

MicroHR

Spectrometers



MicroHR



MicroHR - NIR



Signature

High Performance in a Small Package

MicroHR

When Size Does Matter



The new **MicroHR** 140 mm spectrometer puts a lot of versatility and high performance into a very small package. With a footprint smaller than a sheet of paper, the MicroHR provides better than 0.3 nm resolution with either a CCD array or an exit slit with a PMT or solid state detector. It can be configured as a simple manually tunable spectrograph or an automated dual exit spectrometer capable of acquiring data from 180 nm to 20 μm with the selection of (appropriate) diffraction gratings.

It is a truly transportable spectrometer, comfortable in the field or just a small corner of your lab bench. It also fits very comfortably in your budget, providing exceptional performance at an entry level price.



- 140 mm f/3.9 Czerny-Turner with imaging optics
- Rugged solid milled construction
- Interchangeable dual grating turrets
- Configurable to your requirements
- USB 2.0 interface on automated versions

Specifications stated using a 1200 g/mm grating, CCD with 26 μm pixels and a 10 μm exit slit

Sygnature

Often One Is Enough

The new **Sygnature™** line of low cost linear array detectors is ideal for a wide range of applications. Both linear CCDs and photodiode arrays (PDA) are available. Slightly larger than a hockey puck, Sygnature detectors can be mounted on any spectrometer with the industry standard 3.5 inch OMA bolt circle. Communications with your computer is via a USB 2.0 interface and the unit is supplied with Lynear software as well as a LabVIEW® virtual instrument (VI) module.

The CCD version has outstanding sensitivity and is appropriate for many low light or fiber based applications. The PDA versions, while not as sensitive as the CCD, have a superior dynamic range and signal to noise characteristics. A Sygnature and MicroHR system provides exceptional performance, versatility, and value in a package that you can carry in one hand.

Available Sensors:

CCD with
3648 pixels 8 μm x 200 μm

PDA with
1024 diodes 25 μm x 500 μm



Ideal For

- UV-NIR Absorption
- Laser characterization
- Fluorescence
- Atmospheric studies
- Reflection
- Source characterization
- At-line diagnostics
- Field measurements

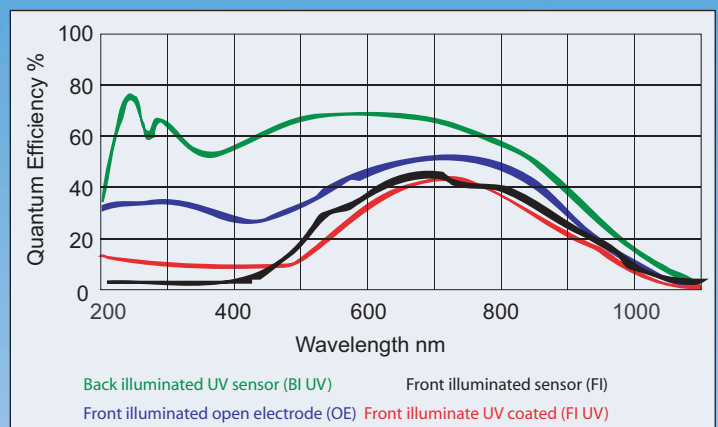
A Sygnature/MicroHR package can be less than half the price of a typical 2D CCD camera and larger format spectrograph

Symphony CCDs and InGaAs Arrays



With the lowest noise, highest dynamic range, and unsurpassed linearity, a **Symphony® CCD** system will capture signals as weak as a few photons. A full line of two-dimensional CCD chips, both front- and back-illuminated provide quantum efficiencies of up to 90%. A linear InGaAs* array detector is available for use with the MicroHR-NIR, with gold-coated optics, for measurements in the 800 nm to 1700 nm region. **Symphony® CCD** detectors are available in thermoelectrically-cooled versions for general purpose spectroscopy and LN-cooled versions for the ultimate in sensitivity.

