driver
FA-M3				
FA-M3 (F3SP05 F3SP20 F3SP21 F3SP25 F3SP30 F3SP35 F3SP38 F3SP53 F3SP58 F3FP36 F3BP20 F3BP30)	F3LC11-1N	RS232C Connection Diagram 1 (Page 2-165)	ER	FACTORY ACE FA-M3
	F3LC11-2N	RS422/485 4-wire Connection Diagram 2 (Page 2-165)	None	
FA-M3 (F3SP05 F3SP21 F3SP25 F3SP28 F3SP35 F3SP38 F3SP53 F3SP58)	Not required	RS232C Connection Diagram 3 (Page 2-165)		
FA-M3 (F3SP05-0P F3SP08-0P F3SP21-0N F3SP22-0S F3SP25-2N F3SP28-3N/3S F3SP35-5N F3SP38-6N/-6S F3SP53-4H/-4S F3SP58-6H/-6S F3SP59-7S F3SP66-4S F3SP67-6S F3SP71-4N F3SP76-7N)	F3LE01-5T/-0T F3LE11-0T F3LE12-0T	Ethernet	-	FACTORY ACE FA-M3(Ethernet)
FA-M3 (F3SP66-4S F3SP67-6S F3SP71-4N F3SP76-7N)	Not required			

2 Connection to External Devices

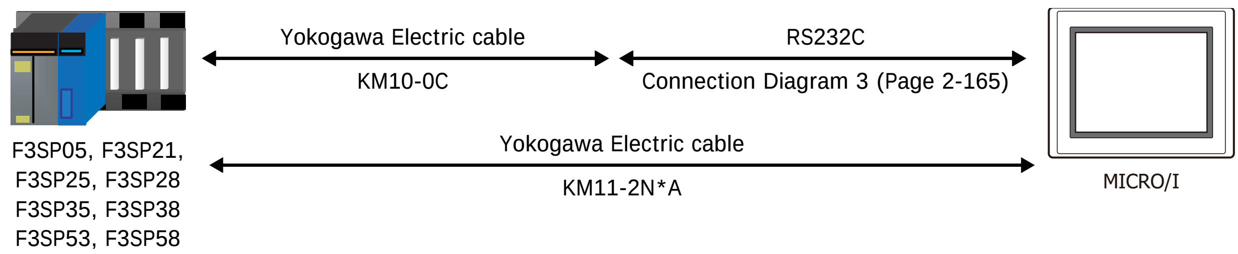
15.2 System Configuration

This is the system configuration for the connection of Yokogawa Electric PLCs to the MICRO/I.

● FA-M3 series (Serial)



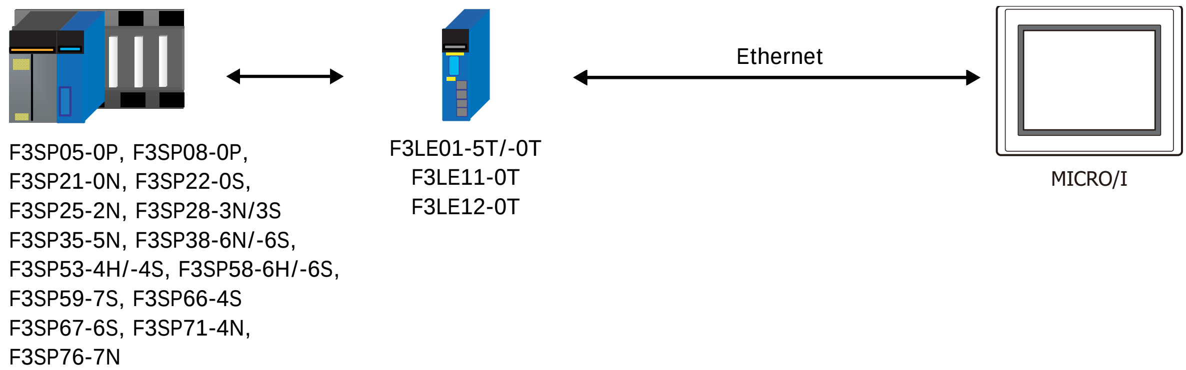
We recommend F3LC11-2N side to carry a “4-WIRE” setup of the terminus resistance (TERMINATOR) in long-distance transmission.

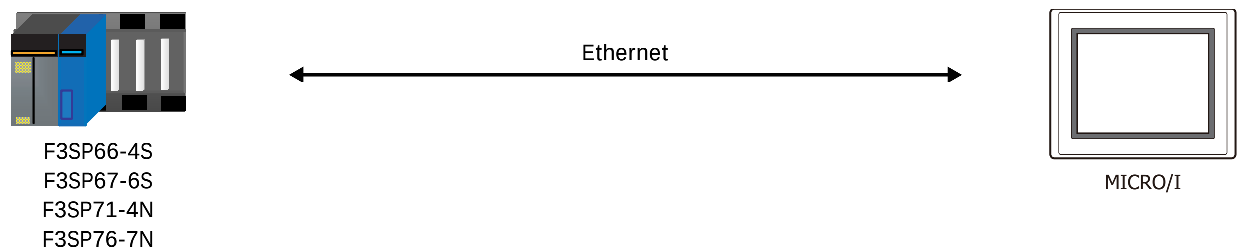


It does not correspond to “CPU direct connection system” of F3SP20 and F3SP30.

It connects with the port for programming tools of a CPU unit.

● FA-M3 series (Ethernet)





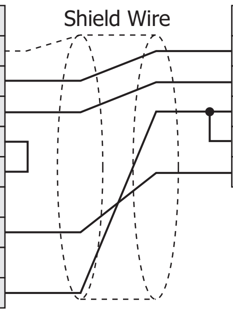
15.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: FA-M3 F3LC11-1N

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
FG	Hood
RD	2
SD	3
RS	7
CS	8
ER	4
SG	5
CD	1
DR	6



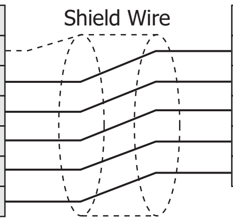
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: FA-M3 F3LC11-2N

PLC(RS422/485): Terminal block

Name	Pin No.
FG	
SDB	
SDA	
RDB	
RDA	
SG	



HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

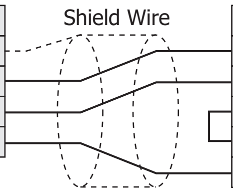
- Configure the **Flow Control** to **None**, because the terminal block of HG2G-5T doesn't have control lines.
- In MICRO/I and PLC, the name of A pole and B pole is reverse.

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 3: FA-M3

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
RD	2
SD	3
SG	5



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

This figure shows the connection diagram when using the cable (KM10-0C) from Yokogawa Electric.

15.4 Environment Settings

● FA-M3 Link Unit (F3LC11-1N/2N)

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS232C or RS485 4-wire
CPU Number		1(0x01) to 4(0x04)(Hexadecimal)
Station Number		1 (Decimal)
Baud Rate		9600 or 19200 bps
Data Bits		7 or 8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Sum check		Enable
Terminus character specification		Enable
Protection function		Disable

● FA-M3 CPU (Programming tool port)

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS232C
Station Number		01 (Decimal)
Baud Rate		9600 or 19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Even or None
Sum check		Enable
Terminus character specification		Enable

● FA-M3 via Ethernet

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of CPU Unit or Link Unit.
	Port Number	Set the IP address of CPU Unit or Link Unit.
	CPU Number	Set the slot number of the CPU Unit to communicate with.

15.5 Usable Device Addresses

● FA-M3 (Serial)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	X	X	201 to 71664	R	*1
Output Relay	Y	Y	201 to 71664	R/W	*1
Int. Relay	I	I	1 to 65536	R/W	Decimal
Comm. Relay	E	E	1 to 4096	R/W	Decimal
Link Relay	L	L	1 to 78192	R/W	*2
Spec. Relay	M	M	1 to 9984	R/W	Decimal
Timer Relay	TU	T	1 to 3072	R	Decimal
Counter Relay	CU	C	1 to 3072	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay	XW	X	201 to 71649	R	*3
Output Relay	YW	Y	201 to 71649	R/W	*3
Int. Relay	IW	I	1 to 65521	R/W	Decimal
Comm. Relay	EW	E	1 to 4081	R/W	Decimal
Link Relay	LW	L	1 to 78177	R/W	*4
Spec. Relay	MW	M	1 to 9969	R/W	Decimal
Timer (Current Value)	TP	T	1 to 3072	R/W	Decimal
Timer (Preset Value)	TS	T	1 to 3072	R	Decimal
Counter (Current Value)	CP	C	1 to 3072	R/W	Decimal
Counter (Preset Value)	CS	C	1 to 3072	R	Decimal
Data Register	D	D	1 to 65536	R/W	Decimal
Comm. Register	R	R	1 to 4096	R/W	Decimal
File Register	B	B	1 to 99999	R/W	Decimal
Link Register	W	W	1 to 74096	R/W	*5
Spec. Register	Z	Z	1 to 1024	R/W	Decimal

*1 The address number range is as follows:

7 16 64

(0 to 7) (2 to 16) (1 to 64)

*2 The address number range is as follows:

7 8192

(0 to 7) (1 to 8192)

*3 The address number range is as follows:

7 16 49

(0 to 7) (2 to 16) (1, 17, 33, 49)

*4 The address number range is as follows:

7 8177

(0 to 7) (2 to 8177)

*5 The address number range is as follows:

7 4096

(0 to 7) (1 to 4096)

2 Connection to External Devices

● FA-M3 (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay (bit)	X	X	00201 to 71664	R	Decimal[*1]
Output Relay (bit)	Y	Y	00201 to 71664	R/W	Decimal[*1]
Int. Relay (bit)	I	I	00001 to 65536	R/W	Decimal
Comm. Relay (bit)	E	E	0001 to 4096	R/W	Decimal
Link Relay (bit)	L	L	00001 to 78192	R/W	Decimal[*2]
Timer Relay (bit)	TU	T	0001 to 3072	R/W	Decimal
Counter Relay (bit)	CU	C	0001 to 3072	R/W	Decimal
Spec. Relay (bit)	M	M	0001 to 9984	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay (word)	XW	X	00201 to 71649	R	Decimal[*3]
Output Relay (word)	YW	Y	00201 to 71649	R/W	Decimal[*3]
Int. Relay (word)	IW	I	00001 to 65521	R/W	Decimal
Comm. Relay (word)	EW	E	0001 to 4081	R/W	Decimal
Link Relay (word)	LW	L	00001 to 78177	R/W	Decimal[*4]
Timer (Current Value)	TP	T	0001 to 3072	R	Decimal
Counter (Current Value)	CP	C	0001 to 3072	R	Decimal
Timer (Preset Value)	TS	T	0001 to 3072	R/W	Decimal
Counter (Preset Value)	CS	C	0001 to 3072	R/W	Decimal
Data Register	D	D	00001 to 65535	R/W	Decimal
Link Register	W	W	00001 to 78192	R/W	Decimal[*5]
File Register	B	B	00001 to 262144	R/W	Decimal
Spec. Relay	MW	M	0001 to 9969	R/W	Decimal
Spec. Register	Z	Z	0001 to 1024	R/W	Decimal
Comm. Register	R	R	0001 to 4096	R/W	Decimal
Index Register	V	V	001 to 256	R/W	Decimal
Cache register	F	F	000001 to 524288	R/W	Decimal

*1 The address number range is as follows:
7 16 64
(0 to 7) (2 to 16) (1 to 64)

*2 The address number range is as follows:
7 8192
(0 to 7) (1 to 8192)

*3 The address number range is as follows:
7 16 49
(0 to 7) (2 to 16) (1, 17, 33, 49)

*4 The address number range is as follows:
7 8177
(0 to 7) (2 to 8177)

*5 The address number range is as follows:
7 4096
(0 to 7) (1 to 4096)

16 Fuji Electric

16.1 Connection Table

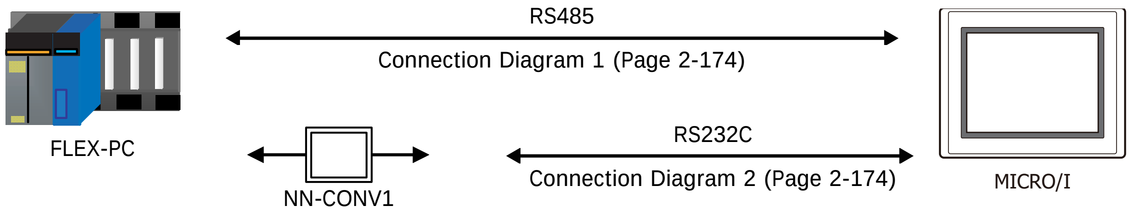
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FLEX-PC				
NB1 NB2 NB3 NJ-CPU-E4 NJ-CPU-A8 NJ-CPU-B16 NS	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-174)	None	FLEX-PC(CPU)
		RS422/485 4-wire Connection Diagram 1 (Page 2-174)		
NB1 NB2 NB3	NB-RS1-AC/DC	RS232C Connection Diagram 3 (Page 2-174)	ER	FLEX-PC(LINK)
		RS422/485 4-wire Connection Diagram 4 (Page 2-175)	None	
NJ-CPU-E4 NJ-CPU-A8 NJ-CPU-B16	NJ-RS2 NJ-RS4	RS232C Connection Diagram 3 (Page 2-174)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-175)	None	
NS	NS-RS1	RS232C Connection Diagram 3 (Page 2-174)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-175)	None	
MICREX-F				
F55	NV1L-RS2	RS232C Connection Diagram 5 (Page 2-175)	None	MICREX-F
F70	NC1L-RS2	RS232C Connection Diagram 5 (Page 2-175)		
	NC1L-RS4	RS422/485 4-wire Connection Diagram 6 (Page 2-175)		
F80H F120H F120S F140S F150S	FFU120B	RS232C Connection Diagram 5 (Page 2-175)		
		RS422/485 4-wire Connection Diagram 6 (Page 2-175)		
F30 F50 F50H F55 F60 F70 F70S F80H F81 F120H F120S F140S F150S F250	FFK120A-C10	RS232C Connection Diagram 5 (Page 2-175)		
		RS422/485 4-wire Connection Diagram 6 (Page 2-175)		

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MICREX-SX				
NP1PH-08 NP1PH-16 NP1PS-32 NP1PS-32R NP1PS-74R NP1PS-117R NP1PS-245R NP1PS-74D NP1PM-48R NP1PM-48E NP1PM-256E NP1PM-256H NP1PU-048E NP1PU-128E NP1PU-256E	Not required (Connect to CPU unit loader connection connector) NP4H-CB2 + NW0H-CNV	RS232C Connection Diagram 7 (Page 2-175)	None	MICREX-SX
	NP1L-RS1	RS232C Connection Diagram 8 (Page 2-176)		
		RS422/485 4-wire Connection Diagram 9 (Page 2-176)		
	NP1L-RS2	RS232C Connection Diagram 8 (Page 2-176)		
	NP1L-RS4	RS422/485 4-wire Connection Diagram 9 (Page 2-176)		
NP1PH-08 NP1PH-16 NP1PS-32 NP1PS-32R NP1PS-74R NP1PS-117R NP1PS-245R NP1PS-74D NP1PM-48R NP1PM-256H	NP1L-ET1	Ethernet	-	MICREX-SX (Ethernet)
NP1PM-48E NP1PM-256E NP1PU-048E NP1PU-128E NP1PU-256E	Not required (Connect to the Ethernet Port)			
	NP1L-ET1			

16.2 System Configuration

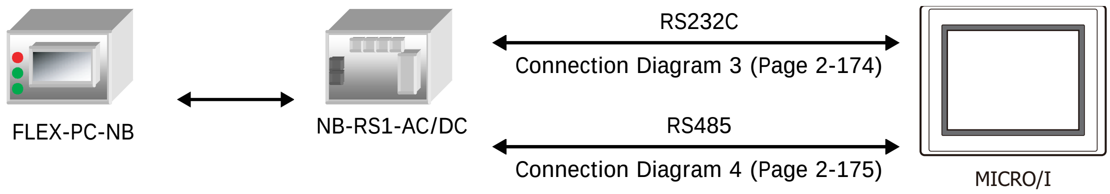
This is the system configuration for the connection of Fuji Electric PLCs to the MICRO/I.

● FLEX-PC Series (Loader Port)

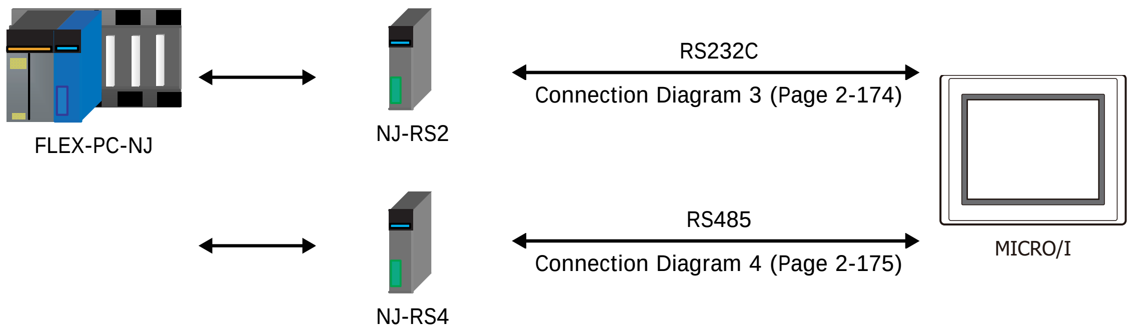


● FLEX-PC Series (Interface Module)

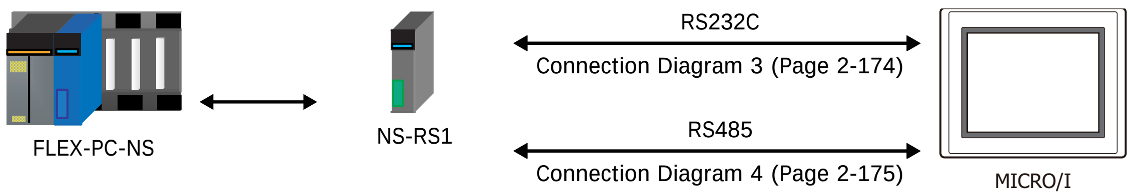
NB Series



NJ Series

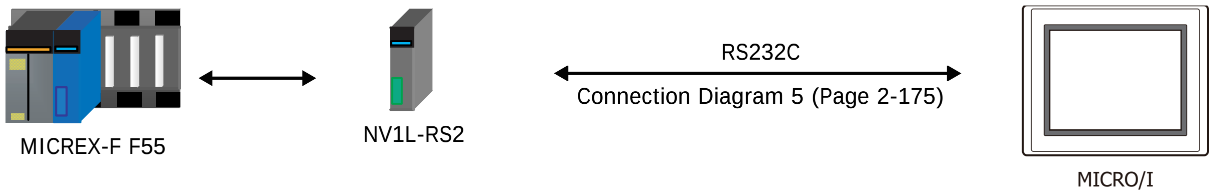


NS Series

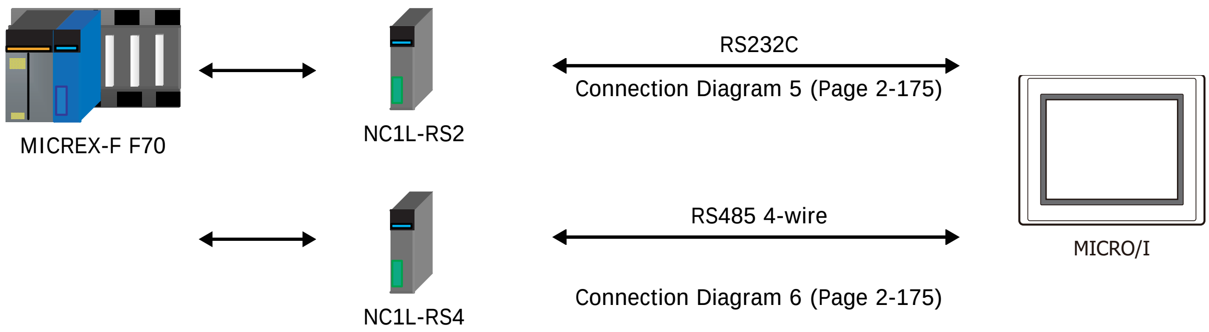


● MICREX-F Series (Interface Card)

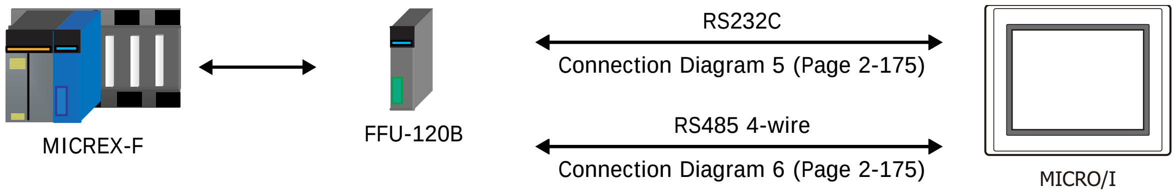
F55



F70

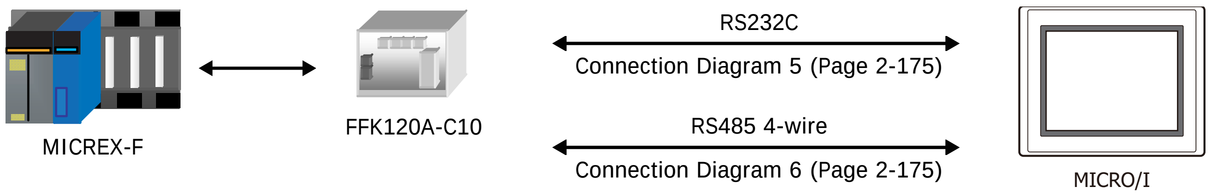


F80H/F120H/F120S/F140S/F150S

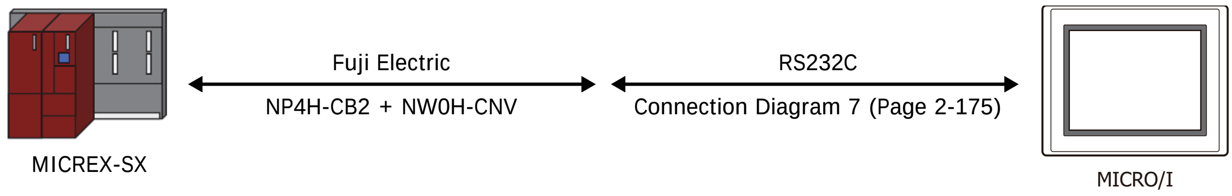


● MICREX-F Series (Interface Module)

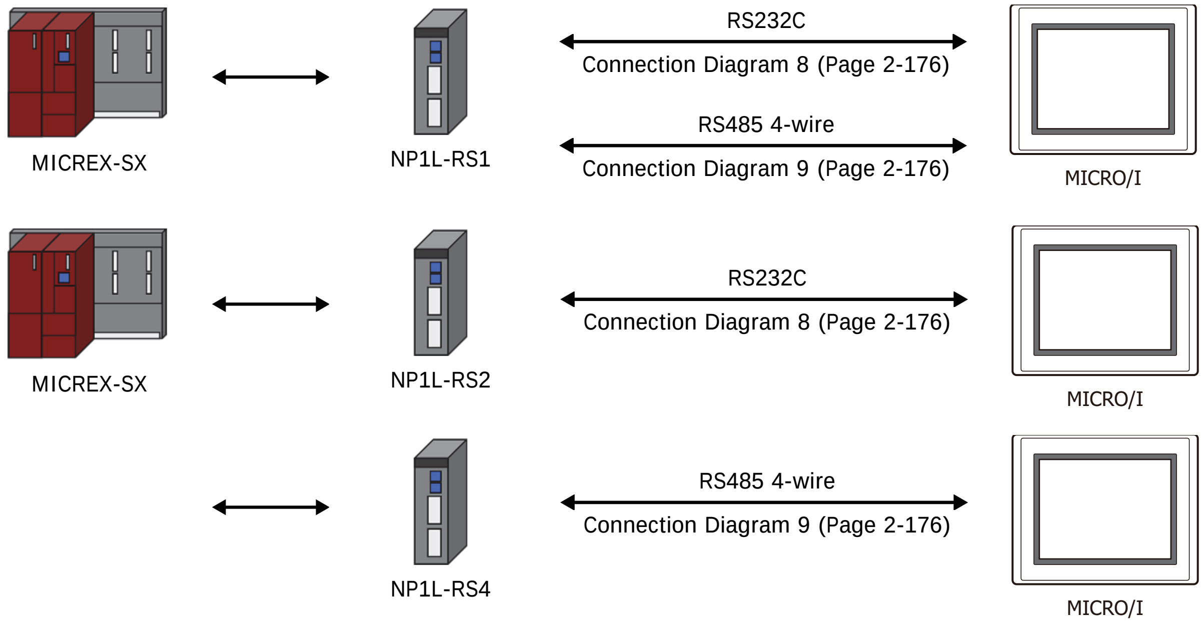
F30/F50/F50H/F55/F60/F70/F70S/F80H/F81/F120H/F120S/F140S/F150S



● MICREX-SX Series (Connects to the Loader Connection Connector on CPU unit)

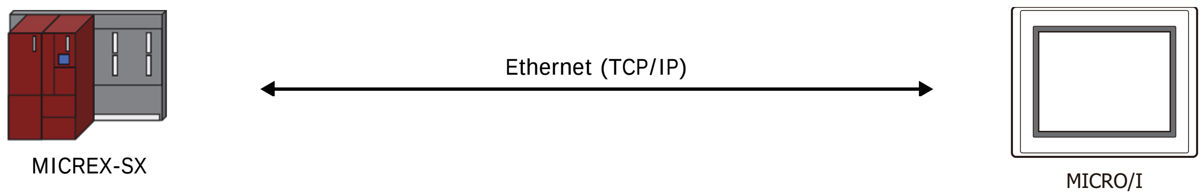


● MICREX-SX Series (Interface Module)

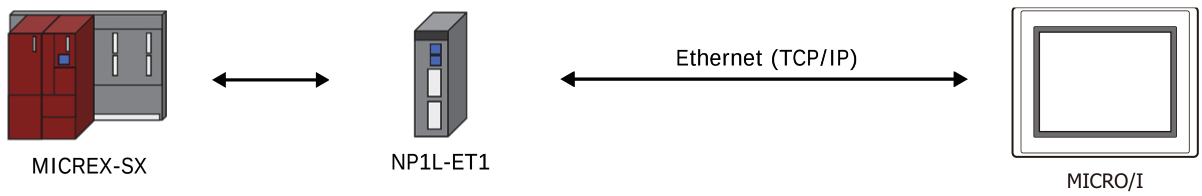


● MICREX-SX Series (Connects to the Ethernet port on CPU unit)

NP1PM-48E/ NP1PM-256E/ NP1PU-048E/ NP1PU-128E/ NP1PU-256E



● MICREX-SX Series (Ethernet Module)



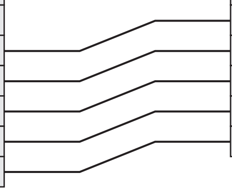
16.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: FLEX-PC series (Loader Port)

PLC(RS485): Modular jack 8-pin

Name	Pin No.
SDA	3
SDB	4
RDA	5
RDB	6
SG	8

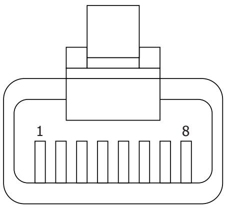


HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

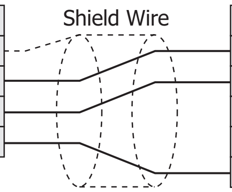
Connector Pin Layout for PLC side Modular jack



● Connection Diagram 2: FLEX-PC series (Loader Port) + NN-CONV1

PLC(RS232C):
D-sub 25-pin Male Connector

Name	Pin No.
FG	1
RD	2
SD	3
SG	7



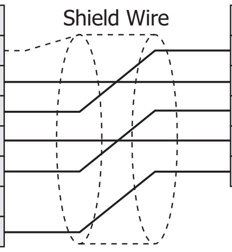
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: FLEX-PC Series (Link Module RS232C Port)

PLC(RS232C):
D-sub 25-pin Female Connector

Name	Pin No.
FG	1
SD	2
RD	3
RTS	4
CTS	5
DSR	6
SG	7



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 4: FLEX-PC Series (Link Module RS485 Port)

PLC(RS485): Terminal block

Name	Pin No.
SDA	
SDB	
RDA	
RDB	
SG	

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 5: MICREX - F Series (RS232C Port)

PLC(RS232C):
D-sub 25-pin Female Connector

Name	Pin No.
5V	1
SD	2
RD	3
RTS	4
CTS	5
DSR	6
SG	7
CD	8
DTR	20
CI	22

HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: MICREX-F Series (RS485 Port)

PLC(RS422/485): Terminal block

Name	Pin No.
SDA	
SDB	
RDA	
RDB	
SG	

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 7: MICREX-SX series (Loader connection Connector)

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8

HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 8: MICREX-SX series (RS232C Port)

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8

HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 9: MICREX-SX series (RS485 Port)

PLC(RS422/485):
D-sub 9-pin Male Connector

Name	Pin No.
SDA	2
SDB	1
RDA	9
RDB	8
SG	5

HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

16.4 Environment Settings

● FLEX-PC (CPU) to MICRO/I settings

Items		Details
Interface		RS232C or RS485 4-wire
Baud Rate	Use the same settings as for the MICRO/I.	19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Odd
Flow Control		None

● FLEX-PC (Link Module) to MICRO/I settings

Items		Items	
Interface		RS232C	RS485 4-wire
Operation Modes*1		Command-setting-type start-stop synchronization non sequenced format	
Baud Rate	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600 or 19200 bps	
Data Bits		7 or 8 bits	
Stop Bits		1 or 2 stop bits	
Parity		None, Odd or Even	
Flow Control		None or ER	
Station Number		-	0 to 99 (Decimal)

For details of communication setting, refer to the FLEX-PC user's manual.

