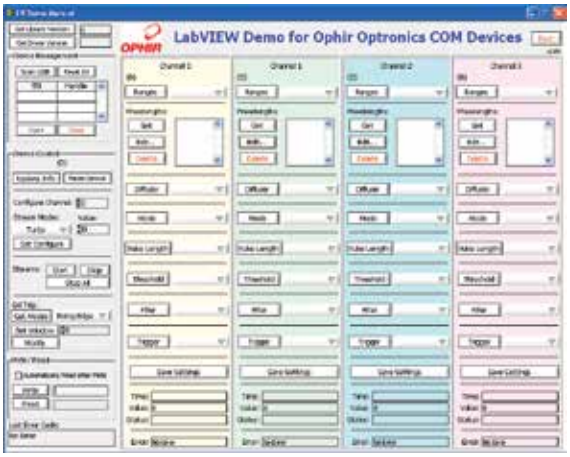
2.2.6 Pulsar Multichannel and Triggered USB Interfaces

Convert your laptop or desktop PC into a multichannel power/energy meter

- From sensor to interface to PC
- 1, 2 and 4 channel models
- Plug and play with most Ophir sensors
- Record every energy pulse at up to 25kHz
- Measure missing pulses & trigger output with external trigger
- Log power and energy, average, statistics, histograms and more with included StarLab application
- LabVIEW VIs and COM Object Interface included

Smart Sensor to Pulsar to PC

Ophir's 1-4 channel Pulsar interface turns your PC or laptop into a full-fledged Ophir multi-channel laser power/energy meter. Just install the software, plug the sensor into the Pulsar and the USB cable from the Pulsar to the PC USB port. With the Pulsar series, you can connect up to 4 sensors to each module, monitor each pulse at up to 25kHz and utilize external trigger.



LabVIEW

Pulsar-4 operating with StarLab software

Specifications

Power Measurement	
Power log period	1s to Unlimited
Energy Measurement	
Max logging rate	25,000Hz [a]
Trigger input and output	BNC trigger input to enable measurement of missing pulses or to select specific pulses. Can also be configured to give trigger output
Timing	Supports time stamp for each pulse - resolution 1µs
General	
Number of sensors supported	4 / 2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC
Compatible sensors	Supports all standard Ophir Pyroelectric, Thermal [b] and Photodiode [c] sensors
Power supply	12V wall cube power supply plugs into jack on rear. The power supply can be ordered from your local distributor.
Dimensions	103mm L x 190mm W x 33mm H
Weight	0.650 kg
Compliance	CE, UKCA, China RoHS
Notes:	(a) Limited by the maximum repetition rate of the sensor. (b) When operating with BeamTrack sensors, measures Power & Energy only. (c) Not including BC20, PD300-CIE and PD300RM sensors.

Ordering Information

Item	Description	Ophir P/N
Pulsar-4	Module to operate up to 4 Ophir sensors from your PC USB port. Comes with software. Max repetition rate for every pulse 25kHz. Has external trigger capability. Powered from wall cube power supply (can be ordered from your local distributor)	7Z01201
Pulsar-2	Same as above but for 2 channels only	7Z01202
Pulsar-1	Same as above but for 1 channel only	7Z01203
Pulsar USB cable	USB-A to B cable (1 unit supplied with Pulsar)	7E01202
N Polarity power supply/charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Pulsar)	7E05029

2.2 PC Interfaces

2.2.1 PC Connectivity Options for Power/Energy Measurement

Ophir Pyroelectric, Thermal and Photodiode sensors measure at up to 25,000 points per second

Ophir sensor to USB interfaces with up to 4 channel connectivity

Ophir EA-1 interface with Ethernet connectivity

Ophir Quasar interface with wireless connectivity

Transmit real time data to PC at 500 points per second via Bluetooth

Transmit real time data to PC at up to 25,000 points/s per channel (sensor limited) via USB

Transmit real time data to Android via USB

Transmit real time data to PC at up to >25,000 points/s (sensor limited) via Ethernet

StarLab Software (data transmitted via USB, Ethernet or Bluetooth)

StarViewer Application (data transmitted via Bluetooth and USB)

StarLab Software

StarViewer Android Application

2.2.8 Summary of Computer Options for Ophir Meters and Interfaces

Communications

With Ophir RS232, Bluetooth, USB and Ethernet communication options you can transfer data from the sensor to the computer in real time or offline. You can also control your Ophir power meter from the computer.

