

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.

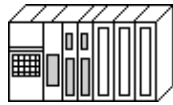
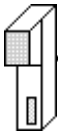

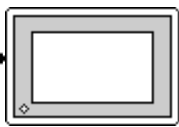
2.9 Toyota Machine Works

2.9.1 System Structure

The following describes the system structure for connecting the GP to Toyota Machine Works PLCs.

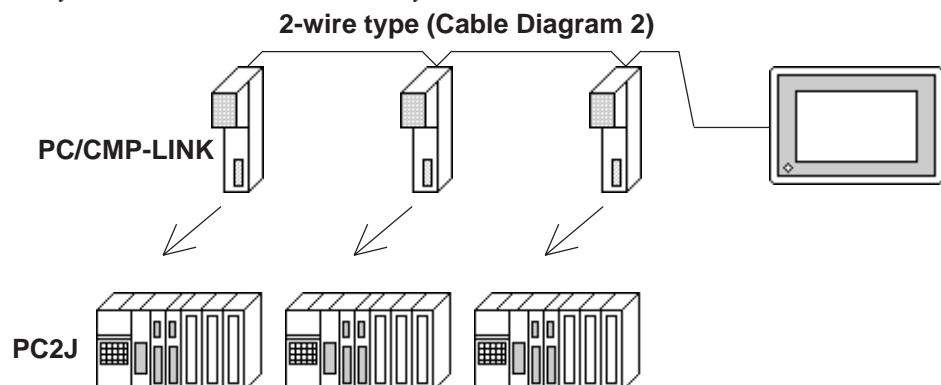
Reference The Cable Diagram mentioned in the following table is listed in the section titled "2.9.2 Cable Diagrams."

■ TOYOPUC-PC2 Series (using Link I/F)

CPU	Link I/F	Cable Diagram	GP
	Computer Link Module/ Link I/F 		
PC2, L2	TPU-2652 (Computer Link Module)	RS-422 (Cable Diagram 1)	GP series
PC2J	THU-2755 (PC/CMP Link Unit)		
	THU-2755	RS-422 *1 1:n communication (Cable Diagram 2)	

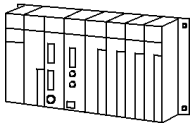



*1 The following system configuration shows how to communicate between one GP and "n" PC2J PLCs, using a host link protocol.

- Only one GP can be used in this system.



- Up to 16 PC2J units can be connected to the single GP.

■ TOYOPUC-PC3J

CPU	Link I/F	Cable Diagram	GP
			
PC3J	Link I/F for CPU unit	RS-422 (4 wires) (Cable Diagram 3)	GP Series
		RS-422 (2 wires) (Cable Diagram 4)	
		RS-422 (4 wires) (1:n) (Cable Diagram 5)	
		RS-422 (2 wires) (1:n) (Cable Diagram 6)	
	PC/CMP-Link (THU-2755) *1	RS-422 (2 wires) (Cable Diagram 7)	
		RS-422 (2 wires) (1:n) (Cable Diagram 8)	

*1 When using PC3J commands to operate the PC/CMP-LINK(THU-2775), a Ver.5.00 or higher link unit is required. This unit, however, will not have the settings for the PC2J or PC3J switches (SW). If a PC3J command is sent to a version5.00 or lower link unit, an error code will appear on the bottom left corner on the GP screen.



- A maximum of 16 PLCs can be connected.
- For the connection cable, the Chugoku Densen Kogyo's double shield twist cable, 0-VCTF-SS 2C*0.75mm² is recommended.
- The maximum cable length is 600 meters.

2.9.2 Cable Diagrams

The cable diagrams illustrated below and the cable diagrams recommended by Toyota Machine Works, Ltd. may differ; however, using these cables for your PLC operations will not cause any problems.



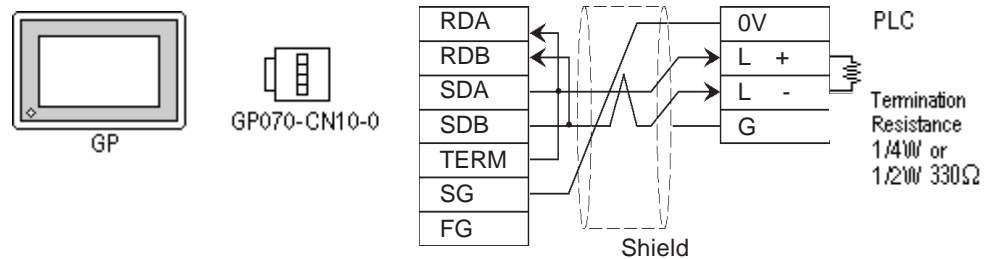
Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.



- Connect the FG line of the Shield cable to either the GP or PLC, depending on your environment.
- If a communications cable is used, it must be connected to the SG (signal ground).

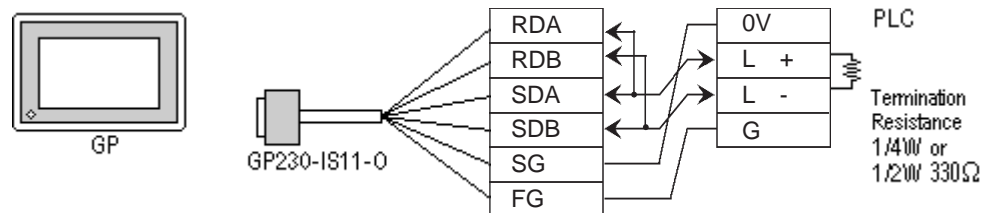
Cable Diagram 1 (RS-422)

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



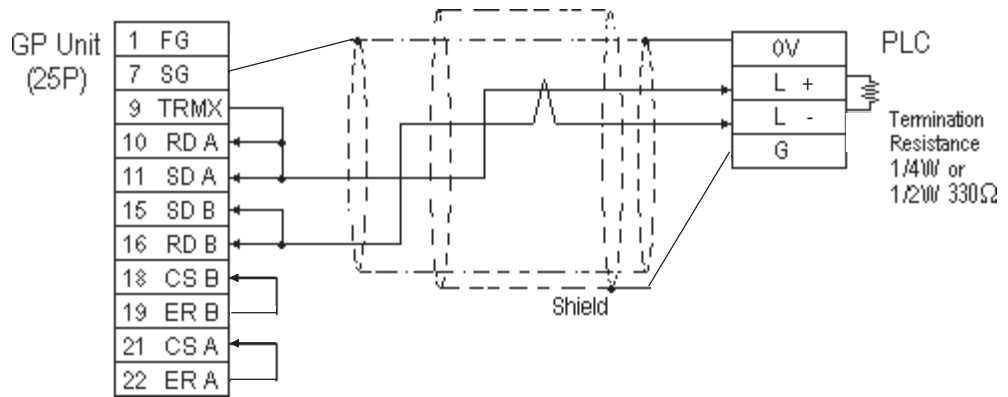
Connect terminals SD A and SD B to terminal L+, and SD B and RD B to terminal L-.

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



Connect terminals SDA and SDB to terminal L+, and SDB and RDB to terminal L-.

