MCS-U Protocol V1.0

Part I. Input Registers，Function code (Hex) : 04

Address (Register)	Input Register Parameter				Modbus Protocol Start Address Hex		Model		
	Description	Length (bytes)	Data Format	Units	Hi Byte	Lo Byte	U30	U31	U32
Multifunction Parameters									
30001	Phase 1 line to neutral volts.	4	Float	V	00	00	●	●	●
30003	Phase 2 line to neutral volts.	4	Float	V	00	02	●	●	●
30005	Phase 3 line to neutral volts.	4	Float	V	00	04	●	●	●
30043	Average line to neutral volts.	4	Float	V	00	2A	●	●	●
30071	Frequency of supply voltages.	4	Float	Hz	00	46	●	●	●
30201	Line 1 to Line 2 volts.	4	Float	V	00	C8	●	●	●
30203	Line 2 to Line 3 volts.	4	Float	V	00	CA	●	●	●
30205	Line 3 to Line 1 volts.	4	Float	V	00	CC	●	●	●
30207	Average line to line volts.	4	Float	V	00	CE	●	●	●
THD Parameters									
30235	Phase 1 L/N volts THD	4	Float	%	00	EA		●	●
30237	Phase 2 L/N volts THD	4	Float	%	00	EC		●	●
30239	Phase 3 L/N volts THD	4	Float	%	00	EE		●	●
30249	Average line to neutral volts THD.	4	Float	%	00	F8		●	●
30335	Line 1 to line 2 volts THD.	4	Float	%	01	4E		●	●
30337	Line 2 to line 3 volts THD.	4	Float	%	01	50		●	●
30339	Line 3 to line 1 volts THD.	4	Float	%	01	52		●	●
30341	Average line to line volts THD.	4	Float	%	01	54		●	●

Part II. Holding Register，Function code (Hex) : 03 / 10

Address Register	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode	Model		
		High Byte	Low Byte			U30	U31	U32
Parameters								
40021	Modbus address	00	14	Range：1~247，Default 1 **Length : 4 byte** **Data Format : Float**	r/w	●	●	●
461697	Model Information（1）	F1	00	Model Information and Software Version **Length : 16 byte** **Data Format : Hex**	ro	●	●	●
464513	Serial number	FC	00	Serial number **Length : 4 byte** **Data Format : unsigned int32**	ro	●	●	●
464515	Model code	FC	02	Product model code **Length : 2 byte** **Data Format : Hex**	ro	●	●	●
Overload Alarm Parameters								
41027	Voltage Alarm Level-upper Limit（2）	04	02	Upper limit of voltage alarm，range:0~480V，Default 276V。 **Length : 4 byte** **Data Format : Float**	r/w		●	●
41029	Voltage Alarm Level-lower limit（2）	04	04	Lower limit of voltage alarm，range: 0~480V，Default 0V。 **Length : 4 byte** **Data Format : Float**	r/w		●	●
41153	Voltage module alarm status（3）	04	80	The first byte shows the voltage status of L1: =0 means no alarm, =1 means the voltage exceeds the upper limit, =2 means the voltage is below the lower limit; The second byte shows the voltage status of L2: =0 means no alarm, =1 means the voltage exceeds the upper limit, =2 means the voltage is below the lower limit; The third byte shows the voltage status of L2: =0 means no alarm, =1 means the voltage exceeds the upper limit, =2 means the voltage is below the lower limit;	ro		●	●

				The forth byte shows the conflict status of voltage module address, =0 means no conflict, =1 means the voltage has address conflict with other Modbus equipment; **Length : 4 byte** **Data Format : Hex** **Example：if the register shows: 01 02 00 01, it means the voltage of L1 exceeds the upper limit; voltage of L2 is below lower limit; voltage of L3 is normal; voltage address has conflict with other equipment.**				
RS485 Parameters								
40019	Parity and stop bit	00	12	Range：0~3，Default 0 0 = One stop bit and no parity. 1 = One stop bit and even parity. 2 = One stop bit and odd parity. 3 = Two stop bits and no parity. **Length : 4 byte** **Data Format : Float**	r/w			●
40029	Network Baud Rate	00	1C	Range：0~ 5，Default 2. 0 = 2400 bps 1 = 4800 bps 2 = 9600 bps 3 = 19200 bps 4 = 38400 bps 5 = 1200 bps 6 = 115200 bps **Length : 4 byte** **Data Format : Float**	r/w			●
464611	Modification of the Modbus Address of MCS-I（4）	FC	62	Data Format： The first 4 bytes is the serial number of MCS-I itself which needs modifying the Modbus address （Data format: unsigned int32, 4byte） The last 4 bytes is the Modbus address to be set. （Data format:Float, 4Byte） The **F**or example：If you want to modify the Modbus address of the MCS-1 whose serial number is 12345678, the data in the register should be 00 BC 61 4E 40 A0 00 00 **Length : 8 byte** **Data Format : Float**	wo			●
464615	Automatic	FC	66	Data Format：	wo			●

