

Aurora/Aurora+ IMU



[https:// www.imems-technology.com](https://www.imems-technology.com)

Specifications

Angles measurements accuracy & Heave Motion:

	Accuracy	Range
Roll	0.1 °	±45°
Pitch	0.1 °	±45°
Yaw	0.1 °	0-360°
Heave Motion	5 cm or 5%	±10m

Sensors

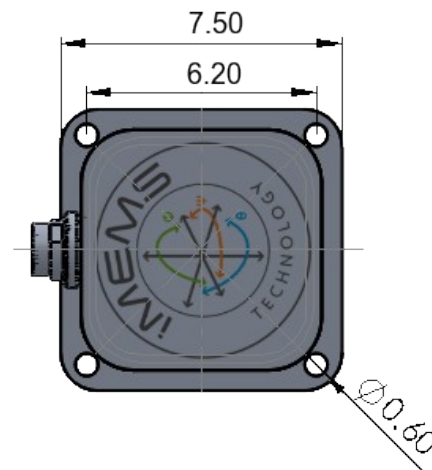
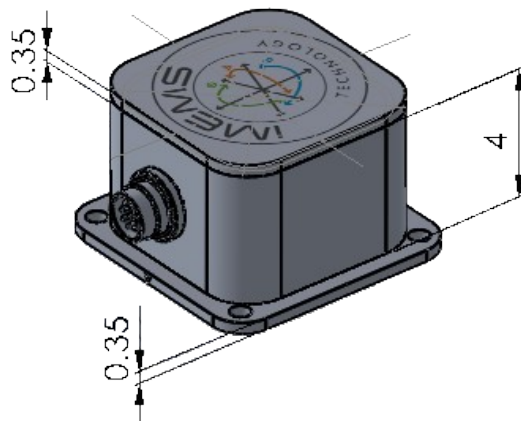
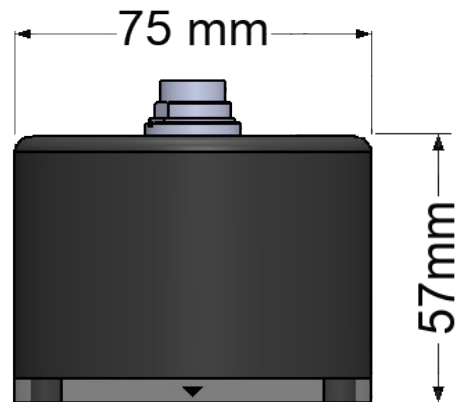
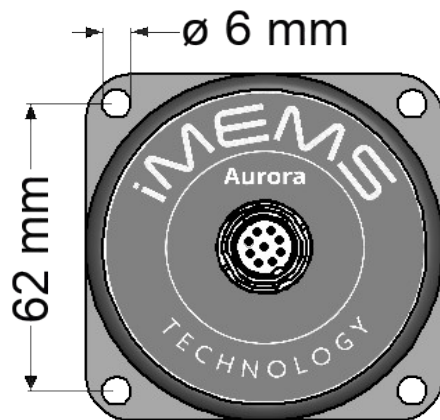
Sensor	Accelerometers	Gyroscopes	Magnetometers
Dynamic Range	±2 g	±100 °/s	±4 Gauss
Bias / Bias Instability	<1 mg	2 °/hr	±1 Gauss
Sensitivity error	< ±1 %	< ±2 %	NA
Linearity Error	< ±5mg	< ±0.5 °/s	NA
Noise Density	120 µg/√Hz	0.008 °/s/√Hz	NA

Communication

Serial Interface	Standard RS232 and RS422
Serial Speed	4800 to 0.5M baud
Ethernet	DHCP, UDP
Ethernet Speed	Supports one 10/100Base-T Port.
Output frequency	1 – 1000 Hz
Serial Output Protocol	Up to 15 parameters, user customized (NMEA)
Peripheral Interface	1xAuxiliary RS232 (for GNSS INTEGRATION)

Hardware

Operating Voltage	6.5 to 36 V
Power Consumption	<2.5 W
Boot time	<15 sec
Operating Temperature	-25 °C to 70 °C
Environmental Protection	IP68
Shock Limit	100 g
Min Dimensions	7.5×7.5×6.5 cm
Max Dimensions	7.5×7.5×7.5 cm
Weight (approximately)	<500 grams

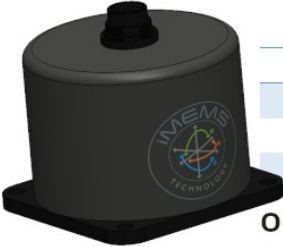


Housing Material:

iMEMS recommends **Titanium** Enclosure providing high strength, low density and corrosion resistance for harsh environments applications, for weight critical applications, **Aluminum** Enclosure is also available upon request.



Product range:



customize your order
Aurora-X-Y

X	series	Y	Available Parameters
	Aurora	A	Roll, Pitch, Yaw
P	Aurora+	H	Heave
		F	All Parameters

Order number examples:
Aurora-A: Aurora series with Roll, Pitch and Yaw.
Aurora-P-F: Aurora+ with all parameters available.

Aurora is available in an OEM package suitable for integration into larger products or an enclosed package for external and standalone use.

What is an IMU:

- **IMU (Inertial Measurement Unit).**
- **IMU uses basically 3 accelerometers and 3 gyroscopes.**
- **The IMU is designed to perform the following tasks:**
 - Measure Euler angles. **Roll, Pitch, Yaw**, which is three angles that describe the orientation of a rigid body in the space with respect to a fixed coordinate system.
 - linear velocities and the linear accelerations.
 - **Heave Motion** for marine applications.

Accurate heave measurements are extremely important in the application of marine field to actively compensate for wave motion of a ship.

Active heave compensation (AHC) systems require an accurate estimate of the vertical vessel motion in order to decouple the offshore crane's lift operation from the motion of the vessel.

In **Aurora IMU** the heave motion is estimated based on measurements from the accelerometers using an adaptive heave filter. Our custom Field Programmable Gate Array (**FPGA**) guarantees high accuracy and no latency heave estimation.

Why Aurora?

