

Syncerity BI-NIR

Scientific Deep-cooled Camera for OEM Industrial Applications



NIR-enhanced Sensitivity
with Ultra-high
Spectral Resolution!

Key Features and Benefits

- **2048 × 70 back-illuminated sensor**
Enable optimum spectral resolution
- **NIR quantum efficiency enhancement**
40% QE at 1000 nm, ideal for NIR Spectroscopy
- **Deep thermoelectric cooling**
−50°C for low dark current
- **Improved etaloning**
Ideal for Raman applications
- **16-bit digitization**
Provides wide dynamic range
- **Lifetime vacuum warranty**
Metal-sealed technology for permanent vacuum

Sensor Size 2048 × 70

Deep-cooled −50°C

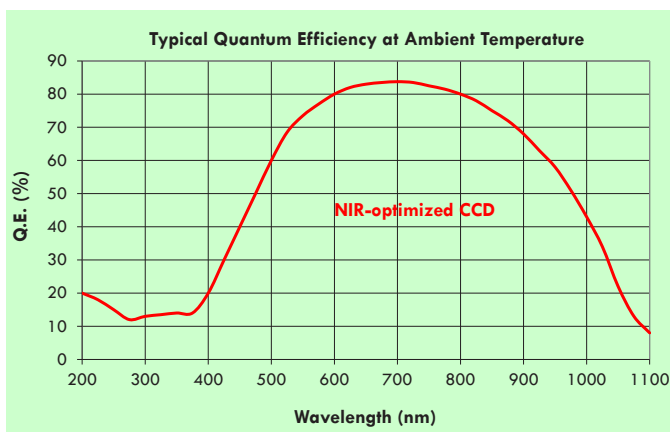
Pixel Size 14 μm × 14 μm

Digitization 16 bit

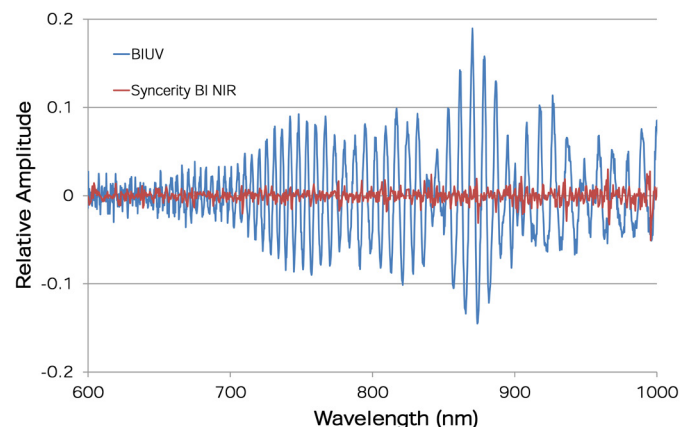
Sample Applications

- Raman spectroscopy
- Microspectroscopy
- Plasma analysis
- VIS/NIR photoluminescence
- Diffuse reflectance spectroscopy

