

**GP-PRO/PBIII for Windows
Device/PLC CONNECTION MANUAL
ADDITIONAL MANUAL**

Toshiba Schneider Inverter Corporation

VF-S9/VF-nC1/VF-S11/VF-A7 Series

Pro-face
Human Machine Interface —

Reading the GP-PRO/PBIII Device/PLC Connection Manual

This document is designed as an addition to the latest GP-PRO/PBIII for Windows Device/PLC Connection manual's Toshiba Schneider Inverter Corporation Toshiba Schneider Inverter Corporation GP-PRO/PBIII for Windows Device/PLC Connection ManualGP-PRO/PBIII for Windows Device/PLC Connection Manual's Toshiba Schneider Inverter Corporation Toshiba Schneider Inverter Corporation GP-PRO/PBIII for Windows Device/PLC Connection ManualGP-PRO/PBIII for Windows Device/PLC Connection Manual's data.

When connecting a Factory Gateway unit, please substitute the words "Factory Gateway" for this document's "GP/GLC/LT".

Installation

This CD-ROM includes all the protocol files required by the GP/GLC to communicate with a Toshiba Schneider Inverter Corporation VF-S9/VF-nC1/VF-S11/VF-A7 Series Inverter. Also, you will need to have one or more of the following software applications installed. The screen and data transfer files included in the CD-ROM must be installed in each of those applications. For information regarding installing the software, refer to that software's Operation Manual.

■ Software Applications

- LT Editor Ver. 1.0 or later
- GP-PRO/PBIII for Windows Ver. 5.0 or later
- Pro-Server with Pro-Studio for Windows Ver. 3.0 or later ^{*1}

- 1) Be sure to confirm that the required software application is installed in your PC prior to starting installation.
- 2) Double-click the CD-ROM's "TOSVERT.exe" file to start the installation.
- 3) After the installation program starts, follow the instructions given to install the protocol files.



When creating a new project and using a Toshiba Schneider Inverter Corporation VF-S9/VF-nC1/VF-S11/VF-A7 Series Inverter, in the "Device/PLC Type" window be sure to select [Others] - [TOSHIBA SCHNEIDER INVERTER].

**1 When using the Factory Gateway unit, GP-Web Ver. 1.0 or later or GP-Viewer Ver. 1.0 or later, be sure to select "Pro-Server with Pro-Studio for Windows" as the "Destination Folder" when installing the software.*

15.6 Toshiba Schneider Inverter Corporation



15.6.1 System Design

The following tables describe the methods for connecting Toshiba Schneider Inverter Corporation VF-S9/VF-nC1/VF-S11/VF-A7 Series inverters to the GP.



If communication halts due to a signal cable break, GP/GLC fault etc., the inverter may not detect a stop command. When this occurs, be sure to stop communication via the inverter's external terminals.




■ VF-S9 Series

Inverter	Option Units	Wiring Diagram	Cables	Operator Interfaces
				
VFS9□-□□□□□□ □-□-□-□□□ ^{*1}		RS-232C <Diagram 1>	Toshiba Schneider Inverter RS20035-0 (5m)	GP/GLC/LT/ST Series, Factory Gateway
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire) <Diagram 2>		
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire 1:n Communication) <Diagram 3>		
	RS4002Z	RS-422(2-wire) <Diagram 4>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <Diagram 5>		

*1 The data indicated by □ may vary, depending on the type of option selected.

*2 The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.




■ VF-NC1 Series

Inverter	Option Units	Wiring Diagram	Cables	Operator Interfaces
				
VFNC1□-□□□□□ □-□-□□□ ^{*1}		RS-232C <Diagram 1>	Toshiba Schneider Inverter RS20035-0 (5m)	GP/GLC/LT/ST Series, Factory Gateway
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire) <Diagram 2>		
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire 1:n Communication) <Diagram 3>		
	RS4002Z	RS-422(2-wire) <Diagram 4>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <Diagram 5>		

**1 The data indicated by □ may vary, depending on the type of option selected.*

**2 The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.*




■ VF-S11 Series

Inverter	Option Units	Wiring Diagram	Cables	Operator Interfaces
				
VFS11□-□□□□□ □□-□□-□□ ^{*1}		RS-232C <Diagram 1>	Toshiba Schneider Inverter RS20035-0 (5m)	GP/GLC/LT/ST Series, Factory Gateway
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire) <Diagram 2>		
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire 1:n Communication) <Diagram 3>		
	RS4002Z	RS-422(2-wire) <Diagram 4>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <Diagram 5>		

*1 The data indicated by □ may vary, depending on the type of option selected.

*2 The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.

■ VF-A7 Series

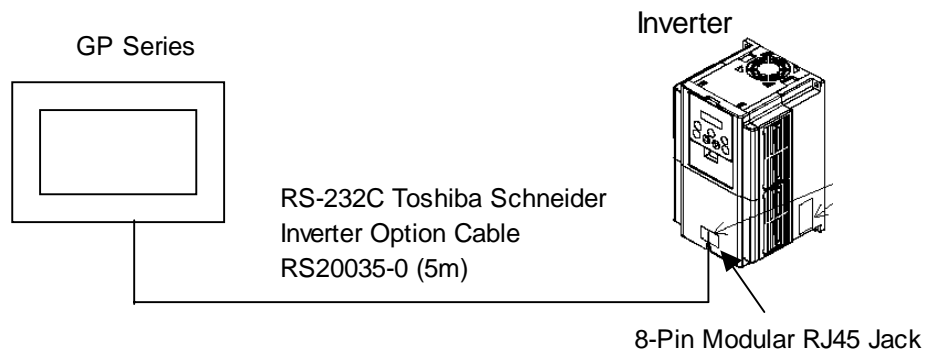
Inverter	Option Units	Wiring Diagram	Cables	Operator Interfaces
				
VFA7-□□□□□□ □-A□□ ^{*1}		RS-232C <Diagram 1>	Toshiba Schneider Inverter RS20035-0 (5m)	GP/GLC/LT/ST Series, Factory Gateway
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire) <Diagram 2>		
	RS4001Z or RS4002Z ^{*2}	RS-422(4-wire 1:n Communication) <Diagram 3>		
	RS4002Z	RS-422(2-wire) <Diagram 4>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <Diagram 5>		

*1 The data indicated by □ may vary, depending on the type of option selected.

