WoMaster

Master in IIoT World

Water Quality Analysis Sensors

WS-102 Series



WS102 Series is a unified family of intelligent, industrial-grade water-quality sensors engineered for continuous, real-time monitoring of critical chemical and physical parameters. Each model combines rugged construction, automatic temperature compensation, and dual outputs (**RS-485 Modbus RTU** and/or **4–20 mA**) for seamless SCADA, PLC, and IoT integration, enabling precise process control, regulatory compliance, and early detection of water-quality issues in applications ranging from **drinking-water treatment and municipal wastewater management to aquaculture, industrial process control, and environmental monitoring**.

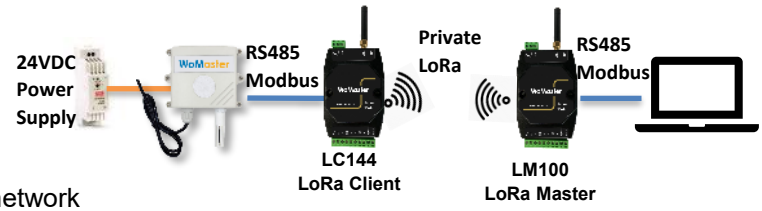
- **Rugged & Reliable**: IP68 protection, wide temperature ranges, and low-power operation for harsh field conditions.
- **Real-Time Data & Control**: Immediate feedback for process optimization, energy savings, and rapid incident response.
- **Easy Integration**: Standard RS-485 Modbus RTU and optional 4–20 mA outputs for plug-and-play connection to SCADA, PLC, and cloud IoT systems.
- **Low Maintenance**: Built-in temperature compensation; models like WS102-COD feature automatic self-cleaning to minimize service intervals.

Model	Sensor	Highlights	Measurement	Pressure Range	Shell Material
WS102-PH	**pH**	Ensures chemical balance for safe drinking water, optimized chemical dosing, and corrosion/scale prevention.	0~14pH	0~300KPa	PPS
WS102-DOS	**Dissolved Oxygen**	Monitors oxygen levels for aeration control, energy savings, and aquatic-life health.	0~20mg/L	0~300KPa	PC+316L
WS102-ORP	**Oxidation-Reduction Potential**	Indicates disinfectant effectiveness and overall oxidation state for reliable sanitation.	-2000~2000mV	0~300KPa	PPS
WS102-CL	**Residual Chlorine**	Tracks free chlorine/Hypochlorous acid to verify disinfection while avoiding over-chlorination.	0~20mg/L	0~100KPa	PC+316
WS102-EC	**Electrical Conductivity**	Measures ionic content to distinguish water purity and manage salinity/TDS in treatment systems.	1~2000μS/cm	0~400KPa (0 – 4 Bar)	ABS, PPS
WS102-BRM	**Bromine**	Provides precise bromine control for industrial water disinfection and environmental safety.	0.4~50000ppm	0~300KPa	PC+316
WS102-TDS	**Total Dissolved Solids**	Gauges mineral and impurity levels for filtration efficiency and drinking-water quality.	0~5000mg/L	0~400KPa	PC, PBT
WS101-OTB	**Optical Turbidity & TSS**	Uses ISO 7027-compliant nephelometry to detect suspended solids and monitor water clarity.	0.3~100NTU, 0.3~1000NTU, 1.0~4000NTU	0~100KPa	PVC, Stainless Steel 316
WS102-COD	**Chemical Oxygen Demand**	UV254 dual-light probe quantifies organic pollution (0–500 mg/L) with auto-cleaning for low maintenance.	0~500mg/L	0~400KPa (0 – 4 Bar)	Stainless Steel
WS104-TN	**Total Nitrogen**	Multi-electrode system measures NH_4-N, NO_3-N, and total nitrogen to control nutrient pollution.	0.25~2000ppm	0~100KPa	PVC, Titian Alloy
WS101-LL	**Liquid Level**	High-accuracy (up to 0.2 %FS) sensor for water or oil level monitoring up to 300 m depth.	3 Meter / 10 Meter Or customization up to 200 Meter	Meter x 10KPa	Stainless Steel

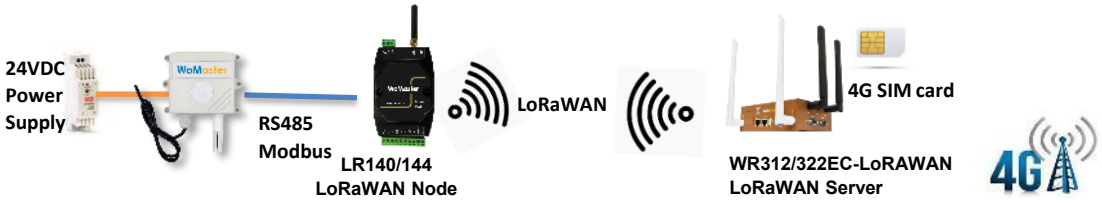
Flexible Connectivity Options

1) Sensor Connects to PC/HMI/PLC
Connect the sensor directly to a PC, HMI, or PLC for local monitoring and control.

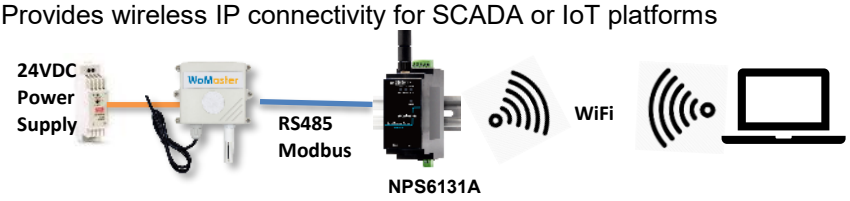
2) Sensor Connects to Private LoRa to PC/HMI/PLC
For long-range private LoRa communication to a local control system



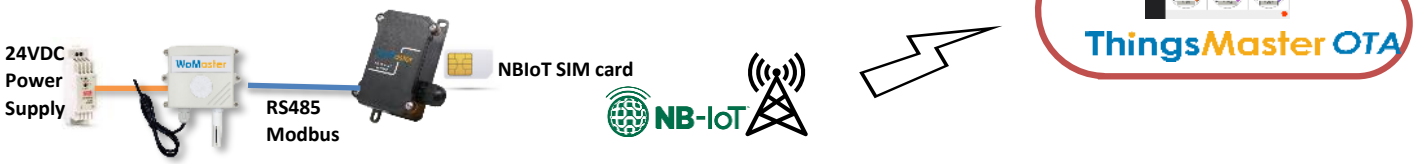
3) Sensor Connects to LoRaWAN Gateway
Sends data to a cloud or remote server via a LoRaWAN network



