

Device/PLC Connection Manuals



About the Device/PLC Connection Manuals

Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file. Furthermore, be sure to keep all manual-related data in a safe, easy-to-find location.

2.5 Hitachi Industrial Equipment System

2.5.1 System Structure

The following describes the system structure for connecting the GP to Hitachi Industrial Equipment System PLCs.

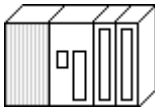
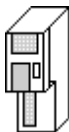


Reference *The Cable Diagrams mentioned in the following tables are listed in the section titled "2.5.2 Cable Diagrams".*



Note: "HIDIC H Series" is made by Hitachi Industrial Equipment System Co., Ltd.

■ HIDIC H Series (using Link I/F)

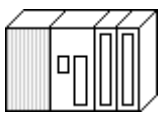
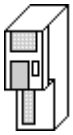


Procedure 1 for transmission control

CPU	Link I/F	Cable Diagram	Cable	GP
	 COMM Module			
H-300 (CPU-03Ha) H-700 (CPU-07Ha) H-2000 (CPU-20Ha) H-2002 (CPU2-20H)	COMM-H COMM-2H	RS-232C (Cable Diagram 1)	RS-232C Hitachi Industrial Equipment System's peripheral cable	GP Series
H-302 (CPU2-03H) H-702 (CPU2-07H) H-2002 (CPU2-20H) H-4010 (CPU3-40H)	COMM-2H	RS-422 (Cable Diagram 3)	GPCB05H ^{*1} or WPCB02H ^{*1}	

**1 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377R and GP-2300 series units.*

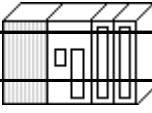
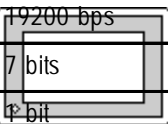
■ HIDIC H Series/COMM-2H (using Link I/F)

Procedure 2 for transmission control

CPU	Link I/F	Cable Diagram	Cable	GP
	 COMM Module			
H-300 (CPU-03Ha) H-700 (CPU-07Ha) H-2000 (CPU-20Ha) H-2002 (CPU2-20H)	COMM-H COMM-2H	RS-232C (Cable Diagram 1)	RS-232C Hitachi Industrial Equipment System's peripheral cable GPCB05H ^{*1} or WPCB02H ^{*1}	GP Series
H-302 (CPU2-03H) H-702 (CPU2-07H) H-2002 (CPU2-20H) H-4010 (CPU3-40H)	COMM-2H	RS-422 (Cable Diagram 3)		

^{*1} Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377, GP-377R, and GP-2300 series units.

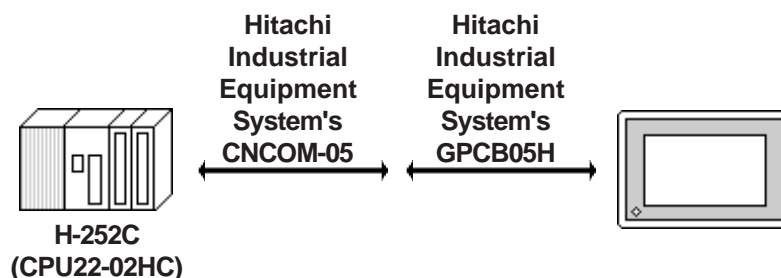
■ HIDIC H Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate 	19200 bps	Baud Rate ^{*1}	19200 bps 
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control		
Communication Format	RS-232C or 4-wire type ^{*4}	Mode Setting Switch	SW1 : OFF (Normal mode)
			SW5 : ON (Exclusive mode)
			SW7 : OFF (Normal Operation mode)
			SW8 : OFF (Normal Operation mode)
		Port ON/OFF Switch	ON (Programmer Connection)
		Exclusive Port Setting ^{*2}	Special Internal Output WRF037 ^{*3}
Unit No.	0		

^{*1} Connect to the CPU module's peripheral port.

- * 2 If the CPU is connected to port 2, a Hitachi Industrial Equipment System's CNCOM-05 conversion cable between the round connector (8-pin) and the D sub-connector (15-pin) is required.