*2 The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.

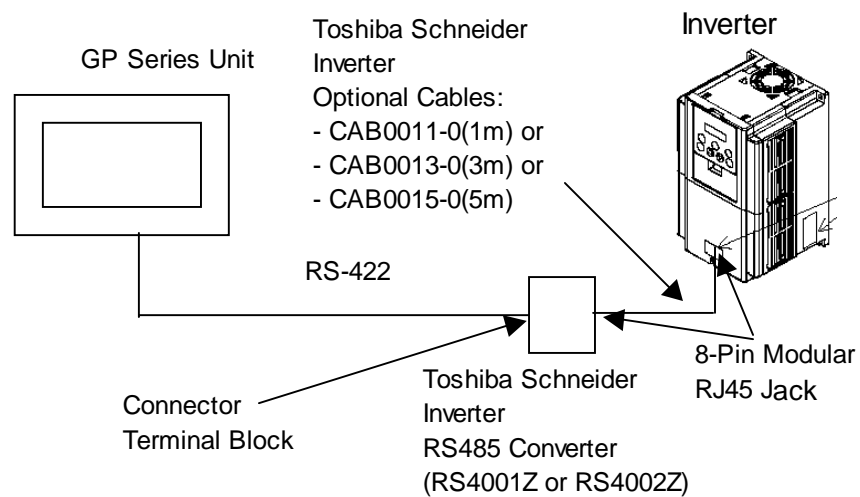
■ Connection Structure

◆ 1:1 Connection (RS-232C)



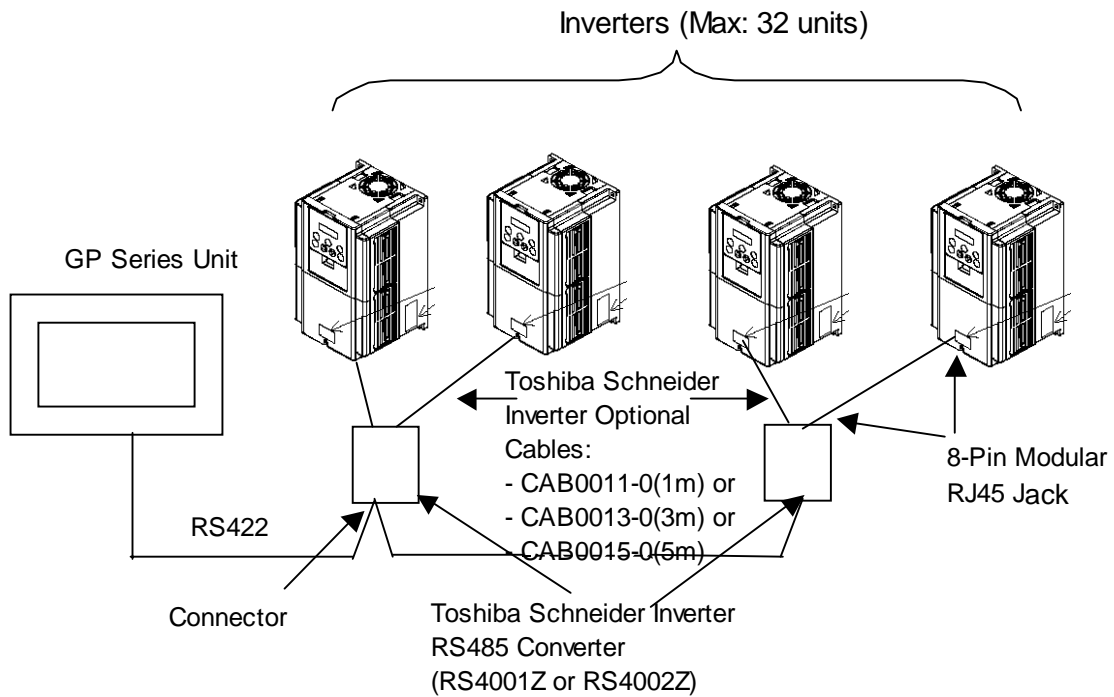
Note: Toshiba Schneider Inverter's option cable (RS20035-0) is required for this type of connection. (Cannot be created by user)

◆ 1:1 Connection (RS-422)



- Toshiba Schneider Inverter's optional cable and an RS485 converter are required for this type of connection.
- The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.

◆ 1:n Connection (RS-422)



- Toshiba Schneider Inverter's optional cable and an RS485 converter are required for this type of connection.
- The RS4001Z unit cannot be used for a 2-wire connection or transfer data at 19200bps. In these cases, the RS4002Z is recommended.
- A maximum of 2 Toshiba Schneider Inverters can be connected to a single RS4001Z RS485 converter, and a maximum of 8 Invertors can be connected to a single RS4002Z converter.

