

# Raven Simulator Setup Instructions




Congratulations, and thank you for taking the next step in becoming a high-tech Raven dealer by investing in a Raven Simulator! Here are some basic set-up instructions to help you maximize the value of your fully functional, high quality Raven product display.

## Powering On & Off, General Maintenance

When powered on for the first time, the Viper<sup>®</sup> 4+ will prompt you to configure the machine.  
When you first power on the Viper 4+:



1. Acknowledge the *License Agreement* prompt by selecting the **OK** button.
2. Select the appropriate language from the drop-down menu and select the **Ok** button. You can place a checkmark in the box to prevent this choice from showing again at each start up.
3. Read through the *Roadway and Obstacles Warning* and select the **OK** button.
4. An *Attached Hardware* list will populate showing devices added or removed from the machine/config. Select **New** as we do not currently have a machine configured.

## Setting Up a Machine Profile

1. Select the **Add Machine Configuration**  button.
2. Use the on-screen keyboard to enter a name for the machine or equipment configuration. The machine configuration includes the vehicle or tractor and any connected implements, carts, or tanks. Choose a profile name that will assist with identifying profiles with similar components as new profiles are added for future operations.
3. Select a *Machine Type*. Self Propelled is used for the remainder of these instructions but choose appropriately based on your preference.
4. Use the on-screen keyboard to enter the name or designation for the vehicle or tractor used with the profile.
  1. **Note:** For example, when setting up a configuration for a pull-type sprayer, the operator might enter the configuration name as "Liquid Applicator" and the tractor nickname as "Front Wheel Assist."
5. You may update the profile for the machine if you choose to change the *Type, Sub-Type, Manufacturer, and/or Model* from the *Custom* default value. Select **OK**.
6. Place a checkmark in *ISO Boom* and select **OK**.
7. Complete the first 2 tabs under the *Sprayer Profile*. The first tab includes: *Type, Sub-Type, Manufacturer, Model, and Nickname*. The second tab includes: *GPS Measurements/Offsets* as well as the machine *Wheel Base*.
8. Select the third tab and select the **Done**  button to return to the *Machine Configuration* panel.
9. Select the **Done**  button again to return to the main run screen of the Viper 4+.

## Setting Up a User Profile

After you add a machine configuration, setting up user profiles helps you showcase the display's unique user-specific customization functionality.

1. Select the *Administrator* panel at the top of the display and select *User Profile*.
2. Select the *Administrator Options/Person* tab.
3. Verify that *Enable User Logins* is selected.
4. In the *Users* area, select the **Add**  button to create a new profile.
5. Create a username (your dealership name) and fill out the rest of the information as desired.
6. Select *Time Zone*, *Language*, and *Unit* preferences.
7. Select the **Done**  button twice to return to the main run screen.

## How to Set Up an RCM Profile

Setting up a Raven Rate Control Module (RCM) Profile helps you implement specific settings for sectional control for your applications using the RCM.

1. Tap the "UT" button.
2. Tap the "Settings" icon.
3. On the Applicator Setup screen, tap "Change/New"
4. On the Select Profile pop-up, select "New Profile" and hit the checkmark.
5. Enter a profile name (representative of an application – e.g., liquid).
6. Select the machine type. (e.g., self-propelled sprayer).
7. Set the application width – the width of your application machine. Using the Liquid machine setup below, I used 100'. Tap "Next."
8. Set the number of control units (ECU) to the number of RCM units you're using and select the number of products you want represented by each. You can use up to 5 products per RCM ECU. Then tap "Next."
9. Follow the machine- or operation-specific instructions.
  - a. Granular | Example single-bin single-product spreader settings:
    - i. Name Profile screen
      1. Profile name: dry spreader
      2. Machine type: Pull-behind Spreader
      3. Application Width: 60 feet
    - ii. Setup System
      1. 1 ECU with 1 product
    - iii. Setup Fan / Spinner RPM
      1. 1 fan – check the box for control.
    - iv. Setup Application Type
      1. Granular fertilizer
      2. Application mode – select "Granular Full Width."

