



# HyperFine HF Series Spectrometer

compact, sub picometer resolution

Designed for measuring hyperfine spectra and subtle spectral shifts, the HyperFine spectrometer from LightMachinery is a compact spectrometer capable of **picometer resolution**.

These spectrometers are ideal for measuring fine features in plasmas, pulsed laser characterization and for measuring the small spectral shifts from Brillouin or Raman scattering. Simple PC based software allows the user to review spectra in real time and save or export for more analysis. LabView drivers and C# named pipe commands enable the HF series to be integrated into automated experimental setups.

## Features

- FAST, No moving parts (single shot laser spectrum analysis)
- Picometer resolution
- Fiber optic input
- Quick data acquisition and export
- Simple USB interface
- LabView Drivers - C# named pipe commands

## Benefits

- Fast acquisition (>10Hz)
- Compact
- Can resolve hyper fine spectra below 1 picometer
- Ultra-reliable
- Large range-over-resolution ratio (>10000)
- LightMachinery's legendary customer support

## Light source characterization

- Lasers of all types
- Single shot pulsed laser spectrum
- Super luminescent diodes
- Gas discharge lamps, etc

## Passive components characterization

- Notch filters
- Etalons
- Fiber Bragg gratings, etc

Spectroscopy

- Plasma spectroscopy
  - High-precision gas spectroscopy
  - Brillouin spectroscopy
  - Femtosecond comb fingerprinting spectroscopy
  - Spectral-domain optical coherence tomography
  - Solar spectroscopy
- Astronomical spectroscopy
  - Raman and ultra-low frequency Raman
  - Undergraduate physics and chemistry laboratories
    - o Zeeman splitting
    - o Hyperfine magnetic structure of elements
    - o Hydrogen structure
    - o Doppler shift of Fraunhofer lines due to sun rotation

Form factors

A: 10 x 24 x 6 inches

C: 8 x 8 x 5 inches

E: 27 x 14 x 6 inches

B: 22 x 13 x 6 inches

D: 28 x 15 x 6 inches

HF Series (for weak sources)

Model number	Form factor	Total range (nm)	Simultaneous range (nm) without grating rotation	Resolution (pm)
HF-9332	C	450 - 650	275	15 - 30
HF-11458-RS	E	350 - 400	10	1.7
HF-8989-1	A	400 - 500	15	1.7
HF-8989-2	B	500 - 600	15	1.6
HF-8989-2e	B	525 - 640	15	1.6
HF-8989-3	A	600 - 700	15	1.6
HF-8995-1	B	700 - 800	25	1.9
HF-8991-3	A	800 - 950	20	2.0
HF-8995-2	A	950 - 1100	20	2.5
HF-UHR	-	-	Upgrade 2X improvement in resolution	-

Accessories and camera upgrade options

Model	Specifications	
HF-11008	Retiga R3 Upgrade	3MP Cooled CCD, Low noise for seconds to 10 minutes
HF-12822	Retiga R6 Upgrade	6MP Cooled CCD, Low noise for seconds to 10 minutes
HF-11009	IRIS 9 SCMOS Upgrade	9MP SCMOS, Low noise from msec's to 20 seconds
HF-11847	PRIME BSI Express SCMOS Camera	High Sensitivity SCMOS, 4.2MP, 95% Quantum Efficiency, 1.0e- Read Noise, 6.5 µm x 6.5 µm Pixel Area
HF-12242	Orca Fusion	5.3MP, 80% Quantum Efficiency, 0.7e- Read Noise, 6.5 µm x 6.5 µm Pixel Area
HF-12531	Sony IMX250 CMOS	Our Standard CMOS Camera
HF-11463	Motorized Grating Rotation Option	For grating rotation to change the wavelength range of the spectrometer
HF-11463	Neon Calibration Source	Fiber output to spectrometer for calibration