15.6.2 Cable Diagrams



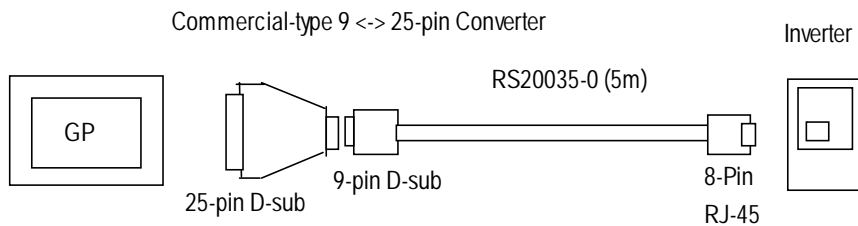
- **Be sure the shield's ground wire is not connected to the Inverter or other unit's live earth wire.**
- **Be sure there is at least 20cm or more distance between the communication and main circuit lines.**
- **The following types of cables are recommended:**

Cable Name	Length	Manufacturer
KMPEV-SB 0.75mm ² (Lay wire)	Max. 600m	Showa Densen Co.
KMPEV-SB 0.75mm ² (Lay wire)	Max. 500m	
GECLS-9004 AWG24 0.2mm ² (Simple wire)	Max. 300m	

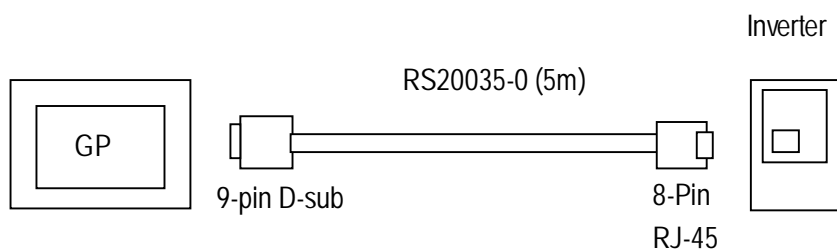
Cable Diagram 1 RS-232C



Note: Be sure to use Toshiba Schneider's RS20035-0 cable.



- **When using an ST Series Unit**



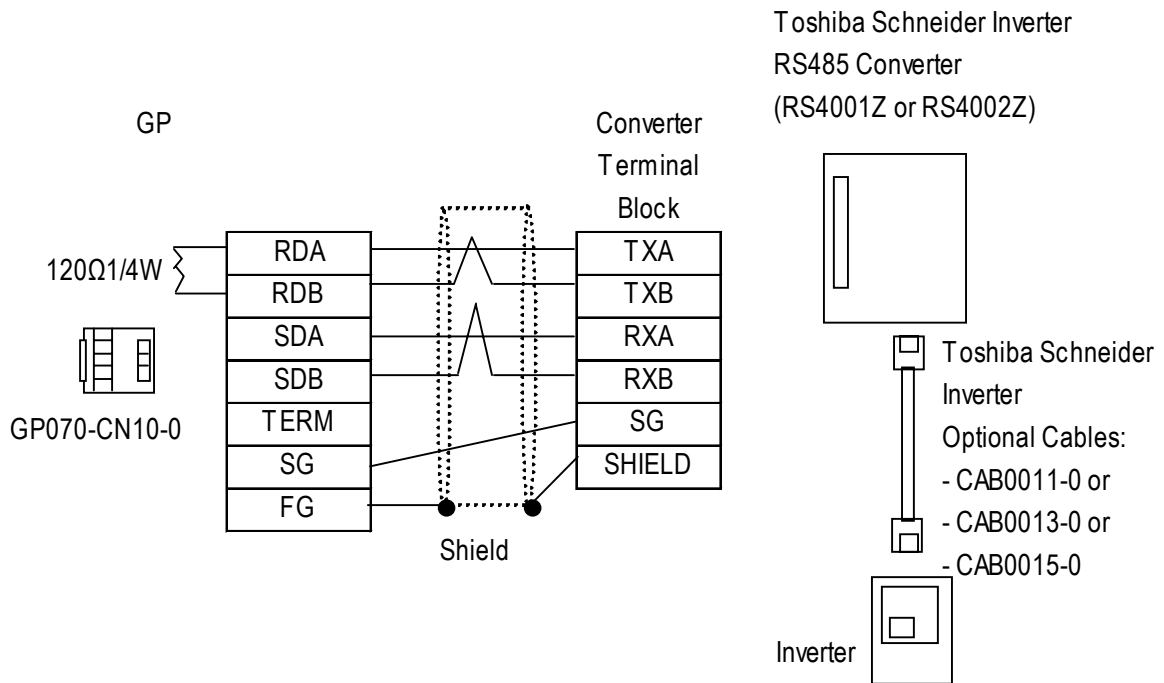
Cable Diagram 2 RS-422, 1:1



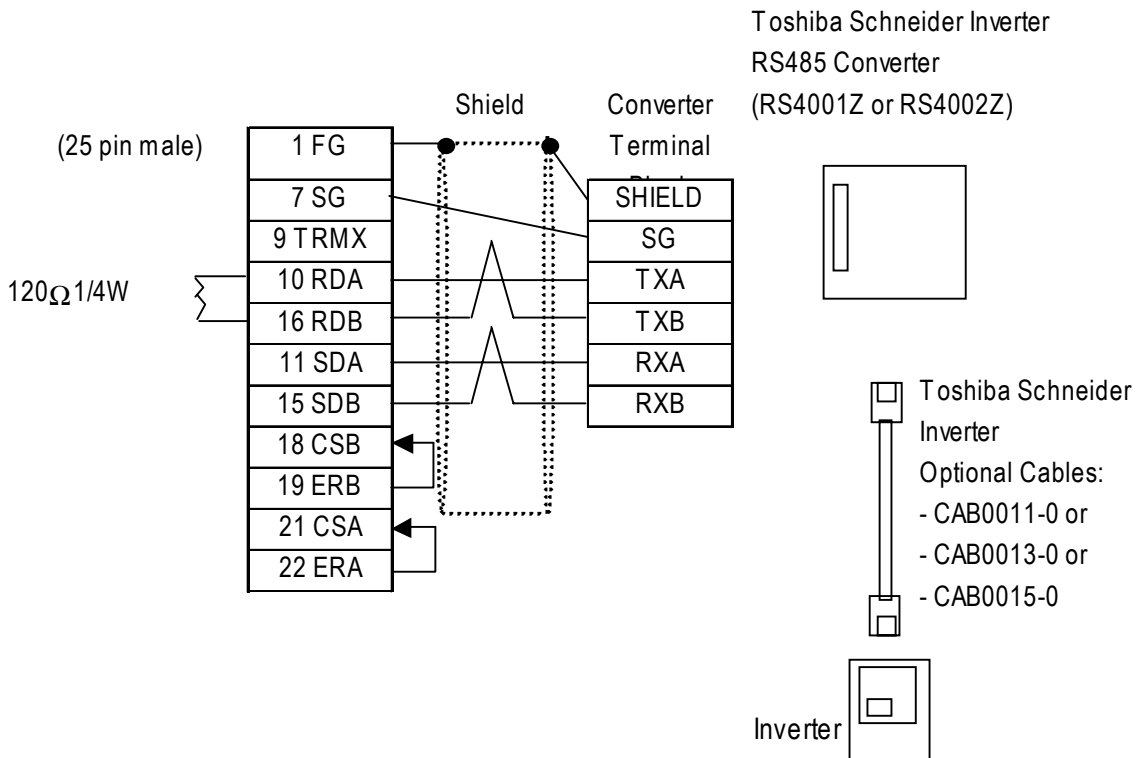
Note:

