

RS10k Echelle Spectrometer

Ultra-compact high-resolution echelle spectrometer with 580 nm simultaneous wavelength coverage.



Product Highlights

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

Key Specifications

1. Optical performance

Spectral range ⁽¹⁾	450-1030 nm
Resolving Power [$R=\lambda/d\lambda$]	17,000 - 8,000 (450-1030 nm)
Wavelength stability	<10 pm/°C
Wavelength accuracy	<50 pm
Signal-to-noise ratio ⁽²⁾	300 : 1
Fibre input	SMF FC/PC
Detector	BSI CMOS uncooled
Exposure time	0.001-60 s
Dark current	<0.5 e-/pixel/s
Read noise ⁽³⁾	2.04 e-/pixel (rms)
Dynamic range	12 bit AD conversion
Data acquisition ⁽⁴⁾	up to 10 Hz

2. Mechanical & Electrical

Weight	0.65 kg (1.43 lbs)
Dimensions (L/W/H)	12 x 7.8 x 4 cm (4.7 x 3.1 x 1.6 inch)
Data interface	USB 3.0 full speed

3. Operational

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

¹⁾ Spectral range can be tuned to 450-1080 nm.

²⁾ Single acquisition.

³⁾ At unity gain (1 e-/ADU).

⁴⁾ Maximum data acquisition only available with USB 3.0.

Performance

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

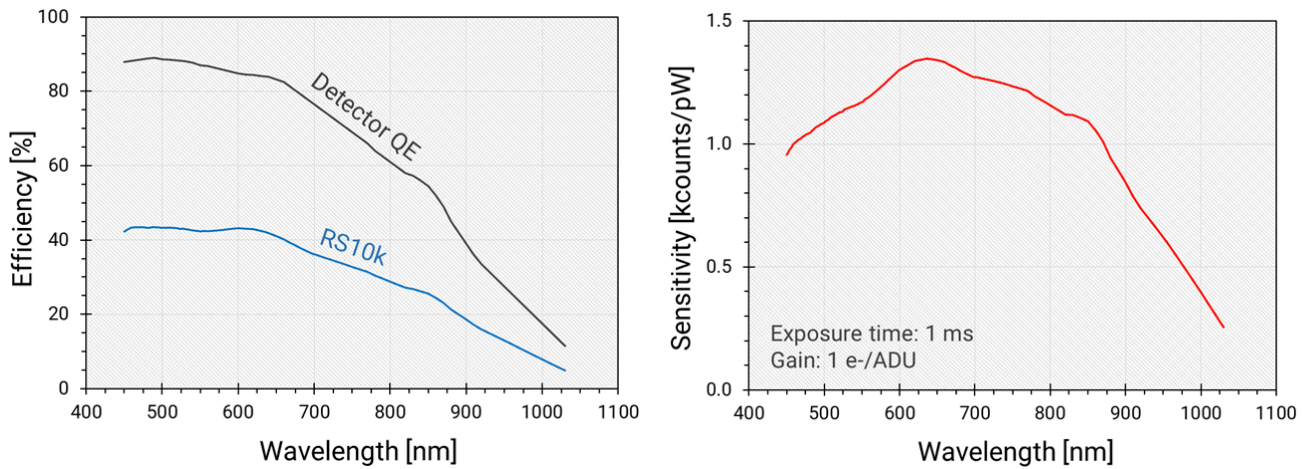


Figure 1: The left plot shows the total efficiency (blue curve) of the RS10k spectrometer, excluding coupling and transmission losses of the single-mode fibre. The right plot shows the calculated sensitivity for an exposure time of 1 ms, and 1 pW input power (calculated at unity gain, where 1 e-/ADU).

Product Applications

- Quantum light source spectroscopy
- Simultaneous high-resolution multi-element analysis
- Optical component characterisation (etalons, filters, etc.)
- Laser spectrum analysis (e.g. monitoring of laser modes)
- Tool for physics teaching labs

What's included:

- RS10k spectrometer in Pelican 1200 storage case
- S-405XP and 780HP SMFs with FC/PC to FC/APC connectors
- USB-B to USB-A cable (2 m)
- Flash drive with calibration file, RedSolve, and drivers