Aurora offers low cost, high accuracy IMU solutions, this was achieved by our **FPGA & DSP** integration in our electronic design.

iMEMS engineering teams decided that it is time to bring new ideas in the field of data processing and integration, using the cutting edge technology provided by the **FPGA**, we have achieved a unique design that allow our IMU to process data at extreme high speed and in real time.

With focusing on data processing and noise filtering and not extremely high cost gyroscopes and accelerometers Aurora has achieved high performance at low cost.



Aurora internal filter runs at minimum speed of 1000Hz and data can also be output at this rate over high speed Serial Port or over Ethernet. its low manufacturing price and great immunity to noise and vibrations makes it the best choice for unstable platforms control.

iMEMS IMU Control Panel software:

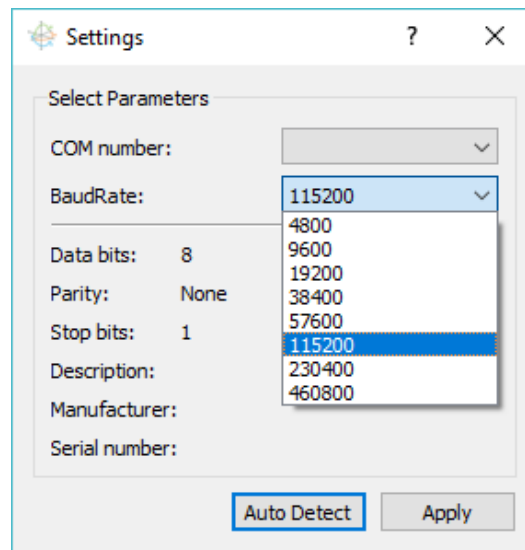
iMEMS provides a simple and a user friendly IMU Control Panel Software, which uses the Serial Port or/and Ethernet for testing, configuration and logging with the IMU.

The control panel is available for both Windows and Mac OS.

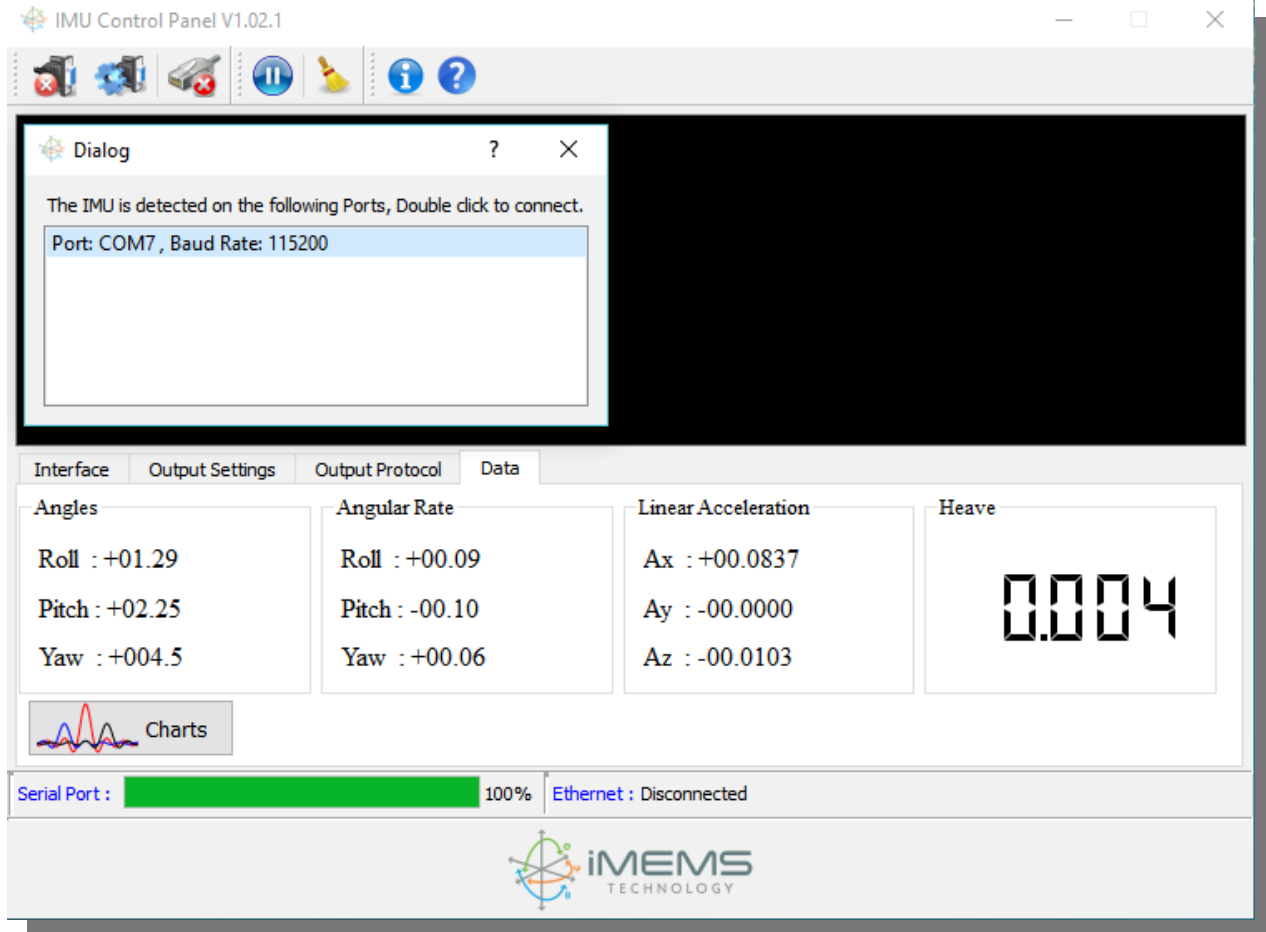
Aurora is an easy go device, plug in the IMU, configure the baud rate or just use **Auto Scan** option -in case you are using the serial Port- click on the connect buttons, the Terminal software will find the IMU.

Note: check the most updated version on the website for new features.

