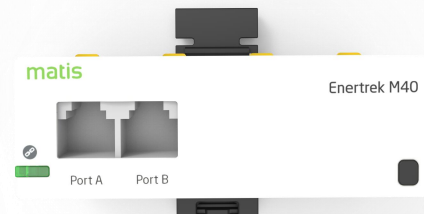
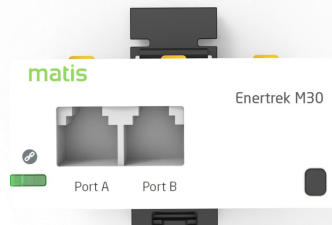
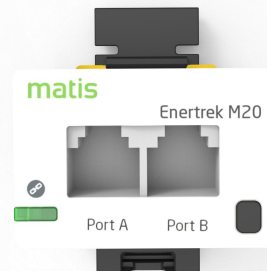
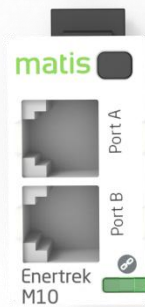
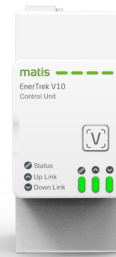


Voltage Module & Energy Module

Enertrek_V&Enertrek_M Series

Communication Protocol

02/2025



INDEX

1 MODBUS COMMUNICATION OVERVIEW 1

1.1 FUNCTION OVERVIEW 1

1.2 MODBUS COMMUNICATION SETTINGS 1

1.3 Command Request Format 1

1.4 FUNCTION CODE 1

1.5 REGISTER LIST 2

1.6 Data Type List 2

1.7 DATE TIME DETAILS 2

1.8 CONFIGURATION VIA MODBUS-RTU 3

1.9 CONFIGURATION COMMAND REQUEST 3

1.10 FUNCTION CODE (0x3=3, 0x6=6) OPERATION INSTRUCTIONS 3

 1.10.1 Request Data Format 3

 1.10.1 Return Data Format 4

2 REGISTER LIST : ENERTREK_V VOLTAGE MODULE CONFIGURATIONS 5

2.1 SYSTEM INFORMATION 5

3 REGISTER LIST: ENERTREK_M10/M20 SINGLE-PHASE ENERGY

MODULE CONFIGURATION 10

3.1 SYSTEM INFORMATION 10

3.2 ELECTRICAL PARAMETERS 12

3.3 ENERGY 13

3.4 TEMPERATURE 13

3.5 OTHER INFORMATION 14

4 REGISTER LIST: ENERTREK_M30/M40 THREE-PHASE ENERGY

MODULE CONFIGURATION 15

4.1 SYSTEM INFORMATION 15

4.2 ELECTRICAL PARAMETERS 16

4.3 ENERGY	18
4.4 TEMPERATURE	20
4.5 OTHER INFORMATION	22

1 Modbus Communication Overview

1.1 Function Overview

Enertrek_V&Enertrek_M modules adopts the standard communication protocol - Modbus-RTU.

1.2 Modbus Communication Settings

Before communicating with a device using the Modbus protocol, use the display screen to configure the following settings:

Parameter	Valid Value	Default Value
Baud rate	19200	1920
Data bit	8	8
Check bit	No check	No check
Stop bit	1	1
Address	1-247	1

1.3 Command Request Format

Slave Address	Function Code	Command	CRC Check
8-Bits	8-Bits	N×8-Bits	16-Bits Checking

1.4 Function Code

Function codes are used to instruct the device how to process the command. The following table shows the available function codes and their descriptions.

Function Code		Function Code Name	Function
Decimal	Hexadecimal		
3	03H	Read Holding Registers	Used to read parameters
6	06H	Writing a Single Holding Register	Used to write parameters
16	10H	Writing multiple registers	Used to configure parameters

1.5 Register List

The register list contains the following items:

Register alias	Register Address	Operation Read/Write	Size	Type	Unit	Description
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- Register alias: Used to refer to the meaning of registers
- Register address: The address of Modbus data. The data address in this manual is in decimal.
- Operation: Indicate the operation that can be performed on the register
- Size: Indicate how many 16-bit data are occupied
- Type: The type of data encoding
- Unit: The unit of the register value
- Description: Introduce the function of this register

1.6 Data Type List

The following table lists the data types used in this manual.

