

Inverter SF-520 Option

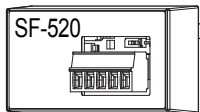
RS-485 MEMOBUS/Modbus Interface

Technical Manual

Type SI-485/J-H

NOTICE

1. Make sure that this installation manual is delivered to the end user of inverter unit.
2. Read this manual before installing or operating the inverter unit, and store it in a safe place for reference.



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1 Preface and Safety

1 Preface and Safety

◆ Applicable Documentation


The following manuals are available for the RS-485 Interface Option:

Option Unit

| | SF-520 RS-485 MEMOBUS/Modbus Interface Option Technical Manual |
|--|--|
|  | <p>Read this manual first.</p> <p>The Technical Manual is packaged with the RS-485 Interface Option and contains a basic overview of wiring, settings, functions, and fault diagnoses.</p> |

1 Preface and Safety

Inverter

| | | |
|--|--|--|
|  | SF-520 Series Operating and Maintenance Manual No. DM2201E | To obtain instruction manuals for Sumitomo products access these sites: http:// www.cyclo.shi.co.jp/ |
| | SF-520 Series Technical Manual No. DM2202E | |

◆ Terms

Note: Indicates a supplement or precaution that does not cause drive damage.

Drive: SF-520 Series

Option: SF-520 RS-485 MEMOBUS/Modbus Interface

1 Preface and Safety

◆ Registered Trademarks

- Company names and product names listed in this manual are registered trademarks of those companies.

◆ Supplemental Safety Information

Read and understand this manual before installing, operating, or servicing this option unit. The option unit must be installed according to this manual and local codes.

The following conventions are used to indicate safety messages in this manual. Failure to heed these messages could result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

DANGER

Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

1 Preface and Safety



CAUTION

Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an equipment damage message.

2 Receiving

2 Receiving

◆ Receiving

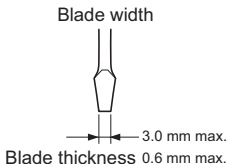
Confirm the packaging after receiving the RS-485 Interface Option. If the wrong model is received or the RS-485 Interface Option does not function properly, contact your supplier.

Components packaged with the option:

- The RS-485 MEMOBUS/Modbus Interface (SI-485/J-H)
- Technical manual

◆ Tool Requirements

Use a flat-blade screwdriver with the dimensions below for installation (See page [14](#)) or removal (See page [15](#)) of the option cover and RS-485 Interface Option.



3 Product Overview

◆ About this product

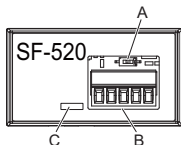
The RS-485 MEMOBUS/Modbus Interface is used to connect the drive to a network using the MEMOBUS protocol.

By installing this option unit, the user can operate the drive with a PLC or some other type of control device.

- Drive operation
- Monitor drive operational status
- Change drive parameter settings

4 Option Components

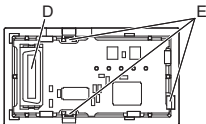
4 Option Components



**A – DIP Switch
S2**

**B – Terminal
Block**

**C – Option
Model
Number**



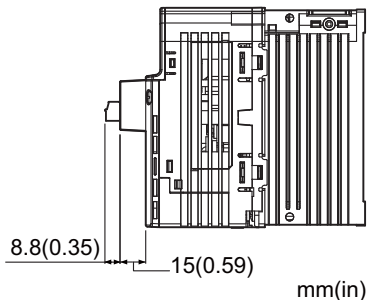
**D – Drive
Connector**

**E – Connection
Tabs**

4 Option Components

◆ Dimensions

The installed Option Interface adds 23.8 mm (0.94 in) to the total depth of the drive.

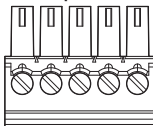


4 Option Components

◆ Terminal Block

| Terminal | Name | Description |
|----------|------|---------------|
| 1 | R+ | Receive (+) |
| 2 | R- | Receive (-) |
| 3 | IG | Shield Ground |
| 4 | S+ | Send (+) |
| 5 | S- | Send (-) |

Top View



Front View



5 Installation Procedure

◆ Section Safety

DANGER

Electrical Shock Hazard

Disconnect all power to the drive, before servicing.

