

Factory Calibrated Hall Effect Isolated Current Sensor

P/N IS-5 1/4" aperture

P/N IS-6 1/2" aperture

P/N IS-7 1/2" aperture with screw terminals

Features:

- Linear Sensing Bipolar DC and AC current
- Factory calibrated offset and gain
- Available from 25Amp to 140+Amps (higher available with segmented core)
- Isolated (sensing wire passes thru opening)
- Bandwidth 20khz response time 15usec
- Single supply +5volt operation (4.5v to 5.5v operating range)
- Low power consumption ~8mA
- Option Output RC filter

Applications:

- Measuring high currents without loss
- Over Current protection
- Motor current control

Please specify sensitivity when ordering. 25,30,35,40,45,50,,, 135,140Amps

Example: IS-7-50A for a +/-50Amp sensor

Contact us for higher currents.

Specifications

Parameter	IS-5,6,7	
Operating Voltage	4.5V to 5.5v	Calibrated at 5.000v
Power Supply Current	8 mA typical	
Measurement Range	+/- 150 Amps Max	Factory Calibrated
Over Current Response Time	~15us	
Bandwidth	20khz	
DC Offset (with no applied field current)	5mv typical	Factory Calibrated
Sensitivity	65mv/Amp to 15 mv/Amp	Factory Calibrated
Output Center Voltage	½ Supply	
Inductance	~30nh	
Gain Temperature Drift -10C to 70C	low	
Offset Temperature Drift -10C to 70C	low	
Hysteresis Offset (After 100Amp Pulse)	low	
Linearity	~1%	
Output Swing	Supply - 200mV	
Chopping Noise	Depends on Sensitivity	
Minimum Load	4.7k ohms	

Input/Output Pins:

Pin	Name	Function
1(top)	Vc	DC power supply input voltage (5v)
2	Gnd	Unit ground input
4	Out	Analog output (~2.5v nominal)

Description

The devicecraft hall effect sensor is a low cost current sensor useful for many applications. The device consists of a special core, hall effect sensor, power line decoupling capacitor, and optional output filter.

The standard device is set to have a center voltage of 1 half the supply voltage. Depending on the direction of current the output voltage will rise or fall with increasing current. To reverse the polarity simply pass the wire through the in opposite direction.

The device can also be configured for increased sensitivity. The device can also be made more sensitive by passing the sense wire through the loop multiple times. The output voltage will be linear multiple with the number of turns.

Output Filter

The devicecraft hall effect sensor has a output filter. The output filter can be seen on the schematic. The output filter consist of the R1 C2 combination. The output filter helps isolated the output of the OPAMP from transients, filters the output, and provides short circuit protection. The output filter is not installed.

The filter can be modified. The noise from the Hall Effect sensor can be reduced further by decreasing the bandwidth. The user may also desire to decrease the bandwidth to delay the response time for any over current condition. The filter bandwidth is reduce by increasing either C2 or R1.

Note: R1 should be greater than 4.7k ohms. The unit cannot source or sink much current.

When sensing 60/50Hz current, a filter will greatly reduce the hall effect sensor chopping noise. Too low a bandwidth and the current phase will be shifted.

Sensing AC Current

The devicecraft hall effect sensor is capable of sensing both AC and DC currents. When sensing AC currents the output voltage will also be AC floating on $\frac{1}{2}$ the power supply rail. The RMS AC current can be calculated by sampling the signal and converting to a DC value proportional to the AC RMS reading. The sensed AC voltage may also be AC coupled with a series capacitor/resistor to ground and connected to a RMS to DC converter or peak detector.

When sensing AC current the output may be phase shifted or non sinusoidal. Inductive loads, such as motors, and power supplies using peak rectification will produce a phase shifted or distorted sine wave. The sensed current waveform along with the AC voltage can be used to accurately calculated the power factor.

Power Supply

The power supply for powering the unit must be stable. The offset is rated for $\frac{1}{2}$ the power supply voltage. Any noise or ripple on the power supply will be reflected in the output.

The unit is calibrate with an accurate 5.000v power supply. If a 5.200 volt power supply is used the offset voltage will be 2.600v rather than 2.500 volts.

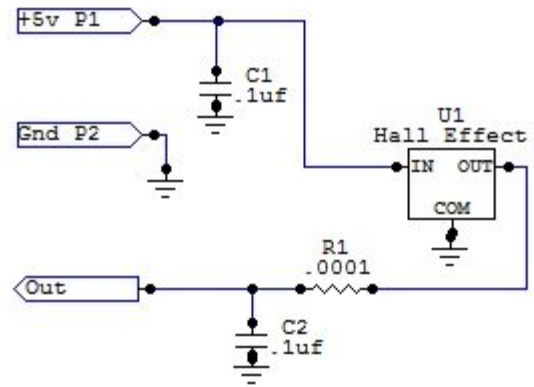


Illustration 1: Note: C2 not installed

