4π Meter: Touch Screen, Laser Power and Energy Meter

ENJOY the MEASUREMENT POSSIBILITIES

- **Large size (116x87mm; RGB640x480 px) display**
- **Display selectable colors for use with laser eyewere on**
- **Choice of digital, analog needle or beam position display (next SW rel.)**
- **Laser tuning screen and power and energy log**
- **Menu driven functions**
- **Several software features: W/cm^2,J/cm^2, full statistics, scaling, dBm, etc.**
- **Compatible with all LaserPoint thermopile and optical sensors**
- **Wavelength selection with 1 nm resolution**
- **Powers to 10KW, Single Shot Energy to 600J**
- **Data logging to USB memory stick up to 345.600 samples**
- **PC interfacing via USB/RS-232 (option)**
- **Configurable Analog output**
- **NiMH rechargeable battery and Line Power Supply**
- **CE marked, RoHS Compliant,**
- **Calibrations provided with NIST or PTB traceability**

PERFORMANCE is SIMPLICITY

The **4π** power/energy meter is an ergonomic micro-computer based instrument with a bright, large colour (5.7"- RGB 640x480) **touch screen** display. It can either be powered by re-chargeable batteries or by external power supply .

The touch screen display, associated with an intuitive SW, based on *OS Windows CE 5.0,* allows the user to easily interact with the instrument and to quickly set it up for measurements.

Digital Display: *shows the instantaneous value of the measured function in form of a large sized numbers with the selected resolution of decimal digits; a coloured bar represents the measured value as a fraction of full scale. Statistical information is given in the lower part of the display .*

Trend Display: *shows the evolution of the measured function over time; the instantaneous value is displayed in digital form at the upper left side .*

*Statistical information is given in the upper part of the display .*

Analogue &Tuning Displays: *show the instantaneous value by a needle-like representation .*

*The **Tune button** changes the analogue representation into a very sensitive tuning tool ; the range is converted into a new one spanning between -25% to +25% of value measured when the tuning function was activated.*

The max. reached value is continuously updated on the display.
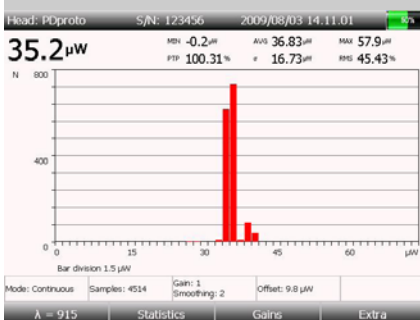
Histogram Display: *shows, in form of histogram, the number of times the same value occurs during a measurement session; measured values are shown in the X axis and the number of events in the Y axis.*

This display is a powerful tool to monitor, e.g., laser sources stability. Instantaneous values are shown in digital form.

The vertical scale is automatically adjusted to allow the adding of more data. Statistical information is also given in the upper part of the display .

GETTING IT RIGHT with a HIGH CLASS INSTRUMENT

Only five soft keys provide a fast access to the main functions :

■**MENU.** Opens two menu pages:
●*USER INTERFACE* to chose:
 -*Display Theme*: for background and digits screen colours;
 -*Language:* actual selection is between English, German French, Spanish or Italian (more languages to come);
 -*Auto-Off:* function aimed to battery saving.
●*DATE and TIME:* to set date and time on buffered RTC.

■**MEASURE.** Opens to :
●*MEASUREMENT:* selects between *Power* or *Energy* and can display measured data as *dBm* units.
●*RESOLUTION :* to set the reading resolution up to 5 digits or 1/99999 of full-scale
●*AREA:* after setting shape and size of the laser beam, measurements will be displayed as *W/cm2 (irradiance)* and *J/cm2 (fluence)*

■**SAVE.** This key allows the user to save the measured data and to define the data logging schedule through two available interaction pages:
●*SNAPSHOT*: the screen content, and/or the last value of the measured function and/or the statistical data can be saved in a USB key, as a *.jpg and *.CSV (text) files.
●*DATA LOGGING :* measured values, and/or the current statistics values can be saved and transferred from the instrument memory to the USB key. The minimum sampling rate setting is 1 second.
Transferred information is saved in a folder containing two different text files (*.CSV), for saved values and statistics data.

■**MODE.** Gives access to four different modes to display data:
● Digital mode;
●Trend mode;
●Analogue & Tuning mode;
●Histogram mode .

■**ZERO.** Can establish an optical zero for the head and the electrical zero by resetting the ADC.

