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

2.2.2 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 Android application, plug the sensor into the Juno module and connect the Juno with a standard USB cable to the device USB port.
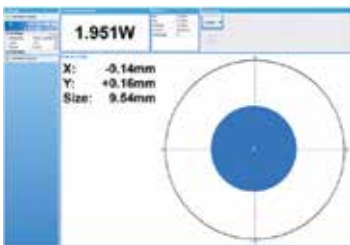

Juno with StarViewer

LabVIEW

Juno operating with StarLab software

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

Specifications

Power Measurement	
Power log period	1s to Unlimited
Energy Measurement	
Max logging rate	10,000Hz [a]
Trigger input and output	N.A.
Timing	Supports time stamp for each pulse - resolution 1μs
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)
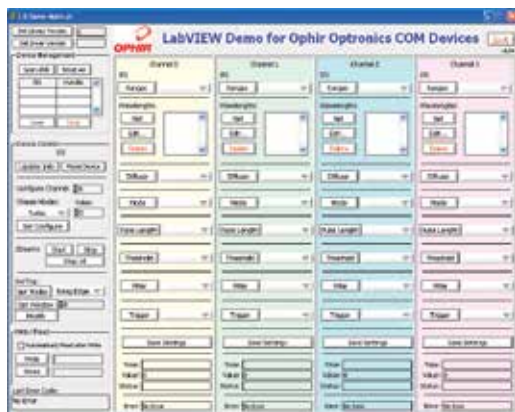- LabVIEW VIs and COM Object interface
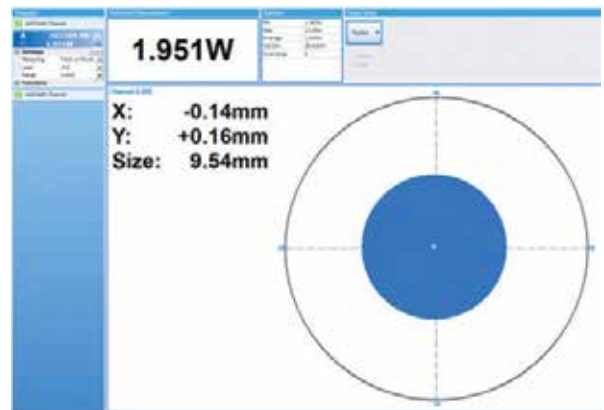
Smart Sensor to Juno+ to PC

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	1s to Unlimited
Energy Measurement	
Max logging rate	10,000Hz [a]
Trigger input and output	N.A.
Timing	Supports time stamp for each pulse - resolution 1µs
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
Note:	(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 Juno-RS Interface

Virtual meter (PC-Interface) allowing connectivity of Ophir's smart (DB-15) power and energy sensors to automation systems and computers using RS-232 communication

- Plug and play with all standard Ophir smart sensors
- Analog output in autonomous mode: Outputs voltage relative to measurement while connected standalone to a sensor
- Robust connectors, suited for semi-industrial environment
- Advanced logging and data processing with included StarLab application
- Pulsed Power measurements with Thermopile detectors
- Low Frequency Power - power measurement from pulse cycle energy (for VCSEL)

Smart Sensor to Juno-RS to PC

Ophir's Juno-RS, virtual meter provides easy integration into automation systems (e.g. PLC) using RS-232 in their communication infrastructure. It also allows turning the customer's PC or laptop into a full-fledged Ophir laser power/energy meter.

The sensor is connected to the Juno-RS which sends the measurement results to the PLC or the destination computer.

The Juno-RS has an analog output which provides an output voltage proportional to the power/energy measured.

When using the Juno-RS with a PC/Laptop, just install the StarLab software, plug the sensor into the Juno-RS module and connect the Juno-RS with a standard RS-232 cable to a PC serial port or USB to RS-232 adapter.

You can connect several Juno-RS modules to the PC at the same time.

RS-232 Terminal

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

Specifications

Power Measurement	
Power log period	Unlimited
Energy Measurement	
Max logging rate	500Hz @ baud rate 115200 [a]
Trigger input and output	N.A.
Timing	Supports time stamp for each pulse - resolution 1µs
General	
Number of sensors supported	One sensor per unit. Can combine several units with StarLab 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	Industrial +12V wall cube power supply, plugs into jack on rear. The power supply is supplied with the device or can be ordered from your local distributor
Power consumption	100mA max at 12V
Power input voltage	11V min to 25V max (if using alternative to provided power supply)
Outputs	RS-232; Analog output with user selectable full-scale of 1, 2, 5 or 10V
Dimensions	114mm L x 80mm W x 29mm H
Compliance	CE, UKCA, China RoHS
Note:	(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-RS	Module to operate one Ophir sensor from your PC RS-232 port. Comes with software	7Z01254
Juno-RS RS-232 Cable	D9 Male/Female 1.8-2 meter (1 unit supplied with Juno-RS)	7E11216
Juno-RS Power Supply	Power Supply AC/DC 12V 2A 2.5x5.5x13.8 S (1 unit supplied with Juno-RS)	7E05093
Juno-RS Analog Output Cable	Coax BNC-M to SMA-M RG-174 Cable 2 meter	7E01541

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.
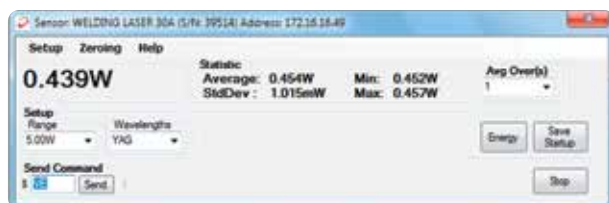
PC application power screen

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	Thermopile 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