Type	Description	Range
UInt16	Unsigned 16 -bit integer	0–65535
Int16	Signed 16 -bit integer	-32768–+32767
UInt32	Unsigned 32 -bit integer	0–4 294 967 295
UInt64	Unsigned 64 -bit integer	0–18 446 744 073 709 551 615
UTF8	8 -bit UTF encoding	Multi-byte Unicode encoding
Float32	32 -bit floating point	Standard IEEE floating point data (single precision)
Bitmap	–	–
Date Time	Time type	-

1.7 Date Time Details

Communication LED Indicates the communication status between the multi-function

smart circuit breaker and the main device as follows.

Byte	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	Reserved (0)							Year (00–99, starting from 2000)								
2	Month (1–12)							Day (1–31)								
3	Hour (0–23)							Points (0–59)								
4	Milliseconds (0–59999)															

1.8 Configuration via Modbus-RTU

You can use function code 6/16 to write commands to the device and configure parameters.

Device parameter configuration can only be done by writing corresponding data to the "configuration command register".

1.9 Configuration Command Request

The following table lists the Modbus request format for configuration commands .

Slave address 8 bits	Function code 8 bits	Configuration instruction register address 16 bits		Configuration command register number 16 bits		Data 8 bits	Instruction (16 bits) XN				CRC check (16 bits)	
1-247	16	High 8bits	Low 8bits	High 8bits	Low 8 bits	N×2	Command		Command parameters		Low 8 bits	High 8 bits
							High 8 bits	Low 8 bits	High 8 bits	Low 8 bits		

1.10 Function Code (0x3=3, 0x6=6) Operation Instructions

Function code (0x03=3) is used to read register parameters, function code (0x06=6) is used to write single register parameters, the request and return data formats are as follows:

1.10.1 Request Data Format

No.	Name	Type	Range (Decimal)	Description
1	Address	UInt8	1-247	

2	Function code	UInt8	3	
3	Starting register address	UInt16	-	High byte first (sending order)
4	Number of registers	UInt16	1-125	High byte first (sending order)
5	CRC-16 check	UInt16	-	Low byte first (sending order)

1.10.1 Return Data Format

No.	Name	Type	Range (Decimal)	Description
1	Address	UInt8	1-247	
2	Function code	UInt8	3	
3	Read register bytes	UInt8	-	Read register number *2
4	The value of register 1		-	High byte first
5	...		-	High byte first
6	The value of register n		-	High byte first
7	CRC-16 check	UInt16	-	Low byte first

2 Register List : Enertrek_V Voltage Module Configuration

2.1 System Information

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
System Information	0	0X0000	DVDU16(0)	1	Null	Voltage module communication address	The default value is 128; Valid range: 1 ~ 247; The written value is not allowed to be the same as the existing energy module address;
System Information	1	0X0001	DVDU16(0)	1	Null	Reserved	Reserved
System Information	2	0X0002	DVDU16(0)	1	Null	Voltage module baud rate and check bit;	The default value of this register is: 0x2000; High byte: baud rate setting (actual value = byte value * 600); 0x08 = 4800

							baud rate; 0x10 = 9600; 0x20 = 19200; 0x40 = 38400; 0x60 = 57600; 0xC0 = 115200; Low byte: check bit: 0x00 = None, 0x01 = Odd, 0x02 = Even, Note: stop bit = 1
System Information	3	0X0003	DVDU64(0)	4	Null	Voltage module product serial number	The meaning of reading and writing is consistent;
System Information	7	0X0007	DVDRaw(20)	10	Null	Voltage module name	Cooperating with the host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;

