

2.2.5 EA-1 Compact Ethernet Adapter

Connects your Ophir sensor to an Ethernet bus

- From sensor direct to Ethernet with no PC connection
- Powers directly from the Ethernet bus or 12V power supply
- Supports thermal, photodiode and pyroelectric smart sensors
- Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)
- Software support via StarLab application or 'Ophir Ethernet App' PC application software package, both included
- Allows remote monitoring via Telnet, HTTP or UDP protocols



DB15 connector

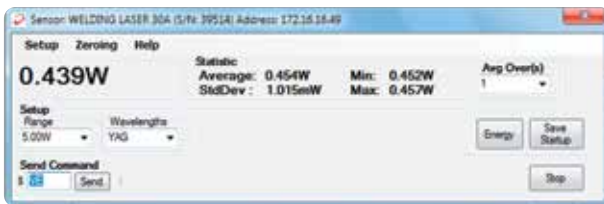


Mini-USB connector; Ethernet RJ45 connector; 12V power connector

Smart Sensor to EA-1 to Ethernet to PC

The EA-1 is suitable for customers who desire Ethernet connectivity and want to remotely monitor and control the sensor via their own custom software or the Ophir provided PC application. The EA-1 is designed to connect an Ophir smart sensor to your Ethernet. Standard thermopile, pyroelectric and photodiode sensors are supported. The unit is powered directly from the Ethernet bus if Power Over Ethernet (PoE) is available, or from a standard Ophir 12V power supply if not. The sensor can be monitored remotely over the Ethernet bus, allowing remote connections from distances far in excess of those allowed via RS232 or USB. The device is suitable for industrial or other environments where the bus of choice is Ethernet. Telnet, HTTP and UDP protocols are supported.

Installation and choosing an IP address are simplified via the simple Ophir Ethernet App PC application supplied with the unit. The PC application allows setup and basic functionality such as monitoring power and energy and changing measurement scales or wavelengths. Configuration of the IP address is via the Ethernet or a separate USB connection. The PC operating screen is shown below measuring power and energy.



PC application power screen



PC application energy screen

Additional features such as logging power or energy graphically are provided by the StarLab PC application which also supports the EA-1 device.