4) Sensor Connects to WiFi Gateway
Provides wireless IP connectivity for SCADA or IoT platforms



5) Sensor Connect to LTE NBIoT Gateway SCB111-485-NB
Enables low-power cellular data transmission to the cloud



6) Sensor Connect to WiFi + LTE Gateway WR222-WLAN+LTE
Offers dual connectivity—Wi-Fi and 4G LTE—for flexible remote monitoring

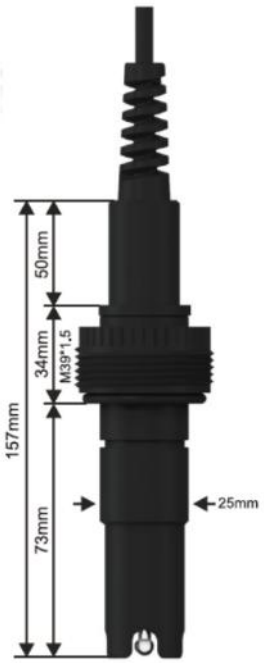
Model	
ThingsMaster OTA-5GW	ThingsMaster OTA for 5 gateways, One Year License
LM100	LoRa Master / Modbus RTU Client (Must work with LC144) (with LoRa antennas)
LC144	LoRa End-Node, 8CH AIO, 1 Modbus RTU 485 2-wire, 2 x 0~10V input, 2 x 4~20mA input, 1 x 0~10V Output, Open Collect (O.C.), 1 x 4~20mA Output, 1 x PWM Output (0~5V), 1 x PWM (0~10V), Open Collect (O.C.) Type, 1 x SMA /LoRa Antenna
LR140	LoRa WAN End-Node, 4CH AI, 1 Modbus RTU 485 Host, 1 x RS485 Host, 2-wire, 1 x SMA /LoRa Antenna Connector (with LoRa antennas)
WR322GR-EC-LTE-LORAWAN	Industrial LoRaWAN Gateway, 2GbE+2COM, LTE 2SIM, (with LTE and LoRa antennas)(Must work with LR140)
WR312GR-EC-LORAWAN	Industrial LoRaWAN Gateway, 2GbE+2COM (Must work with LR140)
NPS6131A	Din Rail 1 port RS485 to WiFi and Ethernet Modbus Device Server
WR222-WLAN+LTE	Industrial Wireless IIoT Field Router, 2FE+1COM, SD, 802.11b/g/n WLAN, 1SIM (with WiFi, LTE Antennas)
SCB111-485-NB-DC	Outdoor Modbus RS485 to NB-IoT / LTE Cat M1 Gateway

Water Quality Analysis PH Sensor

WS102-PH

The WS102-PH is an intelligent water-quality analysis sensor designed for continuous, **real-time pH measurement**, a critical parameter for ensuring water safety, protecting equipment, and meeting environmental regulations. Accurate pH control safeguards drinking water quality, supports healthy aquatic ecosystems, optimizes chemical treatment efficiency, and prevents costly corrosion or scaling in industrial processes. Ideal for general and industrial water treatment, sewage processing, aquaculture, surface-water monitoring, environmental engineering, cooling-tower systems, and food & beverage production, the WS102-PH helps operators maintain compliance and quickly detect contamination events. It features a built-in temperature detector for precise automatic compensation across a **0–60 ˚C** range and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.

G3/4, NPT3/4
WS102-PH-GN



M39x1.5
WS102-PH-M

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~300KPa
Shell material	PPS
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
PH Range	0~14pH
Resolution	0.01pH
Accuracy	±0.01pH
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

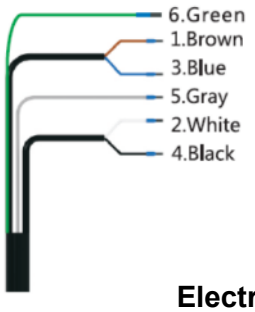
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Address	Data Type	Length	Description
Measurements	0x 00 01	Floating point	2	Storage location for measured value
Temperature	0x 00 03	Floating point	2	Storage location for measured temperature
Current output	0x 00 05	Floating point	2	Output current based on PH measurements
Warning	0x 00 07	Integer	1	00: Normal 01: Measurement exceeds the upper limit 02: Measurement exceeds the lower limit 03: Temperature exceeds the upper limit 04: Temperature exceeds the lower limit
Device address	0x 00 19	Integer	1	Default Value:1;1~254
Band Rate	0x 00 1A	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400
Restore factory	0x 00 1B	Integer	1	

✓ Electrode wiring

- Please follow the instructions carefully, the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switching on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact the power supply line, otherwise the communication of the electrode will be permanently damaged.**



SHIELD
DC10~30V(commend DC12V)
DC0V(I-)
4~20mA(I+)
RS485A
RS485B

Electrode Outlet

Ordering Information

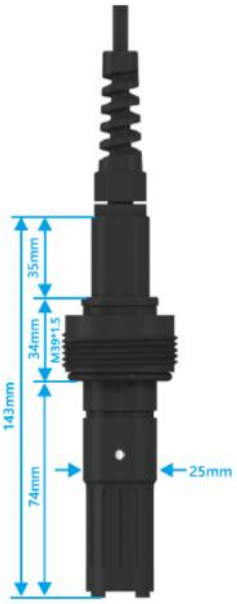
Model	Description
WS102-PH-GN	PH SENSOR, 0~14PH, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, G3/4 and NPT3/4
WS102-PH-M	PH SENSOR, 0~14PH, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Dissolved Oxygen Sensor

WS102-DOS

The WS102-DOS is an intelligent water-quality analysis sensor designed for continuous, **real-time dissolved oxygen (DO) measurement**, enabling immediate process control and optimized aeration for lower energy costs.
Ideal for tap water monitoring, municipal and industrial wastewater treatment, aquaculture systems, and environmental field applications, it helps operators maintain regulatory compliance, protect aquatic life, and detect pollution events early. The sensor features a built-in temperature detector for precise automatic compensation across a **0–60 ℃** range, and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.

