Light Sources

Introduction

Illumination light sources are needed for transmission, absorption and reflection spectroscopic setups. For the convenient coupling of the light into our range of fiber optic cables, bundles and probes, it is necessary that the light is collected and can be coupled through SMA-905 connectors. Avantes offers different light sources for the different applications and wavelength ranges, as can be seen in table 7. Tungsten Halogen light sources are mostly used for the visible range to do color measurements. The halogen light source provides a very stable output and has a lifetime, depending on the color temperature of the bulb. The high stability of the halogen light sources enables the use as color reflection illumination source or as irradiance calibration light source. The most important feature of the halogen light is that the spectral output is smooth and monotonic without spikes or dips.

Table 7 Light sources

Application	Wavelength Range	Type	Principle	Product
Color / VIS / NIR	360-2000 nm	Tungsten Halogen	Continuous	AvaLight-HAL/HL-6000-S
DUV	190-400 nm	Deuterium	Continuous	AvaLight-D-S-DUV
UV	215-400 nm	Deuterium	Continuous	AvaLight-D-S
UV/VIS/NIR refl./abs.	215-2000 nm	Deuterium/Halogen	Continuous	AvaLight-DH-S
UV/VIS/NIR absorption	200-2000 nm	Deuterium/Halogen	Continuous	AvaLight-DHc
UV/VIS	200-1000 nm	Xenon	Pulsed	XE-2000
Fluorescence	Multiple possible	LED	Continuous	AvaLight-LED
Wavelength Calibration	253-922 nm	Mercury-Argon	Continuous	AvaLight-CAL
Irradiance Calibration	360-1100nm	Tungsten Halogen	Continuous	AvaLight-HAL-CAL
Irradiance Calibration	200-1100nm	Deuterium/Halogen	Continuous	AvaLight-DH-CAL

Deuterium light sources provide a stable output and are mostly used for UV absorption- or reflection-measurements. Also, the deuterium's high stability enables the use as irradiance calibration source. The deuterium spectrum is not as smooth as the halogen spectrum and shows a high peak around 656 nm. A combination light source focusing the halogen through the deuterium provides a wide range light source.

Pulsed xenon light sources are mostly used in applications that require a long lifetime and where a stable output is not the highest demand. Also the spectral output of a xenon light source is not as continuous as a halogen or deuterium light source, it has some high peaks and valleys.

Whenever a high power small wavelength range illumination is needed, an LED can efficiently be coupled into the fiber optics. A typical application is the use as an excitation light source for fluorescence applications. The long lifetime, short warm-up time and high stability are main features for LED light sources.

The spectral distribution of the different light sources is given in figure 6.

Avantes offers a source for wavelength calibration with a combination of mercury and argon spectral lines. All Avantes spectrometers are factory wavelength calibrated and do not need recalibration. The AvaLight-CAL can be used for recalibration purposes, AvaSoft offers an autocalibration routine that supports the automatic recalculation of the wavelength calibration coefficients.
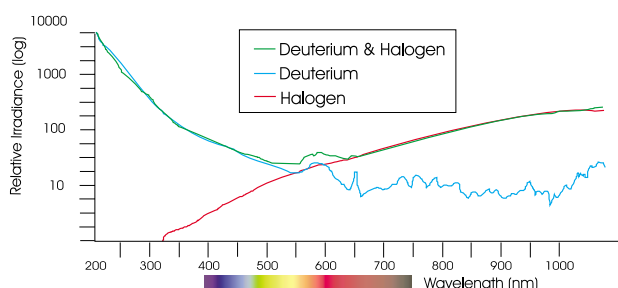
Figure 6 Spectral distribution of different light sources.
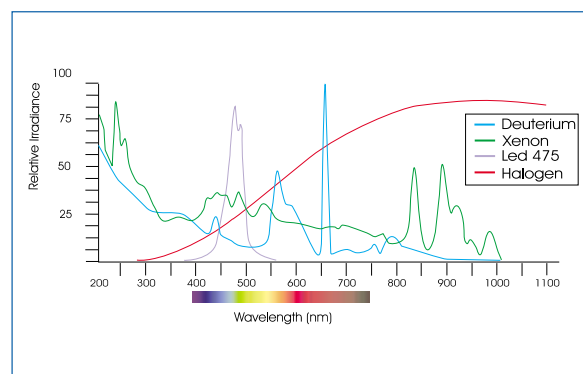
AvaLight-DHc Compact Deuterium Halogen Light Source

The AvaLight-DHc is a combined deuterium-halogen light source, to be used for UV/VIS/NIR applications. The output energy of the AvaLight-DHc is relatively low. The use is therefore recommended in transmission setup with large diameter fibers. The light source emits light from 200 to 2000 nm and has an SMA connector to easily couple into our range of fiber optics. The AvaLight-DHc has an integrated TTL shutter, that can be used for auto-save dark / lamp off in combination with AvaSoft (extra IC-DB15-2 needed).