<Fig. 1>



- *3 You will need to change the wiring depending on the baud rate. Use (Cable Diagram 2) when the baud rate is 4800bps, and use (Cable Diagram 3) when the baud rate is 19200bps. <Fig.1> is only for when using the Hitachi Industrial Equipment System's cable.
- *4 If the CPU's software revision is J or later, and DIPSWI's No.3 and No.4 are turned OFF, you can set the baud rate to 38400bps by using (Cable Diagram3).
- *5 Connect to the CPU module's serial port 1 or serial port 2.
- *6 Connect to the CPU module's serial port 1.
- *7 If the CPU is connected to a GP, a Hitachi Industrial Equipment System's EH-RS05 conversion cable between the modular jack (8-pin) and the D sub-connector (15-pin) is required.
- *8 When using Serial Port 2, you will need to change the wiring depending on the baud rate.
 When the baud rate is 19200bps or 38400bps, use Cable Diagram 3.
 When the baud rate is 4800bps or 9600bps, use Cable Diagram2.
 Either wiring diagram can be used when using Serial Port 1.
- * 9 Due to the size of its connector case, this cable cannot be used for GP-270, GP-370, GP-377, GP-377R, and GP-2300 series.
- *10 The Controller's model number "□" will vary, depending on each controller's specifications.

2.5.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Hitachi Industrial Equipment System Co., Ltd. may differ; however, using these cables for your PLC operations will not cause any problems.

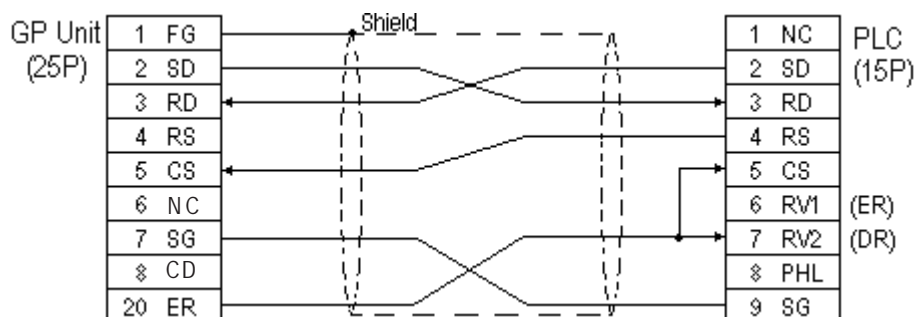


Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.



- **Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment. When using a connector hood and grounding the FG line, be sure to use an electrical conductor. The following connection diagrams show examples for connecting a shielded cable to the PLC.**
- **For the RS-232C connection, use a cable length less than 15m.**
- **If a communications cable is used, it must be connected to the SG (signal ground).**
- **For the RS-422 connection, refer to Hitachi Industrial Equipment System's PLC manual for the cable length.**

Cable Diagram 1 (RS-232C)

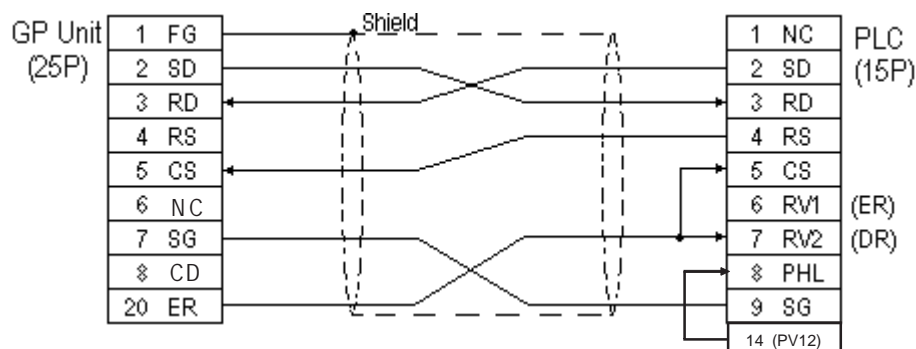


When an error develops during communication, there may be a delay before the error message displays as the unit runs the retry process.



In Procedure 1 for transmission control, when the GP and PLC program console (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error may develop in the GPCL. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.

