

PlantPen
NDVI 300

Operation Manual



Photon Systems Instruments Ltd.

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General Information

PlantPen is a pocket-sized, battery-powered device that characterizes plants by means of reflectance. It serves for rapid and accurate measurements in a plant biology lab or in a field. It can also be a useful tool in education. There are two standard PlantPen versions that measure the **Photochemical Reflectance Index (PRI)** and the **Normalized Difference Vegetation Index (NDVI)**.

The PlantPen model NDVI 300 measures NDVI, which is an important indicator of chlorophyll content in plants. The device compares reflected light at two distinct wavelengths (660 and 740 nm).

NDVI data are stored in the PlantPen memory after they are measured. Each value is numbered sequentially and may be recalled for transcription to a computer.

Technical Specifications

Measured Parameters:

NDVI (Normalized Difference Vegetative Index)

$$\text{NDVI} = (\text{NIR} - \text{VIS}) / (\text{NIR} + \text{VIS})$$

Measuring Light:

Internal dual wavelength light source

VIS = 660 nm, NIR = 740 nm

Detector Wavelength Range:

PIN photodiode with 620 to 750 nm bandpass filters

FluorPen/PlantPen 1.0 Software:

Windows 2000, XP, or higher*

Memory Capacity:

Up to 4 Mb

Internal Data Logging:

Up to 100,000 data points

Display:

2 x 8 characters LC display

Keypad:

Sealed, 2-key tactile response

* Windows is a registered trademark of Microsoft Corporation

Keypad Escape Time:

Turns off after 5 minutes of no use

Power Supply:

4 AAA alkaline batteries

Battery Life:

70 hours typical with full operation

Low Battery Detection:

Low battery indication displayed

Size:

120 x 57 x 30 mm; 4.7" x 2.2" x 1.2"

Weight:

180 g; 6.5 oz

Sample Holder:

Mechanical leaf clip

Operating Conditions:

Temperature: 0 to 55 °C; 32 to 130 °F

Relat. humidity: 0 to 95 % (non-cond.)

Storage Conditions:

Temp.: -10 to +60 °C; 14 to +140 °F;

Relat. humidity: 0 to 95 % (non-cond.)

Warranty:

1 year parts and labor (see last page of this manual for precise conditions)

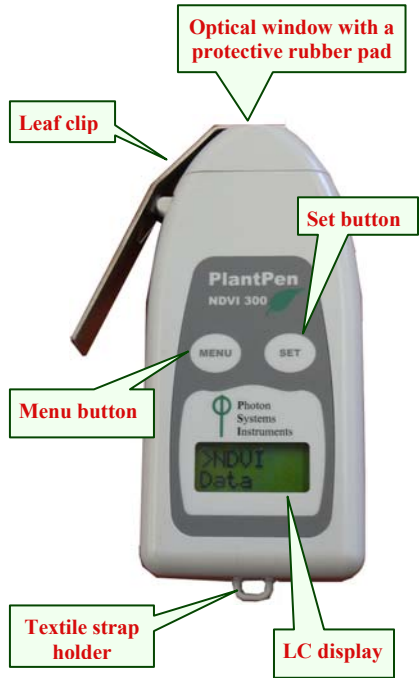
List of Equipment

Carefully unpack the carton. You should have received the following items:

- PlantPen NDVI 300
- 4 AAA alkaline batteries
- Carrying case
- Textile strap for comfortable wearing
- 4 self-adhesive rubber pads for optics protection
- PlantPen Quick Guide
- This owner's manual

Note: If any item is missing, please, contact PSI. Also check the carton for any visible external damage. If you find any damage, notify the carrier and PSI immediately. The carton and all packing materials should be retained for inspection by the carrier or insurer.

Physical Features



Accessories

1. Carrying Case

The PlantPen is supplied with a carrying case which is padded to protect the instrument during transportation. You can either carry the PlantPen case over the shoulder or hang it on your belt.



2. Protective Rubber Pad

The optical part of the PlantPen is covered with a self-adhesive rubber pad that protects the optics from dirt or moisture. The damaged or dirty pad can be easily removed by tearing it off from the surface. To affix a new one, just remove the sheeting and stick the pad on cleaned and dried surface. Be sure that you placed the pad properly and that you did not cover the optical window.



3. Batteries

The PlantPen operates from 4 AAA alkaline batteries that may be replaced by unscrewing the cover of the battery holder on the rear of the instrument. Battery life is approximately 70 hours when the PlantPen is operated continuously.



