The people for Process Analytics

MZD Analytik GmbH is located in Dresden, Europe's Silicon Valley, the capital of Saxony, Germany. It has set itself the goal of offering modern measuring and automation technology in process analytics. The leading employees of **MZD** have a Doctorate or Master's degree in technical discipline and, thanks to many years of experience, are able to competently solve the problems of measurement and automation technology that are pending in the industry. We place great value on certified quality standards for the products we developed and produced. **MZD** has a well-developed network in Europe and Asia(China) in order to be able to respond competently to all questions of our industrial customers.

Our engineers work in partnership with OEM/ODM's (and customers) from the initial design stage through post-production to ensure customer satisfaction throughout all phases of product development.

MZD offers for you both in Europe and Asia

- Project planning, construction and commissioning of measuring equipment, which we plan and act according to your task
- Coordination of all services, including our cooperation partners in some more complex tasks (general contractor)
- Calibration and adjustment of our measuring instruments

Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

MZD Analytik GmbH supply products as follows:

Moisture in Gas	0~1~500pppm(Max.2,500ppm)	**Dewpoint**	-100 ~ -20°C
H2S Gas Analyzer	0~100ppm up to 1%	**Cl2 Gas Analyzer**	0~100ppm up to 30%
HCl Gas Analyzer	0~10ppm up to100ppm	**NH3 Gas Analyzer**	0~10ppm up to100ppm
O2 Gas Analyzer	0~10ppm up to 100%	**O3 Gas Analyzer**	0~1ppm up to 5000ppm
H2 Gas Analyzer	0~100%	**CH4 Gas Analyzer**	0~100ppm up to 100%
C2H2 Gas Analyzer	0~100ppm up to 10%	**CmHn Gas Analyzer**	0~1000ppm up to 100%
CO Gas Analyzer	0~500ppm up to 100%	**CO2 Gas Analyzer**	0~50ppm up to 100%
SO2 Gas Analyzer	0~10ppm up to 10%	**NOx Gas Analyzer**	0~10ppm up to 5000ppm
He/Ne/Kr/D2/SF6/R125 Gas	0~100%		
Thermal Conductivity analyzer		two-component gas (%)	
Infrared photometry analyzer		CO,CO2,CmHn,N2O,SO2,CF4,SF6,H2O	
Ultraviolet photometry analyzer		SO2,NO,NO2,O3,Cl2,ClO2,CS2,H2S	
Laser analyzer		NH3,H2O,CO,CH2O...	
Medical Oxygen Analyzer		H2O,O2,CO,CO2	
Mutigas Analyzer	Up to six gases components		
Bulk Moisture	0~100%		
Water quality analyzer			
Fouling Monitoring	0~1000μm	**Turbidity**	0~4000NTU/FNU
Dissolved Oxygen	0~20mg/L or 200ppm or 200%SAT	**PH**	-2~16pH
ORP	-2000~2000mv	**Conductivity**	0~700ms/cm
Salinity	0~133000ppm	**Total dissolved solids**	0~78g/Kg
SS/MLSS	0~50g/L	**Chlorine/Dioxide Chlorine**	0~2/5/10ppm
COD	0~50mg/L or 1300mg/L	**BOD**	0~15mg/L or 350mg/L
TOC	0~20mg/L or 500mg/L		

If you have any demand for different measuring applications, please contact us. We can develop and customize the measuring system to fit your applications and wishes, for your private labeled products!

The basis of our work is the mutual trust between the partners in a long-term successful cooperation. Our service goal is to uncompromisingly achieve the satisfaction of our customers and to be the most important partner

MZD Analytik GmbH
Enderstraße 94
01277 Dresden, Germany
Tel: +49-(0)351-850-710-10
Email: info@mzdd.de

Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

Overview

Electrolysis principle for trace moisture measurement in gas was successfully tested and applied to trace moisture measurement by Keide in 1959. This method provides a continuous industrial measurement solution for trace moisture in non-alkaline gases, which can continuously, online and real-time monitor the trace moisture in various industrial processes.

Principle

The sensor are plated with parallel platinum layers or wound parallel platinum wires, the platinum wires are coated with a hydrated phosphorus pentoxide film. When the gas passes through the electrolytic cell, all of the water is absorbed and and generates phosphoric acid. At the same time, the DC voltage between the platinum wires causes the phosphoric acid to produce an electrolytic reaction to decompose oxygen, hydrogen and phosphorus pentoxide. When the absorption and electrolysis reach a balance, the water entering the electrolytic cell is all absorbed by the phosphorus pentoxide film and then electrolyzed completely. According to Faraday's law of electrolysis and the gas law, the absolute value of moisture in a gas sample can be directly measured according to the electrolysis current.

