Control Electronics and Software Solutions for OEM Sensors and Heads

Laser Point offers various electronic solutions and SW tools for conditioning the signals of its OEM laser sensors or for analyzing and transferring information to the control units of lasers or laser systems. These electronic products can be small electronics meters, embedded modules, or complex boards with data acquisitions SW.

Built-in Amplifier Board for OEM Sensors

This ultra-compact product ***amplifies the signals and speeds up response times*** *of sensors discs. It is a standard internal unit embedded within our AH series heads, but can also be purchased separately by those OEM customers who want to develop their own measurement set-up.*
Standard output connectivity is 4 wires pigtail.

Amplification
Factory set to provide a high sensitivity to the sensor. The full scale is always 5V and full scale sensitivity ranges between 1V/W to 25mV/ W for the 200 W sensors

Signal Speed-up
Sensors output signals are accelerated to provide the final value of laser power very quickly. The 10W sensors can go from 0-95% in just 0.35 sec.

Noise Filtering
High frequency noise from environment is completely reduced by the integrated low-pass filtering device.

Features

- Output Voltage, Full Scale: 5V
- Min. Detectable Voltage : 5mV
- Total Sensitivity: 5V/ Max Power Value for the sensor in use
- Linearity:± 1%
- Max Power Values: 5W,10W,20W,50W,100W,200W , depending on sensor type
- Minimum detectable Power: 1/1000 of Full Scale
- Head response times: 0.8 sec. typ,
- Supply voltages can range between: ± 7VDC to ± 12VDC or 14 to 24VDC floating.
- Dimensions: Dia. 43mmx10mm
- Max Head Temperature: :60 °C

Rack Mount OEM Board: LPM-OEM (Laser Process Monitor)

The LPM, associated to a suitable sensor from Laser Point monitors the value of power/energy along the beam line or delivered to the work-piece. A cross-check of power/energy values between the LPM and the laser control unit may immediately point-out damages or losses along the beam delivery chain. Alarms signals will be delivered as soon as the set limits for the process have been overtaken.

The LPM is used in:
-Quality laser applications,
-Un-manned machines and robotics
-Laser Cutting & Welding
-Beam Lines Alignment
-Machine Installations & Maintenance
-Machine Test (stability, etc)
-Mapping for Adaptive Optics

- All I/O are opto-isolated and immune from RF and electrical pick-ups.
- The LPM-OEM board easily plugs on standard MR9 DIN rails, inside machine cabinets.
- It can be driven by PC, via its RS232 output or by manual commands.
- Alarms and GO/NO GO command are sent to the machine once set limits have been passed.
- Application SW with full statistical functions (min,max,avg, RMS,PTP) is included
- Unlimited capacity of data recording.
- The LPM-OEM can work with all Laser Point's Power and Energy Sensors and Power Probes except PDs and Quadrant Heads

Features: Operation with Power and Energy Sensors

- Power Ranges: *1mW to 10kW /1mJ to 300J*
- Resolution: 0.5‰ *for any Full Scale*
- Response Time: *<1-5 sec. (depends on each specific head)*

Operation with Power Probes (FIT-H Series)

- Power Ranges: *1mW to 6 kW*
- Resolution: *0.5‰ for any Full Scale*
- Response Time*:* *4 sec (final value)*

General

- Electronics Board **:** *Plugs on MR9 DIN rail*
- External Interfacing: *Remote via RS232 & Local or only Local ((RS485-optional on request)*
- Digital Input (Measurement Trigger): *3-30 Vac /dc Opto -isolated*
- Analogue Outputs : *Opto -Isolated 0- 10V or 4-20mA*
- Detector Input: *DB15 Female Connector*
- Input/Output interface: *Screw terminals*
- Digital Output: *Opto -Isolated RS232 on DB9 connector (RS 485 Mod-BUS Protocol Opt.)*

Alarm Relay

- Process GO/NO GO Relay: *220V, 10A (COM-NC-NO)*
- Power Supply AC (V) @ 50-60Hz: *220V and 110V, internally selectable*
- Size LxWxH (mm): *260x100x110mm*