*1 Set up the mode switch of Interface Module as below.
RS232C: No.1
RS485: No.3

FLEX-PC Communication Setting

When you would like to set up the communication setting with the initialization file, refer to the following setup. Set up item of 4, 5, 6, and 7 as well as MICRO/I settings.

No.	Item	0	1	2	3	4	5	6	7
1	Transmission type	Non sequenced format							
2	Mode		Setting						
3	Received Message No.	0							
4	Baud Rate			1200	2400	4800	9600	19200	
5	Data bit size	7	8						
6	Parity bit	None	Odd	Even					
7	Stop bit size	1		2					
8	DCE/DTE mode		DTE						
9	CTS/RTS control		Constantly ON						
10	DSR/DTR control	Constantly ON							
11	Transmission conditions			None					
13	Transmission code	JIS							
14	Code conversion		Yes						
15	Received data byte size	0							
16	Start code		STX						
17	End code			CR					
18	Start code 1,2	0							
19	End code 1,2	0							
20	BCC		Setting1						
21	Position (range)	TEXT							
22	Calculation formula			EOR					
23	Code	Transmission code							
24	Timer								

● MICREX-F Interface Card/Module

<table>
<tr><th colspan="2">Items</th><th colspan="2">Details</th></tr>
<tr><td colspan="2">Interface</td><td>RS232C</td><td>RS485 4-wire</td></tr>
<tr><td colspan="2">Operation Modes*1</td><td colspan="2">Command-setting-type start-stop synchronization non sequenced format</td></tr>
<tr><td>Baud Rate</td><td rowspan="6">Use the same settings as for the MICRO/I.</td><td colspan="2">1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps</td></tr>
<tr><td>Data Bits</td><td colspan="2">7 or 8 bits*2</td></tr>
<tr><td>Stop Bits</td><td colspan="2">1 or 2 stop bits*2</td></tr>
<tr><td>Parity</td><td colspan="2">None, Odd or Even*2</td></tr>
<tr><td>Flow Control</td><td colspan="2">None</td></tr>
<tr><td>Station Number</td><td>0</td><td>0 to 99 (Decimal)</td></tr>
</table>

For details of communication setting, refer to the MICREX-F user's manual.

● MICREX-SX series (connecting to the CPU unit loader connection Connector or using the Interface Module.)

<table>
<tr><th colspan="2">Items</th><th>Details</th></tr>
<tr><td colspan="2">Interface</td><td>RS232C or RS485</td></tr>
<tr><td>Baud Rate</td><td rowspan="5">Use the same settings as for the MICRO/I.</td><td>38400 bps</td></tr>
<tr><td>Data Bits</td><td>8 bits</td></tr>
<tr><td>Stop Bits</td><td>1 stop bits</td></tr>
<tr><td>Parity</td><td>Even</td></tr>
<tr><td>Flow Control</td><td>None</td></tr>
</table>

When you connect to the Interface Module, set the RS232C or RS485 operation mode as loader setting.
Set up the mode switch of Interface Module as below.
RS232C: No.1 or No.3
RS485: No.2 or No.3

*1 Set up the mode switch of Interface Card/Module as below.
RS232C: No.1
RS485: No.3
*2 Set Character configuration switch to the following.

Switch		Configuration
8	Clear method	By switch
7	Parity bit ON/OFF	Same as MICRO/I
6	Parity bit Odd/Even	Same as MICRO/I
5	Data bit	Same as MICRO/I
4	Stop bit	Same as MICRO/I

● MICREX-SX series (connecting to the Ethernet port or using the Ethernet module.)

MICRO/I Settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I in.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of PLC.
	Port Number	Set the port number of PLC. (Default: 507)

PLC Settings

Item	Setting
IP Address	Set the IP address of PLC.
Subnet mask	Set the subnet mask of PLC .
Default Gateway	Set the default gateway of PLC.

16.5 Usable Device Addresses

● FREX-PC

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Int. Relay (bit)	M	M	0 to 3FF	R/W	Hexadecimal
Input Relay (bit)	X	X	0 to 7FF	R	Hexadecimal
Output Relay (bit)	Y	Y	0 to 7FF	R/W	Hexadecimal
Exp. Int. Relay (bit)	EM	M	400 to 1FFF	R/W	Hexadecimal
Latch Relay (bit)	L	L	0 to 3FF	R/W	Hexadecimal
Exp. Latch Relay (bit)	EL	L	400 to 1FFF	R/W	Hexadecimal
Step Relay (bit)	S	S	0 to 3FF	R/W	Hexadecimal
Spec. Relay (bit)	SM	SM	8000 to 81FF	R/W	Hexadecimal
Timer (Relay)	T	T	0 to 3FF	R	Hexadecimal
Counter (Relay)	C	C	0 to 1FF	R	Hexadecimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Data Register	D	D	0 to 2FFF	R/W	Hexadecimal
Input Relay (word)	WX	X	0 to 7F	R	Hexadecimal
Output Relay (word)	WY	Y	0 to 7F	R/W	Hexadecimal
Int. Relay (word)	WM	M	0 to 3F	R/W	Hexadecimal
Exp. Int. Relay (word)	WEM	M	40 to 1FF	R/W	Hexadecimal
Latch Relay (word)	WL	L	0 to 3F	R/W	Hexadecimal
Exp. Latch Relay (word)	WEL	L	40 to 1FF	R/W	Hexadecimal
Step Relay (word)	WS	S	0 to 3F	R/W	Hexadecimal
Spec. Relay (word)	WSM	M	800 to 81F	R/W	Hexadecimal
Timer (Current Value)	TN	T	0 to 3FF	R	Hexadecimal
Counter (Current Value)	CN	C	0 to 1FF	R	Hexadecimal
Spec. Register	SD	D	8000 to 837F	R/W	Hexadecimal
Link Register	W	W	0 to 3FFF	R/W	Hexadecimal
File Register	R	R	0 to 7FFF	R/W	Hexadecimal

● MICREX-F

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
In.Output Relay (bit)	B	B	0 to 511F	R/W	Hexadecimal
Int.Relay (bit)	M	M	0 to 511F	R/W	Hexadecimal
Keep Relay (bit)	K	K	0 to 63F	R/W	Hexadecimal
Edge Relay (bit)	D	D	0 to 63F	R/W	Hexadecimal
Spec.Relay (bit)	F	F	0 to 125F	R	Hexadecimal
Link Relay (bit)	L	L	0 to 511F	R/W	Hexadecimal
Ann.Relay (bit)	A	A	0 to 45F	R/W	Hexadecimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
InOut Relay (word)	WB	WB	0 to 511	R/W	Decimal
Di.InOut Relay (word)	W24	W24	0 to 159	R/W	Decimal
Int.Relay (word)	WM	WM	0 to 511	R/W	Decimal
Keep Relay (word)	WK	WK	0 to 63	R/W	Decimal
Edge Relay (word)	WD	WD	0 to 63	R/W	Decimal
Link Relay (word)	WL	WL	0 to 511	R/W	Decimal
Spec.Relay (word)	WF	WF	0 to 125	R	Decimal
Ann.Relay (word)	WA	WA	0 to 45	R/W	Decimal
FileMemo.0 (word)	W30	W30	0 to 4095	R/W	Decimal
FileMemo.1 (word)	W31	W31	0 to 4095	R/W	Decimal
FileMemo.2 (word)	W32	W32	0 to 4095	R/W	Decimal
FileMemo.3 (word)	W33	W33	0 to 4095	R/W	Decimal
FileMemo.4 (word)	W34	W34	0 to 4095	R/W	Decimal
FileMemo.5 (word)	W35	W35	0 to 4095	R/W	Decimal
FileMemo.6 (word)	W36	W36	0 to 4095	R/W	Decimal
FileMemo.7 (word)	W37	W37	0 to 4095	R/W	Decimal
DataMemo (16bit)	WBD	WBD	0 to 4095	R/W	Decimal
DataMemo (32bit)	BD	BD	0 to 4095	R/W	Decimal
Timer0.01S (Curr.Value)	TR	TR	0 to 511	R/W	Decimal
Timer0.1S (Curr.Value)	W9	W9	0 to 511	R/W	Decimal
Timer0.01S (Set.Value)	TS	TS	0 to 511	R/W	Decimal
Counter (Curr.Value)	CR	CR	0 to 255	R/W	Decimal
Counter (Set.Value)	CS	CS	0 to 255	R/W	Decimal
FileMemo.0 (32bit)	W30	DW30	0 to 4095	R/W	Decimal
FileMemo.1 (32bit)	W31	DW31	0 to 4095	R/W	Decimal
FileMemo.2 (32bit)	W32	DW32	0 to 4095	R/W	Decimal
FileMemo.3 (32bit)	W33	DW33	0 to 4095	R/W	Decimal
FileMemo.4 (32bit)	W34	DW34	0 to 4095	R/W	Decimal
FileMemo.5 (32bit)	W35	DW35	0 to 4095	R/W	Decimal
FileMemo.6 (32bit)	W36	DW36	0 to 4095	R/W	Decimal
FileMemo.7 (32bit)	W37	DW37	0 to 4095	R/W	Decimal

● MICREX-SX

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input memory*1	-	%IW	-	-	-
Output memory*1	-	%QW	-	-	-
Standard memory	MW1	%MW1	0 to 2490367	R/W	Decimal
Retained memory	MW3	%MW3	0 to 425983	R/W	Decimal
System memory	MW10	%MW10	0 to 511	R/W	Decimal

*1 The virtual addresses for I/O memory differs according to the system configuration. To read and write to the I/O memory area, handle this with indirect access through the standard memory in the MICREX-SX.

17 Toshiba

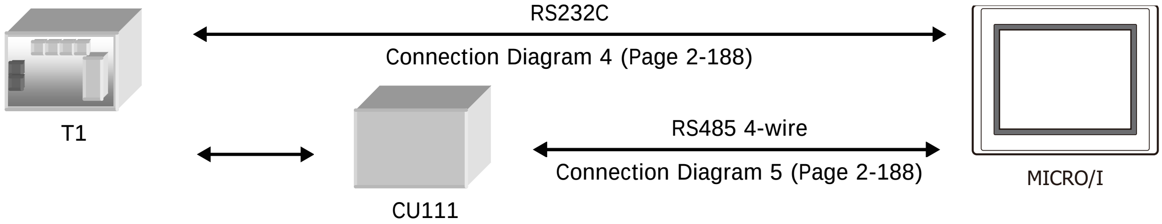
17.1 Connection Table

CPU unit		Link Unit	WindO/I-NV4 Settings		
			Interface	Flow Control	Communication Driver
PROSEC T					
T1	T1-16 T1-28 T1-40	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-188)	ER	PROSEC T
		CU111	RS422/485 4-wire Connection Diagram 5 (Page 2-188)	None	
T1S	T1-40S	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-188)	ER	
			RS422/485 4-wire Connection Diagram 3 (Page 2-187)	None	
		CU111	RS422/485 4-wire Connection Diagram 5 (Page 2-188)		
T2	PU224	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-187)		
T2E	PU234E	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-187)	ER	
		CM231E	RS422/485 4-wire Connection Diagram 5 (Page 2-188)	None	
		CM232E	RS232C Connection Diagram 2 (Page 2-187)	ER	
T2N	PU215N PU235N PU245N	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-187)		
			RS422/485 4-wire Connection Diagram 7 (Page 2-189)	None	
			RS232C Connection Diagram 6 (Page 2-188)	ER	
T3 T3H	PU315 PU325 PU325H PU326H	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-187)	None	
V					
S2T S2E L1 S2 S3	PU672T PU662T PU612E L1PU11H L1PU12H S2PU82 S2PU72 S2PU32 S2PU22 S3PU65 S3PU55 S3PU45 S3PU21	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-187)	None	PROSEC T

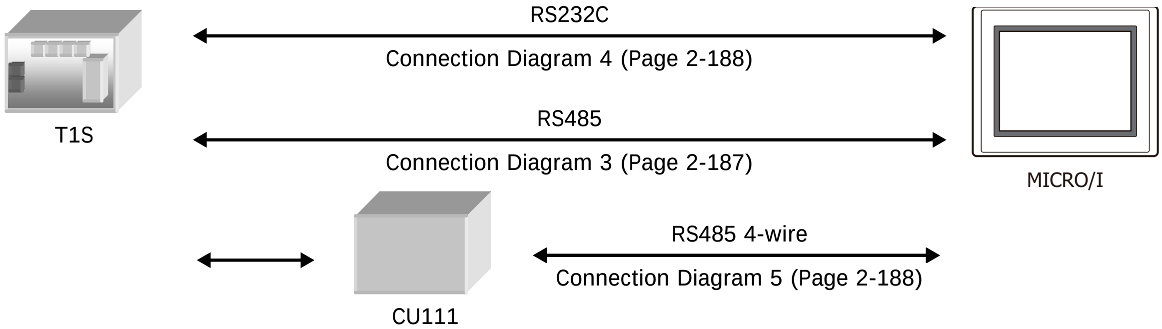
17.2 System Configuration

This is the system configuration for the connection of Toshiba PLCs to the MICRO/I.

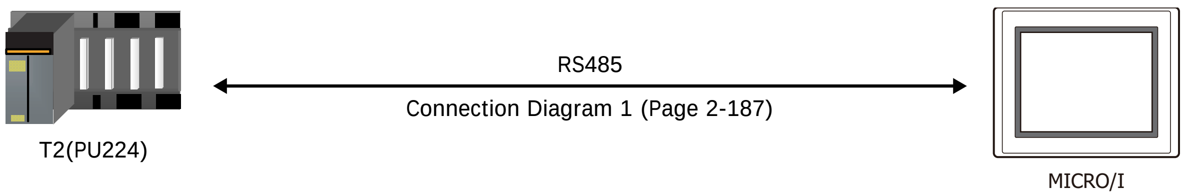
● PROSEC T Series T1



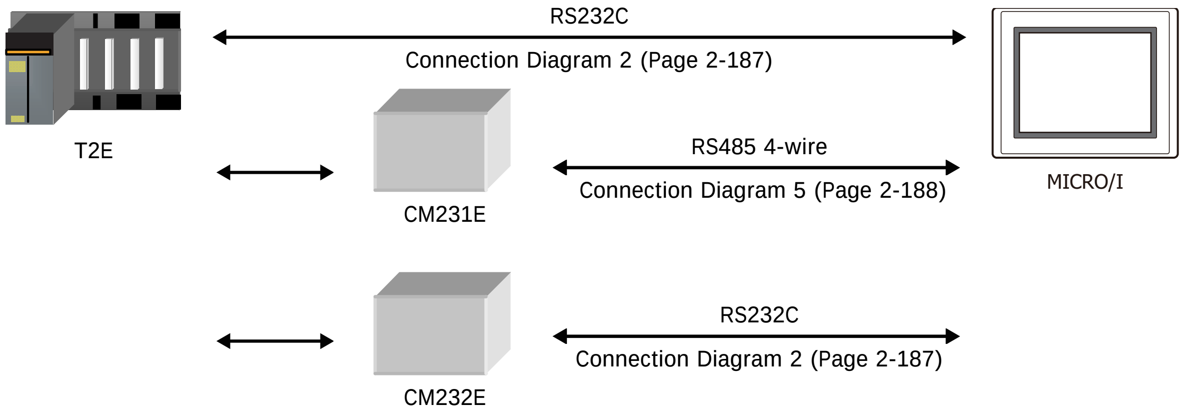
● PROSEC T Series T1S



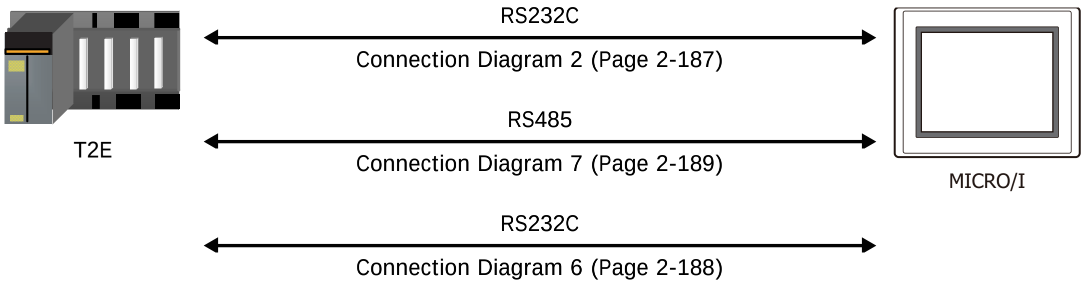
● PROSEC T Series T2 (PU224)



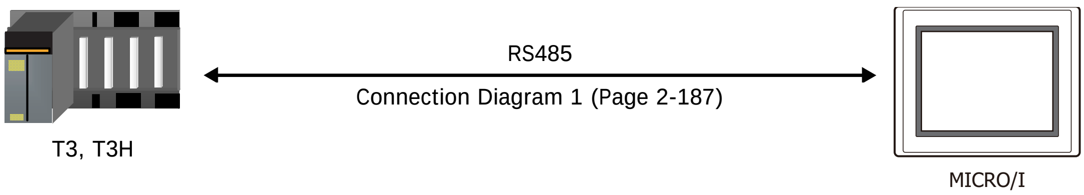
● PROSEC T Series T2E



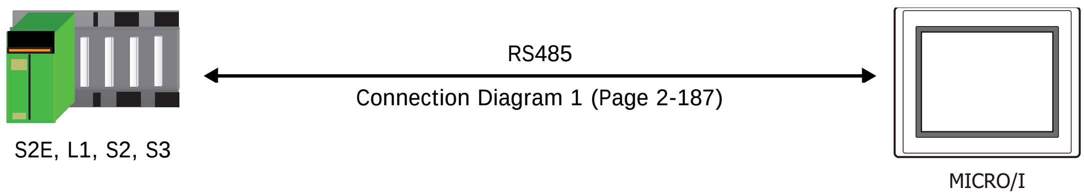
● PROSEC T Series T2N



● PROSEC T Series T3/T3H



● V Series S2T/S2E/L1/S2/S3



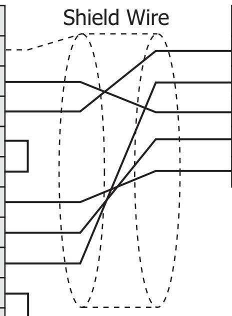
17.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: RS485 D-sub 15-pin

PLC(RS422/485):
D-sub 15-pin Female Connector

Name	Pin No.
FG	1
RXA	2
TXA	3
CTSD	4
RTSD	5
SG	7
RXB	10
TXB	11
CTSB	12
RTSB	13



HG2G-5T:
Terminal block

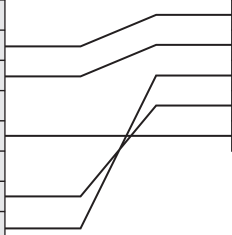
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 2: RS232C D-sub 9-pin

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
N.C.	1
RXD	2
TXD	3
N.C.	4
SG	5
N.C.	6
RTS	7
CTS	8
N.C.	9



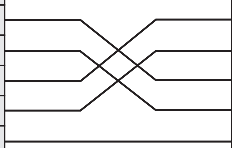
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: T1S RS485 Terminal Block

PLC(RS422/485): Terminal block

Name	Pin No.
RXA	
RXB	
TXA	
TXB	
SG	



HG2G-5T: Terminal block

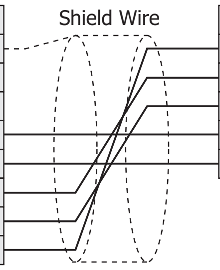
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 4: T1, T1S RS232C Mini DIN 8-pin Connector

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
P5	1
GND	2
P5	3
RTS	4
GND	5
TXD	6
CTS	7
RXD	8



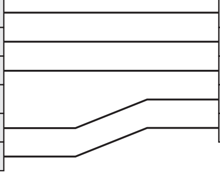
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 5: RS485 Terminal Block

PLC(RS422/485):
Terminal block

Name	Pin No.
TXA	
TXB	
RXA	
TRM	
RXB	
SG	



HG2G-5T:
Terminal block

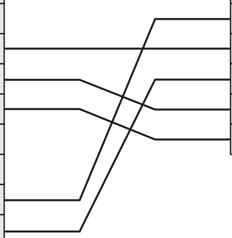
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 6: T2N RS232C D-sub 15-pin Connector (RS232C, RS485)

PLC(RS232C):
D-sub 15-pin Female Connector

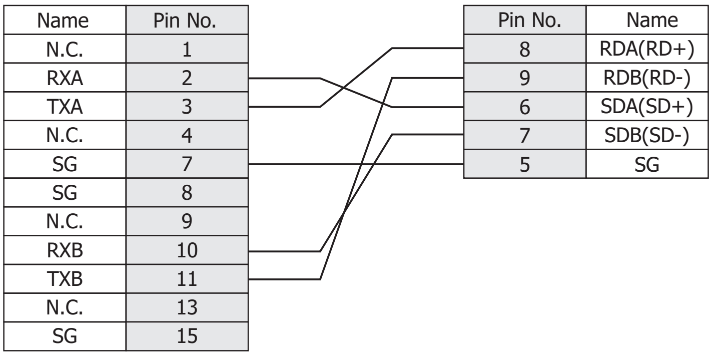
Name	Pin No.
N.C.	4
TXD	5
RTS	6
SG	7
SG	8
N.C.	9
RXD	12
CTS	14
SG	15



HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 7: T2N RS485 D-sub 15-pin Connector (RS232C, RS485)



PLC(RS422/485):
D-sub 15-pin Female Connector

Name	Pin No.
N.C.	1
RXA	2
TXA	3
N.C.	4
SG	7
SG	8
N.C.	9
RXB	10
TXB	11
N.C.	13
SG	15

HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

17.4 Environment Settings

Attend to the limitation of the configuration. It depends on the CPU unit and Link unit.

● PROSEC T Series, V Series

Items	Details
Interface	RS232C, RS485 2-wire or RS485 4-wire
Slave Number	1 to 32 (Decimal)
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER
PLC Model	Check: PROSEC Series Uncheck: EX100 Series

For details of communication setting, refer to the PROSC T Series and V Series user's manual.

17.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input device	X	X	0 to 8191F	R	*1
Output device	Y	Y	0 to 8191F	R/W	*1
Auxiliary device	R	R	0 to 4095F	R/W	*1
Special device	S	S	0 to 511F	R/W	*1
Timer device	TS	T.	0 to 999	R	Decimal
Counter device	CS	C.	0 to 511	R	Decimal
Link device	Z	Z	0 to 999F	R/W	*1
Link relay	L	L	0 to 255F	R/W	*1

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input register	XW	XW	0 to 8191	R	Decimal
Output register	YW	YW	0 to 8191	R/W	Decimal
Auxiliary register	RW	RW	0 to 4095	R/W	Decimal
Special register	SW	SW	0 to 511	R/W	Decimal
Timer register	T	T	0 to 999	R	Decimal
Counter register	C	C	0 to 511	R	Decimal
Data register	D	D	0 to 8191	R/W	Decimal
Link register	W	W	0 to 2047	R/W	Decimal
Link relay register	LW	LW	0 to 255	R/W	Decimal
File register	F	F	0 to 32767	R/W	Decimal

*1 All digits except the last digit are in decimal and the last digit is in hexadecimal.

17.6 The mapping table of devices between PROSEC T Series and V Series

When you use V Series PLCs, refer to the following table and replace a device name from PROSEC T Series to V Series.

V Series (S controller)			T Series (Computer Link)	
Variable name		Symbol	Device Name	Device Type
System register	Device	S	Special device	S
	Register	SW	Special register	SW
Data register	Device	D	Auxiliary device	R
	Register	DW	Auxiliary register, Data register	RW, D
I/O variable	Device	IX	Input device	X
		QX	Output device	Y
	Register	IW	Input register	XW
		QW	Output register	YW
User register	Register	Variable name	File register	F

- V Series (S controller) has some variables to keep compatibility with PROSEC T Series.
  Computer Link protocol of V Series can communicate those variables with the symbol of T Series.
- For details of communication setting, refer to the PROSC T Series and V Series user's manual.

18 LSIS

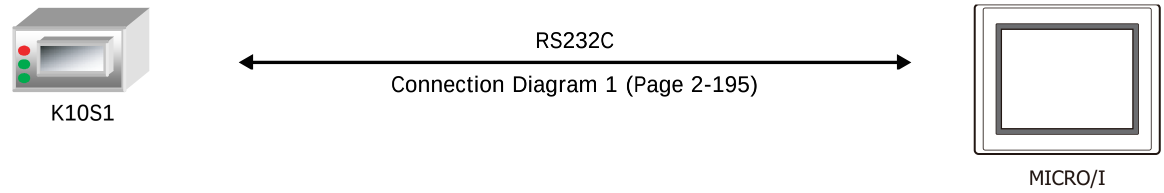
18.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MASTER-K				
K10S1	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-195)	None	MASTER-K
K80S K120S K200S	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-195)		
K80S	G7L-CUEB	RS232C Connection Diagram 3 (Page 2-195)		
	G7L-CUEC	RS422/485 4-wire Connection Diagram 4 (Page 2-196)		
K200S	G6L-CUEB	RS232C Connection Diagram 3 (Page 2-195)		
	G6L-CUEC	RS422/485 4-wire Connection Diagram 4 (Page 2-196)		
K300S	G4L-CUEA	RS232C Connection Diagram 3 (Page 2-195)		
		RS422/485 4-wire Connection Diagram 4 (Page 2-196)		

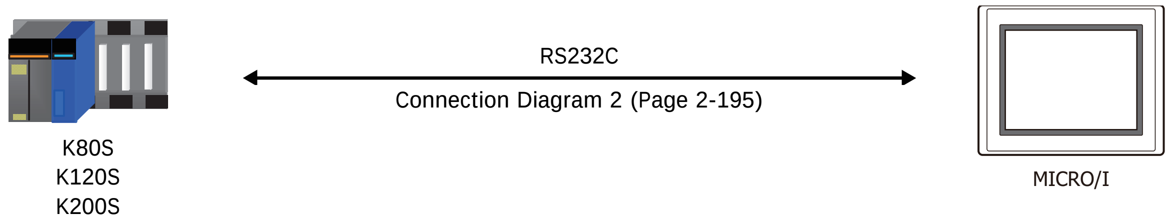
18.2 System Configuration

This is the system configuration for the connection of LSIS PLCs to the MICRO/I.

