

VARIUS™ SPECTROMETER



STARLINE



Meet the VARIUS™, a versatile spectrometer specifically designed to meet the needs of a wide variety of applications. The VARIUS™ is available with a 2k or 4k pixel detector, both of which are compatible with Avantes light sources, accessories, and AvaSoft software.

Additionally, the VARIUS™ spectrometer provides excellent price-to-performance ratio, making it a great choice for laboratories and research institutions seeking a powerful, reliable, and affordable spectroscopy solution.

PRODUCT VARIATIONS

To provide our customers with the best possible service, the VARIUS™ spectrometer is available in two product variations.

1. VARIUS™

Available with 2048 or 4096 pixel detector, USB3 high speed data transfer, and a replaceable slit to customize your throughput and resolution.

2. VARIUS™ OEM

Industrial OEM-version with a stainless steel electromagnetic compatible housing. Optimized for integration into your product or system.

WHY THE VARIUS?

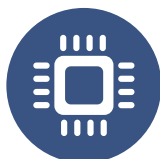
- Patented optical bench design
- Flexible performance through replaceable slit
- Versatile spectroscopy design
- Semi-automated production for unsurpassed inter-instrument reproducibility & scalability
- Superior stray light performance
- High signal-to-noise ratio
- Easy to operate with intuitive software
- Cost-effective instrument

APPLICATIONS & INDUSTRIES

The VARIUS™ is optimized for a wide variety of applications and industries. Including, but not limited to;



Agriculture & Food
Leaf measurements
Chlorophyll analysis



Semiconductor
Thin Film Coating
Coating Deposition



Lighting
Quality Control
Radiometry



Laboratory
Research and
Chemistry labs



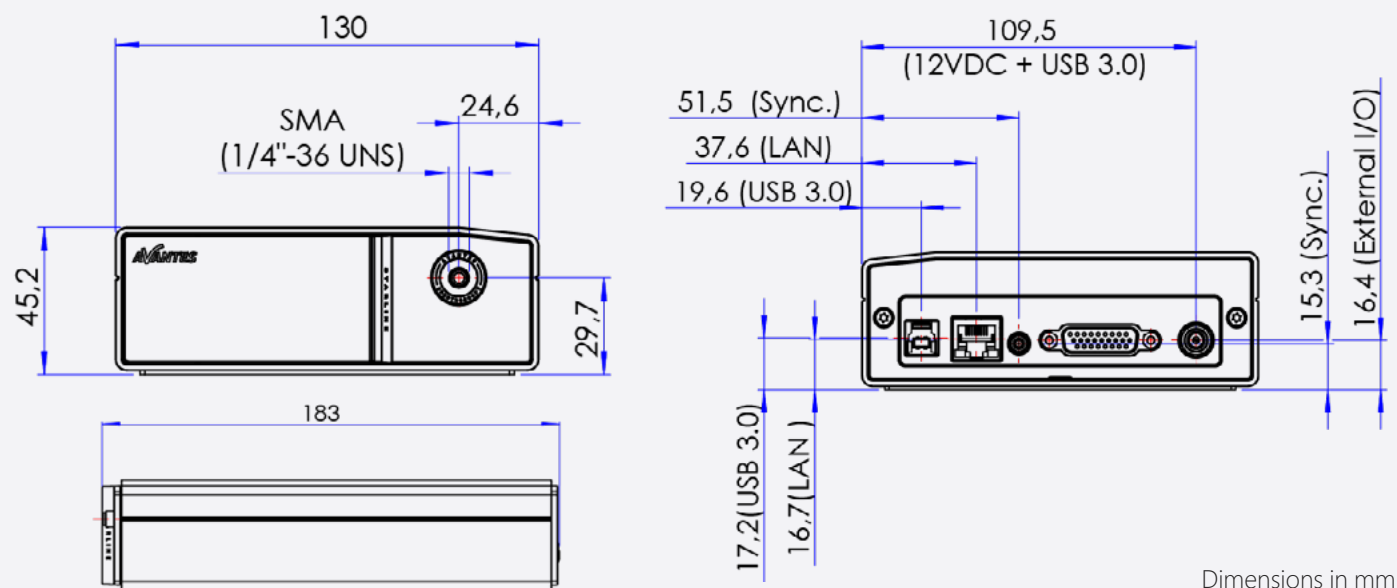
System Integration
Integrate into your
product or system

SPECIFICATIONS VARIUS™

The dimensions of the VARIUS™ OEM differs from the data below. Scan the QR-code below for the full specifications of all variants.

