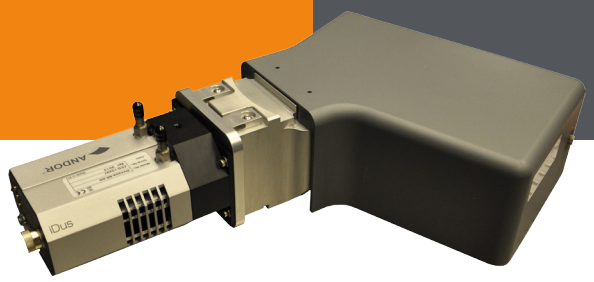
HyperFlux **U1**
Spectrometer Platform

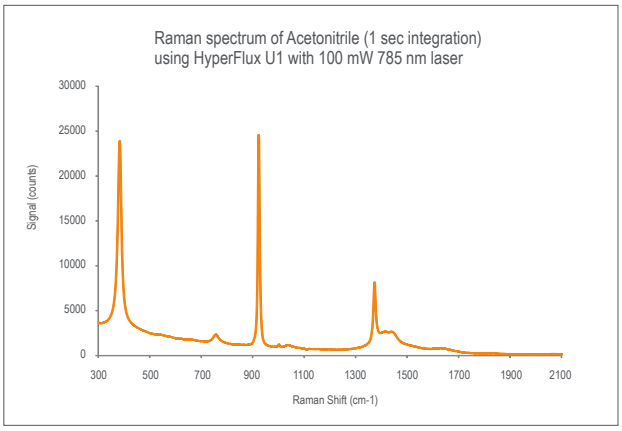


HyperFlux U1: The new standard in performance

Tornado's HyperFlux U1 is an HTVS-enabled spectrometer platform that can provide customized solutions in the ultra-violet, visible and near-infrared bands with spectral resolutions between 0.2 and 0.5 nm.

For Raman spectroscopy, U1 can offer Stokes and anti-Stokes coverage for typical laser excitation wavelengths (532, 633, 785, and others) with spectral resolution as good as 4.9 cm^{-1}.

TYPICAL RESULTS



The HyperFlux U1 offers umatched performance and customization

- No fixed configuration; we build to your resolution requirements across UV/VIS/NIR
- Detect weak signals quickly: fluorescence-free anti-Stokes, low-power illumination
- 4.9 cm^{-1} with no slit, using entire input aperture of 200 µm fiber
- Standard and deep-cooled detector options

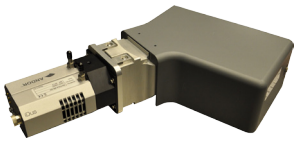
The HyperFlux U1 spectrometer platform offers high-performance spectroscopy with factory-configurable bandpass, resolution, and throughput UV/VIS/NIR options.

Example HyperFlux U1 Configurations

SPECIFICATION	STOKES	STOKES & ANTI-STOKES	STOKES
Application	785 nm Raman Stokes	633 nm Raman Stokes & anti-Stokes	532 nm Stokes
Bandpass	749 - 1024 nm (-610 to 2970 cm^{-1} from 785 nm laser line)	525 - 796 nm (-3200 to 3200 cm^{-1} from 633 nm laser line)	530 - 658 nm (-70 to 3600 cm^{-1} from 532 nm)
Resolution	0.36 nm (4.9 cm^{-1})	0.42 nm (8.0 cm^{-1})	0.23 nm (6.6 cm^{-1})
Camera	Andor iDus DU-416A-LCD-DD	Critical Link MityCCD-H10141	Andor Newton DU940P-BV

Detailed Example: 785 nm Raman Stokes with Andor iDus

SAMPLE SPECIFICATIONS:



Spectroscopic Performance	
Spectral Range	749 - 1024 nm (-610 to 2970 cm^{-1} from 785 nm)
Spectral Resolution	0.36 nm (4.9 cm^{-1} FWHM) R = 2490
Grating	1200 lines/mm volume phase holographic, peak efficiency 85%
Input Source	SMA fiber optic cable, NA = 0.22, core diameter 200 µm
Slit	No slit

Computer Requirements	
Computer Interface	USB 2.0
Operating System	Windows XP or greater (7/8 supported)
Memory Required	50 MB for software installation
External Trigger	TTL/Logic connector type: SMB
Software Libraries	Andor Driver License included
Power Supply	110–240 VAC, 50–60Hz

Detector Specifications	
Peak SNR	>540
Detector	Andor iDus DU 416A-LCD-DD Back-Illum. Low Dark Current Deep Depletion Spectroscopy Camera
Pixel Size	15 µm x 15 µm
Cooling	TE cooling, -80°C (air), -95°C (liquid)
Detector Size	2000 x 256 pixels (30.0 x 3.8 mm)
Wavelength Sensitivity	200–1100 nm (Peak QE up to 95%)
A/D Resolution	16 bits
Max. Integration Time	>1 hour
Linearity	Better than 99%
Read Noise	As low as 4 e-
Dark Curr. @ max cooling	As low as 0.0006 e-/pixel/sec
Max. Spectra/sec	30 (full vertical binning)

Physical Dimensions (including camera)		
Width	20”	[50.8 cm]
Height	4.1”	[10.3 cm]
Depth	11.8”	[29.8 cm]
Weight	22 lbs	[10 kg]

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