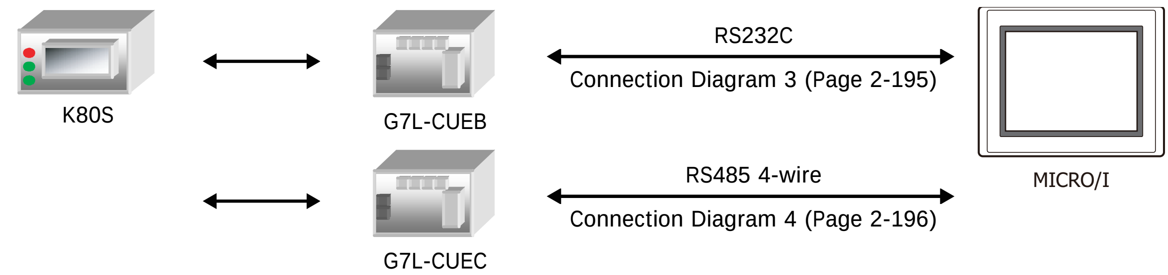
● MASTER-K K10S1 (Loader Port)



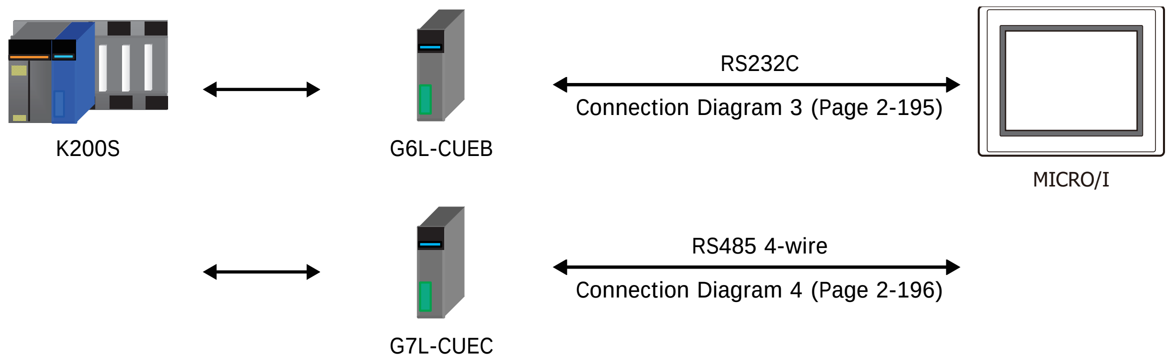
● MASTER-K K80S, K120S, K200S (Loader Port)



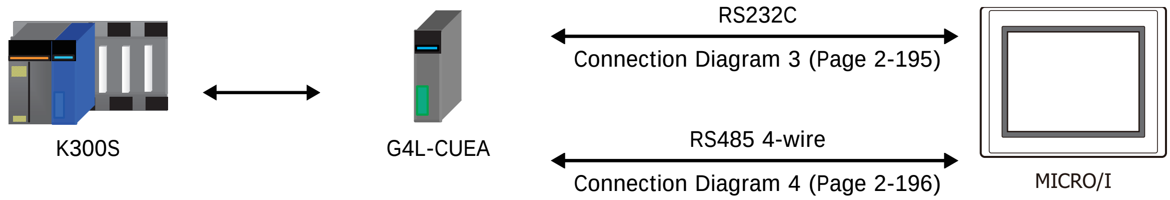
● MASTER-K K80S (Interface Module)



● MASTER-K K200S (Interface Module)



● MASTER-K K300S (Interface Module)



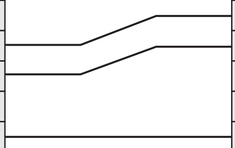
18.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: MASTER-K K10S1 (Loader Port)

PLC(RS232C):
Mini DIN 6-pin Connector

Name	Pin No.
NC	1
RD	2
SD	3
NC	4
SG	5
NC	6



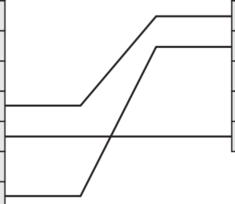
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: MASTER-K K80S, 120S, 200S (Loader Port)

PLC(RS232C):
D-sub 9-pin Male Connector

Name	Pin No.
5V	1
RXD1	2
TXD1	3
RXD2	4
SG	5
5V	6
TXD2	7
SG	8
SG	9



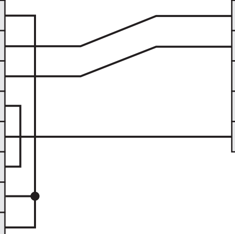
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 3: MASTER-K (Interface Module RS232C Port)

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
CD	1
RXD	2
TXD	3
DTR	4
SG	5
DSR	6
RTS	7
CTS	8
RI	9



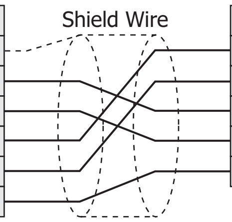
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 4:　MASTER-K (Interface Module RS485 Port)

PLC(RS422/485):
Terminal block

Name	Pin No.
FG	
RDA	
RDB	
SDA	
SDB	
SG	



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

18.4 Environment Settings

● MASTER-K (Loader Port)

Items		Details
Interface		RS232C
Baud Rate	Use the same settings as for the MICRO/I.	38400 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		None
Flow Control		None

● MASTER-K (Interface Module)

Items		Details
Interface		RS232C or RS485 4-wire
Baud Rate	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits		7 or 8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Flow Control		None or ER
Station No.		00 to 1F (Hexadecimal)

For details, refer to the MASTER-K Series user’s manual.

18.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
I/O Relay (bit)	P	P	0 to 31F	R/W	Hexadecimal
Auxiliary Relay (bit)	M	M	0 to 191F	R/W	Hexadecimal
Keep Relay (bit)	K	K	0 to 31F	R/W	Hexadecimal
Link Relay (bit)	L	L	0 to 63F	R/W	Hexadecimal
Special Relay (bit)	F	F	0 to 63F	R	Hexadecimal
Timer (Contact)	TS	T	0 to 255	R/W	Decimal
Counter (Contact)	CS	C	0 to 255	R/W	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
I/O Relay (word)	WP	P	0 to 31	R/W	Decimal
Auxiliary Relay (word)	WM	M	0 to 191	R/W	Decimal
Keep Relay (word)	WK	K	0 to 31	R/W	Decimal
Link Relay (word)	WL	L	0 to 63	R/W	Decimal
Special Relay (word)	WF	F	0 to 63	R	Decimal
Timer (Current Value)	T	T	0 to 255	R/W	Decimal
Counter (Current Value)	C	C	0 to 255	R/W	Decimal
Data Register	D	D	0 to 4999	R/W	Decimal

19 Vigor Electric

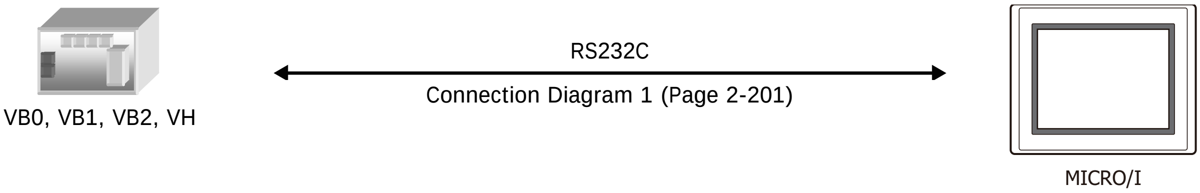
19.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
VB				
V0 VB1 VB2	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-201)	None	VB/VH
	VB-485A	RS422/485 2-wire Connection Diagram 2 (Page 2-201)		
	VB-CADP	RS232C Connection Diagram 3 (Page 2-201)		
		RS422/485 2-wire Connection Diagram 4 (Page 2-201)		
	VB-232	RS232C Connection Diagram 5 (Page 2-202)		
	VB-485	RS422/485 2-wire Connection Diagram 6 (Page 2-202)		
VH				
VH	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-201)	None	VB/VH
	VB-485A	RS422/485 2-wire Connection Diagram 2 (Page 2-201)		
	VB-CADP	RS232C Connection Diagram 3 (Page 2-201)		
		RS422/485 2-wire Connection Diagram 4 (Page 2-201)		
	VB-232	RS232C Connection Diagram 5 (Page 2-202)		
	VB-485	RS422/485 2-wire Connection Diagram 6 (Page 2-202)		

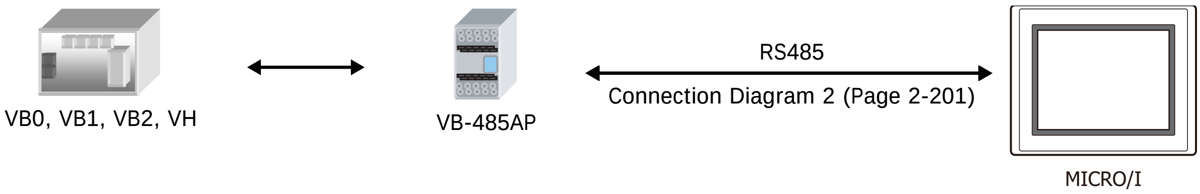
19.2 System Configuration

This is the system configuration for the connection of Vigor Electric PLCs to the MICRO/I.

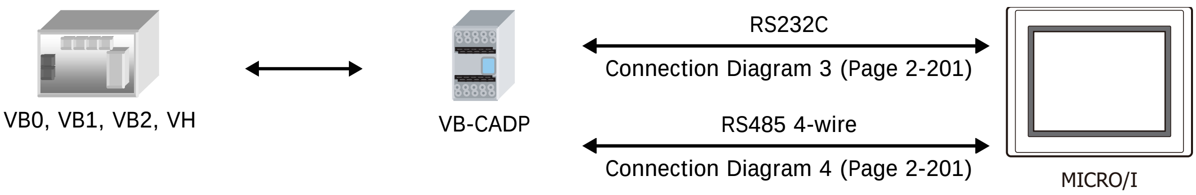
● VB0, VB1, VB2, VH (Programming Tool Communication Port)



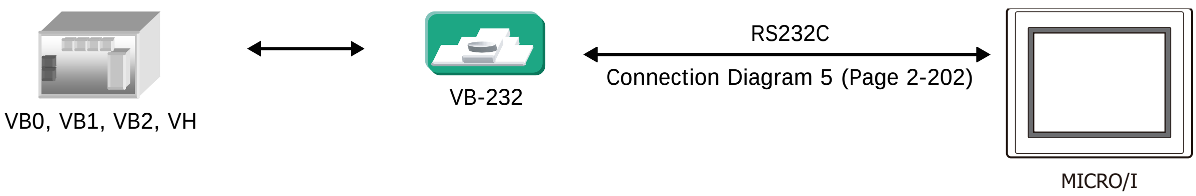
● VB0, VB1, VB2, VH (VB-485A)



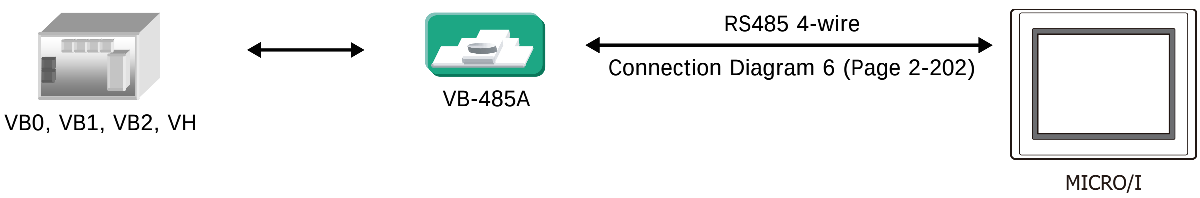
● VB0, VB1, VB2, VH (VB-CADP)



● VB0, VB1, VB2, VH (VB-232)



● VB0, VB1, VB2, VH (VB-485)



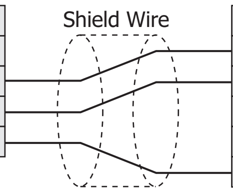
19.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: VB0, VB1, VB2, VH (Programming Tool Communication Port)

PLC(RS232C):
USB-A type connector

Name	Pin No.
RTS	1
RXD	2
TXD	3
SG	4



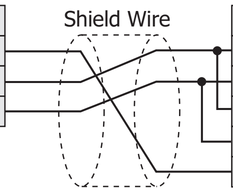
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 2: VB0, VB1, VB2, VH (VB-485A)

PLC(RS422/485):
Terminal block

Name	Pin No.
SG+	
D+	
D-	



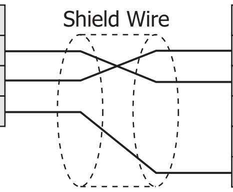
HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

● Connection Diagram 3: VB0, VB1, VB2, VH (VB-CADP) - RS232C

PLC(RS232C):
Tterminal block

Name	Pin No.
TX	
RX	
232G	



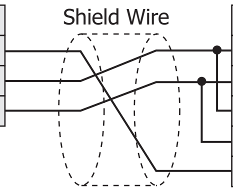
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 4: VB0, VB1, VB2, VH (VB-CADP) - RS485

PLC(RS422/485):
Terminal block

Name	Pin No.
485G	
D+	
D-	



HG2G-5T:
Terminal block

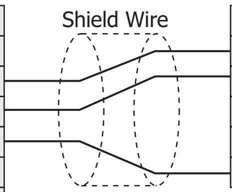
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4

● Connection Diagram 5: VB0, VB1, VB2, VH (VB-232)

PLC(RS232C):
D-sub 9-pin Female Connector

Name	Pin No.
CD	1
RXD	2
TXD	3
SG	5
RTS	7
CTS	8



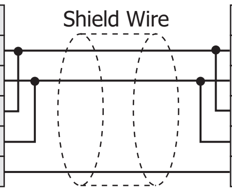
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

● Connection Diagram 6: VB0, VB1, VB2, VH (VB-485)

PLC(RS422/485):
Terminal block

Name	Pin No.
RX+	
RX-	
TX+	
TX-	
SG	



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4

19.4 Environment Settings

● VB/VH Series (Communication Port for Programming Tool)

Items		Details
Interface		RS232C
Baud Rate	Use the same settings as for the MICRO/I.	19200 bps
Data Bits		7 bits
Stop Bits		1 stop bits
Parity		Even
Flow Control		None
Station Number		0

● VB/VH Series (VB-485A, VB-232 or VB-485)

Items		Details
Interface		RS232C or RS485 4-wire
Baud Rate	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits		7 bits
Stop Bits		1 stop bits
Parity		Even
Flow Control		None
Station Number		0 to 255 (Decimal)

● VB/VH Series (VB-CADP)

Items		Details	
Port		CP2	CP3
Interface		RS232C or RS485	RS485
Baud Rate	Use the same settings as for the MICRO/I.	1200, 2400, 4800, 9600, 19200 or 38400 bps	19200 bps
Data Bits		7 bits	7 bits
Stop Bits		1 stop bits	1 stop bits
Parity		Even	Even
Flow Control		None	None
Station Number		0 to 255 (Decimal)	0 to 99 (Decimal)

For details, refer to the VB/VH Series user's manual.

19.5 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay (Bit)	X	X	0 to 777	R	Octal
Output Relay (Bit)	Y	Y	0 to 777	R/W	Octal
Auxiliary Relay (Bit)	M	M	0 to 5119	R/W	Decimal
Step Relay	S	S	0 to 999	R/W	Decimal
Special Relay	SM	M	9000 to 9255	R/W	Decimal
Timer Contact	T	T	0 to 255	R	Decimal
Timer Coil	TC	T	0 to 255	R	Decimal
Counter Contact	C	C	0 to 255	R	Decimal
Counter Coil	CC	C	0 to 255	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input Relay (Word)	WX	X	0 to 769	R	Octal
Output Relay (Word)	WY	Y	0 to 760	R/W	Octal
Auxiliary Relay (Word)	WM	M	0 to 5104	R/W	Decimal
Step Relay (Word)	WS	S	0 to 992	R/W	Decimal
Special Relay (Word)	WSM	M	9000 to 9240	R/W	Decimal
Data Registor	D	D	0 to 8191	R/W	Decimal
Special Registor	SD	D	9000 to 9255	R/W	Decimal
Timer (Current Value)	TCV	T	0 to 255	R/W	Decimal
16 Bit Counter (Current Value)	CCV	C	0 to 199	R/W	Decimal
32 Bit Counter (Current Value)	DCCV	C	2000 to 2551	R/W	Decimal

Device Address 992 in Step Relay (Word) only contains 8bits because the maximum device address of Step Relay (Bit) is 999.

20 Emerson Electric

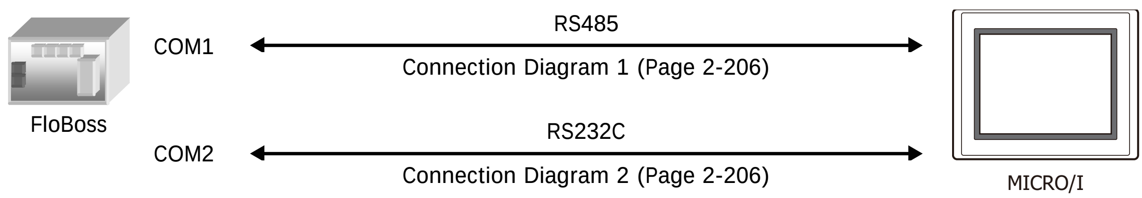
20.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FloBoss				
FloBoss107 ROC800*1	Not required	RS422/485 2-wire Connection Diagram 1 (Page 2-206)	None	ROC Protocol
		RS232C Connection Diagram2(Page 2-206)		

20.2 System Configuration

This is the system configuration for the connection of Emerson Electric devices to the MICRO/I.

● FloBoss

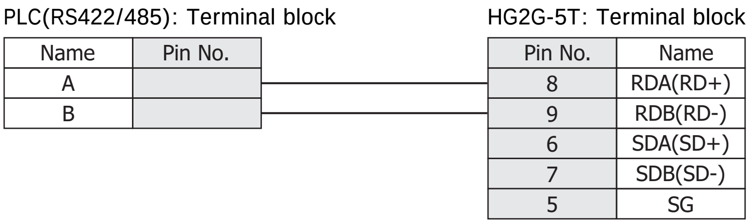


*1 When enabling the check box to **Input TLP** in the Tag Editor on the WindO/I-NV4, allows expansion of these TLPs to support the ROC Plus Protocol.

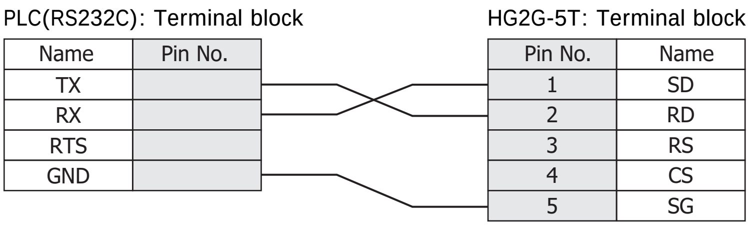
20.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection Diagram 1: FloBoss (COM1, RS485)



● Connection Diagram 2: FloBoss (COM2, RS232C)



20.4 Environment Settings

● Connecting with FloBoss COM1 (RS485) or COM2 (RS232C)

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Items	Details
Communication Interface	Interface	RS232C or RS485
	Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
	Data Bits	7 or 8 bits
	Stop Bits	1 or 2 stop bits
	Parity	None, Odd or Even
	Flow Control	None
Communication Driver	HMI Group No.	Set the Group No. of MICRO/I.
	HMI Unit No.	Set the Unit No. of MICRO/I.
Communication Driver Network	Controller Group No.	Set the Group No. of FloBoss.
	Controller Unit No.	Set the Unit No. of FloBoss.

20.5 Usable Device Addresses

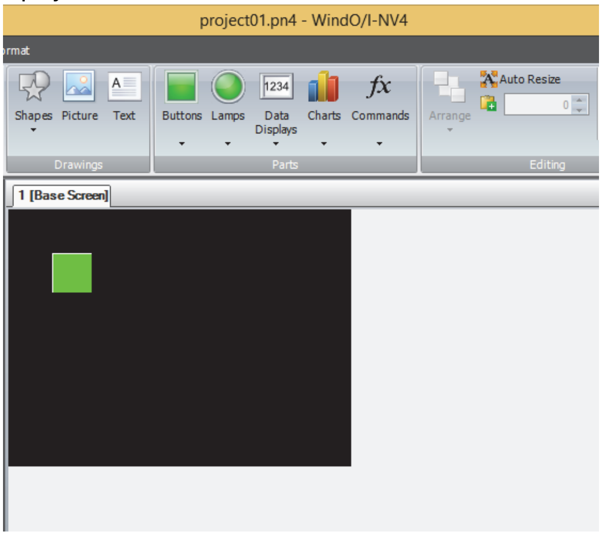
When the Emerson ROC Protocol is selected as a communication driver, check the usable external device addresses in the Tag Editor.

To display the Tag Editor, click ... to the right of the text box for setting the device address.

<u>Example: Set an external device address to the Bit Button.</u>

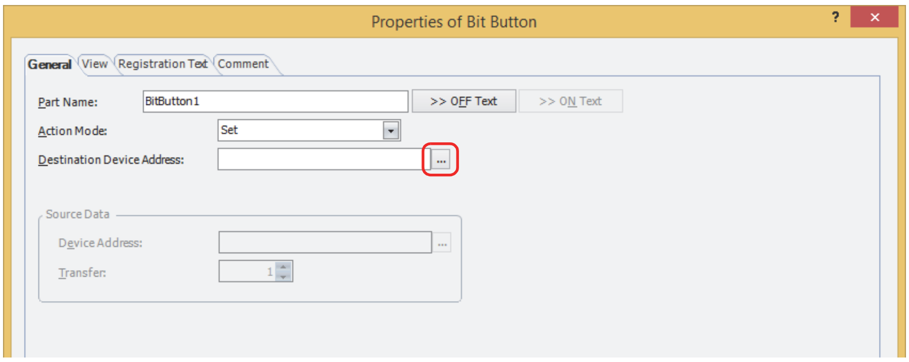
1. Place the Bit Button on the screen, and then double click it.

   The Properties dialog box is displayed.



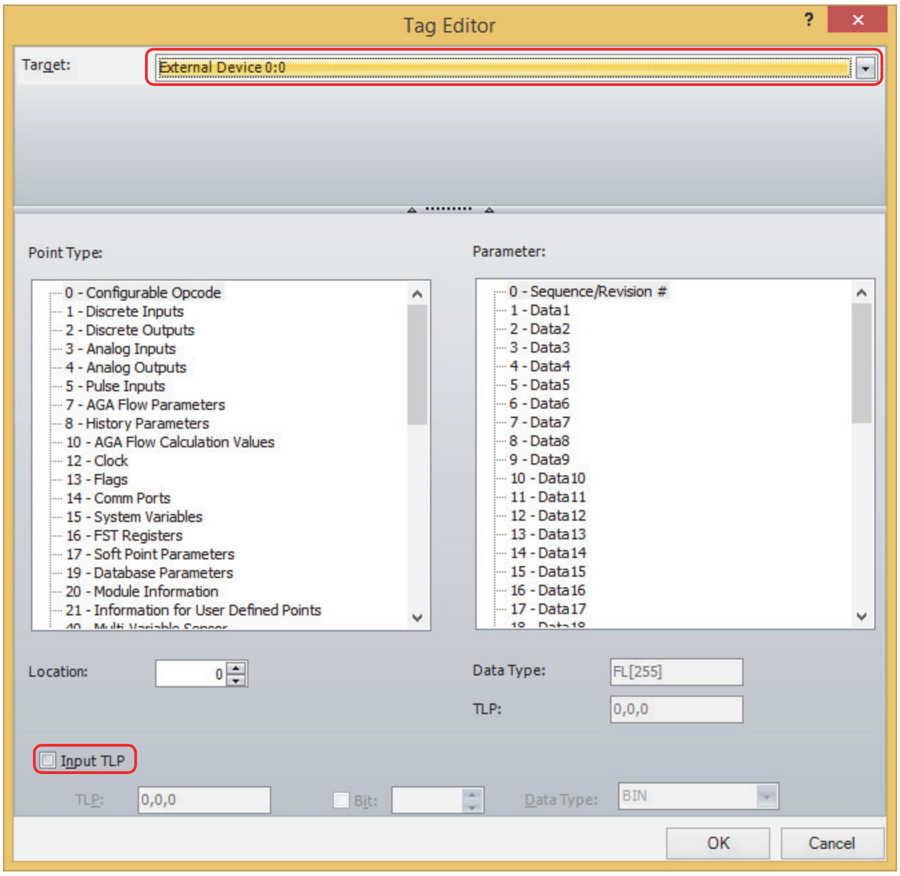
2. Click ... to the right of the **Destination Device Address**.

   Tag Editor is displayed.



3 Under **Target**, select the **External Device**.

The controls to set a device address for Emerson ROC are displayed.

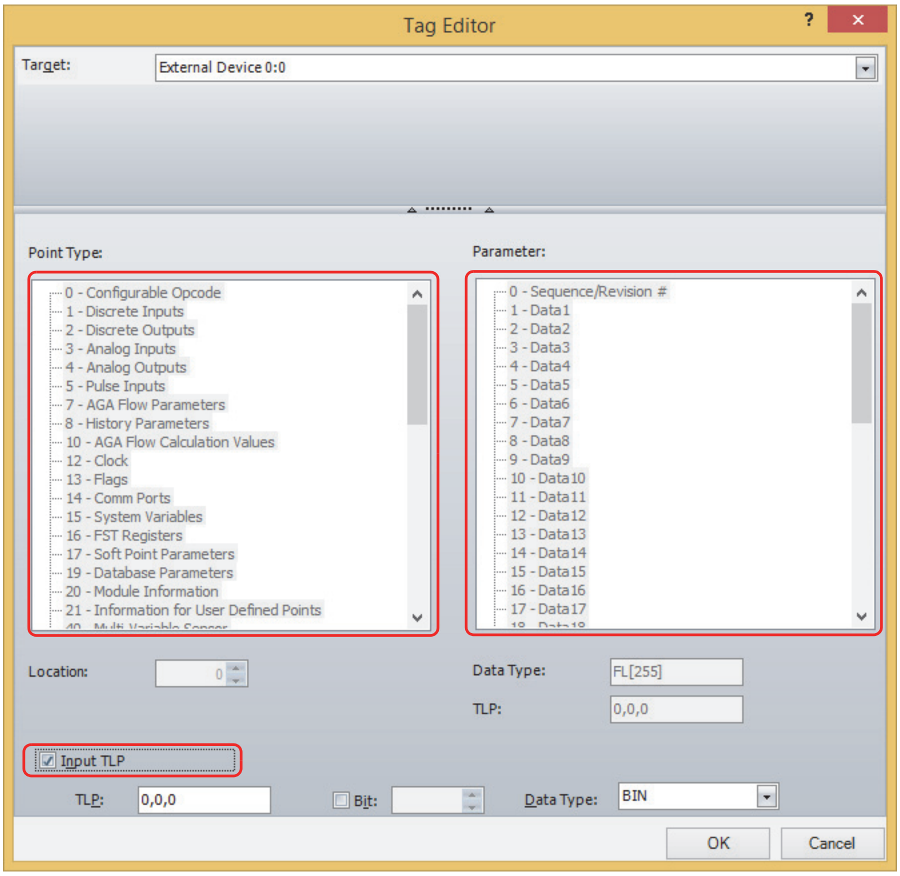


4 Two methods to select for Emerson ROC device address:

☞ "How to select the Point Type, Parameter and Location" on page2-209
☞ "How to enter the TLP manually" on page2-210

● How to select the **Point Type**, **Parameter** and **Location**

1 Select the **Point type**, **Parameter**, **Location**, and then click **OK**.
The selected device address is displayed in the **Destination Device Address**.



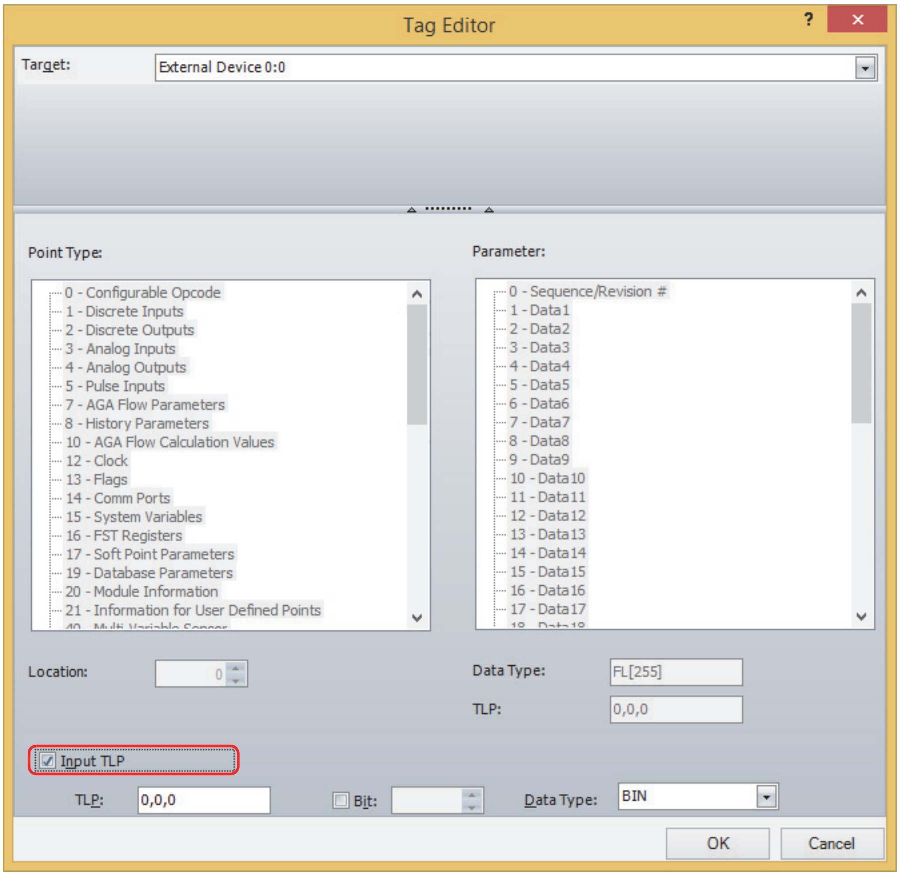
- The following shows the way to set TLP Selection which is selected in Emerson ROC software.

