2022 POWER METERS

2.0 Power Meters & Interfaces
Power Meter Finder

The table below lists the specs and features of Ophir Power Meters and PC Interfaces

	Centauri Single & Dual Channel	StarBright	Vega	Nova II	StarLite	LaserStar Single & Dual Channel
Digital Display	Yes	Yes	Yes	Yes	Yes	Yes
Display Color	Color	Color	Color	Monochrome	Monochrome	Monochrome
Analog Display	Yes	Yes	Yes	Yes	Yes	No
Rechargeable Battery	Yes	Yes	Yes	Yes	Yes	Yes
Detector Support (see compatibility table below)						
Thermal Sensors	Yes	Yes	Yes	Yes	Yes	Yes
Photodiode Sensors	Yes	Yes	Yes	Yes	Yes	Yes
Pyroelectric Sensors	Yes	Yes	Yes	Yes	Yes	Yes
BeamTrack Sensors	Yes	Yes	Yes	Yes	Yes	No
Measurement Options						
Average Power	Yes	Yes	Yes	Yes	Yes	Yes
Energy per Pulse (Pyro. Sensors)	Yes	Yes	Yes	Yes	Yes	Yes
Single Shot Energy (Thermal Sensors)	Yes	Yes	Yes	Yes	Yes	Yes
Statistics	Yes	Yes	Yes	Yes	No	Yes
Analog Out	1V,2V,5V,10V	1V,2V,5V,10V	1V,2V,5V,10V	1V,2V,5V,10V	1V	1V
Trigger input & output	Yes	No	No	No	No	No
Real-Time Logging						
RS232	30Hz	30Hz	30Hz	30Hz	N/A	30Hz
GPIB	N/A	N/A	N/A	N/A	N/A	1500Hz
USB	25,000Hz	5000Hz	2000Hz	2000Hz	20Hz*	N/A
Bluetooth	N/A	N/A	N/A	N/A	N/A	N/A
Ethernet	N/A	N/A	N/A	N/A	N/A	N/A
On-Board Data Storage	2GB	>10MB**	250kB	50kB	No	50kB
Automation Interface	Yes	Yes	Yes	Yes	Yes*	No
LabVIEW VI's	Yes	Yes	Yes	Yes	Yes*	Yes
Part number	7Z01700/ 7Z01701	7Z01580	7Z01560	7Z01550	7Z01565	7Z01600/ 7Z01601
Page in the catalog	137	139	141	143	145	147

* With USB activation code (see page 146)
** Depends on size of USB Flash Drive

Compatibility Table

Meter / Interface / Sensor	Centauri	StarBright	Vega/ Nova II	StarLite	LaserStar	Nova	Juno	Juno+	EA-1	Pulsar	Quasar	Legacy USBI
Supports full calibration curve for sensors so calibrated *	yes	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes
BeamTrack sensors	yes	yes	yes	yes	Power/ Energy only	Power/ Energy only	yes	yes	yes	Power/ Energy only	Power/Energy only	Power/Energy only
BC20 sensor	no	yes	yes	no	yes	yes	yes	yes	no	no	no	no
PD300-CIE sensor	yes	yes	yes	no	yes	yes	yes	yes	no	no	no	no
PD300RM sensors	no	yes	no	yes	no	no	no	yes	no	no	no	no
PE-C Pyroelectric sensors	yes	yes	yes	yes	**Limited functions. See sensor page**	Needs adaptor (P/N 7Z08272) **Limited functions. See sensor page**	yes	yes	yes	**Limited functions. See sensor page**	**Limited functions. See sensor page**	**Limited functions. See sensor page**
Legacy												
LP1 type Thermal sensors	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

* Some sensors are calibrated with a full spectral curve and the user selects any discreet, specific wavelength within the range. For other sensors, the specified spectral range is divided into regions, and the user is prompted to select the region (such as "<800nm"). For those sensors having the full curve, the table above shows which meters support the curve and prompt the user to select specific discreet wavelengths. When using meters that do NOT support this function, the user will only be able to select a number of specific wavelengths from within the range.






Nova	Juno	Juno+	EA-1	Pulsar-1/2/4	Wireless Interface Quasar
Yes	N/A	N/A	N/A	N/A	N/A
Monochrome	N/A	N/A	N/A	N/A	N/A
No	N/A	N/A	N/A	N/A	N/A
Yes	Powered from USB	Powered from USB	12V or PoE	12V	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	Yes	No	No
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
1V	No	1V, 2V, 5V, 10V	No	No	No
No	No	No	No	Yes	No
10Hz	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A
N/A	10,000Hz	10,000Hz	N/A	25,000Hz	N/A
N/A	N/A	N/A	N/A	N/A	500Hz
N/A	N/A	N/A	25,000Hz	N/A	N/A
1kB	No	No	N/A	No	No
No	Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	No	Yes	No
7Z01500	7Z01250	7Z01252	7Z01240	7Z01203 / 7Z01202 / 7Z01201	7Z01300
149	153	154	155	156	157

Ophir power meters are true plug-and-play instruments. With all sensor information and calibration stored in the sensor plug, just plug in any one of over 150 Ophir sensors and the instrument is calibrated and configured to measure laser power and energy with that sensor.

Comparison of Hand Held Meters

Meter	Centauri	StarBright	Vega	Nova II	StarLite	Nova
Supported Sensors						
Standard Thermopile, Photodiode, PyroC sensors	X	X	X	X	X	"X (with adaptor)"
BeamTrack	X	X	X	X	X	
BC20		X	X	X		X
PD300-CIE	X	X	X	X		X
PD300RM		X			X	
Measurement Capabilities						
Parameter Configuration	X	X	X	X	X	X
Power & Energy	X	X	X	X	X	X
Exposure with Pyro	X	X	X	X		X
Position and Size with BeamTrack Sensors	X	X	X	X	X	
Beam Stability with BeamTrack Sensors	X	X	X	X		
Power From Pulse	X	X				
Irradiance		X			X	
Dosage		X			X	
Exposure with PD	X	X				
FAST Power	X					
POWER_SYNC (LowFreqPulse)	X	X				
Density	X	X	X	X		X
Scale Factor	X	X	X	X		X
Normalize	X	X	X	X		
Fixed Offset	X	X				
Mixing Functions Together	X	X				
Showing Function Results in Graphical Display	X	X	X	X	X	
PC Communication						
StarLab Support	X	X	X	X	X	
RS232	X	X	X	X		X
USB Communication	X	X	X	X	X [(a)]	
LabVIEW Library	X	X	X	X	X	X
Max Real Time Delivery (points/s)	10,000 X 2 (PD) 25,000 X 2 (Pyro)	5,000	2,000	2,000	20	15
Graphical Displays Available at All Times						
Bargraph	X	X	X	X	X	X
Simulated Analog Needle	X	X	X	X	X	
Pass/Fail	X	X	X	X		
Line Graph for Both Power and Energy	X	X				
Pulse Chart for Both Power and Energy	X	X				
Real Time Statistics (not just when logging)	X	X				
Screen Specs						
Screen Size	7"	3.5"	3.5"	4"	3.5"	2"
Color Screen	X	X	X		X	
Other Features						
Analog Output (in Volts)	1, 2, 5, 10	1, 2, 5, 10	1, 2, 5, 10	1, 2, 5, 10	1	1
Raw Analog Output	X					
External Trigger	X					
TTL OUT	X					
Calibration Reminder	X	X	X	X		
Time Stamp	X	X				
Japanese	X	X	X	X	X	
Russian and Chinese	X	X			X	
French, Spanish, Italian, German, Korean	X					
Built in Help		X	X	X		

Notes: (a) With USB activation code (see page 146)

Measuring Modes Available: Sensor Type / Device

Device	Sensor Type		
	Photodiode	**Thermopile / BeamTrack***	**Pyroelectric**
Centauri	Power Exposure Fast Power Low Freq Power	Power / Track* Energy Pulsed Power	Power Energy Exposure
StarBright	Power Exposure Low Freq Power	Power / Track* Energy Pulsed Power	Power Energy Exposure
Juno+	Power Low Freq Power	Power / Track* Energy Pulsed Power	Power Energy Exposure
Juno	Power Low Freq Power	Power / Track* Energy Pulsed Power	Power Energy Exposure (PyroC only)
EA-1	Power Low Freq Power	Power / Track* Energy	Power Energy
Nova II	Power	Power / Track* Energy	Power Energy Exposure
Vega	Power	Power / Track* Energy	Power Energy Exposure
StarLite	Power	Power / Track* Energy	Power Energy
Nova	Power	Power Energy	Power Energy
LaserStar	Power	Power Energy	Power Energy
Pulsar	Power	Power Energy	Power Energy
Quasar	Power	Power Energy	Power Energy

* BeamTrack is the trademark name of the sensors that measure power, position and size. They include the Track measuring mode.

Terminology:

Energy - Measurements in Joules.

Exposure - Used to measure the sum of the energy (for Pyroelectric and Photodiode sensors).

Fast Power - Power measurement mode using fast sampling rate; used to measure laser modulation and flicker of LED light sources (for Photodiode sensors).

Low Freq Power - Power measurement mode optimized for VCSELs and similar pulsed sources, where low pulse rate and high pulse peak power would cause problems if measuring in regular power mode.

Power – Measurements in Watts.

Pulsed Power - Can display instantaneous power of a laser pulse. Power is calculated from energy when the length of the pulse is known (for Thermopile sensors).

Track - Used to measure beam position and beam size while measuring power (for Thermopile sensors).

Power Meters and PC Interfaces

Ophir power meters and PC interfaces work on the smart plug principle. This means that almost any Ophir power meter or PC interface can work – plug and play – with almost any of the wide range of Ophir sensors. Ophir power meters are also the most sensitive, lowest noise, most precisely calibrated units on the market thus giving the utmost performance from our smart sensors.
As for ease of use, only Ophir power meters have smart keys to give the easiest and most convenient user interface. The units also come with a versatile range of software to use seamlessly either with the Ophir software or the user's own.

Photodiode Sensors
Powers pW to Watts

Thermal Sensors
Powers mW to kW and
single shot energy

Pyroelectric Sensors
Energies pJ to Joules
Rep rates to 25kHz

Power Meters
with USB/RS232

Computer Interfaces
with USB/Bluetooth/Ethernet

StarBright
added features

Vega
color

Centauri
high end

EA-1
Ethernet

Pulsar
1 ,2 ,4 channels

StarLite
basic

Nova
rugged

Laser Star
2 channel

Juno+
Incl. An Out

Quasar
wireless

Juno
compact

Software Solutions
StarLab, LabVIEW, StarCom, COM Object & StarViewer

LabVIEW

StarLab Software

StarViewer Android Application

Feature Rich Touchscreen Laser Power/Energy Meter

- Compatible with all standard Ophir Thermal, BeamTrack, Pyroelectric and Photodiode sensors
- Large 7" Full Color Touch Display
- Multilingual interface – English, French, Spanish, Italian, German, Russian, Japanese, Chinese and Korean
- Single and Dual Channel models available
- Various Displays: Bargraph, Analog Needle, Line Plot, Pulse Chart, Pass/Fail, Position, Stability, and Real Time Statistics
- Dual Channel Instrument supports Split and Merged Graphical Displays
- Sophisticated power and energy logging, including logging every pulse at up to 25000Hz with Pyro sensors
- Math functions: Density, Scale Factor, Normalize against base line, etc. Functions can be mixed together, displayed graphically, and can also be logged
- Math Channel allows comparison of two measurements
- Field upgrading of embedded software via USB Flash Drive
- 2GB internal storage and USB Flash Drive for ample data storage [(a)]
- USB and RS232 interfaces with StarLab PC application and User Commands document
- LabVIEW driver and COM Object Interface
- Pulsed Power measurements with Thermopile sensors
- Low Frequency Power with Photodiode sensors - power measurement based on pulse cycle (for VCSEL)
- Fast Power (10kHz) logging with Photodiode sensors
- Exposure measurement (Energy Summing) with Photodiode and Pyroelectric sensors
- Scalable Analog Output, TTL Output and External Trigger Input
- Loudspeaker for Audio Warnings

Centauri is the most feature rich desktop laser power/energy meter on the market. Just plug in one of the many Ophir sensors and you have a whole measurement laboratory at your fingertips. The bright color display gives unparalleled legibility and ease of interpreting information. Centauri has many on board features such as laser tuning, data logging, graphing, normalize, power or energy density, attenuation scaling, max and min limits. Centauri can also display the power or energy as a high resolution simulated analog needle display.