Application

- Chemicals (Especially for technologies with aggressive gases , PVC / Chlor-Alkali / Fluorine / Polysilicon / Silicone)
- Oil and gas
- Energy/Power Plant
- Air Separation Unit
- Microelectronics(OLED/capacitor/HID)
- Lithium battery
- University and research
- Glove Boxes

Trace Moisture Analyzer

Sensor features

Zirconia ceramic or glass material is optional. The movable construction of electrolytic cell is easy to disassemble and do maintenance.

Installation

▲Corrosive gas: PVDF electrolytic cell, Non-corrosive gas: PVDF or SS stainless steel electrolytic cell

▲The sample gas pressure can reach 3Bar(PVDF)/10Bar(SS)

▲Stable sample gas flow rate 20Nl/h or 100Nl/h

▲Three-way valve and four-way valve operation, convenient for sensor maintenance and recoating

▲Slight positive pressure protection of compressed air in the sampling unit

▲Filter can be used for unclean gases

▲Electric heating regulator can be used for liquid chlorine evaporation

▲Vacuum pump can be used for the vacuum sample gas

▲The sample gas outlet is recommended to be discharged into the exhaust gas treatment equipment

Some application case

▲Trace moisture measurement in chlorine at the inlet of the chlorine compressor for protection.

▲Trace moisture measurement in chlorine at the outlet and the final outlet of the chlorine compressor for protection.

▲Monitor the leakage of the precooler to protect the chlorine compressor.

▲Monitor the accuracy of the dew point analyzer at the outlet of the freezer.

Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

Features

❖ **Quick and convenient**

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

❖ **Process safety**

4.3” or 7" 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 flow monitoring

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

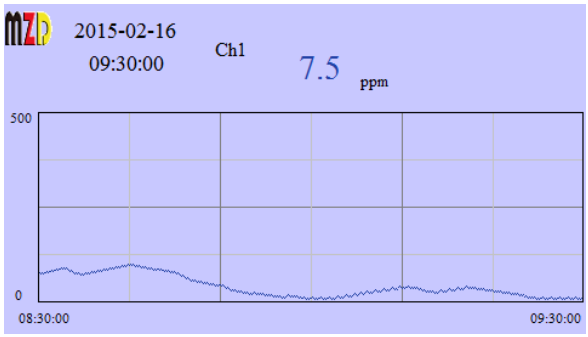
Optional: Timer control(automatic cleaning) function

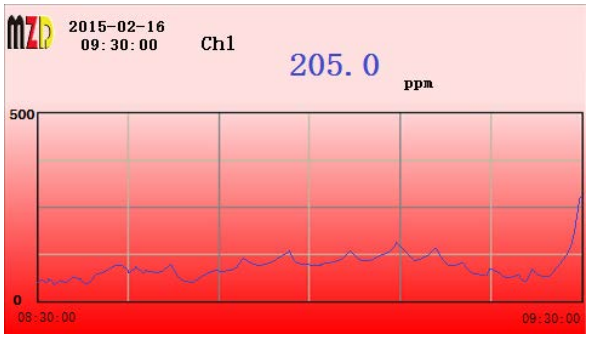
Optional: analog PID control function

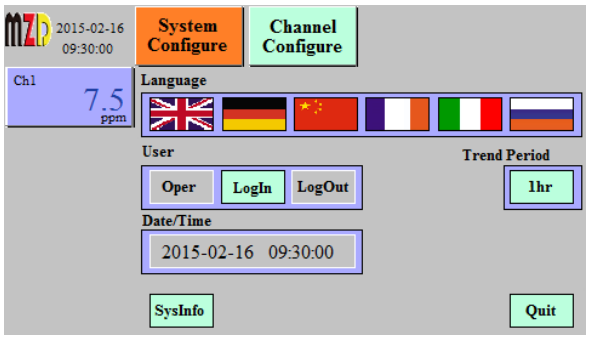
Optional: PWM control function

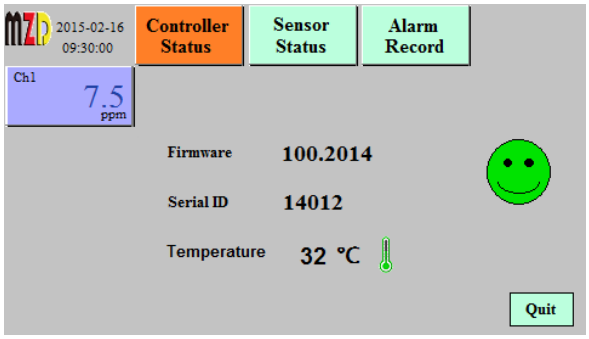
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

