

## MAP4-DC1

### Modbus instructions

#### 1. Physical layer

- 1) RS485 communication port, asynchronous half two-way pattern;
- 2) Speed 2400~9600bps settable, default as 9600 bps;
- 3) Bytes transmission format (N81, E81, O81) :1 initial byte, 8 data bytes (1 odd and even check bytes), and 1 stop byte.

#### 2. Modbus RTU

Meter supports standard Modbus-RTU protocol.

Structure of Data Frame: Text Format.

Address code	Function code	Data code	Check code
1 byte	1 byte	N bytes	2 bytes

**Address Code:** The beginning part of the frame consists of a byte (8 bit binary code), decimal is 0~255, only 1~247 are used in our system while other addresses are reserved. These bits mark the addresses of the terminals defined by the users; The defined terminals will accept the data from the host connected with them. The address of each terminal must be unique, only the terminal is addressed will respond to the query from the host. When the terminal sends out a response, the client data address in a response tells the host which terminal is in communication with it.

**Function Code:** It shows which functions the terminal which addressed to carry out. The following table lists function codes and their definitions and functions that H series meters support.

Code	Meaning
0x03/0x04	Read data register values
0x10	Write setting register orders

**Data Code:** It contains the data for a specific function which the terminal carries or the collected data that the terminal responds the query to the host computer. The contents of these data may be numerical value, reference address or the

set value. For example: The function code instructs the terminal to read a register, the data code indicates from which register start and how much data to be read. While the contents of client returned include the data length and the relating data.

**Check Code:** The error check code (CRC) takes up two bytes, including 16 bits binary value. The CRC value is calculated by the transmitting device, and then added to the data frame. While the receiving devices calculate the CRC value again and compare with the value in CRC, if the two values are not equal, then the CRC makes an error.

## Report Command Format

### (1) Read Data Register Value ( Functional Code: 0x03/0x04 )

Host request	Frame structure	Address Code	Function Code	Data Code		Check Code
				Initial Register Address	Number of registers	
	Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
Data Range	1~247	0x03/ 0x04	0x0000	At most 100	CRC16	
Report Example	<u>0x01</u>	<u>0x03</u>	<u>0x00 0x06</u>	<u>0x00 0x08</u>	<u>0XE4 0x36</u>	
Client Response	Frame structure	Address Code	Function Code	Data Code		Check Code
				Number of bytes of register	Register Value	
	Bytes	1 byte	1 byte	1 byte	12 bytes	2 bytes
Report Example	<u>0x01</u>	<u>0x03</u>	<u>0x0C</u>	( <u>12 bytes data</u> )	( <u>CRC16</u> )	

Remark: The Initial register address which the host requests is the beginning data address of once power grid or second power grid data, the number of registers is the data length in query, the above example which the initial register address "0x00 06" means the beginning address of 3 phase voltage float data, the register number "0x00 0x06" means the data length is 6 Word data.

### (2) Write setting register order (Function code: 0x10)

Host Request	Frame structure	Address Code	Function Code	Data code				Check code
				Initial register address	Register numbers	Data bytes	Write in data	
	Bytes	1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 bytes
Data range	1~247	0x10	0x080A	0x0001	N		CRC16	
Report Example	<u>0x01</u>	<u>0x10</u>	<u>0x08 0x0A</u>	<u>0x00 0x01</u>	<u>0x02</u>	<u>0x00 0x64</u>	<u>0x2ED1</u>	
Client Response	Frame structure	Address Code	Function Code	Data code			Check code	
				Initial register	Register numbers			

				address		
	Bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes
	Report Example	<u>0x01</u>	<u>0x10</u>	<u>0x08 0x0A</u>	<u>0x00 0x01</u>	<u>0x2ED1</u>

Remark: In order to maintain normal communication, please write register according to setting information list.