Centauri can be either battery operated or from an AC source with the charger plugged in at all times. Its bright display and user-selectable color format enables ease of use in dark room conditions or when wearing protective glasses.

The built-in USB and RS232 interfaces and StarLab PC software allow display and processing of data either in real time or from previously stored data. Results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers, a COM Object Interface and demo source code are provided.

The Centauri's dual channel capabilities enable the user to simply plug in any of Ophir's thermal, pyroelectric or photodiode sensors and measure the two channels independently, or a comparison between the two channels.

Centauri Screen Layout

The Centauri's 7" touch-screen provides ease-of-use at the tap of a finger. The display is carefully designed to provide easy reading of the laser measurement, quick access to configuration parameters as well as the ability to set up for more advanced work.

Info Panel. Includes channel (A or B), sensor name, and serial number. Tap the menu icon at the right to easily access more functionality.

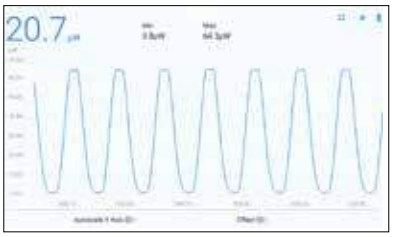
Sensor Settings. Displayed on screen and easily updated. Tap on a parameter to open a window that displays all of the options. Tap on the desired setting to reconfigure and get back to work. Settings are stored in the sensor's memory as the startup settings for the next measurement session.

Measurements. Numeric and Graphical display of reading. Tap Offset to reduce ambient environmental effects on the readings. Tap Zoom to focus the bargraph around the present measurement.

(a) USB Flash Drives of up to 32GB and FAT32 format only (Not exFAT nor NTFS formats).

Selected Screens

Analog needle display of power Persistence and min/max tracking.



Line graph display of power.

Pulse chart display of energy.

Display statistics of the present measurement session.

Pass/Fail screen. Excellent for QA purposes.

Power, Position, and Size measured with a BeamTrack sensor.

Two independent channels of measurement.

Two channels merging into one graph.

Two channels with a math comparison channel.

Specifications

Power Meter	Brilliant color touch-screen TFT 1064 x 600 pixel graphics LCD. Large 16mm digits.
Features	Many screen features including power with bargraph, energy, average, exposure, frequency, graphs, scaling, special units, and more.
I/O's	USB, RS232 and user selectable 1,2,5 and 10 Volt full scale analog output; TTL Output; External Trigger Input; Loudspeaker for Audio Warnings
Screen Refresh	15 times/sec
Case	Molded high impact plastic with optimized angle kickstand. Rubberized sides for easy grip and protection against damage.
Size	Compact 47mm L x 200mm W x 130mm H (Weight 1kg)
Battery	Rechargeable Li-ion batteries with typically 6 hours between charges. The charger also functions as an AC adapter.
Multisensor Option	Two sensors can be connected and measure independently, and with a mathematical comparison.
Data Handling	Data can be viewed on board or transferred to PC: On Board: Data stored to USB Flash Drive (Thumb Drive) at rates up to 25,000 points/s.
Sensor Features	Works with Thermopile, BeamTrack, Pyroelectric (PE-C series) and Photodiode sensors [a].
Program Features	Preferred start up configuration can be set by user.
Compliance	CE, UKCA, China RoHS

Note: (a) Not including BC20 and PD300RM sensors

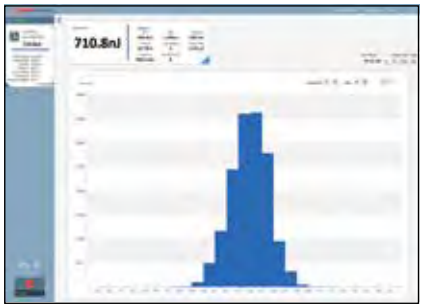
Ordering Information

Item	Description	Ophir P/N
Centauri Single Channel	Centauri high end power meter for Thermal, BeamTrack, Pyroelectric and Photodiode sensors	7Z01700
Centauri Dual Channel	Dual Channel high end power meter for Thermal, BeamTrack, Pyroelectric and Photodiode sensors	7Z01701
Centauri Dual Channel Activation Code	Software activation code to field upgrade a Single Channel Centauri to Dual Channel capabilities	7Z11056
Centauri USB Cable	USB-A to MICRO-B cable (1 unit supplied with Centauri)	7E01279
Centauri RS232 Cable	D9 to 3.5mm plug cable (1 unit supplied with Centauri)	7E01213
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Centauri)	7E05029
General Purpose I/O Connector	Used as analog output, external trigger output and TTL output plug (3 units supplied with Centauri)	7E02008

Feature Rich Laser Power/Energy Meter

- Compatible only with all standard Ophir thermal, BeamTrack, pyroelectric (PE-C series only) and photodiode sensors
- Brilliant color large size TFT 320x240 display
- Choose between Digital with Bargraph, Analog Needle, Line Plot (for laser tuning), Pulse Chart, Pass/Fail, Position, Stability, Real Time Statistics displays
- Sophisticated power and energy logging, including logging every point at up to 5000Hz with Pyro sensors
- Math functions for advanced processing such as Density, Scale Factor, Normalize against base line, etc.
- Can mix functions together and display the results graphically. Function results can also be logged
- USB Flash Drive for nearly unlimited data storage
- USB and RS232 interfaces with StarLab PC application and User Commands (see User Commands document in website)
- LabVIEW driver and COM Object Interface
- Pulsed Power measurements with Thermopile detectors
- Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)
- Exposure measurement (Energy Summing) with Photodiode and Pyroelectric sensors
- Select between English, Japanese, Russian, and Chinese interfaces
- Soft keys and menu driven functions with context sensitive help
- Compact handheld design with rubberized bumpers and optimized kickstand
- Backlighting and rechargeable battery
- Scalable Analog Output

StarBright is the most feature rich handheld laser power/energy meter on the market. Just plug in one of the many Ophir sensors and you have a whole measurement laboratory at your fingertips. The bright color display gives unparalleled legibility and ease of interpreting information. StarBright has many on board features such as laser tuning, data logging, graphing, normalize, power or energy density, attenuation scaling, max and min limits. StarBright can also display the power or energy as a high resolution simulated analog needle display.



StarBright can be either battery operated or from an AC source with the charger plugged in at all times. Its bright display and user-selectable color format enables ease of use in dark room conditions or when wearing protective glasses.

The built-in USB and RS232 interfaces and StarLab PC software allow display and processing of data either in real time or from previously stored data. Results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers, a COM Object Interface and demo source code are provided.

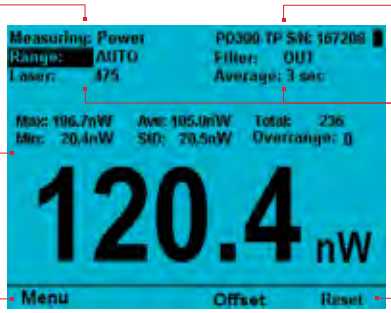
StarBright Screen Layout

StarBright screen ergonomics raise the user experience to new levels. The display is carefully designed to provide easy reading of the laser measurement, quick access to configuration parameters as well as the ability to set up for more advanced work.

Select measurement mode (power, energy, etc.)

Measurement display area. User can select the display type. In this example, the user has chosen large numeric readout with real time statistics.

Press the Menu key to access additional StarBright functions including logging, pass/fail inspection and math processing.



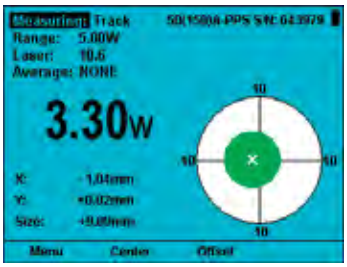
Sensor name and serial number

Configuration parameters for laser measurement. These settings are sensor specific and saved in the sensor's memory.

Softkeys for additional display functionality. In this example, press Offset to remove background noise from the measurement. Press Reset to clear the statistics and start over.

Selected Screens

Analog needle display of power Persistence and min/max tracking.

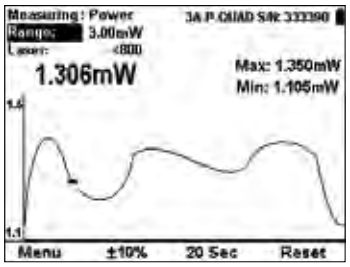


Power, Position, and Size measured with a BeamTrack sensor.

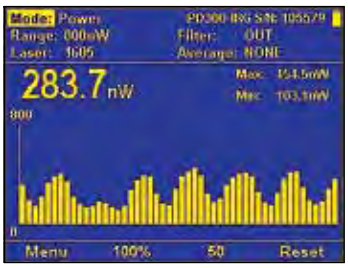
Bargraph display of energy. Colors set for work with protective glasses.

Power density measured after rescaling the power measurement.

Data logs filed to USB Flash Drive. Can be viewed in StarLab or Excel.



Line graph display of power. Wraps back to start for continuous display.



Pulse chart display of power.

Power measurement of laser pulse.
For use with high-power pulsed lasers.

Exposure measurement (energy summing) with photodiode sensor.

Specifications

Power Meter	Brilliant color TFT 320 x 240 pixel graphics LCD. Large 16mm digits.
Features	Many screen features including power with multicolor bar graph, energy, average, exposure, frequency, graphs, scaling, special units, and more.
Outputs	USB, RS232 and user selectable 1, 2, 5 and 10 Volt full scale analog output.
Screen Refresh	15 times/sec
Case	Molded high impact plastic with optimized angle kickstand. Rubberized sides for easy grip and protection against damage.
Size	Folds to a compact 212mm L x 114mm W x 40mm H
Battery	Rechargeable Li-ion batteries with typically 8 hours between charges. The charger can be ordered from your local distributor. The charger also functions as an AC adapter.
Data Handling	Data can be viewed on board or transmitted to PC On Board: Data stored to USB Drive (Thumb Drive) at rates up to 5000 points/s.
Sensor Features	Works with Thermopile, BeamTrack, Pyroelectric (PE-C series) and Photodiode sensors. Works with our PD300RM sensors.
Program Features	Preferred start up configuration can be set by user. User can recalibrate power, energy, response time and zero offset.
Compliance	CE, UKCA, China RoHS

Ordering Information

Item	Description	Ophir P/N
StarBright	StarBright universal power meter for Thermal, BeamTrack, Pyroelectric and Photodiode sensors	7Z01580
Carrying Case	Carrying case 38x30x11 cm. For power meter and up to 3 sensors	1J02079
StarBright USB Cable	USB-A to MICRO-B cable (1 unit supplied with StarBright)	7E01279
StarBright RS232 Cable	D9 to 3.5mm plug cable (1 unit supplied with StarBright)	7E01213
StarBright Battery Pack	Replacement battery pack for StarBright	7E14008
P Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A P-1.35x3.5 (1unit supplied with StarBright)	7E05047
Standard Analog Output Connector	2.5mm mono jack (1unit supplied with StarBright)	7E02008

Color Screen Laser Power/Energy Meter

- Compatible with all standard Ophir thermal, BeamTrack, pyroelectric and photodiode sensors
- Brilliant color large size TFT 320x240 display
- Compact handheld design with rubberized bumpers and optimized 2 position kickstand
- Choice of digital or analog needle display
- Illuminated keys for working in the dark
- Select between English and Japanese interfaces
- Analog output
- Log every point at up to 4000Hz with pyro sensors
- Non-volatile data storage up to 250,000 points
- Laser tuning screen and power and energy log
- USB and RS232 interfaces with StarLab and StarCom PC applications, LabVIEW driver and COM Object Interface (see pages 159-165)
- Soft keys and menu driven functions with on line help
- Many software features such as density, min/max, scaling etc.

