Do Sensor

Model:DO485

Operation Manual

V1.10

JNC technology

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Catalogue

PART 1. PRODUCT DESCRIPTION

1-1 SPECIFICATION

DO Specification		Temperature Specification	
Measuring range	0~20mg/L (ppm) 0~200% Slope reading 70~130%	Temperature principle	NTC30K
		Measuring range	-10~120°C(ATC)
		Accuracy	±0.2°C
Accuracy	±0.2mg/L(0~8mg/L)	Resolution	0.1°C
	±0.3mg/L(8~20mg/L)	Reproducibility	0.1°C
Resolution	0.01mg/L	Other Specification	
Reproducibility	±0.5% F.S	Link above	3/4" NPT
Electrode withstand voltage	Max. 100 Psig	Link below	M42
Operating temperature	0~50°C	Housing Material	Polypropylene (PP), acid and alkali resistant/food grade/zero dissolution
Water flow	Highest 3M/S	Electrode material	Silver/Zinc Electrode
Response time	T90 120 seconds	Dimension	ø45*L214mm
Communication	RS-485Modbus RTU Wi-Fi Modbus TCP Web Browser direct reading (192.168.1.80)	Weight	≤350 公克
		Power	12VDC(Auto-cleaning) 9~36VDC(Non auto-cleaning)
Safety certification	CE、FCC	Power consumption	1.6W (Auto-cleaning) 0.8W(Non auto-cleaning)
		LINE LENGTH	3 meters
		Ingress Protection Rating	IP68

※The default RS485 transmission rate is 9600 bps, and the default station number is 53

PART 2.Wiring method

Line Color	Function	Line Color	Function
Red	DC 12~24V	Black	GND
White	RS485 : D+(A)	Green	RS485 : D-(B)
Yellow	Auto Cleaning pump （V+)	Blue	Auto Cleaning pump (V-)

PART 3.EQUIPMENT OPERATING INSTRUCTIONS

3-1 CONNECTION METHOD

Search for the Wifi signal on your mobile phone, find the Wifi name WQS_DO_XXXXX，並 and connect to the device, where XXXXX is the device serial number. After connecting, open the "Chrome browser" and enter "192.168.1.80" to enter the device screen, as shown in Figure 1 .

(Figure 1 .Sensor Home Page)

3-2 CALIBRATION METHOD

Click on the value on the screen to enter the calibration mode, as shown in Figure 2. At this time, the Modbus communication value will keep the concentration value when you click on the calibration. Therefore, it is recommended to click on the calibration before taking out the sensor, and then it is in the calibration mode. Select "Standard Solution Calibration" or "Gain and Offset" according to your needs as shown in Figure 3.

(Figure 2 calibration mode)

(Figure 3『Standard Solution Calibration』or『Gain and Offset』)

