

New NIR Technology for On-Line Process Measurement



FOOD

TOBACCO

WOOD PRODUCTS

PAPER PROCESSING

CHEMICALS

PHARMACEUTICALS

Real-Time
Moisture Sensor
IR-3000 Series

MoistTech.com
A Sensortech Company

❖ PRODUCT INFORMATION

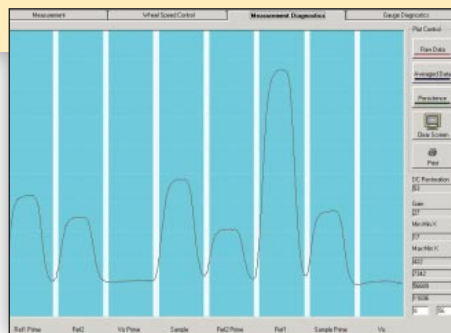
MoistTech's IR-3000 series allows users to optimize their on-line process and dramatically improve product quality. Developed for the 21st century, the IR-3000 series is utilizing a 16-bit A/D processor providing exceptional accuracy, speed of response and extensive diagnostic capability. In addition, the IR-3000 series low operating temperature has resulted in improved performance and reliability.

The IR-3000 series was designed in response to the industry demand for a more modern sensor without hard-wired interfaces. MoistTech uses state of the art components at a far lower cost than any analyzer currently on the market. The IR-3000 series utilizes surface mount and blue eye technology for use with a PDA. In addition to the high efficient first surface optics, new lamp designs and digital processing, the IR-3000 series is the only truly intelligent NIR sensor.

❖ NIR TECHNOLOGY

Molecular bonds, such as O-H in water and C-H in organics, absorb infrared light (NIR) at specific wavelengths. The amount of NIR reflected energy at a given wavelength is inversely proportional to the quantity of absorbing molecules within the product. The NIR technique is non-destructive, non-contacting and provides instant measurements. The IR-3000 series utilizes several wavelengths of Near Infrared Light (NIR), which are projected on the product at a very high frequency. The reflective light is then measured using a digitally enhanced detection system, which analyzes the data several thousand times per second. A powerful embedded PC is used to process, store, and display the required data with accuracy ten times more stable than other conventional sensors. The result is a measurement far more accurate than any sensors currently available.

The MoistTech/SensorTech Group has over 25 years of experience in the development of moisture sensors and is recognized as the world leader in IR, RF, and microwave technology.



Diagnostics Screen



Typical online, dusty installation

⊙ APPLICATIONS ⊙

FOOD

Cereals
Coffee
Tea
Milk Powder
Cheese
Cookies
Crackers
Animal Food
Citrus Pulp
Spent Grain
Chocolate
Potato Powder/Granules
Beet Pulp
Sugar

TOBACCO

Bright/Burley
Turkish
Cut Lamina
Stems
Leaf
Reconstituted
Chewing Tobacco
Cigar
Filler
Snuff
Cased Tobacco
CRS
Expanded

WOOD PRODUCTS

Medium Density
Fiberboard (MDF)
Oriented Strandboard (OSB)
Particleboard
Fiberboard
Hardboard
Flakeboard
Wood Shavings
Raw Material
Hog Fuel
Bark
Resin
Coating Measurement

PAPER PROCESSING

Paper
Converting
Coating
ReMoisturizing
Corrugating Control
Pressure Sensitive
Coatings
Hot Melts
Wax Coatings
Plastic Film Thickness
Carbonless
Coatings

CHEMICALS

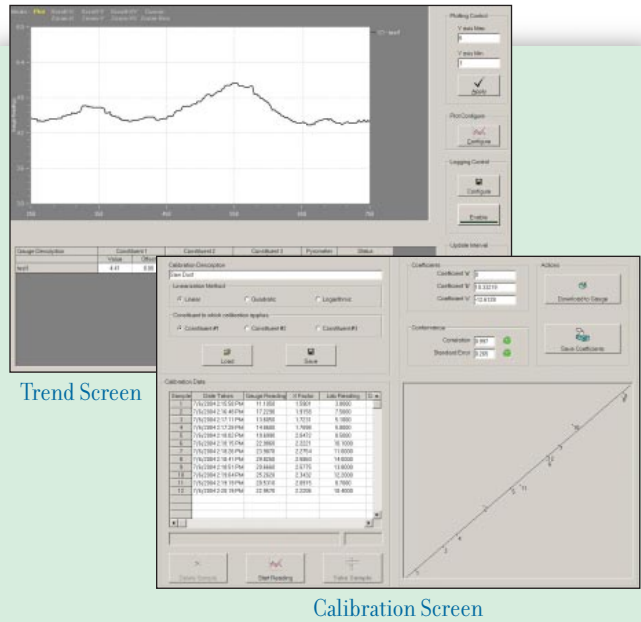
Fertilizers
Detergents
Soap Powder/Flakes
Minerals
Ceramics
Crumb Rubber
PVB Sheet
Laminated Glass
PVC
Cellulose
Acetate
Bauxite
Plastic Chips/Powders
Iron Ore
Cement
Foundry
Sand
Fiber Glass
Chalk

PHARMACEUTICALS

Powders
Pellets
Tablets
Vacuum Dryers
Spray Dryers

❖ MANAGEMENT SOFTWARE

MoistTech has designed a high-tech Windows™ program to configure and monitor the IR-3000 series gauge. With this program you can view and adjust calibrations, parameters and diagnostics. With digital displays and graphs the MoistTech Software program is easy to use and can be operated on any PC and/or laptop computer. While this software provides basic sensor monitoring and logging, communications protocol is provided to users to facilitate communication with more sophisticated HMI's such as Wonderware® and Intellution® products.



