

NIRQuest Spectrometers

Near-Infrared Measurements for Nearly Anything



NIRQuest Spectrometers

These small-footprint spectrometers cover various ranges from 900-2500 nm and are ideal for demanding applications ranging from moisture detection and chemical analysis to high-resolution laser and optical fiber characterization. Each NIRQuest spectrometer model is preset with optical bench and grating options appropriate for a wide range of NIR applications. We also offer a full range of slit, filter and grating options to optimize your setup for higher resolution needs or other performance requirements.

Features

- Choice of multiple spectrometer options for optimizing setups across the range from 800-2500 nm.
- Wide range of gratings, slits and accessories for maximum flexibility
- External hardware triggering function for capturing data when and external event occurs or to trigger and event after data acquisition

Physical	NIRQuest512-XR	NIRQuest512	NIRQuest512-1.9
Dimensions (mm):	182 x 110 x 47	182 x 110 x 47	182 x 110 x 47
Weight:	1.18 kg (2.6 lb.)	1.18 kg (2.6 lb.)	1.18 kg (2.6 lb.)
Optical Bench			
Entrance aperture (standard):	25 μm	25 μm	25 μm
Entrance aperture (custom options):	10 μm , 50 μm , 100 μm and 200 μm (or no slit)	10 μm , 50 μm , 100 μm and 200 μm (or no slit)	10 μm , 50 μm , 100 μm and 200 μm (or no slit)
Grating options (standard):	Grating NIR3, 150 l/mm, 900-1700 nm	Grating NIR3, 150 l/mm, 900-1700 nm	Grating NIR3, 150 l/mm, 900-1700 nm
Grating options (custom):	NIR10, NIR11, NIR12, NIR13 and NIR14	NIR10, NIR11, NIR12, NIR13 and NIR14	NIR10, NIR11, NIR12, NIR13 and NIR14
Longpass filter:	OF1-CGA-780 filter (standard); non-fluorescing, transmits >1000 nm	OF1-RG830 longpass NIR filter (optional)	OF1-CGA1000 (standard); non-fluorescing, transmits >1000 nm
Fiber optic connector:	SMA 905 to 0.22 numerical aperture single-strand optical fiber	SMA 905 to 0.22 numerical aperture single-strand optical fiber	SMA 905 to 0.22 numerical aperture single-strand optical fiber
Spectroscopic			
Wavelength range:	800-1600 nm w/Grating NIR3	900-1700 nm w/Grating NIR3	1100-1900 w/Grating NIR3
Optical resolution (FWHM):	~3.1 nm w/25 μm slit	~3.1 nm w/25 μm slit	~3.1 nm w/25 μm slit
Signal-to-noise ratio at full signal:	>15000:1 @ 100 ms integration; >13000:1 @ 1000 ms integration	>15000:1 @ 100 ms integration; >13000:1 @ 1000 ms integration	>15000:1 @ 100 ms integration; >13000:1 @ 1000 ms integration
A/D resolution	16-bit	16-bit	16-bit
Dark noise:	6 RMS counts @ 100 ms 12 RMS counts @ 1 s	6 RMS counts @ 100 ms 12 RMS counts @ 1 s	6 RMS counts @ 100 ms 12 RMS counts @ 250 ms
Dynamic range:	150M (system); 15K:1 for a single acquisition	150M (system); 15K:1 for a single acquisition	7.5M (system); 10K:1 for a single acquisition
Integration time:	1 ms -120 seconds	1 ms -120 seconds	1 ms -1 second
Noise Equivalent Power:	0.5pW	0.5pW	10.0pW
Electronics			
Power consumption:	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum
Data transfer speed:	Full scan to memory every 5 ms with USB 2.0 port	Full scan to memory every 5 ms with USB 2.0 port	Full scan to memory every 5 ms with USB 2.0 port
Inputs/outputs:	External trigger input + single strobe output	External trigger input + single strobe output	External trigger input + single strobe output
Trigger modes:	4 modes	4 modes	4 modes
Connector:	30-pin connector	30-pin connector	30-pin connector

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Specifications Comparison Table