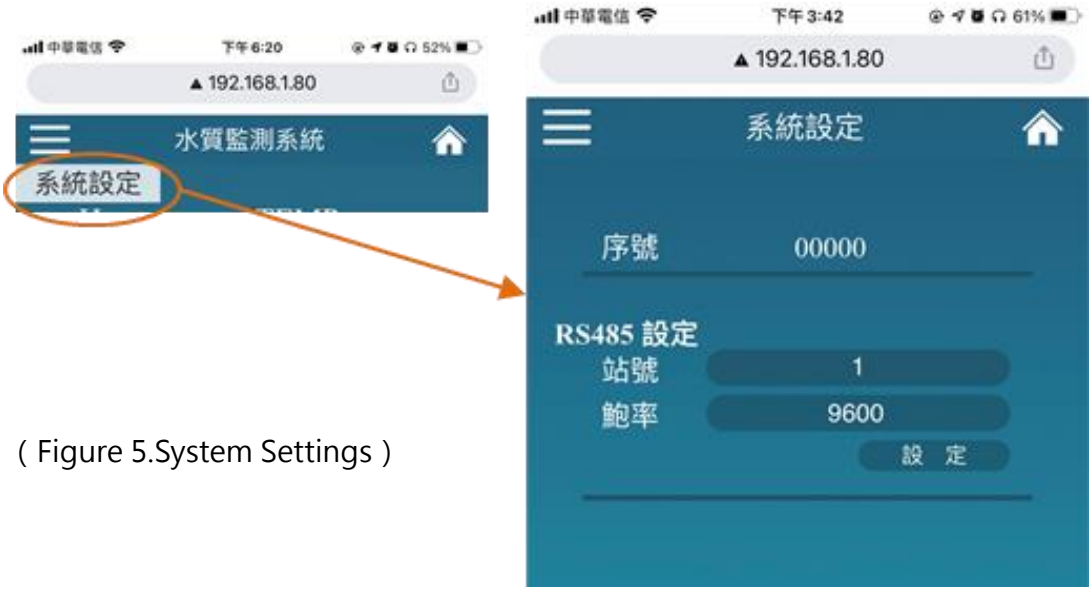
3-3 AUTO CLEANING SETTINGS

Click Settings at the bottom of the homepage to enter the automatic cleaning setting page, as shown in Figure 4. You can set the required self-cleaning cycle according to the usage mode.

(Figure 4. Auto cleaning settings)

3-4 SYSTEM SETTINGS

Click the menu in the upper left corner to enter "System Settings", where you can directly perform RS485 related settings, as shown in Figure 5.



(Figure 5.System Settings)

PART 4.MAINTENANCE AND CLEANING

4-1 REMOVE THE NOZZLE

Hold the blue mechanism and take out the air tube

Rotate the nozzle and remove it

4-2 INSTALL THE CLEANING BOTTLE

T he cleaning solution is recommended to be 1:1 diluted bleach (bleach for laundry))

Soak for 10 minutes (or increase the time if appropriate)

4-3 RINSE WITH WATER

Clean the sensor with a soft brush

4-4 REPLACE THE NOZZLE

Confirm whether the nozzle is aligned with the electrode surface

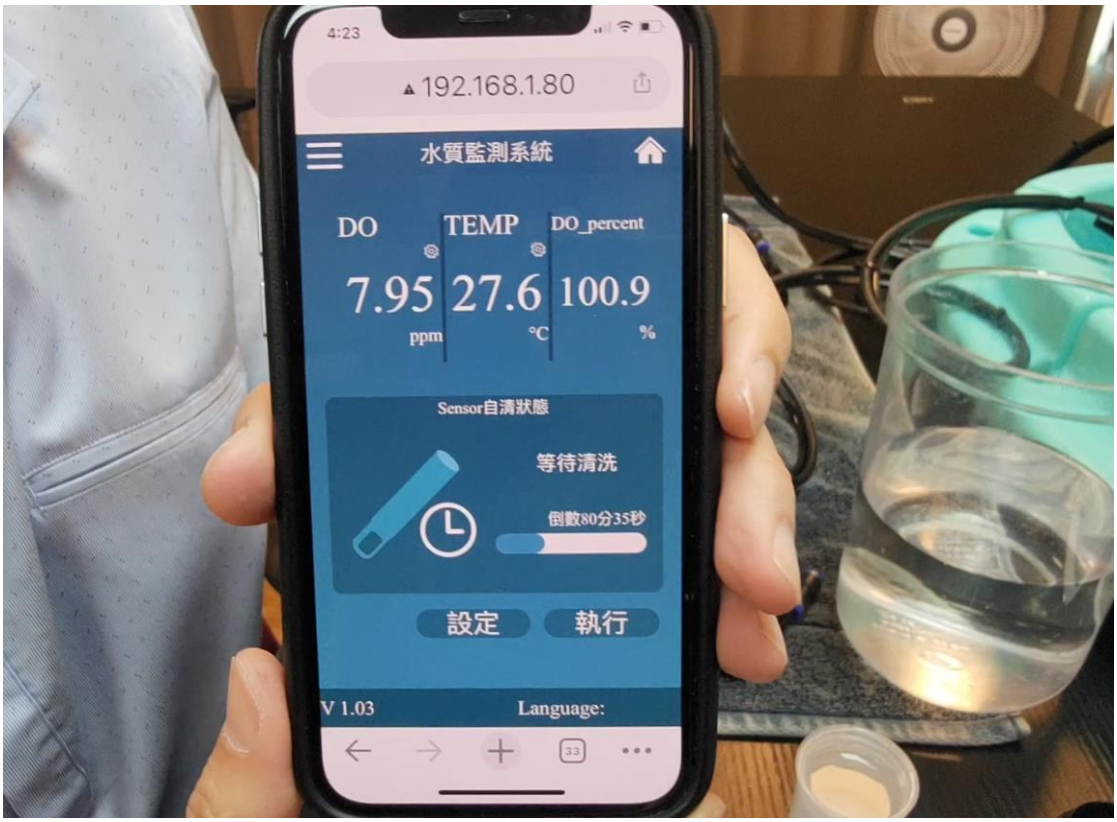
Complete after reinstalling the air pipe