	Allocation of the Modbus address of current modules			The first byte means the start address of automatic allocation address (Hex)； The second byte means the end address of automatic allocation address (Hex). **For example：** If you want to automatically allocate 32 MCS-I, the Modbus address range is 2~33, then the data in register should be 02 21. **Length : 2 byte** **Data Format: Float**				
464769	Read the address list of current modules	FD	00	Data Format： Information of each MCS-I module is consists of 6 bytes: 每个电流模块的信息由6byte组成，分别是： Serial number（4byte） + Modbus address code（1byte） + number of the same address code（1byte） Note：“number of the same address code”means：The current Modbus address code of this current module appears in the number of current modules mounted under the voltage module. For example, the Modbus address code of the current module with serial number 12345678 is 05. In the current module mounted under the voltage module, the Modbus address code of the current module with serial number 87654321 is also 05. Then when the address list is read, the information on current module with serial number 12345678 is 00 BC 61 4E 05 02, 00 BC 61 4E is the serial number information of the current module，05 is the Modbus address code，02 is the number of the same Modbus address code. **Length : 192 byte** **Data Format : Hex**	ro			●

Note：

（1）. Field definition of model information

The equipment code of MCS-U20 is 0x13; MCS-U21 is 0x14; MCS-U22 is 0x15.

For example, if the software version of MCS-U22 is 1.2, the data of model information is as below:

Data position	Field Explanation	Examples
The First Byte	Equipment code（Hex）	0x15
The Second Byte	Description of model information [0]（ASCII）	0x4D (‘M’)
The Third Byte	Description of model	0x43 (‘C’)

	information [1]（ASCII）	
The Fourth Byte	Description of model information [2]（ASCII）	0x53 (‘S’)
The Fifth Byte	Description of model information [3]（ASCII）	0x2D (‘-’)
The Sixth Byte	Description of model information [4]（ASCII）	0x55 (‘U’)
The Seventh Byte	Description of model information [5]（ASCII）	0x32 (‘2’)
The Eighth Byte	Description of model information [6]（ASCII）	0x32 (‘2’)
The Ninth Byte	Description of model information [7]（ASCII）	0x00 (‘’)
The Tenth Byte	Description of model information [8]（ASCII）	0x00 (‘’)
The Eleventh Byte	Description of model information [9]（ASCII）	0x00 (‘’)
The Twelfth Byte	Description of software version information [0]（ASCII）	0x30 (‘0’)
The Thirteenth Byte	Description of software version information [1]（ASCII）	0x31 (‘1’)
The Fourteenth Byte	Description of software version information [2]（ASCII）	0x2E (‘.’)
The Fifteenth Byte	Description of software version information [3]（ASCII）	0x30 (‘0’)
The Sixteenth Byte	Description of software version information [4]（ASCII）	0x32 (‘2’)

（2）。The upper limit of alarm threshold must be greater than lower limit.

（3）。Because there is no phase voltage in 3P3W mode, L1, L2 and L3 in 3P3W mode above should correspond to L1-2, L2-3 and L3-1.

（4）。This register can be used: when the system is just installed, all MCS-I communication addresses are the same, and the MCS-I communication address cannot be modified through the standard Modbus address.

Part III. Example

1, Read Input Registers

Example: Read "Phase 1 line to neutral volts"

Request: 01 04 00 00 00 02 71 CB

Where, 01 = Meter address

04 = Function code

00 = High byte of registers starting address

00 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

71 = CRC Low

CB = CRC High

Response: 01 04 04 43 66 33 34 1B 38

Where, 01 = Meter address

04 = Function code

04= Byte count

43 = Data, (High Word, High Byte)

66 = Data, (High Word, Low Byte)

33 = Data, (Low Word, High Byte)

34 = Data, (Low Word, Low Byte)

1B = CRC Low

38 = CRC High

Note: 43 66 33 34(Hex) = 230.2 (Floating point)

2. Read Holding Registers

Example: read "Modbus Address"

Request: 01 03 00 14 00 02 84 0F

Where, 01 = Meter address

03 = Function code

00 = High byte of registers starting address

14 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

84 = CRC Low

0F = CRC High

Response: 01 03 04 40 40 00 00 EE 27

Where, 01 = Meter address

03 = Function code

04= Byte Count

40 = Data, (High Word, High Byte)

40 = Data, (High Word, Low Byte)

00 = Data, (Low Word, High Byte)

00 = Data, (Low Word, Low Byte)

EE = CRC Low

27 = CRC High

Note: 40 40 00 00 (Hex) = 3 (Floating point)

3. Write Holding Registers

Example: Write “Modbus Address” = 60

Request: 01 10 00 14 00 02 04 42 70 00 00 E6 F3

Where， 01 = Meter address

10 = Function code

00 = High byte of registers starting address

14 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

04 = Byte Count

42 = Data, (High Word, High Byte)

70 = Data, (High Word, Low Byte)

00 = Data, (Low Word, High Byte)

00 = Data, (Low Word, Low Byte)

E6 = CRC Low

F3 = CRC High

Note: 42 70 00 00 (Hex) = 60 (Floating point)

Response: 01 10 00 14 00 02 01 CC

Where, 01 = Meter address

10 = Function code

00 = High byte of registers starting address

14 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

01 = CRC Low

CC = CRC High

If you have any question, please feel free to contact our sales team.

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