HORIBA Scientific

ELEMENTAL ANALYSIS
FLUORESCENCE
GRATINGS & OEM SPECTROMETERS
OPTICAL COMPONENTS
PARTICLE CHARACTERIZATION
RAMAN
SPECTROSCOPIC ELLIPSOMETRY
SPR IMAGING

SYNCERITY™ 1024 × 256

Open-Electrode TE-Cooled CCD Detector for UV-VIS-NIR

Lowest Noise & Highest Dynamic Range in its Class

Research Grade OEM Spectroscopy Camera for 200 nm–1050 nm

Flexible pricing structure scalable with performance and OEM volume requirements

The deep cooled Open Electrode 1024 × 256 CCD Camera combines affordability, performance and versatility for both research and OEM applications. With peak UV QE at 32% and peak VIS-NIR at 58%, Syncerity™ offers a relatively flat response and addresses multiple applications. In the near-NIR, this detector is a lower cost alternative to a deep depleted CCD, with no etaloning. The dynamic range of the Syncerity™ camera is unmatched at 92.5 dB (in image mode) and the CCD's tall format is an excellent fit for imaging spectroscopy applications. Its flexible design allows our OEM-dedicated team to quickly adapt the camera for industrial requirements, ranging from alternate CCD chips to electronics customizations.

Feature	Spectroscopy Benefits for Research and OEM
Unmatched Readout Noise	Unmatched Readout Noise at a speed of 45 kHz
Unparalleled Linearity & Dynamic Range	Measured values on each camera exhibit outstanding performance: 92.5 dB typical dynamic range with <0.4% non linearity.
Deep Thermoelectric Cooling (Minimum)	–60°C @ +25°C ambient yields very low dark current
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.
Open Electrode CCD Technology	Broad spectral coverage with QE of 27% at 250 nm and 55% at 800 nm.
Scientific Grade 1 CCD with 6.7 mm Height	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.

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Specifications

SYNCERITY™ 1024 × 256 – Open-Electrode

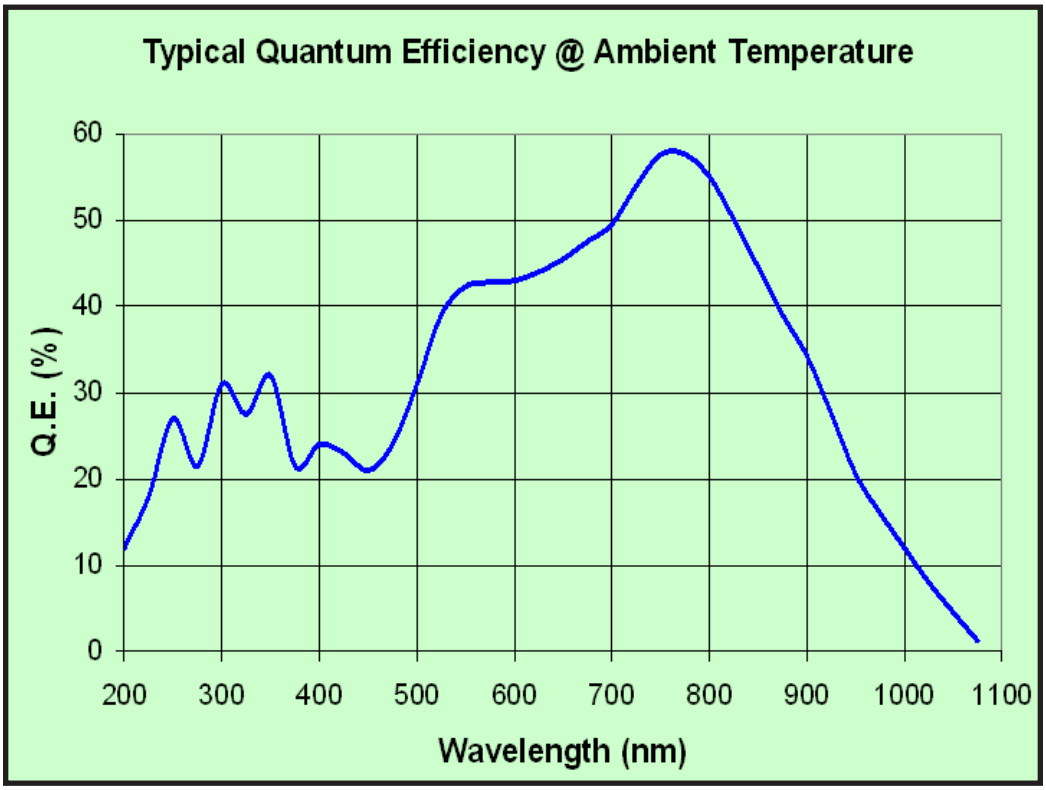
CCD Sensor Format	1024 × 256
Quantum Efficiency at 20 °C (See QE curve below)	27% at 250 nm 31% at 300 nm 42% at 550 nm 58% at 750 nm 55% at 800 nm 12% at 1000 nm
Pixel Size	26 µm × 26 µm
Image Area	26.6 mm × 6.7 mm, 100% fill factor
Deep Thermoelectric Cooling	–60 °C @ +25 °C ambient or –50°C @ +40 °C ambient Yields low dark current suitable for most OEM and some Research applications
Single Pixel Well Capacity	200 000 e^-/pixel (Minimum)
Serial Register Full Well Capacity	1 000 000 e^-/pixel (Typical Output Register Saturation)
Scan Rates	45 kHz and 1 MHz
Readout Noise (at 45 kHz and at –60 °C) *1	4.7 e^- (Typical) to 7 e^- (Maximum)
Readout Noise (at 1 MHz and at –60 °C) *1	17 e^- (Typical) to 20 e^- (Maximum)
Maximum Spectral Rate	27 Hz at 45 kHz scan rate 278 Hz at 1 MHz scan rate
Digitization	16 bit ADC
Dynamic Range (Typical for Single Pixel) *2	42 550:1 (92.5 dB providing >15 bit effective dynamic range)
Non Linearity (Measured on Each Camera)	< 0.4% at 45 kHz – Linearity better than 99.6% < 0.8% at 1 MHz – Linearity better than 99.2%
Dark Current at –60 °C *3 **(Note that pixel size = 26 µm)**	0.0052 e^-/pixel/sec (Typical) equivalent to 0.0020 e^-/pixel/sec for a 16 µm pixel size equivalent to 0.0031 e^-/pixel/sec for a 20 µm pixel size
Software-Adjustable Gains	1–12 e^-/count
Environmental Conditions	o Operating Temperature 0°C to 40°C ambient o Relative Humidity < 70% (non-condensing) o Storage Temperature –25°C to 50°C
Weight	1.769 kg (3.90 lb)
Dimensions	Refer to mechanical drawings herein
Power Requirements	
AC-DC Power Supply (Provided)	90–264 VAC, 47–63 Hz
Recommendation for OEM Supplying Camera Power Directly:	• 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:	• 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)

