PoLabs

CurrentSens

User's manual

v1.0

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Contents

1 Introduction

CurrentSens is the current probe for oscilloscope and measuring equipment that is able to measure AC and DC currents. The goal was to make affordable yet high quality instrument that would allow users to have the capability of measuring time varying currents. The design is simple and intuitive. On one side there is two pole connector that you wire your measured current through. On the other side, we have a BNC connector that you directly connect to the oscilloscope for displaying the waveform of the current. We offer multiple probes that range by their current rating and therefore sensitivity. The current range is traded for sensitivity since output signal is limited to 5V, entire current range have to be represented with that voltage. Sensitivity is represented as how much voltage on the output we get for every ampere of current flowing through the sensor.

Current range RMS	Sensitivity
25 A	25.0 mV/A
15 A	41.7 mV/A
12 A	50.0 mV/A
8 A	75.0 mV/A
5 A	125.0 mV/A

Sensitivity is therefore ranging from 25mV/A for highest current range and 125mV/A for the lower current range.

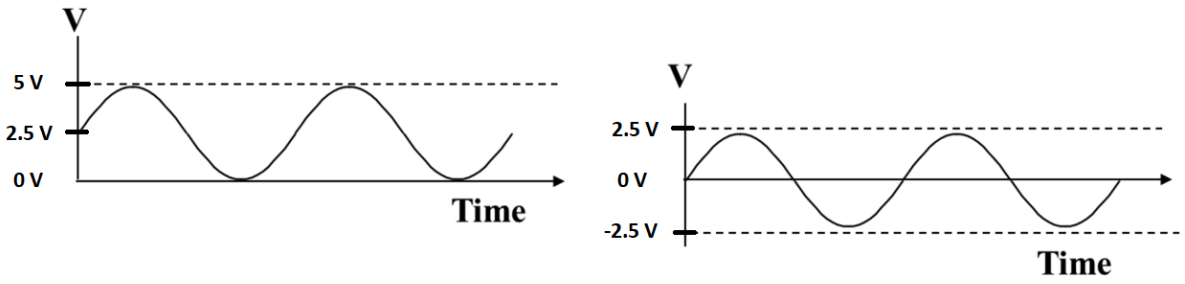
The accuracy of the sensor is 0.7% at the rated current and linearity is 0.1% which is order or magnitude better than comparable current probes and enables really precise and accurate measurements.

Bandwidth of the sensor is 200 kHz meaning currents from DC to that frequency can be measured with almost no loss in signal. Compared to similar current clamp probes that is factor of at least 10 higher and the accuracy of measurement is higher as well.

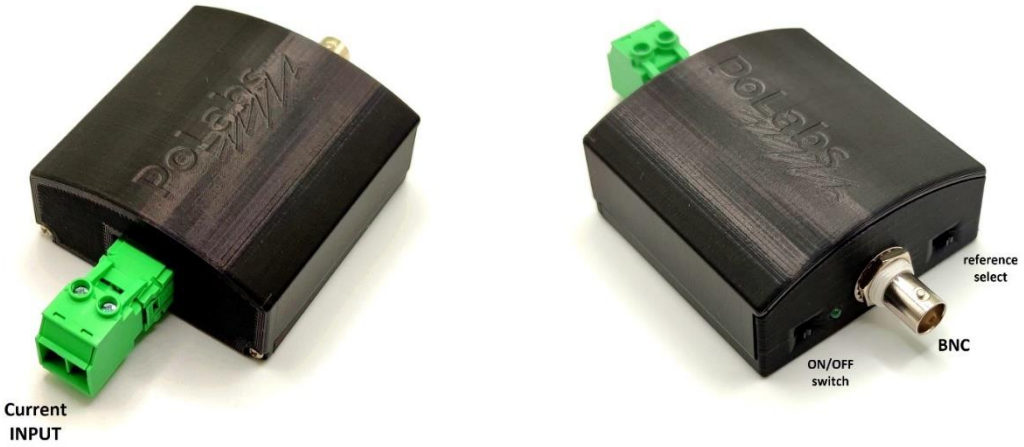
The connector for current is galvanically isolated from the measuring side, so it is safe to measure on voltages up to 450 V RMS and peak discharge voltages up to 1000 V. Please practice safety precautions when measuring and dealing with high voltages.

The CurrentSens has two switches. One is on/off switch with LED on the right. CurrentSens is powered by two standard AA or NiMh batteries. If using AA batteries we strongly recommend using alkaline batteries which should not leak and destroy the device. If device is not used for longer period of time it is recommended to remove the batteries. When not using the CurrentSens it is recommended to turn it off otherwise it will drain the batteries.

The other switch is for selecting the reference. CurrentSens can measure currents in both directions. One way to display that current then is to reference the zero current from 0 V output voltage so the current flowing in negative direction is displayed as negative voltage. But if you want to measure currents with instruments that do not accept negative voltages or ADC-s you want to have zero current in the middle of the output voltage range so you can measure in both



2 Connectors and pinout

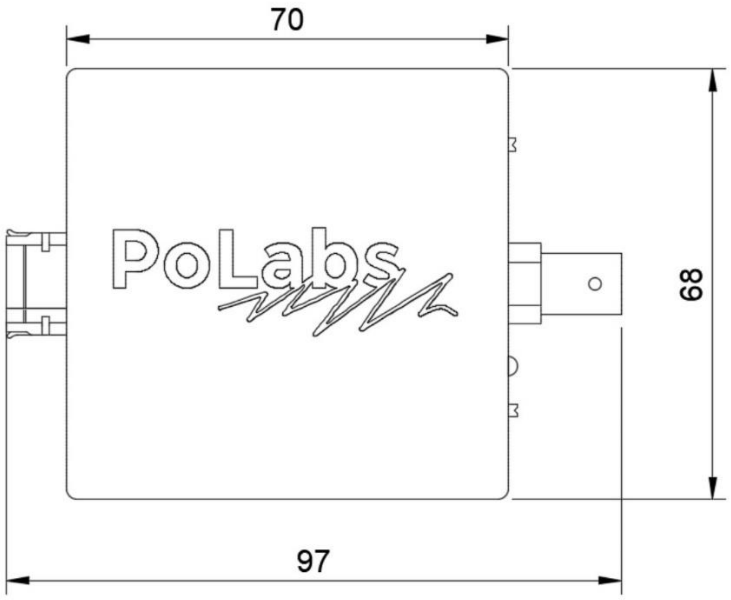


3 Usage examples

The CurrentSens probe is used for measuring currents in motors, high power DC-DC converters, observing and studying applications, development of new electronics devices, observing transient events etc.

4 Technical specification

- 25 A max RMS current
- 85 A max peak current
- Bandwidth of 200kHz
- AC and DC current measurements
- Measure on voltages up to 450 V RMS
- Powered by two cell AA or NiMh batteries
- Selectable reference voltage
- Mechanical dimensions [mm]:



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