

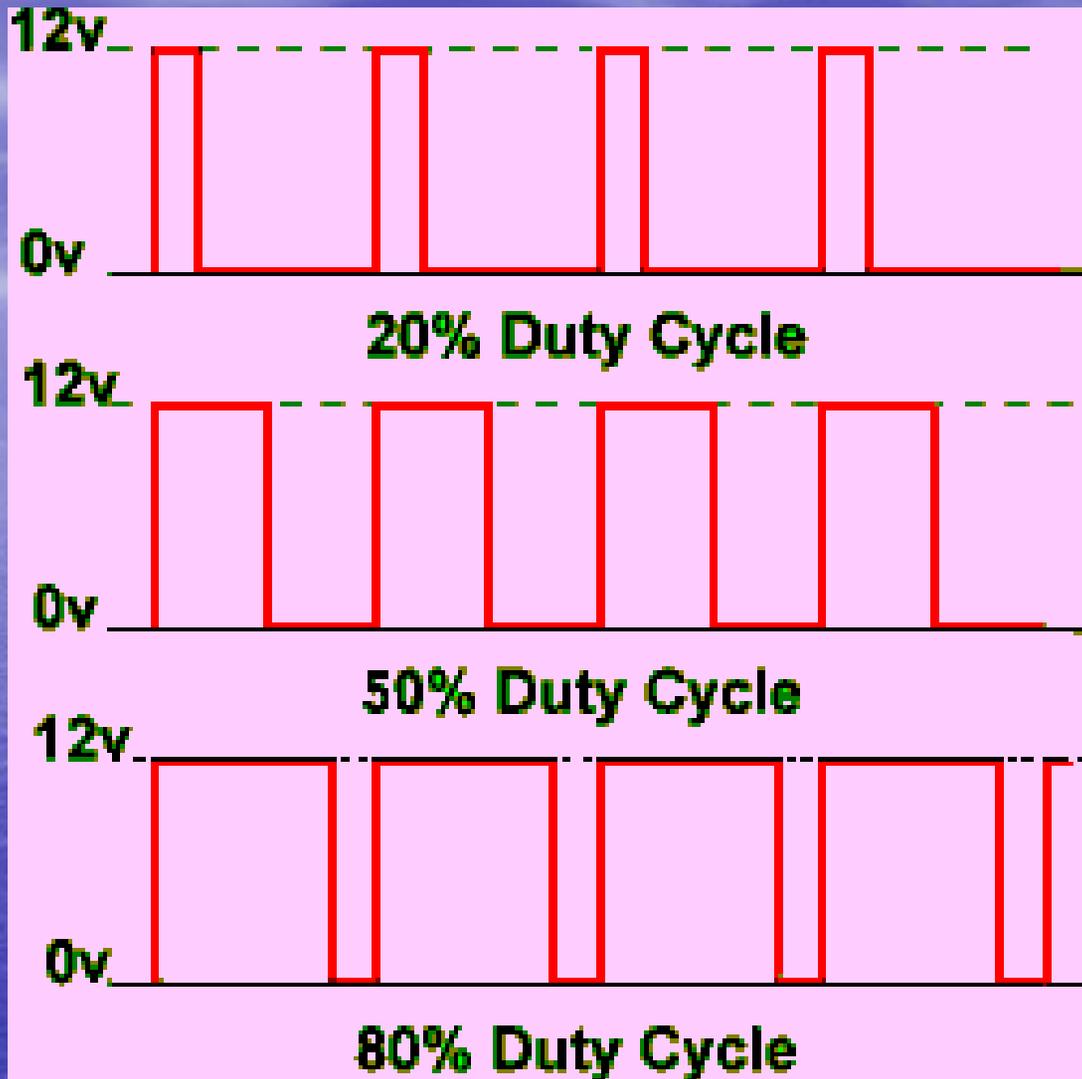
# Variable Speed Control on Solar Powered Motor Driven Fish Screens

