RS485 Communication Meter Reading Application (Communication Protocol) and Register Addresses

This energy meter can realize long-distance reading and recording of electricity in the meter through its RS485 interface. The meter can also be used to read the power data in the meter from a Pocket PC through its infrared communication interface in a short distance. The coding format, checksum (even parity) and data transmission mode (eight data bits and one stop bit) are in accordance with MODBUS-RTU standard. The default baud rate is 1200bps, 2400bps, 4800bps, 9600bps (default) is optional. If there is no special requirement, the meter is set according to the default baud rate of 9600bps from the factory, and you can modify the meter address and communication rate through the software provided by us.

MODBUS-RTU communication protocol description:

1. Data format:

Address + Function Code + Data +CRC check code

2、Example of reading meter parameters:

For example, if you need to read the meter address 01, data start address 00 current A phase voltage data, you need to enter the following data:

(1) Sending data: 01 04 00 00 00 02 71 CB

Data description:

Data	Detailed description
01	Instrument address
04	Function code, reads data from the meter's internal registers
00 00	Read data from the meter's internal register address starting at 00 00
00 02	Read data length, 2 words and 4 bytes of data
71 CB	CRC check of the previous data, where the high bit comes first and the low bit comes second

(2)Return data: 01 04 04 43 6B 58 0E 25 D8

Data description:

Data	Detailed description
01	Meter address
04	Return function code
04	The data length returned is 4 bytes of data length
43 6B 58 0E	Returned data, 4 bytes in length
25 D8	CRC checksum returned

(3) Data format description:

The read data inside the meter conforms to IEEE-754 standard

floating-point number, and the data format is 32-bit 4-byte single-precision floating-point number data format.

3. Modify the meter address:

Command to modify the meter address: for example, to modify the meter address to 02, the following command is issued: 01 10 00 08 00 02 04 40 00 00 00 E7 C9

Data Description:

Data	Detailed description
01	Meter address
10	Function code, writes data to the meter's internal registers
00 08	Write data from the meter's internal register address 00 08
00 02	Write data length, 2 words, 4 bytes of data
04	Write data length, 4 bytes of data
40 00	Table address of the table to be written, 4 bytes of data, floating-point data
00 00	
E7 C9	CRC Checksum

Return data: 01 10 00 08 00 02 C0 0A

4、Modify the communication rate of the meter:

Command to modify the communication rate of the meter: For example, if the communication rate of the meter is changed to 1200bps, the following command is issued: 01 10 00 00 00 02 04 44 96 00 00 07 73

Data Description:

Data	Detailed description
01	Meter address
10	Function code, writes data to the meter's internal registers
00 00	Write data from the meter's internal register address 00 00
00 02	Write data length, 2 words, 4 bytes of data
04	Write data length, 4 bytes of data
40 96 00 00	Table address of the table to be written, 4 bytes of data, floating-point data
25 7B	CRC Checksum

Return data: 01 10 00 00 00 02 41 C8

In the MODBUS protocol, the function code 0x04 is used to read meter data, with the register addresses as follows:

Data description:

Address (Hex)		Register Parameter Description			
HI	**LO**	**Description**	**Unit**	**Format**	**Mode**
00	00	Voltage	Volt	Floating Point	Read Only
00	08	electric current	amperage	Floating Point	Read Only
00	12	Active power	Kilowatts	Floating Point	Read Only
00	2A	Power factor	COS	Floating Point	Read Only
00	36	frequency	hertz (physics)	Floating Point	Read Only
01	00	Total active power	Kilowatt-hours	Floating Point	Read Only

Use function code 0x03 to read the meter parameters or function code 0x10 to modify the parameters with the following register addresses:

Address (Hex)	Save Register Parameters					
HI	LO	Length (bytes)	Format	Description	Unit	Mode
00	00	4	Floating Point	Baud rate (1200 2400 4800 9600)	bps	Read/Write
00	02	4	Floating Point	Parity bit (0: Even parity; 1: Odd parity; 2: No parity)		Read/Write
00	08	4	Floating Point	Correspondence address (Form No. 1-247)	not have	Read/Write