AvaLight-DHc

Figure 7 Spectral output of AvaLight-DHc

Optionally, the AvaLight-DHc can be delivered in Rackmounted version, to be fully integrated in the 19″ rackmount or 9.5″ desktop housing.
A direct attach cuvette holder CUV-DHc (see section accessories) is available for fluorescence or absorbance measurements.

Technical Data

	Deuterium Light Source	Halogen Light Source
Wavelength Range	200 - 400 nm	400 - 2000 nm
Stability	< 1 mAU	< 1 mAU
Warm-up time	8 min	1 min
Drift	< 0.25% / h	< 0.25% / h
Optical Power in 600 µm fiber	25 µWatt	140 µWatt
Lamp Lifetime	1000 hours	2000 hours
Temp. Range	5°C - 35°C	
Power Supply	12VDC / 600mA	
Dimensions	175 x 110 x 44 mm	

ORDERING INFORMATION	
AvaLight-DHc	Compact Deuterium Halogen Light Source with TTL Shutter
AvaLight-DHc-RM	Rackmount Compact Deuterium Halogen Light Source with TTL Shutter
IC-DB15-2	Interface cable AvaSpec to AvaLight-DHc-TTL-shutter
AvaLight-DHc-B	Compact Deuterium Halogen Replacement Bulb
CUV-DHc	Direct attach cuvette holder for AvaLight-DHc
PS-12V/1.25A	Power supply 100-240VAC/12VDC, 1.25A for AvaLight-DHc

Light Sources

AvaLight-HAL Tungsten Halogen Light Source

AvaLight-HAL

The AvaLight-HAL is a compact stabilized halogen fan-cooled light source that can be used for the visible and the near infrared range. The AvaLight-HAL features adjustable focusing of the SMA connector to maximize light coupling into a fiber or fiber bundle with a diameter of up to 600 µm. A filter slot accepts 1" round or 2" x 2" square filters up to 3 mm thick. The lamp stability is achieved by a current stabilization. A fan regulates the airflow around the heatsink to optimize the operation temperature. The AvaLight-HAL needs an extra PS-24V/1.25A 24 VDC power adapter.

The SMA-connector input into any fiber can be optimized by changing the focus. Bulb replacement is easy. With an internal jumper the optical output energy can be controlled. At "low" setting the source acts as a long life source with over 2000 hrs life time. At "medium" setting the color temperature goes up and the expected life time is about 1000 hrs. The "high" setting gives max output in the blue range, but reduces bulb life time to < 1000 hrs (see fig 8).

The Avalight-HAL-S has an internal TTL shutter, that can be controlled from the AvaSpec, so the auto-save dark option in the AvaSoft software can be used (extra IC-DB15-2 needed).

The filter holder can be easily replaced by a direct attach cuvette holder CUV-HAL (see section accessories) useful for fluorescence or absorbance measurements.
Optionally, the AvaLight-HAL(S) can be delivered in Rackmounted version, to be fully integrated in the 19" rackmount or 9.5" desktop housing.