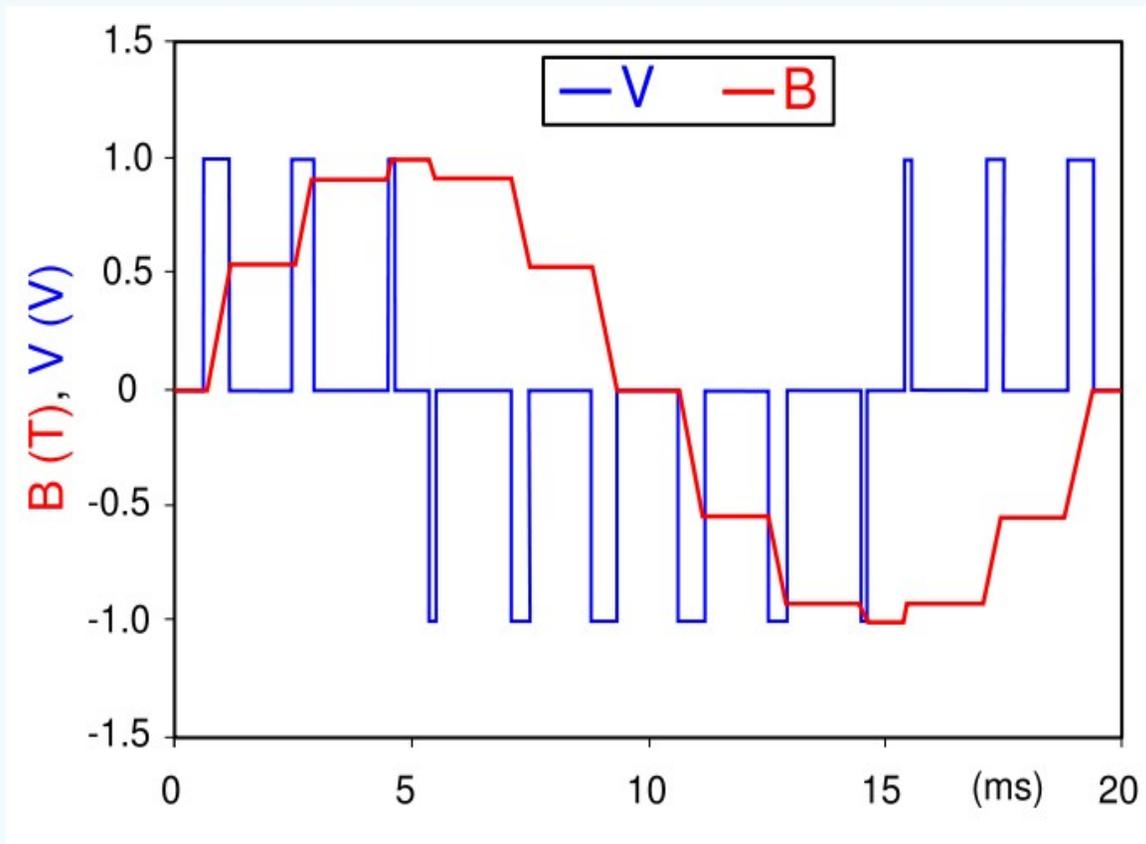
John Day Screen Shop



# I. Background

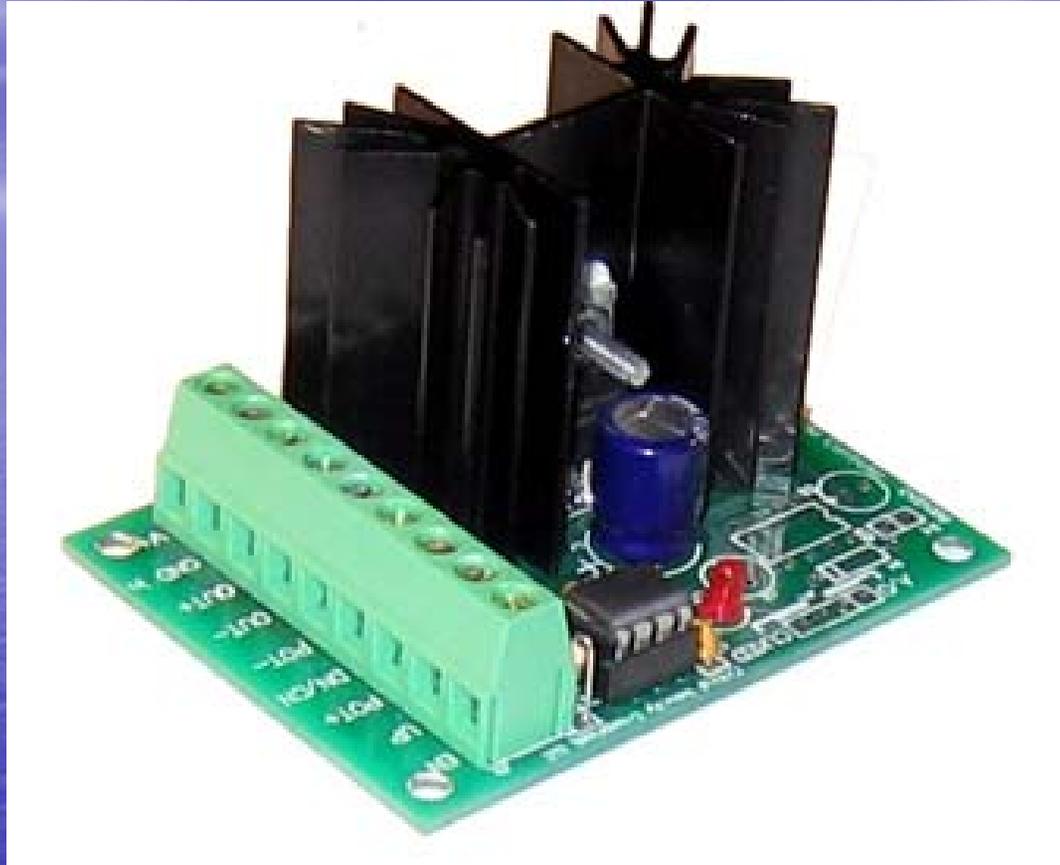
- Pulse-width modulation control works by switching the power supplied to the motor on and off very rapidly (short pulses). The DC voltage is converted to a square-wave signal, alternating between fully on and zero. These pulses vary in duration to change the speed of the motor. The longer the pulses, the faster the motor turns, and vice versa.
- If the switching frequency is high enough, the motor runs at a steady speed due to its momentum.
- By adjusting the duty cycle of the signal (modulating the width of the pulse, ie. the time it is powered on), the average power can be varied, and hence the motor speed.
- DC motors can also be controlled with a variable resistor. While this method works, it generates heat and hence wastes power.





An example of PWM: the supply voltage (blue) modulated as a series of pulses results in a sine-like flux density waveform (red) in a magnetic circuit of electromagnetic actuator. The smoothness of the resultant waveform can be controlled by the width and number of modulated impulses (per given cycle).