Specifications

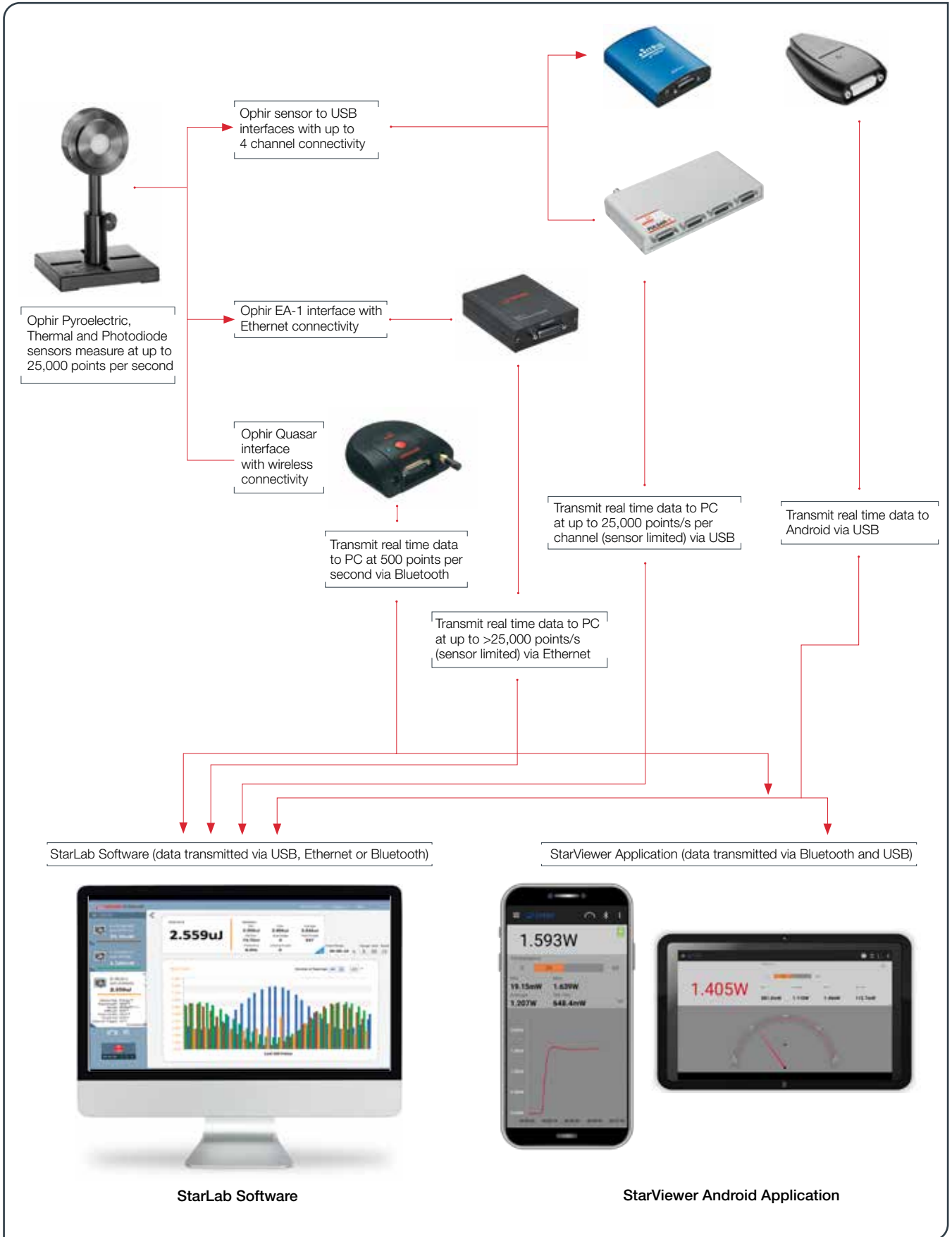
| | |
|-----------------------------|--|
| Model | EA-1 Ethernet Adapter |
| Use | Monitoring Ophir Sensors via Ethernet |
| Measurement Parameters | As defined by sensor |
| Supported Sensors | Thermal ^(a) , Photodiode ^(b) and Pyroelectric (PE-C series) |
| Number of Sensors Supported | One sensor per unit |
| Data Logging | Thermophile and Photodiode sensors: logging of power at 15Hz into log file Pyroelectric and PD-C sensors: via Ophir Ethernet App – logging of energy at up to ~400Hz into log file via StarLab or direct Ethernet connection – logging of energy at up to ~40kHz |
| Instruction Set | Supports entire Ophir instruction set for controlling and monitoring sensor |
| Power Supply | Power over Ethernet or separate 12V power supply |
| Dimensions | 93mm L x 73mm W x 29mm H |
| Weight kg | 0.1 |
| Compliance | CE, UKCA, China RoHS |
| Notes: | (a) BeamTrack functions are only supported via user commands or StarLab, but not with the PC application (b) Not including BC20, PD300-CIE and PD300RM sensors |

Ordering Information

| Item | Description | Ophir P/N |
|---------------------------------|---|-----------|
| EA-1 | Compact module to operate Ophir sensors over the Ethernet. Comes with basic PC software | 7Z01240 |
| EA-1 USB Cable | USB-A to MINI-B Cable (1 unit supplied with EA-1) | 7E01217 |
| EA-1 Ethernet Cable | Ethernet Cross Cable (1 unit supplied with EA-1) | 7E01192 |
| N polarity Power Supply/Charger | Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with EA-1) | 7E05029 |

2.2 PC Interfaces

2.2.1 PC Connectivity Options for Power/Energy Measurement



2.2.8 Summary of Computer Options for Ophir Meters and Interfaces

Communications

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

- 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 LaserStar, Nova II, Vega, StarBright, Centauri and Juno-RS optional on Nova
- GPIB optional on LaserStar
- Ethernet on EA-1 interface