• All specifications subject to change without notice.

Footnotes:

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

Quantum Efficiency



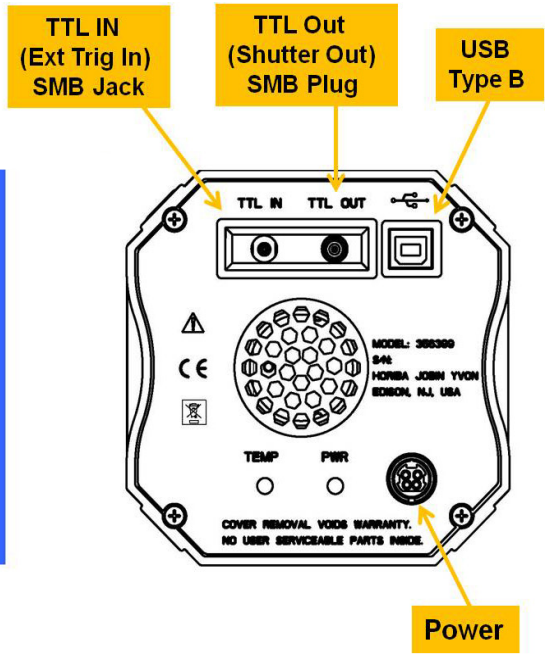
Connecting to Syncerity

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

Camera Interface:
Connector Type: USB standard Type B

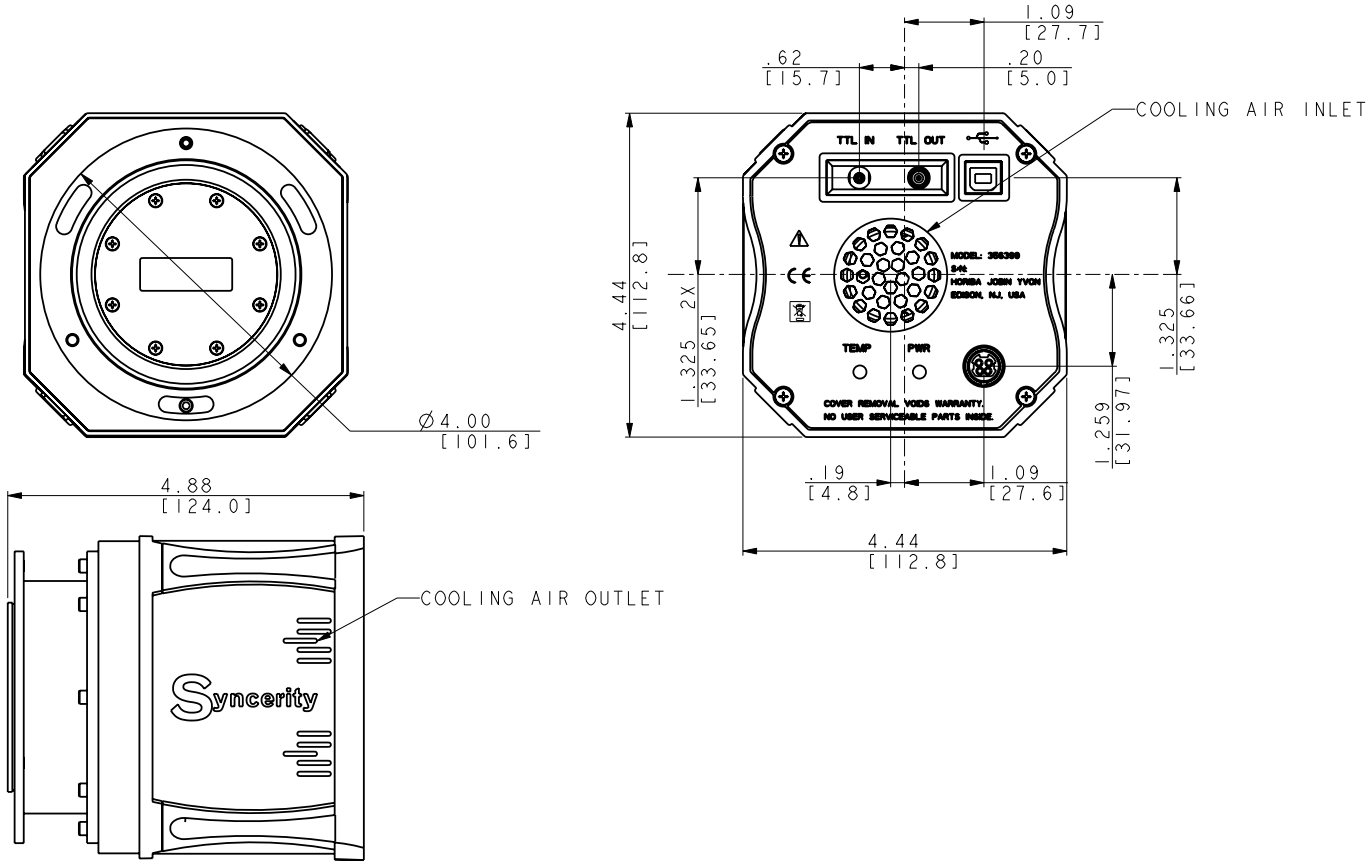
Sync I/O Connectors:
Connector Type: SMB

Input Jack: TTL IN (EXT TRIG IN)
Output Plug: TTL OUT (SHUTTER OUT)



Product Drawings

Dimensions in inches (mm)



Ordering Information

Syncer-1024x256-OE Syncerity TE Cooled CCD Camera Includes:
USB 2.0 Camera Head
Power Supply AC-DC
USB Cable
CD Manual

Optional:
Shutter Driver (SDrive-500 Shutter Control Unit with cable)
CCD Shutter
TTL (IN) Trigger Cable
Printed Manual

Accessory Information:

SDrive-500 Shutter Control Unit

The SDrive-500 Shutter Control Unit is designed to control the activation/opening of an electro-mechanical shutter during the interval when the CCD of a HORIBA Scientific detection system is being exposed to light.

Specifications	
System Parameter	**Units/Description**
	Environmental
Environmental Conditions	Storage Temperature from –25°C to +50°C Operating Ambient Temperature Range +25°C ± 5°C Relative Humidity ≤ 70% non-condensing
	TTL Level Electrical Input Signals
Trigger Input #1	TTL level input signal triggering shutter activation on the rising edge.
Trigger Input #2	TTL level input signal triggering shutter activation on the rising edge.
Shutter Override	TTL level switch located on the unit's front panel providing a manual override activation (i.e., opening) of the shutter.
	Shutter Output Excitation Drive
Shutter Coil Resistance	12 Ω
Shutter Pulsed Voltage to Open	+48 VDC
Shutter Hold Voltage	+5 VDC
Operating Frequency	40 Hz maximum rep rate
	Input Power Requirements
Input Line Voltage	85–264 VAC continuous / universal
Input Line Frequency	47–63 Hz
Input Power	55 W max
	Mechanical Dimensions
Dimensions (L × W × H)	7.24 in × 4.50 in × 3.15 in
Weight	1.3 kg (2.9 lbs)

• All specifications subject to change without notice.

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