



## PlantPen PRI 210 & PlantPen NDVI 310

**PlantPen** is a reflectance-based device that provides a convenient, low-cost method of measuring the relative chlorophyll content of a leaf sample. PlantPens are hand-held, battery-powered devices that help to characterize plants by means of reflectance. PlantPens measure and calculate particular reflectance indices to assess chlorophyll content, photoprotecting carotenoids, and other important features in live foliage. Two standard PlantPen versions measure the most common indexes: **Photochemical Reflectance Index (PRI)** and **Normalized Difference Vegetation Index (NDVI)**. Comprehensive FluorPen 1.1 software provides data transfer routines and many additional features for data presentation in tables and graphs.

The **PlantPen** model **PRI 210** measures **Photochemical Reflectance Index (PRI)** by comparing leaf reflectance in two narrow wavelength bands centered close to 531 nm and 570 nm. PRI is sensitive to changes in carotenoid pigments that are indicative of changes in photosynthetic light use efficiency, the rate of CO<sub>2</sub> uptake and as a reliable water-stress index. As such, it is used in studies of vegetation productivity and stress.

The **PlantPen** model **NDVI 310** measures **Normalized Difference Vegetation Index (NDVI)**, which is an important indicator of chlorophyll content in plants. The pigment in plant leaves, chlorophyll, strongly absorbs visible light (from 0.4 to 0.7  $\mu\text{m}$ ) for use in photosynthesis. The cell structure of the leaves, on the other hand, strongly reflects near-infrared light (from 0.7 to 1.1  $\mu\text{m}$ ). The differences in plant reflectance in the visible and near-infrared wavelengths are used to calculate NDVI index. NDVI is directly related to the photosynthetic capacity and hence energy absorption of plant canopies.



### APPLICATIONS

- Photosynthesis research and education
- Plant biology
- Plant screening & field studies
- Stress physiology
- Agronomy & forestry

### KEY FEATURES

- Rugged and compact device
- Easy-to-use two-button operation
- Both lab and field applications
- Comprehensive software for data processing
- USB and Bluetooth communication for data transfer
- Li-ion rechargeable battery via USB port of a PC

# 01 / Pocket-Sized Devices

## ▼ PLANTPENS MEASURE

- **Normalized Difference Vegetation Index (NDVI)**  
 $NDVI = (R_{NIR} - R_{RED}) / (R_{NIR} + R_{RED})$
- **PRI (Photochemical Reflectance Index)**  
 $PRI = (R_{531} - R_{570}) / (R_{531} + R_{570})$

## ▼ SOFTWARE

- FluorPen 1.1 software (Windows 7, or higher compatible)
- Bluetooth and USB communication
- Visualization and data transfer routines to Microsoft Excel (optional)
- GPS mapping

## ▼ TECHNICAL SPECIFICATION

- **Measured Parameter:**
  - PRI (Photochemical Reflectance Index) =  
 $(R_{531} - R_{570}) / (R_{531} + R_{570})$   
*Reference: Sellers et al. (1985)*
  - NDVI (Normalized Difference Vegetative Index)  
 $NDVI = (NIR - VIS) / (NIR + VIS)$
- **Measuring Light:**
  - Internal dual wavelength light source  
 $R_{531} = 531 \text{ nm}$ ,  $R_{570} = 570 \text{ nm}$  for PRI 210
  - Internal dual wavelength light  
 $VIS = 635 \text{ nm}$  (bandwidth 625 nm – 645 nm),  
 $NIR = 760 \text{ nm}$  (bandwidth 750 nm – 760 nm)
- **Detector Wavelength Range:**
  - PIN photodiode with 500 to 600 nm bandpass filters for PRI 210;
  - PIN photodiode with 620 to 750 nm bandpass filters for NDVI 310
- **FluorPen 1.1 Software:** Windows 7, or higher
- **Sample Holder:** Mechanical leaf clip
- **BIOS:** Upgradeable firmware
- **Communication:** Bluetooth 1.1, USB dongle or serial port
- **Memory Capacity:** 16 Mbit
- **Internal Data Logging:** Up to 100,000 data points
- **Display:** graphical display
- **Keypad:** Sealed, 2-key tactile response
- **Keypad Escape Time:** Turns off after 5 minutes of no use
- **Power Save Mode:** Autosleep
- **Power Supply:** Li-ion rechargeable battery
- **Battery Life:** 70 hours typical with full operation
- **Low Battery Detection:** Low battery indication displayed
- **Size:** 135 × 65 × 33 mm
- **Weight:** 188 g
- **Operating Conditions:** Temperature: 0 to +55 °C;  
Relative humidity: 0 to 95 % (non-condensing)
- **Storage Conditions:** Temperature: -10 to +60 °C;  
Relative humidity: 0 to 95 % (non-condensing)

