AvaLight-DH-CAL UV/VIS calibrated light source

The AvaLight-DH-CAL is a calibrated light source for the UV/VIS/NIR spectral range (205-1095nm). This NIST-traceable calibrated light source is developed for use with all AvaSpec spectrometers to be used in measuring absolute spectral intensity.

The AvaLight-DH-CAL comes with a cosine corrector with SMA adapter. 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 (205-1095nm). In that case 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 (350-1095nm). In that case only the Halogen light needs to be switched on which gives a more smooth and stable output at the higher wavelengths.

The calibration files can be imported in the AvaSoft-IRRAD application software, developed to make your spectrometer system a spectroradiometer.

Changing of the bulb

Since the light source is calibrated, the bulb exchange and recalibration can only be done in our calibration lab.

N.B. The AvaLight-DH-CAL cannot be used as a light source for standard reflection/absorption spectroscopy.

How to take absolute irradiance measurements with AvaSoft6.2-IRRAD

1. Start the AvaSoft 6.2 software, and click the Start button in the main window.

2. Connect a fiber to the Spectrometer input port.

3. Start the Absolute Irradiance Application software by clicking the menu option: Application/Absolute Irradiance. Click the "Perform Intensity Calibration" button.

4. Select the spectrometer channel that will be calibrated, the calibration lamp file and enter the diameter of the fiber/cosine corrector or integrating sphere sample port that is used.

5. Turn on the reference light source (e.g. AvaLight-HAL-CAL or AvaLight-HAL-CAL-ISP). If a cosine corrector is used at the end of the fiber, mount it directly on the reference light source. If an integrating sphere is used at the end of the fiber, put the integrating sphere sample port over the light output port.

6. Verify that the calibration lamp is ON for at least 15 minutes, and click the "Start Intensity Calibration" button. Try to adjust the integration time while looking at the reference light, such that the maximum count over the wavelength range is around 14000 counts. It's also possible to let AvaSoft search for an optimal integration time by clicking the '∫AC' button.

7. Adjust the Smoothing Parameter to optimize smoothing for the Fiber/Slit diameter that is used.

8. If a good reference signal is displayed, click the white "Save Reference" button. A white line will mark the reference spectrum. Then switch off the calibration lamp, wait until the spectrum becomes flat, near the bottom of the scale, and click the black button to save a dark spectrum. A black line will mark the dark spectrum.

9. Click the "Save Intensity Calibration" button. A dialog shows up in which the current settings in this intensity calibration are shown. If the calibration has been performed with diffuser, the intensity calibration data will be saved to an ASCII file with extension *.dfr, with bare fiber this extension will be *.fbr. The name of the intensity calibration file can be entered after clicking the "Save As" button.

10. Switch to the Irradiance Chart TAB to enter the hardware setup and select the colorimetric, radiometric, photometric and/or peak parameters of interest. Then click OK.

11. Measure the output parameters in the experiment. If needed, change the integration time, such that the maximum in Scope Mode is around 14000 A/D Counts . Block the light path to the spectrometer, and save a dark spectrum. If the (ir)radiance of the light to be measured needs to be displayed against time, click the time measurement TAB in the settings dialog.

The intensity calibration as performed under point 9 can be loaded in future experiments by selecting the option "Load Intensity Calibration", as described below under Quick Start (2). After loading an intensity calibration, a dark spectrum needs to be saved before switching to Irradiance mode.