Failure to comply will result in death or serious injury.

Wait at least one minute after all indicators are off. The drive has internal capacitors that remain charged even after main power supply is disconnected. The drive charge LED will extinguish when the DC bus voltage is below 50 Vdc. Measure drive DC bus voltage to confirm safe level.

NOTICE

Damage to Equipment

Properly connect the connectors.

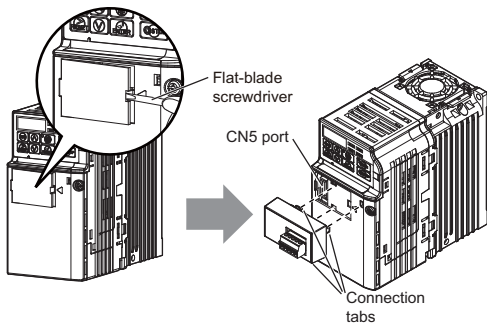
Failure to comply may prevent proper operation and possibly damage equipment.

5 Installation Procedure

◆ Attaching the Interface Option

1. Insert a flat-blade screwdriver into the opening as shown in the diagram below to remove the option cover from the drive.
2. Insert the connector on the back of the interface into the CN5 port and click into place.

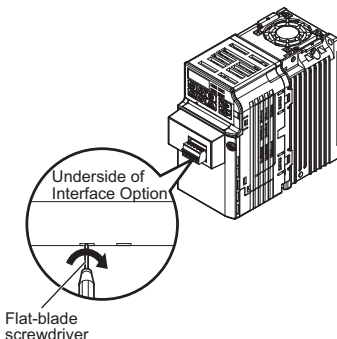
Note: The RS-485 Interface Option has three additional connection tabs that must also click into place to properly mount the option.



5 Installation Procedure

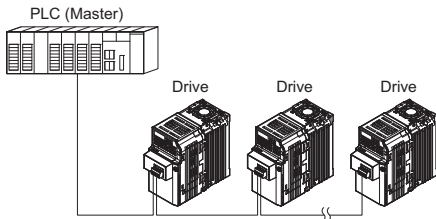
◆ Removing the Interface Option

1. Insert a flat-blade screwdriver into the small opening between the drive and the Interface Option, and gently apply pressure to the connection tabs as shown.



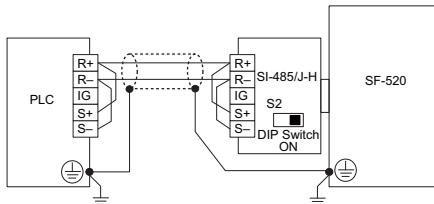
5 Installation Procedure

◆ Connecting Peripheral Devices to the RS-485 Interface Option



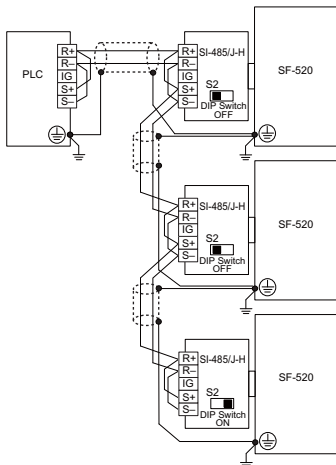
◆ Wiring Diagram

■ RS-485 Communications (2-wire) Single Drive Wiring



5 Installation Procedure

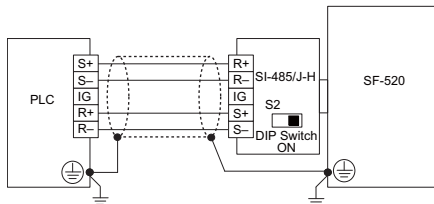
Multiple Drive Wiring



- Note:**
- Set termination resistor switch S2, located on the SI-485/J-H Option Interface to the ON position for the end drive on the network.
 - Set parameter H5-07 = 01 for each drive on the network that is using RS-485 communications.