The Vega is a very versatile and sophisticated handheld laser power/energy meter. Just plug in one of the many Ophir sensors and you have a whole measurement laboratory at your fingertips. The bright color display gives unparalleled legibility and ease of interpreting information. The Vega has many on board features such as laser tuning, data logging, graphing, normalize, power or energy density units, attenuation scaling, max and min limits. The Vega can also display the power or energy with a high resolution simulated analog needle display.

The Vega can be operated either by battery or from an AC source with the charger plugged in at all times. Its bright display and backlit keys allow easy use in dark room conditions or with laser glasses on.

The built-in USB and RS232 interfaces and StarLab and StarCom PC software allow on-line processing of data or processing previously stored data; results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers and COM Object Interface are provided.

StarLab Software

Selected Screens

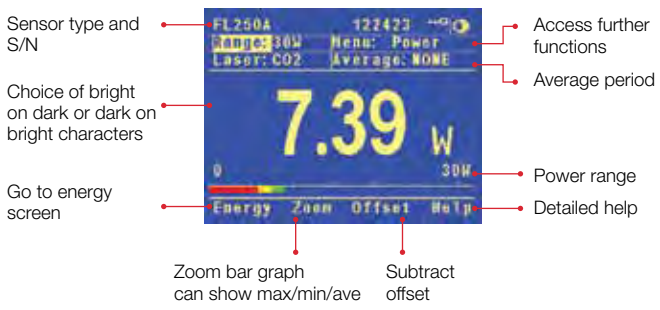
Digital Power Screen and Color Functions

- Choice of bright on dark or dark on bright characters
- Optimize colors for use with laser eye protection glasses
- Can average over selected period. Useful for unstable lasers
- Bar graph can show max / min / average in different colors

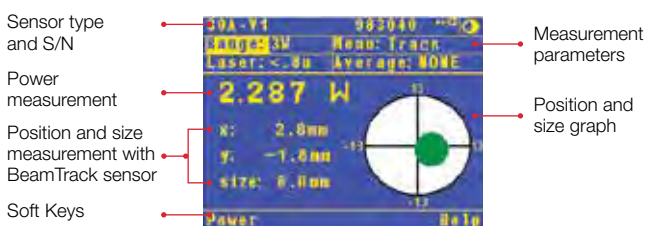
BeamTrack Power/Position/Size Screen

- Monitoring of laser beam size
- Accurate tracking of beam position to fractions of a mm
- Beam position and wander
- All the other features of standard power/energy meters

Standard Power Screen



BeamTrack Power/Position/Size Screen



Analog Power Screen

- Perfect for adjusting and maximizing laser power
- Persistent graphical display allows tracking of minimum maximum values measured
- Large analog needle with small digital display as well

Energy/Limits Screen

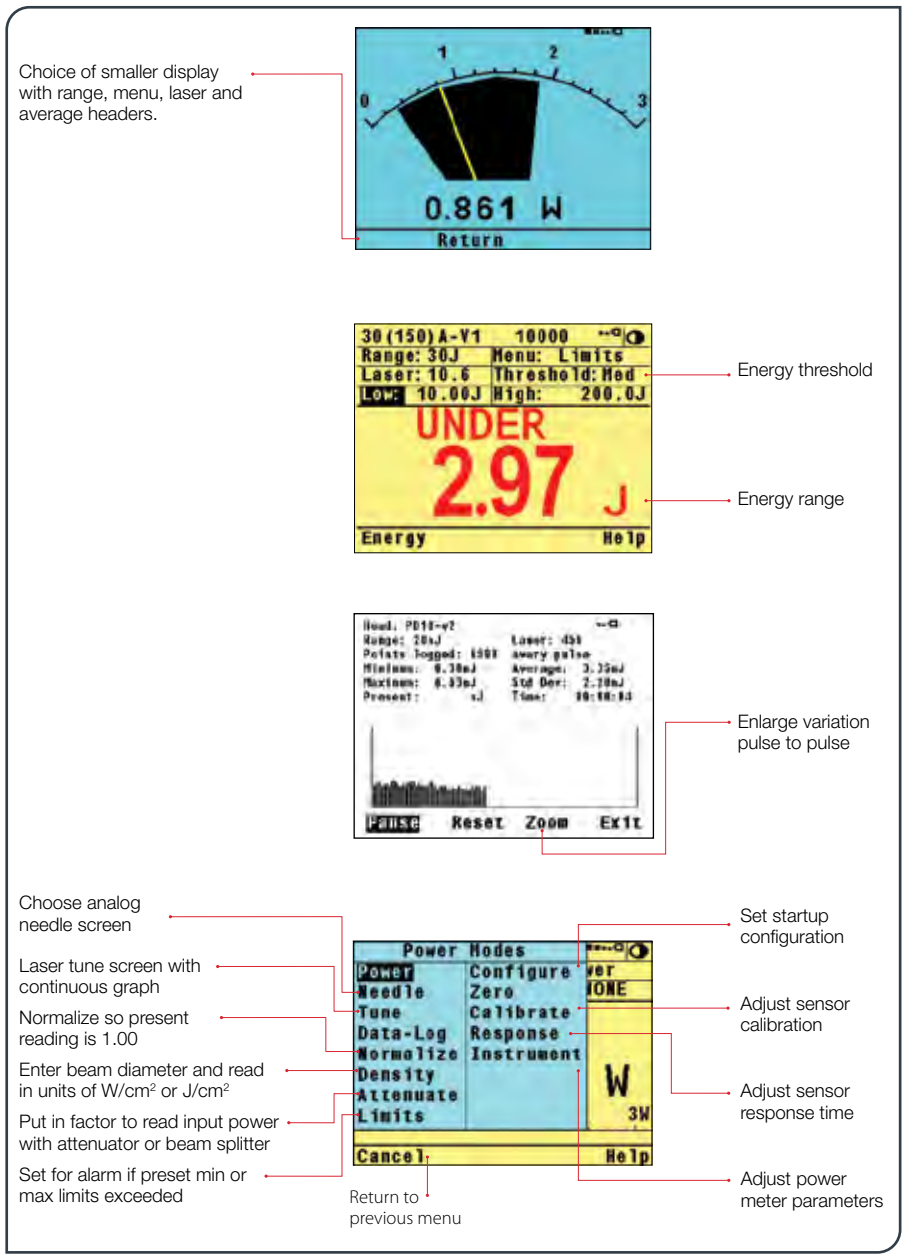
- Pulsed energy sensors (single or repetitive) and thermal sensors (single shot only)
- Frequency measurement with pulsed energy sensors
- Limits screen with bright colored warning

Energy Logging Screen

- Pyroelectric and thermal sensors
- Continuous scroll with up to 100 points on screen
- Full statistics
- Store data onboard and recall

Additional Functions

- Press the menu choice on the main screen and many more options pop up as shown



Specifications

Power Meter	Brilliant color TFT 320 x 240 pixel graphics LCD. Large 16mm digits. High resolution analog needle also can be chosen.
Features	Many screen features including power with multicolor bar graph, energy, average, exposure, frequency, graphs, scaling, special units, and more. Complete on line context sensitive help screens.
Outputs	USB, RS232 and user selectable 1, 2, 5 and 10 Volt full scale analog output.
Screen Refresh	15 times/sec
Case	Molded high impact plastic with optimized angle two level kickstand. Rubberized sides for easy grip and protection against damage.
Size	Folds to a compact 210mm L x 109mm W x 36mm H
Battery	Rechargeable NiMH batteries with typically 18 hours between charges. The charger can be ordered from your local distributor. The charger also functions as an AC adapter.
Data Handling	Data can be viewed on board or transmitted to pc: On Board: Non-volatile storage of up to 250,000 data points in up to 10 files. Max onboard data logging rate 4000 [a] points/s and Max data logging rate to the PC 2000 [a] points/s.
Sensor Features	Works with Thermopile, BeamTrack, Pyroelectric (PE-C series) and Photodiode sensors [b].
Program Features	Preferred start up configuration can be set by user. User can recalibrate power, energy, response time and zero offset.
Compliance	CE, UKCA, China RoHS

Notes: (a) The above refers to the rate of logging every single point in turbo mode. Above that rate, the instrument will sample points but not log every single point

Notes: (b) Not including PD300RM sensors

Ordering Information

Item	Description	Ophir P/N
Vega	Vega color universal power meter for standard thermal, BeamTrack, pyroelectric and photodiode sensors	7Z01560
Carrying Case	Carrying case 38x30x11 cm. For power meter and up to 3 sensors	1J02079
USB Cable for Vega	USB to mini DIN cable (1 unit supplied with Vega)	7E01205
RS232 Cable for Vega	D9 to mini DIN cable (1 unit supplied with Vega)	7E01206
Battery Pack for Vega	Replacement battery pack for the Vega	7E14007A
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Vega)	7E05029
Standard Analog Output Connector	2.5mm mono jack (1 unit supplied with Vega)	7E02008

Versatile Laser Power/Energy Meter

- Compatible with all standard Ophir thermal, BeamTrack, pyroelectric and photodiode sensors
- Large high definition LCD display
- Choice of digital or analog needle display
- 2 position kickstand
- Backlighting and rechargeable battery
- Select between English and Japanese interfaces
- Analog output
- Log every point at up to 4000Hz with pyro sensors
- Non-volatile data storage up to 59,400 points
- Laser tuning screen and power and energy log
- USB and RS232 interfaces with StarLab and StarCom PC applications, LabVIEW driver and COM Object Interface (see pages 159-165)
- Soft keys and menu driven functions with on-line help
- Many software features such and density, min/max, scaling etc.

The Nova II is a very versatile and sophisticated handheld laser power/energy meter. Just plug in one of the many Ophir sensors and you have a whole measurement laboratory at your fingertips. The Nova II has many on-board features such as laser tuning, data logging, graphing, normalize, power or energy density units, attenuation scaling, max and min limits. The Nova II can also display the power or energy with a high resolution simulated analog needle display.

The Nova II can be operated either by battery or from an AC source with the charger plugged in at all times. Its backlight allows illumination of the power meter in low light conditions.

The built-in USB and RS232 interfaces and StarLab and StarCom PC software allow on-line processing of data or processing previously stored data; results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers and COM Object Interface are provided.

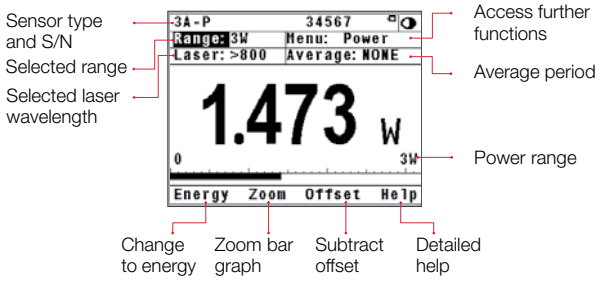
StarLab Software

Selected Screens

Digital Power Screen

- CW industrial, medical and scientific lasers
- pW to Multi kW with appropriate sensors
- Can average over selected period. Useful for unstable lasers
- Fast response bar graph

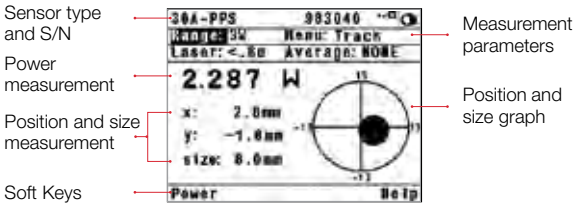
Standard Power Screen



BeamTrack Power/Position/Size Screen

- Monitoring of laser beam size
- Accurate tracking of beam position to fractions of a mm
- Beam position and wander
- All the other features of standard power/energy meters

BeamTrack Power/Position/Size Screen



Analog Power Screen

- Perfect for adjusting and maximizing laser power
- Large analog needle with small digital display as well