Ophir Power Meter and Interface Specifications

| Model | Centauri | StarBright | Nova II / Vega | StarLite | LaserStar | Nova | Juno / Juno+ | Juno-RS | Pulsar-1, 2 or 4 | EA-1 | Quasar Bluetooth |
|------------------------------------|--|---|---|---|---|---|---|---------------------------------------|--|---|---|
| Communication method | USB / RS232 | USB / RS232 | USB / RS232 | USB ^(c) | RS232 / GPIB | RS232 | USB | RS232 | USB | Ethernet | Bluetooth |
| Power Measurement | | | | | | | | | | | |
| Power log period | 1s to 1000hr. | 1s to 1000hr. | 12s to 600hr. | N.A | 12s to 600hr. | 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 | 5400 | 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 | 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. | 1V F.S. | N.A / 1V, 2V, 5V, 10V F.S. | 1V, 2V, 5V, 10V | N.A | N.A | N.A |
| Energy Measurement | | | | | | | | | | | |
| Max real time data logging to PC | 25,000Hz USB 30Hz RS232 | 5000Hz USB 30Hz RS232 | >2000Hz USB ^(a) >30Hz RS232 | 20Hz ^(c) | >30Hz RS232 >1500Hz GPIB ^(a) | >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 | >1500Hz ^(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 | 59,400 | 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 | 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 | N.A | resolution 1µs | resolution 1µs | resolution 1µs | resolution 1µs | resolution 10ms |
| General | | | | | | | | | | | |
| Automation interface | yes | yes | yes | yes ^(c) | no | no | yes | yes | yes | yes | no |
| LabVIEW VIs | yes | yes | yes | yes ^(c) | yes | yes | yes | no | yes | no | no |
| Maximum baud rate | 115200 | 115200 | 38400 | N.A | 38400 | 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 | 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 for single channel mode. Two sensors per unit for dual channel mode | 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 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 | 194 x 228 x 57mm | 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.

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

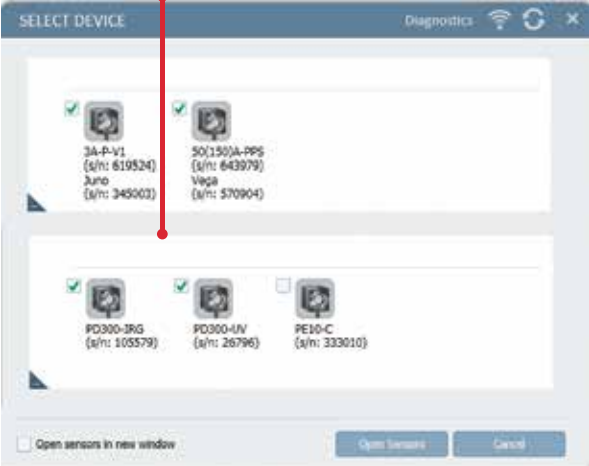
Data Logging for Future Review

- Can be displayed graphically or saved in text format
- Easily exported to an Excel spreadsheet

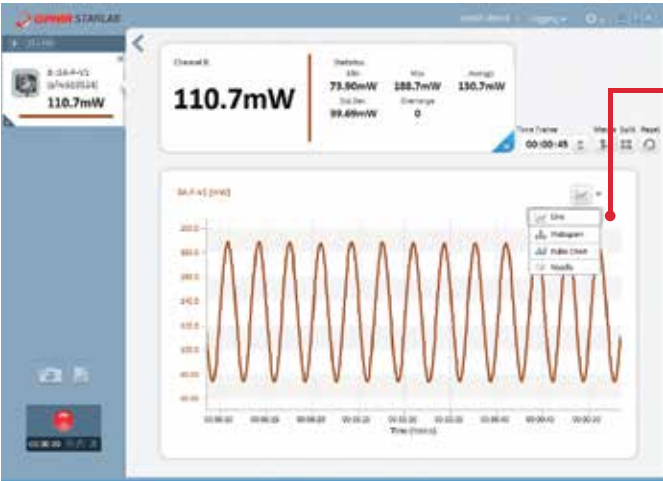
Fully supports IPM, Ariel, Centauri, StarBright, StarLite, Vega, Nova II, Pulsar, Juno, Juno+, Juno-RS, Quasar and EA-1 devices with all standard Ophir sensors