Cable Diagram 2 (RS-232C)



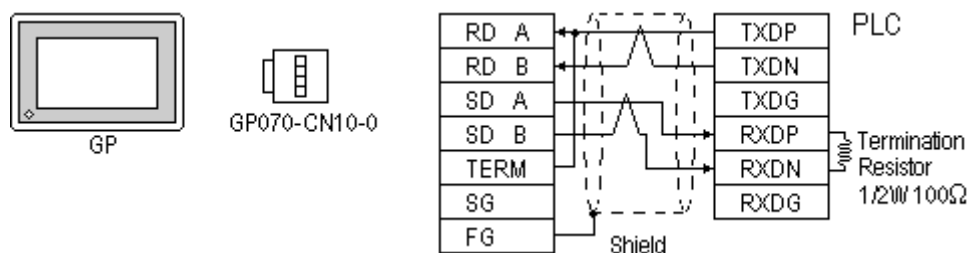
Note: When an error develops during communication, there may be a delay before the error message displays, as the unit runs the *retry* process.



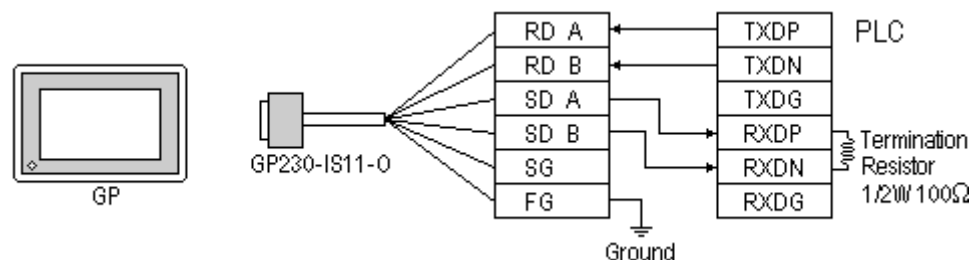
Careful! In Procedure 1 for transmission control, when the GP and PLC program console (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error may develop in the GPCL. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.

Cable Diagram 3 (RS-422)

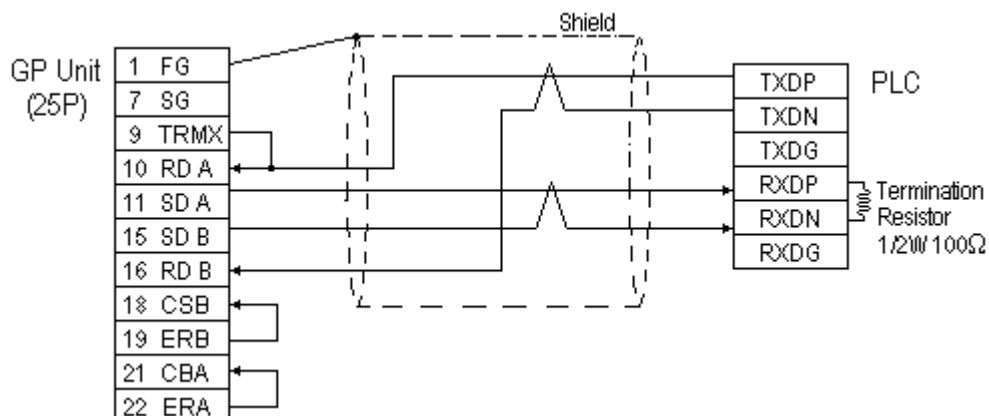
- When using Digital's RS-422 connector terminal GP070-CN10-0 adapter



- When using Digital's RS-422 Cable, GP230-IS11-0



- When making your own cable connections

**Note:**

When an error develops during communication, there may be a delay before the error message displays, as the unit runs the *retry* process.