- **Cable length: Max. 600m.**
- **Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance.**

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



<When making your own cable>

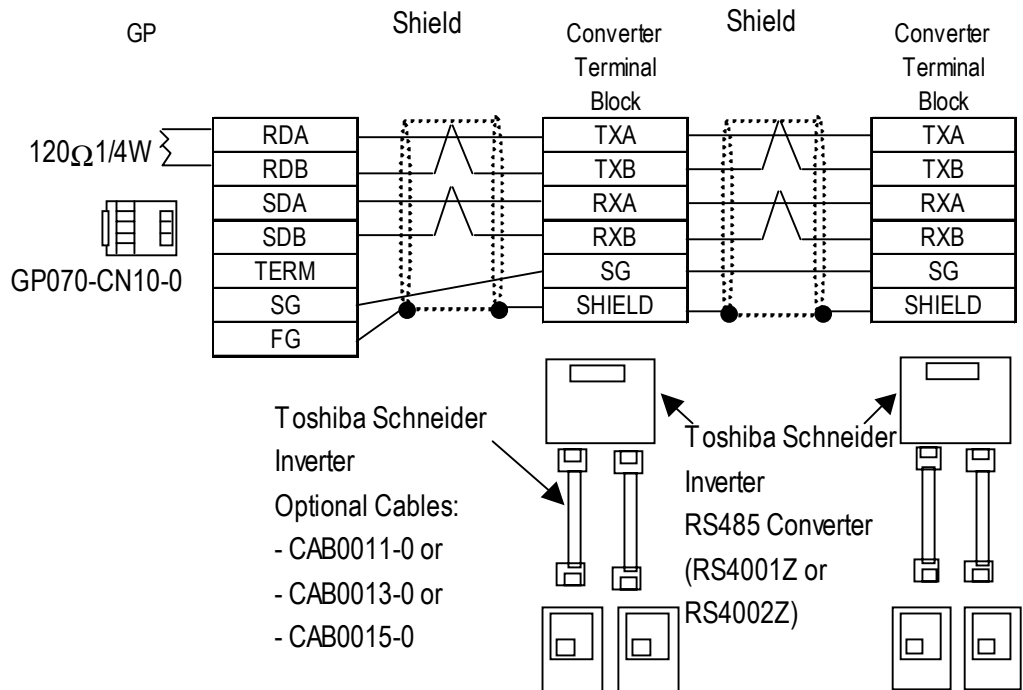


Cable Diagram 3 RS-422, 1:n

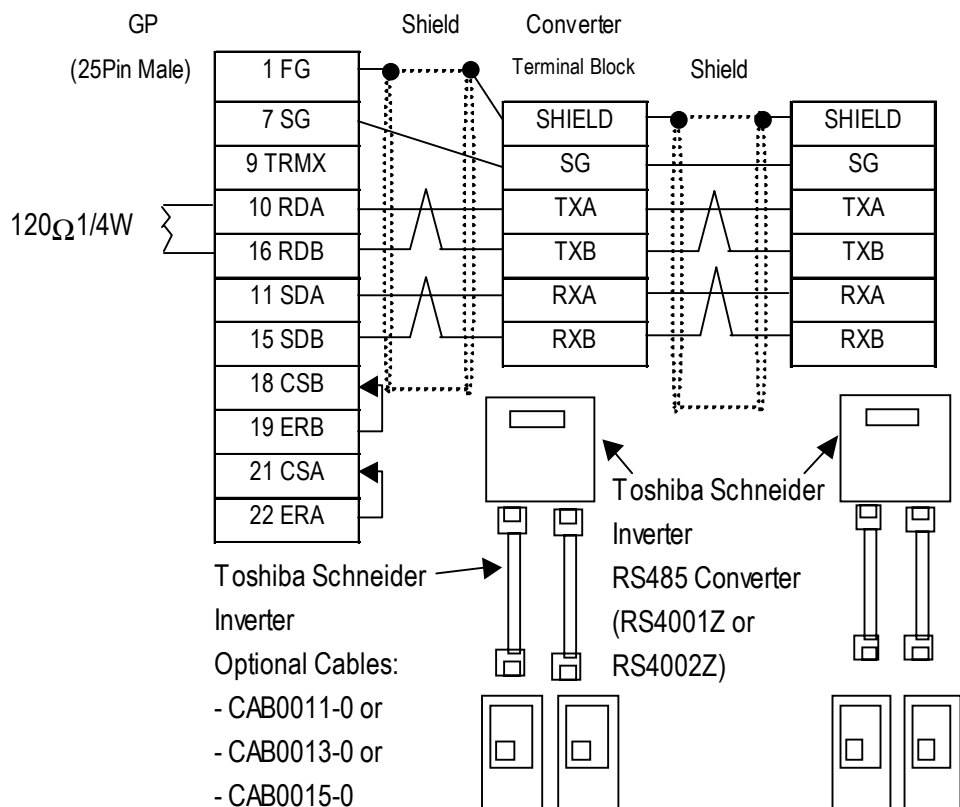


- **Cable length: Max. 600m.**
- **Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance. Be sure to set the dip switches only on the last (final) converter.**