Energy Screen

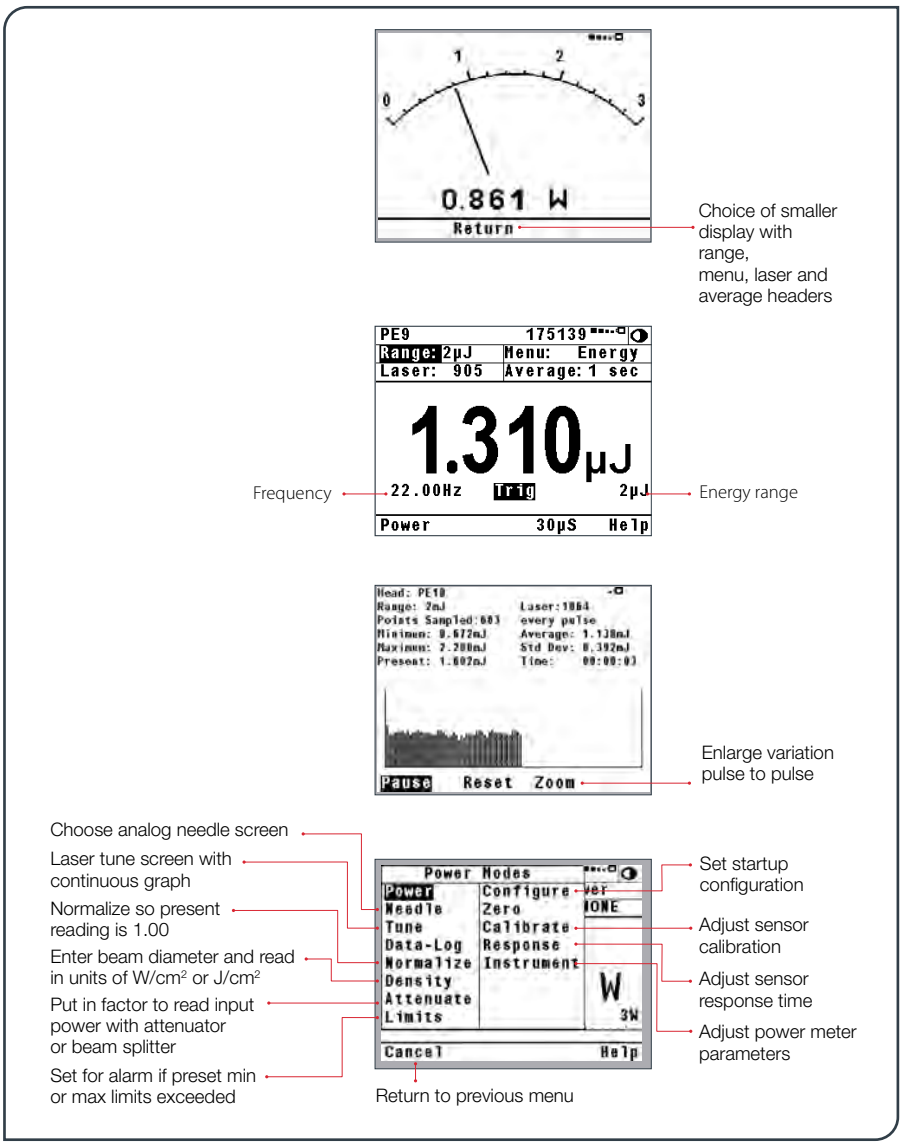
- Pulsed energy sensors (single or repetitive) and thermal sensors (single shot only)
- Frequency measurement with pulsed energy sensors

Energy Logging Screen

- Pyroelectric and thermal sensors
- Continuous scroll with up to 100 points on screen
- Full statistics
- Store data onboard and recall

Additional Functions

- Press the menu choice on the main screen and many more options pop up as shown



Specifications

Power Meter	High legibility 320 x 240 pixel graphics LCD with switchable electroluminescent backlight. Large 18mm digits. High resolution analog needle also can be chosen.
Features	Many screen features including power with bar graph, energy, average, exposure, frequency, graphs, scaling, special units, and more. Complete on line context sensitive help screens.
Outputs	USB, RS232 and 1, 2, 5 and 10 volt full scale analog output.
Screen Refresh	15 times/sec
Case	Molded high impact plastic with two level kickstand.
Size	Folds to a compact 208mm Lx 110mm Wx 43mm H
Battery	Rechargeable NiMH batteries with typically 18 hours between charges. The charger can be ordered from your local distributor. The charger also functions as an AC adapter.
Data Handling	Data can be viewed on board or transmitted to PC: On Board: Non-volatile storage of up to 54000 data points in up to 10 files. Max onboard data logging rate 4000 [a] points/s and Max data logging rate to the PC 2000 [a] points/s.
Sensor Features	Works with Thermopile, BeamTrack, Pyroelectric (PE-C series) and Photodiode sensors [b].
Program Features	Preferred startup configuration can be set by user. User can recalibrate power, energy, response time and zero offset.
Compliance	CE, UKCA, China RoHS

Notes: (a) The above refers to the rate of logging every single point in turbo mode. Above that rate, the instrument will sample points but not log every single point
Notes: (b) Not including PD300RM sensors

Ordering Information

Item	Description	Ophir P/N
Nova II	Nova II universal power meter for standard thermal, BeamTrack, pyroelectric and photodiode sensors	7Z01550
Carrying Case	Carrying case 38x30x11 cm. For power meter and up to three sensors	1J02079
Nova II USB Cable	USB to mini DIN cable (1 unit supplied with Nova II)	7E01205
Nova II RS232 Cable	D9 to mini DIN cable (1 unit supplied with Nova II)	7E01206
Battery Pack	Replacement battery pack for the Nova II	7E14007A
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Nova II)	7E05029
Standard Analog Output Connector	2.5mm mono jack (1 unit supplied with Nova II)	7E02008

Low Cost Laser Power / Energy Meter

- Compatible with all standard Ophir Thermal, BeamTrack, Pyroelectric (PE-C series only) and Photodiode sensors
- Brilliant large size TFT 320x240 display
- Compact handheld design with rubberized bumpers and optimized kickstand
- Choice of digital or analog needle display
- Select between English, Japanese, Russian and Chinese interfaces
- Analog output
- Easy to use soft keys
- Easy measurement configuration with context sensitive help
- Backlighting and rechargeable battery
- Single shot energy measurement with thermal sensors
- Power averaging
- Resizable Screen graphics
- EMI rejection
- Optional software package for USB communication with our StarLab PC suite

StarLite is a low cost power / energy meter capable of measuring power or energy from pJ and pW to hundreds of Joules and thousands of Watts. It also supports position and size measurement with the BeamTrack family of sensors. StarLite can also display the power or energy with a high resolution simulated analog needle display.

All StarLite measurement screens can be configured to either show the measurement parameters or to hide them in order to maximize the graphical and numeric displays.

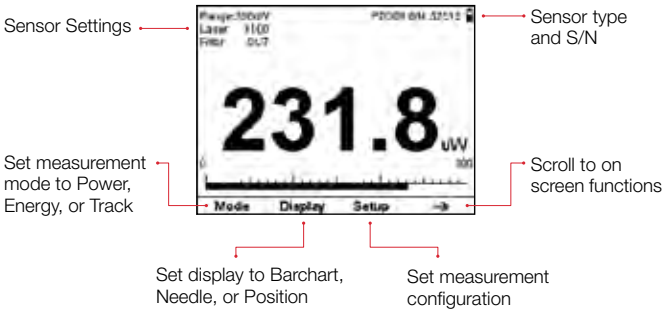
StarLite can be operated either by battery or from an AC source with the charger plugged in at all times. Its backlight allows illumination of the power meter in low light conditions.

Selected Screens

Digital Power Screen

- CW industrial, medical and scientific lasers
- pW to Multi kW with appropriate sensors
- Can average over selected period. Useful for unstable lasers.
- Fast response bar chart

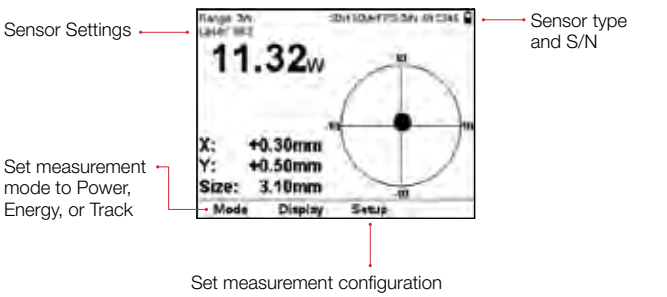
Barchart Display of Power Measurement



BeamTrack Power/Position/Size Screen

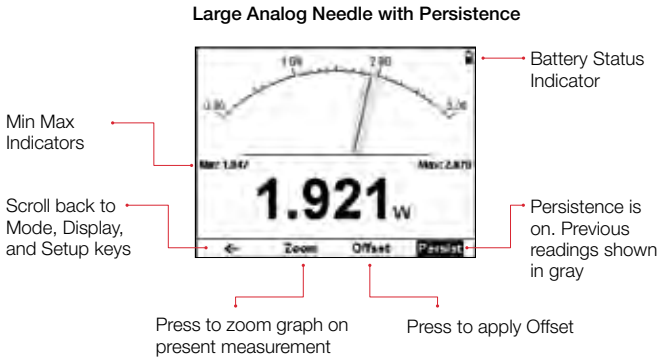
- Monitoring of laser beam size
- Accurate tracking of beam position to fractions of a mm
- Power measured at the same time

BeamTrack Position and Size Screen



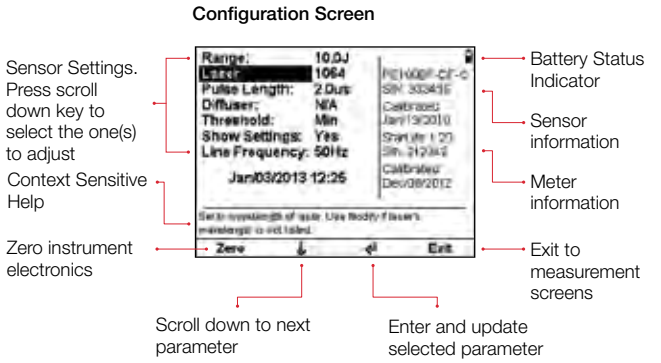
Analog Needle Screen

- Perfect for adjusting and maximizing laser power or energy
- Persistent graphical display allows tracking of minimum maximum values measured
- Large analog needle with small digital display as well



Configuration Screen

- Easy adjustment of all measurement configuration parameters
- Context sensitive help for selected parameter
- Sensor and meter information provided



Specifications

Power Meter	High legibility TFT 320 x 240 pixel graphics LCD. Large 16mm digits. High resolution analog needle also can be chosen.
Features	Power, single shot energy, energy and frequency of high rep rate lasers, position, and size.
Outputs	1V Full Scale analog output.
Screen Refresh	15 times/sec
Case	Molded high impact plastic with optimized angle kickstand. Rubberized sides for easy grip and protection against damage.
Size	Folds to a compact 211mm L x 114mm W x 40mm H
Battery	Rechargeable Li-ion batteries with typically 8 hours between charges. The charger can be ordered from your local distributor. The changer also functions as an AC adapter.
Sensor Features	Automatic continuous background cancellation with PD300 sensors. Submicrojoule and multikilohertz capability with pulsed energy sensors.
Sensor Compatibility	Works with standard Thermopile, BeamTrack, Photodiode and Pyroelectric (PE-C series) [a] sensors. Works with our PD300RM sensors.
Compliance	CE, UKCA, China RoHS

Note: (a) Not including BC20 and PD300-CIE sensors

Ordering Information

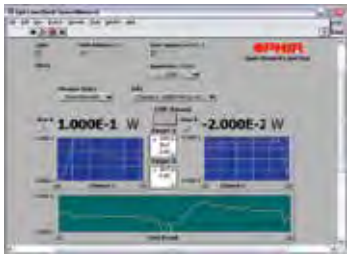
Item	Description	Ophir P/N
StarLite	StarLite universal power meter for Thermal, BeamTrack, Pyroelectric and Photodiode sensors	7Z01565
Carrying Case	Carrying case 38x30x11 cm. For power meter and up to 3 sensors	1J02079
StarLite USB Activation Code	Software Activation Code that enables the StarLite meter to communicate in USB with our StarLab software suite	7Z11049
USB Cable for StarLite	USB-A to MICRO-B cable (1 unit supplied with StarLite)	7E01279
Battery Pack for StarLite	Replacement battery pack for the StarLite	7E14008
P Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A P-1.35x3.5 (1 unit supplied with StarLite)	7E05047
Standard Analog Output Connector	2.5mm mono jack (1 unit supplied with StarLite)	7E02008

Versatile Laser Power/Energy Meter

- Two models available: dual and single channel
- Single channel model can be upgraded to dual channel
- Compatible with all standard Ophir thermopile, pyroelectric, photodiode and RP sensors
- Large LCD display
- Backlighting and rechargeable battery
- Screen graphics and statistics (std dev. min, max)
- Analog output
- Built-in RS232 interface
- Log every data point at >1500Hz with pyroelectric sensors
- Non-volatile data storage up to 59,400 points
- Laser tuning screen and power log
- Audio sound for laser tuning and low battery
- RS232 interface with StarCom PC application software and LabVIEW driver (see pages 159-165)
- GPIB option (IEEE488.1)
- NIST traceable
- CE marked
- Soft keys, menu-driven

IEEE 488 GPIB Cable for LaserStar

The LaserStar's dual channel capabilities enable the user to simply plug in any of Ophir's thermal, pyroelectric or photodiode sensors and measure the two channels independently, or a comparison between the two channels.
Up to 10 data files (54,000 points total) can be stored for onboard review or downloading to computer even if LaserStar has been switched off. The built-in RS232 interface and StarCom PC software allow on-line processing of data or processing previously stored data; results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers are provided.



