2.2.5 EA-1 Compact Ethernet Adapter

Connects your Ophir sensor to an Ethernet bus

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

DB15 connector

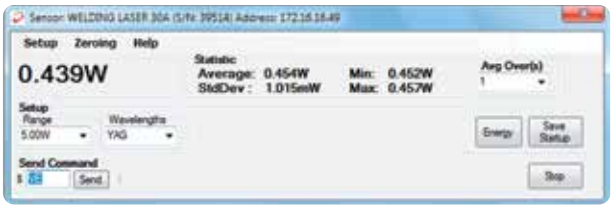
Mini-USB connector;
Ethernet RJ45 connector;
12V power connector

Smart Sensor to EA-1 to Ethernet to PC

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

The device is suitable for industrial or other environments where the bus of choice is Ethernet. Telnet, HTTP and UDP protocols are supported.

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



PC application power screen

PC application energy screen

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

Specifications

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

Ordering Information

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

2.2 PC Interfaces

2.2.1 PC Connectivity Options for Power/Energy Measurement

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

Ophir sensor to USB interfaces with up to 4 channel connectivity

Ophir EA-1 interface with Ethernet connectivity

Ophir Quasar interface with wireless connectivity

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

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

Transmit real time data to Android via USB

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

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

StarViewer Application (data transmitted via Bluetooth and USB)

StarLab Software

StarViewer Android Application

2.2.8 Summary of Computer Options for Ophir Meters and Interfaces

Communications

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

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

Ophir Power Meter and Interface Specifications

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

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

2.3 Software Solutions

2.3.1 StarLab

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

Extensive Graphic Display of Data

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

Advanced Measurement Processing

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

Data Logging for Future Review

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

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

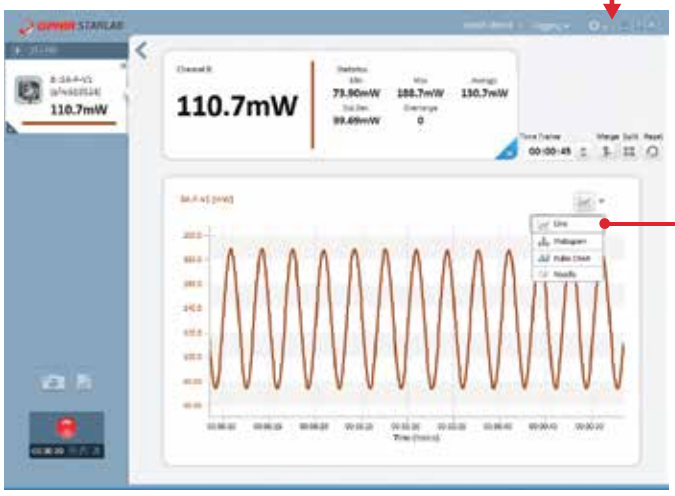
Flexible Display Options with StarLab

Choose which channels to display

Setup screen

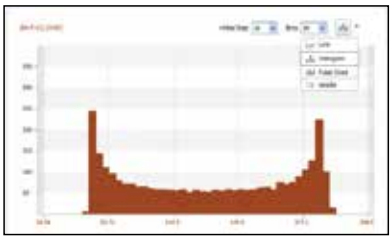
You may choose to display them separately