- USB on Nova II, Vega, StarBright, Centauri (optional on StarLite) power meters and Juno, Juno+, Pulsar PC interfaces
- Bluetooth wireless on Quasar interface
- RS232 on Nova II, Vega, StarBright, Centauri and Juno-RS optional on Nova
- Ethernet on EA-1 interface and Centauri power meter

Ophir Power Meter and Interface Specifications

Model	Centauri	StarBright	Nova II / Vega	StarLite	Nova	Juno / Juno+	Juno-RS	Pulsar-1, 2 or 4	EA-1	Quasar Bluetooth
Communication method	USB / RS232 / Ethernet	USB / RS232	USB / RS232	USB [c]	RS232	USB	RS232	USB	Ethernet	Bluetooth
Power Measurement										
Power log period	1s to 1000hr.	1s to 1000hr.	12s to 600hr.	N.A	5s to 24hr.	1s to Unlimited	1s to Unlimited	1s to Unlimited	1s to Unlimited	1s to Unlimited
Max points stored onboard	Unlimited	Unlimited	Nova II 5400 Vega 27000	N.A	300	N.A	N.A	N.A	N.A	N.A
Max points direct on PC	Unlimited	Unlimited	Unlimited	N.A	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Analog output	1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V F.S.	1V F.S.	1V F.S.	N.A / 1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V	N.A	N.A	N.A
Energy Measurement										
Max logging rate	25,000Hz USB 30Hz RS232	5000Hz USB 30Hz RS232	>2000Hz USB[a] >30Hz RS232	20Hz [c]	>10Hz	10,000Hz [a]	500Hz [a]	25,000Hz [a]	>25,000Hz [a]	500Hz
Max onboard data logging rate	25,000Hz	5000Hz	4000Hz [a]	N.A	>10Hz	N.A	N.A	N.A	N.A	N.A
Max points stored USB/onboard	Unlimited	Unlimited	Nova II 59,400 Vega 250,000	N.A	1000	N.A	N.A	N.A	N.A	N.A
Trigger input and output	Trigger input to synchronize measurement of pulses	N.A	N.A	N.A	N.A	N.A	N.A	BNC trigger input to enable measurement of missing pulses. Can also be configured to give trigger output	N.A	N.A
Timing - time stamp for each pulse	resolution 1µs	resolution 1µs	N.A	N.A	N.A	resolution 1µs	resolution 1µs	resolution 1µs	resolution 1µs	resolution 10ms
General										
Com Object	yes	yes	yes	yes [c]	no	yes	no	yes	yes	no
LabVIEW VIs	yes	yes	yes	yes [c]	yes	yes	no	yes	no	no
Maximum baud rate	115200	115200	38400	N.A	19200 [b]	N.A.	115200	N.A.	N.A.	N.A.
PC file format	Text files, spreadsheet compatible ASCII									
TTL Out	yes	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Number of sensors supported	2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit	4 / 2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 7 Quasars on one PC
Compatible sensors	Supports most Ophir pyroelectric, thermal and photodiode sensors									
Power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from USB	12V wall cube plugs into jack on rear	12V wall cube plugs into jack on rear	12V wall cube plugs into jack or PoE	Powered from internal rechargeable battery power supply
Dimensions	47 x 200 x 130mm	212 x 114 x 40mm	208 x 110 x 43mm / 210 x 109 x 36mm	211 x 114 x 40mm	205 x 95 x 39mm	77 x 55 x 23mm / 105 x 80 x 29mm	114 x 80 x 29mm	103 x 190 x 33mm	93 x 73 x 29mm	94 x 96 x 36mm