<https://www.imems-technology.com/downloads>



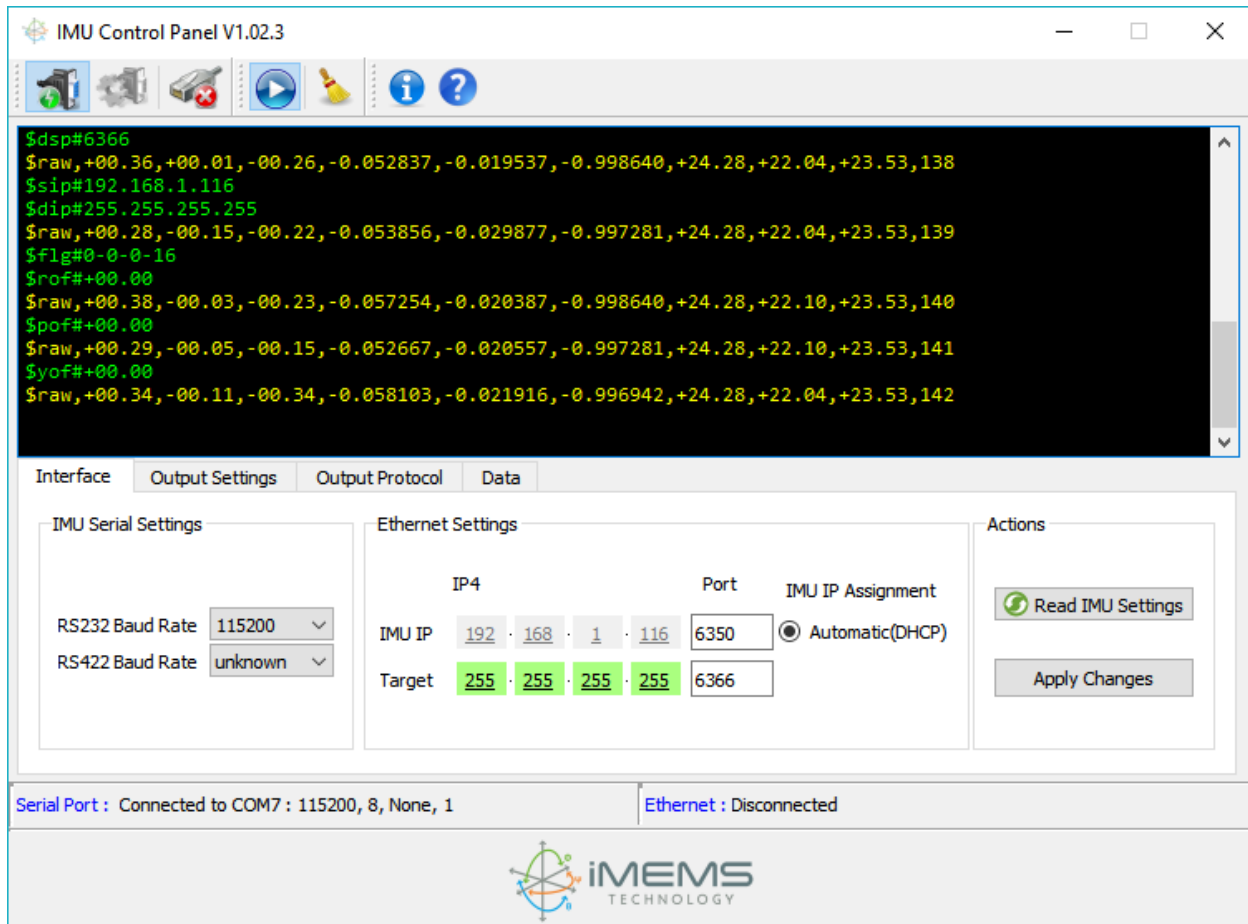
Control Panel – Auto Detect Mode



When the scan is successfully done, the control panel will read and display all the IMU settings and parameters.

