B-1698(10)

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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P.
- The HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P 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

- When using the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P in applications which require high level of safety, add a failsafe or backup functionality, and verify an adequate level of safety using the product specifications.
- Turn off the power to the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P before installation, removal, wiring, maintenance, and inspection of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P. Failure to turn power off may cause electrical shock or fire hazard.
- Special expertise is required to install, wire, configure, and operate the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P. People without such expertise must not use the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P.
- The HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P 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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P.
- Do not use touch switches and the function keys for an emergency circuit or an interlocking circuit. If the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P fails, equipment connected to the HG5G/4G/3G/2G-V, HG4G/3G,HG2G-5F/-5T, HG1G/1P will no longer be protected, and serious injury to operators and equipment damage may be caused.
- For the emergency stop switch and the enabling switch on the HG1P, note the following points:
  - Connect the emergency stop switch to function as either a category 0 or category 1 stop in accordance with IEC/EN60204-1.
  - Perform regular checks to confirm that the emergency stop switch and enabling switch work properly. It is extremely dangerous if the enabling switch no longer returns to position 1 due to a foreign object becoming lodged in the switch.
  - Do not, under any circumstances, hold the enabling switch in position 2 with tape, string, or deform the rubber cover. The function of the enabling switch will be lost, and the enabling switch may not work in an emergency.
  - Place your finger firmly on the enabling switch.
- Stop using the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P if it is accidentally dropped or exposed to significant shock, check the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P for damage, and confirm that its various functions work safely and correctly.
- For the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P, connect the FG wire to grounding resistance of 100 Ω or less. Otherwise there is a risk of electric shock or mistaken operation.
- The screen will not be visible if the backlight of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P burns out, the touch panel and the function keys will remain functional. Incorrect touch panel operation or incorrect function key operation will occur when operating the touch panel when the backlight appears to be off but is actually burnt out. Because such erroneous operations could result in damage, the touch panel and the function key should not be used after the backlight has burned out.
- When more than one button is pressed at the same time, due to the detection characteristics of an analog type touch panel, only the center of the pressed area is sensed and the unit assumes that only one button is pressed. Therefore, do not operate the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P by pressing more than one button simultaneously.

⚠ CAUTION

- Use the HG1P optional cable for proper wiring.
- The D-sub connector on the end of the HG1P optional cable is not water-or dust-proof. If protection against water and dust is required, the user must replace the D-sub connector with a water-proof connector. IDEC takes no responsibility for water or dust protection if an alternate connector is installed.
- Prevent the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P from falling while moving or transporting, otherwise damage or malfunction of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P 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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P is designed for use in pollution degree 2. Use the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P in environments of pollution degree 2. (based on the IEC60664-1 rating)
- Install the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P according to the instructions. Improper installation will result in falling, failure, electrical shock, fire hazard, or malfunction of the HG5G/4G/3G/2G-V, HG4G/3G,
HG2G-5F/-5T, HG1G/1P.
- Prevent metal fragments or wire chips from dropping inside the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P 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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G 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, and tighten the terminal screws of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G to the specified tightening torque.
- When exporting the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P to Europe, use an EN60127 (IEC60127) approved fuse on the power line outside the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P.
- When exporting the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P to Europe, use an EU-approved circuit protector.
- Make sure of safety before starting and stopping the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P. Incorrect operation of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P may cause mechanical damage or accidents.
- Use the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P in a local area network if you download, upload or monitor the project data via the Ethernet port.
- The touch panel of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P is made of glass, and will break if exposed to excessive shock. Take due care when handling it.
- 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.
- Do not use device beyond the rated operating temperature, otherwise the clock accuracy will be affected.
- Do not install the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P 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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P. This can create the risk of fire or electrocution.
- When disposing of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G/1P, do so as an industrial waste.
- Be sure to confirm that the SD Memory Card Access lamp is not lit prior to turning the power off to the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F or pulling out the SD memory card. Refer to this manual for details.
- Do not switch off the power or pull out the SD Memory Card or the USB flash drive while it is being accessed, as this may result in destruction of the stored data. If the data on the SD Memory Card or the USB flash drive is corrupted, format the SD Memory Card or the USB flash drive.

Revision history

August 2015:	First Edition
May 2016:	Second Edition
July 2016:	Third Edition
January 2017:	Fourth Edition
June 2017:	Fifth Edition
August 2017:	Sixth Edition
December 2017:	Seventh Edition
March 2018:	Eighth Edition
June 2018:	Ninth Edition
March 2019:	Tenth Edition
August 2019:	Eleventh 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

WindO/I and MICRO/I are registered trademarks of IDEC CORPORATION in JAPAN. Microsoft, Windows and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Adobe is a trademark of Adobe Systems Incorporated.
All other company names and product names used in this manual or the WindO/I-NV4 application are trademarks of their respective owners.
This product adopts the font of Ryobi.

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
HG5G-V	The name is short for MICRO/I HG5G-VFXT22MF-B.
HG4G-V	The name is short for MICRO/I HG4G-VCXT22MF-B.
HG4G	The name is short for MICRO/I HG4G-CJT22*F-B.
HG3G-V	The name is short for MICRO/I HG3G-V*XT22MF-*.
HG3G	The name is short for MICRO/I HG3G-*JT22*F-*.
HG2G-V	The name is short for MICRO/I HG2G-V5FT22TF-*.
HG2G-5F	The name is short for MICRO/I HG2G-5FT22TF-*.
HG2G-5T	The name is short for MICRO/I HG2G-5T*22TF-*.
HG1G	The name is short for MICRO/I HG1G-4VT22TF-*.
HG1P	The name is short for MICRO/I HG1P-ST32*.
HG5G/4G/3G/2G-V	The format used to refer to HG5G-V, HG4G-V, HG3G-V and HG2G-V.
HG5G/4G/3G-V	The format used to refer to HG5G-V, HG4G-V and HG3G-V.
HG4G/3G	The format used to refer to HG4G and HG3G. HG4G-V and HG3G-V is not included.
HG2G-5F/-5T	The format used to refer to HG2G-5F and HG2G-5T.
HG1G/1P	The format used to refer to HG1G and HG1P.
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.
Device Address	Memory that is capable of storing values in unit of bits or words loaded on the MICRO/I and external device.
System Area	Device area that is pre-allocated for exchanging screen management, error information, and clock data between the MICRO/I 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 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.
Script	A script is an executable list of commands created by a simple programming language.
Maintenance Communication	Communications between the WindO/I-NV4 and MICRO/I using a dedicated protocol.
Pass-through	A function that enables maintenance of the external device via the MICRO/I.

Item	Description
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.
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.

Contents

Chapter 3 O/I Link Communication

Chapter 4 DM Link Communication

Chapter 5 Modbus

Chapter 6 Communication with Multiple External Devices

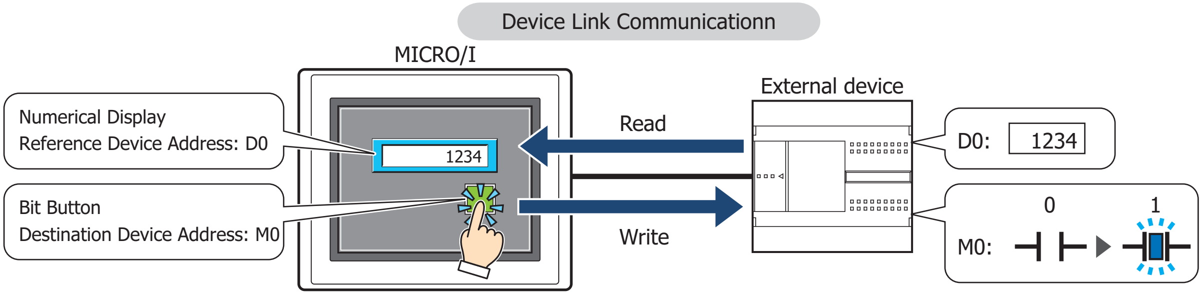
Chapter 7 Communication Cables

Index

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.



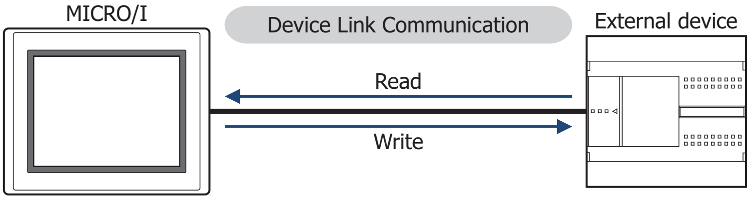
For details regarding the Command Method Communication, refer to Chapter 2 “Connection to External Devices” on page 2-1.

● 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.

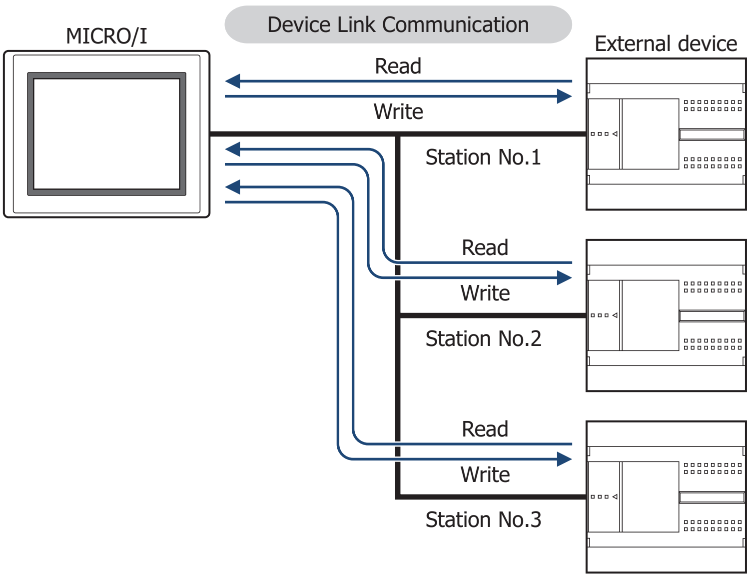
■ 1:1 Communication

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 details, refer to the 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/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 details, 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. Adjust the per unit time communications traffic by increasing this value when the processing speed of the MICRO/I is slow due to a high-traffic communication.
	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 details, 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.

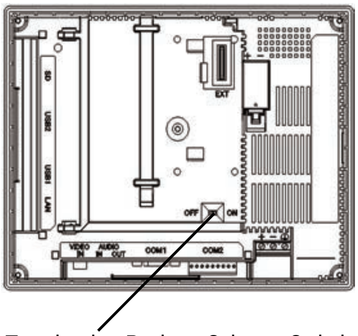
- Depending on the environment, connect a shield wire to the FG terminal on either the External Device side or the MICRO/I side.
- When using the RS422/485 interface, use a twisted-pair cable so that the + and - signals are paired.
- When you use the RS422/485 interface and need a terminating resistor, read the following description.
  - HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T:

    Set the Terminating Resistor Selector Switch to the ON side.

    This will connect the internal terminating resistor between RDA and RDB. The connected resistance value varies based on the model.

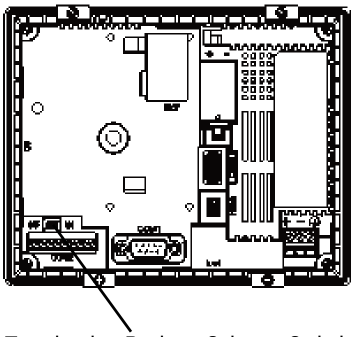
    HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F*1: 120-Ohm, HG2G-5T: 100-Ohm

HG5G/4G/3G-V, HG4G/3G



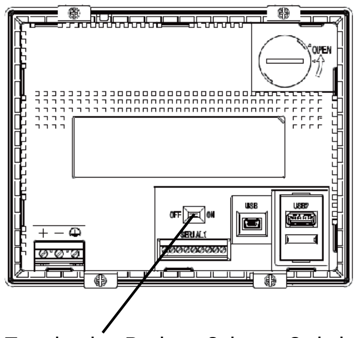
Terminating Resistor Selector Switch

HG2G-V, HG2G-5F



Terminating Resistor Selector Switch

HG2G-5T



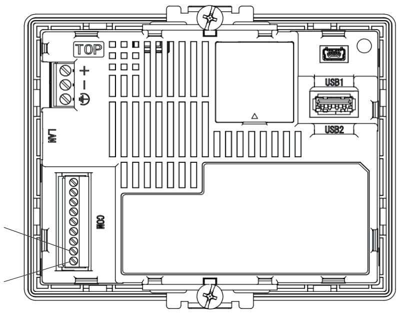
Terminating Resistor Selector Switch

  - HG1G*2:

    Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

Terminal Number 8 (RDA)

Terminal Number 9 (RDB)



*1 In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F inserts terminating resistor to only Terminal port, not D-sub port. Insert a terminating resistor (100 to 120 Ohm, 1/2 W minimum) when using RS422/485 interface at D-sub port if necessary.

*2 This model is not equipped with terminating resistor.

Chapter 2 Connection to External Devices

1 IDEC

1.1 Connection Table

CPU module	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FC6A MICROSmart				
FC6A-C16R1AE FC6A-C16R1CE FC6A-C16K1CE FC6A-C16P1CE FC6A-C24R1AE FC6A-C24R1CE FC6A-C24K1CE FC6A-C24P1CE FC6A-C40R1AE FC6A-C40R1CE FC6A-C40K1CE FC6A-C40P1CE FC6A-C40R1DE FC6A-C40K1DE FC6A-C40P1DE	Not required (Connects to CPU module)	RS232C Connection Diagram 6 (Page 2-16)	None	MICROSmart(FC6A)(RS232C/485)
		RS422/485 2-wire Connection Diagram 7 (Page 2-17)		
	FC6A-PC1	RS232C Connection Diagram 8 (Page 2-18)		
	FC6A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	FC6A-SIF52	RS232C Connection Diagram 4 (Page 2-14)		
		RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	Not required (Connects to Ethernet port)	Ethernet	-	MICROSmart(FC6A)(Ethernet)
	HMI module (FC6A-PH1)			
FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40K1CEJ FC6A-C40P1CEJ FC6A-C40R1DEJ FC6A-C40K1DEJ FC6A-C40P1DEJ	FC6A-PC1	RS232C Connection Diagram 8 (Page 2-18)	None	MICROSmart(FC6A)(RS232C/485)
	FC6A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	FC6A-SIF52	RS232C Connection Diagram 4 (Page 2-14)		
		RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	Not required (Connects to Ethernet port)	Ethernet	-	MICROSmart(FC6A)(Ethernet)
	HMI module (FC6A-PH1)			
FC6A-D16R1CEE FC6A-D16P1CEE FC6A-D16K1CEE FC6A-D32P3CEE FC6A-D32K3CEE	FC6A-HPH1+FC6A-PC1 FC6A-PH1+FC6A-PC1	RS232C Connection Diagram 8 (Page 2-18)	None	MICROSmart(FC6A)(RS232C/485)
	FC6A-HPH1+FC6A-PC3 FC6A-PH1+FC6A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	FC6A-SIF52	RS232C Connection Diagram 4 (Page 2-14)		
		RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
	Not required (Connects to Ethernet port)	Ethernet	-	MICROSmart(FC6A)(Ethernet)
	HMI module (FC6A-PH1)			

The corresponding device type differs depending on the communication driver which be used.
For FC6A type, please select MICROSmart(FC6A)(RS232C/485), MICROSmart(FC6A)(Ethernet) driver.
If use OpenNet,MICROSmart,SmartAXIS Pro/Lite(RS232C485), OpenNet,MICROSmart,SmartAXIS Pro/Lite(Ethernet) driver, the device type is partially different, so please use this manual carefully after confirming it.

<table>
<tr><th rowspan="2">CPU module</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">FT1A SmartAXIS Pro/Lite</td></tr>
<tr><td rowspan="4">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</td><td>Not required
(Connects to CPU module)</td><td>Ethernet</td><td>-</td><td>OpenNet,MICROSmart,
SmartAXIS Pro/Lite(Ethernet)</td></tr>
<tr><td>FT1A-PC1</td><td>RS232C
Connection Diagram 3 (Page 2-13)</td><td rowspan="3">None</td><td rowspan="3">OpenNet,MICROSmart,
SmartAXIS Pro/Lite(RS232C/485)</td></tr>
<tr><td>FT1A-PC2</td><td>RS422/485 2-wire
Connection Diagram 5 (Page 2-15)</td></tr>
<tr><td>FT1A-PC3</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td></tr>
<tr><td colspan="5">FC5A MICROSmart</td></tr>
<tr><td rowspan="7">FC5A-C10R2
FC5A-C16R2
FC5A-C24R2
FC5A-C10R2C
FC5A-C16R2C
FC5A-C24R2C</td><td rowspan="2">Not required
(Connects to CPU module)</td><td>RS232C
Connection Diagram 3 (Page 2-13)</td><td rowspan="2">None</td><td rowspan="6">OpenNet,MICROSmart,
SmartAXIS Pro/Lite(RS232C/485)</td></tr>
<tr><td>RS232C
Connection Diagram 1 (Page 2-12)</td></tr>
<tr><td>FC4A-PC1</td><td>RS232C
Connection Diagram 1 (Page 2-12)</td><td>ER</td></tr>
<tr><td>FC4A-PC3</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td><td rowspan="3">None</td></tr>
<tr><td>FC5A-SIF2</td><td>RS232C
Connection Diagram 4 (Page 2-14)</td></tr>
<tr><td>FC5A-SIF4</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td></tr>
<tr><td>Web Server Unit
(FC4A-SX5ES1E)</td><td>Ethernet</td><td>-</td><td>OpenNet,MICROSmart,
SmartAXIS Pro/Lite(Ethernet)</td></tr>
<tr><td rowspan="10">FC5A-D16RK1
FC5A-D16RS1
FC5A-D32K3
FC5A-D32S3</td><td rowspan="2">Not required
(Connects to CPU module)</td><td>RS232C
Connection Diagram 3 (Page 2-13)</td><td rowspan="2">None</td><td rowspan="9">OpenNet,MICROSmart,
SmartAXIS Pro/Lite(RS232C/485)</td></tr>
<tr><td>RS232C
Connection Diagram 1 (Page 2-12)</td></tr>
<tr><td>FC4A-HPC1</td><td>RS232C
Connection Diagram 1 (Page 2-12)</td><td>ER</td></tr>
<tr><td>FC4A-HPC3</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td><td>None</td></tr>
<tr><td>FC4A-HPH1 +FC4A-PC1</td><td>RS232C
Connection Diagram 1 (Page 2-12)</td><td>ER</td></tr>
<tr><td>FC4A-HPH1 +FC4A-PC3</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td><td rowspan="3">None</td></tr>
<tr><td>FC5A-SIF2</td><td>RS232C
Connection Diagram 4 (Page 2-14)</td></tr>
<tr><td>FC5A-SIF4</td><td>RS422/485 2-wire
Connection Diagram 2 (Page 2-13)</td></tr>
<tr><td>Web Server Unit
(FC4A-SX5ES1E)</td><td>Ethernet</td><td>-</td><td>OpenNet,MICROSmart,
SmartAXIS Pro/Lite(Ethernet)</td></tr>
</table>

CPU module	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FC5A MICROSmart				
FC5A-D12K1E FC5A-D12S1E	Not required (Connects to CPU module)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
	FC4A-HPC1	RS232C Connection Diagram 1 (Page 2-12)	ER	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
	FC4A-HPC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)	None	
	FC4A-HPH1 +FC4A-PC1	RS232C Connection Diagram 1 (Page 2-12)	ER	
	FC4A-HPH1 +FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)	None	
	FC5A-SIF2	RS232C Connection Diagram 4 (Page 2-14)		
	FC5A-SIF4	RS422/485 2-wire Connection Diagram 2 (Page 2-13)		
FC4A MICROSmart				
FC4A-C10R2	Not required (Connects to CPU module)	RS232C Connection Diagram 3 (Page 2-13)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-12)		
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC4A-C16R2 FC4A-C24R2	Not required (Connects to CPU module)	RS232C Connection Diagram 3 (Page 2-13)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-12)		
	FC4A-PC1	RS232C Connection Diagram 1 (Page 2-12)	ER	
	FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)	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 module)	RS232C Connection Diagram 3 (Page 2-13)	None	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS232C Connection Diagram 1 (Page 2-12)		
	FC4A-HPC1	RS232C Connection Diagram 1 (Page 2-12)	ER	
	FC4A-HPC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)	None	
	FC4A-HPH1 +FC4A-PC1	RS232C Connection Diagram 1 (Page 2-12)	ER	
	FC4A-HPH1 +FC4A-PC3	RS422/485 2-wire Connection Diagram 2 (Page 2-13)	None	
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)
FC3A OpenNet Controller				
FC3A-CP2	Not required (Connects to CPU module)	RS232C Connection Diagram 1 (Page 2-12)	ER	OpenNet,MICROSmart, SmartAXIS Pro/Lite(RS232C/485)
		RS422/485 2-wire Connection Diagram 2 (Page 2-13)	None	
	Web Server Unit (FC4A-SX5ES1E)	Ethernet	-	OpenNet,MICROSmart, SmartAXIS Pro/Lite(Ethernet)

1.2 Supported Function

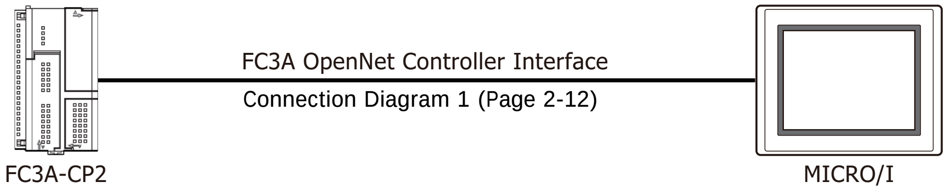
Communication Driver	Functions	
	Pass-through function	1:N Communication function
MICROSmart(FC6A)(RS232C/485)	YES	YES
MICROSmart(FC6A)(Ethernet)	NO	YES
OpenNet,MICRSmart,SmartAXIS Pro/Lite(RS232C/485)	YES	YES
OpenNet,MICRSmart,SmartAXIS Pro/Lite(Ethernet)	NO	YES

- Pass-through function (☞ Chapter 27 “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)

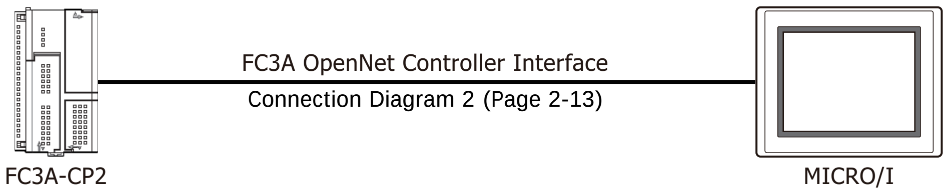
1.3 System Configuration

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

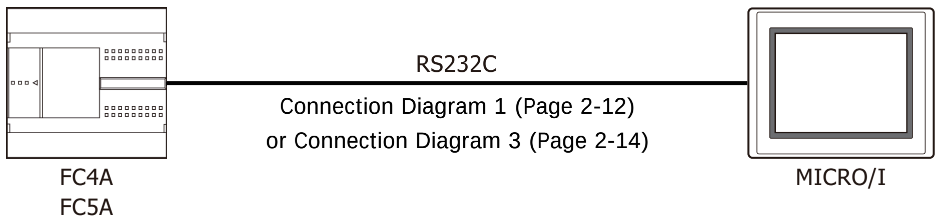
- FC3A OpenNet Controller (Connects to RS232C port of the CPU module)



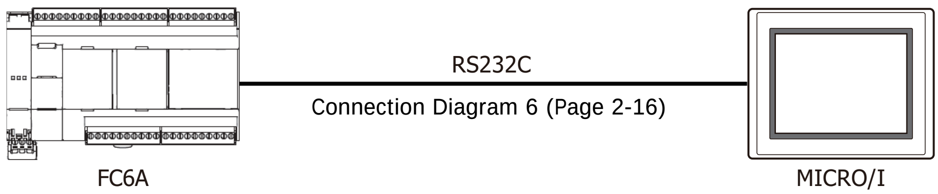
- FC3A OpenNet Controller (Connects to RS485 port of the CPU module)



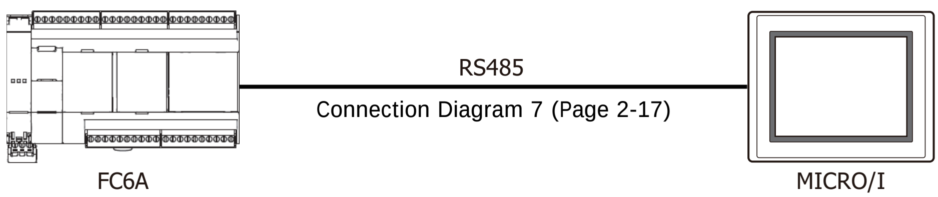
- FC4A/5A/6A MICROSmart (Connects to the Port 1 of the CPU module)



The CPU module of the FC5A-D12*1E does not have the Port 1.

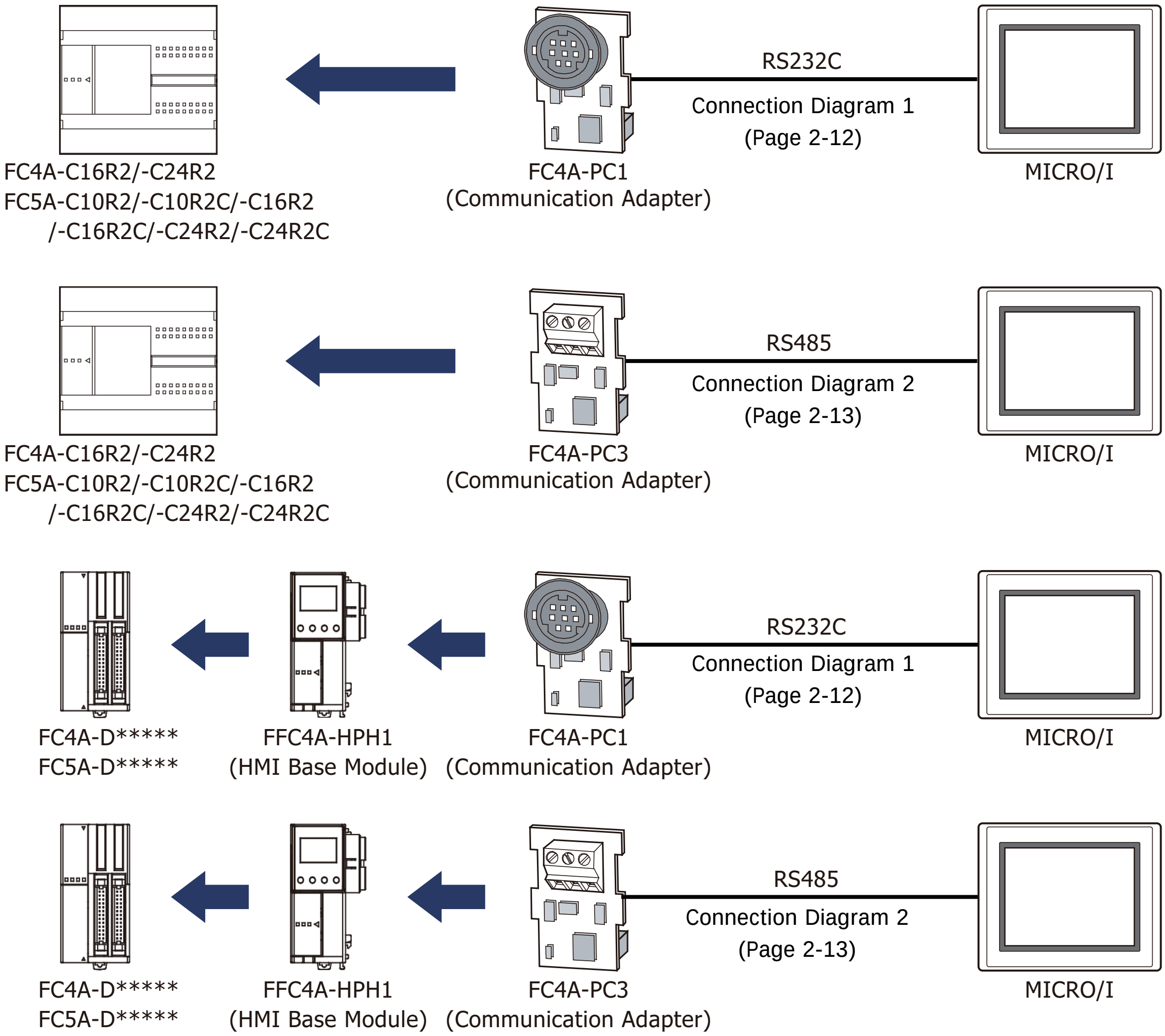


The CPU module of the FC6A-C*****EJ or the FC6A-D****CEE does not have the Port 1.

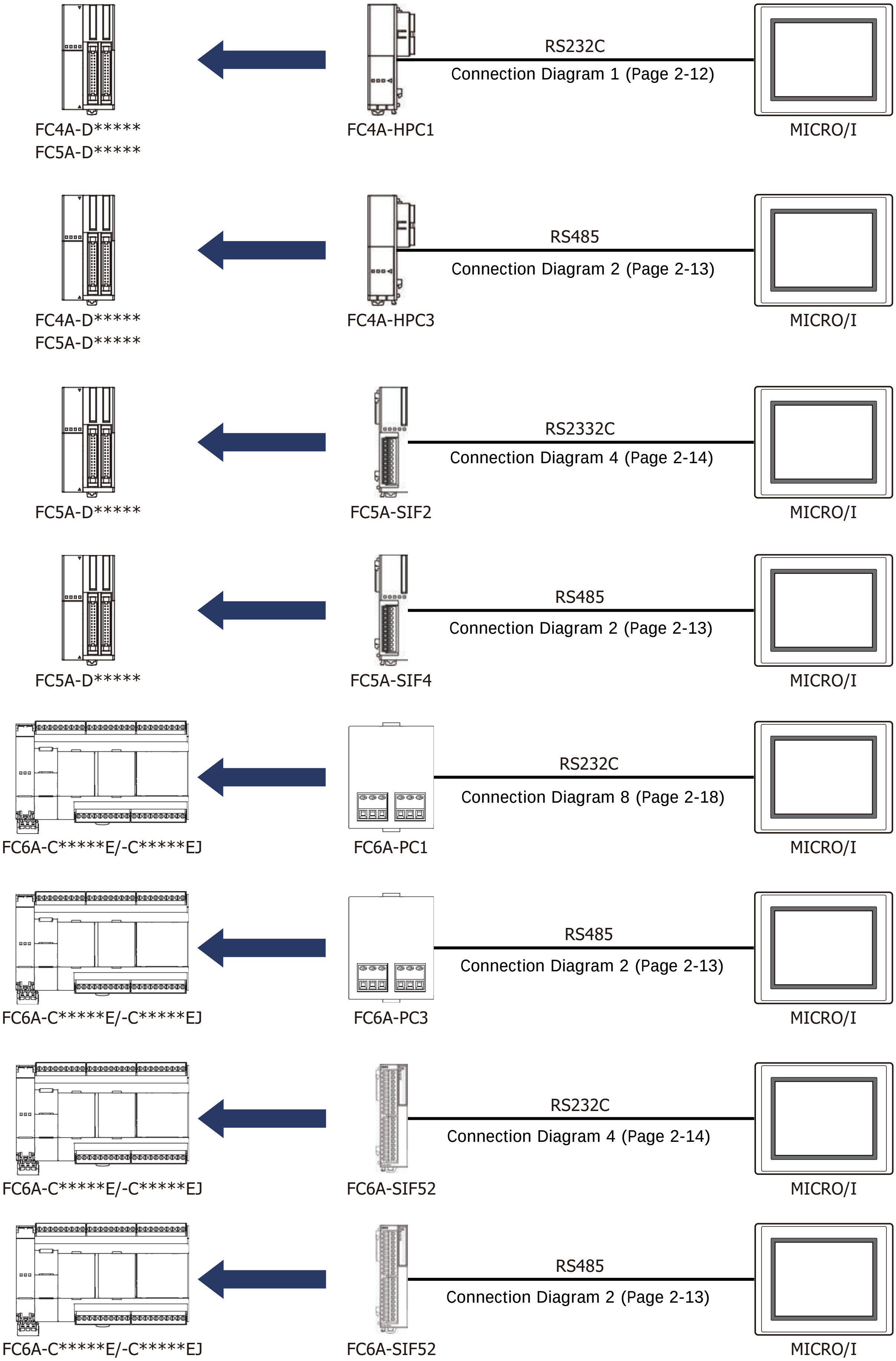


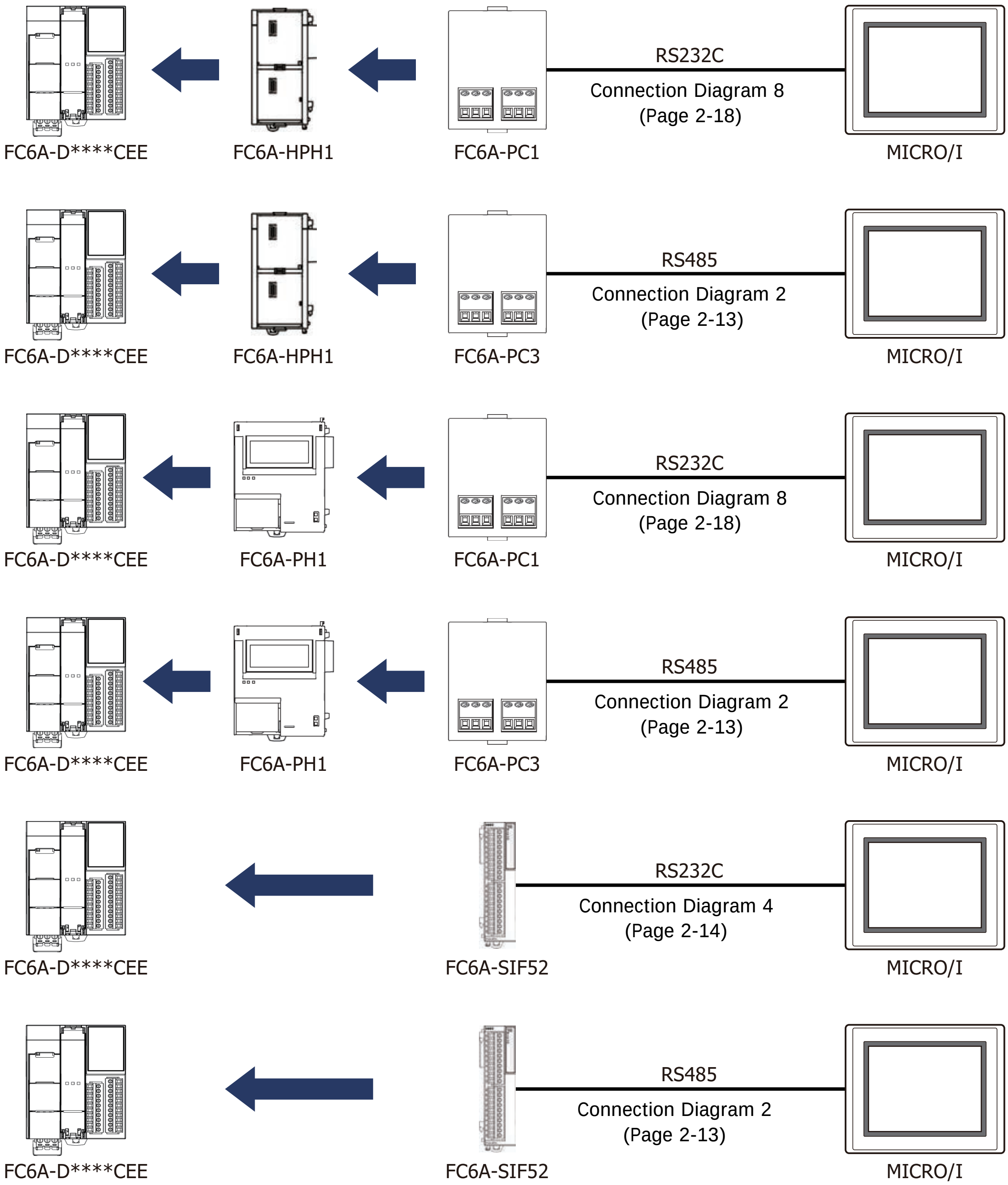
The CPU module of the FC6A-C*****EJ or the FC6A-D****CEE does not have the Port 1.

● FC4A/5A MICROSmart (Connects to the Port 2)

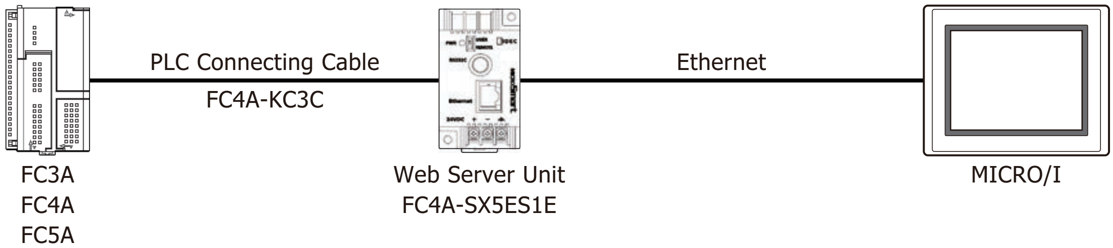


● FC4A/5A/6A MICROSmart (Connects to the Communication module)

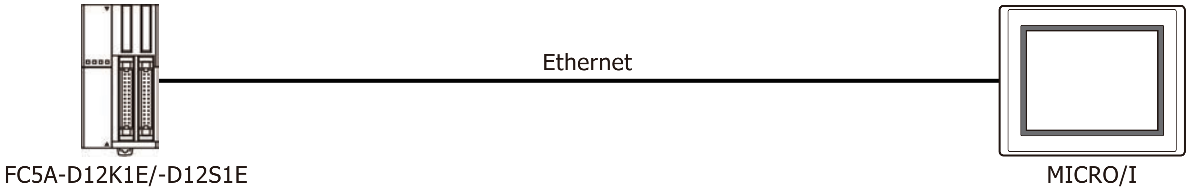



FC6A-D****CEE
FC6A-HPH1
FC6A-PC1
RS232C
Connection Diagram 8
(Page 2-18)
MICRO/I
FC6A-D****CEE
FC6A-HPH1
FC6A-PC3
RS485
Connection Diagram 2
(Page 2-13)
MICRO/I
FC6A-D****CEE
FC6A-PH1
FC6A-PC1
RS232C
Connection Diagram 8
(Page 2-18)
MICRO/I
FC6A-D****CEE
FC6A-PH1
FC6A-PC3
RS485
Connection Diagram 2
(Page 2-13)
MICRO/I
FC6A-D****CEE
FC6A-SIF52
RS232C
Connection Diagram 4
(Page 2-14)
MICRO/I
FC6A-D****CEE
FC6A-SIF52
RS485
Connection Diagram 2
(Page 2-13)
MICRO/I

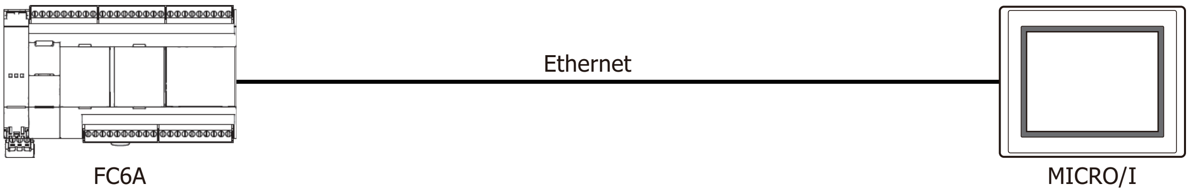
● FC3A OpenNet Controller and FC4A/5A MICROSmart (Connects to Web Server Unit)

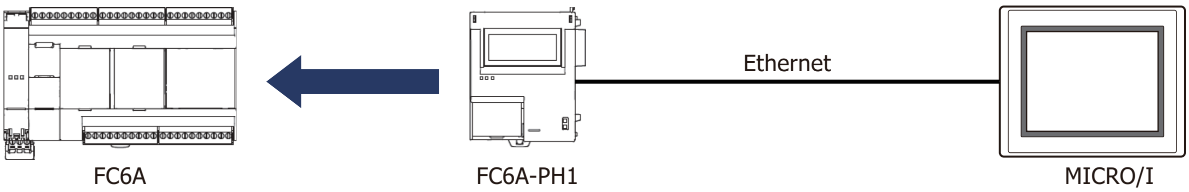


● FC5A MICROSmart (Connects to Ethernet port of the FC5A-D12*1E)

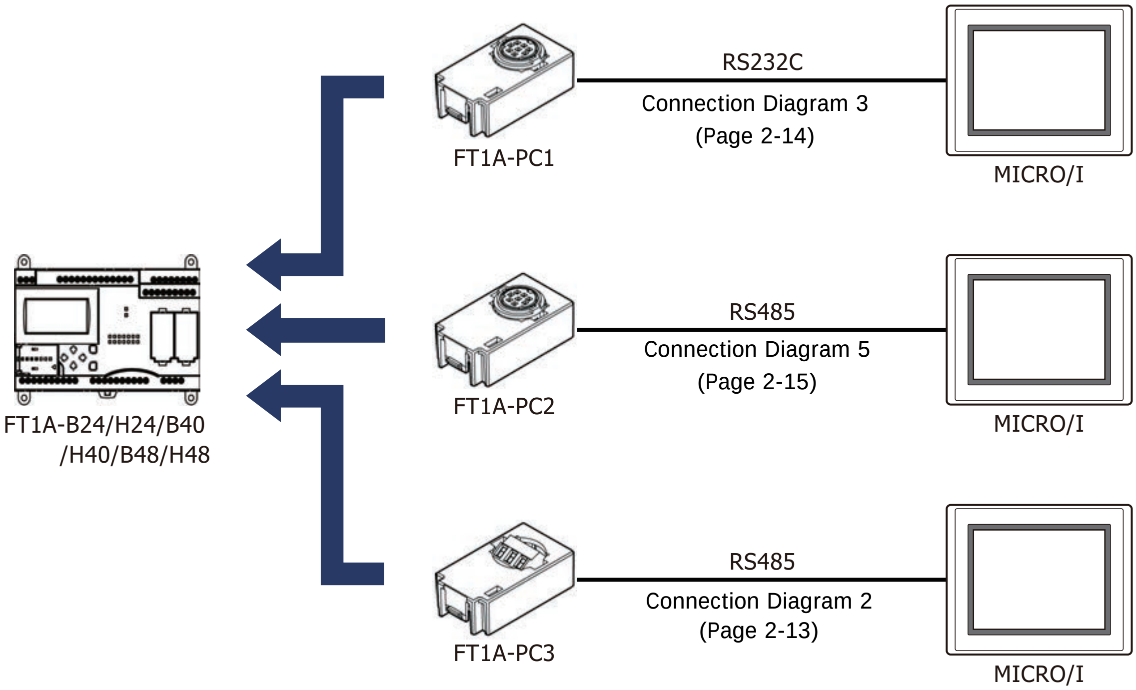


● FC6A MICROSmart (Connects to Ethernet port)

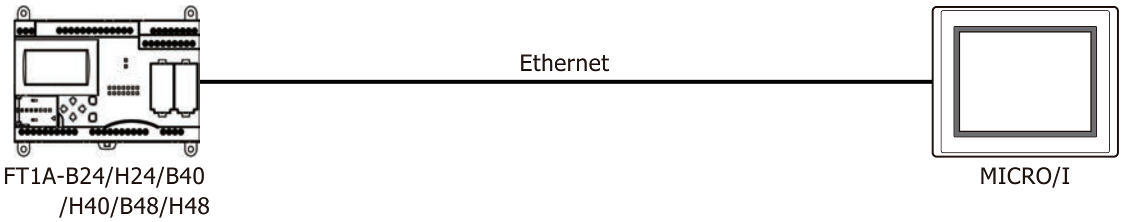




● FT1A SmartAXIS Pro/Lite (Connects to the Communication cartridge)



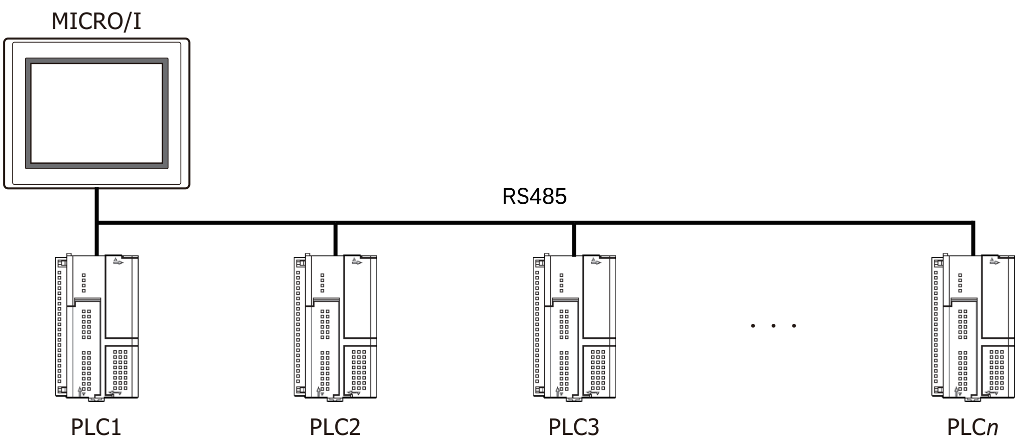
● FT1A SmartAXIS Pro/Lite (Connects to Ethernet port)



● FC3A OpenNet Controller, FC4A/5A/6A MICROSmart and FT1A SmartAXIS Pro/Lite (1:N Communication)

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

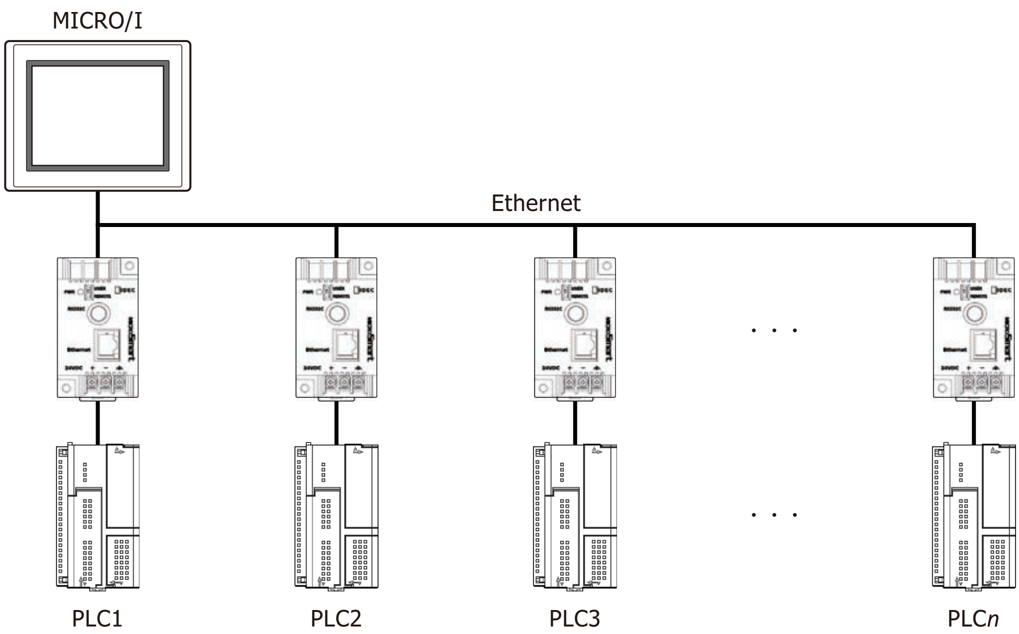
- FC3A OpenNet Controller (Connects to the RS485 port of the CPU module)
- FC4A/5A MICROSmart (Connects to the Port 2)
- FC5A MICROSmart (Connects to the Communication module)
- FC6A MICROSmart (Connects to the Port 1 of the CPU module of the FC6A-C*****E)
- FC6A MICROSmart (Connects to the Communication cartridge or the Communication module)
- FT1A SmartAXIS Pro/Lite (Connects to the Communication cartridge)



● FC3A OpenNet Controller, FC4A/5A/6A MICROSmart and FT1A SmartAXIS Pro/Lite (1:N communication via Ethernet)

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

- FC3A OpenNet Controller (Connects to the Web Server Unit)
- FC4A/5A MICROSmart (Connects to the Web Server Unit)
- FC5A MICROSmart (Connects to the Ethernet port of the FC5A-D12*1E)
- FC6A MICROSmart (Connects to the Ethernet port)
- FT1A SmartAXIS Pro/Lite (Connects to the Ethernet port)

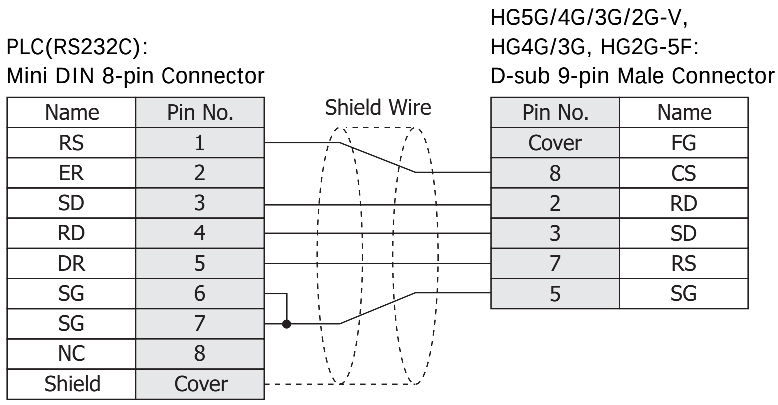


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

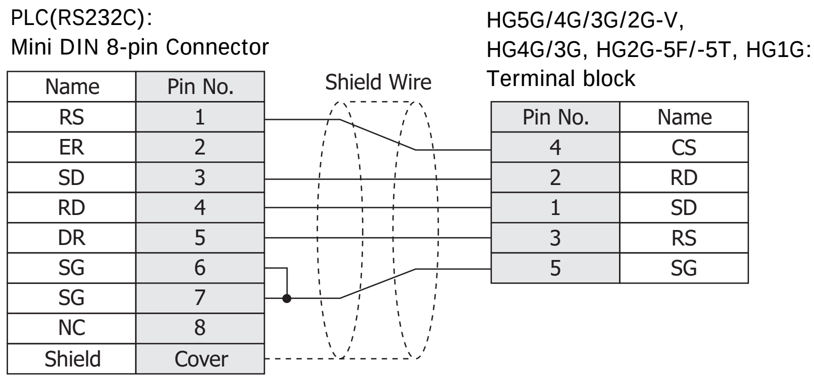
1.4 Connection Diagram

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: FC3A OpenNet Controller and FC4A/5A MICROSmart (RS232C port)

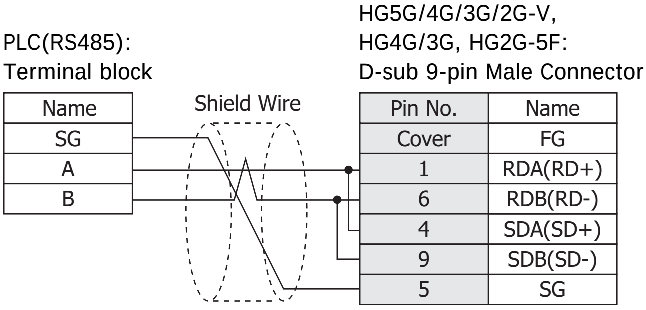


In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F a communication cable (Type Number: HG9Z-XC295) is available. Refer to Chapter 7 "1.2 PLC communication cable (Type Number: HG9Z-XC295)" on page 7-2 about the connection diagram of the HG9Z-XC295.

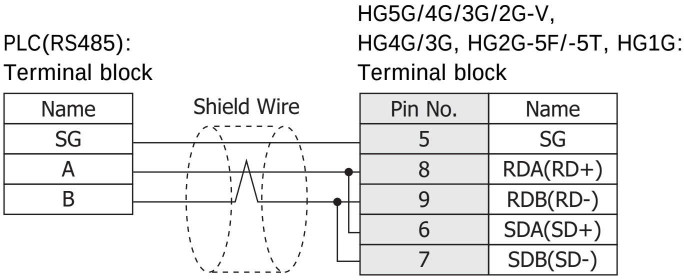


In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G, a communication cable (Type Number: FC2A-KP1C, HG9Z-XC275) is available. Refer to Chapter 7 "1.1 User Communication, Printer or PLC communication cable (Type Number: FC2A-KP1C, HG9Z-XC275)" on page 7-1 about the connection diagram of these cables.

● Connection Diagram 2: FC3A OpenNet Controller and FC4A/5A MICROSmart (RS485 port)
FC5A MICROSmart (FC5A-SIF4)
FC6A MICROSmart (FC6A-PC3, RS485 port of FC6A-SIF52)
FT1A SmartAXIS Pro/Lite (FT1A-PC3)



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

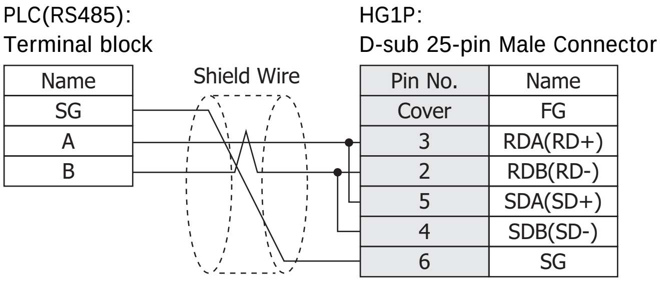


- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

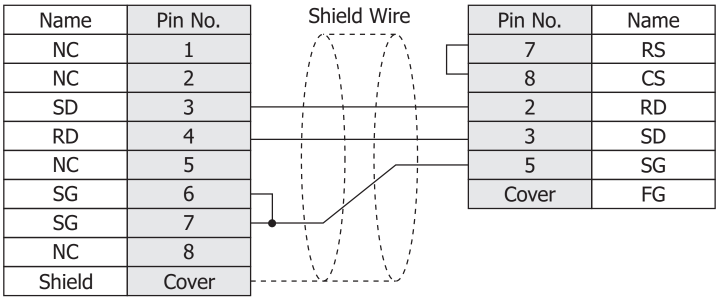
  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.



● Connection Diagram 3: FC4A/5A MICROSmart (Port 1) FT1A SmartAXIS Pro/Lite (FT1A-PC1)

PLC(RS232C):
Mini DIN 8-pin Connector

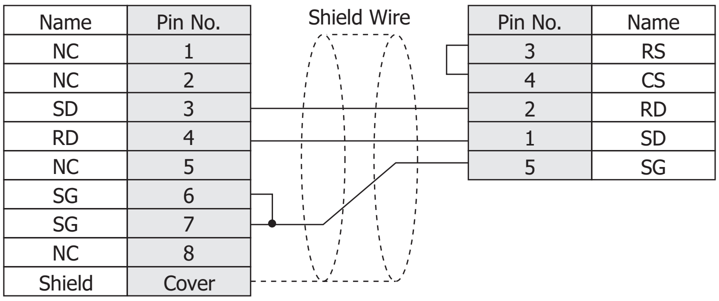
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F a communication cable (Type Number: HG9Z-XC295) is available. Refer to Chapter 7 "1.2 PLC communication cable (Type Number: HG9Z-XC295)" on page 7-2 about the connection diagram of the HG9Z-XC295.

PLC(RS232C):
Mini DIN 8-pin Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

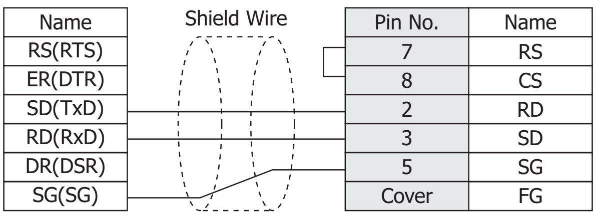


In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G a communication cable (Type Number: FC2A-KP1C, HG9Z-XC275) is available. Refer to Chapter 7 "1.1 User Communication, Printer or PLC communication cable (Type Number: FC2A-KP1C, HG9Z-XC275)" on page 7-1 about the connection diagram of these cables.

● Connection Diagram 4: FC5A MICROSmart (FC5A-SIF2) FC6A MICROSmart (RS232C port of FC6A-SIF52)

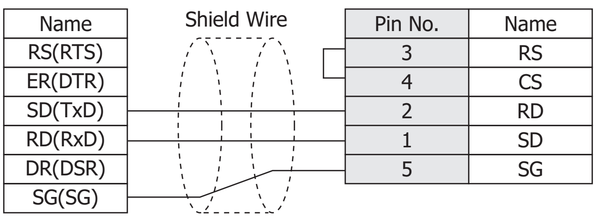
PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



PLC(RS232C):
Terminal block

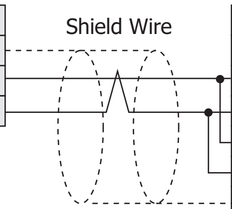
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



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

PLC(RS485):
Mini DIN 8-pin Connector

Name	Pin No.
SG	7
A	2
B	1



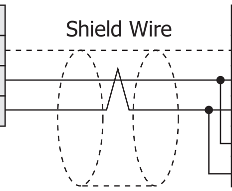
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.

PLC(RS485):
Mini DIN 8-pin Connector

Name	Pin No.
SG	7
A	2
B	1



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

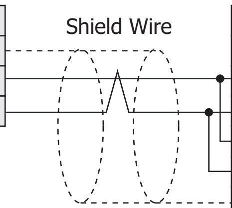
  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G, a communication cable (Type Number: FC2A-KP1C, HG9Z-XC275) is available. Refer to Chapter 7 "1.1 User Communication, Printer or PLC communication cable (Type Number: FC2A-KP1C, HG9Z-XC275)" on page 7-1 about the connection diagram of these cables.

PLC(RS485):
Mini DIN 8-pin Connector

Name	Pin No.
SG	7
A	2
B	1



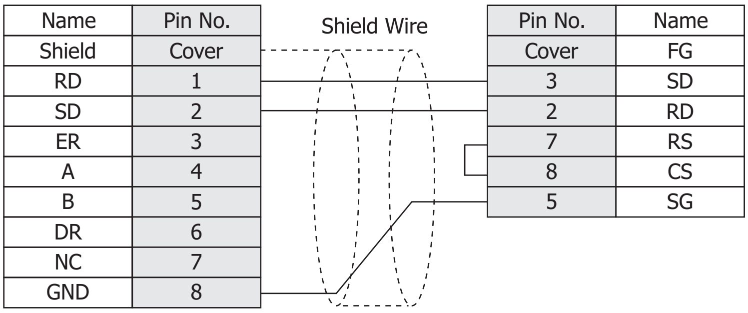
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● Connection Diagram 6: FC6A MICROSmart (Connects the Port 1 of the FC6A-C*****E used as RS232C port)

PLC(RS232C):
RJ-45 8-pin Modular Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



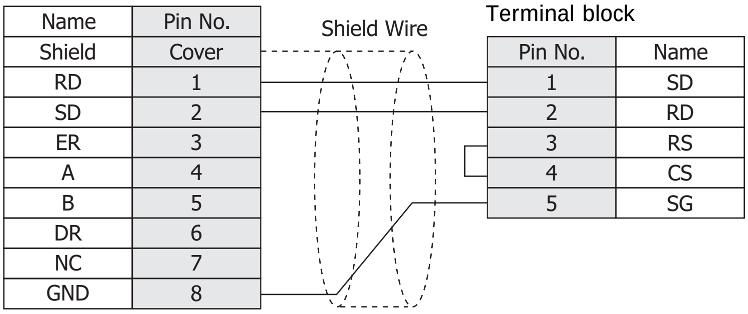
Name	Pin No.
Shield	Cover
RD	1
SD	2
ER	3
A	4
B	5
DR	6
NC	7
GND	8

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	CS
5	SG

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F a communication cable (Type Number: FC6A-KC2C) is available. Refer to Chapter 7 "1.6 User Communication or PLC communication cable (Type Number: FC6A-KC2C)" on page 7-5 about the connection diagram of the FC6A-KC2C.

PLC(RS232C):
RJ-45 8-pin Modular Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



Name	Pin No.
Shield	Cover
RD	1
SD	2
ER	3
A	4
B	5
DR	6
NC	7
GND	8

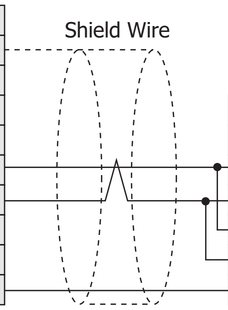
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G a communication cable (Type Number: FC6A-KC1C) is available. Refer to Chapter 7 "1.5 User Communication or PLC communication cable (Type Number: FC6A-KC1C)" on page 7-4 about the connection diagram of the FC6A-KC1C.

● Connection Diagram 7: FC6A MICROSmart (Connects the Port 1 of the FC6A-C*****E used as RS485 port)

PLC(RS485):
RJ-45 8-pin Modular Connector

Name	Pin No.
Shield	Cover
RD	1
SD	2
ER	3
A	4
B	5
DR	6
NC	7
GND	8



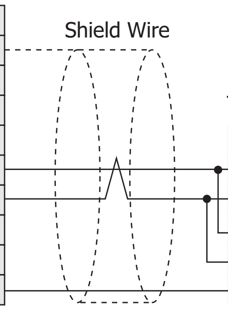
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS485):
RJ-45 8-pin Modular Connector

Name	Pin No.
Shield	Cover
RD	1
SD	2
ER	3
A	4
B	5
DR	6
NC	7
GND	8



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

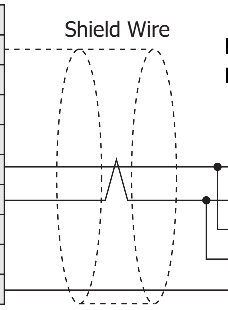
  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G a communication cable (Type Number: FC6A-KC1C) is available. Refer to Chapter 7 "1.5 User Communication or PLC communication cable (Type Number: FC6A-KC1C)" on page 7-4 about the connection diagram of the FC6A-KC1C.

PLC(RS485):
RJ-45 8-pin Modular Connector

Name	Pin No.
Shield	Cover
RD	1
SD	2
ER	3
A	4
B	5
DR	6
NC	7
GND	8



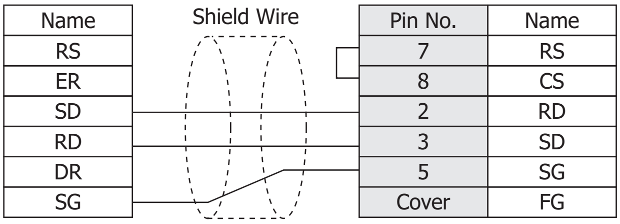
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● Connection Diagram 8: FC6A MICROSmart (FC6A-PC1)

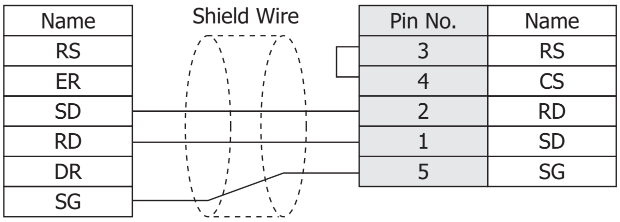
PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



1.5 Environment Settings

● FC3A OpenNet Controller, FC4A/5A/6A MICROSmart and FT1A SmartAXIS Pro/Lite (Serial)

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

Tab Name	Item	Setting
Communication Interface	Baud Rate[*1]	115200, 57600, 38400, 19200 or 9600 bps
	Data Bits	7 bits
	Stop Bits	1 stop bits
	Parity	Even
	Flow Control	None
	Serial Interface[*2]	RS232C, RS422/485 2-wire or RS422/485 4-wire
Communication Driver Network	Slave Number[*3]	Set the Station Number of PLC. (0 to 31)

Set the Special Internal Relay M8014 of FC3A OpenNet Controller to ON if you connect FC3A OpenNet Controller to MICRO/I.

● FC3A OpenNet Controller and FC4A/5A MICROSmart (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 FC3A OpenNet Controller to ON if you connect FC3A OpenNet Controller to MICRO/I.

● FC5A MICROSmart (FC5A-D12*1E), FC6A MICROSmart and FT1A SmartAXIS Pro/Lite (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 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 PLC.
	Port Number	Set the port number for PLC.

*1 The communication speed settings varies based on the PLC model. For details, refer to the PLC manual.
*2 The interface settings varies based on the PLC model. For details, refer to the PLC manual.
*3 Set a decimal number for the Slave Number of MICRO/I.

1.6 Usable Device Addresses

● MICROSmart(FC6A)(RS232C/485),
MICROSmart(FC6A)(Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read/Write	Address Numeral System
	MICRO/I	PLC			
Internal Relay (Bit)	M	M	0 to 7997, 8000 to 9997, 10000 to 21247	R/W	*1
Input (Bit)	I	I	0 to 10597	R	*1
Output (Bit)	Q	Q	0 to 10597	R/W	*1
Timer (Contact)	T	T	0 to 1999	R	Decimal
Counter (Contact)	C	C	0 to 511	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 61999, 70000 to 269999	R/W	Decimal
Input (Word)	WI	I	0 to 10580	R	Decimal*2
Output (Word)	WQ	Q	0 to 10580	R/W	Decimal*2
Internal Relay (Word)	WM	M	0 to 7980, 8000 to 9980, 10000 to 21220	R/W	Decimal*2
Timer Current Value	TC	TC	0 to 1999	R	Decimal
Counter Current Value	CC	CC	0 to 511	R	Decimal
Timer Preset Value	TP	TP	0 to 1999	R/W	Decimal
Counter Preset Value	CP	CP	0 to 511	R/W	Decimal
Shift Register (Word)	WR	R	0 to 240	R	Decimal*3
Index register	P	P	0 to 151	R	*4

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.
*4 This device is a 32-bit device. The first two 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.

● OpenNet,MICROSmart,SmartAXIS Pro/Lite(RS232C/485), OpenNet,MICROSmart,SmartAXIS Pro/Lite(Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read/Write	Address Numeral System
	MICRO/I	PLC			
Internal Relay (Bit)	M	M	0 to 7997, 8000 to 9997, 10000 to 21247	R/W	*1
Input (Bit)	I	I	0 to 10597	R	*1
Output (Bit)	Q	Q	0 to 10597	R/W	*1
Timer (Contact)	T	T	0 to 1999	R	Decimal
Counter (Contact)	C	C	0 to 511	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 61999, 70000 to 269999	R/W	Decimal
Input (Word)	WI	I	0 to 10580	R	Decimal*2
Output (Word)	WQ	Q	0 to 10580	R/W	Decimal*2
Internal Relay (Word)	WM	M	0 to 7980, 8000 to 9980, 10000 to 21220	R/W	Decimal*2
Timer Current Value	TC	TC	0 to 1999	R	Decimal
Counter Current Value	CC	CC	0 to 511	R	Decimal
Timer Preset Value	TP	TP	0 to 1999	R/W	Decimal
Counter Preset Value	CP	CP	0 to 511	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 FC3A OpenNet Controller to ON.