© IR-3000 SERIES FEATURES ©

- ❖ Non-contact
- ❖ Instantaneous measurement
- ❖ NEW Blue Eye technology for use with a PDA
- ❖ Optional user interface
- ❖ 25 times more processing power
- ❖ 16-bit data conversion and processing
- ❖ Surface mount technology
- ❖ Wavelength selection with each application
- ❖ Customized filter selection
- ❖ Non-volatile data storage in Flash™ (no battery backups)
- ❖ Advanced digital filtering for noise free signal
- ❖ No ambient or artificial light sensitivity
- ❖ Very low energy usage
- ❖ Digital diagnostics to monitor all critical components
- ❖ Standard Ethernet output

❖ BENEFITS

Enhanced product quality

Allows immediate production line adjustments to improve product quality and consistency

Improved performance

Allows 100% monitoring of the production process

Reduced "out of specifications product" with 100% inspections

Production line start-up time reduced to a minimum resulting in more in-spec product

Reduced energy usage

The drying process can be finally controlled resulting in a reduction in energy consumption

Production Line Integration

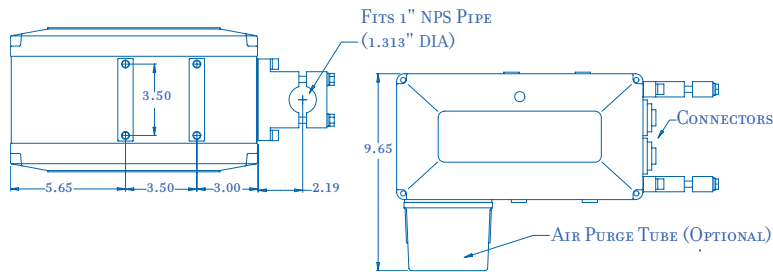
Allows multiple sensors to communicate with plant process computers for real time measurement and control

Low Cost Per Sensing Point

The IR-3000 series is substantially lower in cost than any current sensor on the market

© OPTIONS ©

| | |
|------------------------------------|--|
| PDA | Operator Interface Module |
| LED/LCD Digital Displays | Snorkel Sampler |
| Water Cooling Panel | Sample Hold |
| Vortec Air Cooling Panel | Non-Contact Product Temperature Sensor |
| Sensor Window Air Purge | Optical Window |
| Calibration Check Standards | Stainless Steel/Electro Nickel Enclosures |



◎ SPECIFICATIONS ◎

| | |
|------------------------------|---|
| Moisture Ranges | 0 – 0.1, 0 – 100% |
| Accuracy | ± 0.01% |
| Repeatability | ± 0.01% |
| Optical Measurement Distance | 5.0 – 15.0% (125 – 375mm) |
| Weight | 11 lbs (5 kg) |
| Operating Temperature | 0 – 130°F (0 – 55°C) |
| Vortec Cooling | Max 170°F (85°C) |
| Calibration | Pre-calibrated |
| Ambient Light Sensitivity | None |
| Systems Output | All analog and all digital I/O are isolated to meet UL, CSA and CE requirements. The sensor is completely self-contained for stand-alone operation and does not require a dedicated process/display unit. |

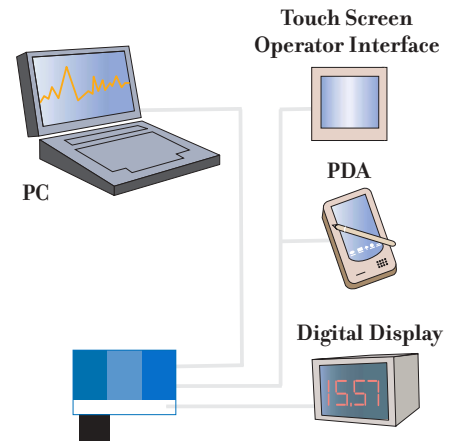
Sensor may be programmed from:

- PDA using wireless IR interface (IRDA) or using isolated RS232/422/485 communications
- PC using isolated RS232/422/485 communications

Communications:

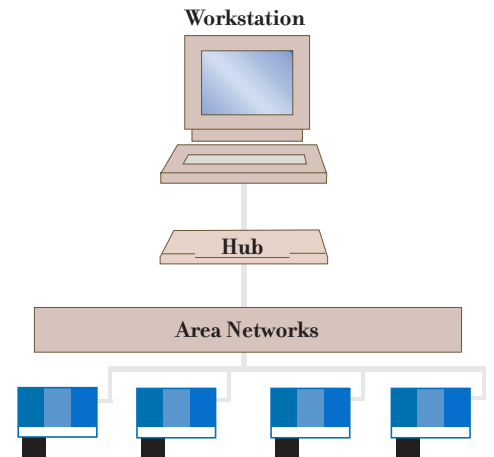
- Three isolated 4–20mA analog outputs
- RS232/422/485
- Local Area Network Protocols include: Ethernet, DeviceNet, Profibus, Modbus, Canbus, Fieldbus and TCP/IP

*Above specifications are subject to application.



Stand-Alone Configuration

The sensor can be installed with a PC or Touch Screen Operator Interface. A PDA is programmed to remotely monitor and adjust parameters. LED or LCD Digital Displays can also be used in conjunction with each sensor.



Multi-Sensor Configuration

Multi-sensors can be connected to a PC and management software is available to record each location for data on process monitoring and instrument performance. Each sensor can also be controlled with LED or LCD Digital Displays, Touch Screen Operator Interfaces as well as PDAs.

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