

Model 412 NIR Process Analyzer

GUIDED WAVE'S Model 412 process Analyzer offers remote multi-channel near-infrared (NIR, 1000-2100 nm) spectroscopic analysis. Essentially a smart chemical sensor, the Model 412 provides exceptional signal-to-noise, excellent wavelength stability, NIST traceable wavelength calibration, dual-beam optics and built-in diagnostics. Process operators, engineers, and researchers will appreciate the Model 412's ability to monitor up to 12 process streams (or points within a stream) with accuracy, repeatability, and reliability

Complete Analyzer System

The Model 412 is the core of a comprehensive process analyzer system that includes the spectrophotometer; one or more NIR probes, fiber optic cables, and intelligent scanning-and-analysis software. Like other Guided Wave spectrophotometers, the Model 412 uses near-infrared radiation to collect spectral data from liquids, gases, slurries, glass, and polymer-based films. The spectral data are interpreted by the analyzer system's software, to determine the composition and/or physical characteristics of the material.

Real-Time Measurements

In remote spectroscopy the analyzer transmits radiation to one or more probes installed directly in your process reactors or pipes. Readings can be made at any time, providing real-time process information. The Guided Wave Model 412 is designed to be used with Guided Wave's fiber optic cable. This patented cable contains a glass fiber, permitting transmission distances of up to several hundred meters.

True Multiplexing

The Model 412 also features Guided Wave's patented integrated multiplexing system. This permits the Model 412 to monitor up to twelve probes simultaneously greatly reducing the cost per measurement point. You may also purchase the Model 412 as a three-channel instrument, then upgrade it later to six, nine, or twelve channels.

Research-Grade Signal-to-Noise Ratio

The Model 412's dual-beam design, coupled with its high output scanning grating, puts more light into the fiber; providing the highest available signal-to-noise ratio of any process analyzer. Every Model 412 provides excellent wavelength accuracy (NIST traceable) and superb wavelength repeatability.



Designed For On-Line Processes

The Guided Wave Model 412 is suitable for on-line analyses of most processes and process streams. Two versions of the Model 412 are available. The NIR version uses an Indium-Gallium-Arsenide (InGaAs) detector and operates at 800-1700 nm. The extended, or XNIR, version uses a cooled extended-range InGaAs detector and operates at 1000-2100 nm. Here are just a few of the many applications for which our customers rely upon the Model 412 for every day:

- On-line analyses of polyols: OH and acid number
- On-line analyses of polymers: reaction endpoint, co-polymer ratio
- On-line analyses of films: color; thickness, %T, %R
- On-line measurement of moisture content
- On-line analyses of refinery products
- On-line analyses of vinyls: solvent composition
- Process research and development

Included as Standard Equipment

- CLASS-PA™ or SpectrOn™ process analysis software
- Integrated opto 22 I/O Panel w/16 positions
- Optical jumper cables and tool kit with torque wrench
- Temperature controlled NEMA 4 (IP66) Enclosure

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Specifications

Model	412 NIR	412 XNIR
Wavelength Range (rated)	800 - 1700 nm	1000 - 2100 nm
Wavelength Range (optimal)	900 - 1600 nm	1050 - 2000 nm
Wavelength Accuracy	±0.20 nm	±0.20 nm
Wavelength Repeatability	±0.02 nm	±0.02 nm
Wavelength Stability (rms/24hrs)	±0.05 nm	±0.05 nm
Minimum Step Size	0.2 nm	0.2 nm
Spectral Resolution	6.8 nm	6.8 nm
Photometric rms Noise	< 13 µAU	< 26 µAU
Photometric (Baseline) Stability (rms/24hrs)	< 1 mAU	< 1 mAU
Dynamic Range (Mid Range)	4.0 decades	4.0 decades
Optical Connections	SMA 905; 500 µm Diameter Single Strand Fiber Optic Cable	
Data Communications	RS422, RS-232 (DB9 Null Modem Cable), or optical fiber modem	
Dimensions	30" (w) x 17.3" (d) x 41.3" (h) [76 cm x 44 cm x 105 cm]	
Weight	200 lbs [91 kg]	
Power	1500 W, 110/220 Vac, 50/60 Hz	
Climate (Temperature/Humidity)	0 °C to 40 °C Shaded/0 - 100% Condensing	
Certification	CE, ATEX	

Options

- Camo Unscrambler® chemometrics software for Windows™
- Model Studio interface to Unscrambler®

Enclosure Options

The Guided Wave Model 412 comes installed with an air-cooled internal climate control system for General Purpose Environments NEMA 4 (IP66). This instrument can also be packaged for hazardous environments. These options include Class I Division 2 Groups C & D T2A, Class I Division 1 Groups C & D T3, and ATEX EEx pdem [ib] II C T4.

Instrument Control Unit (Host Computer)

The Model 412 must be used with an Instrument Control Unit (a Windows computer with at least one expansion slot). Call for specifications.

Operating Environment

- External (ambient) temperature 0-40 °C shaded location
- Temperature limits for constant operation ± 10 °C
- External humidity (condensing) 0-100%

