

## 2.2.6 Quasar Wireless Bluetooth Interface

### Straight from your measuring sensor to your PC or Android device with no cables

- Quasar wireless interface connects to any Ophir sensor and broadcasts to your PC or your Android device running StarViewer
- Wireless range of 10-30 meters depending on surroundings
- Operates from rechargeable battery with typically >40 hours lifetime
- Powerful USB interface with StarLab PC application software included or StarViewer Android application
- Converts your PC or your android Device into a complete laser power/energy meter
- Log power and energy, average, statistics, histograms and more (only in PC)
- Monitor up to 7 Quasars simultaneously on one PC (only in PC)



### Quasar Bluetooth Wireless Sensor to PC Interface

Quasar module connects to any Ophir sensor, thermal, pyroelectric or photodiode

Any PC, laptop or Android device connects to Quasar module via Bluetooth adapter and operates as a power/energy meter/data logger

#### Specification

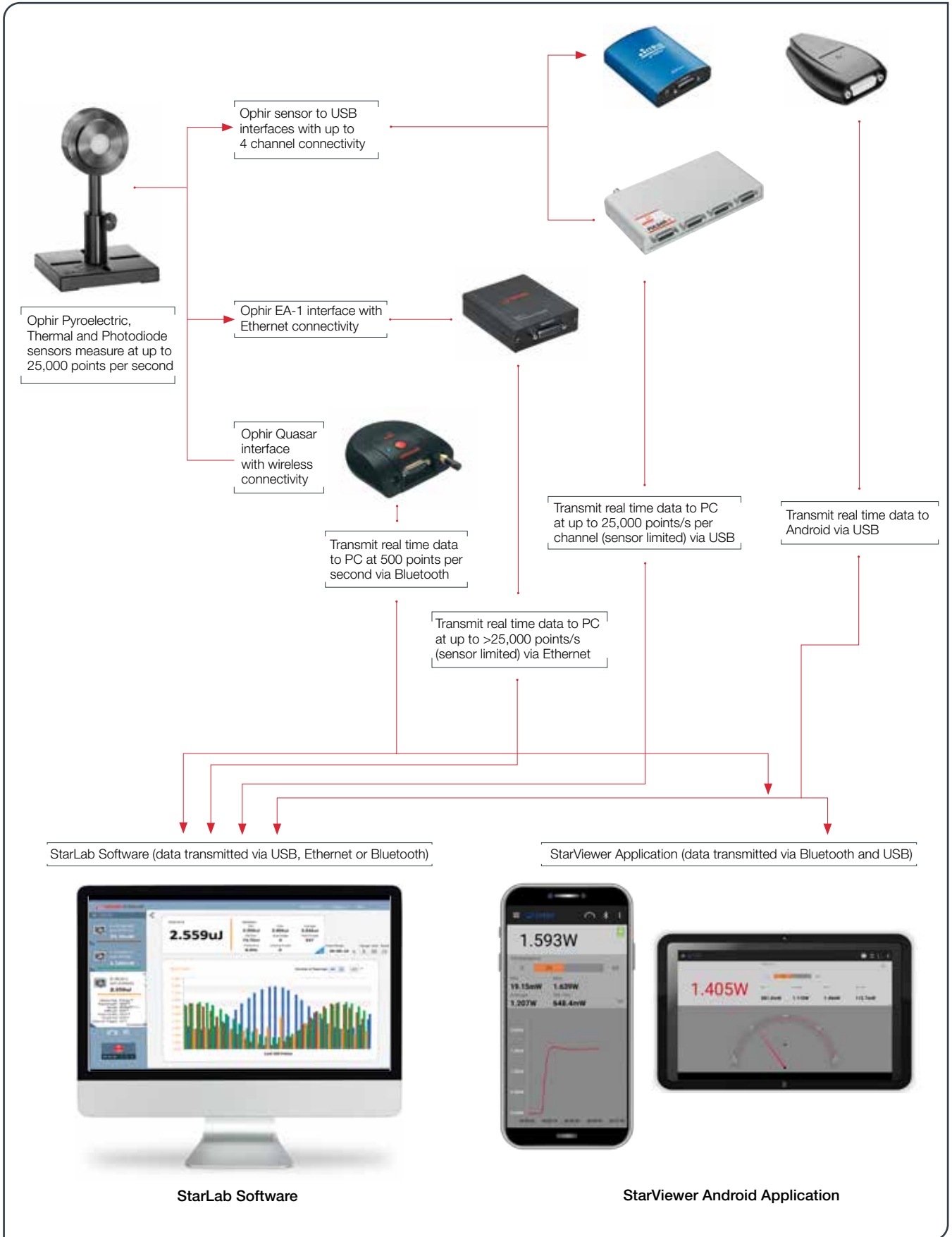
Sensor Compatibility	All Ophir standard sensors, Thermal, Photodiode (a) and Pyroelectric
Number of Sensors on One PC	Up to 7 Quasars can operate simultaneously and be displayed at the same time on one PC
Operating Range	10-30 meters depending on surroundings when used with built in laptop Bluetooth or Ophir recommended adapter
Power	Powered by rechargeable NiMH battery. Battery life typical 40 hours, 20 hours for pyro sensors. Automatically goes into sleep mode when not connected to PC. Low batt indication. Charges from 12VDC either polarity. The charger can be ordered from your local distributor.
LED Indicator	LED indicator indicates whether connected, in standby or off
Bluetooth Standard	Bluetooth class 1. Connection to PC is transparent to user. Will work with built in laptop Bluetooth and most add on USB to Bluetooth adapters. Ophir recommended USB to Bluetooth adapter Ophir P/N 7E10039 (see table below)
Data Transfer Rate for Pyro Sensors	500Hz
Dimensions	94mm L x 96mm W x 36mm H not including antenna
Connections	15 pin D type sensor connector standard Ophir 12V charger input
Compliance	CE, UKCA, China RoHS
Notes:	(a) Not including BC20, PD300-CIE and PD300RM sensors