Figure 8 Spectral output of AvaLight-HAL
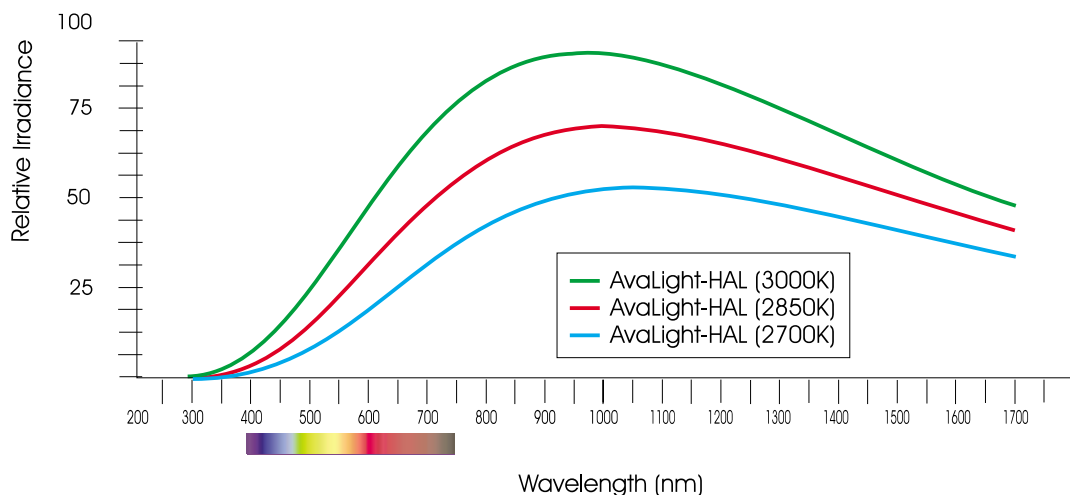
Technical Data

	AvaLight-HAL (standard)	AvaLight-HAL (long life)	AvaLight-HAL (high power)
Wavelength Range	360-2000nm		
Stability	± 0.1%		
Warm-up Time	Ca. 15 min.		
Output to bulb	12.7 VDC / 0.9 A	11.3 VDC /0.8 A	14.1 VDC / 1.0 A
Bulb Life	1000 hrs	> 2000 hrs	< 1000 hrs
Optical power 200µm fiber	20 mWatt	13 mWatt	27 mWatt
Optical power 600µm fiber	80 mWatt	50 mWatt	100 mWatt
Optical power 1000µm fiber	150 mWatt	100 mWatt	200 mWatt
Bulb Color Temperature	2.850K	2.700K	3.000K
Power requirement	24 VDC / 1.25A		
Dimensions (mm)	132 x 110 x 44 mm		

Separate 50 x 50mm filters to install in AvaLight-HAL(-S)

GL-WG305-3	Separate 50 x 50 x 3 mm long-pass filter > 305 nm
GL-KG3-3	Separate 50 x 50 x 3 mm bandpass filter, transparent > 325 nm and < 700 nm
GL-BG28-3	Separate 50 x 50 x 3 mm bandpass filter, transparent > 360 nm and < 500 nm
GL-GG385-3	Separate 50 x 50 x 3 mm long-pass filter > 385 nm
GL-GG475-3	Separate 50 x 50 x 3 mm long-pass filter > 475 nm
GL-OG515-3	Separate 50 x 50 x 3 mm long-pass filter > 515 nm
GL-OG550-3	Separate 50 x 50 x 3 mm long-pass filter > 550 nm
GL-OG590-3	Separate 50 x 50 x 3 mm long-pass filter > 590 nm
GL-NG9-1	Separate 50 x 50 x 1 mm Neutral Density filter
GL-NG9-2	Separate 50 x 50 x 2 mm Neutral Density filter
GL-NG9-3	Separate 50 x 50 x 3 mm Neutral Density filter

More filter types available, please contact us for ordering information.

ORDERING INFORMATION	
AvaLight-HAL	10W Tungsten Halogen Lamp, fan-cooled, needs extra PS-24V/1.25A power supply
AvaLight-HAL-S	10W Tungsten Halogen Lamp, fan-cooled, incl. TTL shutter, needs extra PS-24V/1.25A power supply
AvaLight-HAL-S-RM	Rack mounted version of the 10W Tungsten Halogen Lamp, fan-cooled, incl. TTL shutter
IC-DB15-2	Interface cable AvaSpec to AvaLight-HAL-S
AvaLight-HAL-B	10W Tungsten Halogen Replacement bulb for AvaLight-HAL, AvaLight-HAL-S
CUV-HAL	Direct attach cuvette holder for AvaLight-HAL(-S)
PS-24V/1.25A	Power supply 100-240VAC/24VDC, 1.25A, necessary for AvaLight-HAL(-S)

Light Sources

AvaLight-D(H)-S Deuterium-Halogen Light Sources

AvaLight-DH-S

The AvaLight-DH-S is a combined Deuterium and halogen light source, which can be used for UV/VIS/NIR applications. The AvaLight-DH-S has a SMA905 connector to be used with fiber optic cables and bundles. For optimal coupling an adjustable focus lens assembly is included. The light source supplies a continuous spectrum with high efficiency and highest stability in the UV, visible and near-infrared range from 215-2000 nm.

