

# 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

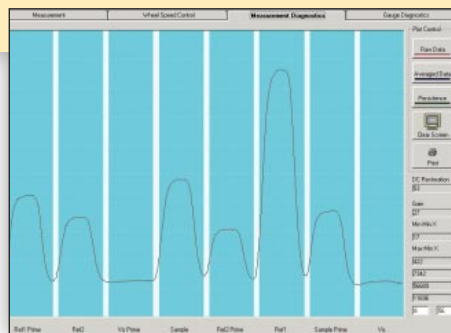
MoistTech's IR-3000 series allows users to optimize their on-line process and dramatically improve product quality. Developed for the 21st century, the IR-3000 series is utilizing a 16-bit A/D processor providing exceptional accuracy, speed of response and extensive diagnostic capability. In addition,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

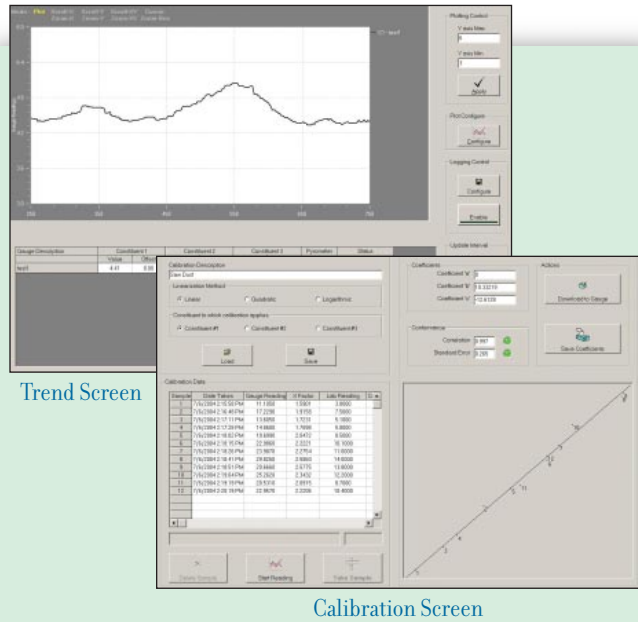
Fertilizers  
Detergents  
Soap Powder/Flakes  
Minerals  
Ceramics  
Crumb Rubber  
PVB Sheet  
Laminated Glass  
PVC  
Cellulose  
Acetate  
Bauxite  
Plastic Chips/Powders  
Iron Ore  
Cement  
Foundry  
Sand  
Fiber Glass  
Chalk

### 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*

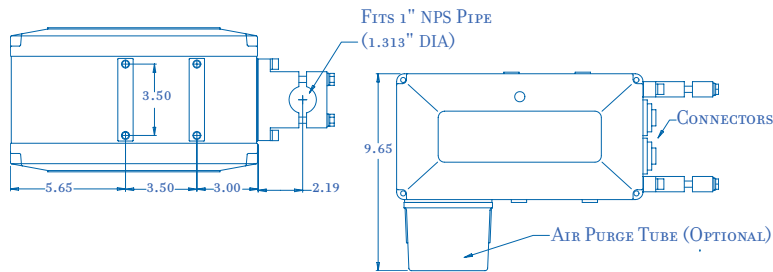
Allows multiple sensors to communicate with plant process computers for real time measurement and control

### *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.

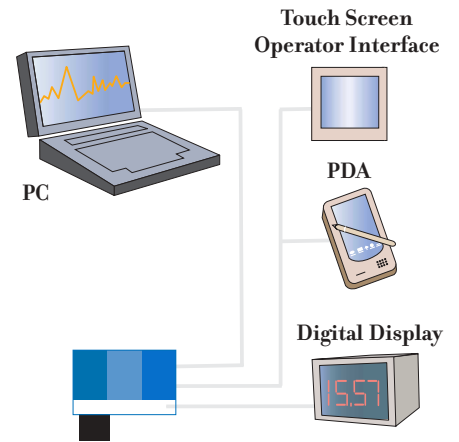
Sensor may be programmed from:

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

Communications:

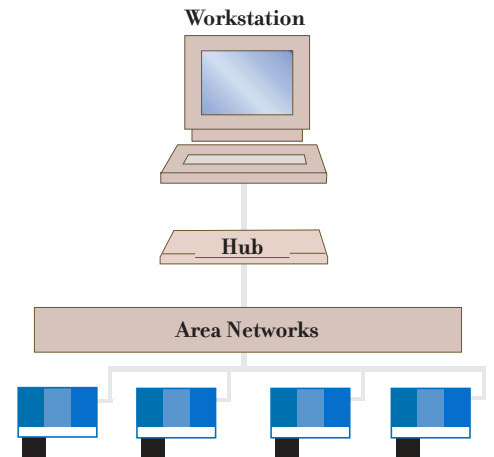
- Three isolated 4–20mA analog outputs
- RS232/422/485
- Local Area Network Protocols include: Ethernet, DeviceNet, Profibus, Modbus, Canbus, Fieldbus and TCP/IP

\*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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