

RS4k Echelle Spectrometer

Cost-effective UV-NIR echelle spectrometer with 550 nm simultaneous wavelength coverage.



Product Highlights

- Picometer resolution over large bandwidth
- Compact A5-sized footprint
- Low polarisation dependency
- Licence-free control software (RedSolve)
- Python API (RedMote)

Key Specifications

1. Optical performance

Spectral range	300-850 nm
Resolving Power [$R=\lambda/d\lambda$]	4,000 (300-850 nm)
Wavelength stability	<10 pm/°C
Aperture	F/5
Fibre input	25 μ m MMF
Detector	CMOS uncooled
Exposure time	15 μ s - 30 s
Dark current	0.5 e-/pixel/s
Read noise	<3 e-/pixel (rms)
Dynamic range	12 bit AD conversion
Data acquisition ⁽¹⁾	up to 10 Hz

2. Mechanical & Electrical

Weight	3.3 kg (7.3 lbs)
Dimensions (L/W/H)	20.7 x 15.6 x 7.7 cm (8.15 x 6.1 x 3.03 inch)
Data interface	USB 3.0

3. Operational

Temperature range	15-30 °C
Humidity range	10-70 %

¹⁾ Maximum data acquisition only available with USB 3.0.

Performance

The plots below show the spectrometer efficiency (left) and sensitivity (right).

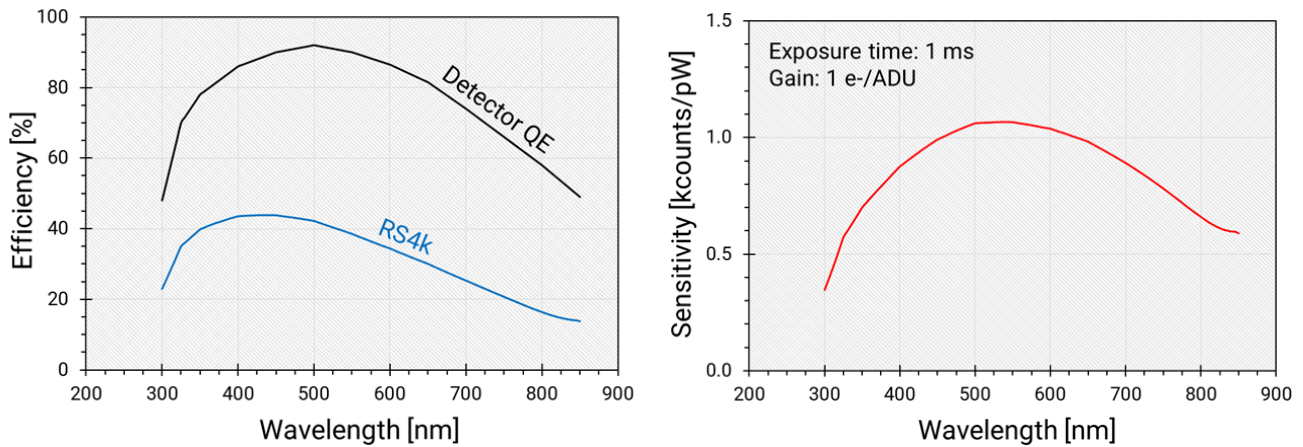


Figure 1: The left plot shows the total efficiency (blue curve) of the RS4k spectrometer, excluding coupling and transmission losses of the multimode fibre. The right plot shows the calculated sensitivity for an exposure time of 1 ms, and 1 pW input power (calculated at unity gain, where 1 e-/ADU).

Product Applications

- Laser-induced breakdown spectroscopy (LIBS)
- Endpoint detection in deposition and etching of semiconductor materials
- Simultaneous multi-element analysis

What's included:

- RS4k spectrometer in Pelican storage case
- 25 μm multimode fibre (1.5 m) with FC/PC connectors (FC/PC to SMA optional)
- USB-C to USB-A 3.1 cable (1.8 m)
- USB flash drive with calibration file, user manual, RedSolve, and drivers

Contact Details

 www.redback.systems

 contact@redback.systems

 [linkedin.redback.systems](https://www.linkedin.com/company/redback-systems)