Notes:
(a) The above refers to the rate for logging every single point in turbo mode. Above that rate, the instrument will sample points but not log every single point.
(b) For pyroelectric sensors, maximum guaranteed baud rate is 9600.
(c) StarLite must be USB enabled in order to work with StarLab. If your StarLite has not been USB enabled, please contact your Ophir distributor in order to obtain a USB Activation Code. Now available: StarLite with USB enabled (P/N 7Z01569)

2.3 Software Solutions
2.3.1 StarLab

StarLab turns your PC into a laser power/energy multi-channel station

Extensive Graphic Display of Data
- Line Plot, Histogram, Bar chart, Simulated Analog Needle
- Multiple data sets on one graph or separate graphs on the same screen

Advanced Measurement Processing
- Power/Energy Density, Scale Factor, Normalize against a reference
- Multi-channel comparisons
- User defined mathematical equations: channels A/B, (A-B)/C etc.
- Position & size measurement with BeamTrack sensors

Data Logging for Future Review
- Can be displayed graphically or saved in text format
- Easily exported to an Excel spreadsheet

Fully supports IPM, Ariel, Centauri, StarBright, StarLite, Vega, Nova II, Pulsar, Juno, Juno+, Juno-RS, Quasar and EA-1 devices with all standard Ophir sensors

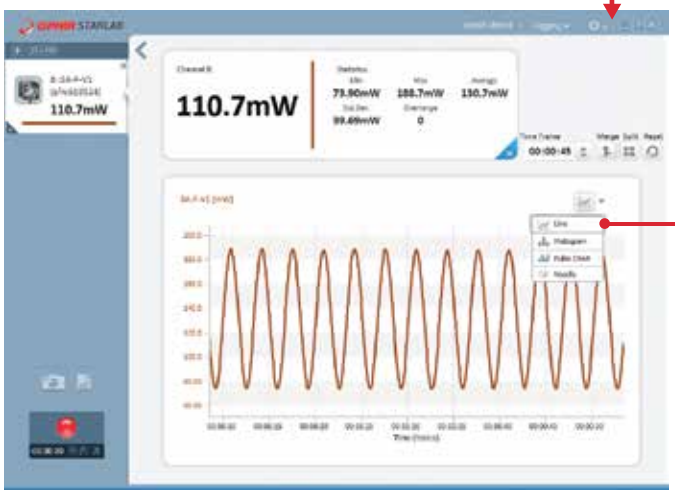
Flexible Display Options with StarLab

Choose which channels to display

Setup screen

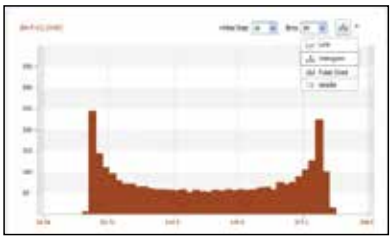
You may choose to display them separately