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

2.1 Connection Table

● PLC

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC-A				
A1N A2N A3N	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS232C Connection Diagram 1 (Page 2-37)	ER	MELSEC-AnN(LINK)
		RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
A1SH	A1SJ71C24-R2 A1SJ71UC24-R2	RS232C Connection Diagram 3 (Page 2-39)	ER	
	A1SJ71C24-R4 A1SJ71UC24-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
A2CCPUC24	Not required (Connects to CPU unit)	RS232C Connection Diagram 3 (Page 2-39)	ER	
A0J2 A0J2H	A0J2-C214-S1	RS232C Connection Diagram 1 (Page 2-37)		
		RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
A2A A3A A2U A3U A4U	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS232C Connection Diagram 1 (Page 2-37)	ER	MELSEC-AnA(Link)
		RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
A2US A2USH-S1	A1SJ71C24-R2 A1SJ71UC24-R2	RS232C Connection Diagram 3 (Page 2-39)	ER	
	A1SJ71C24-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
MELSEC-QnA				
Q4ACPU Q4ARCPU Q3ACPU Q2ACPU-S1 Q2ACPU	AJ71QC24N-R2 AJ71QC24N	RS232C Connection Diagram 1 (Page 2-37)	ER	MELSEC-Q/QnA (LINK)
	AJ71QC24N AJ71QC24N-R4	RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
	AJ71QC24N-R4	RS422/485 4-wire Connection Diagram 9 (Page 2-43)		
	AJ71QE71N3-T	Ethernet	-	MELSEC-Q/QnA (Ethernet)
	AJ71QE71N-B2			
	AJ71QE71N-B5			
Q2ASHCPU-S1 Q2ASHCPU Q2ASCPU-S1 Q2ASCPU	A1SJ71QC24N-R2 A1SJ71QC24N	RS232C Connection Diagram 3 (Page 2-39)	ER	MELSEC-Q/QnA (LINK)
	A1SJ71QC24N	RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
	A1SJ71QE71N3-T	Ethernet	-	MELSEC-Q/QnA (Ethernet)
	A1SJ71QE71N-B2			
	A1SJ71QE71N-B5			

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC-Q				
Q00CPU Q01CPU Q00UJCPU Q00UCPU Q01UCPU Q02UCPU	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-41) Connection Diagram 7 (Page 2-42)	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 Q03UDVCPU Q04UDVCPU Q06UDVCPU Q13UDVCPU Q26UDVCPU	QJ71C24N-R2	RS232C Connection Diagram 3 (Page 2-39)		
	QJ71C24N			
		RS422/485 4-wire Connection Diagram 2 (Page 2-38)	None	
Q02CPU Q02HCPU	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-41) Connection Diagram 7 (Page 2-42)	ER	MELSEC-Q (CPU)

<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 rowspan="1">Q00JCPU
Q00CPU
Q01CPU
Q02CPU
Q02HCPU
Q06HCPU
Q12HCPU
Q25HCPU
Q00UJCPU
Q00UCPU
Q01UCPU
Q02UCPU
Q03UDCPU
Q04UDHCPU
Q06UDHCPU
Q10UDHCPU
Q13UDHCPU
Q20UDHCPU
Q26UDHCPU</td><td>QJ71E71-100
QJ71E71-B5
QJ71E71-B2</td><td rowspan="3">Ethernet</td><td rowspan="3">-</td><td rowspan="3">MELSEC-Q/QnA
(Ethernet)</td></tr>
<tr><td rowspan="2">Q03UDECPU
Q04UDEHCPU
Q06UDEHCPU
Q10UDEHCPU
Q13UDEHCPU
Q20UDEHCPU
Q26UDEHCPU
Q50UDEHCPU
Q100UDEHCPU
Q03UDVCPU
Q04UDVCPU
Q06UDVCPU
Q13UDVCPU
Q26UDVCPU</td><td>Not required
(Connects to CPU unit)</td></tr>
<tr><td>QJ71E71-100
QJ71E71-B2
QJ71E71-B5</td></tr>
</table>

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 2-40)	None	MELSEC-FX(CPU)
FX0 FX0N FX0S FX1S	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
FX1NC FX2NC	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		MELSEC-FX2N(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
FX1N	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX1N-232-BD*1	RS232C Connection Diagram 5 (Page 2-41)	ER	
	FX1N-422-BD*1	RS422/485 4-wire Connection Diagram 4 (Page 2-40)	None	
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX1N-CNV-BD + FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
FX2N	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX2N-232-BD*1	RS232C Connection Diagram 5 (Page 2-41)	ER	
	FX2N-422-BD*1	RS422/485 4-wire Connection Diagram 4 (Page 2-40)	None	
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX2N-CNV-BD + FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
FX3U FX3UC	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		MELSEC-FX3UC(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX3U-232ADP or FX3U-CNV-BD + FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-42)		
	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 2-40)	None	MELSEC-FX3UC(CPU)
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX3G-CNV-ADP + FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
FX3GC	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
	FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
FX3S	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-40)		
		RS422/485 4-wire Connection Diagram 10 (Page 2-44)		
FX1N FX1S	FX1N-232-BD	RS232C Connection Diagram 8 (Page 2-42)		MELSEC-FX(LINK)
	FX1N-CNV-BD + FX2NC-232ADP			
	FX1N-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX1N-CNV-BD + FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX2N	FX2N-232-BD	RS232C Connection Diagram 8 (Page 2-42)		
	FX2N-CNV-BD + FX2NC-232ADP			
	FX2N-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX2N-CNV-BD + FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX1NC FX2NC	FX2NC-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
	FX2NC-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX3U	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-42)		
	FX3U-CNV-BD + FX3U-232ADP			
	FX3U-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX3U-CNV-BD + FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FX3UC	FX3U-232-BD	RS232C Connection Diagram 8 (Page 2-42)	None	MELSEC-FX(LINK)
	FX3U-232ADP			
	FX3U-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX3G	FX3G-232-BD	RS232C Connection Diagram 8 (Page 2-42)		
	FX3G-CNV-ADP + FX3U-232ADP			
	FX3G-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX3G-CNV-ADP + FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX3GC	FX3U-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
	FX3U-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
FX3S	FX3G-232-BD	RS232C Connection Diagram 8 (Page 2-42)		
	FX3G-485-BD	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MELSEC iQ-F				
FX5U	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 11 (Page 2-45)	None	MELSEC-FX5U(LINK)
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX5-232-BD, FX5-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
	FX5-485-BD, FX5-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	Not required (Connects to CPU unit)	Ethernet	-	MELSEC-FX5U(Ethernet)
FX5UC	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 11 (Page 2-45)	None	MELSEC-FX5U(LINK)
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	FX5-232ADP	RS232C Connection Diagram 8 (Page 2-42)		
	FX5-485ADP	RS422/485 4-wire Connection Diagram 11 (Page 2-45)		
		RS422/485 2-wire Connection Diagram 12 (Page 2-46)		
	Not required (Connects to CPU unit)	Ethernet	-	MELSEC-FX5U(Ethernet)

● Inverter

CPU unit	Link unit	WindO/I-NV4 Settings	
	Interface	Flow Control	Communication Driver
FREQROL			
FREQROL-E500 FREQROL-S500	RS422/485 4-wire Connection Diagram 13 (Page 2-47)	None	FREQROL

2.2 Supported Function

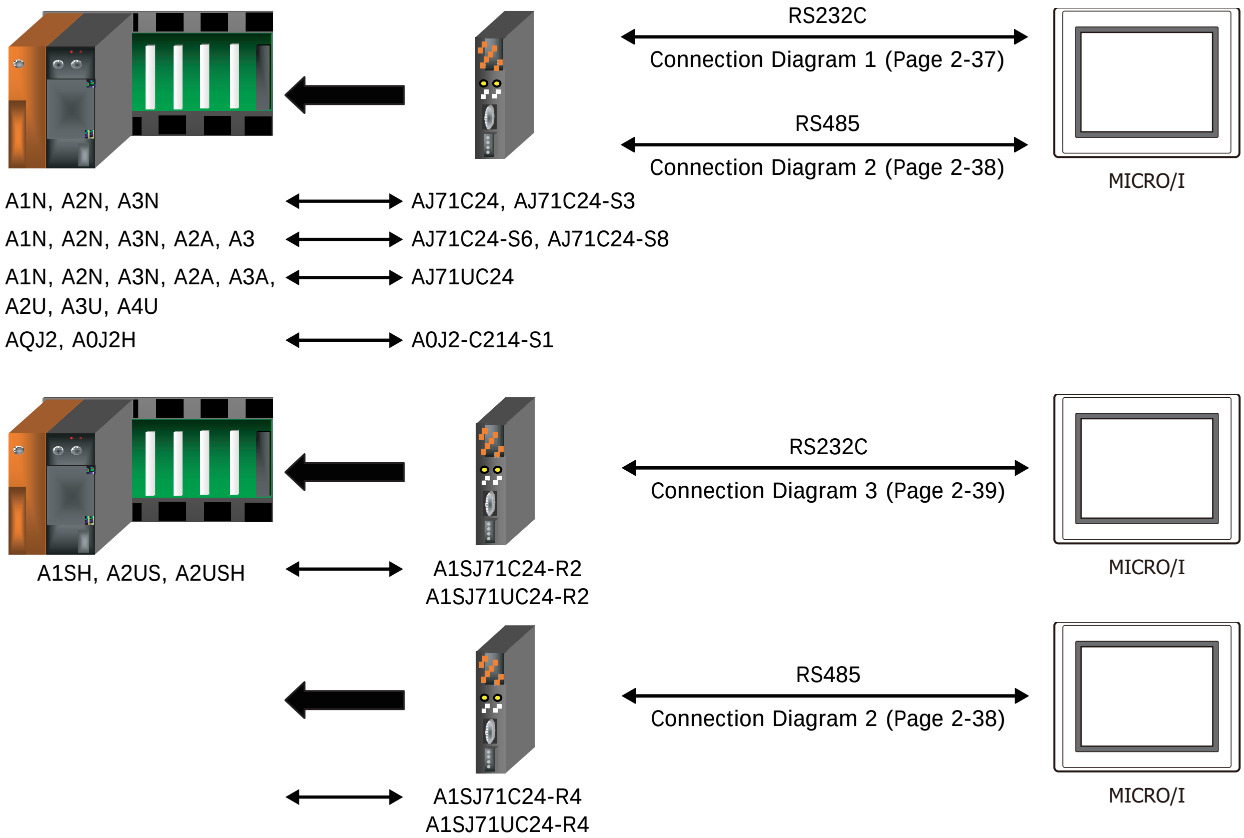
Communication Driver	Functions	
	Pass-through function	1:N Communication function
MELSEC-Q(CPU)	YES	NO
MELSEC-FX(CPU)	YES	NO
MELSEC-FX2N(CPU)	YES	NO
MELSEC-FX3UC(CPU)	YES	NO
MELSEC-Q/QnA(Ethernet)	NO	YES
MELSEC-FX3U(Ethernet)	NO	YES
MELSEC-FX(LINK)	NO	YES

- Pass-through function (☞ Chapter 27 “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)

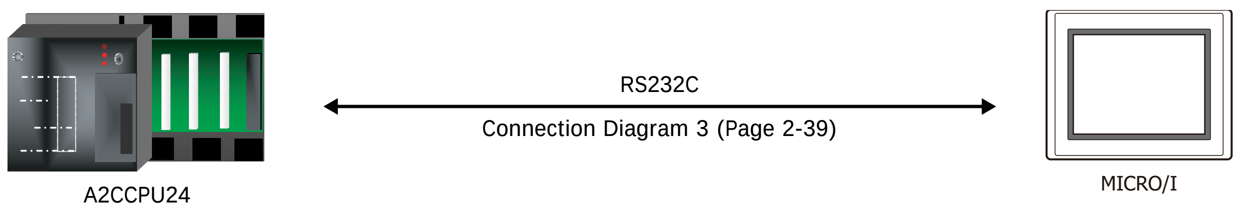
2.3 System Configuration

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

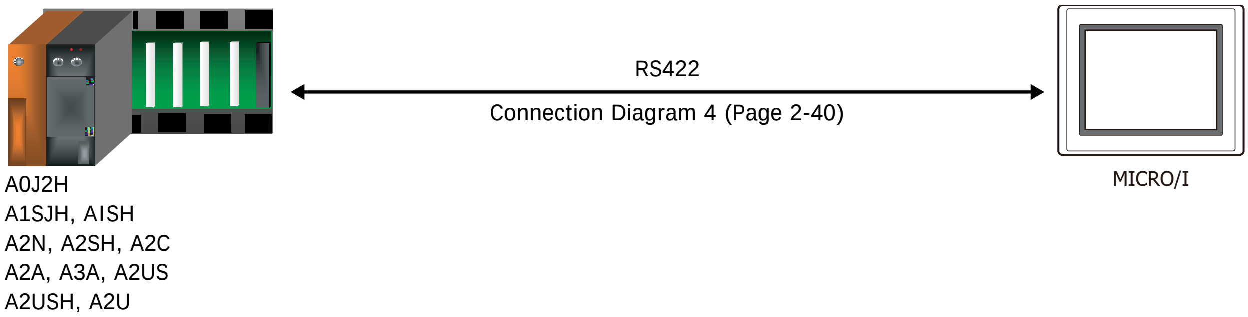
● MELSEC-A Series (Connects to the Computer Link Unit)



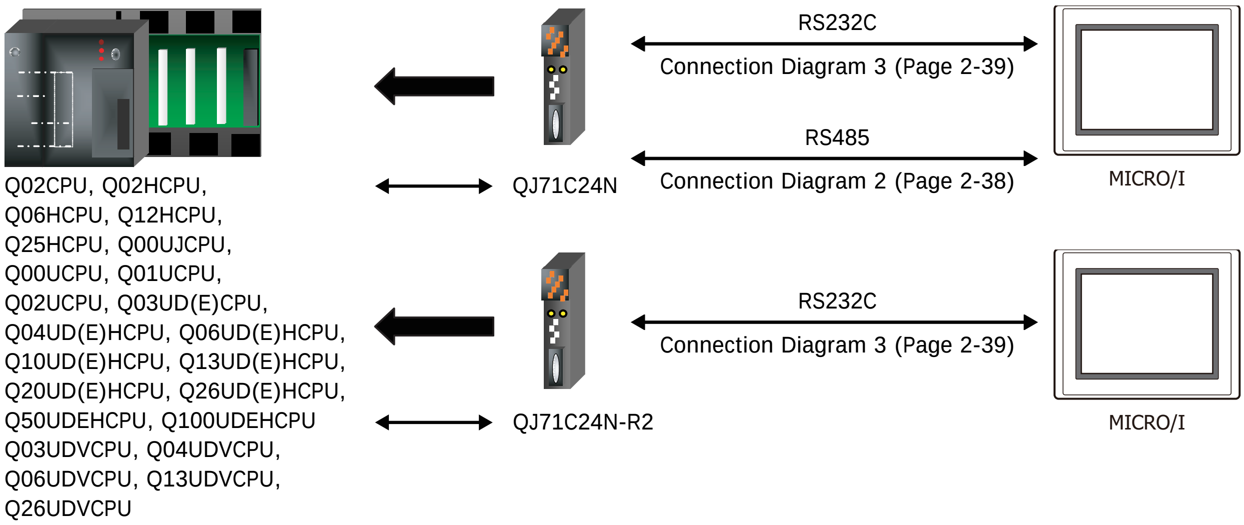
● MELSEC-A Series (Connects to the CPU unit Link Interface)

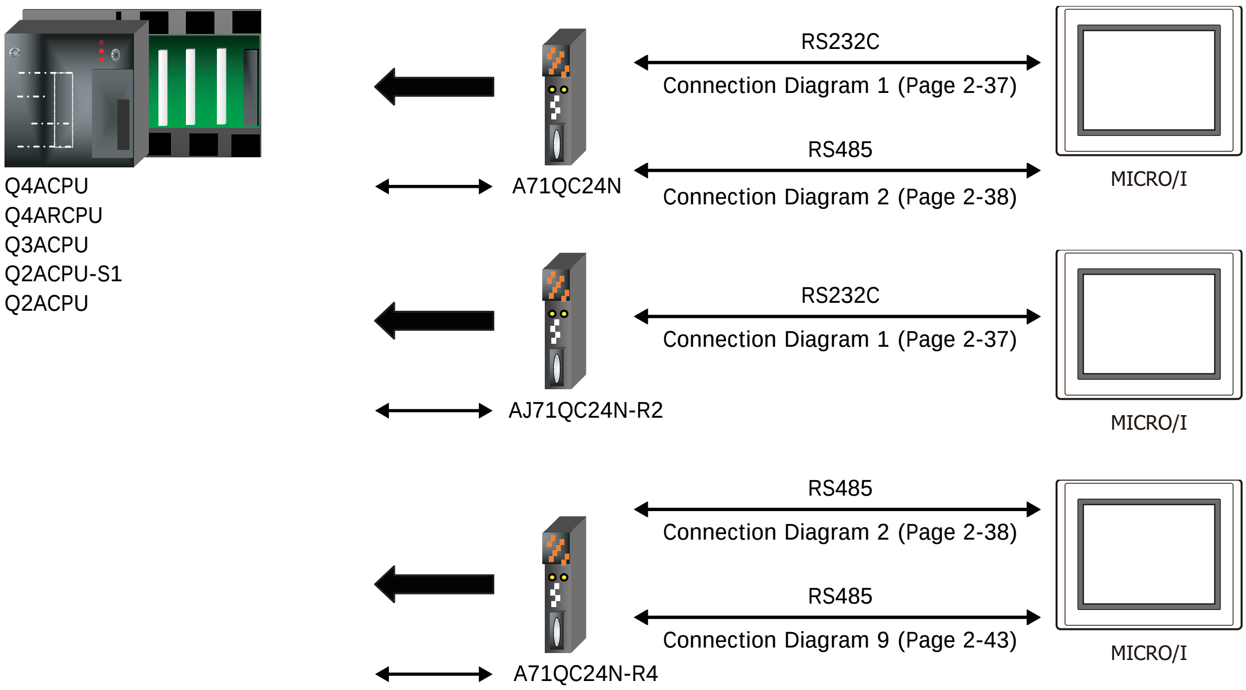


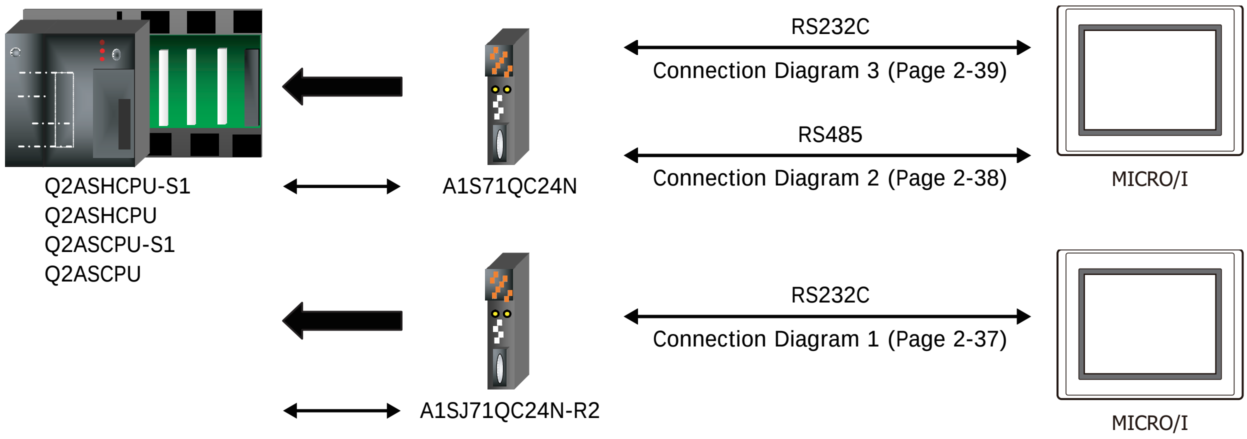
● MELSEC-A Series (Connects to the CPU unit Programming Port)



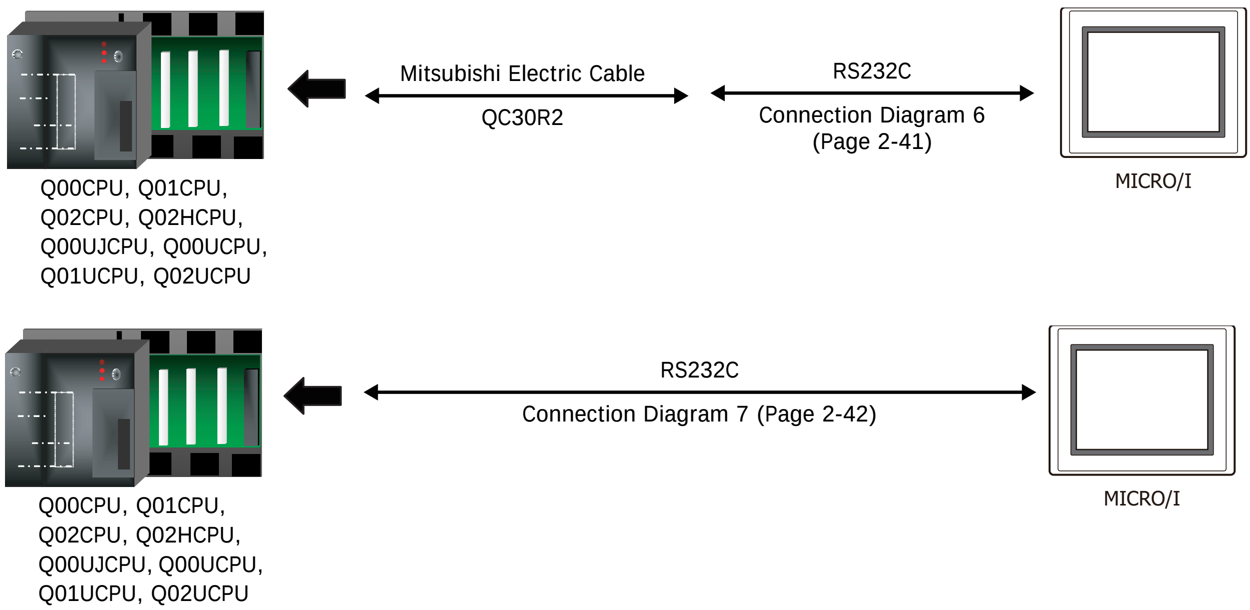
● MELSEC-Q/QnA Series (Connects to the Computer Link Unit)



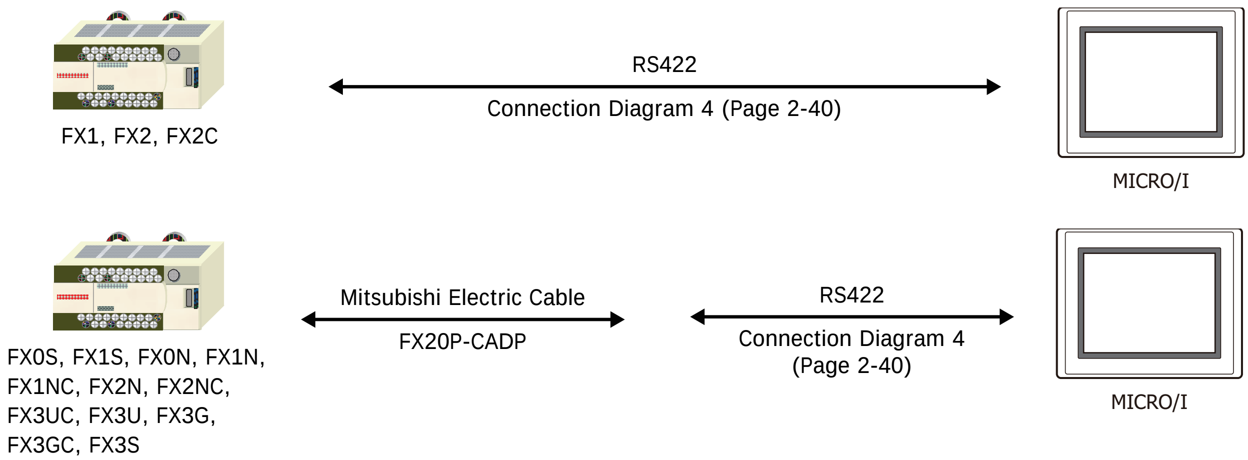


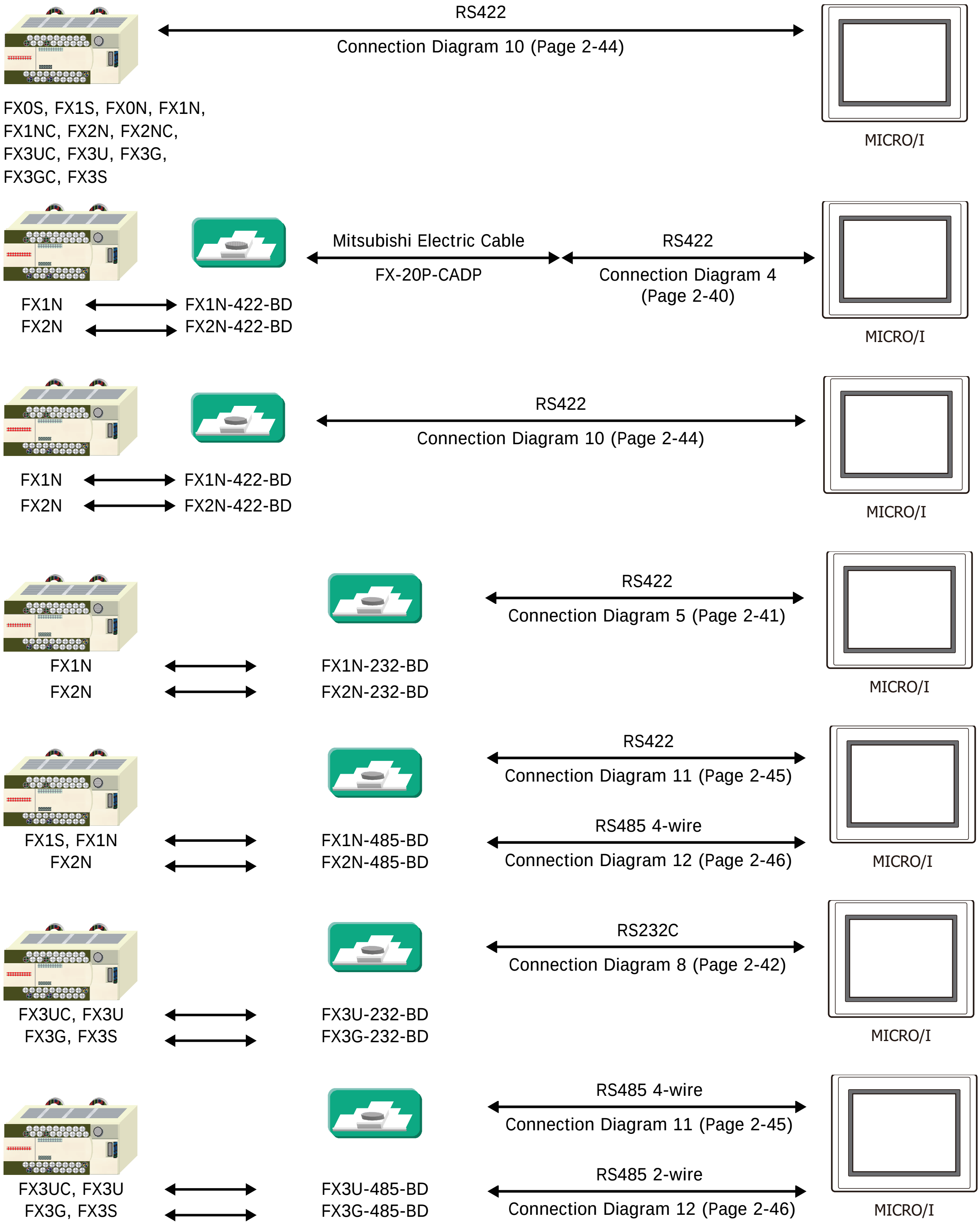


● MELSEC-Q Series (Connects to the CPU unit Programming Port)

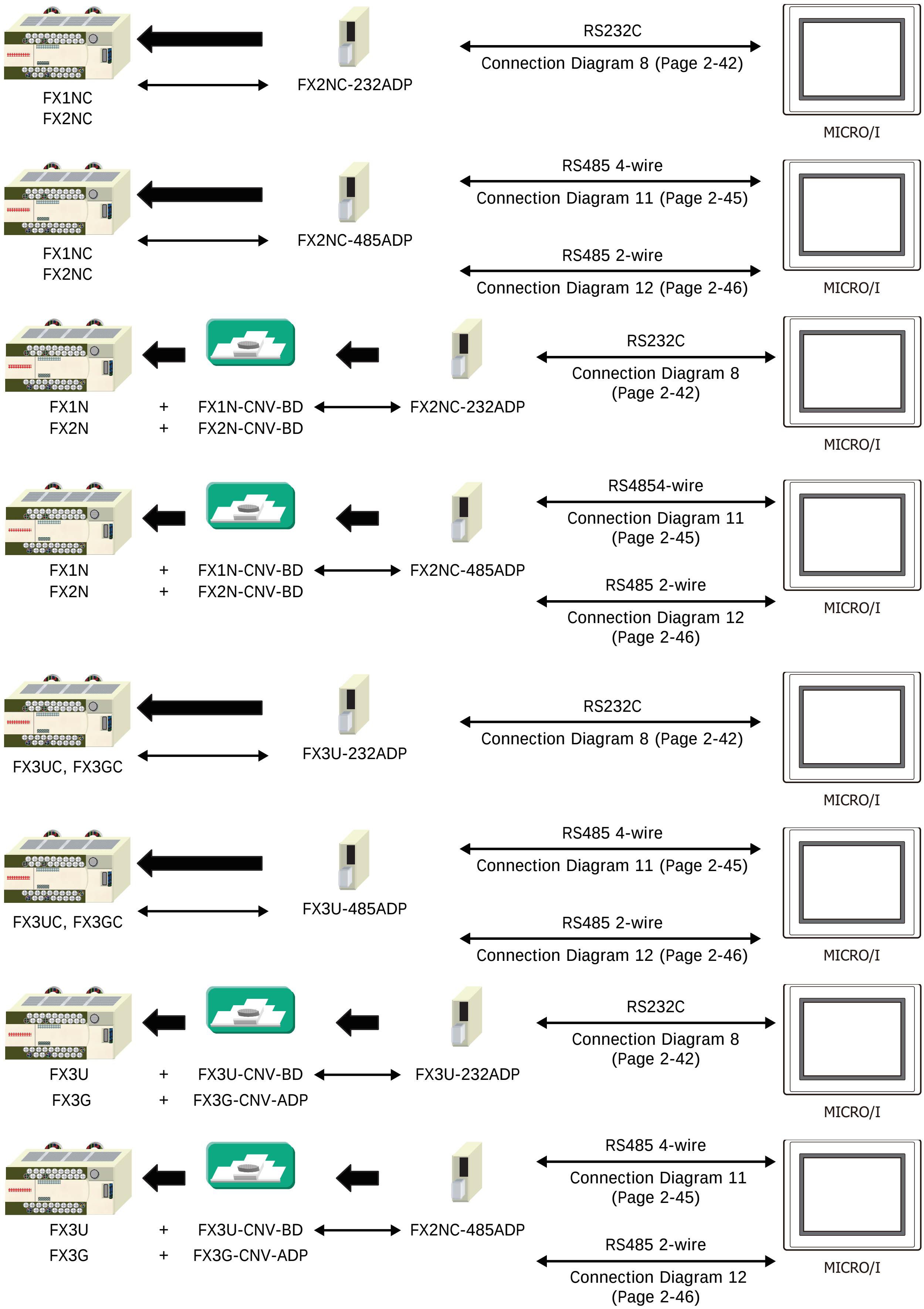


● MELSEC-FX Series (Connects to the CPU unit Programming Port)

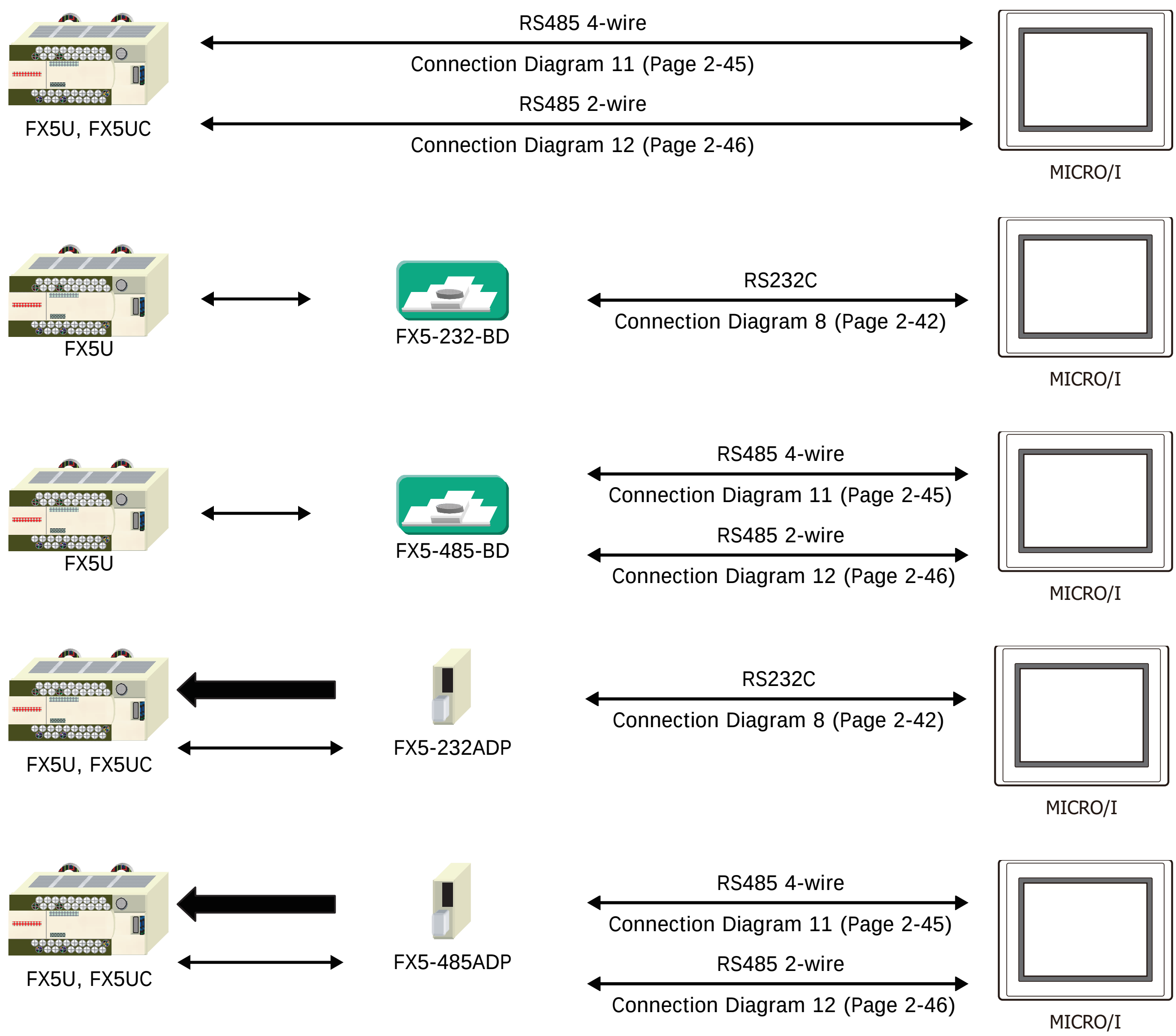



RS422
Connection Diagram 10 (Page 2-44)
FX0S, FX1S, FX0N, FX1N,
FX1NC, FX2N, FX2NC,
FX3UC, FX3U, FX3G,
FX3GC, FX3S
MICRO/I
Mitsubishi Electric Cable
FX-20P-CADP
RS422
Connection Diagram 4
(Page 2-40)
FX1N
FX2N
FX1N-422-BD
FX2N-422-BD
MICRO/I
RS422
Connection Diagram 10 (Page 2-44)
FX1N
FX2N
FX1N-422-BD
FX2N-422-BD
MICRO/I
RS422
Connection Diagram 5 (Page 2-41)
FX1N
FX2N
FX1N-232-BD
FX2N-232-BD
MICRO/I
RS422
Connection Diagram 11 (Page 2-45)
RS485 4-wire
Connection Diagram 12 (Page 2-46)
FX1S, FX1N
FX2N
FX1N-485-BD
FX2N-485-BD
MICRO/I
RS232C
Connection Diagram 8 (Page 2-42)
FX3UC, FX3U
FX3G, FX3S
FX3U-232-BD
FX3G-232-BD
MICRO/I
RS485 4-wire
Connection Diagram 11 (Page 2-45)
RS485 2-wire
Connection Diagram 12 (Page 2-46)
FX3UC, FX3U
FX3G, FX3S
FX3U-485-BD
FX3G-485-BD
MICRO/I

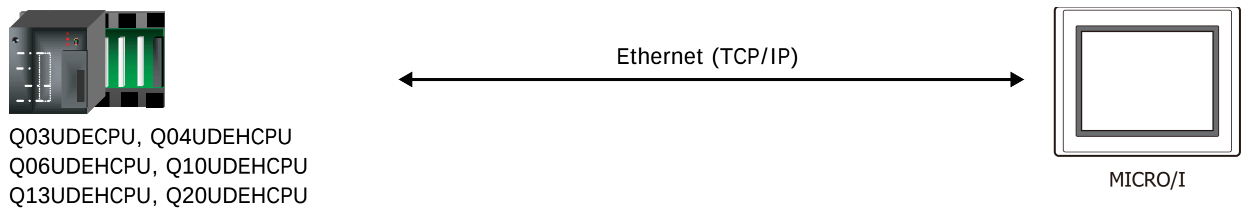
● MELSEC-FX Series (Connects to FX2NC-232ADP/-485ADP, FX3U-232ADP/-485ADP)



● MELSEC iQ-F Series

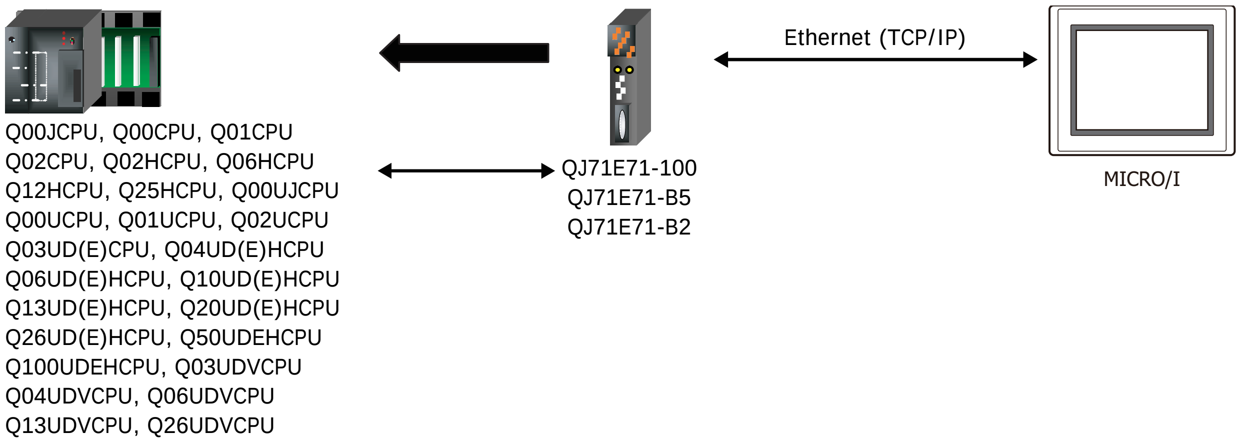


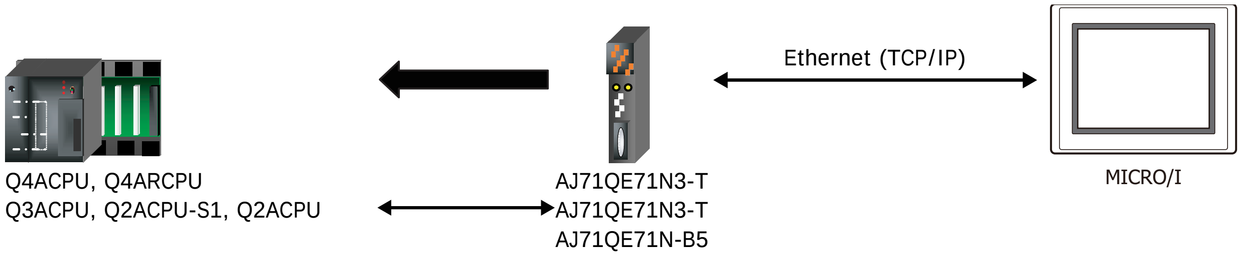
● MELSEC-Q/QnA Series (Connects to the Ethernet port on the CPU unit)

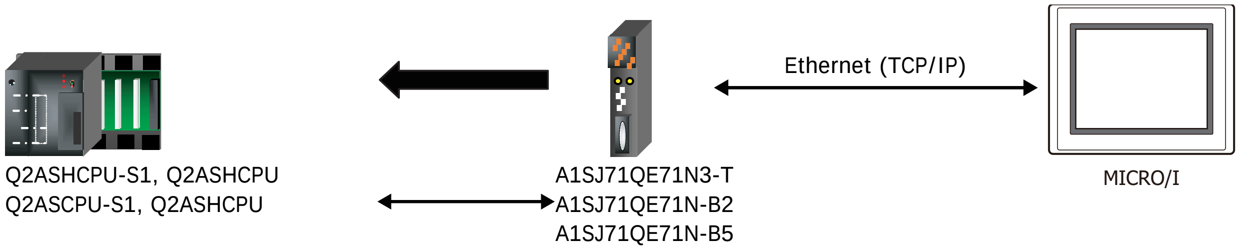


Q03UDECPU, Q04UDEHCPU
Q06UDEHCPU, Q10UDEHCPU
Q13UDEHCPU, Q20UDEHCPU
Q26UDEHCPU, Q50UDEHCPU
Q100UDEHCPU, Q03UDVCPU
Q04UDVCPU, Q06UDVCPU
Q13UDVCPU, Q26UDVCPU

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

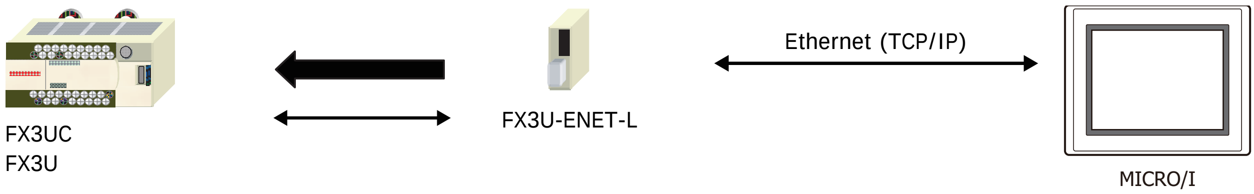






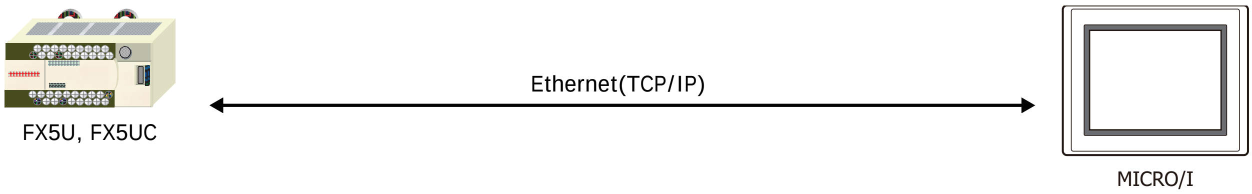
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

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

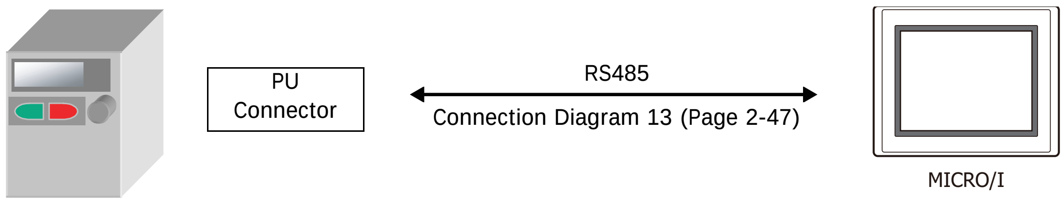


When connecting with MELSEC-FX3UC, FX2NC-CNV-IF or FX3UC-1PS-5V is required.

● MELSEC iQ-F Series (Connects to the Ethernet port on the CPU unit)



● Inverter



For details including the connection procedures, refer to the instruction manual provided with the Mitsubishi Electric inverter.

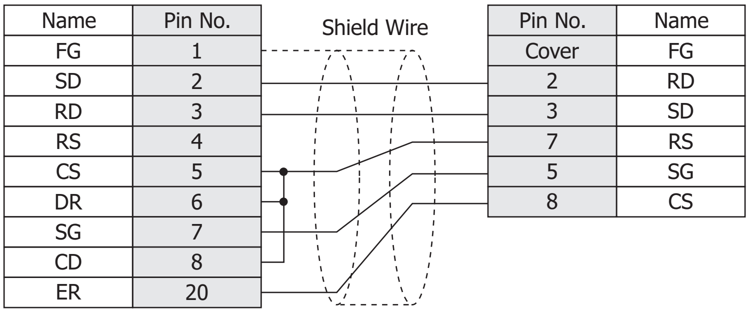
2.4 Connection Diagram

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)

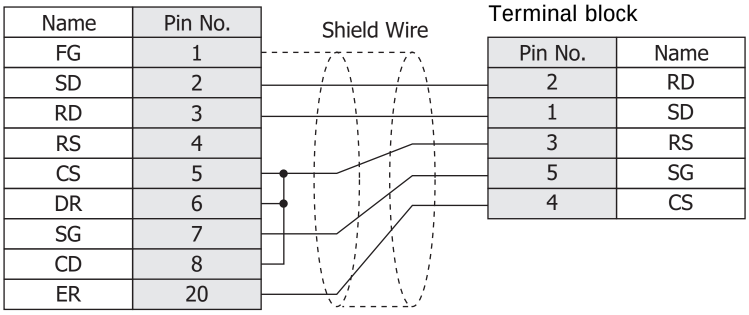
PLC(RS232C):
D-sub 25-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 2: Computer Link Unit (RS485)

PLC(RS422/485): Terminal block — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Name	Pin No.	Name
FG	Cover	FG
SDA	1	RDA(RD+)
SDB	6	RDB(RD-)
RDA	4	SDA(SD+)
RDB	9	SDB(SD-)
SG	5	SG

When using the QJ71C24 Serial Communication Unit, connect a terminator resistor in accordance with the instruction manual.

PLC(RS422/485): Terminal block — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

- When using the QJ71C24 Serial Communication Unit, connect a terminator resistor in accordance with the instruction manual.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

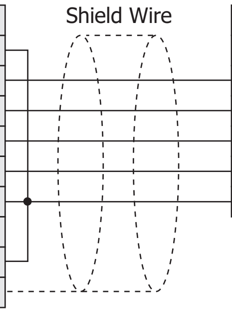
PLC(RS422/485): Terminal block — Shield Wire — HG1P: D-sub 25-pin Male Connector

Name	Pin No.	Name
FG	Cover	FG
SDA	3	RDA(RD+)
SDB	2	RDB(RD-)
RDA	5	SDA(SD+)
RDB	4	SDB(SD-)
SG	6	SG

● Connection Diagram 3: Computer Link Unit (RS232C)

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

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

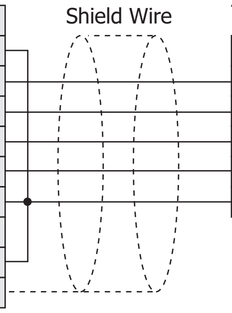


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
8	CS
5	SG
7	RS

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

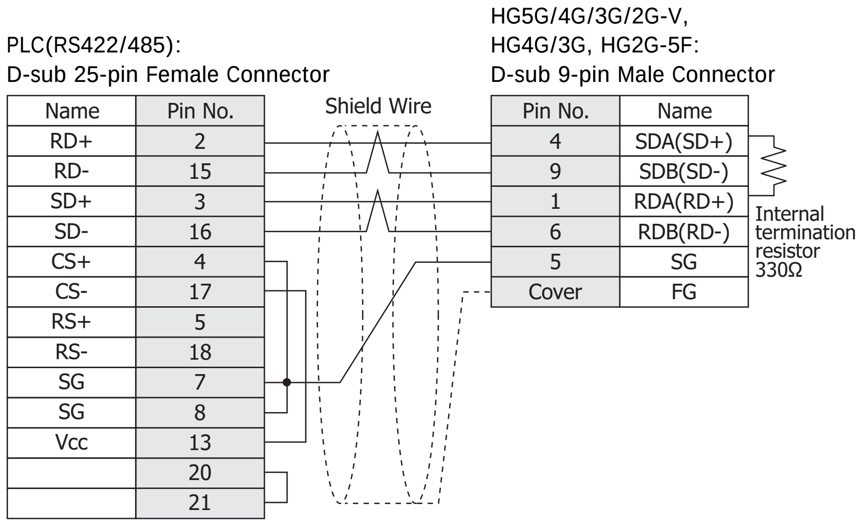
Name	Pin No.
CD	1
RD	2
SD	3
ER	4
SG	5
DR	6
RS	7
CS	8
FG	Cover

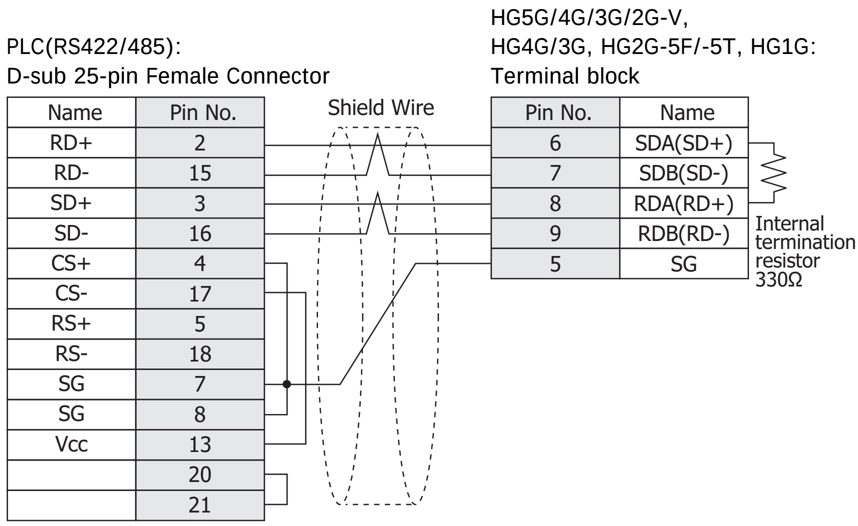


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 4: 2-port Adapter



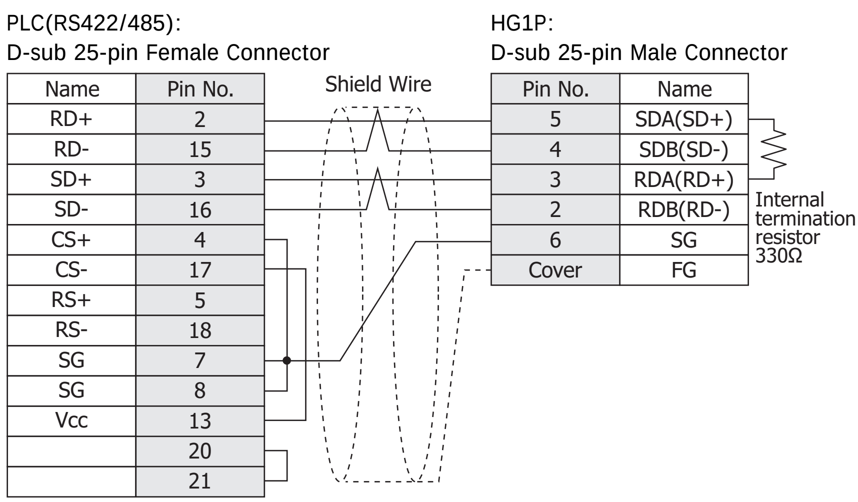


When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

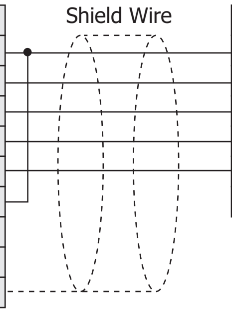
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.



● 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

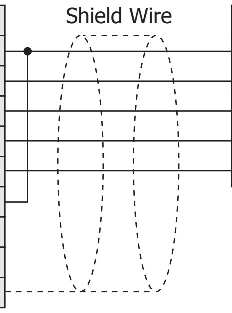


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
7	RS
3	SD
2	RD
8	CS
5	SG
Cover	FG

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



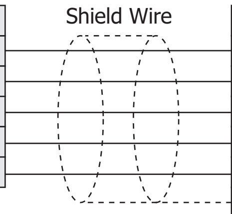
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

Pin No.	Name
3	RS
1	SD
2	RD
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

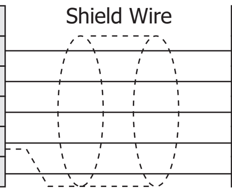


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
2	RD
3	SD
7	RS
5	SG
8	CS
Cover	FG

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
3	SD
2	RD
5	SG
7	RS
8	CS
Cover	FG

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F a connection cable (Type Number: HG9Z-XC315) is available. Refer to Chapter 7 "1.4 PLC communication cable (Type Number: HG9Z-XC315)" on page 7-3 about the connection diagram of the HG9Z-XC315.

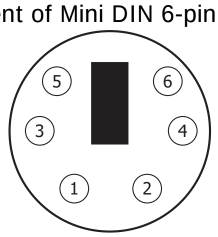
PLC(RS232C):
Mini DIN 6-pin Connector

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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



● Connection Diagram 8: FX2NC-232ADP, FX3U-232ADP, FX3U-232-BD, FX5-232ADP, FX5-232-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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	CS
5	SG

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

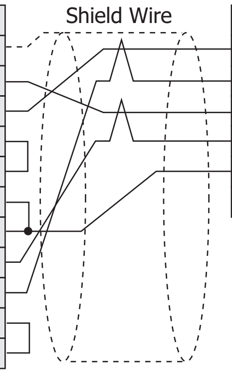
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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 Female Connector

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

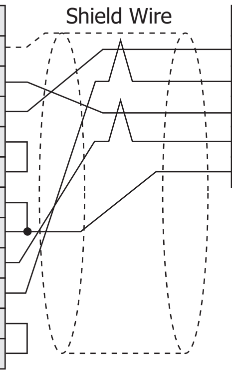


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

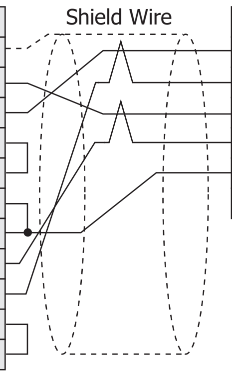
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

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



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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

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

Name	Pin No.
SDA	7
SDB	4
RDA	2
RDB	1
SG	3
SG	6
Shield	Cover

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F a communication cable (Type Number: HG9Z-XC305) is available.
Refer to Chapter 7 "1.3 PLC communication cable (Type Number: HG9Z-XC305)" on page 7-3 about the connection diagram of the HG9Z-XC305.

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

Name	Pin No.
SDA	7
SDB	4
RDA	2
RDB	1
SG	3
SG	6
Shield	Cover

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- In case of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G, a communication cable (Type Number: FC2A-KP1C, HG9Z-XC275) is available. Refer to Chapter 7 "1.1 User Communication, Printer or PLC communication cable (Type Number: FC2A-KP1C, HG9Z-XC275)" on page 7-1 about the connection diagram of these cables.
  Please do not use these cables with FX3U and FX3UC-32MT-LT of the MELSEC-FX Series described in this manual because the Mini DIN Connector interferes with the housing of the PLC.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
SDA	7
SDB	4
RDA	2
RDB	1
SG	3
SG	6
Shield	Cover

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

● Connection Diagram 11: FX1N-485-BD, FX2N-485-BD, FX2NC-485ADP, FX3G-485-BD, FX3U-485ADP, FX3U-485-BD, FX5-485ADP, FX5-485-BD (4-wire)

PLC(RS422/485): Terminal block — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.	Name
SDA	1	RDA(RD+)
SDB	6	RDB(RD-)
RDA	4	SDA(SD+)
RDB	9	SDB(SD-)
SG	5	SG
	Cover	FG

PLC(RS422/485): Terminal block — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

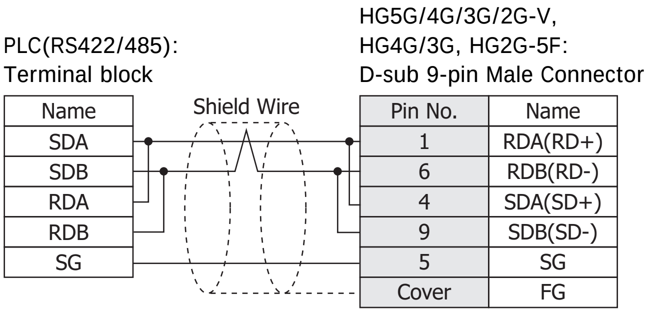
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485): Terminal block — HG1P: D-sub 25-pin Male Connector

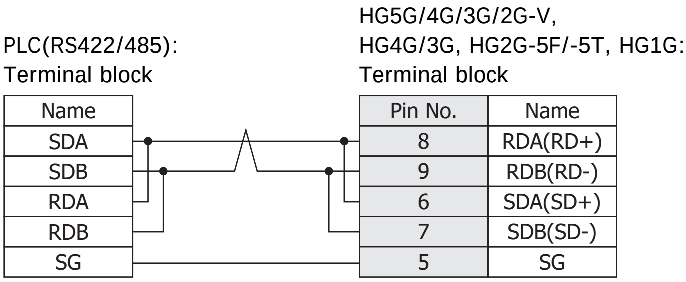
Shield Wire

Name	Pin No.	Name
SDA	3	RDA(RD+)
SDB	2	RDB(RD-)
RDA	5	SDA(SD+)
RDB	4	SDB(SD-)
SG	6	SG
	Cover	FG

● Connection Diagram 12: FX1N-485-BD, FX2N-485-BD, FX2NC-485ADP, FX3G-485-BD, FX3U-485ADP, FX3U-485-BD, FX5-485ADP, FX5-485-BD (2-wire)



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

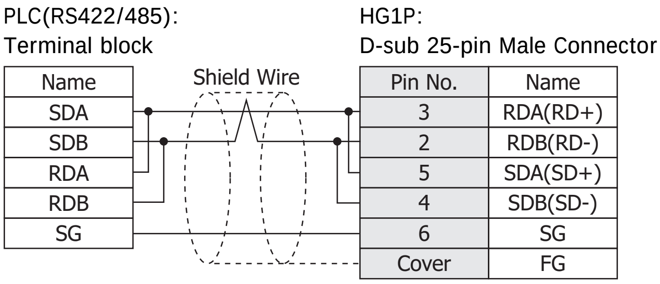


- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.



● Connection diagram 13: Inverter PU connector

PLC(R485):
PU Connector

Name	Pin No.
SDA	5
SDB	4
RDA	3
RDB	6
SG	1

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(R485):
PU Connector

Name	Pin No.
SDA	5
SDB	4
RDA	3
RDB	6
SG	1

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(R485):
PU Connector

Name	Pin No.
SDA	5
SDB	4
RDA	3
RDB	6
SG	1

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

2.5 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">19200, 9600, 4800, 2400 or 1200 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

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

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

● MELSEC-Q00CPU/-Q00UCPU/-Q00UJCPU/-Q01CPU/-Q01UCPU/-Q02UCPU: Connecting to the Programming Port

Select **Use Serial Communication** in the parameter setting of MELSEC-Q.

Item		Setting
Station Number*2	Use the same settings as for the MICRO/I.	0
Baud Rate		115200, 57600, 38400 or 19200 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Odd
Checksum Code		Yes

● MELSEC-Q02CPU/-Q02HCPU: Connecting to the Programming Port

Item	Setting
Baud Rate	115200, 57600, 38400, 19200 or 9600 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.	115200, 57600, 38400, 19200 or 9600 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.	38400, 19200, 9600, 4800, 2400 or 1200 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 iQ-F Series: Using Communication Driver MELSEC-FX5U(LINK)

Item		Setting
Interface		RS232C or RS422/RS485
Baud Rate	Use the same settings as for the MICRO/I.	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 bps
Data Bits		7 or 8 bit
Stop Bits		1 or 2 stop bits
Parity		None, Odd or Even
Protocol Type		MC Protocol
Sum Check		Added
Station Number Settings		0 to 15
Message System		Format4

● MELSEC-Q/QnA Series: Using Communication Driver MELSEC-Q/QnA(Ethernet)

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 (Connects to the Ethernet port on the CPU unit)

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

Item			setting	notes
Built-in Ethernet Port Setting	Communication data code		Binary code	
	IP Address	Input format	Decimal	*2
		IP address	Set IP address of PLC	*2
	Enable Write at RUN time		Check mark (enable)	*1
Open Setting	Protocol		TCP/IP	
	Open system		MC Protocol	
	Local station Port No.		Set an arbitrary port number	*2*3

*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.

PLC Settings (Connects to the Ethernet Unit)

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

Item			setting	notes
Network parameter	Network type		Ethernet	
	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	
	Initial Timing		Always wait for OPEN	
	IP Address	Input format	Decimal	*2
		IP address	Set IP address of PLC	*2
	Send frame setting		Ethernet	
	Enable Write at RUN time		Check mark (enable)	*1
	TCP Existence confirmation setting		Use the Keep Alive	*1
Open Setting	Protocol		TCP/IP	
	Open system		Impassive open	
	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)

● MELSEC iQ-F Series: Using Communication Driver MELSEC-FX5U (Ethernet)

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.

PLC Settings

Configure the following items on the **Own Node Settings** in the **Ethernet Port.**

Item	Setting
IP Address	Set the IP address of PLC.
Subnet Mask	Set the subnet mask of MICRO/I.
Default Gateway	Set the default gateway of MICRO/I.
Communication Data Code	Binary

Configure the following items on the SLMP Connection Module. The procedure for configuring the SLMP Connection Module is shown below.

1. Click the **Detailed Setting** of the **External Device Configuration**. The **Ethernet Configuration** window opens.
2. Select the **SLMP Connection Module** in the **Ethernet Device (General)** on the **Module List** window, and then drag it onto the settings.

Item	Setting
Protocol	TCP
Port Number	Set the arbitrary port number. 1025 to 4999, 5010 to 65534

● Connecting to Inverter

Items		Details
Interface	Use the same settings as for the MICRO/I.	RS485 4-wire
Inverter No.		01 to 31
Baud Rate		19200, 9600 or 4800 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.

2.6 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-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-FX3U (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.

● MELSEC-FX5U (LINK), MELSEC-FX5U (Ethernet)

Bit Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Bit)	X	X	0 to 1777	R	Octal
Output (Bit)	Y	Y	0 to 1777	R/W	Octal
Internal relay (Bit)	M	M	0 to 32767	R/W	Decimal
Latch relay (Bit)	L	L	0 to 32767	R/W	Decimal
Annunciator (Bit)	F	F	0 to 32767	R/W	Decimal
Link relay (Bit)	B	B	0 to 7FFF	R/W	Hexadecimal
Step relay (Bit)	S	S	0 to 4095	R/W	Decimal
Timer (Contact)	TS	T	0 to 1023	R	Decimal
Timer (Coil)	TC	T	0 to 1023	R/W	Decimal
Retentive timer (Contact)	SS	ST	0 to 1023	R	Decimal
Retentive timer (Coil)	SC	ST	0 to 1023	R/W	Decimal
Counter (Contact)	CS	C	0 to 1023	R	Decimal
Counter (Coil)	CC	C	0 to 1023	R/W	Decimal
Long counter (Contact)	LCS	LC	0 to 1023	R	Decimal
Long counter (Coil)	LCC	LC	0 to 1023	R/W	Decimal
Link special relay (Bit)	SB	SB	0 to 7FFF	R/W	Hexadecimal
Special relay (Bit)	SM	SM	0 to 9999	R	Decimal

Word Device

Device Name	Device Type		Address Number Range	Read /Write	Address Numeral System
	MICRO/I	PLC			
Input (Word)	WX	X	0 to 1760	R	Octal*1
Output (Word)	WY	Y	0 to 1760	R/W	Octal*1
Internal relay (Word)	WM	M	0 to 32752	R/W	Decimal*1
Latch relay (Word)	WL	L	0 to 32752	R/W	Decimal*1
Annunciator (Word)	WF	F	0 to 32752	R/W	Decimal*1
Link relay (Word)	WB	B	0 to 7FF0	R/W	Hexadecimal*1
Step relay (Word)	WS	S	0 to 4080	R/W	Decimal*1
Data register	D	D	0 to 7999	R/W	Decimal
Link register	W	W	0 to 7FFF	R/W	Hexadecimal
Timer (Present value)	TN	T	0 to 1023	R	Decimal
Retentive timer (Present value)	SN	ST	0 to 1023	R/W	Decimal
Counter (Present value)	CN	C	0 to 1023	R	Decimal
Long counter (Present value)*2	LCN	LC	0 to 10231	R	Decimal
Link special relay (Word)	WSB	SB	0 to 7FF0	R/W	Hexadecimal*1
Link special register	SW	SW	0 to 7FFF	R/W	Hexadecimal
Special relay (Word)	WSM	SM	0 to 9984	R	Decimal*1
Special register	SD	SD	0 to 11999	R	Decimal
Index register	Z	Z	0 to 23	R/W	Decimal
File Register	R	R	0 to 32767	R/W	Decimal

*1 Set this address number in multiples of 16.
*2 This device is a 32-bit device. The first four 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.

● Inverter

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”.