	VARIUS™ 2K	VARIUS™ 4K
Optical Bench	Symmetrical Czerny-Turner design, 75 mm focal length; VRS bench	
Wavelength range	190 - 1100 nm	
Stray light	0.1 - 1% (typical value 300 l/mm, blaze 300 nm < 0.3%)	
Detector	HAM S11639, CMOS linear array, 2048 pixels (14x200 µm)	HAM S13496, CMOS linear array, 4096 pixels (7x200 µm)
Signal/Noise	375:1	365:1
Dynamic Range	4500	
Dark noise	15 cnts	
AD converter	16-bit, 6 MHz	
Integration time	9 µs – 30 s	
Interface	USB 3.0 high speed (5Gbps), Gigabit Ethernet (1 Gbps)	
Sample speed on-board averaging	0.38 ms/scan	0.70 ms/scan
Data transfer speed	0.38 ms/scan (USB3.0), 1.0 ms (ETH)	0.70 ms/scan (USB3.0), 1.31 ms (ETH)
Digital I/O	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser	
Dimensions, weight	183 x 130 x 45,2 mm, 1068 grams	
Power supply	Default USB3 power, 500 mA or 12 VDC, 300 mA	
Temperature range	5-55 °C	

DIMENSIONS



FULL PRODUCT OVERVIEW & SPECIFICATIONS

Scan the QR-code for the full product specifications, grating options, ordering options, and more. Discover the flexibility of the VARIUS™ and find your ideal variation.

**PHOTO
TECHNICA**

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AVANTES
MEMBER OF THE NYNOMIC GROUP

VARIUS™ NIR ENHANCED SPECTROMETER



STARLINE



Discover the VARIUS™ NIR Enhanced Spectrometer. The standard VARIUS™ has been reimagined with an advanced detector to deliver unparalleled performance in near-infrared spectroscopy.

Designed for professionals who demand precision, reliability, and enhanced sensitivity, this latest development positions the VARIUS™ as the ultimate solution for your needs.

ADVANTAGES DETECTOR

The Near-Infrared enhanced detector has the following advantages:

- Enhanced sensitivity in 700 - 1100 nm range
Up to 2x increase.
- Enhanced NIR quantum efficiency
- Faster data transfer time compared to backthinned models
- Smooth spectrum
- Temperature stability

WHY CHOOSE VARIUS™

- Patented optical bench design
- Flexible performance through replaceable slit
- Versatile spectroscopy design
- Semi-automated production for unsurpassed inter-instrument reproducibility & scalability
- Superior stray light performance
- High signal-to-noise ratio
- Easy to operate with intuitive software
- Cost-effective instrument

APPLICATIONS & INDUSTRIES

The NIR Enhanced VARIUS™ Spectrometer is suitable for applications such as;



