

# Device/PLC Connection Manuals

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## 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.

## 2.3 Fuji Electric

### 2.3.1 System Structure

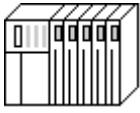


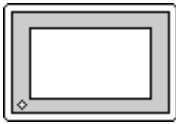
The following describes the system structure for connecting the GP to Fuji Electric Corporation, Ltd. PLCs.

**Reference** Cable Diagrams mentioned in the following tables are listed in the section titled "2.3.2 Cable Diagrams".



- **In the LS area, 32-bit length devices are not supported. Therefore, if the system area is allocated to BD, D1, or W33, no LS area other than the system area can be used.**

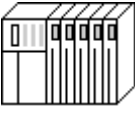
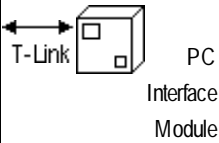

#### ■ MICREX-F Series (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 PC I/F Module/ Generic I/F			
F80H, F120H, F250	FFU-120B PC Interface Module	RS-232C (Cable Diagram 1)  RS-422 (Cable Diagram 2)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
F70S (NC1P-S0)	NC1L-RS2 (Generic Interface) *1	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	

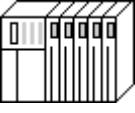


\*1 When expansion units are attached via a T-Link system to a main PLC unit, and more than 2 link units are attached to the expansion unit, the GP unit can be attached to only one of the link units. (Simultaneous connection to 2 link units is not possible.)

Simultaneous connection to 2 link units is possible only when they are attached to the main PLC unit.

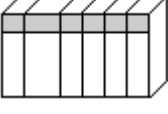


■ **MICREX-F Series <T-link>** (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 T-Link PC Interface Module			
F80H, F120H, F250 F30, F50, F60, F80, F81, F120 F120S, F200	FFK120A-C10	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
	FFK100A-C10	RS-422 (Cable Diagram 2)		
		RS-232C (Cable Diagram 3)		

■ **MICREX-F Series (FLT-ASFK)** (CPU Direct Connection)

CPU	Adapter	Cable Diagram	Cables	GP
	PC Loader adapter 			
F80H, F250, F120H	Fuji Electric's FLT-ASFK	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O	GP Series

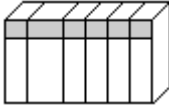


■ **FLEX-PC Series** (using Link I/F)

CPU	Link I/F	Cable Diagram	Cables	GP
	 General SIO Unit/ General I/F Module			
NB1, NB2, NB3	NB-RS1-AC (Generic RS-232C/ 485 SIO unit)	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O (5m)	GP Series
		RS-422 (Cable Diagram 2)		
NJ	NJ-RS2 (Generic RS- 232C SIO interface module)	RS-232C (Cable Diagram 1)	Digital's GP410-IS00-O (5m)	
	NJ-RS2 (Generic RS- 485 SIO interface module)	RS-422 (Cable Diagram 2)		
NS	NS-RS1 (Generic RS- 232C/485 interface module)	RS-232C (Cable Diagram 1)	RS-232C Digital's GP410-IS00-O (5m)	
		RS-422 (Cable Diagram 2)		



Places noted as RS-422 can also use RS-485 on the PLC side.

■ FLEX-PC Series (CPU Direct Connection)

CPU	Cable Diagram	GP
		
NB1, NB2, NB3, NJ, NS	RS-422 (Cable Diagram 4)	GP Series



When using Digital's T-Link I/F Unit, refer to the GP-\*50/70 Series T-Link I/F Unit User's Manual.

**2.3.2 Cable Diagrams**

The cable diagrams illustrated below and the cable diagrams recommended by Fuji Electric Co., Ltd. may differ; in any case, using these cables for your PLC operations will not cause any problems.