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



<When making your own cable>

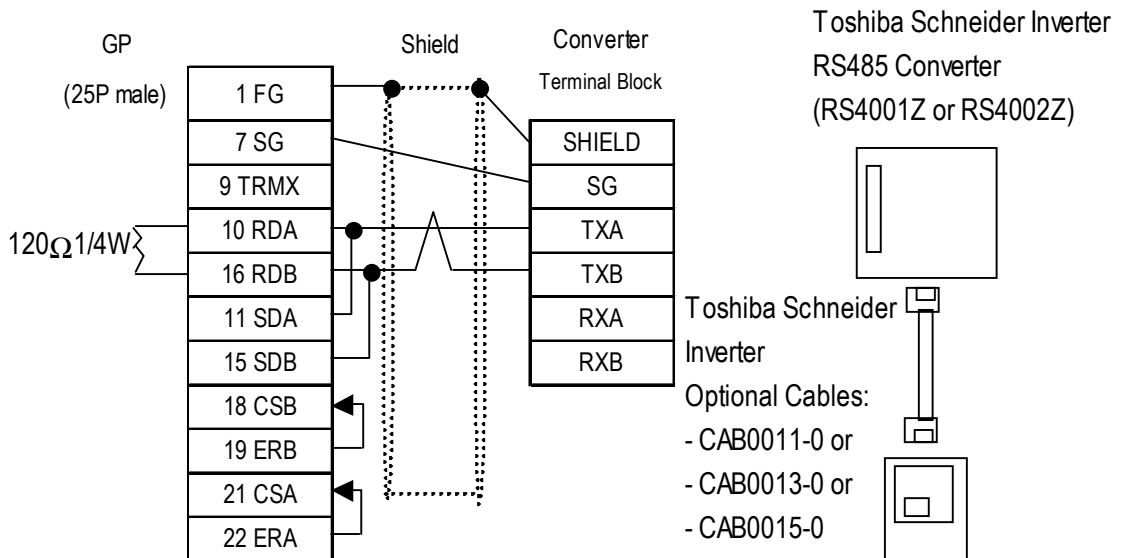
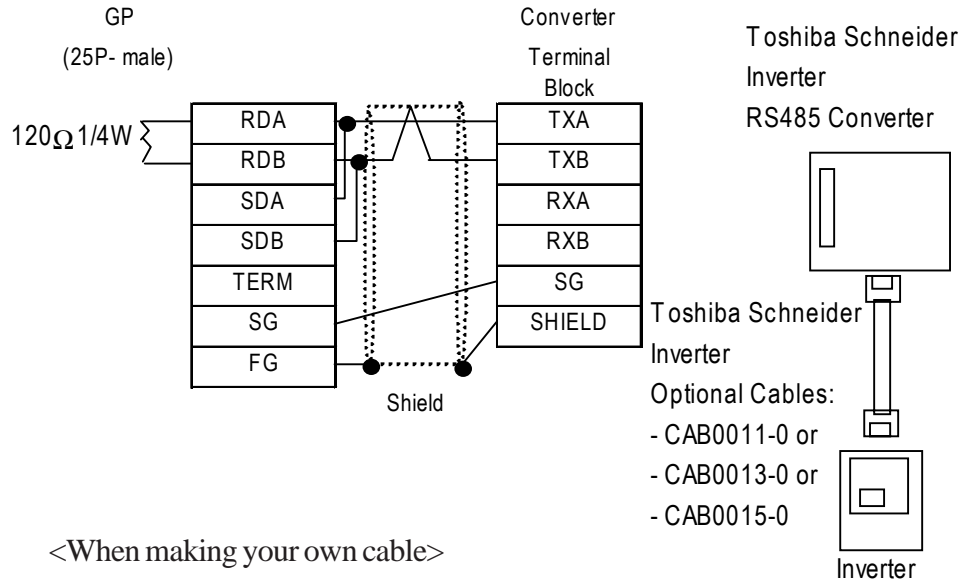


Cable Diagram 4 RS-422, 1:1



- **Cable length: Max. 600m.**
- **Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance.**

