New NIR Technology for On-Line Tobacco Processing Applications

Real-Time Moisture Sensor Model 828

WHOLE LEAF
WHOLE STEMS
CRS
CUT LAMINA
LAMINA STRIPS
EXPANDED TOBACCO

MoistTech.com
A Sensortech Company

※ PRODUCT INFORMATION

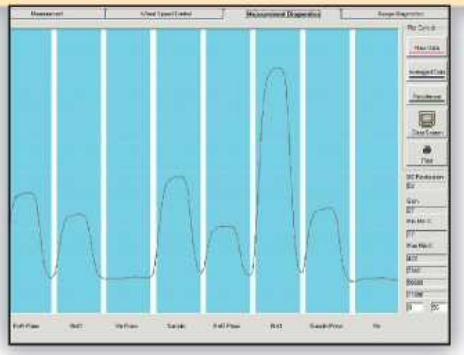
MoistTech has utilised the IR 3000 Series Analyser platform and further refined the technology in our Model 828 specifically for Tobacco applications. Precision filters and algorithms have been selected which are designed to optimise performance under the demanding conditions in Tobacco processing. While moisture measurement remains the most common requirement for the tobacco processor the multi-component capability of the Model 828 means combinations of nicotine, total sugars, flavour addition and temperature are also possible. Developed for the 21st century the model 828 is utilising a 16 bit A/D processor providing exceptional *Accuracy and Speed of Response* and extensive diagnostic capability. In addition the 828 has a ***Low Operating Temperature*** which has resulted in a far superior *Performance* and *Reliability.*

The IR 3000 series Model 828 was designed in response to the tobacco industry demand for a more modern sensor without hard wired interfaces. MoistTech uses state of the art surface mount technology along with Blue Eye for use with a PDA for wireless communication. In addition the systems optical design has been enhanced using highly efficient first surface reflectors and the latest in optical technology, resulting in dramatic improvements in product signal and therefore measurement stability.
Communication Technology in the sensor has been designed to meet all the requirements of the Tobacco processor. Ethernet, Modbus Analogue and Serial communication standard as well as Fieldbus Network interfaces communication protocols such as Profibus, Devicenet, HART plus others are available which enable us to provide customised solutions to the end user.
The IR 3000 Model 828 Tobacco Analyser is the only truly intelligent NIR sensor.

※ NIR TECHNOLOGY

Molecular bonds, such as O-H in water and C-H in organics, absorb near 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 model 828 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

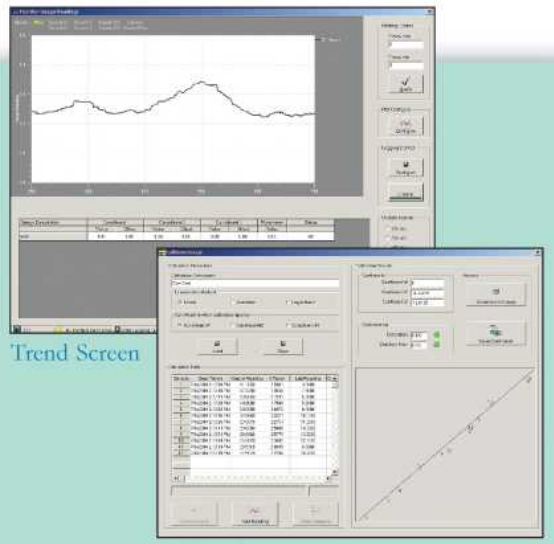
◎ APPLICATIONS ◎

TOBACCO

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

※ MANAGEMENT SOFTWARE

MoistTech has designed a high-tech Windows™ program to configure and monitor the IR 3000 series model 828 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.



Trend Screen

Calibration Screen

※ 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

Fastest Analysis

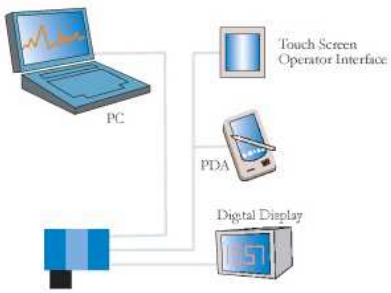
Upto ten times more samples per second than competative systems

◎ IR 3000 SERIES Model 828 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**

◎ OPTIONS ◎

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



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.