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 2-76)	ER	SYSMAC C series
	C120-LK202-V1	RS422/485 4-wire Connection Diagram 2 (Page 2-77)	None	
	C500-LK201-V1	RS232C Connection Diagram 1 (Page 2-76)	ER	
		RS422/485 4-wire Connection Diagram 2 (Page 2-77)	None	
	C500-LK203	RS232C Connection Diagram 1 (Page 2-76)	ER	
		RS422/485 4-wire Connection Diagram 3 (Page 2-78)	None	
C1000HF	C500-LK203	RS232C Connection Diagram 1 (Page 2-76)	ER	
		RS422/485 4-wire Connection Diagram 3 (Page 2-78)	None	
C200HS	C200H-LK201	RS232C Connection Diagram 1 (Page 2-76)	ER	
	C200H-LK202	RS422/485 4-wire Connection Diagram 2 (Page 2-77)	None	
C200HE C200HG C200HX	C200H-LK201	RS232C Connection Diagram 1 (Page 2-76)	ER	
	C200H-LK202	RS422/485 4-wire Connection Diagram 2 (Page 2-77)	None	
	C200HW-COM02 C200HW-COM04 C200HW-COM05 C200HW-COM06	RS232C Connection Diagram 6 (Page 2-80)		
	C200HW-COM03 C200HW-COM06	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
C120 C120F	C120-LK201-V1	RS232C Connection Diagram 1 (Page 2-76)	ER	
	C120-LK202-V1	RS422/485 4-wire Connection Diagram 2 (Page 2-77)	None	
C20H C28H C40H C60H	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-79)		
C200HE-CPU42 C200HG-CPU43 C200HG-CPU63 C200HX-CPU44 C200HX-CPU64	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)		
C200HS-CPU21 C200HS-CPU23 C200HS-CPU31 C200HS-CPU33 CQM1H	Not required (Connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-79)		

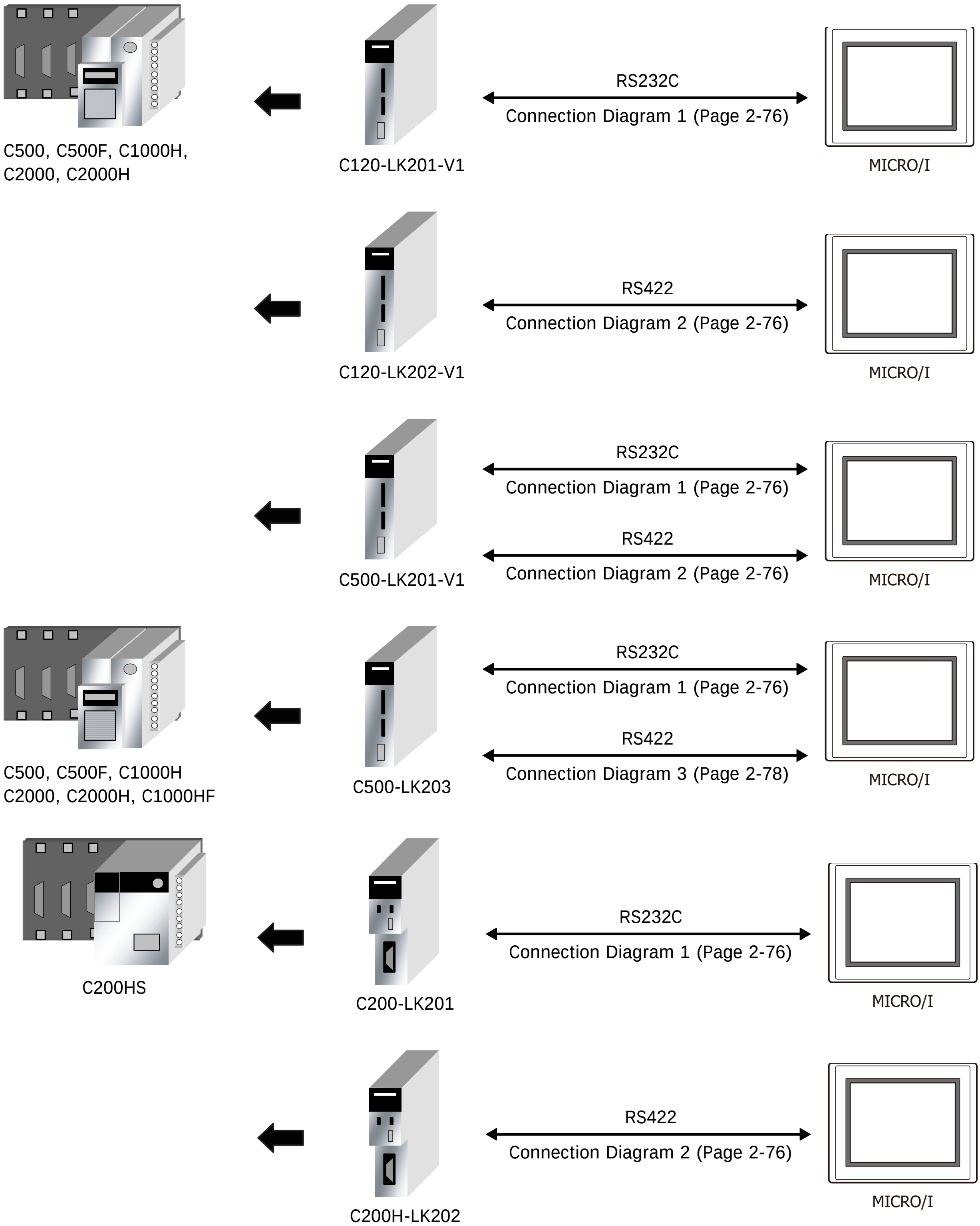
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
CPM1 CPM1A CPM2A	CPM1-CIF01	RS232C Connection Diagram 5 (Page 2-79)	None	SYSMAC C series
	CPM1-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-82)		
CPM2A	Not required (Connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-79)		
SYSMAC CS1				
CS1G CS1H	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
	CS1W-SCB41 (port1)	RS232C Connection Diagram 6 (Page 2-80)		
	CS1W-SCB41 (port2)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CS1W-ENT01 CS1W-ENT11 CS1W-ENT21	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
SYSMAC CJ1				
CJ1H CJ1G CJ1M	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-ETN21	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
SYSMAC CJ2				
CJ2H-CPU64 CJ2H-CPU65 CJ2H-CPU66 CJ2H-CPU67 CJ2H-CPU68 CJ2M-CPU11 CJ2M-CPU12 CJ2M-CPU13 CJ2M-CPU14 CJ2M-CPU15	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-ETN21	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
CJ2M-CPU31 CJ2M-CPU32 CJ2M-CPU33 CJ2M-CPU34 CJ2M-CPU35	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-82)		
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-80)		
	Ethernet port on the CPU unit	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
	CJ1W-ETN21			

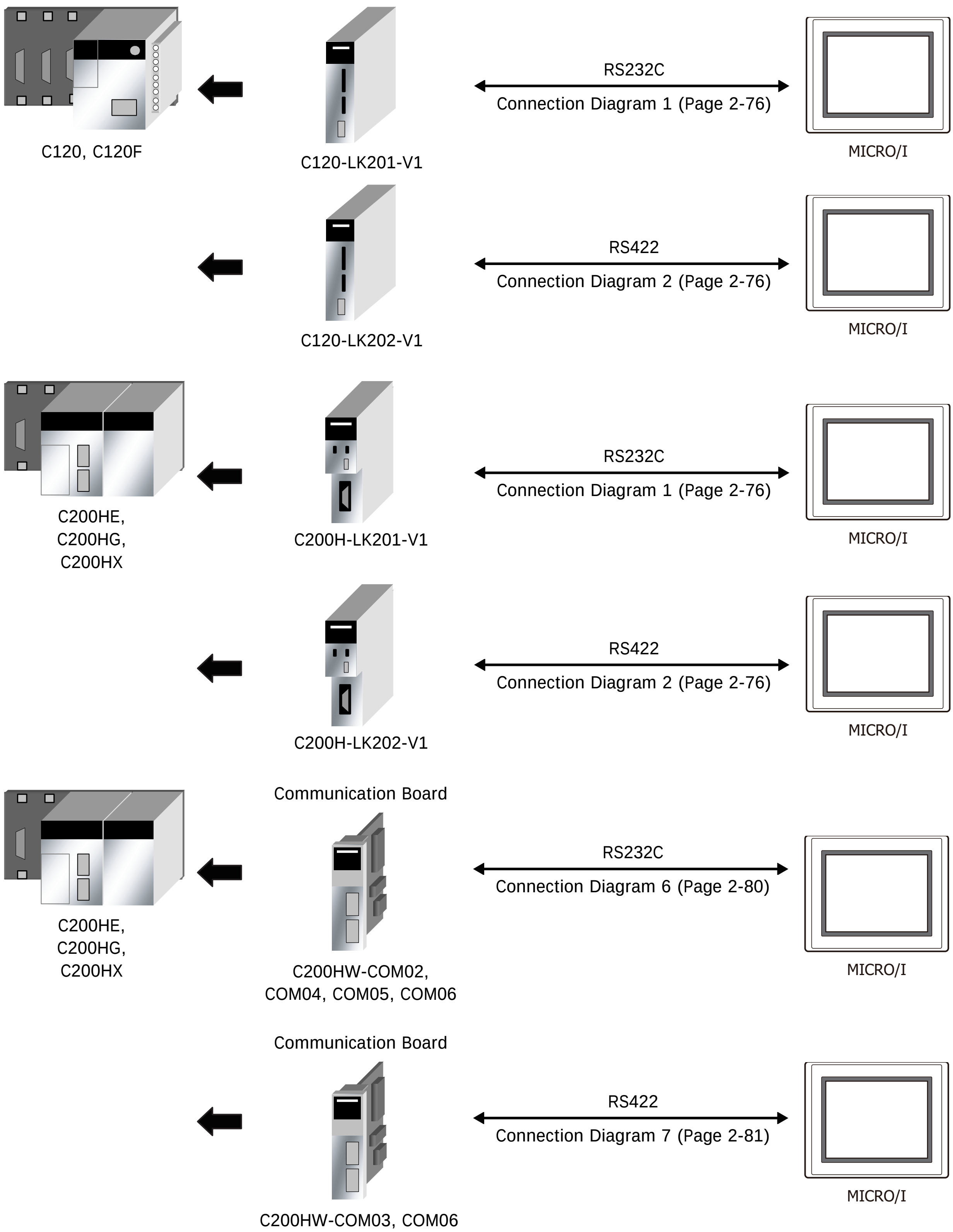
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
CJ2H-CPU64-EIP CJ2H-CPU65-EIP CJ2H-CPU66-EIP CJ2H-CPU67-EIP CJ2H-CPU68-EIP	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-80)		
	Ethernet port on the CPU unit	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)
	CJ1W-ETN21			
SYSMAC CP1				
CP1E-N14 CP1E-N20	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)	None	SYSMAC CS1 series
CP1E-N30 CP1E-N40 CP1E-N60 CP1E-NA20	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-80)		
	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-80)		
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-82)		
CP1L-EL20 CP1L-EM20 CP1L-EM30 CP1L-EM40 CP1L-L14 CP1L-L20 CP1L-M30 CP1L-M40 CP1L-M60	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-80)		
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-82)		
CP1H-X40 CP1H-XA20 CP1H-Y20D	CP1W-CIF01	RS232C Connection Diagram 6 (Page 2-80)		SYSMAC CS1 series
	CP1W-CIF11	RS422/485 4-wire Connection Diagram 8 (Page 2-82)		
	CJ1W-SCU21-V1	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-SCU31-V1	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port1)	RS422/485 4-wire Connection Diagram 7 (Page 2-81)		
	CJ1W-SCU41-V1(port2)	RS232C Connection Diagram 6 (Page 2-80)		
	CJ1W-ETN21	Ethernet	-	SYSMAC CS1/CJ series(Ethernet)

3.2 System Configuration

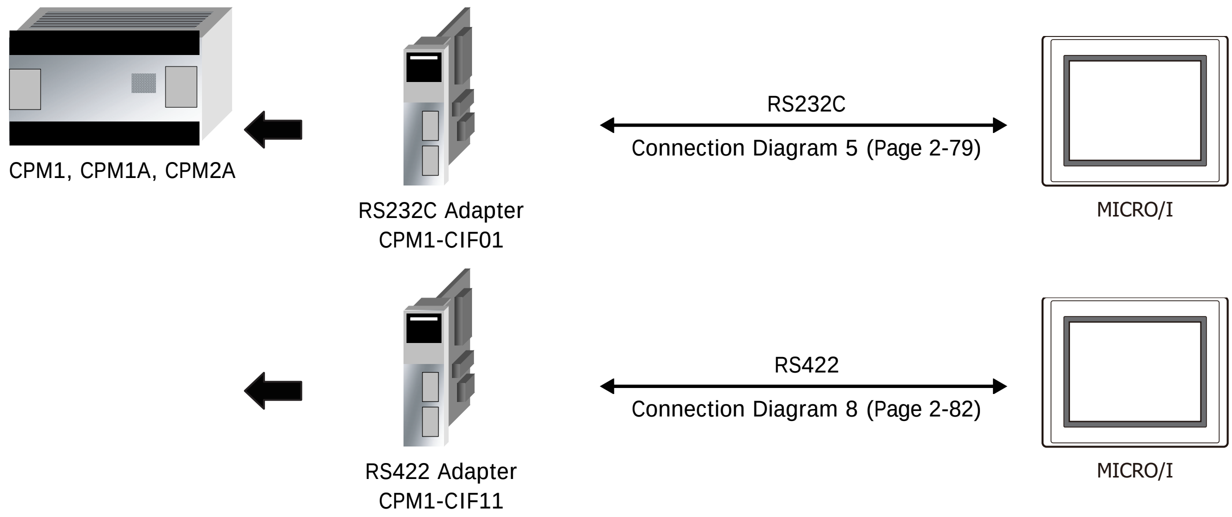
This is the system configuration for the connection of OMRON PLCs to the MICRO/I

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

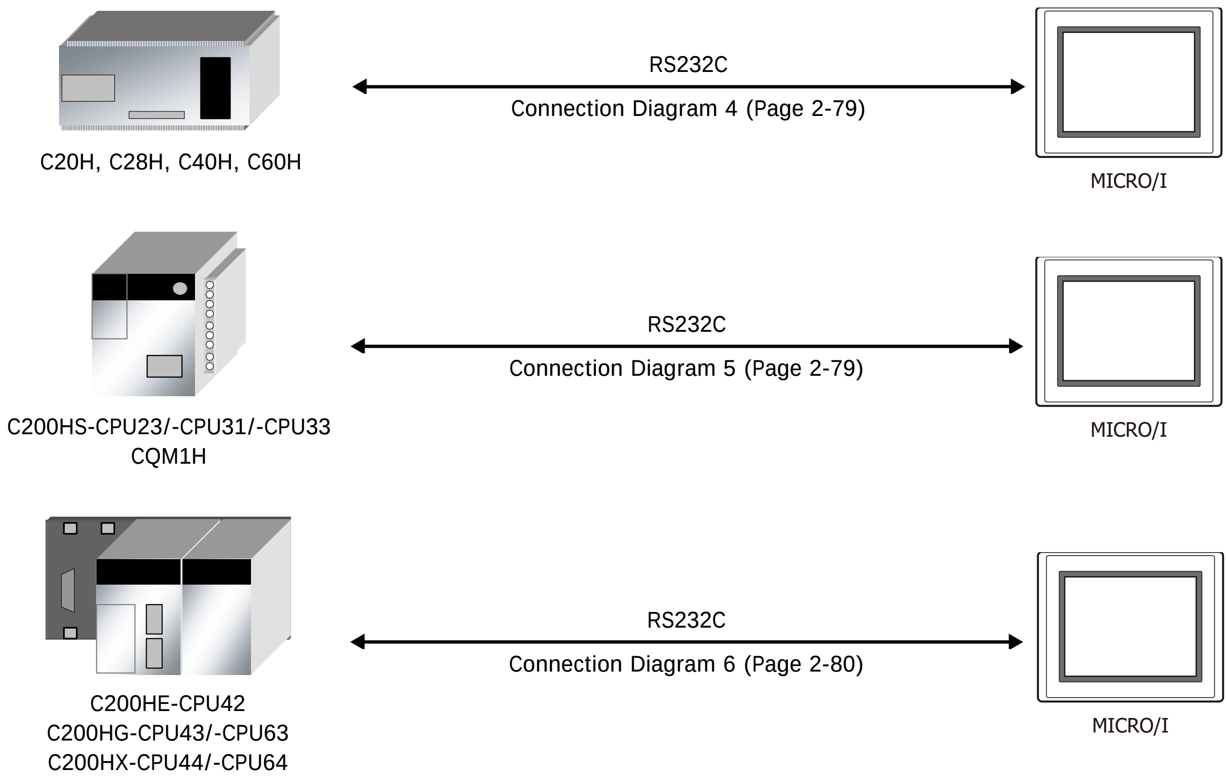




You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

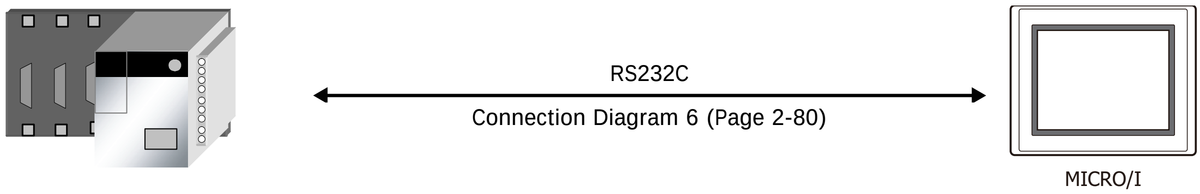


● SYSMAC C series (Connects to the Link Interface on the CPU unit)



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

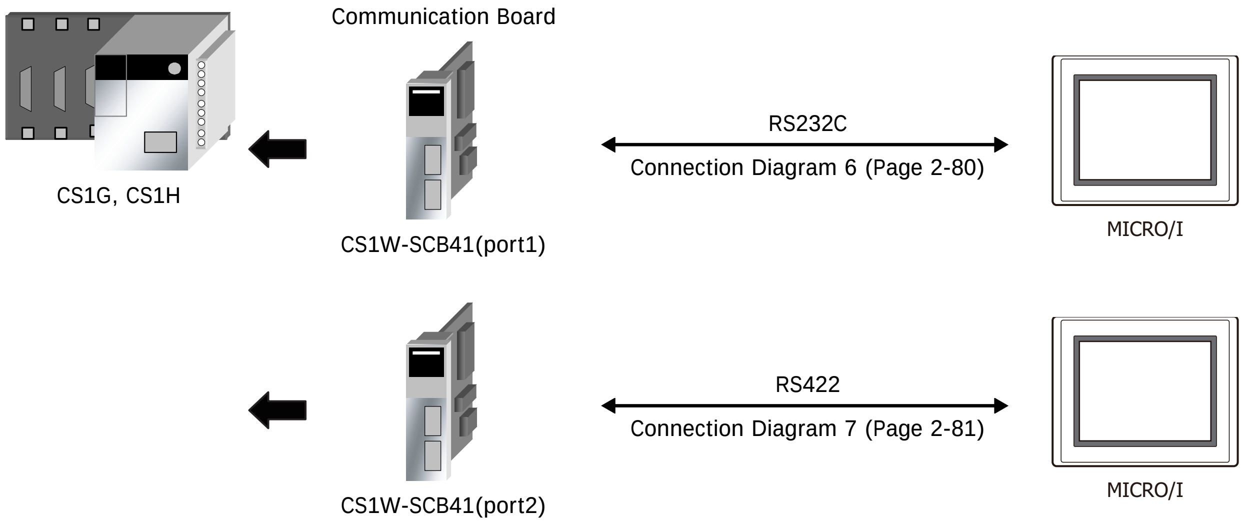
● SYSMAC CS/CJ/CP series (Connects to RS232C port on the CPU unit)



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

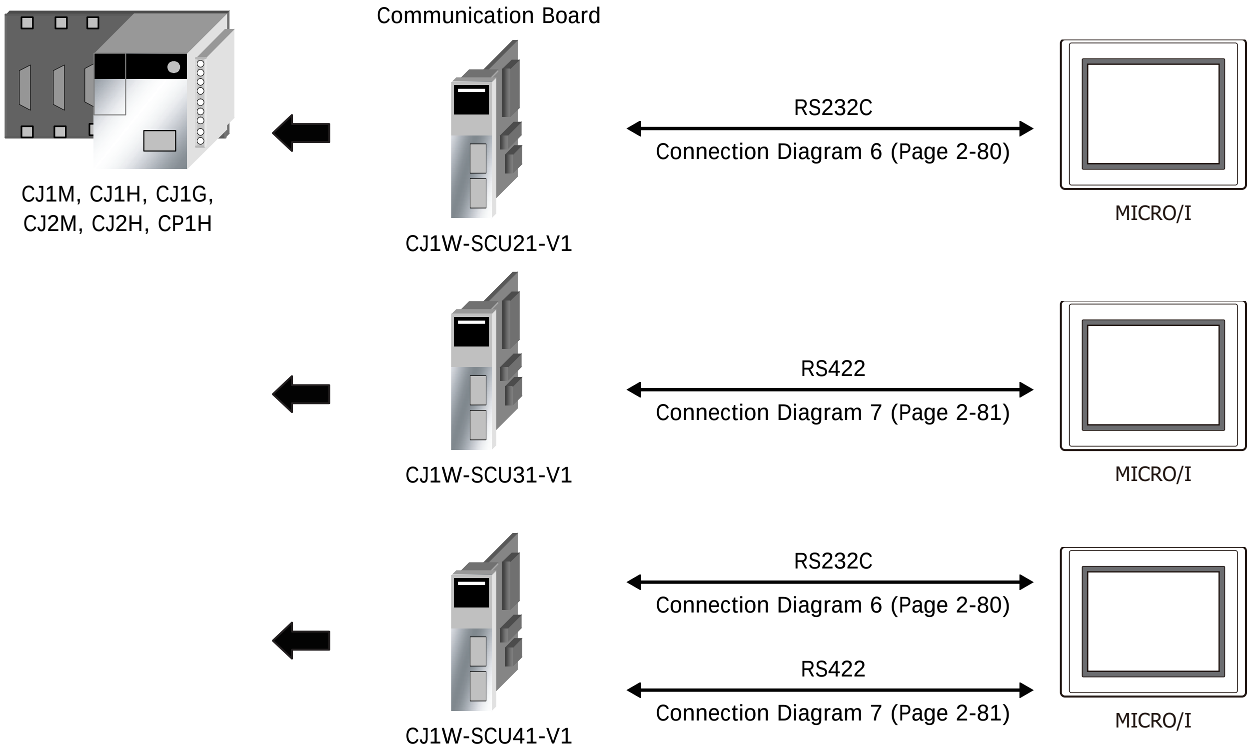
● SYSMAC CS/CJ/CP series (Connects to the Ethernet Communication Unit)

SYSMAC CS1 series



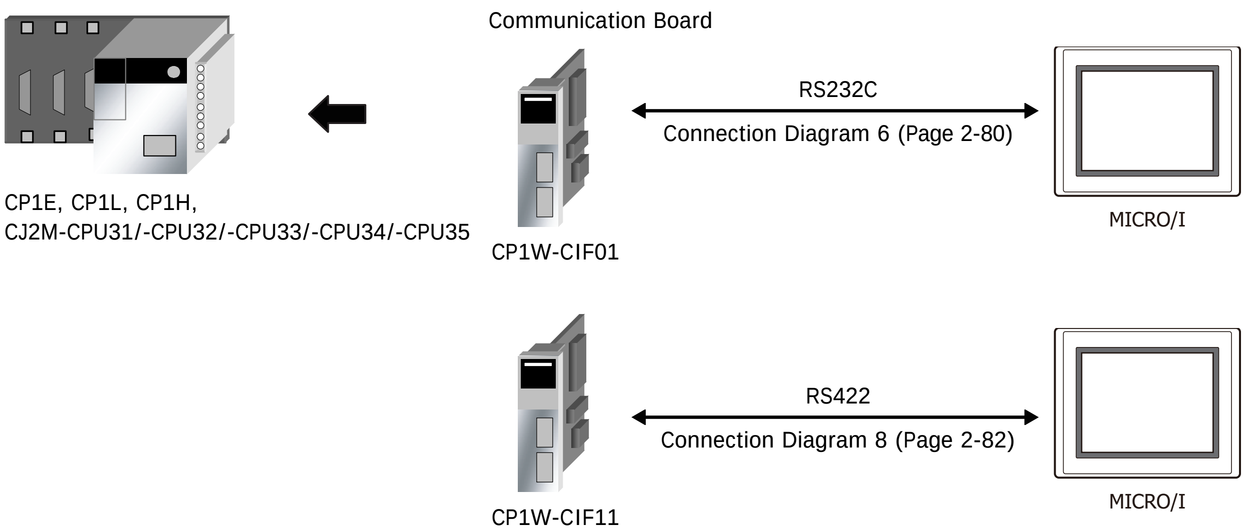
You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

SYSMAC CJ/CP series



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

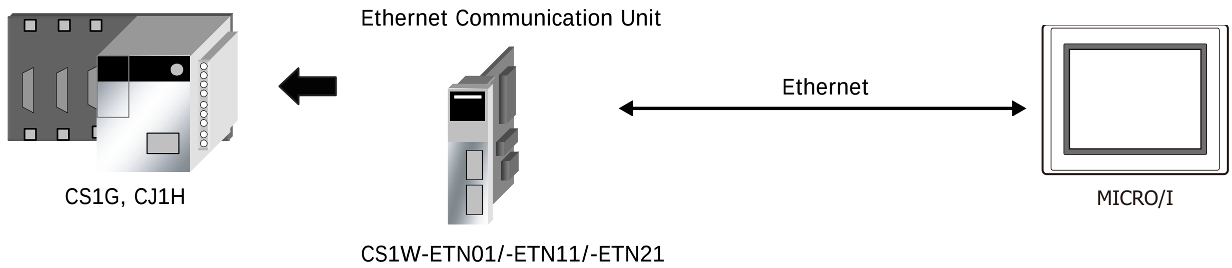
SYSMAC CJ/CP series



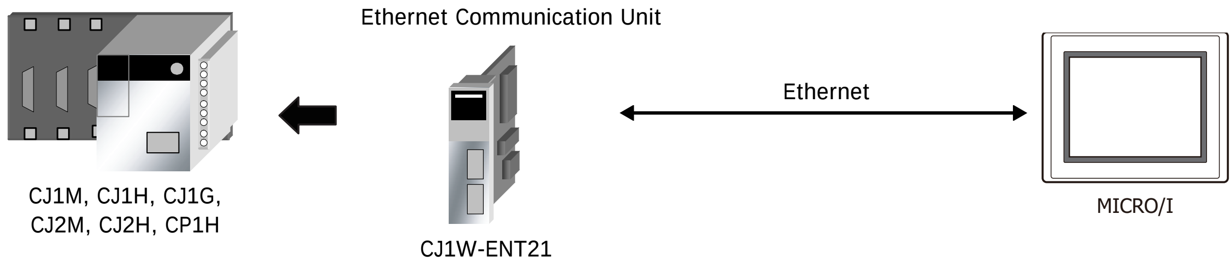
You can use the same cable for Connection Diagram 6 as for Connection Diagram 5.

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

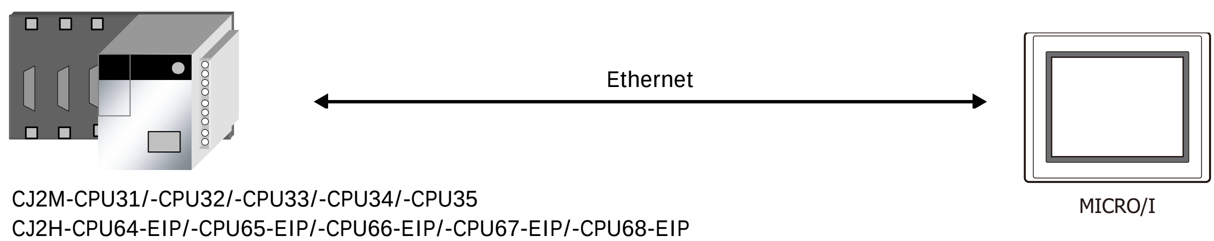
SYSMAC CS1 series



SYSMAC CJ1/CJ2 series



SYSMAC CJ2 series

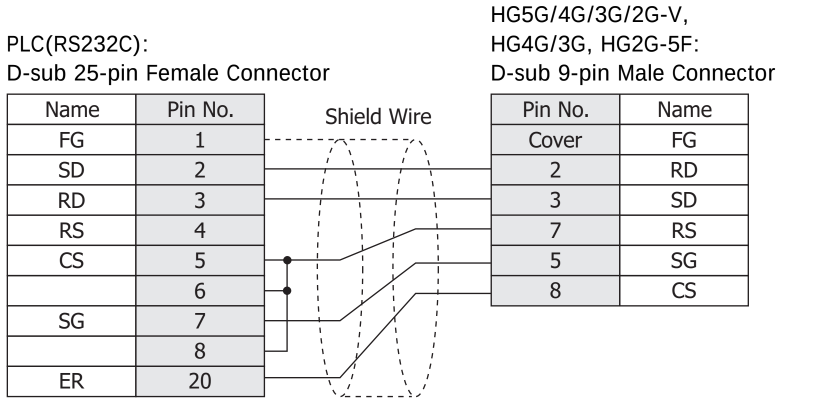


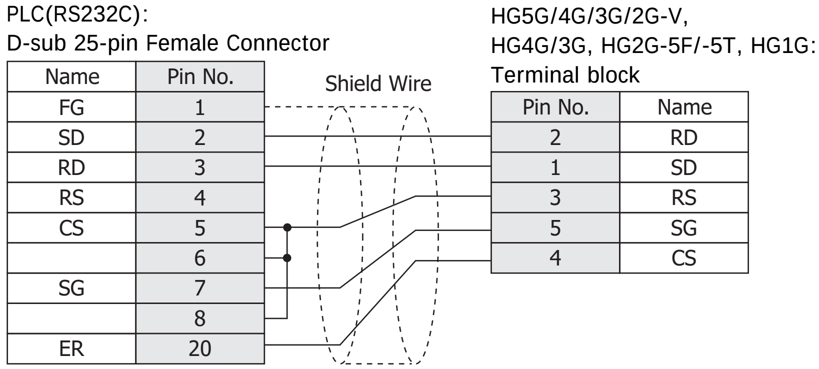
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

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

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

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

HG1P:
D-sub 25-pin Male Connector

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

● 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

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

Shield Wire

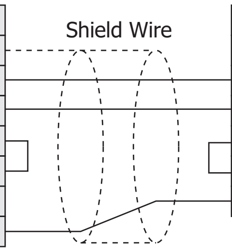
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
2	RDB(RD-)
3	RDA(RD+)
4	SDB(SD-)
5	SDA(SD+)
6	SG

● 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

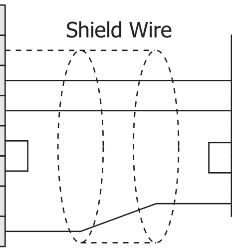


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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



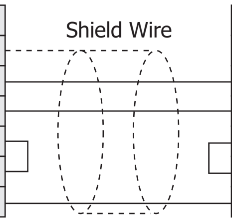
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

Pin No.	Name
2	RD
1	SD
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

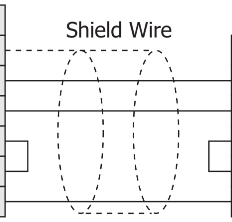


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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

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



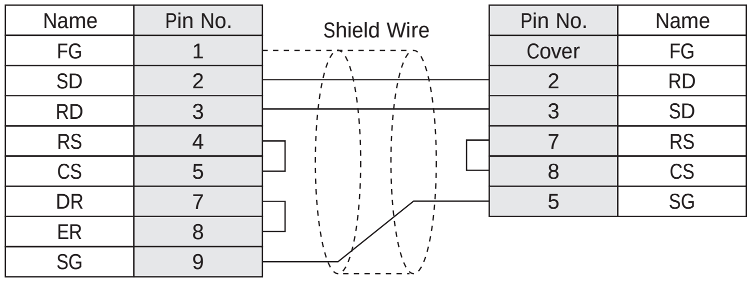
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 6: PLC (RS232C) Interface

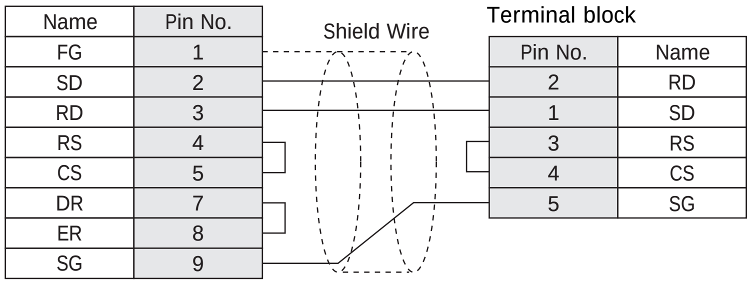
PLC(RS232C):
D-sub 9-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 7: RS422 Communication Board

PLC(RS422/485): D-sub 9-pin Female Connector — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

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

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

PLC(RS422/485): D-sub 9-pin Female Connector — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

PLC(RS422/485): D-sub 9-pin Female Connector — Shield Wire — HG1P: D-sub 25-pin Male Connector

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

● Connection Diagram 8: RS422 Adaptor

PLC(RS422/485): Terminal block

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Shield Wire

PLC Name	Pin No.	Name
FG	Cover	FG
SDA(SD-)	6	RDB(RD-)
SDB(SD+)	1	RDA(RD+)
RDA(RD-)	9	SDB(SD-)
RDB(RD+)	4	SDA(SD+)
SG	5	SG

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

PLC(RS422/485): Terminal block

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

Shield Wire

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

PLC(RS422/485): Terminal block

HG1P: D-sub 25-pin Male Connector

Shield Wire

PLC Name	Pin No.	Name
FG	Cover	FG
SDA(SD-)	2	RDB(RD-)
SDB(SD+)	3	RDA(RD+)
RDA(RD-)	4	SDB(SD-)
RDB(RD+)	5	SDA(SD+)
SG	6	SG

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.	19200, 9600, 4800, 2400 or 1200 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 UDP 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.

Duplicate UDP port numbers of MICRO/I cannot be configured in the following functions.

- **UDP** is selected for the User Communication (☞ refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- **OMRON** as **Manufacture** and **SYSMAC CS1/CJ series(Ethernet)** as **Communication Driver** are selected on the Communication Driver tab
- **IDEC System** as **Manufacture** and **DM LINK Ethernet(UDP)** as **Communication Driver** are selected on the Communication Driver tab (☞ refer to Chapter 4 “Project Settings Dialog Box” on page 4-18)

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 TOSHIBA MACHINE

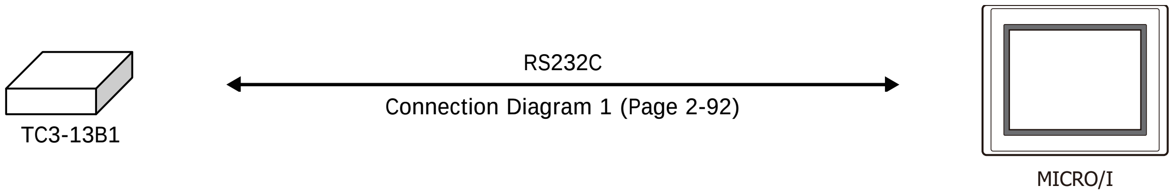
4.1 Connection Table

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 2-92)	ER	TC200
TCmini				
TC03-01 TC03-02	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-92)	ER	TC200
		RS422/485 2-wire Connection Diagram 3 (Page 2-93)	None	

4.2 System Configuration

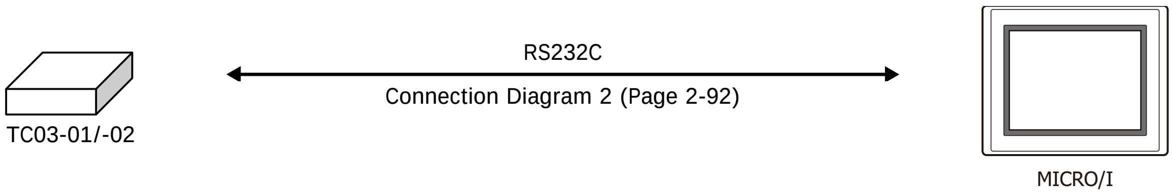
This is the system configuration for the connection of TOSHIBA MACHINE PLCs to the MICRO/I.

● TC200

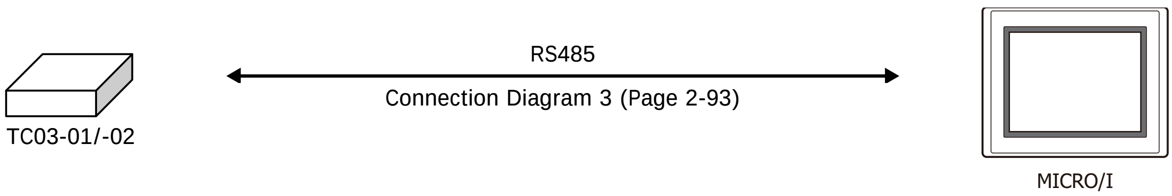


Connects to Serial port of CPU unit.

● TCmini (Connects to the RS232C port)



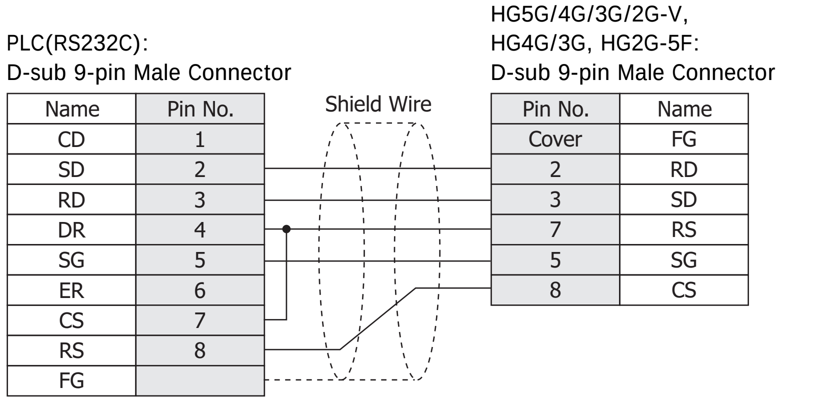
● TCmini (Connects to the RS-TCm485 port)

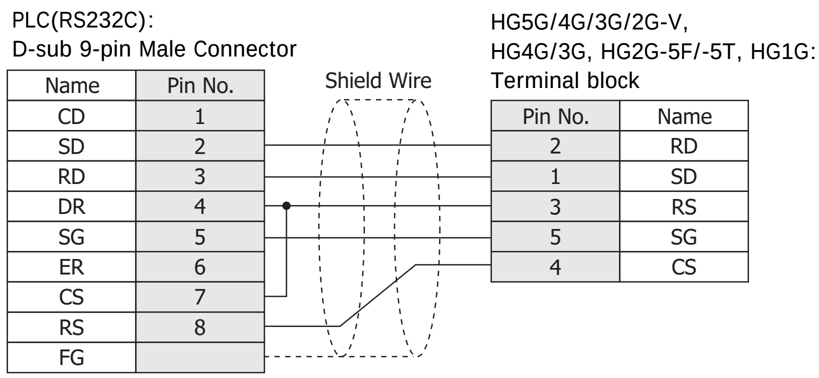


4.3 Connection Diagram

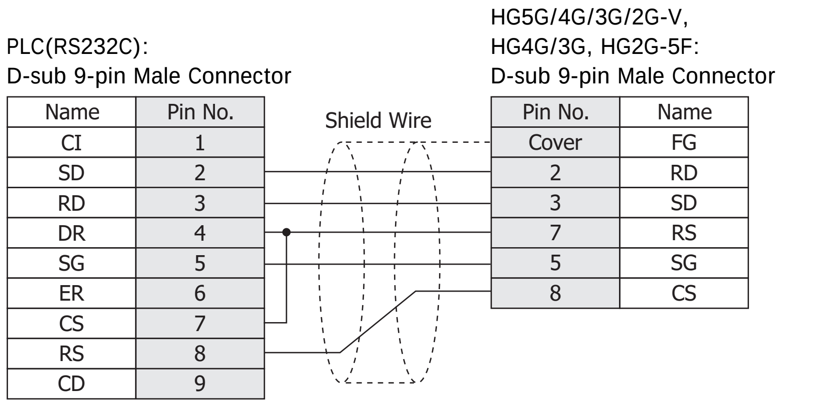
The connector types given in the Connection Diagrams are for the unit and not the cable. For details regarding wiring, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

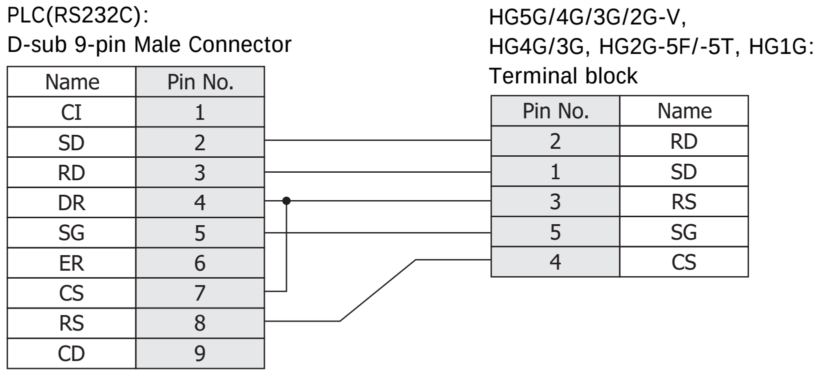
● Connection Diagram 1: TC200 (RS232C)





● Connection Diagram 2: TCmini (RS232C)

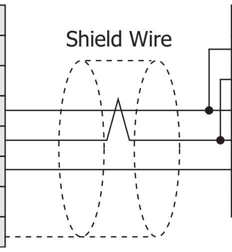




● Connection Diagram 3: TCmini (RS485)

PLC(RS422/485):
Connector

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



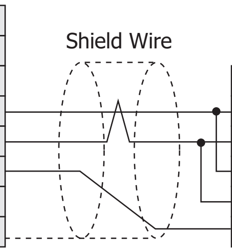
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.

PLC(RS422/485):
Connector

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

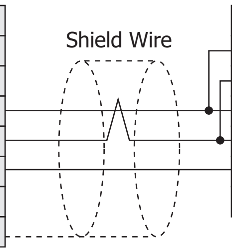
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Connector

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



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
5	SDA(SD+)
4	SDB(SD-)
3	RDA(RD+)
2	RDB(RD-)
6	SG
Cover	FG

4.4 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

4.5 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.

5 Allen-Bradley

5.1 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 2-99)	None	PLC-5(Half Duplex)	
		RS422/485 4-wire Connection Diagram 3 (Page 2-100)			
All PLC-5 models	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-99)			
		RS422/485 4-wire Connection Diagram 4 (Page 2-101)			
SLC 500					
SLC5/03 SLC5/04 SLC5/05	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-99)	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 2-102)	None	MicroLogix/ SLC 500 (Full Duplex)	-
MicroLogix 1100	Not required (Connects to CPU unit)	RS232C Connection Diagram 8 (Page 2-103)			
MicroLogix 1500	Not required (Connects to Mini DIN connector on CPU unit)	RS232C Connection Diagram 5 (Page 2-102)			
	Not required (Connects to D-sub connector on CPU unit)	RS232C Connection Diagram 6 (Page 2-102)			

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 2-103)	None	Logix DF1(Full Duplex)
CompactLogix				
1768 CompactLogix 1769 CompactLogix	Not required (Connects to CPU unit)	RS232C Connection Diagram 7 (Page 2-103)	None	Logix DF1(Full Duplex)
FlexLogix				
1794-L33 1794-L34	Not required (Connects to CPU unit)	RS232C Connection Diagram 7 (Page 2-103)	None	Logix DF1(Full Duplex)

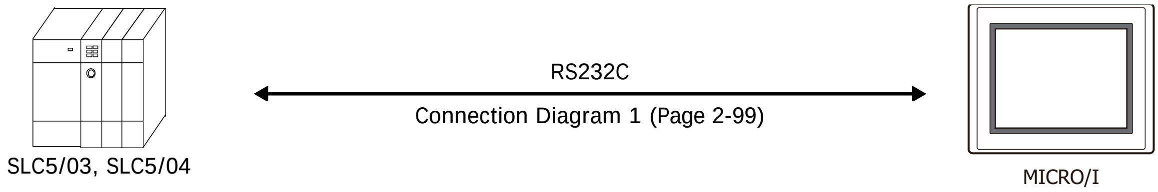
CPU unit	Link unit	WindO/I-NV4 Settings	
		Interface	Communication Driver
ControlLogix			
ControlLogix5550 ControlLogix5555	1756-ENBT, 1756-EN2T	Ethernet	Logix Controllers(Ethernet)
CompactLogix			
1769 CompactLogix	Not required (Connects to CPU unit)	Ethernet	Logix Controllers(Ethernet)
PLC-5			
PLC-5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

*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.)

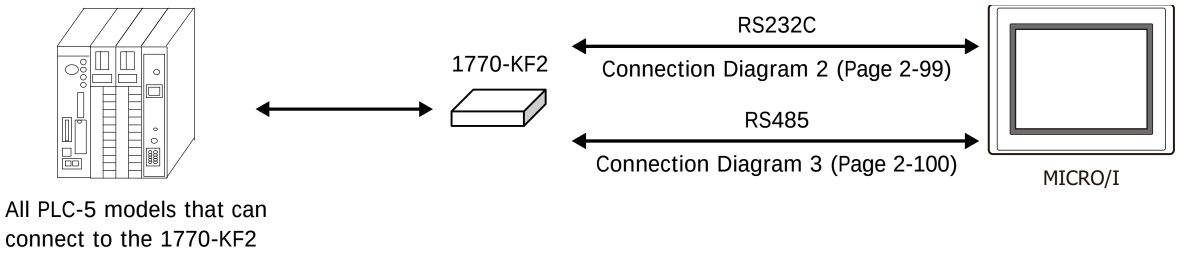
5.2 System Configuration

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

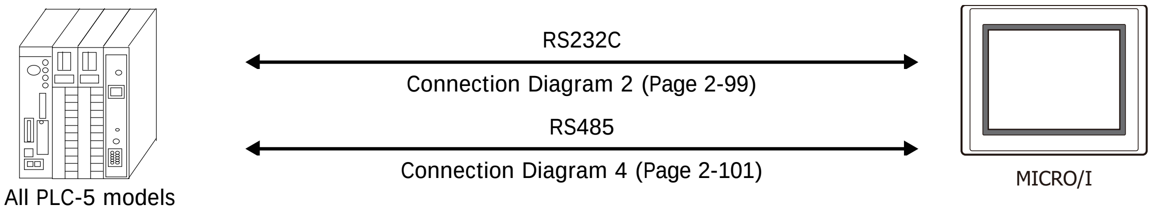
● SLC 500 (Connects to the CPU Channel 0 serial port)



● PLC-5 (Connects to Interface Module)

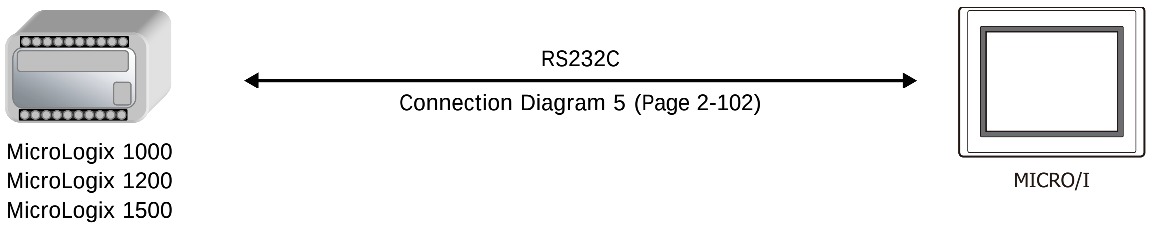


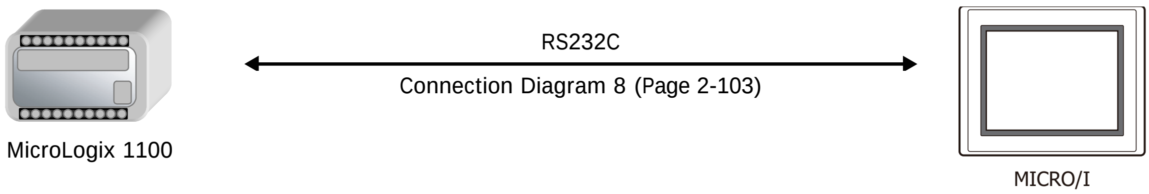
● PLC-5 (Connects to CPU unit)



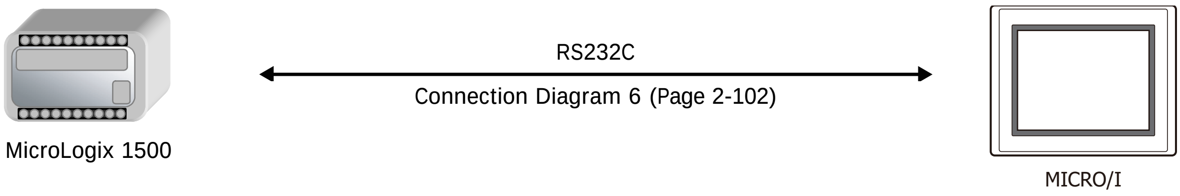
Connect to the CPU Channel 0 serial port.

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

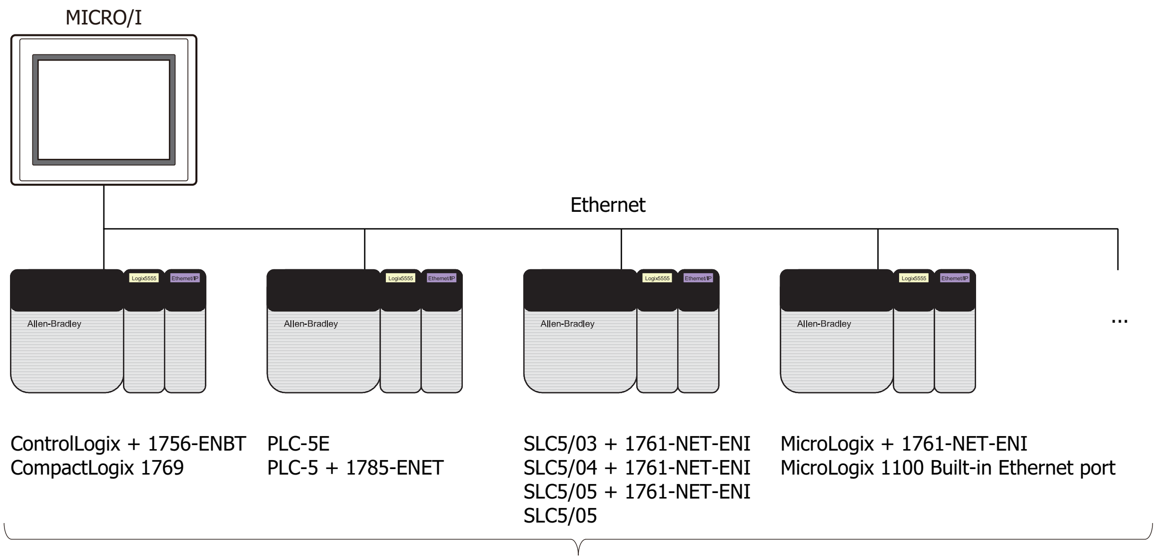




● MicroLogix 1500 (Connects to D-sub 9-pin Connector on the CPU unit)



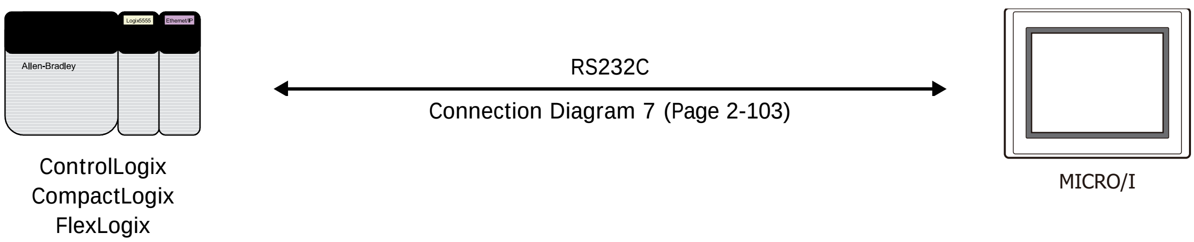
● Logix Controllers(Ethernet)



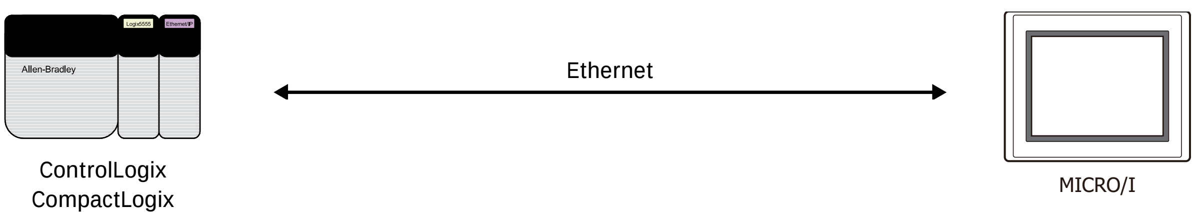
Connect to maximum of 32 different PLCs

- 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)



● Logix Native Tag(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.

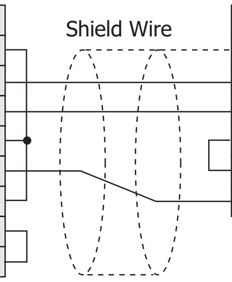
5.3 Connection Diagram

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: SLC 500 (RS232C)

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

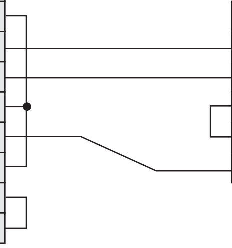


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	CS
5	SG

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



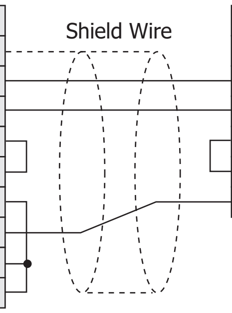
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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

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
DCD	8
DTR	20

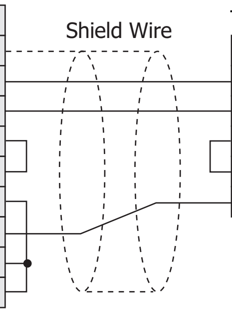


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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
DCD	8
DTR	20



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

2 Connection to External Devices

● Connection Diagram 3: Interface Module (RS422)

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

Name	Pin No.
FG	1
SDA	14
SDB	25
RDA	16
RDB	18
SG	
	4
	5
	6
	8
	20

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
FG	1
SDA	14
SDB	25
RDA	16
RDB	18
SG	
	4
	5
	6
	8
	20

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
FG	1
SDA	14
SDB	25
RDA	16
RDB	18
SG	
	4
	5
	6
	8
	20

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

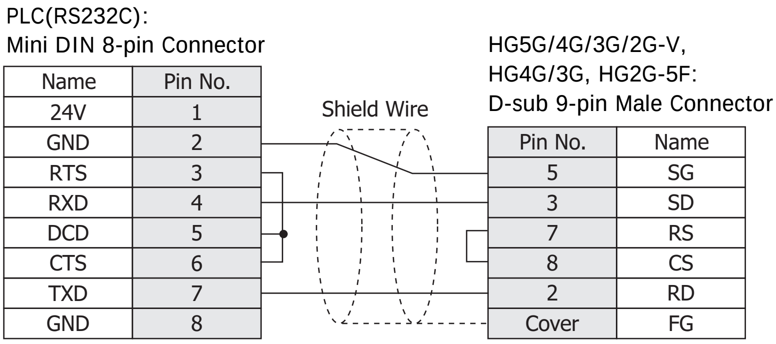
Name	Pin No.
FG	1
SDB	14
SDA	2
RDB	16
RDA	3

Shield Wire

HG1P:
D-sub 25-pin Male Connector

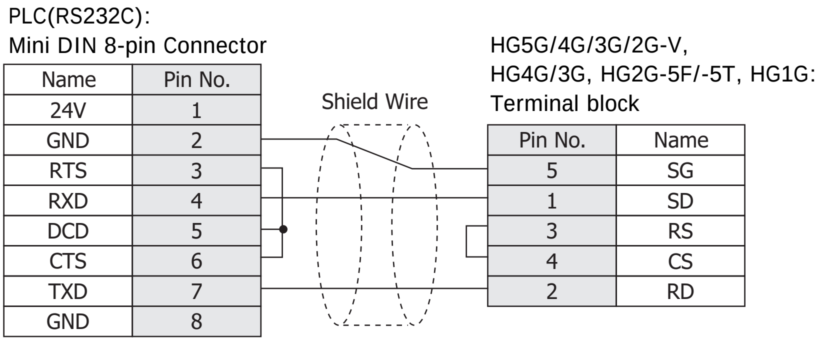
Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

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



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

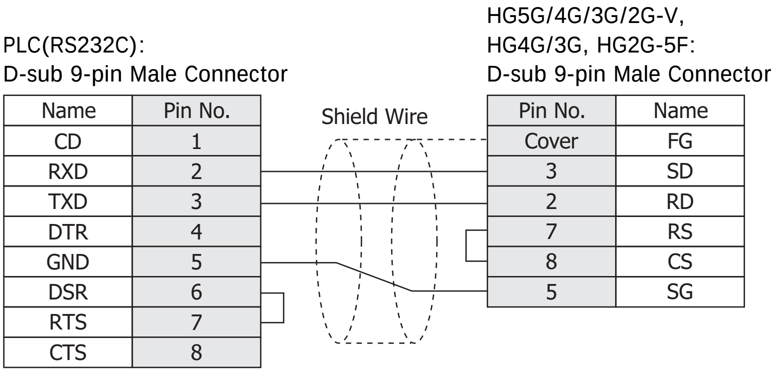
Pin No.	Name
5	SG
3	SD
7	RS
8	CS
2	RD
Cover	FG



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

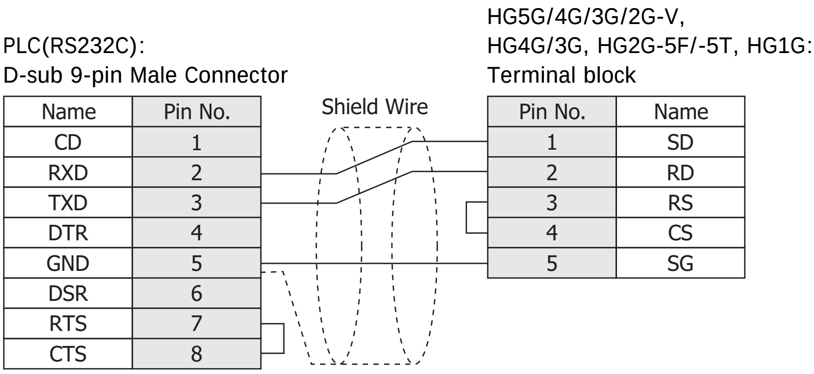
Pin No.	Name
5	SG
1	SD
3	RS
4	CS
2	RD

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



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

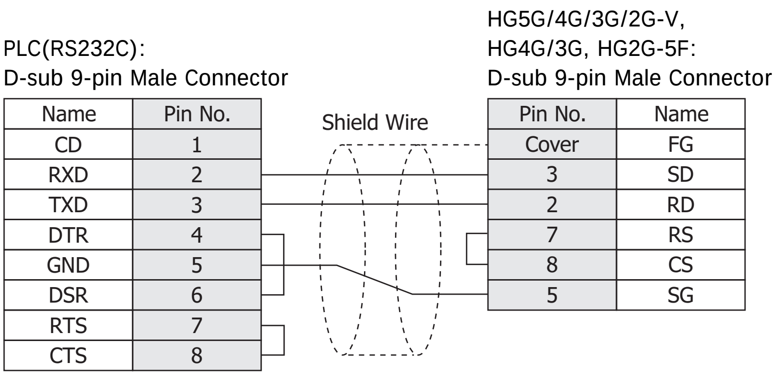
Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	CS
5	SG

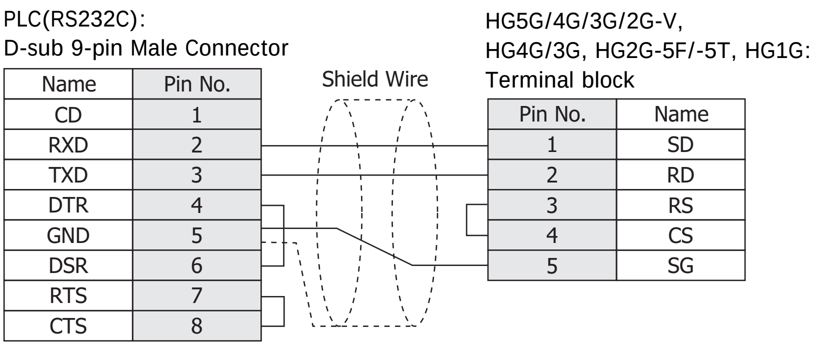


Name	Pin No.
CD	1
RXD	2
TXD	3
DTR	4
GND	5
DSR	6
RTS	7
CTS	8

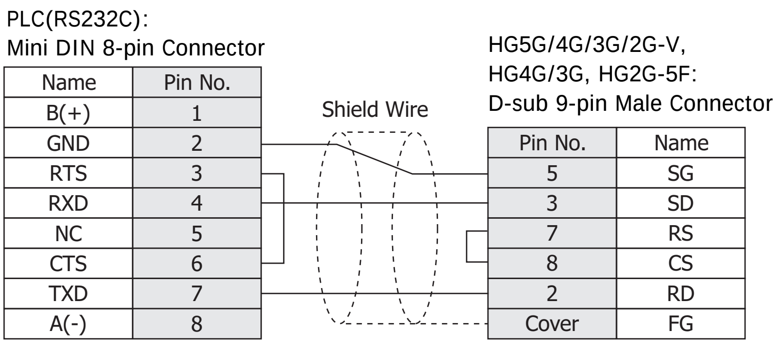
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

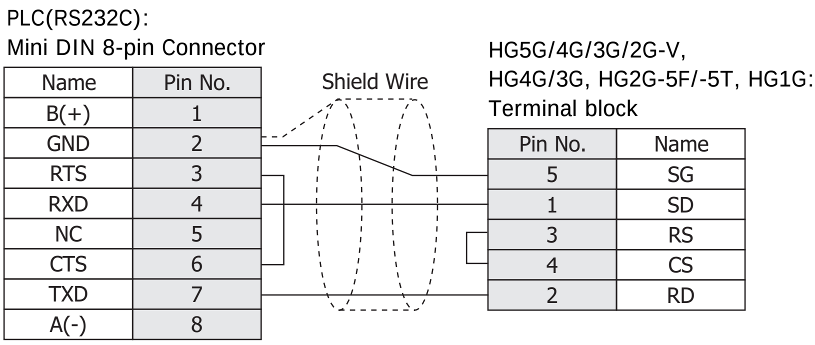
● Connection Diagram 7: ControlLogix, CompactLogix, FlexLogix





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





5.4 Environment Settings

● MicroLogix, SLC 500 (Full Duplex)

Item	Setting
Baud Rate*1*2	38400, 19200, 9600, 4800, 2400 or 1200 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	19200, 9600, 4800, 2400 or 1200 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]	19200, 9600, 4800, 2400 or 1200 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.

● Logix Controllers(Ethernet)

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	38400, 19200, 9600, 4800, 2400 or 1200 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)

● Logix Native Tag(Ethernet)

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.
	Slot Number	Set the CPU slot number of communicated PLC.
	Tag File	Set the tag database file.

*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..

5.5 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 Expression of Device Address Format of each model.)

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	Format		
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 2-108.

Expression of Device Address Format

Format	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	I2.12/6 1 to 2 digits Bit number 1 to 3 digits Word number 1 to 2 digits Slot number	I201206 2 digits Bit number 3 digits Word number 1 to 2 digits Slot number	I:2.12/6
2	B10:123/5 1 to 2 digits Bit number 1 to 3 digits Element number 1 to 3 digits File number	B1012305 2 digits Bit number 3 digits Element number 1 to 3 digits File number	B10:123/5
3	TEN12:123 1 to 3 digits Element number 1 to 3 digits File number	TEN12123 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	Format		
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 2-109.

Expression of Device Address Format

Format	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	WI12.10 1 to 3 digits Word number 1 to 2 digits Slot number	WI12010 3 digits Word number 1 to 2 digits Slot number	I:12.10
2	WB123:255 1 to 3 digits Element number 1 to 3 digits File number	WB123255 3 digits Element number 1 to 3 digits File number	B123:255
3	F123:255_0, F123:255_1 1 digit 0: Lower Word 1: Upper Word 1 to 3 digits Element number 1 to 3 digits File number	F1232550, F1232551 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	ST123:255/40 1 to 2 digits DATA number 1 to 3 digits Element number 1 to 3 digits File number	ST12325540 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	Format		
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

Format	Allen-Bradley	WindO/I-NV4	SLC 500 programming software
1	TDN4:12 1 to 3 digits Element number 1 to 3 digits File number	TDN4012 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	Format		
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

Format	Allen-Bradley	WindO/I-NV4	SLC 500 programming software
1	WI30.1 1 digit Word number 1 to 2 digits Slot number	WI301 1 digit Word number 1 to 2 digits Slot number	I30.1
2	N255:255 1 to 3 digits Element number 1 to 3 digits File number	N255255 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: I10

*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	Format		
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

<table>
<tr><th>Format</th><th>Allen-Bradley</th><th>WindO/I-NV4</th><th>PLC-5 programming software</th></tr>
<tr><td>1</td><td>I277/17
1 to 2 digits Terminal number
1 digit Group number
1 to 2 digits Rack number</td><td>I27717
2 digits Terminal number
1 digit Group number
1 to 2 digits Rack number</td><td>I:277/17</td></tr>
<tr><td rowspan="2">2</td><td>B3:12/15
1 to 2 digits Bit number
1 to 3 digits Element number (or Word number)
1 to 3 digits File number</td><td>B301215
2 digits Bit number
3 digits Element number (or Word number)
1 to 3 digits File number</td><td rowspan="2">B3:12/15</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td>3</td><td>TDN4:12
1 to 3 digits Element number (or Word number)
1 to 3 digits File number</td><td>TDN4012
3 digits Element number (or Word number)
1 to 3 digits File number</td><td>TDN4:12</td></tr>
</table>

Word Device

Device Name	Device Type		Address Number Range		Read /Write	Address Numeral System
	MICRO/I	PLC	Range	Format		
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

Format	Allen-Bradley	WindO/I-NV4	PLC-5 programming software
1	WI277 1 digit: Group number 1 to 2 digits: Rack number	WI277 1 digit: Group number 1 to 2 digits: Rack number	I:277
2	N40:45 1 to 3 digits: Element number (or Word number) 1 to 3 digits: File number	N40045 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.		

2

Connection to External Devices

● Logix Controllers(Ethernet)

If you select Logix Controllers(Ethernet) 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 2-117.

Bit Device

Device Name	Device Type		Address Number Range		Read/Write	Address Numeral System
	MICRO/I	PLC	Range	Format		
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”.

Expression of Device Address Format

Format	Allen-Bradley	WindO/I-NV4	MicroLogix 1200 programming software
1	SI2:12/6 1 to 2 digits Bit number 1 to 3 digits Word number 1 to 2 digits File number	SI201206 2 digits Bit number 3 digits Word number 1 to 2 digits Slot number	I:2/12.6
2	PI277/17 1 to 2 digits Terminal number 1 digit Group number 1 to 2 digits Rack number	PI27717 2digits Terminal number 1 digit Group number 1 to 2 digits Rack number	I:277/17
3	B10:123/5 1 to 2 digits Bit number 1 to 3 digits Element number 1 to 3 digits File number	B1012305 2 digits Bit number 3 digits Element number 1 to 3 digits File number	B10:123/5
4	TEN12:123 1 to 3 digits Element number 1 to 3 digits File number	TEN12123 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	Format		
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>Format</th><th>Allen-Bradley</th><th>WindO/I-NV4</th><th>MicroLogix 1200 programming software</th></tr>
<tr><td>1</td><td>SWI12:10
1 to 3 digits Word number
1 to 2 digits Slot number</td><td>SWI12010
3 digits Word number
1 to 2 digits Slot number</td><td>I:12/10</td></tr>
<tr><td>2</td><td>PWI277
1 digit Group number
1 to 2 digits Rack number</td><td>PWI277
1 digit Group number
1 to 2 digits Rack number</td><td>I:277</td></tr>
<tr><td>3</td><td>WB123:255
1 to 3 digits Element number
1 to 3 digits File number</td><td>WB123255
3 digits Element number
1 to 3 digits File number</td><td>B123:255</td></tr>
<tr><td rowspan="2">4</td><td>F123:255_0, F123:255_1
1 digit 0: Lower word
1: Upper word
1 to 3 digits Element number
1 to 3 digits File number</td><td>F1232550, F1232551
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>ST123:255/40
1 to 2 digits DATA number
1 to 3 digits Element number
1 to 3 digits File number</td><td>ST12325540
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	Format		
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

<table>
<tr><th>Format</th><th>Allen-Bradley</th><th>WindO/I-NV4</th><th>ControlLogix programming software</th></tr>
<tr><td>1</td><td>INT40:45
1 to 3 digits Element number
1 to 3 digits File number</td><td>INT40045
3 digits Element number
1 to 3 digits File number</td><td>N40:45</td></tr>
<tr><td rowspan="2">2</td><td>REAL123:255_0, REAL123:255_1
1 digit 0: Lower word
1: Upper word
1 to 3 digits Element number
1 to 3 digits File number</td><td>REAL1232550, REAL1232551
1 digit 0: Lower word
1: Upper word
3 digits Element number
1 to 3 digits File number</td><td rowspan="2">REAL123:255</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>
</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.
- A communication error occurs if you specify a file or element that is not allocated to the MicroLogis1200 or SLC 500 data table map.

5.6 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.

5.7 Device Addresses used for Logix Native Tag(Ethernet)

When using Logix Native Tag(Ethernet) as a communication driver, the device address is set using tags.
To use tags, on the **Communication Driver Network** tab in the Project Settings dialog box, set the **Tag File** to RSLogix5000 L5K file (*.L5K). The Tag File needs to be a L5K file format from RSLogix5000 software.
You can make the RSLogix5000 L5K file (*.L5K) by using the Allen-Bradley RSLogix5000 software.

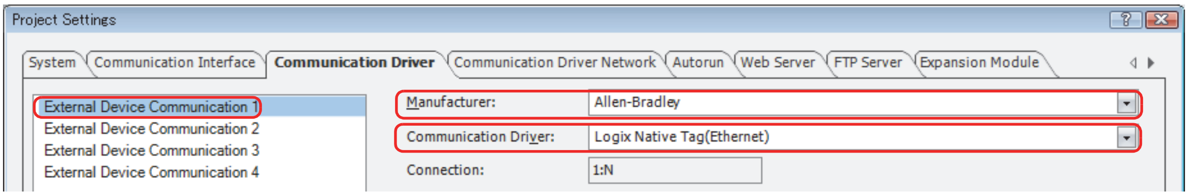
● Supported data type

Logix Native Tag(Ethernet) supports the following data types and it supports arrays with elements of up to three-dimensions and user-defined structure.

- BOOL*1
- INT
- DINT
- SINT
- REAL
- TIMER
- COUNTER
- CONTROL
- STRING

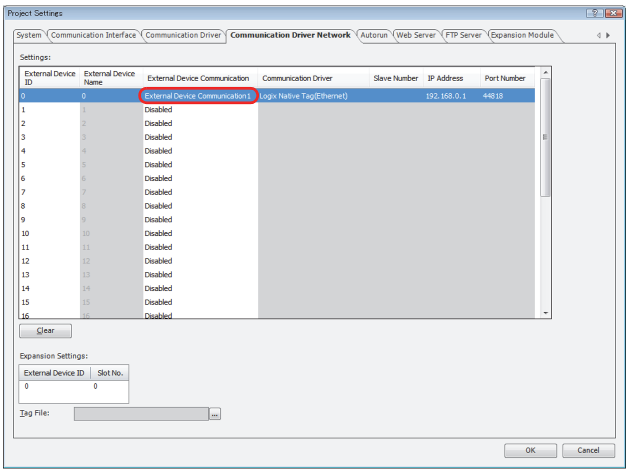
● Tag Files Settings Configuration Procedure

Configure the following settings by using WindO/I-NV4.
Before starting this procedure. Set **Allen-Bradley** as a **Manufacturer** and **Logix Native Tag(Ethernet)** as a **Communication Driver** for the target External Device Communication in the **Communication Driver** tab on the **Project Settings** dialog box.



1 On the **Communication Driver** tab in the **Project Settings** dialog box, setup the **External Device Communication**.

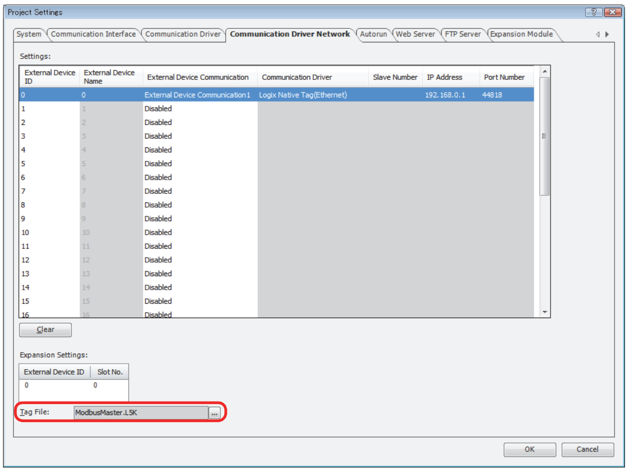
Select the **External Device Communication** that assigned to the Logix Native Tag(Ethernet).



*1 Does not support BOOL type arrays.

2 Set a tag file.

Import the L5K file that exported from RSLogix5000 software.



To get the RSLogix5000 L5K file (*.L5K), open a project in RSLogix 5000 software, select **File**, **Save As**, and then select **RSLogix 5000 Import/Export File(*.L5K)** as the **Save as type**.

3 Change the settings of **External Device Name**, **IP Address**, **Port No.** and **Slot No.** as needed.

● Tags Setting

Tags can be set in the following ways.

- Using the keyboard, type the tag name directly into the text box where the device address is set.
- Click the ... button to the right of the text box where the device address is set, and select a tag in Tag Editor. For details about the Tag Editor, refer to “Logix Native Tag(Ethernet)” on page 2-129.

● How to edit Tags

The content of tags imported in the **Communication Driver Network** tab on the **Project Settings** dialog box in WindO/I-NV4 can be edited using the Tag Editor. For details about the Tag Editor, refer to “Logix Native Tag(Ethernet)” on page 2-129.

2 Connection to External Devices

● Cautions When Using Indirect Read and Indirect Write

MICRO/I is capable of specifying a device address offset for certain parts. When using Logix Native Tag, the offset is specified according to the following rules.

- Offsets cannot be specified for tags with no arrays.
- The array number for tags with arrays changes according to the offset value.

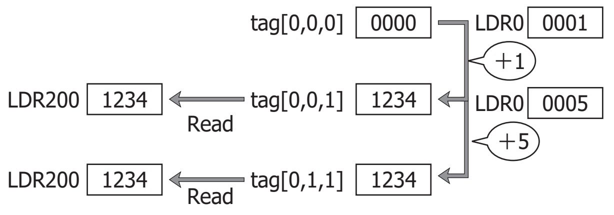
Example: Create a tag as a data type is INT and an array number is [2,3,4], and then set the device address to [0,0,0]. When the offset value is 1, use data of [0,0,1]. When the offset value is 5, use data of [0,1,1].

Script

```
[LDR 200] = OFFSET(tag[0,0,0],[LDR 0]);
```

Operation description

When the value of LDR0 is 1, the value of tag[0,0,1], the device address 1 words from tag[0,0,0], is read and stored in LDR200.



- The offset value changes to match the array numbers in the structure if TIMER, COUNTER, CONTROL or user-defined structure data type array is created.

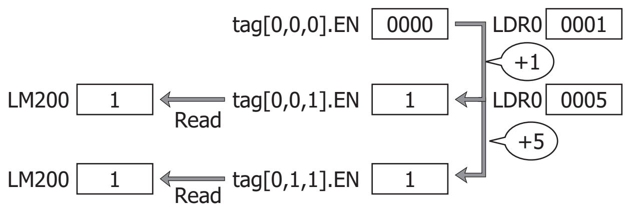
Example: Create a tag as a data type is TIMER and an array number is [2,3,4], and then set the device address to [0,0,0].EN. When the offset value is 1, use data of [0,0,1].EN. When the offset value is 5, use data of [0,1,1].EN.

Script

```
[LM 200] = OFFSET(tag[0,0,0].EN,[LDR 0]);
```

Operation description

When the value of LDR0 is 1, the value of tag[0,0,1].EN, the device 1 words from tag[0,0,0].EN, is read and stored in LDR200.



- When a user-defined structure is created with an array, if members of the structure also have arrays, change the offset value according to the array of the member.

