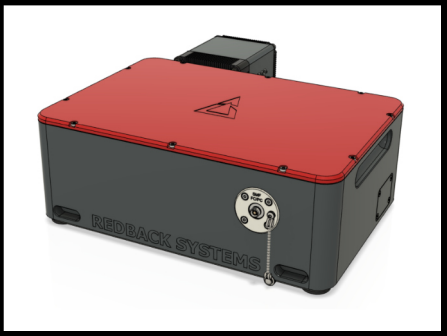
REDBACK SYSTEMS

RS40k Echelle Spectrometer

Compact high-resolution echelle spectrometer with 520 nm simultaneous wavelength coverage.



Product Highlights

- Picometer resolution over large bandwidth
- Cooled sCMOS detector
- Low polarisation dependency
- Licence-free control software (RedSolve)
- Python API (RedMote)

Key Specifications

1. Optical performance

Spectral range [1]	430-950 nm
Resolving Power [R=λ/dλ]	44,000 - 32,000 (430-950 nm)
Wavelength stability	<5 pm/°C
Wavelength accuracy	<20 pm
Signal-to-noise ratio [2]	300 : 1
Fibre input	SMF FC/PC
Detector	BSI sCMOS cooled
Exposure time	21 µs → 20 s
Dark current [3]	0.2 e-/pixel/s
Read noise	1.0 e-/pixel (rms)
Dynamic range	16 bit AD conversion
Data acquisition [4]	up to 10 Hz

2. Mechanical & Electrical

Weight	9.5 kg (20.9 lbs)
Dimensions (L/W/H)	32.5 x 27.6 x 10.6 cm (12.8 x 10.9 x 4.2 inch)
Power Supply	24 V or USB-C
Data interface	USB 3.1 Gen 1

3. Operational

Temperature range	15-30 °C
Humidity range	10-80 %

[1] Spectral range can be tuned to 480-1080 nm.
[2] Single acquisition.
[3] At -25°C sensor temperature.
[4] Maximum data acquisition only available with USB 3.0.

Performance

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

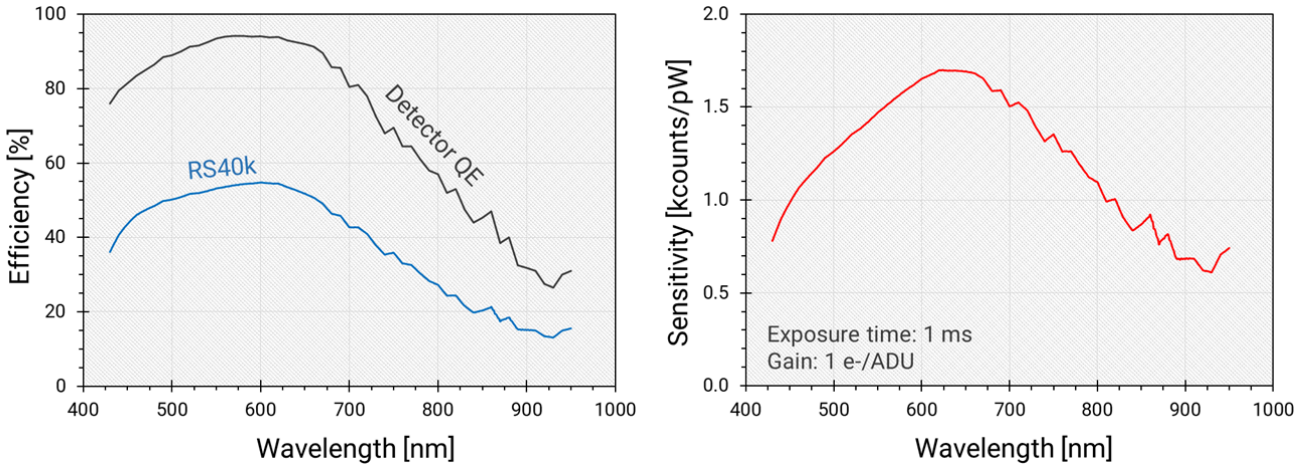


Figure 1: The left plot shows the total efficiency (blue curve) of the RS40k spectrometer, excluding coupling and transmission losses of the single-mode fibre. The right plot shows the calculated sensitivity for an exposure time of 1 ms, and 1 pW input power (calculated at unity gain, where 1 e-/ADU).

Product Applications

- Quantum light source spectroscopy
- Simultaneous high-resolution multi-element analysis
- Laser spectrum analysis (e.g. monitoring of laser modes)
- Plasma spectroscopy

What's included:

- RS40k spectrometer in Pelican 1520 storage case
- S-405XP and 780HP SMFs with FC/PC to FC/APC connectors
- USB-C to USB-A 3.1 cable (1.8 m)
- 24V power supply and IEC cable
- CPC-NS2 water cooling connectors (optional)
- Flash drive with calibration file, RedSolve, and drivers