Physical	NIRQuest256-2.1	NIRQuest512-2.2	NIRQuest512-2.5	NIRQuest256-2.5
Dimensions (mm):	182 x 110 x 47	182 x 110 x 47	182 x 110 x 47	182 x 110 x 47
Weight:	1.18 kg (2.6 lb.)	1.18 kg (2.6 lb.)	1.18 kg (2.6 lb.)	1.18 kg (2.6 lb.)
Optical Bench				
Design:	f/4, symmetrical crossed Czerny-Turner	f/4, symmetrical crossed Czerny-Turner	f/4, symmetrical crossed Czerny-Turner	f/4, symmetrical crossed Czerny-Turner
Entrance aperture (standard):	25 µm	25 µm	25 µm	25 µm
Entrance aperture (custom options):	10 µm, 50 µm, 100 µm and 200 µm (or no slit)	10 µm, 50 µm, 100 µm and 200 µm (or no slit)	10 µm, 50 µm, 100 µm and 200 µm (or no slit)	10 µm, 50 µm, 100 µm and 200 µm (or no slit)
Grating options (standard):	Grating NIR2, 100 l/mm, 900-2050 nm	Grating NIR2, 100 l/mm, 900-2050 nm	Grating NIR1, 75 l/mm, 1075-2500 nm	Grating NIR1, 75 l/mm, 1075-2500 nm
Grating options (custom):	NIR2, NIR3, NIR10, NIR11, NIR12 and NIR13	NIR2, NIR3, NIR10, NIR11, NIR12 and NIR13	NIR2, NIR3, NIR10, NIR11, NIR12 and NIR13	NIR2, NIR3, NIR10, NIR11, NIR12 and NIR13
Order-sorting filter:	Yes (standard w/NIR2)	Yes (standard w/NIR2)	Yes (standard w/NIR1)	Yes (standard w/NIR1)
Longpass filter:	OF1-RG830 longpass NIR filter (optional)	OF1-RG830 longpass NIR filter (optional)	OF1-RG830 longpass NIR filter (optional)	OF1-RG830 longpass NIR filter (optional)
Collimating and focusing mirrors:	Gold-coated for enhanced NIR reflectivity	Gold-coated for enhanced NIR reflectivity	Gold-coated for enhanced NIR reflectivity	Gold-coated for enhanced NIR reflectivity
Fiber optic connector:	SMA 905 to 0.22 numerical aperture single-strand optical fiber	SMA 905 to 0.22 numerical aperture single-strand optical fiber	SMA 905 to 0.22 numerical aperture single-strand optical fiber	SMA 905 to 0.22 numerical aperture single-strand optical fiber
Spectroscopic				
Wavelength range:	900-2050 nm w/Grating NIR2	900-2200 nm w/Grating NIR2	900-2500 nm w/Grating NIR1	900-2500 nm w/Grating NIR1
Optical resolution (FWHM):	~7.6 nm w/25 µm slit	~5.0 nm w/25 µm slit	~6.3 nm w/25 µm slit	~9.5 nm w/25 µm slit
Signal-to-noise ratio at full signal:	10000:1 @ 100 ms integration	10000:1 @ 100 ms integration	10000:1 @ 100 ms integration	7500:1 @ 10 ms integration
A/D resolution	16-bit	16-bit	16-bit	16-bit
Dark noise:	6 RMS counts @ 100 ms 12 RMS counts @ 250 ms	6 RMS counts @ 100 ms 12 RMS counts @ 250 ms	16 RMS counts @ 10 ms 24 RMS counts @ 30 ms	8 RMS counts @ 10 ms 12 RMS counts @ 30 ms
Dynamic range:	15M (system); 10K:1 for a single acquisition	7.5M (system); 10K:1 for a single acquisition	100K (system); 7.5K:1 for a single acquisition	500K (system); 7.5K:1 for a single acquisition
Integration time:	1 ms-2 s	1 ms-1 s	1 ms – 30 ms	1 ms-60 ms
Noise Equivalent Power:	5.0pW	10.0pW	100.0pW	25.0pW
Electronics				
Power consumption:	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum	USB power +5V, 0.5 A maximum; DC input jack +5V, 3 A maximum
Data transfer speed:	Full scan to memory every 5 ms with USB 2.0 port	Full scan to memory every 5 ms with USB 2.0 port	Full scan to memory every 5 ms with USB 2.0 port	Full scan to memory every 5 ms with USB 2.0 port
Inputs/outputs:	External trigger input + single strobe output	External trigger input + single strobe output	External trigger input + single strobe output	External trigger input + single strobe output
Breakout box compatibility:	Yes	Yes	Yes	Yes
Gated delay:	Yes, with external hardware trigger delay	Yes, with external hardware trigger delay	Yes, with external hardware trigger delay	Yes, with external hardware trigger delay
Connector:	30-pin connector	30-pin connector	30-pin connector	30-pin connector
Temperature and Thermoelectric Cooling				
Temperature limits (environmental):	10-35 °C (0-90% non-condensing)	10-35 °C (0-90% non-condensing)	10-35 °C (0-90% non-condensing)	10-35 °C (0-90% non-condensing)
TEC setpoint (software controlled):	Control at -20 °C (up to 45 °C below ambient)	Control at -20 °C (up to 45 °C below ambient)	Control at -20 °C (up to 45 °C below ambient)	Control at -20 °C (up to 45 °C below ambient)
TEC stability:	+/-0.5 °C of set temperature in <1 minute; typical long-term stability +/-0.1 °C	+/-0.5 °C of set temperature in <1 minute; typical long-term stability +/-0.1 °C	+/-0.5 °C of set temperature in <1 minute; typical long-term stability +/-0.1 °C	+/-0.5 °C of set temperature in <1 minute; typical long-term stability +/-0.1 °C