REDBACK SYSTEMS

RS40k 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	430-950 nm
Resolving Power [R=λ/dλ]	44,000 - 32,000 (430-950 nm)
Wavelength stability	<5 pm/°C
Wavelength accuracy	<20 pm
Fibre input	SMF FC/PC
Detector	cooled sCMOS
Exposure time	0.001-20 s
Dark current [1]	0.2 e-/pixel/s
Read noise	1.9 e-/pixel (rms)
Data acquisition [2]	up to 5 Hz

[1] At -25°C sensor temperature.

[2] Maximum data acquisition only available with USB 3.0 cable.

2. Mechanical & Electrical

Weight	8.7 kg (18.1 lbs)
Dimensions (L/W/H)	29.2 x 32 x 10.5 cm (11.5 x 12.6 x 4.1 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 %

Performance

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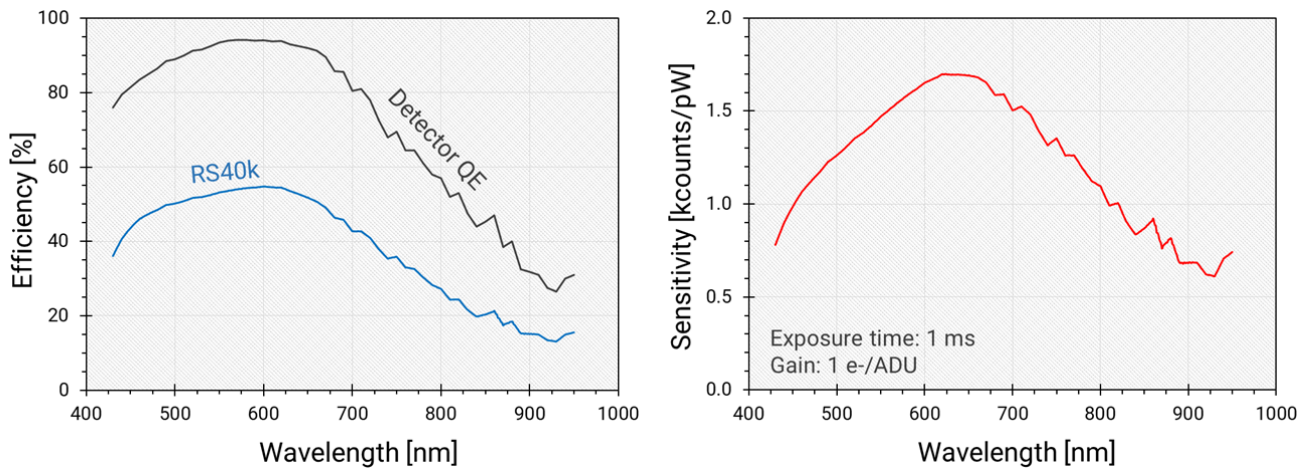

Figure 1: The left plot shows the total efficiency (blue curve) of the RS40k spectrometer, excluding coupling and transmission losses of the single-mode fibre. The right plot shows the calculated sensitivity for an exposure time of 1 ms, and 1 pW input power (calculated at unity gain, where 1 e-/ADU).

Product Applications

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

What's included:

- RS40k spectrometer in Pelican 1520 storage case
- S-405XP and 780HP SMFs with FC/PC to FC/APC connectors
- USB 3.0 cable (2 m)
- 24V power supply and IEC cable
- USB flash drive with calibration file, RedSolve, and drivers

Contact Details

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