

### Description:

The Marine Innovation High Resolution Acquisition board is an analog input module with a very low noise amplifier and a high resolution ADC. Both component selection and circuit board design have been done in order to deliver measurements with the lowest possible noise. The acquisition board is galvanic isolated and has its own low noise power supply. Analog and digital/power parts of the board are divided and shielded.

A relay on the input allows the analog board to perform its own offset calibration and thereby eliminating offset errors from both the ADC and the input amplifier.

Specifications	MI - Highres. Acquisition board			Unit
	Min	Typ	Max	
Number of channels		1		
ADC resolution		24	31 <sup>1</sup>	bits
Type of ADC		Delta-Sigma		
Overvoltage protection		+/- 36		V
Input voltage range <sup>2</sup>	+/-250m		+/-20	V <sub>p-p</sub>
Input coupling		DC		
Input configuration		Differential		
Input impedance		200k		ohm
Programmable gain	1		64	(1, 2, 4, 8, 16, 32, 64 x gain is possible)
Input noise <sup>3</sup>	0.25		20	$\mu V_{rms}$
Gain drift			+/- 3	ppm
Offset drift			T.B.D	
Input voltage		12		V
Input power		700		mW
Galvanic isolation voltage rating	1000			V <sub>rms</sub>

<sup>1</sup> 31bit output is possible

<sup>2</sup> Depends on preamplifier gain set-up

<sup>3</sup> Depends on gain set up and sampling rate

**Typical application:**

The acquisition board can be used stand alone with an SPI-interface to a computer, but is mainly intended for embedded data acquisition systems. The isolated SPI and control signals allow for easy integration to microcontrollers or FPGA's

The figure below shows a typical application for the high resolution module. For measurements that requires deterministic timing an FPGA combined with the PPS signal from a GPS can provide *us* timing accuracy. The number of input channels can be scaled to the applications.

