Solution for On-line MICRORADAR Moisture Analyzer for Powder and Grain Applications

On-line Conveyor Belt System

MS1510TAS Moisture Analyzer

Ref：sMS1510IntE

v1.0

The MS1510RAS ***Microwave Moisture Monitor*** allows accurate **measurement of moisture** in **real time** using a **microwave moisture** technique. This technique is applicable to a wide range of conducting materials including coal, bauxite, wood flake, sugar, bagasse, mineral sands, food, chemicals and others.

The Microwave Moisture Measurement Technique

The moisture content of the material is determined by measuring the transmission of a microwave beam through the process material. This beam is emitted from a transmitter located in one side of sample, always at the lower arm of the System Frame located under the conveyor belt. The transmitted microwave signal is detected by the receiver located in another side, always at the upper arm of the System Frame. The effect on the microwave signal by the material it passes through is recorded and used in the determination of the moisture content.

Flow Density Compensation emmbeded

Flunctuation of flow rate heavily influence the detect results in this technology. It always needs a certain way to monitor the cross density of the sampling flow as well, so that the exact moisture result could be calculated on time.

There are 3 density rectifying technology can be selected by user application situation.

- For sample space and flow stable conveyor, vonveyor speed test can be used
- Conveyor bottom is smooth sliding, US distance test can be used
- Unstable conveyor,flow system, γ-ray density transducer must be choosed.

Applications

Measurement of sand moisture in the concrete, calcareous sandstone or glass industries

Determination of the moisture of coke and sinter mixtures

Advantages

- Rapid realtime results
- Continuous measurement of moisture content on-belt frame construction
  Non contact technique, simple installation in or on existing tanks or vessels
- Independent of the temperature, pressure, pH value and color of the material
- Large measuring volume, ensuring a better, more representative measured value
- User set up

Benefits

- No segregation effects and low cost, straightforward installation
- No wear problems, low maintenance
- Allows proactive process control
- No costly sampling program and no operator intervention
- Elementary commissioning and "Two point" calibration

System Description

Measurement Frame

Call：010-8264.0226; 8264.0225; Fax: 010-8264.0221; 8264.0238;
P.o.Box: 603 BDTI Beijing, China 100190 http://www.fullsense.com/

The measurement On-belt frame houses the measurement systems - the microwave transmitter and receiver. The measurement systems are accurately aligned during the manufacturing process which means that there is no need for lengthy setting up on site. The Measurement Frame is normally arranged so that these measurement systems are aligned with the centre of the belt. The Measurement Frame is designed to fit directly to the conveyor stringers.

The lower arm of the Measurement Frame contains the microwave transmitter. The upper arm of the Measurement Frame contains the microwave receiver, the microwave electronics as well as STIM processor.

Electronic Transducer

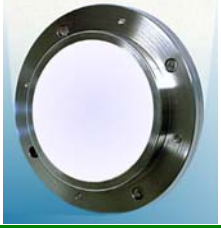
The standard MS1510RAS is supplied with the Electronics Control Cabinet mounted on the Measurement Frame. This cabinet contains electrical, electronic and microwave hardware which consists of:

- STIM Processor
- Power supplies.
- Electrical terminations.
- Microwave Components
- Display Panel and terminal.

Specifications

Operational	
Conveyor width	Up to 1400mm as standard (more than 1400mm requires customised Onbelt frame)
Conveyer Speed	No limit
Material Top Size	Typically up to 500mm (material dependent)
Bed Depth Range	Typically 20mm to 500mm ((material dependent)
Moisture range	0 - 80%
Measurement Update Time	Typically 1 minute (user configurable, dependent on process requirements)
Instrument precision	Typically 0.3% at 1 standard deviation (ultimate precision achievable 0.1%)
Electrical Requirements	
Field Unit (Independent system)	24V DC, Max < 300W supply
Remote Controller (Optional)	220 or 110 V ACt, single phase, <2 amp supply
Environmental Requirements	IP65
Operating temperature range	0 to 45°C with protection from direct sun and rain
Humidity	0 to 95% relative (non-condensing)
Outputs	
Instantaneous moistures	Isolated 4 to 20 mA current loops indicating the rolling average of moisture content over any accumulated time period. And RS485 communication supported with STIMcom, in accordance with IEEE1451.2 STIM standard. Modbus can be order by user.
System running	Relay closure indicating that no alarm conditions exist
Shipping mass	<150 kg

MS1519 Series Microwave Moisture Analyzer

Model	Specifications	Typical applications	
sMS1519TAS Transmission	Flow rate:<0.3m/s Sample thickness:>30mm Sensing space: ϕ72mm Range: 0- 30%, max to 60% Repeatability: 0.01%abs or 1%R Response: <100ms	Belt application Or container against installed	
sMS1519RAS Reflection	Plate Size: ϕ85mm Range: 0- 30%, max to 60% Repeatability: 0.01%abs or 1%R Response: <100ms	Tub, silo, chute etc installation	

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sMS1598Radar	Plate Size: ϕ85mm Range: 0- 30%, max to 60% Repeatability: 0.01%abs or 1%R Response: <100ms	Belt or other resource that can not being installed nearly by.

Assembly STIM Transducer (Independent Analyzer)

Device	Model	Range	
Moisture Transducer	MS1510TAS-B	0.5->30% up	Microwave Moisture Monitor BD5CMD included with LCD display and keypad, user setup

Selective Density Compensation Device

Device	Model	Introduction
Speed Transducer	SPC	For sample space and flow stable conveyor, vonveyor speed test can be used
US Distance Transducer	LM1700	If conveyor bottom is smooth sliding, US distance test can be used fo compensate the flunctuation of the belt for high accuracy measurement.
γ-ray density transducer	DS6201B	Unstable conveyor flow system, γ-ray density transducer must be choosed.
γ-ray Proof Frame		To protect human being from radiation hurt.

Note: Long time exposed to microwave fields is also harmful to health, please select protecton frame according to local law and conditions.

Sampling Accessories

Sample Smoother		

Remote Meter

Device	Model	Num of connection	Introduction
Digitalizer	XM3.5	1 to 1	0-20mA/0-5V signal
Digitalizer	XM4.5	1 to 1	0-20mA/0-5V signal
Controller	BD4CCD	1 to 32,64	Modbus/STIMcom communication

Instrumental Function Accessories

Device	Model	Introduction
Operator	DSP2000	Remote controller, Ethernet and Internet support
Printer	TPμp-24AP	Serial instrumental printer
Paper		Instrument recorder paper, for pinter usage
Wires		

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