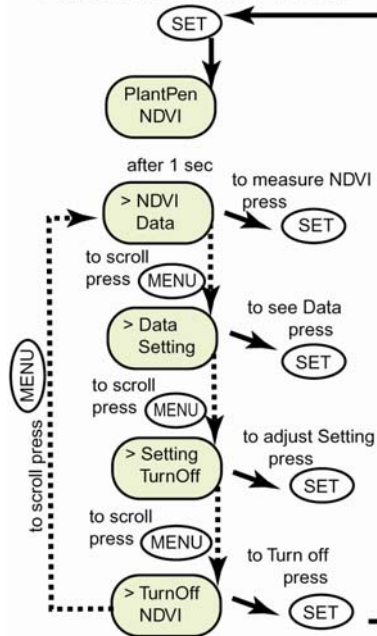
Operation Instructions

1. To Switch on: Hold the **Set** key.
2. To Scroll Through a Menu: Use the **Menu** key.
3. To Select a Menu Option: Use the **Set** key.
4. To Get into a Submenu: Scroll through the main menu and find your option based on the cursor (>). Use the **Set** key to make your selection and to get into a submenu.
5. To Scroll Through a Submenu: Use the **Menu** key.
6. To Return from a Submenu: Scroll through the submenu to the >Return option. Use the **Set** key to make your selection and to return to the Main Menu.
7. To Switch off: Scroll to the >Turn Off command in the Main Menu and click the **Set** key. (The PlantPen switches off automatically after five minutes without a command).

The next five pages show the structure of single menus and bring detailed, step-by-step guiding through all the PlantPen functions.

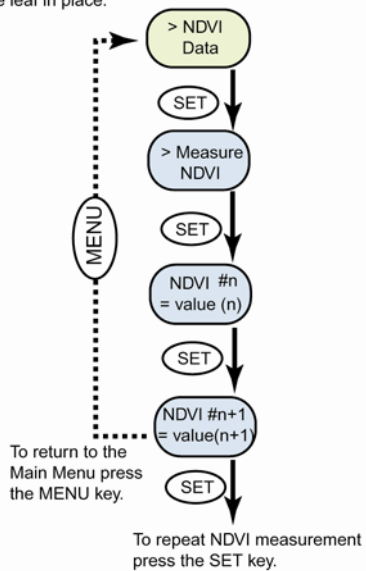
Main Menu

To start hold the SET key for 1 second

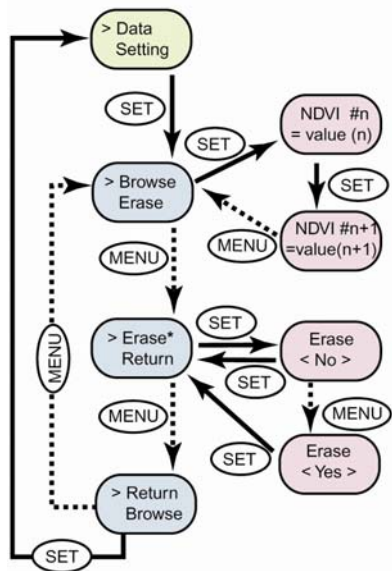


Measure NDVI Submenu

To measure NDVI, depress the clip on the side of the PlantPen to expose the optical window. Place the leaf against the window and allow the clip to hold the leaf in place.

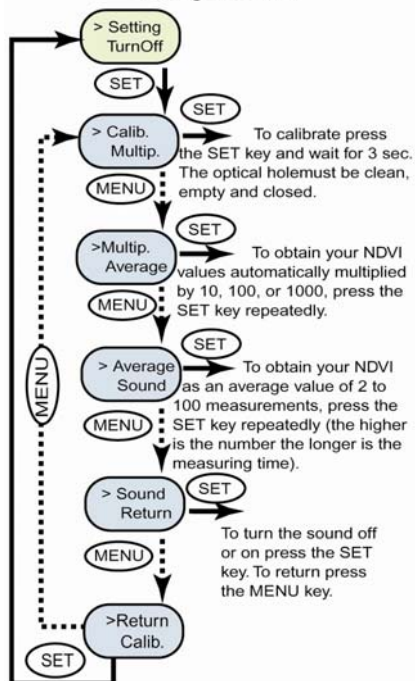


Data Submenu

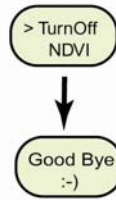


* It is not possible to erase single data. ALL stored data are erased.

Setting Submenu



TurnOff Submenu



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Statement of Limited Warranty

This Limited Warranty applies only to the PlantPen and its accessories (excluding any batteries). It is valid one year from the date of shipment.

The Limited Warranty does not apply if the PlantPen (a) has been altered, opened, or repaired, except as permitted by PSI; (b) has not been installed, operated, repaired or maintained in accordance with instructions and documentation supplied by PSI; (c) has been used in conjunction with software, accessories, products, service, or ancillary or peripheral equipment not approved or provided by PSI, and the defect is the result of such use and not of the PlantPen itself; (d) has been subjected to abnormal physical or electrical stress, misuse, negligence or accident; (e) defect for which the warranty service is sought would be repaired by installing an Enhancement provided by PSI to Customer; or (f) is used other than permitted by PSI.

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