G3/4
WS102-DOS-N



M39x1.5
WS102-DOS-M

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~300KPa
Shell material	PC+316L
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
Measuring Range	0~20mg/L
Resolution	0.01mg/L
Accuracy	±0.2%FS
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

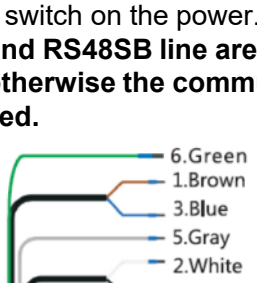
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Address	Data Type	Length	Description
Measurements	0x 00 01	Floating point	2	Storage location for measured value
Temperature	0x 00 03	Floating point	2	Storage location for measured temperature
Current output	0x 00 05	Floating point	2	Output current based on DO measurements
Warning	0x 00 07	Integer	1	00: Normal 01: Measurement exceeds the upper limit 02: Measurement exceeds the lower limit 03: Temperature exceeds the upper limit 04: Temperature exceeds the lower limit
Device address	0x 00 19	Integer	1	Default Value:1;1~254
Band Rate	0x 00 1A	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400
Restore factory	0x 00 1B	Integer	1	

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**



SHIELD
DC10~30V(commend DC12V)
DC0V(I-)
4~20mA(I+)
RS485A
RS485B

Electrode Outlet

Ordering Information

Model	Description
WS102-DOS-M	DISSOLVED OXYGEN SENSOR, 0~20MG/L, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, M39x1.5
WS102-DOS-G	DISSOLVED OXYGEN SENSOR, 0~20MG/L, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, G3/4
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Oxidation Reduction Potential Sensor

WS102-ORP

The WS102-ORP is an intelligent water-quality analysis sensor designed for continuous, **real-time oxidation-reduction potential (ORP) measurement**, a key indicator of a water system's disinfection effectiveness and overall chemical balance. Accurate ORP monitoring helps ensure proper chlorine dosing, supports pathogen control, and provides early warning of contamination or chemical imbalance, making it essential for safe drinking water, stable aquaculture environments, and efficient industrial processes. Suitable for general and industrial water treatment, sewage processing, aquaculture, surface-water monitoring, environmental protection projects, cooling-tower systems, and food & beverage production, the WS102-ORP features a built-in temperature detector for precise automatic compensation across a **0–60 ˚C** range and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.

Modbus

4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~300KPa
Shell material	PPS
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
Measurement Range	-2000~2000mV
Resolution	0.01mV
Accuracy	±0.01mV
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

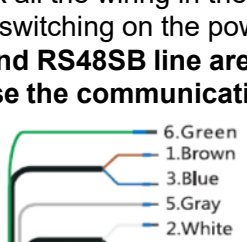
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Address	Data Type	Length	Description
Measurements	0x 00 01	Floating point	2	Storage location for measured value
Temperature	0x 00 03	Floating point	2	Storage location for measured temperature
Current output	0x 00 05	Floating point	2	Output current based on ORP measurements
Warning	0x 00 07	Integer	1	00: Normal 01: Measurement exceeds the upper limit 02: Measurement exceeds the lower limit 03: Temperature exceeds the upper limit 04: Temperature exceeds the lower limit
Device address	0x 00 19	Integer	1	Default Value:1;1~254
Band Rate	0x 00 1A	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400
Restore factory	0x 00 1B	Integer	1	

✓ Electrode wiring

- Please follow the instructions carefully, the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switching on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact the power supply line, otherwise the communication of the electrode will be permanently damaged.**



SHIELD
DC10-30V(commend DC12V)
DC0V(I-)
4~20mA(I+)
RS485A
RS485B

Electrode Outlet

Ordering Information

Model	Description
WS102-ORP-GN	OXIDATION REDUCTION POTENTIAL SENSOR,-2000~2000MV,TEMP. MEASURING RANGE: 0~60℃,5 METER CABLE,RS485 MODBUS,10-30V POWER, G3/4 and NPT3/4
WS102-ORP-G	OXIDATION REDUCTION POTENTIAL SENSOR,-2000~2000MV,TEMP. MEASURING RANGE: 0~60℃,5 METER CABLE,RS485 MODBUS,10-30V POWER, G1 and G3/4
WS102-ORP-M	OXIDATION REDUCTION POTENTIAL SENSOR,-2000~2000MV,TEMP. MEASURING RANGE: 0~60℃,5 METER CABLE,RS485 MODBUS,10-30V POWER, M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Residual Chloride Ion (CL-) Sensor

WS102-CL

The WS102-CL is an intelligent water-quality analysis sensor designed for continuous, **real-time residual chlorine (Cl^-) measurement**, a critical parameter for verifying disinfection efficiency and ensuring safe, clean water. Accurate monitoring of free chlorine or hypochlorous acid (HOCl) levels helps operators maintain optimal disinfection in drinking water systems, industrial process water, and membrane-based treatments such as reverse osmosis, while preventing over-chlorination that can cause taste, odor, or corrosion issues. Ideal for drinking-water plants, industrial disinfection processes, and online chlorine-concentration monitoring, the WS102-CL features a built-in temperature detector for precise automatic compensation across a **0–60 ˚C** range and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.

G3/4
WS102-CL-G

M39x1.5
WS102-CL-M

Modbus 4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~100KPa
Shell material	PC+316
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
Measuring Range	0~20mg/L
Resolution	0.01mg/L
Accuracy	±2%FS
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

Features & Benefits

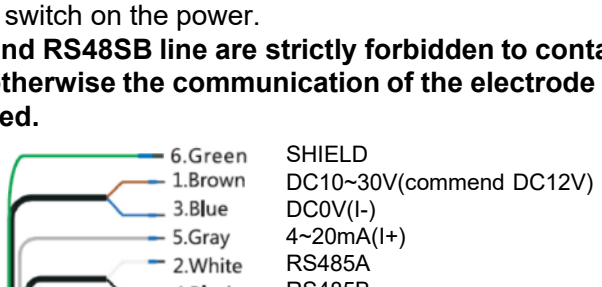
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Address	Data Type	Length	Description
Measurements	0x 00 01	Floating point	2	Storage location for measured value
Temperature	0x 00 03	Floating point	2	Storage location for measured temperature
Current output	0x 00 05	Floating point	2	Output current based on FCL measurements
Warning	0x 00 07	Integer	1	00: Normal 01: Measurement exceeds the upper limit 02: Measurement exceeds the lower limit 03: Temperature exceeds the upper limit 04: Temperature exceeds the lower limit
Device address	0x 00 19	Integer	1	Default Value:1;1~254
Band Rate	0x 00 1A	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400
Restore factory	0x 00 1B	Integer	1	