Trace Moisture Analyzer

Parameters

Sensor Material	Glass pillar with platinum wires or Platinum coated ceramic pillar			
Measuring Cell Material	PVDF or Stainless Steel			
Display	4.3" or 7" industrial color touch screen			
Language	Multi-Language (English, German, Chinese, French, Italian, Russian or Customized)			
Range	0~1 to 500ppm (*Maximum 2500ppm, free setting)			
Sensitivity	1ppb			
Accuracy	0.4ppm or 5% of measuring value(0~2,000ppm) 0.4ppm or 2% of measuring value(0~500ppm) 10% of measuring value(0~20,000ppb)			
Sensitivity	1ppb			
Response Time	Less than 1 s			
Action time T90 (up)	Less than 5 s			
Action time T90 (down)	Less than 15 min			
Diagnosis function	Flow monitoring, Sensor and controller self-diagnosis,Heartbeat monitoring			
Event Logger	Internal Flash,up to 6,000 alarm records			
Analog Output(Galvanic)	4~20mA, maximum load 500Ω			
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm			
Control function	Optional Timer controller,PID analog controller,PWM controller			
Calibration	Expert calibration function,Multi-point calibration function up to 9 point			
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc			
Power	80~264V AC,1A or 19~28V DC,3A			
Electrical protection	EMI / RFI CEI-EN55011 – 05/99			
Ambient Temperature	-15 ~ 60℃			
Storage and transport temperature	-25 ~ 70℃			
Gas Flow	20Nl/h or 100Nl/h			
Process Pressure(Max.)	3Bar(PVDF) or 10Bar(Stainless Steel)			
Sample gas temperature	5~65℃			
Process Connection	1/4"NPT thread or KF40 flange			
Diameter of connecting pipe	6mm			
Leakage Level	< $5x10^{-8}$ mbar x l / s^{-1}			
Wire Connections	5Pin			
Sensor Cable	3 ~ 150 meters			
Explosion-proof	Sensor Intrinsic Safety Ex ia optional, Exd IICT4 Controller optional			
Wall-mounted(1~2Channels)	4.3" color touchscreen	ABS,Gray RAL7045	213x185x84mm	IP65
	1.8" color LCD	Aluminum,Gray	180x160x135mm	IP65, Exd IICT4
Laboratory Desktop(1~2Channels)	7" color touchscreen	Aluminum,Black	250x144x184mm	IP40
Portable(1~2Channels)	7" color touchscreen	ABS,Yellow	420x325x180mm	IP67
19" Rack(1~6Channels)	7" color touchscreen	Aluminu,natural-coloured	483x133x238mm	IP40

Moisture Analyzer

Continuous Measurement of trace moisture in Corrosive Gases

Overview

Trace moisture analyzer is cost-effective and suitable for stable and continuous measurement of trace moisture of most gases.

Application

- Microelectronics(OLED/capacitor/HID)
- Lithium battery
- University and research
- Glove Boxes
- Metal heat treatment/welding
- Chemicals/Pharmaceuticals
- Air Separation Unit

Sensor Material	Platinum coated ceramic pillar
Display	1.8" color LCD, 160*128Pixel, English Menu, Status LED (NAMUR NE107)
Operation	Magnetic button
Range	0~1 to 500ppm (*Maximum 2500ppm, free setting) Or -100 ~ -20℃(Dew point)
Accuracy	2% of measuring value or 0.4ppm (0~500ppm range) 10% of measuring value (0~1ppm range)
Sensitivity	1ppb
Lowest detection limit	1ppb
Response Time	Less than 1s
Action time T90 (up)	Less than 5s
Action time T90 (down)	Less than 30 min
Diagnosis function	Self-diagnosis, heart beat monitoring
Analog Output	4~20mA，Maximum load 500 ohms
Relay Output	2 Relays (2A, 230V AC/DC freely set alarm), 1 Relay (System alarm)
Communication	RS485 MODBUS RTU Slave
Power	19 ~ 28V DC,0.5A
Ambient Temperature	5 ~ 65℃
Process Pressure (Max.)	20Bar
Gas Flow	20Nl/h (Recommend)
Process connection	NPT1/2” screw or KF40 flange
Housing Material	Aluminum alloy, Stainless steel
Size	Φ110*240*107 mm
Weight	1.5Kg
Explosion-proof	Ex d IICT4 optional