The Avalight-DH-S was developed based on the shine-through principle, in which the halogen light is focused through a small diameter aperture in the deuterium bulb.

For UV applications the AvaLight-D-S source (only Deuterium) is available.

The standard AvaLight-D(H)-S light sources have a special UV longpass filter (>220nm) implemented to protect the fibers from solarizing. For applications that require a spectral range below 220 nm a Deep UV bulb is available, in which no UV longpass filter is included. For these Deep-UV measurements (from 190nm) the AvaLight-D(H)-S-DUV may be ordered. For all Deuterium Light Sources solarization resistant fibers (-SR) are recommended. For the DUV lamp special solarization resistant fibers (-SR) are required (see the fiber optic section of this catalog).

The output of the AvaLight-DH-S is optimized for fibers (bundles) with a diameter up to 600 µm, for larger diameter fiber bundles the AvaLight-DH-S SMA connector focal point can be manually adapted to uniformly fill a larger core diameter fiber cable or bundels.
In all AvaLight-Deuterium sources an integrated TTL-shutter and filter holder for filters of up to 50x50x6.5 mm are implemented.
The Avalight-DH-S internal TTL shutter can be controlled from the AvaSpec, so the auto-save dark option in the AvaSoft-FULL software can be used (extra IC-DB15-2 needed).

The filter holder can be easily replaced by a direct attach cuvette holder CUV-DHS (see section accessories) useful for fluorescence or absorbance measurements.

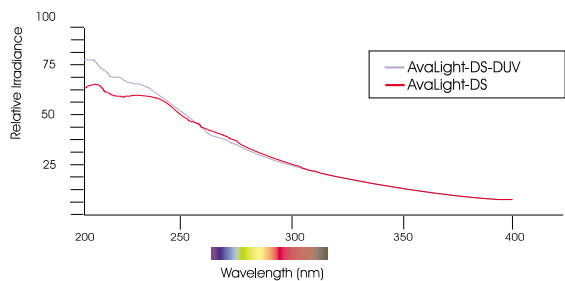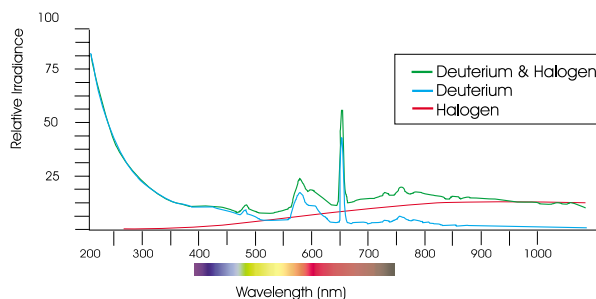### Figure 9 Spectral output AvaLight-D-S

Figure 10 Spectral output AvaLight-DH-S

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Technical Data

	Deep UV Deuterium	Deuterium Lamp	Halogen Lamp
Wavelength Range	190-400nm	215-400nm	360-2000nm
Warm-up Time	30 min.	30 min.	20 min.
Lamp Power	78W / 0.75A	78W / 0.75A	5W /0.5A
Lamp Lifetime	1000 hrs	1000 hrs	1000 hrs
Stability	0,1%	0,1%	0,4%
Color Temperature	-	-	3000 K
Optical Power in 200µm fiber	2.1 mW	2.1 mW	700 µW
Optical Power in 600µm fiber	8.5 mW	8.5 mW	4.6 mW
Power consumption	90 Watt (190Watt for heating D-Lamp 4-5 sec.)		
Power Requirements	85-264VAC 50/60 Hz		
Dimensions / Weight	315 x 165 x 140 mm / ca 5 kg.		