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**



Electrode Outlet

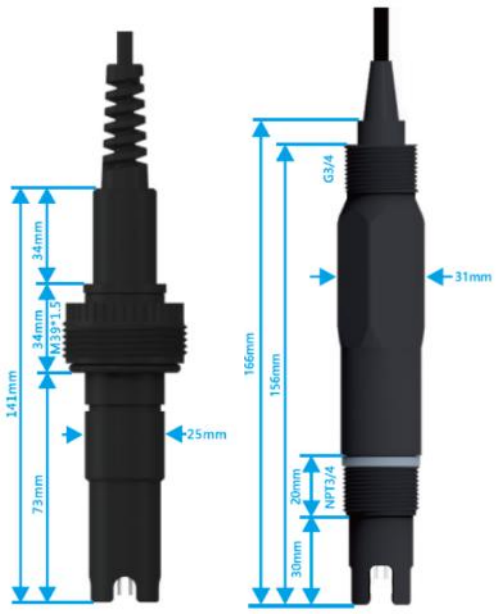
Ordering Information

Model	Description
WS102-CL-G	RESIDUAL CHLORIDE ION (CL-) SENSOR, 0~20MG/L, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, G3/4
WS102-CL-M	RESIDUAL CHLORIDE ION (CL-) SENSOR, 0~20MG/L, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Electric Conductivity Sensor

WS102-EC

The WS102-EC is an intelligent water-quality analysis sensor designed for continuous, **real-time electrical conductivity (EC) measurement**, a key indicator of dissolved ion concentration and overall water purity. Accurate EC monitoring is essential for distinguishing between pure, spring, mineralized, and tap water, as well as for managing industrial processes, detecting pollution in sewage, and ensuring consistent water quality in purification or desalination systems. By providing immediate insight into salinity and total dissolved solids (TDS), it supports process optimization, regulatory compliance, and early detection of contamination.
The WS102-EC features a built-in temperature detector for precise automatic compensation across a **0–80 ˚C** range and offers dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.



M39x1.5
WS102-EC-M

G3/4, NPT3/4
WS102-EC-GN

Modbus 4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~400KPa (0 – 4 Bar)
Shell material	PC, PBT plastic
Cable length	5 meters (default)
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
E.C. Measuring Range	1~2000μS/cm
E.C. Resolution	1 μS
E.C. Measuring Accuracy	±1 μS
Temperature Measuring Range	0~80.0 °C
Temperature Resolution	0.1 °C
Temperature Measuring Accuracy	±0.3°C
Temperature compensation	Automatic
Data Output	RS485(Modbus RTU); 4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Baud Rate	9600bps, Non Parity Check, 8 Data bits, 1 stop bit, 1 CRC

Installation

Thread Gauge	WS102-EC-N: NPT 3/4 Thread Gauge WS102-EC-M: M39x1.5 Thread Gauge

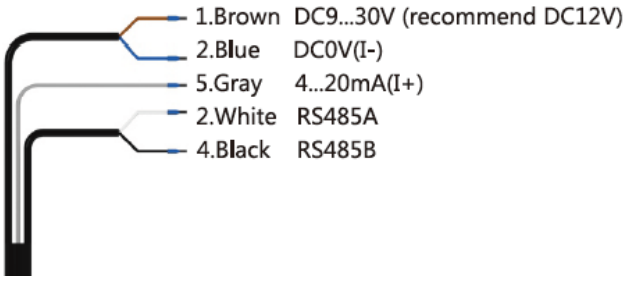
Address Description

Name	Reg. Add.	PLC Add.	Data Type	Length	R/W	Description
Conductivity Value	0x00 00	0x00 01	Float	2	R	Multiply by 1000 (Read value / 1000 = uS/cm)
Resistivity value	0x00 02	0x00 03	Float	2	R	Ohm .cm
Temperature	0x00 04	0x00 05	Float	2	R	Degree C
TDS	0x00 06	0x00 07	Float	2	R/W	ppm or mg/L
Salinity	0x00 08	0x00 09	Float	2	R/W	ppm or mg/L
Conductivity Constant	0x00 0A	0x00 0B	Float	2	R/W	
Compensation Coefficient	0x00 0C	0x00 0D	Float	2	R/W	
Manual compensation temperature	0x00 0E	0x00 0F	Float	2	R/W	
Temperature Offset	0x00 10	0x00 11	Float	2	R/W	
Baud Rate	0x00 12	0x00 13	Float	2	R/O	
Slave Address	0x00 14	0x00 15	Float	2	R/O	
Filtered Seconds	0x00 16	0x00 17	Float	2	R/O	
Electrode Sensitivity	0x00 18	0x00 19	Float	2	R/O	
Compensation mode	0x00 1A	0x00 1B	Float	2	R/O	
Model Compensation Type	0x00 1C	0x00 1D	Float	2	R/O	Pt1000 – 950.0 ; NTC10K – 950.1
Firmware version	0x00 1E	0x00 1F	Float	2	R/O	
4-20mA High Point Value	0x00 20	0x00 21	Float	2	R/O	
High Range Resistivity	0x00 22	0x00 23	Float	2	R/O	
Acquisition Cycle	0x00 24	0x00 25	Float	2	R/O	
Operating mode	0x00 26	0x00 27	Float	2	R/O	
Modify Baud Rate	0x0012	0x00 13	Integer	1	W	2400, 4800, 9600 (default), 19200, 38400, 43000, 57600
Modify Slave Address	0x00 14	0x00 15	Integer	1	W	1-254
Modify Filter Second	0x00 16	0x00 17	Integer	1	W	0:automatic, 1:Manual
Modify Compensation Mode	0x00 1A	0x00 1B	Integer	1	W	0: Positive ; 1:Negative
Adjust Float Order	0x00 32	0x00 33	Integer	1	W	0: Positive ; 1:Negative
Modify Temperature Compensation Type	0x00 33	0x0034	Integer	1	W	0:PT1000 ; 1:NTC10K
Restore Default	0x00 64	0x0065	Integer	1	W	
Restore Baud Rate and address	0x27 0F	0x27 10	Float	2	W	
Modify 4-20mA High Point Value	0x00 12	0x00 13	Float	2	W	
Modify High range resistivity	0x00 14	0x00 15	Float	2	W	
Modify the Sensor Acquisition Cycle	0x00 16	0x00 17	Float	2	W	
Modify Operating Mode	0x00 28	0x00 29	Integer	1	W	0: Periodic Acquisition 1 Trigger Acquisition
Modify 4-20mA Coefficient	0x00 20	0x00 21	Float	2	W	

