

Device/PLC Connection Manuals



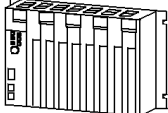
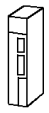

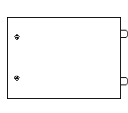
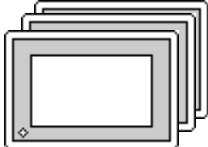
About the Device/PLC Connection Manuals

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.

11.2 Slave I/O

11.2.1 System Structure

The following table shows the system structure for connecting the GP to Siemens PLCs and PCs.

CPU	Link I/F	Cable Diagram	Recommended Cables	Link I/F	GP
					
CPU413-2DP	Phoenix Contact IBS S7-400 DSC/I-T	(Cable Diagram 1)	Phoenix Contact IBS RBC 2M ^{*1} . KONFEX-T	Interbus Slave Module (GP070-IB41)	GP Series ^{*2}
Various PCs	Phoenix Contact IBS PC ISA SC/I-T	(Cable Diagram 1)			

**1 2M indicates the length of the cable as 2 meters. 5M indicates a length of 5 meters etc.*

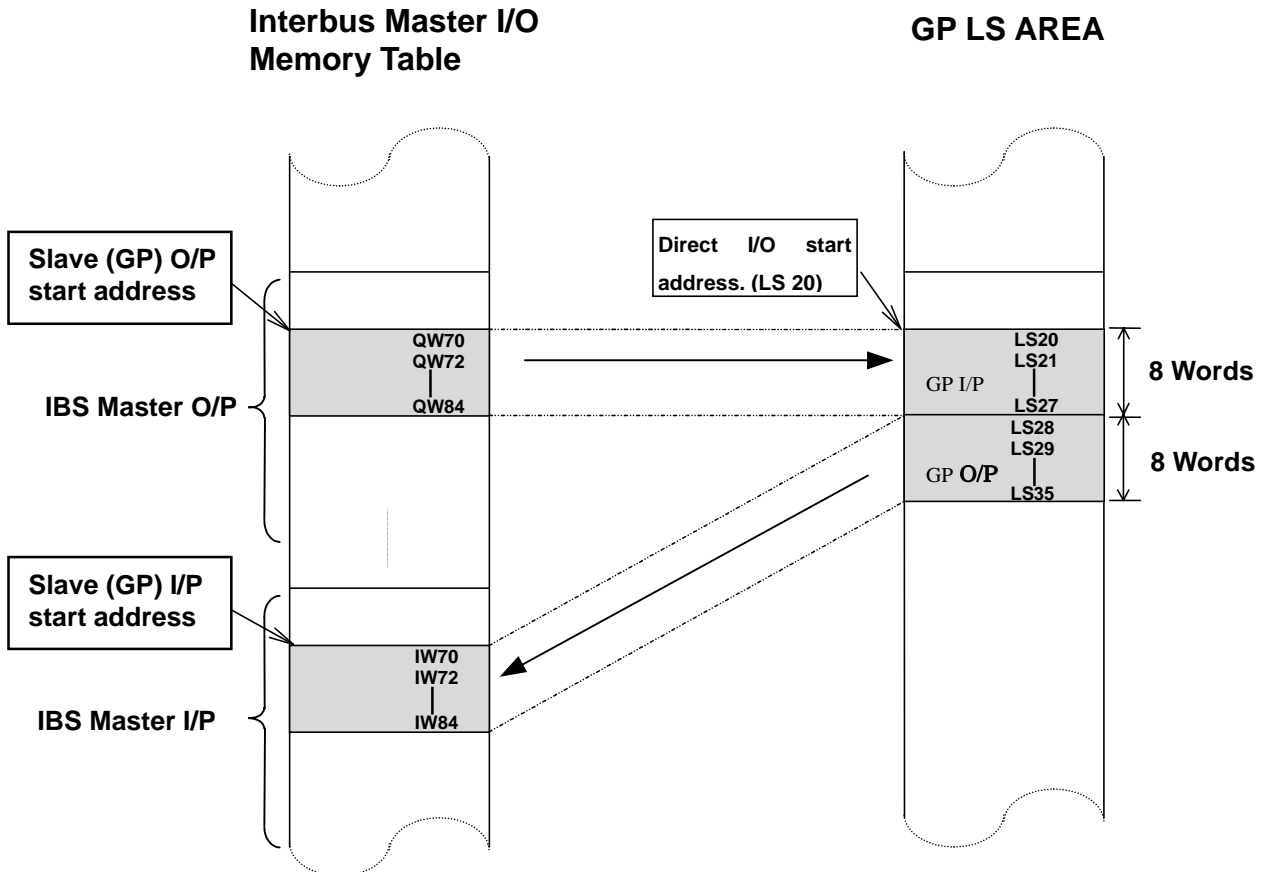
2 For details, **Reference refer to Siemens Connectable Devices.*



Note: i The GP is used is a slave unit.