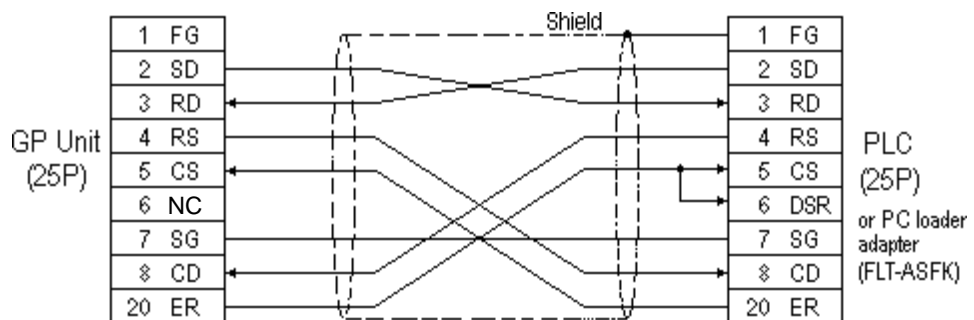


Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the corresponding PLC manual.



- **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.**
- **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).**

**Cable Diagram 1 (RS-232C)**

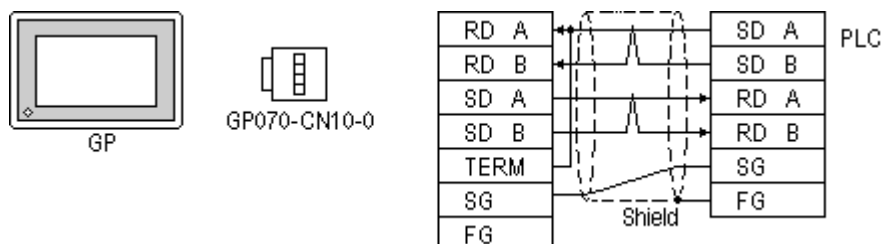


**Cable Diagram 2 (RS-422)**

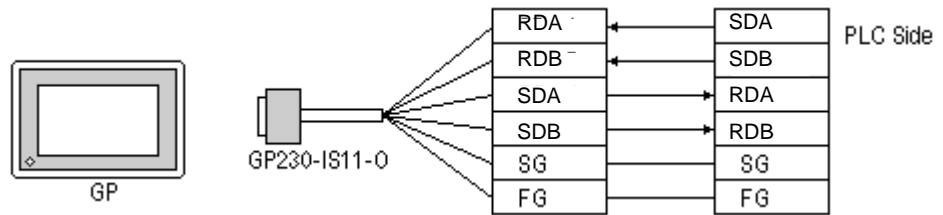


Turn on the Termination Resistor switch, on the PLC side.

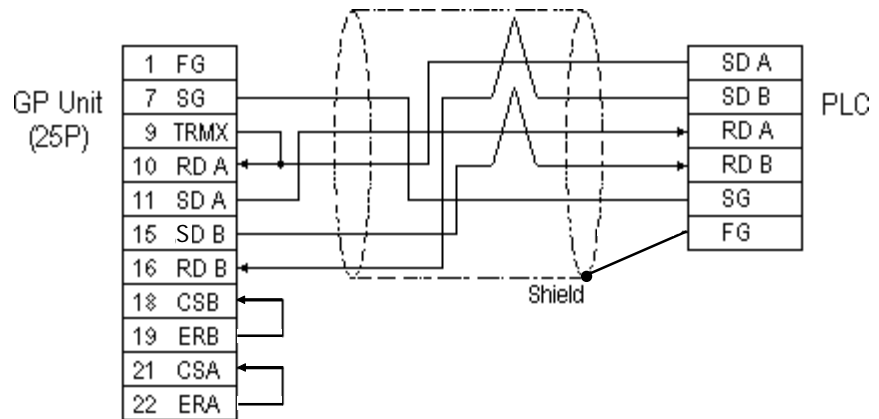
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