- With the MICRO/I, reference device values are specified in units of 16-bit devices. Therefore, to specify a value for DINT, REAL, TIMER (a 32-bit device), or PRE and ACC elements in the CONTROL structure, it is necessary to double the reference device value in the PLC before specifying it.

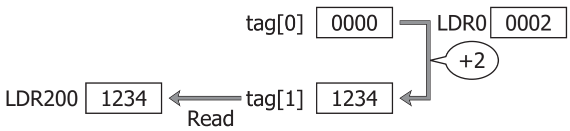
Example 1: If 1 is specified as the reference device value for DINT[0], the upper word for DINT[0] is used. To use DINT[1], specify a reference device value of 2.

Script

```
[LM 200] = OFFSET(tag[0],[LDR 0]);
```

Operation description

When the value of LDR0 is 2, the value of tag[1], the device 2 words from tag[0], is read and stored in LDR200.



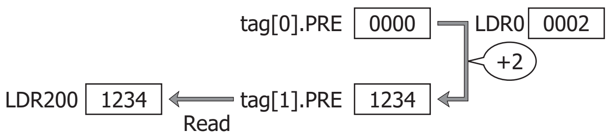
Example 2: If 1 is specified as the reference device value for TIMER[0].PRE, the upper word for TIMER[0].PRE is used. To use TIMER[1].PRE, specify a reference device value of 2.

Script

```
[LM 200] = OFFSET(tag[0].PRE,[LDR 0]);
```

Operation description

When the value of LDR0 is 2, the value of tag[1].PRE, the device 2 words from tag[0].PRE, is read and stored in LDR200.



● Restrictions

- The number of characters that can be set in a tag is as follows.

Item	Number of Characters
Tag Name	40 max.
Total number of Tag Name, array, and member characters	256 max.
Total number of Tag Name, array, and member characters (including the program name) in a tag in Program Scope	248 max.

- Array elements can be up to 3 dimensions.
- The maximum array number is 65535.
- The maximum number of tag names that can be set for a project is 65535 per External Device ID.
- If a tag with 32-bit information is specified, the lower 16 bits will be used in MICRO/I. The upper 16 bits cannot be directly specified.
- The external device address cannot be monitored using the MICRO/I Device Monitor or WindO/I-NV4.
- Operation has been tested using tag files created with RSLogix5000 Version 13.
- The O/I Link Communication cannot be used.
- Does not support Predefined structures and Module-Defined structures except for the TIMER, COUNTER, CONTROL structure.
- Does not support the Alias.
- The STRING data structure DATA is SINT (1 byte) in Allen-Bradley PLC, but it is handled as a 2 bytes data in the MICRO/I.
  After the RSLogix5000 L5K file (*.L5K) is imported, the STRING type tags are displayed as DATA[0], DATA[2], DATA[4], etc. on Tag Editor.
- The STRING data structure LEN stores the number of characters written when a string is written from the DATA start address (D0). 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.

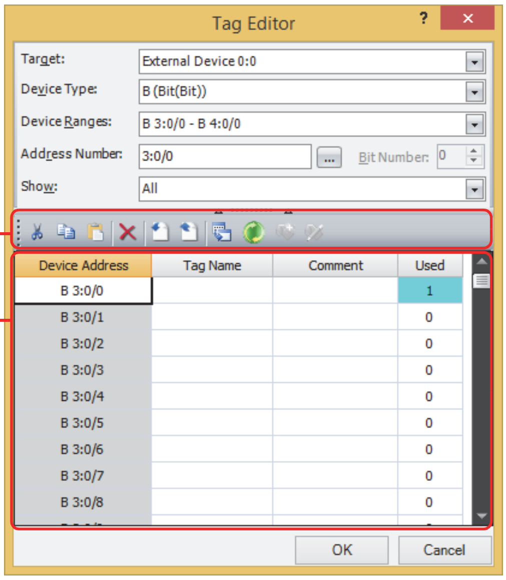
5.8 Tag Editor

This section describes items and buttons on the Tag Editor used for an Allen-Bradley PLC. The Tag Editor varies based on the selected driver as the Communication Driver.

● Other than Logix Native Tag(Ethernet)

(Toolbar)

(Address Number List)



■ **Target**

Select the external device.

The external device set in **(Settings)** on the **Communication Driver Network** tab is displayed in **External Device (External Device ID): (External Device Name)**.

■ **Device Type**

Select the device type.

The list only shows device types that can be used.

■ **Device Ranges**

Select the range of Device Addresses displayed in (Address Number List). The range that can be set varies based on the selected device type.

■ **Address Number**

Specify the address number. The range that can be set varies based on the selected device type.

This only appears if you clicked ... to the right of the text box where the device address is set and opened Tag Editor.

Click the ... button to display the **Address Number Settings for Allen-Bradley** dialog box. For details, refer to “Address Number Settings for Allen-Bradley dialog box” on page 2-128.

■ **Bit Number**

Specify the bit number (0 to 15) of the word device.

This only appears if you clicked ... to the right of the text box where the device address is set and opened Tag Editor. This option can only be configured when a word device is selected for **Device Type**.

■ Show

Select the device address displayed in the (Address Number List) from the following options.

All: Displays all of the device addresses that can be used with the device selected in **Target**.

Used: Displays only the device addresses that are used in the active project data.

Unused: Displays only the device addresses that are not used in the active project data.

■ (Toolbar)

(Cut):	Cuts the selected tag name or comment from (Address number list) and copies it to the clipboard.
(Copy):	Copies the selected tag name or comment to the clipboard.
(Paste):	Pastes the contents of the clipboard.
(Delete):	Deletes the selected tag name or comment.
(Import):	Opens the Open dialog box. Select a file with exported tag names and comments (CSV file), and then click **Open** to collectively overwrite (Address Number List) with the tag names and comments in the selected file. This can only be used when Tag Editor is displayed in the Workspace.
(Export):	Opens the Export dialog box. Select the location to save the file, enter a file name, and then click **Save** to save the tag names and comments of (Address Number List) as a CSV file. This can only be used when Tag Editor is displayed in the Workspace.
(Cross Reference):	Opens the Cross Reference dialog box. For details, refer to "Cross Reference dialog box" on page 2-131.
(Refresh):	Updates the **Used** column on the Tag Editor.

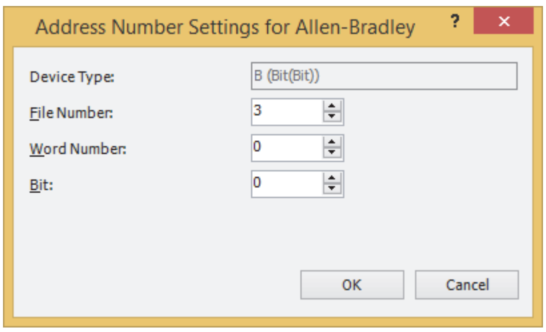
■ (Address Number List)

Displays a list of device addresses that match the specified condition.

Device Address:	Displays the device addresses of the selected Device Type.
Tag Name:	Displays the tag name of the address number.
Comment:	Displays the comment of the address number.
Used:	Displays how many times each address number has used.

Address Number Settings for Allen-Bradley dialog box

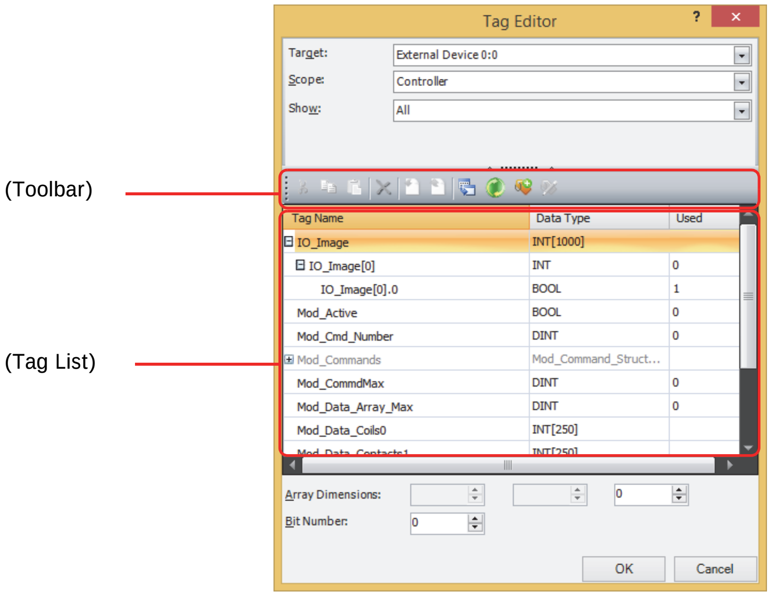
Click ... next to **Address Number** to display the **Address Number Settings for Allen-Bradley** dialog box. You can set or edit the address number of an Allen-Bradley PLC.



Device Type: Displays the device type selected in the Tag Editor.

For the settings other than **Device Type**, enter the device address in accordance with the notation method of address numbers for Allen-Bradley PLC.

● Logix Native Tag(Ethernet)



■ **Target**

Select the device that includes the target device address from **External Device (External Device ID): (External Device Name)**.
The external device set in **(Settings)** on the **Communication Driver Network** tab is displayed in **External Device (External Device ID): (External Device Name)**.

■ **Scope**

Select **Controller** or **(Program scopes)** for Scope.
If program scopes exist on the Allen-Bradley tag of an added RSLogix5000 L5K file (*.L5K), the program names will be displayed in alphabetical order in (Program scopes).

■ **Show**

Select the tags displayed in (Tag List) from the following options.

All: Displays all of the tags that can be used with the device selected in **Target**.

Used: Displays only the tags that are used in the active project data.

Unused: Displays only the tags that are not used in the active project data.

■ **(Toolbar)**

(Delete): Deletes the selected tag name. This can only be used when Tag Editor is displayed in the Workspace and the highest node is selected.

(Cross Reference): Opens the Cross Reference dialog box. For details, refer to “Cross Reference dialog box” on page 2-131.

(Refresh): Updates the **Used** column on the Tag Editor.

(Add New Tag): Opens the Tag Settings dialog box. Adds a tag. For details, refer to “Tag Settings dialog box” on page 2-130.

(Edit Tag): Opens the Tag Settings dialog box. Edits the registered tag. For details, refer to “Tag Settings dialog box” on page 2-130.
This can only be used when Tag Editor is displayed in the Workspace and the highest node is selected.

To enable (Add New Tag) or (Edit Tag), set **Target** to the External Device ID for which the RSLogix5000 L5K file (*.L5K) is set in **Tag File** in the **Communication Driver Network** tab on the **Project Settings** dialog box.

■ (Tag List)

The tags that match the specified conditions are displayed.

Tag Name: Displays the tag name of each tag.

Data Type: Displays the data type of each tag.

Used: Displays how many times each address number has used.

■ Array Dimensions

Specifies the array elements up to 3 dimensions.

This option is only displayed when the Tag Editor opens by clicking ... next to the text box to setup a device address.

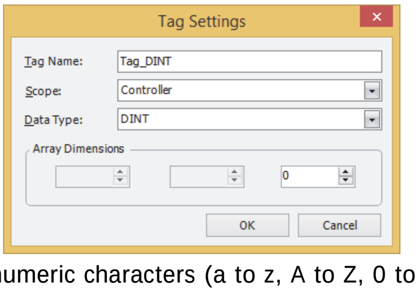
■ Bit Number

Specify the bit number (0 to 15) of the word device.
The maximum Bit Number depends on the data type of the selected tag.

This option is only displayed when the Tag Editor opens by clicking ... next to the text box to setup a device address. Can only be set if a word device is selected as **Device Type**.

Tag Settings dialog box

To display the **Tag Settings** dialog box, click (Add New Tag) or (Edit Tag). You can add or edit an Allen-Bradley tag name, scope, data type, and array.



Tag Name: You can enter alphanumeric characters (a to z, A to Z, 0 to 9) and an underscore (_) for the tag name. The maximum number is 40 characters.

- Characters other than alphanumeric characters (a to z, A to Z, 0 to 9) and an underscore (_) cannot be entered.
- You cannot use the following tag names.
  - First character is a number
  - Last character is an underscore (_)
  - Underscores (_) appear in succession

Scope: Select **Controller** or **(Program scopes)** for Scope.
If program scopes exist on the tag of an added RSLogix5000 L5K file (*.L5K), the program names will be displayed in alphabetical order in (Program scopes).

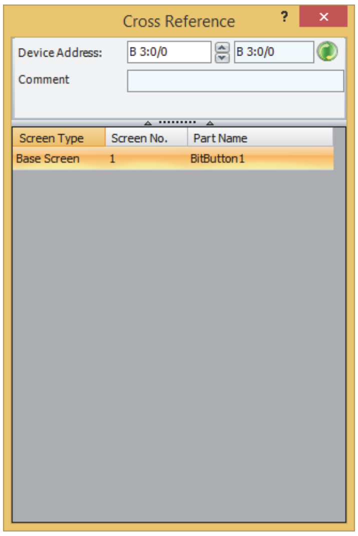
Data Type: Selects the data type.
The list only shows data types that can be used.

Array Dimensions: Specifies the array elements up to 3 dimensions.

This option is only displayed when the Tag Editor opens by clicking ... next to the text box to setup a device address.

● **Cross Reference** dialog box

To display the screen type, screen number, and part name that uses the tag of a tag name, select the tag name with (Tag List) in Tag Editor, and click (Cross Reference).



6 JTEKT (Toyoda)

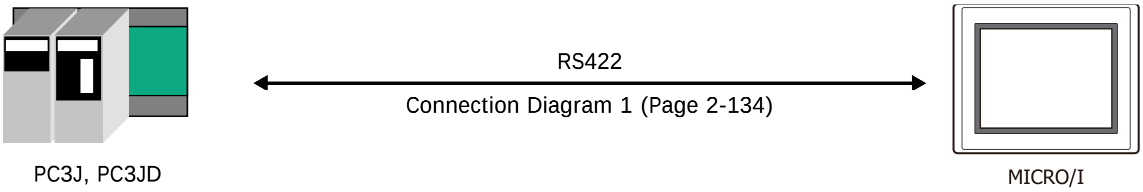
6.1 Connection Table

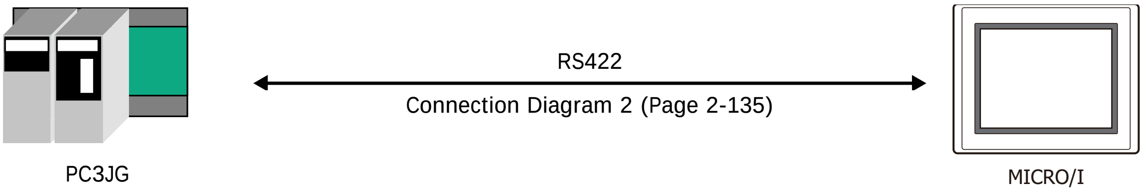
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
TOYOPUC-PC2J				
PC2J	Not required (Connects to Built-in Link)	RS422/485 2-wire Connection Diagram 1 (Page 2-134)	None	TOYOPUC-PC3J
TOYOPUC-PC3J				
PC3J PC3JD	Not required (Connects to Built-in Link)	RS422/485 2-wire Connection Diagram 1 (Page 2-134)	None	TOYOPUC-PC3J
PC3JG	Not required (Connects to Built-in Link)	RS422/485 2-wire Connection Diagram 2 (Page 2-135)		
PC3J PC3JD PC3JG	FL/ET-T-V2H	Ethernet	-	TOYOPUC(Ethernet)
TOYOPUC-PC10				
PC10G	Not required (Connects to L1 or L2 port of the CPU unit)	Ethernet	-	TOYOPUC(Ethernet)

6.2 System Configuration

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

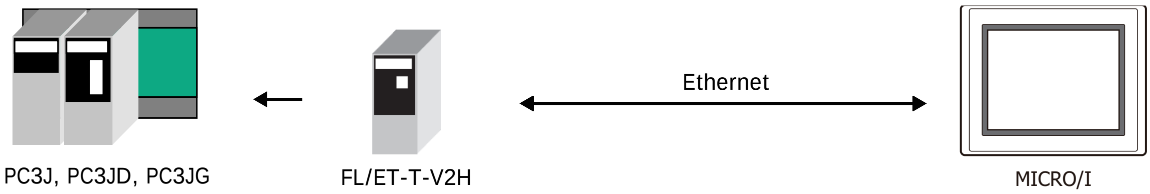
● TOYOPUC-PC3J series (uses to the Built-in Link)

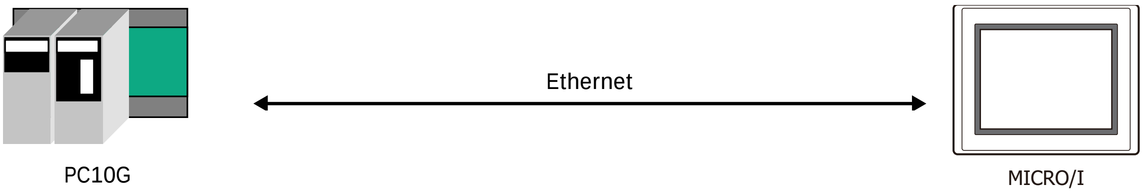




It connects with the Built-in Link port of a CPU unit.

● TOYOPUC-PC3J/-PC10 (Ethernet)

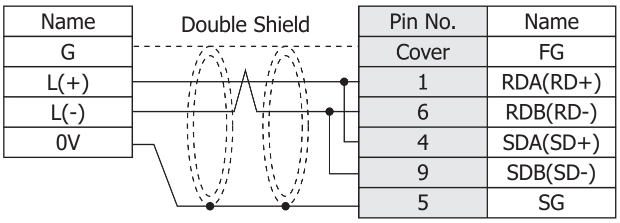




6.3 Connection Diagram

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: PC2J, PC3J, PC3JD



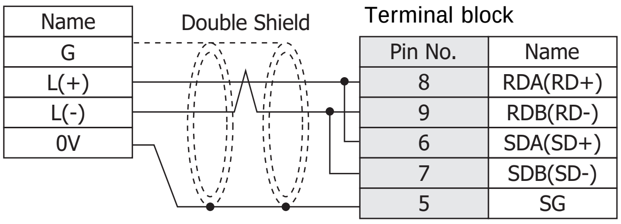
PLC(RS422/485):
Terminal block

Name
G
L(+)
L(-)
0V

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.



PLC(RS422/485):
Terminal block

Name
G
L(+)
L(-)
0V

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

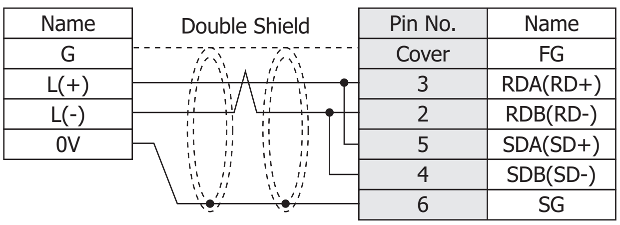
Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.



PLC(RS422/485):
Terminal block

Name
G
L(+)
L(-)
0V

HG1P:
D-sub 25-pin Male Connector

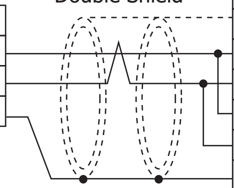
Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● Connection Diagram 2: PC3JG

PLC(RS422/485):
Terminal block

Name
L(+)
L(-)
0V

Double Shield



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

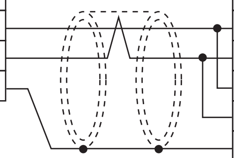
Pin No.	Name
Cover	FG
1	RDA(RD+)
6	RDB(RD-)
4	SDA(SD+)
9	SDB(SD-)
5	SG

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

Name
L(+)
L(-)
0V

Double Shield



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

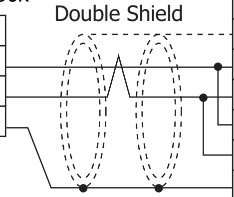
  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485):
Terminal block

Name
L(+)
L(-)
0V

Double Shield



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

6.4 Environment Settings

● TOYOPUC-PC3J

Item	Setting
Interface	RS422/485 2-wire
Station No.	0 to 37 (Octal)*1
Baud Rate	57600, 38400, 19200, 9600, 4800, 2400 or 1200 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.

● TOYOPUC-PC3J/-PC10 (Ethernet)

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.

PLC Settings

Configure the following items on the **Detailed Settings** in the **Link parameter.**

Item	Setting
Own Node IP Address	Set the IP address of PLC.
Connection 1	Used
Open Protocol	TCP Destination Non-Specified Passive Open
Own Node Port No.	Set an arbitrary port number (1025 to 65534).

*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.

6.5 Usable Device Addresses

● TOYOPUC

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 0FF	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 0FF	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 0FF	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 0FF	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 PC3JG only

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 File register is unavailable when **division mode** is selected from **CPU operation mode**.

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 PC3JG only

● TOYOPUC(Ethernet)

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	*1
Output Relay	Y	Y	0 to 7FF	R/W	*1
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 0FF	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 0FF	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 0FF	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 0FF	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 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	
Extended output	GY	GY	0 to FFFF	R/W	
Extended Internal relay	GM	GM	0 to FFFF	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.

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	*1
Output	WY	Y	0 to 7F	R/W	*1
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 File register is unavailable when **division mode** is selected from **CPU operation mode**.

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	
Extended output	WGY	GY	0 to FFF	R/W	
Extended internal relay	WGM	GM	0 to FFF	R/W	
Extended Buffer register 0	EB0	EB	0 to 7FFF	R/W	
Extended Buffer register 1	EB1	EB	8000 to FFFF	R/W	
Extended Buffer register 2	EB2	EB	10000 to 17FFF	R/W	
Extended Buffer register 3	EB3	EB	18000 to 1FFFF	R/W	

The device addresses that can be used vary based on the setting of **CPU operation mode**.

*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.

7 SIEMENS

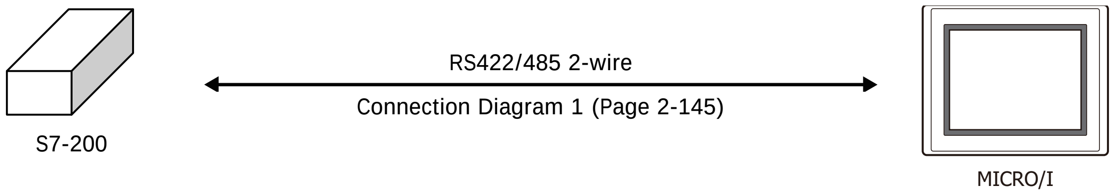
7.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
S7-200				
CPU212 CPU214 CPU215 CPU216 CPU221 CPU222 CPU224 CPU224XP CPU226 CPU226XM	Not required (Connects to CPU unit)	RS422/485 2-wire Connection Diagram 1 (Page 2-145)	None	S7-200(PPI)
S7-300				
CPU 313 CPU 314 CPU 315 CPU 315-2DP CPU 316 CPU 318	CP-340 CP-341	RS232C Connection Diagram 2 (Page 2-146)	None	S7-300 3964(R)/RK512
		RS422/485 4-wire Connection Diagram 3 (Page 2-147)		
CPU 313 C-2PtP	Not required (Connects to CPU unit)	RS422/485 2-wire Connection Diagram 4 (Page 2-148)		S7-MPI
S7-400				
CPU 412 CPU 414 CPU 416 CPU 416F-2 CPU 417	CP-440 CP-441	RS232C Connection Diagram 2 (Page 2-146)	None	S7-300 3964(R)/RK512
		RS422/485 4-wire Connection Diagram 3 (Page 2-147)		
S7-1200				
CPU1211C CPU1212C CPU1214C	Not required (Connects to CPU unit)	Ethernet	-	S7-1200(Ethernet)

7.2 System Configuration

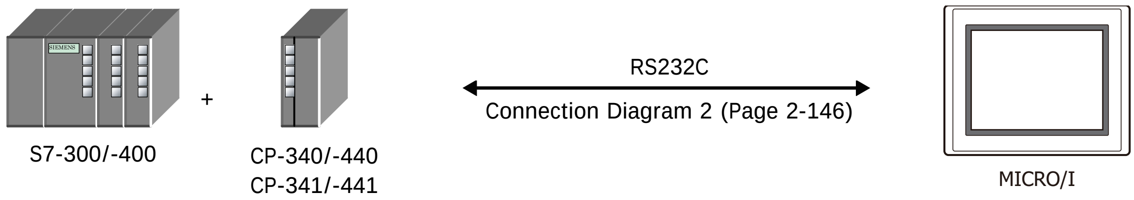
This is the system configuration for the connection of SIEMENS PLCs to MICRO/I.

● S7-200

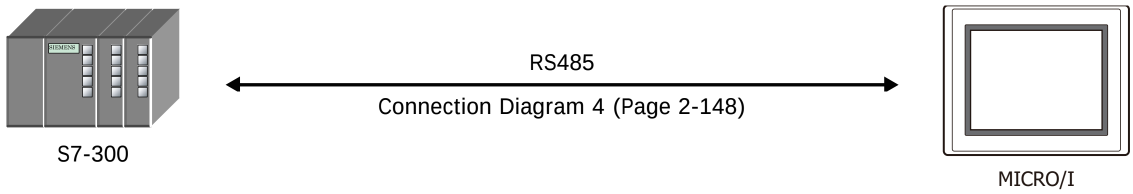


Connects to Serial port of the CPU unit.

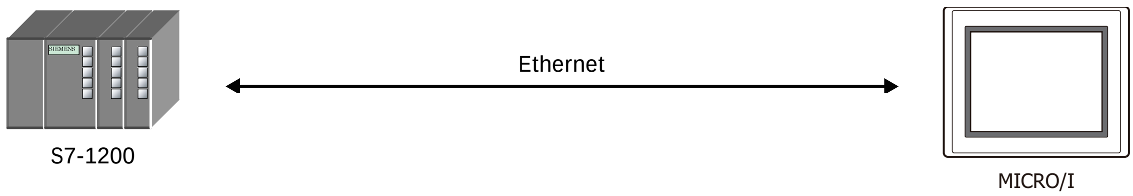
● S7-300/-400 (CP-340/-341)



● S7-300 (MPI Interface)



● Connection to the Ethernet port for S7-1200



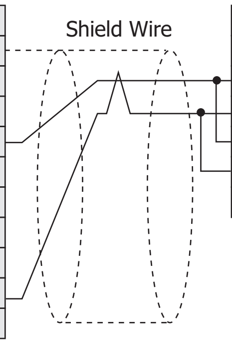
7.3 Connection Diagram

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: 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



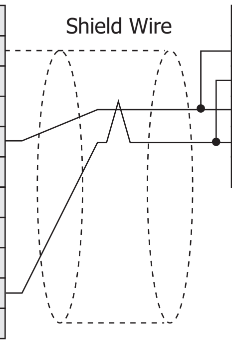
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
1	RDA(RD+)
6	RDB(RD-)
4	SDA(SD+)
9	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.

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

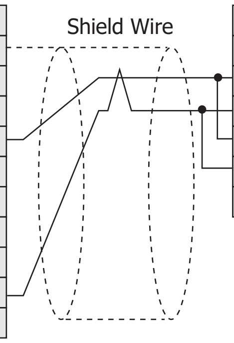
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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.

2 Connection to External Devices

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



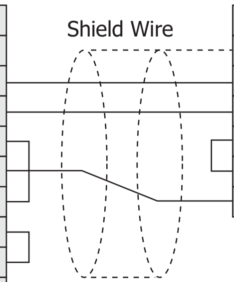
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● 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

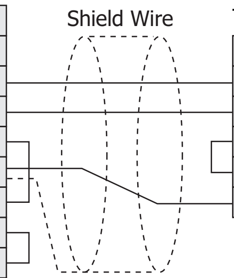


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	CS
5	SG

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



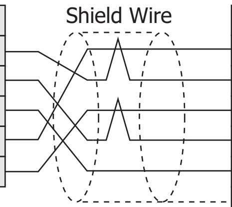
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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

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

Name	Pin No.
T-	2
R-	4
GND	8
T+	9
R+	11

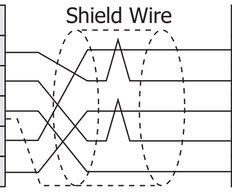


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
T-	2
R-	4
GND	8
T+	9
R+	11



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

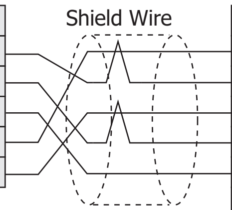
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
T-	2
R-	4
GND	8
T+	9
R+	11



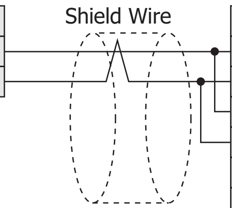
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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

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

Name	Pin No.
+SD/RD	3
-SD/RD	8

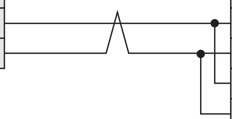


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
+SD/RD	3
-SD/RD	8



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

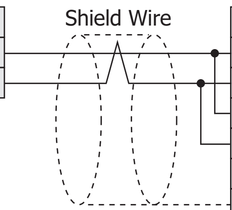
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
+SD/RD	3
-SD/RD	8



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

7.4 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	19200 or 9600 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		38400, 19200, 9600, 4800, 2400 or 1200 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		187500 or 19200 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.

To use the S7-1200 CPU's firmware version 4.0 or later, enable "Permit access with PUT/GET communication from remote partner." check box on Protection tab in the PLC properties of TIA Portal software.

7.5 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 $\underline{255}$ $\underline{510}$

510: 3 digits Address number 0 to 510

255: 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.
- To use the S7-1200 CPU's firmware version 4.0 or later, disable "Optimized block access" check box on Attributes tab in the DB properties of TIA Portal 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 first two digits indicate the Data Block number, and the last four digits indicate the address number.

■ Bit assignments of data block on PLC side

The data block has the following bit assignments on PLC side.

Bit assignments on MICRO/I	Bit assignments on PLC
DB 010000-00	DB1.DBX1.0
DB 010000-01	DB1.DBX1.1
DB 010000-02	DB1.DBX1.2
...	...
DB 010000-06	DB1.DBX1.6
DB 010000-07	DB1.DBX1.7
DB 010000-08	DB1.DBX0.0
DB 010000-09	DB1.DBX0.1
DB 010000-10	DB1.DBX0.2
...	...
DB 010000-14	DB1.DBX0.6
DB 010000-15	DB1.DBX0.7
DB 010002-00	DB1.DBX3.0
DB 010002-01	DB1.DBX3.1
DB 010002-02	DB1.DBX3.2
...	...
DB 010002-06	DB1.DBX3.6
DB 010002-07	DB1.DBX3.7
DB 010002-08	DB1.DBX2.0
DB 010002-09	DB1.DBX2.1
DB 010002-10	DB1.DBX2.2
...	...
DB 010002-14	DB1.DBX2.6
DB 010002-15	DB1.DBX2.7
...	...

8 KEYENCE

8.1 Connection Table

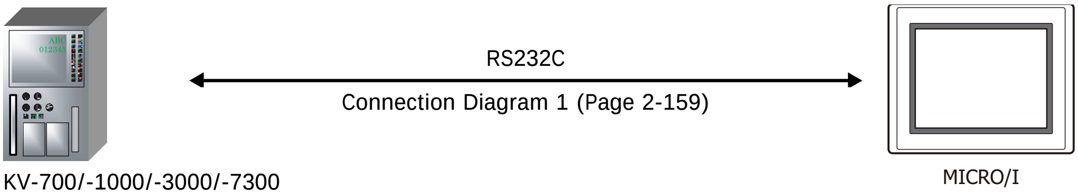
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
KV-700/-1000/-3000/-5000				
KV-700 KV-1000 KV-3000 KV-7300	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-159)	None	KV-3000/5000
KV-700 KV-1000 KV-3000 KV-5000 KV-5500	KV-L20R KV-L20V KV-L21V	RS232C(PORT1) Connection Diagram 2 (Page 2-160)		
		RS232C(PORT2) Connection Diagram 3 (Page 2-160)		
		RS422/485 4-wire Connection Diagram 4 (Page 2-161)		
		RS422/485 2-wire Connection Diagram 5 (Page 2-162)		
	KV-LE20A KV-LE20V KV-LE21V	Ethernet	-	KV (Ethernet)
KV-5000 KV-5500 KV-7500	Not required (Connects to Ethernet port)			
Conventional KV				
KV-10 KV-16 KV-20 KV-40 KV-80	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-159)	None	KV/KZ
Visual KV*1				
KV-10 KV-16 KV-24 KV-40	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-159)	None	KV/KZ
KV Nano				
KV-N14 KV-N24 KV-N40 KV-N60	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-159)	None	KV-3000/5000
	KV-N10L	RS232C Connection Diagram 2 (Page 2-160)		
	KV-N11L	RS422/485 4-wire Connection Diagram 6 (Page 2-163)		

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

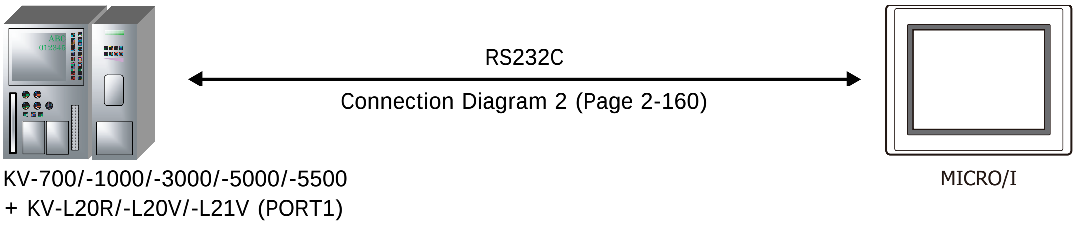
8.2 System Configuration

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

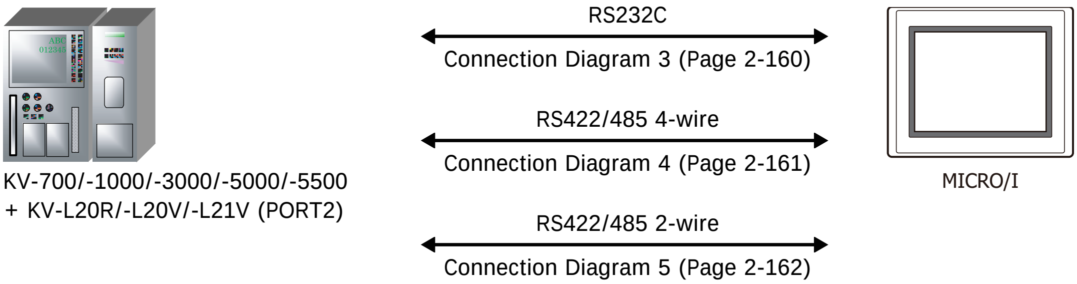
● Connects to the CPU unit modular connector for KV-700/-1000/-3000/-7300



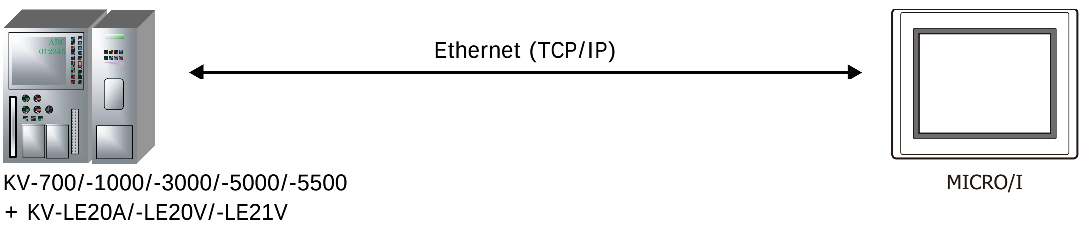
● Connects to the D-sub 9-pin Male Connector for KV-L20R/-L20V/-L21V



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

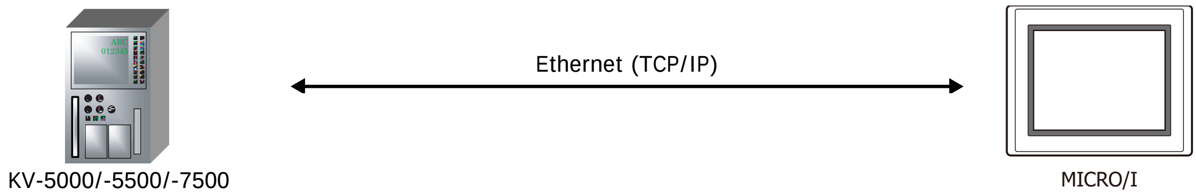


● Connects to the Ethernet port for KV-LE20A/-LE20V/-LE21V



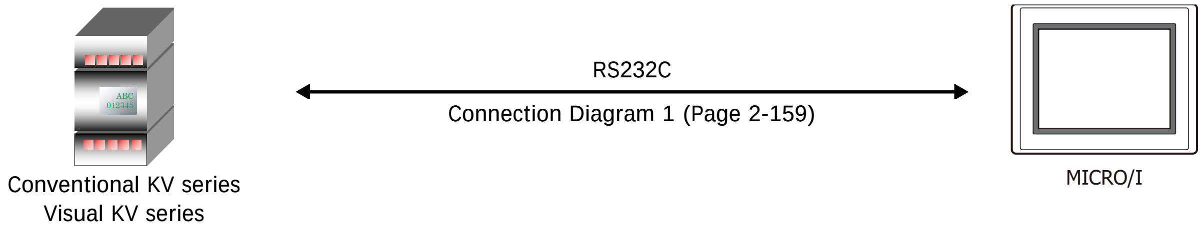
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

● Connects to the Ethernet port for KV-5000/-5500/-7500

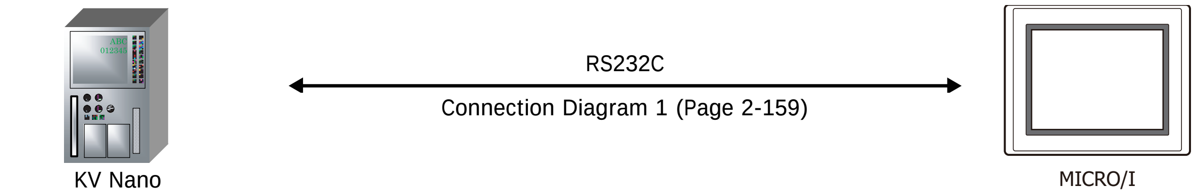


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

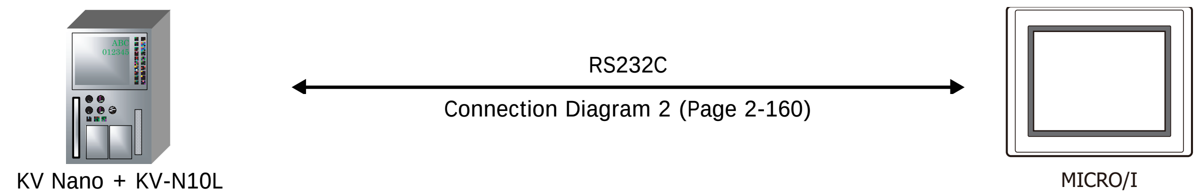
● Connects to the CPU unit modular connector for Conventional KV series and Visual KV series

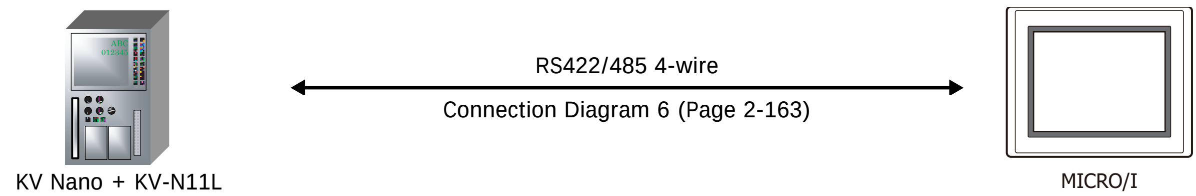


● Connects to the CPU unit modular connector for KV Nano



● Connects to KV Nano + KV-N10L/-N11L





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: KV-700/-1000/-3000/-7300 (RS232C), Conventional KV, Visual KV and KV Nano

PLC(RS232C):
Modular Connector

Name	Pin No.
RD	3
SG	4
SD	5

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
3	SD
5	SG
2	RD
7	RS
8	CS
Cover	FG

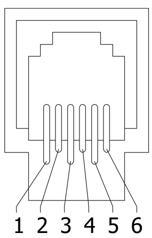
PLC(RS232C):
Modular Connector

Name	Pin No.
RD	3
SG	4
SD	5

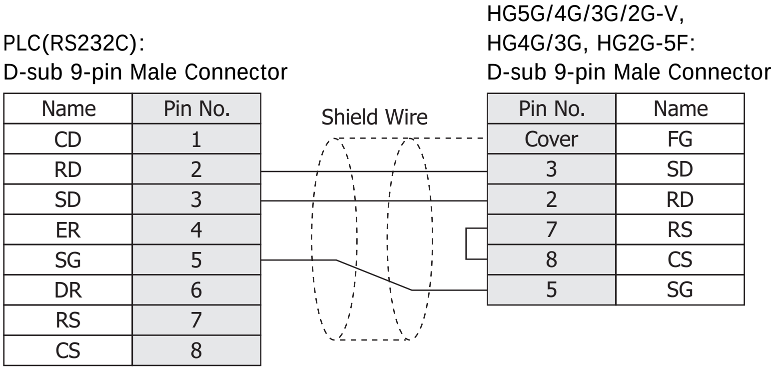
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

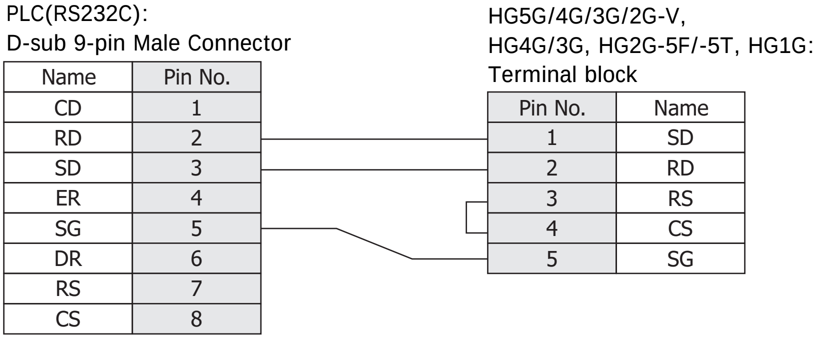
Pin No.	Name
1	SD
5	SG
2	RD
3	RS
4	CS

Connector Pin Layout for PLC side Modular jack

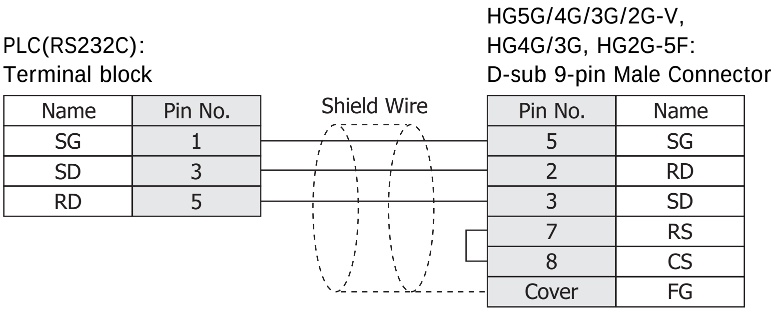


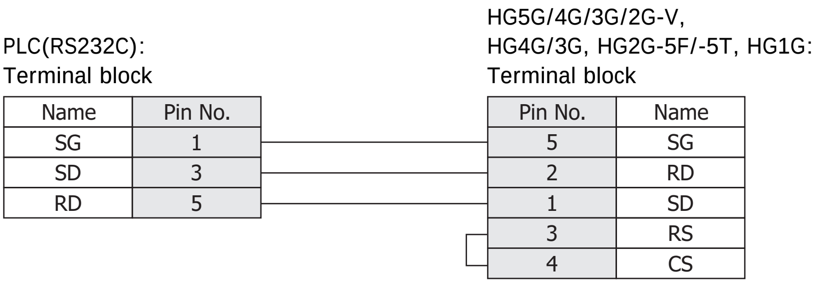
● Connection Diagram 2: KV-700/-1000/-3000/-5000/-5500 + KV-L20R/-L20V/-L21V (PORT1)
KV Nano + KV-N10L





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





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

PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

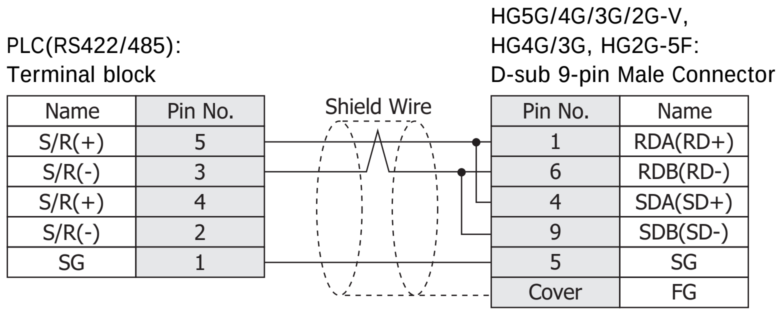
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

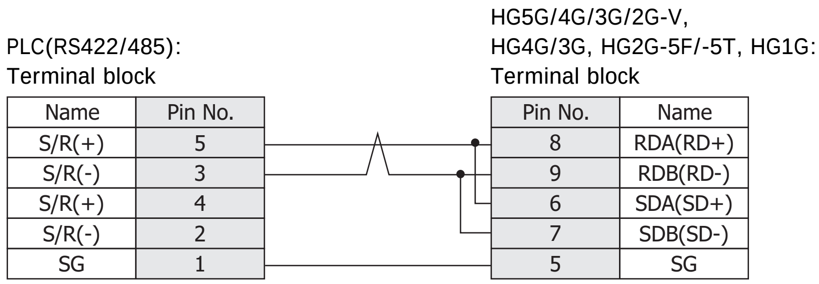
HG1P:
D-sub 25-pin Male Connector

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

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



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

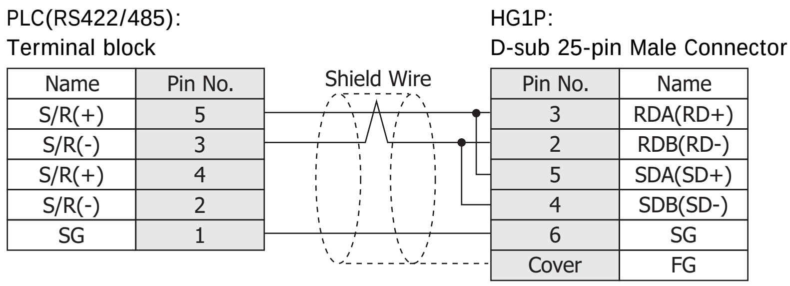


- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
Terminal block

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

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

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

8.4 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 KV-700/-1000/-3000 on CPU unit** on the **Communication Driver** tab in the Project Settings dialog box in WindO/I-NV4.

● KV-1000/-3000

Item	Setting
Interface	RS232C
Baud Rate	115200, 57600, 38400, 19200 or 9600 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, check **the connect KV-700/-1000/-3000 on CPU unit** on the **Communication Driver** tab in the **Project Settings** dialog box in WindO/I-NV4.

● KV-7300, KV-L20R/-L20V/-L21V, KV Nano, KV-N10L/-N11L

Item	Setting
Interface	RS232C, RS422/485 2-wire or RS422/485 4-wire
Baud Rate	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 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 KV-7300, KV Nano or Serial Communication Unit, clear **the Connect KV-700/-1000/-3000 on CPU unit** on the **Communication Driver** tab in the **Project Settings** dialog box in WindO/I-NV4.
- When communicating with the KV-7300 or KV Nano, set the PLC setting port operation mode to KV mode (PLC link).

● KV-5000/-5500/-7500, KV-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 Number	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.
- To communicate with the CPU module of KV-7500, set [Transmission Wait] to 10 ms or more on the [Communication Driver] tab of the [Project Settings] dialog box of WindO/I-NV4.

8.5 Usable Device Addresses

● KV-700/-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	

Writing to the High-speed counter comparator (Relay) supports only for a reset.

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 Value)	TC	TC	0 to 39991	R/W	*1
Timer (Preset Value)	TS	TS	0 to 39991	R/W	*1
Counter (Current Value)	CC	CC	0 to 39991	R/W	*1
Counter (Preset Value)	CS	CS	0 to 39991	R/W	*1
High-speed counter (Current Value)	CTH	CTH	0 to 11	R/W	*1
High-speed counter comparator (Preset Value)	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.

● KV-3000/-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	

Writing to the High-speed counter comparator (Relay) supports only for a reset.

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 Value)	TC	TC	0 to 39991	R/W	*1
Timer (Preset Value)	TS	TS	0 to 39991	R/W	*1
Counter (Current Value)	CC	CC	0 to 39991	R/W	*1
Counte (Preset Value)	CS	CS	0 to 39991	R/W	*1
High-speed counter (Current Value)	CTH	CTH	0 to 11	R/W	*1
High-speed counter comparator (Preset Value)	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.

● 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 Value)	TC	T	0 to 249	R/W	Decimal
Counter (Current Value)	CC	C	0 to 249	R/W	Decimal
Timer (Preset Value)	TS	T	0 to 249	R/W	Decimal
Counter (Preset Value)	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.

9 Hitachi

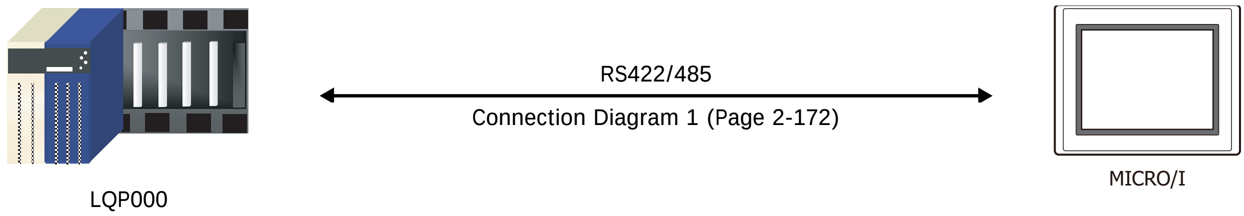
9.1 Connection Table

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 2-172)	None	S10mini
	LQE160	RS232C Connection Diagram 2 (Page 2-173)		
	LQE165	RS422/485 4-wire Connection Diagram 3 (Page 2-174)		
	LQE560	RS232C Connection Diagram 2 (Page 2-173)		
	LQE565	RS422/485 4-wire Connection Diagram 3 (Page 2-174)		
S10V				
LQP510	Not required (built into the CPU unit)	RS232C Connection Diagram 2 (Page 2-173)	None	S10mini
		RS422/485 4-wire Connection Diagram 3 (Page 2-174)		
	LQE560	RS232C Connection Diagram 2 (Page 2-173)		
	LQE565	RS422/485 4-wire Connection Diagram 3 (Page 2-174)		

9.2 System Configuration

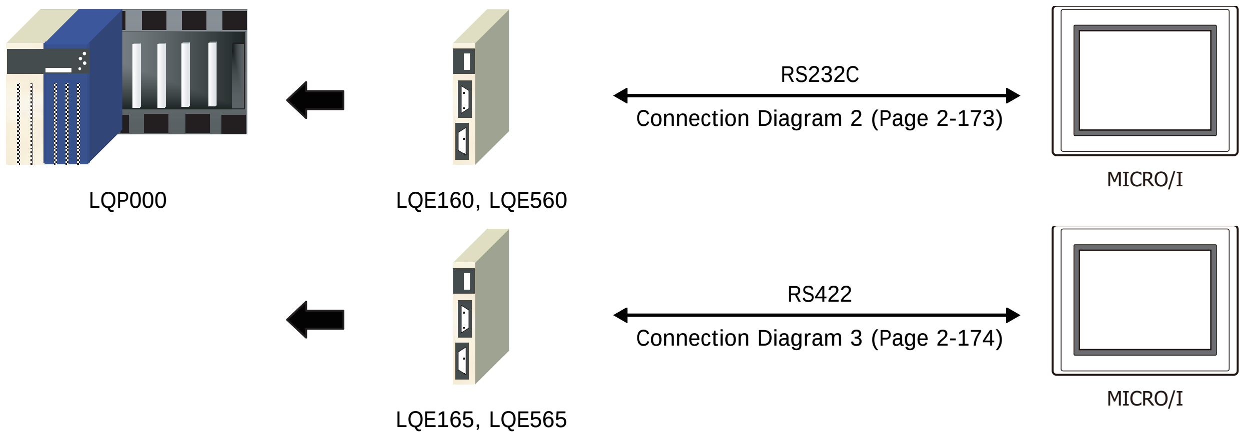
This is the system configuration for the connection of Hitachi PLC to the MICRO/I.

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

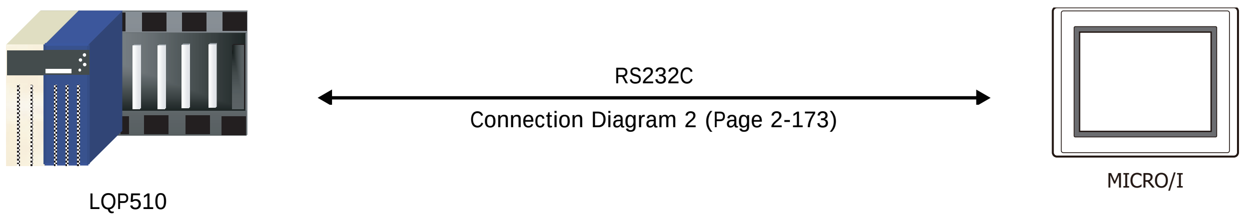


It connects with RS232C port of a CPU unit.

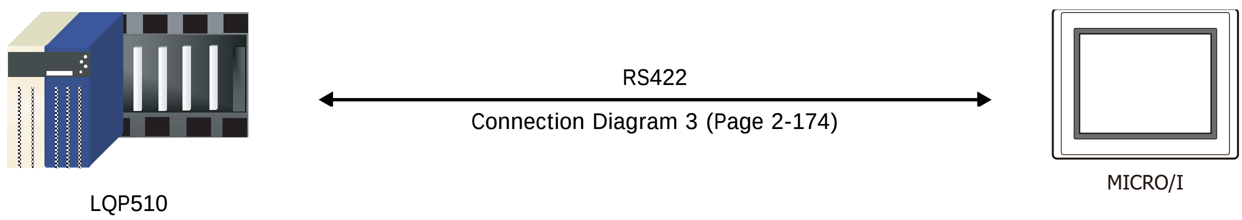
● S10mini Communication module



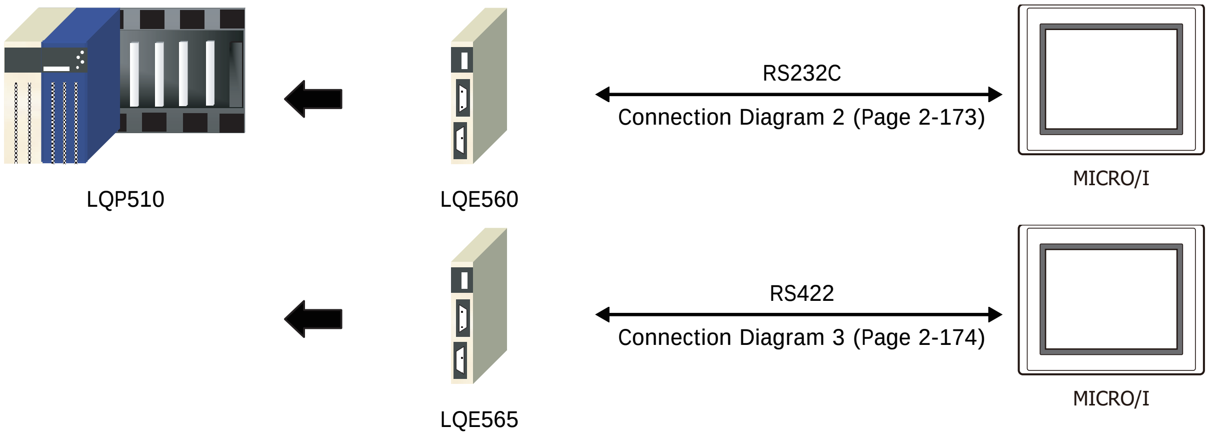
● S10V RS232C port on CPU unit



● S10V RS422 port on CPU unit



● S10V Communication Module



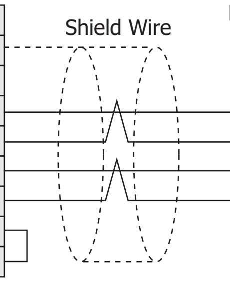
9.3 Connection Diagram

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: S10mini (RS422/485)

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

Name	Pin No.
FG	
NC	1, 2, 3
UTX L	7
UTX H	4
URX L	6
URX H	8
	5
	9

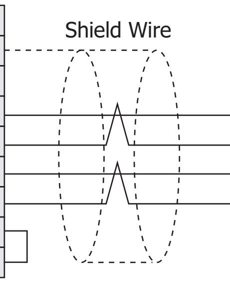


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
FG	
NC	1, 2, 3
UTX L	7
UTX H	4
URX L	6
URX H	8
	5
	9



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

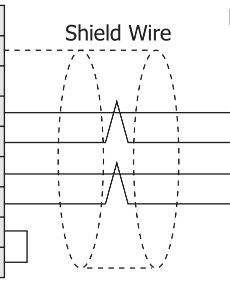
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

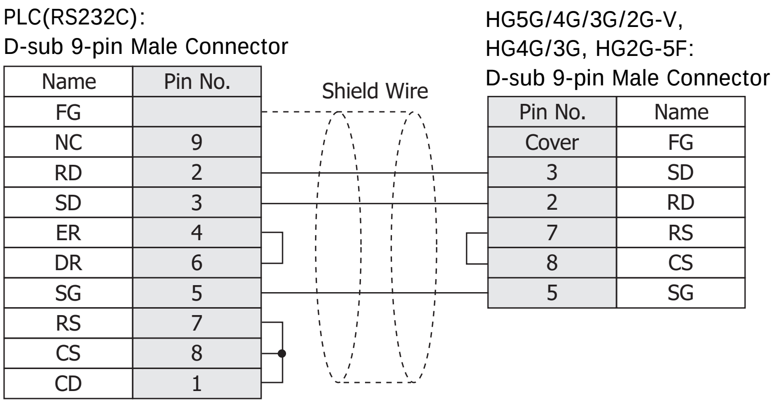
Name	Pin No.
FG	
NC	1, 2, 3
UTX L	7
UTX H	4
URX L	6
URX H	8
	5
	9

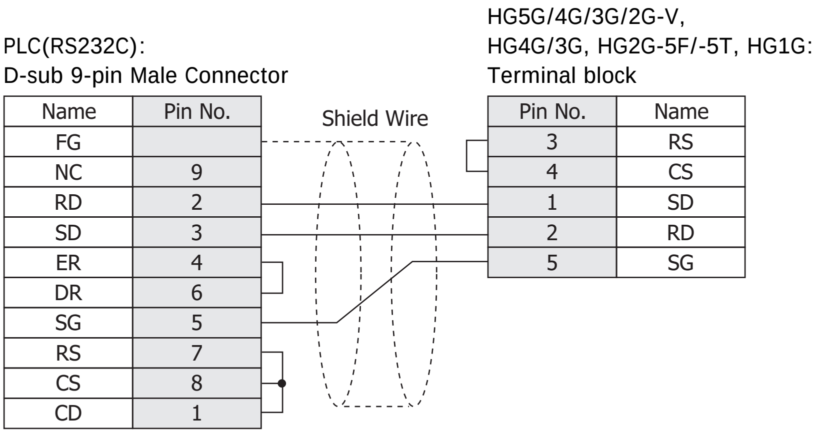


HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
2	RDB(RD-)
3	RDA(RD+)
4	SDB(SD-)
5	SDA(SD+)
6	SG

● Connection Diagram 2: S10mini, S10V (RS232C)





● Connection Diagram 3: S10V (RS422/485)

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.		Pin No.	Name
RD-L	1		9	SDB(SD-)
RD-H	2		4	SDA(SD+)
SD-H	3		1	RDA(RD+)
SD-L	4		6	RDB(RD-)
SG	5		5	SG
			Cover	FG

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

HG1P:
D-sub 25-pin Male Connector

Shield Wire

Name	Pin No.		Pin No.	Name
RD-L	1		4	SDB(SD-)
RD-H	2		5	SDA(SD+)
SD-H	3		3	RDA(RD+)
SD-L	4		2	RDB(RD-)
SG	5		6	SG
			Cover	FG

9.4 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.

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 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

10 GE Fanuc Automation

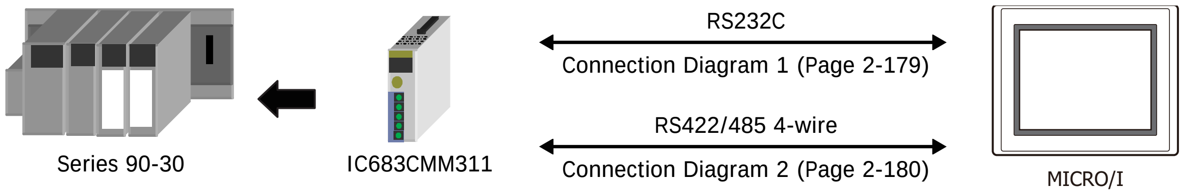
10.1 Connection Table

CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
Series90-30				
IC693CPU331 IC693CPU341 IC693CPU350 IC693CPU351 IC693CPU352 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPU374	IC693CMM311	RS232C Connection Diagram 1 (Page 2-179)	None	Series 90(SNP-X)
		RS422/485 4-wire Connection Diagram 2 (Page 2-180)		
IC693CPU311 IC693CPU313 IC693CPU323 IC693CPU331 IC693CPU341 IC693CPU350 IC693CPU351 IC693CPU352 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPE374	Not required (Connects to CPU (Power Supply) unit)	RS422/485 4-wire Connection Diagram 3 (Page 2-181)		
VersaMax				
Nano	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-182)	None	Series 90(SNP-X)
Micro (14point)				
Micro (23, 28point)		RS422/485 4-wire Connection Diagram 3 (Page 2-181)		
Rx3i Series				
IC695CPE305	Not required (Connects to CPU unit)	RS232C Connection Diagram 5 (Page 2-182)	None	SNP
IC695CPE310 IC695CPU310 IC695CMU310 IC695CPU315 IC695CPU320 IC695CRU320 IC695CRU320QP	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-183)		
IC695CPE305 IC695CPE310 IC695CPU310 IC695CMU310 IC695CPU315 IC695CPU320 IC695CRU320 IC695CRU320QP IC695CPE330 IC695CPK330	IC695NIU001			

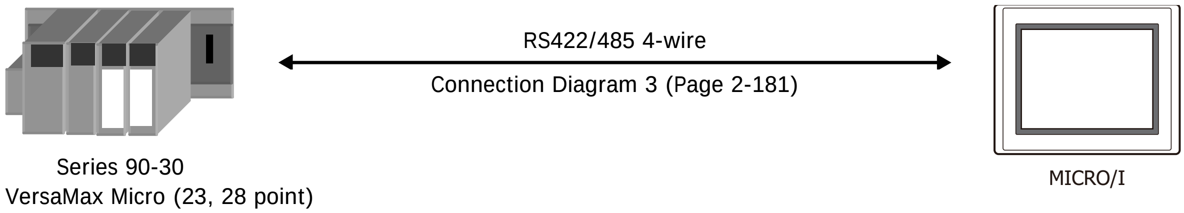
10.2 System Configuration

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

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

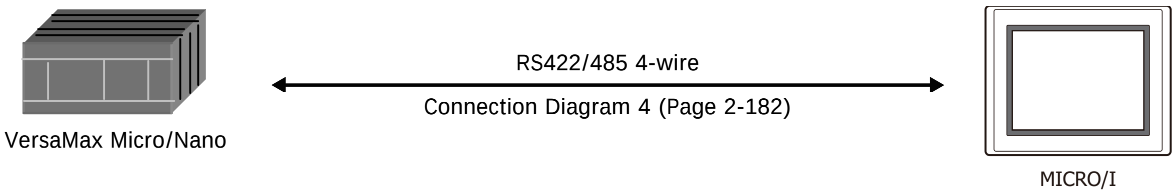


● Series 90-30, VersaMax Micro (Connects to the Serial port on the CPU unit)



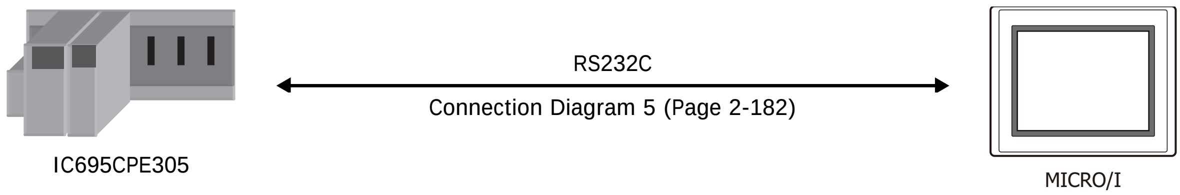
Connects to Serial port on Series 90-30 PLC Power Supply.
Connects to Serial port 2 on VersaMax Micro PLC.

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

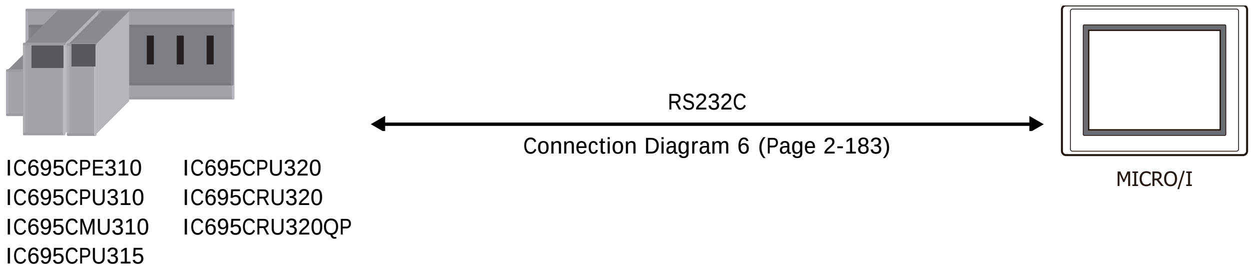


Connects to Serial port 1(RS232C) on VersaMax Micro/Nano PLC.

