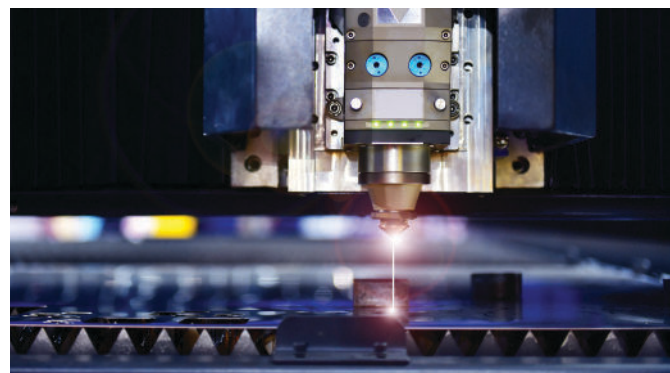


Data Sheet

Laser Induced Breakdown Spectroscopy

Laser-induced breakdown spectroscopy (LIBS) is a popular elemental analysis technique that uses a short laser pulse to create micro-plasma on a sample's surface. It is widely used across industries and offers several advantages over other elemental analysis methods. Avantes has been supporting the LIBS application for 25 years.



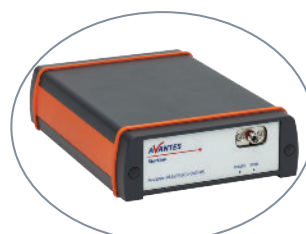
Avantes Advantages:

- Multi-channel capabilities for high resolution
- Superior timing and triggering (21 ns jitter)
- Flexibility in spectrometer configuration (200-1100nm)
- Resolution as high as 0.05 nm (FWHM)
- Extensive knowledge on LIBS applications
- Custom fiber optic cable for all types of environments

Spectrometer Model Recommendations



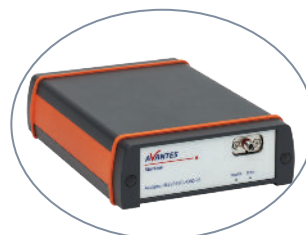
AvaSpec-VARIUS™
2048 and 4096 pixel options
190-1100 nm



AvaSpec-ULS4096CL-EVO
4096 pixels
190-1100 nm



AvaSpec-NEXOS™
2048 and 4096 pixel options
190-1100 nm



AvaSpec-ULS2048CL-EVO
2048 pixels
190-1100 nm

Multi-Channel Housing Configurations Examples (ULS instrument only)



Dual Channel Housing
For ULS Spectrometers



4-Channel Desktop Housing
for ULS Spectrometers



8-Channel Rackmount for
ULS Spectrometers

Examples of Single and Multi-Channel Configurations

Contact a Sales Engineer for More Options

Single Channel Configurations

Broadband Example			
Grating	Spectral Range	Resolution w/ 10µm slit	Resolution w/ 25µm slit
1200 line/mm UC	200-450nm	2048: 0.20-28nm; 4096: 0.14-0.18nm (FWHM)	2048: 0.27-0.38nm; 4096: 0.14-0.18 nm (FWHM)
1800 line/mm UD	200-365nm	2048: 0.10-18nm; 4096: 0.09-0.11nm (FWHM)	2048: 0.10-18nm; 4096: 0.20-0.29 nm (FWHM)

* These configurations require a slit selection (10 or 25 micron typically), cylindrical lens (DCL-UV/VIS), Order sorting coatings (OSC-UA, OSC-UC)

Dual Channel Configurations

Targeted Range Choose between 200-1100nm (Example 190-410nm)				
	Grating	Spectral Range	Resolution w/ 10µm slit	Resolution w/ 25µm slit
Channel 1	2400 line/mm UE grating	190-311 nm	2048: 0.09-0.13nm; 4096: 0.07-0.09nm	2048: 0.13-0.17nm; 4096: 0.13-0.17nm
Channel 2	2400 line/mm NB grating	305-410nm	2048: 0.09-0.13nm; 4096: 0.07-0.09nm	2048: 0.13-0.17nm; 4096: 0.13-0.17nm