#### Ordering Information

Item	Description	Ophir P/N
Quasar Bluetooth Interface	Module to operate one Ophir sensor from your PC via Bluetooth wireless interface. Comes with software. Max repetition rate for every pulse 500Hz. Powered from built in rechargeable battery. Comes with power supply. Bluetooth adapter required when not available on PC. See next line	7Z01300
USB to Bluetooth adapter	Adapter for PC or Laptop not equipped with built in Bluetooth. This adapter works with Quasar on Windows 7/8/10 - not on XP. Quasar is not guaranteed to work with all other adapters on the market	7E10039
Battery Pack for Quasar	Replacement battery pack for Quasar	7E14007A
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Quasar)	7E05029

# 2.2 PC Interfaces

## 2.2.1 PC Connectivity Options for Power/Energy Measurement



## 2.2.7 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 and Centauri 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+	Pulsar-1, 2 or 4	EA-1	Quasar Bluetooth
Communication method	USB / RS232	USB / RS232	USB / RS232	USB <sup>(c)</sup>	RS232 / GPIB	RS232	USB	USB	Ethernet	Bluetooth
<b>Power Measurement</b>										
Power log period	1s to 1000hr.	1s to 1000hr.	12s to 600hr.	N.A.	12s to 600hr.	5s to 24hr.	5s to 500hr.	5s to 500hr.	5s to 500hr.	5s to 500hr.
Max points stored onboard	unlimited	unlimited	Nova II 5400 Vega 27000	N.A.	5400	300	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.	1V F.S.	N.A / 1V, 2V, 5V, 10V F.S.	N.A.	N.A.	N.A.
<b>Energy Measurement</b>										
Max real time data logging to PC	25,000Hz USB 30Hz RS232	5000Hz USB 30Hz RS232	>2000Hz USB <sup>(a)</sup> >30Hz RS232	20Hz <sup>(c)</sup>	>30Hz RS232 >1500Hz GPIB <sup>(a)</sup>	>10Hz	10,000Hz <sup>(a)</sup>	25,000Hz <sup>(a)</sup>	>25,000Hz <sup>(a)</sup>	500Hz
Max onboard data logging rate	25,000Hz	5000Hz	4000Hz <sup>(a)</sup>	N.A.	>1500Hz <sup>(a)</sup>	>10Hz	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.
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.	N.A.	resolution 10µs	resolution 1µs	resolution 1µs	resolution 10ms
<b>General</b>										
Automation interface	yes	yes	yes	yes <sup>(c)</sup>	no	no	yes	yes	yes	no
LabVIEW VIs	yes	yes	yes	yes <sup>(c)</sup>	yes	yes	yes	yes	no	no
Maximum baud rate	115200	115200	38400	N.A.	38400	19200 <sup>(b)</sup>	N.A.	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 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	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 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	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