2.2.6 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.
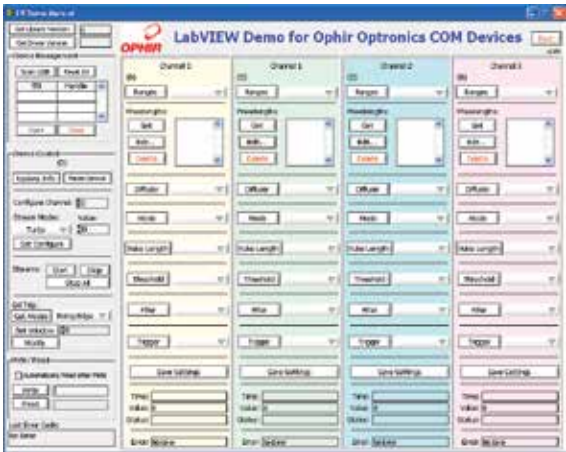
LabVIEW

Pulsar-4 operating with StarLab software

Specifications

Power Measurement	
Power log period	1s to Unlimited
Energy Measurement	
Max logging rate	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

Power Meters

2.2.7 Quasar Wireless Bluetooth Interface

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

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

Quasar Bluetooth Wireless Sensor to PC Interface

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

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

Specification

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

Ordering Information

Item	Description	Ophir P/N
Quasar Bluetooth Interface	Module to operate one Ophir sensor from your PC via Bluetooth wireless interface. Comes with software. Max repetition rate for every pulse 500Hz. Powered from built in rechargeable battery. Comes with power supply. Bluetooth adapter required when not available on PC. See next line	7Z01300
Battery Pack for Quasar	Replacement battery pack for Quasar	7E14007A
N Polarity power supply/charger	Power Supply/Charger AC/DC 12V 2A N-2.1x5.5 (1 unit supplied with Quasar)	7E05029

2.2.8 Summary of Computer Options for Ophir Meters and Interfaces

Communications

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

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

Ophir Power Meter and Interface Specifications

Model	Centauri	StarBright	Nova II / Vega	StarLite	LaserStar	Nova	Juno / Juno+	Juno-RS	Pulsar-1, 2 or 4	EA-1	Quasar Bluetooth
Communication method	USB / RS232 / Ethernet	USB / RS232	USB / RS232	USB [c]	RS232 / GPIB	RS232	USB	RS232	USB	Ethernet	Bluetooth
Power Measurement											
Power log period	1s to 1000hr.	1s to 1000hr.	12s to 600hr.	N.A	12s to 600hr.	5s to 24hr.	1s to Unlimited	1s to Unlimited	1s to Unlimited	1s to Unlimited	1s to Unlimited
Max points stored onboard	Unlimited	Unlimited	Nova II 5400 Vega 27000	N.A	5400	300	N.A	N.A	N.A	N.A	N.A
Max points direct on PC	Unlimited	Unlimited	Unlimited	N.A	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Analog output	1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V F.S.	1V F.S.	1V F.S.	1V F.S.	N.A / 1V, 2V, 5V, 10V F.S.	1V, 2V, 5V, 10V	N.A	N.A	N.A
Energy Measurement											
Max logging rate	25,000Hz USB 30Hz RS232	5000Hz USB 30Hz RS232	>2000Hz USB[a] >30Hz RS232	20Hz [c]	>30Hz RS232 >1500Hz GPIB[a]	>10Hz	10,000Hz [a]	500Hz [a]	25,000Hz [a]	>25,000Hz [a]	500Hz
Max onboard data logging rate	25,000Hz	5000Hz	4000Hz [a]	N.A	>1500Hz [a]	>10Hz	N.A	N.A	N.A	N.A	N.A
Max points stored USB/onboard	Unlimited	Unlimited	Nova II 59,400 Vega 250,000	N.A	59,400	1000	N.A	N.A	N.A	N.A	N.A
Trigger input and output	Trigger input to synchronize measurement of pulses	N.A	N.A	N.A	N.A	N.A	N.A	N.A	BNC trigger input to enable measurement of missing pulses. Can also be configured to give trigger output	N.A	N.A
Timing - time stamp for each pulse	resolution 1µs	resolution 1µs	N.A	N.A	N.A	N.A	resolution 1µs	resolution 1µs	resolution 1µs	resolution 1µs	resolution 10ms
General											
Com Object	yes	yes	yes	yes [c]	no	no	yes	no	yes	yes	no
LabVIEW VIs	yes	yes	yes	yes [c]	yes	yes	yes	no	yes	no	no
Maximum baud rate	115200	115200	38400	N.A	38400	19200 [b]	N.A.	115200	N.A.	N.A.	N.A.
PC file format	Text files, spreadsheet compatible ASCII										
TTL Out	yes	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Number of sensors supported	2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit for single channel mode. Two sensors per unit for dual channel mode	One sensor per unit	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit	4 / 2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC	One sensor per unit. Can combine several units with software for display of up to 7 Quasars on one PC
Compatible sensors	Supports most Ophir pyroelectric, thermal and photodiode sensors										
Power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from internal rechargeable battery power supply	Powered from USB	12V wall cube plugs into jack on rear	12V wall cube plugs into jack on rear	12V wall cube plugs into jack or PoE	Powered from internal rechargeable battery power supply
Dimensions	47 x 200 x 130mm	212 x 114 x 40mm	208 x 110 x 43mm / 210 x 109 x 36mm	211 x 114 x 40mm	194 x 228 x 57mm	205 x 95 x 39mm	77 x 55 x 23mm / 105 x 80 x 29mm	114 x 80 x 29mm	103 x 190 x 33mm	93 x 73 x 29mm	94 x 96 x 36mm

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

Power Meters