- v. Setup Auxiliary Drivers – pass to next screen
- vi. Section Summary – confirm 1 section with 60 feet wide is showing.
- vii. RPM Sensor Assignment – make sure box is checked for Product 1.
- viii. Setup Control Valve
  - 1. Leave Control Valve Type as PWM Close (you do not want your belt to open as you go around the headlands.)
  - 2. Valve Response Rate – 50% is a good starting point.
  - 3. Enable PWM Smart Control.
- ix. Setup PWM – leave the presets as your settings.
- x. Setup Rate Sensor –
  - 1. Product Density - 70.0 lb/feet<sup>3</sup>
  - 2. Spreader Constant – 250 pulses/feet<sup>3</sup> (contact spreader manufacturer for specific constant)
  - 3. Pulses / Revolution – encoder or rate number. 180 is most common.
  - 4. Gate height – 3 inches.
- xi. Setup Tank/Bin –
  - 1. Tank Capacity – 10,000 lbs.
  - 2. Tank Level – 10,000 lbs.
  - 3. Low Tank Level – 250 (check if you want alarm notifications when tank is low).
  - 4. Activate Low Bin Level Sensor – leave other settings as is.
- xii. Setup Rates
  - 1. Preset Rate Values – 250, 300, 350.
  - 2. Rate pump – 10
  - 3. Leave Rate at Predefined or Rx.
- xiii. Setup Alarms
  - 1. Set Off Rate Alarm and check Shaft Sensor alarm if applicable.
- xiv. Set-up Rate Sensor
  - 1. Product 2 – would be your fans.
    - a. Set to PWM Close
    - b. Enable PWM Smart Control.
  - 2. RPM Cal – leave at 1 Pulse/Rev (can be up to 4)
- xv. Setup Rates (Spinner Speeds)
  - 1. Preset Rate Values: 500, 600, 650
  - 2. Rate Bump – 10 RPM
  - 3. Leave rest as/is
- xvi. Setup Summary – shows all relevant details.

b. Liquid | sample self propelled sprayer set-up:

- i. Name Profile
  - 1. Profile Name: Liquid
  - 2. Machine type: Self Propelled Sprayer

3. Application Width: 100 feet
- ii. Setup System
  1. 1 ECU – 1 Product
- iii. Select Application Type
  1. Select “Liquid”
- iv. Aux-N setup. Leave blank.
- v. Setup Sections
  1. Number of sections: 5
  2. Section Valve type – 3-Wire
  3. Uncheck “Equal Width Sections”
  4. Uncheck “Fence Rows Enable”
- vi. Setup Section Width
  1. Set up different section widths (since you unchecked “Equal Width”)
    - a. 10 feet on the ends (sections 1 & 5)
    - b. 20 feet on the next sections (sections 2 & 4)
    - c. 40 feet in the middle (section 3) – this gives us a total of 100 feet.
- vii. Setup Auxiliary Drivers – Leave blank.
- viii. Section summary – verify that section widths are correct, as well as signal drivers.
- ix. Setup Pressure Sensors – None
- x. Auxiliary Functions – leave unchecked.
- xi. Setup Control Valve – Product 1
  1. Set as Standard valve type.
  2. Leave Valve Response Rate/Deadband/Delay/Advance/Control Effort as preset/default.
- xii. Setup Rate Sensor
  1. Flowmeter calibration number – 1440 (depending on flowmeter)
    - a. Leave unit as 10 gal
- xiii. Setup Tank/Bin
  1. Leave as “None”
  2. Tank capacity: 1200 gal
  3. Current tank level: 1200
  4. Low tank level (alarm setting): 100, check box
- xiv. Setup Rates
  1. Preset Rate values: 5.0, 7.5, 10.0
  2. Rate Bump: 1.0 gal/ac
  3. Rate Selection: Predefined or Rx
  4. Display Smoothing – keep checked
  5. Decimal shift – leave at 1
- xv. Setup Alarms
  1. Off rate alarm – 20% (leave checked)
    - a. Will tell you if you are off-rate by 20% or more


2. Minimum Flow Rate – low limit. Set to 12.0
- xvi. Verify setup summary.
10. Confirm that settings are correct on the run screen.
11. Once the profile is set up, you need to put the RCM in Demo Mode.
  - a. Select the **Heartbeat** button on the right side of the *RCM UT*.
  - b. Select the second **Tests** tab and select *Demonstration Mode* from the drop down menu, then the **Done** button.
  - c. Select the **Begin** button.
  - d. Read explanation and select the checkmark.
  - e. Select the *Flow Simulation Type*.
    - i. Select *None* if you want no flow to be simulated.
    - ii. Select *Fixed Freq* to simulate a consistent flow rate. Enter the desired flow value in the corresponding pop-up.
    - iii. Select *Rate Tracking* if you want the system to adjust flow so it matches the target application rate on the main screen.
  - f. Enter *Simulated Pressure* for pressure sensors 1, 3, and 5; and then do the same for 2, 4, and 6.