Maximize one of the sources

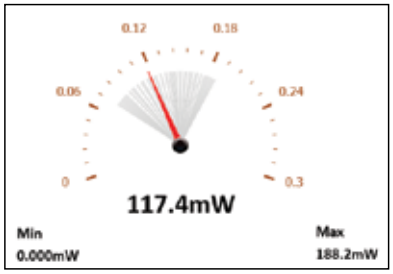


One of the above screens is maximized

Choose line graph



or histogram

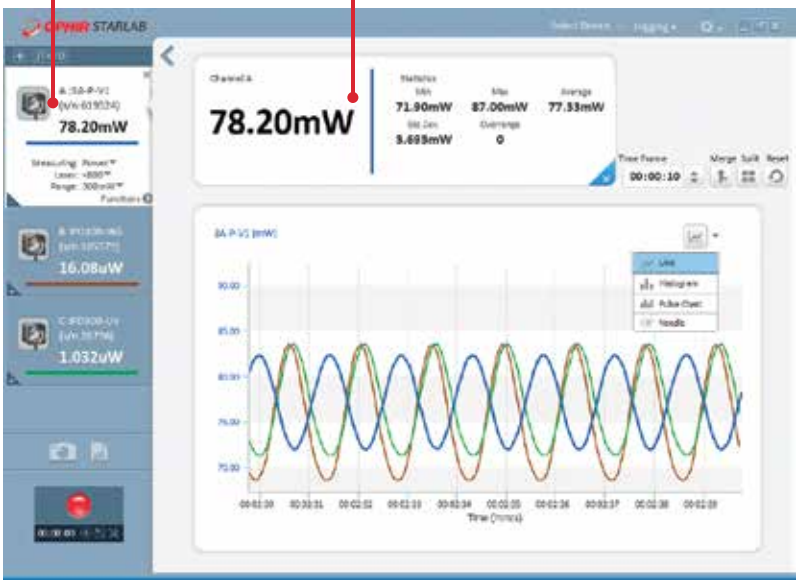


or needle display

Multiple Sensors displayed together

Click on one of the channels

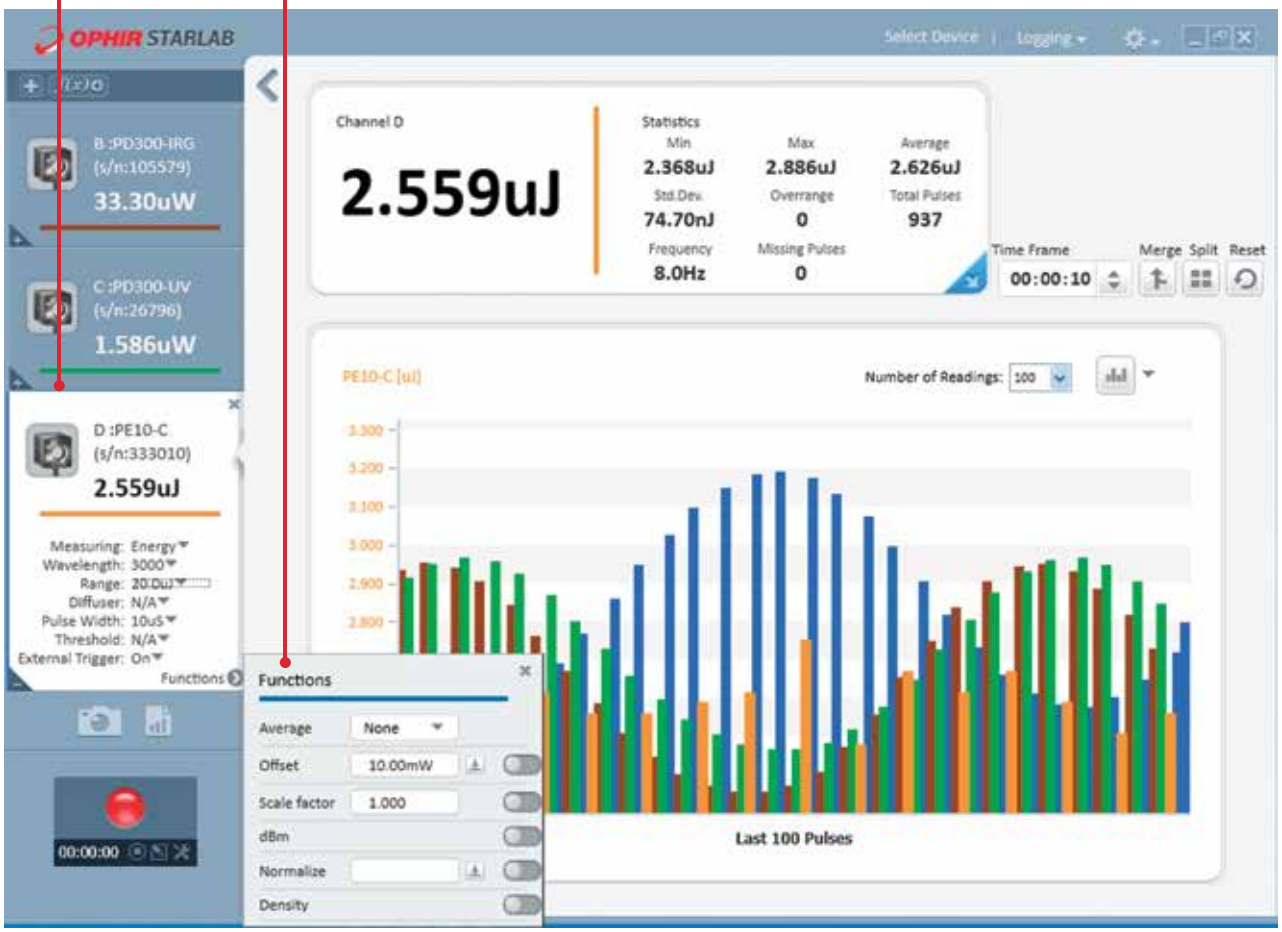
The numerical values are from the channel chosen



