Riscy Workshop Lab Journal

Chapter 001

June 2022

Richard Payne

Contents

[0.0 Reference 2](#_Toc107745391)

[0.1 Weblink 2](#_Toc107745392)

# Reference

## Weblink

# Journal 2022

## 03/July/22: Current Meter Battery Replacement

* Order new battery with tab weld tooling.
* <https://www.youtube.com/watch?v=u5khY6d3qds> Need 12V Battery.
* <https://www.youtube.com/watch?v=TI_ZV-5WHi4> Approved product, identical to below order to mitigate issue. No battery needed.

Graphical user interface, text, application, chat or text message

Description automatically generated

## 03/July/22: PWM Over-Voltage Limiter

### Fundamental: Average voltage of duty cycle

* VIN = Input voltage to 30V
* VOUT = 12V Limited by PWM with fixed duty cycle.
* Va = V \* Width / Period or Va = V\*Duty
* Duty = 12V/20V = 60%
* Duty = 100% if VOUT > VIN

Chart, histogram, box and whisker chart

Description automatically generatedDiagram

Description automatically generated with medium confidence

A picture containing chart

Description automatically generated

<https://community.element14.com/technologies/power-management/b/blog/posts/how-to-compute-the-average-versus-the-rms-value-of-a-pwm-waveform>

* No need for active feedback for VOUT regulation.

### STM32: ADC12 prelim works

* FW: Upgrade ADC12 to capture A1 at 10KHz sample rate.
  + Use DMA, build in via HAL code.
  + Need to apply timer to trigger capture at 10KHz (all channels).
  + Check timing via scope.
  + Translate only on A1 channel in 30,000mV readout
  + Translate all channel via command demand only.
* HW: ADC2 channel A1 connects to 0V to 30V power via resistor 3K // 10nF + 27K: 10: 1 ratio.
  + ADC = 3V => 30V
  + ADC = 1V => 10V
  + Correction on ADC and VREF.
  + F3db = 1/(2.π.R.C) = 5K3 for R = 3K and C = 10nF.

### STM32 PWM channels

* TIM6 : Use to provide 400KHz (experiment)

Diagram, schematic

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