

2.2.7 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

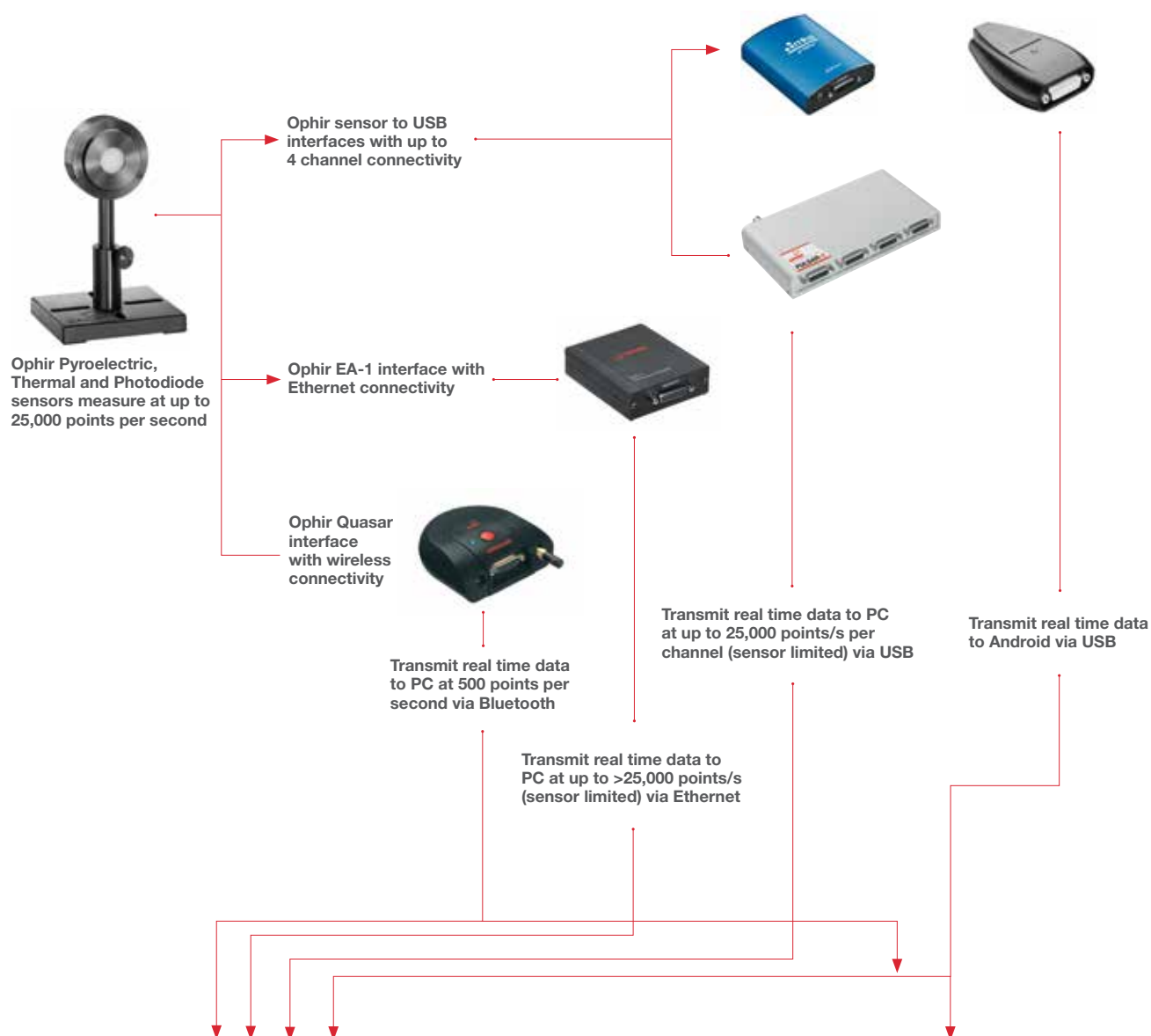
Sensor Compatibility	All Ophir standard sensors, Thermal ^(a) , Photodiode ^(b) and Pyroelectric
Number of Sensors on One PC	Up to 7 Quasars can operate simultaneously and be displayed at the same time on one PC
Operating Range	10-30 meters depending on surroundings when used with built in laptop Bluetooth 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.
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) When operating with BeamTrack sensors, measures Power & Energy only. (b) 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
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