Here multi line graph display has been chosen

Settings and functions may be opened to adjust then minimized as needed

Additional functions are available from the "Functions" tab



Here multi line histogram display has been chosen

Functions and Logging

Functions

Click on f(x) to open another trace combining measured values

Define function combining measured values

New trace is now added per defined function

Files are stored here. They may be viewed graphically OR numerically

Logging

Click on log button and logging of values starts

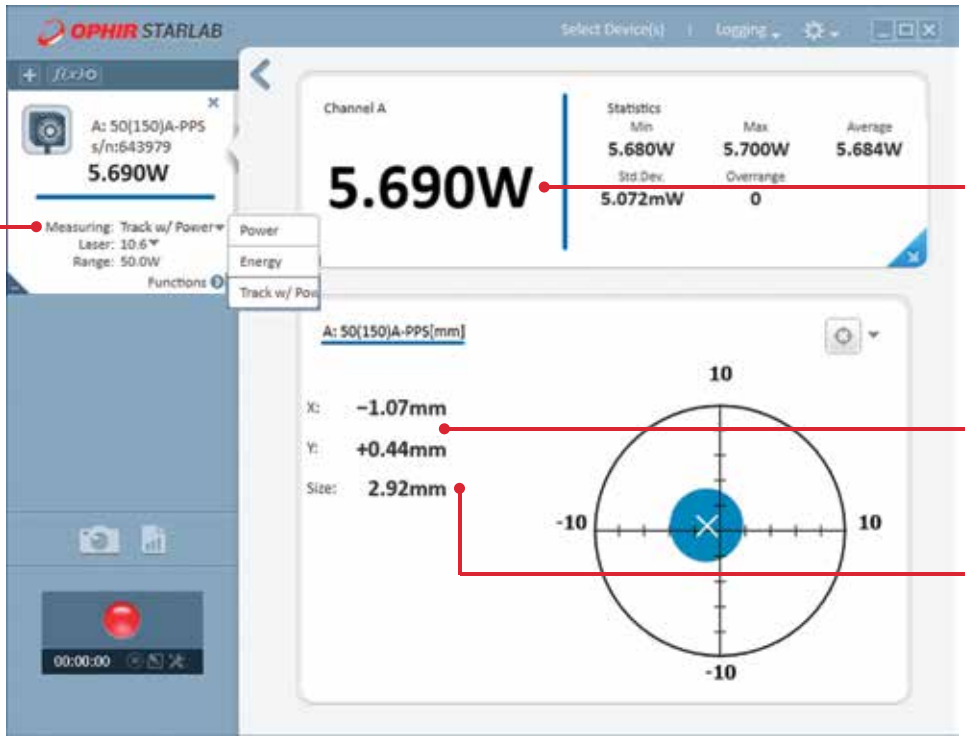

```
;PC Software:StarLab Version 3.00 Build 19
;Logged:25/05/2014 at 09:33:22
;Channel B:Vega Thermopile 3A-P-V1 (s/n:999999)  VG2.31 (s/n:657028)
;Channel A:Juno Photodiode PD300 (s/n:694646)  JN1.24 (s/n:606180)
;Math M:(A-B)^2

;Channel B:Statistics
;Min:3.440mW
;Max:12.22mW
;Average:7.882mW
;Std.Dev.:3.078mW
;Overrange:0

;First Pulse Arrived : 25/05/2014 at 09:33:22.562000
 Timestamp       Channel B       F(B)            Channel A       Math M
         0.000   1.762e-002      6.620e-003
         0.064   1.836e-002      7.360e-003
         0.128   1.911e-002      8.110e-003
         0.136                                   1.067e-002      6.554e-006
         0.193   1.986e-002      8.860e-003
         0.203                                   8.480e-003      1.444e-007
         0.256   2.057e-002      9.570e-003
         0.269                                   6.540e-003      9.181e-006
         0.321   2.123e-002      1.023e-002
         0.334                                   4.900e-003      2.841e-005
         0.384   2.182e-002      1.082e-002
         0.406                                   3.550e-003      5.285e-005
         0.449   2.232e-002      1.132e-002
         0.865   2.291e-002      1.191e-002
         0.870                                   3.400e-004      1.339e-004
         0.928   2.258e-002      1.158e-002
         0.936                                   3.600e-004      1.259e-004
         0.993   2.216e-002      1.116e-002
         1.003                                   4.800e-004      1.141e-004
         1.056   2.164e-002      1.064e-002
         1.070                                   7.600e-004      9.761e-005
         1.120   2.104e-002      1.004e-002
         1.136                                   1.340e-003      7.569e-005
         1.184   2.038e-002      9.380e-003
         1.203                                   2.370e-003      4.914e-005
         1.664   1.558e-002      4.580e-003
```