Laser Process Monitor , Cased Version: LPM-CE CE Marked

For those applications where the LPM board cannot be integrated on MR9DIN rails of machine cabinets, a cased version of LPM is available

Laser Power and Energy Meter : PLUS Monitor CE Marked

The PLUS monitor can be also purchased as an instrument for installation in a host system or machine. Communication with the host system is via its USB digital output.
A 0-2V analog output is available.
The application SW allows to set working thresholds to generate alarms and a GO/NO GO to the machine. It also bears statistical functions (min, max, avg, RMS,PTP) and an unlimited capacity of data recording.
The PLUS can work with all Laser Point's Power and Energy Sensors and Laser Probes with the exception of Photo-detectors and Quadrant (QA series)

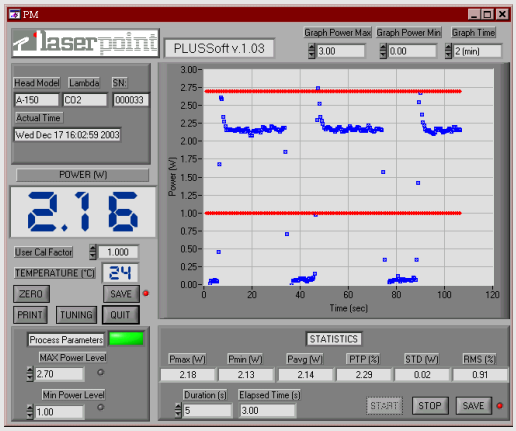
Features

- Power Ranges: *1mW to 10kW/1mJ to 300J*
- Resolution: 0.5*‰ for any Full Scale*
- Response Time: *<1-5 sec. (depends on each specific head)*
- Tuning function: *by Bargraph:*
- Wavelength Selection: *6 wavelenghts for Excimers, VIS, diodes, Nd- Yag, CO2*
- UCF(*User's Own Re-Calibration Factor):* *allows the introduction of a personal factor of calibration at any desired wavelenght*

General

- Digital Display: *4-digit LCD readout*
- Monitor accuracy: *±0.5%*
- Scales*:* *3 scales (00.00 / 000.0 / 0000) ,head with 0.5‰ resolution*
- Analog Output: *0-2V ±1.0%*
- Digital Outputs: *USB*
- Input voltage: *12VDC or battery*
- Dimensions (mm) : 150 *(W) x 105 (H) x 45 (D)*
- Weight: *500g*

Application SW for LPM and PLUS: PLUS-SOFT and LPM-SOFT

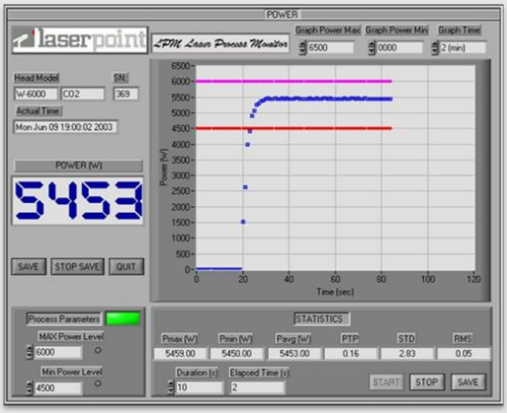


The Plus-Soft and LPM-Soft are powerful application softwares provided as standard with each PLUS- USB and LPM (Laser Process Monitor) unit .
Both Softwares have graphs to plot the evolution of behavior of laser power ve time, display the readings of energy or power probes (FIT-H series) in the form of histograms, show the absolute values of power and energy, provide all relevant statistical information and allow the storage of data to files, as a text format usable for Excel or other programs.
The Plus-Soft and LPM Soft also allow the management of laser processes and laser tuning.