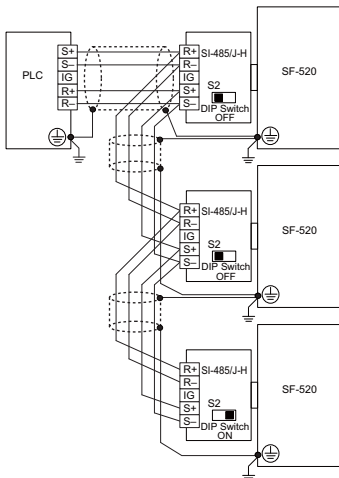
5 Installation Procedure

■ RS-422 Communications (4-wire) Single Drive Wiring



5 Installation Procedure

Multiple Drive Wiring



- Note:**
- Set termination resistor switch S2, located on the SI-485/J-H Option Interface to the ON position for the end drive on the network.
 - Set parameter H5-07 = 00 for each drive on the network that is using RS-422 communications.

6 Related Drive Parameters

6 Related Drive Parameters

| No. | Name | Description | Default |
|-------|---------------------------------|--|---------|
| b1-01 | Frequency Reference Selection 1 | Selects the frequency reference input source. 00 : Operator - Digital preset speed d1-01 to d1-17. 01 : Terminals - Analog input terminal A1 or A2. 02 : MEMOBUS/Modbus communications 03 : Option Potentiometer | 01 |
| b1-02 | Run Command Selection 1 | Selects the run command input source. 00 : Operator - RUN and STOP keys on the digital operator. 01 : Digital input terminals 02 : MEMOBUS communications | 01 |
| H5-01 | Drive Slave Address | Selects drive slave number (address) for MEMOBUS/Modbus terminals R+, R-, S+, S-. Cycle power for the setting to take effect. | 1F |

6 Related Drive Parameters

| No. | Name | Description | Default |
|-------|---|--|---------|
| H5-02 | Communication Speed Selection | <p>Selects the baud rate for MEMOBUS/Modbus terminals R+, R-, S+ and S-. Cycle power for the setting to take effect.</p> <p>00: 1200 bps 01: 2400 bps 02: 4800 bps 03: 9600 bps 04: 19200 bps 05: 38400 bps</p> | 03 |
| H5-03 | Communication Parity Selection | <p>Selects the communication parity for MEMOBUS/Modbus terminals R+, R-, S+ and S-. Cycle power for the setting to take effect.</p> <p>00: No parity 01: Even parity 02: Odd parity</p> | 00 |
| H5-04 | Stopping Method After Communication Error | <p>Selects the stopping method when a communication time-out fault (CE) is detected.</p> <p>00: Ramp to stop 01: Coast to stop 02: Fast-stop 03: Alarm only</p> | 03 |


6 Related Drive Parameters

| No. | Name | Description | Default |
|-------|---|---|---------|
| H5-06 | Drive Transmit Wait Time | Set the wait time between receiving and sending data. | 10 ms |
| H5-07 | RTS Control Selection | Selects "request to send" (RTS) control: 00 : Disabled - RTS is always on. 01 : Enabled - RTS turns on only when sending. | 01 |
| H5-12 | Run Command Method Selection | 00 : FWD/STOP, REV/STOP Method 01 : RUN/STOP, FWD/REV Method | 00 |
| H5-13 | MEMOBUS/Modbus frequency reference and frequency monitor unit | 00 : 0.1 Hz / 1 01 : 01-03 based 02 : 100% / 30000 03 : 0.1% / 1 | 00 |


7 Troubleshooting

Problems with the option interface may trigger an operator error. Refer to the SF-520 Technical Manual for all other errors.

◆ Fault

| LED Operator Display | | Minor Fault Name |
|---|----|---|
|  | CE | MEMOBUS/Modbus Communication Error |
| Cause | | Possible solutions |
| No data was received for longer than 2 seconds. Faulty communications wiring, or a short circuit exists. A communications data error occurred due to noise. | | ⇒Check for improper wiring or loose cables. ⇒Make sure the unit is properly grounded. ⇒Reconnect leads running to the main circuit in the drive. ⇒Make sure the DIP switch for terminal resistance is set appropriately. |

