Analog to Digital Converter

Application Note

# Introduction

The goal of this document includes the following:

* Add description

# Hardware

* 4-channel Analog-to-Digital Converter (ADC)
* 10-bit 312 K samples/sec. Successive Approximation Register ADC
* -2/+2 LSB (Least Significant Bit) Integral Non Linearity, -1/+1 LSB Differential Non Linearity
* Individual enable and disable of each channel
* External voltage reference for better accuracy on low voltage inputs
* Multiple trigger sources
* Hardware or software trigger
* External trigger pin
* Timer Counter – 0 to 2 outputs: TIOA0 to TIOA2 trigger
* Sleep mode and conversion sequencer
* Automatic wakeup on trigger and back to sleep mode after conversions of all enabled channels
* Four analog inputs shared with digital signals

ADC3 is located on pin 9 of the WB45NBT connector.

# Software

The A/D Converter is accessed through the AT91 ADC driver. (<http://www.at91.com/linux4sam/bin/view/Linux4SAM/IioAdcDriver>)

## Accessing the ADC in Linux

If the driver is not included in the kernel, load it.

|  |
| --- |
| # modprobe at91\_adc |

The driver create entries in the following location:

|  |
| --- |
| /sys/bus/iio/devices/iio:device0 |

The device(s) allow access to the raw value being read on the pin along with a scale. The product of the raw value and the scale provide a voltage reading in microvolts.

Access the value being read on the ADC3 pin.

|  |
| --- |
| # cat /sys/bus/iio/devices/iio\:device0/in\_voltage3\_raw  948  # cat /sys/bus/iio/devices/iio\:device0/in\_voltage3\_scale  3222.000000 |

948\*3222 ≈ 3.0V

# Further Information

[[Use of the AT91 ADC driver](http://www.at91.com/linux4sam/bin/view/Linux4SAM/IioAdcDriver)]