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**

Electrode Cable Outlet



✓ Dimension & Thread Gauge

Ordering Information

Model	Description
WS102-EC-GN	E.C. Water Sensor, 0~2000uS/cm,0~80C , 5M Cable, RS-485, 4-20mA,10-30V, G3/4 and NPT3/4
WS102-EC-M	E.C. Water Sensor, 0~2000uS/cm,0~80C , 5M Cable, RS-485, 4-20mA,10-30V,M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

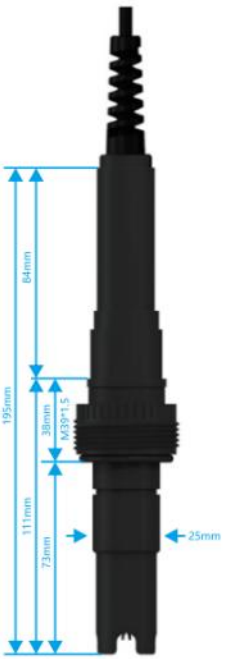
Water Quality Analysis Bromine Level Sensor

WS102-BRM

The WS102-BRM is an intelligent water-quality analysis sensor designed for continuous, **real-time bromine level measurement**, providing critical data for effective disinfection and water-quality control. Accurate bromine monitoring helps ensure proper sanitation in industrial water systems, agricultura IoT applications, environmental protection projects, and educational research, where bromine is often used as a powerf oxidizing agent to control bacteria and algae. Real-time data supports precise chemical dosing, prevents under- or over-bromination, and helps maintain compliance with safety and environmental standards.

The sensor features a built-in temperature detector for automat compensation across a **0–60 ˚C** range and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.

G3/4, NPT3/4
WS102-BRM-GN



M39x1.5
WS102-BRM-M

Modbus

4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~300KPa
Shell material	PC+316
PH Range	1~12pH
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
Measuring Range	0.4~50000ppm
Resolution	0.001ppm
Accuracy	±1%
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

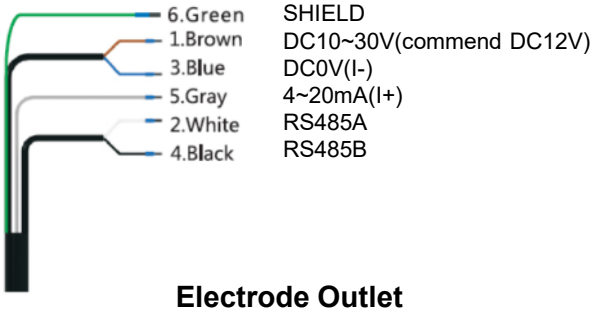
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Address	Data Type	Length	Description
Measurements	0x 00 01	Floating point	2	Storage location for measured value
Temperature	0x 00 03	Floating point	2	Storage location for measured temperature
Current output	0x 00 05	Floating point	2	Output current based on ION/mV measurements
Warning	0x 00 07	Integer	1	00: Normal 01: Measurement exceeds the upper limit 02: Measurement exceeds the lower limit 03: Temperature exceeds the upper limit 04: Temperature exceeds the lower limit
Device address	0x 00 19	Integer	1	Default Value:1;1~254
Band Rate	0x 00 1A	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400
Restore factory	0x 00 1B	Integer	1	

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**



Electrode Outlet

Ordering Information

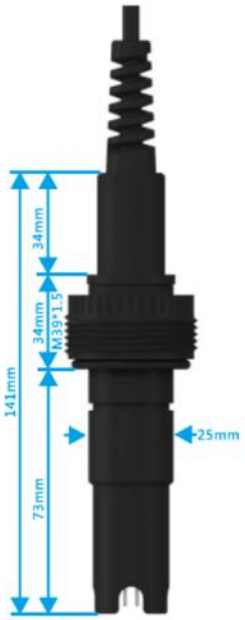
Model	Description
WS102-BRM-GN	BROMINE LEVEL SENSOR, 0.4PPM~79900PPM, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, G3/4 and NPT3/4
WS102-BRM-M	BROMINE LEVEL SENSOR, 0.4PPM~79900PPM, TEMP. MEASURING RANGE: 0~60°C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Total Dissolved Solid Sensor

WS102-TDS

The WS102-TDS is an intelligent water-quality analysis sensor designed for continuous, **real-time total dissolved solids (TDS) measurement**, a key indicator of water purity and mineral content. Accurate TDS monitoring helps distinguish pure, spring, mineralized, and tap water, while providing critical data for water-treatment plants, industrial processes, and environmental monitoring. Real-time TDS measurement enables operators to ensure drinking-water safety, optimize filtration and reverse-osmosis systems, and detect contamination or salinity changes early.

The sensor features a built-in temperature detector for precise automatic compensation across a **0–60 ˚C** range and supports dual signal outputs—**RS-485 (Modbus RTU)** and **4–20 mA**—for seamless integration with SCADA, PLC, or IoT platforms.



