



Instruction Manual

FRENIC 5000G11S/P11S

RS232C option
OPC-G11S-PC

CAUTION

- Deliver this instruction manual without fail to those who actually operate the equipment.
- Read this operation manual and understand the description before installing, connecting (wiring), operating or performing maintenance and inspection of the inverter option.
- Keep this instruction manual in a safe place until the inverter option is discarded.
- The product is subject to change without prior notice.

Preface

Thank you for purchasing our OPC-G11S-PC Inverter Option. Before using the option, read this manual carefully to understand how to use the option correctly. Improper use may result in abnormal operation, reduce product life, and possible failure.

This manual does not describe how to use the Inverter main unit. Refer to the FRENIC 5000G11S/P11S Instruction Manual for details about the Inverter main unit. Keep this manual on hand for reference when using the option.

To Use the Option Safely

Note the following items when using the option. Improper use may result in unexpected failure, electric shock, or possible injury.

(1) Installation and Wiring

WARNING

- Wait at least five minutes (22kW or less) or ten minutes (30kW or more) after turning off the power before installing or wiring the Inverter option.
Use a multimeter or similar instrument to check the voltage before performing installation or wiring.
(Check whether the charge lamp goes off.), **as electric shock may occur**
- Discharge static electricity from your body before handling the Inverter option. Never touch the Inverter option with wet hands, **as accident or electric shock may occur**
- No foreign matter such as screws, metal patches, lint, chips, and dust in the Inverter option.
There is risk of fire or accident.
- Do not damage or stress the wiring, **as accident or electric shock may occur.**

CAUTION

- Do not install or operate a damaged option or one that is lacking parts, **as injury may occur.**
- Since noise is generated by the Inverter, motor, and wiring, carefully monitor surrounding sensors and devices for abnormal operation. **There is a risk of accident.**

(2) Operation

WARNING

- Check and adjust parameters before operation. Improper parameters may cause an unexpected action for some machines. **There is a risk of accident.**

CAUTION

- High-speed operation can be set easily for the Inverter. Fully check motor or device performance before changing the setup, **as accident may occur.**

(3) Maintenance and Inspection, and Parts Replacement

WARNING

- Wait at least five minutes (22kW or less) or ten minutes (30kW or more) after turning off the power before inspecting the Inverter option.
(Check whether the charge lamp goes off.) **There is a risk of electric shock.**
- Only authorized personnel are allowed to maintain and inspect the Inverter option and replace parts, **as electric shock or injury may occur.**
- Never modify the Inverter option, **as electric shock or injury may occur.**

CAUTION

- Do not execute a megger test (insulation resistance measurement).

(4) Discard

CAUTION

- Since the Inverter option uses soldering lead, treat it as an industrial waste when discarding it.

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If anything is unclear about the option or there is something doubtful about its condition, contact your distributor or our nearest branch office.