■ Display Functions

- *Head Model: shows the head model in use*
- *Lambda: shows detector's calibration wavelength*
- *SN: shows the head serial number*
- *Actual Time: shows present day and time*
- *POWER (W/mW); ENERGY(mJ/J): shows measured power or energy values.*
- *User Calibration Factor: gives the user the possibility to introduce a correction factor to modify calibrations values.*
- *Head Temperature (°C): shows the temperature on those heads provided with temp. sensor*
- *ZERO: accomplishes an automatic Zeroing*
- *TUNING: Enables the Tuning Function*
- *SAVE: Enables the automatic function to save measurements on a file*
- *PRINT: prints the displayed window*
- *QUIT: leaves the program*
- *Graph Power Max/Min (W) sets the extention of Y axis on power plot.*
- *Graph Time: sets the duration of Time axis (X) for the power plot;available time scales are 60(sec), 2(min), 5(min), 30(min), 1(hour), 12(hours).*

■ Laser Process Management



An important feature offered by the Software is the possibility monitor the constancy of laser power/energy for the ongoing laser process; an alarm feedback is displayed once the acceptable band of power/energy for a correct operation has exceeded the pre-set limits.

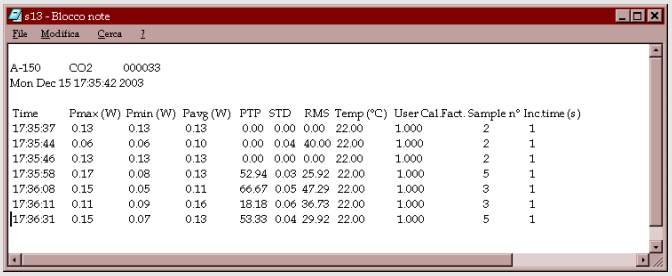
■ *Process Parameters Setting*
-MAX/Min Power/Energy Levels: set process limits which remain visible on the screen as red lines, defining the acceptable working range.
-Alarms: the rectangular Led, changing from green to red , shows that measured value is out the acceptable range and an intervention by the operator may be necessary

■ Statistical Functions

A full set of Statistical functions is provided by the PLUS-Soft. The Duration of acquisition interval can be selected to be as long as 24 hours. Once data have been gathered, SAVE enables an automatic saving on file for data recording or future data tracking .

The Statistical Functions include:

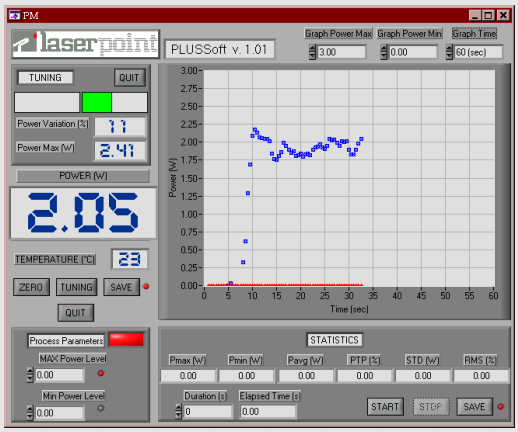
- *Max/Min (W,J): the max/min power/energy values measured during the last acquisition interval*
- *Avg (W,J): the average values of power/energy measured during the last acquisition interval*
- *PTP (%): the Peak-to-Peak stability*
- *STD (W): the Standard Deviation on measured data*
- *RMS (%): the RMS stability*


s13 - Blocco note
File Modifica Cerca ?

A-150 CO2 000033
Mon Dec 15 17:35:42 2003

Time	Pmax (W)	Pmin (W)	Pavg (W)	PTP	STD	RMS	Temp (°C)	User Cal Fact.	Sample n°	Inc time (s)
17:35:37	0.13	0.13	0.13	0.00	0.00	0.00	22.00	1.000	2	1
17:35:44	0.06	0.06	0.10	0.00	0.04	40.00	22.00	1.000	2	1
17:35:46	0.13	0.13	0.13	0.00	0.00	0.00	22.00	1.000	2	1
17:35:58	0.17	0.08	0.13	52.94	0.03	25.92	22.00	1.000	5	1
17:36:08	0.15	0.05	0.11	66.67	0.05	47.29	22.00	1.000	3	1
17:36:11	0.11	0.09	0.16	18.18	0.06	36.73	22.00	1.000	3	1
17:36:31	0.15	0.07	0.13	53.33	0.04	29.92	22.00	1.000	5	1