PART 5.CALIBRATION INSTRUCTION

5-1 CONNECT YOUR PHONE TO WI-FI (PRODUCT SERIAL NUMBER)

The product serial number is marked on the sensor sticker

5-2 OPEN THE GOOGLE BROWSER, THE URL IS (192.168.1.80)



5-3 ENTER THE CALIBRATION SCREEN

Click on DO value

Click standard solution calibration to enter the calibration screen.

5-4 REMOVE THE NOZZLE

Hold the blue mechanism and take out the air tube

Rotate the nozzle and remove it

5-5 ZERO POINT CALIBRATION

Install NaNO2 calibration bottle

Wait for the value to drop to 0.00ppm

Press the START button for anaerobic water

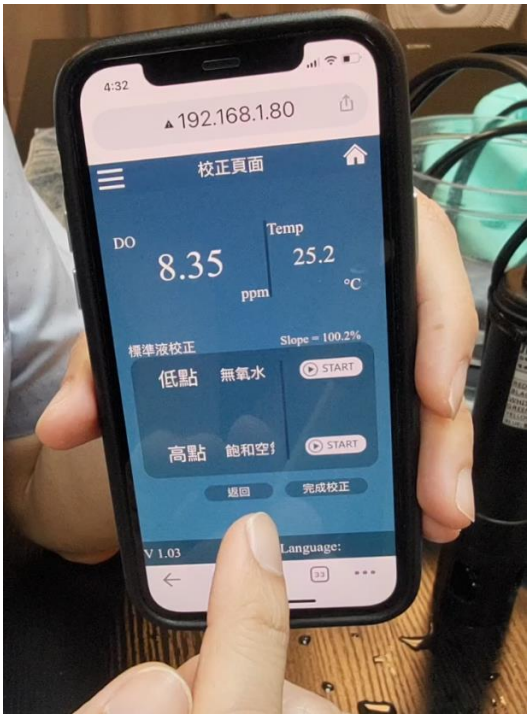
After waiting for the calibration seconds to expire, the anaerobic water calibration is completed.

5-6 SATURATED AIR CALIBRATION (Place in air)

Reinstall the nozzle (the nozzle must be aimed at the film, and the air pipe must be connected)

After a slight rinse, wait for the value to stabilize

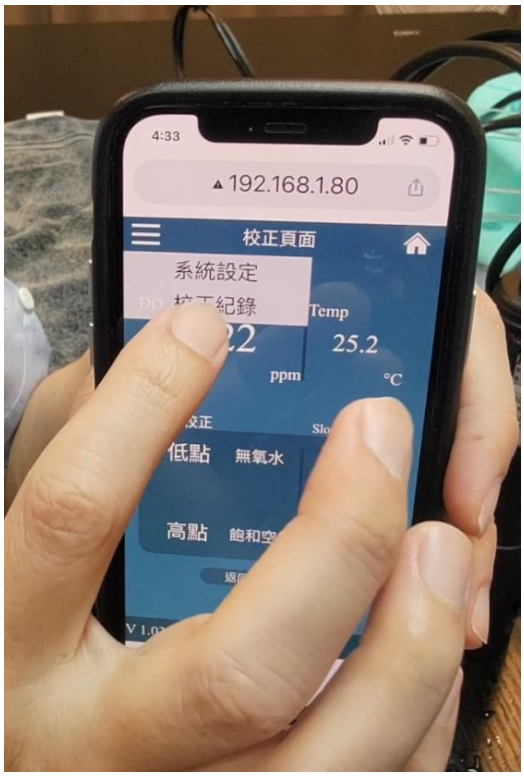
Press the START button for saturated air