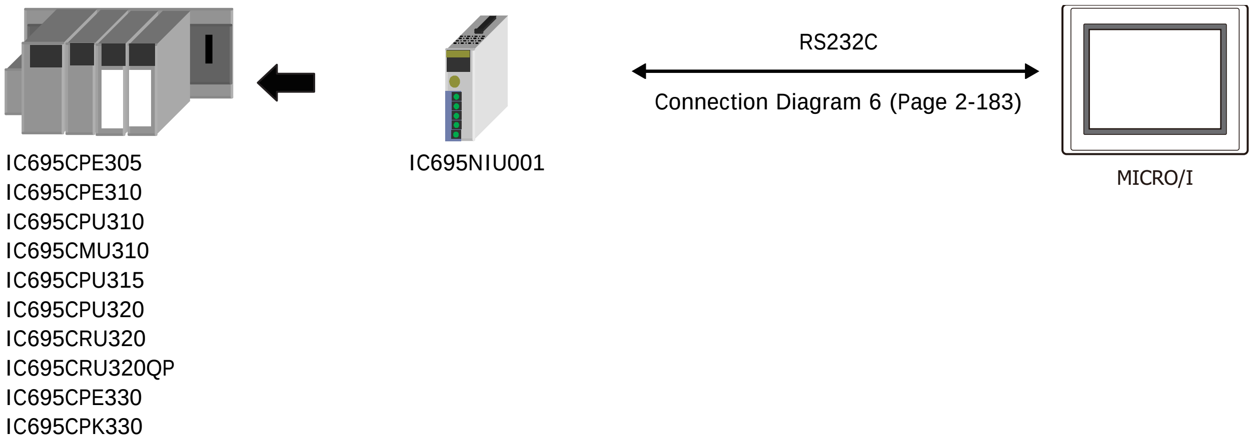
● IC695CPE305 (Connects to Serial port)



● Rx3i Series (Connects to Serial Port 1)



● Rx3i Series (Connects to Communication Coprocessor Module (IC695NIU001))



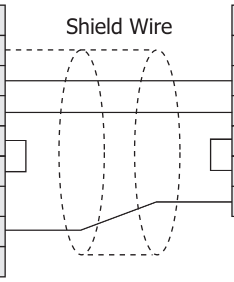
10.3 Connection Diagram

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)

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

Name	Pin No.
Shield	1
TD	2
RD	3
RTS	4
CTS	5
DCD	8
SG	7
DTR	20

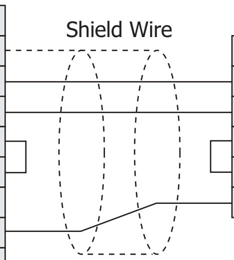


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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

Name	Pin No.
Shield	1
TD	2
RD	3
RTS	4
CTS	5
DCD	8
SG	7
DTR	20



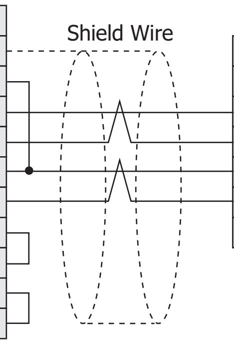
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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

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

Name	Pin No.
Shield	1
RD(TRM)	24
SD(B)	21
SD(A)	9
RD(B)	25
RD(A)	13
RTS(A)	10
CTS(A)	11
RTS(B)	22
CTS(B)	23

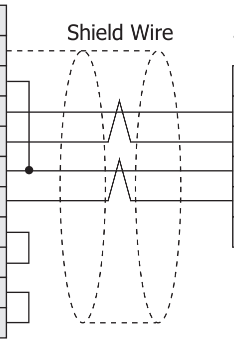


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
Shield	1
RD(TRM)	24
SD(B)	21
SD(A)	9
RD(B)	25
RD(A)	13
RTS(A)	10
CTS(A)	11
RTS(B)	22
CTS(B)	23



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

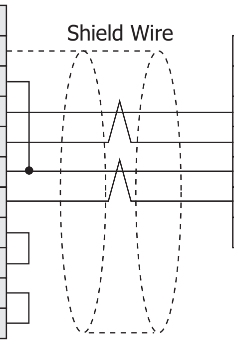
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
Shield	1
RD(TRM)	24
SD(B)	21
SD(A)	9
RD(B)	25
RD(A)	13
RTS(A)	10
CTS(A)	11
RTS(B)	22
CTS(B)	23



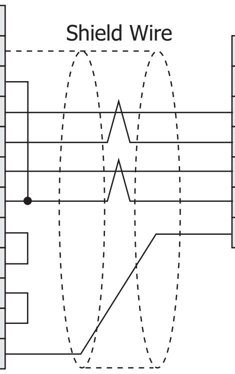
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● 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

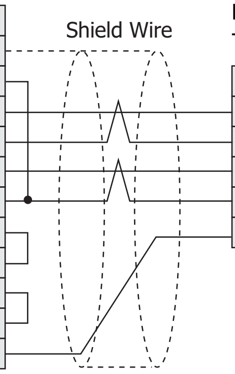


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

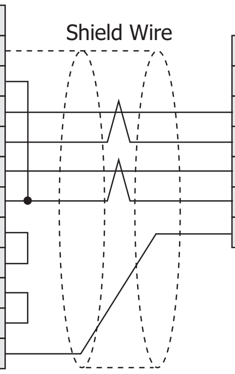
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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



HG1P:
D-sub 25-pin Male Connector

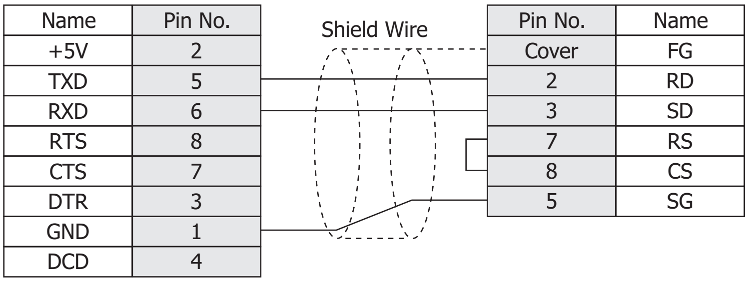
Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

2 Connection to External Devices

● Connection Diagram 4:　PLC (RS232C)

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

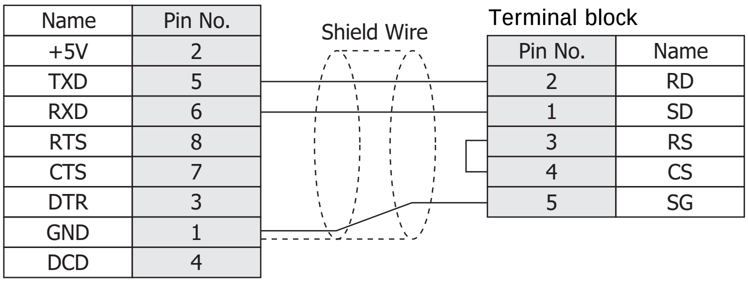


Name	Pin No.
+5V	2
TXD	5
RXD	6
RTS	8
CTS	7
DTR	3
GND	1
DCD	4

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



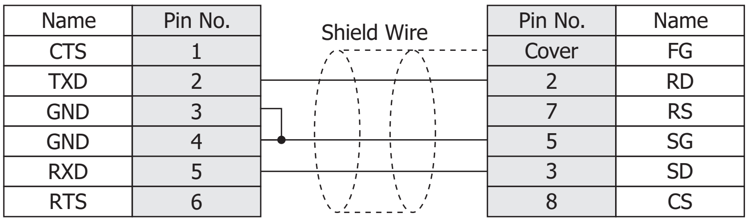
Name	Pin No.
+5V	2
TXD	5
RXD	6
RTS	8
CTS	7
DTR	3
GND	1
DCD	4

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

● Connection Diagram 5:　PLC (RS232C)

PLC(RS232C):
RJ-25 6-pin modular connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

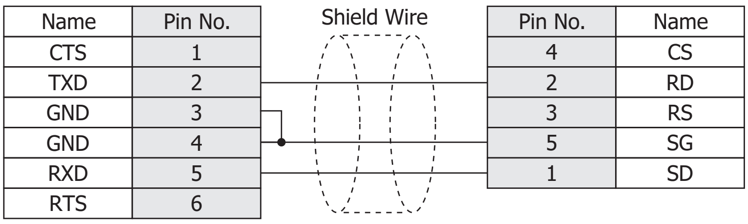


Name	Pin No.
CTS	1
TXD	2
GND	3
GND	4
RXD	5
RTS	6

Pin No.	Name
Cover	FG
2	RD
7	RS
5	SG
3	SD
8	CS

PLC(RS232C):
RJ-25 6-pin modular connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



Name	Pin No.
CTS	1
TXD	2
GND	3
GND	4
RXD	5
RTS	6

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

● Connection Diagram 6: PLC (RS232C)

PLC(RS2232C): D-sub 9-pin Male Connector — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Name	Pin No.		Pin No.	Name
TD	2	Shield Wire	2	RD
RD	3		3	SD
SG	5		5	SG
			Cover	FG

PLC(RS2232C): D-sub 9-pin Male Connector — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

Name	Pin No.		Pin No.	Name
TD	2	Shield Wire	2	RD
RD	3		1	SD
SG	5		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		19200, 9600, 4800, 2400 or 1200 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		19200, 9600, 4800, 2400 or 1200 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		19200, 9600, 4800, 2400 or 1200 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.

● Rx3i Series: Connects to Serial port

MICRO/I settings

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

Tab Name	Item	Setting
Communication Interface	Baud Rate*1	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 bps
	Data Bits	8 bits (Fixed)
	Stop Bits	1 or 2 stop bits
	Parity	None, Odd or Even
	Flow Control	None
	Serial Interface	RS232C
Communication Driver	None	None
Communication Driver Network	None	None

PLC Settings

Item	Setting
Port Mode	SNP Slave
Baud Rate*1	Set to the same setting as the MICRO/I
Parity	
Stop Bits	
Time Out	

- 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 Rx3i Series PLC.

*1 The communication speed settings varies based on the PLC model. For details, refer to the PLC manual.

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 32768	R	Decimal
Discrete Outputs	Q	%Q	1 to 32768	R/W	Decimal
Internal Coils	M	%M	1 to 32768	R/W	Decimal
Temporary Coils	T	%T	1 to 1024	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 32753	R	Decimal[*1]
Discrete Outputs	WQ	%Q	1 to 32753	R/W	Decimal[*1]
Internal Coils	WM	%M	1 to 32753	R/W	Decimal[*1]
Temporary Coils	WT	%T	1 to 1009	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 32640	R/W	Decimal
Analog Inputs	AI	%AI	1 to 32640	R/W	Decimal
Analog Outputs	AQ	%AQ	1 to 32640	R/W	Decimal

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

*1 Set this address number in multiples of 16.

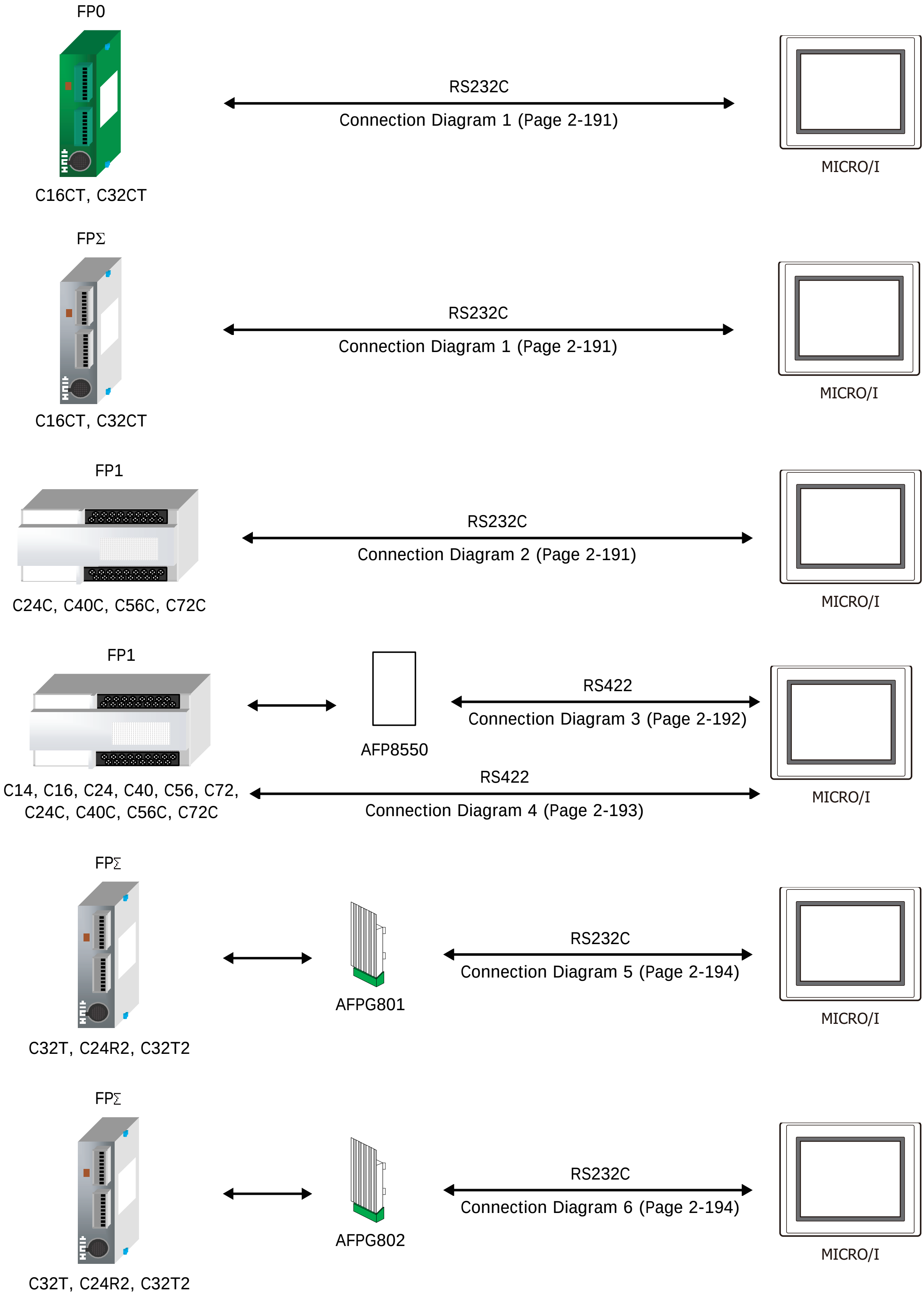
11 Panasonic

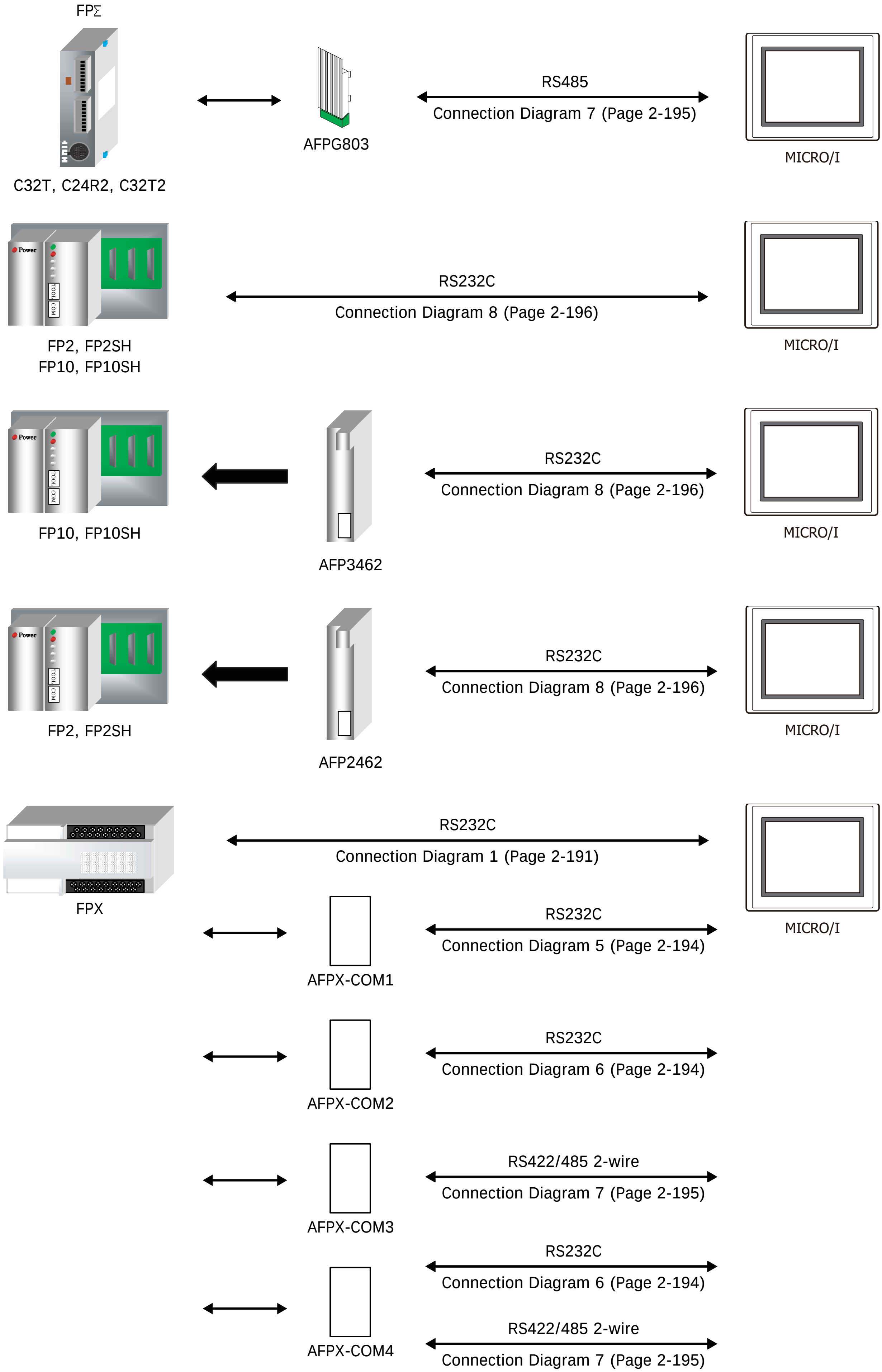
11.1 Connection Table

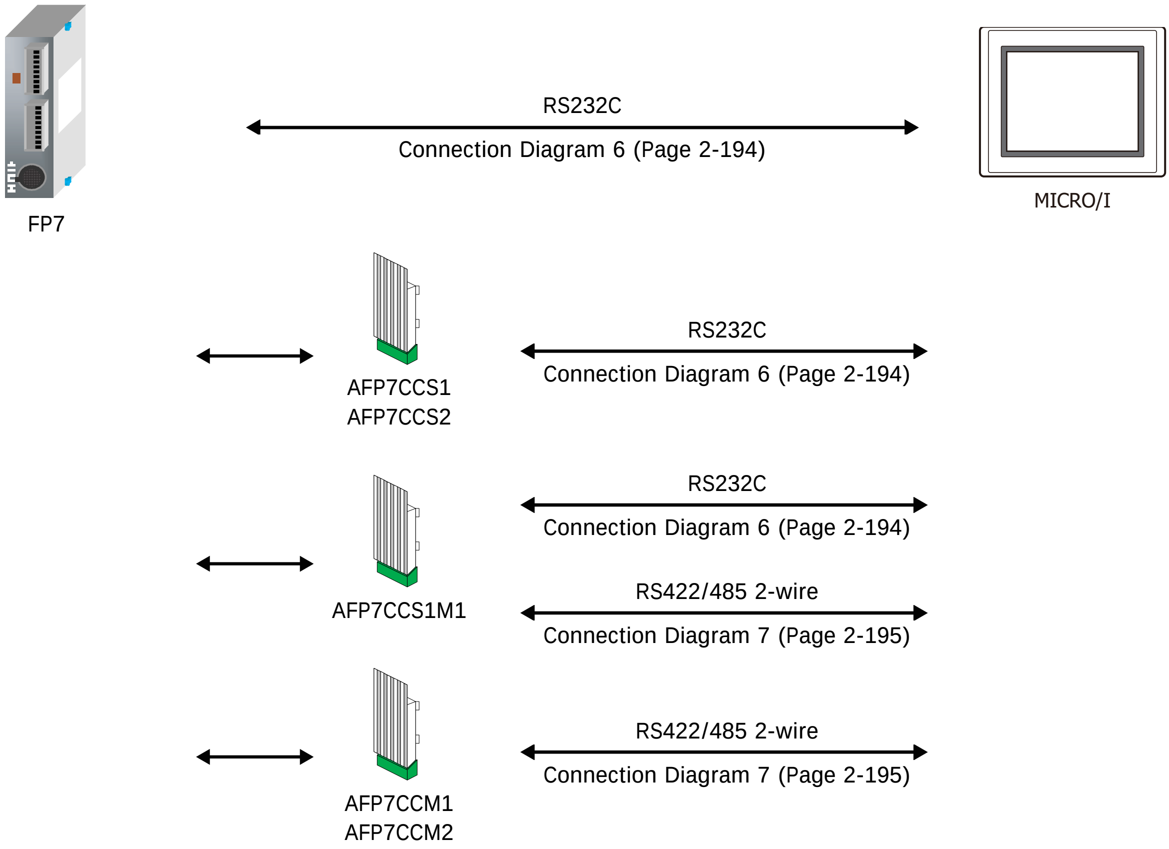
CPU unit	Link unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FP Series				
FP0 FP0R	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-191)	None	MEWNET
FP1	Not required (Connects to RS232C port)	RS232C Connection Diagram 2 (Page 2-191)	ER	
	Not required (Connects to CPU unit)	RS232C (AFP8550) Connection Diagram 3 (Page 2-192)		
	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 4 (Page 2-193)	None	
FPΣ	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-191)		
	Used Communication cassette AFPG801	RS232C Connection Diagram 5 (Page 2-194)	ER	
	Used Communication cassette AFPG802	RS232C Connection Diagram 6 (Page 2-194)	None	
	Used Communication cassette AFPG803	RS422/485 2-wire Connection Diagram 7 (Page 2-195)		
FP10 FP10SH	Not required (Connects to Tool port or Com port)	RS232C Connection Diagram 8 (Page 2-196)		
	AFP3462			
FP2 FP2SH	Not required (Connects to Com port)			
	AFP2462			
FPX	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-191)	None	
	AFPX-COM1	RS232C Connection Diagram 5 (Page 2-194)	ER	
	AFPX-COM2	RS232C Connection Diagram 6 (Page 2-194)	None	
	AFPX-COM3	RS422/485 2-wire Connection Diagram 7 (Page 2-195)		
	AFPX-COM4	RS232C Connection Diagram 6 (Page 2-194)		
		RS422/485 2-wire Connection Diagram 7 (Page 2-195)		
FP7	Not required (Connects to CPU unit)	RS232C Connection Diagram 6 (Page 2-194)		
	AFP7CCS1			
	AFP7CCS2			
	AFP7CCS1M1			
		RS422/485 2-wire Connection Diagram 7 (Page 2-195)		
	AFP7CCM1			
	AFP7CCM2			

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 2-195)
MICRO/I
FP2, FP2SH
FP10, FP10SH
RS232C
Connection Diagram 8 (Page 2-196)
MICRO/I
FP10, FP10SH
AFP3462
RS232C
Connection Diagram 8 (Page 2-196)
MICRO/I
FP2, FP2SH
AFP2462
RS232C
Connection Diagram 8 (Page 2-196)
MICRO/I
FPX
RS232C
Connection Diagram 1 (Page 2-191)
MICRO/I
AFPX-COM1
RS232C
Connection Diagram 5 (Page 2-194)
AFPX-COM2
RS232C
Connection Diagram 6 (Page 2-194)
AFPX-COM3
RS422/485 2-wire
Connection Diagram 7 (Page 2-195)
AFPX-COM4
RS232C
Connection Diagram 6 (Page 2-194)
RS422/485 2-wire
Connection Diagram 7 (Page 2-195)


FP7
RS232C
Connection Diagram 6 (Page 2-194)
MICRO/I
AFP7CCS1
AFP7CCS2
RS232C
Connection Diagram 6 (Page 2-194)
AFP7CCS1M1
RS232C
Connection Diagram 6 (Page 2-194)
RS422/485 2-wire
Connection Diagram 7 (Page 2-195)
AFP7CCM1
AFP7CCM2
RS422/485 2-wire
Connection Diagram 7 (Page 2-195)

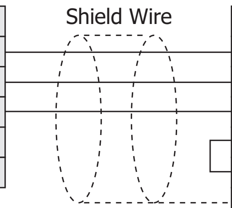
11.3 Connection Diagram

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, FP0R, FPΣ, FPX Tool port

PLC(RS232C):
Mini DIN 5-pin Connector

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

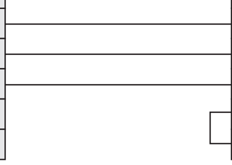


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
5	SG
2	RD
3	SD
7	RS
8	CS
Cover	FG

PLC(RS232C):
Mini DIN 5-pin Connector

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



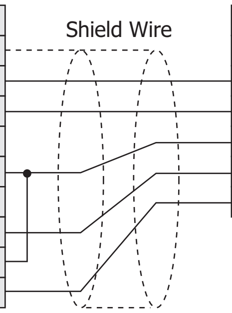
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● 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

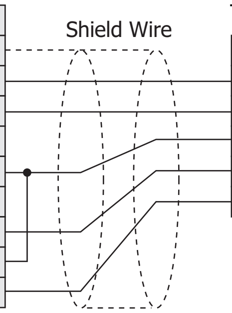


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
5	SG
8	CS

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



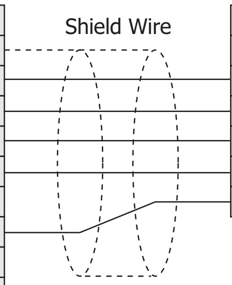
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● 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



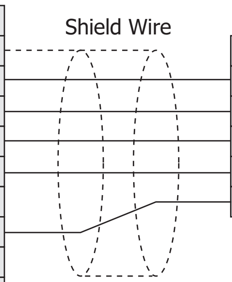
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
8	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.

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

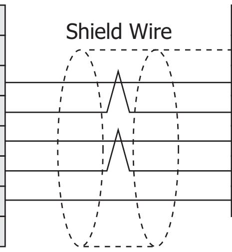
Pin No.	Name
1	SD
2	RD
3	RS
4	CS
5	SG

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

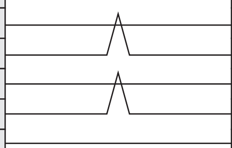


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

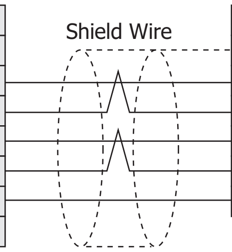
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
2	RDB(RD-)
3	RDA(RD+)
4	SDB(SD-)
5	SDA(SD+)
6	SG

● Connection Diagram 5: FPΣ Communication cassette (AFPG801)
FPX Communication cassette (AFPX-COM1)

PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.	Name
SD	2	RD
RD	3	SD
RS	8	CS
CS	7	RS
SG	5	SG
	Cover	FG

PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 6: FPΣ Communication cassette (AFPG802)
FPX Communication cassette (AFPX-COM2/-COM4)
FP7 COM.0 port, Communication cassette (AFP7CCS1/CCS2/CCS1M1)

PLC(RS232C):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.	Name
SD	2	RD
RD	3	SD
SG	5	SG
	7	RS
	8	CS
	Cover	FG

PLC(RS232C):
Terminal block

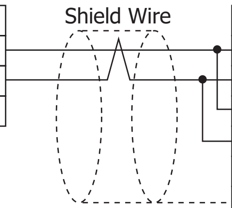
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 7: FPΣ Communication cassette (AFPG803)
FPX Communication cassette (AFPX-COM3/-COM4)
FP7 Communication cassette (AFP7CCM1/CCM2)

PLC(RS422/485):
Terminal block

Name
+
-
E



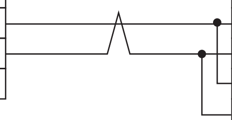
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

Name
+
-
E



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

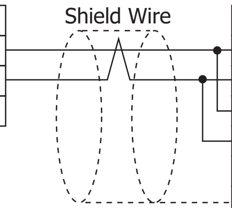
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

Name
+
-
E



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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

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

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

Pin No.	Name
2	RD
1	SD
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	19200 or 9600 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	19200, 9600, 4800, 2400 or 1200 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	115200, 57600, 38400, 19200, 9600, 4800 or 2400 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	19200 or 9600 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	115200, 57600, 38400, 19200, 9600, 4800 or 2400 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	115200, 57600, 38400, 19200, 9600, 4800 or 2400 bps
Data Bits	7 or 8 bits
Stop Bits	1 or 2 stop bits
Parity	None, Odd or Even
Flow Control	None or ER

● FP2 and FP2SH (Computer Communication Unit)

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

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

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

● FP7 (COM.0 port on CPU unit or communication cassette)

Items	Details
Interface	RS232C or RS485 2-wire
Slave Address	01 to 99 (Decimal)
Baud Rate	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 bps
Data Bits	8 bits
Stop Bits	1 stop bits
Parity	Odd
Flow Control	None

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

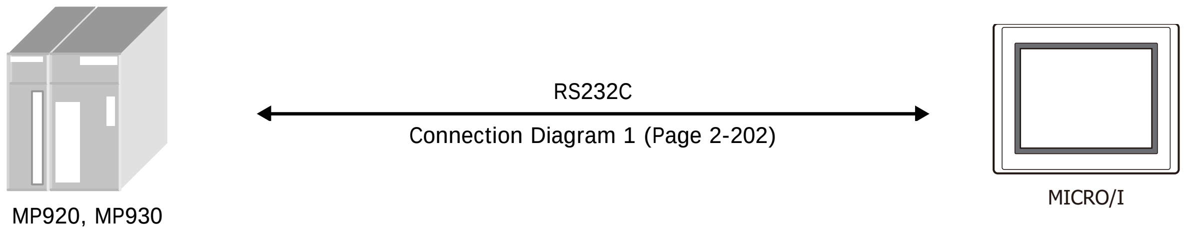
12.1 Connection Table

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 2-202)	ER	MP920-RTU
	217IF	RS422/485 4-wire Connection Diagram 2 (Page 2-203)	None	
		RS422/485 2-wire Connection Diagram 3 (Page 2-204)		
MP2300	217IF-01	RS232C Connection Diagram 1 (Page 2-202)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-205)	None	
		RS422/485 2-wire Connection Diagram 5 (Page 2-206)		
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)			

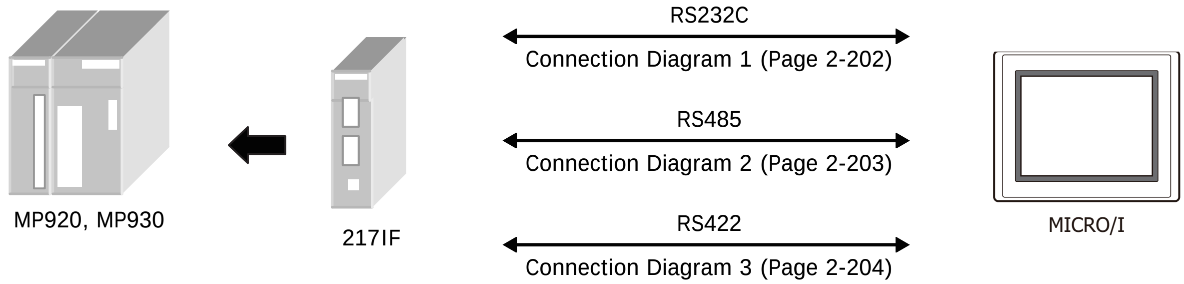
12.2 System Configuration

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

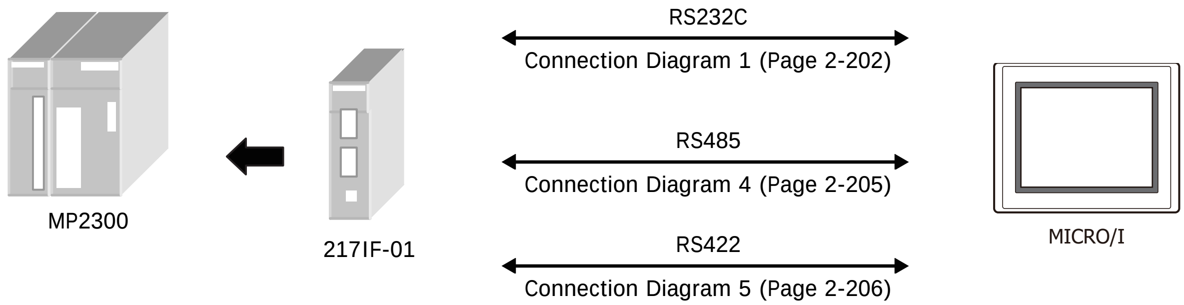
● MP920/930 (Connects to RS232C port on the CPU unit)



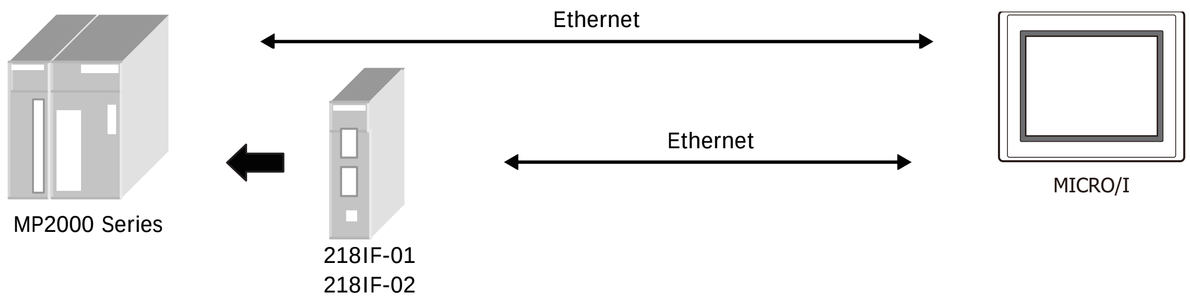
● MP920/930 (217IF)



● MP2300 (217IF-01)



● MP2000 Series (Ethernet)



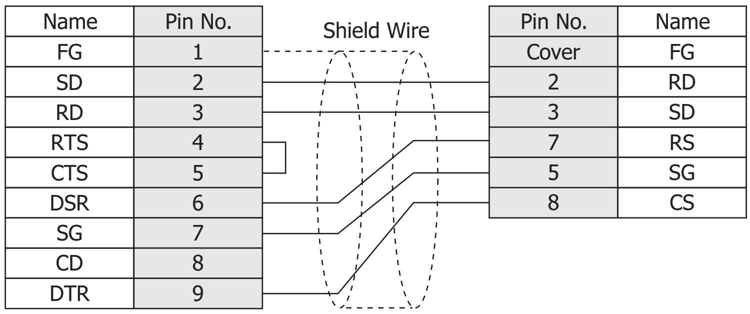
12.3 Connection Diagram

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 (217IF), MP2300 (217IF-01)

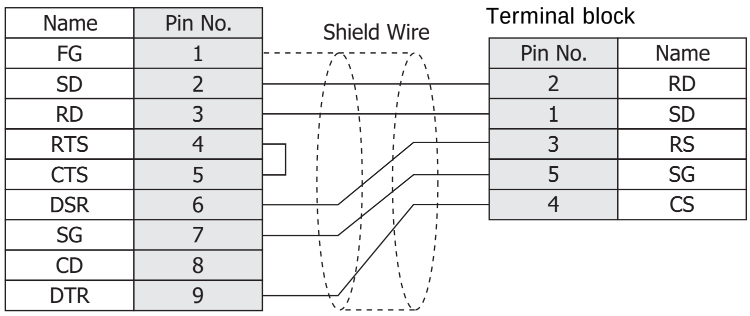
PLC(RS232C):
D-sub 9-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

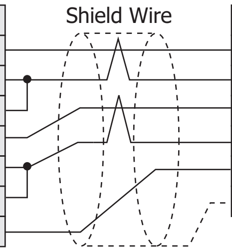
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 2: 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

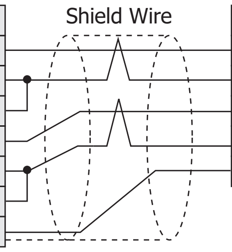


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

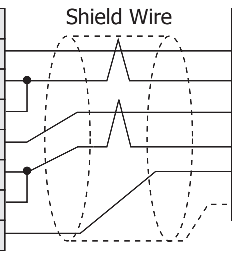
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

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



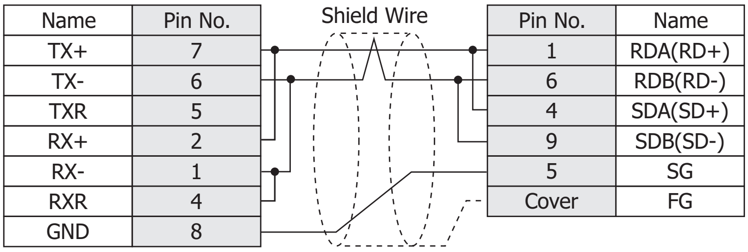
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



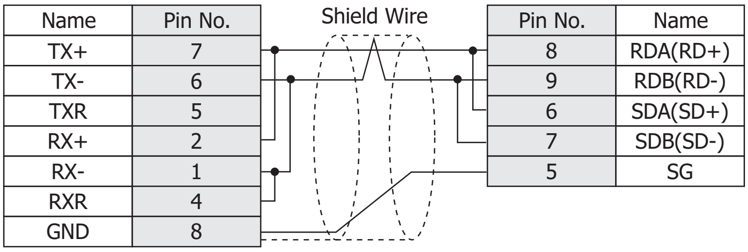
Name	Pin No.
TX+	7
TX-	6
TXR	5
RX+	2
RX-	1
RXR	4
GND	8

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



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

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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

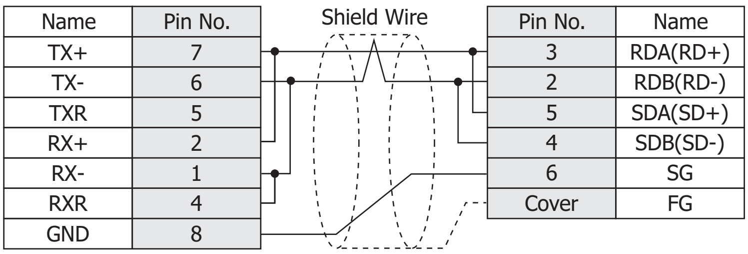
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

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

HG1P:
D-sub 25-pin Male Connector



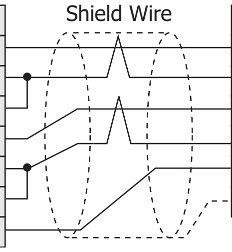
Name	Pin No.
TX+	7
TX-	6
TXR	5
RX+	2
RX-	1
RXR	4
GND	8

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

● 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

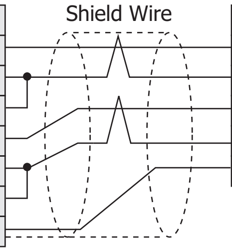


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
MDR14-pin Connector

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

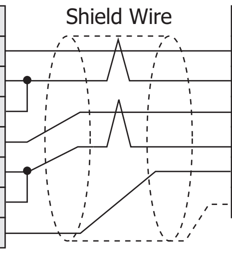
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
MDR14-pin Connector

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



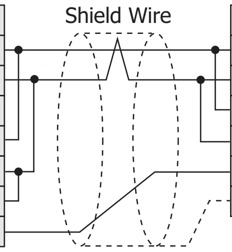
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

● 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



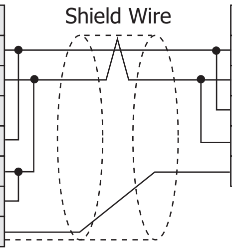
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
MDR14-pin Connector

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

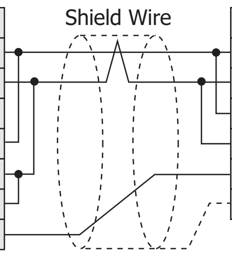
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485):
MDR14-pin Connector

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



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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	19200 or 9600 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 TCP port number of MICRO/I. If you set "0", the port number of MICRO/I is set automatically.

Regarding TCP port number of MICRO/I, note the following points.

The numbers that cannot be used:
- 2538 (for pass-through)
- 2101 (for FC4A Series MicroSmart direct connection pass-through)

Duplicate numbers cannot be configured in the following functions:

- Maintenance communication (☞ refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- Web server function (☞ refer to Chapter 4 “Web Server Tab” in the WindO/I-NV4 User's Manual)
- FTP server function (☞ refer to Chapter 4 “FTP Server Tab” in the WindO/I-NV4 User's Manual)
- **TCP Server** is selected for the User Communication (☞ refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- **Modbus** as **Manufacture** and **Modbus TCP Server** as **Communication Driver** are selected on the Communication Driver tab (☞ refer to Chapter 5 “Project Settings Dialog Box” on page 5-17)
- **YASKAWA Electric** as **Manufacture** and **MP2000(Ethernet)** as **Communication Driver** are selected on the Communication Driver tab

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

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 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**.

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

4095 F
Bit Number
Register Number

13 KOYO ELECTRONICS INDUSTRIES

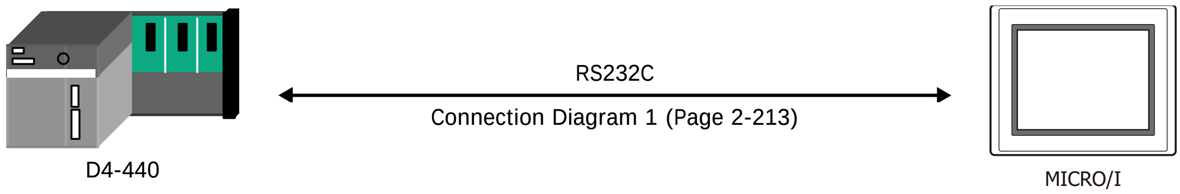
13.1 Connection Table

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 2-215)	None	DirectLogic 205/405
DirectLogic 405				
D4-430 D4-440	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-213)	None	DirectLogic 205/405
		RS422/485 4-wire Connection Diagram 2 (Page 2-214)		
D4-440	D4-DCM	RS232C Connection Diagram 1 (Page 2-213)		
D4-430 D4-440 D4-450	D4-DCM	RS232C Connection Diagram 1 (Page 2-213)		
	D4-ECOM D4-ECOM-F D4-ECOM100	Ethernet	-	DirectLogic (Ethernet)

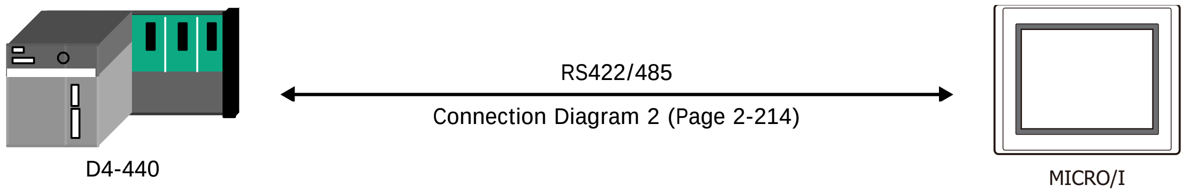
13.2 System Configuration

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

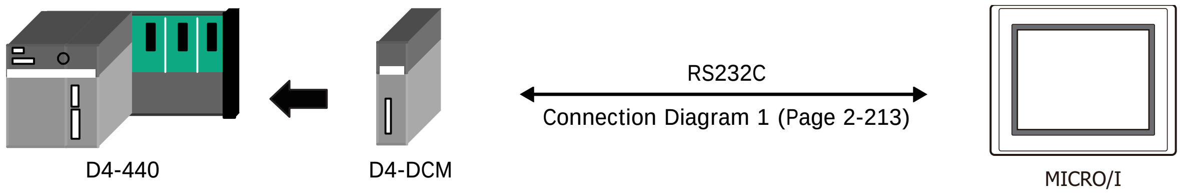
● DirectLogic 405 (Connects to RS232C port on the CPU unit)



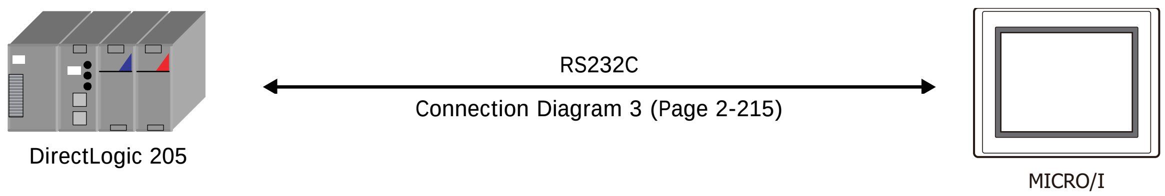
● DirectLogic 405 (Connects to RS422 port on the CPU unit)



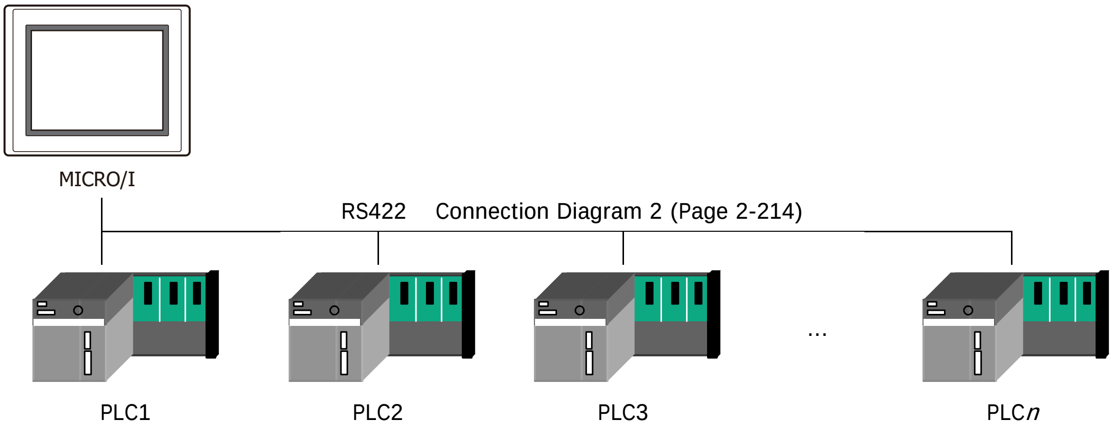
● DirectLogic 405 (Connects to RS232C port on the DATA COMMUNICATIONS MODULE)



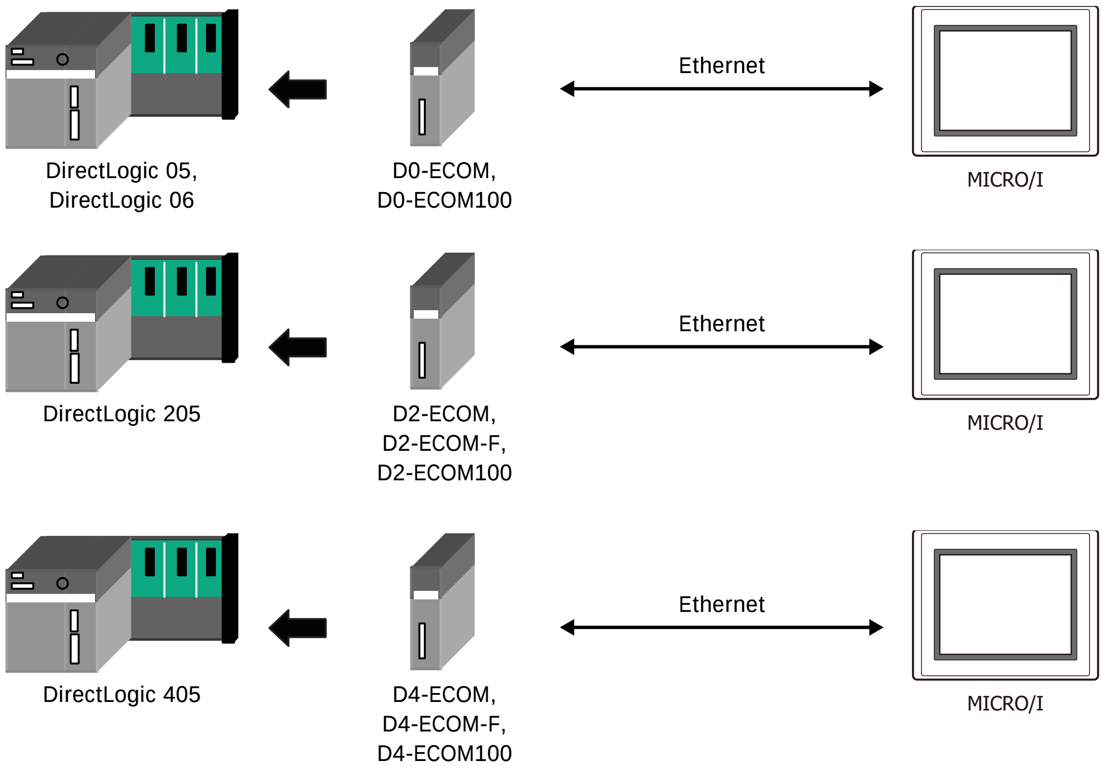
● DirectLogic 205 (Connects to RS232C port on the CPU unit)



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



● DirectLogic Series (Ethernet)

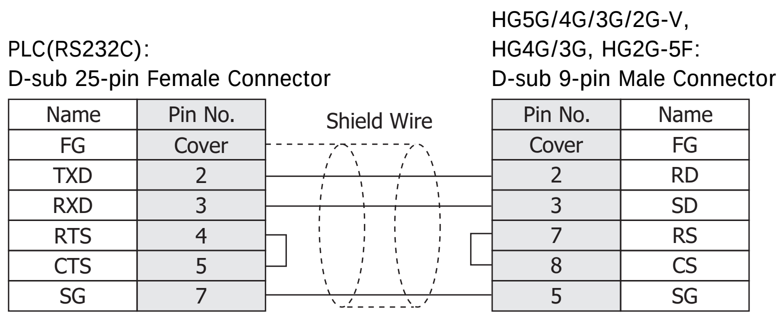


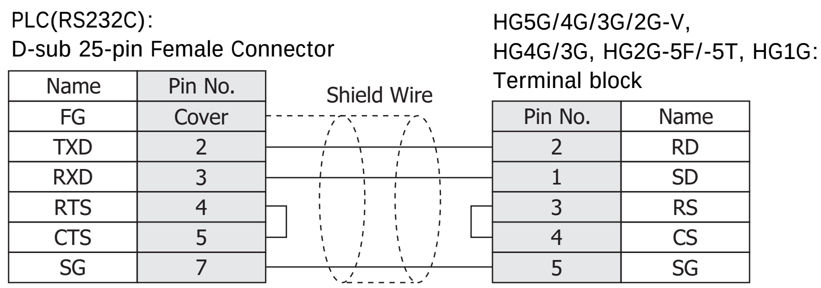
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

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)

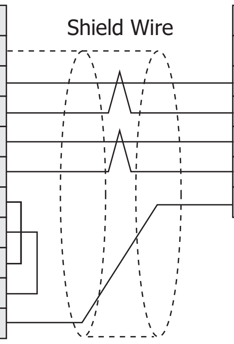




● Connection Diagram 2: DirectLogic 405 (Connects to CPU unit RS422 port)

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

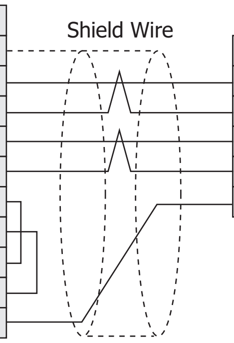


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

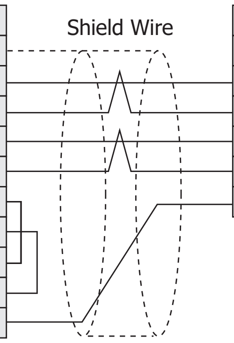
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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



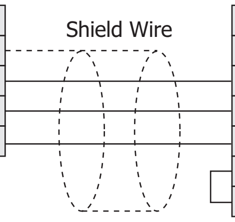
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
5	SDA(SD+)
4	SDB(SD-)
3	RDA(RD+)
2	RDB(RD-)
6	SG

● 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

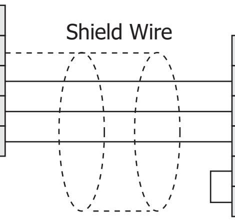


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
5	SG
7	RS
8	CS

PLC(RS232C):
6-pin Modular Connector

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

2

Connection to External Devices

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		19200 or 9600 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		19200 or 9600 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

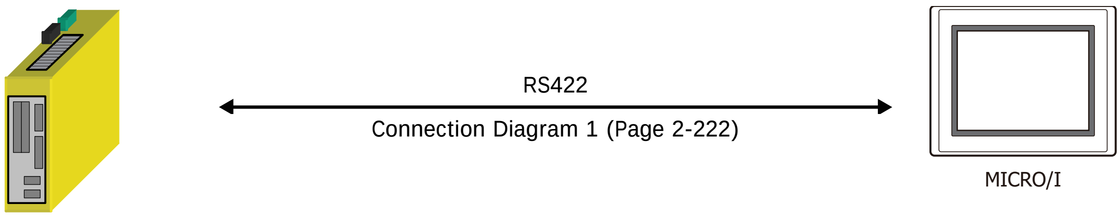
14.1 Connection Table

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 2-222)	None	Power Mate-MODEL D /Series 16i
Series				
16i 160i 18i 180i 30i 31i 32i	Not required	RS232C Connection Diagram 2 (Page 2-223)	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.

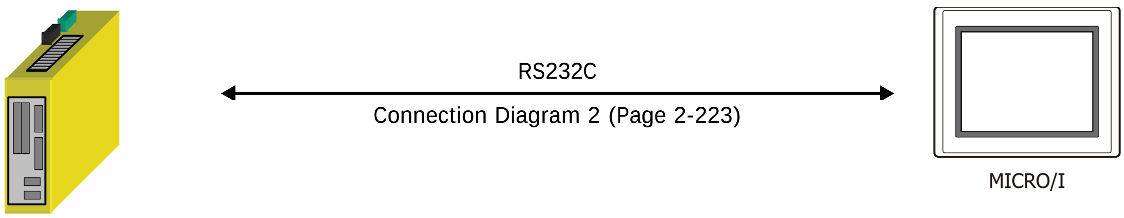
● Power Mate-MODEL D



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

Shield Wire

Terminal resistor

Cable clamp

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Shield Wire

Terminal resistor

Cable clamp

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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 the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Shield Wire

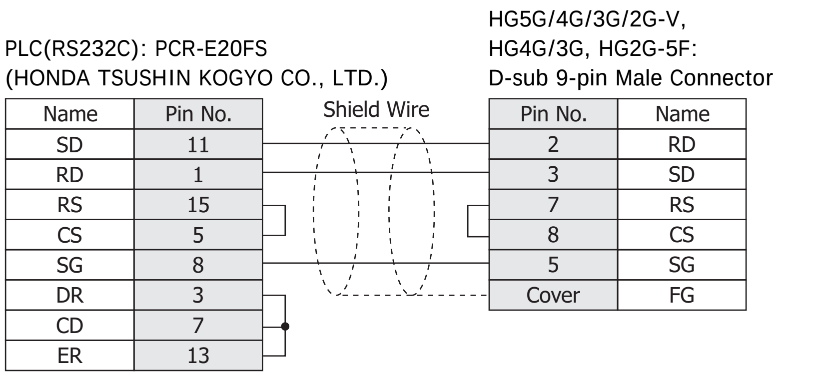
Terminal resistor

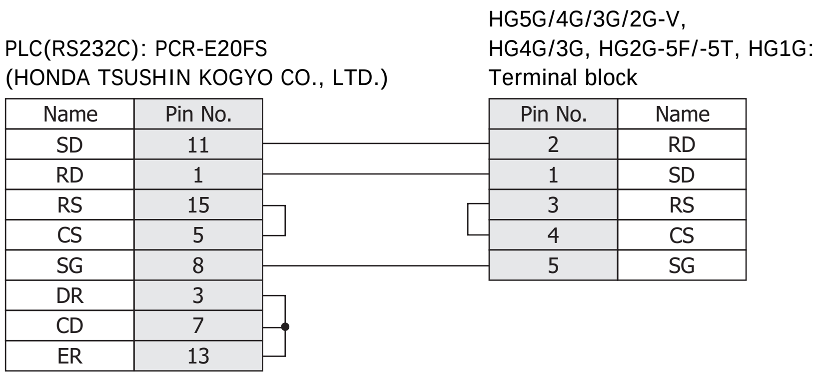
Cable clamp

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

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





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

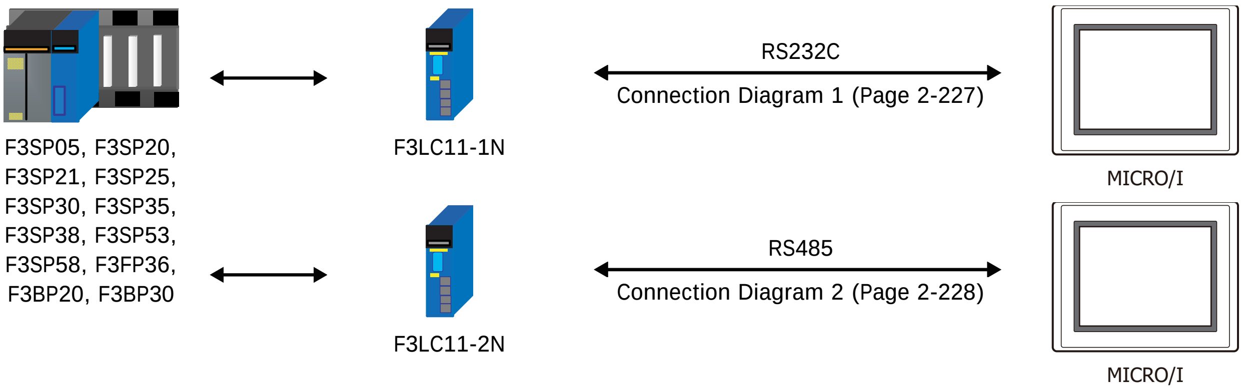
15.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Contro	Communication Driver
FA-M3				
F3SP05 F3SP20 F3SP21 F3SP25 F3SP30 F3SP35 F3SP38 F3SP53 F3SP58 F3FP36 F3BP20 F3BP30	F3LC11-1N	RS232C Connection Diagram 1 (Page 2-227)	ER	FACTORY ACE FA-M3
	F3LC11-2N	RS422/485 4-wire Connection Diagram 2 (Page 2-228)	None	
F3SP05 F3SP21 F3SP25 F3SP28 F3SP35 F3SP38 F3SP53 F3SP58	Not required	RS232C Connection Diagram 3 (Page 2-229)		
F3SP05-0P F3SP08-0P F3SP21-0N F3SP22-0S F3SP25-2N F3SP28-3N F3SP28-3S F3SP35-5N F3SP38-6N F3SP38-6S F3SP53-4H F3SP53-4S F3SP58-6H F3SP58-6S F3SP59-7S F3SP66-4S F3SP67-6S F3SP71-4N F3SP76-7N	F3LE01-0T F3LE01-5T F3LE11-0T F3LE12-0T	Ethernet	-	FACTORY ACE FA-M3(Ethernet)
F3SP66-4S F3SP67-6S F3SP71-4N F3SP76-7N	Not required			

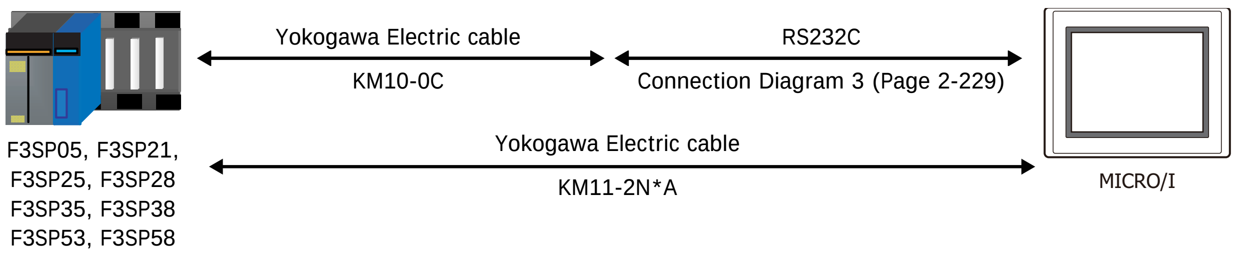
15.2 System Configuration

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

● FA-M3 series (Serial)



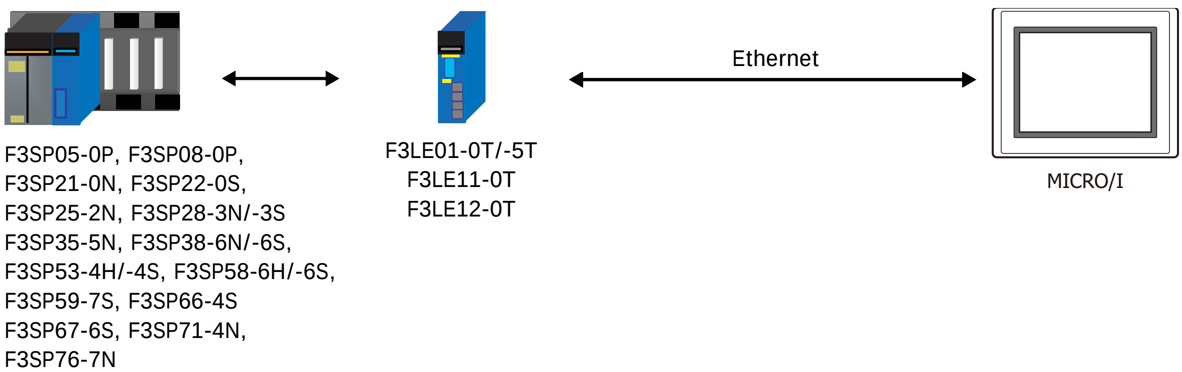
We recommend F3LC11-2N side to carry a “4-WIRE” setup of the terminus resistance (TERMINATOR) in long-distance transmission.

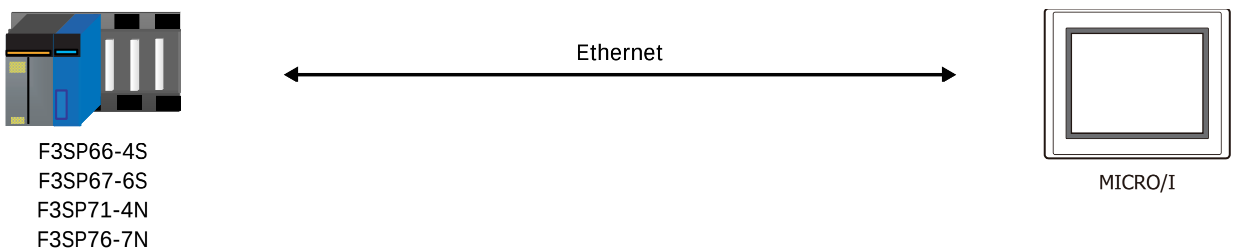


It does not correspond to “CPU direct connection system” of F3SP20 and F3SP30.

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

● FA-M3 series (Ethernet)

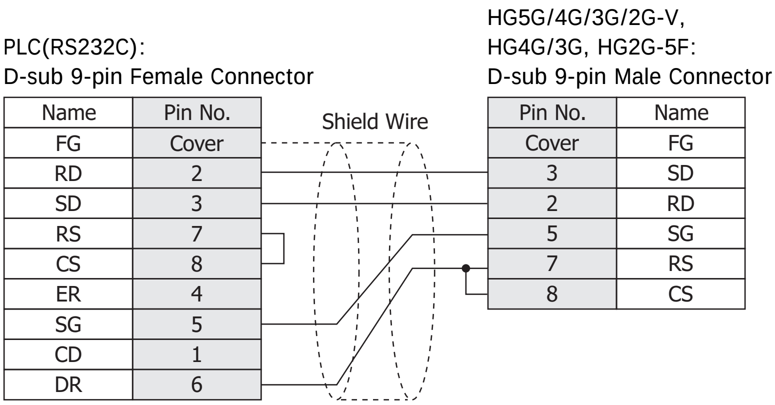


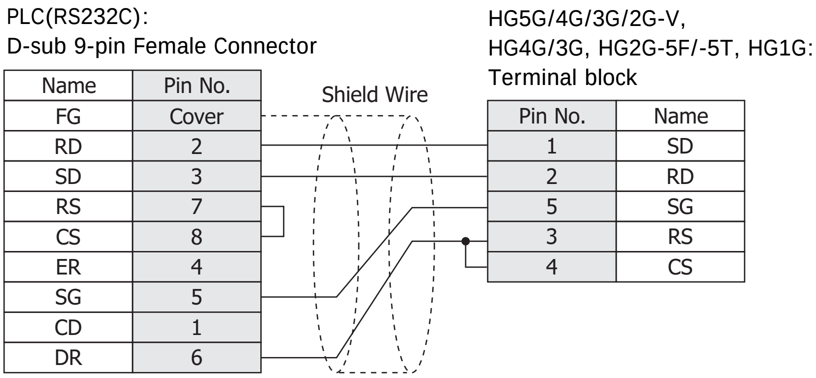


15.3 Connection Diagram

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:   F3LC11-1N

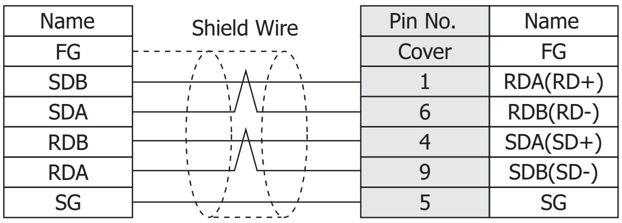




● Connection Diagram 2: F3LC11-2N

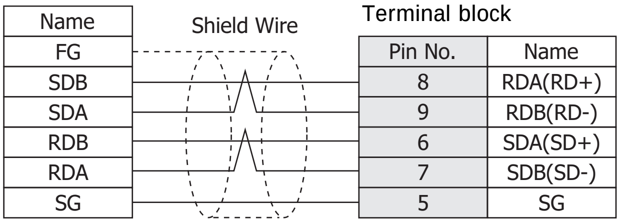
PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



- Configure the **Flow Control** to **None**, because the terminal block of the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G doesn't have control lines.
- In MICRO/I and PLC, the name of A pole and B pole is reverse.

When you need a terminating resistor, read the following description.