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

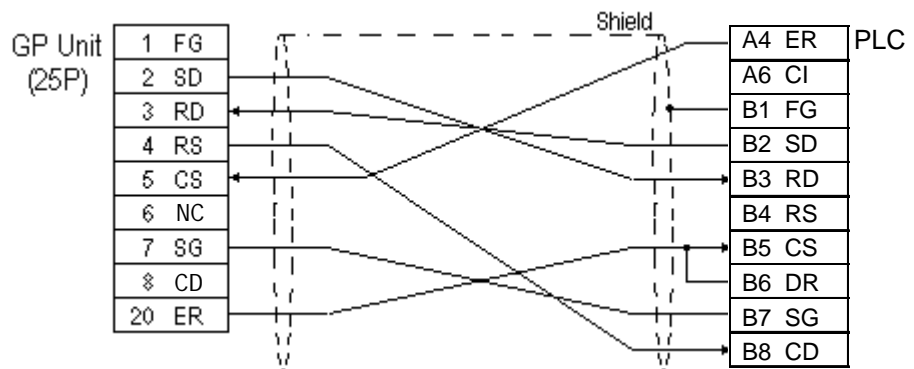


- When making your own cable connections



- When making your own cable connections, we recommend using Hitachi Densen's CO-SPEV-SB(A)3P\*0.5S 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.

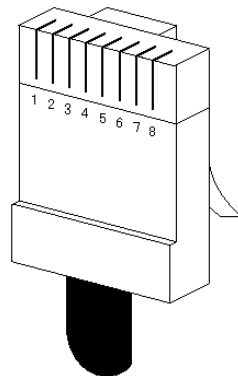
**Cable Diagram 3 (RS-232C)**



**Cable Diagram 4 (RS-422)**

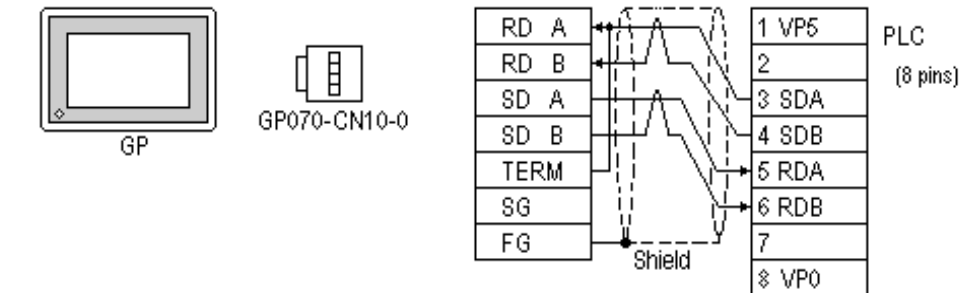


For the PLC side connector (modular-jack) you can use Hirose's TM11P-88P.

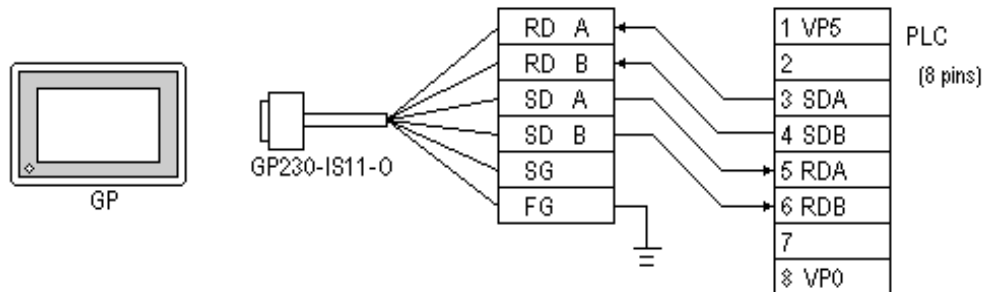


The pin numbers of the modular-jack for the connection diagrams below are based on the order described in the figure at the left.

