The TE-cooled back-illuminated 2048 x 70 CCD Camera combines affordability, performance and versatility for OEM applications. With peak Q.E. of 84% @ 700 nm and 20% @ 1050 nm, Syncerity BI-NIR offers a relatively broad response and addresses multiple applications. In the NIR, this detector is a much lower cost alternative to a deep depleted CCD, with ultra-low etaloning. Syncerity’s flexible design allows our OEM-dedicated team to quickly adapt the camera for industrial requirements, ranging from alternate CCD chips to electronics customizations.

**Ideal for RAMAN**
High resolution:
14 µm pixel size
42% Q.E. @ 1000 nm (*)

**Ultra-low etaloning & much lower cost than Deep Depletion for OEM applications**

TE-cooled to -50°C (-60°C on request)
Great Q.E. from 400 to 1075 nm

**Back-illuminated CCD Technology**
Enhanced near infrared sensitivity Q.E. 42% @ 1000 nm.

**Deep Thermoelectric Cooling**
-50°C @ +25°C ambient (-60°C optional).

**Ultra-Compact Size**
Ideal for use on microscopes and OEM integration.

**Lifetime Vacuum Warranty**
All-metal sealed technology provides a maintenance-free permanent vacuum.

**PC Interface**
USB 2.0 high speed with 100% data integrity. No controller box.

**Ruggedized Connectors**
Maintains overall system integrity in industrial environments.

**Scientific Grade CCD with 1 mm Height Spectroscopy Format**
Ideally suited for low light level detection in a variety of spectroscopic applications. We offer other CCD formats and sensor types for OEM volumes.

**Flexible Input & Output Trigger Interface**
Experiment synchronization with External Trigger In & TTL Shutter Out with programmable edge triggering.

**LabView VIs and SDK available.**
Flexible software to integrate a Syncerity CCD into existing apparatus or as an OEM component.
Contact us for a Linux driver.

*Q.E. from CCD manufacturer @ 25°C
### SYNCERITY™ BI-NIR 2048 x 70 — Back-illuminated

<table>
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<tr>
<th>Specification</th>
<th>Details</th>
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<tr>
<td><strong>CCD Sensor Format</strong></td>
<td>2048 x 70 pixels</td>
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</table>
| **Quantum Efficiency @ 25°C**                    | 60% @ 500 nm  
68% @ 900 nm  
68% @ 900 nm  
80% @ 600 nm  
42% @ 1000 nm  
20% @ 1075 nm |
| **Pixel Size**                                    | 14 μm x 14 μm |
| **Image Area**                                    | 28.7 mm x 0.98 mm, 100% fill factor |
| **Deep Thermoelectric Cooling**                  | –50°C @ +25°C ambient (–60°C @ +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– (Minimum)  
500,000 e–/pixel (Typical)  
(Typical Output Register Saturation) |
| **Scan Rates**                                    | 45 kHz and 500 kHz |
| **Readout Noise (@ 45 kHz and @ –50°C)**         | 9 e– (Typical) to 12 e– (Maximum) |
| **Readout Noise (@ 500 kHz and @ –50°C)**        | 20 e– (Typical) to 25 e– (Maximum) |
| **Maximum Spectral Rate**                        | 20 Hz @ 45 kHz scan rate  
189 Hz @ 500 kHz scan rate |
| **Digitization**                                  | 16 bit ADC |
| **Dynamic Range (Typical for Serial Register)**  | 55,500:1 |
| **Non Linearity (Measured on Each Camera)**      | 0.15% (Typical) @ 45 kHz (0.4% maximum)  
0.20% (Typical) @ 500 kHz (1% maximum) |
| **Dark Current @ –50°C**                         | 0.05 e–/pixel/sec (Typical) |
| **Software-Adjustable Gains**                    | 2, 4 & 9.5 e–/count @ -50°C |
| **Environmental Conditions**                     | • 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**                                    | Refer to mechanical drawings herein |
| **Power Requirements**                           | 90–264 VAC, 47–63 Hz  
• Pin: +9 V ± 5%, 6.44 A maximum  
• Regulation: +8.55 Vmin, +9 Vtyp, +9.45 Vmax  
• Ripple & Noise: 200 mV pp maximum |
| **Minimum Computer Requirements**                | • 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) |

**Footnotes:**
1. Entire system noise measured for a single pixel
2. Dynamic range is defined as: Full Well / Readout Noise and is measured @ 45 kHz
3. Averaged over CCD area, but excluding any regions of blemishes.
Quantum Efficiency: 42% @ 1000 nm

**Typical Quantum Efficiency @ Ambient Temperature**

- **UV-VIS Optimized CCD**
- **NIR Optimized CCD**

*Syncerity BI-NIR Features an NIR-Optimized CCD (Q.E. measured @ 25ºC)*

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**Connecting to Syncerity**

**Power Interface:**
- Connector Type: PDP-40, Mini PWR DIN, 4-Position, STR Plug

**Camera Interface:**
- Connector Type: USB standard Type B

**Sync I/O Connectors:**
- Connector Type: SMB
- Input Jack: TTL IN (EXT TRIG IN)
- Output Plug: TTL OUT (SHUTTER Out)
Ordering Information

SYNCER-2048x70-NIR
Syncerity TE-cooled CCD Camera includes:
USB 2.0 Camera Head
AC-DC Power Supply
USB Cable
CD Manual

Optional:
UV-VIS CCD instead of NIR CCD (See Q.E. Curve)
Shutter Driver (SDrive-500 Shutter Control Unit with cable)
CCD Shutter
TTL IN Trigger Cable
Printed Manual