**Careful!**

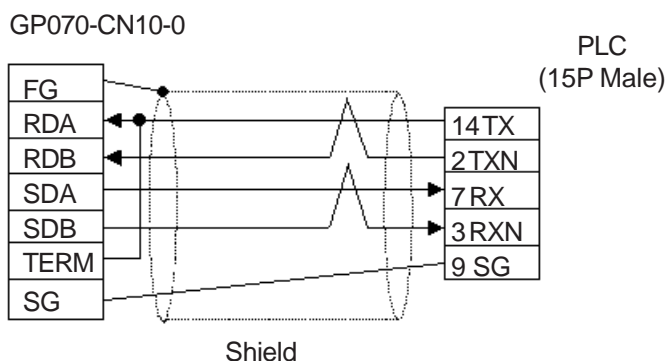
When the GP and PLC program consoles (GPCL) are operated at the same time, a PLC COM ERROR: (02:37) on the GP and a CPU Hold Error may develop in the GPCL. In such cases, the GP automatically reverts to its normal state. Run the GPCL operation again.

**Note:**

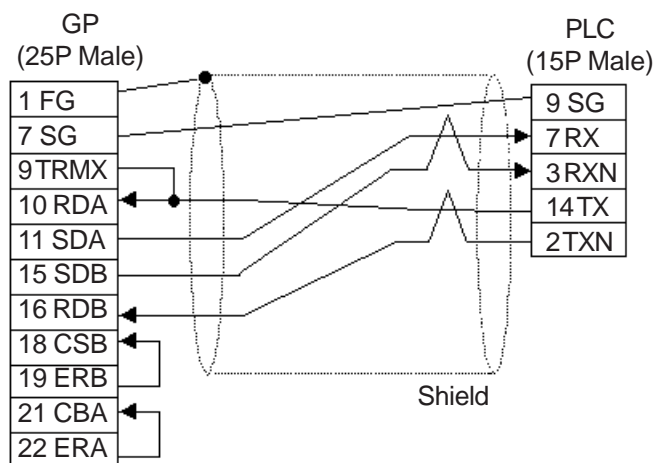
- When making your own connections, we recommend using Hitachi Densen's KPEV-SB-3P0.5mm² cable.
- When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Cable Diagram 4 (RS-422, 4-wire)

- When using Digital's RS-422 connector terminal GP070-CN10-0 adapter



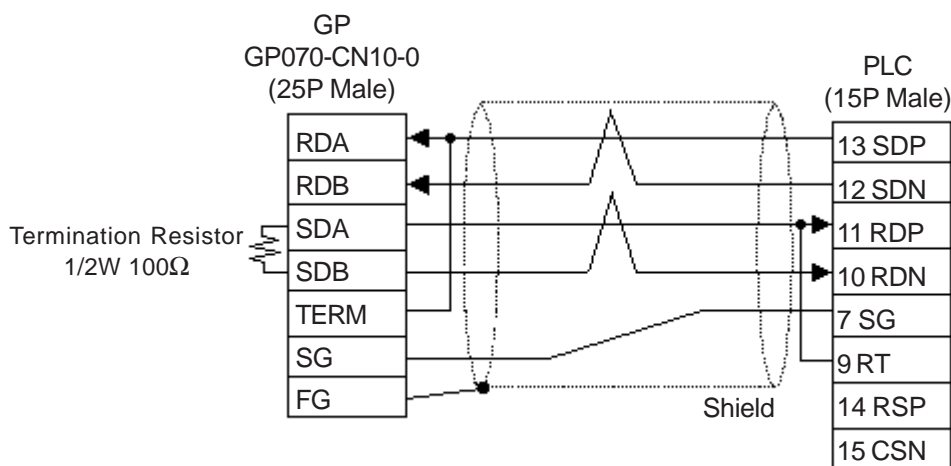
- When making your own cable connections