## How to Calibrate the SC1 for GPS & Steering

1. Verify that the software versions are up to date.
  - a. Touch the upper Light-hand corner.
  - b. Select *System Manager*.
  - c. Select the second tab from the left labeled *Hardware Update*. Ensure the HDU, Raven Rate Control Modules, and RS1 node versions match the latest versions, shown on screen. (GFX: HDU 2.60.29 | Raven Rate Control Module 1.5.2.6 | RS1 1.6.0.32)
    - i. If older software is installed, updates are required. See the Raven RS1 Calibration and Operation Manual for more information.
  - d. Once verified, exit the *System Manager* screen.
2. Next, we'll configure the machine profile.
  - a. Select the **User Terminal (UT)** button.
  - b. Select the **Steering** widget.
  - c. Accept the *Operator Liability Waiver*.
  - d. Select the first profile labeled "Available" and select the **Next** button.
  - e. Select *DEMO* as the machine type.
  - f. Select *Internal GPS Simulator* for *Machine Make*.
  - g. Select *RS1 Speed Source* for *Machine Model*.
  - h. Your *Guidance* setup should auto-fill with *Auto* for the *Guidance Partner*. Select the **Next** button.
  - i. Enter the machine dimensions that were set up on the Viper 4+ and select the **Next** button.
  - j. Select *Steering Only* under the *Omni System Automation Level*.
3. Set up GPS.
  - a. Select *SBAS* in the *Differential Source* drop-down and select the **Next** button.

- b. Wait until converged, then select the **Next** button.
4. Calibrate Terrain Compensation.
  - a. Accept the default node orientation.
  - b. Turn the speed dial up to get the distance required above 32.8 feet (9.9974 meters).
  - c. Select the **Next** arrow after reading the directions.
  - d. Make sure the speed dial is set to *Off* for 0 speed and select the **Calibrate** button.
  - e. Using the speed dial and steering wheel complete the terrain compensation by driving a “lightbulb” shape if viewed from above. The readings will need to be green in color for the **Calibrate** button to reappear. Select it once available.
  - f. After terrain compensation is complete, select the **Next** button.
5. Test the Resume switch.
  - a. On the Verify Resume Switch screen, the icon will turn from red to green when you toggle the Resume Switch. When working correctly the calibration will advance to the steering disengage.
6. Calibrate steering disengage.
  - a. On the *Disengage Calibration* screen, turn the steering wheel at a typical rate. When movement is detected, the system will automatically change to the next screen. Set the disengage threshold to 10 Hz and select the **Next** button.
7. Set Left Wheel Angle Sensor Value
  - a. Using the speed dial, drive the machine 1-4 MPH.
  - b. Turn the steering wheel to the left until a current sensor voltage of 1.00V is achieved. If you turn too far, turn the opposite direction.
  - c. Select the *Left* input value highlighted in blue. This sets the *Left Wheel Angle Sensor* value.
8. Set Center Wheel Angle Sensor Value
  - a. Turn the steering wheel to the right until the current sensor voltage reads 2.50V.
  - b. Select the *Center* input value highlighted in blue. This sets the *Center Wheel Angle Sensor* value.
9. Set Right Wheel Angle Sensor Value.
  - a. Turn the steering wheel to the right until a current sensor voltage of 4.00V is achieved.
  - b. Select the *Right* input value highlighted in blue. This sets the Right Wheel Angle Sensor Value.
  - c. Select the **Next** button.
10. Review the summary screen.
11. Select the checkmark.

## Completing the setup

1. Once the *RCM* and *SC1 UTs* are set up, select the **Map** icon to return to the main run page.
2. Select the **Machine** icon (should have a red “boom” on it).
3. Select the third tab (self-propelled equipment).
  - a. Select the  and the RCM boom setup information will be populated automatically.

- b. If successful, select the **Done** button two times to return to the main run screen.
4. Verify operation by starting a job.
  - a. Set an A/B line and attempt to engage steering.
  - b. Enable *Product Control* and toggle the Master switch.