1 Before Using This Product

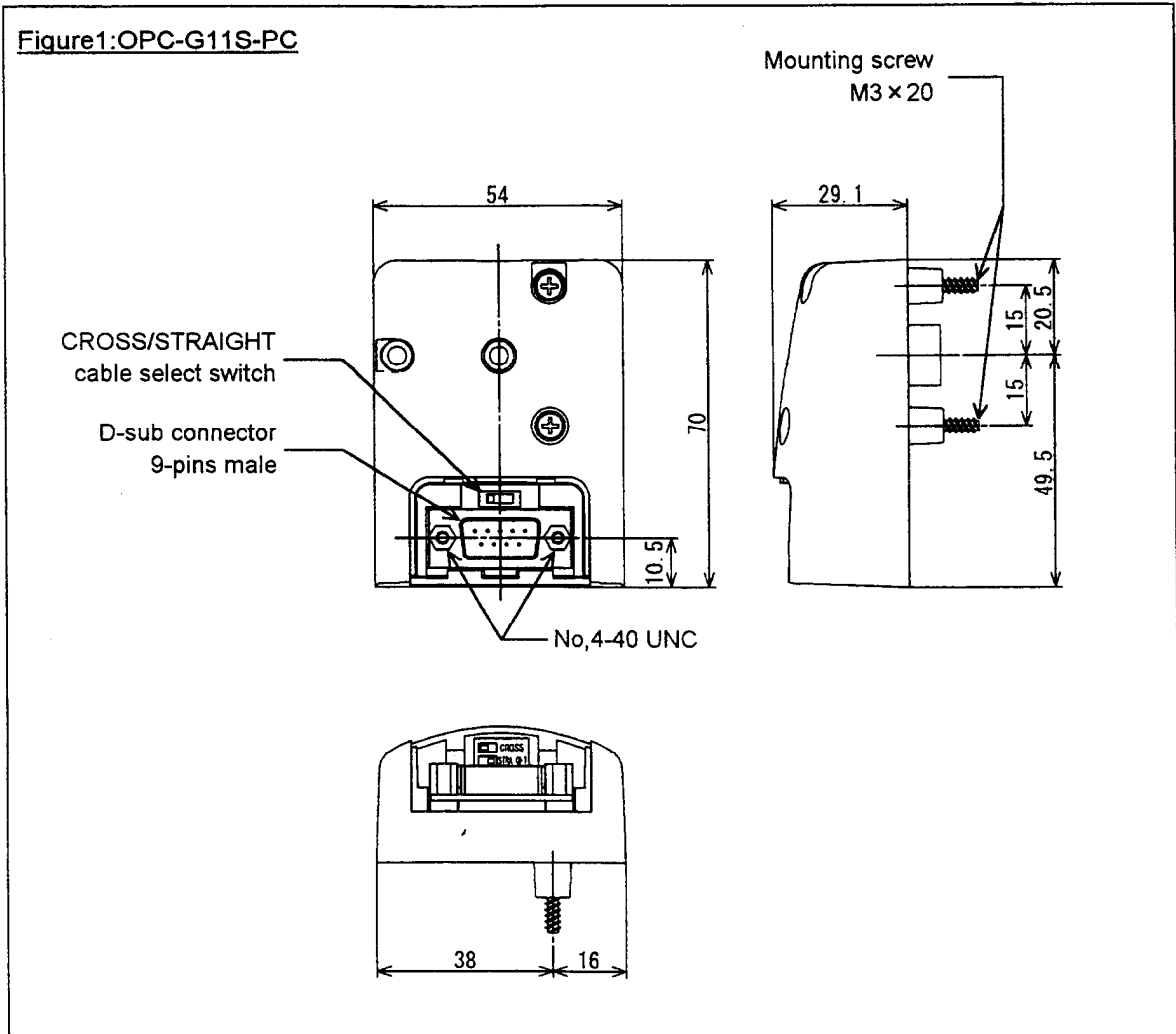
Check the items described below when you receive this product. Also check whether this product has been damaged during transport. If anything is amiss, contact your distributor or our nearest branch office.

1-1 Checking Accessories

Confirm that the following accessories are included in the package:

- | | | |
|---|-------|---|
| 1. Instruction Manual | ..... | 1 |
| 2. Accessories Mounting screw M3 x 20 | ..... | 2 |

1-2 Product Appearance



2 Product Inquiries

2-1 Overview

This product can transmit and receive data by the RS232C communication between the personal computer and the Inverter in this option installed in the FRENIC5000G11S/P11S general-purpose Inverter. The drive control and the function control of the Inverter can manage by the user's program. Moreover, the Inverter loader offered as a freeware can be used. The protocol for the RS-485 interface is used for the communication protocol.

(This option and the Keypad panel cannot be used at the same time.)

2-2 Product Guarantee

The product guarantee term is one year after installation or two years after manufacturing on the nameplate, whichever expires first.

However, the guarantee will not apply in the following cases, even if the guarantee term has not expired:

- (1) Problems caused by incorrect operation or by unauthorized repairs or modifications.
- (2) Problems resulting from using the Inverter in the range outside the standard specification.
- (3) Damage to the Inverter after purchase or during delivery.
- (4) Damage caused by earthquakes, fire, floods, lightning, abnormal voltage fluctuations or other natural disasters and secondary disasters.

