

AvaSpec Services and Calibrations

Wavelength Calibration

All AvaSpec spectrometers come standard with a wavelength calibration and coefficients, to calculate wavelength from pixel number. This information is installed on-board, on the AvaSpec's EEPROM.

Under normal conditions the wavelength calibration does not need to be redone, since the spectrometers have no moving elements inside. If a wavelength shift is measured versus the original wavelength calibration, the spectrometer can be recalibrated by the end-user, using the Avalight-CAL and the auto-calibration software routine in AvaSoft-Full.

As an option the spectrometer can also be returned to Avantes for recalibration, (Spectral-cal-service). Before returning the spectrometer an RMA authorization number needs to be obtained.

Non-linearity Calibration

Most detectors of the AvaSpec spectrometers have a good linear behavior in their detector response, which means that there is a better than 95% correlation between raw signal in A/D counts and the light intensity at the spectrometer entrance. However for some applications, which require a wide dynamic range, such as highly absorbing substances or low light level applications, combined with a need for high accuracy, a non-linearity calibration of the detector is recommended. This NL-calibration is performed on the detector array and the output signal is linearized to better than 99%. A complete calibration report and the calculated NL calibration coefficients are delivered with the spectrometer. For irradiance calibrations the NL-calibration is automatically included.



Irradiance Calibration

Applications that use spectrometers to measure the light energy of radiant sources require an irradiance-calibrated spectrometer. For all AvaSpec spectrometers both irradiance and radiance NIST traceable calibrations can be offered. Irradiance calibrations ($\mu\text{W}/\text{cm}^2$) are normally performed on a system with a fiber-optic cable and a cosine corrector or integrating sphere. Radiance calibrations ($\mu\text{W}/\text{cm}^2/\text{sr}$) can be performed on a spectrometer and a bare fiber or fiber with collimating lens looking at a diffuse illuminated surface.

The (ir)radiance calibrations can be performed over 3 different wavelength ranges, UV (200-400 nm), VIS (360-1100 nm) and NIR (1100-2500 nm). All systems are calibrated against a NIST traceable

irradiance calibration standard and come with a complete report and calibration files, which are stored on the EEPROM of the spectrometer and can be loaded directly into the AvaSoft-IRRAD software module to obtain irradiance parametric measurements.

More information on irradiance can be found in the software section (AvaSoft-IRRAD) and the section Applications - Irradiance Measurements.

As an alternative to Avantes irradiance calibration services, irradiance calibrated light sources, such as Avalight-DHS-CAL and Avalight-HAL-CAL-Mini are available to perform your own irradiance calibration.

Ordering Information

Spectral-cal-service	• Spectral calibration service for an AvaSpec, incl. calibration sheet
NL-calibration	• Non-linearity calibration service (per channel)
IRRAD-CAL-UV	• Irradiance calibration service UV range (200-400 nm) per channel, incl. NL-calibration, needs AvaSoft-Full, AvaSoft-IRRAD and -SR fibers
IRRAD-CAL-VIS	• Irradiance calibration service VIS range (360-1100 nm) per channel, incl. NL-calibration, needs AvaSoft-Full and AvaSoft-IRRAD
IRRAD-CAL-NIR	• Irradiance calibration service NIR range (1100-2500 nm) per channel, incl. NL-calibration, needs AvaSoft-Full and AvaSoft-IRRAD
IRRAD-CAL-UV/VIS	• Irradiance calibration service UV/VIS range (200-1100 nm) per channel, incl. NL-calibration, needs AvaSoft-Full, AvaSoft-IRRAD and -SR fibers