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, GPIB, 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 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 logging rate	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											
Com Object	yes	yes	yes	yes (c)	no	no	yes	no	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. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Two sensors per unit for dual channel mode	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.
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



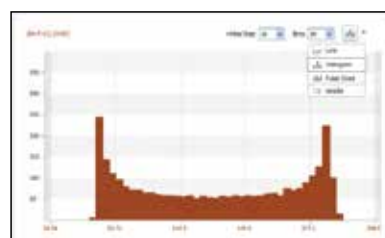
One of the above screens is maximized

You may choose to display them separately

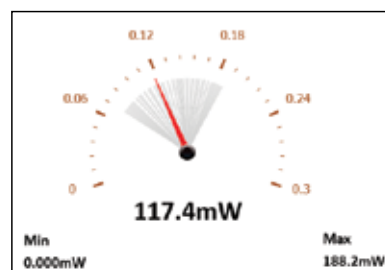
Maximize one of the sources



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

Click on log button and logging of values starts

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



```

PC Software:StarLab version 3.00 Build 19
Logged:25/05/2014 at 09:33:22
Channel 8:Veiga Thermopile 3A-P-V1 (s/n:999999) VG2.31 (s/n:657028)
Channel 9:Veiga Photodiode PD300 (s/n:694646) JKL.24 (s/n:606180)
Math M:(A-B)*A2

Channel 8:Statistics
Min:3.440mw
Max:12.22mw
Average:7.882mw
Std.Dev.:3.078mw
Overrange:0

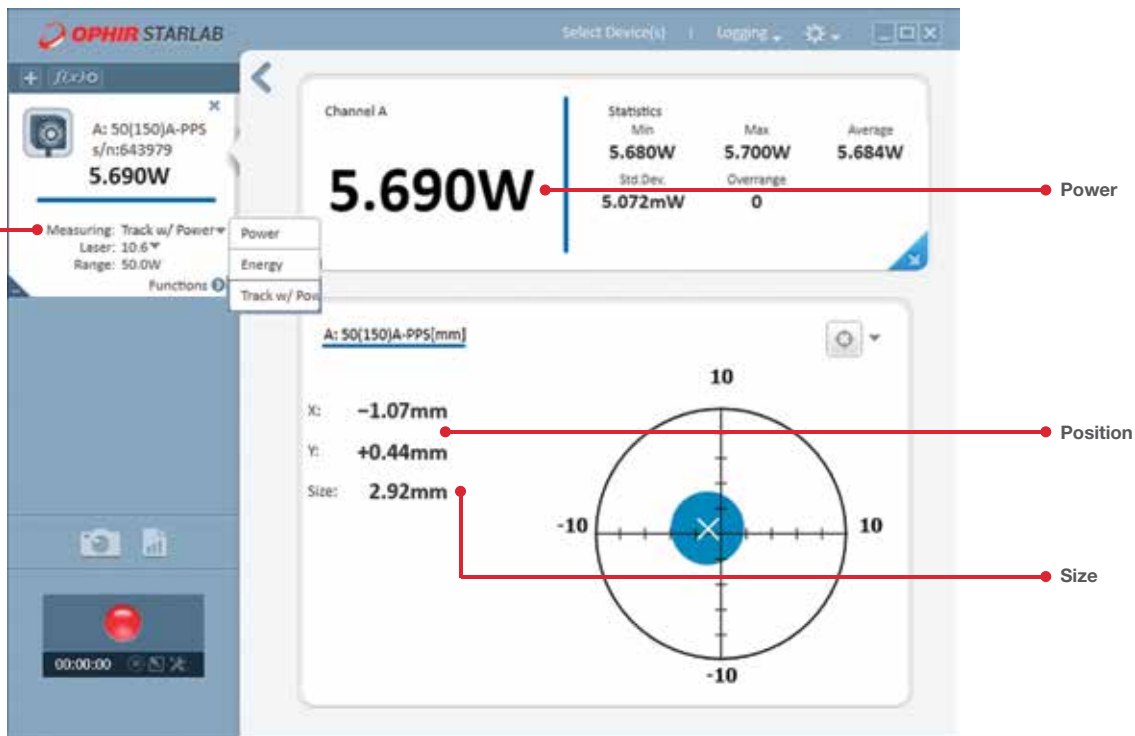
First Pulse Arrived : 25/05/2014 at 09:33:22.562000