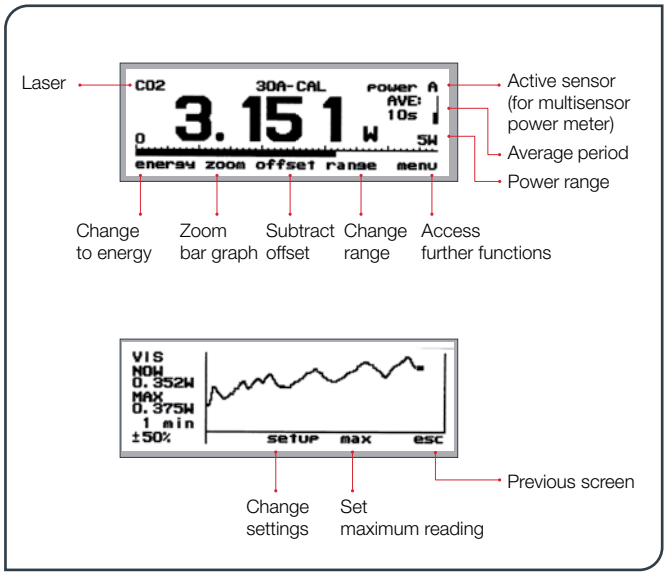
LabVIEW

StarCom Software

Selected Screens

Digital Power Screen

- CW industrial, medical and scientific lasers
- pW to multi kW with appropriate sensors
- Can average over selected period. Useful for unstable lasers
- Fast response bar graph



Laser Tuning Screen or Power Log Screen (not shown)

- Maximizing laser power
- User selected time period and zoom
- Option of audio tune tone for maximizing laser power

Energy Measurement Screen

- Pyroelectric and thermal sensors - single pulse
- Pyroelectric frequency measurement

Energy Log Screen

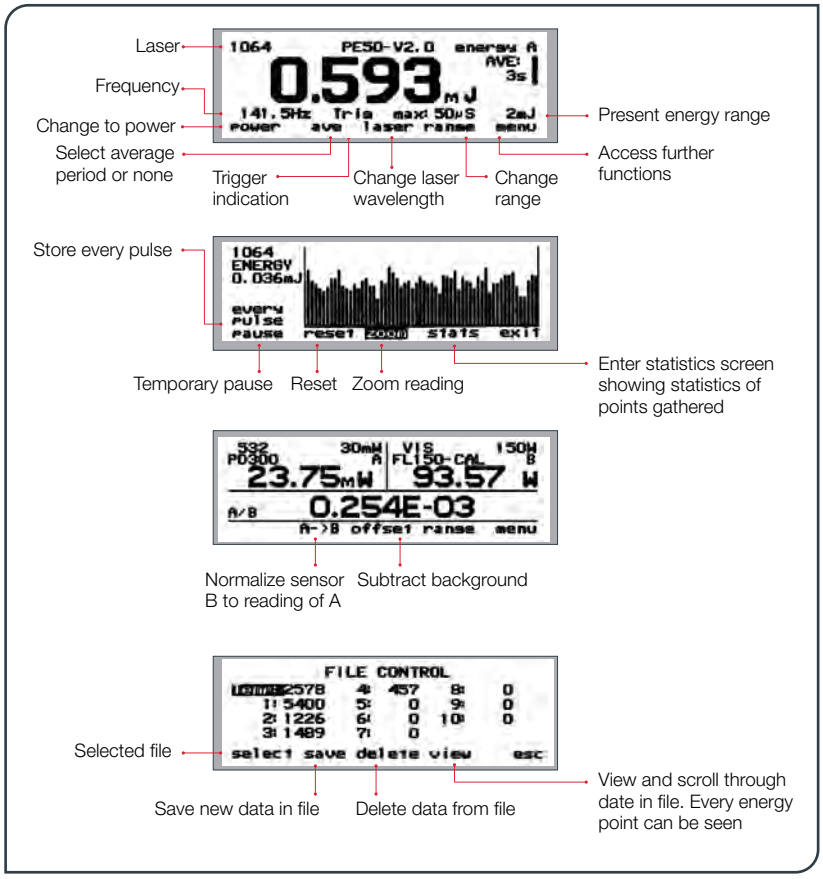
- Pulsed energy sensors
- Thermal sensors - successive single pulses
- Continuous scroll
- Energy statistics

Ratio Screen

- Two independent sensors
- Measure ratio, sum, difference
- Normalize one sensor to the other

Data Storage and Transmission

- Non-volatile storage of power and energy logging data
- Store in up to 10 files and transmit to PC
- PC using StarCom Windows program provided



Specifications

Power Meter	High legibility 64 x 240 pixel graphics supertwist LCD with switchable, electroluminescent backlight which operates from charger or battery. Large 17mm digits. Screen refresh 15Hz.
Features	Many screen features including: power with bargraph, energy, average, exposure, frequency, graphs and more.
Outputs	RS232 and analog output 1V f.s.
Screen Refresh	15 times /sec
Case	Molded high-impact plastic with swivel display and EMI conductive shielding, to allow use even in proximity to pulsed lasers.
Size	Folds to a compact 194mm L x 228mm W x 57mm H.
Battery	Rechargeable 18 hours between charges. The charger can be ordered from your local distributor. The charger also functions as AC adapter.
Multisensor Option	Two sensors can be connected and measure independently, or with a mathematical comparison. Also the ratio, sum or difference of the two can be displayed.
Data Handling	Data can be viewed on board or transmitted to PC: On Board: Non-volatile storage of up to 54,000 data points in up to 10 files. Max data logging rate >1500 points/s. Transmitted to PC: Data transmission rate of ~500 points/s. RS232 baud rate of 38400.
Sensor Features	Works with standard Thermal [a], Pyroelectric [b], Photodiode [c] and RP sensors.
Program Features	Preferred startup configuration can be set by user. User can recalibrate power, energy, response time and zero offset.
Compliance	CE, UKCA, China RoHS

Notes: (a) When operating with BeamTrack sensors, measures Power & Energy only
Notes: (b) Limited functions for new Pyroelectric (PE-C series) sensors
Notes: (c) Not including PD300RM sensors

Ordering Information

Item	Description	Ophir P/N
LaserStar	LaserStar single channel universal power meter for thermal, pyroelectric, photodiode and RP sensors	7Z01600
LaserStar 2 Channel	LaserStar with dual channel capability including ratio and difference measurement	7Z01601
RS232 Cable for LaserStar	Cable RS232 D9 - D25 (1 unit supplied with LaserStar)	7E01121
LaserStar Battery Pack	LaserStar NiMH Battery update Kit	7Z14006A
LaserStar IEEE Option	IEEE GPIB adapter for LaserStar (see page 151)	7Y78300 [a]
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with LaserStar)	7E05029
LaserStar Analog Output Connector	Analog Output plug for LaserStar (1 unit supplied with LaserStar)	7Z11004

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

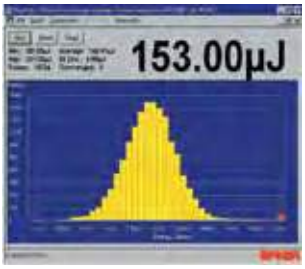
Compact and Durable Power / Energy Meter

- Compact and durable
- Compatible with all standard Ophir sensors: thermal, pyroelectric* and photodiode
- Single shot energy measurement with thermal sensors
- Optional RS232 interface with StarCom PC application and LabVIEW driver (see pages 159-165)
- Power and energy logging with graphical display and statistics
- Power averaging
- Easy to use soft keys, menu-driven
- Screen graphics
- Backlight and rechargeable battery
- Analog output
- EMI rejection

RS232 cable for Nova

Compatible with the complete range of Ophir thermal (power and energy), pyroelectric and photodiode sensors, Nova is truly versatile: measuring power or energy from pJ and pW to hundreds of Joules and thousands of Watts. With the optional scope adapter, you can connect your pyro sensor to an oscilloscope and see every pulse up to the maximum frequency permitted by the sensor.
Smart connector sensors automatically configure and calibrate Nova when plugged in. Soft keys guide you through the screen graphics. Finished working? Your configuration can be saved for future use.
Nova's autoranging tune screen displays laser power graphically and displays maximum power. Zoom and time scale can be adjusted by user.

The optional RS232 interface and StarCom PC software allow on-line processing of data or processing previously stored data; results are displayed graphically on a PC. To support PC interfacing, LabVIEW drivers are provided.



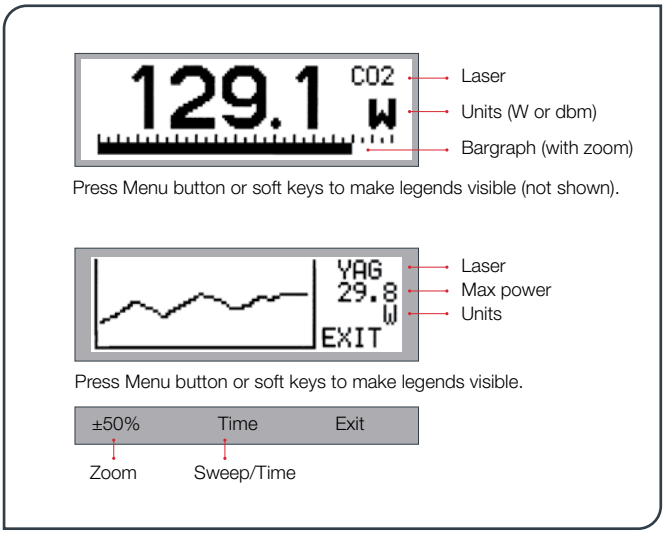
StarCom Software

LabVIEW

Selected Screens

Digital Power Screen

- CW industrial, medical and scientific lasers
- pW to multi kW with appropriate sensors



Laser Tuning Screen or Power Log Screen (not shown)

- Maximizing laser power
- User selected time period and zoom

* PE-C series of pyroelectric sensors are compatible with Nova, when used with an additional adapter (P/N 7Z08272) – see page 110.

