

MADECO Suspended Solid MLSS sensor Model : MDTBS200



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I Specification

Specification	Description
Power supply	12VDC
Dimension	Diameter 60mm*L 256mm
Weight	1.65KG
Materials	Body : SUS316L coating Ti
	O ring : Fluororubber
	Cable : TPU
Waterproof	IP68/NEMA6P
Range	0.01-20,000mg/L, 120g/L
Accuracy	Less measured value $\pm$ 5%
Pressure	$\leq$ 0.4Mpa
Flow rate	$\leq$ 2.5m/s 、 8.2ft/s
Storage temperature	-15~65 °C
Ambient	0~45 °C
Calibration	Standard solution, Sample calibration
Cable length	10 meters , Customized is available
Guarantee	1 year

Notice : Specifications are subject to change without notice.

II Description

2.1 Product Information

The sensor is based on the combined infrared absorption and scattering light method, and the iso7027 method can be used to continuously and accurately determine the turbidity. According to iso7027 infrared double scattering light technology, the turbidity value is not affected by chromaticity. It can be equipped with self-cleaning function according to the use environment. The data is stable and the performance is reliable; the self diagnosis function is set inside to ensure the data is accurate; the installation and correction are simple.

It can be widely used for turbidity monitoring in sewage plant, water plant, water station, surface water, industry and other fields.

2.2 Safety Information

Please read this manual completely before unpacking, installing or using this equipment. Otherwise, it may cause personal injury to the operator or damage to the equipment.

Warning label

Please read all labels and marks on the instrument and follow the instructions of these safety labels, otherwise personal injury or instrument damage may occur.

If this symbol appears in the instrument, it means the operation or safety information in the reference manual.

Please read this manual completely. Pay special attention to some precautions, warnings, etc. Ensure that the protective measures provided by the equipment are not damaged.

III Installation

3.1 Wiring

Please see the color and identified of wire as followed,

No.	1	2	3	4
Color of wire	White	Black	Blue	Brown
Identification	+12VDC	AGND	RS485 A	RS485 B

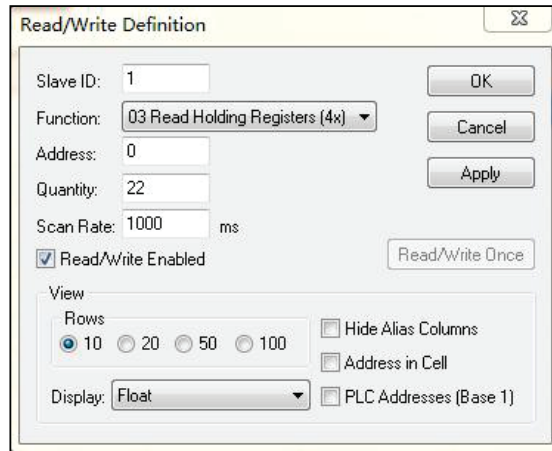
IV、Interface and Operation

4.1 User Interface

- ① The sensor is connected to the computer by RS485 converter, and then the software MODBUS poll is installed on the computer. Double click to execute mbpoll.exe and install according to the prompts to enter the user interface.
- ② If the user is using it for the first time, they need to register first. Click connection on the menu bar and select the first line of connection setup in the drop-down bar to display the registration dialog box.

4.2 Parameter Setting

1. Click setup on the menu bar, select read / write definition, and then set parameters according to the figure below, and click OK.