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

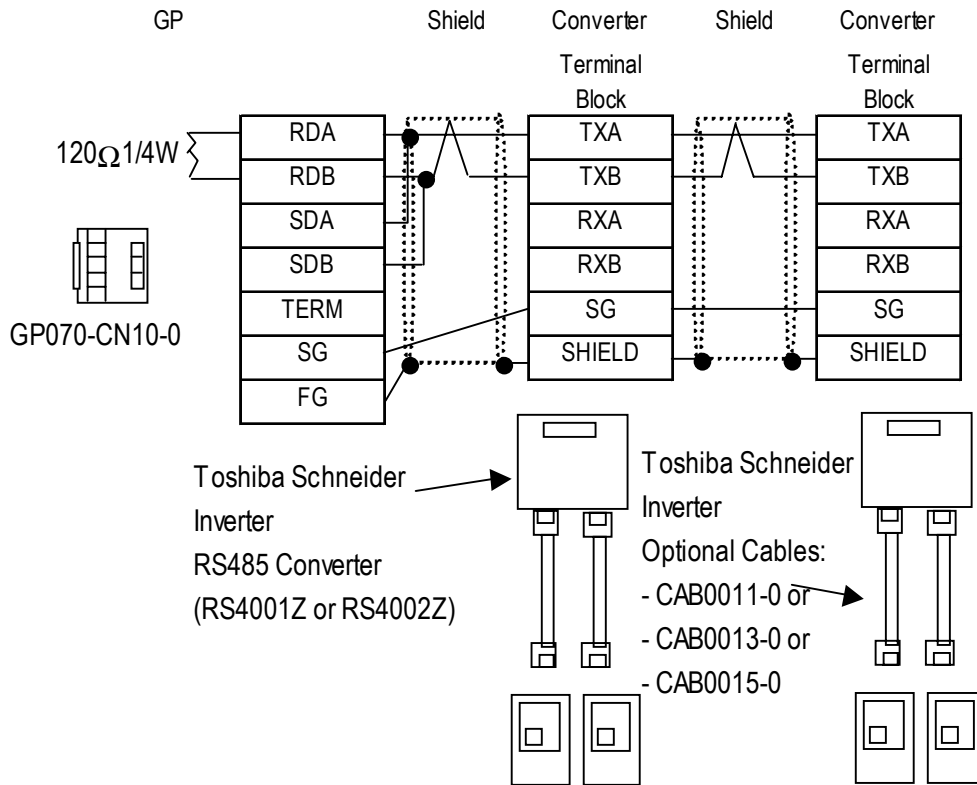


Cable Diagram 5 RS-422, 1:n

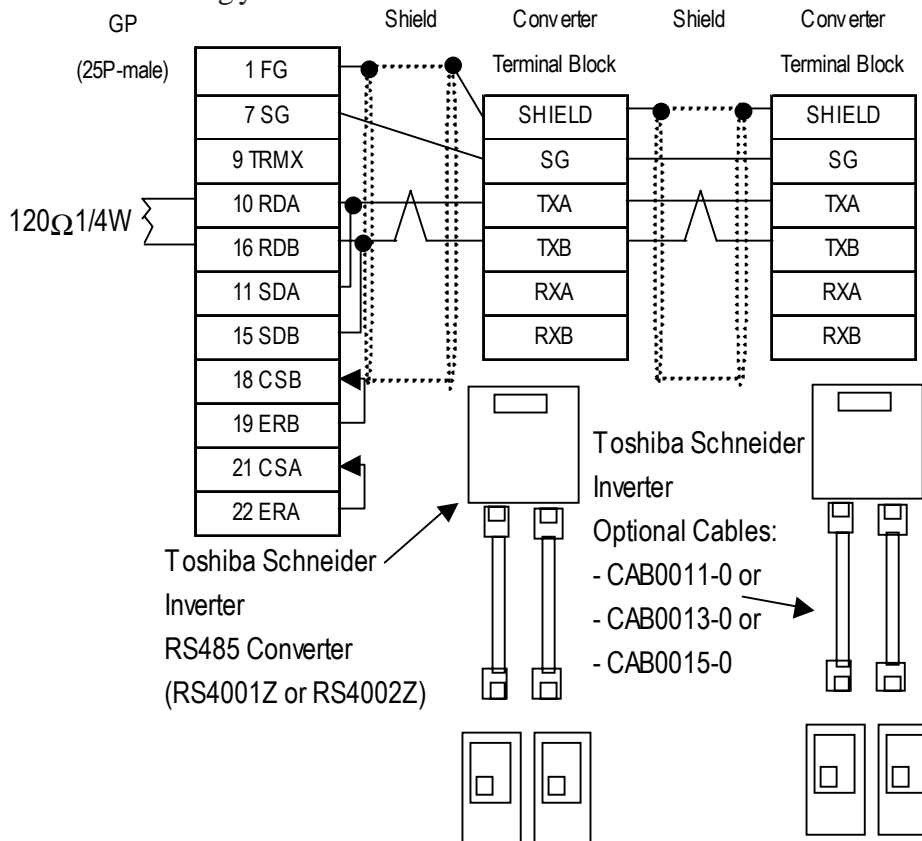


- Note:**
- **Cable length: Max. 600m.**
 - **Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance.**

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



<When making your own cable>



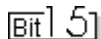
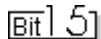
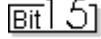
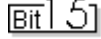
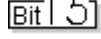

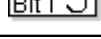
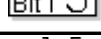
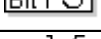
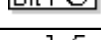
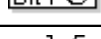
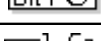
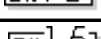
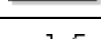
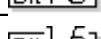
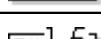
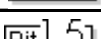
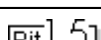
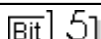
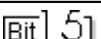
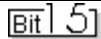
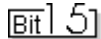



With an RS-422 connection and ST Series unit, the cable must be created by the user. Also, as shown below, the GP and ST pin numbers are different. Please use this table when creating your cable.

ST Pin No.	Pin Name	GP Pin No.
1	RDA	10
2	RDB	16
3	SDA	11
4	ERA	22
5	SG	7
6	CSB	18
7	SDB	15
8	CSA	21
9	ERB	19
Connector Shell	FG	1

15.6.3 Supported Devices

■ VF-A7 Series























Device	Bit Address	Word Address	Description	
Standard Parameters	----	0000 to 0024		H/L
	----	W0000 to W0024		
Extended Parameters	----	0100 to 0199		
	----	W0100 to W0199		
	----	0200 to 0294		
	----	W0200 to W0294		
	----	0300 to 0398		
	----	W0300 to W0398		
	----	0400 to 0491		
	----	W0400 to W0491		
	----	0500 to 0599		
	----	W0500 to W0599		
	----	0600 to 0697		
	----	W0600 to W0697		
	----	0700 to 0730		
	----	W0700 to W0730		
	----	0800 to 0899		
	----	W0800 to W0899		
Instruction	----	FA00 to FA51		
Monitor	----	FB05 to FB58	 ¹	
	----	FC90 to FC91	 ¹	
	----	FD00	 ¹	
	----	FE00 to FE71	 ¹	

*1 Read-only device.



Note: When data is designated as being written to a W**** address, data is written to both RAM and EEPROM memory. When this type of address is not used, data is written to only RAM. Since EEPROM memory has a limited (finite) number of writes that can be performed, if data backup (retention) is not required, write data only to RAM memory.