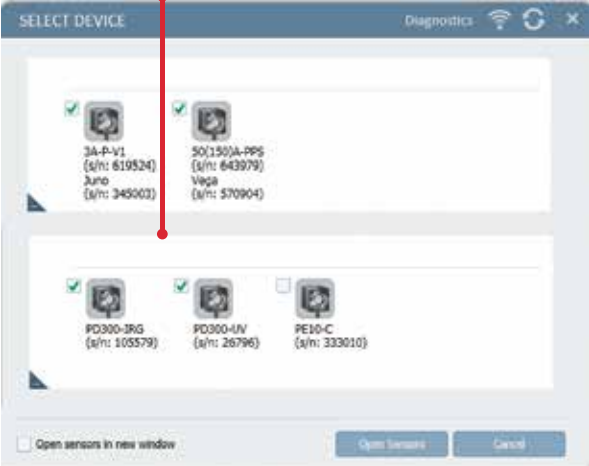
#### Data Logging for Future Review

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

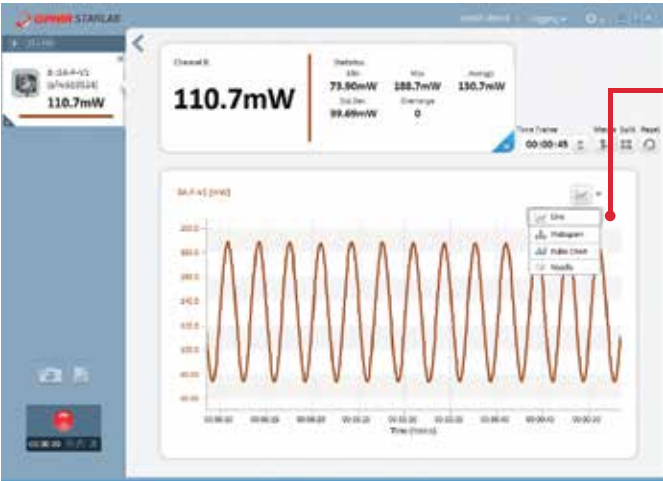
Fully supports Centauri, StarBright, StarLite, Vega, Nova II, Pulsar, Juno, Juno+, Quasar, EA-1 and USB1 devices with all standard Ophir sensors

