2.2.2 Compact 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
- 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
- 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.

Specifications

<table>
<thead>
<tr>
<th>Power Measurement</th>
<th>Energy Measurement</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power log period 5s to 500hr.</td>
<td>Max real time data logging to PC 10,000Hz</td>
<td>One sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
</tr>
<tr>
<td>Energy Measurement</td>
<td>Trigger input and output N/A</td>
<td>Compatible sensors Supports all standard Ophir Pyroelectric, Thermal, BeamTrack and Photodiode sensors</td>
</tr>
<tr>
<td>Timing Supports time stamp for each pulse - resolution 10µs</td>
<td>Power supply Powered from USB</td>
<td>Number of sensors supported</td>
</tr>
<tr>
<td>General</td>
<td>Dimensions 77mm L x 55mm W x 23mm H</td>
<td>Compliance CE, China RoHS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Ophir P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juno</td>
<td>Compact module to operate one Ophir sensor from your PC USB port. Comes with software</td>
<td>7201250</td>
</tr>
<tr>
<td>Juno USB cable</td>
<td>USB-A to MINI-B Cable (1 unit supplied with Juno)</td>
<td>7B01217</td>
</tr>
</tbody>
</table>
### 2.2 Power Meters

#### 2.2.1 PC Connectivity Options for Power/Energy Measurement

- **Sample data with Ophir power meter at up to 4000 points per second**
- **Ophir power meter capable of on board storage of data of up to 250,000 points and data storage rate of up to 4000 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 up to 25,000 points/s per channel (sensor limited) via USB**
- **Transmit real time data to PC at up to >25,000 points/s (sensor limited) via Ethernet**
- **Transmit real time data to PC at 500 points per second via Bluetooth**
- **Transmit stored data or real time data to PC via USB or RS232**

**StarLab software (data transmitted via USB, Ethernet or Bluetooth)**

**StarCom software (data transmitted via RS232)**
2.2.7 Summary of Computer Options for Ophir Meters and Interfaces

Communications

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

- USB on Nova II, Vega, StarBright, Centauri (optional on StarLite) power meters and Juno, Juno+, Pulsar and USB PC interfaces
- Bluetooth wireless on LaserStar 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