Food Sorting



Raman



VCSEL/Laser

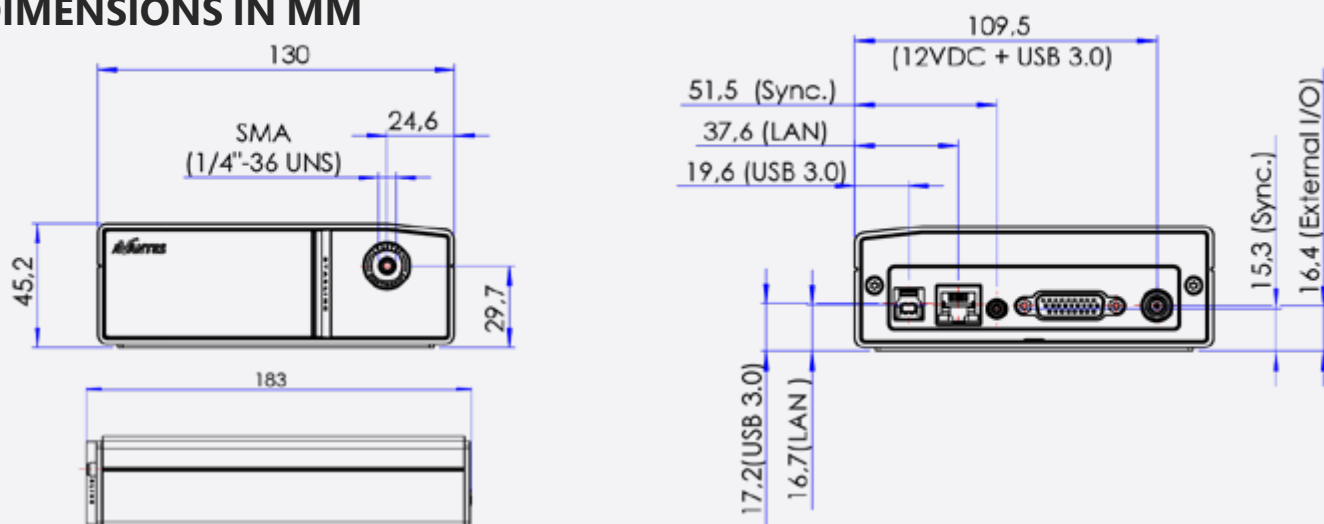


System Integration

SPECIFICATIONS VARIUS™ NIR ENHANCED SPECTROMETER

	VARIUS™ 2K	VARIUS™ 4K
Optical Bench	Symmetrical Czerny-Turner design, 75 mm focal length; VRS bench	
Wavelength range	400 - 1160 nm	
Stray light	0.1 - 1% (typical value 300 l/mm, blaze 300 nm < 0.3%)	
Detector	NIR Enhanced CMOS linear array, 2048 pixels (14x200 µm)	NIR Enhanced CMOS linear array, 4096 pixels (7x200 µm)
Signal/Noise	375:1	365:1
Dynamic Range	4500	
Dark noise	15 cnts	
AD converter	16-bit, 6 MHz	
Integration time	9 µs – 30 s	
Interface	USB 3.0 high speed (5Gbps), Gigabit Ethernet (1 Gbps)	
Sample speed on-board averaging	0.38 ms/scan	0.70 ms/scan
Data transfer speed	0.38 ms/scan (USB3.0), 1.0 ms (ETH)	0.70 ms/scan (USB3.0), 1.31 ms (ETH)
Digital I/O	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser	
Dimensions, weight	183 x 130 x 45,2 mm, 1068 grams	
Power supply	Default USB3 power, 500 mA or 12 VDC, 300 mA	
Temperature range	5-55 °C	

DIMENSIONS IN MM



GRATINGS

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS	250-850	536-532*	600	400	MN0600-0.40
VIS/NIR	300-1160**	800**	300	500	MN0300-0.50
VIS	360-1000	529-519*	600	500	MN0600-0.50
VIS	300-800	247-216*	1200	500	MN1200-0.50
VIS	350-750	147-121*	1800	500	MN1800-0.50
VIS	350-640	96-89*	2400	VIS	MN2400-0.50
NIR	500-1050	515-506*	600	750	MN0600-0.75
NIR	500-1050	210-204*	1200	750	MN1200-0.75
NIR	600-1160	339-300*	830	800	MN0830-0.80
NIR	600-1160**	500**	300	1000	MN0300-1.00
NIR	600-1160	500	600	1000	MN0600-1.00

Note: a selection of starting wavelength is possible, contact us for available configurations.

* Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and smaller the range to select

** Please note that not all pixels will be used for the useable range

RESOLUTION VARIUS™ 2K (FWHM in nm)

Slit size (μm)	10	25	50	100	200	500
300 lines/mm grating	1.0	1.4	2.25	4.8	9.2	21.3
600 lines/mm grating	0.40-0.53*	0.7	1.2	2.4	4.6	10.8
830 lines/mm grating	0.32	0.48	0.93	1.7	3.4	8.5
1200 lines/mm grating	0.20-0.28*	0.27-0.38*	0.52-0.66*	1.1	2.3	5.4
1800 lines/mm grating	0.10-0.18*	0.20-0.29*	0.34-0.42*	0.8	1.6	3.6
2400 lines/mm grating	0.09-0.13*	0.13-0.17*	0.26-0.34*	0.44-0.64*	1.1	2.7

*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the higher the resolution.

RESOLUTION VARIUS™ 4K - (FWHM in nm)

Slit size (μm)	10	25	50	100	200	500
300 lines/mm grating	0.50-0.70	1.4	2.25	4.8	9.2	21.3
600 lines/mm grating	0.30-0.36*	0.7	1.2	2.4	4.6	10.8
830 lines/mm grating	0.25	0.48	0.93	1.7	3.4	8.5
1200 lines/mm grating	0.14-0.18*	0.27-0.38*	0.52-0.66*	1.1	2.3	5.4
1800 lines/mm grating	0.09-0.11*	0.20-0.29*	0.34-0.42*	0.8	1.6	3.6
2400 lines/mm grating	0.07-0.09*	0.13-0.17*	0.26-0.34*	0.44-0.64*	1.1	2.7

*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the higher the resolution.

ORDERING INFORMATION

Order code	Ordering information
AvaSpec-VRS2048CLIR-EVO	VARIUS™ fiber-optic spectrometer, 75 mm AvaBench, 2048 pixel CMOS detector 14 x 200 μm, USB powered, high-speed USB 3.0 and ETH interface, incl. AvaSoft-Basic, USB interface cable. Specify grating, wavelength range and options (A). NIR Enhanced version
AvaSpec-VRS4096CLIR-EVO	VARIUS™ fiber-optic spectrometer, 75 mm AvaBench, 4096 pixel CMOS detector 7 x 200 μm, USB powered, high-speed USB 3.0 and ETH interface, incl. AvaSoft-Basic, USB interface cable. Specify grating, wavelength range and options (A). NIR Enhanced version
AvaSpec-VRS-OEM	Contact one of our offices for ordering information regarding the VARIUS™ OEM

CONFIGURATION DEPENDANT PARAMETERS

Order code	Parameter information
SLIT-XX-PRS	Replaceable Slit for VARIUS™ spectrometer for non OSF configurations. Slit size, please specify XX = 10, 25, 50, 100, 200, 500 μm
SLIT-XX-PRSF	Replaceable Slit for VARIUS™ spectrometer for OSF configurations. Slit size, please specify XX = 10, 25, 50, 100, 200, 500 μm
OSC	Order sorting coating for grating MN 0600-0.50 and MN 0600-0.40 (>350 nm)
OSC-UA	Order sorting coating for grating MN 0300-0.50
OSC-UB	Order sorting coating for grating MN 0600-0.40 (<350 nm)
OSF-YYY-3	Order sorting filter for reduction of second-order effects, possible: YYY = 395, 475, 515, 550, or 600 nm, depending on range
DCL	Detector Collection Lens. To be included

Avantes will select the optimal second order suppression based on desired configuration.



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VARIUS™ OEM NIR ENHANCED SPECTROMETER



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Discover the VARIUS™ OEM NIR Enhanced Spectrometer. The standard VARIUS™ OEM has been reimagined with an advanced detector to deliver unparalleled performance in near-infrared spectroscopy.

Designed for professionals who demand precision, reliability, and enhanced sensitivity, this latest development positions the VARIUS™ OEM as the ultimate solution for your needs.

