Micro Periferals Improved Bi-directional Current Sensor Module by Roland W

The module is based on the ACS758(B) Hall Current Sensor and is featuring an active Low Frequency Filter, plus a Voltage Reference Source of 1,5V.

This sensor module, as shipped out, is optimized for DC current measurement as it will radically filter out any AC component in the output signal of the ACS758! It is designed to coop with a very noisy and ripple contested DC source.

But because this is an active device, the bandwidth of the original sensor is a little bit reduced and are as well dependent on the Vcc used. A higher Vcc is better for the module bandwidth.

Module limitaltions vary by the chip used, and are as follows:

ACS758-100B: max. current 85A (at 5V Vcc), 60A (at 3,3V Vcc)

ACS758-150B: max. current 120A (at 5V Vcc), 90A (at 3,3V Vcc)

DC application:

The sensor output will be Vcc/2 at zero current, and then it will increment the voltage by typically 20mV per each Amp going through the sensor. Reversed current flow will cause a similar decrease in the output voltage.

How to use a Microcontroller to measure current:

1. When you start up your MCU, include the command to read the analog input which is used to read the sensor, while no current is flowing, so that the MCU can store the "Zero-value" for further operation

"ZeroVoltage=(Vcc/Number of the ADCs max value)xZeroReading

2. Inside the Loop, you can then read out the sensor periodically "ActualReading".

The sensor voltage is calculated by:

"ActualVoltage" = (Vcc/Number of the ADCs max value)xActualReading

Number of the ADCs max value: 10bit ADC=1024, 12bit=4096, 16bit=65536, etc

The current is calculated by:

(ActualVoltage-ZeroVoltage)/SensorIncrementFactor expl: 0,020V per 1A

The SensorIncrementFactor will normally be 20mV/A but might differ a little from sensor to sensor. That's why you should compare the measurement with a multimeter and adjust the SensorIncrementFactor if necessary.