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problem 4:

a) MICRO CONTROLLER CLOCK SRC:

Every microcontroller chip uses a clock, which keeps track of time for the chip, in general one assembly code instruction is run every clock cycle.

The Clock Source can be either of the following:

* Internal Clock
* External Clock

‘Internal Clock‘ means the little oscillator inside the chip. This clock is good for most basic projects, but its not very precise. Having an internal oscillator means we don’t need to wire up an external crystal and hence we can use the clock pins for other tasks. Literally, ‘ External Clock‘ means that a square wave is being input into the ‘CLOCK-IN’ pin, but this option is rarely used. If we need a special clock rate (for example 12MHz) we can use an external crystal or oscillator.

Crystals come in different pacakges, with the speed printed on the body, usually in MHz. Ceramic resonator is an alternative to the common crystal. Crystal is a 2-pin component, but ceramic resonator have 3 pins.

b) INTERNAL MICRO CONTROLLER USAGE:

Many AVRs (like ATmega8, ATmega16, ATmega32) have internal RC oscillator. It is calibrated for 1,2,4 or 8 MHz. It has +-3% accuracy. Frequency of oscillator gets affected by VCC and temperature. If you are not performing any time critical operations in your system, then this is best option to go with. Following table shows how to set CKSEL fuses for different frequencies. This table can be found in corresponding AVRs datasheet. CKOPT fuse should always be unprogrammed while using this option.