# PWM Examples



15 Amp PWM Motor Speed Controller (Needs Potentiometer)

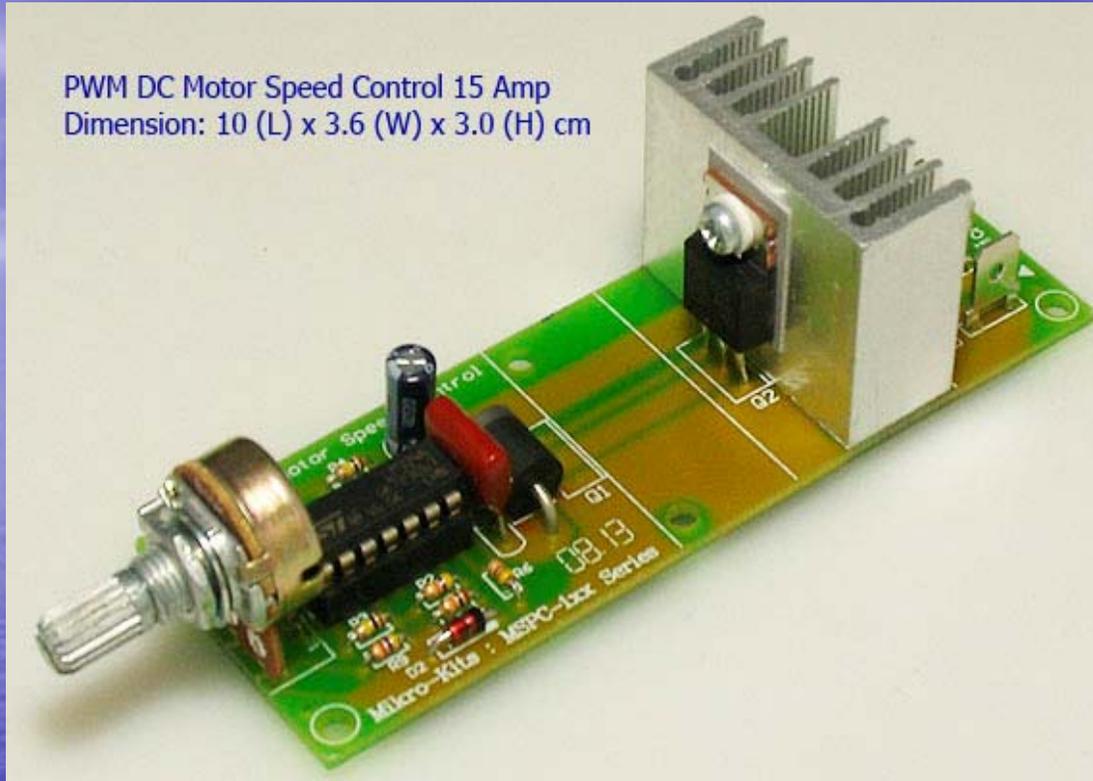
Vendor-Critical Velocity ([www.criticalvelocity.com](http://www.criticalvelocity.com))

Model # SPD-2115B-ES

Price - \$48.95

Operating Voltage – 5.5 to 36 volts

PWM DC Motor Speed Control 15 Amp  
Dimension: 10 (L) x 3.6 (W) x 3.0 (H) cm



DC MOTOR SPEED CONTROL 15A

Vendor – Aseanexport ([www.technologykit.us](http://www.technologykit.us))