<table>
<thead>
<tr>
<th>Model</th>
<th>Centauri</th>
<th>StarBright</th>
<th>Nova II / Vega</th>
<th>StarLite</th>
<th>LaserStar</th>
<th>Nova</th>
<th>Juno / Juno+</th>
<th>Pulsar-1, 2 or 4</th>
<th>EA-1</th>
<th>Quasar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>method</td>
<td>USB / RS232</td>
<td>USB / RS232</td>
<td>USB / RS232</td>
<td>USB (a)</td>
<td>RS232 / GPIB</td>
<td>RS232</td>
<td>USB</td>
<td>USB</td>
<td>Ethernet</td>
<td>Bluetooth</td>
</tr>
<tr>
<td>Power log period</td>
<td>1s to 1000hr.</td>
<td>1s to 1000hr.</td>
<td>12s to 600hr.</td>
<td>N.A.</td>
<td>12s to 600hr.</td>
<td>5s to 24hr.</td>
<td>5s to 500hr.</td>
<td>5s to 500hr.</td>
<td>5s to 500hr.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Max points stored onboard</td>
<td>unlimited</td>
<td>unlimited</td>
<td>Nova II 5400 Vega 27,000 unlimited</td>
<td>N.A.</td>
<td>5400</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Max points direct on PC</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>N.A.</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Analog output</td>
<td>1V, 2V, 5V, 10V F.S.</td>
<td>1V, 2V, 5V, 10V F.S.</td>
<td>1V, 2V, 5V, 10V F.S.</td>
<td>N.A.</td>
<td>1V F.S.</td>
<td>1V F.S.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Energy Measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max real time data logging to PC</td>
<td>25,000Hz USB 30Hz RS232</td>
<td>30,000Hz USB 30Hz RS232</td>
<td>&gt;2000Hz USB 30Hz RS232</td>
<td>400Hz (a)</td>
<td>&gt;200Hz RS232</td>
<td>&gt;1500Hz GPIB</td>
<td>&gt;10Hz</td>
<td>10,000Hz (a)</td>
<td>25,000Hz (a)</td>
<td>&gt;25,000Hz (a)</td>
</tr>
<tr>
<td>Max onboard data logging rate</td>
<td>25,000Hz</td>
<td>5000Hz</td>
<td>400Hz (a)</td>
<td>N.A.</td>
<td>~500 points/s</td>
<td>~500 points/s</td>
<td>~50 points/s</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Data transfer rate of a data file from instrument to PC</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Power log period</td>
<td>1s to 1000hr.</td>
<td>1s to 1000hr.</td>
<td>12s to 600hr.</td>
<td>N.A.</td>
<td>12s to 600hr.</td>
<td>5s to 24hr.</td>
<td>5s to 500hr.</td>
<td>5s to 500hr.</td>
<td>5s to 500hr.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Max points stored onboard</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>N.A.</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
<td>unlimited</td>
</tr>
<tr>
<td>Trigger input and output</td>
<td>Trigger to synchronize measurement of pulses</td>
<td>Trigger to synchronize measurement of pulses</td>
<td>Trigger to synchronize measurement of pulses</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Timing - time stamp for each pulse</td>
<td>resolution 1µs</td>
<td>resolution 1µs</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>resolution 1µs</td>
<td>resolution 1µs</td>
<td>resolution 10ms</td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automation interface</td>
<td>yes</td>
<td>yes</td>
<td>yes (a)</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>LabVIEW VIs</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes (a)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Maximum baud rate</td>
<td>115200</td>
<td>115200</td>
<td>88400</td>
<td>88400</td>
<td>12000 (a)</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>PC file format</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
<td>Text files, spreadsheet software compatible ASCII</td>
</tr>
<tr>
<td>TTL OUT</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Number of sensors supported</td>
<td>2 / 1 sensors per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
<td>1 sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
<td>1 sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
<td>1 sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
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<td>1 sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
<td>1 sensor per unit. Can combine several units with software for display of up to 8 sensors on one PC</td>
</tr>
<tr>
<td>Compatible sensors</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
<td>Powered from internal rechargeable battery power supply</td>
</tr>
<tr>
<td>Power supply</td>
<td>Supports most Ophir pyroelectric, thermistor and photodiode sensors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>47 x 200 x 130mm</td>
<td>212 x 114 x 40mm</td>
<td>208 x 110 x 43mm / 210 x 80 x 29mm</td>
<td>211 x 114 x 40mm</td>
<td>194 x 228 x 57mm</td>
<td>205 x 95 x 39mm</td>
<td>77 x 95 x 23mm / 105 x 80 x 29mm</td>
<td>103 x 190 x 33mm</td>
<td>93 x 73 x 29mm</td>
<td>94 x 95 x 36mm</td>
</tr>
</tbody>
</table>

Notes:

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

2.3.1 StarLab

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

**Extensive Graphic Display of Data**
- Line Plot, Histogram, Bar chart, Simulated Analog Needle
- Multiple data sets on one graph or separate graphs on the same screen

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

**Data Logging for Future Review**
- Can be displayed graphically or saved in text format
- Easily exported to an Excel spreadsheet

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

**Flexible Display Options with StarLab**

![Flexible Display Options with StarLab](image)

Choose which channels to display

Maximize one of the sources

Choose line graph

or histogram

or needle display

You may choose to display them separately

One of the above screens is maximized
Multiple Sensors displayed together

Click on one of the channels - The numerical values are from the channel chosen

Here multi line graph display has been chosen

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

Additional functions are available from the "Functions" tab

Here multi line histogram display has been chosen
Functions and Logging

**Functions**

- Click on f(x) to open another trace combining measured values
- Define function combining measured values
- New trace is now added per defined function

**Logging**

- Files are stored here. They may be viewed graphically OR numerically
- Click on log button and logging of values starts

Files are stored here. They may be viewed graphically OR numerically.
BeamTrack Power/Position/Size Screens

Open Measuring type tab and choose Track

Click on this tab and choose “stability”

Displays beam center wander weighted for dwell time at each position