### 3. Modbus RTU information address

#### 03/04 command set register address

Address (HEX)	Format	Data content	Explain	R/W
0006-0007	Float	Voltage value	V	R
0008-0009	Float	Current value	A	R
000A-000B	Float	Power value	kW	R
000C-000D	Float	Forward total complex rate electric energy	kWh	R
000E-000F	Float	Forward spike rate electric energy	kWh	R
0010-0011	Float	Forward peak complex rate electric energy	kWh	R
0012-0013	Float	Forward flat rate electric energy	kWh	R
0014-0015	Float	Forward valley complex rate electric energy	kWh	R
0016-0017	Float	Reverse total complex rate electric energy	kWh	R
0018-0019	Float	Reverse spike rate electric energy	kWh	R
001A-001B	Float	Reverse peak complex rate electric energy	kWh	R
001C-001D	Float	Reverse flat rate electric energy	kWh	R
001E-001F	Float	Reverse valley complex rate electric energy	kWh	R
0020-0033	Float	Multi rate electric energy of this month, the same as above	kWh	R
0034-0047	Float	The rate of electric energy of last January, the same as above	kWh	R
0048-005B	Float	The rate of electric energy in last February, the same as above	kWh	R
005C-006F	Float	The rate of electric energy in last March, the same as above	kWh	R
0070-0083	Float	The rate of electric energy in last April, the same as above	kWh	R
0084-0097	Float	The electric energy rate of last May, the same as above	kWh	R
0098-00AB	Float	The rate of electric energy in last June, the same as above	kWh	R
00AC-00BF	Float	The rate of electric energy in last July, the same as above	kWh	R
00C0-00D3	Float	The rate of electric energy in last August, the same as above	kWh	R
00D4-00E7	Float	The rate of electric energy in last September, the same as above	kWh	R
00E8-00FB	Float	The rate of electric energy in last October, the same as above	kWh	R
00FC-010F	Float	The rate of electric energy in last November, the same as above	kWh	R
0110-0123	Float	The electric energy rate of last December, the same as above	kWh	R
0124-0125	Float	Today's forward total complex rate electric energy	kWh	R
0126-0127	Float	Today's forward spike complex rate electric energy	kWh	R
0128-0129	Float	Today's forward peak complex rate electric energy	kWh	R

012A-012B	Float	Today's forward flat rate electric energy	kWh	R
012C-012D	Float	Today's forward valley compound rate electric energy	kWh	R
012E-012F	Float	Reverse total complex rate electric energy today	kWh	R
0130-0131	Float	Today's reverse spike rate electric energy	kWh	R
0132-0133	Float	Today's reverse peak complex rate electric energy	kWh	R
0134-0135	Float	Today's reverse flat rate electric energy	kWh	R
0136-0137	Float	Today's reverse valley complex rate electric energy	kWh	R
0138-014B	Float	Complex rate electric energy of the last day	kWh	R
014C-015F	Float	Complex rate electric energy of the last 2 days	kWh	R
0160-0173	Float	Compound rate electric energy of the last 3 days	kWh	R
0174-0187	Float	Compound rate electric energy of the last 4 days	kWh	R
0188-019B	Float	Compound rate electric energy of the last 5 days	kWh	R
019C-01AF	Float	Compound rate electric energy of the last 6 days	kWh	R
01B0-01C3	Float	Compound rate electric energy of the last 7 days	kWh	R
01C4-01D7	Float	Compound rate electric energy of the last 8 days	kWh	R
01D8-01EB	Float	Complex rate electric energy of the last 9 days	kWh	R
01EC-01FF	Float	Compound rate electric energy of the last 10 days	kWh	R

Address (HEX)	Format	Data content	Explain	R/W
0500-0501	Float	Voltage history maximum	V	
0502-0503	Float	Current history maximum value	A	
0504-0505	Float	Power history maximum	kW	
0506-0507	Float	Voltage history minimum	V	
0508-0509	Float	Current history minimum	A	
050A-050B	Float	Power historical minimum	kW	
050C-0517	Float	The historical extreme value of this month, same as above		
0518-0523	Float	Last month's historical extreme value, same as above		
0524-052F	Float	Last two months' historical extreme value, same as above		
0530-053B	Float	Today's historical extreme value, ibid.		
053C-053D	Float	Current demand	A	
053E-053F	Float	Current power demand	kW	
0540-0541	Float	Current demand of last cycle	A	
0542-0543	Float	Power demand of last cycle	kW	
0544-0545	Float	Current demand extreme value	A	
0546-0547	Float	Power demand extreme value	kW	
0548-054B	Float	The extreme demand of this month, same as above		
054C-054F	Float	Last month's demand extreme value, same as above		
0550-0553	Float	The extreme demand of last two months, same as above		
0554-0557	Float	Today's demand extreme value, same as above		
0558-05FF	Reserve			