```

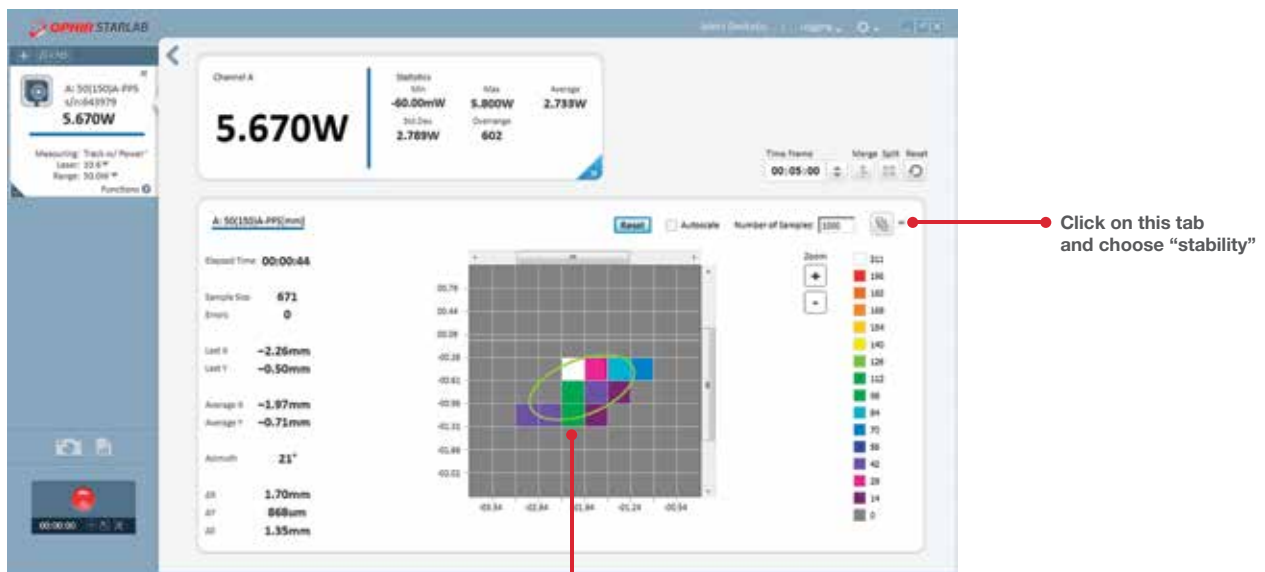
Timestamp	Channel 8	F(B)	Channel A	Math M
0.000	1.762e-002	6.620e-003		
0.064	1.836e-002	7.360e-003		
0.128	1.911e-002	8.110e-003		
0.192			1.067e-002	6.554e-006
0.193	1.989e-002	8.860e-003		
0.203			8.480e-003	1.444e-007
0.256	2.057e-002	9.570e-003	6.540e-003	9.811e-006
0.369				
0.321	2.123e-002	1.023e-002	4.900e-003	2.841e-005
0.354				
0.354	2.182e-002	1.082e-002	3.550e-003	5.285e-005
0.384				
0.406	2.232e-002	1.132e-002		
0.449	2.291e-002	1.192e-002		
0.865			3.400e-004	1.339e-004
0.870				
0.928	2.258e-002	1.158e-002	3.600e-004	1.259e-004
0.936				
0.993	2.216e-002	1.116e-002	4.800e-004	1.141e-004
1.003				
1.056	2.164e-002	1.064e-002	7.600e-004	9.761e-005
1.070				
1.120	2.104e-002	1.004e-002	1.340e-003	7.569e-005
1.136				
1.184	2.038e-002	9.380e-003	2.370e-003	4.914e-005
1.203				
1.664	1.558e-002	4.580e-003		