Emerson ROC	WindO/I-NV4	Details
Point Type	Point Type	Select Point Type which you selected in Emerson ROC software from **Point Type**.
Logical Number	Location	Find number of Logical Number (which is shown in middle of TLP) which you selected in Emerson ROC software and input it in **Location**.
Parameter	Paramete	Select Parameter which you selected in Emerson ROC software form **Parameter**.

- Device for Emerson ROC is based on ROC Protocol Specifications Manual (Form Number A4199, Part Number D301053X012, November 2011).

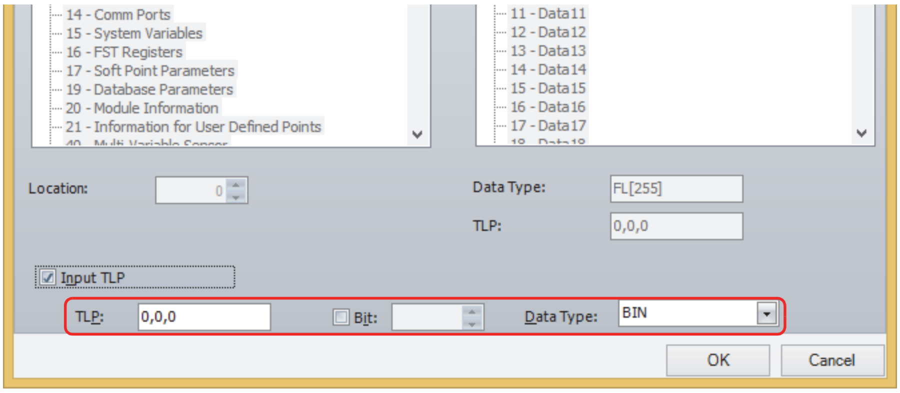
● How to enter the TLP manually

1 Select the **Input TLP**.
The **Point Type**, **Parameter**, and **Location** are disabled and the **TLP**, **Bit**, and **Data Type** are enabled.



2 Configure **TLP**, **Bit**, and **Data Type**.

In **TLP**, enter the values in the order of **Point Type**, **Location** and **Parameter**, and separate each one with a comma. When Bit Device must be configured, select the **Bit** and enter a value.



3 Click **OK**.
The configured Device Address is displayed in the **Destination Device Address**.

The order of TLP in the Emerson ROC device address differs in the following ways:

- Using Tag Editor
  Example: 22,5,3 in TLP box (Point Type, Location, Parameter)
- Emerson ROC device address composed of the entered TLP, Bit, and Data Type information.
  Example: 0:22.3[5]:UINT8 in **Destination Device**. The TLP order is 22,3,5 (Point Type, Parameter, Location). 0 is the External Device ID and UNIT8 is the Data Type.

---

21 Hitachi Industrial Equipment Systems

21.1 Connection Table

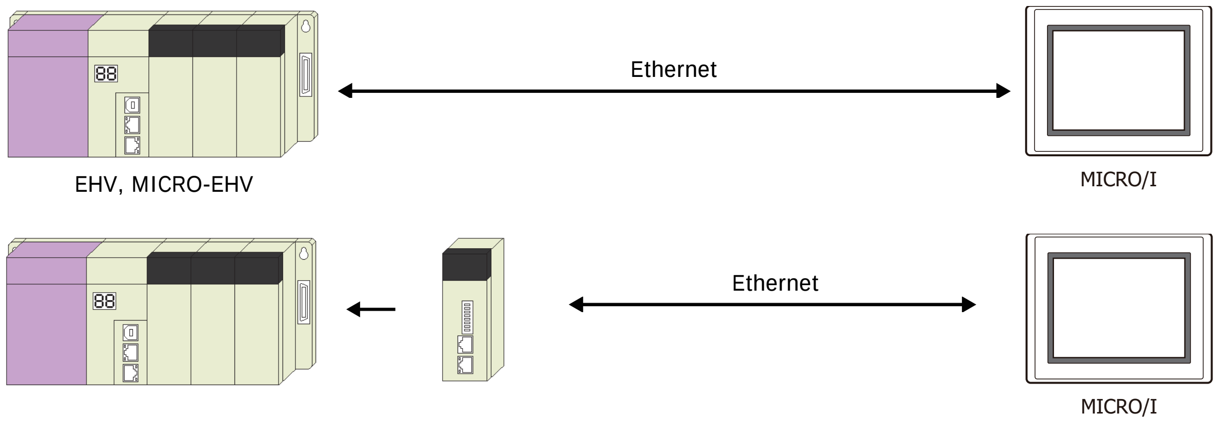
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
H Series				
CPU2-03H CPU2-07H CPU2-10H CPU2-20H CPU3-40H	LAN-ETH2	Ethernet	-	EH (Ethernet)
EH-150				
EH-CPU448 EH-CPU516 EH-CPU548 EH-CPU308A EH-CPU316A EH-CPU448A	EH-ETH2	Ethernet	-	EH (Ethernet)
EHV				
EHV-CPU16 EHV-CPU32 EHV-CPU64 EHV-CPU128	Not required (connects to Ethernet port) EH-ETH2	Ethernet	-	EH (Ethernet)
Web Controller				
EH-WD10DR EH-WA23DR EH-WD23DR	Not required (connects to Ethernet port)	Ethernet	-	EH (Ethernet)
MICRO-EH				
EH-A20 EH-D20 EH-A40 EH-D40 EH-A64 EH-D64	EH-OBETH	Ethernet	-	EH (Ethernet)
MICRO-EHV				
MVH-A40 MVH-D40 MVH-A64 MVH-D64	Not required (connects to Ethernet port)	Ethernet	-	EH (Ethernet)

2

Connection to External Devices

21.2 System Configuration

● H/EH/EHV Series (Ethernet)



H Series	+	LAN-ETH2
EH150	+	EH-ETH2
EHV	+	EH-ETH2
MICRO-EH	+	EH-OBETH

21.3 Environment Settings

● H/EH/EHV Series: Connecting to the Ethernet Port or Ethernet Unit

MICRO/I settings

Set the following items on the Project Settings dialog box in WindO/I-NV4.

Tab Name	Item	Setting
Communication Interface	IP Address	Set the IP address of MICRO/I.
	Subnet Mask	Set the subnet mask of MICRO/I.
	Default Gateway	Set the default gateway of MICRO/I.
Communication Driver Network	IP Address	Set the IP address of PLC.
	Port Number	Set the port number of PLC. (Default: 3004)

PLC Settings

Item		Setting
CPU Communication Setteings (IP Address)	IP Address	Set the IP address of PLC.
	Subnet mask	Set the subnet mask of PLC .
	Default Gateway	Set the default gateway of PLC.
	Communication speed/Method	AUTO 100M/Full Duplex 100M/Half Duplex 10M/Full Duplex 10M/Half Duplex
CPU Communication Setteings (Ethernet Communication Setteings (Task Code))	Port Number	Setting Port Number.
	Protocol	TCP/IP
	Time Out	Setting Timeout time. (sec)

This communication driver does not support CPU Link and Remote communication.

21.4 Usable Device Addresses

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
External Input (Bit)	X	X	0 to 5F95	R	*1
External Output (Bit)	Y	Y	0 to 5F95	R/W	*1
Internal Output (Bit)	R	R	0 to FFF	R/W	Hexadecimal
Data Area M (Bit)	M	M	0 to 7FFFF	R/W	Hexadecimal
Timer Counter (Contact)	TCS	TC	0 to 2559	R	Decimal
Counter Clear	CL	CL	0 to 2559	R/W	Decimal
Extension External Input (Bit)	EX	EX	0 to 5F7FF	R	*2
Extension External Output (Bit)	EY	EY	0 to 5F7FF	R/W	*2

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
External Input (Word)	WX	WX	0 to 5F7	R	*3
External Output (Word)	WY	WY	0 to 5F7	R/W	*3
Internal Output (Word)	WR	WR	0 to FFFF	R/W	Hexadecimal
Data Area WM (Word)	WM	WM	0 to 7FFF	R/W	Hexadecimal
Timer Counter (Current)	TC	TC	0 to 2559	R/W	Decimal
Data Area WN	WN	WN	0 to 1FFFF	R/W	Hexadecimal
Extension External Input (Word)	WEX	WEX	0 to 5F7F	R	*4
Extension External Output (Word)	WEY	WEY	0 to 5F7F	R/W	*4

*1 The address number range is as follows:

X 5 F 95
- Bit Number (00 to 95) Decimal
- Slot Number (0 to F) Hexadecimal
- Unit Number (0 to 5)

*2 The address number range is as follows:

EX 5 F 7FF
- Bit Number (000 to 7FF) Hexadecimal
- Slot Number (0 to F) Hexadecimal
- Unit Number (0 to 5)

*3 The address number range is as follows:

WX 5 F 7
- Word Number (0 to 7)
- Slot Number (0 to F) Hexadecimal
- Unit Number (0 to 5)

*4 The address number range is as follows:

WEX 5 F 7F
- Word Number (00 to 7F) Hexadecimal
- Slot Number (0 to F) Hexadecimal
- Unit Number (0 to 5)

22 INVERTER

22.1 Connection Table

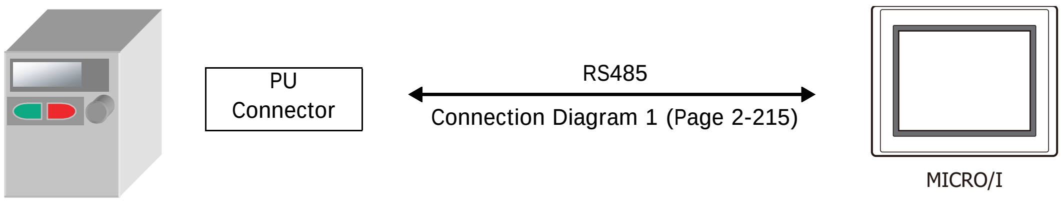
● Mitsubishi Electric

CPU unit	Link unit	WindO/I-NV4 Settings	
	Interface	Flow Control	Communication Driver
FREQROL			
FREQROL-E500 FREQROL-S500	RS422/485 4-wire Connection Diagram 1 (Page 2-215)	None	FREQROL

22.2 System Configuration

This is the system configuration for the connection of a Mitsubishi Electric inverter with the MICRO/I.

● Mitsubishi Electric



For details including the connection procedures, refer to the instruction manual provided with the Mitsubishi Electric inverter.

22.3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

● Connection diagram 1: Mitsubishi Electric inverter PU connector

PLC(R485): PU connector

Name	Pin No.
SDA	5
SDB	4
RDA	3
RDB	6
SG	1

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

22.4 Environment Settings

● Mitsubishi Electric

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS485 4-wire
Inverter No.		01 to 31
Baud Rate		4800, 9600 or 19200 bps
Data Bits		7 or 8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Ignore Write Error*1		Enable or Disable
Terminator		CR only
Communication check time interval		Set to a value other than “0”.

MICRO/I set the error code from the inverter to LSD 112.

*1 When you select the **Ignore Write Error** and MICRO/I sets a value to the device address of the inverter, MICRO/I does not display **Communication Error** even if the inverter replies NAK Error response.

22.5 Usable Device Addresses

Word Device

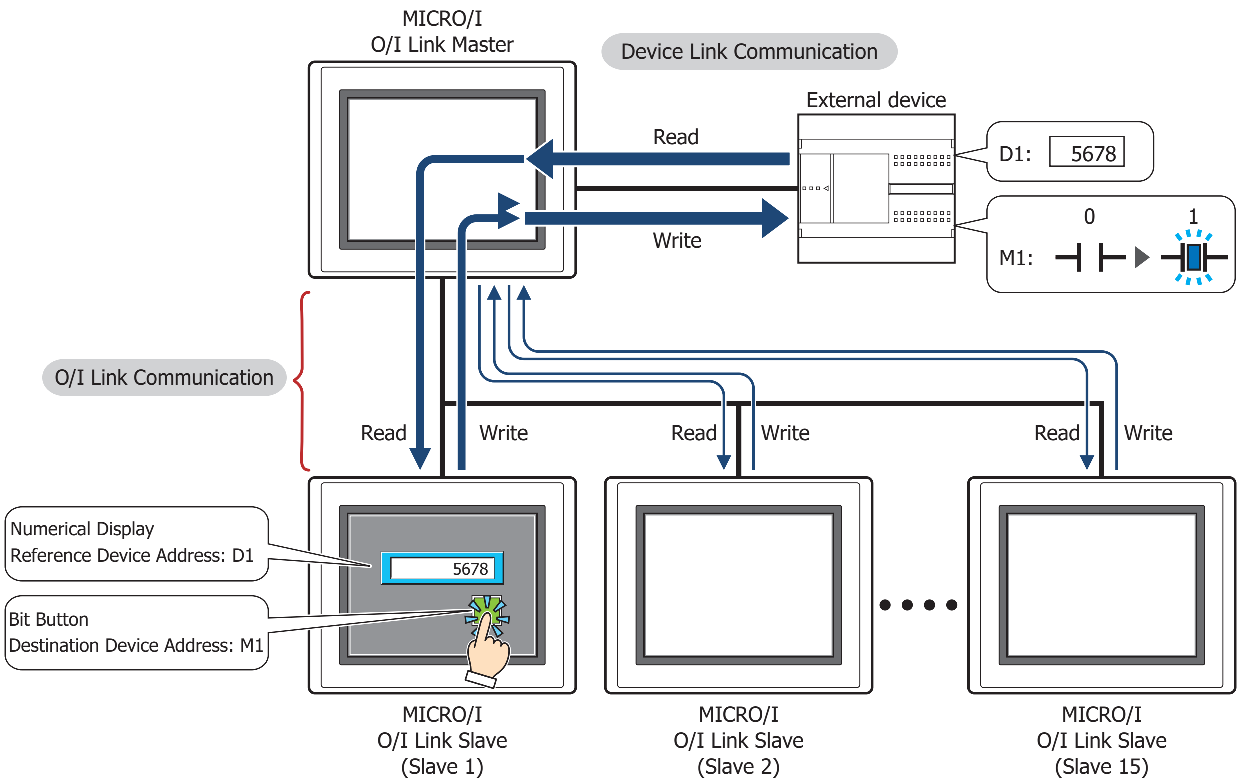
Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Parameter	P	P	0 to 999	R/W	*1
Parameter 37	P37	P	0 to 1	R/W	*2*3
Operation mode	OP	OP	0	R/W	
Output frequency	OF	OF	0	R	*4
Output current	OC	OC	0	R	
Output voltage	OV	OV	0	R	
Alarm description (1, 2)	E12	E12	0	R	
Alarm description (3, 4)	E34	E34	0	R	
Alarm description (5, 6)	E56	E56	0	R	
Alarm description (7, 8)	E78	E78	0	R	
Run command	RC	RC	0	R/W	*5
Inverter status monitor	ISM	ISM	0	R	
Set frequency read (RAM)	SFRR	SFRR	0	R	*4
Set frequency read (E2PROM)	SFRE	SFRE	0	R	*4
Set frequency write (RAM)	SFWR	SFWR	0	R/W	*4*5
Set frequency write (E2PROM)	SFWE	SFWE	0	R/W	*4*5
Inverter reset	IR	IR	0	R/W	*5
Alarm definition batch clear	EC	EC	0	R/W	*5
All parameter clear	PACL	PACL	0	R/W	*5
Link parameter expansion setting	LPES	LPES	0	R/W	
Second parameter changing	SPC	SPC	0	R/W	

For details regarding parameters and write data, refer to the instruction manual provided with the Mitsubishi Electric inverter.

*1 Change the value of the Link parameter expansion setting if you need to read or write the Link parameter.
*2 Use this device address for parameter 37.
*3 This device address is handled as a 32-bit device by combining addresses 0 and 1.
*4 This device address is only available for 4 digits data.
*5 Only the write data is available for this device address. When used for display, the displayed value of this device address is always “0”.

1 Outline

O/I Link Communication is a protocol for communication between Master and Slave, where a MICRO/I connected to the external device is configured as a Master and multiple MICRO/I (Slaves) communicate with the external device via the Master.
The Master MICRO/I unit communicates with the external device by means of Device Link Communication. The Master MICRO/I is called an O/I Link Master and a slave MICRO/I connected to the O/I Link Master is called an O/I Link Slave. A maximum of 15 O/I Link Slaves can be connected to an O/I Link Master

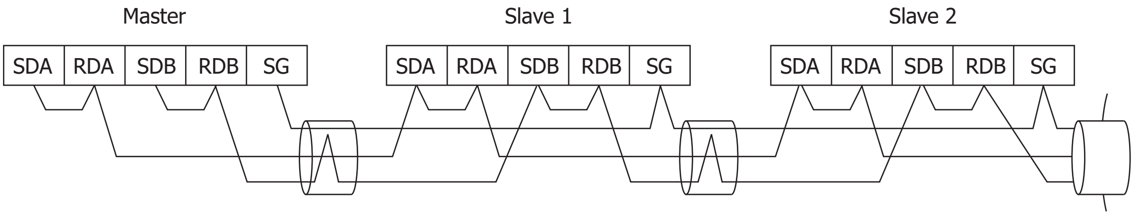


The HG4G/3G, the HG2G-5F/-5T/-5S/-S can be connected on the O/I Link Communication. The HG4G/3G, the HG2G-5F/-5S/-S must support the runtime system version 4.01 or later.

- The HG4G/3G, the HG2G-5F/-5T/-5S/-S, and the HG4F/3F/2F/2S/1F have different O/I Link Communication, therefore they can not be connected on the same O/I Link Communication.
- O/I Link Communication can only be used for an external device set to **External Device Communication 1** on the MICRO/I to use as the O/I Link Master. Set the same communication driver to **External Device Communication 1** of the O/I Link Master and the O/I Link Slave.

1.1 Wiring Diagram

● Connect between HG2G-5T



The HG4G/3G, the HG2G-5F/-5T/-5S/-S, and the HG4F/3F/2F/2S/1F have different O/I Link Communication, therefore they can not be connected on the same O/I Link Communication.

2 Settings

To use the O/I Link Communication, you must set the necessary items in the O/I Link tab of the Configuration - System Setup - Project dialog box. For details, see the WindO/I-NV4 User's Manual.

Project Settings dialog box

Tab Name	Setting Name	Description
O/I Link	O/I Link Type	Set the MICRO/I connected to the PLC as the master, and the other MICRO/I as slaves (1 to 15). Make sure that the settings do not overlap.
	Slave Settings	MICRO/I that are connected to the master MICRO/I (i.e. the one whose O/I Link Type is registered as Master) must be registered as slaves (1 to 15). Select the checkbox.

For the settings of the Device Link Communication, refer to the table below.

Tab Name	Setting Name	Master	Slave 1 to 15
System	Start Time (sec)	Set it according to the environment.	Setting not required.
	Use System Area	When **Use System Area** is selected, we recommend that you make the setting so that there is no overlap. Overlap between system areas can affect operation.	
	Use System Areas 3, 4		
	Watch Dog	Set according to your application.	
	Device Address		
	Time (sec)		
Communication Interface	SERIAL1(RS232C)	Select the **External Device Communication 1**.	Setting not required.
	SERIAL1(RS422/485)	Select the **O/I Link Master**.	Select the **O/I Link Slave**.
	Baud Rate	Match to the setting of O/I Link slave.	Match to the setting of O/I Link master.
Communication Driver	Manufacturer	For the External Device Communication 1 settings, make them the same for all MICRO/I.	
	Communication Driver		
	Transmission Wait (x10 msec)	Set it according to the environment.	For the External Device Communication 1 settings, make them the same for all MICRO/I.
	Time Out (x100 msec)		
	Retry Cycles		
	(Other setting)	Match to the setting of the PLC that you will use.	

3 Communication Service

The O/I Link Master is equipped with registers for changing the O/I Link slave connection settings and for monitoring the online status of the O/I Link slaves.
In addition, the O/I Link slaves are equipped with a register that can be used to monitor the polling period of the O/I Link master.

Online status indicates that the master and a slave are communicating normally.
And offline status indicates that either the master is not communicating with a slave or there is a problem with the communication.

3.1 O/I Link slave Registration Setting Register (LSD102 in the O/I Link master)

This register can be used to change the O/I Link slave connection settings. You can freely add and remove O/I Link slaves using this master register. The configuration of the register is given below.
O/I Link slaves whose corresponding bit is “1” are registered.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
LSD102	Slave 15	Slave 14	Slave 13	Slave 12	Slave 11	Slave 10	Slave 9	Slave 8	Slave 7	Slave 6	Slave 5	Slave 4	Slave 3	Slave 2	Slave 1	Always 0

After power is applied or the screen data is downloaded, the O/I Link slaves to be used are cleared in accordance with the connection settings made using WindO/I-NV4. To add or remove O/I Link slaves, set their corresponding bits to 1 or 0 respectively.

3.2 O/I Link slave Online Data Register (LSD104 in the O/I Link master)

This register can be used to monitor the online status of the O/I Link slaves registered to the O/I Link. The configuration of the register is given below.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
LSD104	Slave 15	Slave 14	Slave 13	Slave 12	Slave 11	Slave 10	Slave 9	Slave 8	Slave 7	Slave 6	Slave 5	Slave 4	Slave 3	Slave 2	Slave 1	Always 0

Bits corresponding to online O/I Link slaves are 1, and bits corresponding to offline O/I Link slaves or O/I Link slaves not selected for connection are 0.

If the values of the data for the O/I Link slave registration setting and the O/I Link slave online data register are not the same, either the registered O/I Link slave does not exist, or there is some problem with the O/I Link slave connection. Check the wiring and the settings.

3.3 O/I Link Polling Period Register (LSD101 in the O/I Link slaves)

This register stores the value of the polling period from the O/I Link master in 10 msec steps. Use it to provide an indication of the response time from the O/I Link master.

3.4 O/I Link slave Error information Register (LSD106 in the O/I Link master)

When the communication error occurred between O/I Link master and any O/I Link slave, the bit of each O/I Link slave turns on for one scan time.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
LSD106	Slave 15	Slave 14	Slave 13	Slave 12	Slave 11	Slave 10	Slave 9	Slave 8	Slave 7	Slave 6	Slave 5	Slave 4	Slave 3	Slave 2	Slave 1	Always 0

4 Communication Status Confirmation

4.1 O/I Link Master Error Processing

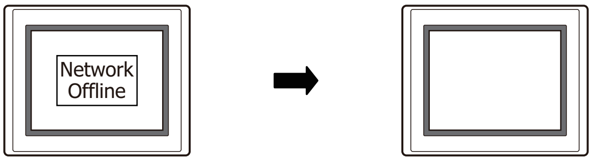
The master does not display O/I Link errors. To monitor for errors, compare LSD102 and LSD104. If they are different, it indicates that there is a communication problem.
In the case of Device Link Communication with the PLC, errors are displayed and the error information is written to the System Area.

4.2 O/I Link Slave Error Processing

When a slave is not engaged in O/I Link communication with the master, Network Offline is displayed on the center of the screen. The screen is cleared when communication starts.

Slave not communicating with the O/I Link

Slave communicating with the O/I Link

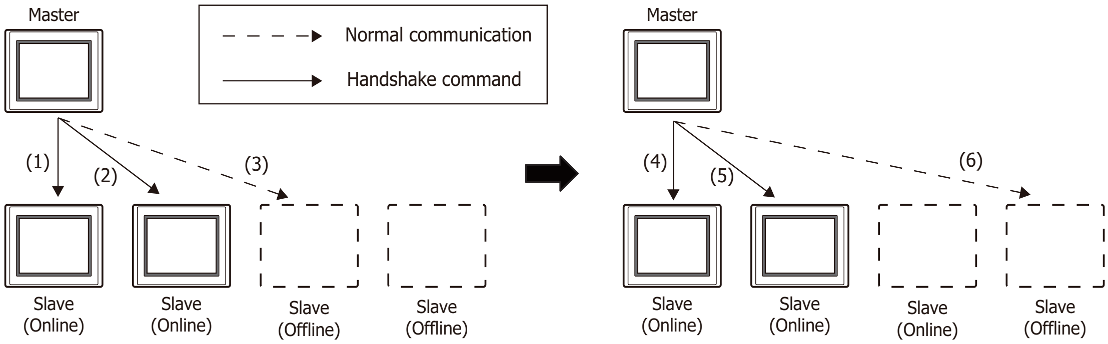


4.3 Status of a Slave in the O/I Link

If a slave unit does not exist or fails to engage in normal communication even though the slave is registered in the Slave Registration Setting Register (LSD102 in the master), the status of the slave is referred to as “offline” status. Conversely, the status of the slave in which normal communication is executed is referred to as “online” status.
When a slave unit is in offline status, the master always monitors the slave status if it is online. In one cycle, the master searches for one slave unit in the offline status after the master completes the communications with all slave units in online status. Two sets of O/I cycle periods are required in order to recognize two slave units in offline status.

2 slave units are in offline status:

The numbers in parenthesis indicate the processing sequence.

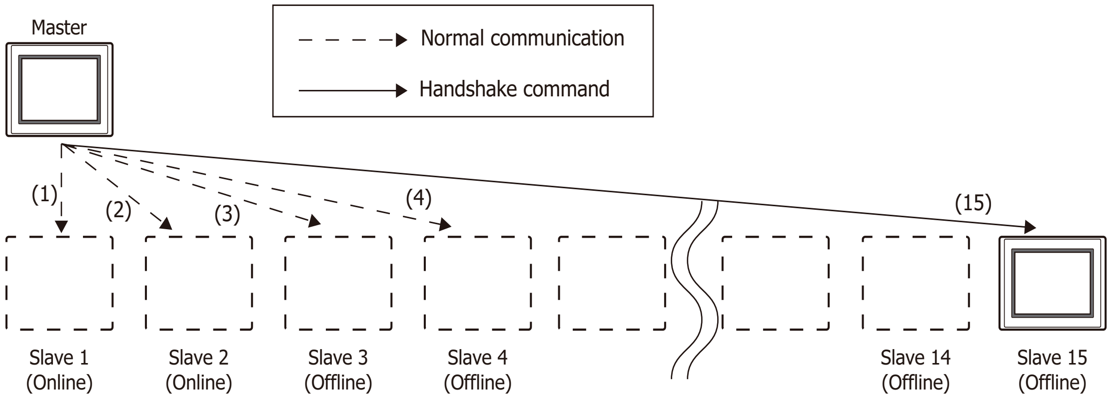


The Time Out duration for the command that detects the presence/absence of a slave (hereafter referred to as a handshake command) is set to 30 msec on the master.
When there are one or more slave units in the offline status, the total scanning time of the O/I Link will increase by 30 msec. Even when 15 slave units are in offline status, the increase will remain at 30 msec.

After power is turned on, the master sends handshake commands to the registered slave units in the ascending sequence and launches normal communication starting with the slave units that send back the response.

When 15 slave units are registered, and only the 15th slave actually exist, the master sends handshake commands sequentially starting from the 1st slave unit until it recognizes the 15th slave unit. The whole sequence takes approximately 420 msec (30 msec x 14).

After the data transmission with the 15th slave unit is completed, the master registers the slave to LSD102 and performs normal communications with Slave 15. During the communication, the master sends a handshake command to one slave unit in offline status per one O/I Link scanning.



4.4 Slave changes status from Online to Offline in the O/I Link

When a slave does not respond during normal communication between the master and a slave, the master aborts the processing and starts communicating with the next slave unit. During the next O/I Link cycle, the master will again send a command to the slave unit with which the error occurred during the previous cycle. If the slave does not respond again, the slave will set to the offline state and will be deleted from Slave online information register (LSD104 in the master).

5 Important Notes

5.1 Communication Traffic Volume of the O/I Link Network

The network scanning time which includes the time to retrieve data from PLC and also to communicate to O/I link depends on the amount of communication on the network. When there is a lot of traffic on the network, scanning may take more time, as a result it may cause MICRO/I to operate slow. At the worst case, MICRO/I is not able to complete scanning, and displays an error message, “Network Offline”.
Please follow instructions below to improve performance. These instructions should reduce amount of communication on the network.
The causes and the solutions are as follows.

Cause	Solution
Base Screen or Popup Screen is switched frequently.	Change the settings so that the screen isn’t switched frequently.
Monitoring Period in Alarm Log Settings is set shorter than the time needed for scanning network.	Please consider the time needed for network scanning before setting schedule for alarm log and parts. We strongly recommend only using the Alarm Log function on Master.
There are many External Device Addresses per screen.	Reduce the number of External Device Address set per screen.