■ VF-nC1 Series

Device	Bit Address	Word Address	Description
Standard Parameters	----	0003 to 0024	
	----	W0003 to W0024	
Extended Parameters	----	0100 to 0173	
	----	W0100 to W0173	
	----	0201 to 0294	
	----	W0201 to W0294	
	----	0300 to 0363	
	----	W0300 to W0363	
	----	0400 to 0419	
	----	W0400 to W0419	
	----	0500 to 0505	
	----	W0500 to W0505	
	----	0600 to 0633	
	----	W0600 to W0633	
	----	0700 to 0710	
	----	W0700 to W0710	
	----	0800 to 0880	
	----	W0800 to W0880	
Instruction	----	FA00 to FA03	
Monitor	----	FC90 to FC91	 *1
	----	FD00 to FD07	 *1
	----	FE00 to FE73	 *1

H/L























*1 Read-only device.



Note:

When data is designated as being written to a W**** address, data is written to both RAM and EEPROM memory. When this type of address is not used, data is written to only RAM. Since EEPROM memory has a limited (finite) number of writes that can be performed, if data backup (retention) is not required, write data only to RAM memory.

■ VF-S9 Series

Device	Bit Address	Word Address	Description
Standard Parameters	-----	0000 to 0041	
	-----	W0000 to W0041	
Extended Parameters	-----	0100 to 0173	
	-----	W0100 to W0173	
	-----	0200 to 0294	
	-----	W0200 to W0294	
	-----	0300 to 0363	
	-----	W0300 to W0363	
	-----	0400 to 0408	
	-----	W0400 to W0408	
	-----	0500 to 0505	
	-----	W0500 to W0505	
	-----	0600 to 0692	
	-----	W0600 to W0692	
	-----	0700 to 0710	
	-----	W0700 to W0710	
	-----	0800 to 0880	
	-----	W0800 to W0880	
Instruction	-----	FA00 to FA02	
Monitor	-----	FC00 to FC91	 ^{*1}
	-----	FD00	 ^{*1}
	-----	FE00 to FE71	 ^{*1}

H/L

*1 Read-only device.



Note: When data is designated as being written to a W**** address, data is written to both RAM and EEPROM memory. When this type of address is not used, data is written to only RAM. Since EEPROM memory has a limited (finite) number of writes that can be performed, if data backup (retention) is not required, write data only to RAM memory.

■ VF-S11 Series

Device	Bit Address	Word Address	Description
Standard Parameters	-----	0000 to 0024	[Bit] 5
	-----	W0000 to W0024	[Bit] 5
Extended Parameters	-----	0100 to 0185	[Bit] 5
	-----	W0100 to W0185	[Bit] 5
	-----	0200 to 0294	[Bit] 5
	-----	W0200 to W0294	[Bit] 5
	-----	0300 to 0366	[Bit] 5
	-----	W0300 to W0366	[Bit] 5
	-----	0400 to 0494	[Bit] 5
	-----	W0400 to W0494	[Bit] 5
	-----	0500 to 0513	[Bit] 5
	-----	W0500 to W0513	[Bit] 5
	-----	0600 to 0692	[Bit] 5
	-----	W0600 to W0692	[Bit] 5
	-----	0700 to 0736	[Bit] 5
	-----	W0700 to W0736	[Bit] 5
	-----	0800 to 0894	[Bit] 5
	-----	W0800 to W0894	[Bit] 5
	-----	0910 to 0911	[Bit] 5
	-----	W0910 to W0911	[Bit] 5
Instruction	-----	FA00 to FA02	[Bit] 5
Monitor	-----	FC00 to FC91	[Bit] 5 *1
	-----	FD00	[Bit] 5 *1
	-----	FE00 to FE71	[Bit] 5 *1

H/L

*1 Read-only device.



When data is designated as being written to a W**** address, data is written to both RAM and EEPROM memory. When this type of address is not used, data is written to only RAM. Since EEPROM memory has a limited (finite) number of writes that can be performed, if data backup (retention) is not required, write data only to RAM memory.

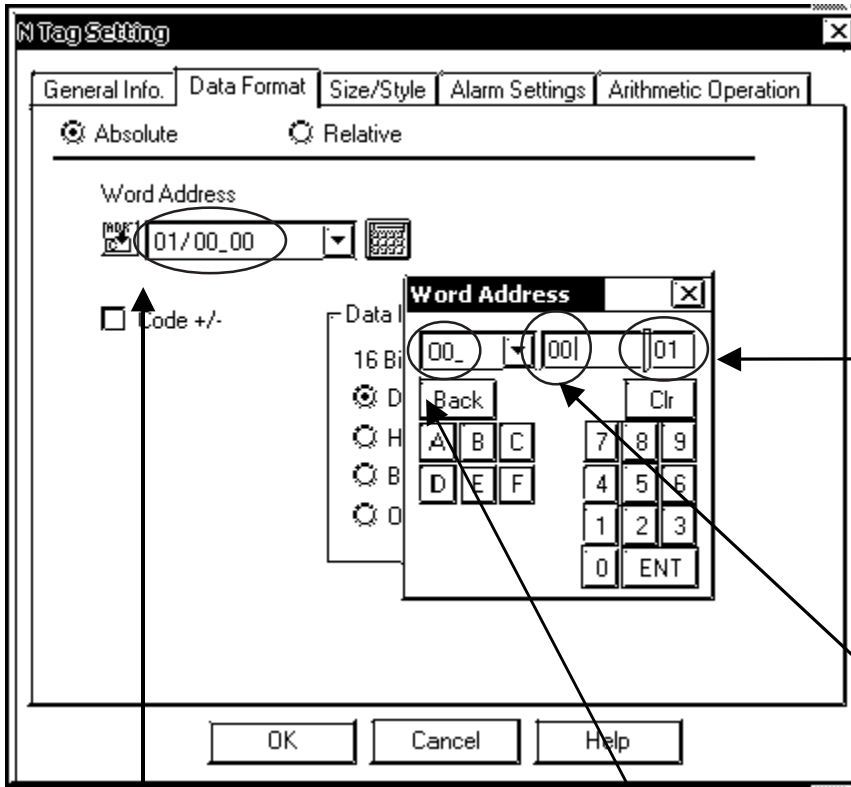


Note: Inverter parameters are allocated to the device and address, as shown below. The command number or the parameter's function code is displayed in the device. For details,

