

- ELEMENTAL ANALYSIS
- FLUORESCENCE
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- OPTICAL COMPONENTS**
- PARTICLE CHARACTERIZATION
- RAMAN
- SPECTROSCOPIC ELLIPSONOMETRY
- SPR IMAGING

*New QEXTRA  
QE-Enhancing and  
Fringe-Suppression  
Technology*

## Synapse<sup>®</sup> 1024 × 256 Back-Illuminated Deep- Depletion CCD Detector

Based on QEXTRA quantum-efficiency enhancing and fringe-suppression technology, the Synapse Back-Illuminated Deep-Depletion 1024 × 256 CCD from HORIBA Scientific is the best choice for spectroscopic applications in the near-IR (300–1050 nm) including Raman, photoluminescence, and fluorescence spectroscopy. Exclusive auxiliary analog input for a voltage or current source. Superior linearity (>99.6% at 20 kHz), which is crucial for absorption, reflectance, chemometrics, quantum yield, and radiometric measurements with up to 95% peak quantum efficiency.



Applications include Raman, fluorescence, and other luminescence applications.

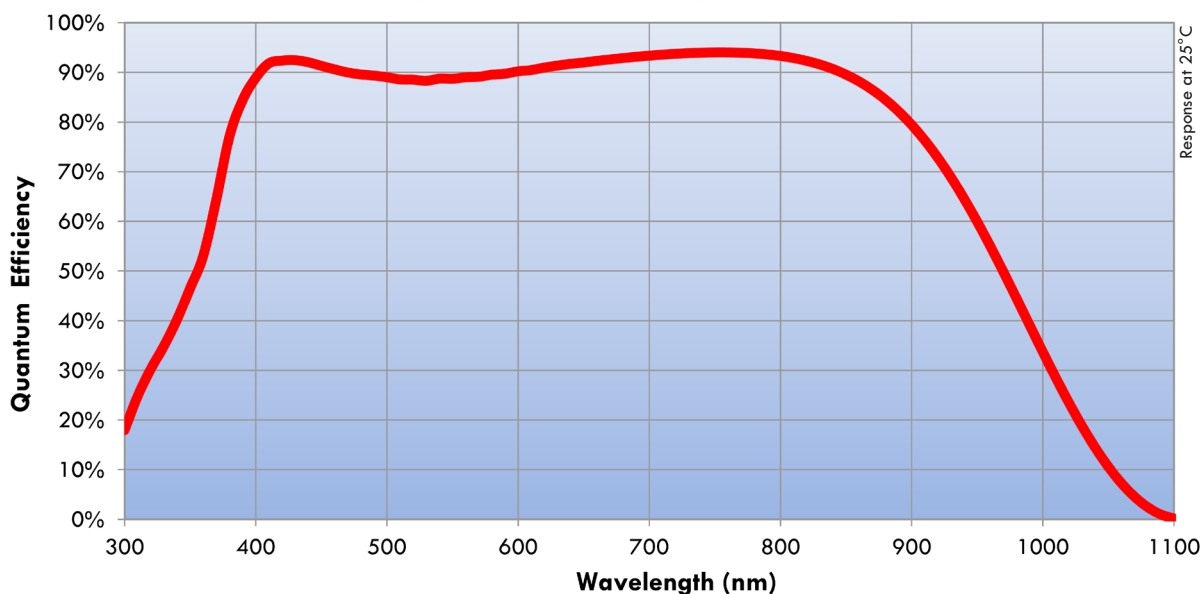
Feature	Spectroscopy Benefits
Deep Thermoelectric Cooling	Low dark signal with no need for liquid nitrogen
Lifetime Vacuum Warranty	All-metal sealed technology allows a permanent vacuum, letting us offer a lifetime warranty
Excellent Linearity	Increased accuracy of data over the full dynamic range
USB 2.0 Interface	Standard connection to PC notebooks and desktops with 100% data integrity
Auxiliary Signal Input	Unique ability to add measurements from single-channel detectors without additional electronics
Back-Illuminated Deep-Depletion Technology	Enhanced near-IR response with fringe suppression and greatly minimized etaloning
Scientific Grade 1 CCD	Ideally suited for low light level detection in a variety of spectroscopic applications
HORIBA Scientific's SynerJY <sup>®</sup> Software	Complete control of a Synapse CCD and HORIBA Scientific Spectrograph system with full analysis capabilities
LabVIEW VIs and SDK Available	Flexible software to integrate a Synapse CCD into existing apparatus or as an OEM component