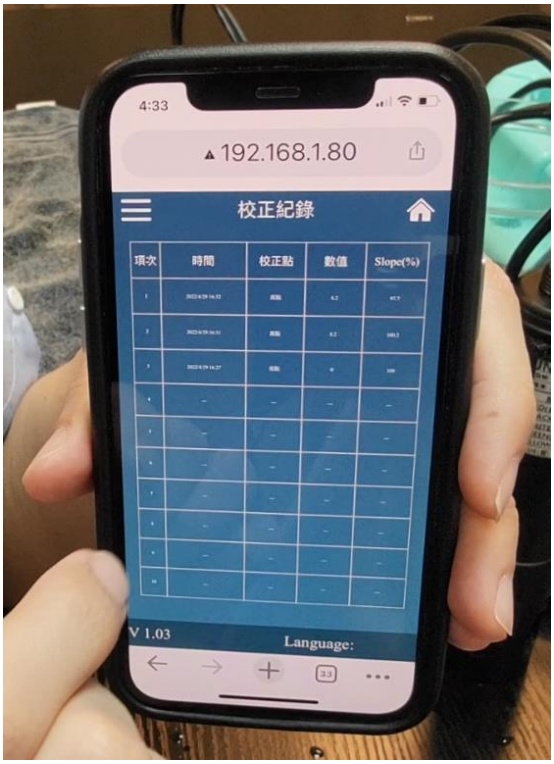


After waiting for the calibration seconds to expire, the saturated air calibration is completed.

