## VS7000-CCD-HD Miniature CCD Spectrometer

A high-performance fiber-optic spectrometer for OEM volumes, designed for UV-VIS (200–860 nm), VIS (380–750 nm), and UV-NIR (200–1050 nm). Features include:

- High dynamic range (7000:1)
- High throughput (f/2.8)
- Ultra-low stray light
- Ideal for industrial low-light applications such as fluorescence, emission, absorbance, and reflectance.

### Available for OEM customers only

### Spectroscopy Benefits for OEMs

<table>
<thead>
<tr>
<th>Feature</th>
<th>Spectroscopy Benefits for OEMs</th>
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<tbody>
<tr>
<td>Most popular UV-VIS range</td>
<td>Excellent peak symmetry in a miniature grating spectrometer</td>
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<tr>
<td>High readout speed</td>
<td>4.5 ms maximum readout speed</td>
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<td>Advanced electronics</td>
<td>Low noise; high linearity (raw) and linearity-correction</td>
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<td>Back-illuminated linear CCD</td>
<td>QE = 63% at 250 nm; 76% at 650 nm; 55% at 850 nm</td>
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<tr>
<td>High signal-to-noise ratio</td>
<td>Highest full well/signal-to-noise ratio of any uncooled CCD mini-spectrometer</td>
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<tr>
<td>USB 2.0 high and full-speed</td>
<td>Standard connection interfaces to PCs with 100% data integrity</td>
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<tr>
<td>Order-sorting filter</td>
<td>Eliminates second-order interference</td>
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<td>Windows® acquisition software and LabVIEW™ VIs and DLLs available</td>
<td>Software to integrate VS-7000 as an OEM component</td>
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<td>Sturdy single-optic design</td>
<td>Excellent light purity, with concave grating design</td>
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<td>No moving parts or shutter</td>
<td>Excellent reliability for OEM integration</td>
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Explore the future
This VS7000-CCD-HD system for industrial applications uses a modified VS70 optical engine optimized for UV-VIS.

### Spectral Coverage
- UV-VIS (200–860 nm), 250 nm optimized grating, built-in order-sorting filter
- VIS (380–750 nm), VIS-blazed grating, built-in long-pass filter
- UV-NIR (200–1050 nm), dual-blaze grating, built-in order-sorting filter

### Numerical Aperture
- f/2.8

### Stray-light Rejection
- 0.01% (0.02%) for UV-VIS configuration with 300 µm tall CCD, measured at 700 nm (measured with broad bandpass 510 nm filter, 75 µm slit-width)
- >2.4 AU linear range (5% variation) with caffeine 273 nm absorption peak in 10 mm cuvette and D2 lamp.

### CCD Detector
- Back-illuminated CCD with low etaloning in NIR
- 65% peak QE in UV

### Detector Height
- 300 µm CCD height standard (1000 µm optional)
- 600 µm dia., 1.5 m long fiber-optic (for 1 mm tall CCD, prefer 800–1000 µm dia.)

### Thermoelectric Stabilization
- None. Dark current and CCD-pattern noise must be subtracted. User must switch off light source or install manual shutter in optical path. QE shifts slightly with temperature.

### Spectral Resolution
- UV-VIS: 75 µm slits, 2048 pixels, 2.7 nm resolution; 0.33 nm/pixel (configuration with 300 µm tall CCD)
- Available slits: 12-25-37-50-62-75-100-125-150-200 µm (contact us for other gratings)

### Improved CCD Full Well
- >250 ke– (sensitivity mode); >390 ke– (high FW mode)

### Raw Non-linearity
- <1% (sensitivity mode)

### Factory-corrected Non-linearity
- <0.4% (sensitivity mode)

### Dynamic Range
- Typical dynamic range 7000:1 in sensitivity mode; 5500:1 in high FW mode

### A/D Converter
- 16 bit, 500 kHz (pixel rate)

### Typical Dark Current
- 1 count/ms at 20°C (room temp.); typical offset = 1000 counts

### Readout Noise
- Gain selection: 4 e–/count and 6 e–/count

### Typical Signal-to-Noise Ratio
- 500:1 (sensitivity mode) to 625:1 (high FW mode). Shot-noise-limited conditions

### Dimensions (H × W × D)
- 2.9” × 4.1” × 4.3” (73.0 mm × 103.2 mm × 109.4 mm)

### Weight
- 1.8 lb (0.82 kg)

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**Specifications**, form factor, and spectrometer cover subject to change without notice.

No LabVIEW™ license is needed to run our acquisition software. LabVIEW™ license ver. 2011 required to edit our code. No code customization supported in price.

**Gratings and OEM Spectrometers Division**
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