

FDO-99 DO sensor RS485 Protocol

1. Communication protocol accords MODBUS protocol.
2. Communication information composition: address code - function code - data segment -CRC check code. A message is sent and received continuously. The character spacing is not greater than one character, or it will be thought as beginning of a new message or the end of an old message. The message is composed of hexadecimal number.
3. Data definition: each data parameter is floating point type which is in line with IEEE754 standard.
4. Communication command:
Function code 0x03- used to read display data
Function code 0x10- used to set value

Send	01	; address	Response	01	; address
	03	; function code		03	; function code
	00	; register address: high		04	; number of bytes
	00	; register address: low		80	; Data 1
		(Show address)			
	00	; register number: high		04	; Data 2
	02	; register number: low		80	; Data 3
CRCH		; CRC check code High		80	; Data 4
CRCL		; CRC check code Low	CRCH		;CRC check code High
			CRCL		;CRC check code Low

5. DATA format:

Register address	Name and type	Number of bytes	Remarks
0	float DO	4	DO concentration, Unit: mg/L
2	float Saturation	4	Saturability, 0-1
4	float temperature	4	Temperature, °C
6	float phase	4	Phase, Angle value
8	Float a	4	Used for factory commissioning, user don't set
10	float b	4	Used for factory commissioning, user don't set
12	float salt	4	Salinity
14	float kpa	4	Pressure
16	unsigned short addr	2	Address of sensor
17	unsigned short d	2	Used for factory commissioning, user don't set
18	unsigned short e	2	Used for factory commissioning, user don't set

Communication case

1. Read measured value

Host sends a read measurement command: 01 03 00 00 00 10 44 06

Analysis:

0x01 //device addresses

0x03 //read command

0x00 0x00 //address

0x00 0x10 //length (word length)

0x44 0x06 //CRC check code

Sensor response:

0x01 0x03 //device address post back command

0x20 //number of data bytes

0x28 0xF6 0x41 0x04 //DO concentration

0x00 0x00 0x3F 0x80 //saturation

0x00 0x00 0x41 0xC8 //temperature

0x00 0x00 0x42 0x00 //Phase

0x00 0x00 0x3F 0x80 //a

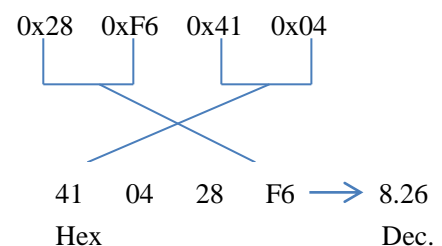
0x00 0x00 0x00 0x00 //b

0x00 0x00 0x00 0x00 //salinity

0xA6 0x66 0x42 0xCA //pressure

0x6A 0x1D //CRC check code

It is 32 bits hexadecimal floating number, lower 16 bits in the front, and higher 16bits in the back, with higher bytes in the front.



2. Modify the pressure and salinity values

Host send modify pressure and salinity:

0x01 //device addresses

0x10 //function codes

0x00 0x0C //address

0x00 0x04 //word length

0x08 //number of byte

0x00 0x00 0x42 0x04 //pressure

0x00 0x00 0x42 0xC8 //salinity

0x69 0xBE //CRC check code

Sensor response:

0x01 //device addresses

0x10 //function codes

0x00 0x0C //address

0x00 0x04 //word length

0x01 0xC9 // CRC check code

3. Calibration for full range

Host sends command:

0x01 0x65 0x00 0x34 0x00 0x01 0x02 0x00 0x06 0xE5 0x3D

Analysis:

0x01 // device addresses
0x65 // function codes
0x00 0x34 // calibration address
0x00 0x01 // word length
0x02 // number of data bytes
0x00 0x06 //calibration command
0xE5 0x3D // CRC check code

Sensor response:

0x01 0x65 0x00 0x34 0x00 0x01 0xCD 0xCC

Analysis:

0x01 // device addresses
0x65 // function codes
0x00 0x34 // calibration address
0x00 0x01 // word length
0xCD 0xCC // CRC check code

4. Preserve the parameters

After calibration, once power off, the calibration data, salinity and pressure will be deleted.

If you want to preserve the data, the host has to send preserve command.

0x01 0x10 0x00 0x11 0x00 0x01 0x02 0x00 0x0F 0xE5 0x15

Analysis:

0x01 // device addresses
0x10 // function codes
0x00 0x11 //command address
0x00 0x01 // word length
0x02 // number of data bytes
0x00 0x0F //preserve command
0xE5 0x15 // CRC check code

Sensor response:

0x01 0x10 0x00 0x11 0x00 0x01 0x51 0xCC
0x01 // device addresses
0x10 // function codes
0x00 0x11 //command address
0x00 0x01 // word length
0x51 0xCC // CRC check code