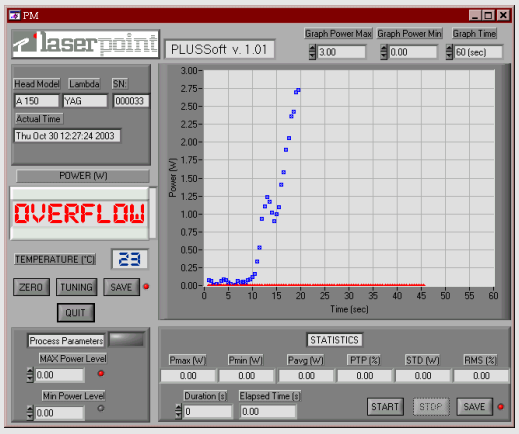
■ Laser Tuning

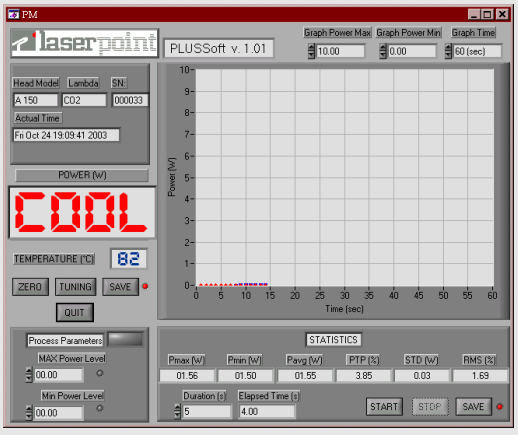


A fast and double colour Tuning Bar (green and red) is available for laser tweaking or alignments.
The Power Variation (%) box shows how much power was gained or lost from an initial reference level.
The Power Max (W) box stores the highest reached value.
Evolution of laser tuning can also be comfortably followed on the screen.

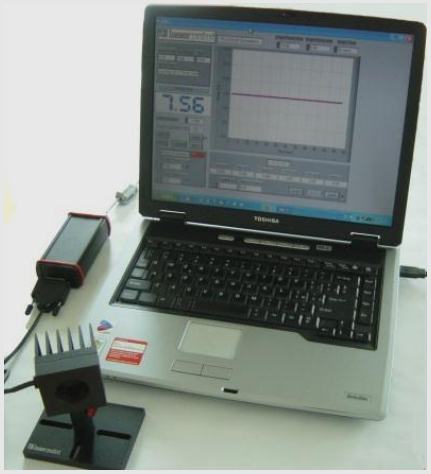
■ Warning Messages

All times measurement heads undergo to power levels above their full scale, an OVERFLOW alarm is displayed. The same way, whenever the temperature of a detector head is above its safety working limit, a COOL alarm message is displayed.





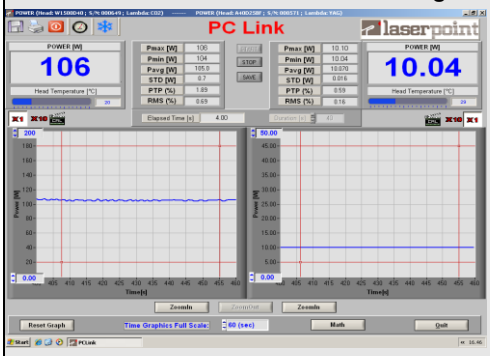
Your PC turned into a Single or Dual Channel Power / Energy Meter: the PC-Link



*The **PC-Link** is a smart head to USB interface that converts any PC or laptop into a powerful instrument to measure, analyse and record power and energy from any of Laser Point sensors.*
PC-Links are supplied with user-friendly communication software packages for single channel or dual channel operations.
*When 2 sensors and electronics are connected to a PC, the **PC-2-Link** SW is visible as double display on the PC screen.*
Working with PC-Links is very easy: it is sufficient to install the software, connect the sensors to the interface units and these latter to the USB ports of a PC. No other operation and external power source are needed.

