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

# **Toshiba Schneider Inverter Corporation**

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



#### 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 De

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 Important the "Device/PLC Type" window be sure to select [Others] -[TOSHIBA SCHNEIDER INVERTER].

<sup>\*1</sup> 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
	•		<b></b>	
VFS9		RS-232C <diagram 1=""></diagram>	Toshiba Schneider Inverter RS20035-0 (5m)	
	RS4001Z or RS4002Z*2	RS-422(4-wire) <diagram 2=""></diagram>		GP/GLC/LT/ST
	RS4001Z or RS4002Z*2	RS-422(4-wire 1:n Communication) <diagram 3=""></diagram>		Series, Factory Gateway
	RS4002Z	RS-422(2-wire) <diagram 4=""></diagram>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <diagram 5=""></diagram>		

<sup>\*1</sup> The data indicated by  $\square$  may vary, depending on the type of option selected.

<sup>\*2</sup> 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
	•		<b></b>	
VFNC1 <sub>□</sub> -□□□□□  □-□-A□□ <sup>*1</sup>		RS-232C <diagram 1=""></diagram>	Toshiba Schneider Inverter RS20035-0 (5m)	
	RS4001Z or RS4002Z <sup>*2</sup>	RS-422(4-wire) <diagram 2=""></diagram>		GP/GLC/LT/ST
	RS4001Z or RS4002Z*2	RS-422(4-wire 1:n Communication) <diagram 3=""></diagram>		Series, Factory Gateway
	RS4002Z	RS-422(2-wire) <diagram 4=""></diagram>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <diagram 5=""></diagram>		

<sup>\*1</sup> The data indicated by o may vary, depending on the type of option selected.

<sup>\*2</sup> 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
	•		<b></b>	
VFS11*1		RS-232C <diagram 1=""></diagram>	Toshiba Schneider Inverter RS20035-0 (5m)	
	RS4001Z or RS4002Z <sup>2*</sup>	RS-422(4-wire) <diagram 2=""></diagram>		GP/GLC/LT/ST
	RS4001Z or RS4002Z <sup>*2</sup>	RS-422(4-wire 1:n Communication) <diagram 3=""></diagram>		Series, Factory Gateway
	RS4002Z	RS-422(2-wire) <diagram 4=""></diagram>		
	RS4002Z	RS-422 (2-wire, 1:n Communication) <diagram 5=""></diagram>		

<sup>\*1</sup> The data indicated by  $\square$  may vary, depending on the type of option selected.

<sup>\*2</sup> 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

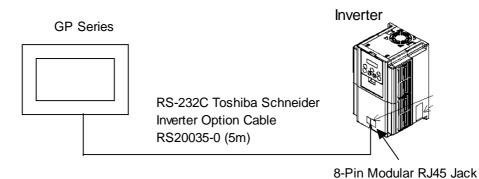
Inverter	Option Units	Wiring Diagram	Cables	Operator Interfaces
	<b>\</b>		<b></b>	
VFA7-□□□□□□□ □-A□□*1		RS-232C <diagram 1=""></diagram>	Toshiba Schneider Inverter RS20035-0 (5m)	
	RS4001Z or RS4002Z*2	RS-422(4-wire) <diagram 2=""></diagram>		GP/GLC/LT/ST
	RS4001Z or RS4002Z*2	RS-422(4-wire 1:n Communication)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

<sup>\*1</sup> The data indicated by  $\square$  may vary, depending on the type of option selected.

<sup>\*2</sup> 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

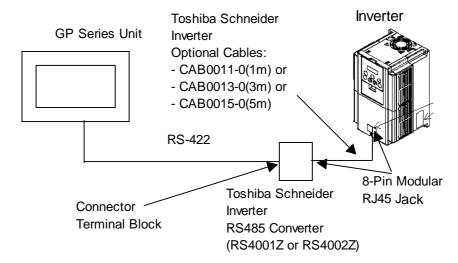
#### **♦** 1:1 Connection (RS-232C)



Note:

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

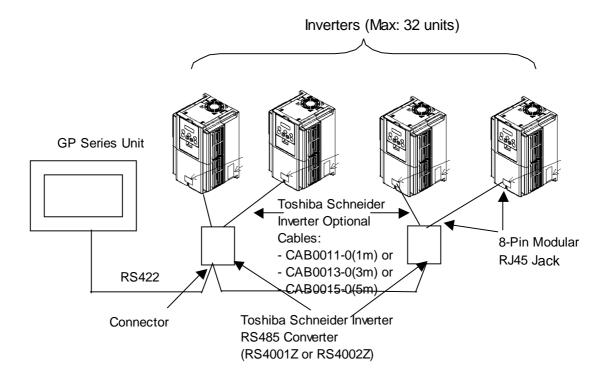
#### **♦** 1:1 Connection (RS-422)





- 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 convertor, and a maximum of 8 Invertors can be connected to a single RS4002Z converter.