You can check the scanning time on the network by LSD6 of the O/I Link master and LSD101 of the O/I Link Slave.

6 Result on the Performance Evaluation of the MICRO/I

Evaluation of O/I Link performance with the MICRO/I is conducted in the following conditions.

6.1 Conditions

PLC	PLC Link compatible MELSEC-Q Series Baud Rate: 115200 bps
O/I Link	No. of units: 16 units Total cable length: 200 m Baud Rate: 115 kbps

● Device address of the same type are set for O/I Link Slave 1 to 15

For the O/I Link Master, enable System Area 1 to 4 (12 words data).
For the O/I Link Slave 1 to 15, enable System Area 1 to 4(12 words data) and 50 words data which are same as each Slaves.

O/I Link Polling Period (LSD101 in the O/I Link Slaves)	220 msec
Read scan of PLC device (LSD6 in the master)	150 msec[*1]

● Device address of different types are set for O/I Link Slave 1 to 15

For the O/I Link Master, enable System Area 1 to 4 (12 words data).
For the O/I Link Slave 1 to 15, enable System Area 1 to 4(12 words data) and 50 words data which are different from each Slaves.

O/I Link Polling Period (LSD101 in the O/I Link Slaves)	250 msec
Read scan of PLC device (LSD6 in the master)	1360 msec

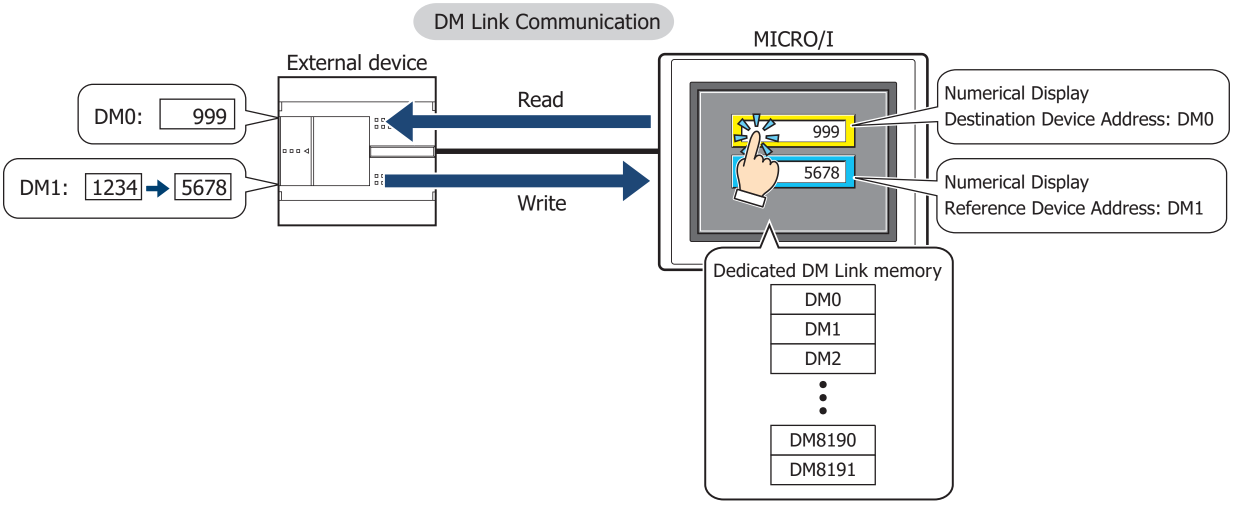
The above measurement results vary depending on the communication driver.
Use the values as a rough guide. Also make sure to evaluate the performance before constructing a system.

*1 Since the O/I Link Master performs lump communication for the device addresses used redundantly with the O/I Link Slaves, the communication time can be reduced.

Chapter 4 DM Link Communication

1 Overview

DM Link Communication reads and writes value to external devices using the MICRO/I's dedicated DM Link memory. The device type of dedicated DM Link memory is DM.
This method uses a dedicated IDEC protocol, so a communication program is required in the external device.

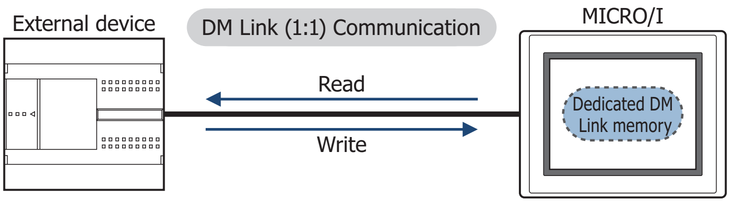


1.1 Communication Methods

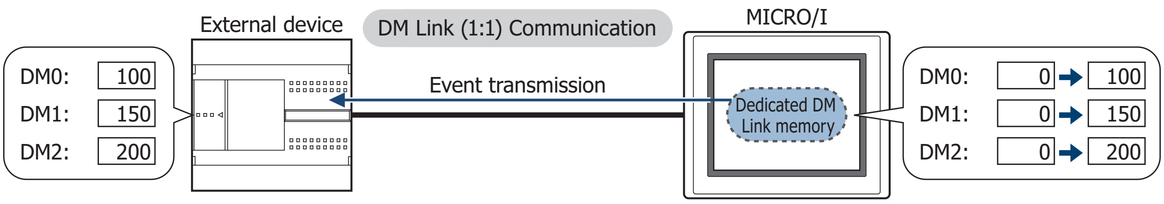
There are two basic types of DM Link Communication. DM Link (1:1) Communication, where the MICRO/I is connected to an external device; and DM Link (1:N) Communication, where multiple MICRO/I are connected to an external device.

● DM Link (1:1) Communication

The external device is connected to a single MICRO/I.

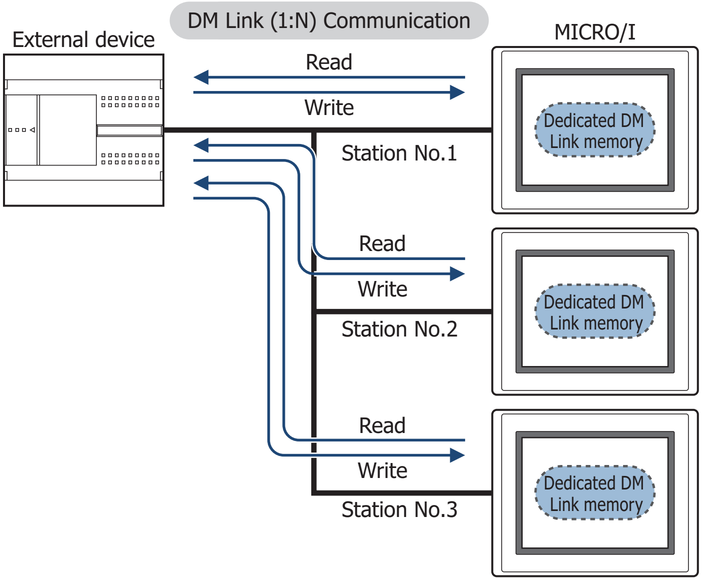


The Event Transmission function from the MICRO/I can be used with DM Link (1:1) Communication.
The Event Transmission function is a function that works as follows. When value in the dedicated DM Link memory of the MICRO/I is changed, the data is transmitted from the MICRO/I to the external device.



● DM Link (1:N) Communication

The external device is connected to multiple MICRO/I by using a serial interface.

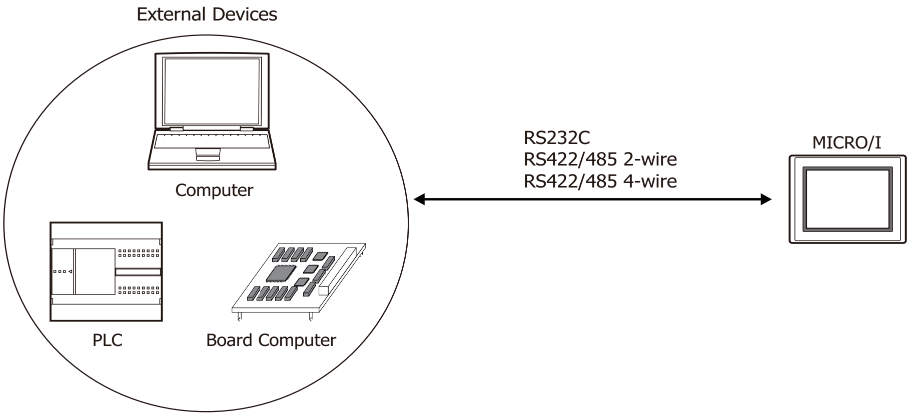


The Event Transmission function cannot be used with DM Link (1:N) communication.

2 System Configuration

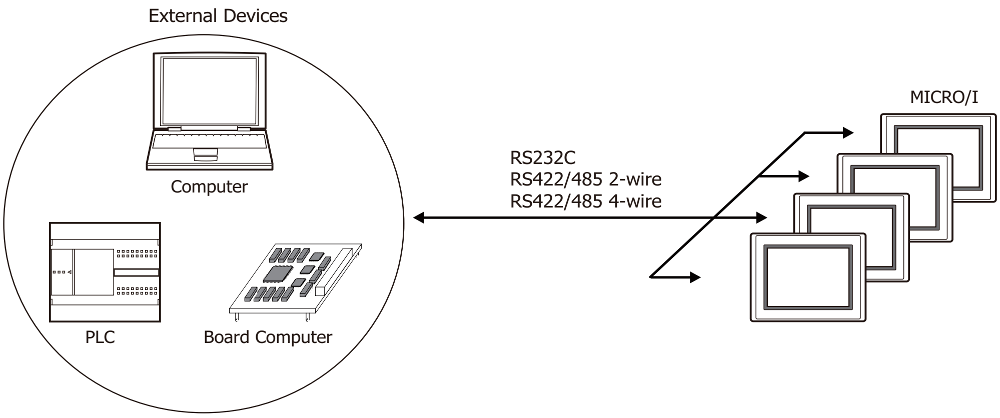
The system configuration for the DM Link communication is shown below.

2.1 DM Link (1:1) Communication



When constructing a system using RS422/485, design the circuit so that when the external device receiver input is not connected, the receiver output is in the mark state.

2.2 DM Link (1:N) Communication



- When using an RS232C connection with DM Link (1:N) communication, only one MICRO/I unit can be connected.
- When constructing a system using RS422/485, design the circuit so that when the external device receiver input is not connected, the receiver output is in the mark state.

3 Wiring

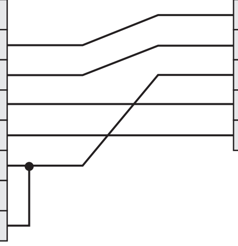
The following is an example of wiring for use with DM Link communication.

3.1 RS232C

● Flow Control setting: ER

External Device:
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8



HG2G-5T:
Terminal block

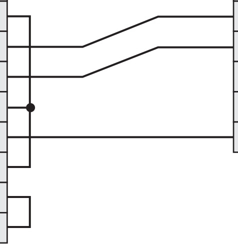
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

The pin numbers are for a typical personal computer. Be sure to check the pin arrangement for the external device that you will be using.

● Flow Control setting: None

External Device:
D-sub 9-pin Male Connector

Name	Pin No.
CD	1
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8



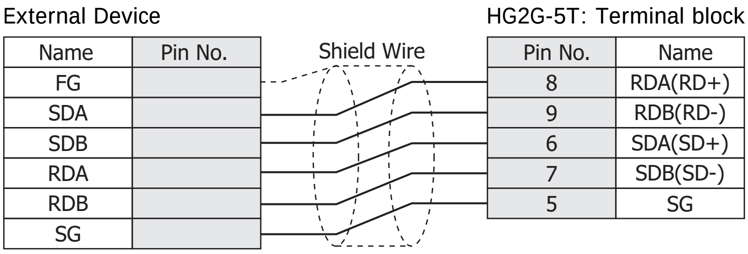
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

The pin numbers are for a typical personal computer. Be sure to check the pin arrangement for the external device that you will be using.

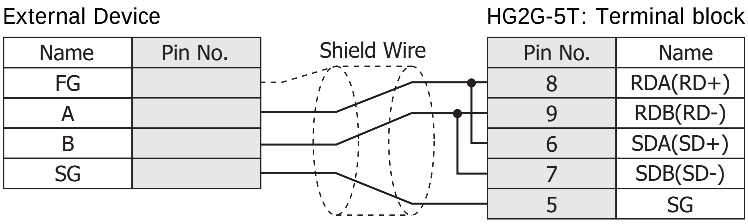
3.2 RS422/485

● 4-wire



There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

● 2-wire

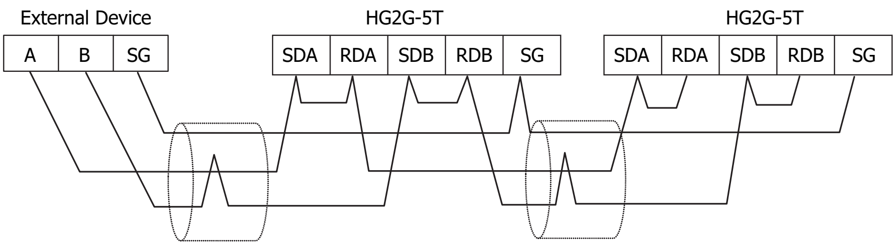


There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

● RS422/485 2-wire (DM Link (1:N) Communication: N=2)

In the following diagram, only describe the terminal name.
Refer to Chapter 4 "2-wire" for the correspondence between the terminal name and the pin number.

HG2G-5T Wiring Diagram



If more than one MICRO/I is connected to an external device, select **RS422/485 2-wire** from **Serial Interface** under **Interface Settings**.

4 Communication Specifications

4.1 Communication Method

The communication method varies based on the serial interface selected.

● DM Link (1:1) Communication

Interface	Communication Method
RS232C	Full Duplex
RS422/485 2-wire	Half Duplex
RS422/485 4-wire	Full Duplex

● DM Link (1:N) Communication

Interface	Communication Method
RS232C	Half Duplex
RS422/485 2-wire	
RS422/485 4-wire	

4.2 Communication Conditions

● DM Link (1:1) Communication, DM Link (1:N) Communication

Item	Setting
Synchronization	Asynchronous
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even

4.3 Flow control

The following choices are available for the flow control method.

● DM Link (1:1) Communication

Interface	Flow Control
RS232C	None or ER
RS422/485 2-wire	None
RS422/485 4-wire	

● DM Link (1:N) Communication

Interface	Flow Control
RS232C	None or ER
RS422/485 2-wire	None
RS422/485 4-wire	

5 Data Memory (DM) Allocation

In DM Link (1:1) Communication or DM Link (1:N) Communication, DM0 to DM13 and DM16 to DM8191 can be freely used as the User Area.

In DM Link (1:1) Communication, the Event transmission control area can be allocated to DM14 and DM15. However, the Event transmission is not supported with DM Link (1:N) Communication.

Data Memory	Description	
	DM Link (1:1) Communication	DM Link (1:N) Communication
DM0 to 11	User Area (Event Transmission can be available)	User Area
DM12, 13	User Area (Event Transmission is not available)	
DM14	D0 to D11 Event Transmission enable/disable setting 0: Disable output setting 1: Enable output setting	Reserved
DM15	Event area start address setting	Reserved
DM16 to 8191	User Area	User Area

Do not write to the reserved area.

5.1 System Area

When allocating the system area to DM, in order to avoid interference with the Event transmission control area and the Response address settings control area in DM14 and DM15, set the start address of the system area in DM Link (1:1) Communication and DM Link (1:N) Communication to DM0 or DM16 or higher. For further details regarding the system area, refer to the WindO/I-NV4 User's Manual.

5.2 Event transmission control area

This function only supports DM Link (1:1) Communication.

● D0 to D11 Event Transmission (DM14)

You can set whether or not DM0 to DM11 are to perform event transmission. When the value in DM14 is 1, system area event transmission is performed, and when it is 0, it is not performed. After power up the value in DM14 is set to 0. Use this in the case that DM0 to DM11 is specified as the system area.

● Event Area Setting (DM15)

Specify the start address for the event area in DM15. The area after the specified address is then allowed to be used for event data transmission. For example, if the value 256 is written to DM15, the area from DM256 to DM8191 becomes the event area, and if the data in this area changes an event data transmission is performed. After power up, the value in DM15 is 512.
Event data transmission is not performed in the following cases:

- When a value equal to or larger than 8192 is written to DM15.
- When the serial interface is RS422/485 2-wire.
- When data in the event area is modified by a write command from the external device.

6 Settings

The settings required in WindO/I-NV4 for the using the DM Link communication are located in the Configuration - System Setup - Project dialog box. For details, refer the WindO/I-NV4 User's Manual. Set the items in the following table in accordance with the external device that you will be using.

6.1 DM Link (1:1) Communication, DM Link (1:N) Communication

Project Settings dialog box

Tab Name	Setting Name	Description
System	Start Time (sec)	Set this to 0.
	Use System Area	Select this if you want to use the system area.
	Device Address	Specify the system area start Device address.
	Use System Areas 3, 4	Select this if you want to use the system areas 3 and 4.
	Watch Dog	If you select Watch Dog, set the Write Device and the Time (write interval). If you will transmit from the MICRO/I to the external device, set a write device for the event output area.
	Device Address	
	Time (sec)	
Communication Interface	Function	Select the Function to be used. The details of **External Device Communication 1** to the **External Device Communication 4** are configured on the Communication Driver tab.
	Baud Rate	Select the same setting used for the external device. 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps
	Data Bits	Select the same setting used for the external device. 7 or 8 bits
	Stop Bits	Select the same setting used for the external device 1 or 2 stop bits
	Parity	Select the same setting used for the external device. None, Odd or Even
	Flow Control	Select either None or ER.
	Serial Interface	Select the serial interface that you will be using. RS232C, RS422/485 2-wire or RS422/485 4-wire

Tab Name	Setting Name	Description
Communication Driver	Manufacturer	Select **IDEC System**.
	Communication Driver	Select **DM Link (1:1)** for DM Link (1:1) Communication or **DM LINK (1:N)** for DM Link (1:N) Communication.
	Transmission Wait (x10 msec)	Set the time after which the MICRO/I sends a response command to the external device after receiving a command from the external device. The actual time until the response is sent is greater than the Transmission wait time and less than the Transmission wait time +10msec.
	Time Out (x100 msec)	This setting is not required.
	Retry Cycles	
	DM LINK No.[*1]	Set the DM Link station number.
	Max Event Transmission Words[*2]	Set the max number of words for event transmission.
	Protocol[*2]	Select the number of protocol format. 0: Basic protocol format 1: Type 1 (Add an error code and “CR” to “ACK”, “NAK” in Basic protocol format.) 2: Type 2 (follows the Basic protocol format, but ETX cannot be added when the BCC check is appended)
	With BCC	Select the checkbox if you want to perform BCC checking.

*1 DM Link (1:N) only
*2 DM Link (1:1) only

7 DM Link (1:1) Communication Format

With DM Link (1:1) communication, the following communication format is used.

■ **Command (Response)**

Read
Write
Transmission Control
Clear

■ **Event**

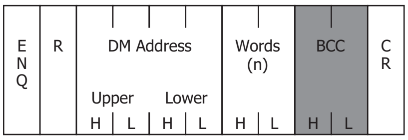
Event Transmission

7.1 Read

This command is used by the external device to read the MICRO/I data memory. One command can read a maximum of 255 words of data.

● Command

Format

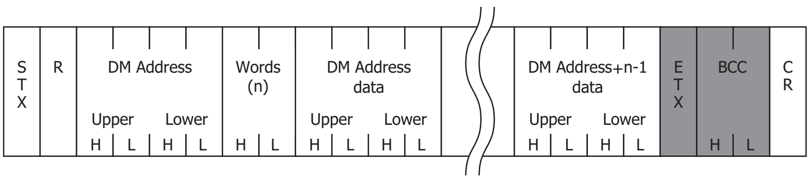


Description

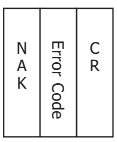
Command	Code	Description	Bytes
ENQ	05h	Command start	1
R	52h	Read Command	1
DM Address		Starting DM address for read. The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
BCC		Only required when **With BCC** is selected. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



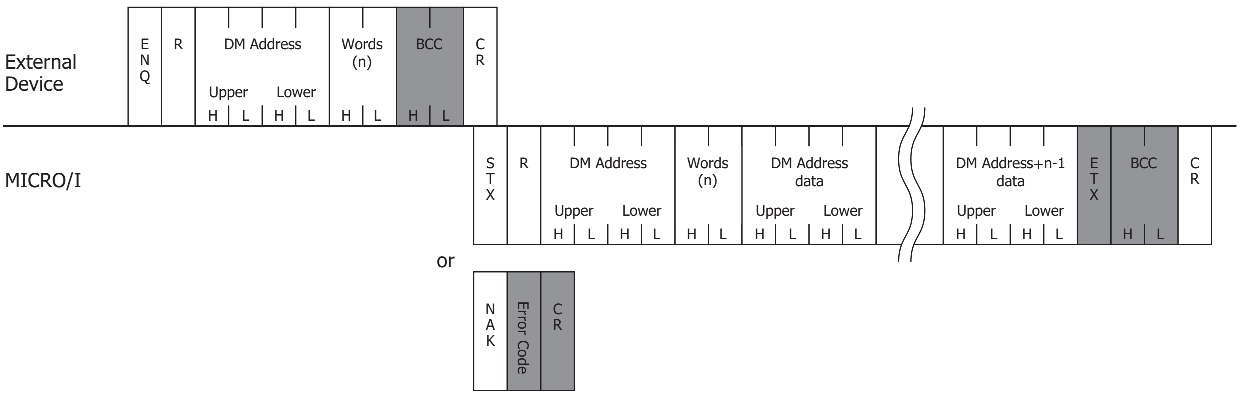
Description: Normal response

Command	Code	Description	Bytes
STX	02h	Response start	1
R	52h	Read response	1
DM address		Starting DM address for read. The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
Data		DM address data The hexadecimal value expressed using ASCII code. The words are in order from the lowest address.	4 x n n is the number of words
ETX	03h	Only required when **With BCC** is selected. (However, this is not added when Type 2 is selected for the Protocol.) At the end of the response data.	1
BCC		Only required when **With BCC** is selected. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

Description: Error response

Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Error Code		Only Protocol format 1. (Refer to Chapter 4 “10 Error Codes” on page 4-26)	1
CR	0Dh	Only Protocol format 1. End	1

● Read Sequence



Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

4 DM Link Communication

● Read Communication Example

<u>To read the two words of data in DM200 and DM201 (without BCC, Basic protocol format)</u>

If the data in DM200 is 4951 (1357h), and the data in DM201 is 9320 (2468h) the sequence is as follows.
The DM address 200 (00C8h) is converted and expressed as ASCII code.

External Device

ENQ	R	0	0	C	8	0	2	CR
05	52	30	30	43	38	30	32	0D

MICRO/I

STX	R	0	0	C	8	0	2	1	3	5	7	2	4	6	8	CR
02	52	30	30	43	38	30	32	31	33	35	37	32	34	36	38	0D

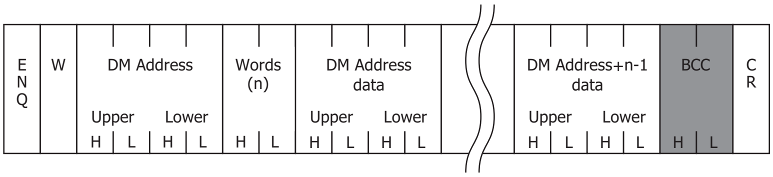
The shaded part of the command is ASCII code.

7.2 Write

This command is used by the external device to write data to the MICRO/I data memory. One command can write a maximum of 255 words of data.

● Command

Format

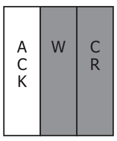


Description

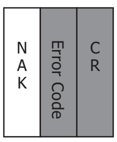
Command	Code	Description	Bytes
ENQ	05h	Command start	1
W	57h	Write Command	1
DM Address		DM address to begin writing from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to write The hexadecimal value expressed using ASCII code.	2
Data		DM ADDRESS DATA. The hexadecimal value expressed using ASCII code. The words are in order from the lowest address.	4 x n n is the number of words
BCC		Only required when 'with BCC' is set. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



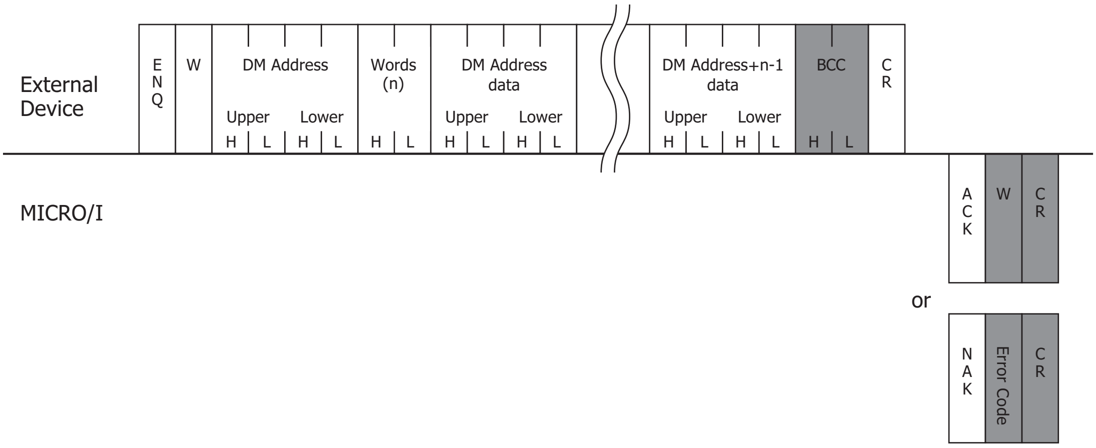
Description: Normal response

Command	Code	Description	Bytes
ACK	06h	Write completed normally.	1
W	57h	Only required when Protocol format 1 is set. Write response.	1
CR	0Dh	Only required when Protocol format 1 is set. End	1

Description: Error response

Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Error Code		Only required when Protocol format 1 is set. (Refer to Chapter 4 “10 Error Codes” on page 4-26)	1
CR	0Dh	Only required when Protocol format 1 is set. End	1

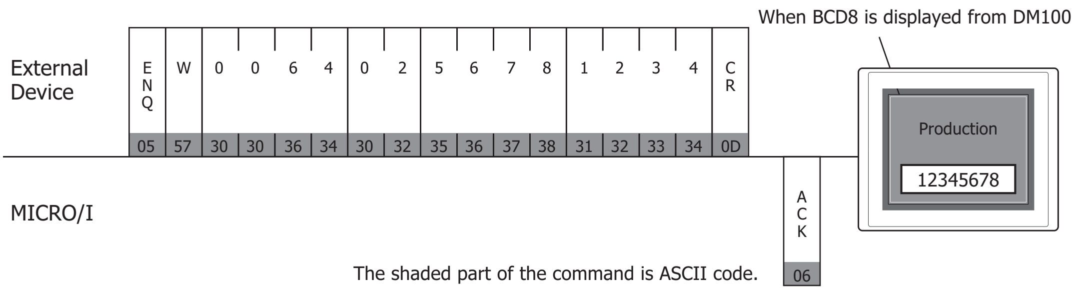
● Write Sequence



Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Write Communication Example

Write 22136 (5678h) to DM100 and 4660 (1234h) to DM101 (without BCC, Basic protocol format)



7.3 Transmission Control

The external device command controls the transmission from the MICRO/I. The commands are Transmission Prohibited and Transmission Allowed. The Transmission Control commands are the same as the general X-ON and X-OFF commands. Therefore, you can use DM Link (1:1) Communication with an external device that can perform X-ON and X-OFF control without making any settings.

● Stop Transmission Command

Format

DC3

Description

Command	Code	Description	Bytes
DC3	13h	Stop Transmission	1

- After the MICRO/I receives the DC3 command it sends up to a maximum of 15 bytes of data and then transmission is stopped.
- While transmission is stopped the MICRO/I can store up to 1023 bytes of transmission data. If event outputs occur that would cause this number to be exceeded, the MICRO/I stops operating until the data is output.
- There is no response to the Transmission Prohibited command.