Quantum Efficiency

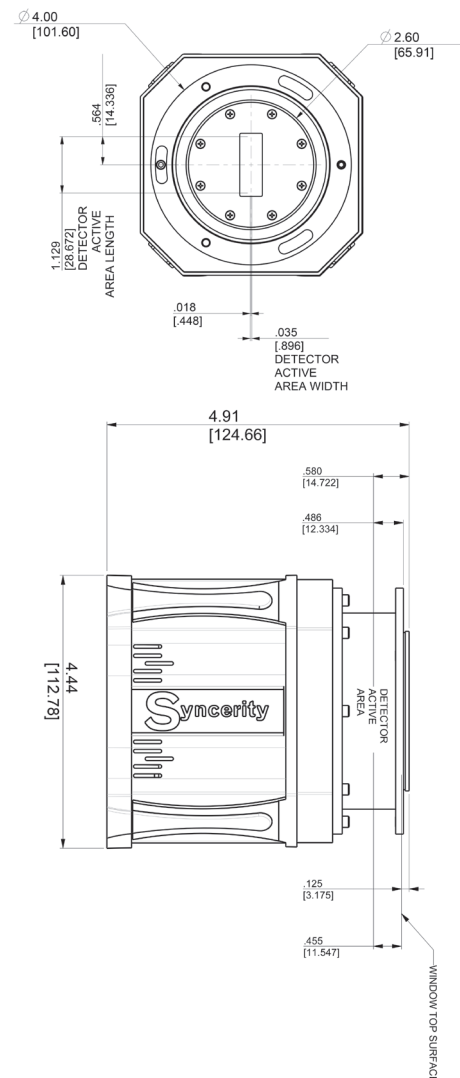


Suppressed Etaloning



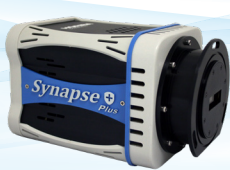



Syncerity™ BI-NIR Specifications

CCD Sensor Format	2048 × 70
Quantum efficiency at 20°C (See QE curve below for NIR-optimized)	60% at 500 nm; 80% at 600 nm; 80% at 800nm 68% at 900 nm; 42% at 1000 nm; 20% at 1075 nm
Pixel size	14 μm × 14 μm
Image area	28.7 mm × 0.98 mm, 100% fill factor
Deep thermoelectric cooling	-50°C at +25°C ambient (-60°C at +25°C ambient on request) Yields low dark current suitable for most OEM and some research applications
Single pixel well capacity	50 000 e ⁻ /pixel (minimum); 60 000 e ⁻ /pixel (typical)
Serial register full well capacity	250 000 e ⁻ /pixel (minimum) 500 000 e ⁻ /pixel (typical output register saturation)
Scan rates	45 kHz and 500 kHz
Readout noise (at 45 kHz and at -50°C)¹ Readout noise (at 500 kHz and at -50°C)¹	9 e ⁻ (typical) to 12 e ⁻ (maximum) 20 e ⁻ (typical) to 25 e ⁻ (maximum)
Maximum spectral rate	20 Hz at 45 kHz scan rate 189 Hz at 500 kHz scan rate
Digitization	16-bit ADC
Dynamic range (typical for single pixel)²	55 500:1
Non-linearity (measured on each camera)	<0.15% (typical) at 45 kHz (0.4% maximum) <0.20% (typical) at 500 kHz (1% maximum)
Dark current at -50°C³ (Note that pixel size = 14 μm)	0.05 e ⁻ /pixel/s (typical)
Software-adjustable gains	2, 4, and 10 e ⁻ /count at -50°C
Environmental conditions	<ul style="list-style-type: none"> Operating temperature 0°C to 40°C ambient Relative humidity <70% (non-condensing) Storage temperature -25°C to 50°C
Weight	1.769 kg (3.90 lb)
Dimensions	See mechanical drawings
Power requirements AC/DC power supply (provided) Recommendation for OEM supplying camera to power directly:	90–264 VAC, 47–63 Hz <ul style="list-style-type: none"> Pin: +9 V, ± 5%, 6.44 A maximum Regulation: +8.55 V_{min}, +9 V_{typ}, +9.45 V_{max} Ripple & Noise: 200 mV_{pp} maximum
Minimum computer requirements	<ul style="list-style-type: none"> 3.0 GHz single core or 2.4 GHz multi-core processor 2 GB RAM 32-bit or 64-bit compatible 500 MB free hard disk space (additional disk space may be required depending on data-storage needs) USB 2.0 High-speed host controller capable of sustained rate of 40 MB/s Windows® (XP, Vista and 7)



1. Entire system noise measured for a single pixel
2. Dynamic range is defined as Full Well/Readout Noise, measured at 45 kHz
3. Averaged over CCD area, but excluding any regions of blemishes.

Scientific Deep Cooled CCD, InGaAs and CMOS cameras

 <p>Syncerity®</p> <p>Low Cost -50° C Air-cooled OEM Camera</p>	 <p>Synapse® Plus</p> <p>Deep-cooled -80° C to -100° C Air or Water-cooled Camera</p>	 <p>Synapse® EM</p> <p>EM CCD Deep-cooled Camera</p>	 <p>VUV Syncerity®</p> <p>TE-cooled to -50° C (Vacuum) or -30° C with N2 purge</p>	 <p>Synapse® InGaAs</p> <p>Deep Cooled NIR Camera to -75° C (Water-cooled)</p>
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