ADVANTAGES DETECTOR

The Near-Infrared enhanced detector has the following advantages:

- Enhanced sensitivity in 700 - 1100 nm range
Up to 2x increase.
- Enhanced NIR quantum efficiency
- Faster data transfer time compared to backthinned models
- Smooth spectrum
- Temperature stability

WHY CHOOSE VARIUS™ OEM

- Patented optical bench design
- EMC shielded housing
- Semi-automated production for unsurpassed inter-instrument reproducibility & scalability
- Superior stray light performance
- High signal-to-noise ratio
- Easy to operate with intuitive software
- Cost-effective instrument
- Easy integration into products or solutions

APPLICATIONS & INDUSTRIES

The NIR Enhanced VARIUS™ OEMSpectrometer is suitable for applications such as;



Food Sorting



Raman



VCSEL/Laser

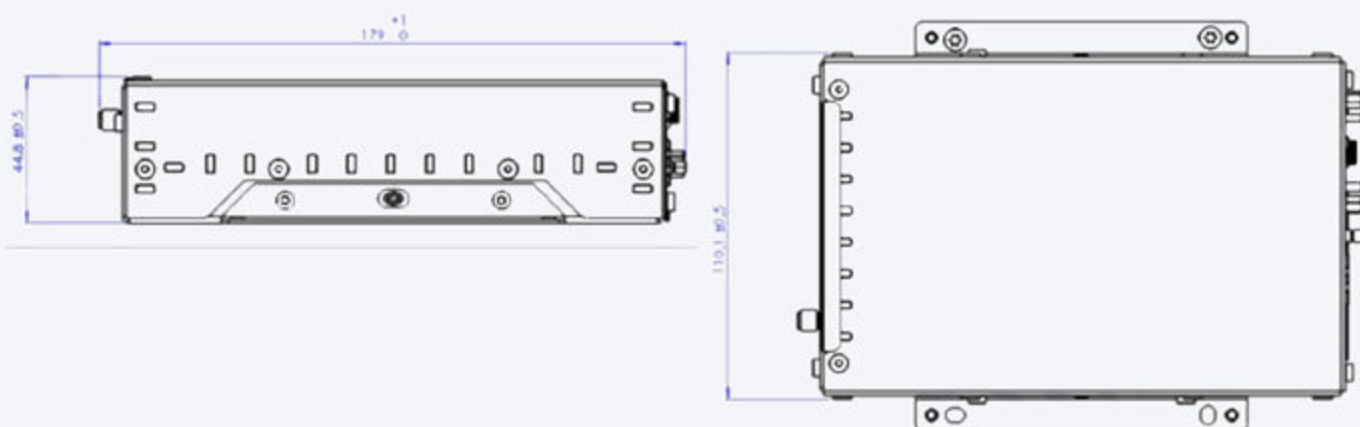


System Integration

SPECIFICATIONS VARIUS™ OEM NIR ENHANCED SPECTROMETER

	VARIUS™ 2K	VARIUS™ 4K
Optical Bench	Symmetrical Czerny-Turner design, 75 mm focal length; VRS bench	
Wavelength range	400 - 1160 nm	
Stray light	0.1 - 1% (typical value 300 l/mm, blaze 300 nm < 0.3%)	
Detector	NIR Enhanced CMOS linear array, 2048 pixels (14x200 µm)	NIR Enhanced CMOS linear array, 4096 pixels (7x200 µm)
Signal/Noise	375:1	365:1
Dynamic Range	4500	
Dark noise	15 cnts	
AD converter	16-bit, 6 MHz	
Integration time	9 µs – 30 s	
Interface	USB 3.0 high speed (5Gbps), Gigabit Ethernet (1 Gbps)	
Sample speed on-board averaging	0.38 ms/scan	0.70 ms/scan
Data transfer speed	0.38 ms/scan (USB3.0), 1.0 ms (ETH)	0.70 ms/scan (USB3.0), 1.31 ms (ETH)
Digital I/O	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser	
Dimensions, weight	179x110,1x44,8 mm - 799,5 grams	
Power supply	Default USB3 power, 500 mA or 12 VDC, 300 mA	
Temperature range	5-55 °C	