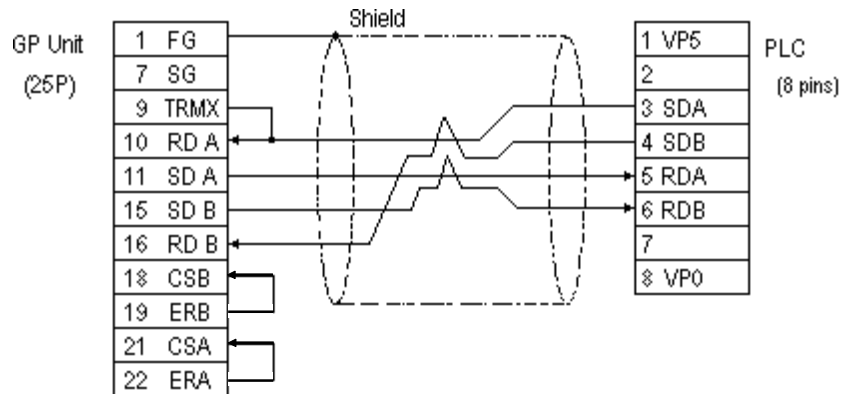
- When using Digital's RS-422 connector terminal adapter GP070-CN10-0



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



- When making your own cable connections



When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

**2.3.3 Supported Devices**

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

**MICREX-F Series**

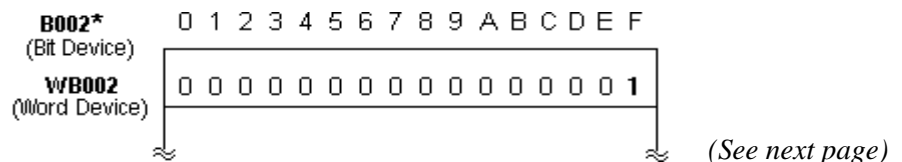
Setup System Area here.

Device	Bit Address	Word Address	Particulars
I/O Relay	B0000 ~ B511F	WB0000 ~ WB0511	*1
Direct I/O	---	W24.0000 ~ W24.0159	
Auxiliary Relay	M0000 ~ M511F	WM0000 ~ WM0511	*1
Keep Relay	K0000 ~ K063F	WK000 ~ WK063	*1
Differential Relay	D0000 ~ D063F	WD000 ~ WD063	*1 *4
Link Relay	L0000 ~ L511F	WL000 ~ WL0511	*1
Special Relay	F00000 ~ F4095F	WF0000 ~ WF4095	*1 *4
Announce Relay	A00000 ~ A4095F	WA0000 ~ WA4095	*1 *4
Timer 0.01 sec	T0000 ~ T0511	---	
Timer 0.1 sec	T0512 ~ T1023	---	
Counter	C0000 ~ C0255	---	
Timer 0.01 sec (current value)	---	TR0000 ~ TR0511	
Timer 0.01 sec (setup value)	---	TS0000 ~ TS0511	
Timer 0.1 sec (current value)	---	W9.000 ~ W9.511	
Counter (current value)	---	CR0000 ~ CR0255	
Counter (setup value)	---	CS0000 ~ CS0255	
Data Memory	---	BD0000 ~ BD4095	[Bit 31]
	---	DI0000 ~ DI4095	[Bit 31]
	---	SI0000 ~ SI4095	[Bit 15]
File Memory	---	W30.0000 ~ W30.4094	[Bit 15] *2
	---	W31.0000 ~ W31.4094	[Bit 15] *2
	---	W32.0000 ~ W32.4094	[Bit 15] *2
	---	W33.0000 ~ W33.4094	[Bit 31] *3
	---	W34.0000 ~ W34.4094	[Bit 31] *3

H/L

\*1 The MSB (most significant bit) of a word device corresponds to bit 0 of the device, and the LSB (least significant bit) corresponds to bit F.

E.g. When hexadecimal data **0001** is written to a Word device address



(See next page)



(from previous page)

- \* 2 Define and use 16 bit length data.
- \* 3 Define and use 32 bit length data.
- \* 4 This device cannot write. Use it only for reading.