3 Installation

3-1 Installation Environment

The installation environment for the Inverter in which this product is being installed is listed Table 3-1-1

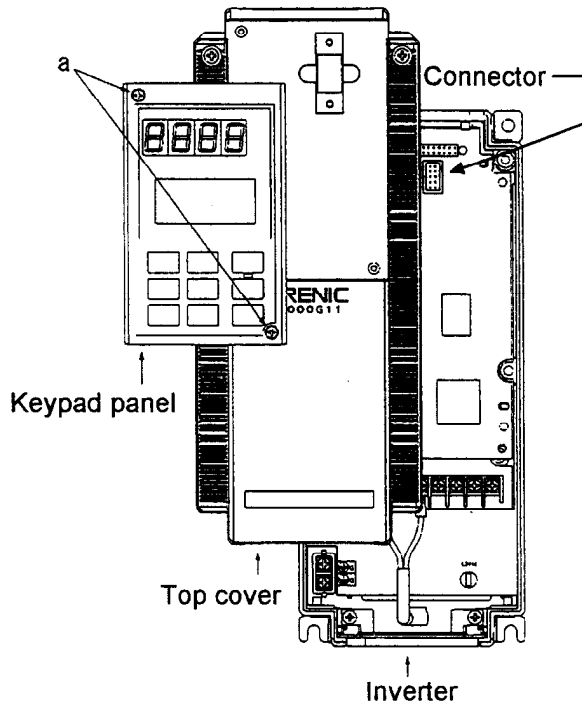
Table 3-1-1 Installation Environment.

Item	Specifications	Remarks
Location	Indoors	—
Ambient temperature	-10 to 50°C	—
Ambient relative humidity	5 to 95%	—
Environment	The place should be away from direct sunlight and free from dust, corrosive gases, inflammable gases, oil mists, steam, dripping water or vibration. Salty environments should preferably be avoided. Avoid places where sudden changes in temperature occur which could cause condensation or freezing.	—
Altitude	Up to 1000m	—

3-2 Installation Procedure

Before installing or removing the option, be sure to turn off input power to the Inverter and confirm that the charge lamp (CHARGE or CRG) is off.

Applicable Inverter Type
FRN22G11S -2/4 or smaller models
(22kW or less)



Step1

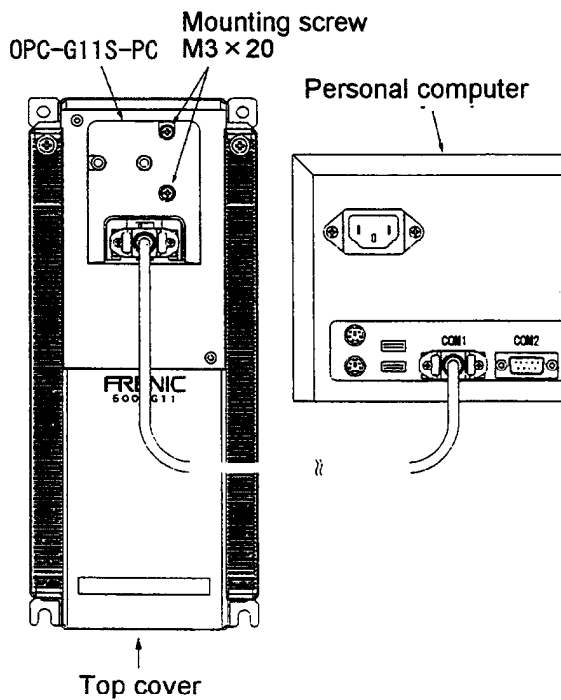
Remove the top cover, and loosen the mounting screws of the Keypad panel(part of a). The Keypad panel remove from the top cover.

Step2

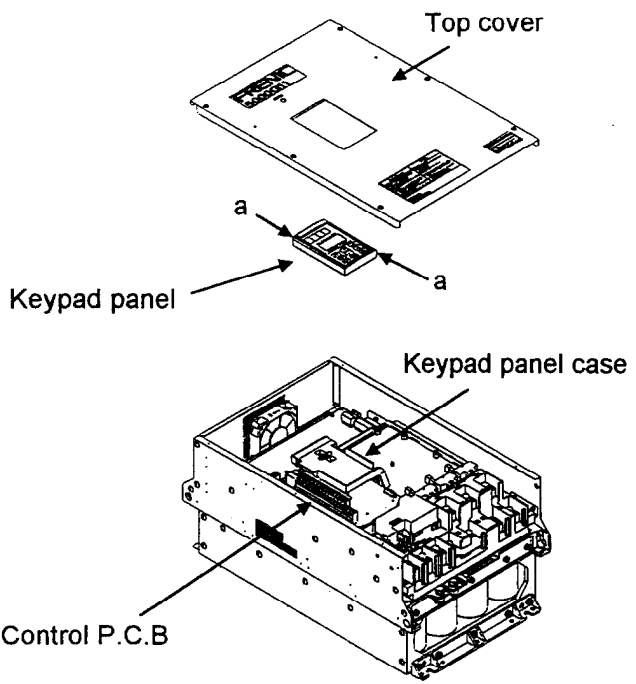
Install the top cover to the Inverter. OPC-G11S-PC is inserted in connector. Fix OPC-G11S-PC to the top cover with the mounting screws. (M3 × 20 2pieces)