● Transmission Allowed Command

Format

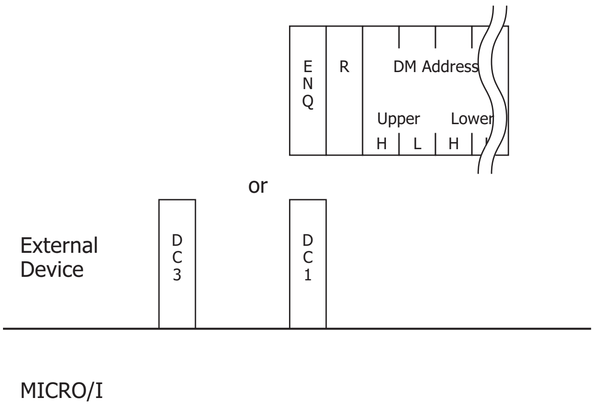
DC1

Description

Command	Code	Description	Bytes
DC1	11h	Transmission Allowed	1

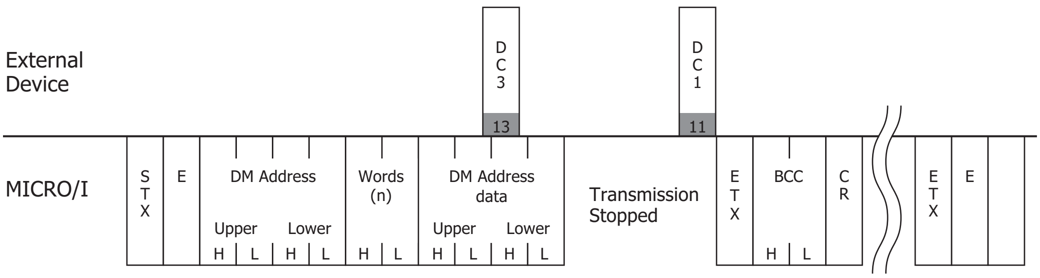
- After the MICRO/I receives DC1, it sends out all event data transmissions that were generated while transmission was stopped.
- There is no response to the Transmission Allowed command.
- When the ENQ (Start Command, 05h) is received, the MICRO/I also enters the Transmission Allowed state.
- After receiving ENQ, the MICRO/I sends out all event data transmissions generated while transmission was stopped.
- After receiving ENQ, the MICRO/I receive buffer is cleared.

● Transmission Control Sequence

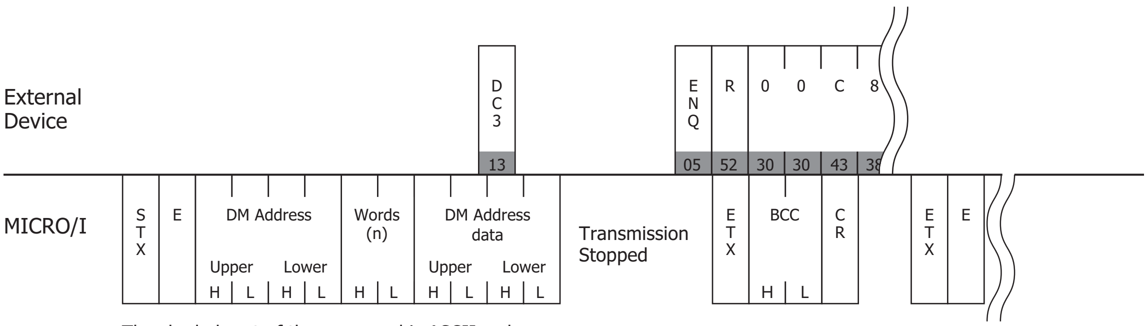


● Transmission Control Communication Example

Example 1: Transmission stopped by DC3 and started by DC1



Example 2: Transmission stopped by DC3 and started by ENQ



The shaded part of the command is ASCII code.

7.4 Clear

This external device command clears the MICRO/I receive buffer.

● Command

Format

EOT

Description

Command	Code	Description	Bytes
EOT	04h	Clear the receive buffer	1

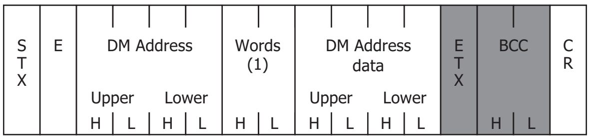
When the MICRO/I receives the EOT command, all data received prior to receiving it is cleared.

7.5 Event Transmission

This is used to perform Event Transmission when a value in the MICRO/I data memory is changed

● Command

Format

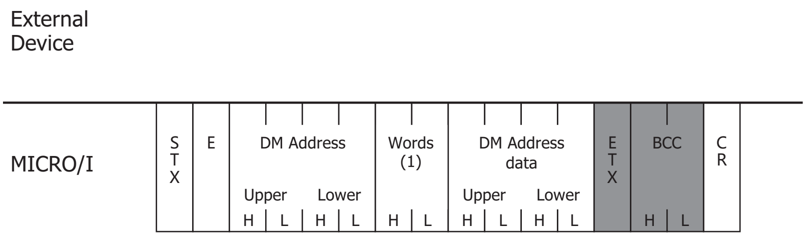


Description

Command	Code	Description	Bytes
STX	02h	Command start	1
E	45h	Event Transmission command	1
DM Address		Event Transmission address. The hexadecimal value expressed using ASCII code.	4
Words		Event Transmission words. The hexadecimal value expressed using ASCII code.	2
Data		DM Address data. The hexadecimal value expressed using ASCII code.	4
ETX	03h	Only required when “with BCC” is set. (However, this is not added when Type 2 is selected for the Protocol.) Command end of the event transmission data.	1
BCC		Only required when 'with BCC' is set. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

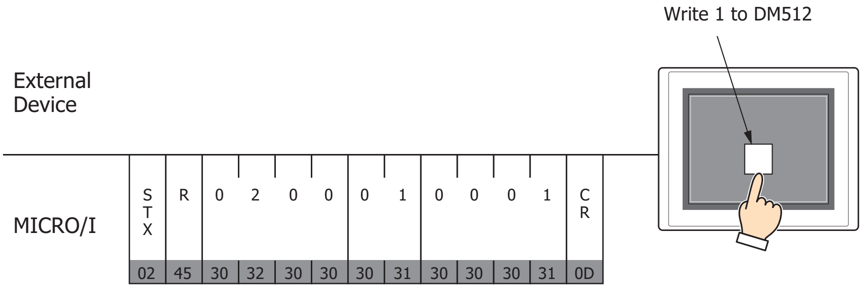
- The Max Event Transmission Words setting is set from 0 to 255.
- Number of Event Transmission words should not be larger than the number of Max Event Transmission Words. When the Max Event Transmission Words is 0, then Event Transmission words is set to 1.

● Event Data Transmission Sequence



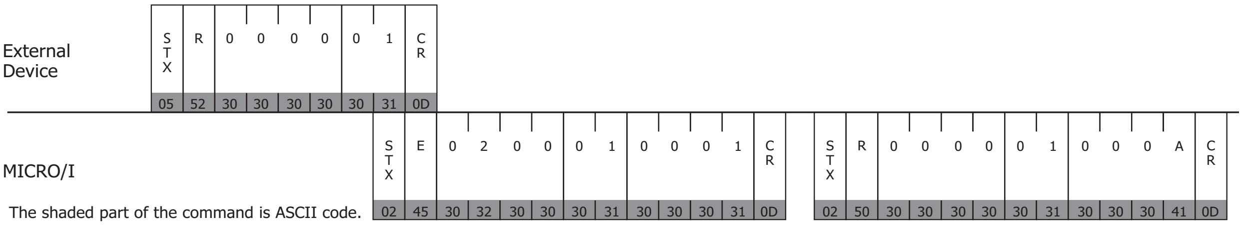
● Event Data Transmission Communication Example

Example 1: Write 1 to DM512 (without BCC)



The shaded part of the command is ASCII code.

Example 2: When the above example occurred in the middle of a read (without BCC)



4

DM Link Communication

8 DM Link (1:N) Communication Format

The communication format with DM Link (1:N) Communication is as follows.

- **Command (Response)**

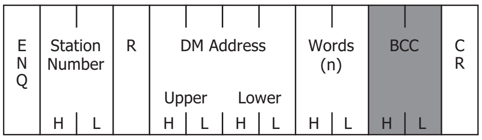
Read
Write
Clear

8.1 Read

The Read command is used by the external device to read the MICRO/I data memory.
One command can read a maximum of 255 words of data.

● Command

Format

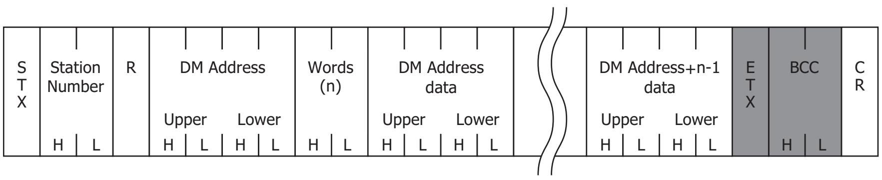


Description

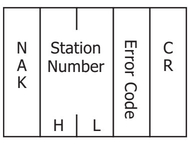
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Station Number		DM Link Station Number expressed in ASCII.	2
R	52h	Read Command	1
DM address		DM address to start reading from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
BCC		Only required when 'with BCC' is set. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



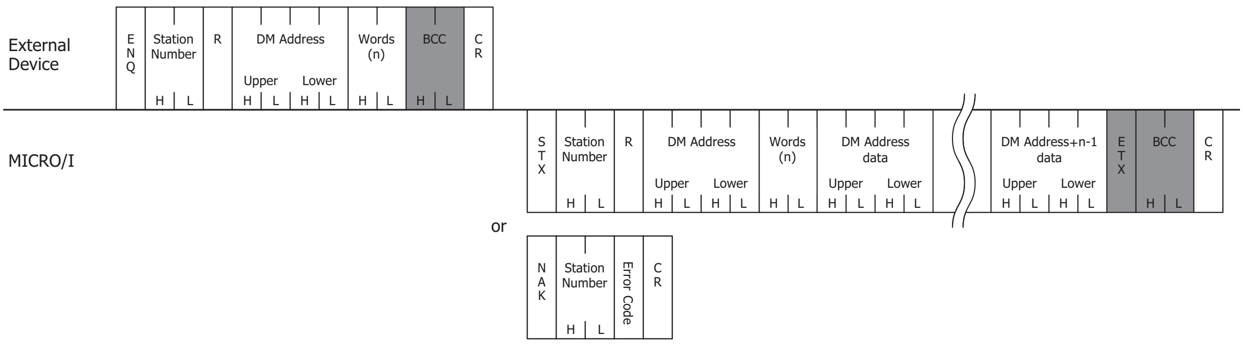
Description: Normal response

Command	Code	Description	Bytes
STX	02h	Response start	1
Station Number		DM Link Station Number expressed in ASCII.	2
R	52h	Read response	1
DM address		DM address to start reading from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
Data		DM Address Data The hexadecimal value expressed using ASCII code. The words are in order from the lowest address.	4 x n n is the number of words
ETX	03h	Only added when 'with BCC' is set. End of the response data.	1
BCC		Only added when 'with BCC' is set. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

Description: Error response

Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Station Number		DM Link Station Number expressed in ASCII.	2
Error Code		Refer to Chapter 4 “10 Error Codes” on page 4-26.	1
CR	0Dh	End	1

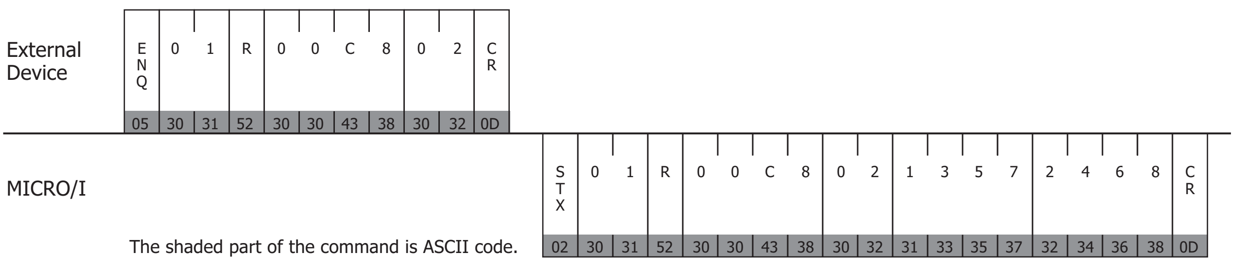
● Read Sequence



Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Read Communication Example

Read the two words of data from DM200 and DM201 of DM Link Station Number 1 (without BCC)
If the data in DM200 is 4951 (1357h), and the data in DM201 is 9320 (2468h) the sequence is as follows.
The DM address 200 (00C8h) is converted to ASCII code and stored.



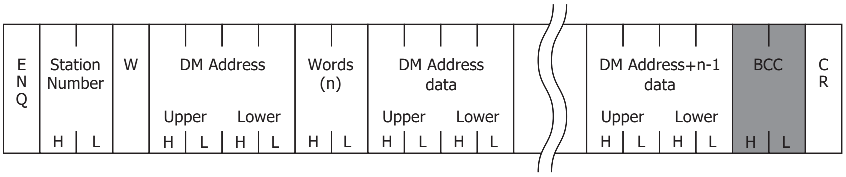
The shaded part of the command is ASCII code.

8.2 Write

This command is used by the external device to write data to the MICRO/I data memory.
One command can write a maximum of 255 words of data.

● Command

Format

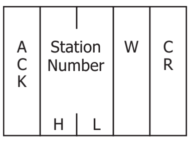


Description

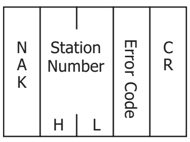
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Station Number		DM Link Station Number expressed in ASCII.	2
W	57h	Write Command	1
DM Address		DM address to start writing from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to write The hexadecimal value expressed using ASCII code.	2
Data		DM Address Data The hexadecimal value expressed using ASCII code. The words are in order from the lowest address.	4 x n n is the number of words
BCC		Only added when 'with BCC' is set. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



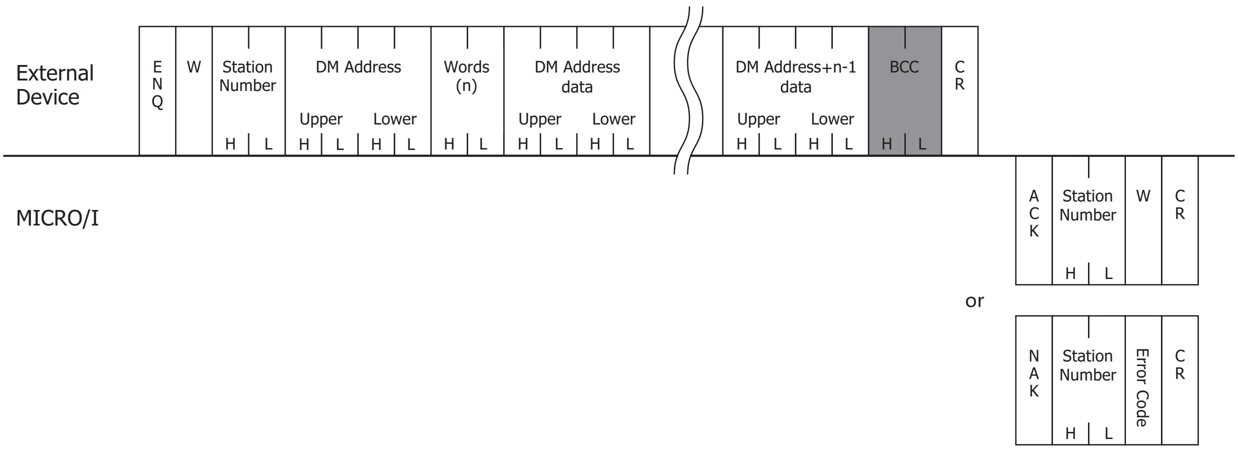
Description: Normal response

Command	Code	Description	Bytes
ACK	06h	Write finished correctly.	1
Station Number		DM Link Station Number expressed in ASCII.	2
W	57h	Write response	1
CR	0Dh	End	1

Description: Error response

Transmission Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Station Number		DM Link Station Number expressed in ASCII.	2
Error code		Refer to Chapter 4 “10 Error Codes” on page 4-26.	1
CR	0Dh	End	1

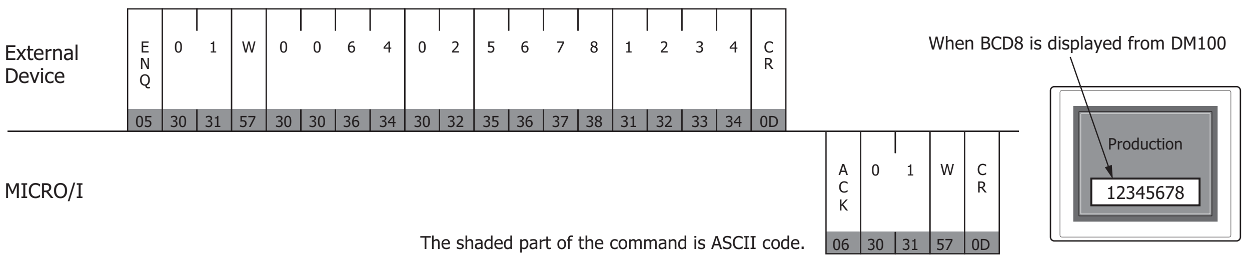
● Write Sequence



Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Write Communication Example

Write 22136(5678h) to DM100 and 4660(1234h) to DM101 (without BCC).



4

DM Link Communication

8.3 Clear

This command is used by the external device to clear the MICRO/I receive buffer.

Format

EOT

Description

Command	Code	Description	Bytes
EOT	04h	Clear receive buffer	1

When the MICRO/I receives the EOT command, all data received prior to receiving it is cleared.

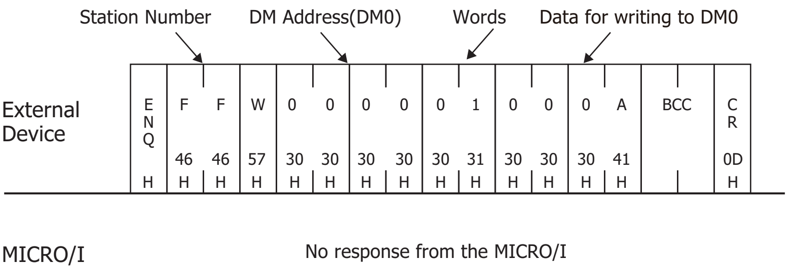
8.4 Station Number

With DM Link (1:N) Communication, the MICRO/I receives commands when the station number is its own station number, FFh or 00h. The operations that take place are given in the following table.

Station Number	Operation
The station number of the MICRO/I	Reads from or writes to the data memory and returns a response. This is used in normal operation.
FFh	Writes to the data memory, but does not return a response. This is used to write to all connected MICRO/I units at one time.
00h	Reads from the data memory, and returns a response. This is used for monitoring.

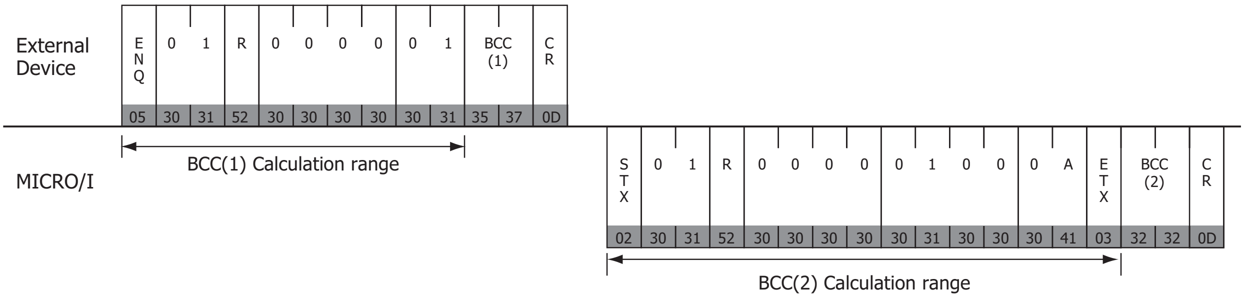
● Communication Example

Write Ah to DM0 (with BCC)



9 BCC Calculation

9.1 BCC Calculation Example (for DM Link (1:N) Communication)



Refer to the Exclusive OR (XOR) truth table to calculate BCC.

A XOR B=C

A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

BCC(1) Calcuration

05h
30h
31h
52h
30h
30h
30h
30h
30h
31h

XOR Result 57h

BCC(1)	35h	37h

BCC(2) Calcuration

02h
30h
31h
52h
30h
30h
30h
30h
30h
31h
30h
30h
30h
41h
03h

XOR Result 22h

BCC(2)	32h	32h

10 Error Codes

- When a command that starts with the ENQ (05h) code and ends with CR (0Dh) code is received, but the content is not valid, an error response is returned.
- The error response codes are as follows.

Error Code	Type	Error Description
'2' (32h)	BCC	BCC doesn't match (when “with BCC” is set)
'3' (33h)	Command	A command other than 'W' or 'R' was received (with the exception of the Clear command)
'4' (34h)	Address Number	Invalid DM address (Outside DM0 to DM8191)
'5' (35h)	Number of Words	Invalid number of words specified (outside the range 1 to 255 or the DM address + No. of words - 1 exceeds 8191)
'6' (36h)	Received Bytes	Received bytes invalid (the number of words of data did not exist)

The error code is a code appended to a negative acknowledgment when 1 (Type 1) is selected in Protocol of DM Link (1:N) Communication or DM Link (1:1) Communication. Not used when 0 (Basic protocol format) is selected in Protocol on the Communication Driver tab of DM Link (1:1) Communication.

10.1 Response Time

The MICRO/I replies to commands from the external device within 10msec plus the transmission wait. However, the delay may occur when the screen image is updating.

If there was no response from the MICRO/I, retry sending command on the external device side after an amount of time longer than "2 seconds + transmission wait time" has elapsed.

Chapter 5 Modbus

1 Connection Table

Selecting Modbus RTU Master or Modbus TCP Client for the Communication Driver allows the user to use the 1:N Communication function (☞ Chapter 6 “Communication with Multiple External Devices” on page 6-1).

1.1 Compatible Protocols

Protocol	WindO/I-NV4 Settings		
	Interface	Flow Control	Communication Driver
Modbus RTU Master	RS232C RS422/485 2-wire RS422/485 4-wire	None, ER	Modbus RTU Master
Modbus RTU Slave	RS232C RS422/485 2-wire RS422/485 4-wire	None, ER	Modbus RTU Slave
Modbus ASCII Master	RS232C RS422/485 2-wire RS422/485 4-wire	None, ER	Modbus ASCII Master
Modbus TCP Client	Ethernet	-	Modbus TCP Client
Modbus TCP Server	Ethernet	-	Modbus TCP Server

For details about Modbus TCP Server and Modbus RTU Slave, refer to Chapter 5 “6 Modbus TCP Server/Modbus RTU Slave Function” on page 5-12.

1.2 Compatible Table

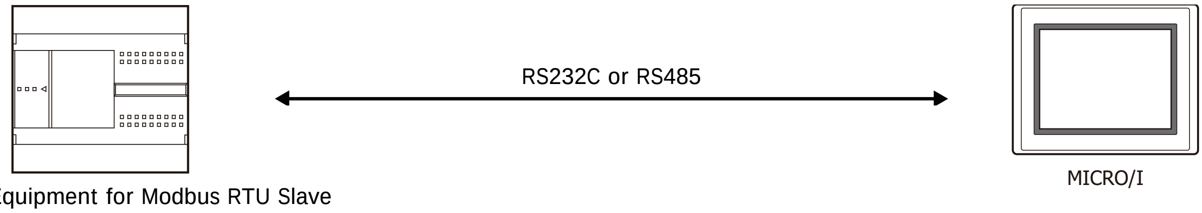
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
Schneider Twido				
TWD LC*A 10DRF	Not required (connects to CPU unit directly)	RS422/485 2-wire Connection Diagram 2 (Page 5-9)	None	Modbus RTU Master, Modbus ASCII Master
TWD LC*A 16DRF TWD LC*A 24DRF TWD LCA* 40DRF	Not required (connects to CPU unit directly)	RS422/485 2-wire Connection Diagram 2 (Page 5-9)		
	TWD NAC 232D	RS232C Connection Diagram 1 (Page 5-9)	ER	
	TWD NAC 485D	RS422/485 2-wire Connection Diagram 2 (Page 5-9)	None	
	TWD NAC 485T	RS422/485 2-wire Connection Diagram 3 (Page 5-9)		
TWD LMDA 20DTK TWD LMDA 20DUK TWD LMDA 20DRT TWD LMDA 40DTK TWD LMDA 40DUK	Not required (connects to CPU unit directly)	RS422/485 2-wire Connection Diagram 2 (Page 5-9)		
	TWD NOZ 485D	RS422/485 2-wire Connection Diagram 2 (Page 5-9)		
	TWD NOZ 232D	RS232C Connection Diagram 1 (Page 5-9)	ER	
	TWD NOZ 485T	RS422/485 2-wire Connection Diagram 3 (Page 5-9)		
	TWD XCP ODM+TWD NAC 232D	RS232C Connection Diagram 1 (Page 5-9)	ER	
	TWD XCP ODM+TWD NAC 485D	RS422/485 2-wire Connection Diagram 2 (Page 5-9)		
	TWD XCP ODM+TWD NAC 485T	RS422/485 2-wire Connection Diagram 3 (Page 5-9)		
Schneider Momentum				
171CCC96020	Not required (connects to Ethernet Port)	Ethernet	-	Modbus TCP Client

Only a portion of corresponding models are described. Other than those above, devices that support Modbus Communication can be connected.

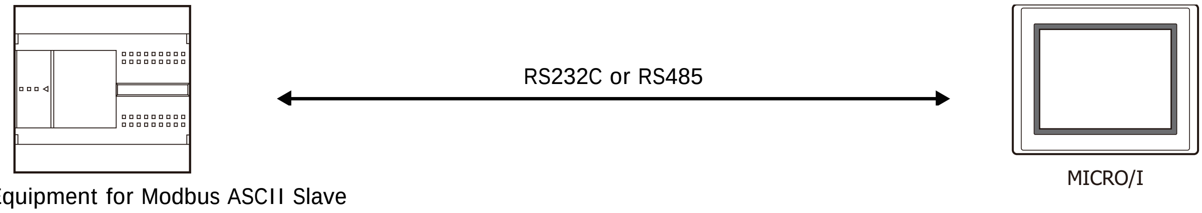
2 System Configuration

This is the system configuration for the connection of Schneider PLCs to the MICRO/I.