Separate 50 x 50mm filters to install in AvaLight-D(H)-S

GL-WG305-3	Separate 50 x 50 x 3 mm long-pass filter > 305 nm
GL-KG3-3	Separate 50 x 50 x 3 mm bandpass filter, transparent > 325 nm and < 700 nm
GL-BG28-3	Separate 50 x 50 x 3 mm bandpass filter, transparent > 360 nm and < 500 nm
GL-GG385-3	Separate 50 x 50 x 3 mm long-pass filter > 385 nm
GL-GG475-3	Separate 50 x 50 x 3 mm long-pass filter > 475 nm
GL-OG515-3	Separate 50 x 50 x 3 mm long-pass filter > 515 nm
GL-OG550-3	Separate 50 x 50 x 3 mm long-pass filter > 550 nm
GL-OG590-3	Separate 50 x 50 x 3 mm long-pass filter > 590 nm
GL-NG9-1	Separate 50 x 50 x 1 mm Neutral Density filter
GL-NG9-2	Separate 50 x 50 x 2 mm Neutral Density filter
GL-NG9-3	Separate 50 x 50 x 3 mm Neutral Density filter

More filter types available, please contact us for ordering information.

ORDERING INFORMATION	
AvaLight-D-S	Deuterium light source, 215-400 nm, incl. TTL shutter, -SR fibers recommended
AvaLight-DH-S	Deuterium-Halogen light source, 215-2000 nm, incl. TTL shutter, -SR fibers recommended
AvaLight-D-S-DUV	Deep UV deuterium light source, 190-400 nm, incl. TTL shutter, -SR fibers needed
AvaLight-DH-S-DUV	Deep UV deuterium-halogen light source, 190-2000 nm, incl. TTL shutter, -SR fibers needed
IC-DB15-2	Interface cable AvaSpec to AvaLight-D(H)S
AvaLight-D-B	Replacement deuterium bulb for AvaLight-D/AvaLight DH light source
AvaLight-D-B-DUV	Replacement deep UV deuterium bulb for AvaLight-D(H)-S-DUV light source
AvaLight-DH-B	Replacement halogen bulb for AvaLight-DH light source
CUV-DHS	Direct attach cuvette holder for AvaLight-D(H)S

Light Sources

AvaLight-HAL-CAL and AvaLight-DH-CAL Calibrated Light Sources

AvaLight-HAL-CAL

The AvaLight-HAL-CAL is a compact, low-cost light source, calibrated for the VIS/NIR spectral range (350-1095 nm). This NIST traceable calibrated light source is developed for use with all AvaSpec spectrometers, to measure absolute spectral intensity.

The AvaLight-HAL-CAL comes with a built-in diffuser, a cosine corrector CC-UV/VIS-CAL with SMA adapter and a diskette with the calibration file in ASCII format. The AvaLight-HAL-CAL calibration file can be read by AvaSoft-IRRAD, a software package developed to make your spectrometer system a spectroradiometer.

A special version of the calibrated light source, the AvaLight-HAL-CAL-ISP, is available to couple the AvaSphere-50-IRRAD integrating sphere to the light source.

The AvaLight-HAL-CAL cannot be used as an illumination source for spectral absorbance, transmission and reflection measurements. The AvaLight-HAL-CAL comes with a calibrated PS-24V/1.25A power supply.

AvaLight-DH-CAL

The AvaLight-DH-CAL is a calibrated light source for the UV/VIS/NIR spectral range (200-1099 nm). This NIST-traceable calibrated light source is developed for use with all AvaSpec spectrometers to measure absolute spectral intensity.

The AvaLight-DH-CAL comes with a built-in diffuser, a cosine corrector CC-UV/VIS-CAL with SMA adapter and a diskette with the calibration file in ASCII format. The software includes two calibration files, both valid for calibration with the cosine corrector. One calibration file can be used for irradiance calibration over the full range (205-1095 nm). In that case both the Deuterium and Halogen light need to be switched on during the calibration.

The other calibration file can be used for irradiance calibration over the VIS/NIR range (350-1099 nm). In that case only the Halogen light needs to be switched on which gives a more smooth and stable output around 656 nm and at the higher wavelengths.

The calibration files can be imported in the AvaSoft-IRRAD application software, developed to make your spectrometer system a spectroradiometer. The AvaLight-DH-CAL cannot be used as an illumination source for spectral absorbance, transmittance and reflectance measurements.