- Ultra low noise electronics with high sensitivity and high dynamic range modes
- UV-VIS and NIR optimized sensors
- TE (200 K) and LN (140 K) versions available
- Wide Variety of CCD Formats including 2048 x 512 (13.5 µm x 13.5 µm pixels), 1024 x 256 and 1024 x 128 formats (26 µm x 26 µm pixels)
- Integrated shutter driver electronics
- Includes SynerJY® acquisition and analysis software
- Available Software Developer's Kit (SDK) and LabVIEW® VIs



Available Sensors:

- Front illuminated, standard and lumigen coated
- Front illuminated Open Electrode
- Back illuminated UV, VIS, or NIR optimized, deep depletion
- Linear InGaAs NIR sensor

Several larger HORIBA Jobin Yvon spectrometers can accommodate both a CCD and an IGA detector for high sensitivity detection between 200 nm and 1700 nm.



MicroHR-NIR

Symphony InGaAs Array on a MicroHR-NIR Spectrograph featuring gold coated mirrors and gratings for enhanced throughput

- * 512 pixel (50 µm x 500 µm pixels)
- 512 pixel (25 µm x 500 µm pixels) and 1024 pixel (25 µm x 500 µm pixels) available

| MicroHR (Manual) | | MicroHR (Auto) | | Signature | |
|---|--------------------------------|---|--------------------------------------|--|---|
| Focal Length | 140 mm | Focal Length | 140 mm | MODEL NUMBER | SYGNATURE-CCD |
| Entrance Aperture Ratio | f/3.88 | Entrance Aperture Ratio | f/3.88 | Sensor | Toshiba TCD 1304AP Linear CCD |
| Grating Mount | Interchangeable single grating | Grating Mount | Interchangeable dual grating turret | Pixels | 3648 x 1 |
| Grating Size | 32 mm x 32 mm | Grating Size | 32 mm x 32 mm | Pixel Size | 8 μm x 200 μm |
| Scanning Range | 0 – 1000 nm | Scanning Range** | 0 nm to 1500 nm | Spectral Range | 200 nm to 1100 nm |
| Multi-channel coverage ** | 140 nm over 26.7 mm array | Multi-channel coverage ** | 140 nm over 26.7 mm array | Dynamic Range | 1250 : 1 (10+ bits) |
| Focal Plane | 27 mm wide x 10 mm high | Focal Plane | 27 mm wide x 10 mm high | Spectral Acquisition Time | 20 ms per spectrum |
| Image Magnification at Exit Slit | 1.1 | Image Magnification at Exit Slit | 1.1 | Integration time | 10 ms to 65 s |
| Spectral Dispersion** | 5.25 nm/mm at 400 nm | Spectral Dispersion** | 5.25 nm/mm | MODEL NUMBER | SYGNATURE-PDA |
| Spectral Resolution | | Spectral Resolution** (w/ Exit Slit & PMT) | 0.25 nm | Sensor | Hamamatsu S3903-1024Q PDA |
| w/ 26 μm pixel array ** | 0.3 nm | Wavelength Accuracy** | ± 0.25 nm | Pixels | 1024 x 1 |
| Wavelength Accuracy** | ± 0.5 nm | Wavelength Repeatability ** | ± 0.04 nm | Pixel Size | 25 μm x 500 μm |
| Wavelength Repeatability** | ± 0.15 nm | Minimum Drive Step Size** | 0.025 nm | Spectral Range | 200 nm to 1100 nm |
| Wavelength Counter | Marked in 0.1 nm increments | Drive Speed | 500 nm/s | Dynamic Range | 6000 : 1 (12+ bits) |
| Slits | Fixed or micrometer | Slits | Fixed or micrometer | Spectral Acquisition Time | 6 ms/spectrum |
| Dimensions: | | Computer Interface | USB 2.0 | Integration time | 3 ms to 65 s |
| Length | 7 in (178 mm) | Dimensions | | COMMON SPECIFICATIONS | |
| Width | 6 in (152 mm) | Length | 7 in (178 mm) | Input Trigger | TTL Edge Trigger |
| Height | 5.5 in (140 mm) | Width-Single Exit -Dual Exit | 8.1 in (206 mm) 10.5 in (267 mm) | Output Trigger/ Shutter Control | TTL programmed to exposure time |
| Optical Axis Height | 3.5 in (89 mm) | Height | 5.5 in (140 mm)** | Computer Interface | USB 2.0 (USB 1.1 Compatible) |
| Weight | 8.8 lb (4.0 kg) | Optical Axis Height | 3.5 in (89 mm) | Included Software | Lyneer™ basic data acquisition package Optional: SynerJY® Spectroscopic Software |
| | | Weight-Single Exit -Dual Exit | 10.0 lb (4.5 kg) 11.0 lb (5.0 kg) | Operating System | Windows 2000/XP |
| | | | | Size | 4.0 in by 2.06 in (102 mm by 52.3 mm) |
| | | | | Weight | 0.8 lb (0.36 kg) |