* These configurations require a slit selection (10 or 25 micron typically), cylindrical lens (DCL-UV/VIS), Order sorting coatings (OSC-UB) or order sorting longpass filters (OSF-XX)

**Due to pixel size resolution for 10 or 25 micron slit is the same but 25 micron slit increases signal throughput by 2.5

Six-Channel Configuration Example

6-Channel Configuration Example (190-1018 nm)				
	Grating	Spectral Range	Resolution w/ 10µm slit	Resolution w/ 25µm slit
Channel 1	2400 line/mm UE grating	190-311nm	2048: 0.09-0.13nm; 4096: 0.07-0.09nm	2048: 0.13-0.17 nm; 4096: 0.13-0.17nm
Channel 2	2400 line/mm VE grating	305-410nm	2048: 0.09-0.13nm; 4096: 0.07-0.09nm	2048: 0.13-0.17 nm; 4096: 0.13-0.17nm
Channel 3	1800 line/mm NC grating	405-545nm	2048: 0.1-0.18nm; 4096: 0.09-0.11nm	2048: 0.20-0.29nm; 4096: 0.20-0.29nm
Channel 4	1800 line/mm NC grating	540-657nm	2048: 0.1-0.18nm; 4096: 0.09-0.11nm	2048: 0.20-0.29nm; 4096: 0.20-0.29nm
Channel 5	1200 line/mm NC grating	652-854nm	2048: 0.2-0.28nm; 4096: 0.09-0.11nm	2048: 0.27-0.38nm; 4096: 0.17-0.38nm
Channel 6	1200 line/mm NC grating	840-1018nm	2048: 0.2-0.28nm; 4096: 0.09-0.11nm	2048: 0.27-0.38nm; 4096: 0.17-0.38nm

* These configurations require a slit selection (10 or 25 micron typically), cylindrical lens (DCL-UV/VIS), and order sorting longpass filters (OSF-XX)

**Due to pixel size resolution for 10 or 25 micron slit is the same but 25 micron slit increases signal throughput by 2.5

Eight-Channel Configuration Example

8-Channel Desktop Housing Example				
	Grating	Spectral Range	Resolution w/ 10µm slit	Resolution w/ 25µm slit
Channel 1	3600 line/mm UF grating	190-262 nm	2048: 0.06-0.08 nm; 4096: 0.05-0.06 nm	2048: 0.1 nm; 4096: 0.1 nm
Channel 2	2400 line/mm UE grating	257-369 nm	2048: 0.09-0.13 nm; 4096: 0.07-0.09 nm	2048: 0.13-0.17 nm; 4096: 0.13-0.17 nm
Channel 3	2400 line/mm VE grating	365-460 nm	2048: 0.09-0.13 nm; 4096: 0.07-0.09 nm	2048: 0.13-0.17 nm; 4096: 0.13-0.17 nm
Channel 4	2400 line/mm VE grating	455-533 nm	2048: 0.09-0.13 nm; 4096: 0.07-0.09 nm	2048: 0.13-0.17 nm; 4096: 0.13-0.17 nm
Channel 5	1800 line/mm VD grating	528-647 nm	2048: 0.10-0.18 nm; 4096: 0.09-0.11 nm	2048: 0.20-0.29 nm; 4096: 0.20-0.29 nm
Channel 6	1800 line/mm VD grating	642-739 nm	2048: 0.10-0.18 nm; 4096: 0.09-0.11nm	2048: 0.20-0.29 nm; 4096: 0.20-0.29 nm
Channel 7	1200 line/mm NC grating	634-838 nm	2048: 0.20-0.28nm; 4096: 0.14-0.18nm	2048: 0.27-0.38 nm; 4096: 0.27-0.38 nm
Channel 8	1200 line/mm NC grating	832-1004 nm	2048: 0.20-0.28nm; 4096: 0.14-0.18nm	2048: 0.27-0.38 nm; 4096: 0.27-0.38 nm

* These configurations require a slit selection (10 or 25 micron typically), cylindrical lens (DCL-UV/VIS), and order sorting longpass filters (OSF-XX)

**Due to pixel size resolution for 10 or 25 micron slit is the same but 25 micron slit increases signal throughput by 2.5