Step3

Connect the OPC-G11S-PC between personal computer with the RS232C cable of D-sub connector 9-pins. Refer to page 7-9 for the application cable and connection diagram.

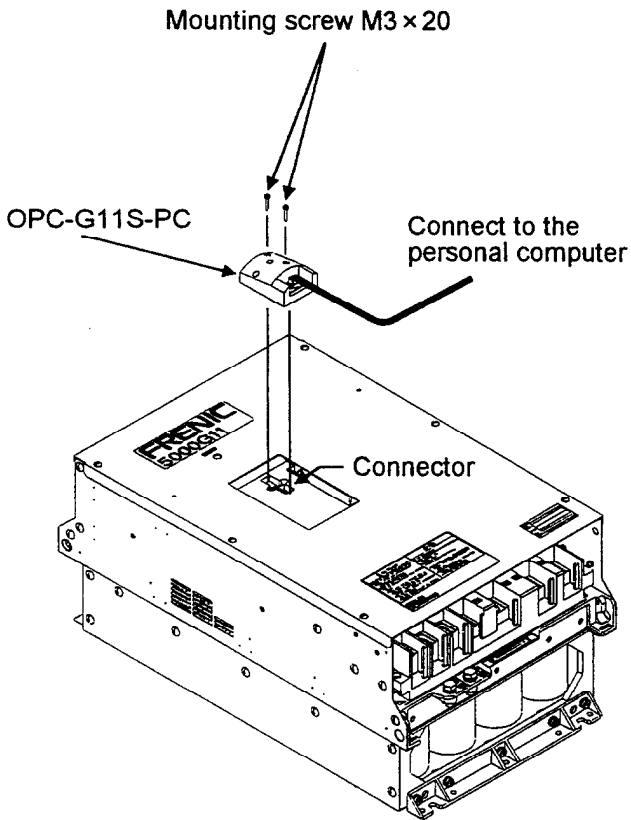
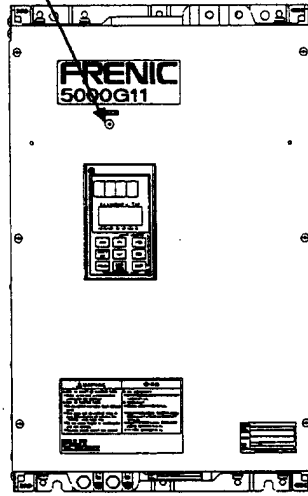


Applicable Inverter Type
FRN30G11S -2/4 or larger models
(30kW or more)



Charge lamp(CHARGE)

(The position is different depending on the model.)



Step1

Remove the top cover, and loosen the mounting screws of the Keypad panel(part of a)
The Keypad panel remove from the Keypad panel case.

Step2

Install the top cover to the Inverter.
OPC-G11S-PC is inserted in connector.
Fix OPC-G11S-PC to the Keypad panel case with the mounting screws. (M3 x 20 2pieces)