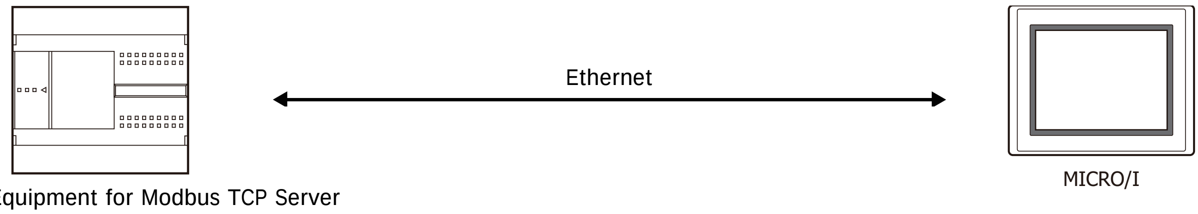
2.1 Modbus RTU Master



2.2 Modbus ASCII Master

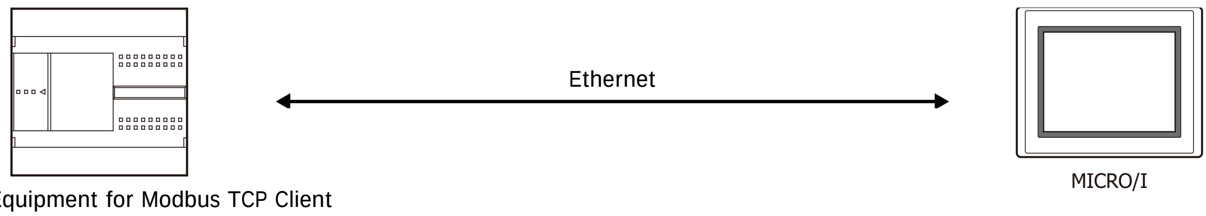


2.3 Modbus TCP Client



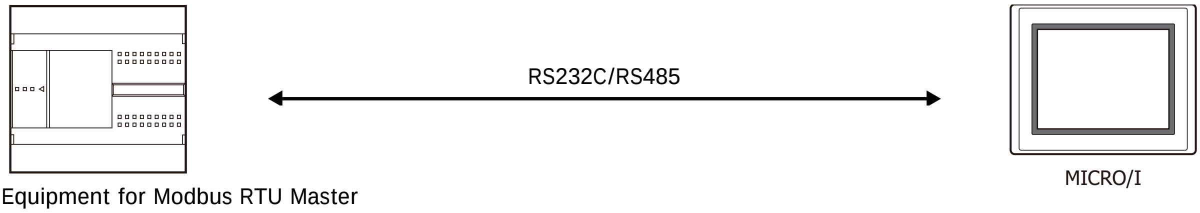
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

2.4 Modbus TCP Server



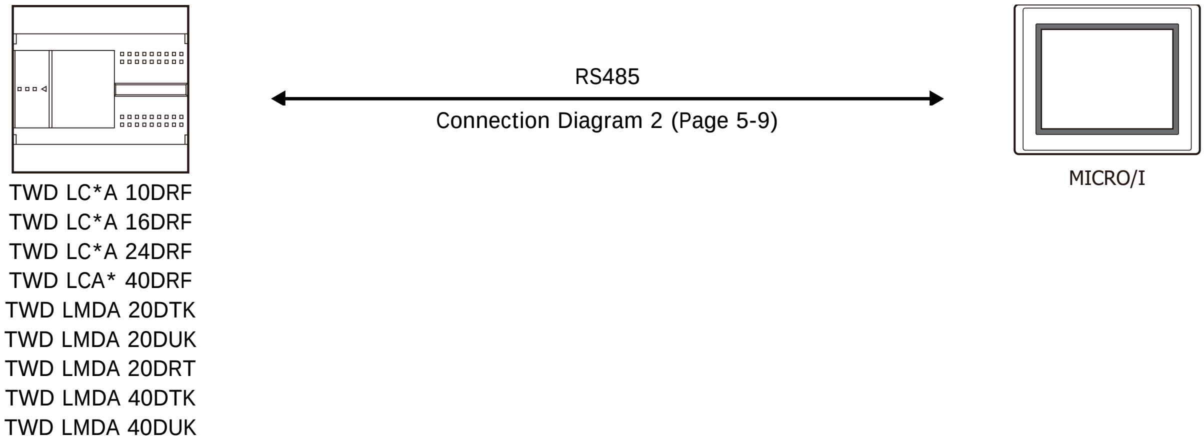
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

2.5 Modbus RTU Slave

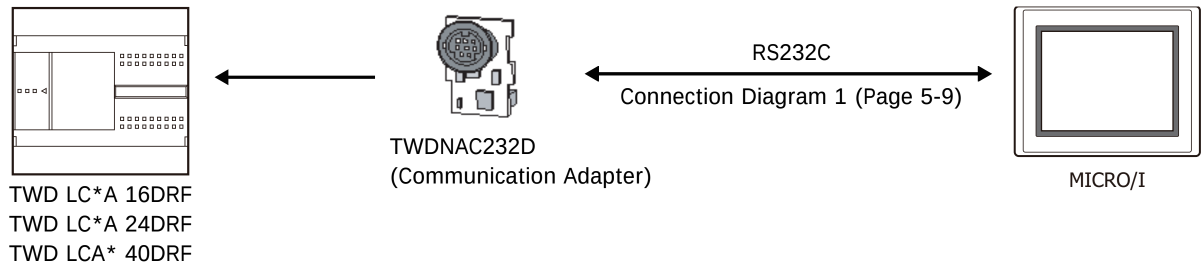


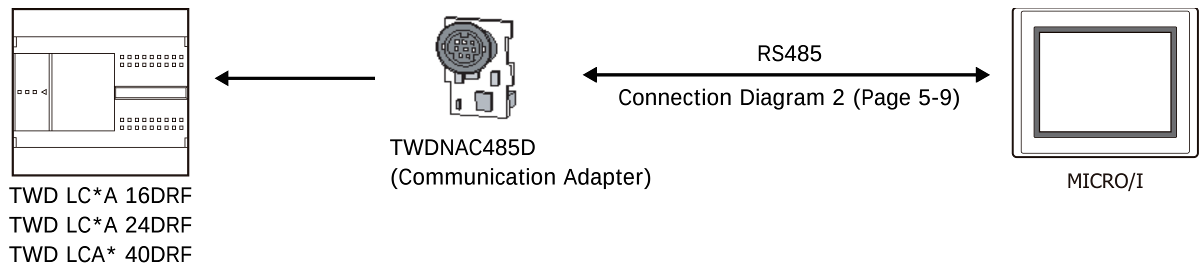
2.6 Twido

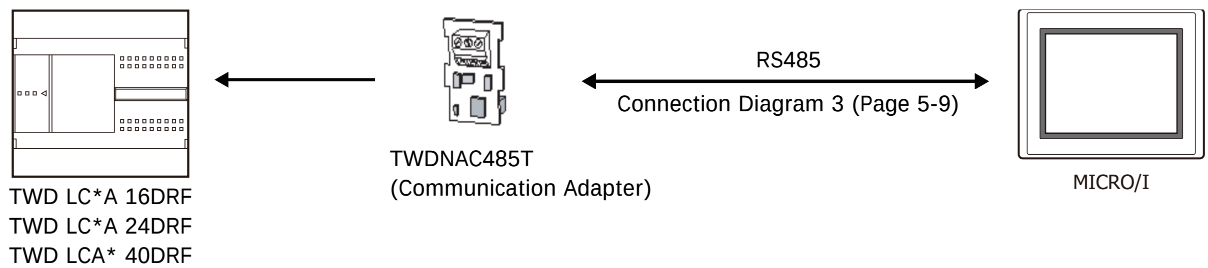
● Serial Port on CPU module



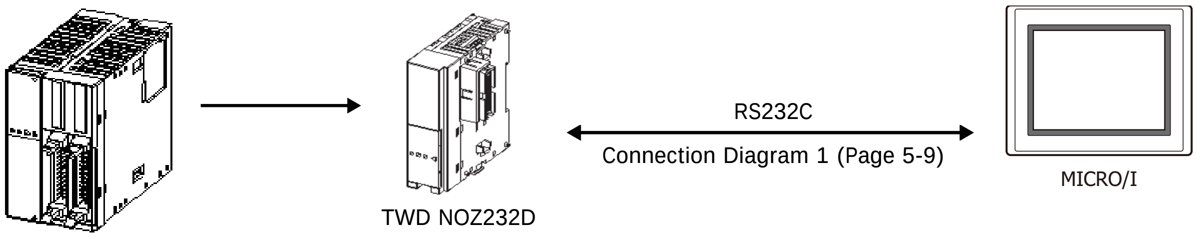
● Compact Controller + Communication Adapter

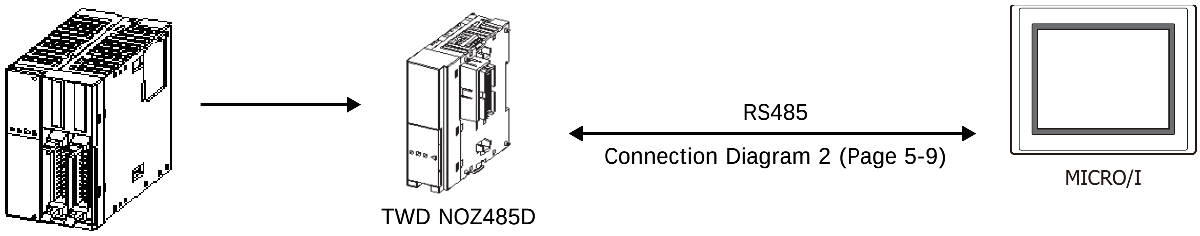


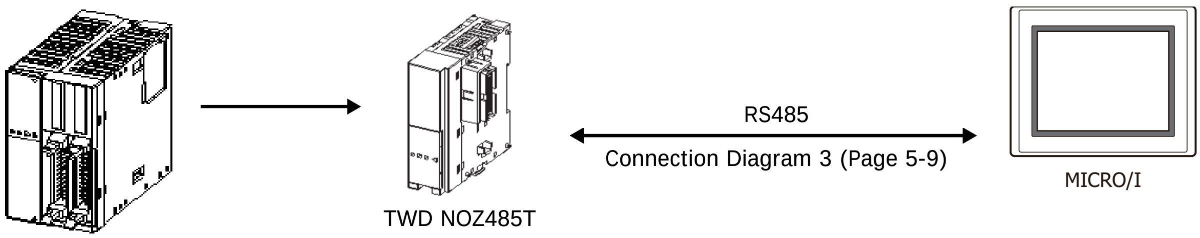




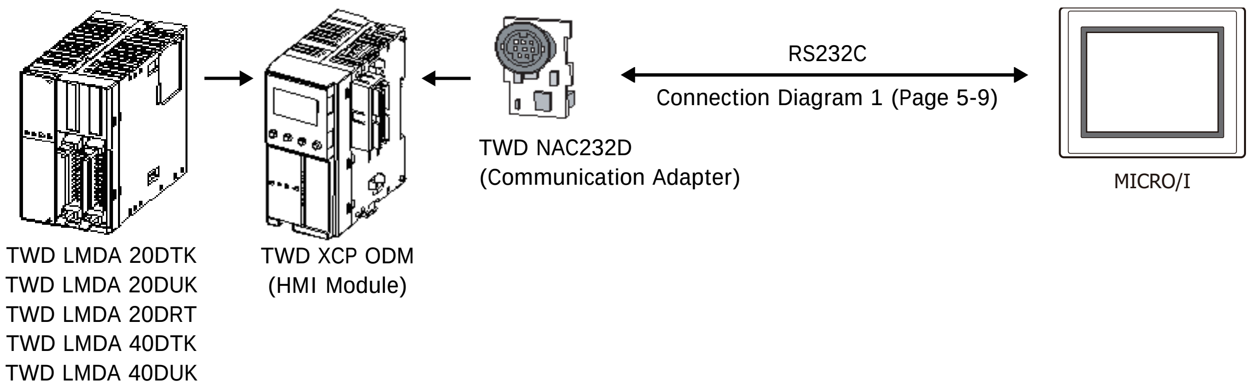
● Module Controller + Communication Module

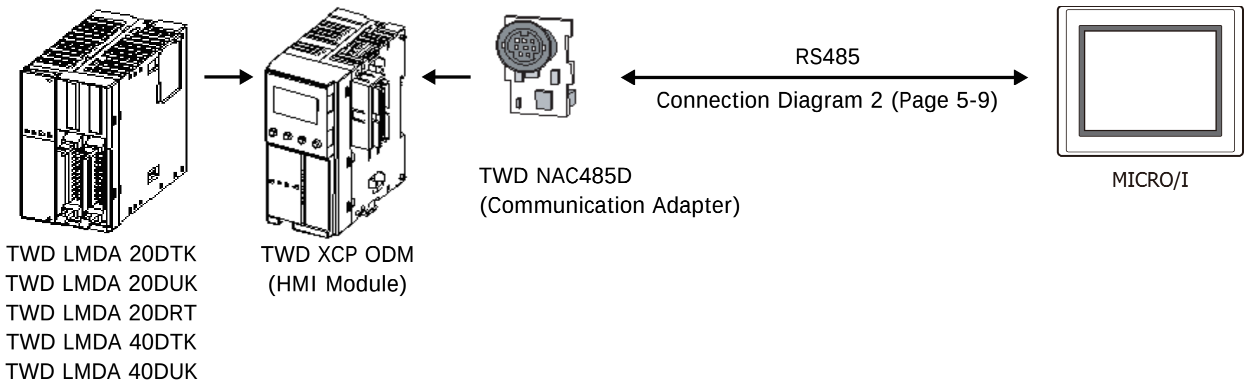


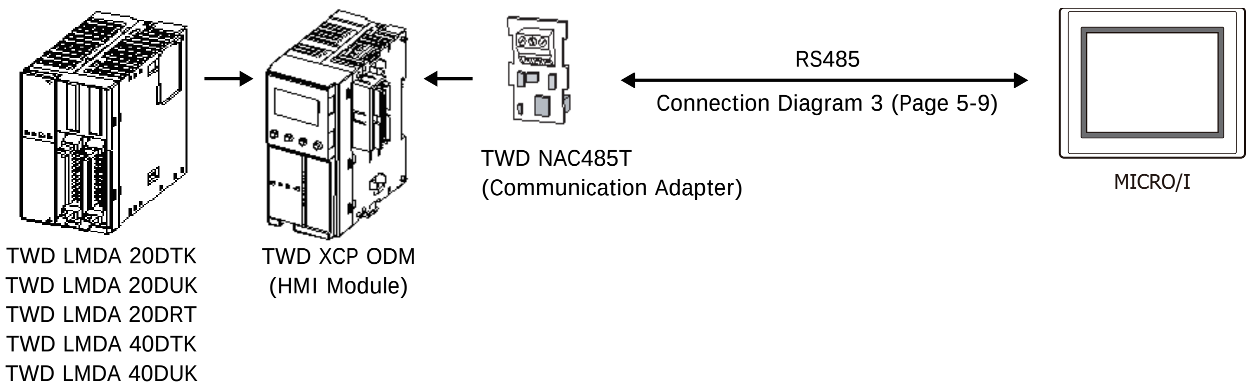




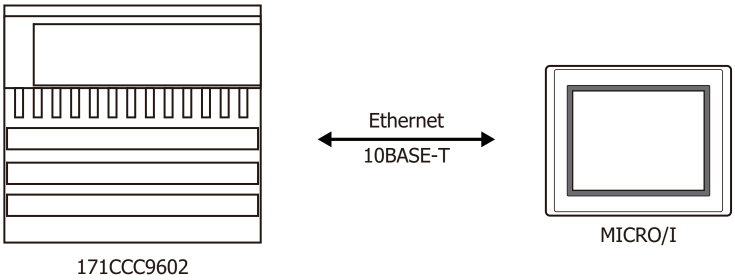
● Module Controller + HMI Module + Communication Adapter





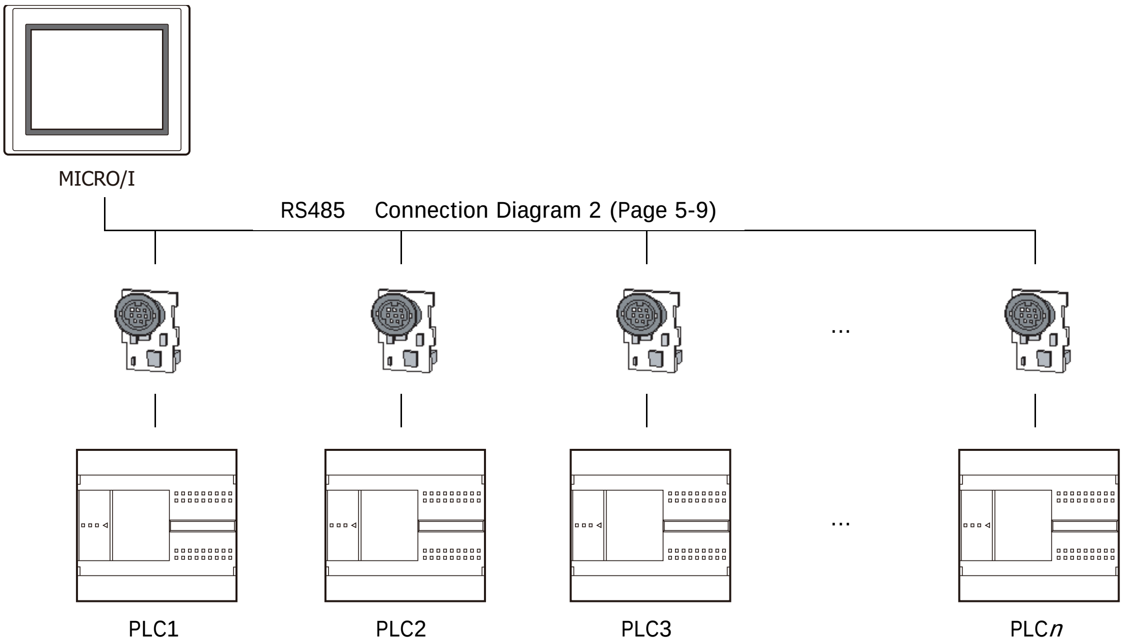


2.7 Momentum (MODUBS TCP Client)

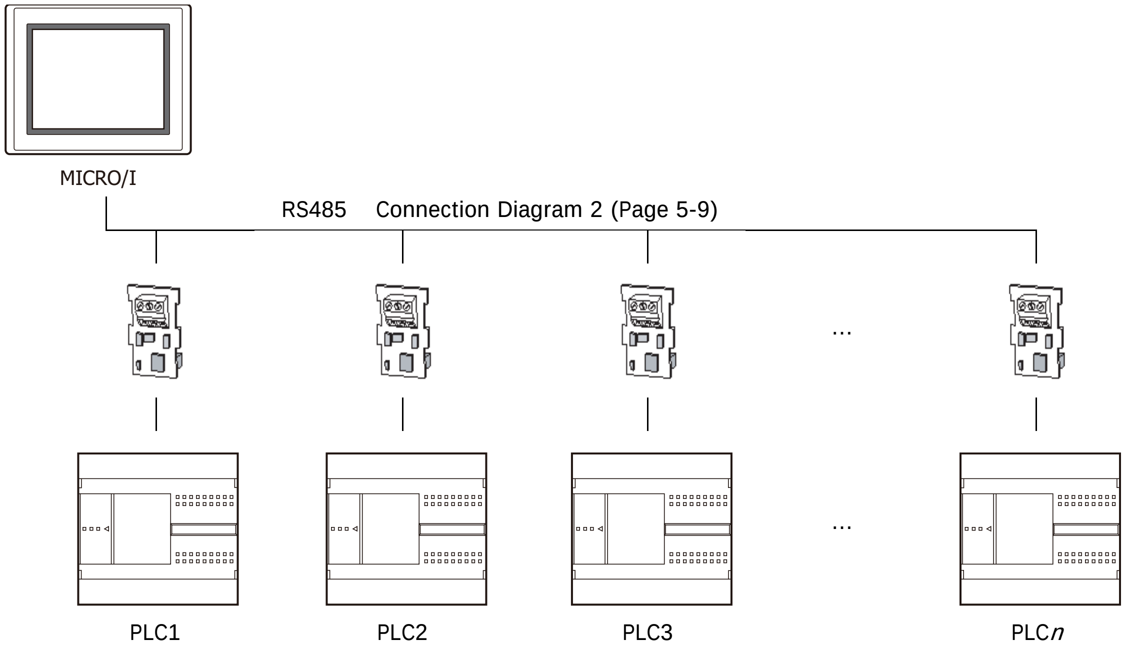


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.
- Please avoid using for the long distance communication because this driver may be used in the control network in the same factory only.

2.8 TWDLCAA16DRF/24DRF+TWDNAC485D (Communication board)



2.9 TWDLCAA16DRF/24DRF +TWDNAC485T (Communication board)



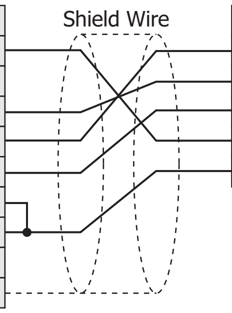
3 Connection Diagram

The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

3.1 Connection Diagram 1: TWDNAC232D

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
RS	1
ER	2
SD	3
RD	4
DR	5
SG	6
SG	7
+5V	8
Shild	Cover



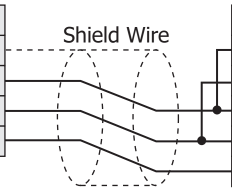
HG2G-5T:
Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

3.2 Connection Diagram 2: TWDNAC485D

PLC(RS422/485):
Mini DIN 8-pin Connector

Name	Pin No.
Shield	Cover
D+	1
D-	2
0V	7



HG2G-5T:
Terminal block

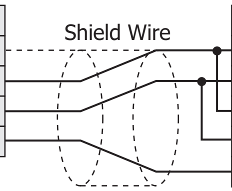
Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4

3.3 Connection Diagram 3: TWDNAC485T

PLC(RS422/485):
Terminal block

Name	Pin No.
FG	
A	
B	
SG	



HG2G-5T:
Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4

4 Environment Settings

4.1 Twido

Items		Details
Interface	The same setting as MICRO/I.	RS232C or RS485 2-wire
Slave Address*1		1 to 247
Baud Rate		1200, 2400, 4800, 9600, 19200 or 38400 bps
Data Bits		7 or 8 bits
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Flow Control		ER
Use No.0 as Broadcast		0: Disable, 1: Enable When 2 to 255 are set, the behavior is the same as when 1 was set.
Use function6 instead of function16		Enable: Use function6 for writing to HR Disable: Use function16 for writing to HR

4.2 Momentum (Modbus TCP Client)

Items		Details
Interface	This setting is not required.	*2
Slave Address		*2
Baud Rate		*2
Data Bits		*2
Stop Bits		*2
Parity		*2
Unit ID*3	The same setting as MICRO/I.	1 to 247
Destination Address*4		IPv4 Typed IP address
Port Number*4		0 to 32767*5

*1 Set the Slave Address Number in decimal.
*2 These settings will be ignored since it is using the Ethernet port.
*3 Set the unit ID in decimal.
*4 Destination Address and Port Number cannot be changed from the system menu of MICRO/I. Please change it using WindO/I-NV4.
*5 When the port number is "0", this driver will set “502” (the number of Modbus TCP default port) automatically.

5 Usable Device Addresses

5.1 Modbus RTU Master, Modbus ASCII Master, Modbus TCP Client

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Coil	C	C	1 to 65536	R/W	Decimal
Inputs Status	I	I	100001 to 165536	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Holding Registers	HR	HR	400001 to 465536	R/W	Decimal
Inputs Registers	IR	IR	300001 to 365536	R	Decimal

5.2 Twido (Modbus RTU Master)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Coil	C	%M	1 to 256	R/W	Decimal
Inputs Status	I	%M	100001 to 100256	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Holding Registers	HR	%MW	400001 to 401500	R/W	Decimal
Inputs Registers	IR	%MW	300001 to 301500	R	Decimal

5.3 Momentum (Modbus TCP Client)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Coil	C	-	1 to 65536	R/W	Decimal
Inputs Status	I	-	100001 to 165536	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Holding Registers	HR	-	400001 to 465536	R/W	Decimal
Inputs Registers	IR	-	300001 to 365536	R	Decimal

6 Modbus TCP Server/Modbus RTU Slave Function

6.1 Overview of the Modbus TCP Server, Modbus RTU Slave Function

The Modbus TCP Server, Modbus RTU Slave function performs that a computer or PLC (refers to as an external device) can read and write the MICRO/I communication devices via the Ethernet or Serial cable.
The read/write of a device is performed using the Modbus TCP protocol (Modbus TCP Server function) or Modbus RTU protocol (Modbus RTU Slave function).
For Modbus TCP Server, a maximum of four external devices can be simultaneously connected to the MICRO/I.

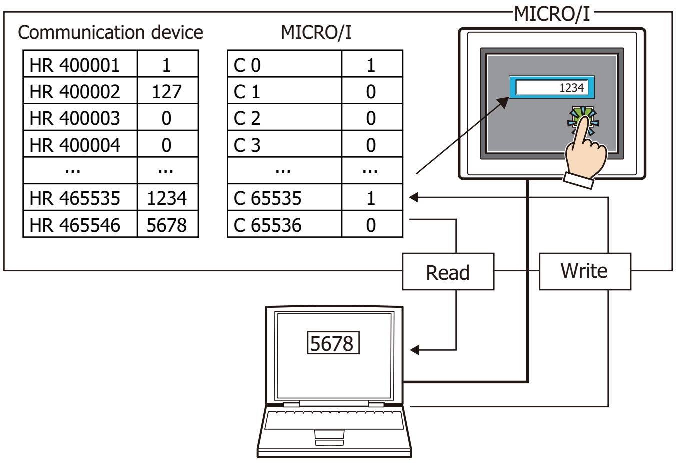
● Operation of the Communication

The external device is capable of reading/writing to the MICRO/I communication devices. It is also possible to read or write communication devices from the MICRO/I.

● Read/Write from the External Device

The external device is capable of reading or writing the data in the communication device value at the any timing.

Conceptual Diagram fo Communication



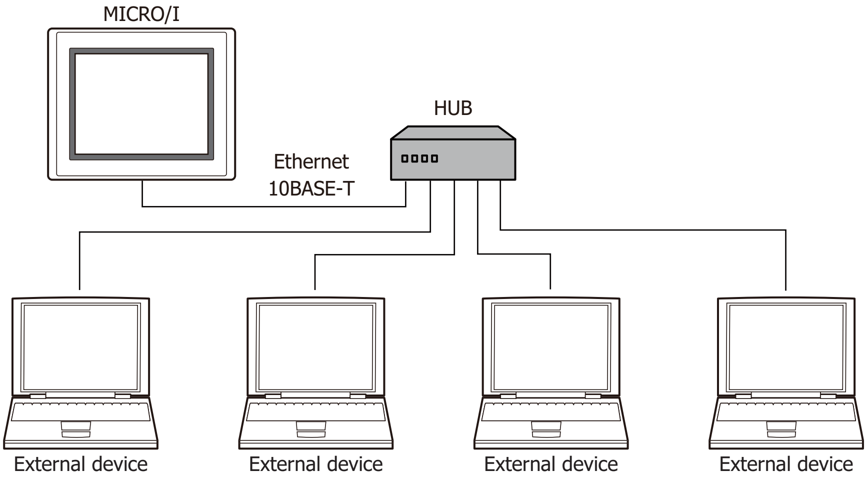
Computer, PLC or other external devices

Modbus communication is the open protocol. For detail information, visit the web site at http://www.modbus.org/.

6.2 Modbus TCP Server function system configuration

● System Configuration

The following is the system configuration.



- Up to 4 external devices can communicate with a single MICRO/I unit at one time.
- The MICRO/I unit and an external device can be directly connected on a 1:1 basis by bypassing a hub. In this case, use a crossing cable for the connection.

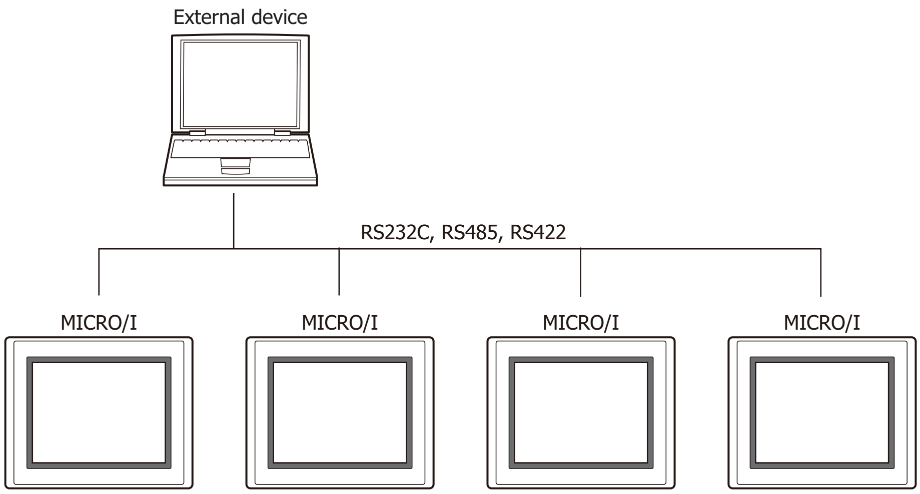
● Wiring

Make sure to use commercially available 10BASE-T ready cables for connecting the devices.
Use a straight cable when using a hub, and use a crossing cable when directly connecting to the MICRO/I and an external device.

6.3 Modbus RTU Slave function system configuration

● System Configuration

The following is the system configuration.



● Wiring

Wire according to the external device.

6.4 Device Addresses

The following devices are available for Modbus TCP Server function, Modbus RTU Slave function.

Bit Device

Device Name	Device Type	Address Number Range	MICRO/I Read/Write	External Device Read/Write	Address Numeral System
Coil Status	C	1 to 4096	R/W	R/W	Decimal
Input Status	I	100001 to 104096	R/W	R	Decimal

Word Device

Device Name	Device Type	Address Number Range	MICRO/I Read/Write	External Device Read/Write	Address Numeral System
Holding Register	HR	400001 to 404096	R/W	R/W	Decimal
Input Register	IR	300001 to 304096	R/W	R	Decimal

All devices are general-purpose devices intended for nonspecific purposes.

6.5 Settings

● Settings of the Modbus TCP Server Function

The settings of the Modbus TCP Server communication can be configured in the Configuration - System Setup - Project dialog boxes in WindO/I-NV4. The following table lists the configurable settings. Configure the settings according to the external device to be used.

Project Settings dialog box

Tab Name	Setting Name	Description
Communication Interface	Function	Select from the **External Device Communication 1** to the **External Device Communication 4**.
Communication Driver	Manufacturer	Select **Modbus**.
	Communication Driver	Select **Modbus TCP Server**.
	Refuse Access From Unknown Clients	Select this box to refuse access from devices other than the specified external device (client).
Communication Driver Extension Settings	Time Out (x100 msec)	Enter the duration after which timeout occurs if request is not sent from the external device (in units of seconds).
	Port Number	Select the port number used for the communication.
	Processing Interval	Enter the interval in units of milliseconds at which the MICRO/I performs communication processing. When the speed of other operations of the MICRO/I seems slow this is due to a large amount of communications, therefore, set a large value here to maybe increase the communication processing speed.
	Client Address 1 to Client Address 4	When **Refuse Access From Unknown Clients** is checked, specify the IP address of the external device (client) from which access will be accepted. When the number of accessible external devices is three or less, then "0.0.0.0" to the address for unused client.