## 15.6.2 Cable Diagrams



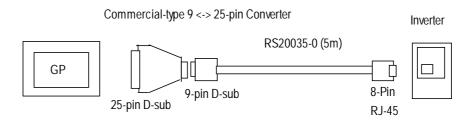
- Be sure the shield's ground wire is not connected to the Invertor or other unit's live earth wire.
- Be sure there is at least 20cm or more distance between the communication and main circuit lines.
- The following types of cables are recomended:

Cable Name	Length	Manufacturer
KMPEV-SB 0.75mm <sup>2</sup> (Lay wire)	Max. 600m	
KMPEV-SB 0.75mm <sup>2</sup> (Lay wire)	Max. 500m	Showa Densen Co.
GECLS-9004 AWG24 0.2mm <sup>2</sup>	Max. 300m	Showa Bensen oo.
(Simple wire)	Wax. 300III	

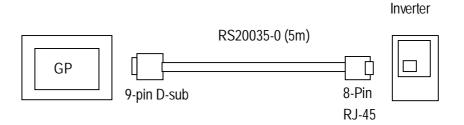
#### Cable Diagram 1 RS-232C



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



• When using an ST Series Unit

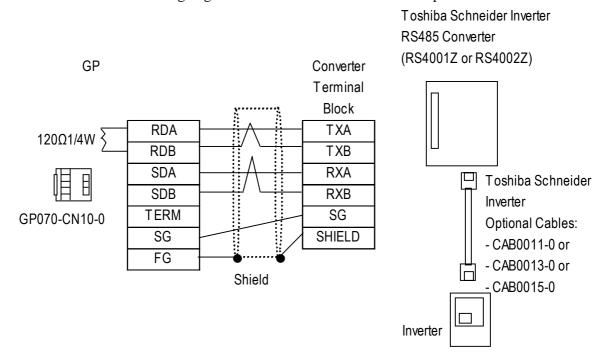


#### Cable Diagram 2 RS-422, 1:1

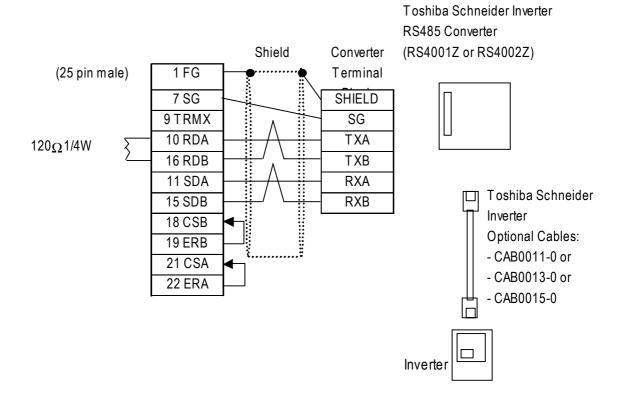


- Cable length: Max. 600m.
- Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance.

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



<When making your own cable>

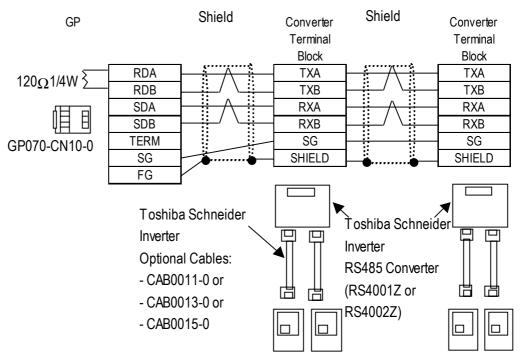


#### Cable Diagram 3 RS-422, 1:n

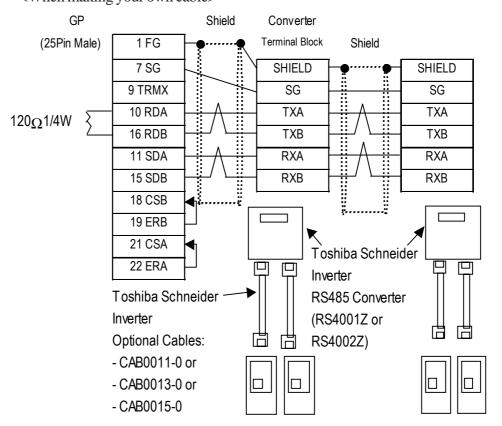


- Cable length: Max. 600m.
- Turning the Converter unit (Inverter-side) Dip Switch 2-4 ON will insert termination resistance. Be sure to set the dip switches only on the last (final) converter.