**Flexible Display Options with StarLab**

Choose which channels to display




Setup screen



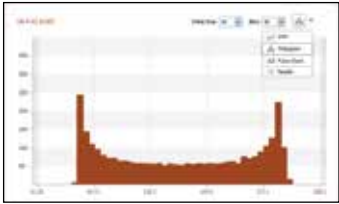
One of the above screens is maximized

**You may choose to display them separately**

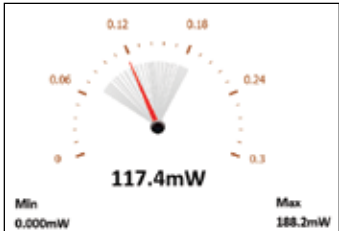
Maximize one of the sources



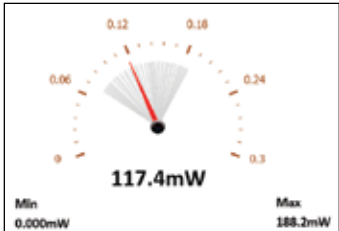
Choose line graph



or histogram



or needle display



## Multiple Sensors displayed together

Click on one of the channels

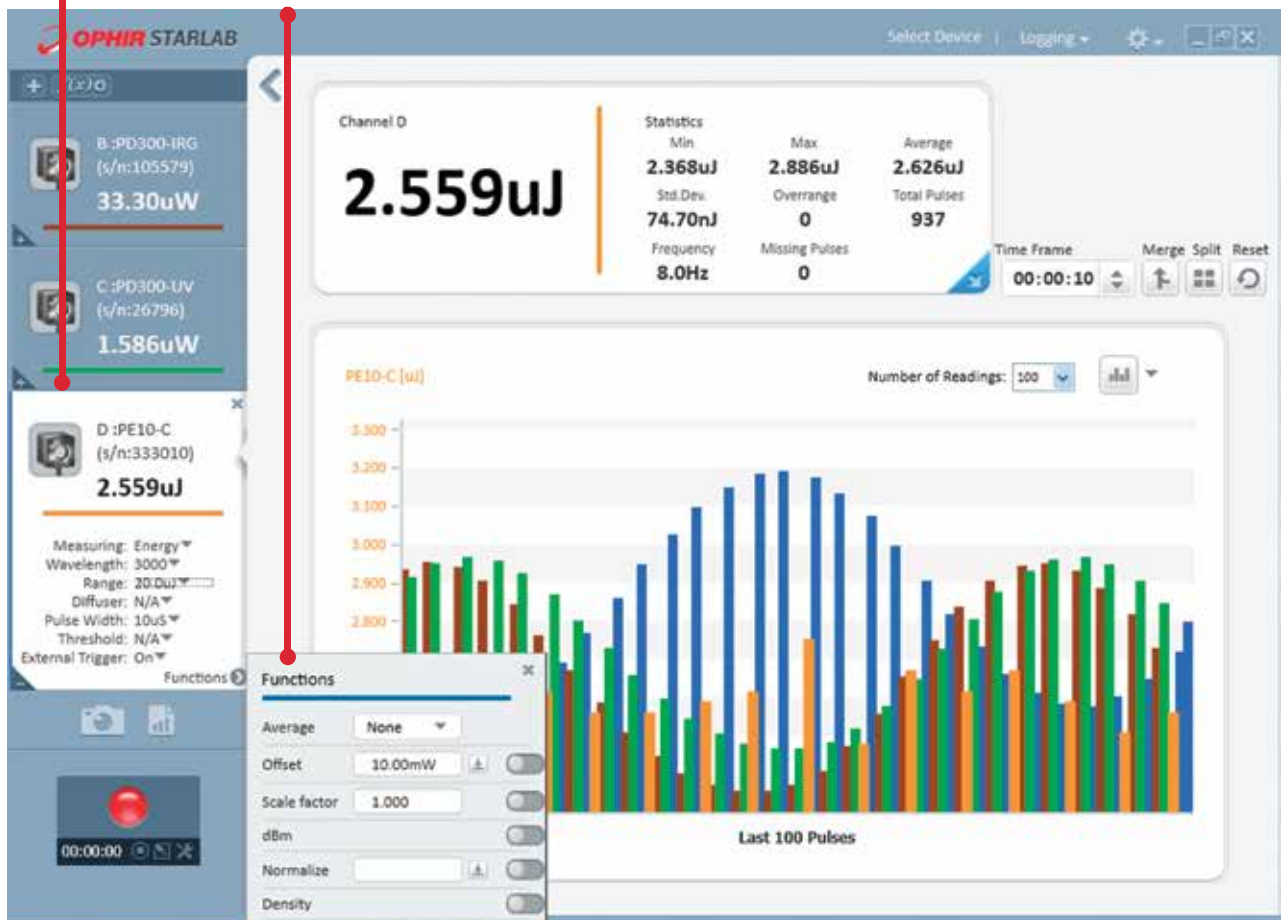
The numerical values are from the channel chosen