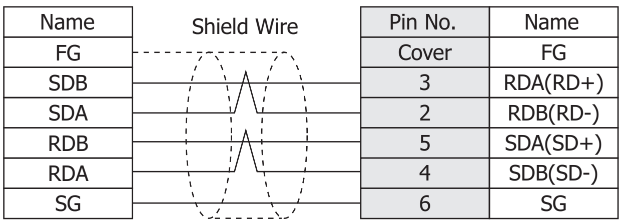
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

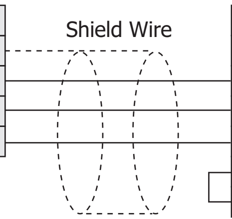
HG1P:
D-sub 25-pin Male Connector



● Connection Diagram 3: FA-M3 (Yokogawa Electric Cable KM10-0C)

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

Name	Pin No.
RD	2
SD	3
SG	5

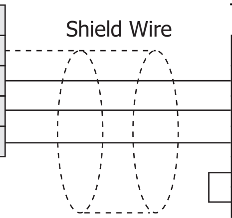


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
5	SG
7	RS
8	CS

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

Name	Pin No.
RD	2
SD	3
SG	5



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

2 Connection to External Devices

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		19200 or 9600 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		19200 or 9600 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)

● 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

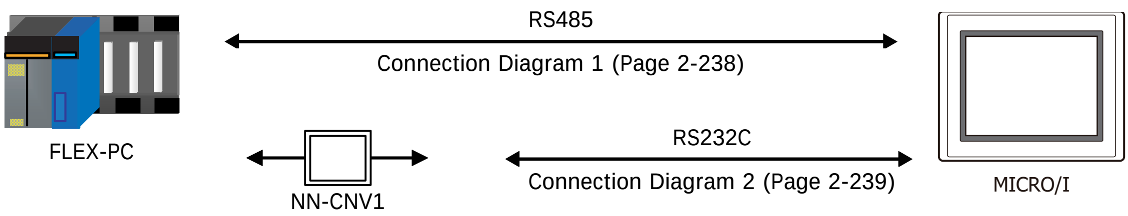
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
FLEX-PC				
NB1 NB2 NB3 NJ-CPU-E4 NJ-CPU-A8 NJ-CPU-B16 NS	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-239)	None	FLEX-PC(CPU)
		RS422/485 4-wire Connection Diagram 1 (Page 2-238)		
NB1 NB2 NB3	NB-RS1-AC NB-RS1-DC	RS232C Connection Diagram 3 (Page 2-239)	ER	FLEX-PC(LINK)
		RS422/485 4-wire Connection Diagram 4 (Page 2-240)	None	
NJ-CPU-E4 NJ-CPU-A8 NJ-CPU-B16	NJ-RS2 NJ-RS4	RS232C Connection Diagram 3 (Page 2-239)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-240)	None	
NS	NS-RS1	RS232C Connection Diagram 3 (Page 2-239)	ER	
		RS422/485 4-wire Connection Diagram 4 (Page 2-240)	None	
MICREX-F				
F55	NV1L-RS2	RS232C Connection Diagram 5 (Page 2-241)	None	MICREX-F
F70	NC1L-RS2	RS232C Connection Diagram 5 (Page 2-241)		
	NC1L-RS4	RS422/485 4-wire Connection Diagram 6 (Page 2-242)		
F80H F120H F120S F140S F150S	FFU120B	RS232C Connection Diagram 5 (Page 2-241)		
		RS422/485 4-wire Connection Diagram 6 (Page 2-242)		
F30 F50 F50H F55 F60 F70 F70S F80H F81 F120H F120S F140S F150S F250	FFK120A-C10	RS232C Connection Diagram 5 (Page 2-241)		
		RS422/485 4-wire Connection Diagram 6 (Page 2-242)		

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 2-243)	None	MICREX-SX
	NP1L-RS1	RS232C Connection Diagram 8 (Page 2-243)		
		RS422/485 4-wire Connection Diagram 9 (Page 2-244)		
	NP1L-RS2	RS232C Connection Diagram 8 (Page 2-243)		
	NP1L-RS4	RS422/485 4-wire Connection Diagram 9 (Page 2-244)		
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 Ethernet port)			
	NP1L-ET1			

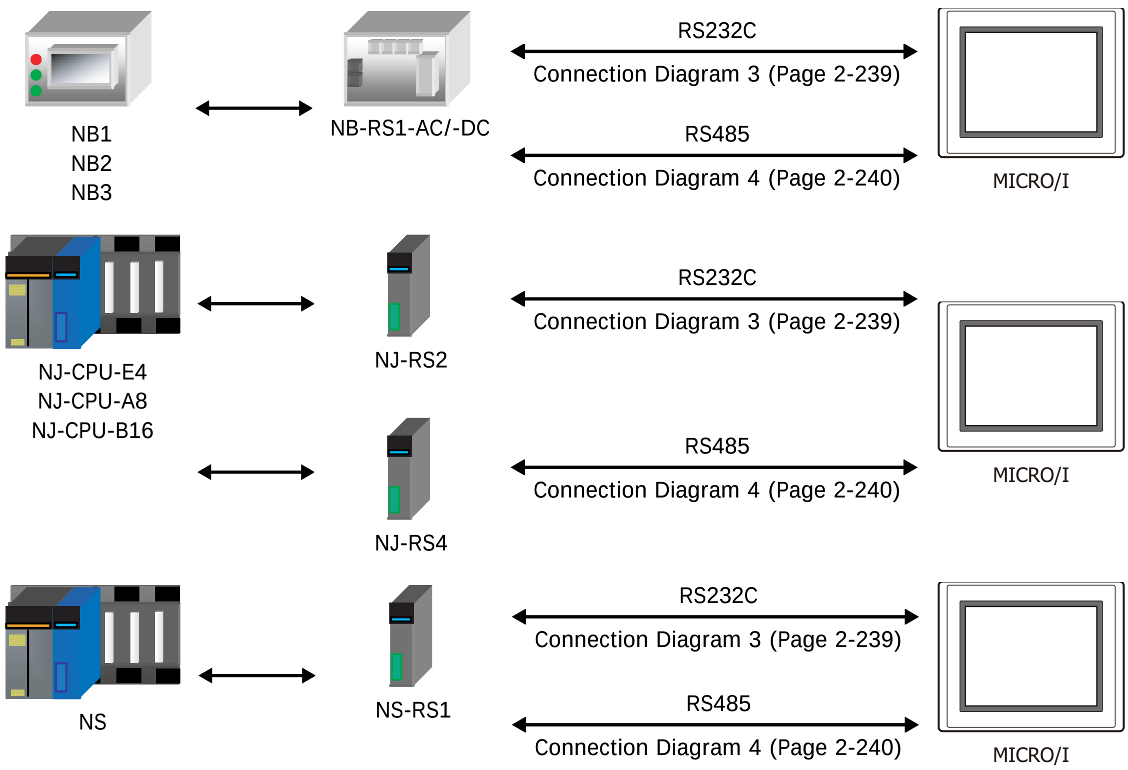
16.2 System Configuration

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

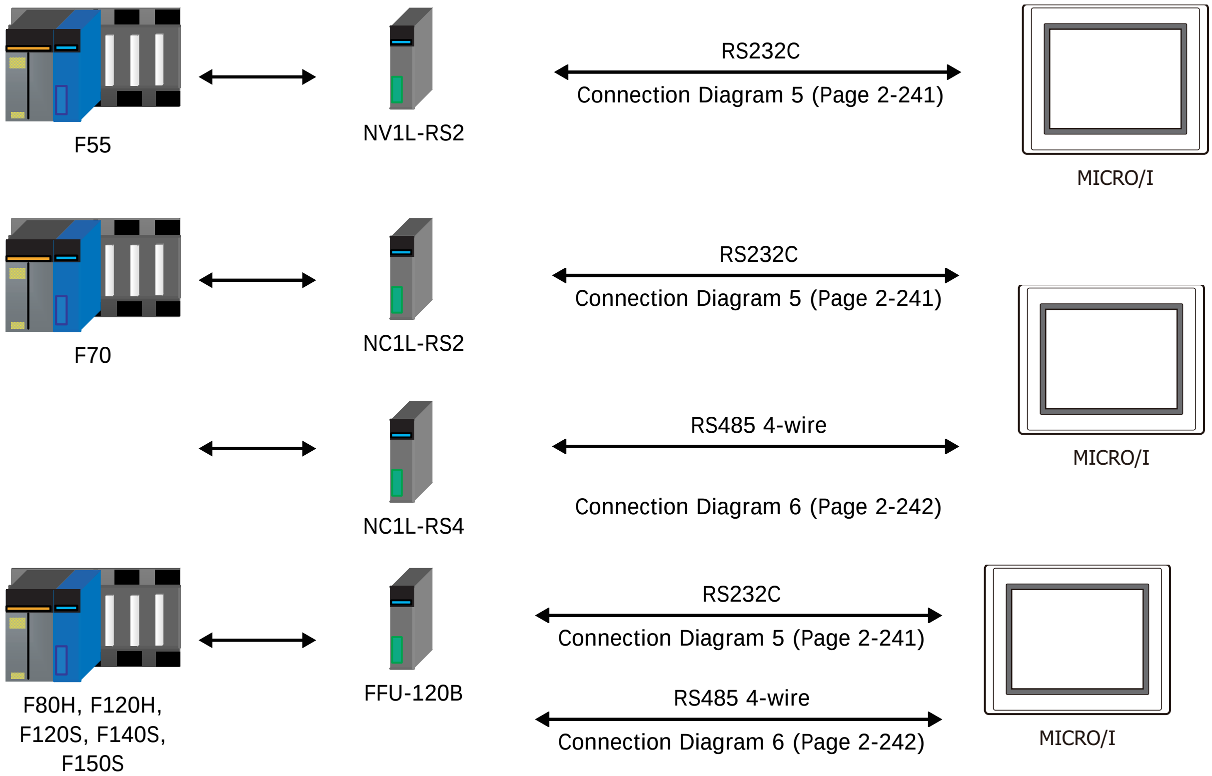
● FLEX-PC Series (Loader port)



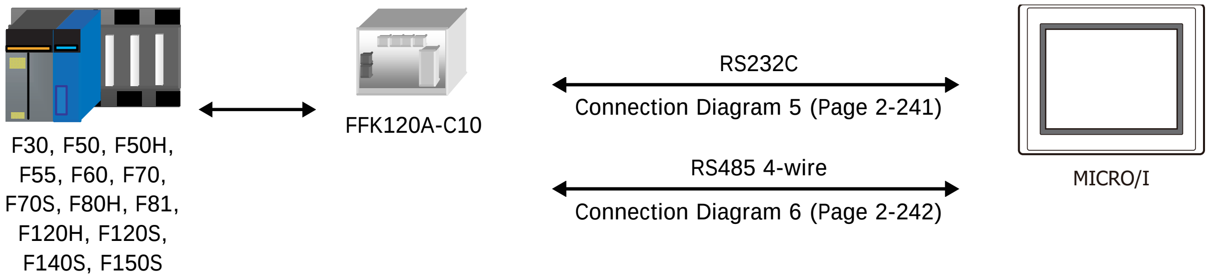
● FLEX-PC Series (Interface Module)



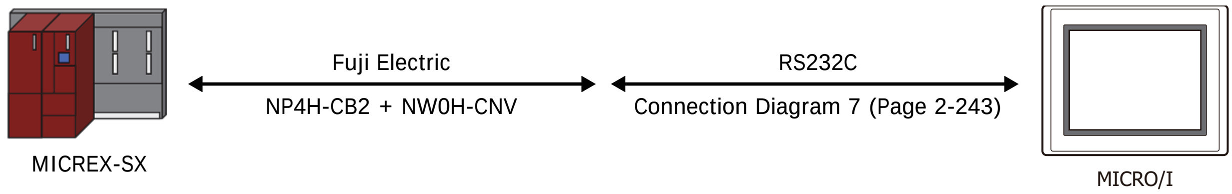
● MICREX-F Series (Interface Card)



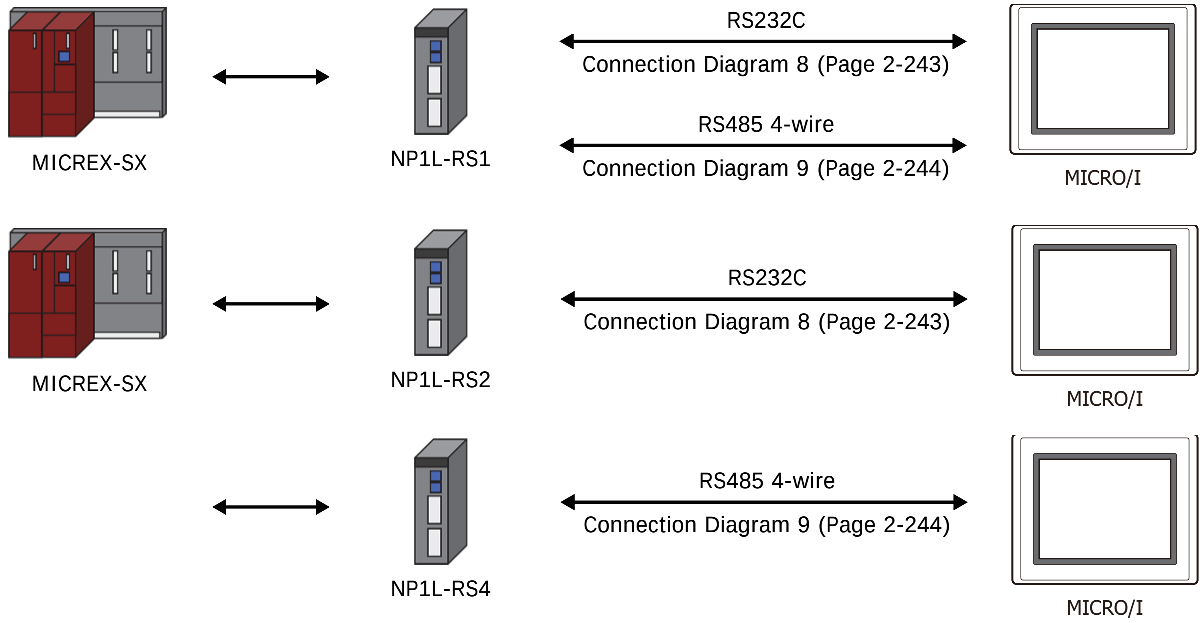
● MICREX-F Series (Interface Module)



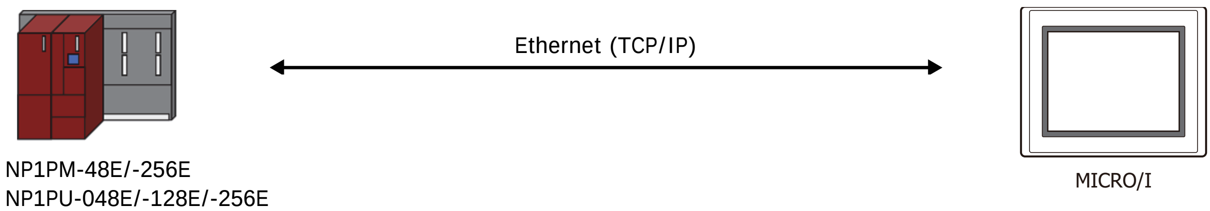
● MICREX-SX Series (Connects to Loader Connection Connector on the CPU unit)



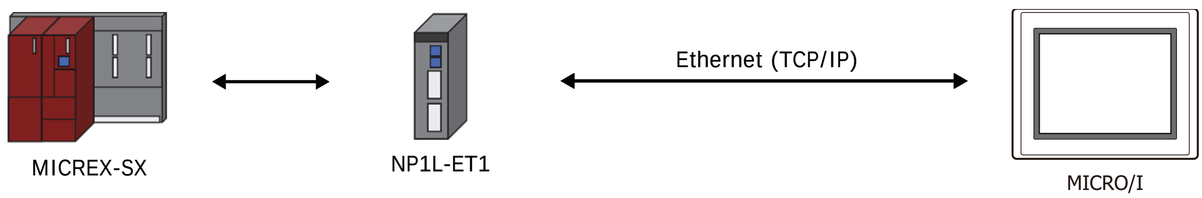
● MICREX-SX Series (Interface Module)



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



● 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 → HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Shield Wire

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

PLC(RS485): Modular jack 8-pin → HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

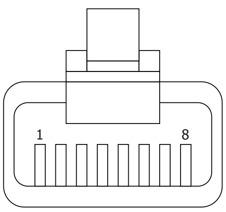
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS485): Modular jack 8-pin → HG1P: D-sub 25-pin Male Connector

Shield Wire

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

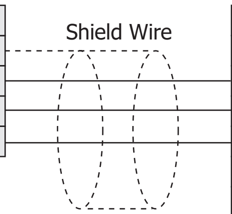
Connector Pin Layout for PLC side Modular jack



● Connection Diagram 2: FLEX-PC series (Loader port) + NN-CNV1

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

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

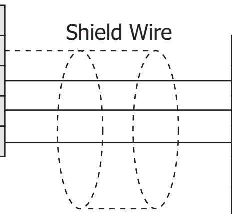


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
5	SG
7	RS
8	CS

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

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



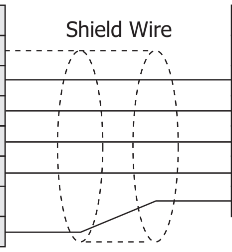
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● 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

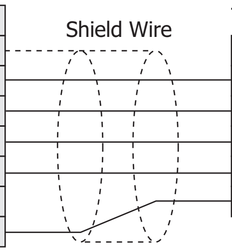


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
8	CS
7	RS
5	SG

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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

PLC(RS485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.	Name
SDA	1	RDA(RD+)
SDB	6	RDB(RD-)
RDA	4	SDA(SD+)
RDB	9	SDB(SD-)
SG	5	SG
	Cover	FG

PLC(RS485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS485):
Terminal block

HG1P:
D-sub 25-pin Male Connector

Shield Wire

Name	Pin No.	Name
SDA	3	RDA(RD+)
SDB	2	RDB(RD-)
RDA	5	SDA(SD+)
RDB	4	SDB(SD-)
SG	6	SG
	Cover	FG

● 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
2	RD
3	SD
7	RS
8	CS
5	SG

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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

PLC(RS422/485): Terminal block

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Shield Wire

Name	Pin No.	Name
SDA	1	RDA(RD+)
SDB	6	RDB(RD-)
RDA	4	SDA(SD+)
RDB	9	SDB(SD-)
SG	5	SG
	Cover	FG

PLC(RS422/485): Terminal block

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485): Terminal block

HG1P: D-sub 25-pin Male Connector

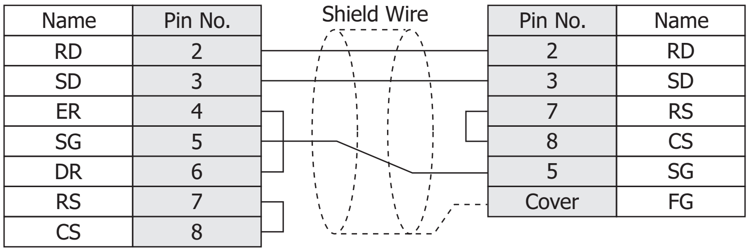
Shield Wire

Name	Pin No.	Name
SDA	3	RDA(RD+)
SDB	2	RDB(RD-)
RDA	5	SDA(SD+)
RDB	4	SDB(SD-)
SG	6	SG
	Cover	FG

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

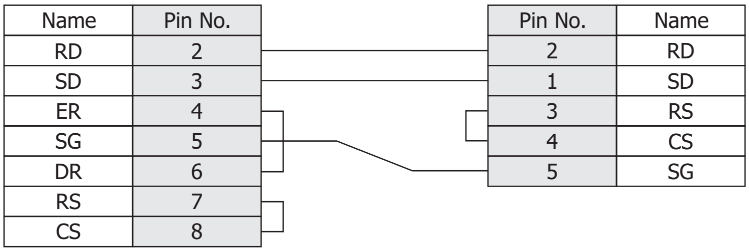
PLC(RS232C):
D-sub 9-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

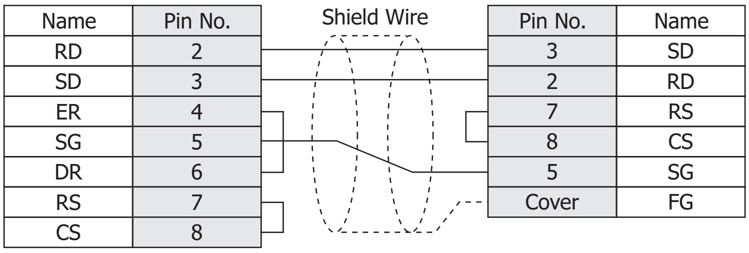
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 8: MICREX-SX series (RS232C port)

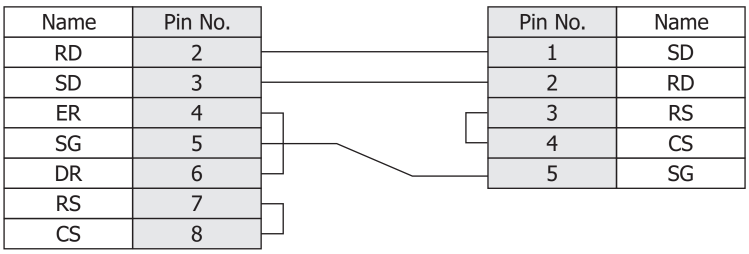
PLC(RS232C):
D-sub 9-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 9: MICREX-SX series (RS485 port)

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Shield Wire

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

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

HG1P:
D-sub 25-pin Male Connector

Shield Wire

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

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.	19200, 9600, 4800, 2400 or 1200 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 or Interface Module

Items		Details	
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.	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 bps	
Data Bits		7 or 8 bits*2	
Stop Bits		1 or 2 stop bits*2	
Parity		None, Odd or Even*2	
Flow Control		None	
Station Number		0	0 to 99 (Decimal)

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.)

Items		Details
Interface		RS232C or RS485
Baud Rate	Use the same settings as for the MICRO/I.	38400 bps
Data Bits		8 bits
Stop Bits		1 stop bits
Parity		Even
Flow Control		None

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 or Interface 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

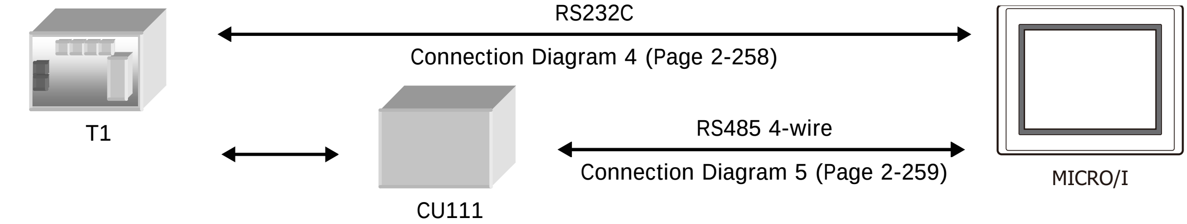
17.1 Connection Table

CPU unit		Link Unit	WindO/I-NV4 Settings		
			Interface	Flow Control	Communication Driver
PROSEC T-series					
T1	T1-16 T1-28 T1-40	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-258)	ER	PROSEC T
		CU111	RS422/485 4-wire Connection Diagram 5 (Page 2-259)	None	
T1S	T1-40S	Not required (Connects to CPU unit)	RS232C Connection Diagram 4 (Page 2-258)	ER	
			RS422/485 4-wire Connection Diagram 3 (Page 2-257)	None	
		CU111	RS422/485 4-wire Connection Diagram 5 (Page 2-259)		
T2	PU224	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-255)		
T2E	PU234E	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-256)	ER	
		CM231E	RS422/485 4-wire Connection Diagram 5 (Page 2-259)	None	
		CM232E	RS232C Connection Diagram 2 (Page 2-256)	ER	
T2N	PU215N PU235N PU245N	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-256)		
			RS422/485 4-wire Connection Diagram 7 (Page 2-261)	None	
			RS232C Connection Diagram 6 (Page 2-260)	ER	
T3	PU315 PU325	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-255)	None	
T3H	PU325H PU326H				
V series					
L1	L1PU11H L1PU12H	Not required (Connects to CPU unit)	RS422/485 4-wire Connection Diagram 1 (Page 2-255)	None	PROSEC T
S2E	PU612E				
S2T	PU662T PU672T				
model2000	S2PU22 S2PU32A S2PU72A/D S2PU82				
model3000	S3PU21 S3PU45A S3PU55A S3PU65A				

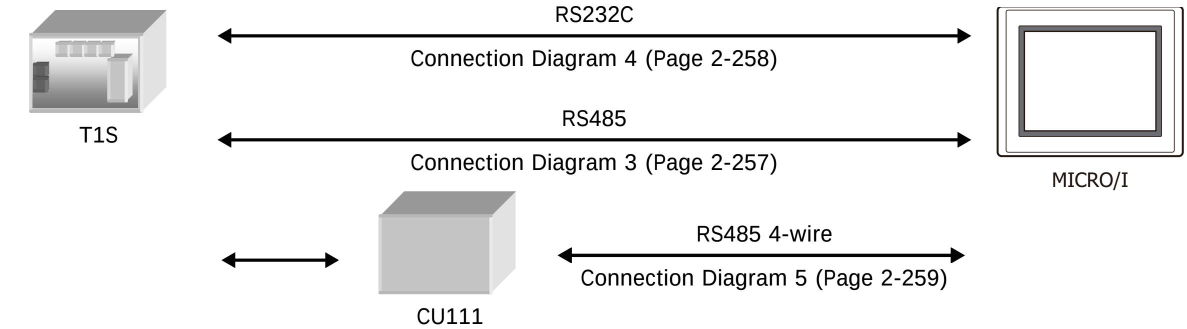
17.2 System Configuration

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

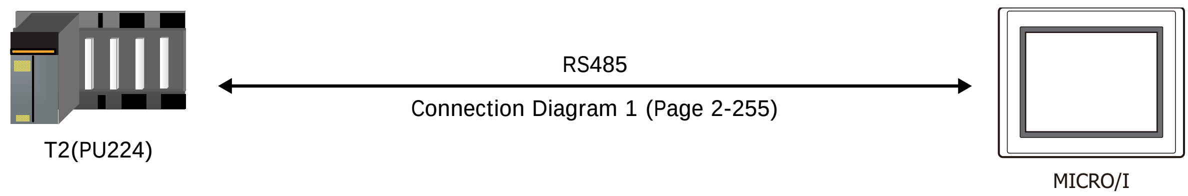
● T1



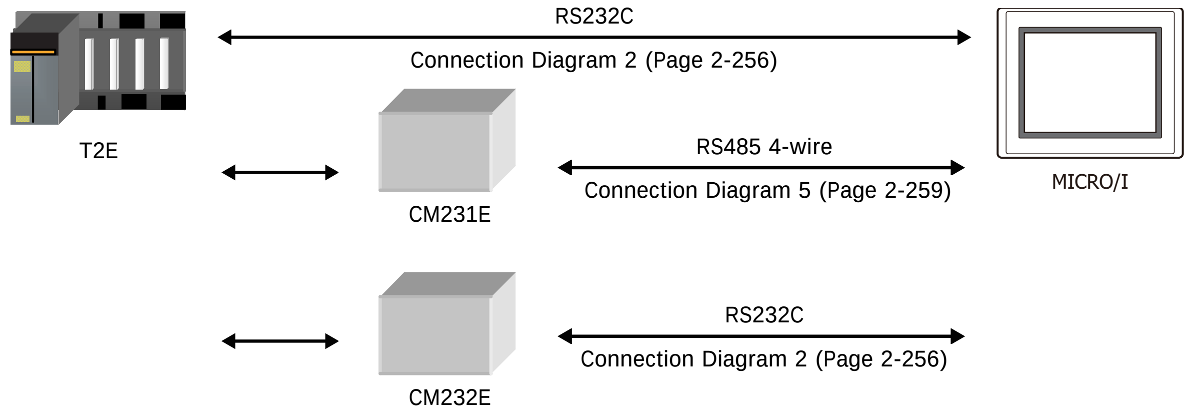
● T1S



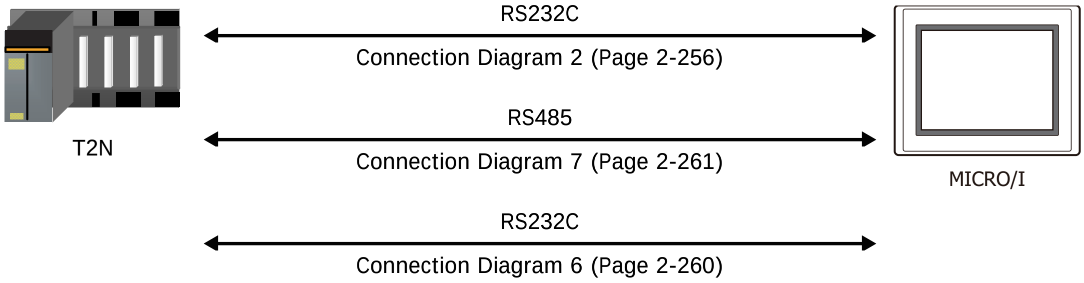
● T2 (PU224)



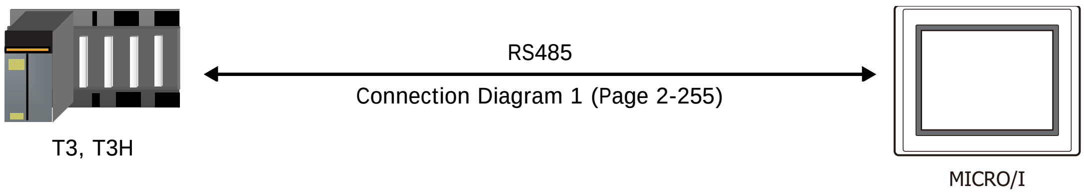
● T2E



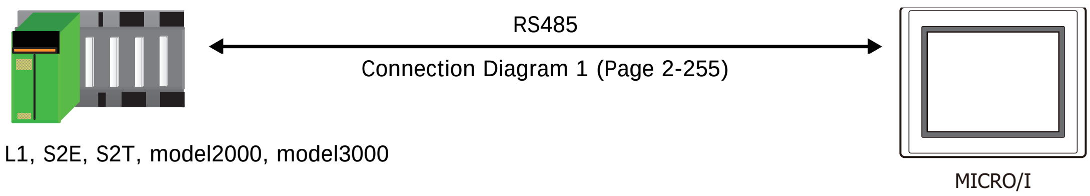
● T2N



● T3, T3H



● V series



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: T2, T3, T3H, L1, S2E, S2T, model2000, model3000 (RS485, D-sub 15-pin Connector)

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Shield Wire

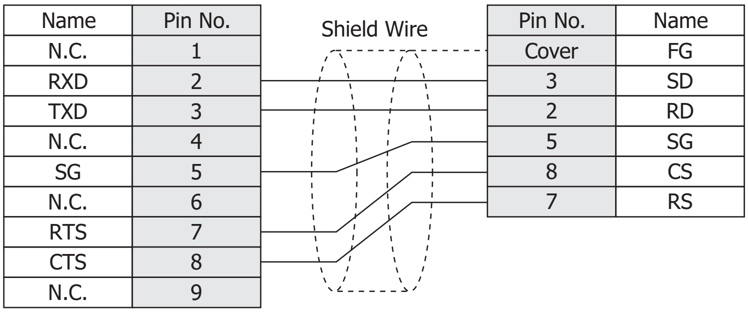
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

● Connection Diagram 2: T2E, T2N (RS232C, D-sub 9-pin Connector)

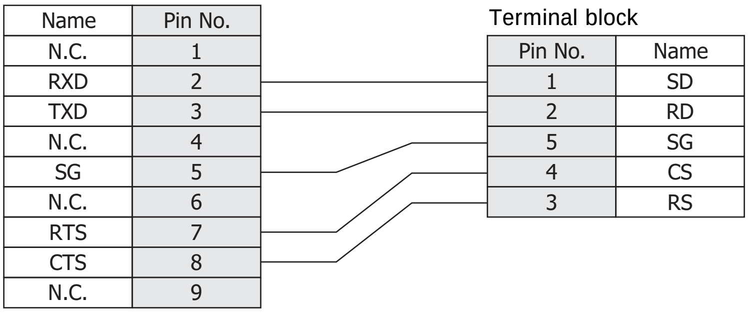
PLC(RS232C):
D-sub 9-pin Female Connector

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



● Connection Diagram 3: T1S (RS485, Terminal block)

PLC(RS422/485):
Terminal block

Name
RXA
RXB
TXA
TXB
SG

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
Terminal block

Name
RXA
RXB
TXA
TXB
SG

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

Name
RXA
RXB
TXA
TXB
SG

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
5	SDA(SD+)
4	SDB(SD-)
3	RDA(RD+)
2	RDB(RD-)
6	SG
Cover	FG

● 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
8	CS
5	SG
2	RD
7	RS
3	SD

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

Shield Wire

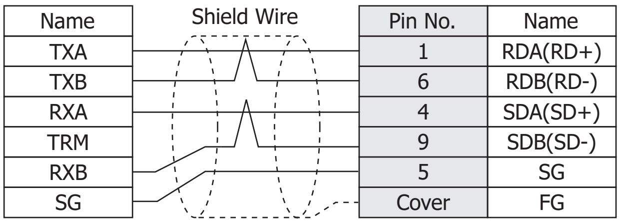
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 5: T1, T1S, T2E (RS485, Terminal block)

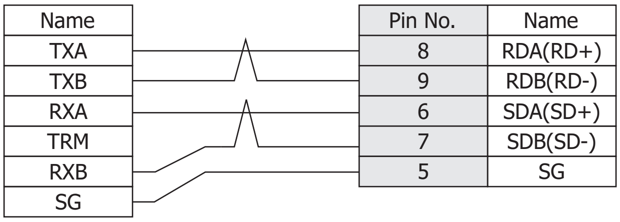
PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



When you need a terminating resistor, read the following description.

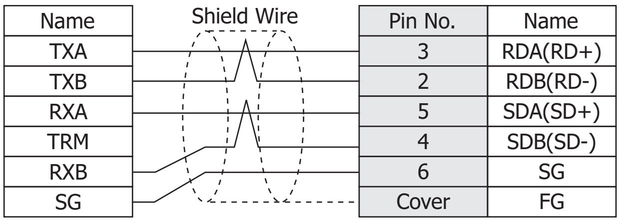
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

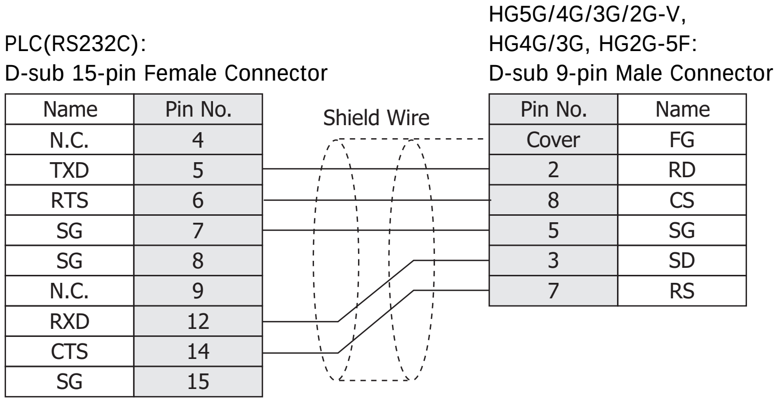
For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

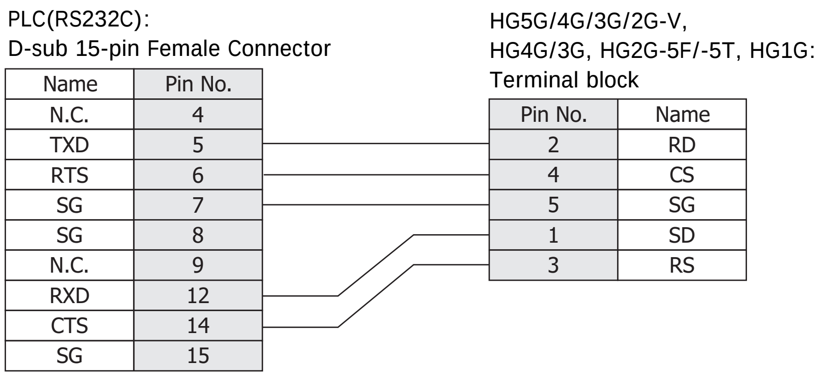
PLC(RS422/485):
Terminal block

HG1P:
D-sub 25-pin Male Connector



● Connection Diagram 6: T2N (RS232C, D-sub 15-pin Connector)

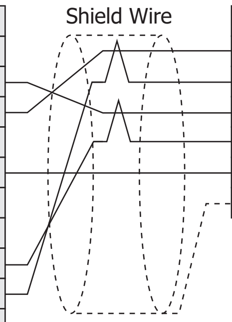




● Connection Diagram 7: T2N (RS485, D-sub 15-pin Connector)

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

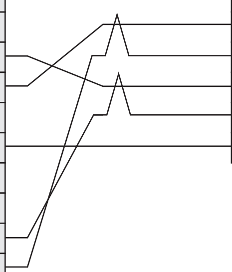


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

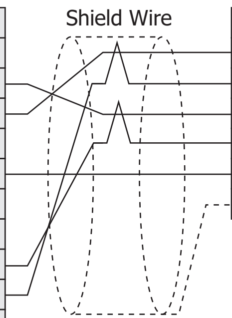
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

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	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 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 PROSEC T-series.
- For details of communication setting, refer to the PROSEC T-series and V series user’s manual.

18 LSIS

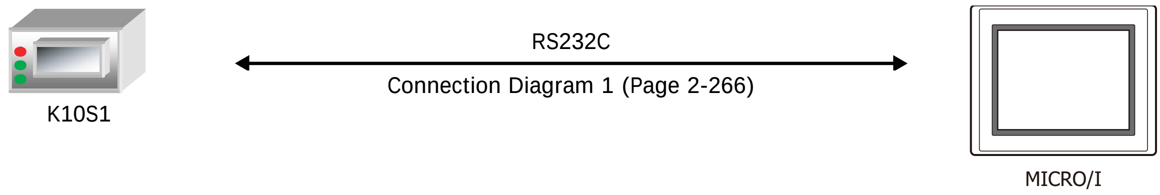
18.1 Connection Table

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 2-266)	None	MASTER-K
K80S K120S K200S	Not required (Connects to CPU unit)	RS232C Connection Diagram 2 (Page 2-266)		
K80S	G7L-CUEB	RS232C Connection Diagram 3 (Page 2-267)		
	G7L-CUEC	RS422/485 4-wire Connection Diagram 4 (Page 2-268)		
K200S	G6L-CUEB	RS232C Connection Diagram 3 (Page 2-267)		
	G6L-CUEC	RS422/485 4-wire Connection Diagram 4 (Page 2-268)		
K300S	G4L-CUEA	RS232C Connection Diagram 3 (Page 2-267)		
		RS422/485 4-wire Connection Diagram 4 (Page 2-268)		

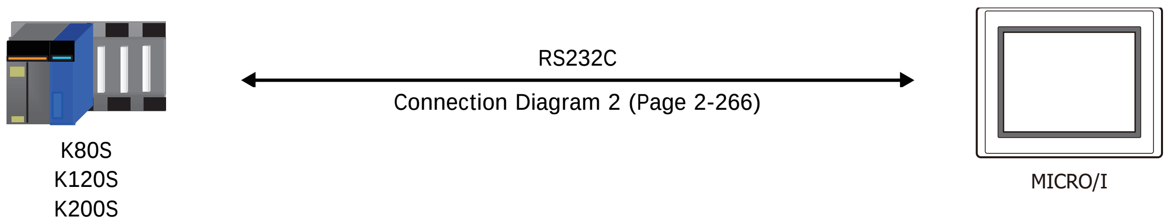
18.2 System Configuration

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

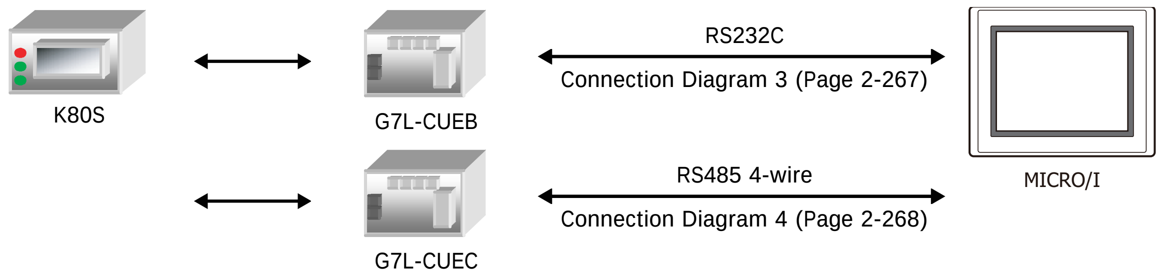
● K10S1 (Loader port)



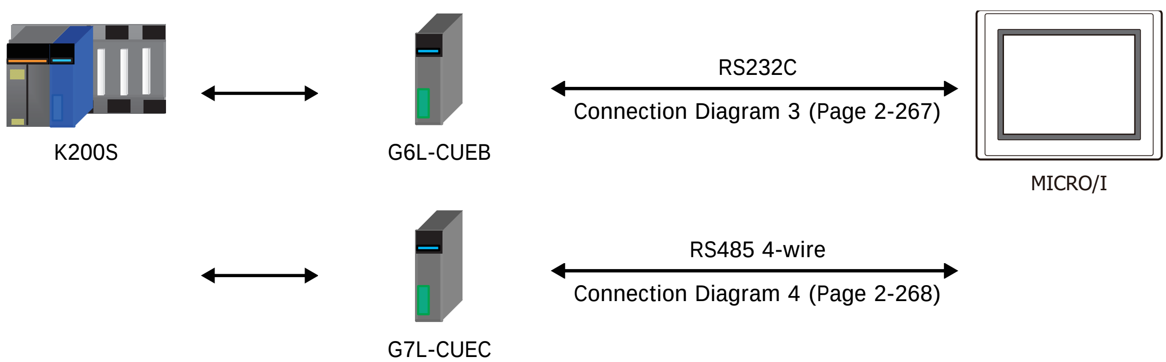
● K80S, K120S, K200S (Loader port)



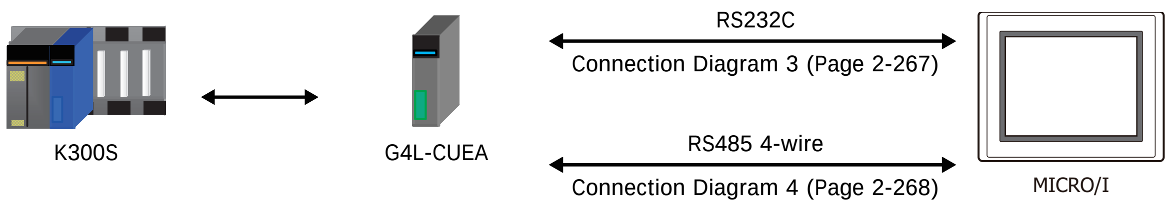
● K80S (Interface Module)



● K200S (Interface Module)



● 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: 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
5	SG
8	CS

PLC(RS232C):
Mini DIN 6-pin Connector

Name	Pin No.
NC	1
RD	2
SD	3
NC	4
SG	5
NC	6

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 2: 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
5	SG
7	RS
2	RD
8	CS

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

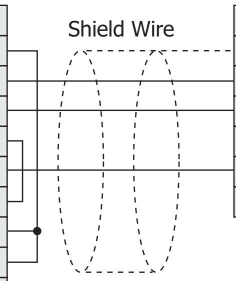
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

● Connection Diagram 3: MASTER-K Series (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

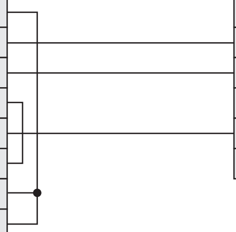


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
7	RS
5	SG
8	CS

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



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 4: MASTER-K Series (Interface Module RS485 port)

PLC(RS422/485):
Terminal block

Name
FG
RDA
RDB
SDA
SDB
SG

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
Terminal block

Name
FG
RDA
RDB
SDA
SDB
SG

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
Terminal block

Name
FG
RDA
RDB
SDA
SDB
SG

Shield Wire

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
5	SDA(SD+)
4	SDB(SD-)
3	RDA(RD+)
2	RDB(RD-)
6	SG

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.	38400, 19200, 9600, 4800, 2400 or 1200 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

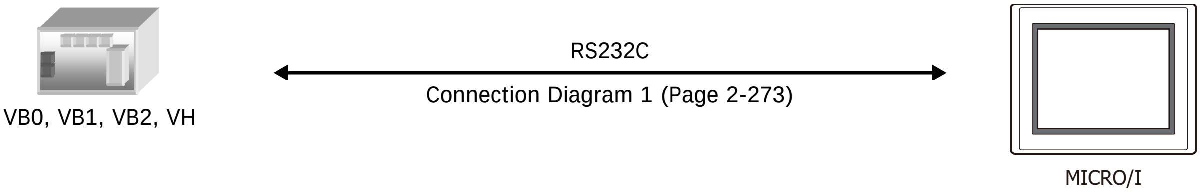
19.1 Connection Table

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 2-273)	None	VB/VH
	VB-485A	RS422/485 2-wire Connection Diagram 2 (Page 2-274)		
	VB-CADP	RS232C Connection Diagram 3 (Page 2-275)		
		RS422/485 2-wire Connection Diagram 4 (Page 2-276)		
	VB-232	RS232C Connection Diagram 5 (Page 2-277)		
	VB-485	RS422/485 2-wire Connection Diagram 6 (Page 2-278)		
VH				
VH	Not required (Connects to CPU unit)	RS232C Connection Diagram 1 (Page 2-273)	None	VB/VH
	VB-485A	RS422/485 2-wire Connection Diagram 2 (Page 2-274)		
	VB-CADP	RS232C Connection Diagram 3 (Page 2-275)		
		RS422/485 2-wire Connection Diagram 4 (Page 2-276)		
	VB-232	RS232C Connection Diagram 5 (Page 2-277)		
	VB-485	RS422/485 2-wire Connection Diagram 6 (Page 2-278)		

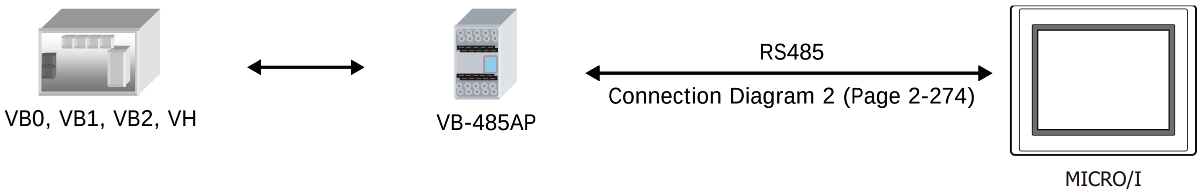
19.2 System Configuration

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

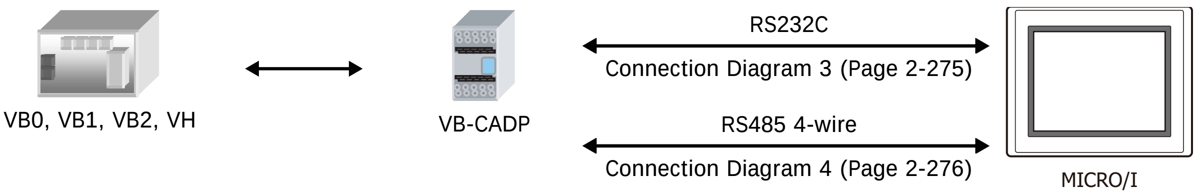
● Programming Tool Communication Port



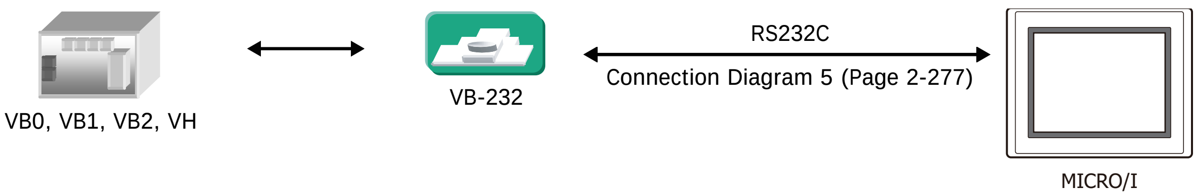
● VB-485A



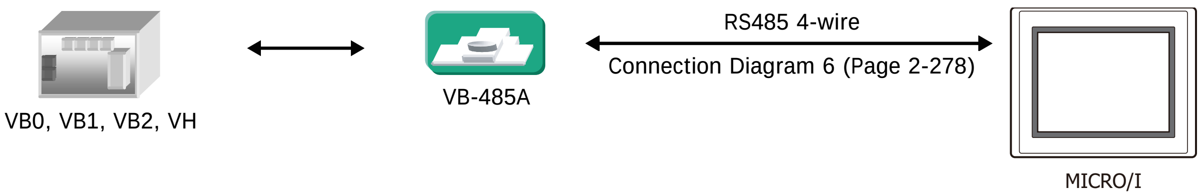
● VB-CADP



● VB-232



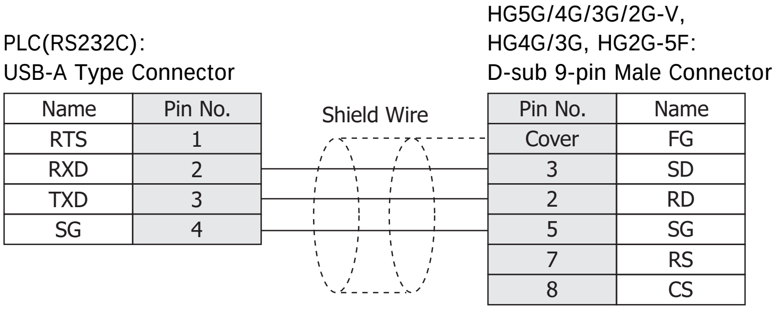
● VB-485

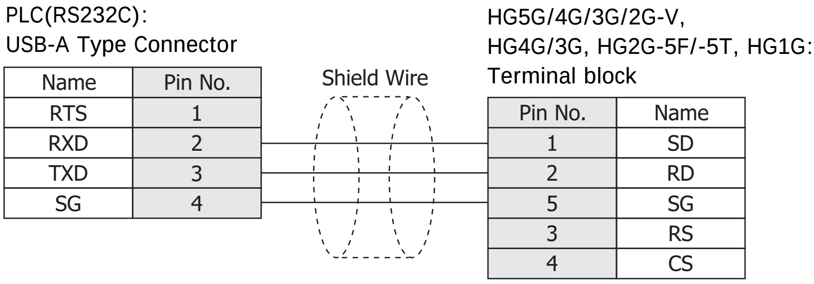


19.3 Connection Diagram

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: Programming Tool Communication Port

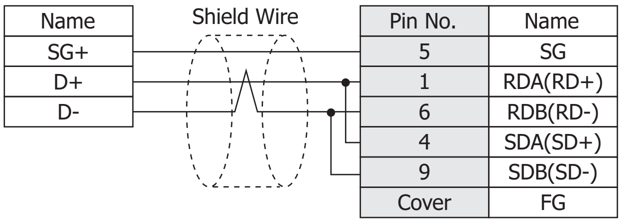




● Connection Diagram 2: VB-485A

PLC(RS422/485):
Terminal block

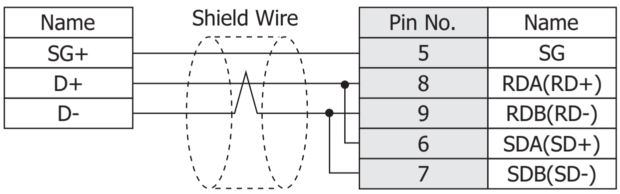
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

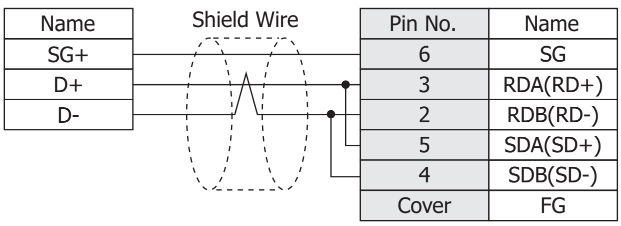
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485):
Terminal block

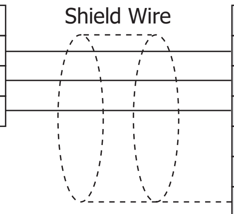
HG1P:
D-sub 25-pin Male Connector



● Connection Diagram 3: VB-CADP (RS232C)

PLC(RS232C):
Tterminal block

Name
TX
RX
232G

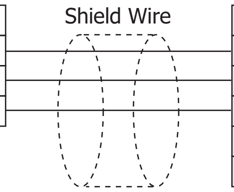


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
2	RD
3	SD
5	SG
7	RS
8	CS
Cover	FG

PLC(RS232C):
Tterminal block

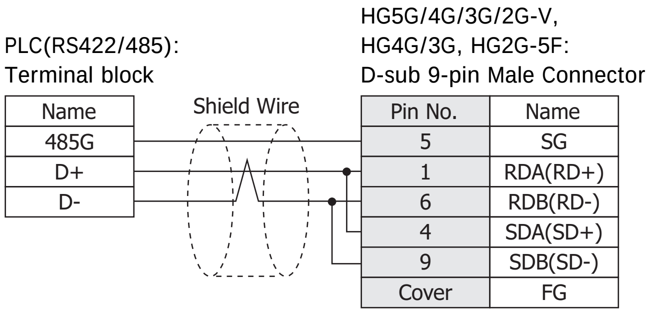
Name
TX
RX
232G



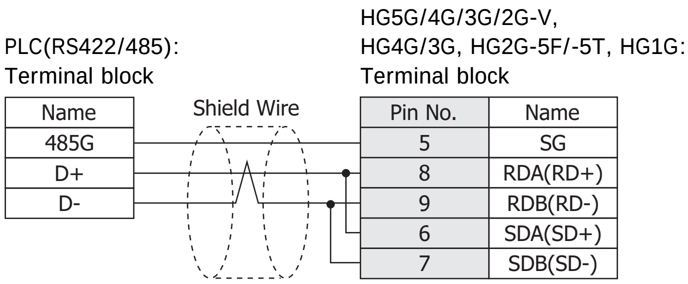
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 4: VB-CADP (RS485)



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

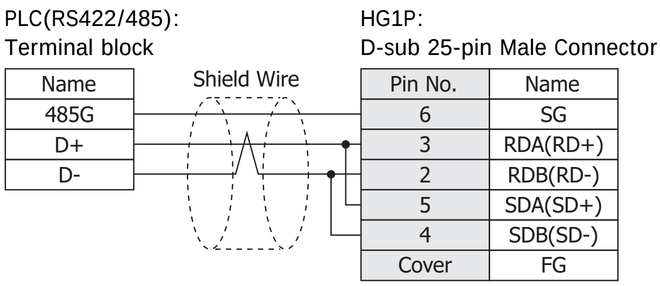


- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.



● Connection Diagram 5: 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

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
3	SD
2	RD
5	SG
7	RS
8	CS

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

Name	Pin No.
CD	1
RXD	2
TXD	3
SG	5
RTS	7
CTS	8

Shield Wire

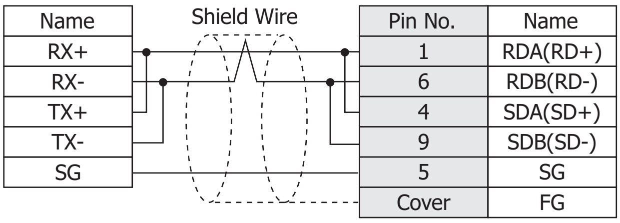
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

● Connection Diagram 6: VB-485

PLC(RS422/485):
Terminal block

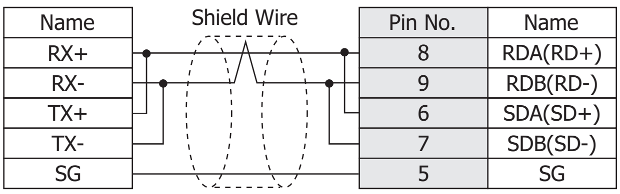
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

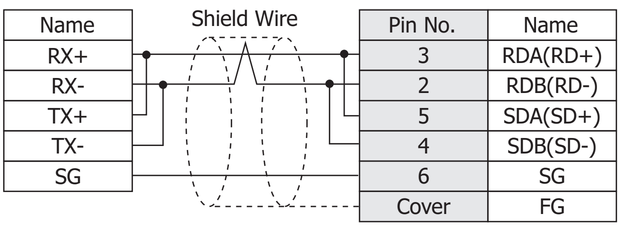
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485):
Terminal block

HG1P:
D-sub 25-pin Male Connector



19.4 Environment Settings

● 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-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.	38400, 19200, 9600, 4800, 2400 or 1200 bps
Data Bits		7 bits
Stop Bits		1 stop bits
Parity		Even
Flow Control		None
Station Number		0 to 255 (Decimal)

● VB-CADP

Items		Details	
Port		CP2	CP3
Interface		RS232C or RS485	RS485
Baud Rate	Use the same settings as for the MICRO/I.	38400, 19200, 9600, 4800, 2400 or 1200 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

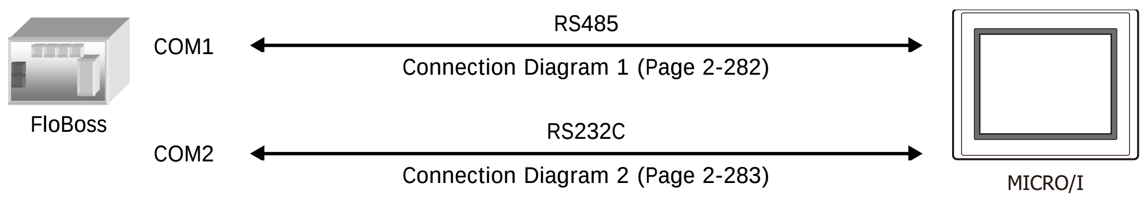
20.1 Connection Table

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 2-282)	None	ROC Protocol
		RS232C Connection Diagram 2 (Page 2-283)		

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)

PLC(RS422/485):
Terminal block

Name
A
B

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

Name
A
B

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.

PLC(RS422/485):
Terminal block

Name
A
B

HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG
Cover	FG

● Connection Diagram 2: FloBoss (COM2 RS232C)

PLC(RS232C):
Terminal block

Name
TX
RX
RTS
GND

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
2	RD
3	SD
7	RS
5	SG
8	CS
Cover	FG

PLC(RS232C):
Terminal block

Name
TX
RX
RTS
GND

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

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	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 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

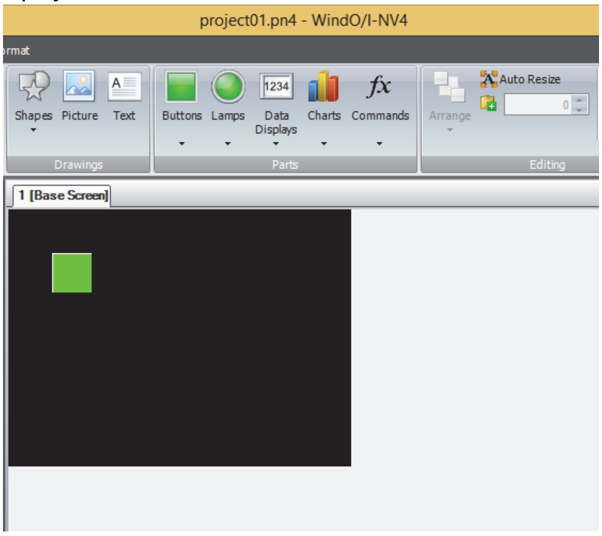
When the Emerson ROC Protocol is selected as a communication driver, check the usable external device addresses in the Tag Editor.

To display the Tag Editor, click ... to the right of the text box for setting the device address.

Example: Set an external device address to the Bit Button.

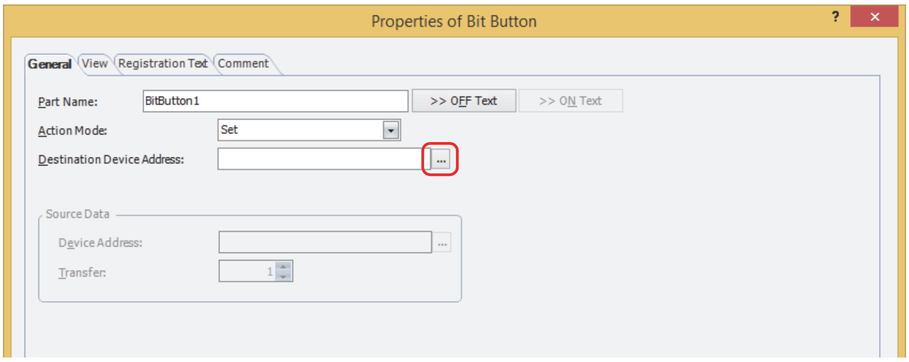
1 Place the Bit Button on the screen, and then double click it.

The Properties dialog box is displayed.



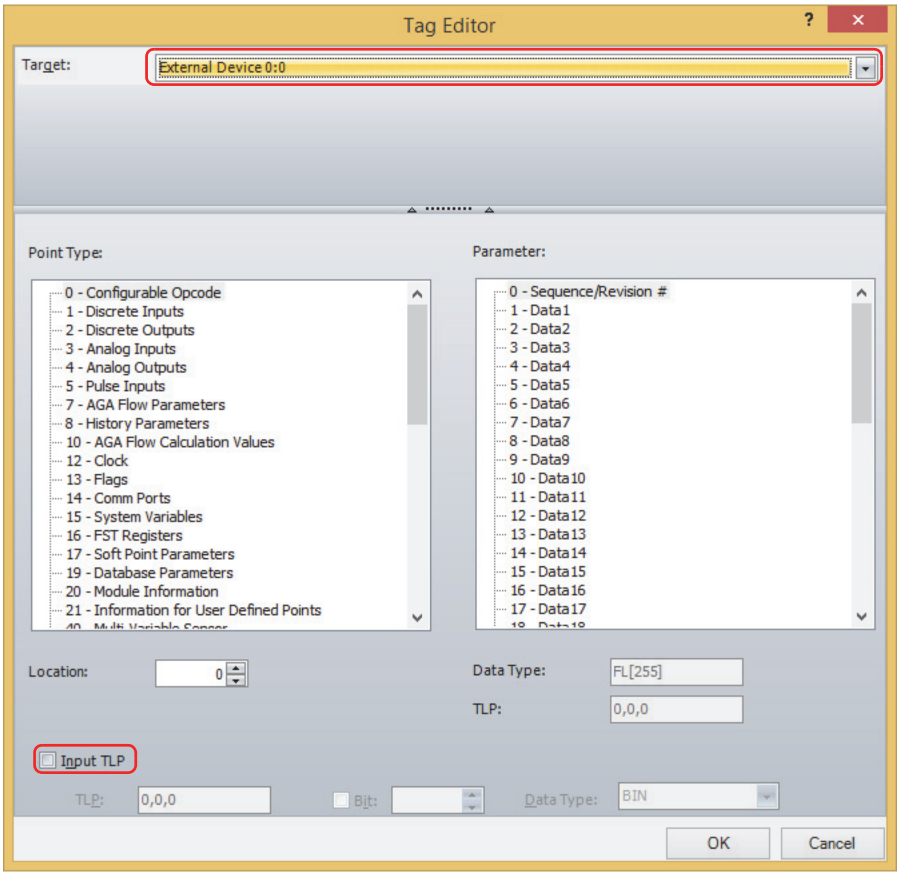
2 Click ... to the right of the **Destination Device Address**.

Tag Editor is displayed.



3 Under **Target**, select the **External Device**.

The controls to set a device address for Emerson ROC are displayed.



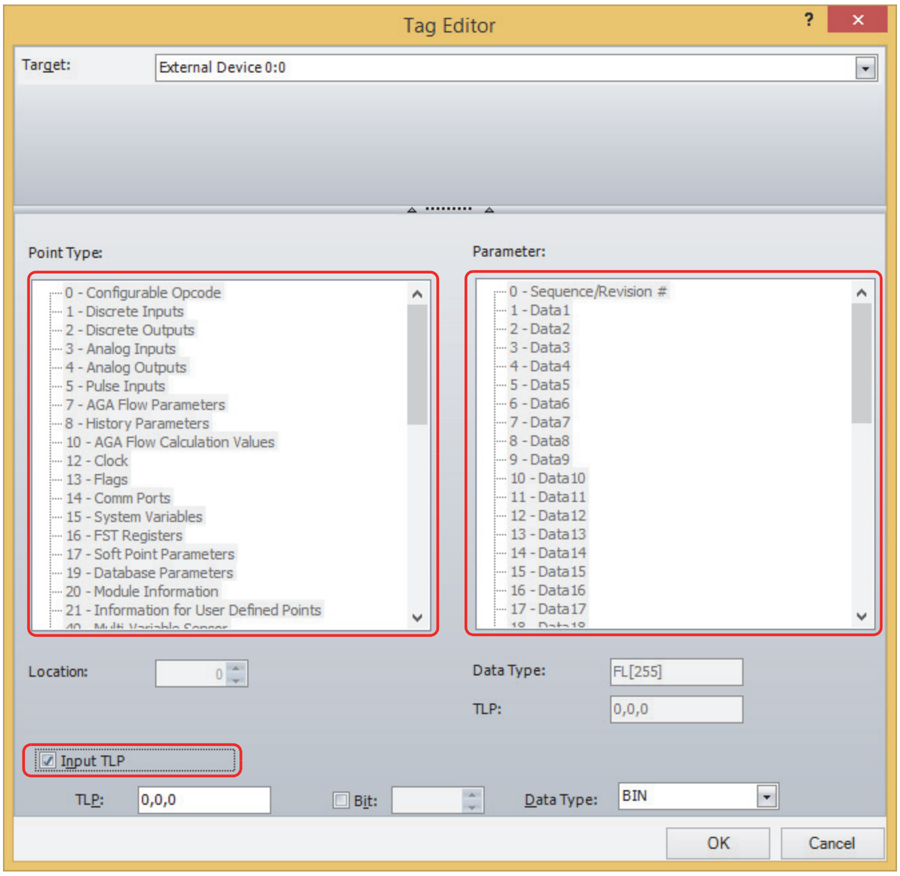
4 Two methods to select for Emerson ROC device address:

☞ "How to select the Point Type, Parameter and Location" on page 2-286
☞ "How to enter the TLP manually" on page 2-287

● 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**.



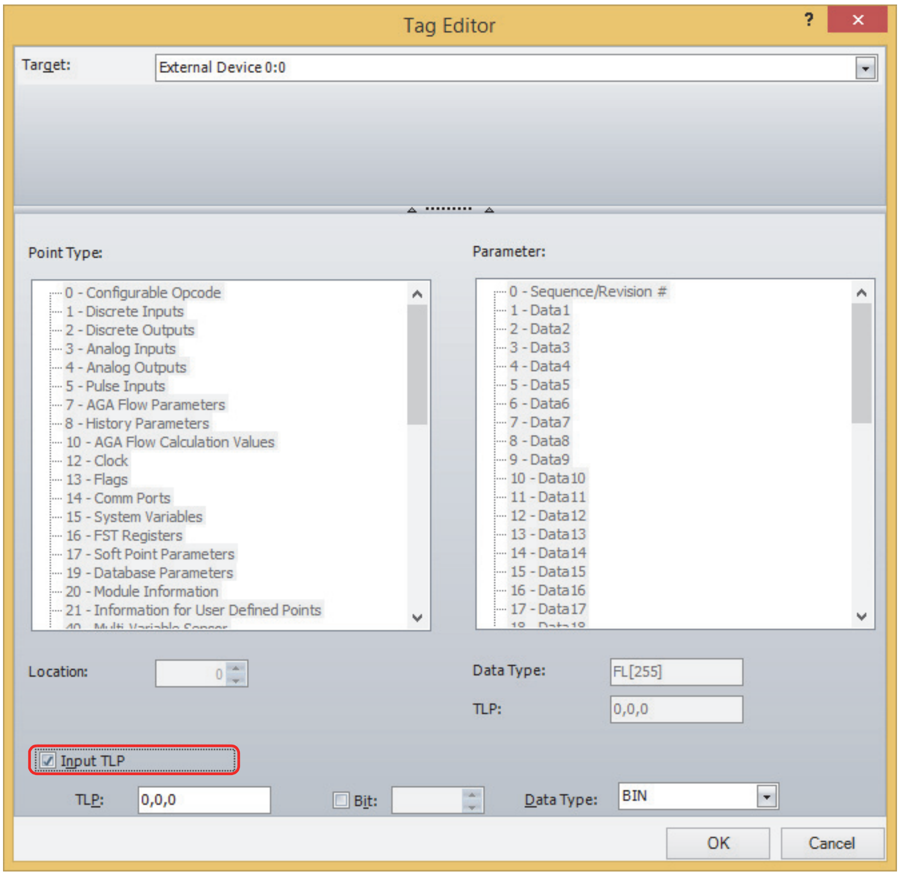
• The following shows the way to set TLP Selection which is selected in Emerson ROC software.

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).