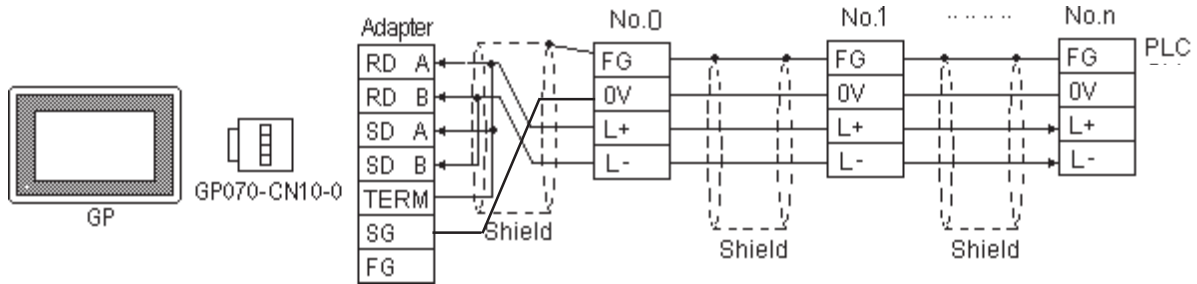
- When making your own cable connections



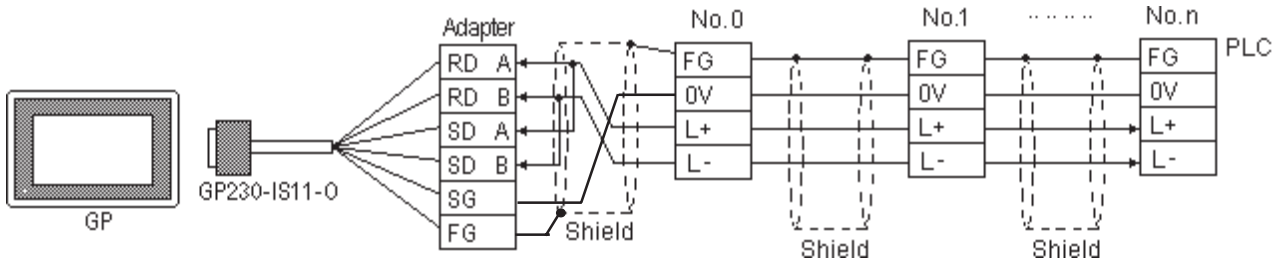
- When making your own connections, we recommend using Chugoku Densen Kogi's O-VCTF-SS2C*0.75mm² (2 overlapping *Shield Twist Pair*) cable.
- When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Cable Diagram 2 (RS-422)

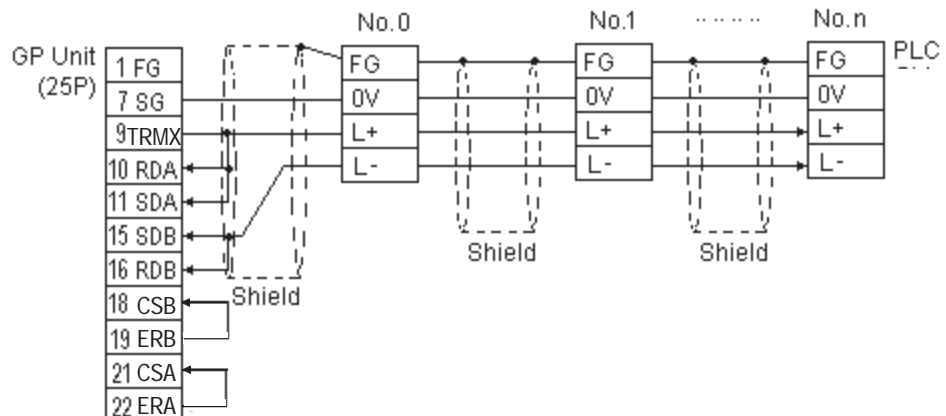
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



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

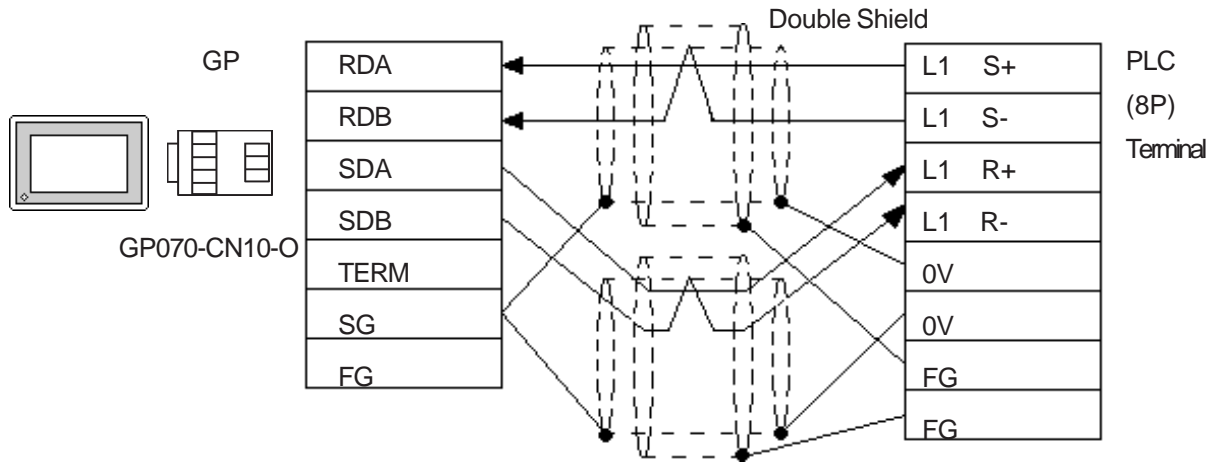


- When making your own cable connections



Cable Diagram 3 RS-422 4-wire type

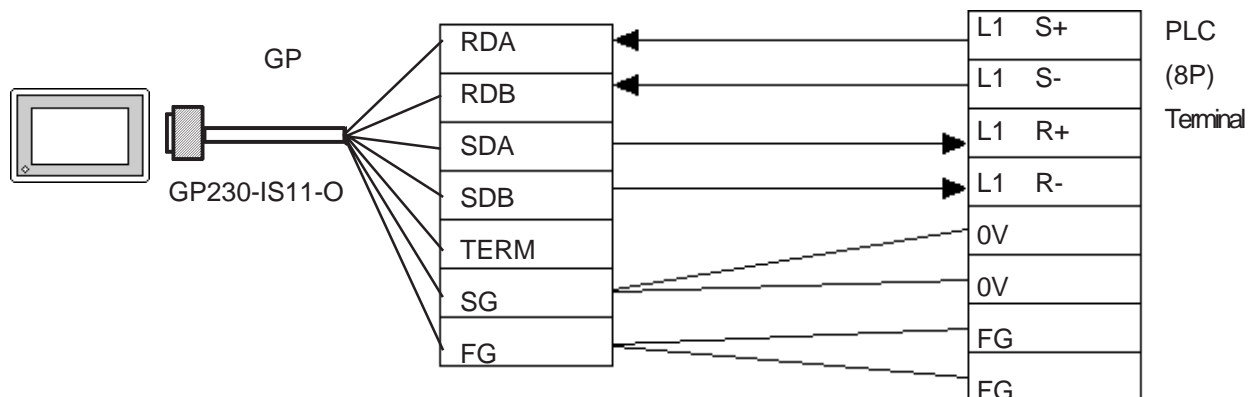
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



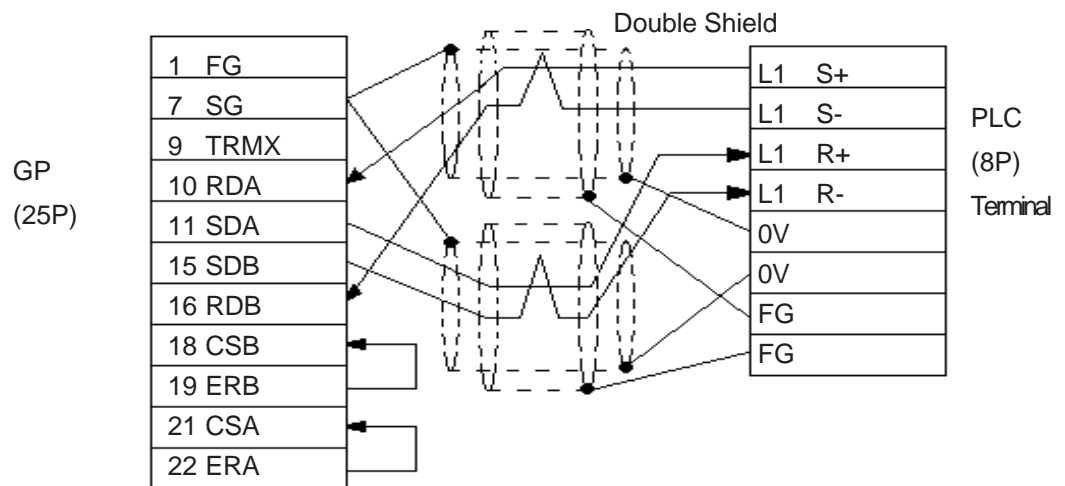
- When using Digital's RS-422 cable, GP230-IS12-0



In areas with excessive noise, use a double shielded cable.