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



<When making your own cable>

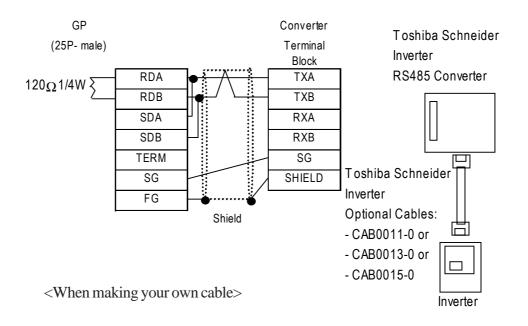


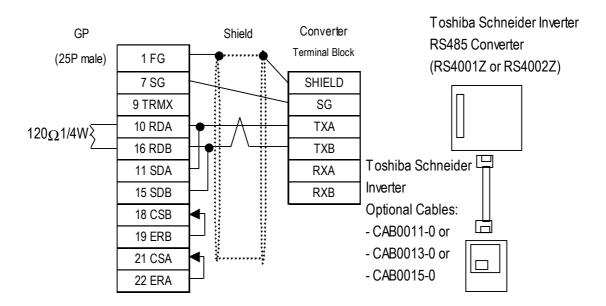
#### Cable Diagram 4 RS-422, 1:1



- 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>



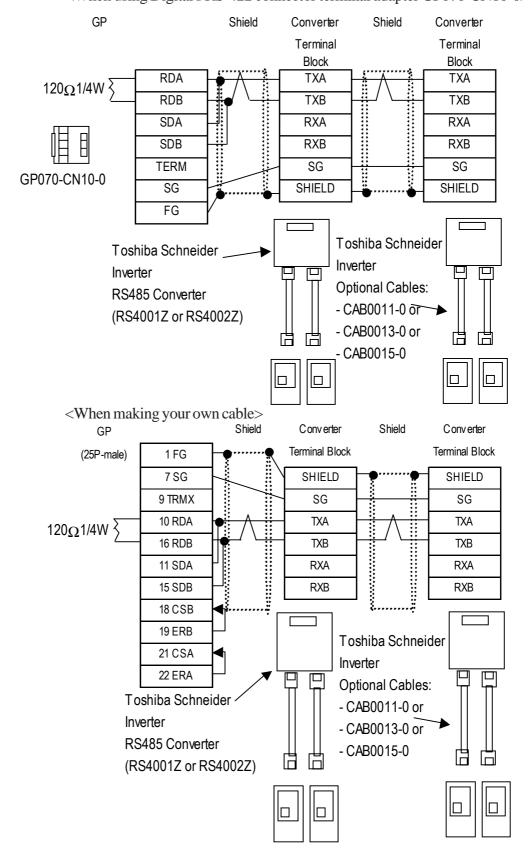


#### Cable Diagram 5 RS-422, 1:n



- 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>





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	Descripti	on
Standard		0000 to 0024	Bit ] 5]	
Parameters		W0000 to W0024	Bit 1 51	
Extended		0100 to 0199	Bit ] 5]	
Parameters		W0100 to W0199	Bit 1 51	
		0200 to 0294	Bit ] 5]	
		W0200 to W0294	Bit 1 51	
		0300 to 0398	Bit 1 51	
		W0300 to W0398	Bit ] 5]	
		0400 to 0491	Bit 1 51	
		W0400 to W0491	Bit 1 51	
		0500 to 0599	Bit 1 51	
		W0500 to W0599	Bit 1 51	H/L
		0600 to 0697	Bit 1 51	
		W0600 to W0697	Bit 1 51	
		0700 to 0730	Bit ] 5]	
		W0700 to W0730	Bit 1 51	
		0800 to 0899	Bit 1 51	
		W0800 to W0899	Bit 1 5 1	
Instruction		FA00 to FA51	Bit 1 51	
Monitor		FB05 to FB58	Bit ] 5] 1	
		FC90 to FC91	<u>Bit 1 51</u> "	
		FD00	Bit ] 5] 1	
		FE00 to FE71	Bit ] 5] 1	

<sup>\*1</sup> Read-only device.