■ Direct I/O Mode

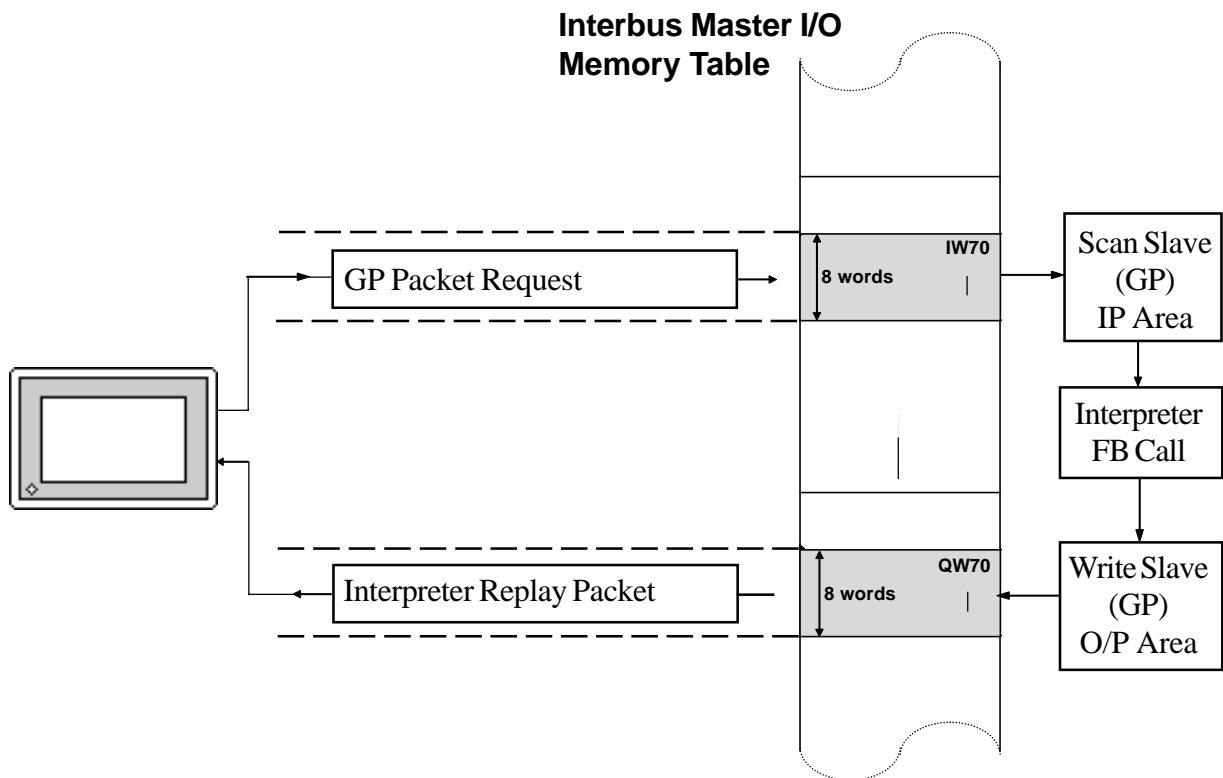
When communicating via Interbus in “Direct I/O” mode, the GP communicates with an Interbus master in a very simple manner. An area of memory is mapped from the GP’s LS area into the Interbus master’s input area and an area of the Interbus master’s output is mapped into the GP’s LS area. This is demonstrated in the following diagram example (Input & Output size 8 Words).



The GP Slave Input and Output start addresses and sizes (IW40 and QW20 in the above example) have to be configured using the Interbus Master's configuration software. Please refer to the Interbus Master's documentation for instructions on how to make these settings.