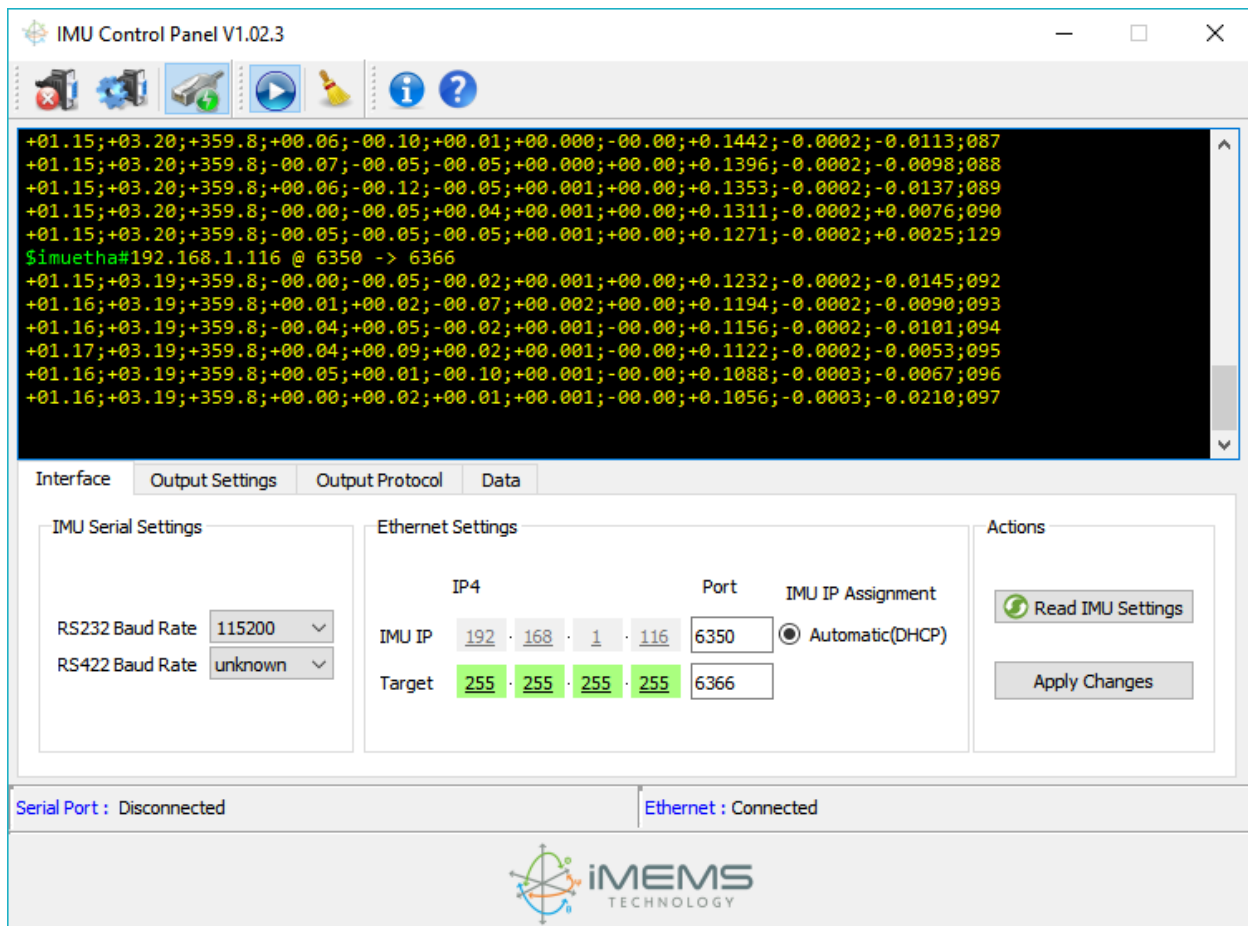
Control Panel – Interface Tab

the control panel while reading and displaying all the IMU user settings and parameters using the serial port Interface option.



Control Panel – Interface Tab (Ethernet)

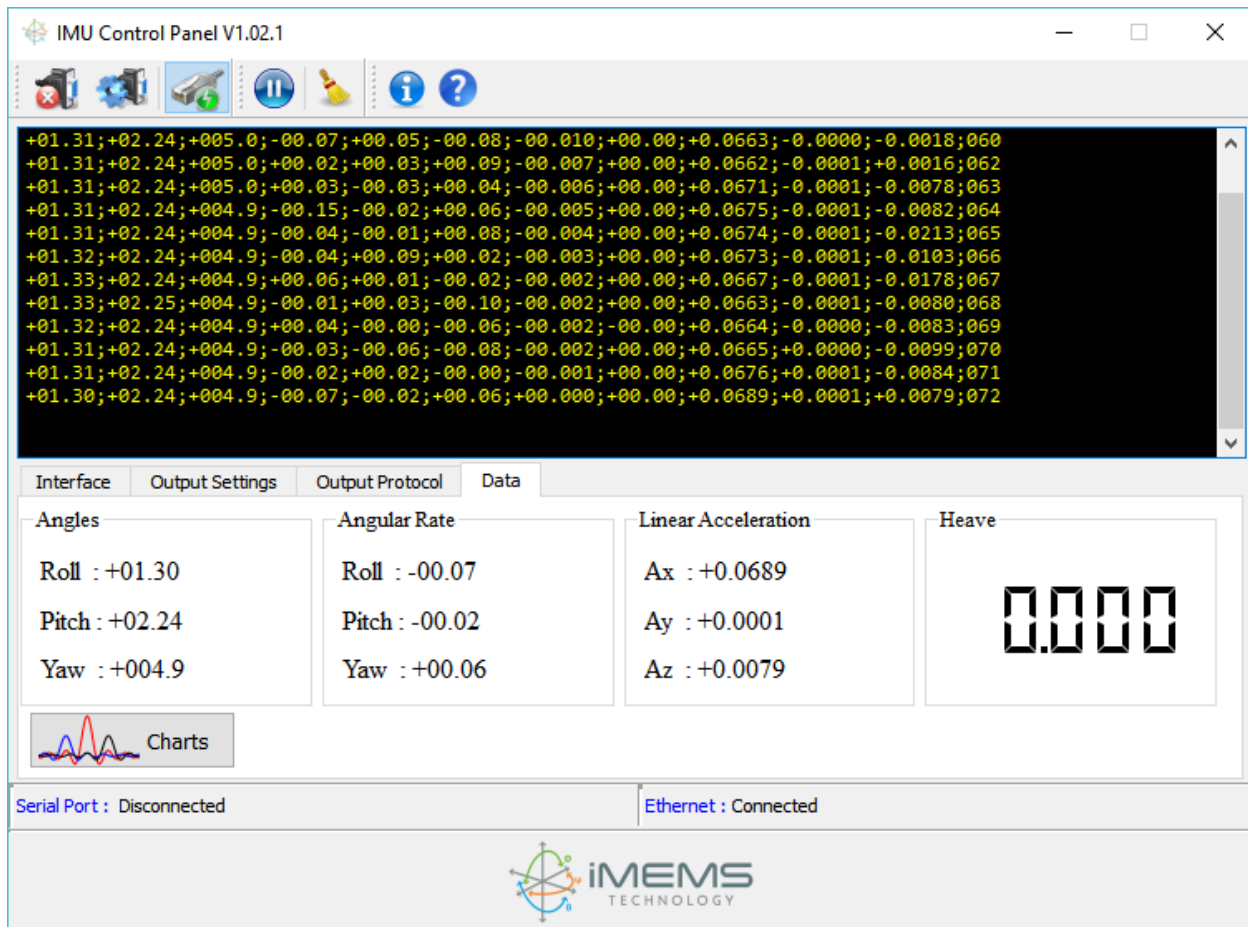
if you are using the Ethernet, no IP or port number settings is required to initialize the communication, the terminal software will just scan the network find the IMU, display all the information, then you can choose the port number and the IP you prefer.



the control panel tabs allow the user to switch between different options, either for redefining the Motion Sensor settings, or for output data visualization using the Data tab.