M39x1.5
WS102-TDS-M

G3/4, NPT3/4
WS102-TDS-GN

Modbus 4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~400KPa
Shell material	PPS
Cable length	5m or customize
Protection grade	IP68
Weight	0.5kg(Without packaging)
Inspection Parameter	
TDS Range	0~5000mg/L
Resolution	0.01mg/L
Accuracy	±0.01mg/L
Temperature range	0~60℃
Resolution	0.1℃
Accuracy	±0.3℃
Temperature compensation	Automatic
Output	RS485(Modbus RTU);4~20mA
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bit

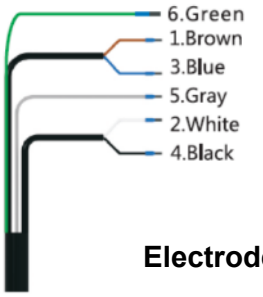
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description

Name	Register Addr.	PLC Addr.	Data Type	Length	R/W	Description
Temperature	0x 00 04	40005	Float	2	R	Storage location for measured temperature
TDS	0x 00 06	40006	Float	2	R	Storage location for measured value
Current output	0x 00 20	40033	Float	2	R	Output current based on TDS measurements
Band Rate	0x 00 12	40019	Float	2	R	2400 , 4800 , 9600(Default) 19200 , 38400
Slave ID	0x 00 14	40021	Float	2	R	Default Value:1;1~254
Band Rate	0x 00 12	40019	Signed	1	W	2400 , 4800 , 9600(Default) 19200 , 38400
Slave ID	0x 00 14	40021	Signed	1	W	Default Value:1;1~254
Restore factory	0x 00 64	40101	Signed	1	W	

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**



SHIELD
DC10~30V(commend DC12V)
DC0V(I-)
4~20mA(I+)
RS485A
RS485B

Electrode Outlet

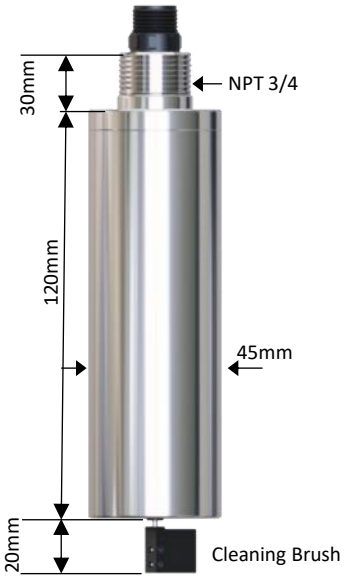
Ordering Information

Model	Description
WS102-TDS-GN	Total Dissolved Solid Sensor, 0~5000mg/L, TEMP. MEASURING RANGE: 0~60˚C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, G3/4 and NPT3/4
WS102-TDS-M	Total Dissolved Solid Sensor, 0~5000mg/L, TEMP. MEASURING RANGE: 0~60˚C, 5 METER CABLE, RS485 MODBUS, 10-30V POWER, M39x1.5
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Optical Turbidity TSS Sensor, Auto-Brush Cleaning

WS102-OTB-100/1000/4000

The WS102-OTB is an intelligent water-quality analysis sensor designed for continuous, **real-time turbidity and total suspended solids (TSS) measurement**, essential for assessing water clarity, filtration efficiency, and overall water treatment performance. Utilizing a fiber-optic nephelometric design, the sensor emits an **860 nm light** that penetrates the sample and measures scattered light at a 90-degree angle via a photodiode detector, ensuring precise readings in **nephelometric turbidity units (NTU)** compliant with **ISO 7027** standards. Accurate turbidity and TSS monitoring provides early detection of sediment load changes, supports regulatory compliance, and helps optimize filtration and sedimentation processes in drinking water treatment, wastewater management, industrial operations, and environmental monitoring.



Modbus

4-20 mA

Features & Benefits

System Parameter	
Power supply	DC10-30V(Recommend 12V)
Pressure range	0~300KPa (0~3 Bar)
Shell material	Stainless - 316
Cable length	5 Meters, or customize length by request
Protection grade	IP-68
Weight	0.5kg (Without packaging)
Install Thread	WS102-OTB-N: NPT 3/4
Inspection Parameter	
T.S.S. Measuring Range	0~100; 0~200; 0~400; 0~1000; 0~2000; 0~4000 (by request) Unit:NTU
T.S.S Resolution	0.001NTU : 0~100, 0~200 0.01NTU: 0~400,0~1000 0.1 NTU: 0~2000, 0~4000NTU (by special request)
T.S.S. Accuracy	≤± 5% Full Scale
Temperature Range	0~60 °C
Temperature Resolution	0.1°C
Temperature Accuracy	±1 °C Full Scale
Temperature Compensation	Automatic
Output	RS-485A/B 2-Wires (Modbus RTU); 4~20mA, 1% Full Scale Accuracy
Communication Protocol Basic Parameter	
Protocol	Modbus RTU
Data bits	8 bits

Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

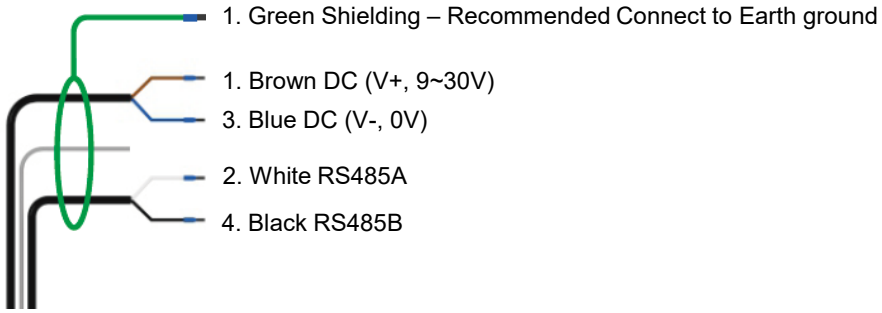
Address Description (Integer BA, Floating point number DCBA)

Name	Register Addr.	PLC Addr.	Data Type	Length	R/W	Description
TSS Value Temperature	0x 2C 00 (BA)	40045	Floating Point (Big-Endian)	8	R	Data 1 (DCBA): Temperature,℃ Data 2 (DCBA): T.S.S, NTU The read value should Big-Endian swap
K, B Value	0x 2A 00 (BA)	40043	Floating Point (Big Endian)	8	R/W	Data 1: K value, floating, default 1 Data 2: B value, floating, default 0
Brush	0x 30 00 (BA)	40049	Integer	1	W	write “0x00 00” to trigger the brush one time
Device ID	0x 2E 00 (BA)	40047	Integer	2	R/W	Default Value:1; 1~254

Note: More Detail Information, Check QIG.