DIMENSIONS IN MM



GRATINGS

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS	250-850	536-532*	600	400	MN0600-0.40
VIS/NIR	300-1160**	800**	300	500	MN0300-0.50
VIS	360-1000	529-519*	600	500	MN0600-0.50
VIS	300-800	247-216*	1200	500	MN1200-0.50
VIS	350-750	147-121*	1800	500	MN1800-0.50
VIS	350-640	96-89*	2400	VIS	MN2400-0.50
NIR	500-1050	515-506*	600	750	MN0600-0.75
NIR	500-1050	210-204*	1200	750	MN1200-0.75
NIR	600-1160	339-300*	830	800	MN0830-0.80
NIR	600-1160**	500**	300	1000	MN0300-1.00
NIR	600-1160	500	600	1000	MN0600-1.00

Note: a selection of starting wavelength is possible, contact us for available configurations.

* Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and smaller the range to select

** Please note that not all pixels will be used for the useable range

RESOLUTION VARIUS™ 2K (FWHM in nm)

Slit size (μm)	10	25	50	100	200	500
300 lines/mm grating	1.0	1.4	2.25	4.8	9.2	21.3
600 lines/mm grating	0.40-0.53*	0.7	1.2	2.4	4.6	10.8
830 lines/mm grating	0.32	0.48	0.93	1.7	3.4	8.5
1200 lines/mm grating	0.20-0.28*	0.27-0.38*	0.52-0.66*	1.1	2.3	5.4
1800 lines/mm grating	0.10-0.18*	0.20-0.29*	0.34-0.42*	0.8	1.6	3.6
2400 lines/mm grating	0.09-0.13*	0.13-0.17*	0.26-0.34*	0.44-0.64*	1.1	2.7

*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the higher the resolution.

RESOLUTION VARIUS™ 4K - (FWHM in nm)

Slit size (μm)	10	25	50	100	200	500
300 lines/mm grating	0.50-0.70	1.4	2.25	4.8	9.2	21.3
600 lines/mm grating	0.30-0.36*	0.7	1.2	2.4	4.6	10.8
830 lines/mm grating	0.25	0.48	0.93	1.7	3.4	8.5
1200 lines/mm grating	0.14-0.18*	0.27-0.38*	0.52-0.66*	1.1	2.3	5.4
1800 lines/mm grating	0.09-0.11*	0.20-0.29*	0.34-0.42*	0.8	1.6	3.6
2400 lines/mm grating	0.07-0.09*	0.13-0.17*	0.26-0.34*	0.44-0.64*	1.1	2.7

*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the higher the resolution.

ORDERING INFORMATION

Order code	Ordering information
AvaSpec-VRS-OEM	VARIUS™ OEM NIR Enhanced fiber-optic spectrometer, 75 mm AvaBench for OEM Customers. Contact one of our offices for ordering information regarding the VARIUS™ OEM

CONFIGURATION DEPENDANT PARAMETERS

Order code	Parameter information
SLIT-XX-PRS	Replaceable Slit for VARIUS™ spectrometer for non OSF configurations. Slit size, please specify XX = 10, 25, 50, 100, 200, 500 μm
SLIT-XX-PRSF	Replaceable Slit for VARIUS™ spectrometer for OSF configurations. Slit size, please specify XX = 10, 25, 50, 100, 200, 500 μm
OSC	Order sorting coating for grating MN 0600-0.50 and MN 0600-0.40 (>350 nm)
OSC-UA	Order sorting coating for grating MN 0300-0.50
OSC-UB	Order sorting coating for grating MN 0600-0.40 (<350 nm)
OSF-YYY-3	Order sorting filter for reduction of second-order effects, possible: YYY = 395, 475, 515, 550, or 600 nm, depending on range
DCL	Detector Collection Lens. To be included

Avantes will select the optimal second order suppression based on desired configuration.