Control Panel – Data Tab

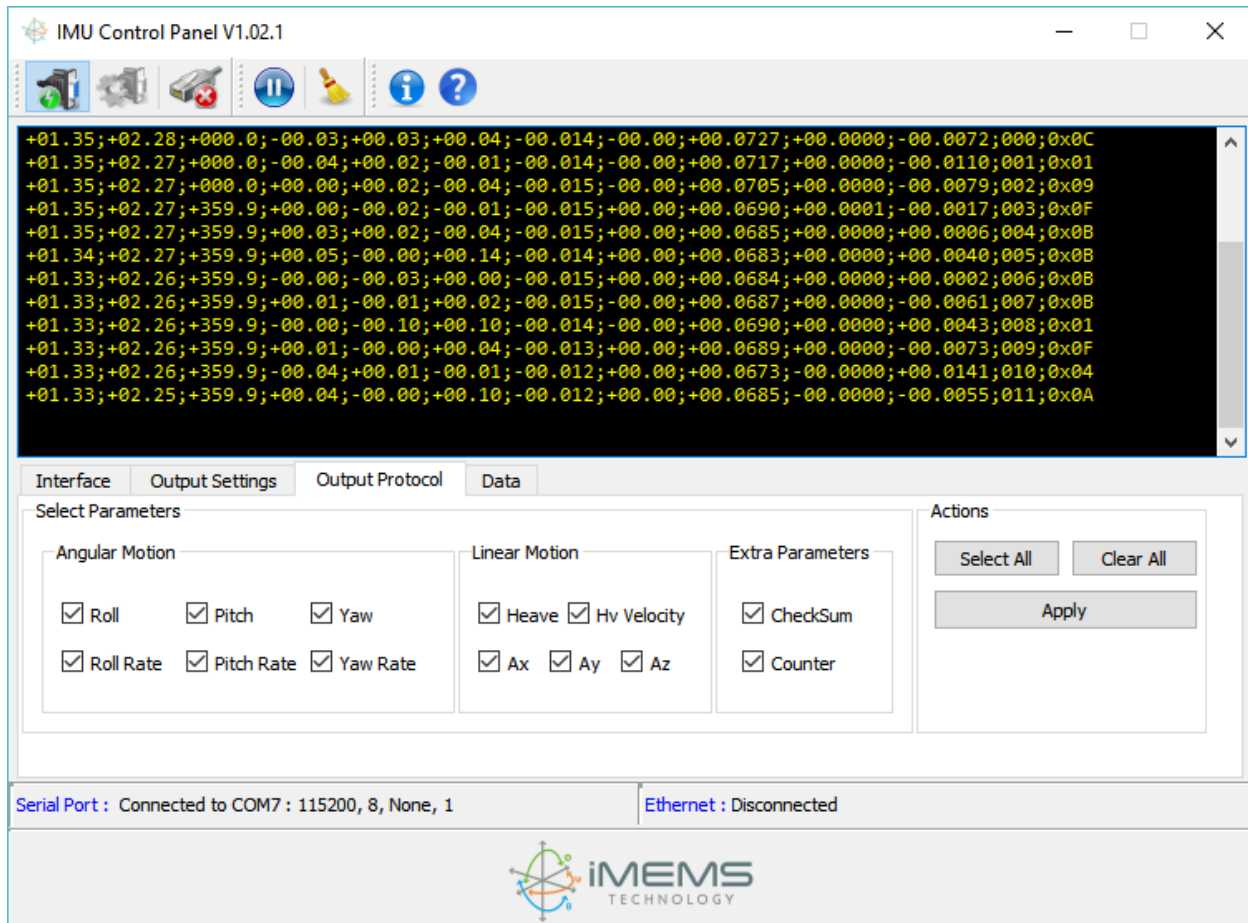
output data visualization when the Data tab is active.



Control Panel – Output Protocol Tab

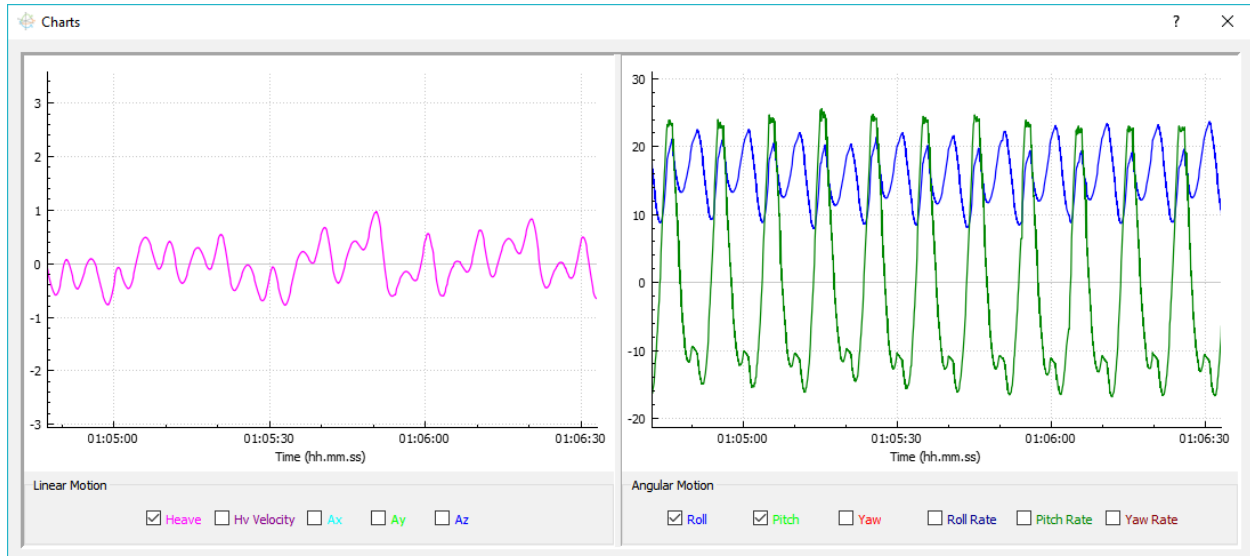
The Output Protocol tab allows the user to configure the output string format, just tick the checkbox next to the desired parameter name, then click the Apply button.

Note: this applicable only for Standard Serial Port output, the Ethernet output use binary format, and transmit all the parameters at once using UDP packet.