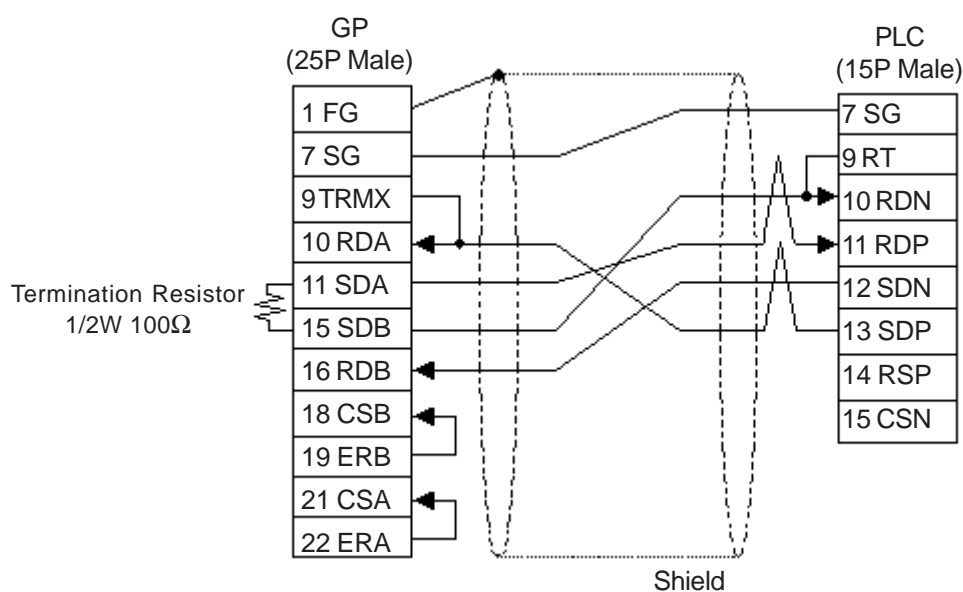
Note: Contact Hitachi Industrial Equipment System Co., Ltd. for enquiries regarding termination resistance.

Cable Diagram 5 (RS-422, 4-wire)

- When using Digital's RS-422 connector terminal GP070-CN10-0 adapter



- When making your own cable connections

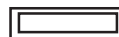


Note: Short-circuiting pin Nos. 9 and 10 on the PLC provides a termination resistance of 120Ω

2.5.3 Supported Devices

The following describes the range of devices supported by the GP.

■ HIDIC H (HIZAC H) Series

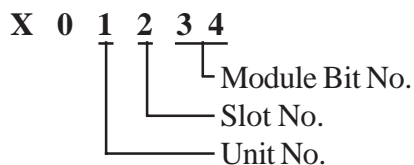


Setup System Area here.

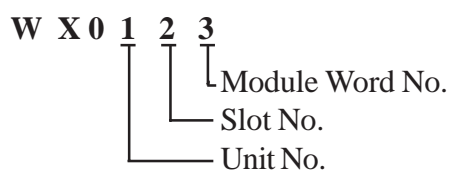
Device	Bit Address	Word Address	Particulars
External Input	X00000 ~ X05A95	WX0000 ~ WX05A7	L/H
External Output	Y00000 ~ Y05A95	WY0000 ~ WY05A7	
Remote Input Relay	X10000 ~ X49A95	WX1000 ~ WX49A7	
Remote Output Relay	Y10000 ~ Y49A95	WY1000 ~ WY49A7	
Internal Output	R000 ~ R7BF	---	
CPU Link Area 1	L0000 ~ L3FFF	WL000 ~ WL3FF	
CPU Link Area 2	L10000 ~ L13FFF	WL1000 ~ WL13FF	
Data Area	M0000 ~ M3FFF	WM000 ~ WM3FF	
On-Delay Timer	TD000 ~ TD1023	---	
Single Shot Timer	SS000 ~ SS1023	---	
Watch Dog Timer	WDT000 ~ WDT1023	---	
Monostable Timer	MS000 ~ MS1023	---	
Accumulation Timer	TMR000 ~ TMR1023	---	
Up Counter	CU000 ~ CU2047	---	
Ring Counter	RCU000 ~ RCU2047	---	
Up/Down Counter	CT000 ~ CT2047	---	
Timer/Counter (Elapsed Time)	---	TC000 ~ TC2047	
Word Internal Output	---	WR0000 ~ WRC3FF	
Network Link Area	---	WN0000-WN7FFF	

*1 Write your data as follows.

E.g. External Input unit No. 1, Slot No. 2, Module Bit No. 34



E.g. External Input unit No. 1, Slot No. 2, Module Word No. 3.





If the first CPU link (L0000 to L3FFF) and the second CPU link (L10000 to L13FFF) are used with any GP-PRO/PB III for Windows drawing software which is Ver. 1.0 or earlier, enter L00000 to L03FFF for the first CPU link; and enter L100000 to L103FFF for the second CPU link by adding a zero to each one.

