AGRINOVO-EC-110

Digital Conductivity & Salinity Sensor

1. Overview

The AGRINOVO-EC-110 is a high-range digital conductivity and salinity sensor for industrial water, brine, and marine environments. A single PTFE-housed probe with a K=10.0 two-graphite electrode measures conductivity up to 200 mS/cm and salinity up to 100 ppt, with simultaneous TDS and temperature output, all delivered over RS485 Modbus-RTU.

Features

- Conductivity: 0 to 200 mS/cm
- Salinity: 0 to 100 ppt
- TDS in ppm
- Accuracy: ±1.5% FS
- K=10.0 graphite electrode
- PTFE housing
- RS485 Modbus-RTU output
- Low power: ≤0.5 W

Applications

Industrial brine and salt processing
Aquaculture, marine, and seawater
Desalination plants
Wastewater and environmental monitoring
Food processing, fermentation, dye, plating
Chemical and process water

2. Specifications

Parameter	Specification
Conductivity Range	0 to 200,000 µS/cm (0 to 200 mS/cm)
Salinity Range	0 to 100 ppt
TDS Output	ppm (composition dependent)
Accuracy	±1.5% FS
Temperature Range	0 to 60°C
Temperature Compensation	Automatic
Operating Humidity	≤85% RH
Power Consumption	≤0.5 W
Electrode Constant	K = 10.0
Electrode Material	Two-graphite
Housing Material	PTFE
Output	RS485 Modbus-RTU

Parameter	Specification
Supply Voltage	12-24 VDC

3. Wiring

Wire Color	Function	Description
Red	V+	Power Supply
Black	GND	Power Ground
Yellow	RS485-A	Data +
Green	RS485-B	Data -

4. Communication Settings

Parameter	Value
Protocol	Modbus-RTU
Baud Rate	9600 bps
Data Bits	8
Parity	None
Stop Bits	1
Default Address	0x01

5. Register Map

Measurement Registers (Function 0x03)

Address	Description	Scaling	Range
0x0000	Conductivity	Value × 10 → µS/cm	0 to 200,000 µS/cm
0x0001	Temperature	Value ÷ 10 → °C	0 to 60°C
0x0002	TDS	Value × 10 → ppm	composition dependent
0x0003	Salinity	Value ÷ 10 → ppt	0 to 100 ppt

The salinity-to-TDS ratio depends on water composition. For NaCl-dominant water (seawater, marine aquaculture, industrial brine), the ratio is typically 1.5 to 2.0.

Configuration Registers (Function 0x06)

Address	Description	Range / Notes
0x0000	Slave Address	0x01 to 0xFE
0x0004	Slope	Value × 1000 (default: 1000)

6. Reading Data

Read 4 registers from 0x0000:

```
Request:  01 03 00 00 00 04 44 09
Response: 01 03 08 00 1A 00 BF 00 0D 00 02 2B CF
```

Decoding (tap water example):

Register	Hex	Decimal	Scaling	Result
Conductivity	0x001A	26	× 10	260 µS/cm
Temperature	0x00BF	191	÷ 10	19.1°C
TDS	0x000D	13	× 10	130 ppm
Salinity	0x0002	2	÷ 10	0.2 ppt

7. Address Configuration

Change Address (0x01 to 0x02)

Write to register 0x0000:

```
01 06 00 00 00 02 08 0B
```

Broadcast Discovery

Use address 0xFE with only one device on the bus.

8. Calibration

Slope Adjustment

The slope register at 0x0004 trims the sensor against a known reference standard. Slope is stored as `value × 1000`. To set a slope of 1.200, write 1200 (0x04B0):

```
01 06 00 04 04 B0 CB 7F
```

Default slope is 1.000 (raw value 1000).

9. Installation Notes

Sensor Placement

- Electrode faces flow direction
- Fully submerged in water
- Avoid dead space and air pockets
- Use bypass mounting for stable flow

Cable and Maintenance

- Keep electrode surface clean
- Avoid bare hand contact and oils
- Route signal cable separate from power lines
- Do not extend the factory cable

10. Ordering Information

Part number	Description
`AGRINOVO-EC-110`	Digital Conductivity & Salinity Sensor

11. Revision History

Rev	Date	Changes
1.0	June 2026	Initial release
1.1	August 2026	Layout revision
1.2	October 2026	New layout

Modular IoT sensors and controllers for agriculture and aquaculture.
Specifications subject to change without notice.