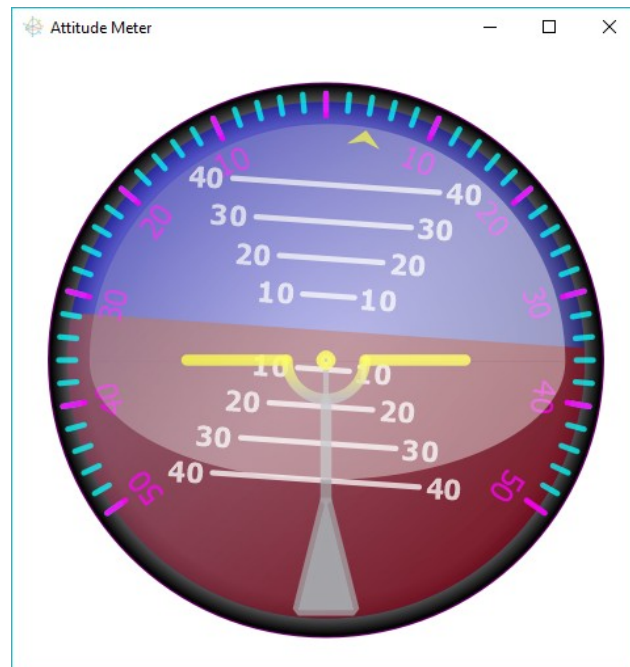
Control Panel Chart Viewer

The IMU Control Panel offers a very flexible floating window for charts view in real-time.



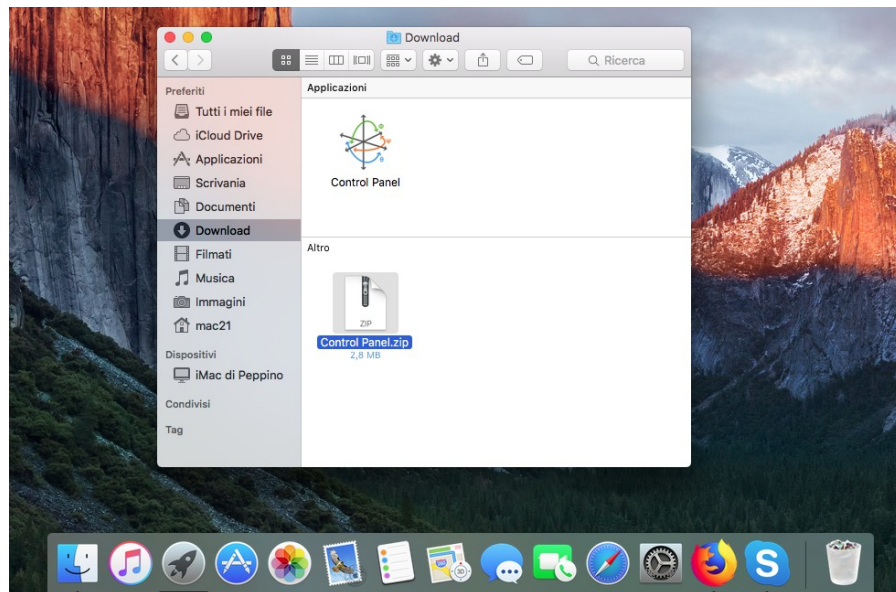
Control Panel 2D & 3D Viewer

The IMU Control Panel offers a very efficient 2D and 3D data visualization options in real-time.



Control Panel for Mac OS users:

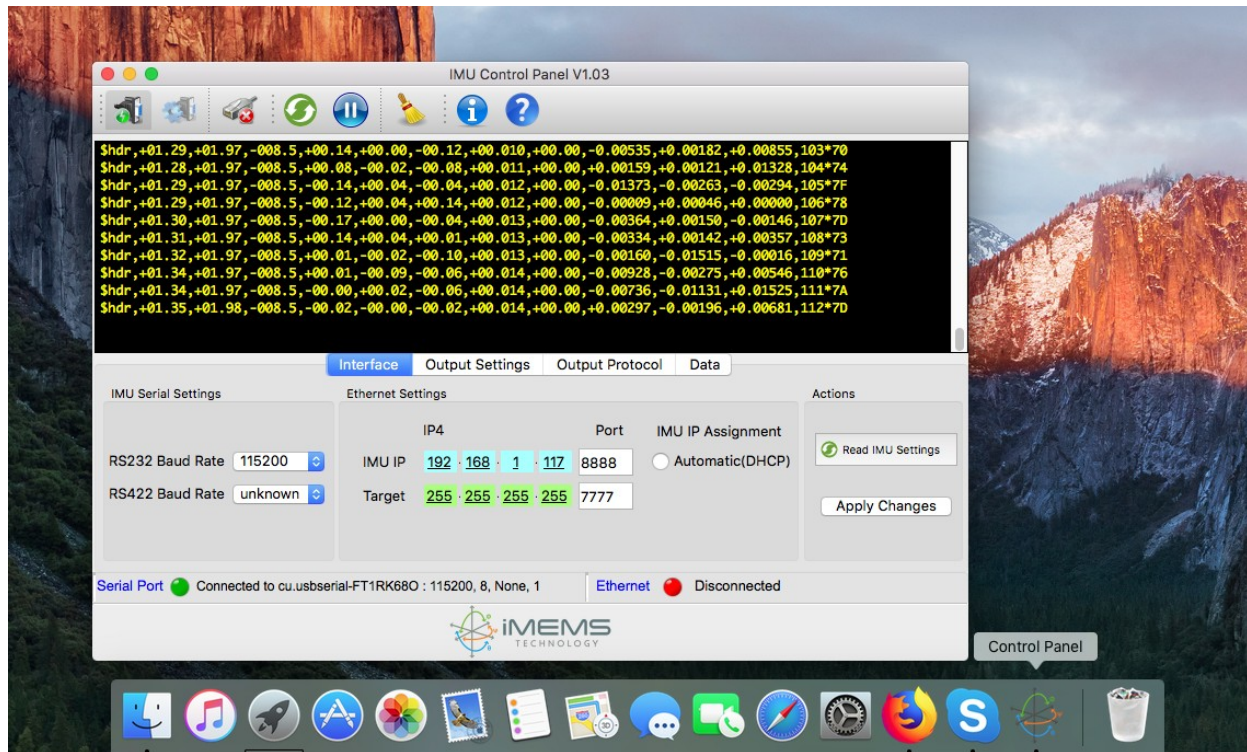
the control panel is available as an application package for Mac OS, after downloading the compressed package, you just need to extract it in your application folder and double click to use the application.