Flexible Display Options with StarLab

Choose which channels to display




Setup screen



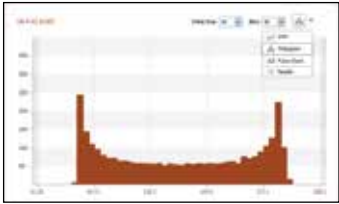
One of the above screens is maximized

You may choose to display them separately

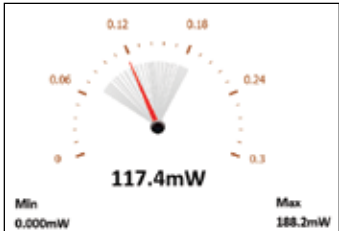
Maximize one of the sources



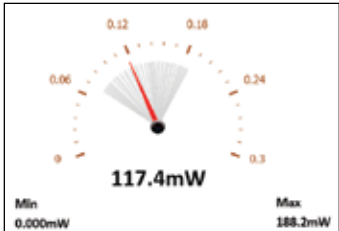
Choose line graph



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



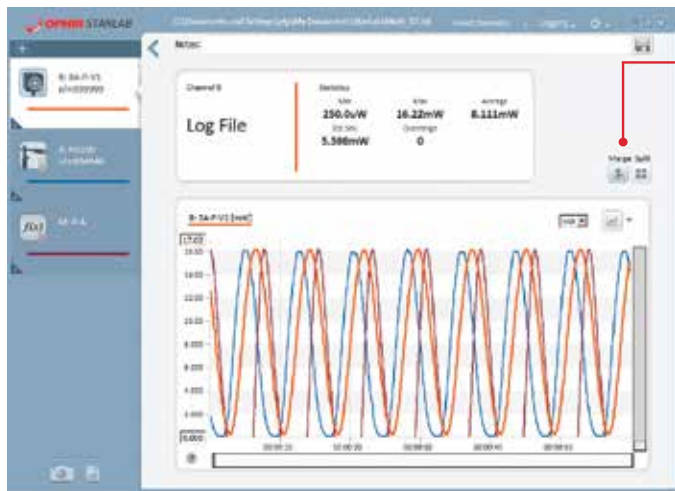
Define function combining measured values

New trace is now added per defined function

Logging

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

Click on log button and logging of values starts



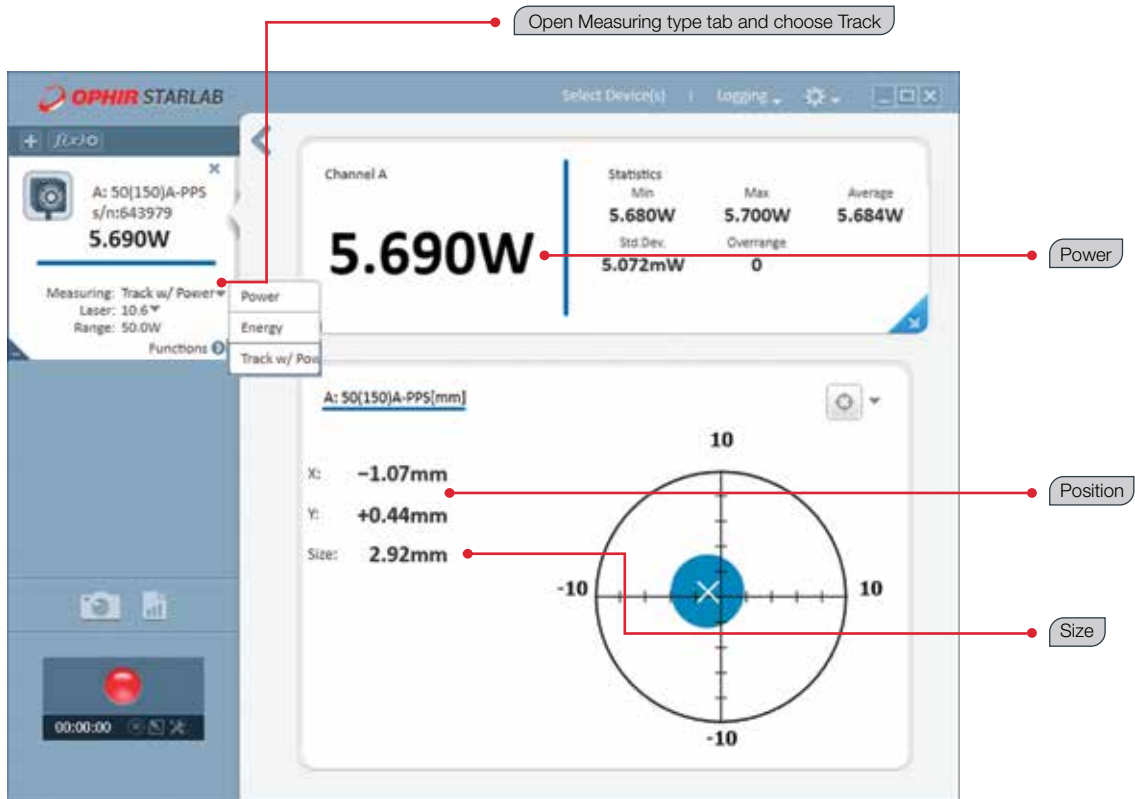
```

:PC software:starLab version 3.00 build 19
:Logged:25/05/2014 at 09:33:22
:Channel 8:Vega Thermopile 3A-P-V1 (s/n:999999) VQ2.31 (s/n:657028)
:Channel A:Juno Photodiode P0300 (s/n:694646) JML.24 (s/n:606180)
:Math M:(A-B)*2
:Channel 8: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

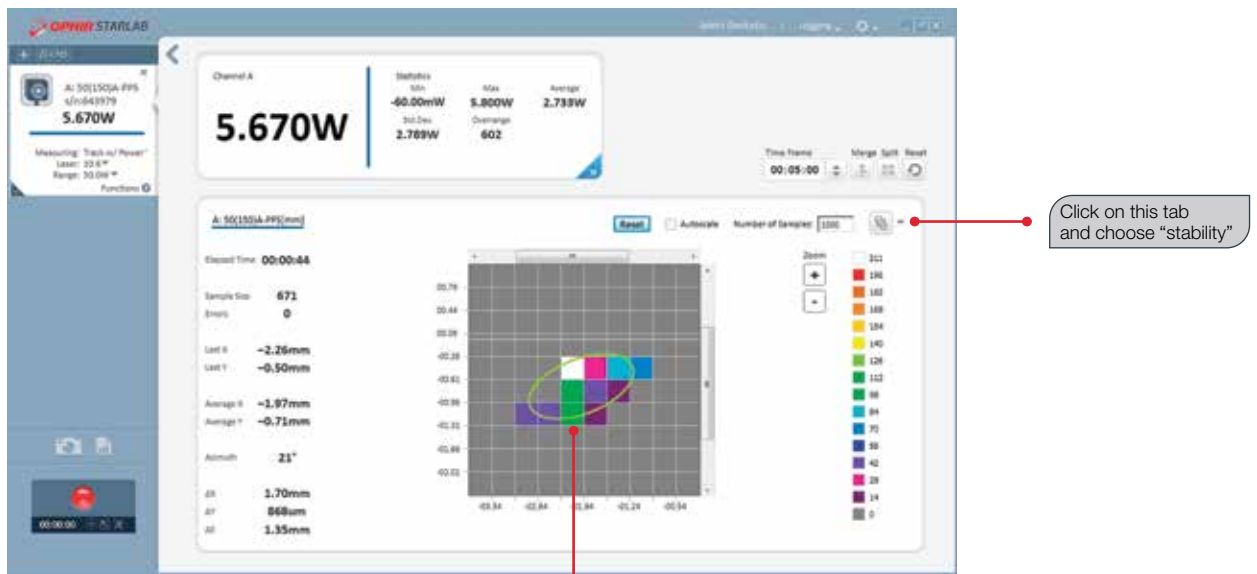
```