5-7 VIEW SLOP

5-8 CALIBRATION RECORD





5-9 REPLACE THE NOZZLE

Confirm whether the nozzle is aligned with the electrode surface

Complete after reinstalling the air pipe

PART 6.REPLACE ELECTRODE FILLING SOLUTION

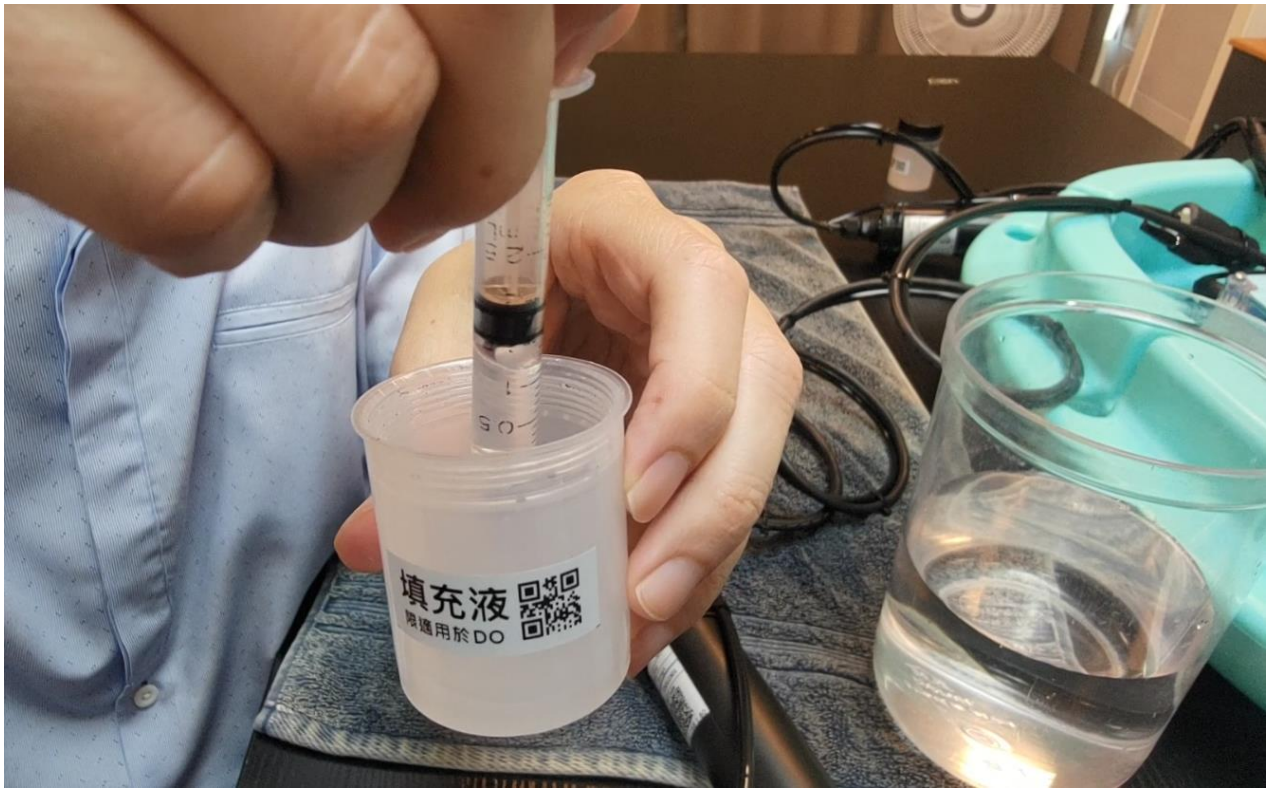
6-1 REMOVE THE NOZZLE

Hold the blue mechanism and take out the air

Rotate the nozzle and remove it

6-2 Rotate the film cover off

6-3 Use a needle to remove the filling solution

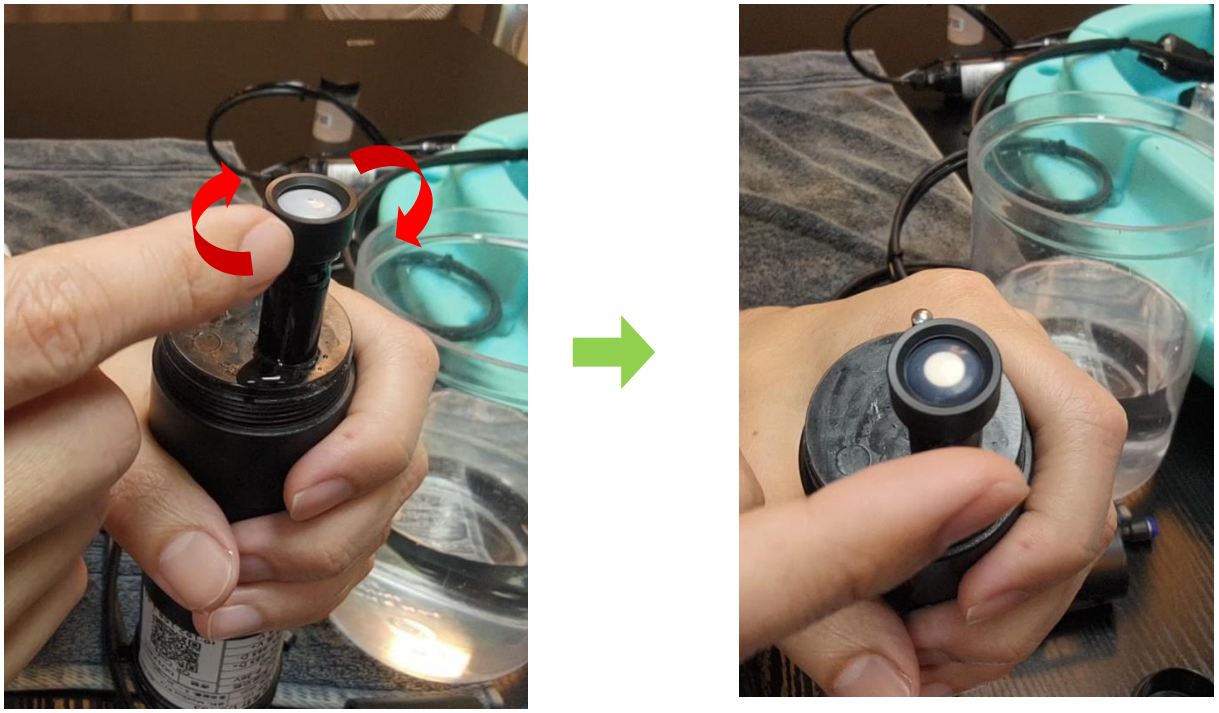


6-4 Inject filling fluid

Repeatedly inject (at least 2 times) 10 CC to overflow the filling liquid and clean the inside of the electrode.

6-5 Convoluted film

Slow down when rotating to avoid bubbles



6-6 Replace the nozzle

Confirm whether the nozzle is aligned with the electrode surface

Complete after reinstalling the air pipe

PART 7. MODBUS TABLE

Function 3 to Read/Function 6 to write					
Address	Setting Value	Item	Type	R/W	Remarks
0x0000	400001	instant value	INT16	R	Value/100
0x0001	400002	Temp. instant value	INT16	R	Value/10
0x0008	400009	DO saturation (percentage)	INT16	R	Value/10
0x0009	400010	Current saturated dissolved oxygen concentration value	INT16	R	Value/100
0x000A	400011	Temp. instant value	INT16	R	Value/10
0x000C	400014	Current electrode potential (Float low bit)	FLOAT	R	Unit：mV
0x000D	400015	Current electrode potential (Float high bit)	FLOAT	R	Unit：mV
0x0015	400026	RS485 station number	INT16	R/W	1～254
0x0016	400027	RS485 transmission rate	INT16	R/W	B2400=0,B4800=1,B9600=2, B19200=3,B38400=4, B57600=5,B115200=6
0x001E	400031	DO instant value (Float low bit)	FLOAT	R	
0x001F	400032	DO instant value (Float high bit)	FLOAT	R	