## Specifications\*

CCD Format	1024 × 256, back-illuminated, deep-depletion, Scientific Grade 1			
Pixel Size	26 μm × 26 μm			
Image Area	26.6 mm × 6.7 mm, 100% fill factor			
Cooling System	Four-stage thermoelectric cooling. Typical operating temperature -80°C, guaranteed to -75°C. External cooling option available (-95°C typical).			
		Minimum	Typical	Maximum
Readout Noise	20 kHz		4 e <sup>-</sup> rms	6 e <sup>-</sup> rms
	1 MHz		16 e <sup>-</sup> rms	20 e <sup>-</sup> rms
Pixel Well Capacity		400 ke <sup>-</sup>	700 ke <sup>-</sup>	
Register Well Capacity			1000 ke <sup>-</sup>	
Dark Current**			0.01 e <sup>-</sup> /pixel/s	
Nonlinearity	< 0.4% at 20 kHz < 1% at 1 MHz			
Scan Rates	20 kHz and 1 MHz, software-selectable			
Software-Selectable Gains	3 software-selectable gains			
Dynamic Range	16 bits			
Vertical Shift Rates	36 μs, 9 μs			
Maximum Spectral Rate	20 kHz	13 Hz		
	1 MHz	278 Hz		

Typical Spectral Response



# HORIBA

## Scientific

### Ordering Information:

**CCD-1024x256-BD-SYN Synapse Thermoelectric Cooled CCD System**

Our CCD packages include a CCD shutter for clean CCD charge transfer and background subtraction.

\*Specifications subject to change without notice.

\*\*At  $-95^{\circ}\text{C}$  with external cooling. Typical dark current at  $-80^{\circ}\text{C}$  is  $0.07\text{ e}^{-}/\text{pix}/\text{s}$

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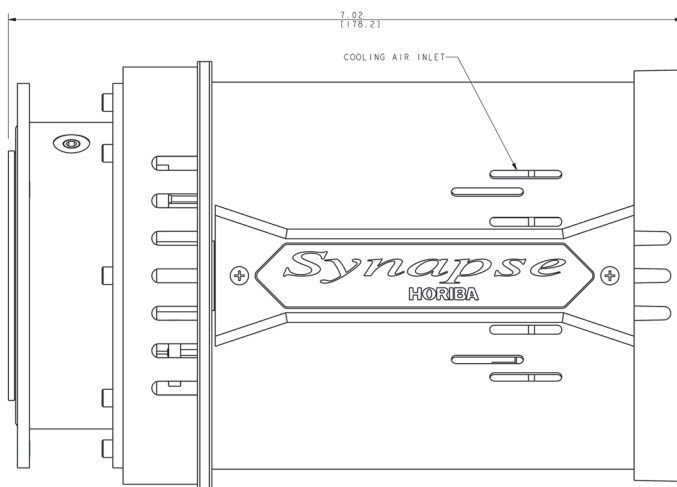
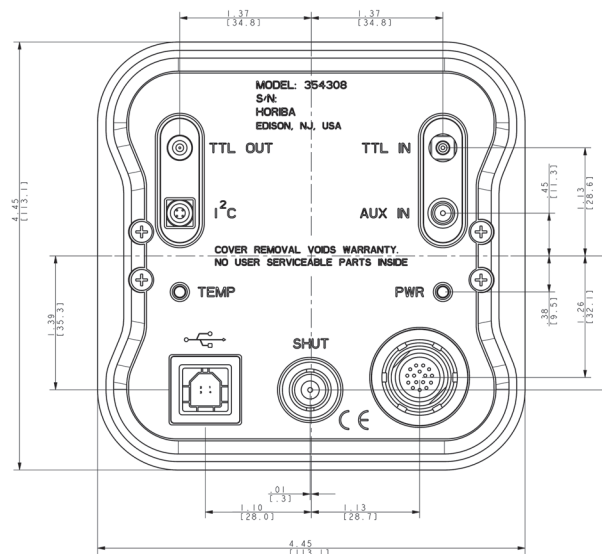
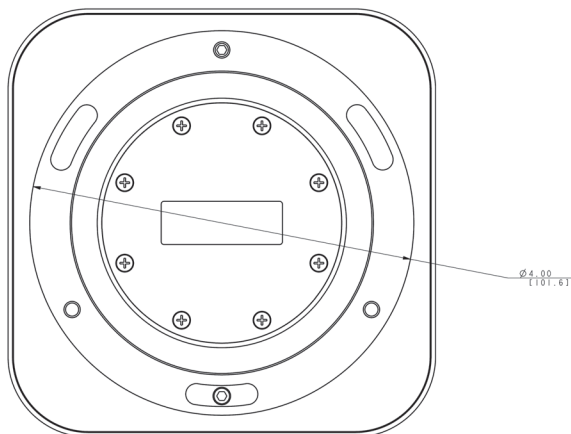
PARTICLE CHARACTERIZATION

RAMAN

SPECTROSCOPIC ELLIPSOMETRY

SPR IMAGING

## Mechanical Dimensions



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