- **In this LS area, no 32-bit device is supported. Therefore, when the System Area is allocated to the BD, DL, or W33 devices, no LS Area other than the System Area can be used.**
- **When using the GP-570VM or GP-870VM, do not allocate the System Area for BD, DI, or W33 word addresses.**
- **Certain PLC models and versions may not be able to perform bit reading or writing.**

- F30 ..... not possible with versions 0.9 or lower**
- F50 ..... not possible with versions 1.4 or lower**
- F50H ..... not possible with versions 0.7 or lower**
- F80 ..... not possible with any version**
- F81 ..... not possible with any version**
- F120 ..... not possible with any version**
- F200 ..... not possible with any version**

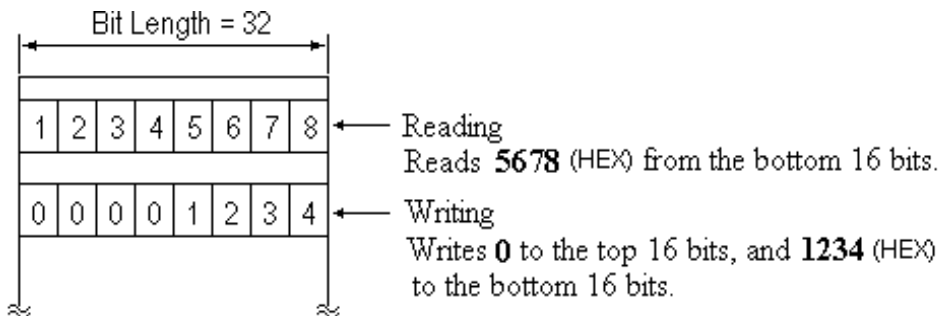
**Check the information plate on the side of the PLC to find the PLC's version information.**

**When processing 16-bit single word data:**

Internally, the GP basically processes 1 word as 16 bit length data. As a result, the reading and writing of 32 bit length data devices are processed as follows:

- Reading From 32 bit data, reads data only from the bottom 16 bits.
- Writing From 32 bit data, writes data only to the bottom 16 bits, as 0 is written to the top 16 bits.

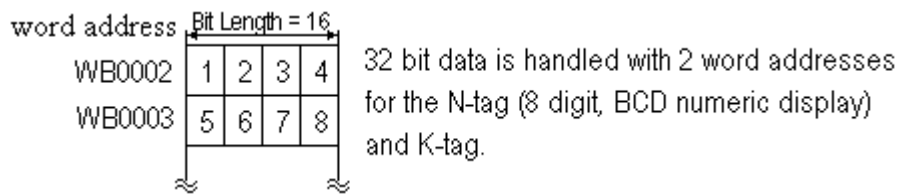
E.g. When data is **12345678** hex.



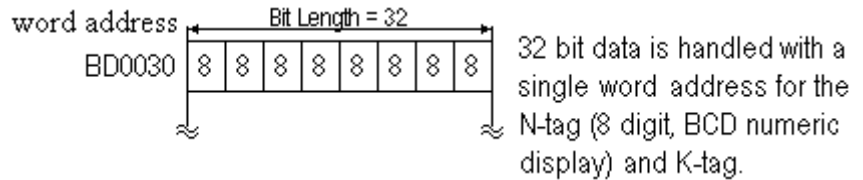
**When processing 2 word 32-bit data:**

Two word addresses at bit length 16 are necessary to handle 32 bit long data, but when using a 32 bit device, only one word address needs to be specified.

