

## Conductivity/Salinity/TDS Analyzer

### Overview

SMART series intelligent multi-parameter universal controller has high accuracy, its unique professional design can be applied in water, chemical, pharmaceutical, food and hygiene in the production process of the most extreme physical and chemical environments. SMART series intelligent multi-parameter universal controller has modular bus structure, highly scalable functionality, high reliability and comfortable operation.

### Principle

Total dissolved solids (TDS) is the total amount of all solutes in water, including both inorganic and organic content. Since organic matter and molecular inorganic matter contained in natural water are generally not considered, the salt content is generally referred to as total dissolved solids.

Salinity refers to the amount of dissolved salts per kilogram of water, and can be understood as the concentration of salt in the water.

In general, the higher the conductivity, the higher the salt content, and the higher the TDS, which means that the water contains more impurities. Generally  $1\text{TDS}=0.5\mu\text{S}/\text{cm}$ .

In liquid conductors, current is generated by the movement of free ions. According to Ohm's law:  $I=U/R=U \cdot G$ , solution conductivity:  $C=G \cdot d/A=G \cdot k$  ( $d$  is the distance between the plates,  $A$  is the area of the plates, and the electrode constant  $k=d/A[\text{cm}^{-1}]$ ).

Electrode type: The conductivity is measured by using 4 electrodes equivalent to the two plates of the capacitor.

Inductive type: The transmitting coil generates an alternating magnetic field, which generates an induced voltage in the medium to move the positively or negatively charged ions in the liquid, and form an alternating current in the liquid. The current generates an alternating magnetic field in the receiving coil, and the circuit has a certain proportional relationship between the induced current generated by the coil and the conductivity, thereby measuring the conductivity. Since ion clusters are formed on the positive plate of the small face, the free movement of positive and negative ions is hindered, and it is impossible to measure solutions with high ion concentration, so an inductive sensor is required.



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### Typical application

- ▲ Source water monitoring
- ▲ Filter backwash detection
- ▲ Filter monitoring
- ▲ Drinking-water quality monitoring
- ▲ Separation process monitoring
- ▲ Cooling water monitoring
- ▲ Circulating water detection
- ▲ Sludge treatment monitoring
- ▲ Aeration tank monitoring

### Feature

- ★ Smart digital MEMS sensor
- ★ Sensor self-diagnosis, proactively reminding maintenance and management
- ★ The sensor automatically completes all compensation and measurement algorithms
- ★ Quick response sensor
- ★ IP68 Sensor
- ★ Automatic temperature compensation
- ★ Good robustness
- ★ 4-electrode/inductive sensor

### Application Case

- ▲ Power plant: the quality of boiler feed water
- ▲ Pharmaceutical: ultrapure water



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### Features

#### ❖ Quick and convenient

The navigation menu contains 6 languages, which can be operated easily.

#### ❖ Process safety

4.3" large size color LCD touch screen, convenient and safe touch operation and debugging

Large size screen with red flashing alarm, clearly visible from long distances and in dark areas

Alarm immediately, safe the process

#### ❖ Alarm event record

Real-time data curve display

Record function for up to 6,000 alarms

#### ❖ Expert calibration function

Multi-point calibration function up to 9 point

#### ❖ Powerful self-diagnosis function

Built-in heartbeat monitoring function and watchdog

Monitor the status of analyzer and sensors, and promptly remind customers to take necessary maintenance

High-standard hardware and software security and password protection

#### ❖ Powerful control function

High(low) limit control function

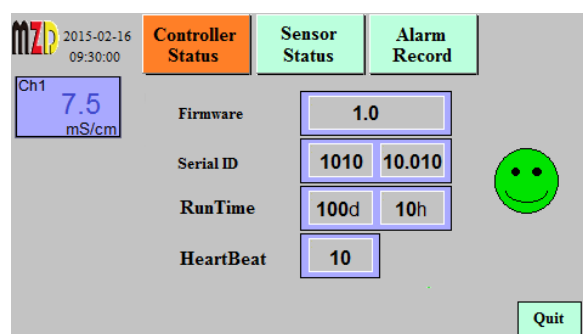
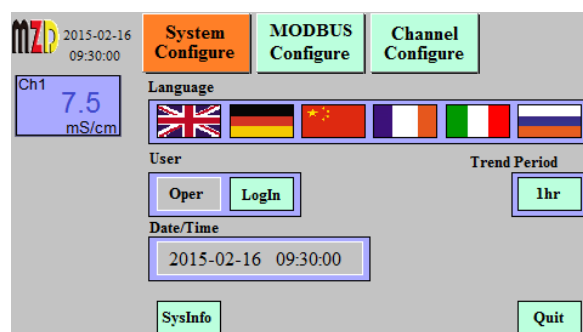
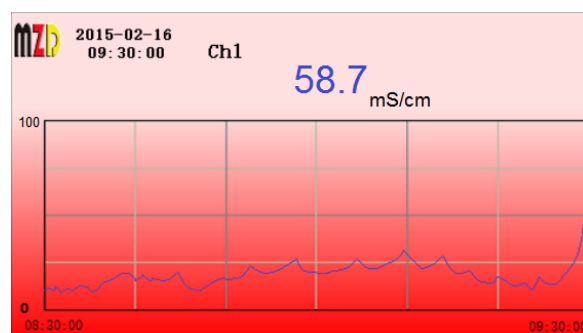
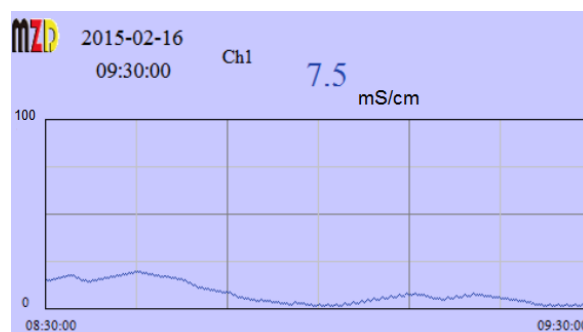
Optional: Timer control(automatic cleaning) function

