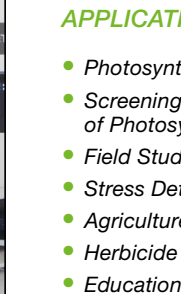


# Handheld Devices NEWS

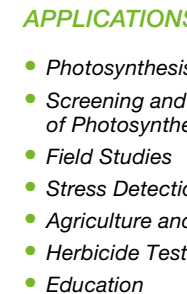
Lightweight battery-powered devices  
Quick, reliable, and repeatable experiments  
Excellent tools for research and education

## New Design

- Ergonomic
- Splash-Proof
- OLED Graphical Display
- Integrated GPS Module
- Li-ion Rechargeable Battery via USB port
- Communication by Bluetooth and USB



## FluorPen & PAR-FluorPen



**APPLICATIONS**

- Photosynthesis Research
- Screening and Characterization of Photosynthetic Mutants
- Field Studies
- Stress Detection
- Agriculture and Forestry
- Herbicide Testing
- Education

- Measurement of photosynthetic activity in the lab, field or greenhouse
- Automated measurements of Ft, QY, OJIP, NPQ and Light Curves
- May be equipped with an integrated light meter for direct digital readouts of PAR
- Different leaf clips for gentle sample holding available



## Monitoring Pen



- APPLICATIONS**
- Monitor Photosynthetic Performance
  - Plant Screening in Lab and Field
  - Stress Physiology
  - Agriculture & Forestry
  - Oceanography: Coral Physiology and Stress

- Designed for extreme conditions
- Pre-programmed chlorophyll fluorescence measurement of Ft, QY, NPQ, OJIP, and Light Curves
- Long-term automated environmental monitoring
- Environmental version for field experiments. Aquatic version for underwater applications

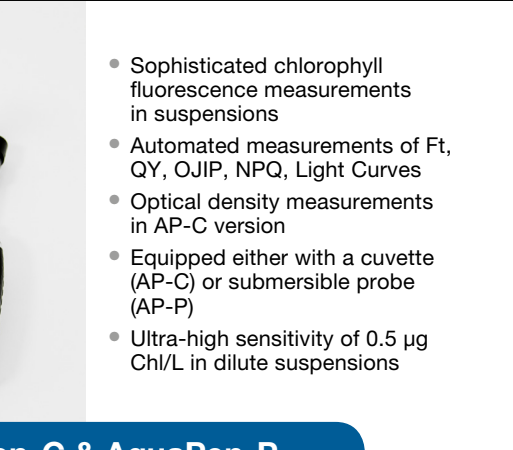


## AquaPen-C & AquaPen-P



- APPLICATIONS**
- Photosynthesis Research of Algal and Cyanobacterial Suspensions
  - Detection of Algal Contamination in Water
  - Phycology and Limnology
  - Oceanography
  - Biotechnology

- Sophisticated chlorophyll fluorescence measurements in suspensions
- Automated measurements of Ft, QY, OJIP, NPQ, Light Curves
- Optical density measurements in AP-C version
- Equipped either with a cuvette (AP-C) or submersible probe (AP-P)
- Ultra-high sensitivity of 0.5 µg Chl/L in dilute suspensions

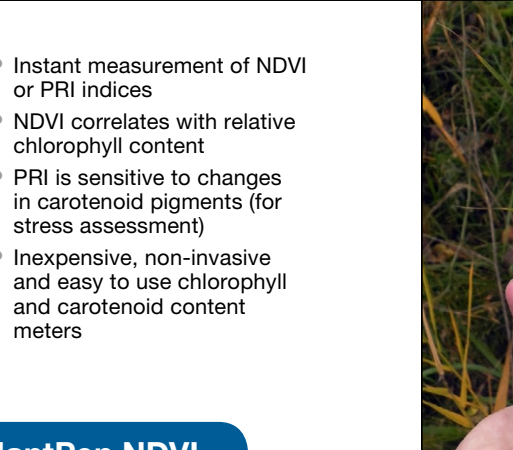


## PlantPen PRI & PlantPen NDVI



- APPLICATIONS**
- Rapid Screening of Chlorophyll Content
  - Field and Lab Studies
  - Early Stress Detection
  - Nutrition Effects
  - Agronomy, Forestry and Plant Physiology

- Instant measurement of NDVI or PRI indices
- NDVI correlates with relative chlorophyll content
- PRI is sensitive to changes in carotenoid pigments (for stress assessment)
- Inexpensive, non-invasive and easy to use chlorophyll and carotenoid content meters



## N-Pen



- APPLICATIONS**
- Yield Predictions
  - Increasing Nitrogen Use Efficiency
  - Minimizing Yield-limiting N Deficiencies
  - Minimizing Fertilizer Applications and Environmental Contamination

- Rapid non-invasive measurement of leaf nitrogen-content
- Absolute calibrations for wheat, maize and barley
- Relative measurement of nitrogen in all other species (can be calibrated for all)
- Rapid measurements in the lab or field