BeamTrack Power/Position/Size Screens

- Open Measuring type tab and choose Track



Power / Position / Size screen



Position stability screen

- Displays beam center wander weighted for dwell time at each position

2.3.2 System Integrator Solutions

Besides their use as stand-alone, fully featured laser power/energy meters, Ophir devices are easily incorporated into larger end-user applications. This allows system integrators to leverage Ophir's excellence in measurement capabilities with legacy analysis packages.

Communication Protocols

All Ophir devices support one or two forms of communication with the PC.

Device	USB	RS232	GPIO	Bluetooth	Ethernet
Centauri	•	•			
StarBright	•	•			
Vega	•	•			
Nova II	•	•			
*StarLite	•				
LaserStar		•	•		
Nova		•			
Juno / Juno+	•				
Juno-RS		•			
EA-1					•
Pulsar	•				
Quasar				•	

* StarLite with USB enabled prestored (P/N 7Z01569) or with activation code (P/N 7Z11049) see page 178

USB

Ophir provides a common interface for communication and control of all of our USB speaking devices.

OphirLMMMeasurement is a COM object that is included as part of the StarLab installation (StarLab 2.10 and higher) that allows the system integrator to take control of the Centauri, Ariel, StarBright, StarLite, Juno, Juno+, Nova II, Pulsar, USBI and Vega devices; integrating them into his in-house measurement and analysis package.

For communication via USB, device drivers and additional support software must be installed on your PC. These components are installed as part of the StarLab application's installation process.

RS232

RS232 communication is the simplest to integrate into your Customized Solutions (OEM) application. Integrated Development Environments (IDE's) such as Microsoft Visual Studio provide functions and methods for accessing the PC's com port.

The following is all that you need to get your RS232 applications up and running

- User Commands document contains an alphabetical listing and detailed description of all commands available with the Centauri, StarBright, Vega, Nova II and Juno-RS devices.
- Appendix A5 of the StarCom User Manual contains an alphabetical listing and detailed description of all commands available with the Nova and LaserStar devices.
- Appendix A4 of the StarCom User Manual gives an example of polling the Nova device for measurements. This was written in VB6.
- An appropriate RS232 assembly
- Nova RS232 Assembly (P/N 7Y78105 ^(a)) for use with the Nova device

- Nova II / Vega RS232 cable (P/N 7E01206) for use with the Nova II and Vega devices (included with the Nova II / Vega)
- LaserStar RS232 cable (P/N 7E01121, included with the LaserStar)
- StarBright / Centauri RS232 cable (P/N 7E01213, included with the StarBright and Centauri)
- Juno-RS RS232 cable (P/N 7E11216, included with the Juno-RS)

GPIO

Besides RS232, the LaserStar can also communicate via GPIO (IEEE 488.1). Using the SDK supplied by the vendor of your GPIO controller hardware, a LaserStar IEEE cable (P/N 7Y78300 ^(b)) and the StarCom User Manual, you can integrate the LaserStar into your GPIO solution.

Bluetooth

Bluetooth system integration for the Ariel and Quasar is easily accomplished, in a similar way to our RS232 devices. For more information (and a list of commands), please contact Ophir.