System Information	17	0X0011	DVDRaw(20)	10	Null	Voltage module installation location	Cooperating with the host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;
System Information	27	0X001B	DVDU16(0)	1	Null	Reserved	Reserved
System Information	4096	0X1000	DVDU32(0)	2	Second	Voltage Module_Unix Timestamp	For example, 0x0000 0000: The time displayed in the UTC+0:00 area is 1970-01-01 00:00:00, and the time displayed in the UTC+8:00 area is 1970-01-01 08:00:00; The following are the results of the

							test in the UTC+8: The minimum writable value is 0x0000 0000, and the read time is 1970-01-01 08:00:00; The maximum writable value is 0x38 6C D2 FC, and the read meaning is 2099-12-31 23:59:56; but after a few seconds it will become 2036-02-07 06:28:16;
System Information	4098	0X1002	DVDS16(0)	1	Hour	Voltage module_UTC time zone	Default value 8; Power-off storage;
System Information	4099	0X1003	DVDU32(0)	2	Null	Reserved	None
System Information	4101	0X1005	DVDU08(0)	1	Null	Voltage module_ operation	The meaning of writing the low byte is as

						energy module	follows: 0x01 = research all (will not delete the previously added but now offline devices); 0x02=search new devices only; 0x03 = verify all devices; The operation is valid only when the sum of the high byte and the low byte equals 0xFF;
System Information	4102	0X1006	DVDU16(0)	1	Null	Voltage module_automatically assign address start address	The written value must satisfy the format of $N*20+1$, and the overall value ≤ 241; For example, write 0x0051=81; after all devices are searched again, the module

							address will be assigned from 61 to 80;
System Information	65472	0XFFC0	DVDU16(0)	1	Null	Voltage module_firmware version	Related to product batches;
System Information	65473	0XFFC1	DVDU16(0)	1	Null	Voltage module_hardware version	Related to product batches;

3 Register List: Enertrek_M10/M20 Single-Phase Energy Module Configuration

3.1 System Information

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
System Information	0	0X0000	DVDU64(0)	4	Null	Unique Identifier UUID	
System Information	4	0X0004	DVDU16(0)	1	Null	Phase	The default value is 1; 1=L1(A) phase; 2=L2(B) phase 3=L3(C) phase;
System	5	0X0005	DVDRaw(20)	10	Null	Device	Cooperating with the

Information						Name	host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;
System Information	15	0X000F	DVDRaw(20)	10	Null	Installation location	Cooperating with the host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;
System Information	25	0X0019	DVDU16(0)	1	Null	Baud rate and check bit;	Default register value: 0xC000; High byte: Baud rate setting (actual value = byte value * 600) Low byte: Check bit: 0 = None, 1 = Odd, 2 = Even, Note: stop bit

							= 1
System Information	26	0X001A	DVDU16(0)	1	Null	Reserved;	
System Information	27	0X001B	DVDU16(0)	1	Null	Reserved;	
System Information	28	0X001C	DVDU16(0)	1	Null	Reserved;	
System Information	29	0X001D	DVDU16(0)	1	Null	Reserved;	

3.2 Electrical Parameters

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Electrical Parameters	256	0X0100	DVDU16(0)	1	0.1V	Voltage;	
Electrical Parameters	257	0X0101	DVDU16(0)	1	0.01A	Current;	
Electrical Parameters	258	0X0102	DVDU16(0)	1	0.01HZ	Frequency;	
Electrical Parameters	259	0X0103	DVDS16(0)	1	0.001	Power factor;	
Electrical Parameters	260	0X0104	DVDS16(0)	1	W	Active power;	
Electrical Parameters	261	0X0105	DVDS16(0)	1	Var	Reactive power;	
Electrical Parameters	262	0X0106	DVDU32(0)	1	VA	Apparent power	

3.3 Energy

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Energy	263	0X0107	DVDU32(0)	2	0.1KWH	Forward active energy;	
Energy	265	0X0109	DVDU32(0)	2	0.1KWH	Reverse active energy;	
Energy	267	0X010B	DVDU32(0)	2	0.1kVarh	Forward reactive energy;	
Energy	269	0X010D	DVDU32(0)	2	0.1kVarh	Reverse reactive energy;	

3.4 Temperature

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Temperature	512	0X0200	DVDS16(0)	1	0.01℃	Temperature 1;	The temperature measured for the single-phase conductor temperature; If the sensor is missing, the value is approximately 0xEC72=-5006=-5