● Settings of the Modbus RTU Slave Function

The settings of the Modbus RTU Slave communication can be configured in the Configuration - System Setup - Project dialog boxes in 4. The following table lists the configurable settings. Configure the settings according to the external device to be used.

Project Settings dialog box

Tab Name	Setting Name	Description
Communication Interface	Function	Select from the **External Device Communication 1** to the **External Device Communication 4**.
Communication Driver	Manufacturer	Select **Modbus**.
	Communication Driver	Select **Modbus RTU Slave**.
	Slave Address	Set the MICO/I slave address number.

5 Modbus

6.6 Modbus TCP Server Function Communication Format

This chapter describes the communication format of the Modbus TCP communication.
The Modbus TCP communication supports Class 0 and Class 1 functions of the OPEN Modbus TCP SPECIFICATION Release1.0. For details about the communication methods, refer to the OPEN Modbus TCP SPECIFICATION Release1.0 as well as this manual.

● Preparations for Communication

The Modbus TCP Server performs communications using the TCP. Make sure to establish a connection with the specified port of the MICRO/I with TCP before executing reading/writing of devices.

● Basic Format

The following table lists the basic format of communications. The same format applies to both requests and responses.
Data is processed as a byte sequences.

	Description
Byte 0	Transaction ID*1. The same value is returned from the server. The value is normally “0”.
Byte 1	Transaction ID*1. The same value is returned from the server. The value is normally “0”.
Byte 2	Protocol ID*2. The value is always “0”.
Byte 3	Protocol ID*2. The value is always “0”.
Byte 4	Message length*3 (high byte). The value is always “0”. (Since the message is 256 bytes at maximum.)
Byte 5	Message length*3 (low byte). The length of the following message.
Byte 6	Unit ID*4
Byte 7	Function code*5
Byte 8 to	Data*6

*1 The data included in a request is returned from the server without changes. The client (external device) sends a different Transaction ID for each request, and identifies the response by checking the Transaction ID of a response. Enter “0” to not check the Transaction ID.
*2 The number indicating the Modbus TCP protocol, and is always “0”.
*3 Indicates the length of the following message in units of bytes.
*4 ID used for identifying devices. The ID is not used with the MICRO/I. When the ID is used in a request, the returned data is unchanged.
*5 Numbers assigned for functions such as reading and writing.
*6 Data required for each processing.

6.7 Modbus RTU Slave Function Communication Format

This chapter describes the communication format of the Modbus RTU communication.
The Modbus RTU communication supports Class 0 and Class 1 functions of the MODBUS APPLICATION PROTOCOL SPECIFICATION V1.1b3. For details about the communication methods, refer to the MODBUS over Serial Line Specification and Implementation Guide V1.02 as well as this manual.

● Basic Format

The following table lists the basic format of communications. The same format applies to both requests and responses.
Data is processed as a byte sequences.

	Description
Idle	3.5 characters*1
Byte 0	Slave address Specify the MICRO/I slave address.
Byte 1	Function code*2
Byte 2 to	Data*3
Byte n-1	CRC*4
Byte n	
Idle	3.5 characters

*1 Idle means no data flowing on the communication line. Modbus RTU communication requires a minimum of 3.5-character-long idle time between frames to determine the beginning of a frame.
*2 Numbers assigned for functions such as reading and writing.
*3 Data required for each processing.
*4 Modbus RTU communication uses CRC.
Calculating the CRC-16 (cyclic redundancy checksum)
Calculate the BCC using CRC-16 for the range from the slave number to the byte immediately before the BCC.

The generation polynomial is: X16 + X15 + X2 + 1.

1. Take the exclusive OR (XOR) of FFFFh and the first 1-byte data at the slave number.
2. Shift the result by 1 bit to the right.
3. When a carry occurs, take the exclusive OR (XOR) of A001h, then go to step 3.
   If not, directly go to step 3.
4. Repeat step 2, shifting 8 times.
5. Take the exclusive OR (XOR) of the result and the next 1-byte data.
6. Repeat step 2 through step 4 up to the byte immediately before the BCC.
7. Swap the higher and lower bytes of the result of step 5, and store the resultant CRC-16 to the BCC (CRC) position.

6.8 Modbus TCP / Modbus RTU shared protocol format

● Reference Numbers

Reference numbers are used to specify a device address with the Modbus TCP.
The reference number is obtained by subtracting 1 from the 1st to 5th value of the device address, and is expressed in hexadecimal format. The following table lists the address of each device and the corresponding reference number.

Device Address	Reference No.	Device Address	Reference No.	Device Address	Reference No.	Device Address	Reference No.
C 1	0000	I 100001	0000	HR 400001	0000	IR 300001	0000
C 2	0001	I 100002	0001	HR 400002	0001	IR 300002	0001
...	...	...	...	...	...	...	...
C 65535	FFFE	I 165535	FFFE	HR 465535	FFFE	IR 365535	FFFE
C 65536	FFFF	I 165536	FFFF	HR 465536	FFFF	IR 365536	FFFF

● Functions

Function code	Function name	Description
3	Read multiple registers	Reading of Holding Register (HR) consecutively
16 (10Hex)	Write multiple registers	Writing to Holding Register (HR) consecutively
1	Read coils	Reading of Coil (C) consecutively
2	Read discrete inputs	Reading of Input Relay (I) consecutively
4	Read input registers	Reading of Input Register (IR) consecutively
5	Write coil	Writing to a single Coil (C)
6	Write single register	Writing to a single Holding Register (HR)
7	Read exception status	Reading of exception status (0 to 7th bit of HR400001)*1

*1 This function is not supported in Modbus RTU Slave function.

The following section describes the details of the functions.
The communication example listed for each function is only for the function code. The following communication examples are listed for each function code.If Modbus TCP is selected, add byte 0 to byte6 before the following examples, if Modbus RTU is selected, add the slave address as byte 0 and CRC as last byte.

■ FC3 Read multiple registers - Reading of Holding Register (HR) consecutively

Request

Modbus TCP	Modbus RTU	Description
Byte 1	Byte 1	FC (Function code) = 03
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Number of read words (1 to 125 words)

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 03
Byte 8	Byte 2	Number of bytes of the response (number of read words x 2)
From Byte 9	From Byte 3	Read data

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 83 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Reading of HR400001 (1 word). The read value is 1234 (Hexadecimal).

03h	00h	00h	00h	01h

Request

→

03h	02h	12h	34h

Normal response

■ FC16 Write multiple registers - Writing to Holding Register (HR) consecutively

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 10 (Hexadecimal)
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Number of write words (1 to 100 words)
Byte 12	Byte 6	Number of write bytes (2 x number of write words)
From Byte 13	From Byte 7	Write data

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 10 (Hexadecimal)
Byte 8, 9	Byte 2, 3	Reference Number
From Byte 10	From Byte 4	Number of write words

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 90 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Writing to HR400001 (1 word). The write value is 1234 (Hexadecimal).

10h	00h	00h	00h	01h	02h	12h	34h

Request

→

10h	00h	00h	00h	01h

Normal response

■ FC1 Read coils - Reading of Coil (C) consecutively

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 01
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Number of read bits (1 to 2000 bits)

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 01
Byte 8	Byte 2	Number of bytes for the response ((number of read bits +7)/8)
From Byte 9	From Byte 3	Read data

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 81 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Reading of C1. 1 bit. The read value is 1.

01h	00h	00h	00h	01h

Request

→

01h	01h	01h

Normal response

Data sequence of read value

When two or more data are read out, the read data are arranged starting from the lowest address by 8 bits (1 byte).
Within any 1 byte, data in the lower address is set to the lower bit. The data in the unread bit becomes “0”.
For example, when reading an 11-bit data as shown below, the read value becomes 21 03.

<table>
<tr><th>Device Address</th><th>Data</th><th>Remarks</th></tr>
<tr><td>C1</td><td>1</td><td rowspan="8">Data for the 1st byte
Bit pattern= 00100001 = 21 (Hexadecimal)</td></tr>
<tr><td>C2</td><td>0</td></tr>
<tr><td>C3</td><td>0</td></tr>
<tr><td>C4</td><td>0</td></tr>
<tr><td>C5</td><td>0</td></tr>
<tr><td>C6</td><td>1</td></tr>
<tr><td>C7</td><td>0</td></tr>
<tr><td>C8</td><td>0</td></tr>
<tr><td>C9</td><td>1</td><td rowspan="8">Data for 2nd byte
Bit pattern 00000011 = 03 (Hexadecimal)</td></tr>
<tr><td>C10</td><td>1</td></tr>
<tr><td>C11</td><td>0</td></tr>
<tr><td>C12</td><td>0</td></tr>
<tr><td>C13</td><td>0</td></tr>
<tr><td>C14</td><td>0</td></tr>
<tr><td>C15</td><td>0</td></tr>
<tr><td>C16</td><td>0</td></tr>
</table>

■ FC2 Read discrete inputs - Reading of Input Relay (I) consecutively

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 02
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Number of read bits (1 to 2000 bits)

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 02
Byte 8	Byte 2	Number of bytes for the response ((number of read bits+7)/8)
From Byte 9	From Byte 3	Read data

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 82 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Reading of I100001. 1 bit. The read value is 1.

02h	00h	00h	00h	01h

Request

→

02h	01h	01h

Normal response

The data sequence for the read value is similar to that of FC1 Read Coils.

■ FC4 Read input registers - Reading of Input Register (IR) consecutively

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 04
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Number of read words (1 to 125 words)

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 04
Byte 8	Byte 2	Number of bytes for the response (number of read words x 2)
From Byte 9	From Byte 3	Read data

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 84 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Reading of IR300001 (1 word). The read value is 1234 (Hexadecimal).

04h	00h	00h	00h	01h

Request

→

04h	02h	12h	34h

Normal response

FC5 Write coil - Writing to a single Coil (C)

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 05
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10	Byte 4	Write value (FF when write value is 1, and 00 when write value is 0)
Byte 11	Byte 5	Fixed value 00

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 05
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10	Byte 4	Write value (FF when write value is 1, and 00 when write value is 0)
Byte 11	Byte 5	Fixed value 00

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 85 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Writing of C1 (1 bit). The write value is 1.

05h	00h	00h	FFh	00h	→	05h	00h	00h	FFh	00h

Request — Normal response

FC6 Write single register - Writing to a single Holding Register (HR)

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 06 (Hexadecimal)
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Write data

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 06 (Hexadecimal)
Byte 8, 9	Byte 2, 3	Reference Number
Byte 10, 11	Byte 4, 5	Write data

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 86 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Writing to HR400001. The write value is 1234 (Hexadecimal).

06h	00h	00h	12h	34h	→	06h	00h	00h	12h	34h

Request — Normal response

FC7 Read exception status -Reading of exception status (Bit 0 to 7 of HR400001)

Request

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 07 (Hexadecimal)

Normal response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code) = 07 (Hexadecimal)
Byte 8	Byte 2	Value of exception status

Error response

Modbus TCP	Modbus RTU	Description
Byte 7	Byte 1	FC (Function code)= 87 (Hexadecimal)
Byte 8	Byte 2	Exception code 01 or 02

Example: Reading of exception status. The read value is 34 (Hexadecimal).

07h	→	07h	34h
Request		Normal response	

The Read exception status function reads the data from the device holding special status information using the Modbus protocol. Since the MICRO/I does not have special registers, the exception status is read by bit 0 to 7 of HR400001.

This function is not supported in Modbus RTU Slave function.

● Exception code

The following table describes the exception codes that are sent upon an error response.

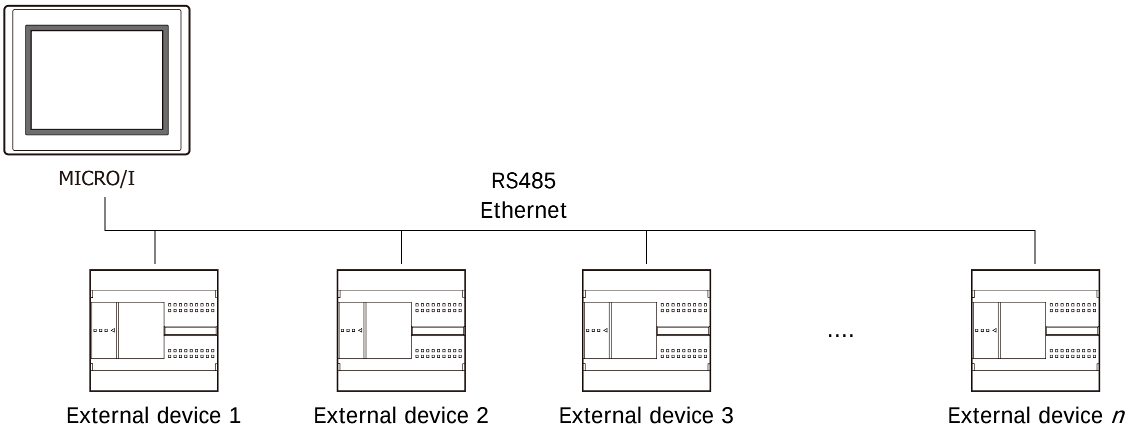
Exception code	Name	Description
01	ILLEGAL FUNCTION	Indicates that a function code that is not defined by the Modbus protocol or a function code that is not supported by the MICRO/I is designated.
02	ILLEGAL DATA ADDRESS	The address information included in the data is invalid. For example, when reading the number of read words starting from the starting reference No. for the read, this exception code is sent if the data exceeds the maximum address of the device.
03	ILLEGAL DATA VALUE	The value of the data is invalid. This exception code is also sent when the number of data is invalid.

Chapter 6 Communication with Multiple External Devices

1 About 1:N Communication (Multi-drop)

1.1 Outline

For a communication driver that supports the 1:N Communication function, Device Link Communication is possible by connecting multiple external devices to a single MICRO/I.



Different types of external devices can be simultaneously connected by using multiple communication drivers, refer to Chapter 6 “5 Using Multiple Communication Drivers” on page 6-8.

6

Communication with Multiple External Devices

2 Communication Drivers Supporting 1:N Communication

The table below lists the Communication Drivers supporting 1:N communication.

Compatible Communication Drivers

Manufacturer	Communication Driver
IDEC	OpenNet,MICROSmart,SmartAXIS Pro/Lite(RS232C/485)
	OpenNet,MICROSmart,SmartAXIS Pro/Lite(Ethernet)
Mitsubishi Electric	MELSEC-FX (LINK)
	MELSEC-Q/QnA (Ethernet), MELSEC-FX3U (Ethernet)
OMRON	SYSMAC CS1/CJ series(Ethernet)
Allen-Bradley	Ethernet/IP
KOYO ELECTRONICS INDUSTRIES	DirectLogic 205/405, DirectLogix(Ethernet)
Modbus	Modbus RTU Master, Modbus ASCII Master
	Modbus TCP Client
KEYENCE	KV(Ethernet)
YASKAWA Electric	MP2000(Ethernet)
Yokogawa Electric	FACTORY ACE FA-M3(Ethernet)
Fuji Electric	MICREX-SX(Ethernet)
Emerson Electric	ROC Protocol
SIEMENS	S7-1200(Ethernet)
Hitachi Industrial Equipment Systems	EH(Ethernet)

3 Settings of the 1:N Communication

3.1 External Device Address Settings

● Common setting

When 1:N Communication is specified, configure the device setting according to the format below. This applies to the external device settings only.

External Device ID	Delimiter	Device Type	Space	Device Address

Delimiter is a colon ":"
Example 1): D 1000

● Ethernet communication driver

In case of Ethernet communication driver, attach IP address and Port number for PLC to the External Device ID. Configure communicated PLC information on Communication Driver Network in Project Settings.

● Settings when a communication error occurs

Configure the operation settings in the event of a communication error. These settings are displayed in the Communication Driver tab on the Project Settings dialog box.

Item	Setting
Ignore communication errors and continue operation	Specifies whether or not to stop MICRO/I operation if a communication error occurs.
Display error message	Specifies whether or not to display an error message (communication error) if operation continues after a communication error occurs. If "Ignore communication errors and continue operation" is enabled, an Ack (acknowledge) button is displayed in the error message. If it is disabled, the Ack (acknowledge) button is not displayed in the error message.
Auto retry	Specifies whether or not to automatically try connecting the MICRO/ to the Station No. when the communication error occurred. To retry manually, either write 1 in the 2nd bit (initialization) of the device address set under "Batch monitor error information for all Station No.'s" (mentioned later) or write 1 in the 1st bit (connection settings) of the device addresses assigned to the relevant Station No.'s set under "Individually monitor error information for each Station No.". The communication for the other PLC stations stop while retrying the disconnecting PLC station.
Batch monitoring the communication error information for all Station Numbers	Specifies the device address that stores communication error information for all Station No.'s. It is only possible to set HMI devices. The following kind of information is stored as error information: (For details, refer to Chapter 6 "Communication error information" on page 6-4.) • Initialization • Conditions under which the error occurred • Read error log • Write error log
Monitoring communication error information for each station, individually	Specifies the device address that stores communication error information for each Station No. It is only possible to set HMI devices. Take care to avoid redundant addresses when using this setting, as this error information occupies up to 256 devices. The following kind of information is stored as error information: (For details, refer to Chapter 6 "Communication error information for each Station Number" on page 6-5.) • Connection settings • Conditions under which the error occurred • Read error log • Write error log

- The communication error settings can be specify per communication driver which is selected in **External Device Communication 1** to **External Device Communication 4**.
- The station number varies based on the communication interface. The displayed settings are as follows:
  Serial interface: Slave Number
  Ethernet interface: External Device ID

Communication error information

It is possible to check the conditions of the communication and the error log. It is also possible to initialize the connection status for each Station No.

Bit	15 - 8	7	6	5	4	3	2	1	0
Function	Reserved	Write error log	Read error log	Reserved	Conditions under which the error occurred	Reserved	Reserved	Initialization	Reserved
Read/Write		R	R		R		R	R/W	

■ Bit 1 (Initialization)

Writing 1 initializes all values related to error information and communication error information for each Station No. When the value turns to 0 after 1 is written, this indicates that initialization is complete.
When "Auto retry" is disabled, communication is not made with the Station No. where the communication error occurred, but if this bit is used for initialization, communication is resumed with all Station No.'s.

■ Bit 4 (Conditions under which the error occurred)

If an error is occurring at a Station No., this bit turns to 1.
When the system recovers from the communication error, it automatically turns to 0. It is always 0 when "Auto retry" is disabled. When the Bit 0 (connection settings) of the "Communication error information for each Station No." settings is 0, the conditions under which the error occurred at each Station No. are not reflected in this bit.

■ Bit 6 (Read error log)

If a read error occurs on a device used on the MICRO/I, 1 is written.
It will not change to 0 even after the system recovers from the read error. To make it 0, write 1 in the Bit 1 (initialization).

■ Bit 7 (Write error log)

If a write error occurs on a device used on the MICRO/I, 1 is written.
It will not change to 0 even after the system recovers from the write error. To make it 0, write 1 in the Bit 1 (initialization).

Communication error information for each Station Number

The “Communication error Information” setting stores all communication error information. To refer to error information for each Station No., use this setting. “Communication error information for each Station No.” occupies the same number of devices as the set number of words for each Communication Driver, starting with the set device first.

Bit	15 - 8	7	6	5	4	3	2	1	0
Function	Reserved	Write error log	Read error log	Reserved	Conditions under which the error occurred	Reserved	Reserved	Reserved	Condition settings
Read/Write		R	R		R		R		R/W

Bit 0 (Connection settings)

Instructs whether or not to communicate with the relevant Station No.
Communication is made if this bit is 1. Communication is not made if this bit is 0.
When the power is turned on, the default value of this bit is 1.
When “Auto retry” is enabled, this bit is always 1.
When “Auto retry” is disabled, this bit is 0 if a communication error occurs.

Bit 4 (Conditions under which the error occurred)

This bit turns to 1 when an error is occurring at a relevant Station No.
When the system recovers from the communication error, it automatically turns to 0.

Bit 6 (Read error log)

If a read error occurs at a relevant Station No., 1 is written.
It will not change to 0 even after the system recovers from the read error. To make it 0, write 1 in the Bit 1 (initialization) of the communication error information.

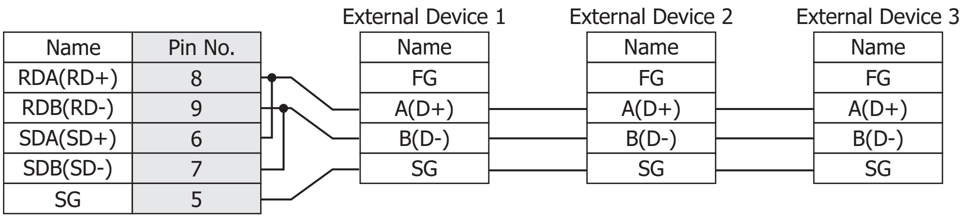
Bit 7 (Write error log)

If a write error occurs at a relevant Station No., 1 is written.
It will not change to 0 even after the system recovers from the write error. To make it 0, write 1 in the Bit 1 (initialization) of the communication error information.

3.2 Connection Diagram

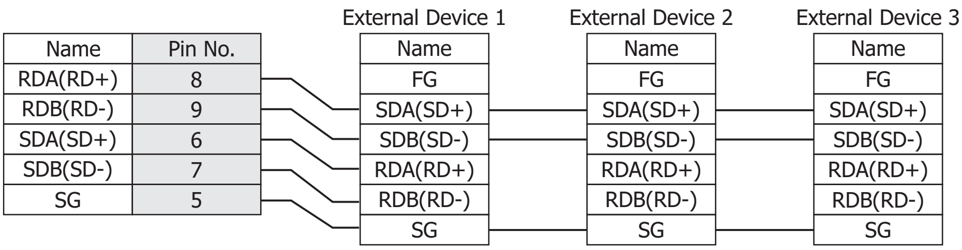
For the wiring diagram between the PLC and MICRO/I, refer to the PLC manual for PLC pin-outs. For connecting two or more PLC units with the MICRO/I, refer to the diagram below.

● RS422/485 2-wire



There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4

● RS422/485 4-wire



There is no pin number corresponding to TERM on the HG2G-5T. When inserting a termination resistor, use a Terminating Resistor Selector Switch. For the setting of the switch, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4

4 1:N Communication Operation

4.1 1:N Communication Operation

These instructions describe operation when a communication error occurs during 1:N communication. For details about settings, refer to Chapter 6 "Settings when a communication error occurs" on page6-3.

● When **Ignore communication errors and continue operation** is disabled

When **Ignore communication errors and continue operation** is enabled, if the MICRO/I fails to connect to the target external device, an error message and the Station No. of the external device that failed to connect are displayed, and MICRO/I operation stops.

Settings	Action when MICRO/I fails to connect to the external device
None	Displays an error message and stops operation. An Ack (acknowledge) button is not displayed in the error message. The error message is displayed until communication with the PLC recovers.

● When **Ignore communication errors and continue operation** is enabled

When **Ignore communication errors and continue operation** is enabled, if the MICRO/I fails to connect to the external device, it does not stop operation. Information related to communication errors is stored in the devices set in **Batch monitoring the communication error information for all Station Numbers** and **Monitoring communication error information for each station, individually**.

■ Reading from an external device under the conditions in which a communication error occurred

The device value of an external device that caused a communication error is maintained as the last read value until the displayed screen changes. When the screen changes, all device values of the external device that caused the communication error turn to 0.

■ Writing to an external device under the conditions in which a communication error occurred

If data is written to an external device that is experiencing a communication error, values displayed on the MICRO/I are changed, but are not written to the external device. Values displayed on the MICRO/I are maintained until the screen changes, but are initialized to 0 when the screen changes. Values written on the MICRO/I during a communication error are not written to the external device even after the MICRO/I has recovered from the communication error.

■ Options when using Ignore communication errors and continue operation

When **Ignore communication errors and continue operation** is enabled, several options become available. This section describes what these optional settings do.

Settings	Action when MICRO/I fails to connect to the external device	
Display error message	Enable	An error message is displayed, but operation continues (communication error). The error message does not automatically close even if the connection with the external device recovers. To close the error message, press the Ack (acknowledge) button that is displayed on the error message itself.
	Disable	No error message is displayed (communication error), and operation continues.
Auto retry	Enable	MICRO/I automatically tries to reconnect if a communication error occurs.
	Disable	MICRO/I does not try to reconnect if a communication error occurs.In this case, the bit 1 (connection settings) of the device set in **Monitoring communication error information for each station, individually** automatically turns to 0.

5 Using Multiple Communication Drivers

The HG2G-5T can simultaneously use a maximum of four communication drivers. All external devices are managed by the external device ID which is a number that the MICRO/I uses for external device management, and a total of 32 external devices can be configured. The maximum number of connected devices for each communication driver is dependent on the external devices to be connected. For details, refer to the manuals for the external devices to be connected.

You will find the WindO/I-NV4 setting items in the **System- System Setup - Project Setting** dialog boxes. For detail refer to WindO/I-NV4 User's Manual.

Communication drivers that cannot be simultaneously used

The following communication driver combinations can only be used in a single (Function). They cannot be configured in multiple settings.

■ Communication drivers that cannot be simultaneously used (1)

Manufacturer	Communication Driver
Modbus	Modbus RTU Master
	Modbus RTU Slave
SIEMENS	S7-200(PPI)
	S7-MPI
YASKAWA Electric	MP920-RTU

■ Communication drivers that cannot be simultaneously used (2)

Manufacturer	Communication Driver
IDEC System	DM Link (1:1)
	DM Link (1:N)
Modbus	Modbus RTU Slave
	Modbus TCP Server

Example: **Communication Driver** for **External Device Communication 1** is set to **Modbus RTU Slave**
According to the communication drivers that cannot be simultaneously used (1), **External Device Communication 2, External Device Communication 3,** and **External Device Communication 4** cannot be set to **Modbus RTU Master, S7-200(PPI), S7-MPI**, or **MP920-RTU**.
According to the communication drivers that cannot be simultaneously used (2), **External Device Communication 2, External Device Communication 3,** and **External Device Communication 4** cannot be set to **DM Link (1:1)**, **DM Link (1:N)**, or **Modbus TCP Server**.

6 Restrictions

Note the following restrictions when performing 1:N communication.

■ Number of external device limitations

- The number of external devices that can be connected to **External Device Communication 1** to **External Device Communication 4** is a total of 32 external devices.
- The number of external devices that can be set varies based on the communication interface.
- The maximum number of external devices per communication driver varies based on the external device. For details, see the manual for the connected external devices.

Communication Interface	Number of External Devices
Serial Interface (Connection: 1:1 communication)	1
Serial Interface (Connection: 1:N communication)	31 max.
Ethernet Interface	32 max.

■ Maximum number of source devices at one time

The maximum number of devices (including O/I Link) that can be read at one time is 8192. Devices exceeding this limit cannot be read out.

Chapter 7 Communication Cables

1 Communication Cables

1.1 External devices / PLC connection cable: FC2A-KP1C, HG9Z-XC275

Communication cable for the HG2G-5T Serial and the IDEC MICROSmart or the Mitsubishi Electric MELSEC-FX series.

Type Number	Cable length
FC2A-KP1C	2.4m
HG9Z-XC275	5m

● Pinout

Mini DIN 8-pin Connector

Shield

Pin No.	Color
1	Black
2	Yellow
3	Blue
4	Green
5	Brown
6	Gray
7	Red
8	White
Cover	

● Connection Diagram

Connecting the IDEC MICROSmart

PLC(RS232C): Mini DIN 8-pin Connector

Name	Color	Pin No.
NC	Black	1
NC	Yellow	2
SD	Blue	3
RD	Green	4
NC	Brown	5
SG	Gray	6
SG	Red	7
NC	White	8
Shield	-	Cover

Shield

HG2G-5T: Terminal block

Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

Connecting the Mitsubishi Electric MELSEC-FX series (except the FX3U and FX3UC-32MT-LT)

PLC(RS422/485): Mini DIN 8-pin Connector

Name	Color	Pin No.
SDA	Red	7
SDB	Green	4
RDA	Yellow	2
RDB	Black	1
SG	Blue	3
SG	Grey	6
Shield	-	Cover

HG2G-5T: Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

- Terminate any unused wires properly to make sure that these wires do not contact other wires or metal parts electrically.
- Please do not use the communication cables (part number: FC2A-KP1C and HG9Z-XC275) with FX3U/FX3UC-32-MT-LT of the MELSEC-FX Series described in this manual because the Mini DIN Connector interferes with the housing of the PLC.

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