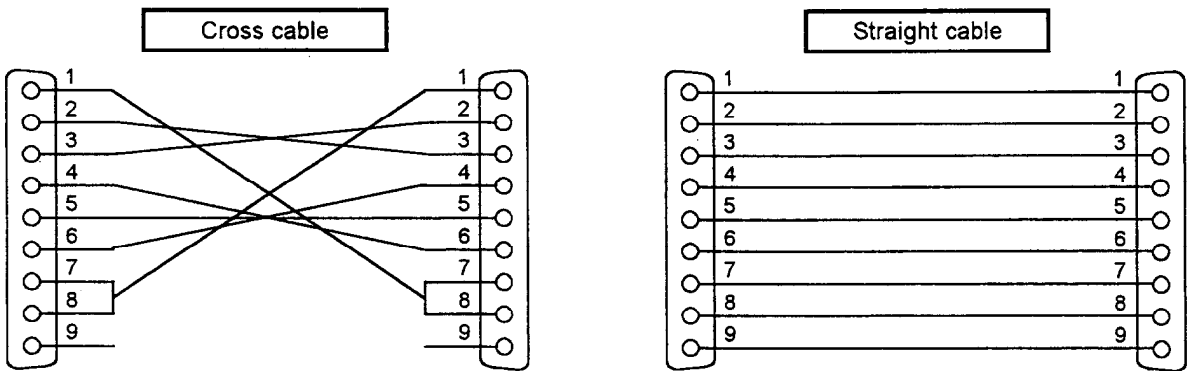
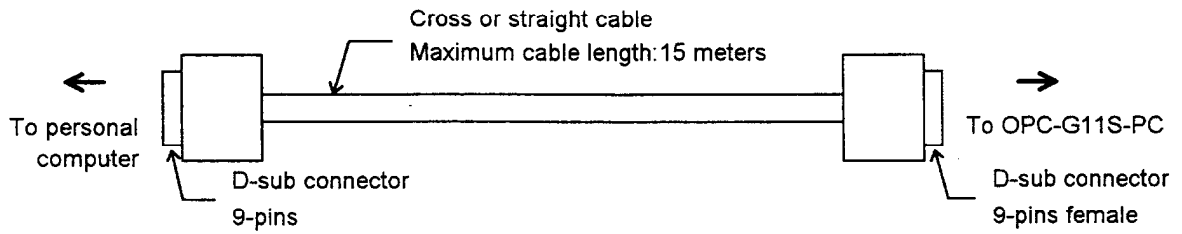
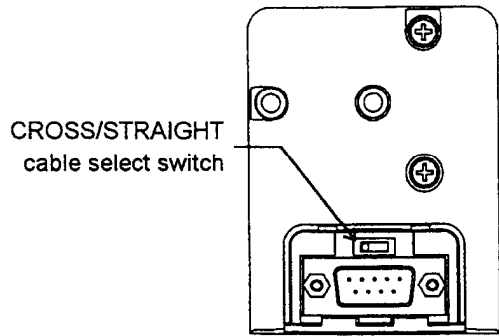
Step3

Connect the OPC-G11S-PC between personal computer with the RS232C cable of D-sub connector 9-pins.
Refer to page 7-9 for the application cable and connection diagram.

3-3 Application Cable

The RS232C cable must use goods which correspond to the undermentioned specification on the market. It is possible to correspond to the cable of a cross cable or a straight cable by setting the "CROSS"/"STRAIGHT" cable select switch in the option.

Please do the cable length is 15 meters or less.



CAUTION

● Please connect the personal computer with the D-sub connector of 9-pins as RS232C port.
 This option does not correspond to the personal computer with RS232C ports other than 9-pins.
There is a risk of accident.

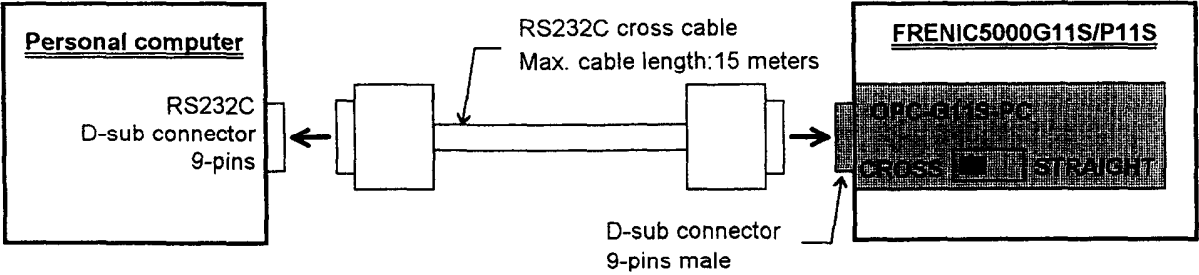
3-4 Specification of connector

Shape and the specification of D-sub connector in the OPC-G11S-PC are the following tables.