The advanced features of PC-Link, together with the fact that it is very compact and has low weight, make this monitor an ideal partner for service applications, laboratory or OEM use offering the convenience, flexibility and value of computer-based operations.
The PC-Link is also a precious candidate for use in laser machines, in particular when associated to Laser Point's FIT-H family of OEM detectors, that work up to 6KW without the need of water cooling.

■ Rich and Versatile Laser Monitoring



The software packages for Single Channel and Dual Channel operation supplied with the PC Link are extremely rich. Both SW versions allow to measure, analyse with full statistical functions (Min., Max., mean, and standard deviation) and record power and energy from all LaserPoint heads without the need of a display. Data from each detector can be logged simultaneously to file The PC-2-Link software package includes in addition Mathematical functions to compare signals from both channel, e.g. A/B or A-B.
The same SW also includes a ZOOM function which permits to see the details, e.g. random events or small fluctuations, within both signal tracks.
One feature offers the possibility to access to the User's Own Calibration Factor (UCF) and a there is also X10 gain to enhance measurement flexibility (eg low power measurements to 20µW resolution).
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■ Statistics and Statistics Data saved on a File

This function is also available on the single channel SW and on each of the 2 channels of PC-2 Link SW.
This function is available for the Power, Energy and FIT mode.
The following statistical data are calculated:

- *Pmax(W): max power value measured during the last acquisition interval*
- *Pmin(W): min power value measured during the last acquisition interval*
- *Pavg(W): average value of power measured during the last acquisition interval*
- *PTP(%): Peak-to-Peak stability*
- *STD(W): measured Standard Deviation*
- *RMS(%):RMS stability*

Measured data can be saved on a file, by clicking on the "SAVE" key in the statistic section.The structure of saved

Power_Statistics.txt - Blocco note

File Modifica Formato Visualizza ?

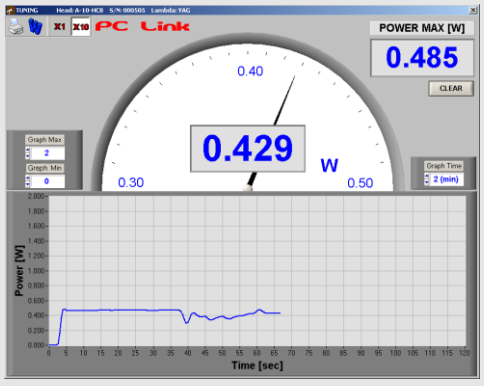
FIT-500H CO2 123456
Wed Jul 12 12:37:05 2006

Date	Time	Pmax (W)	Pmin (W)	Pavg (W)	PTP	STD	RMS	Temp (°C)	Samp.Time (s)	Alarms
Jul 12 2006	12:37:06	0.00	-0.0	-0.0	+Inf	0.0	-200.0	29.0	5	
Jul 12 2006	12:37:11	0.25	-0.0	0.1	100.4	0.1	103.6	29.0	5	
Jul 12 2006	12:37:16	0.39	0.3	0.4	27.0	0.0	11.0	29.0	5	
Jul 12 2006	12:37:21	0.45	0.4	0.4	6.7	0.0	2.6	29.0	5	
Jul 12 2006	12:37:26	1.36	0.5	0.9	66.5	0.3	36.1	29.0	5	overflow
Jul 12 2006	12:37:31	1.55	1.2	1.4	19.7	0.1	7.2	30.0	5	overflow
Jul 12 2006	12:37:36	1.40	1.2	1.4	10.7	0.1	4.1	30.0	5	overflow
Jul 12 2006	12:37:41	1.38	0.9	1.1	37.9	0.2	19.0	30.0	5	
Jul 12 2006	12:37:46	0.80	0.7	0.7	14.1	0.0	5.5	30.0	5	
Jul 12 2006	12:37:51	0.67	0.6	0.7	4.5	0.0	1.5	30.0	5	
Jul 12 2006	12:37:56	0.64	0.6	0.6	5.3	0.0	1.8	30.0	5	

**.txt files, as shown in the picture, reports all head data, calibration wavelength, all measurement data over time and alarms.*
Data of each saved file can be imported into a spreadsheet (e.g.Excel).