#### ■ VF-nC1 Series

Device	Bit Address	Word Address	Description	
Standard		0003 to 0024	Bit 1 51	
Parameters		W0003 to W0024	Bit 1 51	
Extended		0100 to 0173	Bit 1 51	
Parameters		W0100 to W0173	Bit 1 51	
		0201 to 0294	Bit 1 5 1	
		W0201 to W0294	Bit ] 5]	
		0300 to 0363	Bit 1 5 1	
		W0300 to W0363	Bit 1 51	
		0400 to 0419	Bit 1 51	
		W0400 to W0419	Bit 1 5 1	
		0500 to 0505	Bit 1 51	H/L
		W0500 to W0505	Bit ] 5]	∏/L
		0600 to 0633	Bit 1 51	
		W0600 to W0633	Bit 1 51	
		0700 to 0710	Bit 1 51	
		W0700 to W0710	Bit 1 5 1	
		0800 to 0880	Bit 1 51	
		W0800 to W0880	Bit 1 51	
Instruction		FA00 to FA03	Bit 1 5 1	
Monitor		FC90 to FC91	Bit ] 5] *1	
		FD00 to FD07	Bit ] 5] *1	
		FE00 to FE73	Bit 1 51 *1	

<sup>\*1</sup> Read-only device.



#### ■ VF-S9 Series

Device	Bit Address	ess Word Address Descri		ion
Standard		0000 to 0041	Bit 1 51	
Parameters		W0000 to W0041	Bit 1 51	
Extended		0100 to 0173	Bit 1 51	
Parameters		W0100 to W0173	Bit 1 51	
		0200 to 0294	Bit 1 5 1	
		W0200 to W0294	Bit 1 5 1	
		0300 to 0363	Bit 1 51	
		W0300 to W0363	Bit 1 51	
		0400 to 0408	Bit 1 51	
		W0400 to W0408	Bit 1 51	
		0500 to 0505	Bit 1 51	H/L
		W0500 to W0505	<u>Bit 1 5 1</u>	∏/L
		0600 to 0692	Bit ] 5]	
		W0600 to W0692	Bit 1 51	
		0700 to 0710	Bit 1 5 1	
		W0700 to W0710	Bit 1 51	
		0800 to 0880	Bit 1 51	
		W0800 to W0880	Bit 1 51	
Instruction		FA00 to FA02	Bit 1 5 1	
Monitor		FC00 to FC91	Bit 1 51 *1	
		FD00	Bit 1 51 <sup>-1</sup>	
		FE00 to FE71	Bit ] 5] "	

<sup>\*1</sup> Read-only device.



#### ■ VF-S11 Series

Device	Bit Address	Word Address	Descripti	on
Standard		0000 to 0024	Bit 1 51	
Parameters		W0000 to W0024	Bit 1 51	
		0100 to 0185	Bit 1 51	
		W0100 to W0185	Bit 1 51	
		0200 to 0294	Bit 1 51	
		W0200 to W0294	Bit 1 5 1	
		0300 to 0366	<u>Bit 1 51</u>	
		W0300 to W0366	Bit 1 5 1	
		0400 to 0494	Bit 1 51	
		W0400 to W0494	<u>Bit 1 5 1</u>	
Extended		0500 to 0513	Bit 1 51	
Parameters		W0500 to W0513	<u>Bit 1 5 1</u>	H/L
		0600 to 0692	Bit 1 5 1	1 I/L
		W0600 to W0692	Bit 1 51	
		0700 to 0736	Bit 1 51	
		W0700 to W0736	Bit 1 51	
		0800 to 0894	Bit 1 51	
		W0800 to W0894	Bit 1 5 1	
		0910 to 0911	Bit 1 51	
		W0910 to W0911	Bit 1 51	
Instruction		FA00 to FA02	Bit 1 5 1	
		FC00 to FC91	Bit ] 5] *1	
Monitor		FD00	Bit ] 5] *1	
		FE00 to FE71	Bit ] 5] *1	