7 Troubleshooting

| LED Operator Display | | Minor Fault Name |
|---|-------|--|
|  oPE05 | oPE05 | Run Command Selection Error |
| | | The Run command selection parameter b1-02 is set to 03 but no option unit is installed. |
| Cause | | Possible solutions |
| Frequency reference is assigned to an option (b1-01 = 02) that is not connected to the drive. | | ⇒Make sure that parameters b1-01 and b1-02 are set properly. ⇒Reconnect the option unit to the drive. |
| The Run command is assigned to an option (b1-02 = 02) that is not connected to the drive. | | |

8 Specifications

◆ Option Specifications

| Item | Specification |
|----------------------------------|--|
| Model Number | SI-485/J-H |
| Storage/ Installation Area | Indoors (an area free from oil mist and dust) |
| Ambient Temperature | -10 to +50°C |
| Humidity | 95% RH or less with no condensation |
| Storage Temperature | -20 to +60°C allowed for short-term transport of the product |
| Altitude | 1000 m or less |

8 Specifications

◆ Network Specifications

| Item | Specification | |
|--------------------------|--------------------------------------|-------------------------------------|
| Interface | RS-422, RS-485 | |
| Communication Parameters | Communication Speeds Available | 1.2; 2.4; 4.8; 9.6; 19.2; 38.4 kbps |
| | Data length | 8 bit (fixed) |
| | Parity | Select even, odd, or none |
| | Stop bit | 1 bit (fixed) |
| Protocol | MEMOBUS/Modbus (using RTU mode only) | |
| Maximum Number of Slaves | 31 drives (using RS-485) | |

9 Warranty

◆ Warranty policy on inverter

| | |
|--------------------|--|
| Warranty period | The warranty period is 18 months from date of shipment or 12 months after initial operation, whichever comes first. |
| Warranty condition | <p>In the event that any problem or damage to the Product arises during the "Warranty Period" from defects in the Product whenever the Product is properly installed and combined with the Buyer's equipment or machines maintained as specified in the maintenance manual, and properly operated under the conditions described in the catalog or as otherwise agreed upon in writing between the Seller and Buyer or its customers; the Seller will provide, at its sole discretion, appropriate repair or replacement of the Product without charge at a designated facility, except as stipulated in the "Warranty Exclusions" as described below.</p> <p>However, if the Product is installed or integrated into the Buyer's equipment or machines, the Seller shall not reimburse the cost of: removal or re-installation of the Product or other incidental costs related thereto, any lost opportunity, any profit loss or other incidental or consequential losses or damages incurred by the Buyer or its customers.</p> |

9 Warranty

| | |
|--------------------|--|
| Warranty exclusion | <p>Notwithstanding the above warranty, the warranty as set forth herein shall not apply to any problem or damage to the Product that is caused by:</p> <ol style="list-style-type: none">1. Installation, connection, combination or integration of the Product in or to the other equipment or machine that rendered by any person or entity other than the Seller.2. Insufficient maintenance or improper operation by the Buyer or its customers such that the Product is not maintained in accordance with the maintenance manual provided or designated by the Seller;3. Improper use or operation of the Product by the Buyer or its customers that is not in-formed to the Seller, including, without limitation, the Buyer's or its customers' opera-tion of the Product not in conformity with the specifications;4. Any problem or damage on any equipment or machine to which the Product is installed, connected or combined or any specifications particular to the buyer or its customers;5. Any changes, modifications, improvements or alterations to the Product or those func-tions that are rendered on the Product by any person or entity other than the Seller;6. Any parts in the Product that are supplied or designated by the Buyer or its customers; |
|--------------------|--|

9 Warranty

| | |
|--------------------|--|
| Warranty exclusion | <ol style="list-style-type: none">7. Earthquake, fire, flood, salt air, gas, lightning, acts of God or any other reasons beyond the control of the Seller;8. Normal wear and tear, or deterioration of the Product's parts, such as the cooling fan bearings;9. Any other troubles, problems or damage to the Product that are not attributable to the Seller. |
| Others | The Seller will not be responsibility for the installation and removal of the inverter. Any inverter transportation cost shall be born by both Seller and Buyer. |

- Specifications, dimensions, and other items are subject to change without prior notice.



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