▼ **Reference** ▲ ■ *Inverter Commands*

▼ **Reference** ▲ ■ *Parameter Function Codes*

▼ **Reference** ▲ ■ *Parameter Numbers*



Enter the unit no. of the inverter you wish to designate

Displays the parameter number

01 / 00_00

Displays the command number or the parameter function code

Parameter Number

Command Number or Parameter Function Code

Inverter Unit No.

GP/GLC System Data Area (LS0 to LS19)



The system area (LS0 to LS19) of the GP/GLC cannot be allocated to the data area available on the inverter. Even if the system area is set using GP-PRO/PBIII or the GP/GLC offline mode, this allocation cannot be made. For the following and later system versions, system area data cannot be sent to the inverter even though the system data area has been allocated (selected) to the data area available on the inverter.

GP/GLC Model	GP77R Series	GP377 Series	GLC300 Series	GLC2000 Series	GP2000 Series	LT
System Version	Ver. 2.60	Ver. 2.60	Ver. 2.60	Ver. 2.45	Ver. 3.10	Ver. 2.69b

■ Inverter Commands

Inverter parameters are allocated the following communication codes. When setting up Tags, the left-most two digits are for the device name, and the right-most two digits are for the device address. For detailed information, refer to your inverter manual's Parameter List.

GP unit's designated Device Address

Communication Number	Feature
0000	Inverter-based speed increase/decrease
0001	Inverter-based control
0002	Select type of operation
0003	Select speed command
0004	:
0005	:

15.6.4 Environment Setup

The following table shows Digital's recommended Toshiba Schneider Inverter Corporation's communication settings and their corresponding settings on the GP.

GP Settings		Inverter Settings	
Baud Rate	9600 bps	Baud Rate (F800) ^{*1}	9600 bps
Data Length	8 bits (fixed)	-----	-----
Stop Bit	1 bits (fixed)	-----	-----
Parity Bit	Even	Parity (F801) ^{*1}	Even
Control Method	ER	-----	-----
Communication Format (4-wire)	4-wire	RS485 ^{*2}	4-wire
Communication Format (2-wire)	2-wire	RS485 ^{*2}	2-wire
Communication Format (RS232C)	RS-232C	-----	-----
Station No.	0	Inverter No. (F802) ^{*1 *3}	0

**1 Inverter settings should be entered via the Function Mode's parameters.*

For details, refer to your inverter's manual.

Use the Toshiba Schneider's RS485 Convertor unit's dip switches to enter settings for that unit. Be sure that the settings are the same as those used on the inverter unit.

**2 Only the RS4002Z unit has settings. This is performed via the unit's dip switches (SW1, SW-2). The RS4001Z only supports 4-wire communication.*

**3 Use Inverter No. from 0 to 31 when connecting to the GP unit.*

A**Toshiba Schneider Inverter Corporation****A.1****Maximum Number of Consecutive Device Address**

The following lists the maximum number of consecutive addresses that can be read for each device.

Device	Max.No. of Consecutive Device Addresses
Basic Parameter	1 Word
Extended Parameter	
Instruction-related	
Monitor-related	

A.2**Device Codes and Address Codes**

Device codes and address codes are used to specify indirect addresses for the E-tags or K-tags.

The word addresses of data to be displayed are coded and stored in the word address specified by the E-tags and K-tags. (Code storage is done either by the PLC, or with T-tag and K-tags)

Device	Word Address	Device Code	Description
Basic Parameter	0000 ~	0240	Word Address
	W0000 ~	3040	Word Address
Extended Parameter	0100 ~	0440	Word Address
	0200 ~	0640	Word Address
	0300 ~	0840	Word Address
	0400 ~	1040	Word Address
	0500 ~	1240	Word Address
	0600 ~	1440	Word Address
	0700 ~	1640	Word Address
	0800 ~	1840	Word Address
	0900 ~	3040	Word Address
	W0100 ~	3240	Word Address
	W0200 ~	3440	Word Address
	W0300 ~	3640	Word Address
	W0400 ~	3840	Word Address
	W0500 ~	6040	Word Address
	W0600 ~	6240	Word Address
	W0700 ~	6440	Word Address
	W0800 ~	6640	Word Address
W0900 ~	6840	Word Address	
Instruction-related	FA00 ~	2040	Word Address
Monitor-related	FB00 ~	2240	Word Address
	FC00 ~	2440	Word Address
	FD00 ~	2640	Word Address
	FE00 ~	2840	Word Address
LS Area	LS0000 ~	4040	Word Address

A.3 Address Conversion Table

The address conversion table is shown below.

		After Conversion															
		00 (W00)	01 (W01)	02 (W02)	03 (W03)	04 (W04)	05 (W05)	06 (W06)	07 (W07)	08 (W08)	09 (W09)	FA	FB	FC	FD	FE	LS
B e f o r e C o n v e r s i o n	Basic Parameter 00 (W00)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 01 (W01)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 02 (W02)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 03 (W03)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 04 (W04)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 05 (W05)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 06 (W06)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 07 (W07)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 08 (W08)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Extended Parameter 09 (W09)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Instruction-related FA	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Instruction-related FB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Monitor-related FC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Monitor-related FD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Monitor-related FE	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
LS Area LS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ : When the conversion mode is set to "Word", both word and bit devices will be converted. If the conversion mode is set to "Bit", only bit devices will be converted.