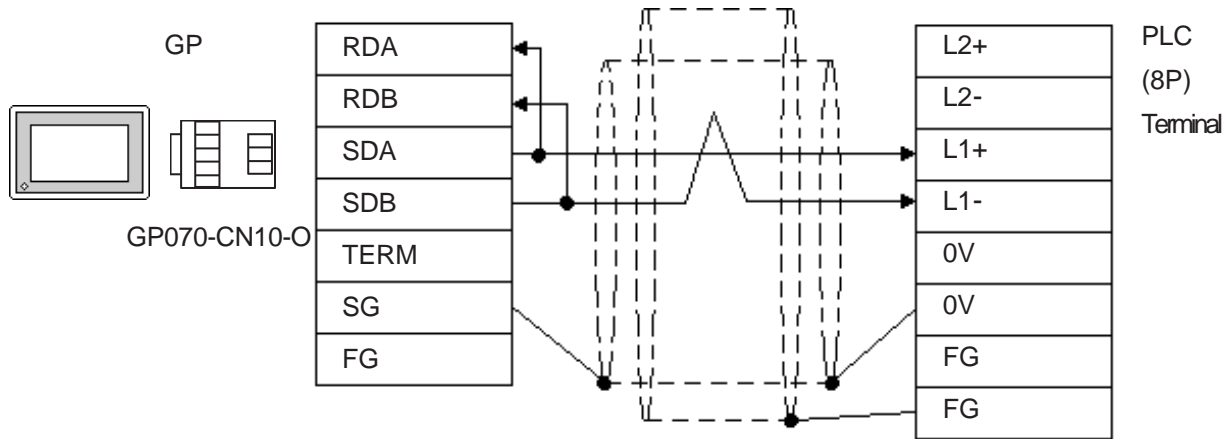


- When making your own cable



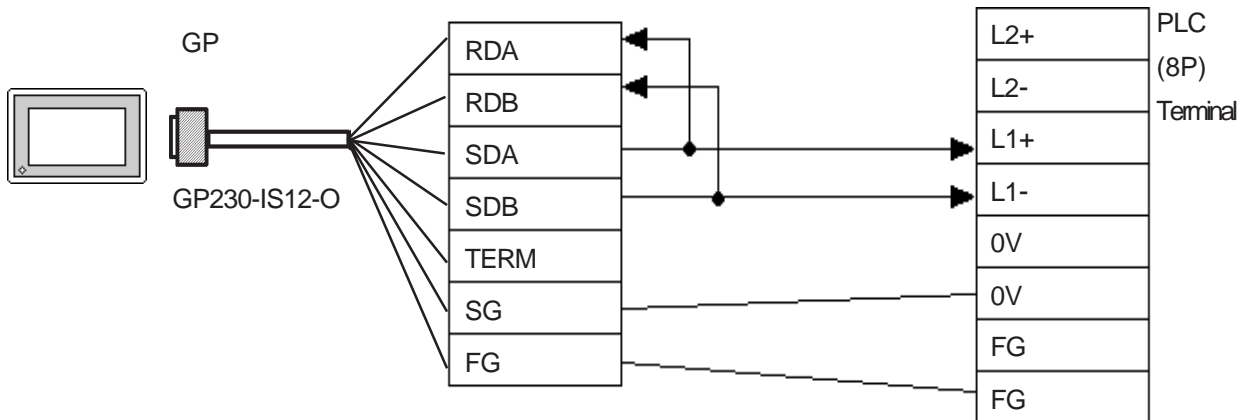
Cable Diagram 4 (1:1) RS-422 2-wire type, using I/F unit for CPU

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

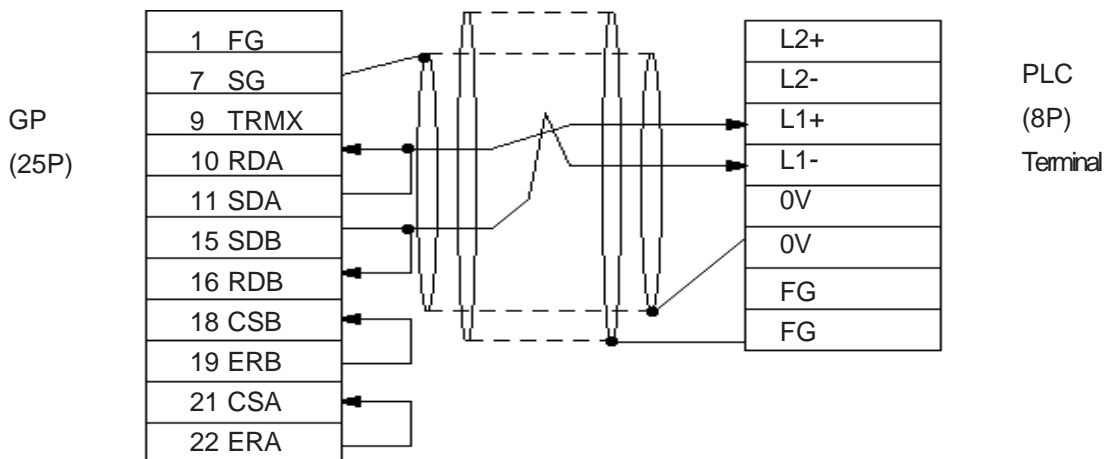


- When using Digital's RS-422 cable, GP230-IS12-0

Note: In areas with excessive noise, use a double shielded cable.