Address	Format	Data content	Explain	R/W
---------	--------	--------------	---------	-----

(HEX)				
0780	char	High byte: year; Low byte: month	V	R
0781	char	High byte: day; Low byte: hour	A	R
0782	char	High byte: minute; Low byte: Second	A	R
0783	char	High byte: week; Low byte: reserved	A	R

**0x10 Command set register address:**

Address (HEX)	Format	Data content	Explain	R/W
0800-0801	keep unused			
0802	Int	High byte: cyclic display	0x01: cyclic display, ! (0x01): no cyclic display	R/W
		Low byte: reserved		
0803	Int	Reserve		
0804	Int	High byte: #1 meter address	1-247	R/W
		Low byte: #1 baud rate	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps	
0805	Int	High byte: #1 check format	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
0806-0807	Reserve			
0808	Int	High byte: voltage range	40-1000v, instructions when ordering	R
		Current channel signal type (shunt or sensor type)	0: 4V 1:75mV instructions when ordering	R
0809	Reserve			
080A	Int	1# Current channel rating	0 ~ 9999 A	R/W
080B-0819	Reserve			
081A	Int	#1 relay operating mode	0: Off 1: Alarm 2: Remote control	R/W
081B	Int	#1 pulse width	0.00: Level mode 0.1~99.99s	R/W
081C	Int	#1 alarm items	0: Overvoltage 1: Undervoltage 2: Overcurrent 3: Undercurrent 4: The first switch input is linked, the switch input is closed, and the relay output acts. 5: The first channel switch input is linked; the switch input is disconnected, and the relay output acts. 6/7: Linkage of the second switch input	R/W

			8/9: Linkage of the third switch input 10/11: The fourth switch input linkage	
081D	Int	#1 Alarm value	Numerical scale factor: Voltage unit: V Current unit: A	R/W
081E	Int	#1 Hysteresis	Numerical scale factor	R/W
081F	Int	#1 Alarm Delay Time	0.0~99.99s	R/W
0820-0825	Int	#2 Relay Setup	Same as #1 relay setting	R/W
0826-033	Reserve			
0834	Int	Demand items	Default to current, power	R
0835	Int	#1 Demand Work Mode	0: Slip block 1: Fixed block	R/W
0836	Int	#1 Demand slip time (t)	1~9999s	R/W
0837	Int	#1 Demand calculation period (τ)	1~30t	R/W
0838-083A	Char	Meter DLT645 address [6]		R/W
0838-0843	Reserve			
0844-084F	Char	First set of rate period settings	Hours and minutes of 12 sets of time periods, The first period is fixed at 00:00	R/W
0850-085B	Char	Second set of rate period settings	Hours and minutes of 12 sets of time periods, The first period is fixed at 00:00	R/W
085C-0861	Char	First set of rate settings	The rate types corresponding to the first set of rate periods: 0-sharp, 1-peak, 2-flat and 3-valley	R/W
0862-0867	Char	Second set of rate settings	The rate types corresponding to the second set of rate periods: 0-sharp, 1-peak, 2-flat and 3-valley	R/W
0868-086D	Char	Monthly rate selection:	0: the first set of rates 1: the second set of rates	R/W
086E	Char	Meter reading day setting	Automatic meter reading: day and hour	R/W
086F-08FF	Reserve			



Tel : +33 (0)1 84 60 40 25

[info@lettel.fr](mailto:info@lettel.fr)

[lettel.fr](http://lettel.fr)

Paris France - SAS au Capital de 100.000 Euros

RCS Paris 901237933 - Sujet à modifications sans préavis - Edition 02.22