

Reading And Calculating The Battery Voltage On The JN516x

Reading of the supply voltage is complicated by the fact that the ADC has a resistor network to drop the voltage to 2/3 of the supply so that it fits between 0 and 2 Vref. To calculate the voltage use the formula below for the 10 bit ADC:

$$V \times (2/3) = (2 \times vref / 1024) \times u16AdcReading$$

When using the internal VRef, the voltage is listed in section "19.3.6 Bandgap Reference" of the JN516X Datasheet as typically 1.235V. This means that the formula simplifies to:

$$V = (7.41/2048) \times u16AdcReading$$

and can be implemented using integer maths as:

```
uint32 temp = ((uint32)u16AdcReading * 7410);  
u16BattLevelmV = (temp>>11);
```

This gives the voltage in millivolts.

See below for source code

```
/* General ADC initialisation */  
vAHI_ApConfigure(E_AHI_AP_REGULATOR_ENABLE,  
                E_AHI_AP_INT_DISABLE,  
                E_AHI_AP_SAMPLE_2,  
                E_AHI_AP_CLOCKDIV_500KHZ,  
                E_AHI_AP_INTREF);  
  
/* Wait for ADC to power up */  
while (!bAHI_APRegulatorEnabled());  
  
vAHI_AdcEnable(E_AHI_ADC_SINGLE_SHOT, E_AHI_AP_INPUT_RANGE_2,  
              E_AHI_ADC_SRC_VOLT);  
  
/* Start ADC sampling */  
vAHI_AdcStartSample();  
while(bAHI_AdcPoll()){}
```

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```
vAHI_AdcDisable();  
  
u16AdcReading = u16AHI_AdcRead();  
uint32 u32Temp = ((uint32)u16AdcReading * 7410);  
u16BattLevelmV = (u32Temp>>11);
```