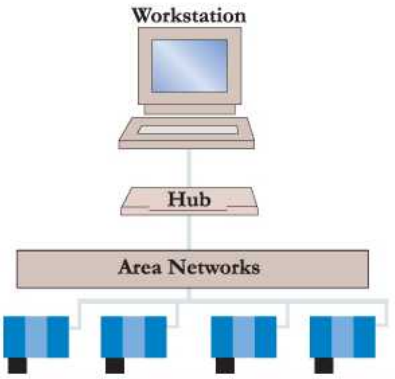
SPECIFICATIONS

Measured Range and Accuracy	Moisture Range 0-90% Accuracy +/- 0.1%* Nicotine Range 0-10% Accuracy +/- 0.1%* Sugars Range 0-40% Accuracy +/- 1%*
Repeatability	+/- 0.1 of measured value. Each dependent on product
Calibration	*Factory Pre-Calibrated. Routine Re-Calibration not required
Response Time	0.01s to 1000s
Operating Temperature	0 to 50 degrees Centigrade (32 to 122 degrees Fahrenheit) High Temp versions Available
Storage Temperature	-20 to 70 degrees Centigrade (-4 to 158 degrees Fahreheit)
Sensor/Sample Distance	10 - 35 cm (4 to 14 inches)
Sampling Size	Approximately 25 mm (1 inch) in diameter on sample
Sensor Construction	Cast aluminum housing designed to meet requirements of IP 65(NEMA 4)
Dimensions	31 cm x 18 cm x 16 cm (12.1 in x 7.1 in x 6.4 in) excluding mounting brackets & air purge tube
Weight	7 kilograms (15.5 pounds)
Outputs	3 x 4-20 ma isolated analog outputs RS 232/485/422 isolated digital outputs Ethernet communication Various LAN's (optional) IR communication channel (thru Palm-type PDA or similar)
Power Requirements	85 - 250VAC 50/60 hertz (auto switched) 25 watts power consumption
Local Area Network Protocols include	Ethernet, DeviceNet Profibus, Modbus, Canbus, Fieldbus and TCP/IP
Reliability	System Warranty 2yrs Lamp and Motor Lifetime (MTBF 20yrs)

*Above specifications are subject to application.

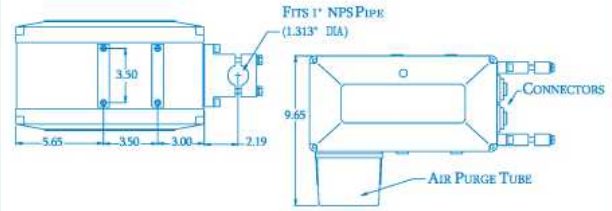
OPERATOR INTERFACE SPECIFICATION

I/O Ports	1 RJ45 Ethernet port for connection to sensor upto 100M (additional length conduct the factory) 2 Serial ports RS232and RS485 2 PS/2 ports for keyboard/mouse 1 USB port
Safety and Environment	FCC class B and CE certified BSMI certified Housing is IP65/NEMA4 compliant Operating temperature 0~50°C Storage temperature -20~60°C Humidity 10~95% @ 40°C
Screen	STN color LCD Size 145MM (5.7") diagonal Resolution 320x240 (QVGA)
Touch-Screen	Construction Tempered Glass Resolution Continuous Software Driver Windows CE
Operating System	Windows CE
Power	85~250Vac 50/60HZ @ 20W
Overall Dimensions	282w x 170h x 96d (mm)



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.



MoistTech.com
A Sensortech Company

Head Office
5140 Commerce Avenue C/D
Moorpark, CA93021 USA
Tel: 805-378-1160 Fax: 805-378-1163
http://www.moisttech.com
E-mail: info@MoistTech.com

Asia Pacific Office
1/375 Pacific Highway
Artarmon, NSW 2064, Australia
Tel: + 61 2 9438 4544 Fax: + 61 2 9438 4322
E-mail: seanh@sensortech.com