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Introduction to PIC Programming

Programming Baseline PICs in C

by David Mellisham, Gooligum Electronics

Lesson 6: Analog Comparators

[Baseline Analog Comparators](#) explained how to use the analog comparators and absolute and programmable voltage reference sources available on baseline PICs, such as the PIC16F50, using assembly language. This lesson demonstrates how to use C to access these facilities, in conjunction with the examples using Microchip's XC8 compiler in "Free mode" and CCS' PIC8 compiler.

In summary, the lesson covers:

- Basic use of the analog comparator modules available on the PIC16F50
- Using the internal absolute 0.6 V voltage reference
- Configuring and using the internal programmable voltage reference
- Enabling comparator output to facilitate the addition of external resistors
- Wake-up on comparator change
- Driving Timers off an comparator output

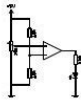
with examples for XC8 and CCS PIC8.

Comparators

As we saw in [Baseline Analog Comparators](#), an analog comparator is a device which compares the voltage present on its positive and negative inputs. In normal (non-inverting) operation, the comparator's output is either logical "high" only when the voltage on the positive input is greater than that on the negative input, otherwise the output is "low".

As usual, they provide an interface between analog and digital circuitry. In the circuit shown above, the comparator output will go high, lighting the LED, only when the measurement is not in operation past "halfway", i.e. positive input is greater than 2.5 V.

Comparators are typically used to detect when an analog input is above or below some threshold (e.g. if no comparators are used, within a defined band) - they are useful for working with many types of real-world sensors. They are also used to digitalize inputs to match different logic levels, and to shape poorly defined signals.



* XC8 is available as a free download from www.microchip.com and CCS PIC8 is licensed for the v80-M0-08

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