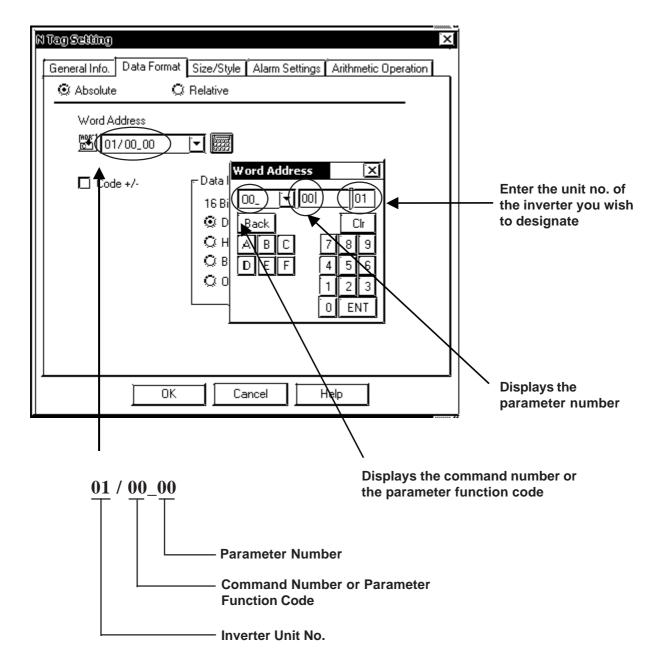
<sup>\*1</sup> Read-only device.





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



#### **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	GP77R	GP377	GLC300	GLC2000	GP2000	LT
Model	Series	Series	Series	Series	Series	
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.

CD unit's designated Davise Address

	GP unit's designated L	Device Address
Communication	Contura	

		) Feature					
/	Number	realule					
	0000	Inverter-based speed					
	0000	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 Se	ttings	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 0					
Communication Format (RS232C)	RS-232C							
Station No.	0	Inverter No. (F802) *1 *3						

<sup>\*1</sup> 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.

<sup>\*2</sup> 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.

<sup>\*3</sup> 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						
Extended Parameter	1 Word					
Instruction-related	1 Word					
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					
	0000 ~	0240	Word Address					
Basic Parameter	W0000 ~	3040	Word Address					
	0100 ~	0440	Word Address Word Address					
	0200 ~	0640	Word Address Word Address					
	0300 ~	0840	Word Address					
	0400 ~	1040	Word Address Word Address					
		10.10						
	0500 ~	1240	Word Address					
	0600 ~	1440	Word Address					
	0700 ~	1640	Word Address					
	0800 ~	1840	Word Address					
Extended	0900 ~	3040	Word Address					
Parameter	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					
	FB00 ~	2240	Word Address					
Manitan nalatad	FC00 ~	2440	Word Address					
Monitor-related	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 (M04)	05 (W05)	06 (W06)	07 (W07)	08 (N/08)	09 (M09)	FA	FB	FC	FD	FE	15
В	Basic Parameter 00 (W00)	(1100)	(1101) O	(110 <u>2</u> )	(1105)	0	(1105)	(H00)	0	(1100)	O	0	0	0	0	0	0
l e	Extended Parameter 01 (W01)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
f	Extended Parameter 02 (W02)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	Extended Parameter 03 (W03)	O	0	0	0	0	0	0	0	0	O	0	0	0	O	O	0
r	Extended Parameter 04 (W04)	O	O	O	O	0	O	O	O	O	O	O	O	O	O	0	0
е	Extended Parameter 05 (W05)	O	O	O	O	0	O	0	O	0	O	0	O	0	O	O	0
	Extended Parameter 06 (W06)	O	O	0	O	0	O	0	0	O	O	0	0	0	O	O	$\mathbf{c}$
C	Extended Parameter 07 (W07)	C	C	C	C	0	C	O	C	C	O	0	O	O	O	O	O
l n	Extended Parameter 08 (W08)	0	0	O	0	0	0	0	O	0	O	0	0	0	O	O	O
"	Extended Parameter 09 (W09)	O	0	O	0	0	0	0	O	0	O	0	0	0	O	O	O
е	Instruction-related FA	O	0	O	0	0	0	0	O	0	0	0	0	0	0	O	O
r	Instruction-related FB	O	0	O	0	0	0	0	O	0	0	0	0	0	O	O	$\mathbf{c}$
s	Monitor-related FC	O	0	O	0	0	0	0	O	0	0	0	0	0	0	O	O
i	Monitor-related FD	O	0	O	0	0	0	0	O	0	0	0	0	0	0	O	$\mathbf{c}$
0	Monitor-related FE	C	C	C	C	O	O	O	C	C	O	O	O	O	O	O	$\mathbf{c}$
n	LS Area LS	C	C	O	C	C	C	C	O	C	C	O	O	O	O	O	$\mathbf{c}$

<sup>•</sup> 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.