

LLTF CONTRAST™

THE ULTIMATE SUPERCONTINUUM FILTER

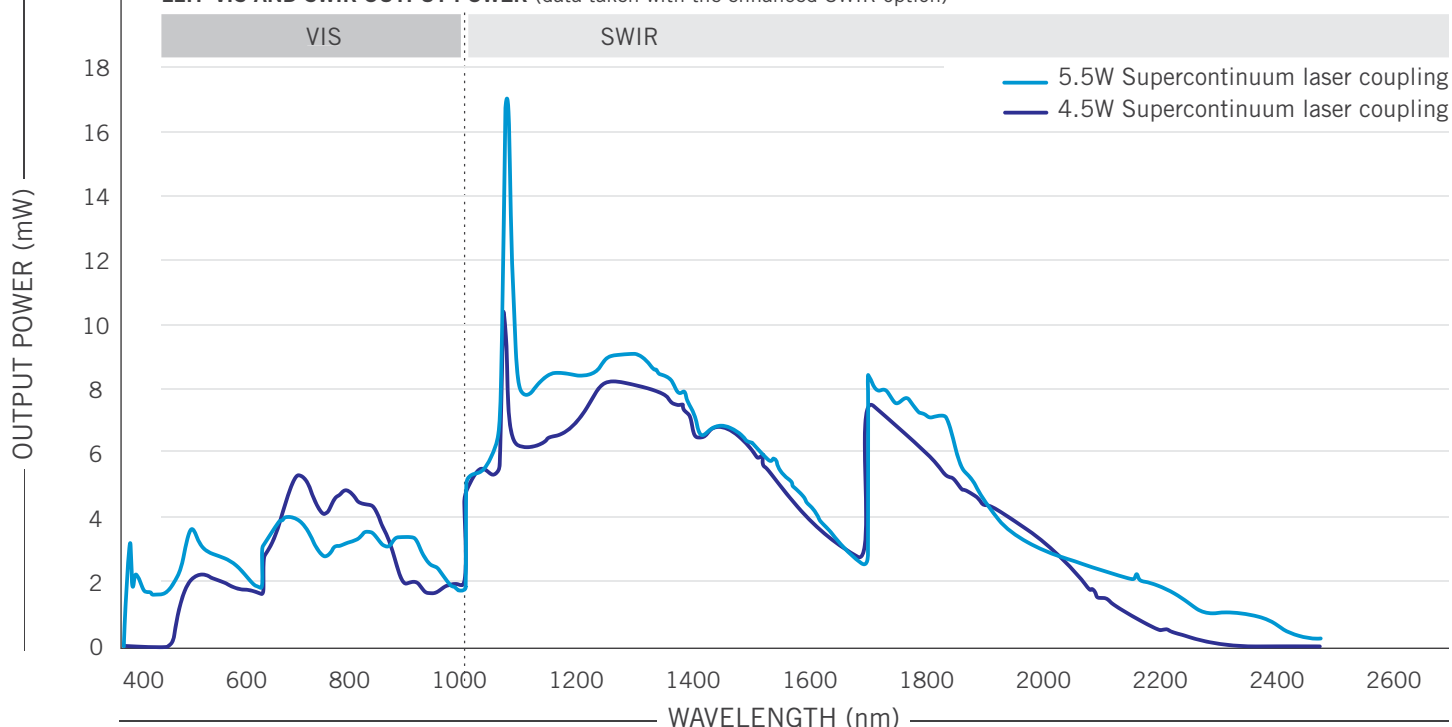


The Laser Line Tunable Filter is a non-dispersive tunable bandpass filter based on volume Bragg gratings. It combines very high optical density (> OD6), an outstanding out-of-band rejection, and wide tunability. The LLTF can be customized to cover the entire 400-2500 nm spectral range in a single instrument with a high spectral resolution. It can be coupled with a wide variety of broadband sources to create a tunable laser source. It can also be used as a cleanup filter for spectroscopy applications.

TECHNICAL SPECIFICATIONS

	CONTRAST VIS	CONTRAST SWIR	CONTRAST EXT-III		CONTRAST EXT-IV		CONTRAST X
Spectral range (custom ranges available)	400-1000 nm	1000-2300 nm (2500 nm optional)	400-1700 nm		400-2300 nm (2500 nm optional)		Up to 5 gratings. See graph on page three for available gratings.
Spectral bandwidth (FWHM) ¹	1.5 - 2.5 nm	2.0 - 5.0 nm	400-1000 nm	1000-1700 nm	400-1000 nm	1000-2300 nm	0.15 - 0.9 nm. See graph on page three for available gratings.
			1.5 - 2.5 nm	2.0 - 5.0 nm	1.5 - 2.5 nm	2.0 - 5.0 nm	
Out of band rejection ²	<-60 dB@±40 nm	<-60 dB@±80 nm	<-60 dB@±40 nm	<-60 dB@±80 nm	<-60 dB@±40 nm	<-60 dB@±40 nm ⁴	typically -55 dB @ ±5 nm
	typically -30 dB@±10 nm	typically -40 dB@±20 nm	typically -30 dB@±10 nm	typically -30 dB@±10 nm	typically -40 dB@±20 nm	typically -40 dB@±20 nm	