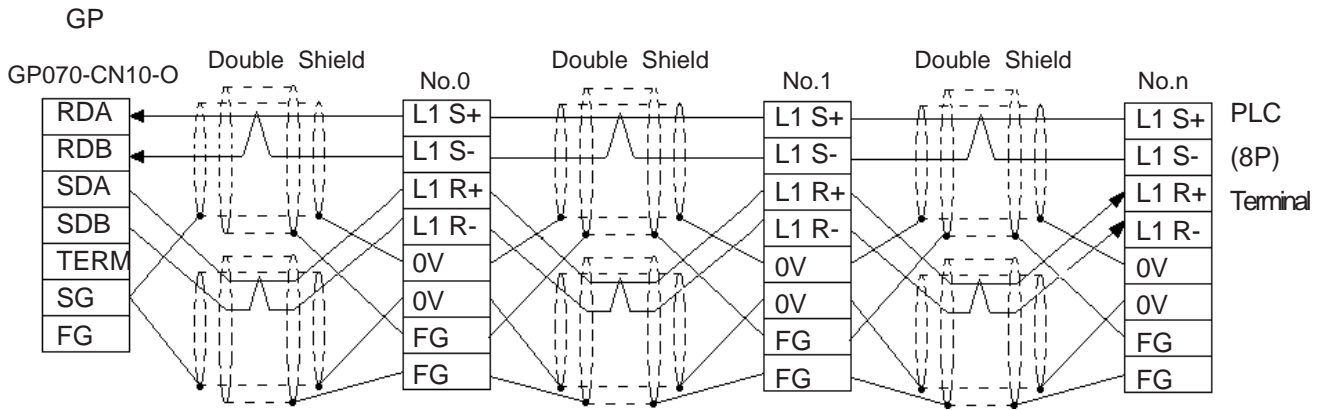


- When making your own cable



Cable Diagram 5 (1:n) RS-422 4-wire type

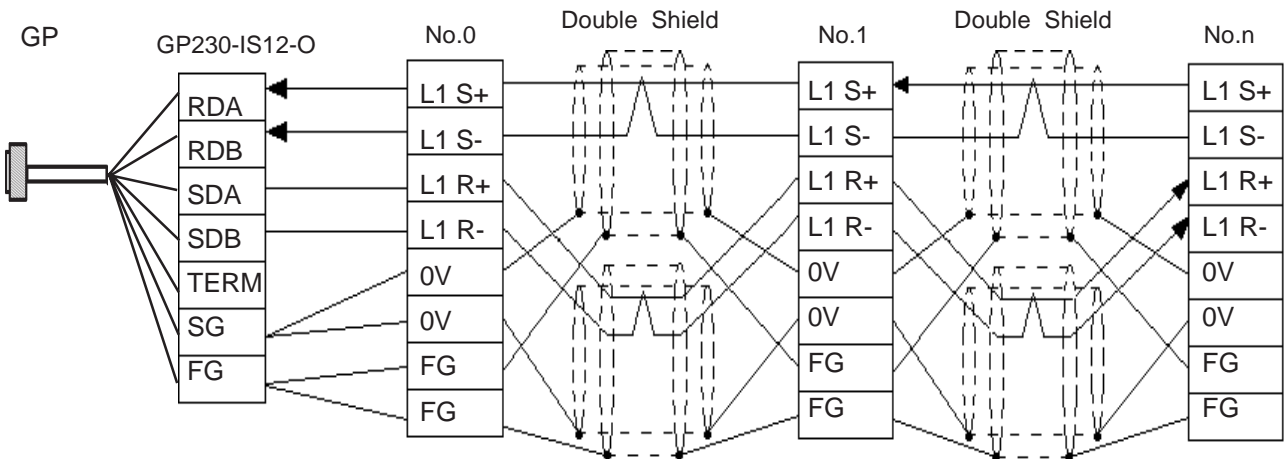
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



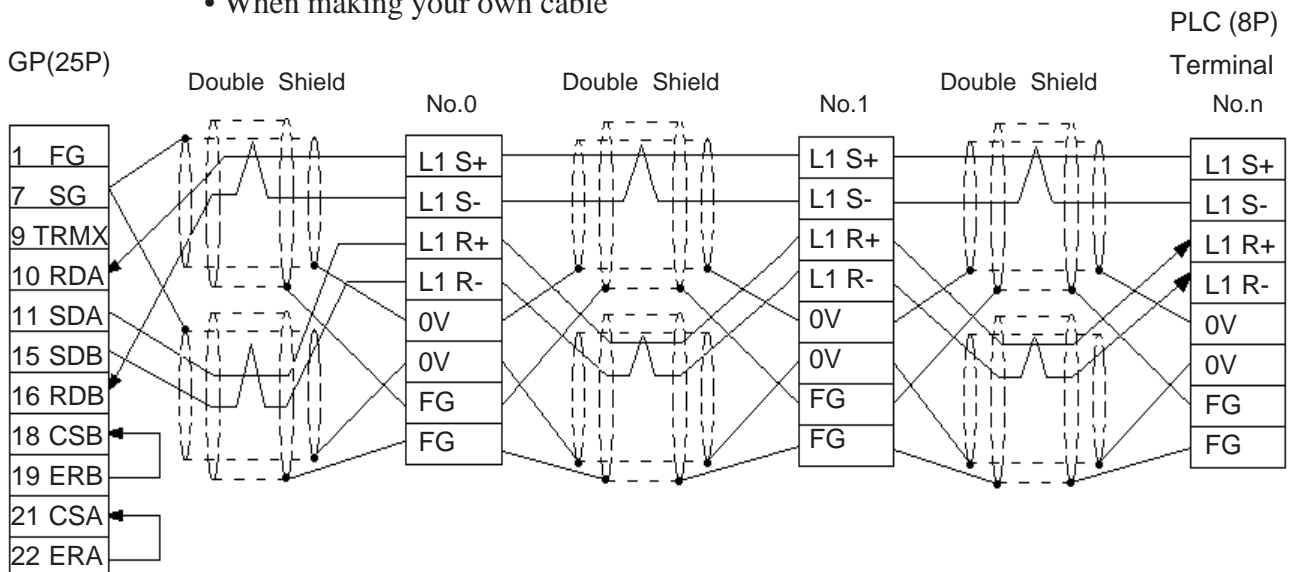
- When using Digital's RS-422 cable, GP230-IS12-0



In areas with excessive noise, use a double shielded cable.