■ **Screen's top and bottom bars -** The top bar displays the sensor head model and its S/N, the date, the type of power supply in use (Battery or wall AC) and the battery charge status.
Four soft touch keys are located within then bottom bar:
●*LAMBDA:* shows the wavelength being used on the head . A numerical keypad allows the head to be set for working at any custom wavelength, with *1 nm resolution*
●*STATISTICS*: provides *Full Statistics* (Min., max., mean, average, std. dev. PTP stability, RMS) on measured data
●*GAINS*: introduces a multiplying factor, particularly useful when beam splitters or partializing devices are used
●*SMOOTHING:* unstable or noisy measures can be made smooth by removing signal ripples or overshoots by an algorithm based on signal digital filtering.
●*EXTRA*: opens 3 additional screen pages bearing important information
● Info: provides information about the instrument HW and FW versions, the suggested next calibration date and battery residual charge level.
● Calibration: shows the factory-set calibration coefficient loaded in the head memory. The calibration factor can be changed by the user by simply acting on up and down arrows on the screen .
● LaserPoint: mainly reserved to LaserPoint engineering, it is also available to the user, on a limited extent to make SW updates, new language releases, etc.
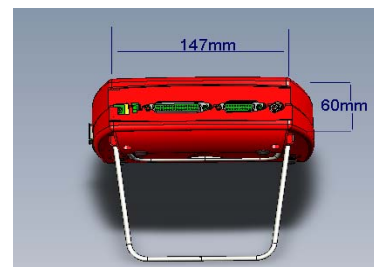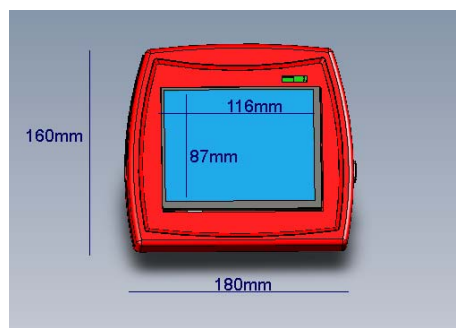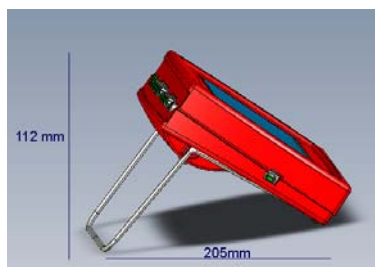
■External Communication
The instrument right side hosts two USB ports that can be used to plug in USB pen to transfer the selected data and/or a mouse to optionally operate the instrument as alternative to the touch screen feature.
The instrument left side hosts a USB port for PC for data transfer (option).

Specifications

■ **Display:**	• Touch Screen 116x87mm; RGB640x480 px color graphics LCD. • Customer selectable colours • High res. analog needle page for laser tuning, system alignment, etc • Screen Refreshing: 4 times/sec
■ **Head Features**:	• Works with thermopile and photodiode heads
■ **Measurement & Analysis:**	• Power, Energy (single shot), dBm • Full Statistics (min., max., mean, RMS, std. dev. PTP stability), Trend, Tuning • Additional features include: Wavelength selection every 1nm, laser power with colour bar graph, graphs, scaling and more. • Area function for Radiance (W/cm^2) and Fluence (J/cm^2) • Status Bar
■ **Sampling Rate:**	• 1KHz
■ **Gain:**	• 24 Bit ADC
■ **Resolutions:**	• Measurement Resolution: 1/100.000 of full-scale • Displayable Resolution: 3, 4,or 5 digits (user selectable, head depend.)
■ **Instrument Accuracy:**	• Digital Meter ±1.0% • Analog Output ±1.0%
■ **Data Storage** :	• Data logging to USB memory stick up to 345.600 samples (4 samples / sec for 24h) • Screen Print, Current Value and Statistics on USB Memory Stick
■ **Program Features**:	• Preferred start up configuration can be set by user. • User can recalibrate power, energy, response time and zero offset.
■ **Analog Output (VDC):**	• 2 VDC on 10.000 steps (configurable full scale) • Analog Output Update Rate : 4 Hz for thermopile and optical heads
■ **Temperature Ranges:**	• Operating: +5° to +40°C • Storage Range: -20° to 70°C
■ **Supply Voltages:**	• AC : 90 to 260 VAC, 50/60 Hz • Rechargeable NiMH batteries: 2 hours between charges, typical. Charger (included) also functions as AC adapter.
■ **Case:**	• Molded high impact plastic with optimized angle kickstand • EMI rejection • Dimensions (H x W x D): 160 x 180 x 60 mm(6.3 x 7.1 x 2.4 in.) • Weight: 730 g (1.6 lbs.)
■ **International Regulations Met**:	• CE, RoHS,WEEE