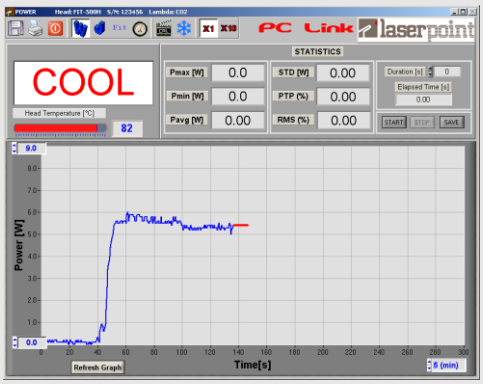
■ Laser Tuning

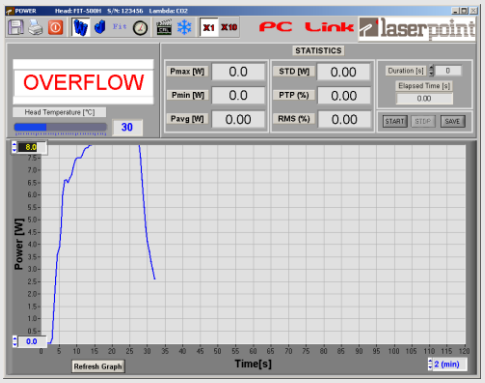
The Laser Tuning display of Pc Plug is used to achieve a high resolution laser alignment . The analogue needle shows the direction of tuning; the actual power is shown on the box of the tuning display, while the maximum value reached during the tuning procedure is kept in a second box at the upper right corner of the screen.
The resulting trend of the tuning session is shown on the lower graph.



■ Warning Messages

Each time the laser power or energy exceeds the head full scale the OVERFLOW alarm is displayed as shown in the picture. Should a measurement head reach its limit temperature (overheating of a head may be due to problems to the cooling circuit such as low water pressure, lack of fluid, obstructions, etc, or poor heat exchange in air cooled heads), the COOL message will be displayed on the main window and the data displayed in the graph are pinned to the last power value acquired before the alarm.





PC-Link: Technical Specifications

■ Power Meter Mode

- Power Ranges: *1mW to 10kW*
- Resolution: 0.5‰ *for any Full Scale*
- Response Time: *< 5sec.(depends on specific head)*

■ Energy Meter Mode

- Energy Range: *1mJ to 300J*
- Resolution: *0.5‰ for any Full Scale*
- Response Time*:* *<1-5 sec (depends on specific head)*

■ FIT Mode

- Power Ranges: *1mW to 10kW*
- Resolution: *0.5‰ for any Full Scale*
- Response Time*:* *4 sec (final value)*

■ Tuning

- Displays a Digital Bargraph for Tuning Direction
- Displays Actual Power Value
- Displays Variations (as %) form Tuning Initial Value

■ Wavelengths Selections:

- EXC : UV and excimer laser (250-350nm)
- VIS: Visible (400-700nm)
- LD: Laser Diodes (800-900nm)
- Yag: Nd-Yag (1064 nm)
- Erb: Erbium (2943 nm)
- CO2 : CO2 (10600nm)
- *UCF*:User's Own Re-Calibration Factor

■ GENERAL SPECIFICATIONS

- Software: Full Window application software
- Communication: Full Speed USB 1.1

Communication between Host Computer and PC-LINK

- Display: Computer Screen
- Data Storage: Limited by PC capacity
- Data Displays: Real time, Histogram, Statistics
- Additional Input Gain: 10X
- Dimensions 113 (L) x 56 (W) x 35 (H) mm
- Weight 0.106 kg
- External Power Supply Not required

■ Operating environment:

- Storage Temperature:*-10 to 60 ºC*
- Range of Use :*5 to 45 ºC*
- Reference Conditions : *21 ± 4 ºC ;RH 20-80%*