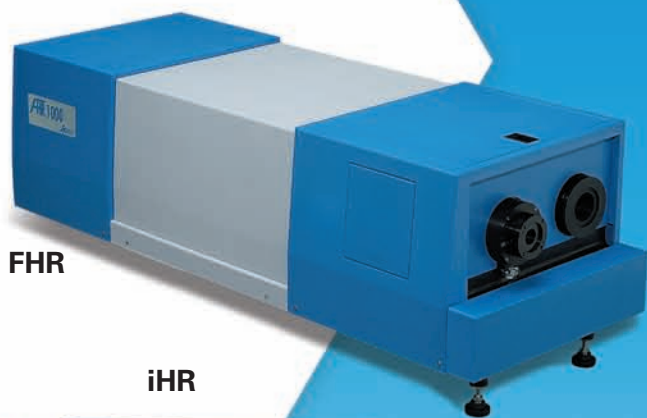
Spectral Performance of a Signature-CCD & MicroHR Package

| Grating (grooves/mm) | Coverage (nm) | Typical working Ranges | Resolution: 10μm slit (nm) FWHM | Resolution: 100μm fiber (nm) FWHM |
|----------------------|---------------|------------------------|---------------------------------|-----------------------------------|
| 1200 | 153 | High resolution | 0.10 | 1.0 |
| 600 | 300 | 400 nm-700 nm | 0.20 | 2.0 |
| 300 | 613 | 200 nm-800 nm | 0.40 | 4.0 |
| 150 | 1200 | 200 nm-1100 nm | 0.80 | 8.0 |

All measurements taken at 633 nm

* Actual coverage on the array is 200 nm to 1400 nm however the detector is sensitive only to 1100 nm

** for 1200 g/mm grating at 400 nm



FHR



iHR



MicroHR



HORIBA Jobin Yvon's Optical Spectroscopy Division manufactures a complete line of spectrometers that spans from 100 mm to 1500 mm in focal length. The iHR and FHR families of spectrometers feature multiple entrance and exit ports, multi-grating turrets, direct grating drives, and toroidal imaging optics. These spectrometers, as well as our line of classical spectrometers, can be used with any of HORIBA Jobin Yvon's detectors, encompassing PMTs, solid state single channel detectors and our full line of Symphony TE and LN cooled CCDs.

The VS140 series provides a complete fiber optic based spectrometer designed with HORIBA Jobin Yvon's concave holographic gratings and state of the art detectors.

SynerJY[®] software combines exceptionally versatile control of all spectrometer/detector configurations with extremely powerful data analysis to allow complete control of your experiment.

HORIBA Jobin Yvon was the first spectroscopy based company to embrace the emerging CCD detector technology and to integrate the unique two dimensional capabilities of these detectors with spectrometer control functions. HORIBA Jobin Yvon has 15 years of experience in producing CCD detectors and optimizing their, as well as our spectrometer designs for unmatched spectroscopic performance.

A full line of large and small format CCD chips is available. Every chip innovation from wavelength optimized back illuminated chips to deep depletion versions are available in both TE-cooled and LN-cooled housings.

Visit our website,
www.JobinYvon.com/OSD,
to learn more about our full line of spectrometers, detectors, and accessories.

HORIBA Jobin Yvon also produces applications specific systems for Raman, fluorescence, atomic emission spectroscopy, and ellipsometry.

HORIBA JOBIN YVON

(All HORIBA Jobin Yvon companies were formerly known as Jobin Yvon)

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