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AvaSpec Multi-Channel Spectrometer

Do you need more precise measurements over a broad range? Or multiple measurements at the same moment for process control? AvaSpec multi-channel spectrometers fulfill your every need. You can select from our range of spectrometer detectors, choose different slits or gratings: anything is possible.

Two enclosure options are available: the 9" desktop housing for up to 4 channels and the 19" rack-mountable which holds a maximum of 10 spectrometers. For our USB2 version all channels are connected to the computer through a single USB2-cable.

For the EVO series a USB3 and a Ethernet version is available.

The Ethernet version (ETH) supports standard 4 channels. With the additional hub installed, it can handle up to 10 channels.

Benefits:

- Combine up to 10 channels in one enclosure
- Any channel fully configurable to your needs
- Different integration times and averaging settings possible for each channel
- Ideal for process control

AVS-RACKMOUNT



Technical Data

Housing	Desktop	Rack-mount
Max nr. Channels	4	10 (UV/VIS)
Dimensions	315 x 235 x 135 mm (d x w x h)	315 x 445 x 135 mm

Ordering Information

AVS-DESKTOP-USB2	<ul style="list-style-type: none"> • Desktop for USB2 platform multichannel AvaSpec, incl. channel synchronization, USB2-hub and 100-240VAC power supply, supports max. 4 Rack-mount spectrometer units.
AVS-RACKMOUNT-USB2	<ul style="list-style-type: none"> • 19" Rack-mount for USB2 platform multichannel AvaSpec, incl. channel synchronization, USB2-hub and 100-240VAC power supply, supports max. 10 Rack-mount spectrometer units.
AvaSpec-DDDD-USB2-RM	<ul style="list-style-type: none"> • Rack-mount Unit USB2 Fiber-optic Spectrometer, self powered high-speed USB2 interface, incl. AvaSoft-Basic software, USB cable and sync cable, specify detector type DDDD (ULS2048/ULS3648/ULS2048L/ULS2048XL/NIR256/512), grating, wavelength range and options. Desktop/Rack-mount needs to be ordered separately
AVS-DESKTOP-USB3	<ul style="list-style-type: none"> • Desktop for USB3 platform multichannel AvaSpec-EVO, incl. channel synchronization, USB3-hub and 100-240VAC power supply, supports max. 4 Rack-mount spectrometer units.
AVS-DESKTOP-ETH	<ul style="list-style-type: none"> • Desktop for ETH platform multichannel AvaSpec-EVO, incl. channel synchronization, ETH-hub and 100-240VAC power supply, supports max. 4 Rack-mount spectrometer units.
AVS-RACKMOUNT-EVO-USB3	<ul style="list-style-type: none"> • 19" Rackmount for USB3 platform multichannel AvaSpec-EVO, including channel synchronization, USB3-hub, one DB26-IO connector and 100-240VAC power supply, supports max 10 rackmount unit spectrometer channels.
AVS-RACKMOUNT-EVO-ETH	<ul style="list-style-type: none"> • 19" Rackmount for ETH platform multichannel, including channel synchronization, 4 channel ETH-hub, one DB26-IO connector and 100-240VAC power supply, supports max. 10 rackmount unit spectrometer channels (needs AVS-RM-ADDON-5-10ETH).
AVS-RM-ADDON-5-10ETH	<ul style="list-style-type: none"> • Extra Industrial Hub for extension of AVS-RACKMOUNT-EVO-ETH to 5-10 channels
AvaSpec-EEEE-EVO-RM	<ul style="list-style-type: none"> • Rack-mount EVO Fiber-optic Spectrometer, incl. AvaSoft-Basic software, USB cable and sync cable, specify detector type EEEE (ULS2048CL/ULS4096CL/ULS2048L/ULS2048XL/NIR256/512), grating, wavelength range and options. Desktop/Rack-mount needs to be ordered separately

Synchronize all channels easily with internal sync cables

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