0x0020	400033	Temp. instant value (Float low bit)	FLOAT	R	
0x0021	400034	Temp. instant value (Float high bit)	FLOAT	R	
0x0022	400035	Saturation instant value (Float low bit)	FLOAT	R	
0x0023	400036	Saturation instant value (Float high bit)	FLOAT	R	

0x0030	400049	Sensor status	INT16	R	0: Value reading / 1: Automatic cleaning 2: Value keeping / 3: Calibrating
0x0031	400050	Electrode Slope	INT16	R	Value/10
0x0032	400051	Temp.Slope	INT16	R	Value/10
0x003A	400059	DO Salinity Compensation (Float low bit)	FLOAT	R/W	Unit：ppt
0x003B	400060	DO Salinity Compensation (Float high bit)	FLOAT	R/W	Unit：ppt
0x003C	400061	DO altitude compensation (Float low bit)	FLOAT	R/W	Unit：m
0x003D	400062	DO altitude compensation (Float high bit)	FLOAT	R/W	Unit：m

Function (04H)					
Address	Setting Value	Item	Type	R/W	Remarks
0x0000	300001	DO instant value	INT16	R	Value/100
0x0001	300002	Temp. instant value	INT16	R	Value/10
0x0002	300003	Saturation instant value	INT16	R	Value/10
0x0009	300010	Current saturated dissolved oxygen concentration value	INT16	R	Value/100
0x000A	300011	Temp. instant value	INT16	R	Value/10
0x000C	300014	Current electrode potential (Float low bit)	FLOAT	R	Uint：mV
0x000D	300015	Current electrode potential (Float high bit)	FLOAT	R	Uint：mV
0x001E	300031	DO instant value (Float low bit)	FLOAT	R	
0x001F	300032	DO instant value (Float high bit)	FLOAT	R	
0x0020	300033	Temp. instant value (Float low bit)	FLOAT	R	
0x0021	300034	Temp. instant value (Float high bit)	FLOAT	R	
0x0022	300035	Saturation instant value (Float low bit)	FLOAT	R	
0x0023	300036	Saturation instant value (Float high bit)	FLOAT	R	