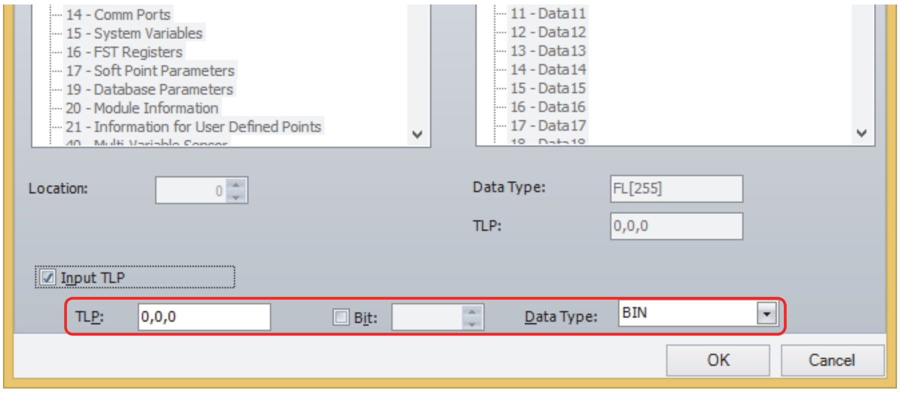
● How to enter the TLP manually

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

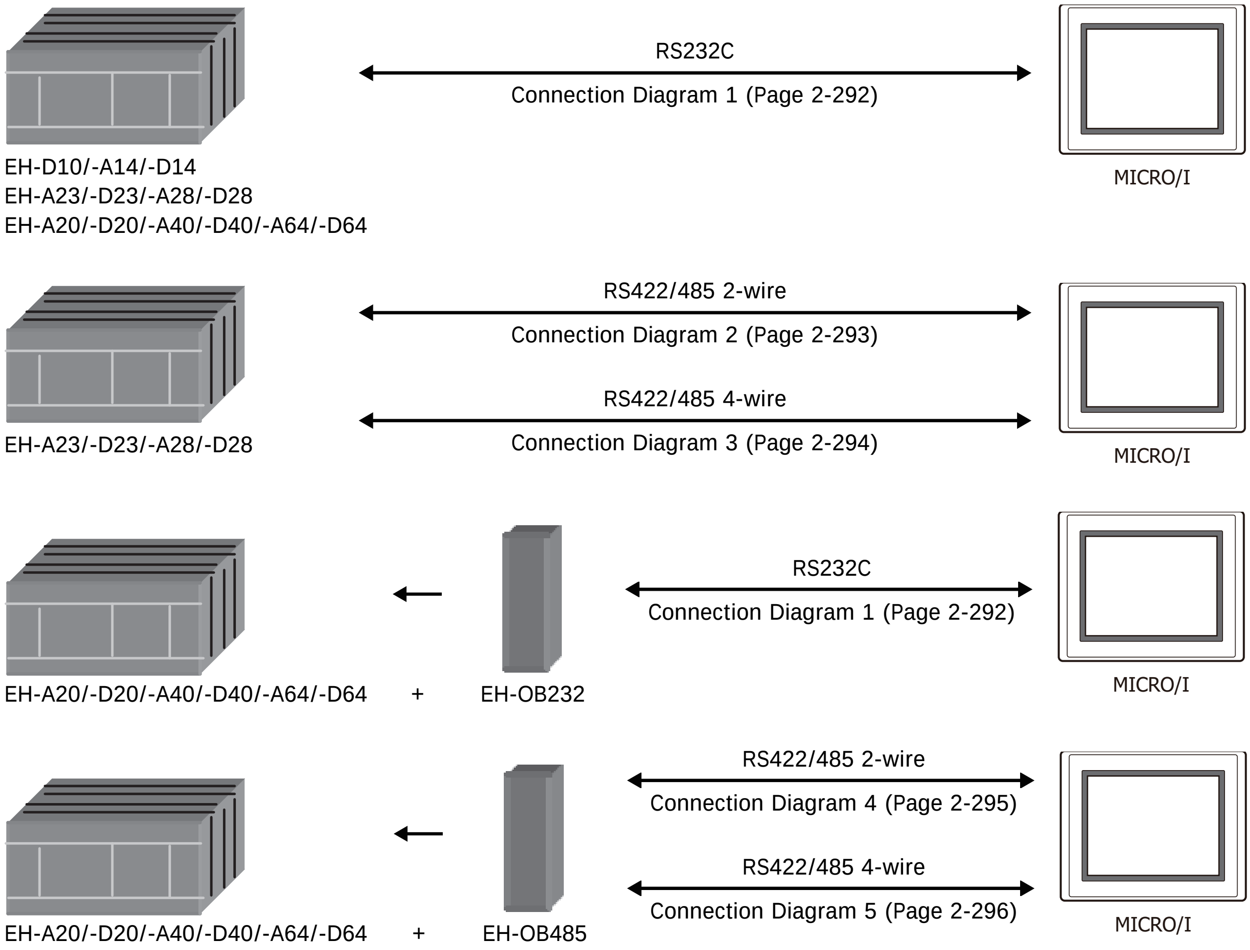
21.1 Connection Table

CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
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)	Ethernet	-	EH (Ethernet)
	EH-ETH2			
Web Controller				
EH-WD10DR EH-WA23DR EH-WD23DR	Not required (Connects to Ethernet port)	Ethernet	-	EH (Ethernet)
MICRO-EH				
EH-D10 EH-A14 EH-D14	Not required (Connects to Serial port)	RS232C Connection Diagram 1 (Page 2-292)	None	EH
EH-A23 EH-D23 EH-A28 EH-D28	Not required (Connects to Serial port 1)	RS232C Connection Diagram 1 (Page 2-292)		
	Not required (Connects to Serial port 2)	RS422/485 2-wire Connection Diagram 2 (Page 2-293)		
		RS422/485 4-wire Connection Diagram 3 (Page 2-294)		
EH-A20 EH-D20 EH-A40 EH-D40 EH-A64 EH-D64	Not required (Connects to Serial port 1)	RS232C Connection Diagram 1 (Page 2-292)		
	EH-OB232	RS232C Connection Diagram 1 (Page 2-292)		
	EH-OB485	RS422/485 2-wire Connection Diagram 4 (Page 2-295)		
		RS422/485 4-wire Connection Diagram 5 (Page 2-296)		
EH-A20 EH-D20 EH-A40 EH-D40 EH-A64 EH-D64	EH-OBETH	Ethernet	-	EH (Ethernet)

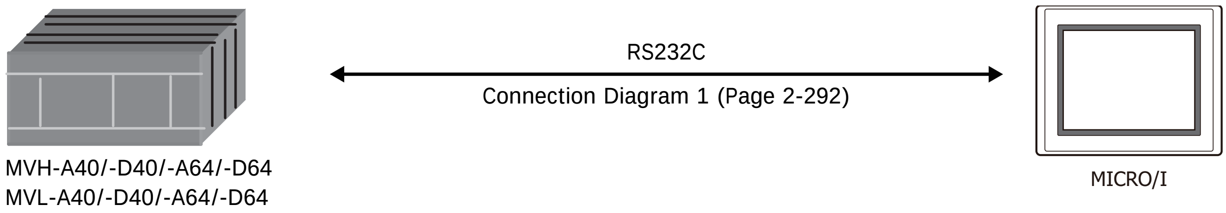
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	Flow Control	Communication Driver
MICRO-EHV				
MVH-A40 MVH-D40 MVH-A64 MVH-D64 MVL-A40 MVL-D40 MVL-A64 MVL-D64	Not required (Connects to Serial port)	RS232C Connection Diagram 1 (Page 2-292)	None	EH
	OBV-NES	RS422/485 2-wire Connection Diagram 6 (Page 2-297)		
	OBV-485A	RS422/485 4-wire Connection Diagram 5 (Page 2-296)		
MVH-A40 MVH-D40 MVH-A64 MVH-D64	Not required (Connects to Ethernet port)	Ethernet	-	EH (Ethernet)

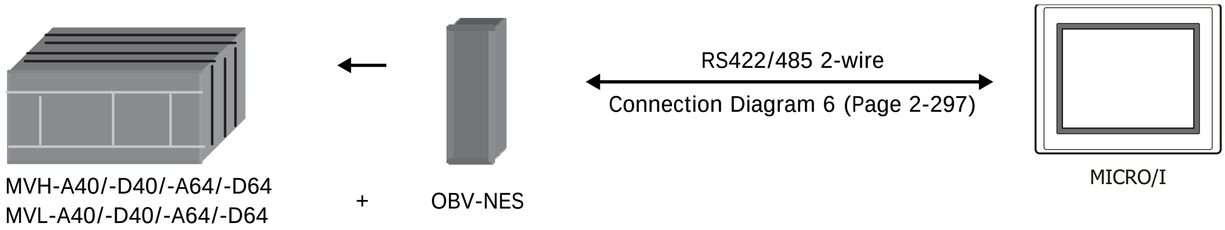
21.2 System Configuration

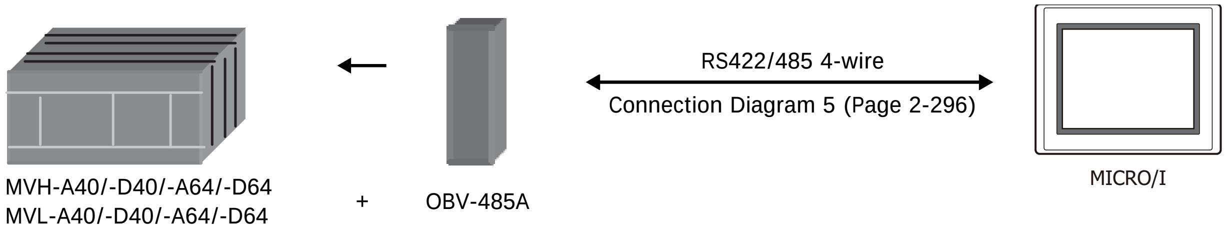
● MICRO-EH Series (Serial port)



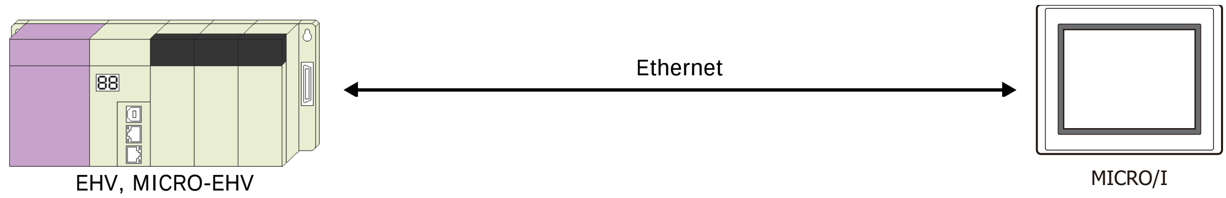
● MICRO-EHV Series (Serial port)

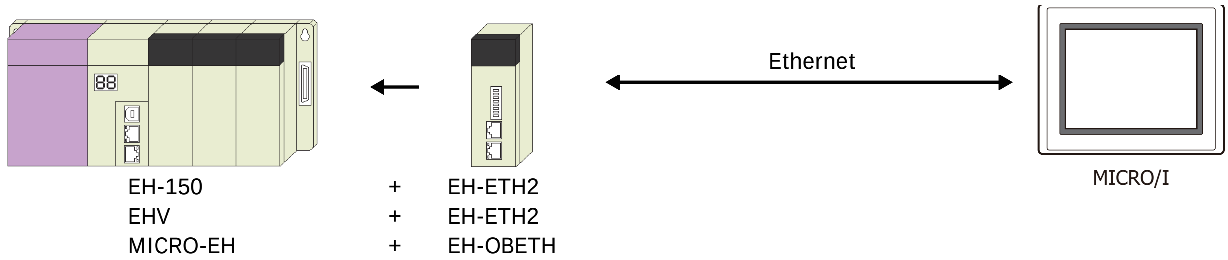






● EH-150, EHV Series (Ethernet)

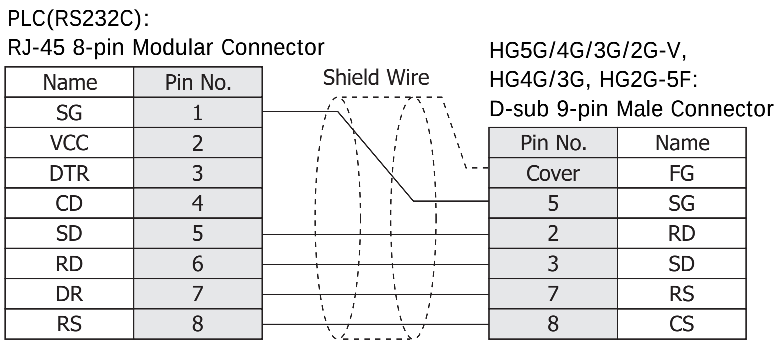


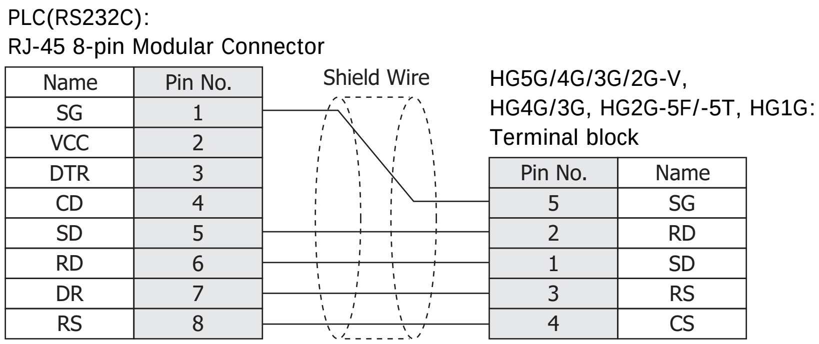


21.3 Connection Diagram

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: MICRO-EH and MICRO-EHV Series (RS232C)

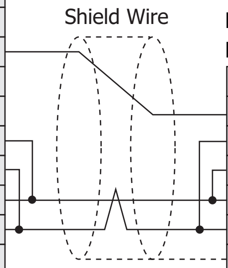




● Connection Diagram 2: MICRO-EH Series Serial port 2 (RS485)

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15



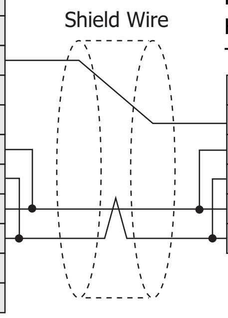
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

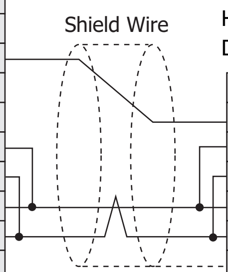
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15



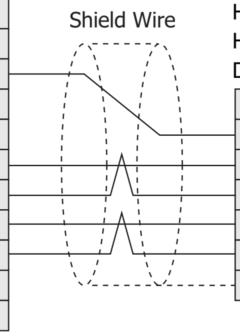
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
6	SG
4	SDB(SD-)
5	SDA(SD+)
2	RDB(RD-)
3	RDA(RD+)
Cover	FG

● Connection Diagram 3: MICRO-EH Series Serial port 2 (RS422)

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15

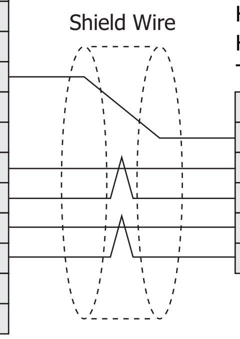


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

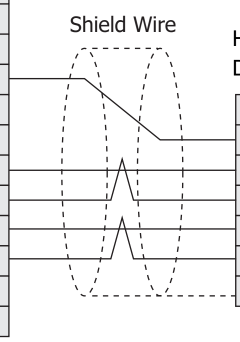
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

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

Name	Pin No.
VCC	5
RSN	6
SG	7
CSP	8
RT	9
RDN	10
RDP	11
SDN	12
SDP	13
RSP	14
CSN	15



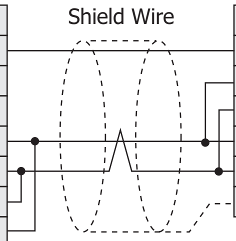
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
6	SG
4	SDB(SD-)
5	SDA(SD+)
2	RDB(RD-)
3	RDA(RD+)
Cover	FG

● Connection Diagram 4: MICRO-EH Series + EH-OB485 (RS485)

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8



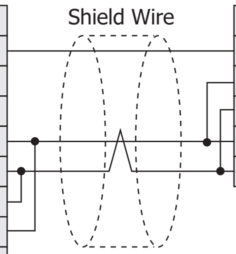
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

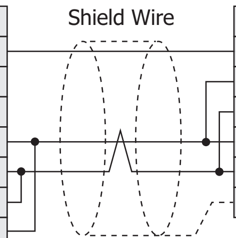
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8



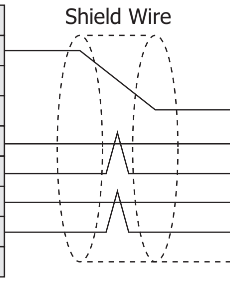
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
6	SG
5	SDA(SD+)
4	SDB(SD-)
3	RDA(RD+)
2	RDB(RD-)
Cover	FG

● Connection Diagram 5: MICRO-EH Series + EH-OB485 (RS422)
MICRO-EHV Series + OBV-485A (RS422)

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8

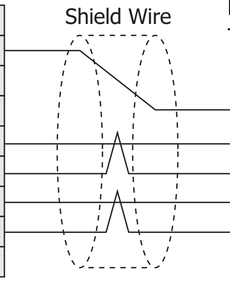


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

When you need a terminating resistor, read the following description.

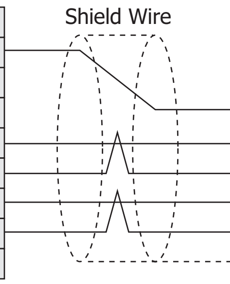
HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	1
VCC	2
NC	3
SDP	4
SDN	5
RDN	6
RDP	7
TERM	8



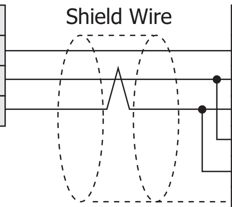
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
6	SG
3	RDA(RD+)
2	RDB(RD-)
4	SDB(SD-)
5	SDA(SD+)
Cover	FG

● Connection Diagram 6: MICRO-EHV Series + OBV-NES (RS485)

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	4
SP	5
SN	6



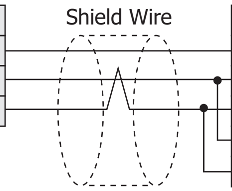
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	4
SP	5
SN	6



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

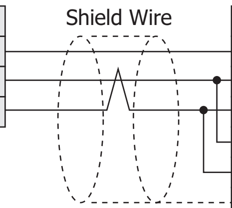
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

PLC(RS422/485):
RJ-45 8-pin Modular Connector

Name	Pin No.
SG	4
SP	5
SN	6



HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
6	SG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
Cover	FG

21.4 Environment Settings

● MICRO-EH/-EHV Series: Connects to Serial port

MICRO/I settings

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

Tab Name	Item	Setting
Communication Interface	Baud Rate*1	115200, 57600, 38400, 19200, 9600 or 4800 bps
	Data Bits	7 bits
	Stop Bits	1 stop bits
	Parity	Even
	Flow Control	None
	Serial Interface*2	RS232C, RS422/485 2-wire or RS422/485 4-wire
Communication Driver	Set the Station Number	It varies based on the **Communication procedure** of the PLC. Procedure1(1:1): Not selected Procedure1(1:n): Selected
Communication Driver Network	Slave Number*3	Set the Station Number (0 to 31) of PLC.

PLC Settings

Item		Setting
Interface	Use the same settings as for the MICRO/I.	RS232C, RS422 or RS485
Baud Rate*1		115200, 57600, 38400, 19200, 9600 or 4800 bps
Station Number		Set the Station Number (0 to 31) of PLC.
Purpose		Dedicated
Communication procedure		Procedure1(1:1) Procedure1(1:n)

● EH-150, EHV Series: Connects to 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)

*1 The communication speed settings varies based on the PLC model. For details, refer to the PLC manual.
*2 The interface settings varies based on the PLC model. For details, refer to the PLC manual.
*3 This setting is disregarded when **Set the Station Number** check box is not selected.

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 Settings (Ethernet Communication Settings (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.

21.5 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 Value)	TC	TC	0 to 2559	R	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)

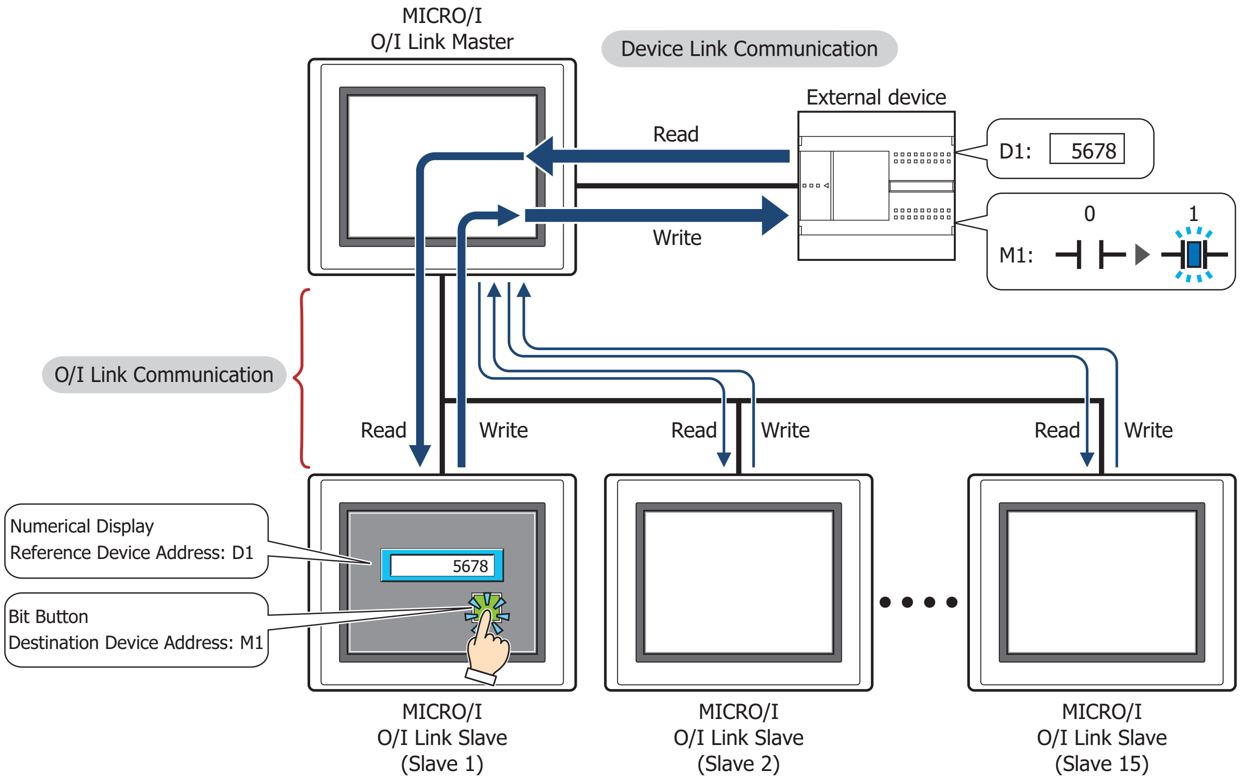
*4 The address number range is as follows:

WEX 5 F 7F
- Word Number (00 to 7F) Hexadecimal
- Slot Number (0 to F) Hexadecimal
- Unit Number (0 to 5)

Chapter 3 O/I Link Communication

1 Outline

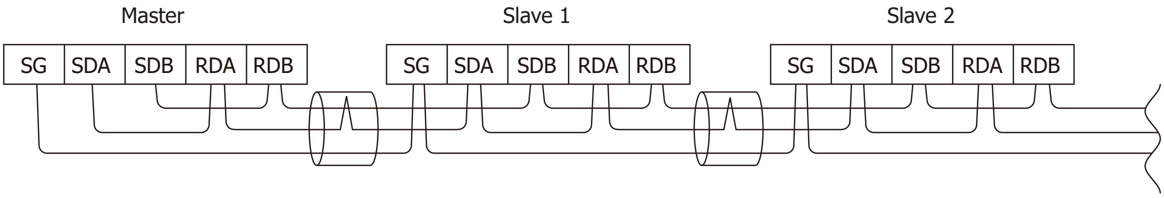
O/I Link Communication is a protocol for communication between Master and Slave, where a MICRO/I connected to the external device is configured as a Master and multiple MICRO/I (Slaves) communicate with the external device via the Master.
The Master MICRO/I unit communicates with the external device 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



O/I Link Communication can only be used for the External Device Communication 1. The communication driver of O/I Link Slave should match the O/I Link Master's.

- Use the runtime system version 4.01 or later when connecting the HG4G/3G, HG2G-5F/-5S/-SHG4G/3G, HG2G-5F/-5T, HG1G via O/I Link Communication.
- The HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G and the HG4F/3F/2F/2S/1F use a different protocol for the O/I Link Communication. To communicate them via the O/I Link Communication, select the **Use the same O/I Link Communication as the HG4F/3F/2F/2S/1F** check box on the **Compatible** tab of the **Project Settings** dialog box.

1.1 Wiring Diagram



- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When connect COM1 of The HG5G/4G/3G/2G-V, HG4G/3G and the SERIAL1 of the HG2G-5T, set the terminating resistor of the HG2G-5T to OFF.
- The HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G and the HG4F/3F/2F/2S/1F use a different protocol for the O/I Link Communication. To communicate them via the O/I Link Communication, select the **Use the same O/I Link Communication as the HG4F/3F/2F/2S/1F** check box on the **Compatible** tab of the **Project Settings** dialog box.

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, refer to 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

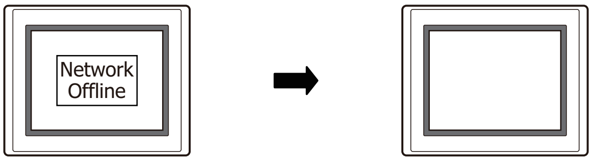
The master does not display O/I Link errors. To monitor for errors, compare LSD102 and LSD104. If they are different, it indicates that there is a communication problem.
In the case of Device Link Communication with the PLC, errors are displayed and the error information is written to the System Area.

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

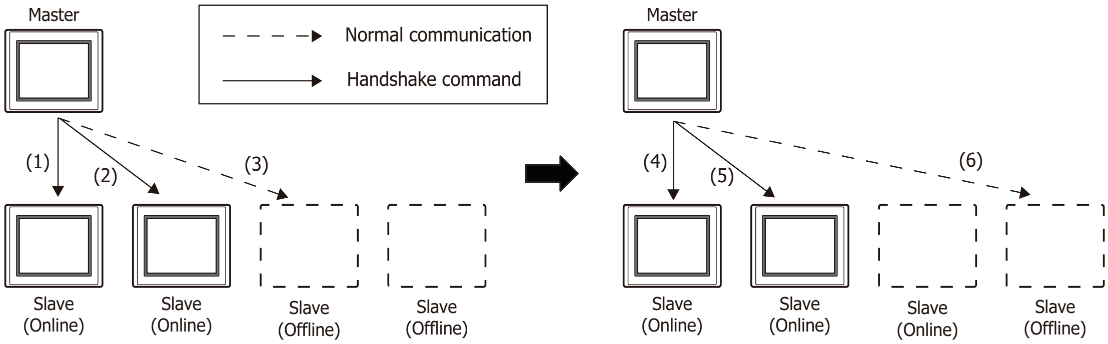


4.3 Status of a Slave in the O/I Link

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.

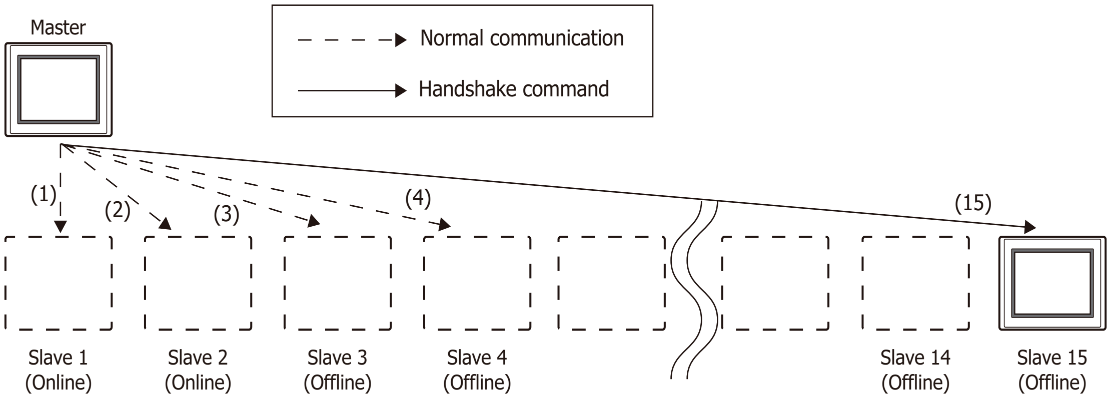


The Time Out duration for the command that detects the presence/absence of a slave (hereafter referred to as a handshake command) is set to 30 msec on the master.
When there are one or more slave units in the offline status, the total scanning time of the O/I Link will increase by 30 msec. Even when 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

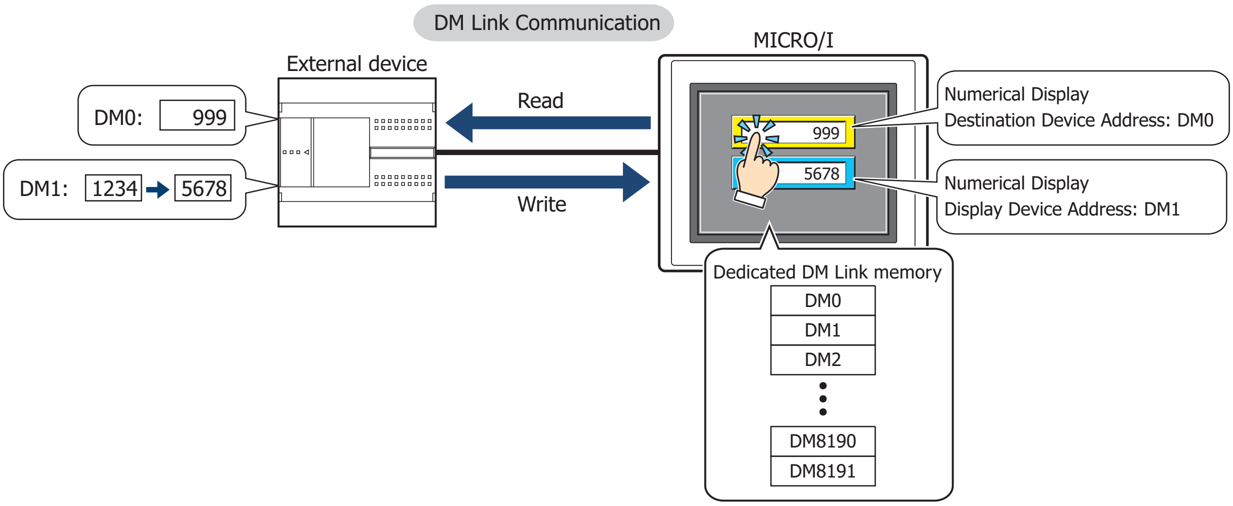
The above measurement results vary depending on the communication driver.
Use the values as a rough guide. Also make sure to evaluate the performance before constructing a system.

*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.

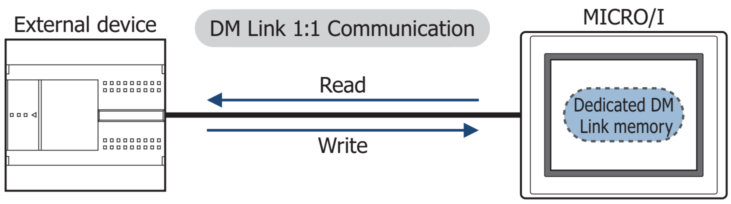


1.1 Communication Methods

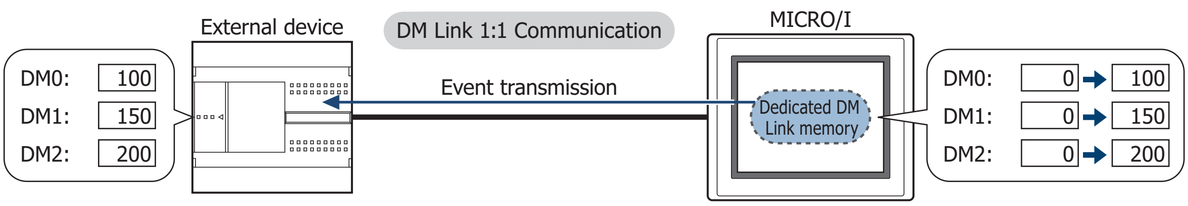
With the DM Link communication, devices such as PLCs, PCs, and board computers (hereafter referred to as external device) read from and write to dedicated DM Link memory (hereafter referred to as data memory) in the MICRO/I. Over the serial interface, when one external device is communicating with one MICRO/I using this communication method it is called DM Link 1:1 communication, and when one external device is communicating with multiple MICRO/I units, it is called DM Link 1:N communication. When external devices and the MICRO/I are communicating using DM Link communication over the Ethernet interface (UDP protocol), it is called DM Link Ethernet (UDP) communication*1.
Each methods use a special protocol developed by IDEC that does not require the external device to run a communications program.

● DM Link 1:1 Communication

The external device is connected to a single MICRO/I by using a serial interface.



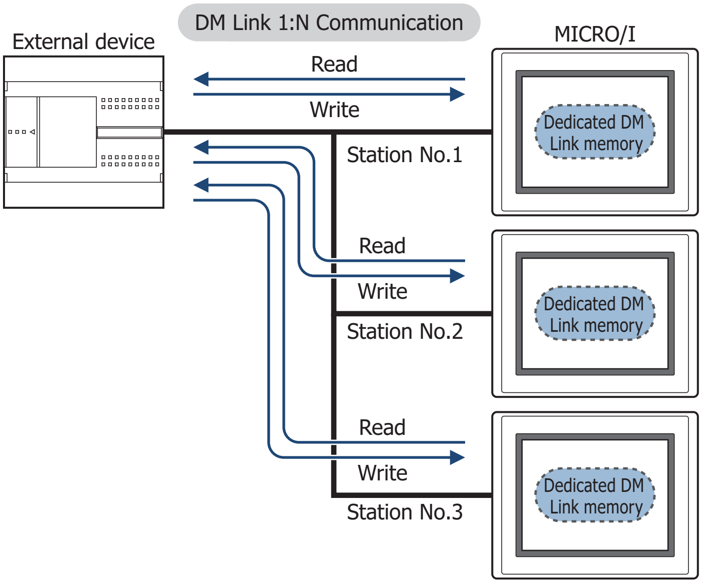
The Event Transmission function from the MICRO/I can be used with DM Link 1:1 Communication.
The Event Transmission function is a function that works as follows. When value in the dedicated DM Link memory of the MICRO/I is changed, the data is transmitted from the MICRO/I to the external device.



*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

● DM Link 1:N Communication

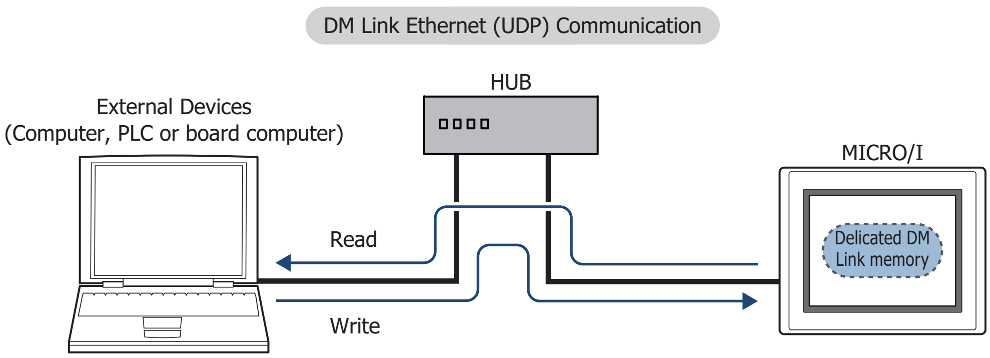
The external device is connected to multiple MICRO/I by using a serial interface.



The Event Transmission function cannot be used with DM Link 1:N Communication.

● DM Link Ethernet (UDP) Communication*1

The external device is connected to multiple MICRO/I by using the Ethernet interface (UDP protocol).



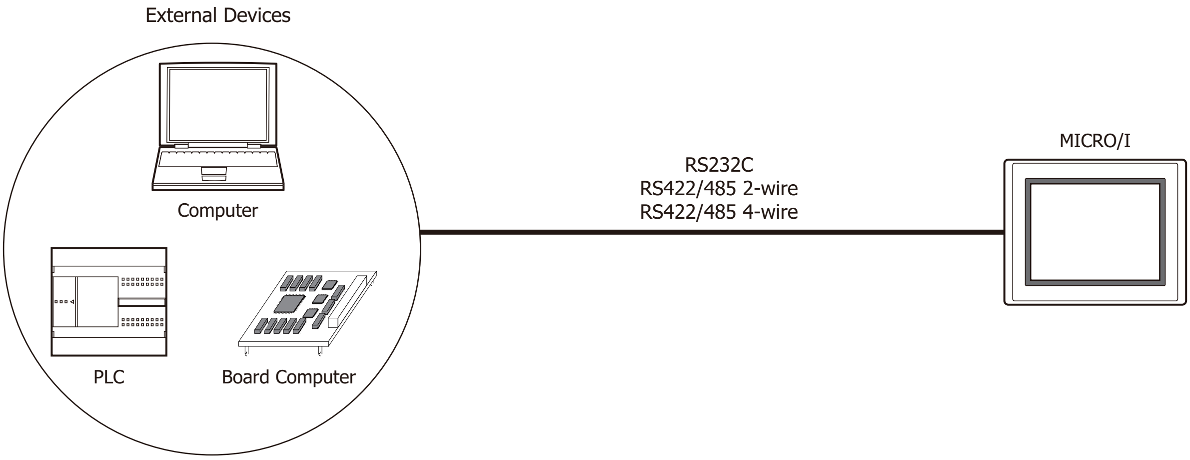
- The Event Transmission function cannot be used with DM Link Ethernet (UDP) communication.
- In DM Link Ethernet (UDP) Communication, when a Response is returned from the MICRO/I to a command source, the Response can also be returned to specified addresses (IP Address, Port Number) at the same time. For details, refer to “5 Data Memory (DM) Allocation” on page 4-11.

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

2 System Configuration

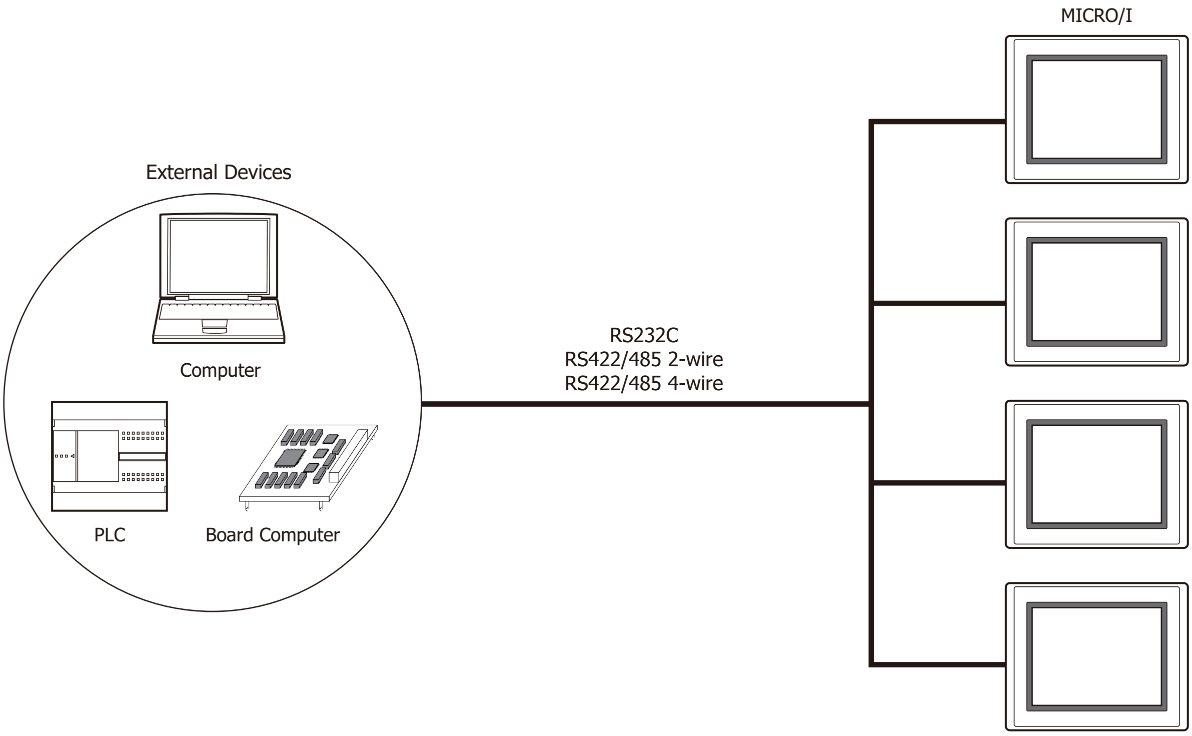
The system configuration for the DM Link communication is shown below.

2.1 DM Link 1:1 Communication



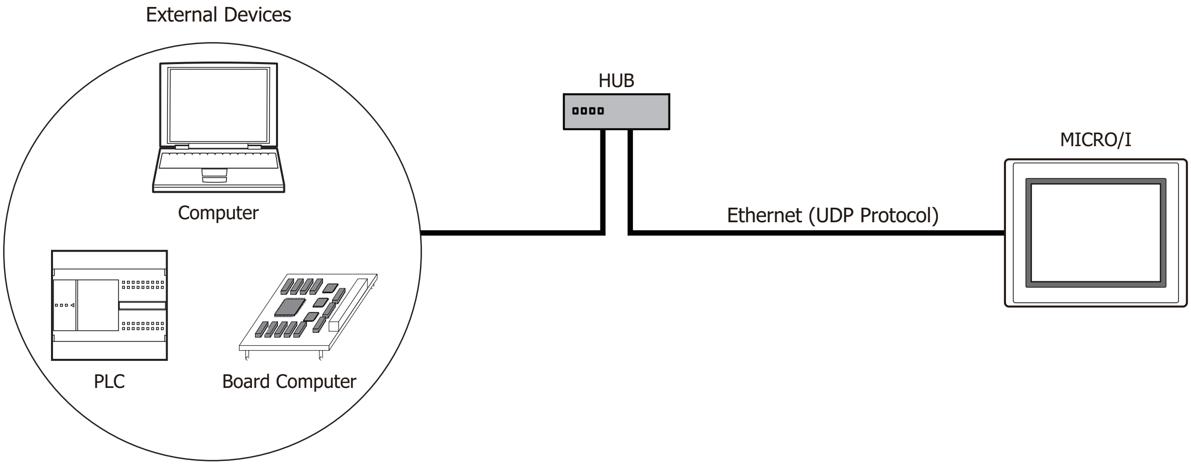
When constructing a system using RS422/485, design the circuit so that when the external device receiver input is not connected, the receiver output is in the mark state.

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.

2.3 DM Link Ethernet (UDP) Communication*1



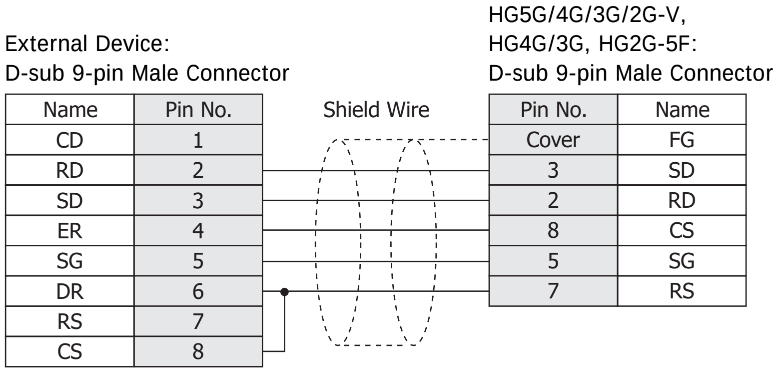
*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

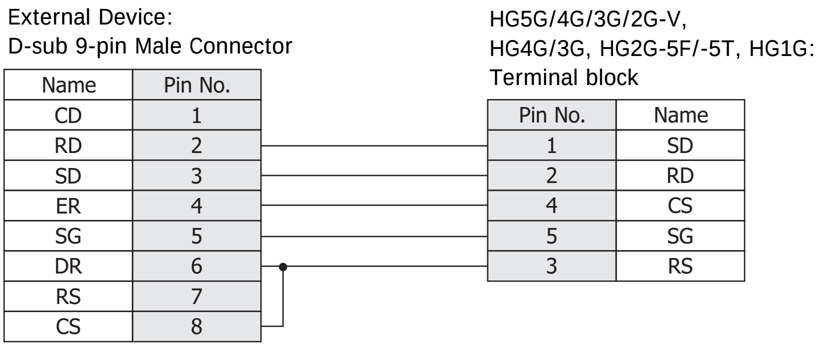
3 Connection Diagram

The following is an example of wiring for use with DM Link communication.

3.1 RS232C*1

● Flow Control setting: ER

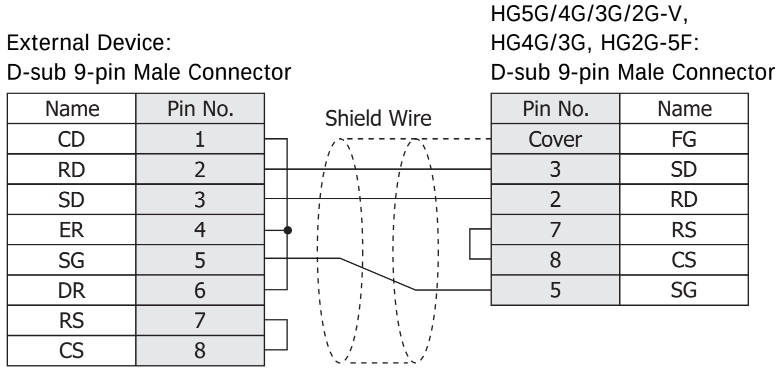


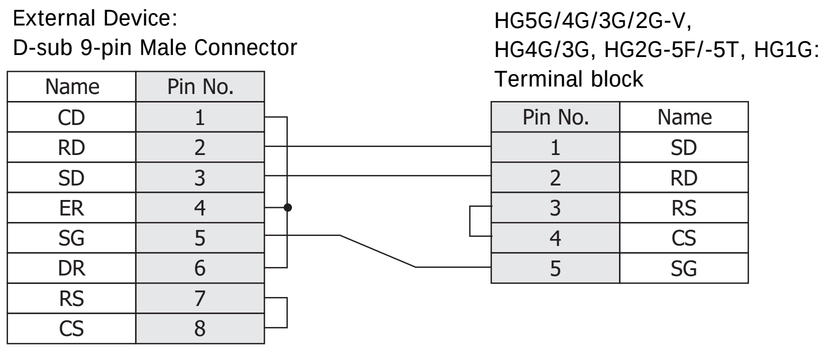


The pin numbers are for a typical personal computer. Be sure to check the pin arrangement for the external device that you will be using.

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G only

● Flow Control setting: None





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

External Device — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

External Device Name	Pin No.	Name
FG	Cover	FG
SDA	1	RDA(RD+)
SDB	6	RDB(RD-)
RDA	4	SDA(SD+)
RDB	9	SDB(SD-)
SG	5	SG

External Device — Shield Wire — HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G: Terminal block

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

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

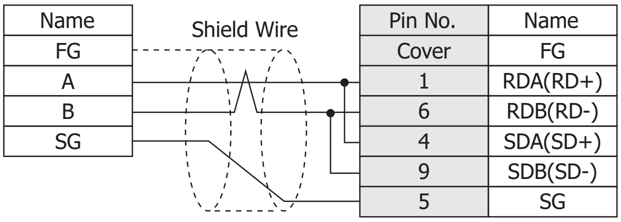
External Device — Shield Wire — HG1P: D-sub 25-pin Male Connector

External Device Name	Pin No.	Name
FG	Cover	FG
SDA	3	RDA(RD+)
SDB	2	RDB(RD-)
RDA	5	SDA(SD+)
RDB	4	SDB(SD-)
SG	6	SG

● 2-wire

External Device

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector



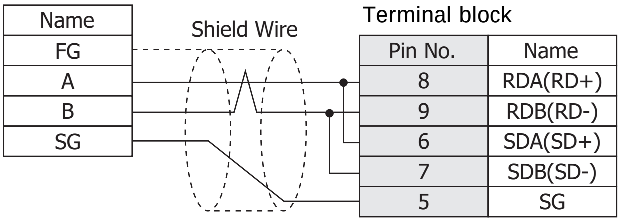
Name
FG
A
B
SG

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.

External Device

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block



Name
FG
A
B
SG

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don’t need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

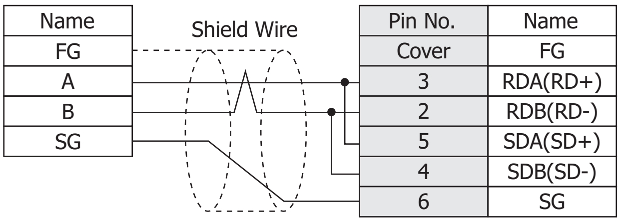
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

External Device

HG1P:
D-sub 25-pin Male Connector



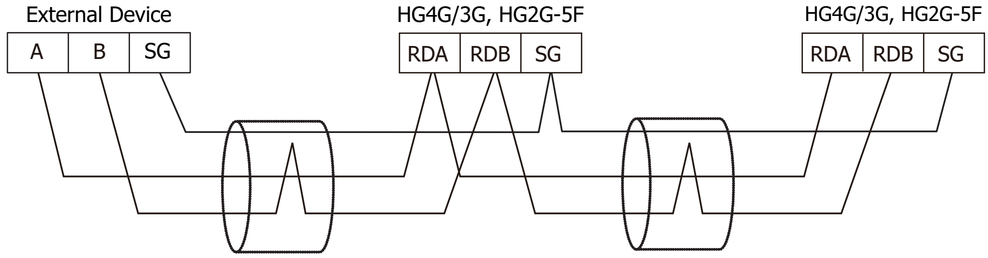
Name
FG
A
B
SG

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

● RS422/485 2-wire (DM Link 1:N Communication: N=2)

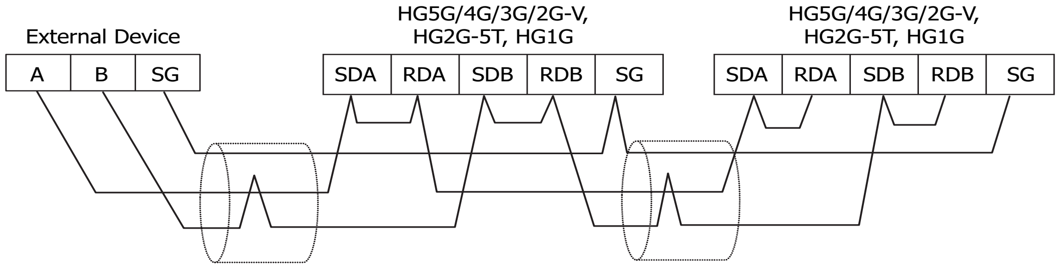
In the following diagram, only describe the terminal name.
Refer to "2-wire" on page 4-8 for the correspondence between the terminal name and the pin number.

HG4G/3G, HG2G-5F



If more than one MICRO/I is connected to an external device, select **RS422/485 2-wire** from **Serial Interface** under **Interface Settings**.

HG5G/4G/3G/2G-V, HG2G-5T, HG1G



If more than one MICRO/I is connected to an external device, select **RS422/485 2-wire** from **Serial Interface** under **Interface Settings**.

4

DM Link Communication

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	

● DM Link Ethernet (UDP) Communication*1

Interface	Protocol
Ethernet	UDP/IP

4.2 Communication Conditions

● DM Link 1:1 Communication, DM Link 1:N Communication

Item	Setting
Synchronization	Asynchronous
Baud Rate	115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 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, DM Link 1:N Communication

Interface	Flow Control
RS232C	None or ER
RS422/485 2-wire	None
RS422/485 4-wire	

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

5 Data Memory (DM) Allocation

In DM Link 1:1 Communication or DM Link 1:N Communication, DM0 to DM13 and DM16 to DM16383*1 or DM8191*2 can be freely used as the User Area.

In DM Link Ethernet (UDP) Communication*3, DM0 to DM13 and DM17 to DM16383*1 or DM8191*2 can be freely used as the User Area. When DM14 is 0, DM16 can be 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 and DM Link Ethernet (UDP) Communication*3.

For DM Link Ethernet (UDP) Communication*3, the address settings control area for the Response can be allocated to DM14 and DM16. When DM14 is 0, DM16 can be used as the User Area. Use this when returning a Response to arbitrary addresses (IP Address, Port Number) at the same time as the Response to the command source.

<table>
<tr><th rowspan="2">Data Memory</th><th colspan="3">Description</th></tr>
<tr><th>DM Link1:1 Communication</th><th>DM Link 1:N Communication</th><th>DM Link Ethernet (UDP) Communication*3</th></tr>
<tr><td>DM0 to 11</td><td>User Area
(Event Transmission can be available)</td><td rowspan="2">User Area</td><td rowspan="2">User Area</td></tr>
<tr><td>DM12, 13</td><td>User Area
(Event Transmission is not available)</td></tr>
<tr><td>DM14</td><td>D0 to D11 Event Transmission enable/disable setting
0: Disable output setting
1: Enable output setting</td><td>Reserved</td><td>Response address settings enable setting
0: Disable address settings
2: Enable address settings</td></tr>
<tr><td>DM15</td><td>Event area start address setting</td><td>Reserved</td><td>Reserved</td></tr>
<tr><td>DM16</td><td rowspan="2">User Area</td><td rowspan="2">User Area</td><td>Start address of the Response address settings area
(Just after the MICRO/I is powered up, the value is 0.)</td></tr>
<tr><td>DM17 to DM16383*1
DM17 to DM8191*2</td><td>User Area</td></tr>
</table>

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, and set the start address of the system area in DM Link Ethernet (UDP) Communication*3 to DM0 or DM17 or higher. For further details regarding the system area, refer to the WindO/I-NV4 User’s Manual.

*1 HG5G/4G/3G/2G-V only
*2 HG4G/3G, HG2G-5F/-5T, HG1G only
*3 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

5.2 Event transmission control area

This function only supports DM Link 1:1 Communication.

● DM0 to DM11 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 DM16383[*1] or DM8191[*2] 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 16384[*1] or 8192[*2] 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.

5.3 Response address settings control area[*3]

This function only supports DM Link Ethernet (UDP) Communication.

● Response address settings area Settings

"Response address settings enable setting" is allocated to DM14.
The function of DM16 depends on the value of DM14. When the value of DM14 is 0, DM16 can be used as the User Area. When the value of DM14 is 2, "Start address of the Response address settings area" is allocated to DM16.

*1 HG5G/4G/3G/2G-V only
*2 HG4G/3G, HG2G-5F/-5T, HG1G only
*3 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

● Response address settings area (The value of DM14 is 2)

Set the number of address settings and the addresses in the Response address settings area. The maximum number of addresses is 4.

When the value of DM16 is n, the address settings area is allocated as shown in the following table.

Data Memory	Description
DM*n*	Number of address settings (0 to 4)
DM*n*+1 DM*n*+2 DM*n*+3 DM*n*+4	Address 1: IP Address
DM*n*+5	Address 1: Port Number
DM*n*+6 DM*n*+7 DM*n*+8 DM*n*+9	Address 2: IP Address
DM*n*+10	Address 2: Port Number
DM*n*+11 DM*n*+12 DM*n*+13 DM*n*+14	Address 3: IP Address
DM*n*+15	Address 3: Port Number
DM*n*+16 DM*n*+17 DM*n*+18 DM*n*+19	Address 4: IP Address
DM*n*+20	Address 4: Port Number

Example

To return a Response from the MICRO/I to the following two devices that are not the command source. (Start address of the Response address settings area is 512.)

- External Device 1
  IP Address: 192.168.0.1, Port Number: 50001
- External Device 2
  IP Address: 192.168.0.2, Port Number: 50002

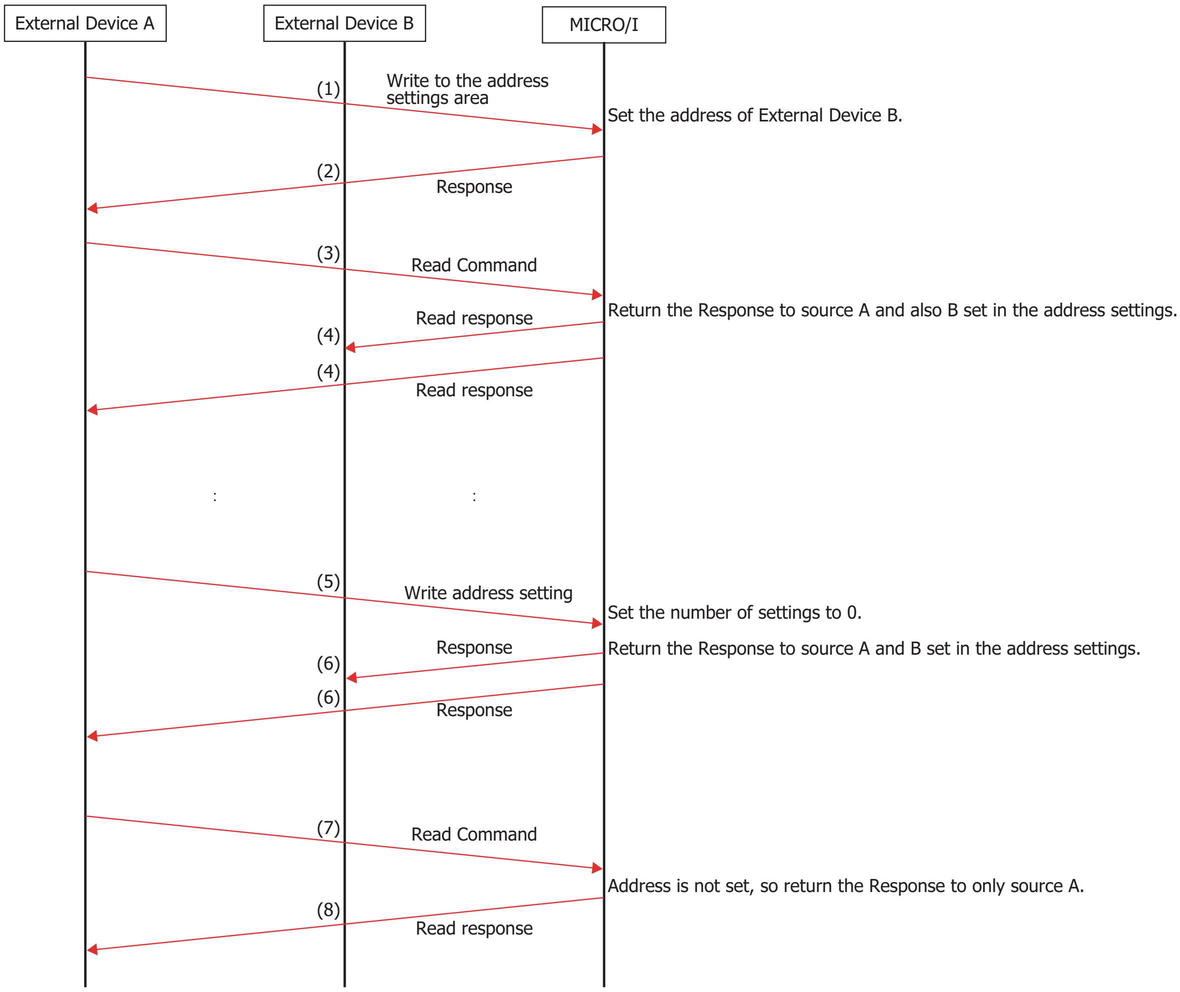
Data Memory	Description	Setting
...		
DM14	Response address settings enable setting	2
...		
DM16	Start address of the Response address settings area	512
...		
DM512	Number of address settings	2
DM513 DM514 DM515 DM516	Address 1: IP Address	192 168 0 1
DM517	Address 1: Port Number	50001
DM518 DM519 DM520 DM521	Address 2: IP Address	192 168 0 2
DM522	Address 2: Port Number	50002

If the number of address settings is 0, the Response is returned to the command source IP address and port number.
If the number of address settings is 4, the Response is returned to the source address and the Address 1 to 4.
If a numeric value other than (0 to 255) is set in each DM Address that stores the IP Address, it will be considered an invalid address and the Response will not be sent to the set addresses.

The command format to read from and write to DM0 to DM16 and to the address settings area is the same as the commands to read from and write to the normal DM areas.

● Communication timing

The communication timing to change a Response address setting is shown in the following diagram.



(1) Send address settings write command from External Device A to the MICRO/I.
Settings content: Set the IP Address and Port Number of External Device B.

(2) Send a Response for the address settings write command.

(3) Send a Read Command from External Device A to the MICRO/I.

(4) Send a Response from the MICRO/I to External Device A and External Device B (source and address settings destination).

(5) Send address settings write command from External Device A to the MICRO/I.
Settings content: Set the number of settings to 0.

(6) Send a Response for the address settings write command (source and address settings destination).

(7) Send a Read Command from External Device A to the MICRO/I.

(8) Send a Response from the MICRO/I to External Device A (source).

4 DM Link Communication

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 to 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. 115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 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

6.2 DM Link Ethernet (UDP) Communication[*1]

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).
	Device Address	
	Time (sec)	
Communication Interface	Function	Select one of **External Device Communication 1** to the **External Device Communication 4** as the interface to be used.
	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	Manufacturer	Select IDEC HG System.
	Communication Driver	Select DM Link Ethernet(UDP) 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.
	Retry Cycles	This setting is not required.
	Time Out (x100 msec)	
Communication Driver Extension Settings	Port Number	Select the UDP port number used for the communication.
	Reserved	This setting is not required.

Duplicate UDP port numbers of MICRO/I cannot be configured in the following functions.

- **UDP** is selected for the User Communication (refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- **OMRON** as **Manufacture** and **SYSMAC CS1/CJ series(Ethernet)** as **Communication Driver** are selected on the Communication Driver tab (refer to Chapter 2 “SYSMAC CS1/CJ series (Ethernet Communication Unit) Settings” on page 2-86)
- **IDEC System** as **Manufacture** and **DM LINK Ethernet(UDP)** as **Communication Driver** are selected on the Communication Driver tab

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F 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**

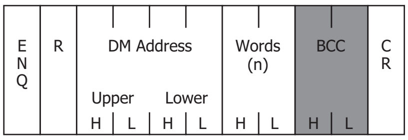
Event Transmission

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

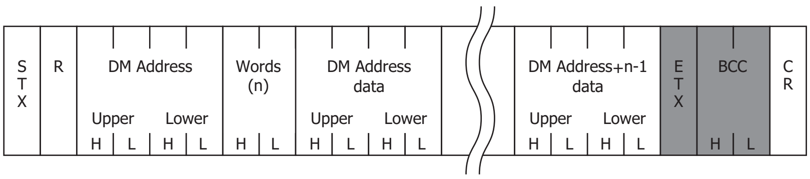


Description

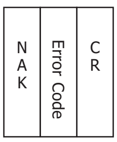
Command	Code	Description	Bytes
ENQ	05h	Command start	1
R	52h	Read Command	1
DM Address		Starting DM address for read. The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
BCC		Only required when **With BCC** is selected. Exclusive OR (Hexadecimal) from ENQ to before BCC converted to ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



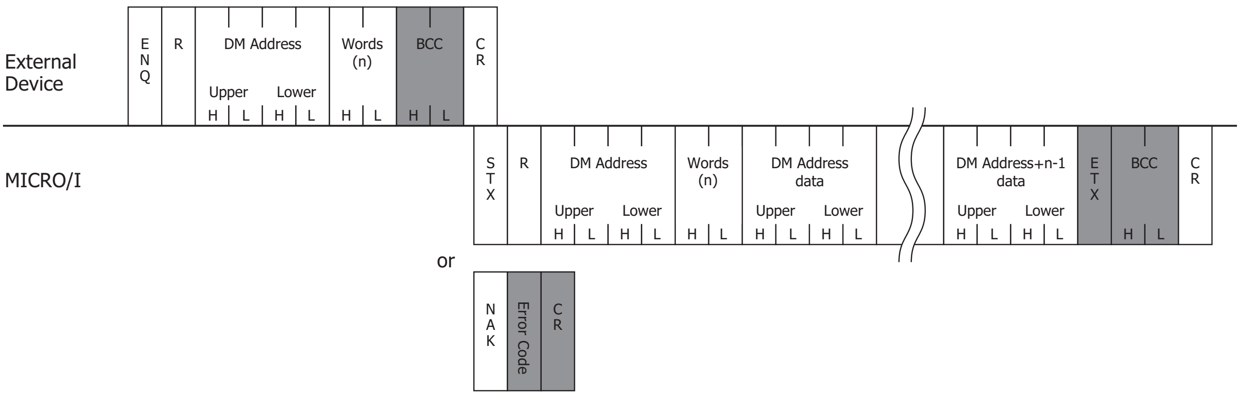
Description: Normal response

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 “11 Error Codes” on page 4-37.)	1
CR	0Dh	Only Protocol format 1. End	1

● Read Sequence

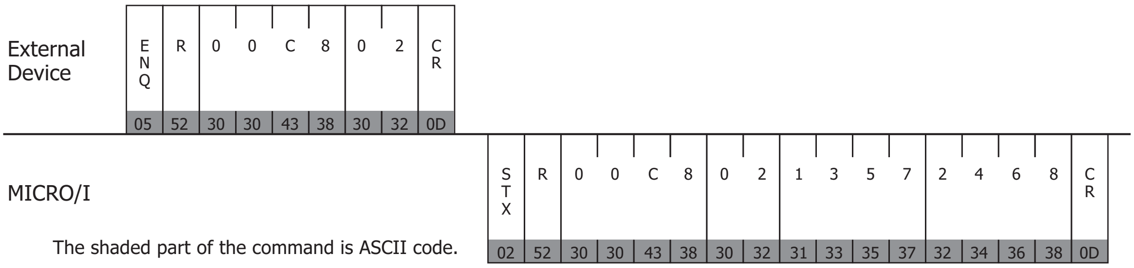


Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Read Communication Example

To read the two words of data in DM200 and DM201 (without BCC, Basic protocol format)

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.

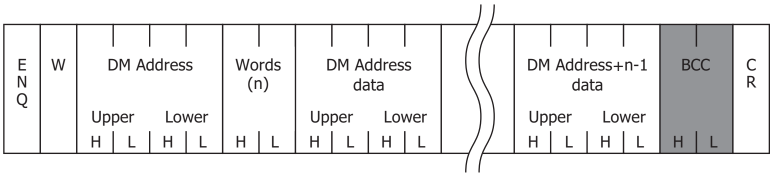


7.2 Write

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

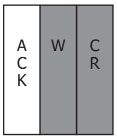


Description

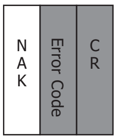
Command	Code	Description	Bytes
ENQ	05h	Command start	1
W	57h	Write Command	1
DM Address		DM address to begin writing from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to write The hexadecimal value expressed using ASCII code.	2
Data		DM ADDRESS DATA. The hexadecimal value 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



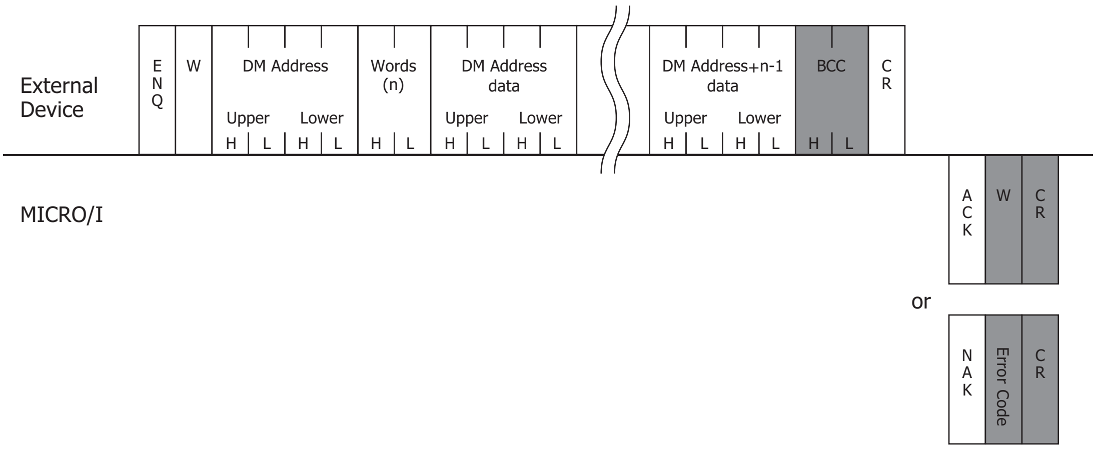
Description: Normal response

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 “11 Error Codes” on page 4-37.)	1
CR	0Dh	Only required when Protocol format 1 is set. End	1

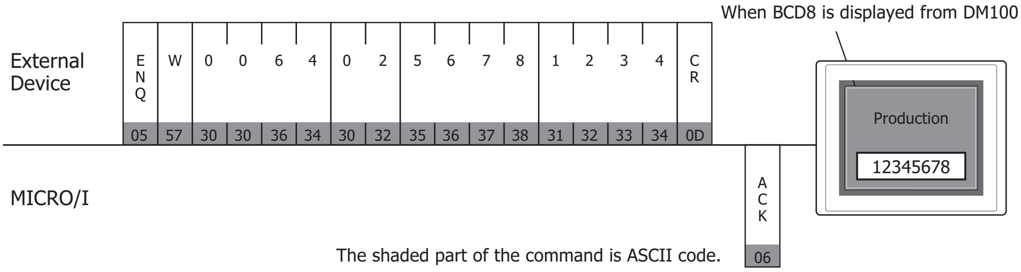
● Write Sequence



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

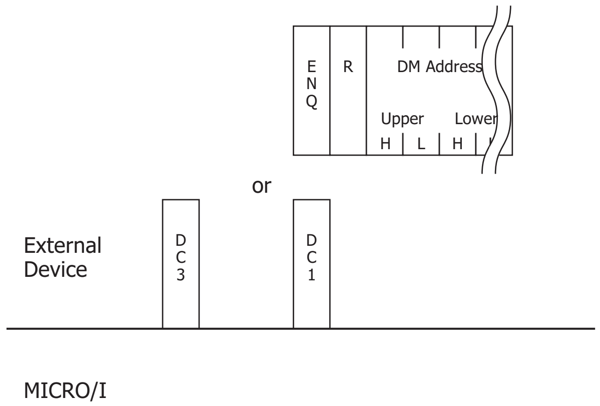
DC1

Description

Command	Code	Description	Bytes
DC1	11h	Transmission Allowed	1

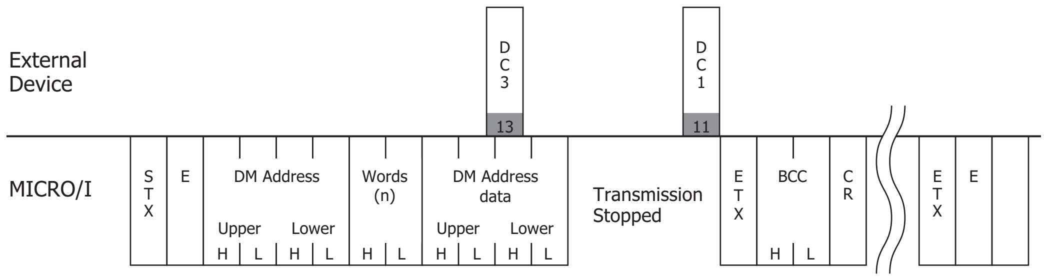
- After the MICRO/I receives DC1, it sends out all event data transmissions that were generated while transmission was stopped.
- There is no response to the Transmission Allowed command.
- When the ENQ (Start Command, 05h) is received, the MICRO/I also enters the Transmission Allowed state.
- After 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

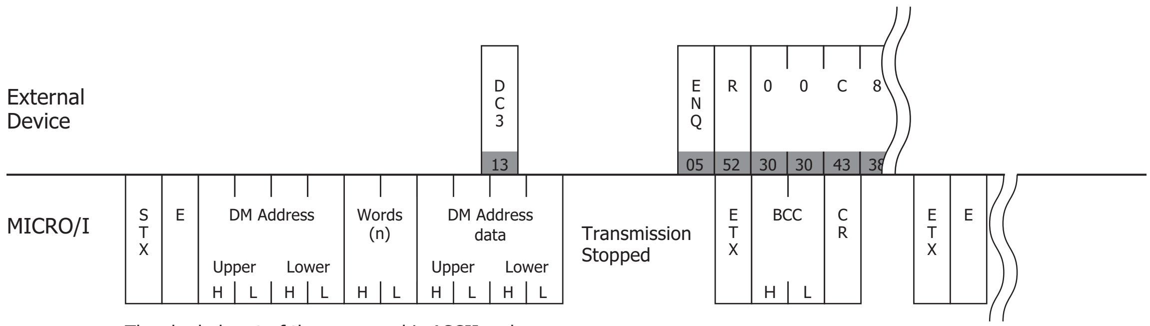


● Transmission Control Communication Example

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

Description

Command	Code	Description	Bytes
EOT	04h	Clear the receive buffer	1

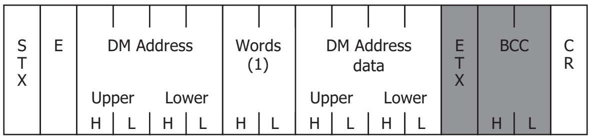
When the MICRO/I receives the EOT command, all data received prior to receiving it is cleared.

7.5 Event Transmission

This is used to perform Event Transmission when a value in the MICRO/I data memory is changed

● Command

Format

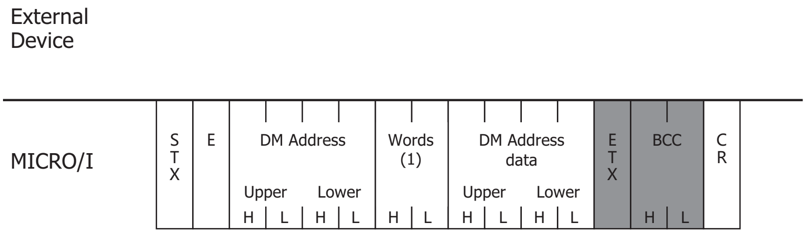


Description

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

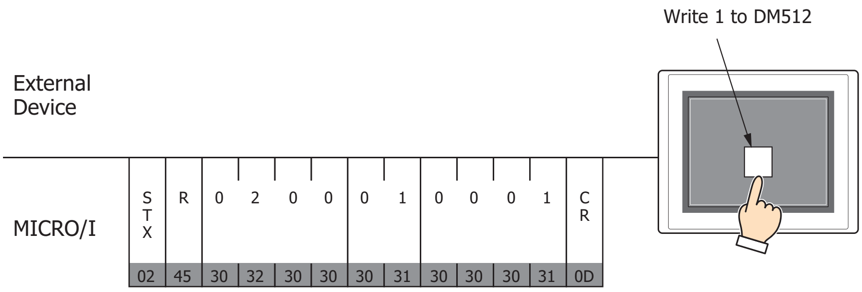
- The Max Event Transmission Words setting is set from 0 to 255.
- Number of Event Transmission words should not be larger than the number of Max Event Transmission Words. When the Max Event Transmission Words is 0, then Event Transmission words is set to 1.

● Event Data Transmission Sequence



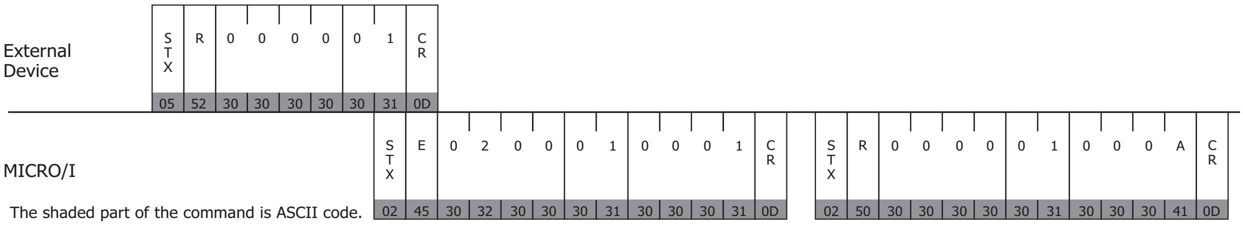
● Event Data Transmission Communication Example

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)



8 DM Link 1:N Communication Format

The communication format with DM Link 1:N Communication is as follows.