Technical Data

	AvaLight-HAL-CAL	AvaLight-DH-CAL
Wavelength Range	350-1095nm	200-1099nm
Calibration Accuracy	± 15 %	± 15%
Stability	± 0.1 %	± 0.5%
Calibration valid for	60 hrs	60 hrs
Warm-upTime	Ca. 15 Min.	Ca. 30 min.
Bulb Output (CC-UV/VIS-CAL)	170µW/cm^{2}nm (@800nm)	80µW/cm^{2}nm (@215nm) 3µW/cm^{2}nm (@800nm)
Power Requirements	24 VDC / 1.25A	85-264VAC 50/60 Hz
Dimensions (mm)	132 x 110 x 44 mm	315 x 165 x 140

Figure 11 Spectral output Avalight-HAL-CAL and Avalight-DH-CAL
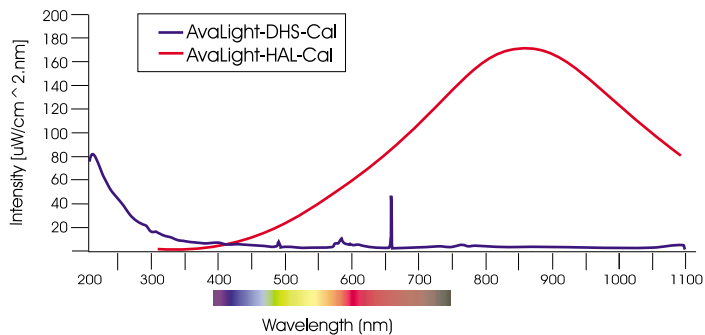
ORDERING INFORMATION	
AvaLight-HAL-CAL	NIST traceable Halogen Lamp with CC-UV/VIS-CAL diffuser, needs extra PS-24V/1.25A
AvaLight-HAL-CAL-ISP	NIST traceable Halogen Lamp for use with AvaSphere-50-IRRAD, needs extra PS-24V/1.25A
HL-Recal	AvaLight-HAL-CAL recalibration service
AvaLight-DH-CAL	NIST traceable UV/VIS Deuterium/Halogen Lamp with CC-UV/VIS-CAL diffuser, -SR fibers recommended
DH-Recal	AvaLight-DH-CAL recalibration service
PS-24V/1.25A	Power supply 100-240VAC/24VDC, 1.25A, necessary for AvaLight-HAL-CAL
AvaSoft-IRRAD	Irradiance add-on software, to be ordered with AvaSoft-full

Light Sources

AvaLight-CAL Spectral calibration source

AvaLight-CAL

The AvaLight-CAL is a spectral calibration lamp. It emits all mercury and argon lines from 254 to well over 965 nm. The major lines and structures are shown on the bottom surface including their relative intensity.

With the standard SMA 905 connector the lamp can quickly be attached to optical fibers, and therefore lends itself to an easy wavelength calibration of fiber optic spectrometer systems.

In the AvaSoft software an automatic recalibration option is included.
The AvaLight-CAL can also be delivered in a rackmounted version, to be fully integrated in the 19" rackmount or 9.5" desktop housing.

A PS-12V/1.25A 12VDC power adapter should be ordered with the unit.

Figure 12 Spectral lines of Avalight-CAL
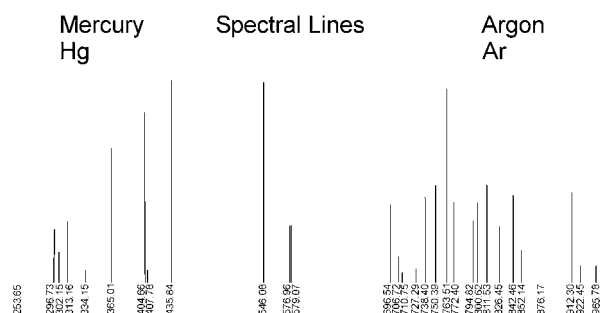
Technical Data

Wavelength Range	Hg and Ar lines from 254 nm to 965 nm
Optical power in 600µm fiber	1.6 mW
Connector	SMA 905 connector
Internal Voltage	1200 Volts AC at 30 kHz, 10 mA
Warm-up Time	1 minute for vapor stabilization
Power requirement	12VDC supply, 420 mA
Dimensions	175 x 110 x 44 mm

ORDERING INFORMATION	
AvaLight-CAL	Mercury-Argon Spectral Calibration Source
AvaLight-CAL-RM	Rack mounted version of Mercury-Argon Spectral Calibration Source
AvaLight-CAL-B	Replacement bulb, Mercury-Argon
PS-12V/1.25A	Power supply 100-240VAC/12VDC, 1.25A necessary for AvaLight-CAL

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AvaLight-LED Light sources for fluorescence applications

The AvaLight-LED light sources are compact, low-cost Light Emitting Diodes that produce continuous or pulsed spectral output at different wavelengths for high sensitivity fluorescence measurements. The Avalight-LED475 is specially designed to be used with the Fiber Optic Oxygen Sensor and the AvaSpec-2048 (see section Applications, page 112).