■ Packet Transfer Mode

When communicating via Interbus in “Packet Transfer” mode, the GP acts as a “Logical Master”, i.e. it can request to read and write any data areas in the PLC as if it was a master. In this mode an “Interpreter Function Block” is required in the PLC. In this mode the GP uses a fixed input and output area size (16 bytes or 8 words) of the PLCs I/O memory Table. The GP transmits commands (read or write requests) based on its outputs. The PLC’s interpreter function block scans this input area and performs the requested action, then places the result on the output area. See the diagram below for an explanation.



The GP Slave Input and Output start addresses and sizes (IW256 and QW 256 in the previous example) have to be configured using the Interbus Master's configuration software. Please refer to the Interbus Master's documentation for instructions on how to create these settings. Currently a function block exists only for the S7-400 PLC. This should be called from OB1 of the Step 7 Program. Please refer to the following example for how to call this.



- In this example the GP uses input address IW70 and output address QW70. It is also necessary to use 3 bytes of PLC internal memory. In this example, Marker bytes (MB) 103, 104 and 105 are used.

```

OB1: MAIN BLOCK
???
```

Network 1 : GP-PROFIBUS/INTERBUS INTERPRETER CALL

```

IP/OP_ADDR: First I/O byte addresses of GP panel like configured in S7 HW CONFIG
in decimal format
ERR_BYTE: Interpreter error due to bad data format
Byte 0: Bad device type (DB,M,I,O)
Byte 1: Bad Data Block Address (word address over range)
Byte 2: Attempt to write to a input
Byte 3: Unknow Data block operations
Byte 4: Interpreter general error
TEMP_OUT Output byte 0 previous scan value
Byte 6:
Byte 7:
```

```

CALL FC 99
IP_ADDR := 70 // GP First input byte address
OP_ADDR := 70 // GP First input byte address
ERR_BYTE := 103 // Interpreter error byte (see comment)
TEMP_OUT := 104 // First output byte buffer for extended addressing
GP_STATUS := 105 // Profibus new data request checking (see comment)
```

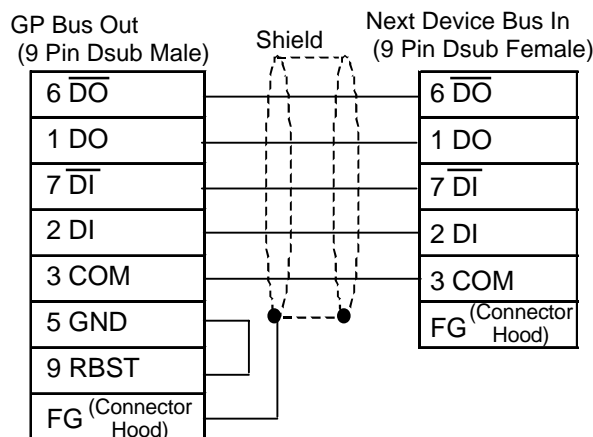
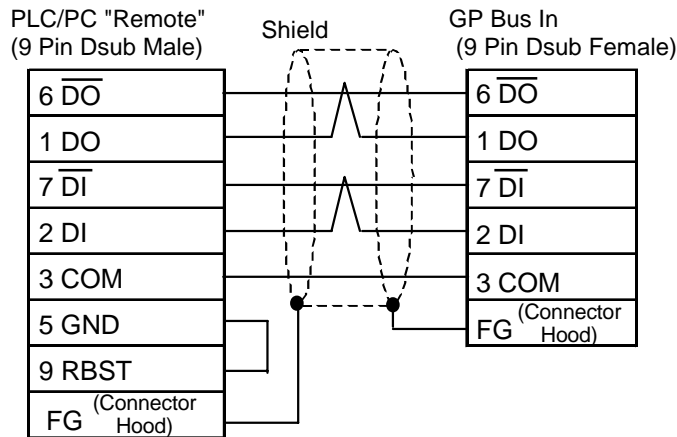


- The Interpreter Function Block can be found in the example S7-400 PLC project is contained on the GP-PRO/PBIII for Windows CD-ROM which (folder name is "FIELDBUS"). This was created with version 3.2 of the Step 7 Software. Please follow the instration instructions in the README.TXT file on how to install this.

11.2.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by Phoenix Contact may differ. Using these cables for your PLC, however, will not cause any problems.