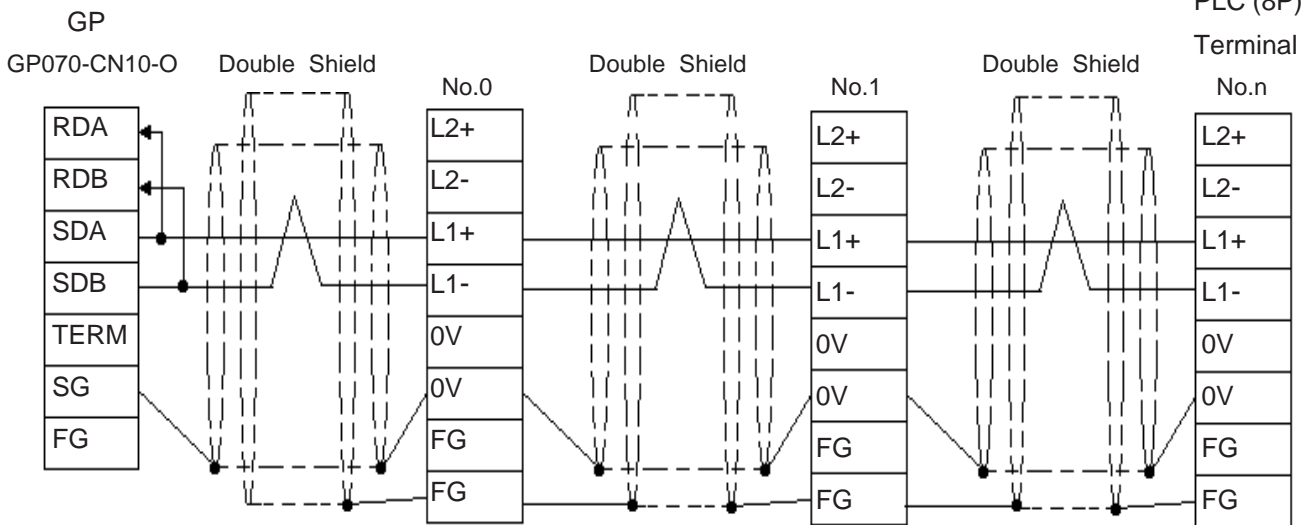


- When making your own cable



Cable Diagram 6 (1:n) RS-422 2-wire type, using I/F unit for CPU

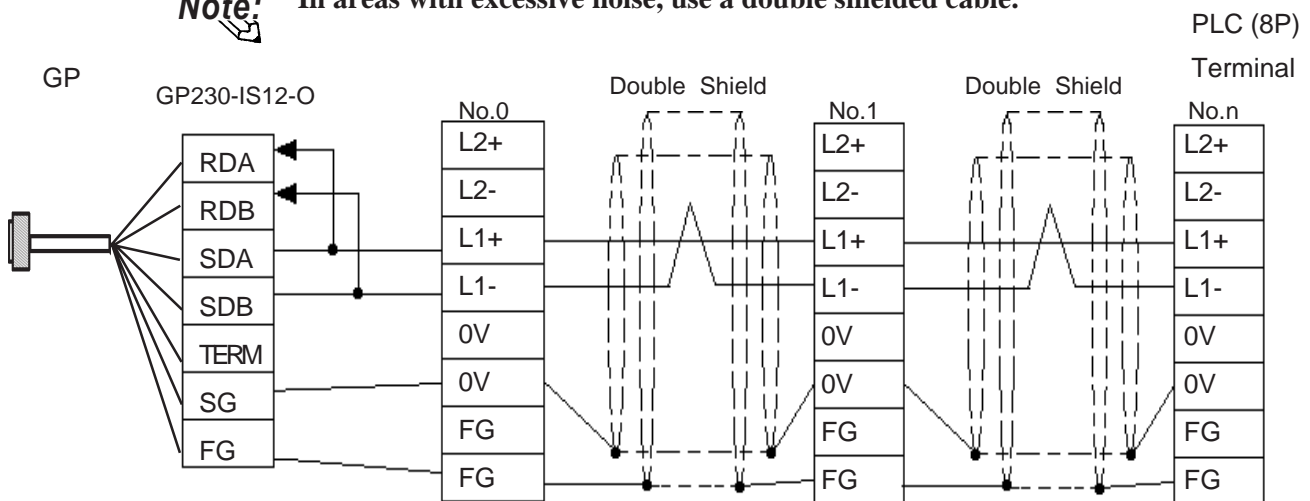
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



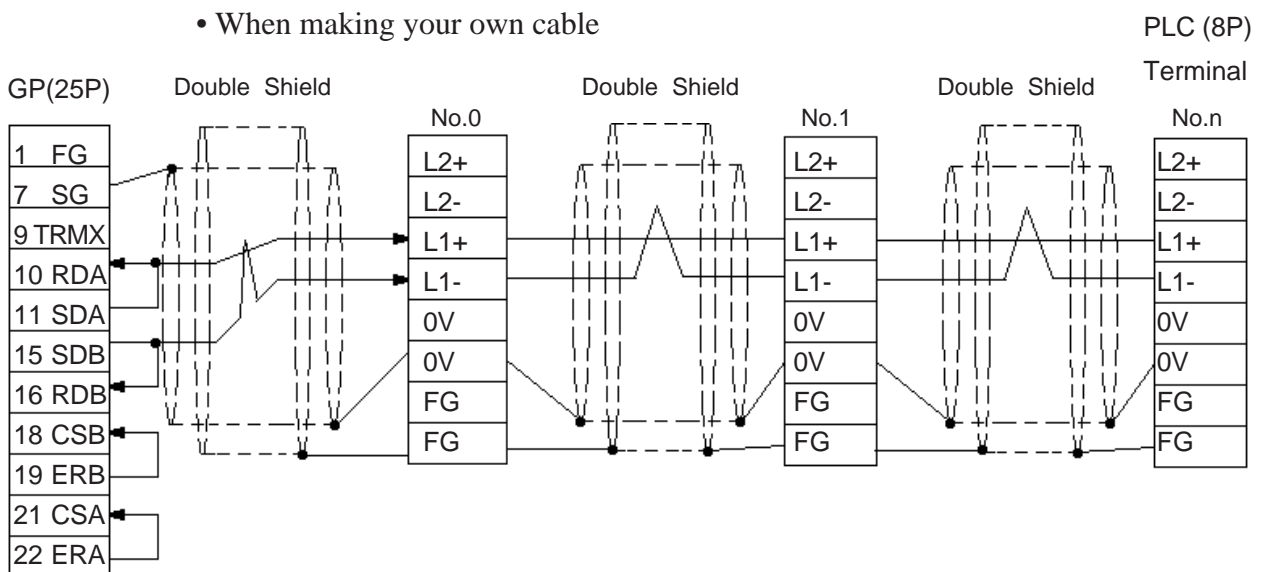
- When using Digital's RS-422 cable, GP230-IS12-0



Note: In areas with excessive noise, use a double shielded cable.

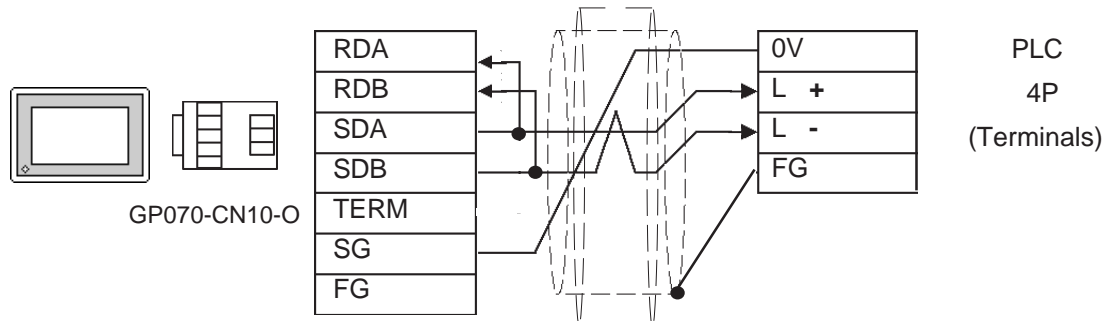


- When making your own cable



Cable Diagram 7 (1:1) <PC/CMP-Link> RS-422 2-wire type

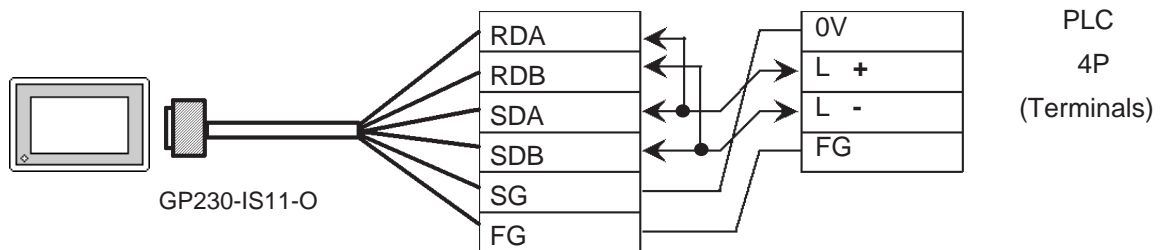
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



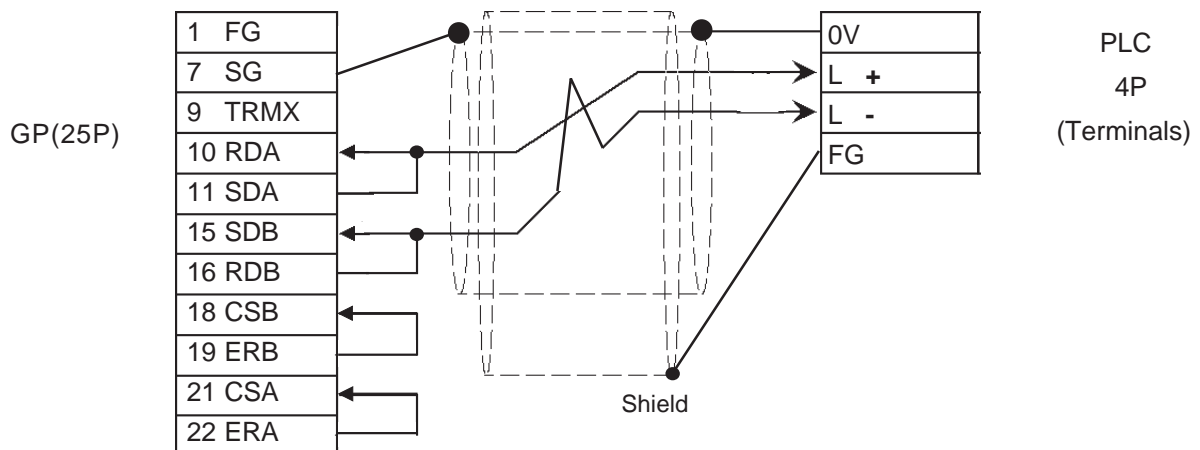
- When using Digital's RS-422 cable, GP230-IS11-0



In areas with excessive noise, use a double shielded cable.