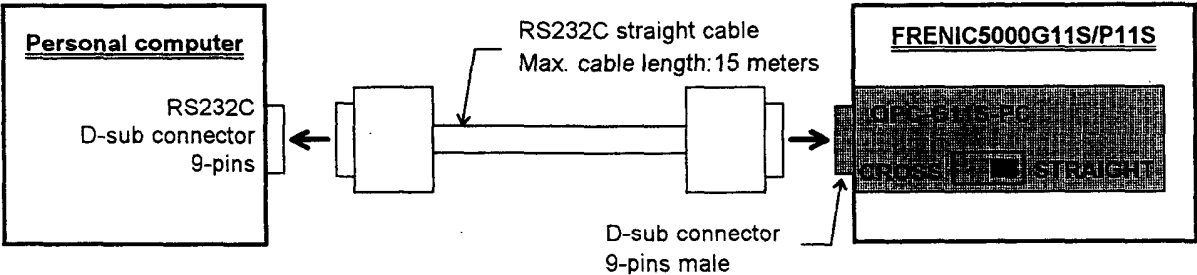
	Specification																																																											
Shape	D-sub connector 9-pins male with No.4-40 UNC lock screw																																																											
Specification of signal	<p>OPC-G11S-PC has adopted three line type interface. (Receive data, Transmit data, Ground)</p> <p>The pin array of the receive data and the transmit data changes places by setting the cable select switch. (CROSS/STRAIGHT)</p> <p>It is possible to correspond to both cable (cross cable and straight cable)</p> <p>Please set on "CROSS" side when use cross cable or set on "STRAIGHT" side when use straight cable.</p> <p><u>Pin array</u></p> <div style="text-align: center;"> </div> <p><u>Signal</u></p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2" style="width: 15%;"></th> <th colspan="2" style="width: 40%;">Use cross cable</th> <th colspan="2" style="width: 45%;">Use straight cable</th> </tr> <tr> <th style="width: 15%;">CROSS <input type="checkbox"/></th> <th style="width: 25%;">STRAIGHT <input checked="" type="checkbox"/></th> <th style="width: 15%;">CROSS <input type="checkbox"/></th> <th style="width: 25%;">STRAIGHT <input checked="" type="checkbox"/></th> </tr> <tr> <th>Pin No,</th> <th>Signal</th> <th>Contents</th> <th>Signal</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td colspan="4" style="text-align: center;">Unused</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">RD</td> <td style="text-align: center;">Receive data</td> <td style="text-align: center;">TD</td> <td style="text-align: center;">Transmit data</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">TD</td> <td style="text-align: center;">Transmit data</td> <td style="text-align: center;">RD</td> <td style="text-align: center;">Receive data</td> </tr> <tr> <td style="text-align: center;">4</td> <td colspan="4" style="text-align: center;">Pin No,4 and No,6 are short-circuited in the option.</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">GND</td> <td style="text-align: center;">Ground</td> <td style="text-align: center;">GND</td> <td style="text-align: center;">Ground</td> </tr> <tr> <td style="text-align: center;">6</td> <td colspan="4" style="text-align: center;">Pin No,4 and No,6 are short-circuited in the option.</td> </tr> <tr> <td style="text-align: center;">7</td> <td colspan="4" style="text-align: center;">Pin No,7 and No,8 are short-circuited in the option.</td> </tr> <tr> <td style="text-align: center;">8</td> <td colspan="4" style="text-align: center;">Pin No,7 and No,8 are short-circuited in the option.</td> </tr> <tr> <td style="text-align: center;">9</td> <td colspan="4" style="text-align: center;">Unused</td> </tr> </tbody> </table>		Use cross cable		Use straight cable		CROSS <input type="checkbox"/>	STRAIGHT <input checked="" type="checkbox"/>	CROSS <input type="checkbox"/>	STRAIGHT <input checked="" type="checkbox"/>	Pin No,	Signal	Contents	Signal	Contents	1	Unused				2	RD	Receive data	TD	Transmit data	3	TD	Transmit data	RD	Receive data	4	Pin No,4 and No,6 are short-circuited in the option.				5	GND	Ground	GND	Ground	6	Pin No,4 and No,6 are short-circuited in the option.				7	Pin No,7 and No,8 are short-circuited in the option.				8	Pin No,7 and No,8 are short-circuited in the option.				9	Unused			
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3-5 Connection Diagram

Use cross cable



Use straight cable



CAUTION

- Check the wiring again before operating the Inverter. Improper wiring may cause unexpected Inverter operation or device operation. **There is a risk of accident or injury.**
- Since noise is generated by the Inverter, motor, and wiring, carefully monitor surrounding sensors and devices for abnormal operation. **There is a risk of accident.**