✓ Electrode wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**



Electrode Outlet

Ordering Information

Model	Description
WS102-OTB-100	Infrared Total Suspended Solid Water Sensor, 0~100NTU, DC9~30V, with Brush
WS102-OTB-200	Infrared Total Suspended Solid Water Sensor, 0~200NTU, DC9~30V, with Brush
WS102-OTB-400	Infrared Total Suspended Solid Water Sensor, 0~400NTU, DC9~30V, with Brush
WS102-OTB-1000	Infrared Total Suspended Solid Water Sensor, 0~1000NTU, DC9~30V, with Brush
WS102-OTB-2000	Infrared Total Suspended Solid Water Sensor, 0~2000NTU, DC9~30V, with Brush
WS102-OTB-4000	Infrared Total Suspended Solid Water Sensor, 0~4000NTU, DC9~30V, with Brush (by Request)
	Package List
	1 x Product Unit
	1 x QIG

Water Quality Analysis Chemical Oxygen Demand Sensor Auto-Brush Cleaning

WS102-COD

G3/4

The WS102-COD is an immersion-type UV254 dual-light optical probe designed for continuous, **real-time chemical oxygen demand (COD) monitoring**, a critical indicator of organic pollution and overall water quality. Accurate COD measurement helps operators quickly assess wastewater treatment efficiency, detect contamination events, and maintain compliance with discharge regulations. Engineered for demanding environments, it measures **0–500 mg/L COD** with a fine **0.01 mg/L resolution** and **<5 % accuracy**, operating reliably across **0–60 ˚C**. Its rugged **IP68 stainless-steel housing** withstands up to **4 bar pressure** and supports **RS-485 (MODBUS)** or optional **4–20 mA** outputs for easy integration with SCADA and PLC systems. A low-power **12/24 V DC** supply (<50 mA) and a **built-in automatic cleaning brush**—activating every 30 or 60 minutes—ensure long-term measurement stability and minimal maintenance.

Modbus 4-20 mA

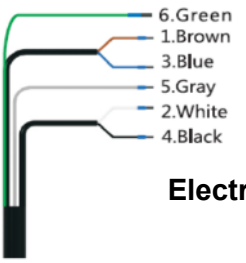
Features & Benefits

System	
Power supply	DC 12V/24V
Pressure range	0~400KPa
Shell material	Stainless Steel 316
Cable length	5m or customize
Protection grade	IP68
Measurement	
COD Range	0~500mg/L equivalent KHP
Method	UV254 absorption method
Resolution	0.01mg/L equivalent KHP
Accuracy	± 5% equivalent KHP
Sensitivity	0.05% of the COD Range
Temperature range	0~60℃
Output	RS485(Modbus RTU);4~20mA
Communication	
Protocol	RS485 Modbus RTU
Data bits	8 bit
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Address Description					
Name	**Register Addr.**	**Data Type**	**Length**	**R/W**	**Description**
Device ID	0x0000	Uint16	1	R/W	Defaut: 1
COD	0x0001	Float	2	R	
Temperature	0x0003	Float	2	R	Degree C
Rotation period	0x000A	Uint16	1	R/W	Unit: minutes
COD Measure offset	0x0025	Float	2	R/W	
Temperature offset	0x0027	Float	2	R/W	
Current measurement value AD	0x000D	Uint16	1	R/W	
Standard value 0	0x0029	Float	2	R/W	
Correction AD value 0	0x002B	Float	2	R/W	
Standard value 1	0x002D	Float	2	R/W	
Correction AD value 1	0x002F	Float	2	R/W	
Measurement upper limit	0x0049	Float	2	R/W	
Measurement lower limit	0x004B	Float	2	R/W	
Temperature upper limit	0x004D	Float	2	R/W	
Temperature lower limit	0x004F	Float	2	R/W	
4mA corresponding value	0x005D	Float	2	R/W	
20mA corresponding value	0x005F	Float	2	R/W	

✓ Electrode wiring

- Please follow the instructions carefully, the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switching on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact the power supply line, otherwise the communication of the electrode will be permanently damaged.**



SHIELD
DC10-30V(commend DC12V)
DC0V(I-)
4~20mA(I+)
RS485A
RS485B

Electrode Outlet

Ordering Information

Model	Description
WS102-COD	Water COD Sensor 0-500mg/L, Auto-Cleaning Brush, 5 METER CABLE, RS485 MODBUS, 12~24VDC POWER, G3/4
	Package List
	1 x Product Unit
	1 x QIG

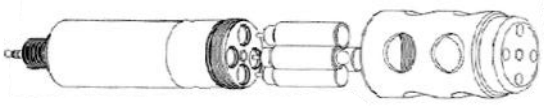
Water Quality Analysis Four-in-One Total Nitrogen Sensor

WS104-TN

The WS104-TN is an advanced water-quality analysis sensor designed for continuous, **real-time total nitrogen (TN) monitoring**, a key parameter for evaluating nutrient pollution, controlling eutrophication, and ensuring regulatory compliance in wastewater treatment and environmental monitoring.
The sensor integrates **four electrochemical electrodes**—a reference electrode, pH electrode, **NH_4^+ (ammonium) electrode**, and **NO_3^- (nitrate) measurement electrode**—all of which are **user-replaceable on-site** for easy maintenance. It supports automatic compensation for nitrate, ammonium, pH, and temperature, enabling accurate calculation of **ammonia nitrogen (NH_4-N)**, **nitrate nitrogen**, and **total nitrogen** values. This multi-parameter capability provides comprehensive nutrient data to optimize treatment processes and protect aquatic ecosystems.

Chemical Electrode

Modbus



Main Body

Protection Cover

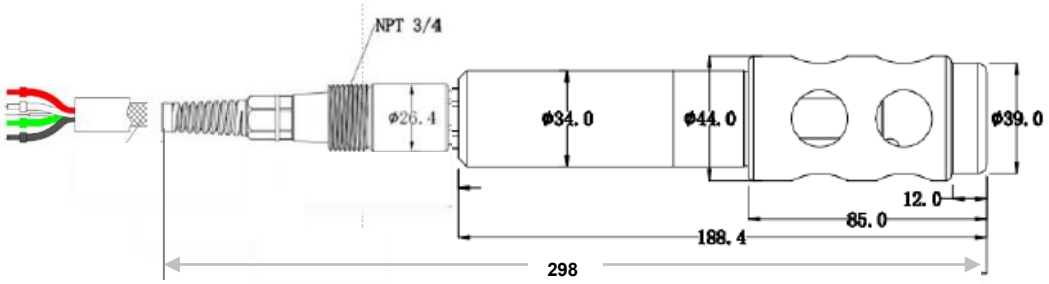
Features & Benefits

System	
Power supply	DC 5~12V
Pressure range	0~100KPa
Shell material	PVC, Titian Alloy
Cable length	5m or customize
Protection grade	IP68, <10meters depth
Dimension	Outer diameter 35.5mm, length 186mm (without audio connector)
Measurement	
Range	NH4-N: 0.15~1000ppm NO3-N: 0.25~2000ppm Total Nitrogen (T.N.) : 0.25~2000ppm
Method	Polymer membrane ISE electrode, glass bubble pH, and KCL reference
Resolution	0.01ppm, 0.01pH
Accuracy	NH4-N,NO3-N,TN.: 5%FS or 2ppm, W.I.G pH: +/- 0.2pH(in E.C.< 1500uS/cm, pH5~9 fresh water)
Temperature range	5~45℃
Communication	
Protocol	RS485 Modbus RTU
Data bits	8 bit
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