Moisture Sensor and Analyzer

Overview

Electrolysis principle for trace moisture measurement in gas was successfully tested and applied to trace moisture measurement by Keide in 1959. This method provides a continuous industrial measurement solution for trace moisture in non-alkaline gases, which can continuously, online and real-time monitor the trace moisture in various industrial processes.

Principle

The sensor pillar is plated with parallel spiral platinum layer as the electrode, and the hydrated phosphorus pentoxide film is coated between the platinum layer. Phosphorus pentoxide has a strong water absorption, when chlorine gas flows steadily through the sensor flow cell, where the water is absorbed to generate phosphoric acid, the reaction formula is as follows:

$P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$

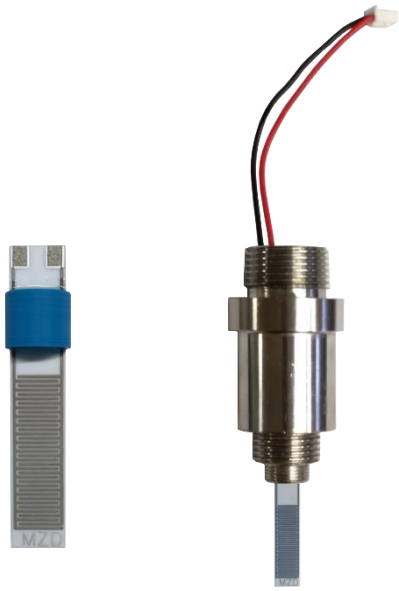
At the same time, between the two platinum layers to plus DC voltage, that has the electrolysis reaction, phosphoric acid is reductively decomposed into oxygen,chlorine, phosphorus pentoxide.The reaction formula is as follows:

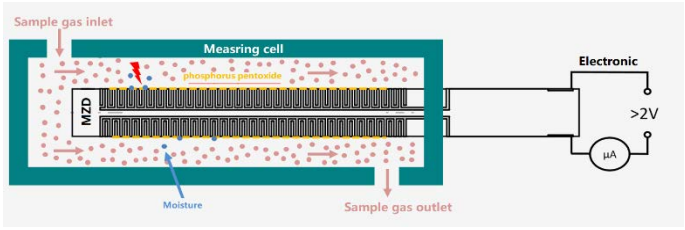
$4H_3PO_4 \rightarrow 6H_2+3O_2+2P_2O_5$

When the absorption and electrolysis reach a balance, the water entering the electrolytic cell is absorbed by the phosphorus pentoxide film and electrolyzed. According to Faraday's law of electrolysis and gas law, it can be deduced that the electrolysis current of water is proportional to the water content of the gas sample. The specific calculation relationship is as follows:

$I = QPT_0FU\times10^{-4}/3P_0TV_0$

I -- electrolysis current of water, μA;
U -- water content of the gas sample μL/L (volume ratio);
Q -- gas sample flow mL/min;
P -- environmental pressure, Pa;
T_0=273.15K;
F=96485C;
P_0=101325 Pa;
T -- the absolute temperature of the environment, K;
V_0=22.4L/mol.





Advantage

- Anticorrosive
- Quick response, T90(up) < 5s
- High accuracy and repeatability
- 0 ~ 10ppm/2000ppm
- No calibration required*
- Rugged and durable design
- Easy installation
- Long-life