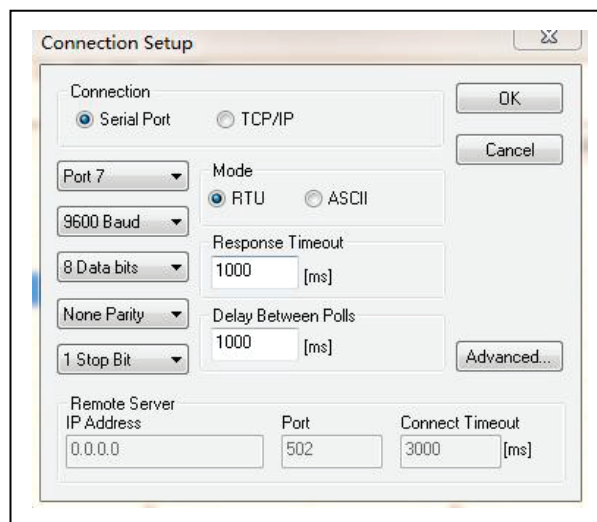


The 'Read/Write Definition' dialog box contains the following fields and options:

- Slave ID: 1
- Function: 03 Read Holding Registers (4x)
- Address: 0
- Quantity: 22
- Scan Rate: 1000 ms
- ☒ Read/Write Enabled
- Buttons: OK, Cancel, Apply, Read/Write Once
- View section:
 - Rows: ☒ 10, ☐ 20, ☐ 50, ☐ 100
 - ☐ Hide Alias Columns
 - ☐ Address in Cell
 - ☐ PLC Addresses (Base 1)
 - Display: Float

Notice : By default, the slave address used for the first time (slave ID) is 4. When the slave address is changed, it will communicate with the new address, and the slave address connected for the next time is also the latest changed address.

2. Click connection on the menu bar, select the first line of connection setup in the pull-down menu, set it according to the following figure, and click OK.



The 'Connection Setup' dialog box contains the following fields and options:

- Connection: ☒ Serial Port, ☐ TCP/IP
- Port: Port 7
- Baud: 9600 Baud
- Data bits: 8 Data bits
- Parity: None Parity
- Stop Bit: 1 Stop Bit
- Mode: ☒ RTU, ☐ ASCII
- Response Timeout: 1000 [ms]
- Delay Between Polls: 1000 [ms]
- Buttons: OK, Cancel, Advanced...
- Remote Server section:
 - IP Address: 0.0.0.0
 - Port: 502
 - Connect Timeout: 3000 [ms]

Notice: Set according to the port number of the connection.

Notice : If the sensor has been connected according to the instructions, and no connection appears in the display status of the software, it means that it has not been connected, remove and replace the USB connection port or check the USB to RS485 converter, and repeat the above operations until the sensor connection is successful.