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



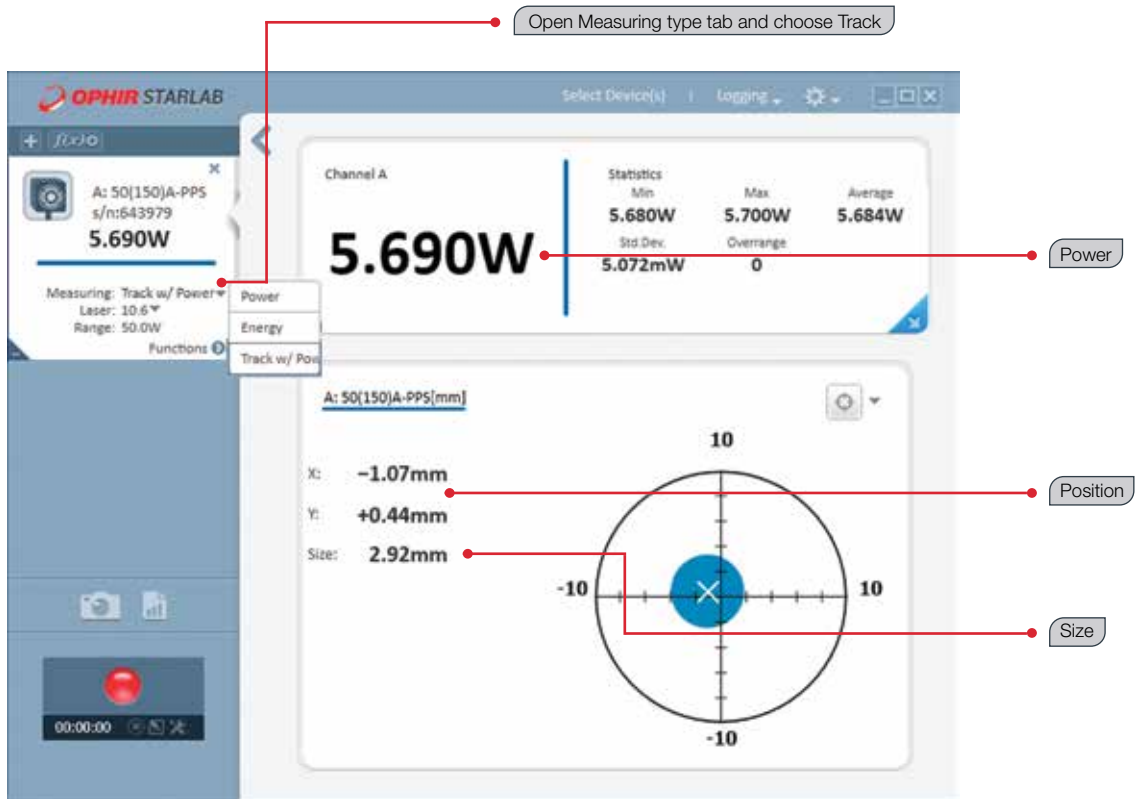
```

: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) JNL.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

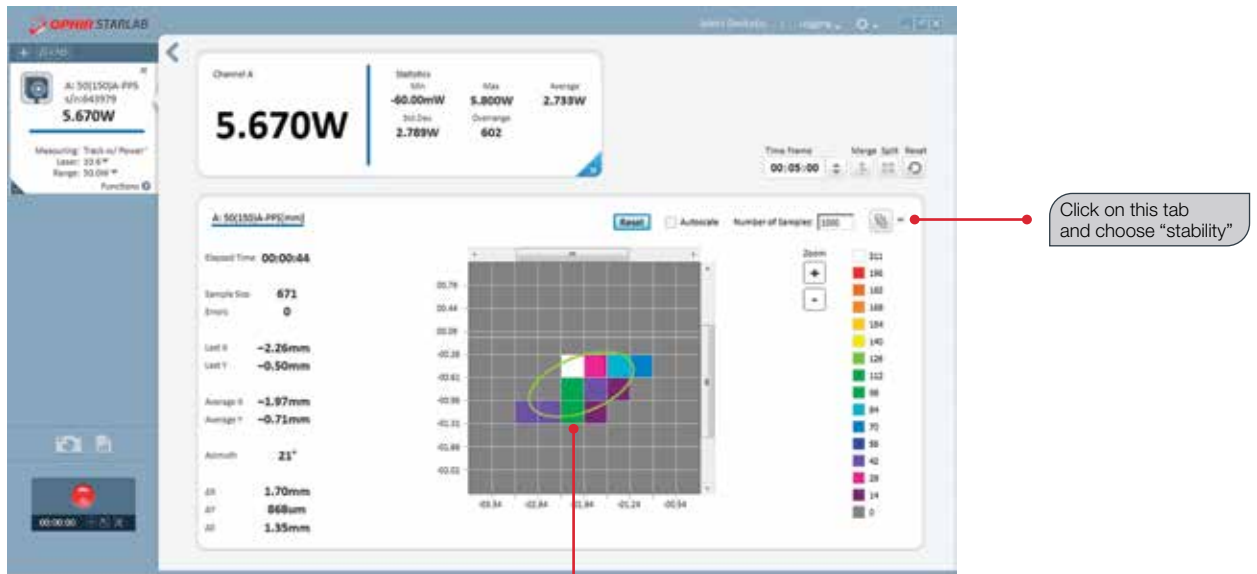
```