*Recoating sensor regularly

Moisture Sensor and Analyzer

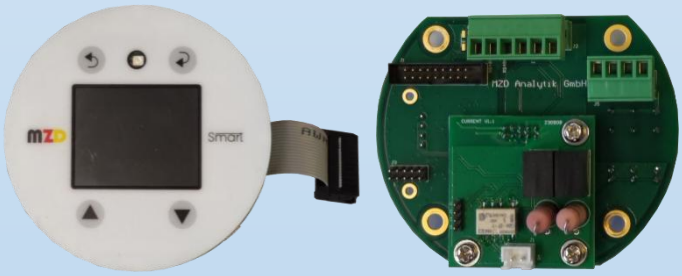
The electrolysis moisture analyzer is an absolute measurement method, which is stable and does not drift. It can be used for acid gas such as chlorine, hydrogen chloride, hydrogen sulfide, hydrogen fluoride, sulfur dioxide, sulfur trioxide, or used for air, nitrogen, hydrogen, oxygen, argon, helium, neon, carbon monoxide, carbon dioxide, sulfur hexafluoride , Methane, ethane, propane, butane, natural gas and other neutral gases, but not suitable for alkaline gases that react with P2O5, such as ammonia.

The phosphorous pentoxide coating needs to be regenerated regularly, and the maintenance cost is very low, usually using phosphoric acid regeneration every 3 to 6 months. When used in high-humidity situations, the life of the phosphorus pentoxide coating will be shortened, and the regeneration cycle needs to be shortened.

Features

- **Ceramic pillar sensor**: Based on the glass sensor, MZD have developed a ceramic sensor that can realize standardized and automation production. Positive and negative platinum layers are plated on ceramic cylinders or flat plates. The contact area between the platinum layer and the sample gas is larger, the reaction is faster, and the measurement is more stable and reliable.
- **No calibration required***
- Range: 0 ~ 1 to 500ppm*
- Quick response: T90(up) < 5s
- High accuracy and repeatability: Accuracy <2%FS, Repeatability <±0.5%FS
- Flow: 20l/h
- Rugged and durable design
- Long-life ceramic sensor

*Recoating sensor regularly



Main applications

- Lithium battery
- Vacuum drying oven manufacturer
- Vacuum glove box manufacturer
- Metal heat treatment/welding
- OLED/capacitor/HID lamp and electronics
- Fine Chemicals/Pharmaceuticals
- Vacuum drying box/glove box moisture meter and OEM
- Universities and scientific research institutions (nuclear industry/new energy materials)

Moisture Sensor and Analyzer

Parameters

Measuring principle	Electrolysis (P2O5 sensor)
Sensor Material	Platinum coated ceramic plate
Ambient Temperature	5 ~ 65℃
Process Pressure(Max.)	20Bar
Gas Flow	20Nl/h
Process connection	NPT1/2” screw or KF40 flange
Display	1.8" industrial color LCD, 160*128Pixel
LED Light	Status LED(Complies with NAMUR NE107)
Language	English Menu
Operation	Magnetic button
Range	0~1 to 500ppm(*Maximum 2500ppm, free setting)
Accuracy	0.4ppm or 2% of measuring value(0~500ppm) 10% of measuring value(0~1ppm)
Sensitivity	1ppb
Lowest detection limit	1ppb
Response Time	Less than 1 s
Action time T90 (up)	Less than 5 s
Action time T90 (down)	Less than 30 min
Diagnosis function	Self-diagnosis, Heartbeat monitoring
Calibration	Expert calibration function: Multi-point calibration function up to 9 point
Power	19 ~ 28V DC,0.5A
Analog Output	4~20mA
Relay Output	Relay(2A, 230V AC/DC freely set alarm), System alarm
Communication	RS485 MODBUS RTU
Electrical protection	EMI / RFI CEI-EN55011 – 05/99
Housing Material	Aluminum alloy, Stainless steel
Size	Φ110*240*107 mm
Weight	1.5Kg
Explosion-proof	Exd IICT4 optional

Bulk Moisture Analyzer

Online bulk material internal moisture measurement

Overview

SMART series intelligent bulk moisture analyzer can be applied to measure the moisture content in most solids, which helps to control product quality and cost (dryer, water, energy, weight, etc.) according to material moisture.

Principle

The capacitance field sensor generates electromagnetic waves (frequency of about 30 MHz), which can penetrate about 15 cm inside the material. Because the change of the moisture content causes the change of the dielectric constant, which makes the electromagnetic field change, the moisture inside the material can be detected.

Application

★Food: grains, flour, soybeans, malt, rapeseed, corn, lentils, noodles, bean products, sugar, beet saccharification, beet flakes, candy, grain starch, coffee raw materials, food processing materials, fish meal, dry food, potato products , Potato flour, crumbs, flakes, seasoning powder, milk powder, spices, nuts, etc.