Features & Benefits

Address Description					
Name	**Register Addr.**	**Data Type**	**Length**	**R/W**	**Description**
PH	0x004A	Float	2	R	PH Floating Point
NH4+	0x004E	Float	2	R	NH4+ (ppm) Floating Point
NH4-N	0x0052	Float	2	R	NH4-N (ppm) Floating Point
NH3	0x0054	Float	2	R	NH3 (ppm) Floating Point
NO3-N	0x0058	Float	2	R	NO3-N (ppm) Floating Point
Total Nitrogen	0x005A	Float	2	R	TN (ppm) Floating Point

RED:V+ 12V
White: RS485-B
Bare Wire: Shielding
Green: RS485-A
Black: GND



Ordering Information

Model	Description
WS104-TN	Water Total Nitrogen Sensor, NH4+ , NH4-N, NH3, NO3-N, T.N, 5 METER CABLE, RS485 MODBUS, 5~12VDC POWER
	Package List
	1 x Product Unit
	1 x QIG

Liquid Level Sensor

WS101-LL-10M

The WS101-LL is a high-precision submersible level sensor engineered for reliable fluid-pressure and depth measurement across a wide range of industries. Its **front protective cap** shields the sensitive diaphragm while allowing liquid to flow freely for accurate pressure sensing. A **waterproof cable** is hermetically sealed to the housing, with an integrated **vent tube** that equalizes internal and external pressure, and the internal structure is specially designed to **prevent condensation**.

With **RS-485 Modbus communication**, a wide measurement range, and low power consumption, the WS101-LL is ideal for precise fluid-level monitoring in **industrial process control, petroleum, agriculture, irrigation, and IoT applications**.

Typical uses include **waterworks, wastewater treatment plants, municipal water supply systems, high-rise water tanks, wells, geothermal wells, mines, industrial tanks, oil reservoirs, hydrogeology studies, reservoirs, rivers, and marine environments**, providing dependable level measurement and control in challenging conditions.

Modbus

Features & Benefits

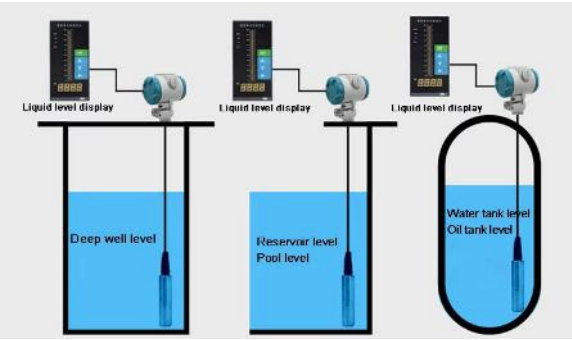
System	
Power supply	DC 10~30V
Power consumption	0.2w
Pressure range	Depth x 10 KPa
Shell material	Stainless Steel
Cable length	3M, 10M, or Customized up to 200M
Protection grade	IP68
Dimension	Outer diameter 26.8mm, length 106mm (without audio connector)
Measurement	
Range	0~200m customizable
Overload capacity	<1.5 times the range
Sampling time	≤1s
Long-term stability	±0.2%FS/year
Temperature range	-20~80℃
Communication	
Protocol	RS485 Modbus RTU
Data bits	8 bit
Parity bit	No
Stop bit	1
Error Detecting Code	CRC
Baud Rate	9600bps(Default)

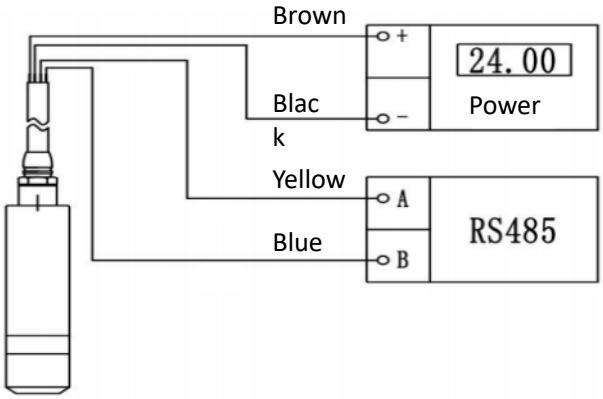
Features & Benefits

Address Description				
Name	**Register Address**	**Data Type**	**Length**	**Description**
Unit type	0x 00 02	Integer	1	9 represents m 10 represents cm 11 represents mm
Number of decimal points	0x 00 03	Integer	1	
Measure output value	0x 00 04	Integer	1	Actual value
Zero point of transmitter range	0x 00 05	Integer	1	
Full point of transmitter range	0x 00 06	Integer	1	
Offset value	0x 00 0C	Integer	1	
Device address	0x 07 D0	Integer	1	Default Value:1;1~254
Band Rate	0x 07 D1	Integer	1	0=2400 , 1=4800 , 2=9600(Default) 3=19200 , 4=38400

✓ Wiring

- Please follow the instructions carefully , the wrong wiring will damage the product completely.
- Please carefully check all the wiring in the system and confirm that the wiring is complete right before switch on the power.
- **Note: RS48SA line and RS48SB line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**





Ordering Information

Model	Description
WS101LL-10M	HIGH INTEGRATED OUTDOOR LIQUID SENSOR, MODBUS RTU PROTOCOL, 2-WIRE RS-485, 24VDC, 10M Cable
WS101LL-3M	HIGH INTEGRATED OUTDOOR LIQUID SENSOR, MODBUS RTU PROTOCOL, 2-WIRE RS-485, 24VDC, 3M Cable
	** Customized Depth by request (up to 200 meters)
	Package List
	1 x Product Unit
	1 x QIG