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			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		
0.354			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



Power / Position / Size screen



Displays beam center wander weighted for dwell time at each position

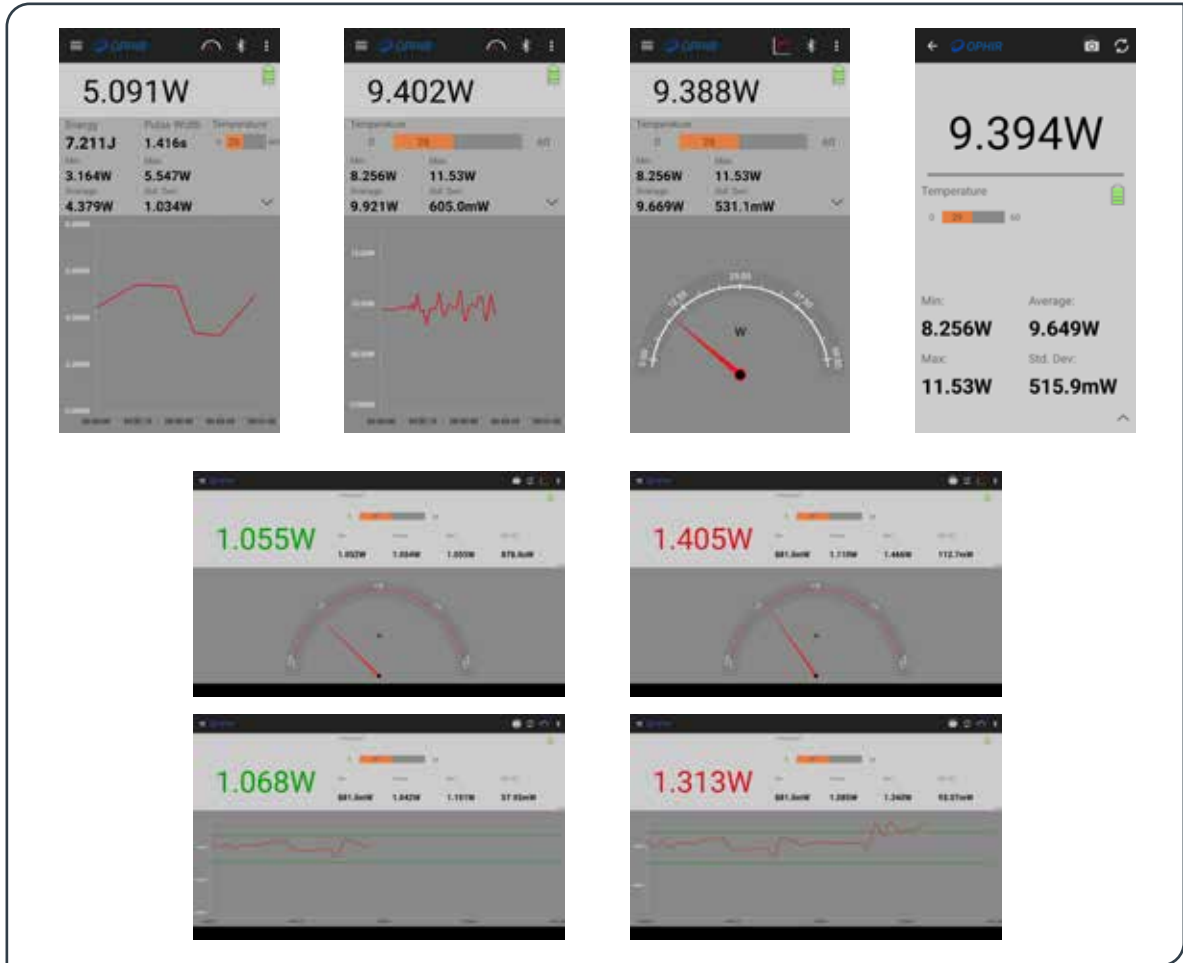
## 2.3.5 StarViewer Android App

### Description:

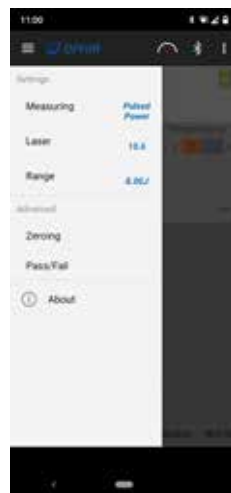
- Turn your Android smartphone or tablet into a laser power / energy meter (Android version 7 or higher). Available on Google Play
- Works with Ariel/Juno/Quasar devices
- Display measurements as line graph, simulated analog needle, or full screen numeric display with statistics
- Screen Capture and Share built into the application
- Measurement settings fully configurable to match your laser measurement needs
- Great for field technicians that make service calls

StarViewer brings laser power and energy measurement to your Smartphone / Tablet via our Ariel, Juno & Quasar devices. It is an intuitive easy-to-learn application. Just install it, connect to your device, and get started immediately.

StarViewer allows you to display the measurement in a time-based line graph, as a needle display, or large numeric display with statistics.



You can also perform a screen capture and share it. Great for field technician's reporting results back to the lab. StarViewer can be used with any standard Ophir Thermopile, Photodiode, or Pyroelectric PE-C sensor. The measurement settings are fully configurable by opening the settings panel at the left of the screen.





StarViewer can be used with the Juno via your device's USB on-the-go (OTG) port, or via Bluetooth with the Quasar and Ariel.



### Requirements:

- Android version 7 or higher

### For use with the Ariel:

- Bluetooth: Minimum version 4.0 required, 5.1 recommended
- Ariel firmware version 1.23 or higher (available here)
- Note: StarViewer supports and leverages Ariel's measurement capabilities to display Continuous Power, Single Pulse Energy, and Pulsed power together with Pulse width, Battery level and temperature

### For use with the Juno:

- Smartphone / tablet with an OTG port, capable of providing 100mA or more downstream current
- Micro USB to Type A Female Adapter (between the OTG port and the Juno cable)
- Juno firmware version 1.39 or higher (available here)

### For use with the Quasar:

- Bluetooth capability
- Quasar version 1.25 or higher (available here)
- PIN code for Bluetooth pairing is 1234
- Note: StarViewer does not support measurement with Pyroelectric sensors with the Quasar



Ophir StarViewer Android App