

Your setup may vary. See the full setup instructions for your particular Liquid or NH3 system.

### Setup Control Valve

**Product 2 Liquid**

Control Valve Type:

Valve Response Rate (1-100):

Control Deadband (%):

Start with the Valve Response Rate at 5. If system is too slow to adjust to speed changes, increase Valve Response by 1 at a time. If the system overshoots and oscillates decrease by 1 at a time.

### Setup PWM

**Product 2 Liquid**

Coil Frequency (Hz):

PWM High Limit (%):

PWM Low Limit (%):

PWM Startup (%):

**IMPORTANT:**  
Adjust PWM Startup for best performance in the field.

Start with the Low Limit and PWM Startup as shown above. Monitor the PWM DC % on the Run page. If the pump needs to go below 10% DC, decrease the Low Limit above. Adjust the PWM Startup % so the pump starts at the speed you want.

Spartan Model	115	125	135	145
Flowmeter Calibration	1700 fl oz	890 fl oz	450 fl oz	220 fl oz

### Setup Rate Sensor

**Product 2 Liquid**

Flowmeter Calibration:

Flowmeter Pulse/Units:

### Setup Alarms

**Product 2 Liquid**

Off Rate Alarm (% off target rate):   Alarm?

Typical Off Rate Alarm is 20%. Set as desired.

### Setup Rates

**Product 2 Liquid**

Preset Rate Values (gal/ac)	Rate 1: <input type="text" value="0.25"/>	Rate 2: <input type="text" value="0.0"/>	Rate 3: <input type="text" value="0.0"/>
Rate Bump (gal/ac)	<input type="text" value="0.0"/>		
Rate Selection	<input type="text" value="Predefined or Rx"/>		
Display Smoothing	<input checked="" type="checkbox"/>		
Decimal Shift	<input type="text" value="2"/>		

Example shown is 32 oz/acre or 0.25 gal/ac. Set **Decimal Shift** to 2. (32 / 128 = 0.25)

### Setup Tank/Bin

**Product 2 Liquid**

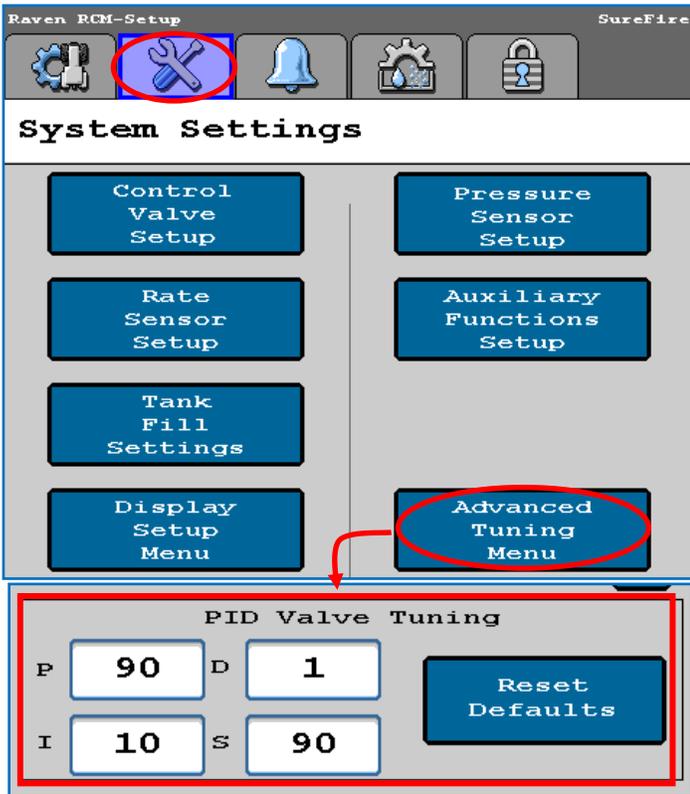
Tank Capacity (gal):

Current Tank Level (gal):

Low Tank Level (gal):   Alarm?

Tank Fill Monitor:

Use this if you want to keep track of product in the tank.



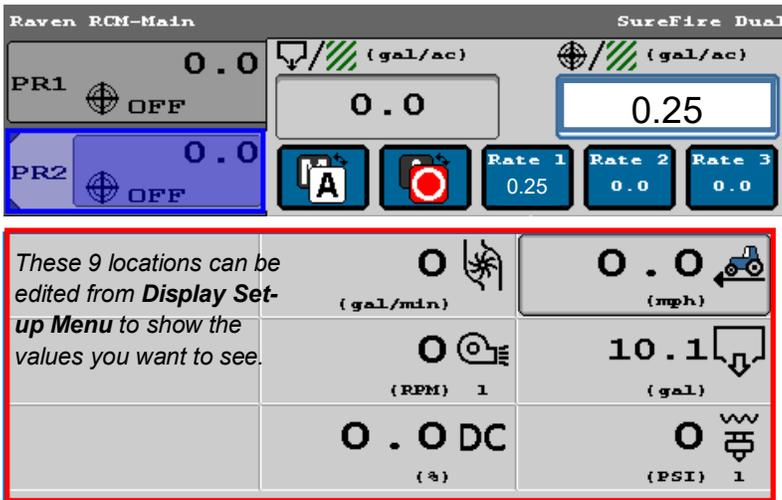
**Advanced Tuning**

On SureFire **electric pump systems** (Tower 110, Tower 200), it will be necessary to use the **Advanced Tuning** feature in addition to the regular Control Valve Calibration. To activate **Advanced Tuning**, press and hold the **Settings tab** for about 8 seconds.

On **electric pump** systems, set the PID Valve Tuning parameters as shown (below left). Press the “?” for an explanation of what each of these values does.

Fine-tuning of the system may require some adjustment of these numbers along with the Valve Response Rate on the Control Valve Setup.

*If the system oscillates and will not lock on to rate, return these to Default Settings.*



The screenshot to the left shows the Run page with 4 items that be set in **Display Settings**. These items give valuable information about the performance of your system.

- Flow (gal/min)
- Pressure (PSI)
- PWM Duty Cycle (DC %)
- Speed (mph)

**Caution:** The Spartan pump will produce up to 290 PSI. Limit operating pressure to 80 PSI or damage to plumbing components may result. You can set a Maximum Pressure Alarm at 80 PSI and check the Alarm box of a pressure sensor that is plugged into and assigned to the Spartan system to limit pressure to 80 PSI.

The pressure you get when testing with water will be much less than it will be with a heavier, thicker fertilizer product.

See the other SureFire publications and setup instruction sheets for more screenshots and complete profile setup information.

Read the Raven RCM Operator’s Manual for complete safety and operating instructions.