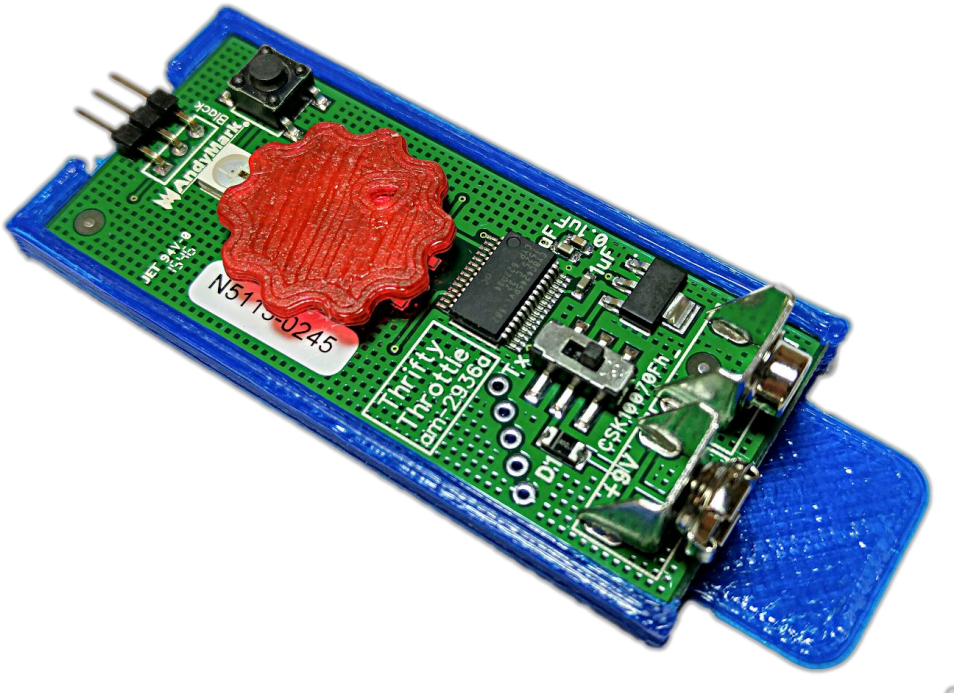
AndyMark, Inc.

Thrifty Throttle Two^{tm}
Simple PWM generator
for testing speed controllers
(and Servos too!)



User Manual
Version 1.0

12/17/2015

Overview

As the son of the AndyMark Handheld Motor Meter, the Thrifty Throttle is a low cost, no-frills alternative that allows teams to test their electro-mechanical systems before their control software is complete. It generates a PWM that can be used to drive motor controllers such as the Talon.

This second generation uses a more advanced microprocessor for a rock solid PWM signal allowing it to drive servos with no servo twitch. It also makes use of an RGB LED to better indicate what PWM range is currently in operation. Finally, it can send serial data out to a PC to allow you to see exactly what PWM rate is being output.

Features

- PWM generation
  - Standard Range (use for speed controllers) - 1000us-2000us
  - Extended range (use for servos) - ~500us~2400us
- Handheld
  - Comfortable form factor – one hand operation
  - 9V battery operation (battery not included)
- ***New for Thrifty Throttle Two***
  - Cypress PSOC4 running @ 24Mhz for solid PWM
  - Drive servos with external power source using Y cable
  - RGB LED for visual PWM range/mode indication
  - Low battery indication – Fading Yellow LED

Getting Started

- Install 9V battery (not included)
- Connect the PWM cable to the PWM output on the Thrifty Throttle – black wire toward the **Black** indicator on the printed circuit board
- Connect the other end of the PWM cable to your speed controller's PWM input – maintain correct polarity
- Switch the unit on with the power switch near the battery (up is on)
  - You should now see a white heartbeat blink pattern on the RGB LED indicating that the unit is powered and ready
  - In this mode a neutral 1500us is being output

NOTE: This unit produces a PWM signal only; it does not supply power to devices. Devices such as servos, speed controllers etc. need to be powered from a separate power supply. Servos can be powered from their own supply using a Y cable (AM-2261 or AM-2581). See Driving Servos section for details.

Basic Operation

The push button in the upper right hand corner enables and disables the PWM control.