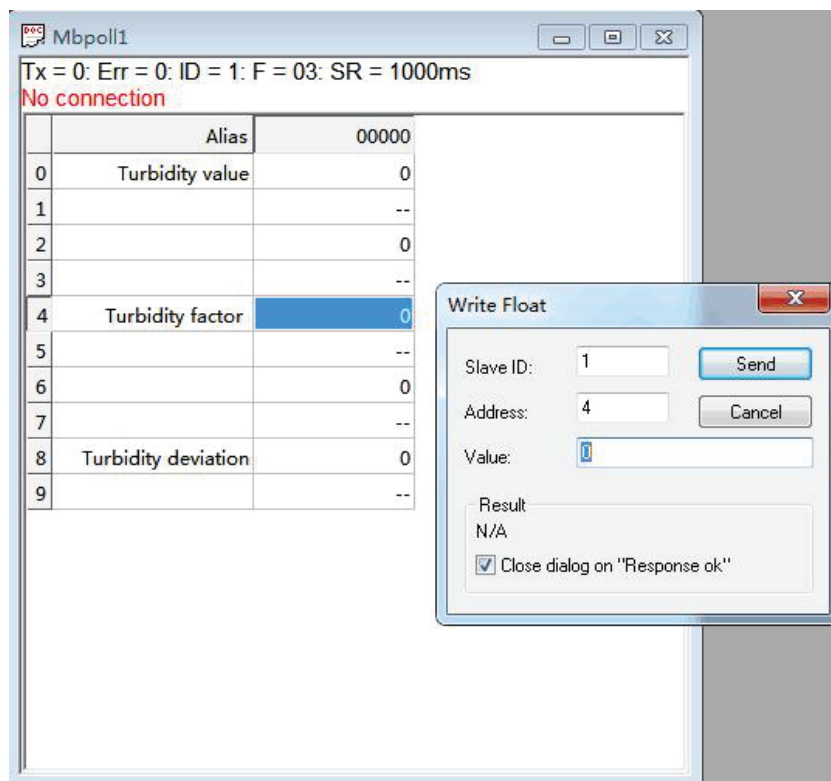
V Calibration

The turbidity sensor has been calibrated before leaving the factory. If self calibration is required, the following steps can be followed. Turbidity standard solution is required for turbidity calibration. The specific steps are as follows:

If there is a large deviation between the measured value and the standard solution value, factor correction is required for the slope of the calibration curve

1. Connect the sensor to PC terminal;
2. Set the relevant parameters and wipe the sensor;
3. Slowly immerse the sensor into the turbidity standard solution;
4. Wait for the value to stabilize, and record the stable value;
5. Calculate the correction factor. The correction factor is equal to the value of the standard solution divided by the value measured in step 4. (factor = standard liquid value / stable reading value);
6. Input the calculated correction factor into the register corresponding to the factor to complete the correction.

Note: during the calibration, ensure that the probe lens is 15cm away from the bottom of the calibration cup, and ensure that there is no bubble at the front of the lens. It is recommended that the calibration cup be treated in a light proof environment.



VI Communication Protocol

The sensor is equipped with MODBUS RS485 communication function. Please refer to 3.2 of this manual for communication wiring. The default baud rate is 9600, and the specific MODBUS-RTU table is shown in the table below.

MODBUS-RTU	
Baud Rate	4800/9600/19200/38400
Data length	8 bit
Parity Check	None
Stop Bit	1 bit

Register name	ADD.	R/W	Data type	Length	Description
SS/MLSS type	13	RW	Int	2	This addr. Should be 2, if not please change to be 2.
SS/MLSS	2	OR	Float	2	Measured Value
SS/MLSS factor	6	RW	Float	2	0.1-10
Wipe interval	11	OR	Int	1	
刮刷时间 Manual wiping	20	W	Int	1	Send 66
Automatic wipe interval setting	21	W	Int	1	To send (1、 5、 15、 30、 60 (1h) 、 240 (4h) 、 720 (12h) 、 1440 (1D) 、 4320 (3D) 、 10080 (7D) unit : min)
Digital filter	12	RW	Int	1	1-60s
Internal Humidity	14	OR	Int	1	Should be less 10
Baud Rate	16	RW	Int	1	0...4800

					1...9600 2...19200 3...38400
ID	17	RW	Int	1	1-254
Serial no. 1	18	OR	Int	1	First 4 digits of serial
Serial no. 2	19	OR	Int	1	last 4 digits of serial number

VII Maintenance

In order to get the best measurement effect, it needs regular maintenance. Maintenance mainly includes sensor cleaning and sensor damage inspection. You can also view the status of the sensor during maintenance and inspection.

7.1 Sensor Cleaning

Two lenses on the sensor need to be cleaned. Please clean and maintain them regularly according to the actual use to ensure the accuracy of measurement. Wash with water first, then wipe with detergent and cloth to remove stubborn stains.

7.2 Sensor Checking

Check the appearance of the sensor to see if there is any damage. If there is any damage, contact the after-sales service center in time to replace it, so as to prevent the sensor from water inflow and failure due to damage.

7.3 Wiper replacement

For the sensor with wiper, it is recommended to replace the rubber wiper every 3 months.

The specific steps are as follows:

1. Unscrew the screw beside the wiper with the corresponding screwdriver;
2. Take out the wiper, then take out the inner rubber wiper, and replace with a new rubber wiper;
3. Finally, put the wiper back and tighten the screw and wiper with a screwdriver.