Optional: analog PID control function

Optional: PWM control function

#### ❖ Flexible fieldbus communication functions for IOT4.0

Optional fieldbus MODBUS, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, etc.



## Conductivity/Salinity/TDS Analyzer

### Parameters

<b>Sensor Type</b>	Conductivity/Salinity /TDS_Total dissolved solids(4Electrode type/Inductive type)			
<b>Range</b>	4Electrode type:0~200mS/cm, 0~60g/Kg, 0~133000ppm Inductive type: 0~700mS/cm, 0~78g/Kg			
<b>Accuracy</b>	1% FS			
<b>Resolution</b>	0.01μS/cm, 0.1°C			
<b>Response Time T90</b>	<1 s			
<b>Temperature compensation</b>	Automatic			
<b>Working temperature</b>	0~50°C			
<b>Temperature Sensor</b>	CTN Thermistor			
<b>Pressure</b>	Max. 5Bar			
<b>Ambient Temperature</b>	-10~50°C			
<b>Ambient humidity</b>	0~90%			
<b>Sensor Size</b>	Φ27mm*150mm			
<b>Sensor Weight</b>	350g			
<b>Sensor Material</b>	PVC			
<b>Sensor Ingress Protection</b>	IP68			
<b>Sensor cable length</b>	7m			
<b>Display</b>	4.3" industrial color touch screen			
<b>Language</b>	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)			
<b>Diagnosis function</b>	Sensor and controller self-diagnosis,Heartbeat monitoring			
<b>Event Logger</b>	Internal Flash,up to 6,000 alarm records			
<b>Analog Output(Galvanic)</b>	4~20mA, maximum load 500Ω			
<b>Relay Output(Galvanic)</b>	Relay(2A, 230V AC freely set alarm), System alarm			
<b>Control function</b>	Optional Timer controller,PID analog controller,PWM controller			
<b>Calibration</b>	Can store 6 calibration curves of different materials, Multi-point calibration function up to 9 point			
<b>Communication</b>	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc			
<b>Power</b>	80~264V AC,1A or 19~28V DC,3A			
<b>Electrical protection</b>	EMI / RFI CEI-EN55011 – 05/99			
<b>Ambient Temperature</b>	-15 ~ 60°C			
<b>Storage and transport temperature</b>	-25 ~ 70°C			
<b>Ambient humidity</b>	0~90%RH			
<b>Wall-mounted(1~2Channels)</b>	4.3" color touchscreen	ABS,Gray RAL7045	213x185x84mm	IP65
	1.8" color LCD	Aluminum,Gray	180x160x135mm	IP65, Exd IICT4

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<b>Sensor Type</b>	Conductivity/Salinity /TDS_Total dissolved solids(4Electrode type/Inductive type)
<b>Display</b>	1.8" color LCD, 160*128Pixel
<b>Language</b>	English Menu
<b>LED Light</b>	Status LED Light(NAMUR NE107)
<b>Keypad</b>	Magnetic button
<b>Range</b>	4Electrode type:0~200mS/cm, 0~60g/Kg, 0~133000ppm Inductive type: 0~700mS/cm, 0~78g/Kg
<b>Accuracy</b>	1% FS
<b>Resolution</b>	0.01μS/cm, 0.1°C
<b>Response Time T90</b>	<1 s
<b>Temperature compensation</b>	Automatic
<b>Working temperature</b>	0~50°C
<b>Temperature Sensor</b>	CTN Thermistor
<b>Pressure</b>	Max. 5Bar
<b>Diagnosis function</b>	Sensor and controller self-diagnosis,Heartbeat monitoring
<b>Analog Output</b>	4~20mA, Maximum load 500 ohms
<b>Relay Output</b>	2 Relays (2A, 230V AC/DC freely set alarm), 1 Relay (System alarm)
<b>Communication</b>	RS485 MODBUS RTU Slave
<b>Power</b>	19 ~ 28V DC,0.5A
<b>Electrical protection</b>	EMI / RFI CEI-EN55011 – 05/99
<b>Ambient Temperature</b>	-10~50°C
<b>Ambient humidity</b>	0~90%
<b>Protection</b>	IP67
<b>Housing Material</b>	Aluminum alloy
<b>Size</b>	Φ126*110 mm
<b>Weight</b>	1.5Kg
<b>Explosion-proof</b>	Ex d IICT4 optional



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