# System Tuning

Use this screen to adjust the performance when acquiring the line. Can be adjusted between 1 and 50. The higher the number, the more aggressive it will be.

```
RAVEN         SmarTrax
INDUSTRIES    Straight shot to easy steering
Aggressiveness
Line Acquire 30
← ↑ ↓ →
```

These are the only 2 screens you will use to tune the SmarTrax system.

```
RAVEN         SmarTrax
INDUSTRIES    Straight shot to easy steering
Sensitivity
OnLine    38
← ↑ ↓ →
```

Use this screen to adjust the on-line performance. Can be adjusted between 1 and 50. The higher the number, the more sensitive it will be.

Line Acquire

Case 2 - Increase

Case 1 - Decrease

OnLine

Case 2 - Increase
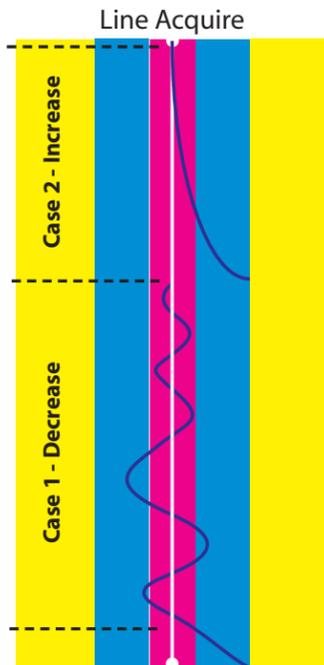
Case 1 - Decrease

Line Acquire Tuning

If the machine is constantly overshooting the line as in Case 1, decrease your Aggressiveness Line Acquire number.

If the machine takes too long to acquire the line as in Case 2, increase your Aggressiveness Line Acquire number.

Important: DO NOT adjust any other calibration number to tune the machine. If you cannot tune the machine with the 2 screens above, go back and verify that all of the calibration numbers you entered are correct.
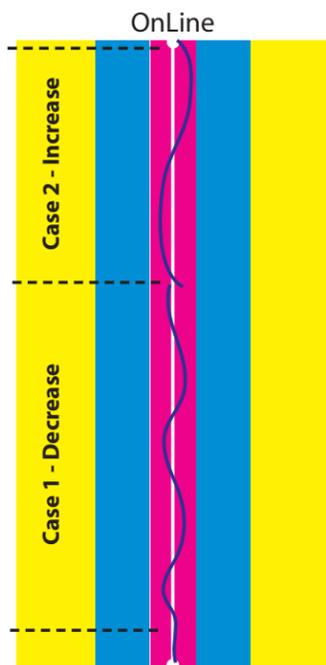
OnLine Tuning

If the machine constantly weaves around the line as in Case 1, decrease your Sensitivity OnLine number.

If the machine has a very slow weave as in Case 2, increase your Sensitivity OnLine number.

Troubleshooting
This screen is located under the Status Menu

```
RAVEN         SmarTrax
INDUSTRIES
‹L FOOT SWTCH R›
steer swtch 236
← ↑ ↓ →
```
The foot switch is activated when "FOOT SWTCH" appears in capital letters.

```
RAVEN         SmarTrax
INDUSTRIES
‹L foot swtch R›
STEER SWTCH 344
← ↑ ↓ →
```
The pressure switch is activated when "STEER SWTCH" appears in capital letters.

```
RAVEN         SmarTrax
INDUSTRIES
‹L foot swtch R›
steer swtch 236
← ↑ ↓ →
```
This is the current reading from the steering sensor

You can manually steer using the left or right arrow button.

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R A V E N

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SmarTrax
Straight shot to easy steering

Initial System Start-Up

(1)
```
ated in the OPER
‹ NO agree? YES›
```
Upon initial start-up, the SmarTrax controller will prompt you to answer 'Yes' or 'No' to having read and understand the Operation Manual. To continue with start-up, you must answer 'Yes' by pressing the Right arrow button.

(2)
```
Sensor Type
SPS
← ↑ ↓ →
```
Press the Left or Right arrow to select the Sensor Type you are using (SPS or Yaw). Once the correct type is displayed, press the Down arrow.
Yaw: If 'Yaw' is selected as the Sensor Type, refer to the instructions in blue to help set up your SmarTrax controller.