Function 1 to Read/Function 5 to write					
Address	**Setting Value**	**Item**	**Type**	**R/W**	**Remarks**
0x0000	100001	Automatic cleaning switch	On / off	R/W	

※The firmware version is v1.04 or above, which complies with the above Modbus table.

PART 8.Modbus BYTE FORMAT DESCRIPTION

8.1 INT16 READS INSTANT VALUE (Function03)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x03	0x00	0x00	0x00	0x01	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x03	Number of data *2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x35	0x03	0x00	0x00	0x00	0x01	0x80	0x7E
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x35	0x03	0x02		0x03	0x61	0xC8	0x98

Convert the sensor data bit 0x0361 (hexadecimal) to decimal format to 865. According to the two decimal places, it is 865/100=8.65, and the dissolved oxygen is 8.65ppm.

8.2 Float READS INSTANT VALUE (Function03)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x03	0x00	0x00	0x00	0x02	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x03	Number of data *2		WordL	WordH	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x35	0x03	0x00	0x1E	0x00	0x02	0xA0	0x79
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x35	0x03	0x04		0x66	0x66	0x41	0x0A	0xC1	0x30

Rearrange the sensor data bit 0x6666410A value so that the data bytes are exchanged so that the value is high byte first and low byte last 0x410A6666. Then directly convert it to Float to 8.65, and the dissolved oxygen is 8.65ppm.

Please refer to the online conversion tool:https://gregstoll.com/~gregstoll/floattohex/

8.3 INT16 READS INSTANT VALUE (Function04)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x04	0x00	0x00	0x00	0x01	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x04	Number of data *2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x35	0x04	0x00	0x00	0x00	0x01	0x35	0xBE
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x35	0x04	0x02		0x06	0x61	0xC9	0xEC

Convert the sensor data bit 0x0361 (hexadecimal) to decimal format to 865. According to the two decimal places, it is 865/100=8.65, and the dissolved oxygen is 8.65ppm.

8.4 Float READS INSTANT VALUE (Function04)

Protocol format description								
	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	Address	0x04	0x00	0x00	0x00	0x02	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x04	Number of data *2		WordL	WordH	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	0x35	0x04	0x00	0x1E	0x00	0x02	0x15	0xB9
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	0x35	0x04	0x04		0x66 0x66 0x41 0x0A		0xC0	0x87

Rearrange the sensor data bit 0x6666410A value so that the data bytes are exchanged so that the value is high byte first and low byte last 0x410A6666. Then directly convert it to Float to 8.65, and the dissolved oxygen is 8.65ppm.

Please refer to the online conversion tool:https://gregstoll.com/~gregstoll/floattohex/

8.4 PERFORM AUTO CLEANING (Function05)

Protocol format description								
	Equipment station number	Function	Starting address		Control bit	Complement	16 CRC code	
Host command	Address	0x05	0x00	0x00	0xFF	0x00	CRC0	CRC1
	Equipment station number	Function	Data bytes		Sensor data		16 CRC code	
Reply from machine	Address	0x05	Number of data *2		ByteH	ByteL	CRC0	CRC1

Communication Examples

	Equipment station number	Function	Address		Control bit	Complement	16 CRC code	
Host command	0x35	0x05	0x00	0x00	0xFF	0x00	0x88	0x4E
	Equipment station number	Function	Address		Control bit	Complement	16 CRC code	
Reply from machine	0x35	0x05	0x00	0x00	0xFF	0x00	0x88	0x4E

Writing 0xFF to the control bit starts automatic cleaning.

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