

# Ultrasonic level meter liquid level meter serial protocol

## 1.RTU mode communication protocol

The instrument adopts RS-485 master-slave half-duplex communication, the host calls the slave address, the slave answers the communication mode.

- a) Support baud rate: 600-115200bps
- b) Data bits: 8
- c) Check bits: N/O/E default N
- d) Stop bit: 1

The check mode is CRC16  $x^{16}+x^{15}+x^2+1$  Initial value is FFFF

## 2.Instrument RTU protocol

2.1Function code 03H: Read register value

### Host sending

1	2	3	4	5	6	7	8
ADR	03H	Start register high byte	Start register low byte	Register number high byte	Register number low byte	CRC low bytes	CRC high bytes

The 1st byte ADR: slave address code (=001 to 254)

2nd byte 03H: Read register value function code

3rd and 4th byte: the start address of the register to be read

To read the FCC under the hanging meter, the

5th and 6th byte: the number of registers to be read

Byte 7 and 8: CRC16 checksum from byte 1 to 6

### Return from aircraft

1	2	3	4、5	6、7		M-1、M	M+1	M+2
ADR	03H	Bytes total	Register data 1	Register data 2	...	Register data M	CRC low bytes	CRC high bytes

The 1st byte ADR: slave address code (=001 to 254)

2nd byte 03H: return read function code

3rd byte: total number of bytes from 4 to M (including 4 and M)

Byte 4 to M: register data

M + 1, M + 2 bytes: CRC16 checksum from byte 1 to M

### When the slave receives an error, the slave sends back.

1	2	3	4	5
ADR	83H	Information Code	CRC low bytes	CRC high bytes

The 1st byte ADR: slave address code (=001~254)

2nd byte 83H: Read register value error

3rd byte information code: see information code table

4th and 5th byte: CRC16 checksum from byte 1 to 3

2.2Function code 10H: Write multiple register values consecutively

1	2	3	4	5	6	7	8 9	10 11	N N+1	N+2	N+3
ADR	10H	Start register high byte address	Start register low byte address	Register number high byte	Register number low byte	Total number of data bytes	Register data 1	Register data 2	Register data M	CRC code low byte	CRC code high byte

**When the slave receives correctly, the slave sends back.**

1	2	3	4	5	6	7	8
ADR	10H	Register high byte address	Register low byte address	Register number high byte	Register number low byte	CRC code low byte	CRC code high byte

**When the slave receives an error, the slave sends back.**

1	2	3	4	5
ADR	90H	Error message code	CRC low bytes	CRC high bytes

The 1st byte ADR: slave address code (=001~254)

2nd byte 90H: Error in writing register value

3rd byte error message code: see message code table

The 4th and 5th byte: CRC16 from byte 1 to 3

**3.Register definition table: (Note: the register address code is hexadecimal)**

Register address	Data name	Data type	Read-only	Instructions	Configuration address
0000 0001	Display value	Floating point type	√		40001
0002 0003	Temperature	Floating point type	√		40003
0004 0005	Supply voltage	Floating point type	√		40005
0006 0007	Operating time	Floating point type	√		40007
0008 0009	Liquid level/level	Floating point type		1: Liquid level 0: Object level	40009
000A 000B	Mounting height	Floating point type			40011
000C 000D	Ineffective	Floating point type			40013
000E 000F	Open/closed	Floating point type		1: Open 0.	40015
0010 0011	Output starting point	Floating point type			40017
0012 0013	Output end point	Floating point type			40019
0014 0015	485 Address	Floating point type			40021
0016 0017	Baud rate	Floating point type		Actual Baud Rate	40023
0018 0018	Calibration method	Floating point type		0 for N,8,1 mode	40025
001A 001B	Serial delay	Floating point type		Default 10ms	40027
001C 001D	Relay 1 on	Floating point type			40029
001E 001F	Relay 1 off	Floating point type			40031
0020 0021	Relay 2 on	Floating point type			40033

0022 0023	Relay 2 off	Floating point type			40035
0024 0025	Invalid	Floating point type			40037
0026 0027	Invalid	Floating point type			40039
0028 0028	Output low end trim	Floating point type		Calibrate 4-20mA Output	40041
002A 002B	Output high end trim	Floating point type		Calibration 4-20mA output	40043
002C 002D	Units	Floating point type		0 for mm	40045
002E 002F	Number of decimal places	Floating point type			40047
0030 0031	Display conversions	Floating point type			40049
0032 0033	Contrast ratio	Floating point type		0-9	40051
0034 0035	Off display delay	Floating point type		Unit seconds	40053
0036 0037	Media	Floating point type		0 Air Water Custom	40055
0038 0038	Custom sound velocity	Floating point type			40057
003A 003B	Custom sound velocity Temperature coefficient	Floating point type			40059
003C 003D	Measurement period	Floating point type		Unit milliseconds	40061
003E 003F	Blind area	Floating point type		Unit meter	40063
0046 0047	Filtering	Floating point type		0-4, None, Rapid Fast, Normal, Stable	40071
0048 0048	Temperature Correction	Floating point type		No adjustment recommended	40073
004A 004B	Frequency	Floating point type		No adjustment recommended	40075
004C 004D	Range	Floating point type		Unit meter	40077
0054 0055	User Password	Floating point type			40085
0056 0057	Administrator password	Floating point type			40087
005E 005F	Voice	Floating point type		0 Chinese 1 English	40095
End		Floating point type			40097

## 4.Examples

### 4.1 Reading parameters

Read level	01 03 00 00 00 02 C4 0B
Read temperature	01 03 00 02 00 02 65 CB
Read voltage	01 03 00 04 00 02 85 CA

### 4.2 Modify parameters

The installation height is set to 3 meters	01 10 00 0A 00 02 04 40 40 00 00 67 C4
Set to level mode	01 10 00 08 00 02 04 3F 80 00 00 FF F5