(3)
```
Machine Type
Front Steered
← ↑ ↓ →
```
Press the Left or Right arrow to select the machine type you are using (Articulated, Front Steered, Rear Steered, Track, or a specific Tune Set). Once the correct type is selected, press the Down arrow.
Yaw: A machine specific tune set must be selected as the Machine Type.

(4)
```
Driving Device
Hydraulic
← ↑ ↓ →
```
Press the Left or Right arrow to select the Driving Device (Hydraulic or QuickTrax). Once the correct device is selected, press the Down arrow.
Yaw: If a QuickTrax tune set is available, you may select either 'QuickTrax' or 'Hydraulic.' Otherwise, this setting will be locked to 'Hydraulic' if 'Yaw' was selected in Step 2.

(5)
```
Turn wheel
steer switch
← ↑ ↓ →
```
Turn the steering wheel to verify that the pressure switch is working properly. The words "steer switch" will display in capital letters and a new screen will display when the console detects a change from the steer switch.

(6)
```
Press
foot switch
← ↑ ↓ →
```
Press the foot switch to ensure that it is connected properly. The words, "foot switch" will display in capital letters and a new screen will display when the console detects a change from the foot switch.

(7)
```
Left 510 SPS 987
SPS cal Left  →
← ↑ ↓ →
```
Yaw: Skip to Step 12.
Turn the wheels all the way to the left. Press the Right arrow to save the displayed value. The next screen will display.
Important: The number must be greater than 10, but less than 1000.

(8)
```
Cntr 512 SPS 549
SPS cal Center →
← ↑ ↓ →
```
Turn the wheels to the center. Press the Right arrow to save the displayed value. The next screen will display.
Important: The number must be at least 100 more than the right number.

(9)
```
Rght 513 SPS  80
SPS cal Right  →
← ↑ ↓ →
```
Turn the wheels all the way to the right. Press the Right arrow to save the displayed value. The next screen will display.
Important: The number must be greater than 10, but less than 1000 and must be at least 100 more than the center number.

(10)
```
Verify left turn
with left button
← ↑ ↓ →
```
Hold the Left arrow button. The console will verify that the wheels turn in that direction. The next screen will display.

(11)
```
Verify rght turn
with rght button
← ↑ ↓ →
```
Hold the Right arrow button. The console will verify that the wheels turn in that direction. The next screen will display.

(12)
```
Zero Yaw Rate
Offset  +0.40° →
← ↑ ↓ →
```
If SPS was selected as the Sensor Type is Step 2, skip this step.
Make sure the vehicle is at a complete stop before pressing the Right arrow button to Zero the Yaw Rate. Press the Down arrow to proceed to the next step.

(13)
```
Distance Units
Feet-Decimal
← ↑ ↓ →
```
Press the Left or Right arrow to select the distance units (Feet Decimal, Feet-Inches, or Metric). Press the Down arrow to lock in your selection.
Yaw: Skip to Step 16.

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(14)
```
Wheel Base
9.8ft
← ↑ ↓ →
```
Note: If a Tune Set was selected in Step 3, Skip to Step 16.
Measure and enter the correct wheel base for your machine. Use the Left or Right arrow to enter the value. Press the Down arrow to lock in your measurement.
Note: Entering an inaccurate number will cause the system to operate incorrectly. See the SmarTrax manual for information on measuring the wheel base correctly.

(15)
```
Min Turn Radius
19.7ft
← ↑ ↓ →
```
Measure and enter the correct minimum turn radius for your machine. Use the Left or Right arrow to enter the value. Press the Down arrow to lock in your measurement.
Note: Entering an inaccurate number will cause the system to operate incorrectly. See the SmarTrax manual to measure the minimum turn radius correctly.

(16)
```
Antenna Position
+10.0ft
← ↑ ↓ →
```
Measure the distance between the rear axle and the GPS antenna. Use the Left or Right arrow to enter the number. Press the Down arrow to lock in your measurement.
Note: Entering an inaccurate number will cause the system to operate incorrectly.
Yaw: If no Tilt Sensor or GPS Enhancer is installed, initial setup is complete.