| Timestamp | Channel 8 | 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 | | |
| 0.193 | 1.986e-002 | 8.860e-003 | 1.067e-002 | 6.554e-006 |
| 0.203 | 2.057e-002 | 9.570e-003 | 8.480e-003 | 1.444e-007 |
| 0.256 | 2.057e-002 | 9.570e-003 | 6.540e-003 | 9.181e-006 |
| 0.269 | 2.123e-002 | 1.023e-002 | 4.900e-003 | 2.841e-005 |
| 0.321 | 2.182e-002 | 1.082e-002 | 3.550e-003 | 5.285e-005 |
| 0.354 | 2.232e-002 | 1.132e-002 | | |
| 0.384 | 2.291e-002 | 1.191e-002 | 3.400e-004 | 1.339e-004 |
| 0.406 | 2.258e-002 | 1.158e-002 | 3.600e-004 | 1.259e-004 |
| 0.449 | 2.216e-002 | 1.116e-002 | 4.800e-004 | 1.141e-004 |
| 0.865 | 2.164e-002 | 1.064e-002 | 7.600e-004 | 9.761e-005 |
| 0.870 | 2.104e-002 | 1.004e-002 | 1.340e-003 | 7.569e-005 |
| 0.928 | 2.038e-002 | 9.380e-003 | 2.370e-003 | 4.914e-005 |
| 0.936 | 1.558e-002 | 4.580e-003 | | |
| 0.993 | | | | |
| 1.003 | | | | |
| 1.056 | | | | |
| 1.070 | | | | |
| 1.120 | | | | |
| 1.136 | | | | |
| 1.184 | | | | |
| 1.203 | | | | |
| 1.664 | | | | |

BeamTrack Power/Position/Size Screens



Power / Position / Size screen



Displays beam center wander weighted for dwell time at each position