AGRINOVO-DO-130

Dissolved Oxygen Sensor with Self-Cleaning Brush
(KYV0111)

1. Overview

The AGRINOVO-DO-130 is a digital dissolved oxygen sensor using RS485 Modbus-RTU protocol (KYV0111). It provides DO concentration and temperature readings as little-endian floating-point values, with salinity and atmospheric pressure compensation. Features an integrated self-cleaning brush for low-maintenance operation in aquaculture and water monitoring applications.

Protocol Version: KYV0111 (supersedes KYV-01) **Power Requirement:** 12V DC
Self-Cleaning: Automatic brush with configurable interval

Key Features

- DO measurement (mg/L)
- Temperature measurement (°C)
- Little-endian float32 data
- Fixed 9600 baud rate
- Salinity compensation (ppt)
- Pressure compensation (kPa)
- Self-cleaning brush
- RS485 Modbus-RTU
- 9V DC power supply

Applications

- Aquaculture monitoring
- Water quality analysis
- Environmental monitoring
- Industrial process control

2. Specifications

Parameter	Specification
DO Unit	mg/L
Temperature Unit	°C
Salinity Range	1 ppt minimum
Pressure Unit	kPa
Supply Voltage	12 VDC
Baud Rate	Fixed 9600 bps
Protocol Version	KYV0111 (with self-cleaning)

3. Wiring

Wire Color	Function	Description
Red	V+	Power Supply (12V DC+)
Black	GND	Power Ground (12V DC-)
White	RS485-A	Data+
Green	RS485-B	Data-

Note: If A/B labels don't match your transceiver, swap connections.

4. Communication Settings

Parameter	Value
Protocol	Modbus-RTU
Baud Rate	9600 bps
Data Bits	8 (LSB first)
Parity	None
Stop Bits	1
Checksum	CRC16

5. Register Map

Data Encoding

DO and Temperature are **float32** in **little-endian byte order**.

Measurement Registers (Function 0x03)

Address	Registers	Description
0x0000	4	DO (float32) + Temp (float32)
0x000A	2	Production Number
0x0010	1	Slave Address
0x0062	1	Salinity (ppt)
0x0064	1	Atmospheric Pressure (kPa × 100)
0x0014	1	Brush Interval (seconds)

Configuration Registers (Function 0x10)

Address	Description	Notes
0x0010	Set Slave Address	Range: 1–250
0x0011	Field Calibration	Atmospheric pressure × 100 for calibration
0x0013	Manual Brush Trigger	Write 0x0000 to clean once
0x0014	Brush Interval	Seconds (e.g., 180 = 3 min)
0x0021	Reset Calibration	Write 0x0014 to restore factory
0x0062	Set Salinity	Value in ppt
0x0064	Set Atmospheric Pressure	kPa × 100 (range: 8000-13000)

6. Reading Data

Read DO + Temperature

Read 4 registers from 0x0000:

```
Request:  01 03 00 00 00 04 44 09
Response: 01 03 08 [DO_4B] [Temp_4B] [CRC]
```

Decoding (Little-endian float32):

Example bytes `48 E1 0A 41`:

Received	Reordered	Result
48 E1 0A 41	41 0A E1 48	**8.68 mg/L**

7. Address Configuration

Read Address (Broadcast 0xFF)

```
FF 03 00 10 00 01 [CRC]
```

Set New Address

Write to 0x0010 using function 0x10:

```
[OLD] 10 00 10 00 01 02 [NEW] 00 [CRC]
```

8. Salinity Compensation

Read Salinity

```
01 03 00 62 00 01 [CRC]
```

Response: `0x0A 0x00` = 10 ppt

Write Salinity (10 ppt)

```
01 10 00 62 00 01 02 0A 00 [CRC]
```

9. Calibration

Field Calibration

1. Place sensor in saturated DO (air) until stable
2. Write atmospheric pressure to 0x0011

Reset to Factory

Write to 0x0021 to restore factory calibration.

10. Self-Cleaning Brush

Manual Cleaning Trigger

Trigger immediate brush cleaning cycle by writing 0x0000 to register **0x0013** using function **0x06** (write single register):

Example (Address 0x03):

```
Request:  03 06 00 13 00 00 78 0F
Response: 03 06 00 13 00 00 78 0F (echo)
```

The brush cycle typically takes 3-5 seconds to complete.

Set Automatic Cleaning Interval

Write interval (in **SECONDS**) to register **0x0014** using function **0x06**.

Set to 180 seconds (3 minutes) - Address 0x03:

```
Request:  03 06 00 14 00 B4 BE CE
Response: 03 06 00 14 00 B4 BE CE (echo)
```

Value `0x00B4` = 180 seconds = 3 minutes

Read Current Interval

Read 1 register from **0x0014** using function **0x03**:

Example (Address 0x03):

```
Request:  03 03 00 14 00 01 C4 0E
Response: 03 03 02 00 B4 CF 44
```

Response `0x00B4` (big-endian) = 180 seconds

Maintenance Recommendations

Environment	Cleaning Interval	Seconds	Notes
Clean water	Every 2-4 hours	7200-14400	Low biofouling
Aquaculture	Every 1 hour	3600	Moderate biofouling
High density	Every 30 minutes	1800	High biofouling
Wastewater	Every 10-15 minutes	600-900	Very high biofouling
Manual override	As needed	Write 0 to 0x0013	Immediate clean