(17)
```
Antenna Height
13.2ft
← ↑ ↓ →
```
Measure and enter the height of the GPS antenna above ground. Use the Left or Right arrow to enter the value. Press the Down arrow to lock in your measurement.

(18)
```
CAUTION: Wheels
will turn.
← ↑ ↓ →
```
Turn the machine up to the working RPM. Move to an open space. Drive ahead slowly and press the foot switch to begin calibration.

(19)
```
Please Wait
CALIBRATING...
```
The "Calibrating" screen will display and the wheels should be turning. If the pressure switch is triggered, calibration will stop and will need to be re-started. The Home screen will display when calibration is complete.

SmarTrax Controller Menu Structure

Below you will find the menu structure for the SmarTrax controller. When you power up and after the initial start-up and calibration, the Home screen will display after pressing the right arrow.

Home Screen

Press and hold the Up and Down arrows simultaneously to return to the Home screen at any time.

Home

```
RAVEN  SmarTrax
SmarTrax OK  OnL
v3.1    +11.5Mph
←  ↑  ↓  →
```

Press and hold the Left and Right arrows simultaneously to go to the Zero Yaw Rate screen if 'Yaw' was selected as the Sensor Type.

press ↓

```
Aggressiveness
Line Acquire 30
```
1 - 50
See the System Tuning section for more information.

press ↓

```
Sensitivity
OnLine    38
```
1 - 50
See the System Tuning section for more information.

press ↓

```
Hold → To Enter
Advanced Menu
```
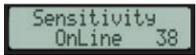
press →
and hold to enter Advanced Menu

Return to Home screen

```
Sensor Type
Yaw
```
follow the menu structure for the selected Sensor Type

press ↓

```
Zero Yaw Rate
Offset  +0.40°  →
```
While the machine is at a complete stop, press the Right arrow button to re-zero the Yaw Rate

press ↓

If Yaw is selected as the Sensor Type, the Wheel Base screen will display the programmed wheel base of the selected tune set. This is a display only.

Advanced Menu

Vehicle Setup

```
RAVEN  SmarTrax
VEHICLE
SETUP
←  ↑  ↓  →
```

press ↓

```
Machine Type
Front Steered
```
Displays the selected Machine Type (Front steered, Rear steered, Articulated, Track, or a specific machine Tune Set).

press ↓

```
Driving Device
Hydraulic
```
Displays the Driving Device selection (Hydraulic or QuickTrax).

press ↓

```
Sensor Type
SPS
```
Displays the selected Sensor Type (SPS or Yaw).

press ↓

```
Left 256 SPS   0
SPS cal Left   →
```
Current SPS Count
Turn the wheel to the left. Press the Right arrow to calibrate.

press ↓

```
Cntr 512 SPS   0
SPS cal Center →
```
Current SPS Count
Turn the wheel to the center. Press the Right arrow to calibrate.

press ↓

```
Rght 768 SPS   0
SPS cal Right  →
```
Current SPS Count
Turn the wheel to the right. Press the Right arrow to calibrate.

press ↓

```
Wheel Base
9.8ft
```
Refer to the machine's owners manual or the SmarTrax Operation Manual for information on measuring the Wheel Base.

press ↓

```
Min Turn Radius
19.7ft
```
Refer to the machine's owners manual or the SmarTrax Operation Manual for information on measuring the Minimum Turning Radius.

press ↓

```
Antenna Position
+8.7ft
```
Refer to the SmarTrax Operation Manual for help with programming the antenna position.

press ↓

```
Steer Pulse
Time   65ms
```
Sets the length of pulse from the pressure switch needed to disengage the system. Press the Left or Right arrow to set this value.