							0.06℃;
Temperature	513	0X020 1	DVDS16(0)	1	0.01℃	Temperature 2;	The temperature measured for the single-phase conductor temperature; If the sensor is missing, the value is approximately 0xEC72=-5006=-5 0.06℃;
Temperature	514	0X020 2	DVDS16(0)	1	0.01℃	Temperature 3 (reserved);	Reserved;
Temperature	51 5	0X020 3	DVDS16(0)	1	0.01℃	Temperature 4 (reserved);	Reserved;

3.5 Other Information

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Other Information	65472	0XFFC0	DVDU16(0)	1	Null	Firmware version number	Related to product batches;
Other Information	6547 3	0XFFC1	DVDU16(0)	1	Null	Hardware version number	Related to product batches;
Other Information	6547 4	0XFFC2	DVDU16(0)	1	Null	Find your location	Write 0x55AA, and the corresponding device

							will flash red and yellow alternately for 10 seconds, making it easier for users to find its location;
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4 Register List: Enertrek_M30/M40 Three-Phase Energy Module Configuration

4.1 System Information

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
System Information	0	0X0000	DVDU64(0)	4	Null	Unique Identifier UUID	
System Information	4	0X0004	DVDU08(0)	1	Null	Reserved;	
System Information	5	0X0005	DVDRaw(20)	10	Null	name	Cooperating with the host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;
System	15	0X000F	DVDRaw(20)	10	Null	Installation	Cooperating with the

Information						location	host computer, users can write tags by themselves, which supports UTF-8 character writing. The corresponding number of bytes of data written at a time should be equal to 20;
System Information	25	0X0019	DVDU16(0)	1	Null	Baud rate and check bit;	Default register value: 0xC000; High byte: Baud rate setting (actual value = byte value*600) Low byte: check bit: 0 = None, 1 = Odd, 2 = Even, Note: stop bit = 1
System Information	26	0X001A	DVDU16(0)	1	Null	Reserved;	
System Information	27	0X001B	DVDU16(0)	1	Null	Reserved;	
System Information	28	0X001C	DVDU16(0)	1	Null	Reserved;	
System Information	29	0X001D	DVDU16(0)	1	Null	Reserved;	

4.2 Electrical Parameters

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Electrical Parameters	256	0X0100	DVDU16(0)	1	0.1V	Voltage A	
Electrical Parameters	257	0X0101	DVDU16(0)	1	0.1V	Voltage B	
Electrical Parameters	258	0X0102	DVDU16(0)	1	0.1V	Voltage C	
Electrical Parameters	259	0X0103	DVDU16(0)	1	0.1V	Line voltage AB	
Electrical Parameters	260	0X0104	DVDU16(0)	1	0.1V	Line voltage AC	
Electrical Parameters	261	0X0105	DVDU16(0)	1	0.1V	Line voltage BC	
Electrical Parameters	262	0X0106	DVDU16(0)	1	0.1°	Voltage angle AB	
Electrical Parameters	263	0X0107	DVDU16(0)	1	0.1°	Voltage angle AC	
Electrical Parameters	264	0X0108	DVDU16(0)	1	0.1°	Voltage angle BC	
Electrical Parameters	265	0X0109	DVDU16(0)	1	0.01A	Current A	
Electrical Parameters	266	0X010A	DVDU16(0)	1	0.01A	Current B	
Electrical Parameters	267	0X010B	DVDU16(0)	1	0.01A	Current C	
Electrical Parameters	268	0X010C	DVDU16(0)	1	0.01A	Current N	

Electrical Parameters	269	0X010D	DVDU16(0)	1	0.01HZ	Frequency	
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4.3 Energy