Ethernet

The EA-1 Ethernet Adapter device provides system integration using a Telnet connection over an Ethernet network. A list of user commands is provided, similar to the RS232 commands described above. See the EA-1 User Manual for more details, available on the website.

System Integrators will need the following components:

- OphirLMMMeasurement COM Object.pdf. lists and describes the methods and events available for configuring, controlling and uploading measurements from Ophir devices.
- OphirLMMMeasurement.dll. COM object component developed and supplied by Ophir for communication with the Centauri, StarBright, StarLite, Juno, Juno+, Nova II, Pulsar, USBI and Vega devices. The COM object is registered when the application is installed. OphirLMMMeasurement COM Object.pdf describes how to register it on another PC where the Ophir application has not been installed.
- Standard USB cable (P/N 7E01202) for use with the Pulsar device (included).
- Standard mini-B USB cable (P/N 7E01217) for use with the Juno and Juno+ devices (included).
- Nova II / Vega USB cable (P/N 7E01205) for use with the Nova II and Vega devices (included).
- StarBright / StarLite / Centauri micro-B USB cable (P/N 7E01279) for use with StarBright, StarLite and Centauri devices (included).

Ophir provides example projects of COM Object clients in VC#, VB.NET and LabVIEW. These are found in the Automation Examples subdirectory of our StarLab PC Application.

Note: (a) P/N 7Y78105 replaces P/N 78105

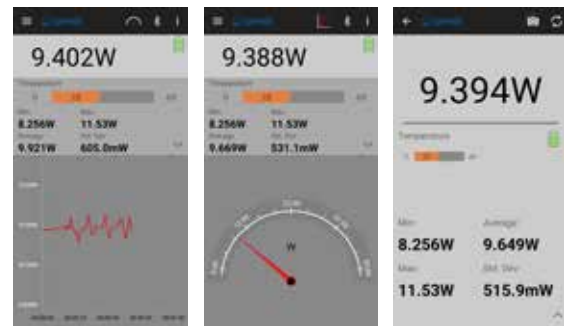
Note: (b) P/N 7Y78300 replaces P/N 78300

2.3.5 StarViewer

Description:

- Turn your smartphone or tablet into a laser power / energy meter
- Works a selection of Ophir 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 who make service calls

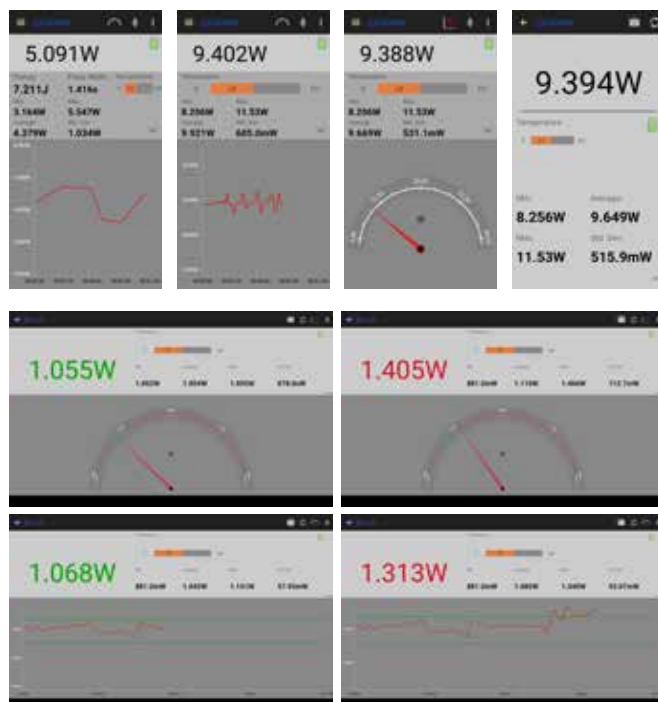
StarViewer brings laser power and energy measurement to your Smartphone / Tablet from selected Ophir devices. It is an intuitive easy-to-learn application. Just install it, connect to your device, and get started immediately. You can also perform a screen capture and share it. Great for field technician's reporting results back to the lab.