Maximize one of the sources

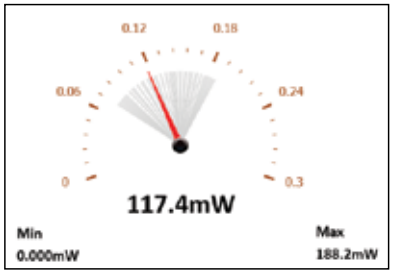


One of the above screens is maximized

Choose line graph



or histogram

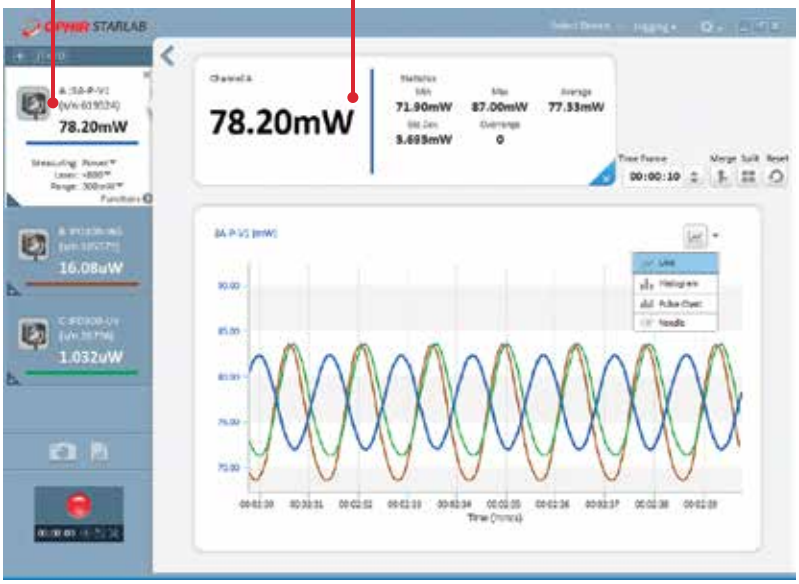


or needle display

Multiple Sensors displayed together

Click on one of the channels

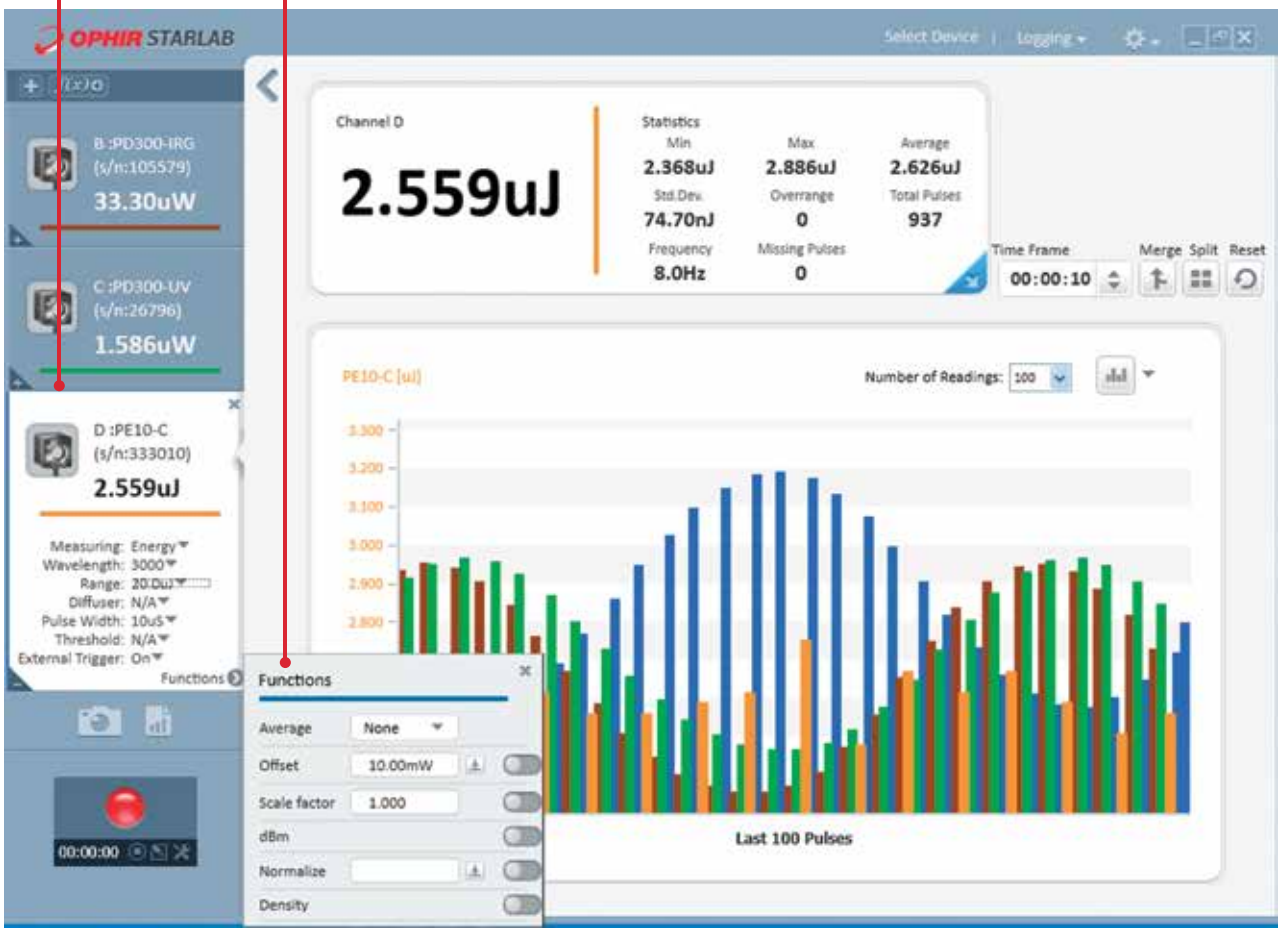
The numerical values are from the channel chosen