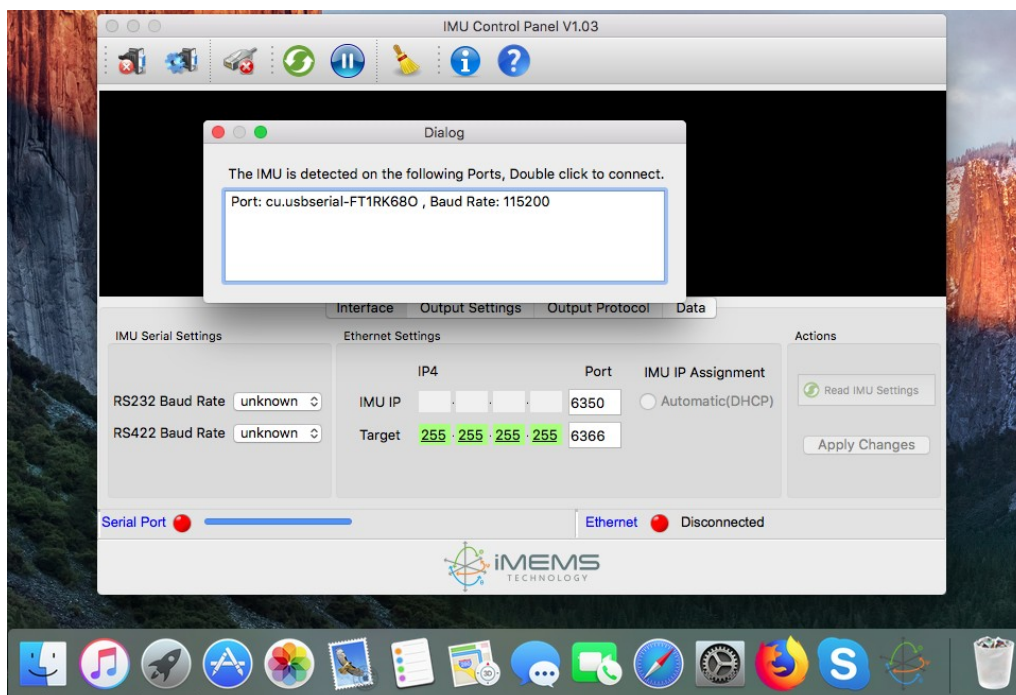
Drag and drop the application package in your application folder.



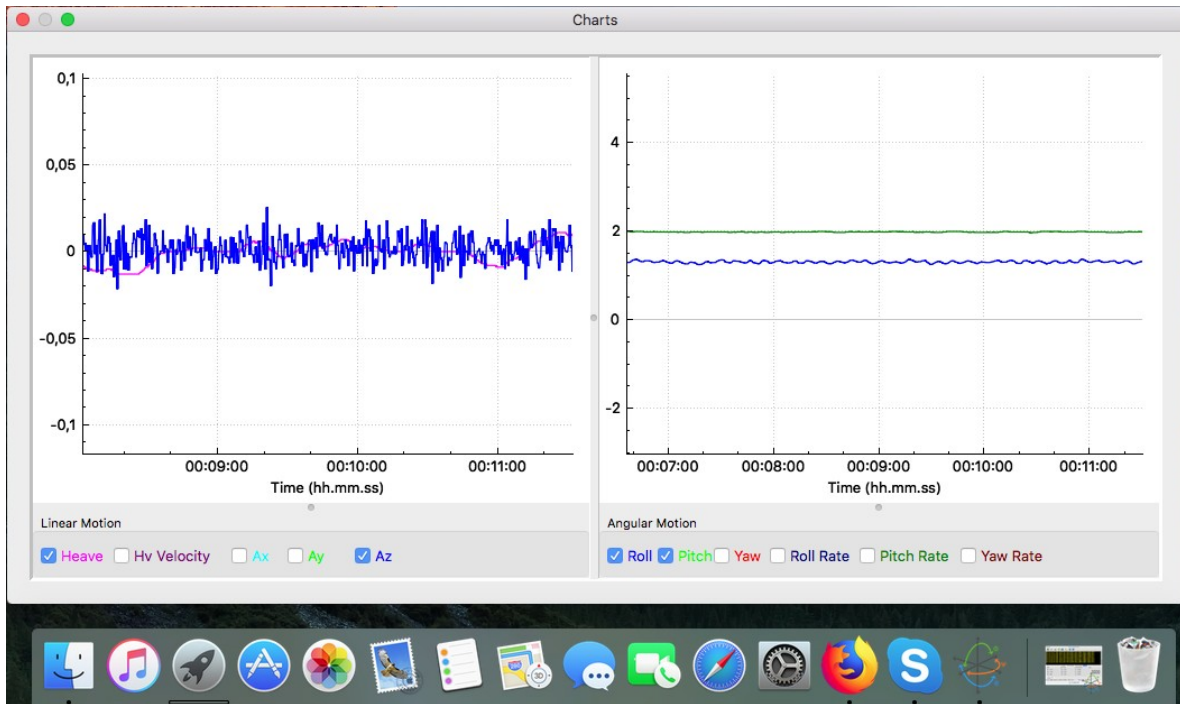
double click to use the application in your OS.