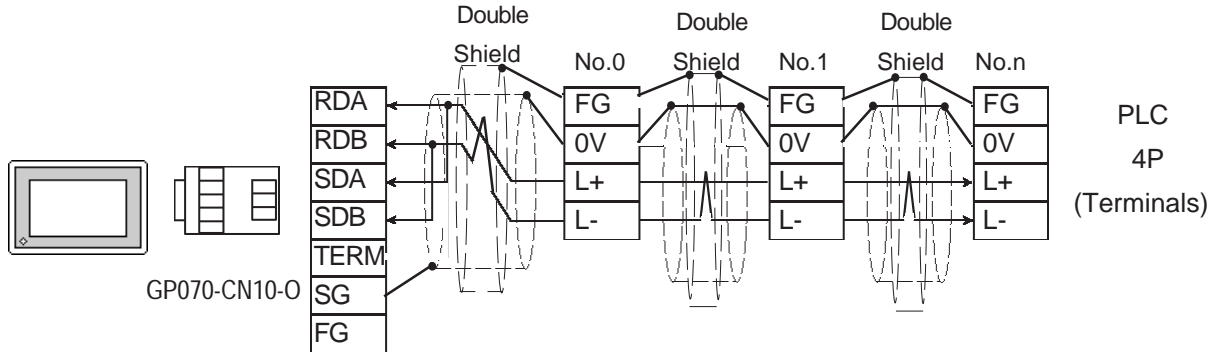


- When making your own cable



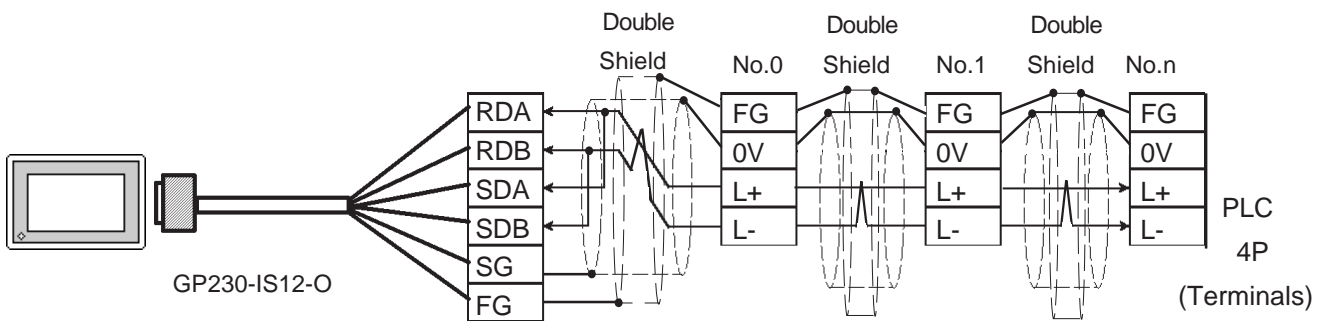
Cable Diagram 8 (1:n) <PC/CMP-Link> RS-422 2-wire type

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

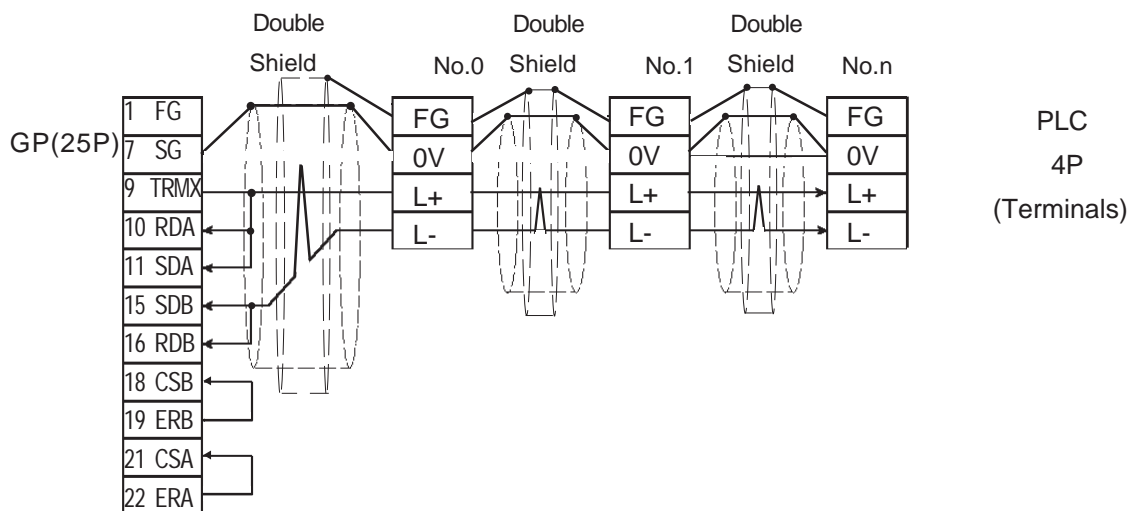


- When using Digital's RS-422 cable, GP230-IS12-0

Note: In areas with excessive noise, use a double shielded cable.



- When making your own cable

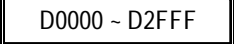






2.9.3 Supported Devices

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

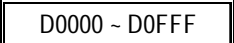




■ TOYOPUC-PC2 Series

 Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X000 ~ X7FF	X0000 ~ X007F	L/H	
Output Relay	Y000 ~ Y7FF	Y0000 ~ Y007F		
Internal Relay	M000 ~ M7FF	M0000 ~ M007F		
Keep Relay	K000 ~ K2FF	K0000 ~ K002F		
Link Relay	L000 ~ L7FF	L0000 ~ L007F		
Special Relay	V000 ~V0FF	V000~V00F		
Edge Detection	P000 ~ P1FF	---		
Timer (contact)	T000 ~ T1FF	---		
Counter (contact)	C000 ~ C1FF	---		
Current Value Register	---	N0000 ~ N01FF		
Data Register	---	 D0000 ~ D2FFF		
Link Register	---	R0000 ~ R07FF		
File Register	---	B0000~B1FFF		
Special Register	---	S0000 ~ S03FF		

■ TOYOPUC-PC2 Series (1:n Connection)

 Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	X0000 ~ X007F	L/H	
Output Relay	Y0000 ~ Y07FF	Y0000 ~ Y007F		
Internal Relay	M0000 ~ M07FF	M0000 ~ M007F		
Keep Relay	K0000 ~ K02FF	K0000 ~ K002F		
Link Relay	L0000 ~ L07FF	L0000~L007F		
Special Relay	V0000 ~V00FF	V0000~V000F		
Edge Detection	P0000 ~ P01FF	---		
Timer (contact)	T0000 ~ T01FF	---		
Counter (contact)	C0000 ~ C01FF	---		
Current Value Register	---	N0000 ~ N01FF		
Data Register	---	 D0000 ~ D0FFF		
Link Register	---	R0000 ~ R07FF		
File Register	---	B0000 ~ B0FFF		
Special Register	---	S0000 ~ S03FF		

■ TOYOPUC-PC3J (1:1 connection)

In this list, "Exp." means "Expansion".

Setup system area here.