press ↓

Return to top of menu

GPS Enhancer *

```
RAVEN  SmarTrax
GPS ENHANCER
CONFIGURATION
←  ↑  ↓  →
```

press → ← or →

press ↓

```
Antenna Height
12.0ft
```
Sets the height from the ground to the GPS Antenna

press ↓

Roll → ```R 00.0 P 00.0``` ← Pitch
GPS → ```G 00.0 E 00.0``` ← Enhancer Heading
Heading
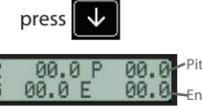
press ↓

```
Vtg Config
DMU/Corr
```
This is the correct setting for this screen

press ↓

```
Firmware Version
5025-0290-04_D
```
Displays the enhancer software version

press ↓

```
Reset
Enhancer   →→
```
Press the Right arrow to reset the enhancer

press ↓

```
Toggle Enhancer
Bypassed   →→
```
Press the Right arrow to switch select Active or Bypassed mode for the enhancer

press ↓

Return to top of menu
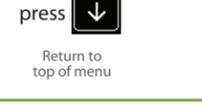
*This advanced menu screen is only available if you are using a GPS enhancer.

**Holding the Left and Right arrows while at the Home screen will send a forward command to the enhancer.

TM-1 Tilt Sensor*

```
RAVEN  SmarTrax
TM1 SENSOR
CONFIG
←  ↑  ↓  →
```

press → ← or →

press ↓

Angle of sensor → ```Fwd Ok
-2.9° +42.0°C``` ← Temperature of the tilt sensor

press ↓

```
Set Zero
→→
```
Press the Right arrow to reset the sensor to zero. Be sure the machine is on level ground before pressing the Right arrow.

press ↓

```
Antenna Height
13.2ft
```
Sets the height from the ground to the GPS Antenna.

press ↓

```
Tilt Filter
Normal
```
Refers to the tilt compensation speed. Press the Right arrow to select from the available settings (Off, Slow, Normal, or Fast).

press ↓

*This advanced menu screen is only available if you have a tilt sensor installed.

Console Configuration

```
RAVEN  SmarTrax
CONSOLE
CONFIGURATION
←  ↑  ↓  →
```

press → ← or →

press ↓

```
LCD Back Light
On
```
Press the Right arrow to turn the back light On or Off.

press ↓

```
LCD Contrast
44%
```
Press the Left or Right arrow to adjust the LCD Contrast.

press ↓

```
Distance Units
Feet-Decimal
```
Sets the displayed units. Press the Right arrow to select from Feet-Decimal, Feet-Inches, or Metric.

press ↓

```
Speed Units
Mph
```
Sets the speed units. Press the Right arrow to select from Mph or Km/h.

press ↓

```
5Hz Viper Output
Off
```
Sets the GPS output on the programming port. Press the Right arrow to choose On or Off.

press ↓

```
Key Beep
On
```
Toggles the sound when a key is pressed. Press the right arrow to select from On or Off.

press ↓
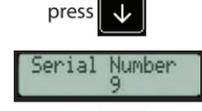
```
Serial Number
9
```
Displays the serial number of the controller.

press ↓

```
Lockout Setting
Changes  Off
```
This screen locks the calibration values that are entered for the machine. Press the Right arrow to select On and lock the settings or Off to allow settings to be modified.

press ↓

Return to top of menu

Status Menu Configuration

```
RAVEN  SmarTrax
STATUS
MENU
←  ↑  ↓  →
```

press →

press ↓

```
←L foot swtch R→
steer swtch 236
```
See the Tuning section for more information.

press ↓

```
DeltaTime actual
0.1 sec  0.110s
```
Displays the actual receiver speed.
.2 = 5 Hz
.1 = 10 Hz

press ↓

```
Err Log 00:12:20
1 NoLB GER Msg
```
Displays error logs 1-10. Press the Right arrow to view errors.

press ↓

```
UTC    :  :
date   /  /
```
Displays the GPS date and time.

press ↓

```
Yaw Rate
+0.2 °/s
```
If 'Yaw' is selected as the Sensor Type, the current Yaw Rate of the sensor.

press ↓

```
1:  0%  4:  0%
8:  0%    STATS0
```
Displays the percentage of time verses inches for the last hour that the system has been engaged.

press ↓

```
Avg Sp  0.0Mph
Avg Err 0.0ft
```
Average speed and error over the last 5 minutes that the system has been engaged.

Return to top of menu

```
RAVEN  SmarTrax
Press ↓ To Exit
Advanced Menu
←  ↑  ↓  →
```

press ↓

Return to Home screen