

# NIR-O™ Process Analyzer - Spectrometer

**GUIDED WAVE'S** NIR-O process analyzer offers remote multi-channel extended range near-infrared (xNIR 1000-2100nm) spectroscopic analysis. NIR-O provides excellent signal-to-noise ratio, wavelength stability, NIST traceable wavelength calibration, dual beam optics and built-in diagnostics. Process engineers, operators, and researchers will appreciate NIR-O's ability to monitor up to 12 process streams or points within a stream with accuracy, repeatability, and reliability.

## Complete Analyzer System

NIR-O is the core of a comprehensive process analyzer system that includes the spectrometer, one or more NIR probes, fiber optic cables, and OmniView™ scanning and analysis software. Like our previous Guided Wave spectrometers, NIR-O uses infrared radiation to collect spectral data from liquids, gases, glass, and polymer-based films. The spectral data are interpreted by the OmniView software to determine the composition or physical characteristics of the material.

## Real-Time Measurements

Using fiber optic cables to transmit intrinsically safe light from the spectrometer to your process and back allows real time measurements at any time, providing you with up-to-date process information. NIR-O is designed to be used with Guided Wave's 500 µm core jacketed fiber optic cables. These unique cables contain a high purity fused silica core fiber, surrounded by specialized jacketing to protect both the data transmitted and the fiber itself, allowing the analyzer to be located up to two hundred meters away.

## True Multiplexing

NIR-O can be configured for up to 12 channels (i.e., independent sample points). This allows you to incorporate the number of sampling points you need now, while being able to easily and more economically add sampling points as your process or facility needs change. NIR-O can measure multiple parameters at up to 12 independent sampling locations in rapid succession, using a solid state detector by employing digital optical switching technology. Multiplexing greatly reduces the cost-per-measurement point, making cost-per-result more economical.

## Research-Grade Signal-to-Noise Ratio

NIR-O's dual beam design, coupled with its high output near-zero aberration scanning grating, puts more light into the fiber. This provides an excellent signal-to-noise ratio, which means better sensitivity in your measurements. Each NIR-O provides excellent wavelength accuracy (NIST traceable) and superb wavelength repeatability.

## Designed for Online Processes

NIR-O is suitable for online analyses of most processes and process streams. Having the built-in capacity to add more sampling points (up to 12 total channels) within the same process or across processes, in any combination, gives you the flexibility to invest in exactly the capacity you require now. It also minimizes



investment for any expansion you may want in the future. NIR-O is compatible with all Guided Wave probes and flow cells which can be used in any combination required for your analytical needs. NIR-O operates in the xNIR range of 1000-2100nm, using process-proven TE-cooled InGaAs detector technology. Built-in Modbus TCP over Ethernet allows easy communication with your system. NIR-O is rugged and robust for process installations.

## Common Online Applications/Analyses

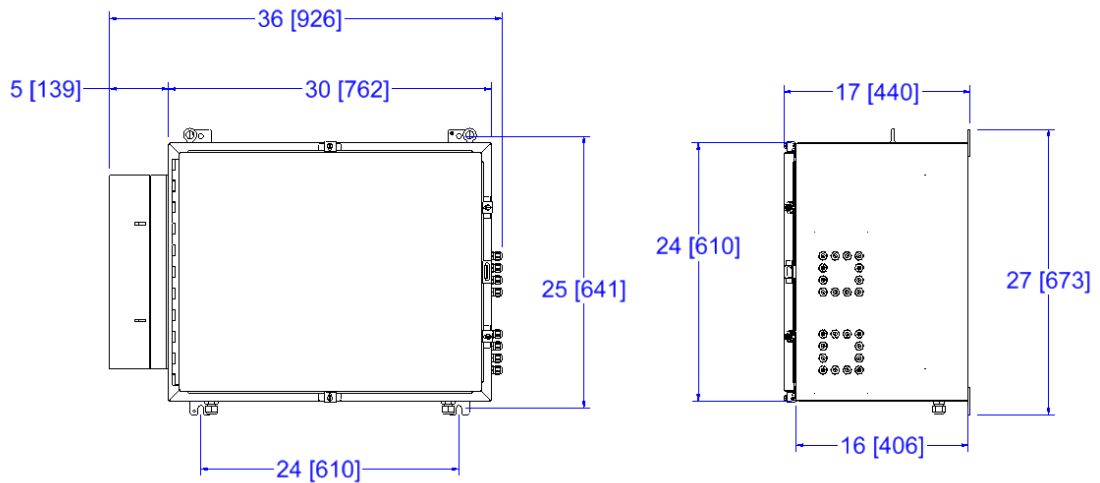
- Polyols: OH (hydroxyl) and acid number
- Polymers: reaction endpoint, co-polymer ratio
- Films: thickness, %T, %R
- Measurement of moisture content
- Refinery products; RON, MON, RVP, BPs, Olefins, % Oxygen
- Vinyls: solvent composition
- Process research and development