If GP-PRO/PB III for Windows Ver. 2.0 or later is used, enter the addresses shown in the previous page's table.

If you upgrade your GP-PRO/PB III for Windows Ver. 1.0 or earlier to Ver. 2.0 or later, your internal data will not be affected. Only the addresses to be entered are different.

The device type, the applicable range, and the ability or disability of writing may be different depending upon your CPU. Check with the manual for your CPU before use.

2.5.4 Environment Setup

The following tables list Digital's recommended PLC and GP communication settings.

■ HIDIC H Series (using COMM module)

Procedure 1 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	——	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	RS-422
——		Mode Switch	2
		Sum Check	Yes
Unit No. (RS-232C)	0	Station No. (RS-232C)	0
Unit No. (RS-422)	1	Station No. (RS-422)	1

■ HIDIC-H Series/COMM-2H Procedure 2 for transmission control

GP Setup		COMM Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	——	
Communication Format (RS-232C)	RS-232C	Communication Format (RS-232C)	RS-232C
		Mode Switch	9
Communication Format (RS-422)	4-wire type	Communication Format (RS-422)	RS-422
		Mode Switch	9
——		Sum Check	Yes
Unit No. (RS-232C)	0	Station No. (RS-232C)	0
Unit No. (RS-422)	1	Station No. (RS-422)	1

■ HIDIC-H Series (CPU Direct Connection)

GP Setup		PLC Setup	
Baud Rate	4800 bps ^{*1}	Baud Rate	4800 bps ^{*1}
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Data Flow Control	DTR Control
Communication Format	RS-232C	Communication Format	RS-232C
_____		Operation Mode	Transmission Control Procedure 1
Unit No.	0	Station No.	0

**1 With some CPUs, a baud rate of 19200bps or 38400bps can be used. Refer to "2.5.1 System Structure" for details.*

■ HIDIC EH150 Series

GP Setup		PLC Setup	
Baud Rate	19200 bps	Baud Rate ^{*1}	19200 bps
Data Length	7 bits	Data Bit	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	_____	
Communication Format	RS-232C or 4-wire type ^{*4}	Mode Setting Switch	SW1 : OFF (Normal mode)
			SW5 : ON (Exclusive mode)
			SW7 : OFF (Normal Operation mode)
			SW8 : OFF (Normal Operation mode)
		Port ON/OFF Switch	ON (Programmer Connection)
		Exclusive Port Setting ^{*2}	Special Internal Output WRF037 ^{*3}
Unit No.	0	_____	

**1 Set the Mode Setting Switch. (SW3, 4 : Port 1, SW6 : Port 2)
When using Port 2, the cable diagram needs to be changed.*

▼Reference▲ refer to 2.5.1 System Structure

**2 Set when using EH-CPU448.*

**3 Depending on your Interface and Procedure, varies as shown below.
RS-232C Procedure 1 : 8000H
RS-232C Procedure 2 : C000H
RS-422 Procedure 1 with unit No. : A1xxH (xx indicates GP's Unit No.)
RS-422 Procedure 2 with unit No. : E1xxH (xx indicates GP's Unit No.)*

**4 Only EH-CPU448's serial port1 can be set.*

■ MICRO-EH Series

GP Setup		PLC Setup	
Baud Rate	9600 bps	Baud Rate	19200 bps
Data Length	7 bits (fixed)	——	——
Stop Bit	1 bit (fixed)	——	——
Parity Bit	Even (fixed)	——	——
Data Flow Control	ER Control	——	——
Communication Format	RS-232C, 4-wire	——	——
Unit No.	0	——	——
——	——	Port 1 Setup	Special Internal Output Set to WRF01A ^{*1}
		Port 2 Setup	Special Internal Output Set to WRF03D ^{*2}

**1 Transmission Control Procedure 1: 000H*

Transmission Control Procedure 2: 8000H

**2 Transmission Control Procedure 1 (with Station Number) (192000 bps): A200H*

Transmission Control Procedure 2 (with Station Number) (192000 bps): E200H