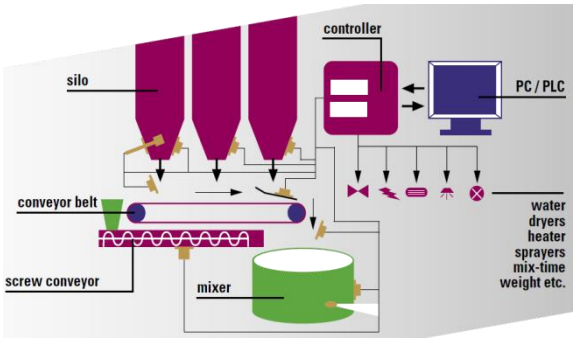
★Building materials: sand/gravel quartz powder, sand, bricks (raw materials), ceramics (raw materials), mortar, etc.

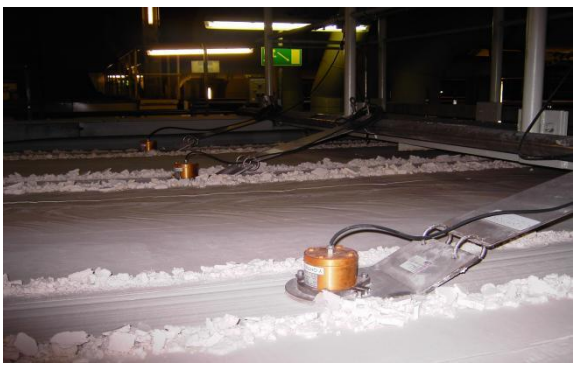
★Chemicals and pharmaceuticals: powder, granule, tablet, pill, flake fertilizer, phosphate, salt, potash, washing powder, polystyrene, foam plastic, synthetic material, PVC, acrylic paint, etc.

★Recycling: biomass, sludge, compost, etc.

★Others: wood shavings, sawdust, wood powder, calcium carbide slag, coal(pieces/powder), tobacco(shag/leaf), cast sand, glass, ceramics, coke, etc.

Bulk Moisture Analyzer





Features

★Can store 6 calibration curves of different materials.

★Detect the average moisture inside the material

★Insensitive to the color and PH value of the material

★ Very high repeatability.

★High sensor protection level

★Maintenance-free sensor

★Optional high temperature (up to 130℃) sensor or explosion-proof sensor

Installation

All Smart series smart bulk moisture sensors are dustproof, waterproof, shockproof and knockproof, and optional explosion-proof. The most typical installation positions of the sensor are inside the silo, on the silo wall, on the material conveying ramp, the upper or lower part of the conveyor belt, on the screw conveyor, and mixers and dryers.

Some application case:

★ Sludge water treatment, drying, wastewater and sludge process

★ Food (cereals, rice, flour, starch)

★ Salt products, mines

★ Potassium Chloride

★ Bulk Cargo Drying Plant

★ Ore processing

★ Energy/Coal

★ Sawdust, wood chips (granule products)

★ Porcelain products (granules and semi-finished products)

★ Clay processing

★ Kaolinit processing

★ REA-Gypsum products

★ Concrete mixing plant

Bulk Moisture Analyzer

Online bulk material internal moisture measurement

Features

❖ **Quick and convenient**

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

❖ **Process safety**

4.3” or 7" 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**

Can store 6 calibration curves of different materials

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

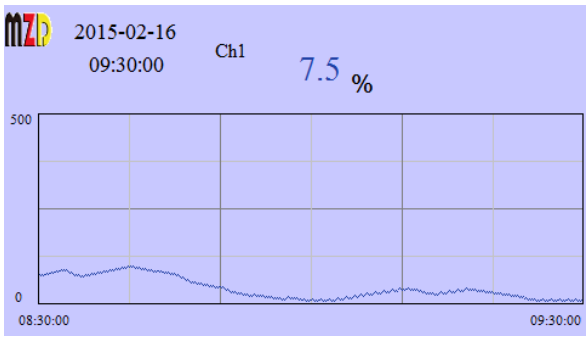
Optional: Timer control(automatic cleaning) function