Energy Measurement Screen

- Pyroelectric and thermopile sensors-single pulse
- Pyroelectric frequency measurement (not shown)

Energy Log Screen

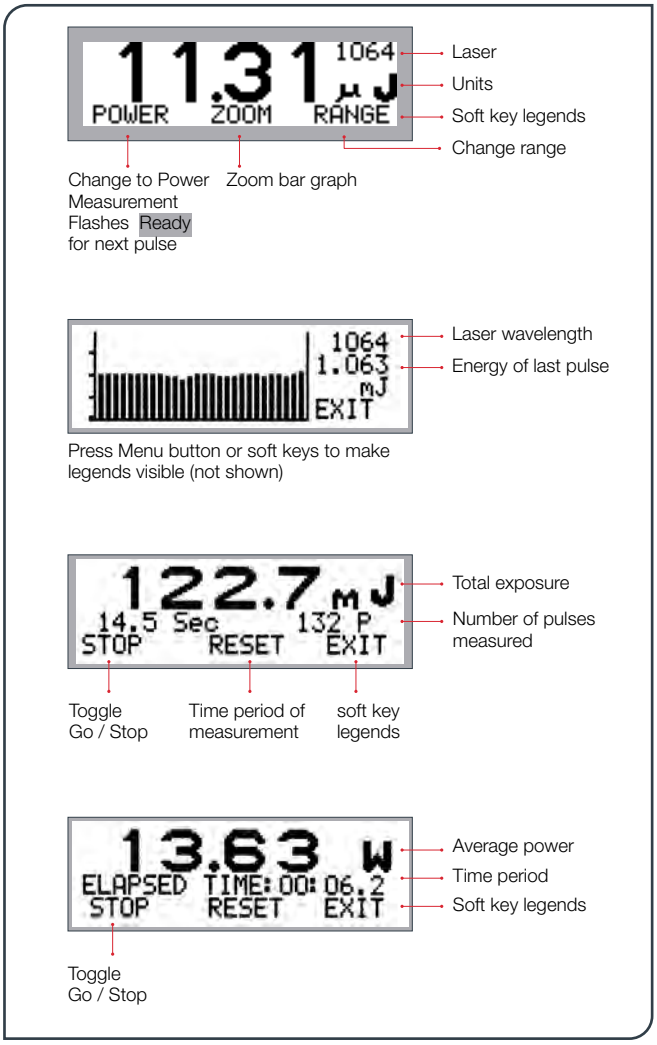
- Pyroelectric sensors
- Thermopile sensors-successive single pulses
- Continuous scroll
- Energy statistics

Pyroelectric Exposure Screen

- Sum or average energies over user selected time period / number of pulses
- Medicine, photolithography

Average Screen

- Thermopile, photodiode and pyroelectric sensors (Does not operate with PE-C series of pyroelectric sensors)
- Periodic (1/3 sec to 30 sec) or continuous (10 sec to 1 hour) average for fast-changing or slow-changing laser



Specifications

Power Meter	High legibility 32 x 122 pixel graphics supertwist LCD with switchable electroluminescent backlight. Large 12mm digits.
Features	Many screen features: including power with bar graph, energy, average, exposure, frequency, graphs, and more.
Outputs	RS232 and analog output 1V f.s. (optional)
Screen Refresh	15 times / sec.
Case	Molded high-impact plastic with kickstand and EMI conductive shielding, to allow use even in proximity to pulsed lasers.
Size	Very compact: 205mm L x 95mm W x 39mm H.
Battery	Rechargeable 12 volts. 22 hours use between charges. The charger can be ordered from your local distributor. The charger also functions as AC adapter.
Data Handling	Data can be viewed on board or transmitted to PC: On Board: Max data logging rate >10 points/s Transmitted to PC: Data transmission rate of ~50 points/s. RS232 baud rate of 19200
Sensor features	Works with standard Thermal [a], Pyroelectric [b] and Photodiode [c] sensors.
Program features	Preferred startup configuration can be set by user. User can recalibrate power or energy. Response time. Zero offset.
Compliance	CE, UKCA, China RoHS

Notes: (a) When operating with BeamTrack sensors, measures Power & Energy only
Notes: (b) In order to operate with the new Pyroelectric (PE-C series) sensors, Nova needs an adapter (see ordering information below)
Notes: (c) Not including PD300RM sensors

Ordering Information

Item	Description	Ophir P/N
Nova	Nova power meter for standard thermal, pyroelectric and photodiode sensors	7Z01500
Nova PE-C Adapter	Adapter to allow Nova to operate with PE-C series pyroelectric sensors. Plugs between Nova D15 socket and PE-C D15 plug	7Z08272
Carrying Case	Carrying case 38x30x11cm. For display and up to three sensors	1J02079
Nova RS232 assemblies - allow Nova power meter to communicate with PC and be controlled by PC		
Nova RS232 Assembly	RS232 adapter with standard 2 meter cable (including software) (see page 151)	7Y78105 [a]
Nova RS232 Assembly	RS232 adapter with 5 meter cable (including software)	7Y71052 [b]
Nova RS232 Assembly	RS232 adapter with 8 meter cable (including software)	7Y71051 [c]
Battery Pack	Replacement battery pack for Nova	7E14005A
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Nova)	7E05029
Standard Analog Output Connector	2.5mm mono jack (1 unit supplied with Nova)	7E02008

Note: (a) P/N 7Y78105 replaces P/N 78105
Note: (b) P/N 7Y71052 replaces P/N 781052
Note: (c) P/N 7Y71051 replaces P/N 781051

Power Supply/Charger
Negative Polarity Power Supply/Charger for Centauri, Vega, Nova II, LaserStar, Nova, EA-1, Pulsar and Quasar
Positive Polarity Power Supply/Charger for StarBright and StarLite.

Analog Output Connectors
Replacement standard analog output plug for most Ophir meters.
Replacement analog output plug for LaserStar.


Standard Analog Output Connector


LaserStar Analog Output Connector

StarLite USB Activation Code
Software Activation Code that enables the StarLite meter to communicate in USB with our StarLab software suite.

Centauri Dual Channel Activation Code
Software activation code to field upgrade a Single Channel Centauri to Dual Channel capabilities.

USB Cables for Meters & Interfaces
Cables for communicating with the PC in USB – for use with our StarLab application, COM Objects, LabVIEW and to upgrade Firmware files.

Ethernet Cable for EA-1
Ethernet cross cable for communicating with an Ethernet network or direct to a PC for initial setup of the device – can be used with our StarLab or OphirEthernetApp applications or with customer's own software.

RS232 Cables for Meters & Interfaces
Cables for communicating with the PC in RS232 – for use with our StarCom application or to use our RS232 command set.

RS232 Module for Nova
Plug in module allows transfer of power and energy data to PC and remote control of power meters from PC. Includes manual and StarCom application program (refer to page 164).

IEEE488 GPIB for LaserStar
Option available with LaserStar power meter allowing LaserStar to operate with GPIB protocol.
The option comes with StarCom software and also LabVIEW VIs to build LabVIEW applications.

Carrying Cases
Carrying case for StarBright, StarLite, Vega, Nova II or Nova power meters and up to 3 sensors.

Ordering Information

Item	Description	Ophir P/N
N Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5	7E05029
P Polarity Power Supply/Charger	Power Supply/Charger AC/DC 12V 2A P-1.35x3.5	7E05047
Standard Analog Output Connector	2.5mm mono jack	7E02008
LaserStar Analog Output Connector	Analog Output plug for LaserStar	7Z11004
StarLite USB Activation Code	Software Activation Code that enables the StarLite meter to communicate in USB with our StarLab software suite	7Z11049
Centauri Dual Channel Activation Code	Software activation code to field upgrade a Single Channel Centauri to Dual Channel capabilities	7Z11056
Centauri / StarBright / StarLite USB Cable	USB-A to MICRO-B cable	7E01279
Nova II / Vega USB Cable	USB to mini DIN cable	7E01205
Juno / Juno+ / EA-1 USB Cable	USB-A to MINI-B Cable	7E01217
Pulsar USB Cable	USB-A to B cable	7E01202
EA-1 Ethernet Cable	Ethernet Cross Cable	7E01192
Centauri / StarBright RS232 Cable	D9 to 3.5mm plug cable	7E01213
Nova II / Vega RS232 Cable	D9 to mini DIN cable	7E01206
Nova RS232 Module	RS232 adapter with 2 / 5 / 8 meter cable (including software)	7Y78105 / 7Y71052 / 7Y71051 [(a)]
LaserStar RS232 Cable	RS232 D9 to D25 Cable	7E01121
LaserStar IEEE Option	IEEE GPIB adapter for LaserStar	7Y78300 [(a)]
Carrying Case for StarBright, StarLite, Vega, Nova II and Nova	Carrying case 38x30x11 cm. For Power Meter and up to three sensors	1J02079

Note: (a) 7Y78105 (was 78105), 7Y71051 (was 781051), 7Y71052 (was 781052), 7Y78300 (was 78300)

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 (sensor limited) via Ethernet

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

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

StarViewer Application (data transmitted via Bluetooth and USB)

StarLab Software

StarViewer Android Application

2.2.2 Compact Juno USB Interface

Convert your PC or Android device into an Ophir sensor power/energy meter

- From sensor to interface to PC - powered from USB
  - Plug and play with all standard Ophir smart sensors
  - Position & size measurement with BeamTrack sensors
  - Record every energy pulse at up to 10kHz
  - Log power and energy, average, statistics, histograms and more with included StarLab application
  - Pulsed Power measurements with Thermopile detectors
  - Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)
  - LabVIEW VIs and COM Object interface

- From sensor to interface to Android Device - powered from USB
  - Plug and play with all standard Ophir smart sensors
  - Measure power and energy, average, statistics and more with included Android StarViewer application
- Very compact - is just an extension of the smart plug

Smart Sensor to Juno to PC

Ophir's basic smart compact Juno module turns your PC or Laptop into a full-fledged Ophir laser power/energy meter.
Just install the software, plug the sensor into the Juno module and connect the Juno with a standard USB cable to the PC USB port.
You can connect several Juno modules to the PC.

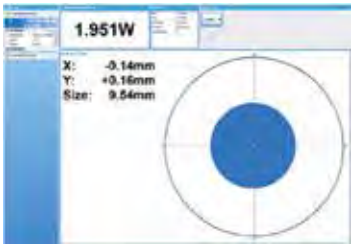
Smart Sensor to Juno to Android device

Ophir's basic smart compact Juno module turns your Android device into a full-fledged Ophir laser power/energy meter.
Just install the StarViewer application, plug the sensor into the Juno module and connect the Juno with a standard USB cable to the device USB port.

Juno with StarViewer

LabVIEW

Juno operating with StarLab software



Juno with BeamTrack sensor and StarLab showing beam power, position and size

Specifications

Power Measurement	
Power log period	5s to 500hr.
Energy Measurement	
Max real time data logging to PC	10,000Hz [a]
Trigger input and output	N.A.
Timing	Supports time stamp for each pulse - resolution 10µs
General	
Number of sensors supported	One sensor 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, BeamTrack and Photodiode sensors [b]
Power supply	Powered from USB
Dimensions	77mm L x 55mm W x 23mm H
Compliance	CE, UKCA, China RoHS

Notes:
(a) This is the data logging rate for every single point in turbo mode. Above that rate, the instrument will sample points but not log every single point
(b) Not including PD300RM sensors

Ordering Information

Item	Description	Ophir P/N
Juno	Compact module to operate one Ophir sensor from your PC USB port. Comes with software	7Z01250
Juno USB cable	USB-A to MINI-B Cable (1 unit supplied with Juno)	7E01217

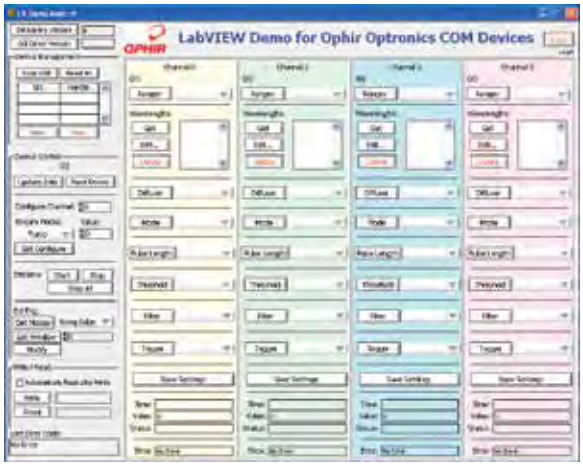
2.2.3 Juno+ USB Interface

Convert your laptop or desktop PC into an Ophir sensor power/energy meter

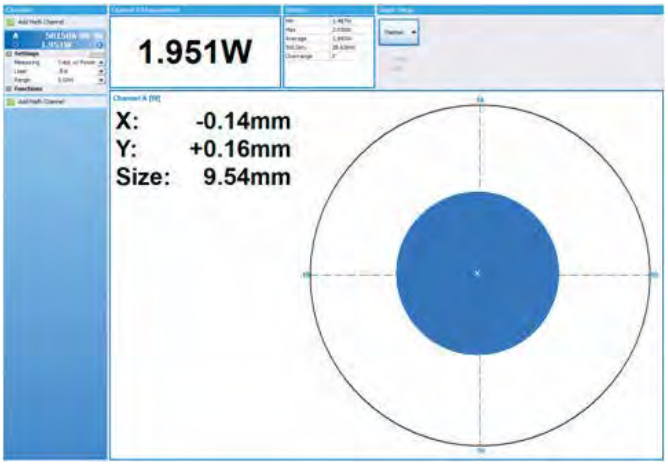
- From sensor to interface to PC - powered from USB
- Autonomous mode: Outputs voltage relative to measurement while connected via USB to a standalone power supply and not a PC
- Plug and play with all standard Ophir smart sensors
- Position & size measurement with BeamTrack sensors
- Record every energy pulse at up to 10kHz
- Analog output
- Log power and energy, average, statistics, histograms and more with included StarLab application
- Pulsed Power measurements with Thermopile detectors
- Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)
- LabVIEW VIs and COM Object interface

Smart Sensor to Juno+ to PC

Ophir's basic smart compact Juno+ module turns your PC or laptop into a full-fledged Ophir laser power/energy meter.
Just install the software, plug the sensor into the Juno+ module and connect the Juno+ with a standard USB cable to the PC USB port.
You can connect several Juno+ modules to the PC.