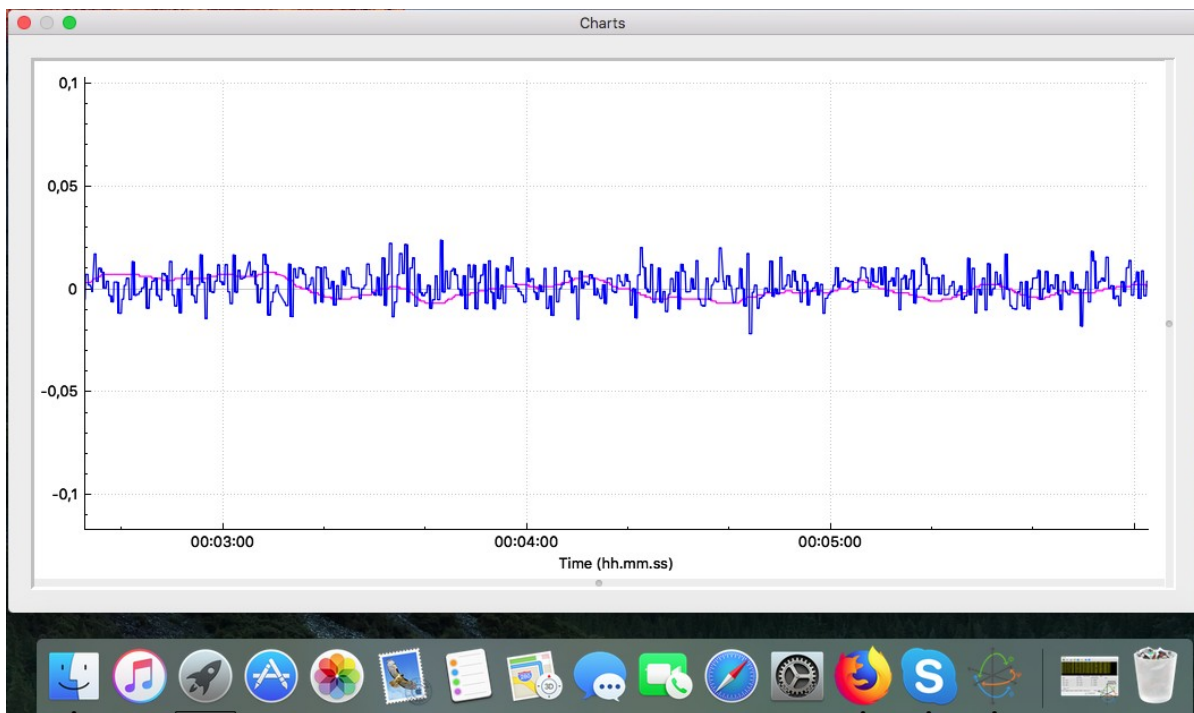
You can enjoy all the functionality of the software on Mac OS, including the Sensor auto detection and the charts view.



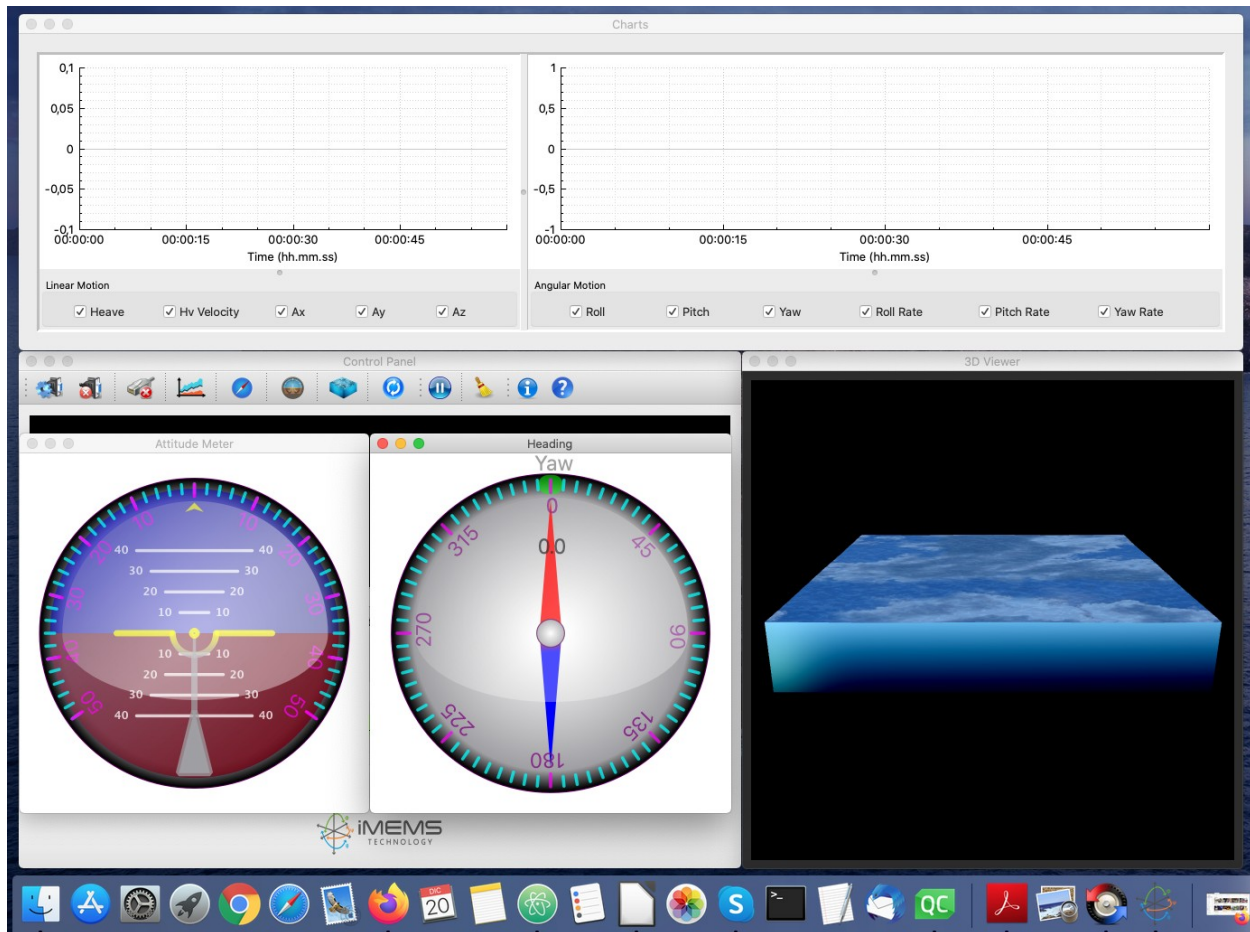
Charts view in Mac OS.



Expand or overlap the chart for higher resolution view.



Control Panel 2D & 3D Viewer(Mac OS)



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