Device	Bit Address	Word Address	Comments
Input	1X0000 ~ 1X03FF	1X0000 ~ 1X003F	L/H
	2X0000 ~ 2X03FF	2X0000 ~ 2X003F	
	3X0000 ~ 3X03FF	3X0000 ~ 3X003F	
Output	1Y0000 ~ 1Y03FF	1Y0000 ~ 1Y003F	
	2Y0000 ~ 2Y03FF	2Y0000 ~ 2Y003F	
	3Y0000 ~ 3Y03FF	3Y0000 ~ 3Y003F	
Internal Relay	1M0000 ~ 1M07FF	1M0000 ~ 1M007F	
	2M0000 ~ 2M07FF	2M0000 ~ 2M007F	
	3M0000 ~ 3M07FF	3M0000 ~ 3M007F	
Keep Relay	1K0000 ~ 1K02FF	1K0000 ~ 1K002F	
	2K0000 ~ 2K02FF	2K0000 ~ 2K002F	
	3K0000 ~ 3K02FF	3K0000 ~ 3K002F	
Link Relay	1L0000 ~ 1L07FF	1L0000 ~ 1L007F	
	2L0000 ~ 2L07FF	2L0000 ~ 2L007F	
	3L0000 ~ 3L07FF	3L0000 ~ 3L007F	
Special Relay	1V0000 ~ 1V00FF	1V0000 ~ 1V000F	
	2V0000 ~ 2V00FF	2V0000 ~ 2V000F	
	3V0000 ~ 3V00FF	3V0000 ~ 3V000F	
Edge Detection	1P0000 ~ 1P01FF	----	
	2P0000 ~ 2P01FF	----	
	3P0000 ~ 3P01FF	----	
Timer	1T0000 ~ 1T01FF	1T0000 ~ 1T001F	
	2T0000 ~ 2T01FF	2T0000 ~ 2T001F	
	3T0000 ~ 3T01FF	3T0000 ~ 3T001F	
Counter	1C0000 ~ 1C01FF	1C0000 ~ 1C001F	
	2C0000 ~ 2C01FF	2C0000 ~ 2C001F	
	3C0000 ~ 3C01FF	3C0000 ~ 3C001F	
Data Register	1D00000 ~ 1D2FFFF	1D0000 ~ 1D2FFF	
	2D00000 ~ 2D2FFFF	2D0000 ~ 2D2FFF	
	3D00000 ~ 3D2FFFF	3D0000 ~ 3D2FFF	
Link Register	1R00000 ~ 1R07FFF	1R0000 ~ 1R07FF	
	2R00000 ~ 2R07FFF	2R0000 ~ 2R07FF	
	3R00000 ~ 3R07FFF	3R0000 ~ 3R07FF	
Special Register	1S00000 ~ 1S03FFF	1S0000 ~ 1S03FF	
	2S00000 ~ 2S03FFF	2S0000 ~ 2S03FF	
	3S00000 ~ 3S03FFF	3S0000 ~ 3S03FF	
Current Value Register	1N00000 ~ 1N01FFF	1N0000 ~ 1N01FF	
	2N00000 ~ 2N01FFF	2N0000 ~ 2N01FF	
	3N00000 ~ 3N01FFF	3N0000 ~ 3N01FF	
File Register	B00000 ~ B1FFFF	B0000 ~ B1FFF	
Exp. Input	EX0000 ~ EX07FF	EX0000 ~ EX007F	
Exp. Output	EY0000 ~ EY07FF	EY0000 ~ EY007F	
Exp. Internal Relay	EM0000 ~ EM1FFF	EM0000 ~ EM01FF	
Exp. Keep Relay	EK0000 ~ EK0FFF	EK0000 ~ EK00FF	
Exp. n Link Relay	EL0000 ~ EL1FFF	EL0000 ~ EL01FF	
Exp. Special Relay	EV0000 ~ EV0FFF	EV0000 ~ EV00FF	
Exp. Edge Relay	EP0000 ~ EP0FFF	----	
Exp. Timer	ET0000 ~ ET07FF	ET0000 ~ ET007F	
Exp. Counter	EC0000 ~ EC07FF	EC0000 ~ EC007F	
Exp. Special Register	ES00000 ~ ES07FFF	ES0000 ~ ES07FF	
Exp. Current Value Register	EN00000 ~ EN07FFF	EN0000 ~ EN07FF	
Exp. Setting Value Register	H00000 ~ H07FFF	H0000 ~ H07FF	
Exp. Data Register	U00000 ~ U7FFFF	U0000 ~ U7FFF	

■ TOYOPUC-PC3J (1:n connection)

In this list, "Exp." means "Expansion".

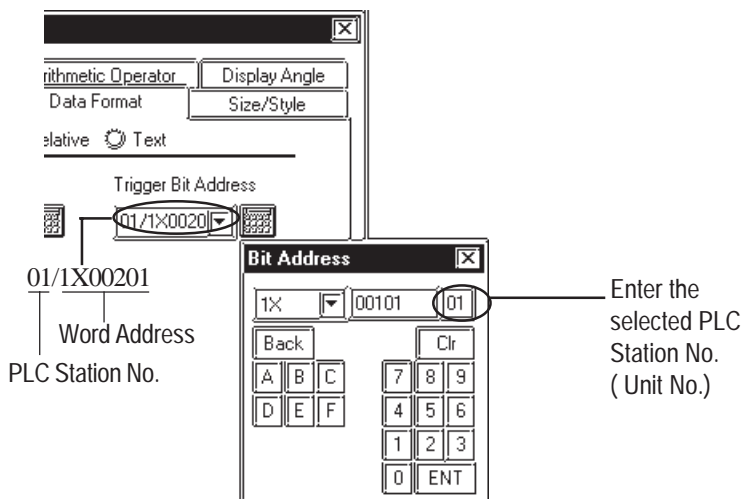


Setup system area here.