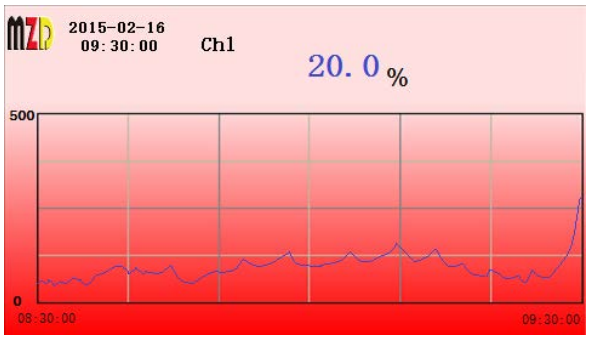
Optional: analog PID control function

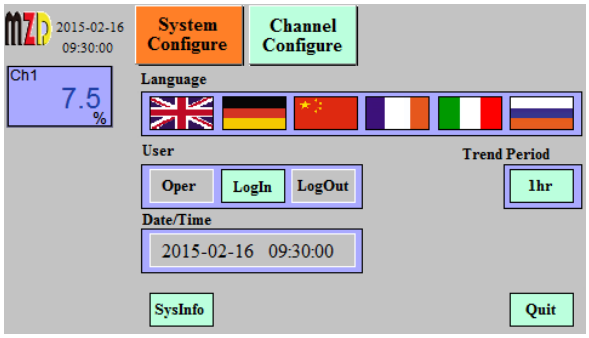
Optional: PWM control function

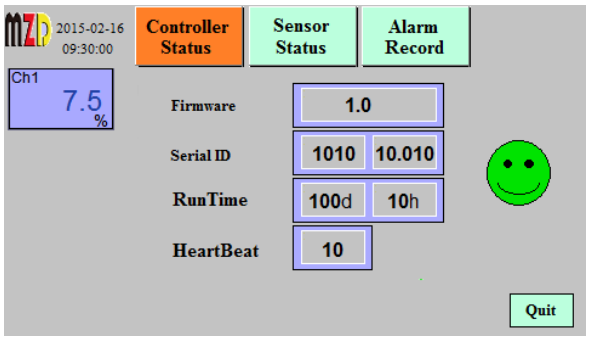
❖ **Flexible fieldbus communication functions for IOT4.0**

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









Modbus PROFIBUS Fieldbus Foundation HART COMMUNICATION PROTOCOL WirelessHART

Bulk Moisture Analyzer

Parameters

Measuring principle	Capacitive field sensor			
Range	0~100%			
Accuracy	0.1%*			
Depth	150mm			
Response Time	<1s			
Action time T90 (up)	<3s			
Working temperature	4~70℃			
Temperature compensation	Automatic internal temperature compensation			
Ambient Temperature	-35~80℃			
Sensor surface material	Wear-resistant plastic/ceramic/Teflon/rubber			
Material of sensor house	stainless steel			
Distance to material	Contact, or non-contact (maximum 1mm)			
Installation	Clamping flange			
Size	Φ76mm*70mm			
Ingress Protection	IP67			
Explosion-proof	Sensor Ex-Zone 20/22， Ex-Zone 0/1， ATEX Ex II 1/2， EExd ia IIC T6			
*Depends on materials and measurement installation conditions				
Display	4.3" or 7" industrial color touch screen			
Language	Multi-Language (English, German, Chinese, French,Italian, Russian or Customized)			
Diagnosis function	Sensor and controller self-diagnosis,Heartbeat monitoring			
Event Logger	Internal Flash,up to 6,000 alarm records			
Analog Output(Galvanic)	4~20mA, maximum load 500Ω			
Relay Output(Galvanic)	Relay(2A, 230V AC freely set alarm), System alarm			
Control function	Optional Timer controller,PID analog controller,PWM controller			
Calibration	Can store 6 calibration curves of different materials, Multi-point calibration function up to 9 point			
Communication	RS485 MODBUS RTU, HART, Foundation Fieldbus FF, PROFIBUS PA, PROFIBUS DP, MODBUS TCP/IP, etc			
Power	80~264V AC,1A or 19~28V DC,3A			
Electrical protection	EMI / RFI CEI-EN55011 – 05/99			
Ambient Temperature	-15 ~ 60℃			
Storage and transport temperature	-25 ~ 70℃			
Ambient humidity	0~90%RH			
Wall-mounted(1~2Channels)	4.3" color touchscreen	ABS,Gray RAL7045	213x185x84mm	IP65,Ex d IICT4 optional
	7" color touchscreen		323x237x172mm	