

There are two adjustments for the brake response. The response is non-linear and is defined by a lookup table. In newer installs like yours, the lookup table is located in the **C:/NadsMiniSim_2.2.x/bin.x64/config/hardware.xml** file.

A piecewise linear function (lookup table) converts the pedal displacement measurement (0 to 1) to pedal force (0 to 180 lb). You can find these entries by searching for the word 'brake' in a text editor. Be sure to back-up your file before making changes. I have attached the copy we have of your hardware.xml file from when I updated it.

The lookup table looks like this:

```
<Device name="PiecewiseLinearFunction" kind="Adapter" ID="Brake">
  <Settings>
    <Setting name="Point Table" type="map" unit="none">
      <Entry>
        <Key type="float" unit="none"> 0.000 </Key>
        <Value type="float" unit="none"> 0.000 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.019 </Key>
        <Value type="float" unit="none"> 0.540 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.037 </Key>
        <Value type="float" unit="none"> 1.080 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.056 </Key>
        <Value type="float" unit="none"> 1.620 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.075 </Key>
        <Value type="float" unit="none"> 2.160 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.094 </Key>
        <Value type="float" unit="none"> 2.700 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.113 </Key>
        <Value type="float" unit="none"> 3.240 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.133 </Key>
        <Value type="float" unit="none"> 3.780 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 0.153 </Key>
        <Value type="float" unit="none"> 4.500 </Value>
      </Entry>
    </Setting>
  </Settings>
</Device>
```

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    <Key type="float" unit="none"> 0.172 </Key>
    <Value type="float" unit="none"> 5.040 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.192 </Key>
    <Value type="float" unit="none"> 5.760 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.213 </Key>
    <Value type="float" unit="none"> 6.480 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.233 </Key>
    <Value type="float" unit="none"> 7.200 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.254 </Key>
    <Value type="float" unit="none"> 7.920 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.275 </Key>
    <Value type="float" unit="none"> 8.640 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.297 </Key>
    <Value type="float" unit="none"> 9.540 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.318 </Key>
    <Value type="float" unit="none"> 10.44 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.340 </Key>
    <Value type="float" unit="none"> 11.34 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.363 </Key>
    <Value type="float" unit="none"> 12.24 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.386 </Key>
    <Value type="float" unit="none"> 13.32 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.409 </Key>
    <Value type="float" unit="none"> 14.40 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.433 </Key>
    <Value type="float" unit="none"> 15.48 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.457 </Key>
    <Value type="float" unit="none"> 16.74 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.482 </Key>
    <Value type="float" unit="none"> 18.18 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.508 </Key>
    <Value type="float" unit="none"> 19.62 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.534 </Key>
    <Value type="float" unit="none"> 21.24 </Value>
</Entry>
<Entry>
    <Key type="float" unit="none"> 0.561 </Key>

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    <Value type="float" unit="none"> 22.86 </Value>
  </Entry>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.589 </Key>
  <Value type="float" unit="none"> 24.84 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.617 </Key>
  <Value type="float" unit="none"> 27.18 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.647 </Key>
  <Value type="float" unit="none"> 29.52 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.679 </Key>
  <Value type="float" unit="none"> 32.40 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.712 </Key>
  <Value type="float" unit="none"> 35.82 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.746 </Key>
  <Value type="float" unit="none"> 39.78 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.783 </Key>
  <Value type="float" unit="none"> 44.82 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.823 </Key>
  <Value type="float" unit="none"> 51.12 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.867 </Key>
  <Value type="float" unit="none"> 59.58 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.916 </Key>
  <Value type="float" unit="none"> 72.00 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 0.973 </Key>
  <Value type="float" unit="none"> 93.06 </Value>
</Entry>
<Entry>
  <Key type="float" unit="none"> 1.000 </Key>
  <Value type="float" unit="none"> 180.0 </Value>
</Entry>
</Setting>
</Settings>

```

You can reduce it to just a linear function by editing it to remove the entries between 0:1 and 1:180 like this:

```

<Device name="PiecewiseLinearFunction" kind="Adapter" ID="Brake">
  <Settings>
    <Setting name="Point Table" type="map" unit="none">
      <Entry>
        <Key type="float" unit="none"> 0.000 </Key>
        <Value type="float" unit="none"> 0.000 </Value>
      </Entry>
      <Entry>
        <Key type="float" unit="none"> 1.000 </Key>
        <Value type="float" unit="none"> 180.0 </Value>
      </Entry>
    </Setting>
  </Settings>

```

This will change the feel of the pedal quite a bit making it more responsive at the beginning of travel. Obviously, you can also change the 'shape' of the curve by editing all the entries as you wish as well.. possibilities are endless.

Also (in addition to or instead of the above) you can edit the point at which the 'fully applied' position of the pedal occurs, in effect making the pedal's 100% point occur with smaller displacement. This is controlled by the Shift and Scale values for the brake calibration... these represent the Slope (m) and Y-intercept (b) of the equation of a line (Y=mX+b) in the hardware.xml file. This data is located in the file just above the piecewise linear data:

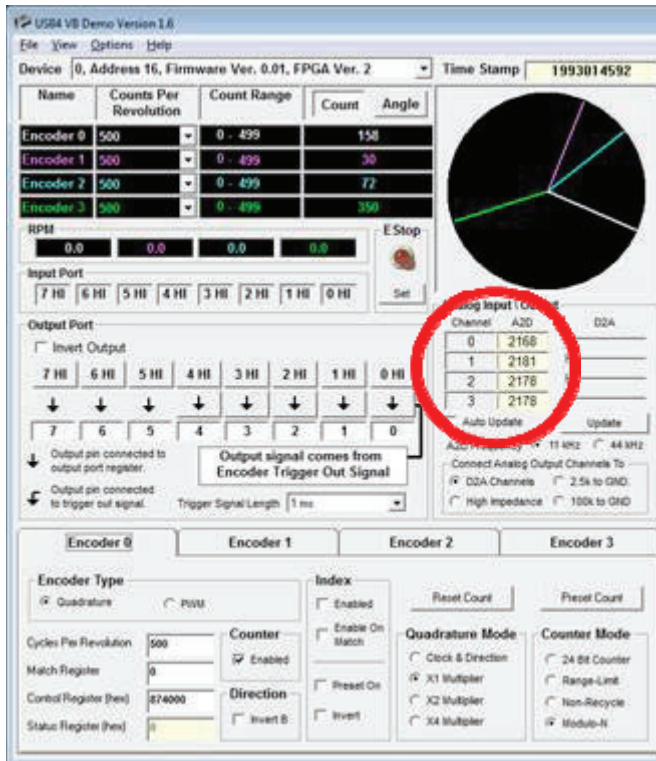
```

</Device>
<Device name="ShiftScaleCalibration" kind="Adapter" ID="Brake">
  <Settings>
    <Setting name="Shift" type="float" unit="none">
      -0.2355
    </Setting>
    <Setting name="Scale" type="float" unit="none">
      7.0e-4
    </Setting>
  </Settings>

```

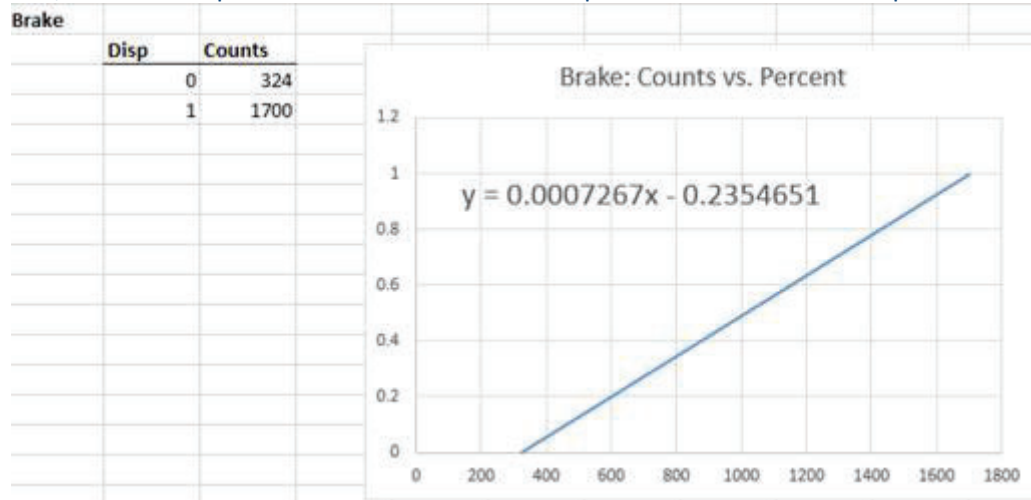
These values are obtained by doing the following:

1. Close the miniSim application
2. Launch the **USB4 DEMO** application. This will open a window that displays the status of the inputs to the USB4 board that the miniSim software uses to read the driver input sensors.



3. Press the brake pedal, note which of the Analog inputs (circled in red) changes with brake pedal position – in your case its input 1.
4. Record the value with the pedal at rest (0)
5. Record the value with the pedal pressed at what you want to be 100% (1)

- Open the attached spreadsheet from when I calibrated your system and enter the values you wrote down in the Counts column next to the corresponding pedal displacement (0 and 1). The spreadsheet will calculate the equation of the line for you.
- Update the Shift (b) and Scale (m) values for the new brake calibration – these represent the Slope (m) and Y-intercept (b) of the equation of a line ($Y=mX+b$). See below. In this case, for zero displacement the value was 324, for 100% displacement it was 1700. The slope is 0.0007 and Y-intercept is 0.2355.



- Close the USB4 DEMO application.