- From the neutral mode (white LED heartbeat blink)
  - If you do a quick push-button press you will enter the standard PWM range
    - 1000us – 2000us
    - In this range the LED colors are as follows:
      - Neutral is **Orange**
      - Forward is **Green**
      - Reverse is **Red**
  - If you hold the push-button for about 2 seconds you will enter the extended PWM range
    - ~500us ~2400us
    - In this range the LED colors are as follows:
      - Neutral is **Blue**
      - Forward is **Turquoise**
      - Reverse is **Violet**
  - Now you can adjust the speed and direction by moving the red throttle wheel with your thumb
    - Clockwise - forward
    - Counter-clockwise - reverse
    - The blink speed will change with the PWM speed
  - To exit and return to neutral simply press the push button again

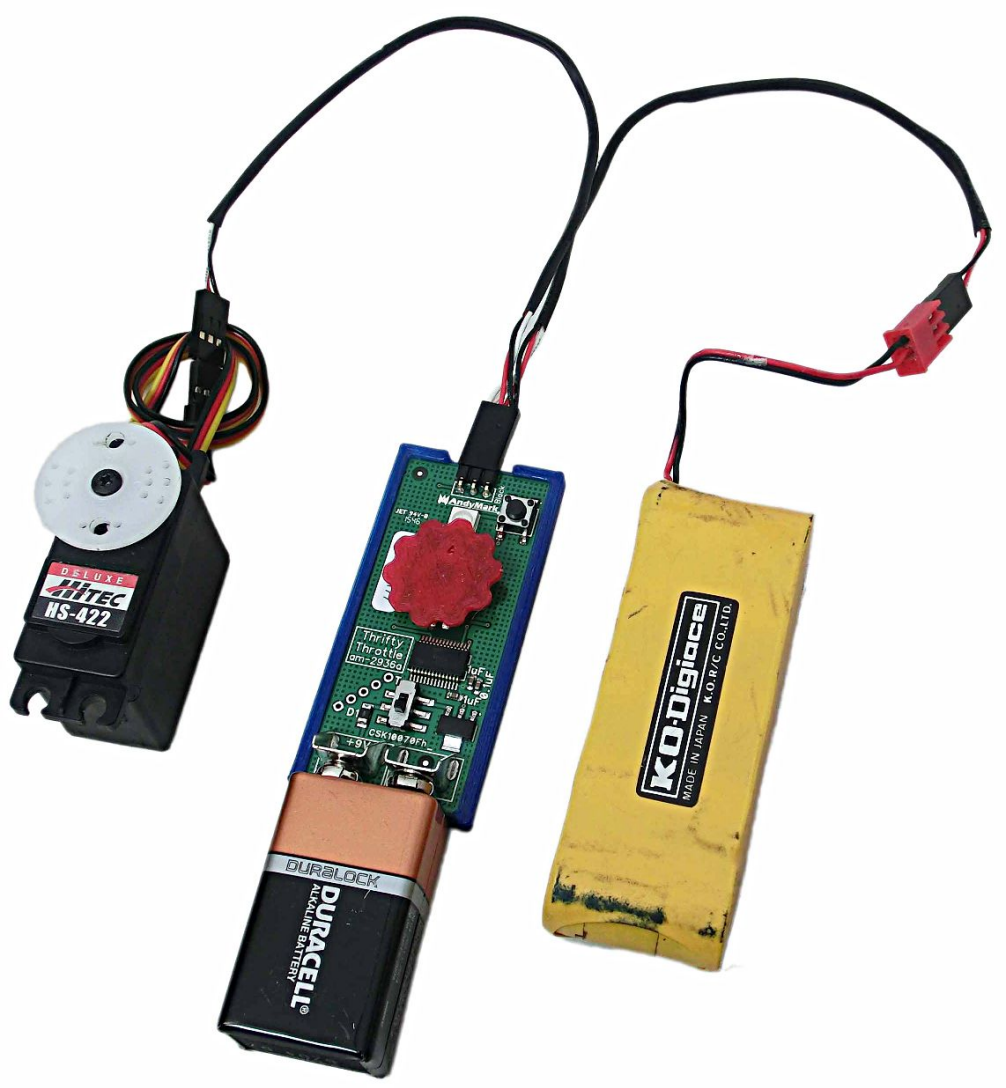
Low Battery

If the LED starts flashing a fading yellow pattern it is time to change the battery.

Driving Servos

Since there are so many servos with varying power requirements, it was decided not to power servos directly from the Thrifty Throttle. However, you can easily power such devices from your own power source (e.g. RC batter pack) using a Y cable (AM-2261 or AM-2581).

Simply plug the Y cable into the Thrifty Throttle PWM connector observing the correct polarity (black wire to Black text on connector). Plug one of the other ends into your battery and the remaining end into the servo's connector as shown below.



You are now ready to start controlling your servo using the basic operation steps detailed above.

12/17/2015