# Handheld Devices



## PolyPen

- APPLICATIONS**
- Plant Screening & Field Studies
  - Stress Response
  - Pigment Composition
  - Water Content of Plants
  - Nitrogen Status
  - Grain Yield



- Complete system for measurement of reflectance spectra from leaves
- Automatic calculation of all commonly used reflectance indices: NDVI, PRI, MCARI, TVI, NPCI etc.
- Allows calculation of customised indices
- Versions:
  - UVIS: 380 to 780 nm
  - NIR: 640–1,050 nm

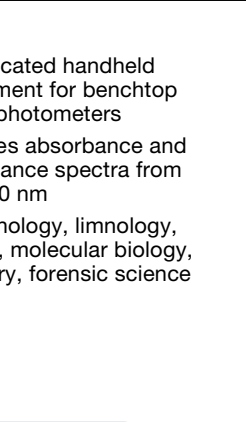


## PolyPen-Aqua

- APPLICATIONS**
- Quantitative and Qualitative Analyses of Solutions
  - Growth Monitoring of Autotrophic and Heterotrophic Microorganisms
  - Spectral Measurements of Cell Suspensions
  - Pigment Composition
  - Protein Analysis

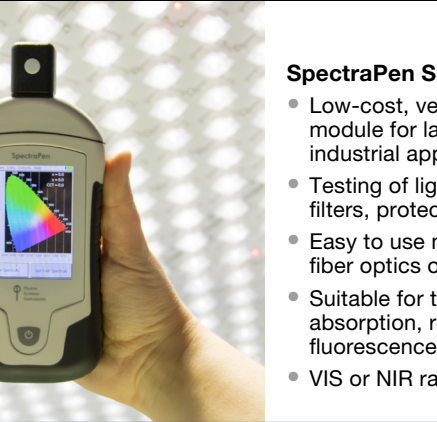
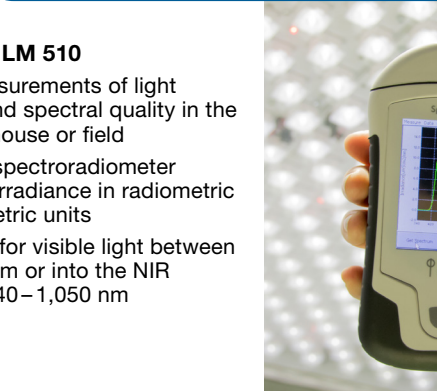


- Sophisticated handheld replacement for benchtop spectrophotometers
- Measures absorbance and transmittance spectra from 380–780 nm
- Biotechnology, limnology, ecology, molecular biology, chemistry, forensic science etc.

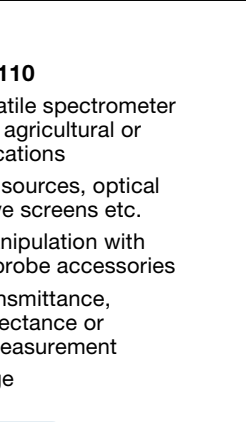


## SpectraPen

- Applications**
- Rapid measurements of light intensity and spectral quality in the lab, greenhouse or field
  - Handheld spectroradiometer measures irradiance in radiometric or photometric units
  - Calibrated for visible light between 380–780 nm or into the NIR between 640–1,050 nm

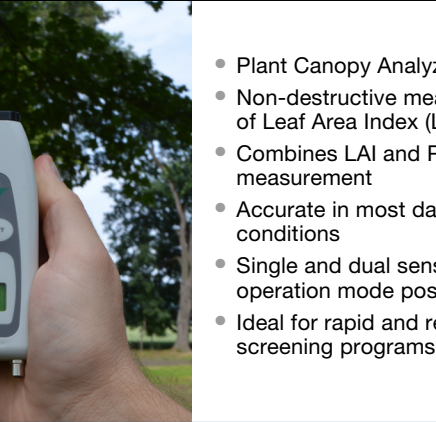


- SpectraPen SP 110**
- Low-cost, versatile spectrometer module for lab, agricultural or industrial applications
  - Testing of light sources, optical filters, protective screens etc.
  - Easy to use manipulation with fiber optics or probe accessories
  - Suitable for transmittance, absorption, reflectance or fluorescence measurement
  - VIS or NIR range



## LaiPen

- APPLICATIONS**
- Canopy Growth and Productivity
  - Forest Dynamics
  - Impact of Air Pollution and Insect Damage on Foliar Health
  - Remote Sensing
  - Global Carbon Cycle



- Plant Canopy Analyzer
- Non-destructive measurement of Leaf Area Index (LAI)
- Combines LAI and PAR measurement
- Accurate in most day light conditions
- Single and dual sensor operation mode possible
- Ideal for rapid and repeated screening programs

# Handheld Devices