LLTF VIS AND SWIR OUTPUT POWER (data taken with the enhanced SWIR option)



TECHNICAL SPECIFICATIONS

	CONTRAST VIS	CONTRAST SWIR	CONTRAST EXT-III	CONTRAST EXT-IV	CONTRAST X
Wavelength selection accuracy (relative)	<0.33 nm	<0.66 nm	<0.66 nm	<0.66 nm	<0.13 nm
Standard input module	Free-space and compatible with 12 mm diameter supercontinuum collimator				
Standard output	Free-space				
Maximum input average power	Standard 8W - Up to 20W available				
Peak efficiency ³	Typically around 65%				
Optical density (OD)	> OD6 (measured at 1064 nm)				
Damage threshold	< 5 GW/cm ² peak power @ 1064 nm, 8 ns				
Input beam diameter requirement	< 5 mm				
Input beam divergence requirement (full angle)	< 1.5 mrad				
Pointing stability across spectral range	<0.5 mm displacement @1 m from filter		<1.0 mm displacement @ 1 m from filter		
Typical scanning speed	25 ms stabilization time for 1 nm step, 50 ms stabilization time for 10 nm step				
Software	PHySpec™ control and analysis software for Windows 11 PC (computer not included), connection via USB 2.0 (1.1 compatible) - SDK included				
Dimensions (L x W x H)	9 x 6.3 x 6.7 (inches) 23 x 16 x 17 (cm)			11.8 x 9.1 x 6.7 (inches) 30 x 23 x 17.4 (cm)	9 x 6.3 x 6.7 (inches) 23 x 16 x 17 (cm)
Operating temperature	10 to 40 °C				
Storage temperature	0 to 50 °C				
Power requirement	120 VAC / 60 Hz, 230 VAC / 50 Hz				

OPTIONS AND ACCESSORIES

Fibered output	An X-Y-Z translation adjustment allows coupling optimization. FC/APC standard connector (SMA, FC/PC on demand). Both lens and mirror based models available
Alignment kit	Allows fast and easy optical input alignment In free space configuration

¹ Valid if the divergence of the input beam does not exceed 1.5 mrad (full angle)
² Measured in output fibered configuration with an OSA
³ For input beam divergence under 1.5 mrad (full angle) and M² < 1.2.

Examples of available gratings/bandwidth for the LLTF CONTRAST X

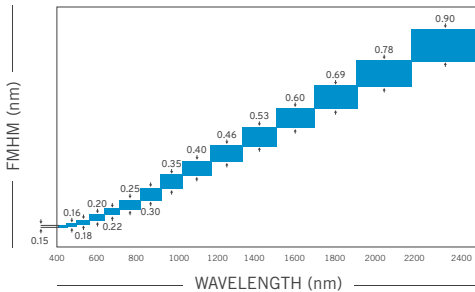
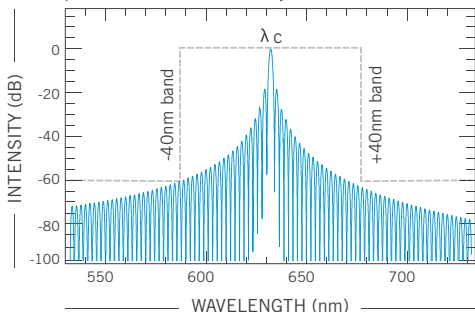
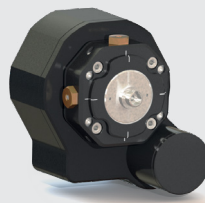


Illustration of the out-of-band rejection of a volume holographic grating at $\lambda_c = 632$ nm. Bands of ± 40 nm are presented and an out-of-band rejection of -60 dB is obtained.

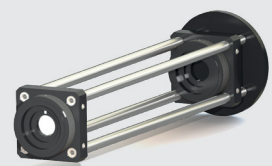


ACCESSORIES



FIBEROPTIC OUTPUT

The LLTF Contrast, in its basic configuration, delivers a collimated free-space output beam. The fibered output option takes this beam and couples it into a fiber to fit the needs of various applications. An X-Y-Z translation adjustment allows coupling optimization. Compatible with most standard fiber connectors (ex. FC/PC, FC/APC, etc.)



ALIGNMENT KIT (FOR FREE-SPACE)

In free-space configuration, the alignment of the input laser is challenging without the proper tools. Our alignment kit allows the user to do this quickly. Two irises, mounted on removable posts, are easily placed at the entrance of the filter. The laser beam then simply needs to follow the path created by the irises.