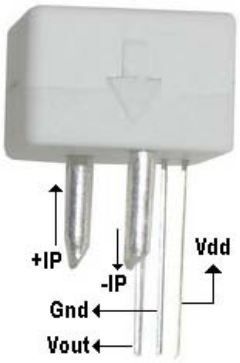
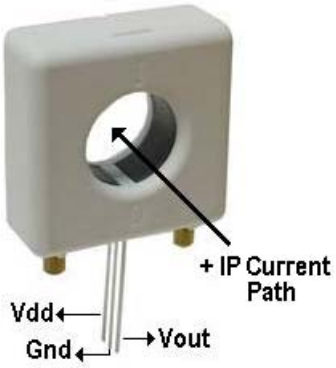
Winson Semiconductor Corp.
Tel:886-3-6673166 Fax:886-3-6673167
2F, No.193,Gaotie 8th Road,Zhubei, Hsin Chu,TW
Website: www.winson.com.tw

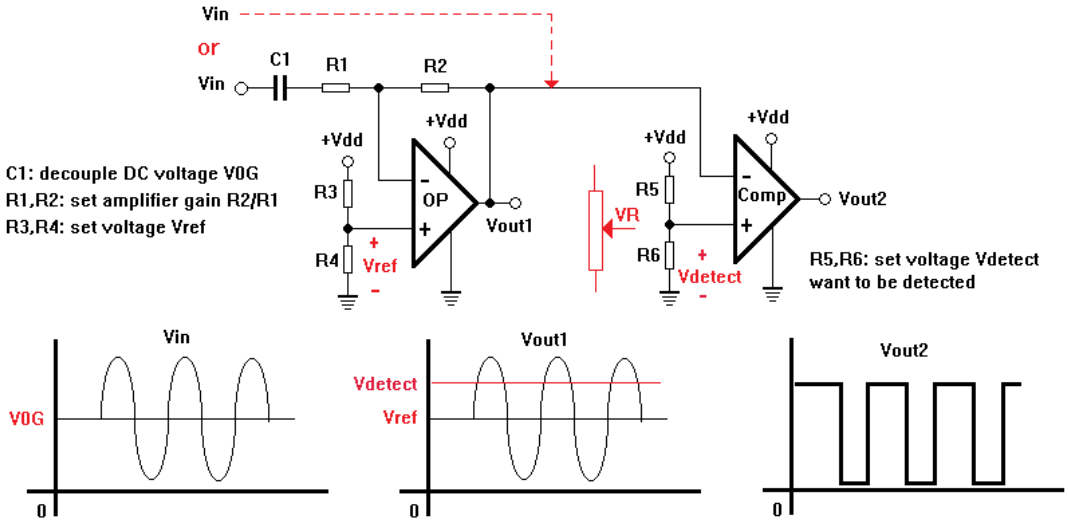
WCS current sensor Application note





To precisely measure the current by using WCS series products is easy and straight forward. First connect the conductor in series with the current path you plan to measure (or pass conductor through the conductcor hole) and apply 5V between Vdd and Gnd (Fig. above). Then you already finish the hardware settlement of WCS series current sensor.

Over current detection:



The above circuit can detect current and protect your system from over current or short circuit.

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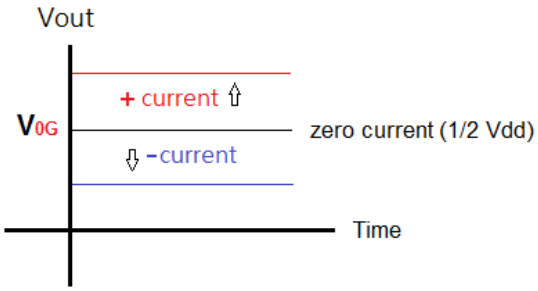
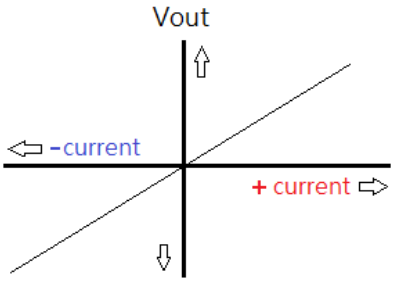
DC Current measurement:

1. **Zero current:** measure the output's voltage V_{0G} when no current pass through.
2. **Calibration:** Pass an already known current (for example: 10A) through the current sensor and measure the output voltage V_{10A}. The sensitivity of this current sensor is **Sensitivity = (V_{10A}-V_{0G})/10A unit: V/A**
3. **Start Measurement:** you can measure any current by the following equation. **Current = (Vout-V_{0G})/Sensitivity (A)**





AC Average Current measurement:

1. **Zero current:** measure the output's voltage V_{0G} when no current through.
2. **Software Solution**:

   2.1 Pass an already known AC current (for example: 10A) through the current sensor

   2.2 Connect sensor's output signal $Vout_{10A}$ directly into analog input of micro-controller

   2.3 Write a program to calculate the area of several TT periods of AC signal, the higher sampling rate per TT period the more precision you get.

   2.4 Divide "Area/TT" and get the average value of $Vout_{10A}$

   $Vout_{10A\ average}$ = Average(Σ |Vout-V_{0G}|)

   2.5 Calibrate the Sensitivity of current sensor by

   Sensitivity = $Vout_{10A\ average}$ **/10** unit: V/A

   2.6 Start Meaurement**:** Use the same program to measure any current by equation Current = Vout/sensitivity (A)

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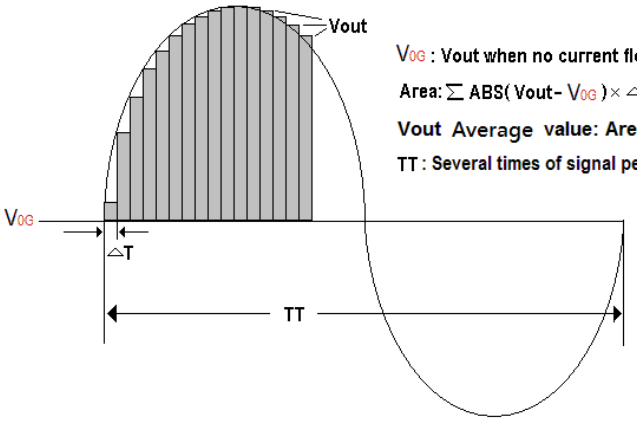

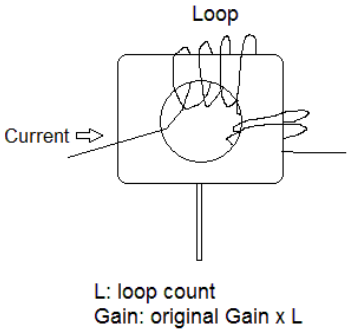

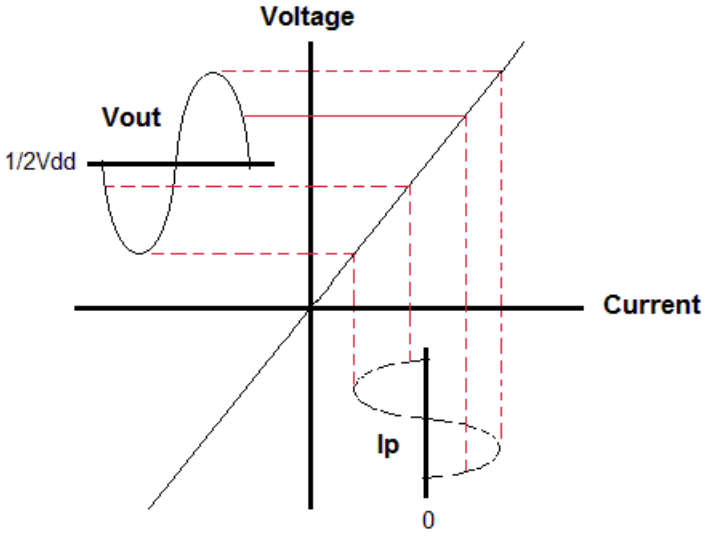

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3. **Hareware Solution**:

3.1 Pass an already known AC current (for example: 10A) through the current sensor

3.2 Connect sensor's output signal $Vout_{10A}$ into AC amplifier circuit listed below to remove DC part V_{0G} and amplify it, Amplify Gain =R2/R1

3.3 Procure the average value of $Vout_{10A}$ and calculate sensitivity

Sensitivity = $Vout_{10A}$**/10** unit: V/A

3.4 Start Meaurement**:** measure any current by the following equation

Current = Vout/sensitivity (A)