LabVIEW



Juno+ with BeamTrack sensor and StarLab showing beam power, position and size

Specifications

Power Measurement	
Power log period	5s to 500hr
Energy Measurement	
Max real time data logging to PC	10,000Hz [a]
Trigger input and output	N.A.
Timing	Supports time stamp for each pulse - resolution 10µs
General	
Number of sensors supported	One sensor 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 (PE-C series), Thermal, BeamTrack and Photodiode sensors. Works with our PD300RM sensors.
Power supply	Powered from USB
Outputs	USB and user selectable 1, 2, 5 and 10 Volt full scale analog output
Dimensions	105mm L x 80mm W x 29mm H
Compliance	CE, UKCA, China RoHS
Notes:	(a) This is the data logging rate for every single point in turbo mode. Above that rate, the instrument will sample points but not log every single point

Ordering Information

Item	Description	Ophir P/N
Juno+	Module to operate one Ophir sensor from your PC USB port. Comes with software	7Z01252
Juno+ USB cable	USB-A to MINI-B Cable (1 unit supplied with Juno+)	7E01217
Standard Analog Output Connector	2.5mm mono jack (1 unit supplied with Juno+)	7E02008

2.2.4 EA-1 Compact Ethernet Adapter

Connects your Ophir sensor to an Ethernet bus

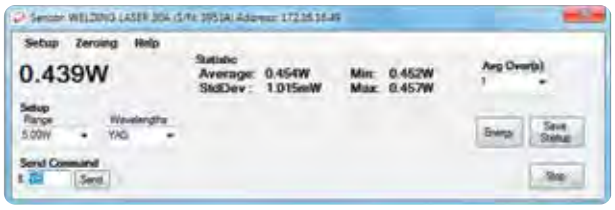
- From sensor direct to Ethernet with no PC connection
- Powers directly from the Ethernet bus or 12V power supply
- Supports thermal, photodiode and pyroelectric smart sensors
- Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)
- Software support via StarLab application or '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

2.2.5 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	5s to 500hr.
Energy Measurement	
Max real time data logging to PC	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
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

2.2.6 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 [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. 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) 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
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

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 [c]	RS232 / GPIB	RS232	USB	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.	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
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]	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
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
General										
Automation interface	yes	yes	yes	yes [c]	no	no	yes	yes	yes	no
LabVIEW VIs	yes	yes	yes	yes [c]	yes	yes	yes	yes	no	no
Maximum baud rate	115200	115200	38400	N.A	38400	19200 [b]	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 Ariel, Centauri, StarBright, StarLite, Vega, Nova II, Pulsar, Juno, Juno+, Quasar, EA-1 and USBI devices with all standard Ophir sensors

Flexible Display Options with StarLab

Choose which channels to display

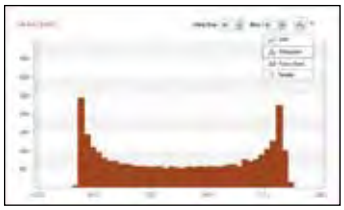
Setup screen

One of the above screens is maximized

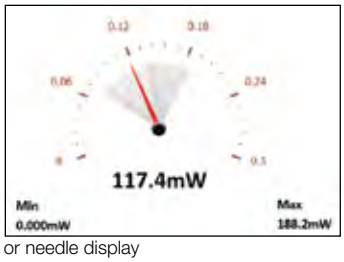
You may choose to display them separately

