

# JB-NOX

The NoX automatic Field spectrometer is a new JB product. It allows measuring from Visible up to the Near Infrared region (1650 nm). Its low power consumption and rugged case makes it suitable for installation in harsh environment: from the poles to the equator. Being a dual Field Of View system the light is collected looking up at the sky with an 180 degree cosine receptor and simultaneously looking down to the target with a 25 degree Field of View. From vegetation to snow the NoX is suitable for researches where the NIR range makes the difference.





# NoX DESCRIPTION

## Overview:

JB Hyperspectral Devices is company founded in 2016 and based in Düsseldorf, Germany. Our core competence is the design and production of advanced and unique hyperspectral field systems. The company is devoted to the reliable, accurate and long-term measure of environmental variables such as water quality, snow optical properties and plant phenology. The NIR reflectance box (NoX) is the natural extension of the RoX system, a robust and easy tool to collect hyperspectral time series of your environmental research area. Fully autonomous operation, a rugged weatherproof design paired with low power consumption makes it your uncomplicated companion for all kind of reflectance observations.

## Specifications:

The NoX system can combine different spectrometer models measuring the Visible and the NIR regions, in the following table the Optical specifications refer to the best combination found. Alternative solutions are possible. Ask JB for further info.

OPTIC	Spec1	Spec2
Wavelength Range	~ 350-1100 nm	~ 900-1650 nm
Spectral sampling interval (SSI)	~ 0.7 nm	~ 1.5 nm
Spectral resolution (FWHM)	~ 3 nm	~ 3 nm
Signal to Noise ratio	~ 1000	~ 300

OPERATIONAL	
Signal Optimization	Automatic adaption to varying light conditions
Dark current	Accurate dark current determination at each measurement cycle
Automatic Acquisition	Fully autonomous measurement mode for unattended data acquisition
Quick measurements	20 seconds under bright sunshine 60 seconds in overcast condition
Stability	Reference system stability check and uncertainty estimates
Simultaneous metadata	Spectrometer temperature, Outside temperature, GPS position, GPS time
Data Display	Live assessment of the systems status
Data storage	SD card up to 64 GB (12 months of measurements)
Case	Robust and Waterproof housing based on the 1510 Pelicase
Dimension	Small form factor (50 × 30 × 20 cm)
Power supply	12 Volt. From battery or solar panels
Power consumption	Average consumption of 60 Watt. (20/100 Watt, cooling on/o)
Energy saver	Day/night switch for energy saving
Interfaces	RS232 via cable and wireless - SDI-12

OPTIONAL	
Dust Protection	Additional dust protection for Cosine Receptors
Fiber optics	Flexible length of fiber optics according to user needs
Communication	Addon for LAN/WLAN/Mobile Network Remote access



# NoX Data Examples

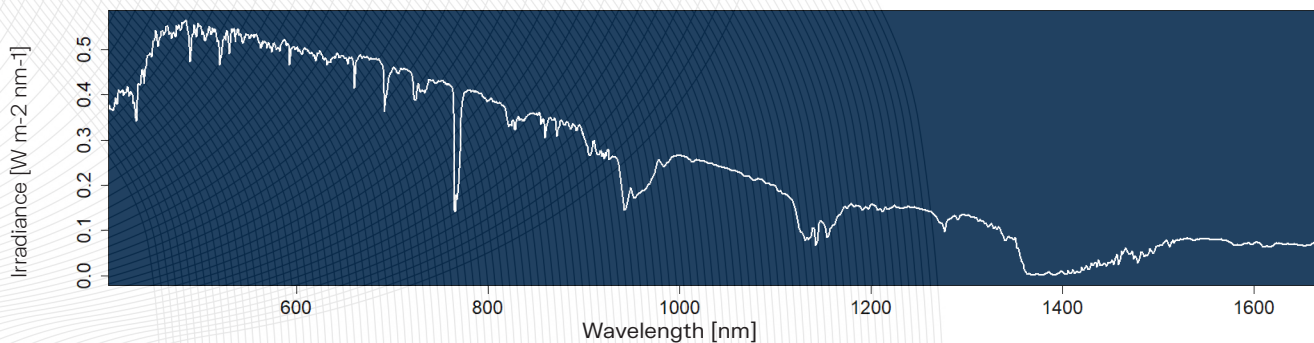
NoX is typically installed on tripods or towers with the upward looking channels pointing to the sky (collecting down-welling irradiance) and the downward looking channels looking at the monitored target (collecting up-welling radiance).

The ratio of up-welling radiance and down-welling radiance is giving the reflectance. From reflectance various Spectral Indices can be computed using the spectral bands of interest.

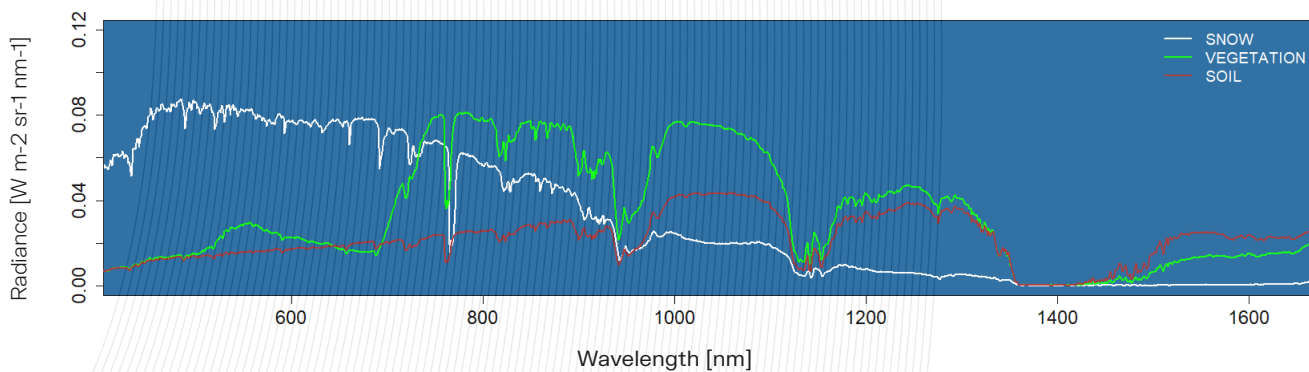
A free data processing software based on R (R core team 21018) allows simple processing of the data to: convert RAW data collected by NoX into Up-welling and Down-welling radiance, Reflectance and spectral Indices.



## Down-welling Irradiance



## Up-welling radiance



## Reflectance

