SeaWave® NIR Spectrometer
Small Footprint High-Performance NIR Spectrometer

Key Features
- Very compact and rugged design based on linear diode array technology
- Wide spectral response range (900 – 1700 nm)
- High resolution (3 - 12 nm) for specific slits and detectors
- High readout speed (>1000 spectra/second)
- Multiple configurations to suit customised spectral ranges and resolutions
- Both, fiber coupled and free-space entrance port
- Triggered by software or via electronic trigger input
- Robust and user-friendly control software package and programming platform
- No moving parts and customisable for OEM applications

Applications
- Pharmaceutical and food industry analysers
- Monitoring of petrochemical manufacturing processes
- Agricultural product quantification
- Medical non-invasive assessments
- Photovoltaic material quality control
- Chemical reaction monitoring
- Laser characterization

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The SeaWave® NIR spectrometer from Radiantis® offers maximum compactness and readout speed with very high performance across the NIR range (900 - 1700 nm). Based on robust and efficient Hamamatsu uncooled InGaAs linear image sensors, it provides a cost-effective, rugged, lightweight and USB2-powered solution for many industrial and scientific applications.

The Radiantis® SeaWave® incorporates both, SMA 905 optical fiber connector and free-space optical coupling into the device. The trade-off between slit/fiber size and resolution leads to a best of 2 nm resolution for the complete bandwidth. The SeaWave® can also be configured with different gratings for improved resolution and reduced spectral ranges. Four threaded holes (two metric threads and two imperial threads) for standard optical posts are provided in the base of the product.

With a 16bit DAC capable of high speed acquisition and a USB 2.0 Hi-speed connection to the PC, it offers fast readout speeds (> 1000 spectra/second). It is also powered by the USB connection so no external power supply is required, making it ideal for applications where portability is critical.

A user-friendly software package and software drivers are included with the system. The drivers use a simple but effective software architecture for maximum ease of use, robustness and speed of integration into OEM applications. The acquisition can be started either directly via the software interface which provides millisecond-level timing accuracy, or to the sub-millisecond level by using the electronic trigger.

The SeaWave® is an ideal spectrometer platform for many applications, including the pharmaceutical, petrochemical, food and beverage industries where a compact and robust spectrometer with high speed and resolution is required. It can also be used for laser characterisation purposes in the scientific sector.

### Specifications

#### Optical Configuration

- **Grating:** 300 lines/mm, 900 - 1700 nm, blaze wavelength 1 μm (default)
- **Entrance aperture:** 25/50/100/200 μm slit or no slit
- **Input:** Fiber SMA and free-space
- **Longpass filter:** Optional
- **Collimating and focusing mirrors:** Protected Aluminium (default), Silver or Gold (optional)
- **Detector:** Hamamatsu InGaAs linear array (512 pixels)
- **Numerical aperture:** 0.25

#### Output

- **Spectral response range:** 900 - 1700 nm (default), Alternative spectral ranges (optional)
- **Spectral resolution (FWHM)** for complete spectral response range: 512 pixels (3 mm - 12 mm)
- **Silt and fiber size dependent**
- **Signal to noise ratio at full signal:** 18,000 : 1 at 20 ms
- **Dynamic range:** 60:1 (default) Improved dynamic range (optional)
- **Integration time:** 6 μs to 1 s
- **Readout speed:** >1000 spectra/second
- **Dynamic range:** 16 bit (64Hz A/D converter)
- **Software:** User interface and driver software included as standard for Windows XP and higher, Linux drivers available.
- **Trigger modes:** Software triggered (1 μs timing accuracy)  
  External TTL trigger (1 μs timing accuracy)

#### Electronics

- **Power:** USB 2.0 bus powered
- **Data transfer speed:** Full scan to memory every 1 ms with USB 2.0 Hi-speed port
- **Inputs/Outputs:** External trigger input
- **Gated delay:** Yes
- **Connector:** SMA
- **Interface:** USB 2.0 Hi-speed
- **Driver software:** Windows and Linux
- **Cooling:** Uncooled
- **Dimensions [W x L x H]:** 70.5 x 104 x 42 mm (2.7 x 4.1 x 1.65 inch)

### Footnotes

1. Specifications are subject to change without notice
2. Other grating options for different spectral ranges are available upon request
3. Higher resolution available for reduced spectral ranges (grating dependent)

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