Cable Diagram 1



Reference For details, refer to Digital's GP70 Series Interbus I/F Unit Users Manual.

11.2.3 Supported Devices

■ Direct I/O Mode

	Word Address	Particulars	Default
Input Area size (Word)	0~10	Read Only	0
Output Area size (Word)	0~10		0
Direct I/O Start Address	LS0020-LS1999		LS20

The System Area (LS0 to LS19) and Reading Area settings cannot be used for PLC communications. Only LS Area's User's Area (LS20 to LS1999) can be used for communication. The maximum Input & Output Size is 10 Words (20 bytes) each.



- Only the LS Area's User Area (from LS20 to LS1999) is used for this communication.
- The System Area (from LS0 to LS19) and Reading Area settings cannot be used for the PLC communication.
- The System Data Area's contents will become programless.

■ Packet Transfer Mode

 Setup System Area here.

	Bit Address	Word Address	Note
Data Block	—	DB2W00000-DB60W65534	*1*2
Input Relay	I000000-I655357	IW00000-IW65534	*3*4
Output Reply	O000000-O655357	OW00000-OW65534	*3
Internal Memory	M000000-M655357	MW00000-MW65534	*3

- *1 The Data Block Memory to be used in the GP-PRO/PBIII for Windows must be configured in the PLC first. Please confirm that all addresses to be accessed already exist in the PLC.
- *2 The address format for Data Block Memory is according to Siemens S7 conventions. This is word (16 bit) addressing of Byte addresses so only even addresses are valid e.g. DB2W0050 represents Data Block 2, Word 50.
- *3 The address format for these devices is according to Siemens S7 conventions. For bit addressing the last digit represents the bit position, e.g. I0164 represents byte 16, bit number 4. For word addressing only even byte addresses can be used.
- *4 Input relays cannot be written to by the GP.



- The Interpreter Function Block can be found in an example S7-400 PLC project that is contained on the GP-PRO/PBIII for Windows CD-ROM in the folder "FIELDDBUS". This was created with version 3.2 of the Step 7 Software. Please follow the instructions in the README.TXT file on how to install this.

11.2.4 Environment Setup

There are no communication parameters to be set up on the GP side of the Interbus Connection. The Master PLC/PC automatically assigns node addresses to each slave on the network and the baud rate is fixed at 500 Kbps.

	GP	PLC/Interbus Master
Transmission speed	500 Kbps (fixed)	500 Kbps (fixed)
Node No.	Automatically Configured	Automatically Configured

The GP's OFFLINE screen used to enter these communication settings is shown below. The settings on this screen govern the manner in which the GP communicates via Interbus, i.e. the communication data type (Direct I/O or Packet Transfer) and for Direct I/O; the addresses in the GP's internal memory where data will be read and written from, and the sizes of these blocks of data. These settings can be also made from the GP setup menu in GP-PRO/PBIII for Windows software. For Packet Transfer please set the Input and Output Area Size via this menu.

◆ **From the initial OFFLINE menu screen:**

- 1) Select [INITIALIZE] to call up the initial settings screen.
- 2) Select the [SET UP OPERATION SURROUNDINGS] menu item (screen below appears).
- 3) Configure the environment settings to suit your particular requirements. (Ex. Communication Data Type, Input/Output Area Size, etc.)

```

SET UP OPERATION SURROUNDINGS

SYSTEM DATA AREA  START DATA BLOCK [  0010  ]

                        START DATA WORD [  000  ]

SYSTEM AREA READING AREA SIZE (0 - 256) [  0  ]

COMMUNICATION DATA TYPE                DIRECT I/O  PACKET

DIRECT I/O START ADDRESS                  [ LS0020  ]

                        INPUT AREA SIZE    [  8  ]

                        OUTPUT AREA SIZE   [  8  ]

```


The input and output area sizes used here must match those set up in the Interbus Master's configuration for the GP slave. Please refer to the Interbus Master's documentation. For Packet Transfer Mode, the input and output size are fixed at 16 bytes.

11.2.5 Error Codes

The following list shows the error codes for the Device Net connection. These error codes will appear as "PLC COM.ERROR (02:**)" on the bottom left on the GP screen. (** stands for an error code.)

Error Code	Details	Status
14	No reply from Interbus H/W module	Unit is not properly installed, or unit failure
16	Interbus Not online	Configuration error