Maximize one of the sources

Choose line graph

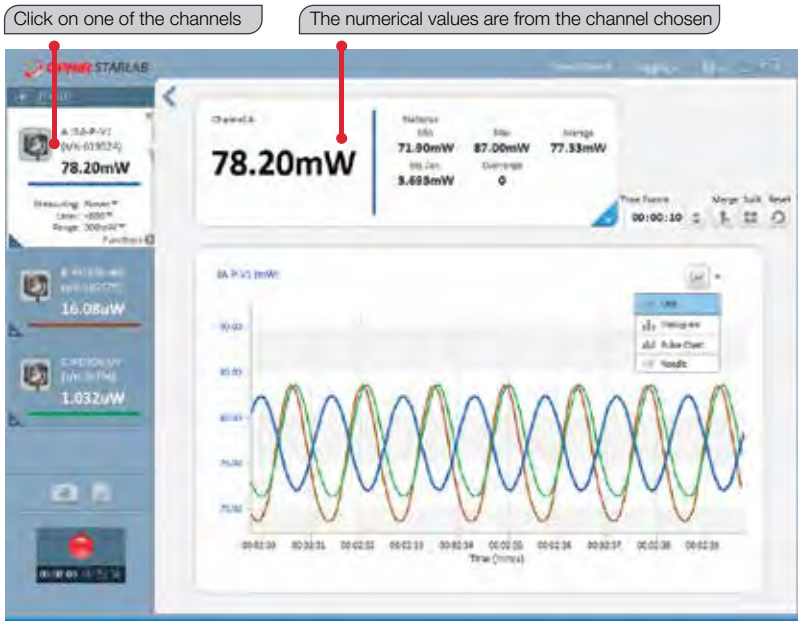


or histogram

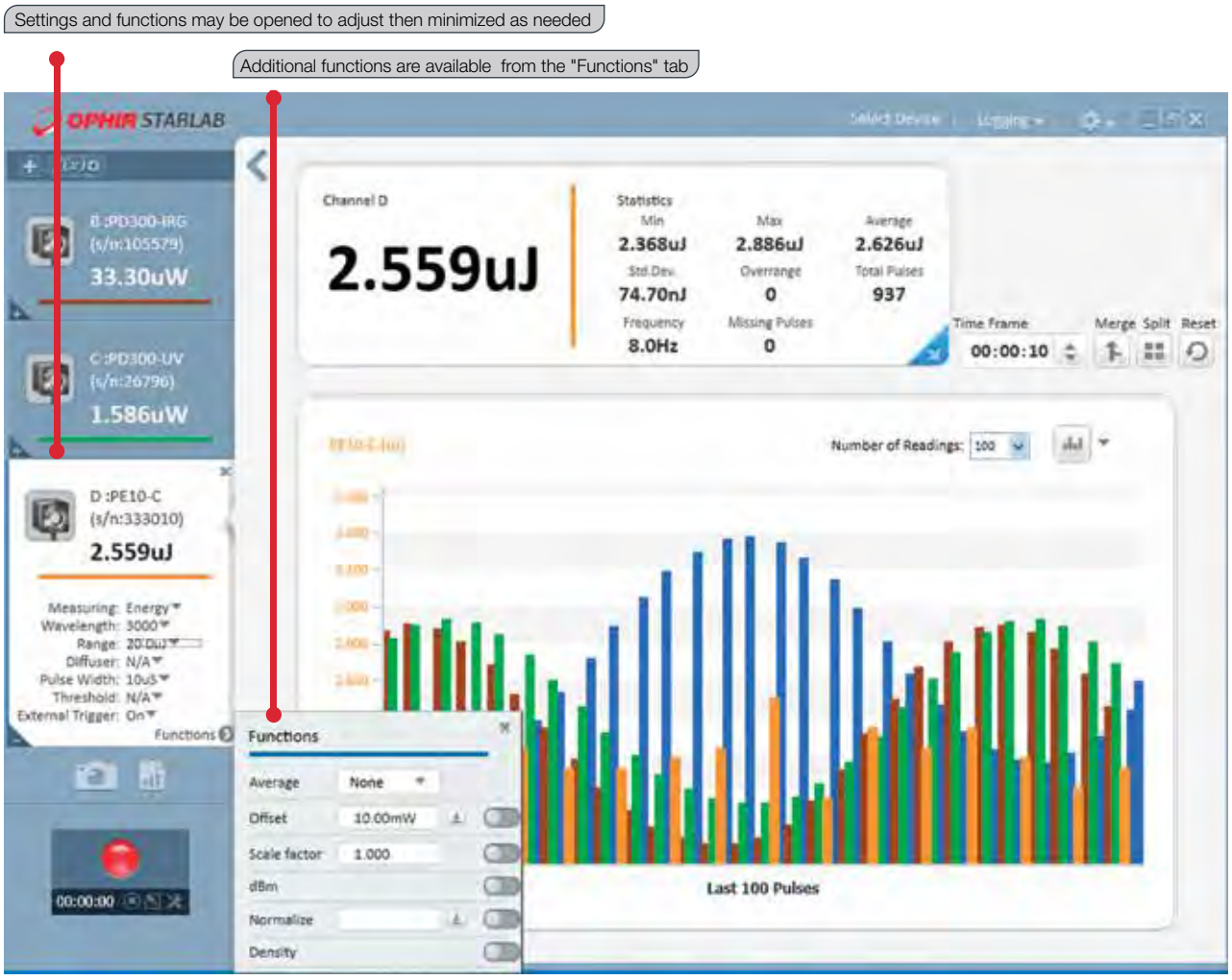


or needle display

Multiple Sensors displayed together



Here multi line graph display has been chosen



Here multi line histogram display has been chosen

Functions

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

Logging

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

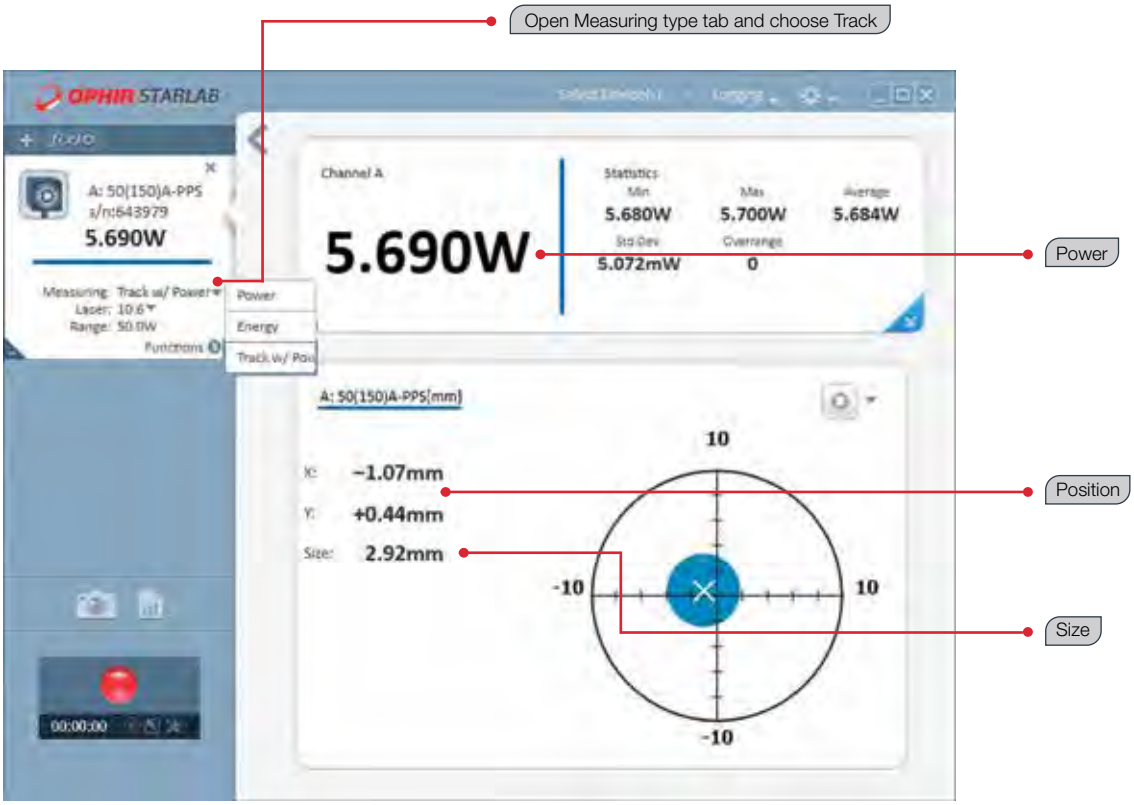
Click on log button and logging of values starts


```
:PC Software:StarLab Version 3.00 Build 19
:Logged:25/05/2014 at 09:33:22
:Channel B:Vega Thermopile SA-P-V1 (s/n:999999)  VG2.31 (s/n:637028)
:Channel A:Juno Photodiode PD300 (s/n:1694648)  JN1.24 (s/n:6061180)
:Math M:(A-B)^2

:Channel B:Statistics
:Min:3.440mW
:Max:12.22mW
:Average:7.582mW
:Std.Dev.:3.078mW
:Overrange:0

:First Pulse Arrived : 25/05/2014 at 09:33:22.162000
 Timestamp      Channel B       F(B)            Channel A       Math M
         0.000   1.762e-002   6.820e-003
         0.064   3.835e-002   7.360e-003
         0.128   1.911e-002   8.110e-003
         0.136                                1.067e-003   6.554e-006
         0.193   1.986e-002   9.860e-003
         0.200                                8.480e-003   1.444e-007
         0.256   2.057e-002   9.570e-003
         0.264                                6.540e-003   9.181e-006
         0.321   2.123e-002   1.029e-002
         0.328                                4.900e-003   2.843e-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
         0.465   2.291e-002   1.191e-002
         0.470                                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
         1.000                                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   7.169e-005
         1.184   2.038e-002   9.380e-003
         1.200                                2.270e-003   4.914e-005
         1.664   1.558e-002   4.180e-001
```

BeamTrack Power/Position/Size Screens



Power / Position / Size screen

Position stability screen

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	GPIB	Bluetooth	Ethernet
Centauri	●	●			
StarBright	●	●			
Vega	●	●			
Nova II	●	●			
*StarLite	●				
LaserStar		●	●		
Nova		●			
Juno / Juno+	●				
EA-1					●
Pulsar	●				
Quasar				●	

* With USB activation code

USB

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

GPIB

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

- OphirLMMeasurement COM Object.pdf. lists and describes the methods and events available for configuring, controlling and uploading measurements from Ophir devices.
- OphirLMMeasurement.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. OphirLMMeasurement 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).

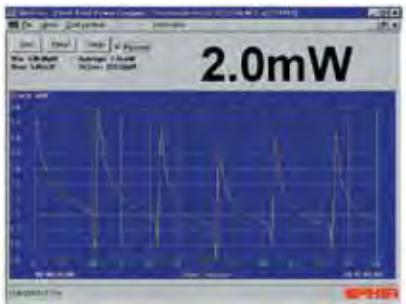
Ophir provides example projects of COM Object clients in VC#, VB.NET and LabVIEW. These are found in the Automation Examples subdirectory of our StarLab PC Application.

Note: (a) P/N 7Y78105 replaces P/N 78105
Note: (b) P/N 7Y78300 replaces P/N 78300

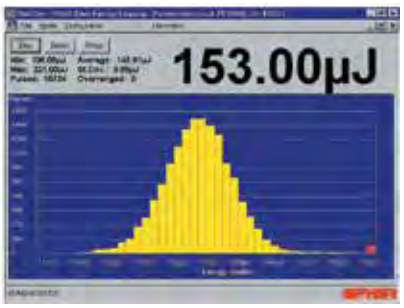
2.3.3 StarCom

This software is supplied with the Nova II, LaserStar, Vega and Nova with RS232 option. It allows you to measure, analyze and record power and energy from any Ophir sensor.
You can log the data from each sensor simultaneously to file.

Plot of ratio of energy B/A vs. energy A



Plot of power vs. time



Histogram plot of energy distribution

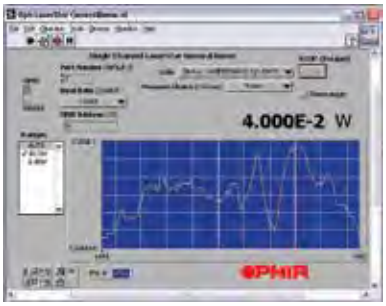
2.3.4 LabVIEW Solutions

Ophir has long recognized the growing LabVIEW community of developers. For over 10 years, we have been providing LabVIEW libraries for all of our devices. These are full open-source applications that can be used as is or tailored by the LabVIEW programmer to his specific needs.

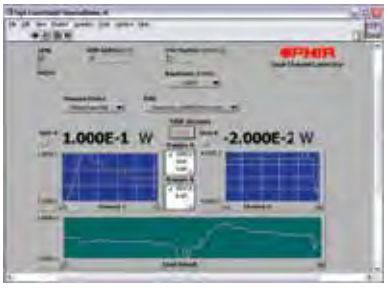
These starter applications are basic software only that allows the LabVIEW programmer to experiment freely to fully feel the strength of our devices' respective command sets.

These applications contain VIs (Virtual Instruments) to control the instrument. You can combine VIs to create successively larger and more versatile larger VIs by simply connecting them together. Users can create sophisticated, custom applications in minutes. In most cases, applications can be built and tested even before the instrument even arrives. The versatility of these tools is limitless.

All of our LabVIEW libraries can be downloaded from our web site: www.ophiropt.com

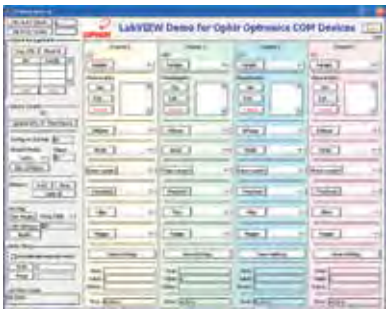


VI Libraries
Ophnova.llb
Library supplied for use with the Nova. Communication is in RS232 and is based on NI-VISA.



OphIstrd.llb
Library supplied for use with the Dual-Channel LaserStar. Communication can be set to RS232 or GPIB and is based on NI-VISA.

OphInstr.llb
This library can be configured to work with the Nova II, Vega, or Single-Channel LaserStar devices. It can also work with the Juno or Juno+ with a Thermopile or Photodiode sensors.
It can be set to RS232, USB or GPIB. It is based on NI-VISA for all 3 communication protocols.



LabVIEW COM Demo.llb
Library supplied for use with all of our USB speaking devices (Ariel, Centauri, StarBright, StarLite, Juno, Juno+, Nova II, Pulsar, Vega). Makes use of our COM object. Included with our StarLab application.

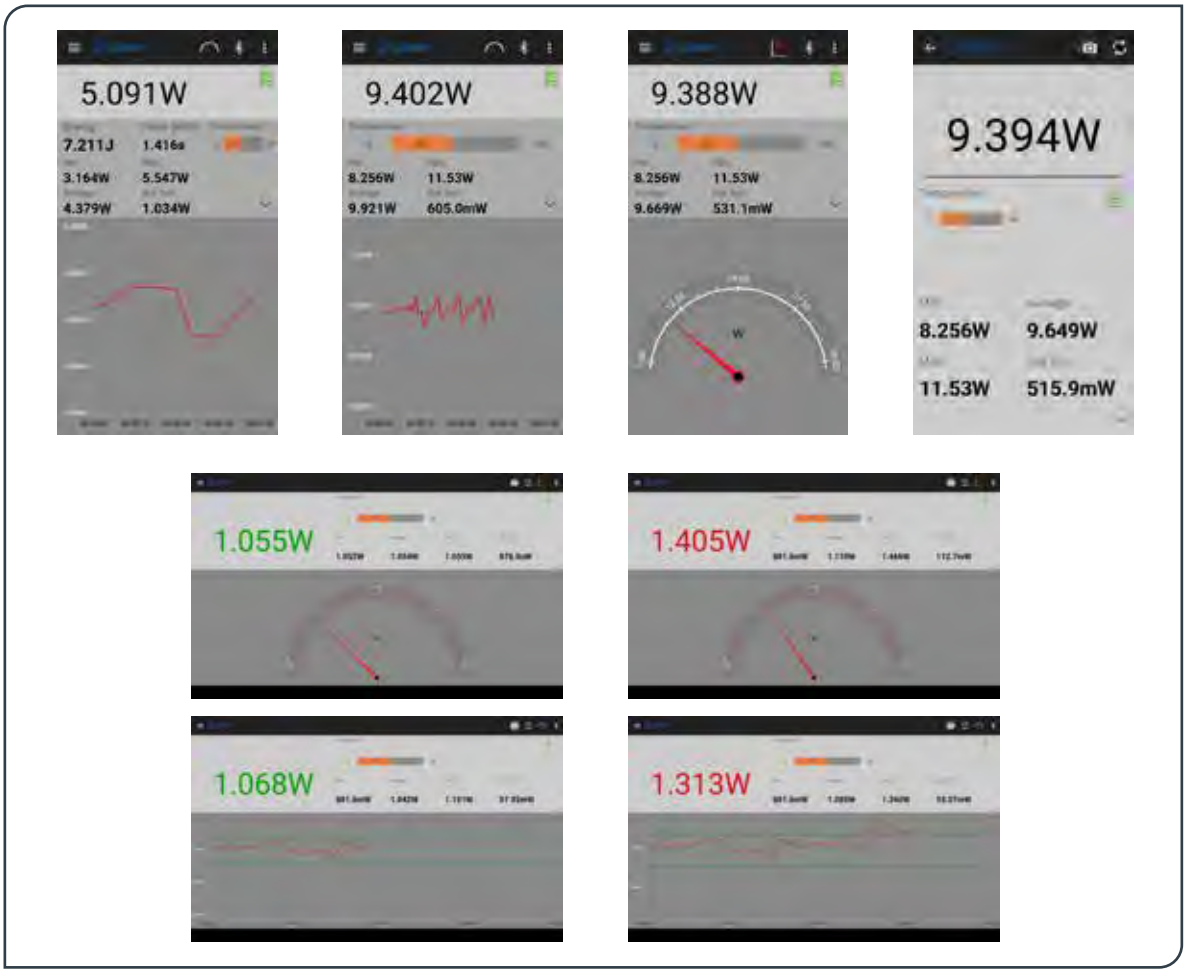
2.3.5 StarViewer Android App

Description:

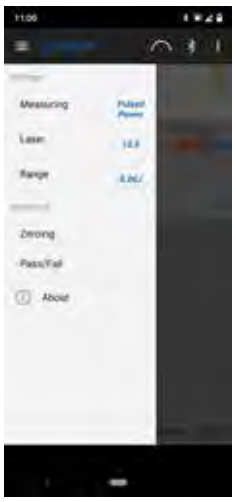
- Turn your Android smartphone or tablet into a laser power / energy meter (Android version 7 or higher). Available on Google Play
- Works with Ariel/Juno/Quasar devices
- Display measurements as line graph, simulated analog needle, or full screen numeric display with statistics
- Screen Capture and 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
- 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

Ophir StarViewer Android App