Device	Bit Address	Word Address	Comments
Input	1X0000 ~ 1X03FF	1X0000 ~ 1X003F	L/H
	2X0000 ~ 2X03FF	2X0000 ~ 2X003F	
	3X0000 ~ 3X03FF	3X0000 ~ 3X003F	
Output	1Y0000 ~ 1Y03FF	1Y0000 ~ 1Y003F	
	2Y0000 ~ 2Y03FF	2Y0000 ~ 2Y003F	
	3Y0000 ~ 3Y03FF	3Y0000 ~ 3Y003F	
Internal Relay	1M0000 ~ 1M07FF	1M0000 ~ 007F	
	2M0000 ~ 2M07FF	2M0000 ~ 007F	
	3M0000 ~ 3M07FF	3M0000 ~ 007F	
Keep Relay	1K0000 ~ 1K02FF	1K0000 ~ 1K002F	
	2K0000 ~ 2K02FF	2K0000 ~ 2K002F	
	3K0000 ~ 3K02FF	3K0000 ~ 3K002F	
Link Relay	1L0000 ~ 1L07FF	1L0000 ~ 007F	
	2L0000 ~ 2L07FF	2L0000 ~ 007F	
	3L0000 ~ 3L07FF	3L0000 ~ 007F	
Special Relay	1V0000 ~ 1V00FF	1V0000 ~ 000F	
	2V0000 ~ 2V00FF	2V0000 ~ 000F	
	3V0000 ~ 3V00FF	3V0000 ~ 000F	
Edge Detection	1P0000 ~ 1P01FF	----	
	2P0000 ~ 2P01FF	----	
	3P0000 ~ 3P01FF	----	
Timer	1T0000 ~ 1T01FF	1T0000 ~ 1T001F	
	2T0000 ~ 2T01FF	2T0000 ~ 2T001F	
	3T0000 ~ 3T01FF	3T0000 ~ 3T001F	
Counter	1C0000 ~ 1C01FF	1C0000 ~ 1C001F	
	2C0000 ~ 2C01FF	2C0000 ~ 2C001F	
	3C0000 ~ 3C01FF	3C0000 ~ 3C001F	
Data Register	1D00000 ~ 1D0FFFF	1D0000 ~ 1D0FFF	
	2D00000 ~ 2D0FFFF	2D0000 ~ 2D0FFF	
	3D00000 ~ 3D0FFFF	3D0000 ~ 3D0FFF	
Link Register	1R00000 ~ 1R07FFF	1R0000 ~ 1R07FF	
	2R00000 ~ 2R07FFF	2R0000 ~ 2R07FF	
	3R00000 ~ 3R07FFF	3R0000 ~ 3R07FF	
Special Register	1S00000 ~ 1S03FFF	1S0000 ~ 1S03FF	
	2S00000 ~ 2S03FFF	2S0000 ~ 2S03FF	
	3S00000 ~ 3S03FFF	3S0000 ~ 3S03FF	
Current Value Register	1N00000 ~ 1N01FFF	1N0000 ~ 1N01FF	
	2N00000 ~ 2N01FFF	2N0000 ~ 2N01FF	
	3N00000 ~ 3N01FFF	3N0000 ~ 3N01FF	
File Register	B00000 ~ B0FFFF	B0000 ~ B0FFF	
Exp. Input	EX0000 ~ EX07FF	EX0000 ~ EX007F	
Exp. Output	EY0000 ~ EY07FF	EY0000 ~ EY007F	
Exp. Internal Relay	EM0000 ~ EM0FFF	EM0000 ~ EM01FF	
Exp. Keep Relay	EK0000 ~ EK0FFF	EK0000 ~ EK00FF	
Exp. Link Relay	EL0000 ~ EL0FFF	EL0000 ~ EL01FF	
Exp. Special Relay	EV0000 ~ EV0FFF	EV0000 ~ EV00FF	
Exp. Edge Relay	EP0000 ~ EP0FFF	----	
Exp. Timer	ET0000 ~ ET07FF	ET0000 ~ ET007F	
Exp. Counter	EC0000 ~ EC07FF	EC0000 ~ EC007F	
Exp. Special Register	ES00000 ~ ES07FFF	ES0000 ~ ES07FF	
Exp. Current Value Register	EN00000 ~ EN07FFF	EN0000 ~ EN07FF	
Exp. Setting Value Register	H00000 ~ H07FFF	H0000 ~ H07FF	
Exp. Data Register	U00000 ~ U0FFFF	U0000 ~ U0FFF	



- The range of devices supported may differ for 1:1 communication and for 1:n communication. A maximum of 16 PLCs can be connected.
- When setting tags in GP-PRO/PBIII for Windows, the PLC Station number can be specified during address Input. If a station number is not indicated, the previously entered station number is used. (The default value is 0)



2.9.4 Environment Setup

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

■ **TOYOPUC-PC2 Series (PC2/L2)**

GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	2-wire type	---	
---		Card Classification	CMP Link
---		SET5	Watch Dog Timer ON
Unit No.	0	Station Number Setting	0

■ **TOYOPUC-PC2 Series (PC2J)**

GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format	2-wire type	---	
---		Internal Switch (SW4)	1 is Off 2 is On
Unit No.	1	Station Number Setting	1

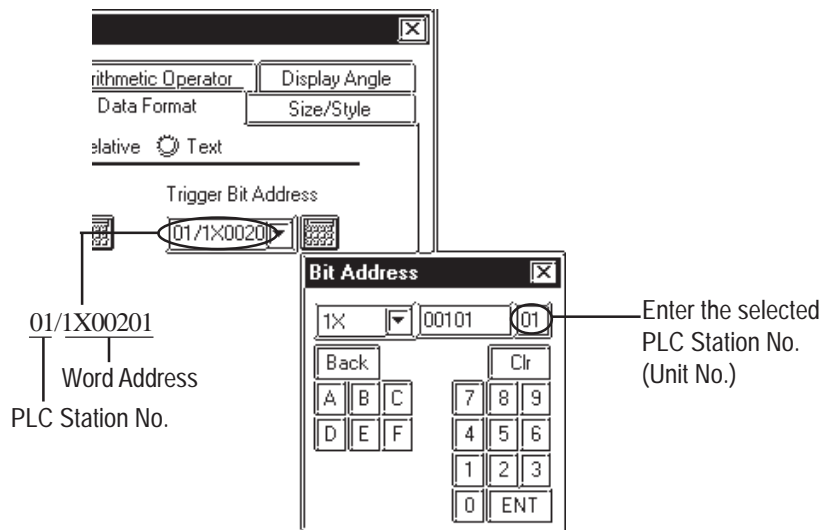
■ TOYOPUC-PC2 Series (PC2J) (1:n connection)

GP Setup		Computer Link Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Bit	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control		---
Communication Format	2-wire type		---
Unit No. ^{*1}	Match this number with that of any PC/CMP link.	Station Number Setting ^{*1}	All PC/CMP link numbers must be different from each other.
	---	Internal Switch (SW4)	1 is Off 2 is On

*1 The memory used for the system area and the read area is allocated to the PLC which has been given the same number as that of the GP.



Note: When entering tag address data in GP-PRO/PBIII for Windows, the PLC Station number can be specified. If a station number is not indicated, the previously entered station number is used. (The initial default value is 1.)



■ TOYOPUC-PC3J (1:1 connection) <Link I/F on CPU unit>

GP Setup		PLC Setup	
Baud Rate ^{*1}	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format ^{*2}	4-wire or 2-wire type	RS-422 communication port	4-wire or 2-wire type
Unit No.	0	Station No.	0

*1 The CPU's Link I/F unit maximum baud rate is 57600bps. It does not support 115200bps.

*2 Change the communication format depending on the cables you use.

■ TOYOPUC-PC3J (1:n connection) <Link I/F on CPU unit>

GP Setup		PLC Setup	
Baud Rate ^{*1}	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format ^{*2}	4-wire or 2-wire type	RS-422 communication port	4-wire or 2-wire type
Unit No.	Select any unit number between 0 to 15. ^{*3}	Station No.	All link station numbers must be different

*1 The CPU's Link I/F unit maximum baud rate is 57600bps. It does not support 115200bps.

*2 Change the communication format depending on the cable you use.

*3 A maximum of 16 PLCs can be connected. The PLC's station number must be in base8, however, GP's unit number must be in decimal.

■ TOYOPUC-PC3J (1:1 connection) <PC/CMP-Link>

GP Setup		PLC Setup	
Baud Rate ^{*1}	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format	2-wire type	RS-422 communication port ^{*2}	2-wire type
Unit No.	0	Station No.	0

*1 The PC/CMP-Link (THU-2755) unit's maximum baud rate is 57600bps. It does not support 115200bps.

*2 With the PC/CMP-Link (THU-2755), only a 2-wire type can be used. When using PC3J commands, the link unit must be version 5.00 or higher.

■ TOYOPUC-PC3J (1:n connection) <PC/CMP-Link>

GP Setup		PLC Setup	
Baud Rate ^{*1}	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER	----	----
Communication Format	2-wire type	RS-422 communication port ^{*2}	2-wire type
Unit No. ^{*3}	Select any unit number between 0 to 15.	Station No.	All PC/CMP link station numbers must be different
----	----	Internal Switch	SW4-1 OFF SW4-2 ON

*1 The PC/CMP-Link (THU-2755) unit's maximum baud rate is 57600bps. It does not support 115200bps.

*2 With the PC/CMP-Link (THU-2755), only a 2-wire type can be used. When using PC3J commands, the link unit must be version 5.00 or higher.

*3 A maximum of 16 PLCs can be connected. The PLC's station number must be in octal, however, GP's unit number must be in decimal.