## Options:

- Touch screen computer for local process visualization and control (only on general purpose and Z-purge package)
- Z-Purge package: Class 1 Div 2 Groups A,B,C,D (CSA<sub>US</sub>)  
Class 1 Zone 2 Groups IIC (ATEX, IECEx)
- X-Purge package: Class 1 Div 1 Groups A,B,C,D (CSA<sub>US</sub>)  
Class 1 Zone 1 Groups IIC (ATEX, IECEx)
- Camo Unscrambler® chemometrics software
- Support for popular prediction engines
- Remote desktop computer
- External 4-20mA analog I/O box, custom configured for your needs
- Starter Library models for Refinery Applications
- Chemometric modeling support available
- FAT/SAT support available
- Chemometric and/or instrument maintenance training
- WaveCare extended warranty and premium support packages

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12 channel NIR-O General Purpose (GP) enclosure shown. Dimensions will vary depending upon purge packages



## Specifications

Warranty	Two (2) Year Limited Warranty
Channels	Up to 12
Dual Beam	1 reference channel for each 6 available sample channels
Light Source	Tungsten Halogen, 7.5 V, 15 W (5000 hour life), additional spare lamp included
Fiber Optic Cables	500 $\mu$ m diameter ultra low OH
Fiber Optic Cable Connectors	SMA 905
Detector Type	Extended range InGaAs with 2-stage TE cooler
Multiplexer	Digital Rotary Switch
Modbus Communications	Modbus TCP over Ethernet or external OPTO 22 analog and digital I/O
Software Required	OmniView™ Process Analysis Software (literature #7004)
Wavelength Range	1000-2100 nm
Wavelength Accuracy	$\pm 0.10$ nm
Wavelength Precision (Repeatability)	$\pm 0.02$ nm
Wavelength Stability (Drift)	$\pm 0.02$ nm/day rms
Minimum Step Size	0.5 nm
Photometric Noise	Single scan full range $\leq 50$ $\mu$ AU rms, 4 scan average full range $\leq 25$ $\mu$ AU rms
Photometric Stability (Baseline)	$\leq 0.00075$ AU/day rms
Stray Light	$\pm 0.1$ %
Scan Time (Dual Beam)	6 sec/channel (1000 - 2100 nm) minimum
RoHS Compliant	Yes
Dimensions (General Purpose)	Overall: 36" (w) x 17" (d) x 27" (h) [93 cm x 44 cm x 68 cm]
Enclosure Options	Temperature controlled NEMA 12, NEMA 4, IP 54, IEC 60529
Protection Options	General Purpose, Z-Purge, X-Purge
Certifications	Pending $c_{CSA}_{us}$ ; C1D1, C1D2; ATEX, IECEx: C1Z1, C1Z2
Environmental	0-45°C Shaded, 0-100% Condensing
Weight	Approximately 180 lbs [82 kg]
Power Requirements	110/230 VAC, 50/60 Hz (instrument only) 50 W (1500 W maximum)



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Literature: 1052-17-09