■ **Command (Response)**

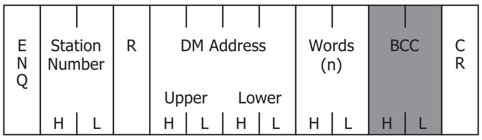
Read
Write
Clear

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

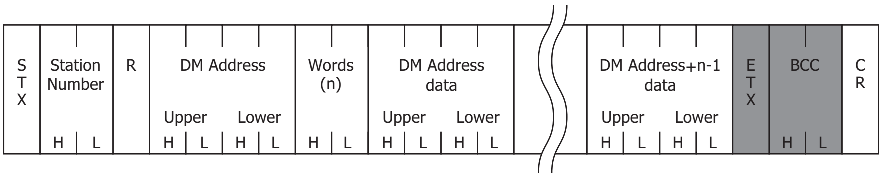


Description

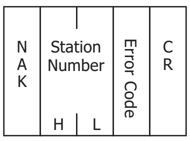
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Station Number		DM Link Station Number expressed in ASCII.	2
R	52h	Read Command	1
DM address		DM address to start reading from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using 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



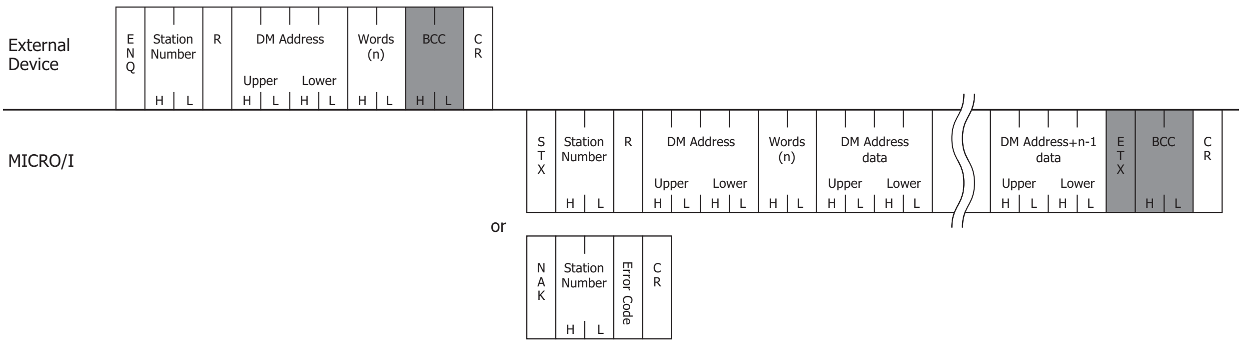
Description: Normal response

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 “11 Error Codes” on page 4-37.	1
CR	0Dh	End	1

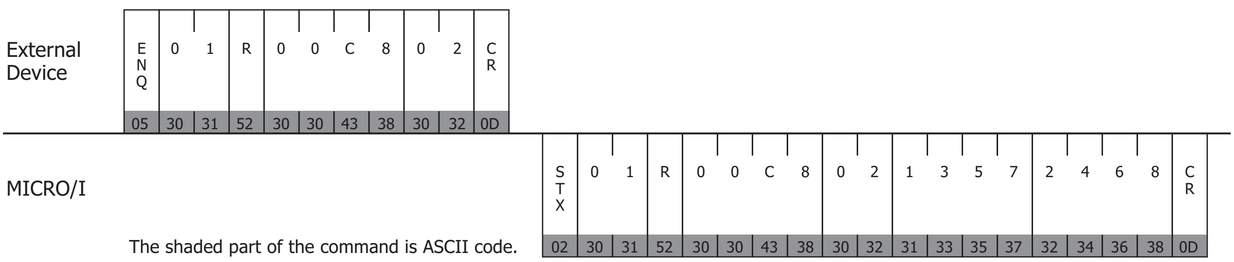
● Read Sequence



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.

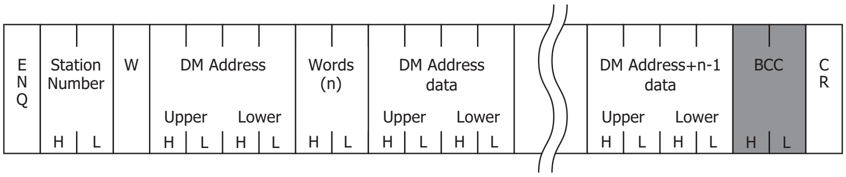


8.2 Write

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

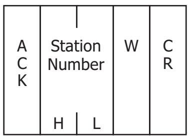


Description

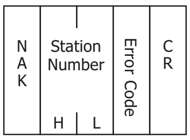
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Station Number		DM Link Station Number expressed in ASCII.	2
W	57h	Write Command	1
DM Address		DM address to start writing from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to write The hexadecimal value expressed using 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



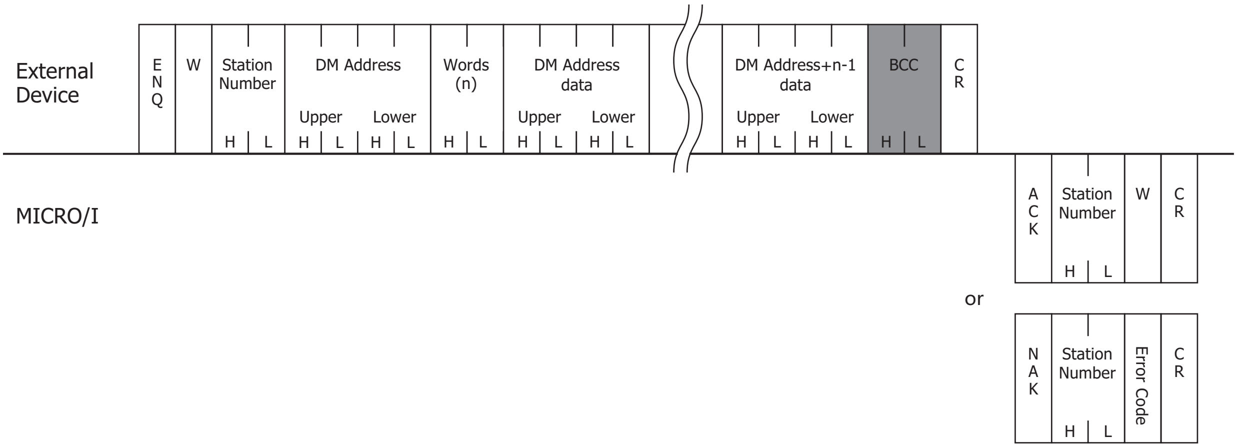
Description: Normal response

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 “11 Error Codes” on page 4-37.	1
CR	0Dh	End	1

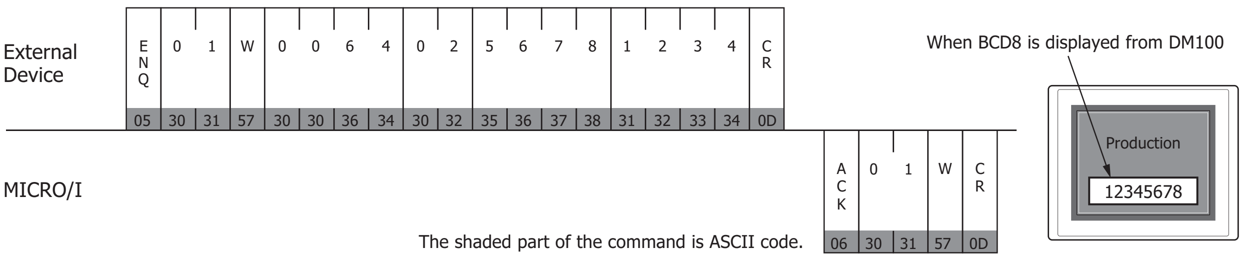
● Write Sequence



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).



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.

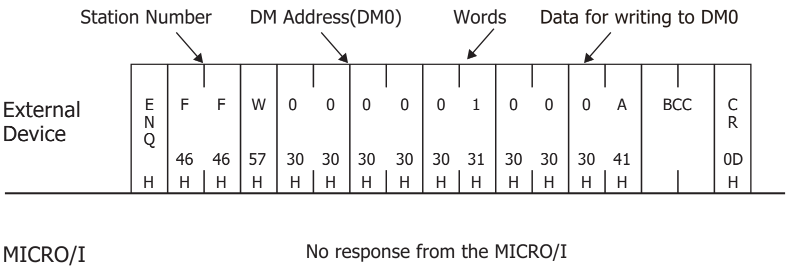
8.4 Station Number

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 DM Link Ethernet (UDP) Communication Format*1

The communication format with DM Link Ethernet (UDP) Communication is as follows.

- **Command (Response)**

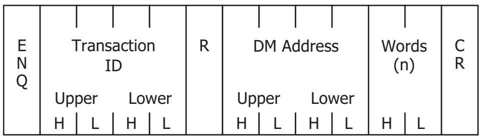
Read
Write

9.1 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.
The MICRO/I returns a response to the device (command source IP address and port number) that sent the command.

● Command

Format

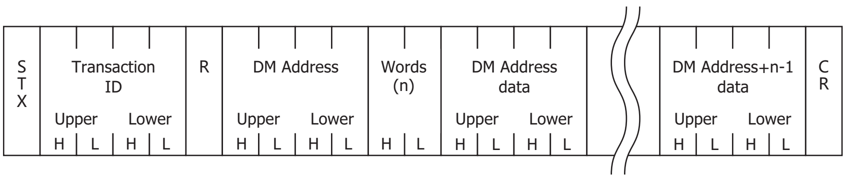


Description

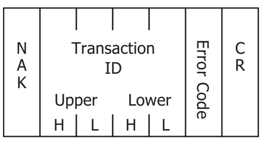
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Transaction ID		MICRO/I sets an ID on the external device side. Specify the ID in a range from 0000h to FFFFh with the hexadecimal value expressed using ASCII code.	4
R	52h	Read Command	1
DM address		DM address to start reading from The hexadecimal value expressed using ASCII code.	4
Words		Number of words to read The hexadecimal value expressed using ASCII code.	2
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

Description: Normal response

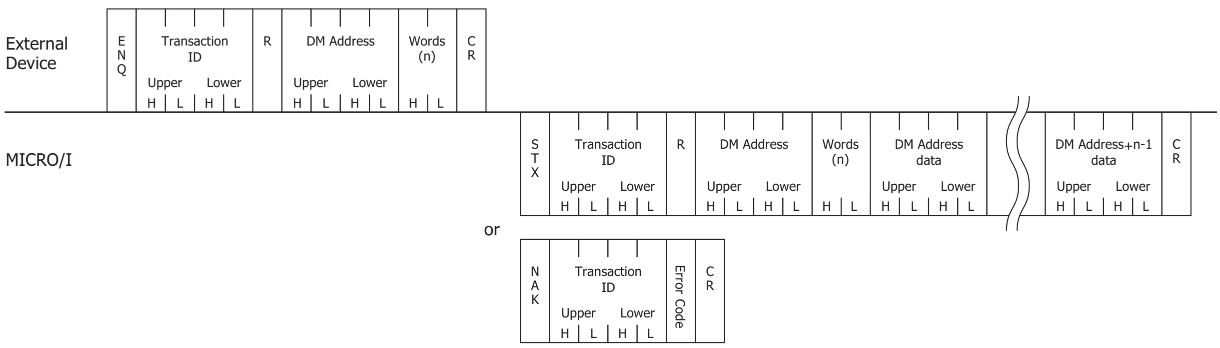
Command	Code	Description	Bytes
STX	02h	Response start	1
Transaction ID		MICRO/I stores the Transaction ID which is set by the external device. The hexadecimal value expressed using ASCII code.	4
R	52h	Read response	1
DM address		DM address to start reading from The hexadecimal value expressed using ASCII 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
CR	0Dh	End	1

Description: Error response

Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Transaction ID		MICRO/I stores the Transaction ID which is set by the external device. The hexadecimal value expressed using ASCII code.	4
Error Code		Added for an error response. (Refer to “11 Error Codes” on page 4-37.)	1
CR	0Dh	End	1

The external device can use the Transaction ID to determine the corresponding command for a received response.

● Read Sequence

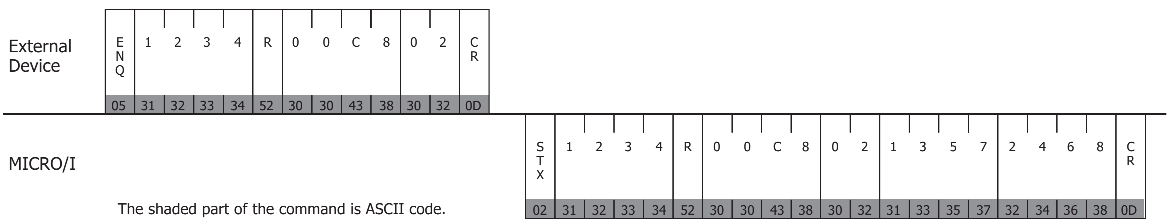


Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Read Communication Example

Read the two words of data from DM200 and DM201

If the data in DM200 is 4951 (1357h), the data in DM201 is 9320 (2468h) , and the Transaction ID is 1234h the sequence is as follows. The DM address 200 (00C8h) is converted to ASCII code and stored.



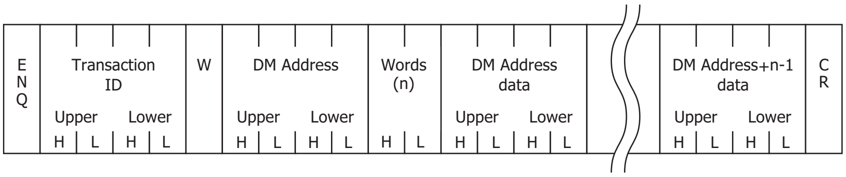
4 DM Link Communication

9.2 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.
The MICRO/I returns a response to the device (command source IP address and port number) that sent the command.

● Command

Format

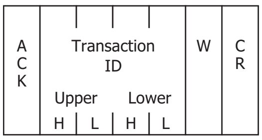


Description

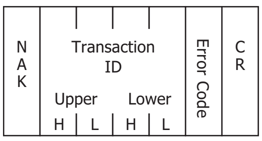
Command	Code	Description	Bytes
ENQ	05h	Command Start	1
Transaction ID		MICRO/I sets an ID on the external device side. Specify the ID in a range from 0000h to FFFFh with the hexadecimal value expressed using ASCII code.	4
W	57h	Write Command	1
DM Address		DM address to start writing from The hexadecimal 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
CR	0Dh	End	1

● Response

Format: Normal response



Format: Error response



Description: Normal response

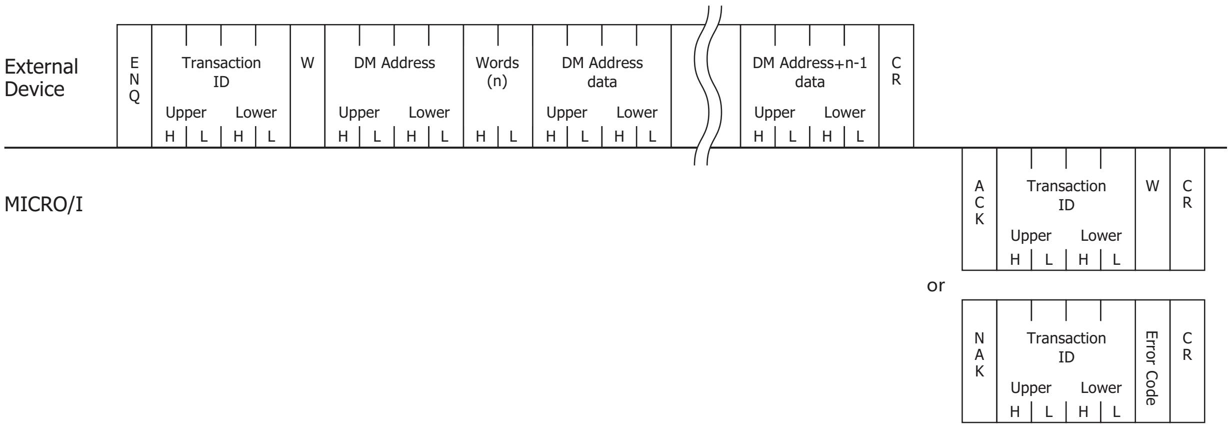
Command	Code	Description	Bytes
ACK	06h	Write finished correctly.	1
Transaction ID		MICRO/I stores the Transaction ID which is set by the external device. The hexadecimal value expressed using ASCII code.	4
W	57h	Write response	1
CR	0Dh	End	1

Description: Error response

Transmission Command	Code	Description	Bytes
NAK	15h	Command was not received correctly.	1
Transaction ID		MICRO/I stores the Transaction ID which is set by the external device. The hexadecimal value expressed using ASCII code.	4
Error code		Added for an error response. (Refer to “11 Error Codes” on page 4-37.)	1
CR	0Dh	End	1

The external device can use the Transaction ID to determine the corresponding command for a received response.

● Write Sequence

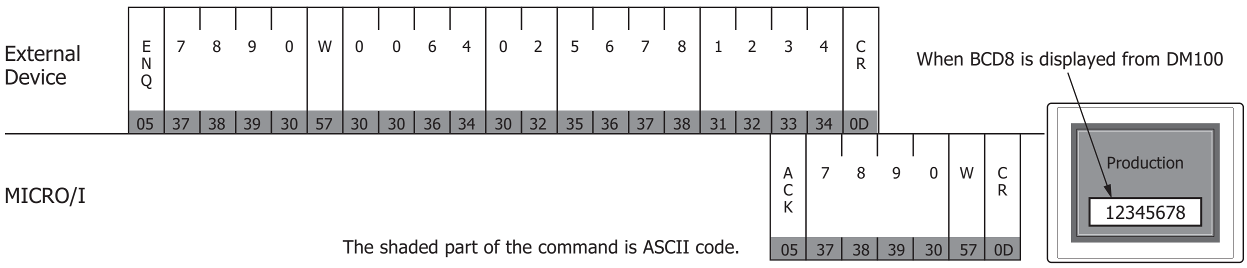


Do not transmit the following command until the external device receives the response of a command which transmitted to the display machine or serves as a timeout.

● Write Communication Example

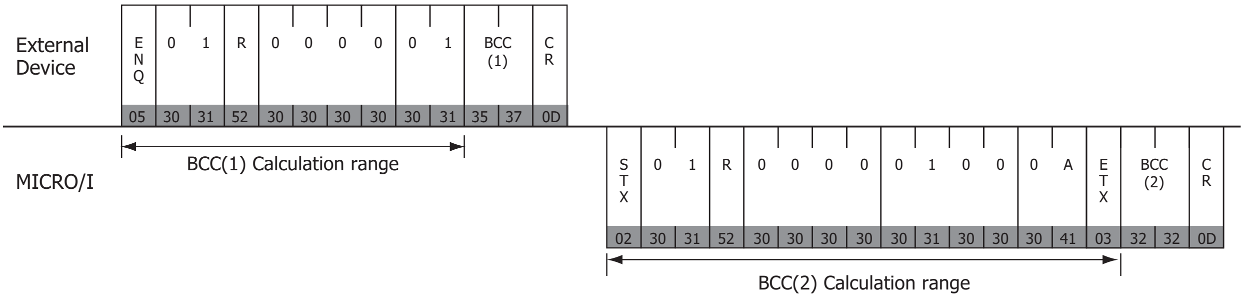
Write 5678h to DM100 and 1234h to DM101 (without BCC)

If the Transaction ID is 7890h the sequence is as follows.
The DM address 100 (0064h) is converted to ASCII code and stored.



10 BCC Calculation

10.1 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

11 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. For DM Link Ethernet (UDP) Communication*1, a response is returned if ENQ(05h), CR(0Dh), and the Transaction ID are correct.
- 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 (DM Link 1:1 Communication, DM Link 1:N Communication: Outside DM0 to DM16383*2 or DM8191*3 DM Link Ethernet (UDP) Communication*1: Outside DM16 to DM16383*2 or DM8191*3)
'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 16383*2 or 8191*3)
'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, DM Link Ethernet (UDP) Communication*1 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.

11.1 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.

With DM Link Ethernet (UDP) Communication*1, when commands are simultaneously received from multiple external devices, the response processing is performed in order from the received commands. However, when a command is continuously received, it may no longer be possible to respond correctly.
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.

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only
*2 HG5G/4G/3G/2G-V only
*3 HG4G/3G, HG2G-5F/-5T, HG1G only

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 "6 Modbus TCP Server, Modbus RTU Slave Function" on page 5-14.

1.2 Compatible Table

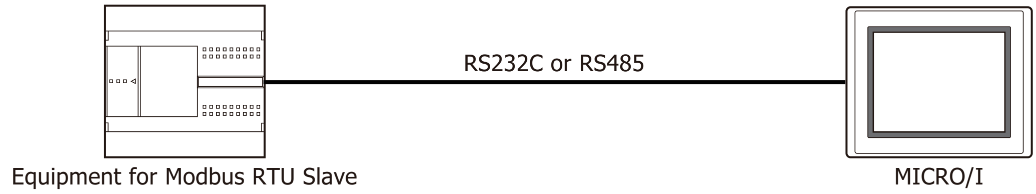
CPU unit	Link Unit	WindO/I-NV4 Settings		
		Interface	**Flow Control**	**Communication Driver**
Schneider Twido				
TWD LC*A 10DRF	Not required (Connects to CPU unit)	RS422/485 2-wire Connection Diagram 2 (Page 5-9)	None	Modbus RTU Master, Modbus ASCII Master
TWD LC*A 16DRF TWD LC*A 24DRF TWD LCA* 40DRF	Not required (Connects to CPU unit)	RS422/485 2-wire Connection Diagram 2 (Page 5-9)		
	TWD NAC 232D	RS232C Connection Diagram 1 (Page 5-8)	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 5-10)		
TWD LMDA 20DTK TWD LMDA 20DUK TWD LMDA 20DRT TWD LMDA 40DTK TWD LMDA 40DUK	Not required (Connects to CPU unit)	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 5-8)	ER	
	TWD NOZ 485T	RS422/485 2-wire Connection Diagram 3 (Page 5-10)		
	TWD XCP ODM+TWD NAC 232D	RS232C Connection Diagram 1 (Page 5-8)	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 5-10)		
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.

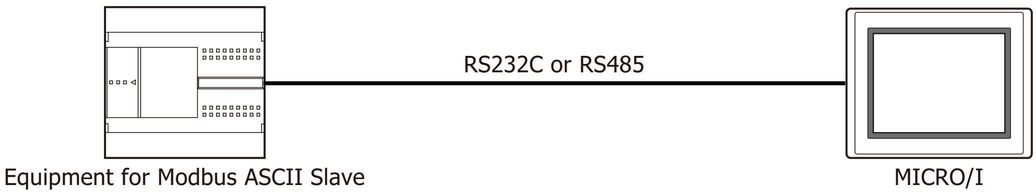
2 System Configuration

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

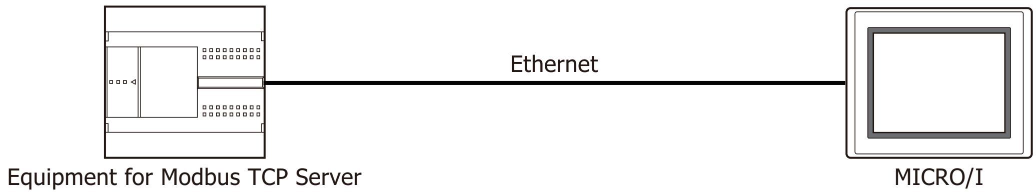
2.1 Modbus RTU Master



2.2 Modbus ASCII Master

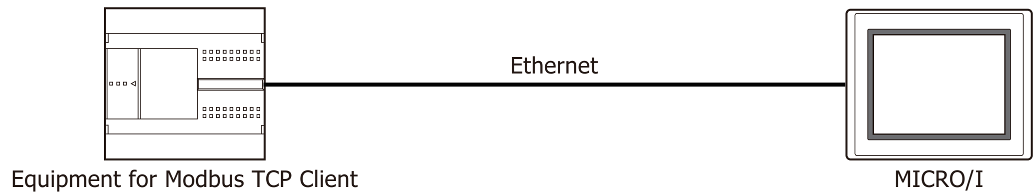


2.3 Modbus TCP Client



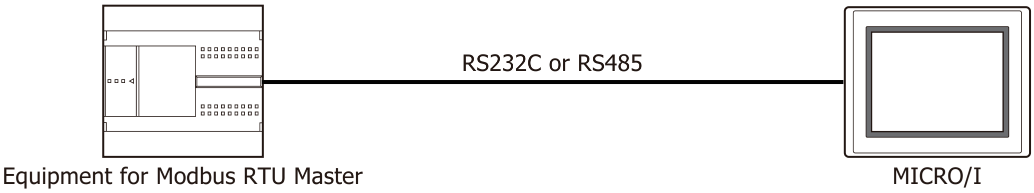
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

2.4 Modbus TCP Server



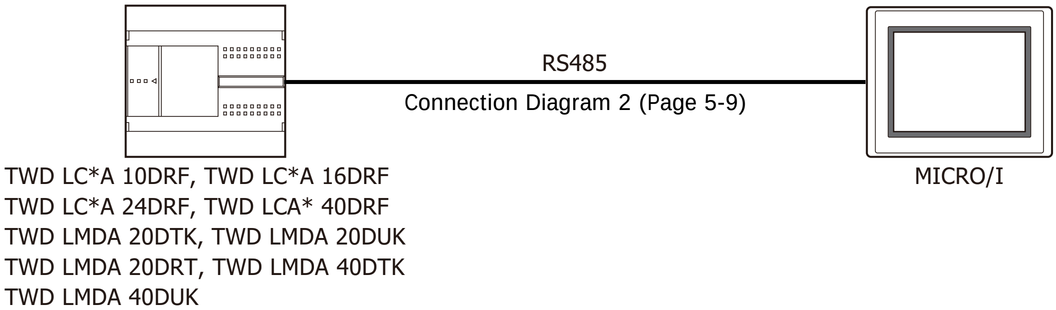
- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.

2.5 Modbus RTU Slave

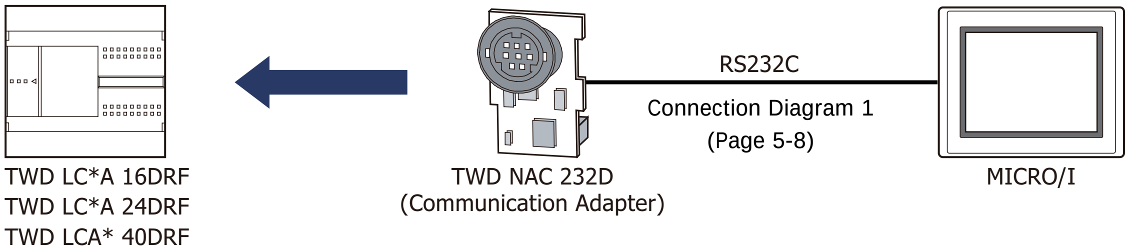


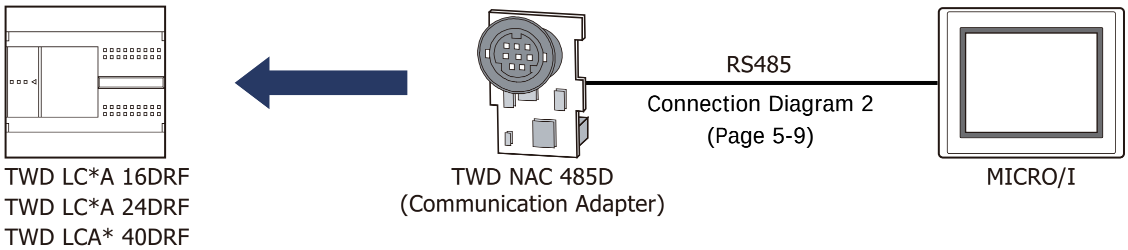
2.6 Twido

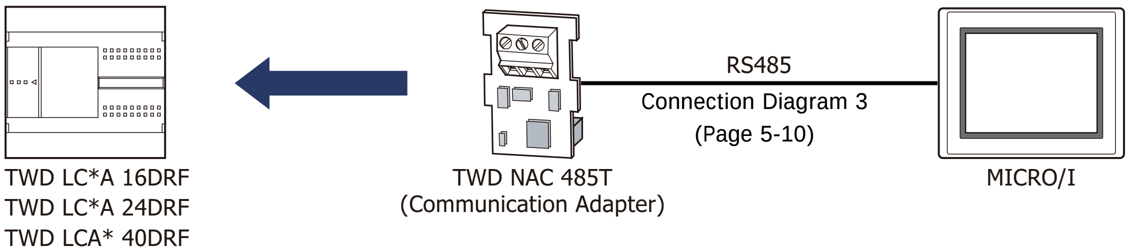
● Serial port on the CPU module



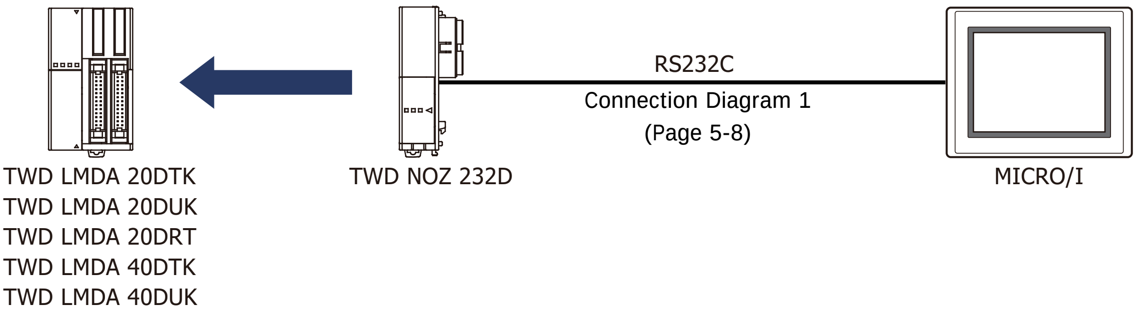
● Compact Controller + Communication Adapter

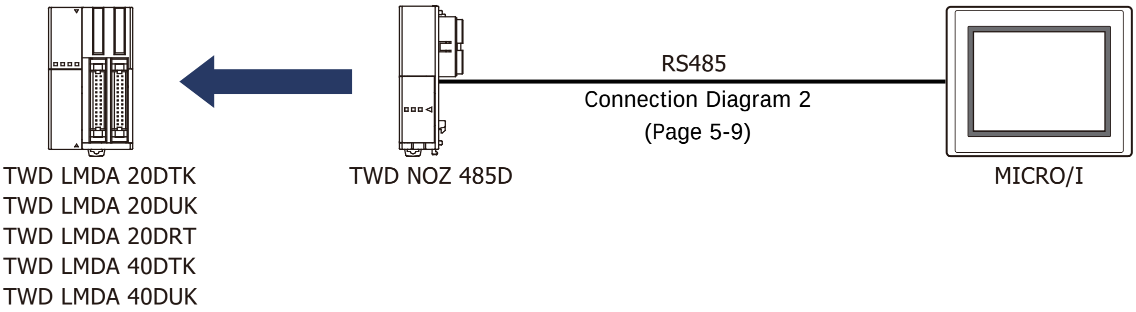


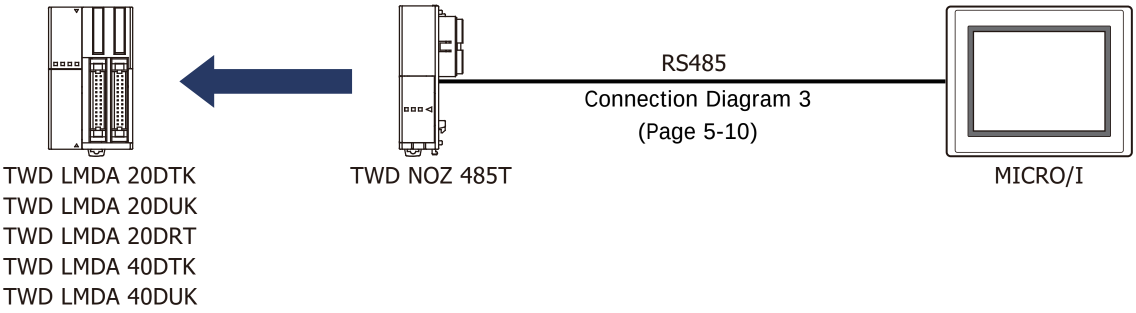




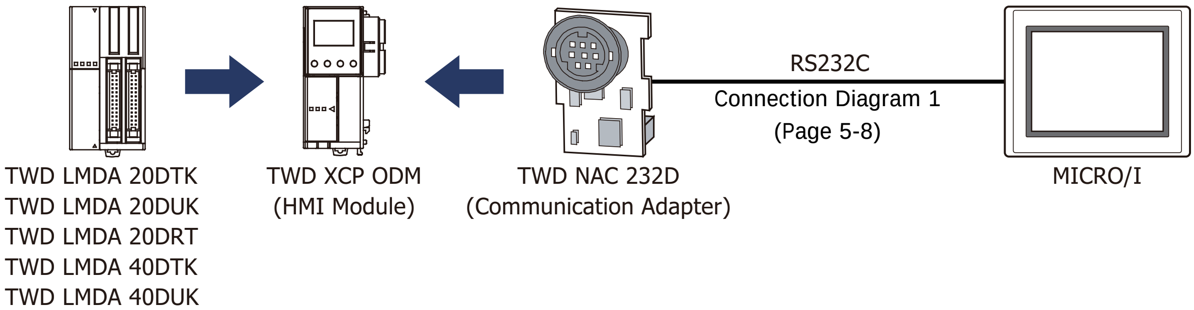
● Module Controller + Communication Module

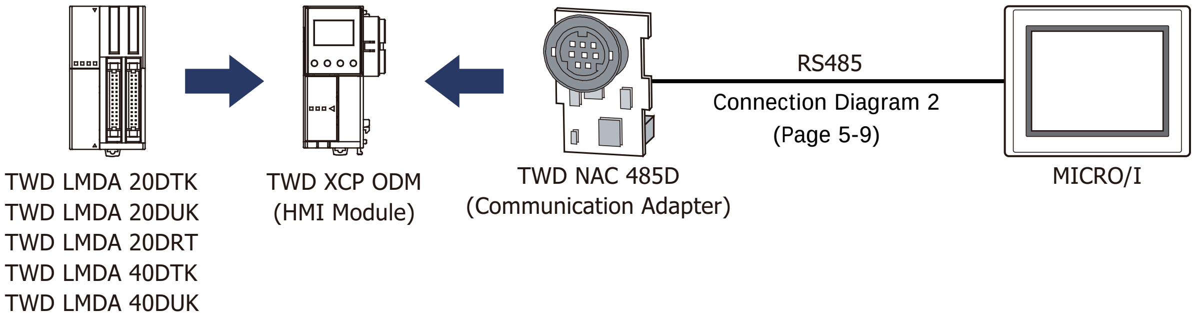


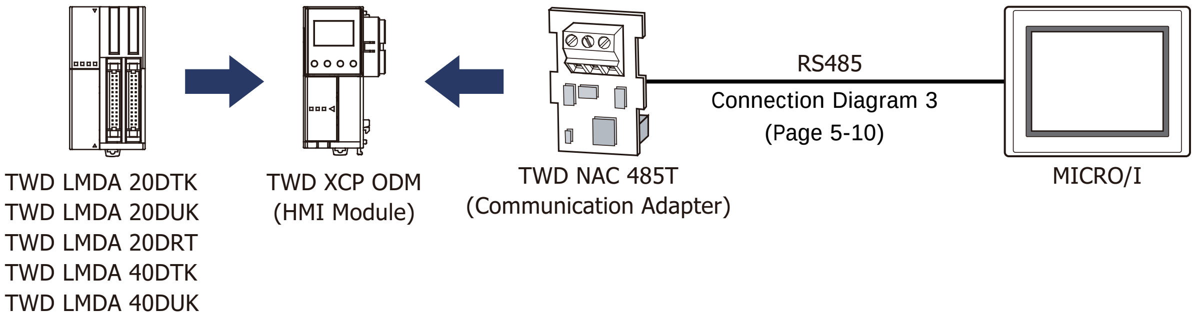




● Module Controller + HMI Module + Communication Adapter

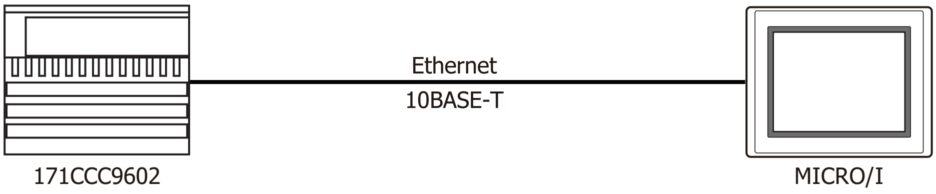






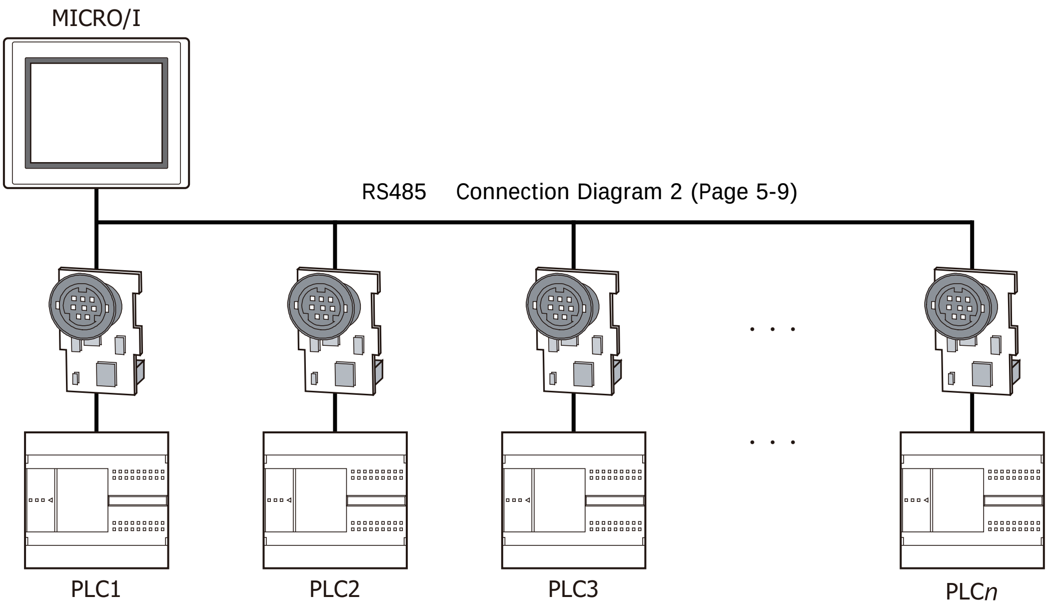
5 Modbus

2.7 Momentum (MODUBS TCP Client)

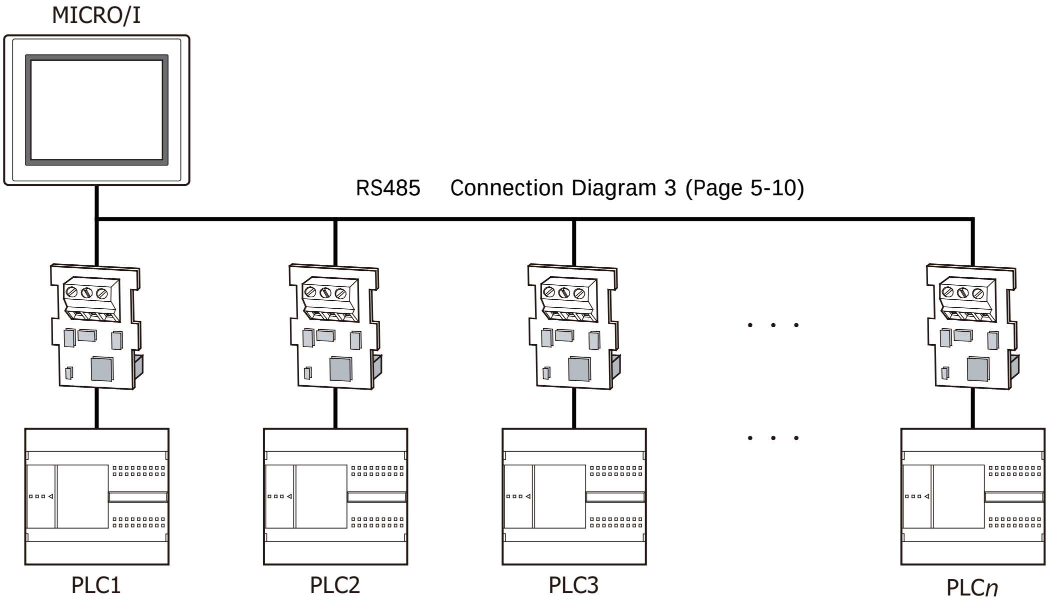


- Use a crossover cable to connect the MICRO/I and PLC directly.
- When using a hub (Ethernet switch), use a cable that can be used with the hub.
- Please avoid using for the long distance communication because this driver may be used in the control network in the same factory only.

2.8 TWD LCAA 16DRF/24DRF+TWD NAC 485D (Communication board)



2.9 TWD LCAA 16DRF/24DRF+TWD NAC 485T (Communication board)



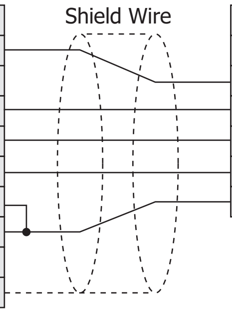
3 Connection Diagram

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: TWD NAC 232D

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



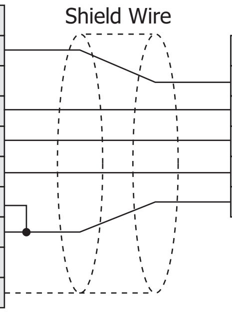
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
8	CS
2	RD
3	SD
7	RS
5	SG

When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.

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



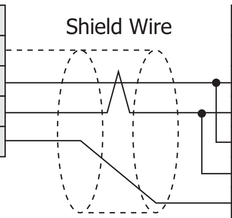
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

3.2 Connection Diagram 2: TWD NAC 485D

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

Name	Pin No.
Shield	Cover
D+	1
D-	2
0V	7



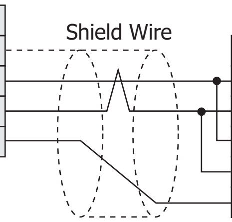
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

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

Name	Pin No.
Shield	Cover
D+	1
D-	2
0V	7



HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

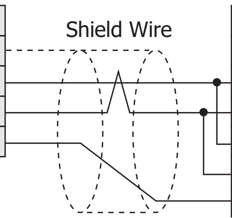
  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

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

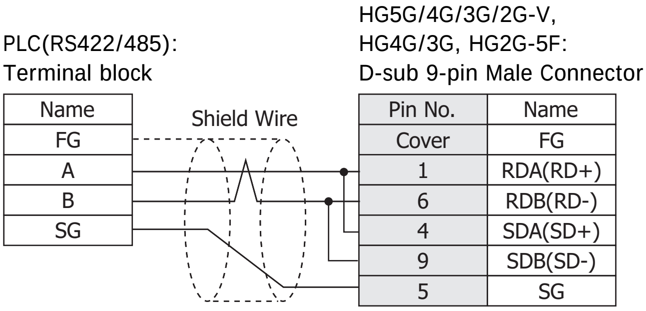
Name	Pin No.
Shield	Cover
D+	1
D-	2
0V	7



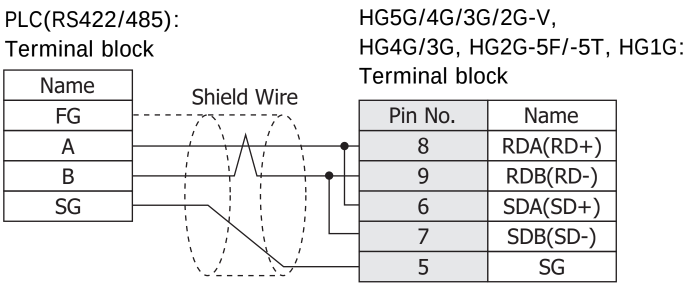
HG1P:
D-sub 25-pin Male Connector

Pin No.	Name
Cover	FG
3	RDA(RD+)
2	RDB(RD-)
5	SDA(SD+)
4	SDB(SD-)
6	SG

3.3 Connection Diagram 3: TWD NAC 485T



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

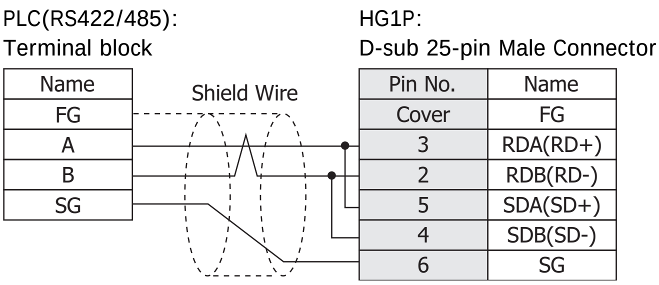


- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.



4 Environment Settings

4.1 Configure Modbus RTU/ASCII Master

Tab Name	Items		Details
Communication Interface	Interface	The same setting as the external device.	RS232C, RS485 2-wire or RS485 4-wire
	Baud Rate		115200, 57600, 38400, 19200, 9600, 4800, 2400 or 1200 bps
	Data Bits		7 or 8 bits
	Stop Bits		1 or 2 stop bits
	Parity		None, Odd or Even
	Flow Control		None or ER
Communication Driver	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
Communication Driver Network	Slave Address*1	The same setting as the external device.	0 to 255 (When "Specify Slave Number of Modbus RTU Master by Value of Device Address" is enabled, this value is used as default value when MICRO/I starts running)
	Specify Slave Number of Modbus RTU Master by Value of Device Address*2		Enable: Specify top device address to change slave number while running by changing value of each occupied address numbers. Change the top device address value to change slave number of External Device ID 0. The start address number +1 to the top address number +31 correspond to the external device ID 1 to the external device ID 31, change the value of the address number and change the slave number specified as the corresponding external device ID. Disable: Slave number is fixed.
	Maximum number of multiple Read/Write		1 to 123 Set the maximum number of data which can be read/written in one command.

When use **Specify Slave Number of Modbus RTU Master by Value of Device Address** function, please pay attention to the following items.

- If you change the slave number during operation, the slave number is changed from the next request command transmission to the external device. If you change the slave number while setting multiple external device addresses, values read from different slave devices may mix.
- If you use external device which Slave Number was changed, please excute it after data are loaded from all of using external devices. Please use the following conditions to judge whether data are loaded from all of using external devices.
  (Example) External Device Communication1
    The elapsed time is more than twice the value of the LSD 6
    LSM7 switches for two times

*1 Set the Slave Number in decimal.
*2 This function can be used with Modbus RTU Master only. It cannot be used with Modbus ASCII Master.

4.2 Configure Modbus TCP Client

<table>
<tr><th>Tab Name</th><th colspan="2">Items</th><th>Details</th></tr>
<tr><td>Communication Driver</td><td colspan="2">Use function6 instead of function16</td><td>Enable: Use function6 for writing to HR
Disable: Use function16 for writing to HR</td></tr>
<tr><td rowspan="4">Communication Driver Network</td><td>IP Address*1</td><td rowspan="3">The same setting as the external device.</td><td>IPv4 Typed IP address</td></tr>
<tr><td>Port Number*1</td><td>0 to 65535*2</td></tr>
<tr><td>Unit ID*3</td><td>1 to 247</td></tr>
<tr><td colspan="2">Maximum number of multiple Read/Write</td><td>1 to 123
Set the maximum number of data which can be read/written in one command.</td></tr>
</table>

*1 IP Address and Port Number cannot be changed from the system menu of MICRO/I. Please change it using WindO/I-NV4.
*2 When the port number is "0", this driver will set "502" (the number of Modbus TCP default port) automatically.
*3 Set the Unit ID in decimal.

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

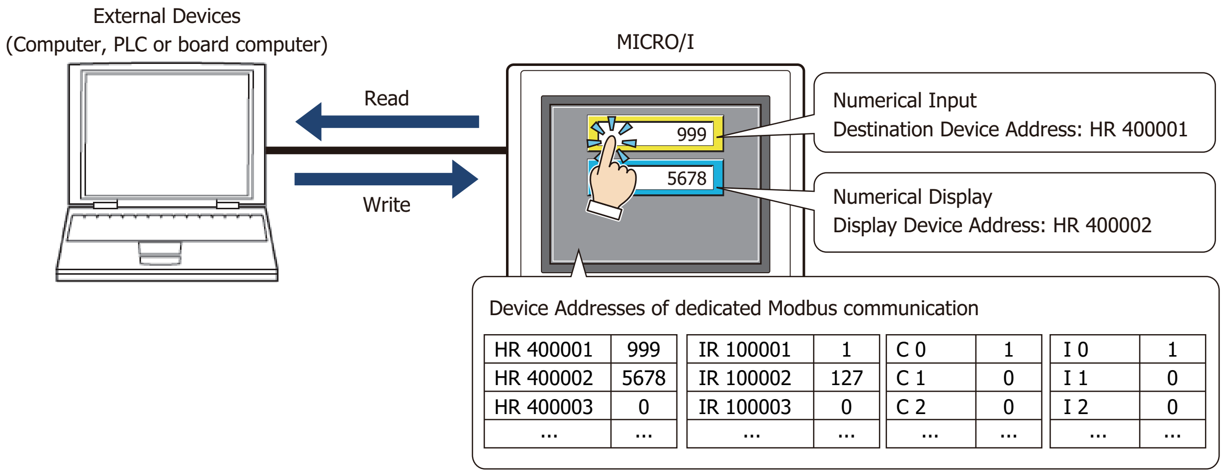
The Modbus TCP Server, Modbus RTU Slave function performs that a computer or PLC (refers to as an external device) can read and write the MICRO/I device addresses of dedicated Modbus communication via the Ethernet or Serial cable.
The read/write of a device is performed using the Modbus TCP protocol (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 device addresses of dedicated Modbus communication. It is also possible to read or write device addresses of dedicated Modbus communication from the MICRO/I.

● Read/Write from the External Device

The external device is capable of reading or writing the data in the device addresses of dedicated Modbus communication at the any timing.
The device types of dedicated Modbus communication are C(Coil), I(Inputs Status), HR(Holding Registers) and IR(Inputs Registers). For details, refer to 5 “Usable Device Addresses” on page 5-13 and 6.4 “Device Addresses” on page 5-16.



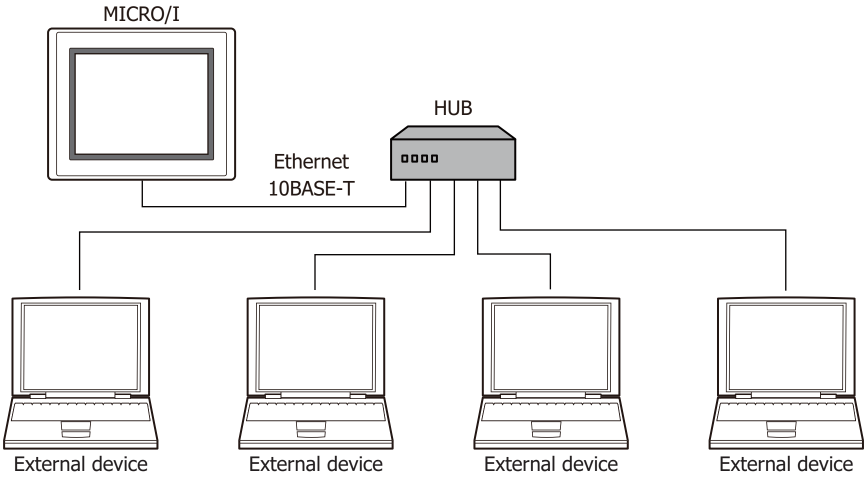
HR 400001	999	IR 100001	1	C 0	1	I 0	1
HR 400002	5678	IR 100002	127	C 1	0	I 1	0
HR 400003	0	IR 100003	0	C 2	0	I 2	0
...	...	...	...	...	...	...	...

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.

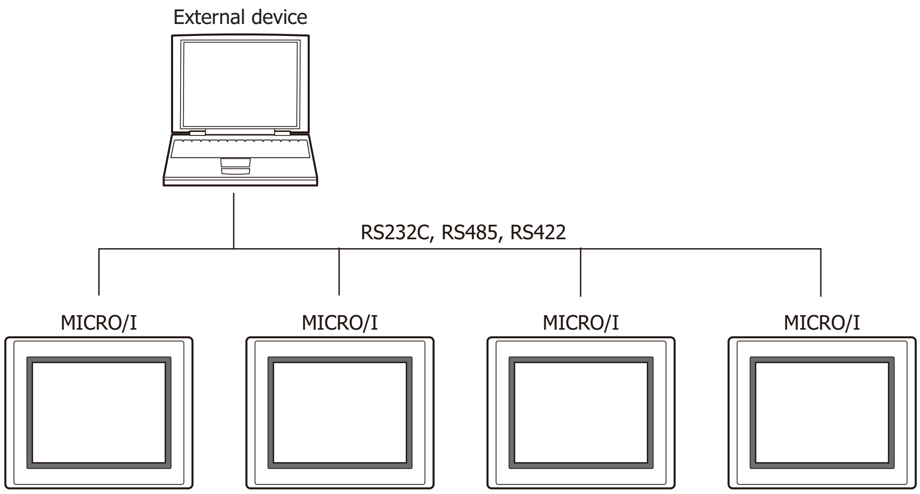
● Wiring

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).
	Monitor the Connection Status	To monitor the connection status, select this check box and specify a word device. The connection status is stored in the word device.
Communication Driver Extension Settings	Time Out (sec)	Enter the duration (in units of seconds) after which timeout occurs if request is not sent from the external device (client).
	Port Number	Specify the TCP port number of MICRO/I.
	Processing Interval (msec)	Enter the interval in units of milliseconds at which the MICRO/I performs communication processing. Adjust the communications traffic by increasing this value when the processing speed of the MICRO/I is slow due to a high-traffic communication.
	Client Address 1 to Client Address 4	When **Refuse Access From Unknown Clients** is selected, specify the IP address of the external device (client) from which access will be accepted. Configure 0.0.0.0 when the client address allowed is not specified.

Regarding TCP port number of MICRO/I, note the following points.

The numbers that cannot be used:
- 2538 (for pass-through)
- 2101 (for FC4A Series MicroSmart direct connection pass-through)

Duplicate numbers cannot be configured in the following functions:

- Maintenance communication (☞ refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- Web server function (☞ refer to Chapter 4 “Web Server Tab” in the WindO/I-NV4 User's Manual)
- FTP server function (☞ refer to Chapter 4 “FTP Server Tab” in the WindO/I-NV4 User's Manual)
- **TCP Server** is selected for the User Communication (☞ refer to Chapter 4 “Communication Interface Tab” in the WindO/I-NV4 User's Manual)
- **Modbus** as **Manufacture** and **Modbus TCP Server** as **Communication Driver** are selected on the Communication Driver tab
- **YASKAWA Electric** as **Manufacture** and **MP2000(Ethernet)** as **Communication Driver** are selected on the Communication Driver tab (☞ refer to Chapter 2 “MICRO/I settings” on page 2-208)

Monitor the Connection Status

The connection status between MICRO/I and an external device (client) can be monitored.
Select Monitor the Connection Status check box, and then specify a word device to store the connection information. The information for each connection is stored starting with the allocated device address and utilizes 26 words of address numbers.

Address Number	Description
+0	4 (Maximum connections)
+1	0 (Reserved)
+2	Connection Status 0: Not connected, 1: Connected Bit 0: Connection 1 Bit 1: Connection 2 Bit 2: Connection 3 Bit 3: Connection 4 Bit 4 to Bit 15: 0 (Reserved)
+3 to +9	0 (Reserved)
+10 to +13	The IP address of the external device connected to the Connection 1. Example: The top device address is LDR100 and the IP address of the external device is 192.168.1.100. LDR110=192, LDR111=168, LDR112=1, LDR113=100
+14 to +17	The IP address of the external device connected to the Connection 2. Example: The top device address is LDR100 and the IP address of the external device is 192.168.1.101. LDR114=192, LDR115=168, LDR116=1, LDR117=101
+18 to +21	The IP address of the external device connected to the Connection 3. Example: The top device address is LDR100 and the IP address of the external device is 192.168.1.102. LDR118=192, LDR119=168, LDR120=1, LDR121=102
+22 to +25	The IP address of the external device connected to the Connection 4. Example: The top device address is LDR100 and the IP address of the external device is 192.168.1.103. LDR122=192, LDR123=168, LDR124=1, LDR125=103

● 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.

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 external device (client) 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 Common 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

5 Modbus

*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.

Device Address	Data	Remarks
C1	1	Data for the 1st byte Bit pattern= 00100001 = 21 (Hexadecimal)
C2	0	
C3	0	
C4	0	
C5	0	
C6	1	
C7	0	
C8	0	
C9	1	Data for 2nd byte Bit pattern 00000011 = 03 (Hexadecimal)
C10	1	
C11	0	
C12	0	
C13	0	
C14	0	
C15	0	
C16	0	

■ 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	→	02h	01h	01h

Request → 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	→	04h	02h	12h	34h

Request → 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

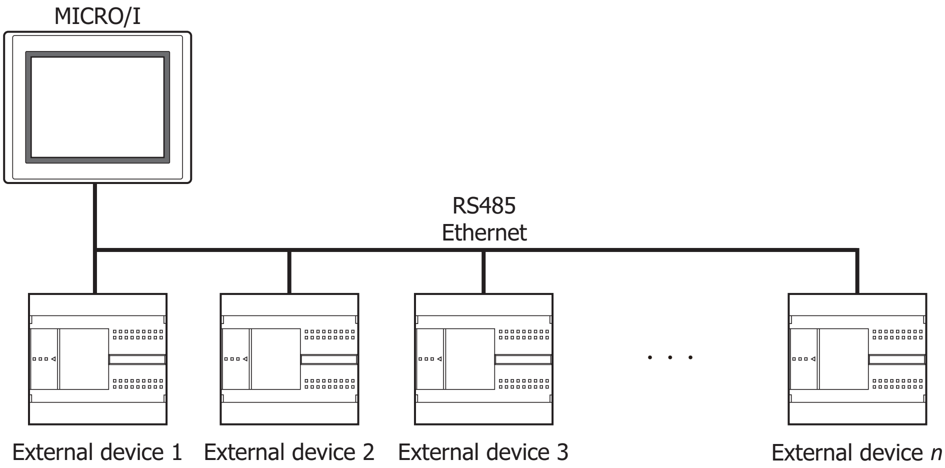
The following table describes the exception codes that are sent upon an error response.

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.

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 "5 Using Multiple Communication Drivers" on page 6-9.

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	MICROSmart(FC6A)(RS232C/485) OpenNet,MICROSmart,SmartAXIS Pro/Lite(RS232C/485)
	MICROSmart(FC6A)(Ethernet) 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	Logix Controllers(Ethernet), Logix DF1(Full Duplex), Logix Native Tag(Ethernet)
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 “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 “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)

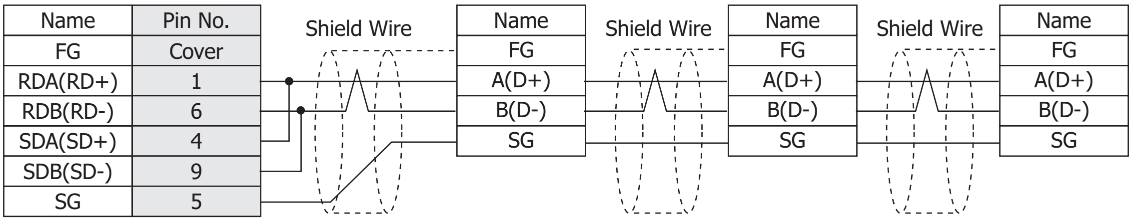
If a write error occurs at a relevant Station No., 1 is written.
It will not change to 0 even after the system recovers from the write error. To make it 0, write 1 in the Bit 1 (initialization) of the communication error information.

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.

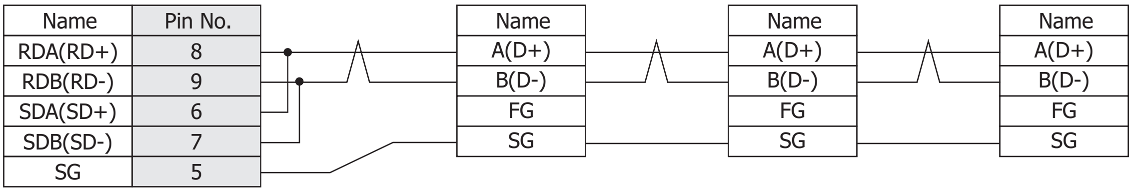
● RS422/485 2-wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector External Device 1 External Device 2 External Device 3



- When connecting COM1 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F to the external device, do not insert terminating resistor to the external device. If terminating resistor can not be removed, use COM2 on the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F instead of COM1.
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block External Device 1 External Device 2 External Device 3



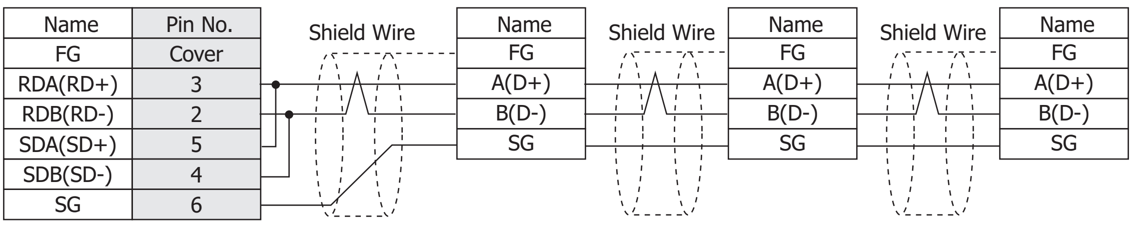
- The HG4G/3G, HG2G-5F uses only RDA and RDB when using RS422/485 2-wire, therefore, you don't need to connect SDA or SDB.
- When you need a terminating resistor, read the following description.

  HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

  HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

  For details, refer to Chapter 1 "3 Important Points Regarding Wiring" on page 1-4.

HG1P:
D-sub 25-pin Male Connector External Device 1 External Device 2 External Device 3



● RS422/485 4-wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Male Connector

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

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

Name	Pin No.	External Device 1 Name	External Device 2 Name	External Device 3 Name
RDA(RD+)	8	SDA(SD+)	SDA(SD+)	SDA(SD+)
RDB(RD-)	9	SDB(SD-)	SDB(SD-)	SDB(SD-)
SDA(SD+)	6	RDA(RD+)	RDA(RD+)	RDA(RD+)
SDB(SD-)	7	RDB(RD-)	RDB(RD-)	RDB(RD-)
SG	5	SG	SG	SG
		FG	FG	FG

When you need a terminating resistor, read the following description.

HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T: Set the Terminating Resistor Selector Switch to the ON side.

HG1G: Insert a terminating resistor of an appropriate value (about 100 to 120 Ohm, 1/2 W minimum) between terminal number 8 (RDA) and terminal number 9 (RDB).

For details, refer to Chapter 1 “3 Important Points Regarding Wiring” on page 1-4.

HG1P:
D-sub 25-pin Male Connector

Name	Pin No.	Shield Wire	External Device 1 Name	Shield Wire	External Device 2 Name	Shield Wire	External Device 3 Name
FG	Cover		FG		FG		FG
RDA(RD+)	3		SDA(SD+)		SDA(SD+)		SDA(SD+)
RDB(RD-)	2		SDB(SD-)		SDB(SD-)		SDB(SD-)
SDA(SD+)	5		RDA(RD+)		RDA(RD+)		RDA(RD+)
SDB(SD-)	4		RDB(RD-)		RDB(RD-)		RDB(RD-)
SG	6		SG		SG		SG

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 "Settings when a communication error occurs" on page 6-3.

● 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 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G 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 details, refer to the WindO/I-NV4 User’s Manual.

Restriction for using Multiple Communication Drivers

The following communication driver combinations can only be used in a single (Function). They cannot be configured in multiple settings.

■ Restriction for using Multiple Communication Drivers (1)

Manufacturer	Communication Driver
Modbus	Modbus RTU Master
	Modbus RTU Slave
SIEMENS	S7-200(PPI)
	S7-MPI
YASKAWA Electric	MP920-RTU

■ Restriction for using Multiple Communication Drivers (2)

Manufacturer	Communication Driver
Allen-Bradley	Logix Controllers(Ethernet)
	Logix Native Tag(Ethernet)

■ Restriction for using Multiple Communication Drivers (3)

Manufacturer	Communication Driver
IDEC System	DM Link (1:1)
	DM Link (1:N)
	DM Link Ethernet (UDP)*1
Modbus	Modbus RTU Slave
	Modbus TCP Server

Example: **Communication Driver** for **External Device Communication 1** is set to **Modbus RTU Slave**
According to the Restriction for using Multiple Communication Drivers (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 Restriction for using Multiple Communication Drivers (3), **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), DM Link Ethernet(UDP)***1, or **Modbus TCP Server**.

*1 HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F only

6 Restrictions

■ 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 User Communication, Printer or PLC communication cable (Type Number: FC2A-KP1C, HG9Z-XC275)

Communication cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G Serial Interface and the IDEC FC4A/5A MICROSmart or the Mitsubishi Electric MELSEC-FX series.

Type Number	Cable length
FC2A-KP1C	2.4m
HG9Z-XC275	5m

● Pinout

Mini DIN 8-pin Modular Connector

Shield Wire

Pin No.	Color
Cover	
1	Black
2	Yellow
3	Blue
4	Green
5	Brown
6	Gray
7	Red
8	White

● Connection Diagram

Connecting the IDEC FC4A/5A MICROSmart

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Color	Pin No.
Shield		Cover
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 Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
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.
Shield		Cover
SDA	Red	7
SDB	Green	4
RDA	Yellow	2
RDB	Black	1
SG	Blue	3
SG	Grey	6

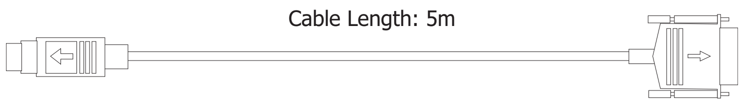
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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 (Type Number: FC2A-KP1C and HG9Z-XC275) with FX3U/FX3UC-32MT-LT of the MELSEC-FX Series described in this manual because the Mini DIN Connector interferes with the housing of the PLC.

1.2 PLC communication cable (Type Number: HG9Z-XC295)

Direct connection cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F Serial Interface (COM1) and the IDEC FC4A/5A MICROSmart Programming Port.



● Connection Diagram

PLC(RS232C):
Mini DIN 8-pin Connector

Name	Pin No.
Shield	Cover
SD	3
RD	4
SG	6
SG	7

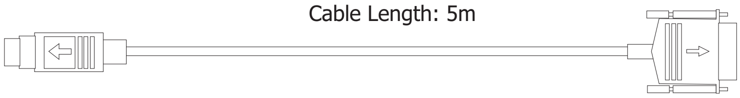
Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Female Connector

Pin No.	Name
Cover	Shield
2	RD
3	SD
5	SG
7	RS
8	CS

1.3 PLC communication cable (Type Number: HG9Z-XC305)

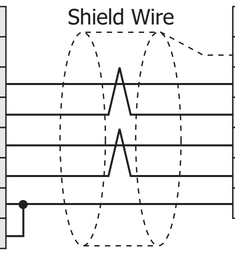
Direct connection cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F Serial Interface (COM1) and the Mitsubishi FX Series.



● Connection Diagram

PLC(RS422):
Mini DIN 8-pin Connector

Name	Pin No.
Shield	Cover
RDA	2
RDB	1
SDA	7
SDB	4
SG	3
SG	6

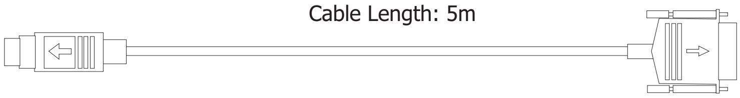


HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Female Connector

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

1.4 PLC communication cable (Type Number: HG9Z-XC315)

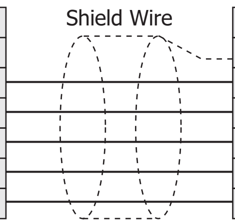
Direct connection cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F Serial Interface (COM1) and the Mitsubishi Q Series.



● Connection Diagram

PLC(RS232C):
Mini DIN 6-pin Connector

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



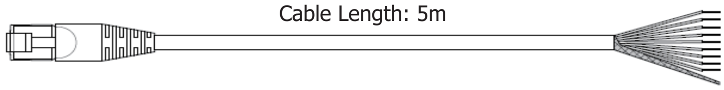
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F:
D-sub 9-pin Female Connector

Pin No.	Name
Cover	Shield
2	RD
3	SD
5	SG
7	RS
8	CS

7 Communication Cables

1.5 User Communication or PLC communication cable (Type Number: FC6A-KC1C)

Communication cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F/-5T, HG1G Serial Interface and the IDEC FC6A MICROSmart (FC6A-C*****E) Serial port 1.



● Pinout

RS-45 8-pin Modular Connector

Shield Wire

Pin No.	Color
Cover	
1	White/Orange
2	Orange
3	White/Green
4	Blue
5	White/Blue
6	Green
7	White/Brown
8	Brown

● Connection Diagram

PLC(RS232C):
RJ-45 8-pin Modular Connector

Name	Color	Pin No.
Shield		Cover
RD	White/Orange	1
SD	Orange	2
	White/Green	3
	Blue	4
	White/Blue	5
	Green	6
	White/Brown	7
GND	Brown	8

Shield Wire

HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

PLC(RS485):
RJ-45 8-pin Modular Connector

Name	Color	Pin No.
Shield		Cover
	White/Orange	1
	Orange	2
	White/Green	3
A	Blue	4
B	White/Blue	5
	Green	6
	White/Brown	7
GND	Brown	8

Shield Wire

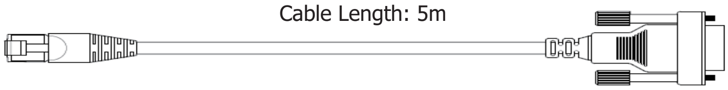
HG5G/4G/3G/2G-V,
HG4G/3G, HG2G-5F/-5T, HG1G:
Terminal block

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

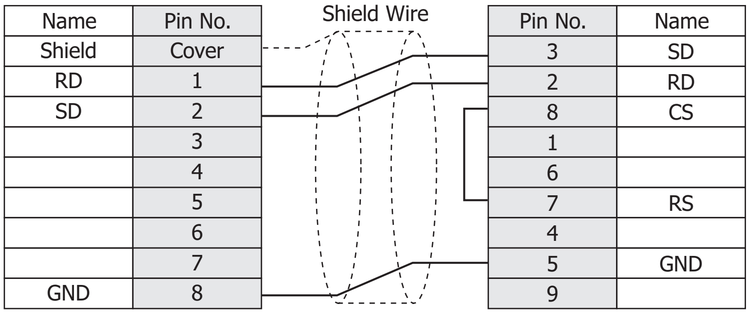
Terminate any unused wires properly to make sure that these wires do not contact other wires or metal parts electrically.

1.6 User Communication or PLC communication cable (Type Number: FC6A-KC2C)

Connection cable for the HG5G/4G/3G/2G-V, HG4G/3G, HG2G-5F Serial Interface (COM1) and the IDEC FC6A MICROSmart (FC6A-C*****E) Serial port 1.



● Connection Diagram



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

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

Index

Numerics

A

B

C

D

Index

E

F

G

H

I

J

K

L

M

N

O

Y