BeamTrack Power/Position/Size Screens

Open Measuring type tab and choose Track

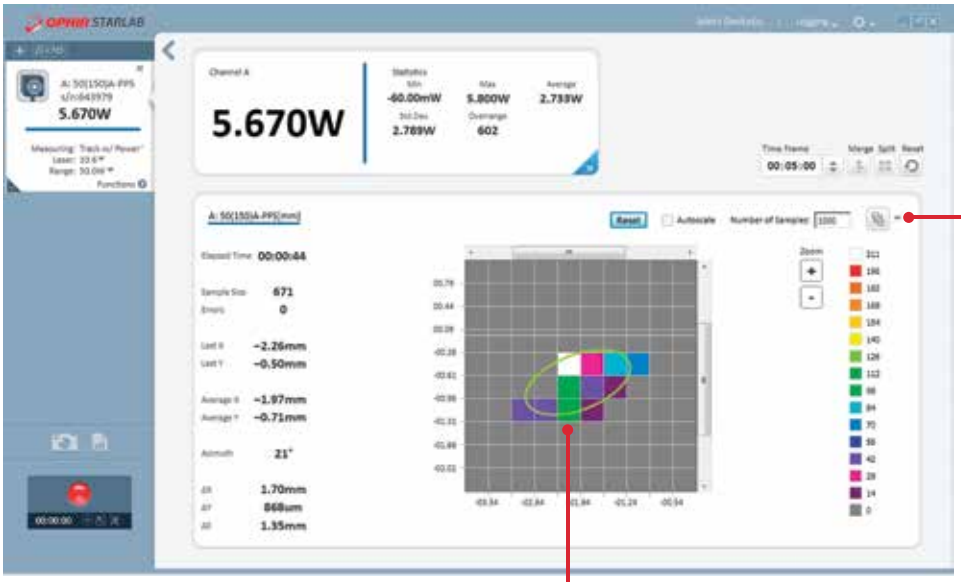


Power

Position

Size

Power / Position / Size screen



Click on this tab and choose “stability”

Position stability screen

Displays beam center wander weighted for dwell time at each position