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Energy	270	0X010E	DVDS16(0)	1	0.001	Power factor A	
Energy	271	0X010F	DVDS16(0)	1	0.001	Power factor B	
Energy	272	0X0110	DVDS16(0)	1	0.001	Power factor C	
Energy	273	0X0111	DVDS16(0)	1	0.001	Power factor T	
Energy	274	0X0112	DVDS16(0)	1	W	Active power A	
Energy	275	0X0113	DVDS16(0)	1	W	Active power B	
Energy	276	0X0114	DVDS16(0)	1	W	Active power C	
Energy	277	0X0115	DVDS16(0)	1	W	Active power T	
Energy	278	0X0116	DVDS16(0)	1	Var	Reactive power A	
Energy	279	0X0117	DVDS16(0)	1	Var	Reactive power B	
Energy	280	0X0118	DVDS16(0)	1	Var	Reactive power C	
Energy	281	0X0119	DVDS16(0)	1	Var	Reactive power T	
Energy	282	0X011A	DVDU16(0)	1	VA	Apparent power A	
Energy	283	0X011B	DVDU16(0)	1	VA	Apparent power B	
Energy	284	0X011C	DVDU16(0)	1	VA	Apparent power C	

Energy	285	0X011D	DVDU16(0)	1	VA	Apparent power T	
Energy	286	0X011E	DVDU32(0)	2	0.1K WH	Forward active energy A	
Energy	288	0X0120	DVDU32(0)	2	0.1K WH	Forward active energy B	
Energy	290	0X0122	DVDU32(0)	2	0.1K WH	Forward active energy C	
Energy	292	0X0124	DVDU32(0)	2	0.1K WH	Forward active energy T	
Energy	294	0X0126	DVDU32(0)	2	0.1K WH	Reverse active energy A	
Energy	296	0X0128	DVDU32(0)	2	0.1K WH	Reverse active energy B	
Energy	298	0X012A	DVDU32(0)	2	0.1K WH	Reverse active energy C	
Energy	300	0X012C	DVDU32(0)	2	0.1K WH	Reverse active energy T	
Energy	302	0X012E	DVDU32(0)	2	0.1kV arh	Forward reactive energy A	
Energy	304	0X0130	DVDU32(0)	2	0.1kV arh	Forward reactive energy B	
Energy	306	0X0132	DVDU32(0)	2	0.1kV arh	Forward reactive energy C	
Energy	308	0X0134	DVDU32(0)	2	0.1kV arh	Forward reactive energy T	
Energy	310	0X0136	DVDU32(0)	2	0.1kV arh	Reverse reactive energy A	
Energy	312	0X0138	DVDU32(0)	2	0.1kV	Reverse reactive	

					arh	energy B	
Energy	314	0X013A	DVDU32(0)	2	0.1kV arh	Reverse reactive energy C	
Energy	316	0X013C	DVDU32(0)	2	0.1kV arh	Reverse reactive energy T	

4.4 Temperature

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Temperature	512	0X0200	DVDS16(0)	1	0.01℃	L1(A) Temperature 1;	The temperature measured for the three-phase L1(A) conductor temperature; If the sensor is missing, the value is approximately 0xEC72=-5006=-50.06℃;
Temperature	513	0X0201	DVDS16(0)	1	0.01℃	L2(B) Temperature 2;	The temperature measured for the three-phase L2(B) conductor temperature; If the sensor is missing, the

							value is approximately 0xEC72=-5006=-50.06°C;
Temperature	514	0X0202	DVDS16(0)	1	0.01°C	L3(C) Temperature 3;	The temperature measured for the three-phase L3(C) conductor temperature; If the sensor is missing, the value is approximately 0xEC72=-5006=-50.06°C;
Temperature	515	0X0203	DVDS16(0)	1	0.01°C	N temperature 4;	If there is a three-phase plus N module, it corresponds to the N pole temperature. Some models do not have this function; If the sensor is missing, the value is approximately 0xEC72=-5006=-

							50.06°C;
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4.5 Other Information

Category	DEC Address	HEX Address	Data Type	Register Length	Unit	Name	Attribute
Other Information	65472	0XFFC0	DVDU16(0)	1	Null	Firmware version number	Related to product batches;
Other Information	65473	0XFFC1	DVDU16(0)	1	Null	Hardware version number	Related to product batches;
Other Information	65474	0XFFC2	DVDU16(0)	1	Null	Find your location	Write 0x55AA, and the corresponding device will flash red and yellow alternately for 10 seconds, making it easier for users to find its location;