StarViewer (Android app) v3.05

Overview:

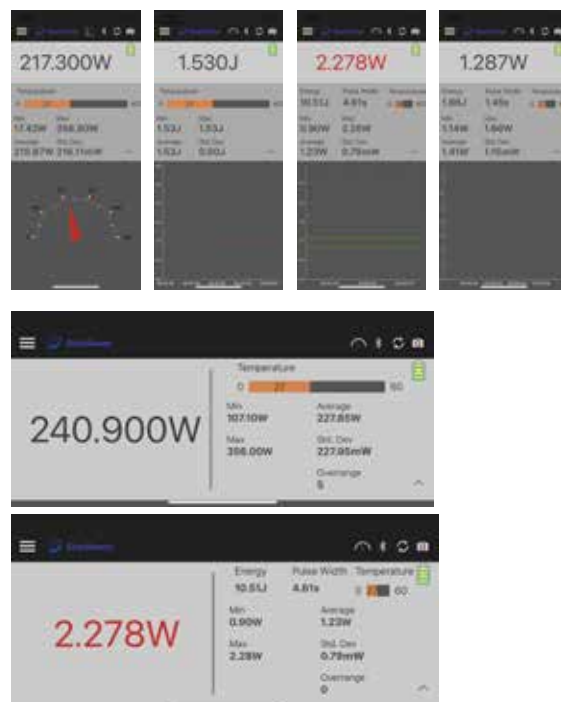
- (Android version 7 or higher). Available on Google Play or from the Ophir website here
- Works with Ariel/Juno/Quasar devices
- StarViewer brings laser power and energy measurement to your Smartphone / Tablet from our Ariel, Juno & Quasar devices



StarViewer (iOS app) v1.1.2

Overview:

- (iOS version 8 or higher). Available on Apple's App Store
- Works with Ariel
- StarViewer brings laser power and energy measurement to your Smartphone / Tablet from our Ariel device



StarViewer (Android app) v3.05

Connectivity:

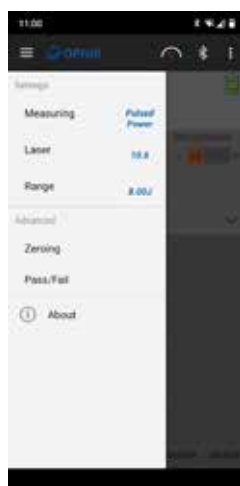
- StarViewer can be used with any standard Ophir Thermopile, Photodiode, or Pyroelectric PE-C sensor
- StarViewer can be used with the Juno via your device's USB on-the-go (OTG) port, or via Bluetooth with the Quasar and Ariel.



The measurement settings are fully configurable by opening the settings panel at the left of the screen

For use with the Ariel:

- Bluetooth: Minimum version 4.0 required, 5.1 recommended
- Ariel firmware version 1.33 or higher (available here)
- 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



Note: The Ariel you are using might have a lower F/W version, please update it to v1.33

For use with the Juno:

- Smartphone / tablet with an OTG port, capable of providing 100mA or more downstream current
- Optional - OTG adapter - from USB connector on your device to USB Type A Female Adapter (for 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

Requirements:

- Android version 7 or higher
- Available on Google Play or from the Ophir website here



Ophir StarViewer
Android App

StarViewer (iOS app) v1.1.2

Connectivity:

- StarViewer can be used via Bluetooth with Ariel



The measurement settings are fully configurable by opening the settings panel at the left of the screen

For use with the Ariel:

- Bluetooth: Minimum version 4.0 required, 5.1 recommended
- Ariel firmware version 1.33 or higher (available here)
- 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



Note: The Ariel you are using might have a lower F/W version, please update it to v1.33

Requirements:

- iOS version 8 or higher
- Available on Apple's App Store



Ophir StarViewer
iOS App