4 Handling The Product

4-1 Attention in handling

- 1) As for this option, only the connection of 1:1 [Host : Inverter] is possible based on the RS-232C specification. (It is not a translation with which Inverters up to 31 of RS-485 interfaces can be connected.)
- 2) When this option is used, the Keypad panel cannot be used.
- 3) When this option is used, the RS-485 interface cannot be used.
- 4) Please do the procedure of the communication close when you finished the use of this option.
 In the following cases, the display of the keypad panel becomes "Er2" and there is a possibility that the Keypad panel cannot be used when the Keypad panel is connected.
 - When terminating abnormally by using the Inverter loader.
 - When you do not do the communication close.
 It is possible to return from this state to reactivate of the power supply.
- 5) The shape of waves of the real-time trace function might not be able to be displayed accurately when the Inverter loader is used by this option. (Because the baud rate of this option is slower than that of the Inverter loader recommendation speed)

4-2 Use by user's program

The communication protocol is common with the RS-485 interface. It is necessary to communicate for the protocol change before and after the communication by the user's program. Please communicate according to the following procedures. Please obtain "RS-485 interface manual" beforehand when using by the user's program.

Table 4-2-1. Procedure of communication

	Processing	Explanation	Communication frame	Note
Procedure 1	Start	The use of the protocol for RS-485 is enabled by this option.	① Communication beginning frame	It is not possible to usually communicate if does not begin to communicate.
Procedure 2	Confirmation	Whether it is possible to communicate is confirmed. Returns to procedure 1 when failing.	② Frame for confirmation (reading of model code)	The terminal RS-485 cannot be used from now when the switch succeeds.
Procedure 3	Usual communication	It is possible to usually communicate by the user's program.	Standard frame Option frame	Refer to the manual in the RS-485 interface.
Procedure 4	End	Using the touch panel becomes possible.	③ Communication close frame	There is a possibility that the Keypad panel cannot be used when the communication close is not done.

① **Communication beginning frame**

A5H	00h	00H	00H	00H	00H	00H	00H	00H	00H	00H	A5H	HEX
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The answer does not returns. (Please send the frame for the confirmation after 10msec or more passes)

② **Frame for confirmation (When "H31 station address" of the Inverter is set value "01")**

SOH	'0'	'1'	ENQ	'R'	'M'	'2'	'3'	SP	'0'	'0'	'0'	'0'	ETX	'4'	'D'	ASCII
-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-------

01H 30H 31H 05H 52H 4DH 32H 33H 20H 30H 30H 30H 30H 03H 34H 44H HEX

At success : The answer returns. Refer to the manual in the RS-485 interface in detail of respond.

At failure : The answer does not returns. (no response)

After of the passage of 100msec or more, try to send the communication beginning frame.

③ **Communication close frame**

SOH	'9'	'9'	ENQ	' '	SP	SP	SP	SP	'0'	'0'	'0'	'0'	ETX	'1'	'9'	ASCII
-----	-----	-----	-----	-----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-------

01H 39H 39H 05H 5FH 20H 20H 20H 20H 30H 30H 30H 30H 03H 31H 39H HEX

The answer does not returns.

4-3 Use by Inverter loader

Please obtain and install the Inverter loader offered as a freeware.

Please refer to "4. How to Operate" of "Inverter loader Instruction Manual" for the use of this option with the Inverter loader.

Please read the part of "4-3 How to start loader" and "4-4 Initialization procedure (Environment Setup)" in a different way as the following.

Reading of Inverter loader manual in a different way

4-3 How to start loader

Make sure to execute the installation described before to start the loader. If the installation was successful, select Start, Programs, Fuji electric and then click the icon for the loader **INV loader(OPC-G11S-PC)** to start the loader.

4-4 Initialization procedure (Environment Setup)

When you use the loader for the first time or you have changed the model of the Inverter, make sure to execute the following initialization procedure (main menu - Environment Setup).

- 1) Setting communication port Select the Communication tab to set the communication port number for a PC connected with the loader.
- 2) Setting communication conditions Set the communication conditions of the Communication tab in the following fixed values.

Baud rate	.....	4800bit/s
Data length	.....	8bit
Stop bit	.....	1bit
Parity	.....	Odd

- 3) Connection Select the Connection tab to register a station address to use. Use the Connected Inverter Automatic Detection button to register the station address automatically.

NOTE