**When using a 16 bit device**



**When using a 32 bit device**



**■ FLEX-PC Series**

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X0000 ~ X07FF	WX0000 ~ WX07F	L/H	
Output Relay	Y0000 ~ Y07FF	WY0000 ~ WY07F		
Internal Relay	M0000 ~ M03FF	WM000 ~ WM03F		
Extended Internal Relay	M0400 ~ M1FFF	WM040 ~ WM1FF		
Latch Relay	L0000 ~ L03FF	WL000 ~ WL03F		
Extended Latch Relay	L0400 ~ L1FFF	WL040 ~ WL1FF		
Special Relay	M8000 ~ M81FF	WM800 ~ WM81F		
Timer	T0000 ~ T03FF	---		
Counter	C0000 ~ C01FF	---		
Timer (current value)	---	T0000 ~ T03FF		
Timer (setup value)	---	TS0000 ~ TS03FF		*1
Counter (current value)	---	C0000 ~ C01FF		
Counter (setup value)	---	CS0000 ~ CS01FF		*1
Data Register	---	D0000 ~ D2FFF		Bit 5
Special Register	---	D8000 ~ D837F		Bit 5
Link Register	---	W0000 ~ W3FFF	Bit 5	
File Register	---	R0000 ~ R7EFF	Bit 5	

\* 1 Define and use 16 bit length data.



- **Cannot read the *Timer* and *Counter* setup value. However, the write operation is possible only when the PLC is in program mode.**

- When the *Timer* and *Counter* setup values are written from the GP, the ladder is changed so that the setup value uses a relative reference. For this reason, be careful when the setup value for the *Timer* and *Counter* uses an indirect ladder. Normally, *access* is recommended for indirectly referenced devices.

### 2.3.4 Environment Setup

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

#### ■ MICREX-F Series (using PC I/F module FFU120B)

GP Setup		FFU120B Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	DTR on/ CTS on
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
---		Char. structure Switch	8 (INIT) is Off
---		RS-485 Station # setup Switch (Only for RS-485)	0
Unit No.	0 (fixed)	---	



**Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.**

#### ■ MICREX-F Series (using General Interface Module NC1L-RS2)

GP Setup		NC1L-RS2 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	None	Parity Bit	None
Data Flow Control	ER Control	Transfer Condition	DTR on/CTS on
Communication Format	RS-232C	MODE Setup	1
---		Character Structure Switch	8 (Initialize Setup Process) is Off (Initial file)
Unit No.	0 (fixed)	---	



**Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.**

■ MICREX-F Series (using PC I/F capsule FFK120A-C10)

GP Setup		FFK120A-C10 Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	None
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
---		RS-485 Station # setup Switch (Only when using RS-485)	0
Unit No.	0 (fixed)	---	



**Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.**

■ MICREX-F Series (using PC I/F capsule FFK100A-C10)

GP Setup		FFK100A-C10 Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	---	
Communication Format (When using RS-232C)	RS-232C	---	
Unit No.	0 (fixed)	---	
---		PK access	Permitted
---		Code conversion	Available



**Setup this data in *File Definition*. Communication is not possible when using a Link I/F switch.**

■ MICREX-F Series (FLT-ASFK)

GP Setup		Adapter Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	---	
Parity Bit	None	Parity Bit ON/OFF EVEN/ODD	OFF None
Data Flow Control	ER Control	---	
Communication Format	RS-232C	---	
Unit No.	0	---	
---		MODE	LOADER

■ FLEX-PC Series (using Link I/F)

GP Setup		Communication Unit / Interface Module Setup	
Baud Rate	19200 bps	Baud Rate	19200 bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	Transfer Condition	DTR on/ CTS on
Communication Format (RS-232C)	RS-232C	MODE Switch (RS-232C)	1
Communication Format (RS-422)	4-wire type	MODE Switch (RS-422)	3
Unit No.	1	Station No.	1

■ FLEX-PC Series (using CPU Direct Connection)

GP Setup		PLC side Setup
Baud Rate	19200 bps (fixed)	---
Data Length	8 bits (fixed)	---
Stop Bit	1 bit (fixed)	---
Parity Bit	Odd (fixed)	---
Data Flow Control	ER Control (fixed)	---
Communication Format	4-wire type (fixed)	---
Unit No.	1 (fixed)	---