

C9 – Analogue Input

Preparation

1. The ADC's are 10 bit resolution (0-1024).
2. There are 8 single ended inputs, all of which can be found on port A.
3. A channel is selected by setting the ADMUX register.
4. $0x00FF = 255$, $3.3 * (255/1024) = 0.8218V$
5. The prescaler can range from 2 to 128, so 6MHz to 94kHz. But it takes 13 clock cycles to complete a measurement so the prescaler must be greater than 13, so therefore the fastest is 16.
6. The chip requires 13 clock cycles to complete a measurement.
7. You can set the prescaler to 16 by setting bit ADPS2.
8. `ADCSRA |= _BV(ADSC);`
9. `while(!(ADCSRA & _BV(ADSC)));`
10. Auto triggering is when the ADC automatically starts the conversion. This can be set with the ADSC bit in ADCSRA and then the source can be chosen with register ADCSRB.
11. Free running mode is when the ADC keeps sampling and updates the registers straight after the previous conversion. This is enabled by setting ADSC in ADCSRA and setting ADCSRB to 0.