All AvaLight-LED light sources are recommended for fluorescence applications, where the excitation wavelength can be chosen from the following table.
Other fluorescence accessories and probes, such as the CUV-DA, CUV-FL/ CUV-ALL cuvette holders and the FCR-UV200/ 600 fluorescence probe can be found elsewhere in this catalog. A typical application setup for fluorescence is depicted at the end of this catalog, page 115.
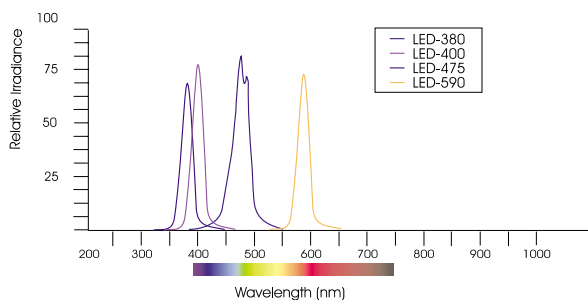The AvaLight-LED has an SMA 905 connector for coupling to fiber optics, a PS-12V/1.25A power supply should be ordered with the unit.

The AvaLight-LED can be used as a DC source or pulsed at a 1kHz frequency, supplied by the AvaSpec spectrometers´output (IC-DB15-2 needed).

AvaLight-LED

Figure 13 Spectral output different AvaLight-LED's

Technical Data

	AvaLight-LED380	AvaLight-LED400	AvaLight-LED475	AvaLight-LED590
Spectral Range*	380 nm	400 nm	475 nm	590 nm
FWHM (nm)	15 nm	11 nm	30 nm	30 nm
LED Output	10 µWatt	25 µWatt	25 µWatt	25 µWatt
Connector	SMA 905			
Power Supply	12 VDC/ 800mA			
Dimensions	175 x 110 x 44 mm			

other wavelengths available on request.

ORDERING INFORMATION	
AvaLight-LED-XXX	Light Emitting Diode Lightsource, specify wavelength XXX
AvaLight-LED-XXX-RM	Rackmount version of the Light Emitting Diode Lightsource, specify wavelength XXX
IC-DB15-2	Interface cable AvaSpec to AvaLight-LED
PS-12V/1.25A	Power supply 100-240 VAC/12VDC, 1.25 A necessary for AvaLight-LED

Light Sources

# HL-6000-S Halogen Light Source with TTL shutter

HL-6000-S

The HL-6000-S is a tungsten lightsource with a high light power output and an effective color temperature of 6000 K. The HL-6000-S has a blue enhancement and can be used for extended visible applications (380-1100nm). The light source has an SMA 905 optical connector and an internal electro-mechanical shutter, that can be operated through a push-button or a TTL signal. The TTL signal can be generated by AvaSoft-FULL and used to automatically save the dark spectrum.

The high stability and low drift makes the light source suitable for most industrial applications.

The light intensity at 370 nm is with ca. 10% of maximum intensity about the same as the intensity of the AvaLight-HAL, but the spectrum is much more balanced. The HL-6000-S needs an additional PS-12V / 1.25A power supply.

Figure 14 Spectral Output Avalight-HAL / HL-6000-S
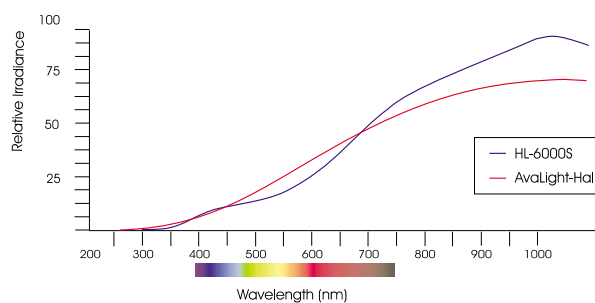
Technical Data

