Chapter 5

RUNNING THROUGH RS485 COMMUNICATION (OPTION)

This chapter describes an overview of inverter operation through the RS485 communications facility. Refer to the RS485 Communication User's Manual (MEH448) for details.

Contents

5.1 Overview on RS485 Communication

Mounting an optional RS485 communications card on the FRENIC-Mini series of inverters enables the following:

■ Operation from a remote keypad

A remote keypad can be connected to the RS485 communications card using the extension cable. You may install the remote keypad to the easy-to-access front of the control panel. The maximum length of the extension cable is 20 m.

■ Operation by FRENIC Loader

The Windows-based PC can be connected to the RS485 communications card. Through the RS485 communications facility, you may run FRENIC Loader in the PC to edit the function code data and monitor the running status information of the inverter.

■ Operation from the host equipment

Host equipment such as a PLC or personal computer can be connected to the RS485 communications card. It may act as a master device that controls the inverter as a slave device.

Protocols for managing a network including inverters include the Modbus RTU protocol (compliant to the protocol established by Modicon Inc.) that is widely used in FA markets and the Fuji general-purpose protocol that supports the FRENIC-Mini and conventional series of inverters.

Note For the remote keypad, the inverter uses the dedicated protocol that automatically switches the operation source to the remote keypad, so no function code setting is required.

For FRENIC loader, however, you need to set up function code H30 for some communications conditions although the dedicated protocol is used.

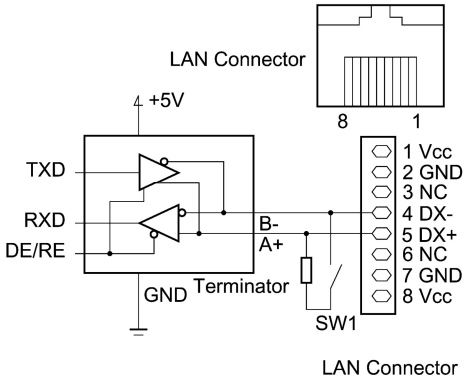
5.1.1 Common specifications

Items	Specifications		
Protocol	FGI-BUS	Modbus RTU	FRENIC Loader
Compliance	Fuji general-purpose inverter protocol	Modicon Modbus RTU-compliant (only in RTU mode)	Dedicated protocol (Not disclosed)
No. of supporting stations	Host device: 1 Inverters: up to 31		
Electrical specifications	EIA RS485		
Connection to RS485	8-wire RJ-45 connector		
Synchronization	Start-Stop system		
Transmission mode	Half-duplex		
Transmission speed	2400, 4800, 9600 or 19200 bps		
Max. transmission cable length	500 m		
No. of available station addresses	1 to 31	1 to 247	1 to 255
Message frame format	FGI-BUS	Modbus RTU	FRENIC loader
Frame synchronization	Detection SOH (Start Of Header) character	Detection of no-data transmission time for 3-byte period	Start code 96H detection
Frame length	16 bytes (fixed) in normal transmission 8 or 12 bytes in high-speed transmission	Variable length	Variable length
Max. transfer data	Write: 1 word Read: 1 word	Write: 50 words Read: 50 words	Write: 41 words Read: 41 words
Messaging system	Polling/Selecting/Broadcast		Command message
Transmission character format	ASCII	Binary	Binary
Character length	8 or 7 bits (selectable by the function code)	8 bits (fixed)	8 bits (fixed)
Parity	Even, Odd, or None (selectable by the function code)		Even
Stop bit length	1 or 2 bits (selectable by the function code)	No parity: 2 bits Even or Odd parity: 1 bit	1 bit (fixed)
Error checking	Sum-check	CRC-16	Sum-check

5.1.2 Connector specifications

The RS485 communications card is equipped with an RJ-45 connector whose pin assignment is listed in the table below.

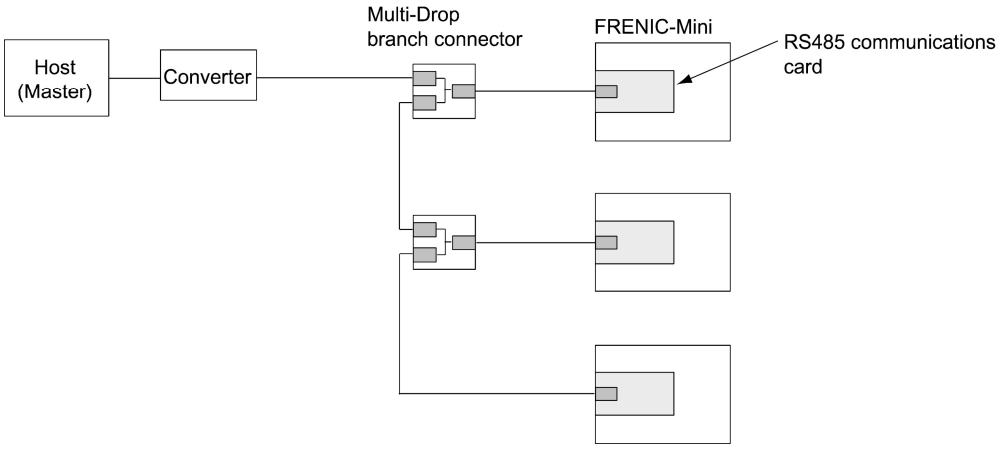
Pin	Signal name	Function	Remarks
1 and 8	Vcc	Power source for the remote keypad	5V
2 and 7	GND	Reference voltage level	GND
3 and 6	NC	Not used.	
4	DX-	RS485 data (-)	Built-in terminator: 112 Ω Open/close by SW1
5	DX+	RS485 data (+)	



Note The RJ-45 connector has power source pins (pins 1 and 8) designed for the remote keypad. When connecting other devices to the RJ-45 connector, take care not to use those pins. Failure to do so may cause a short-circuit.

5.1.3 Connection

You need to select devices suitable for your network configuration, referring to the figure shown below.



Converter

Equipment such as personal computers is not equipped with an RS485 communications port but with an RS232C port, so an RS485/RS232C converter is required to connect them to the RS485 communications card. It is recommended that insulated converters such as RS485/RS485 converters (KS-485PTI by System Sacomm, Inc.) be used for eliminating electric noise.

Multi-drop branch connector

The RS485 communications port of the communications card uses an RJ-45 connector. For multi-drop connection of inverters, multi-drop branch connectors (MS8-BA-JJJ by SK Koki Co.) are required.

Cable

For the connection of the remote keypad, use an 8-wire straight cable with an RJ-45 connector. (Remote keypad extension cable option: CB-5S)

For the connection of other equipment or connection of FRENIC-Mini inverters with each other, use a cable that has signal wires only. (EIA568-compliant 10BASE-T)

Note

- No converter is required for connection of the remote keypad.
- To connect the FVR-E11S series of general-purpose inverters to the FRENIC-Mini series, take necessary measures for the difference of the pin assignment between FVR-E11S and FRENIC-Mini series to avoid a short-circuited failure.