Here multi line graph display has been chosen

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

Additional functions are available from the "Functions" tab



Here multi line histogram display has been chosen

Functions and Logging

Functions

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

Define function combining measured values

New trace is now added per defined function

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

Logging

Click on log button and logging of values starts

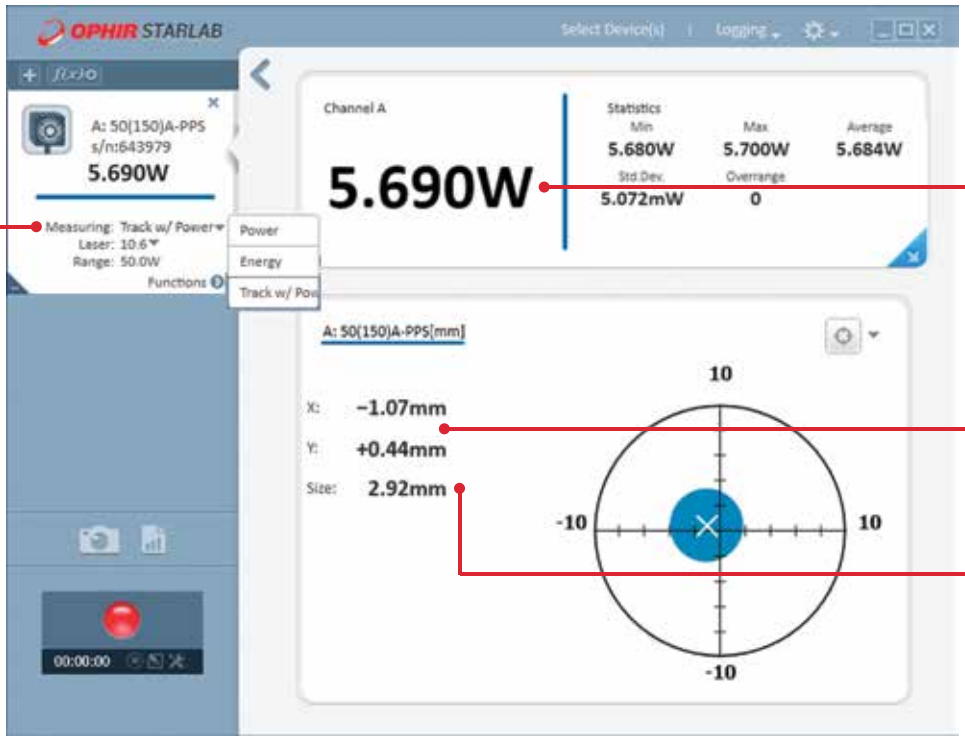

```
;PC Software:StarLab Version 3.00 Build 19
;Logged:25/05/2014 at 09:33:22
;Channel B:Vega Thermopile 3A-P-V1 (s/n:999999)  VG2.31 (s/n:657028)
;Channel A:Juno Photodiode PD300 (s/n:694646)  JN1.24 (s/n:606180)
;Math M:(A-B)^2

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

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

BeamTrack Power/Position/Size Screens

Open Measuring type tab and choose Track

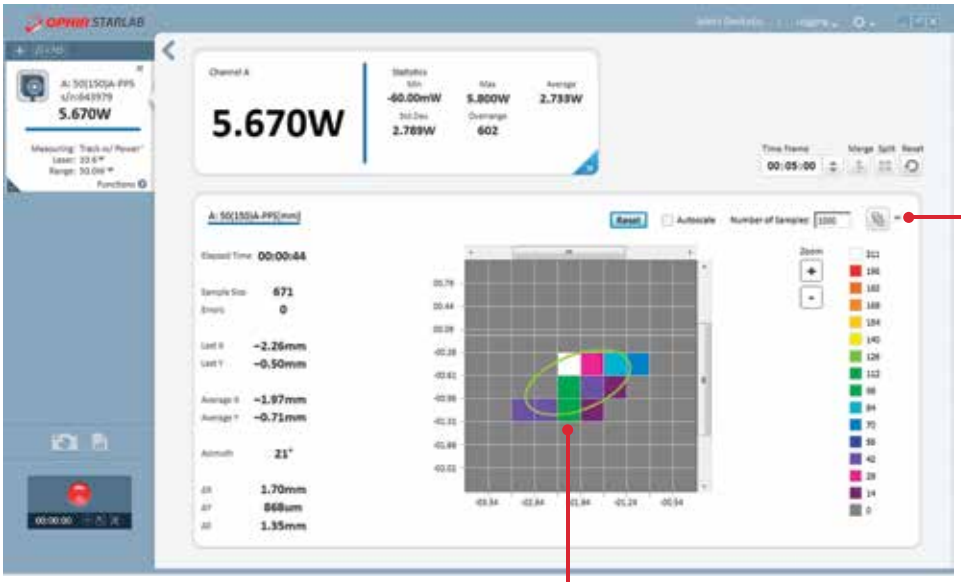


Power

Position

Size

Power / Position / Size screen



Click on this tab and choose “stability”

Position stability screen

Displays beam center wander weighted for dwell time at each position