Wavelength range	380-1100 nm
Color Temperature	6000 K
Drift	< 0.5 mAU / hrs
Connector	SMA 905, ca. 600 μm
Bulb lifetime	3000 hrs
Power Requirement	12 VDC, 1.2A
Dimensions	190 x 120 x 70 mm / 600 grams

ORDERING INFORMATION	
HL-6000-S	Tungsten Halogen Light Source 6000K with TTL shutter
HL-6000-B	Replacement bulb HL-6000-S, 3000 hrs.
PS-12V / 1.25A	Power supply 100-240VAC / 12 VDC, 1.25A for HL-6000-S

Light Sources

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XE-2000 Xenon Pulsed Light Source

The XE-2000 is a xenon pulsed light source, used for UV-applications, such as fluorescence measurements. It is connected with the AvaSpec spectrometer through a 15-pole interface cable (IC-DB15-2) to synchronize the flashes with the data taken by the spectrometer. In the AvaSoft software you can select one or multiple flashes per scan.
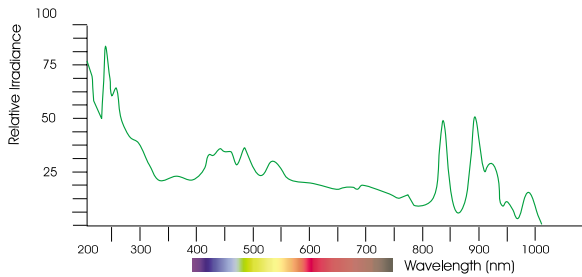
The XE-2000 has no internal flash generator and therefore needs to be connected to an external pulse generator, as included in the AvaSpec spectrometers.

The lamp needs an extra PS12/1.25A 12VDC power converter.

XE-2000

Figure 15 Spectral output of XE-2000

Technical Data

Wavelength range	200 nm to 1000 nm
Power output (max.)	45 mJ per pulse
Power output (average)	9.9 W
Synchronization Input	15 pin sub D connector, TTL level
Pulse Duration	5 µsec (at 1/3 height)
Pulse delay	6 µsec
Pulse rate (max.)	220 Hz
Bulb Life	min. 10^9 pulses
Connector	SMA-905 connector
Power requirement	12 VDC/1000 mA (12 W)
Dimensions	100 x 120 x 40 mm

ORDERING INFORMATION	
XE-2000	Xenon Light Source
XE-2000-B	Spare Bulb for XE-2000
PS-12V/1.25A	Power supply 100-240 VAC/12 VDC, 1.25 A necessary for XE-2000
IC-DB15-2	Interface cable AvaSpec to XE-2000

Light Sources

PS-12V/24V DC Power Adapters

PS-12V Power Adapter

The PS-12V/24 VDC Power Wall adapters converts the 100-240 VAC into a 12V or 24V DC Voltage. The 12 Volts DC version is used for the AvaSpec spectrometers, most light sources and accessories, such as HL-6000-S, Avalight-LED, XE-2000, AvaLight-DHc and AvaLight-CAL.

The PS-24V version is used for the AvaLight-HAL and the FOS-Inline.

The power supplies are equipped with an automatic thermal and overload cut off circuitry.
All power supplies can be delivered with EURO/UK/USA or AUSTRALIAN plug, please specify upon ordering.

PS-24V Power Adapter

Technical Data

	PS-12V/1.25A	PS-24V/1.25A
Power Input	100-240 VAC ± 10%/ 47-63 Hz	
Power consumption	400 mA	700 mA
Power Output	12 VDC ± 5%, depending on load	24 VDC ± 5%, depending on load
Output current (max.)	1.25 A	1.25 A
DC –Connector	5.5 mm OD, 2.0mm ID, 11.5 mm long	3.5 mm OD, 1.3 mm ID, 10 mm long
Dimensions	76 mm x 51 mm x 35 mm	105 mm x 68 mm x 39 mm
Operating Temperature	0 - 45°C	
Cable length	2.0 m	

ORDERING INFORMATION	
PS-12V/1.25A	Power supply 100-240VAC/12VDC, 1.25A
PS-24V/1.25A	Power supply 100-240VAC/24VDC, 1.25A for AvaLight-HAL
Euro plug standard, special power plug specify:	
-UK	UK plug
-US	USA plug
-AUS	Australian plug

Light Sources

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