Model # LX033

Price – \$19.95

Operating Voltage – 12 to 30 volts

## II. Applications

- Solar Powered Screens
  - Rotary Drums
  - Belts
  - Brush Wipers





# III. Completed Projects

- John Day River #40



ProStar  
VERSION PS-15A  
**PROSTAR-15**  
SOLAR CHARGE CONTROLLER  
MORNINGSTAR

26.5

BATTERY VOLT  
SOLAR AMP  
LOAD AMP

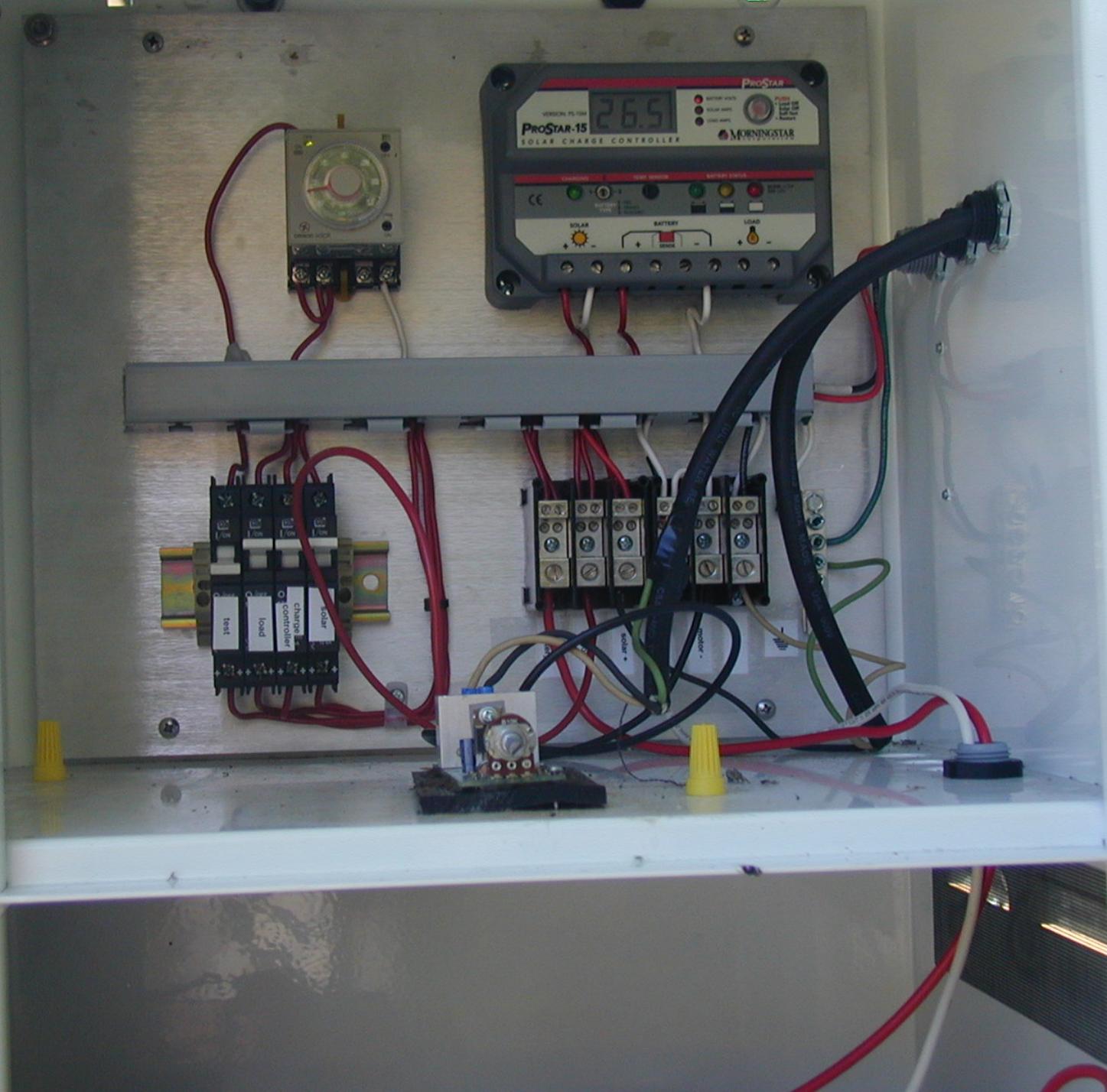
CHARGE MODE  
TEMP. COMPEN.  
BATTERY STATUS

SOLAR BATTERY LOAD

ANALOG METER

test load charge controller solar

solar





# IV. Current Projects

- Long Creek #2 (Belt)
- Dog Creek #3 (Belt)
- Rock Creek-Wilkins (Belt)
- Ingle Creek #10 (Belt)
- John Day River #12 (Rotary Drum)

# VI. Outcome

- Cleaning ability – can vary the speed to keep up with debris loads
- Energy Savings – as debris loads decrease, can reduce the speed to conserve power
- Inexpensive – \$25 to \$50 for one unit, simple to install