

Inverter & Charger & Solar Charge Inverter
Modbus Protocol V1.0

1. Revision History

Table with 3 columns: Version, Update Date, Update Content. Row 1: V1.0, 2025.06.04, Initial release (compatible with both high-frequency and power-frequency inverters, undefined addresses filled with 0xFFFF).

2. Pin Definitions

Diagram of a 16-pin connector and a list of pin definitions:
• ① +5V (Power positive, load capacity not less than 200mA)
• ② A (RS485 bus signal)
• ③ B (RS485 bus signal)
• ④ GND (Power ground/communication ground)
• ⑤ NC (Not connected, not allowed for other functions)
• ⑥ CAN_H (CAN bus signal)
• ⑦ NC (Not connected, not allowed for other functions)
• ⑧ CAN_L (CAN bus signal)
Notes:
• RS485 initial baud rate: 9600bps
• CAN initial baud rate: 500Kbps
• RS485 and CAN can be combined into a single physical interface or separated into two physical interfaces
• Products without CAN interface requirements may ignore CAN pin definitions

3. Protocol Definition

3.1 Format

Table with 4 columns: Field, Length, Description. Rows define fields like Start Delimiter, Address Code, Function Code, Start Address, Data Length, CRC Check, End Delimiter.

3.2 Specifications

Table with 4 columns: Command Name, Data Access Type, Function Code, Error Code. Rows define commands like Read single or multiple word registers, Write single word register, Write continuous N word registers, Read file content.

Important Notes:
1. Data addresses and data are 2 bytes, with high byte sent first, then low byte; whereas CRC is sent with low byte first, then high byte.
2. Error code for server frame data errors, client returns error exception response function code: Error code = Function code | 80H
3. Exception code description:
o 01H -- Unsupported function code
o 02H -- Incorrect PDU start address or PDU start address + data length exceeds legal range
o 03H -- Data for reading registers or writing registers is too long
o 04H -- Client failed to read or write registers
o 05H -- Incorrect checksum in server data

3.3 Examples

1) Read Holding Registers

Request:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, start address, number of words to read, and checksum.
Normal Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, data length, data content, and checksum.

Exception Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, error code, exception code, and checksum.
2) Write Single Register
Request:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, start address, write data, and checksum.
Normal Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, write data, and checksum.

Exception Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, error code, exception code, and checksum.
3) Write Continuous N Registers
Request:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, start address, number of addresses to write, number of bytes to write, data content, and checksum.
Normal Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, start address, number of addresses to write, and checksum.

Exception Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, error code, exception code, and checksum.
4) Read File Content
Request:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, padding data, read file type, read file packet number, read file packet sequence number, read file size, and checksum.
Normal Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, function code, file packet number, file packet sequence number, file size, data content, and checksum.

Exception Response:
Table with 3 columns: Description, Bytes, Command. Rows show device address, error code, exception code, and checksum.

4. PDU Address Allocation Table

Table with 8 columns: PDU Address (Decimal), Bytes, RW, Unit, Description, Data Parsing, Return Data, Parsing Example. Rows allocate addresses for various inverter functions like input/output voltage, current, frequency, and power.

Battery Related Settings

Table with 6 columns: Address, Bytes, RW, Unit, Description, Notes. Rows define settings for battery charging current, battery type, and battery settings.

Table with 8 columns: PDU Address (Decimal), Bytes, RW, Unit, Description, Min value, Max value, Default value, Notes. Rows define battery-related parameters like Bat Const Chg Volt, Bat Over Dischg Back Volt, Bat Under Volt, Bat OverDischg Volt, Bat Dischg Limit Volt, Bat OverDischg Delay Time, Bat Const Chg Time, Bat Improv Chg Time, Bat Const Chg Gap Time, Bat Switch Dc Volt, Bat Volt Sw to Inv, Bat Equal Chg Time out.

Inverter Settings

Table with 6 columns: Address, Bytes, RW, Unit, English Name, Description, Notes. Rows define inverter parameters like Output Priority, Output Frequency, AC Volt Range, Power Saving Mode, Chg Source Priority, BAT_OVP, BAT_OVP_Return, BAT_LDV_Return, GridInputCurrentLimitMax, LActiveEnable, PowerSavingModeThreshold.

Special Note:
(1) Negative number parsing method: -(0xFFFF - register value) + 1

Fault Code Appendix

Current Fault Codes:
1. Current fault codes use 4 addresses, each address stores one current fault code, capable of displaying 4 fault codes simultaneously, 0 indicates no fault. For example, if there are currently battery under-voltage and inverter overload faults, they are displayed as follows:
4398: 0001, 4399: 14 4400: 00 4401: 00

Fault Code Categories: A, B;
2. Classification method: Category A represents faults directly presented to users; Category B refers to non-theoretical normal faults that occur during product operation, which will be automatically resolved and the system will resume normal operation; when displayed to users, they can be replaced with "Comprehensive Fault".

Table with 4 columns: Fault Code, Category, Fault Name, Notes. Rows list various fault codes from 01 to 69, categorized as A or B, with descriptions and notes.

Alarm Information Appendix

Table with 3 columns: No., Bit Position, Description. Rows list alarm bits B115, B114, B113, B112, B110, B109, B108, B107, B106, B105, B104, B103, B102, B101, B100.