

PSIscale User Guide

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Table Of Contents

Table Of Contents i

FCC Information ii

FCC Information

This equipment has been tested and found to comply with the limits for Class B digital devices, pursuant to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

These limits are designed to provide reasonable protection against harmful interference in a commercial/industrial installation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the FCC, to operate this equipment.

1.0 Hardware Installation

The wireless sensor tee's into the air line of the suspension system for each axle group. It measures the pressure and transmits the information to a receiver. One sensor is required per axle group.

1.1 What you need

Before you start with the hardware installation here is a list of the components needed to mount a sensor.

- A clamp (part# **MT-K01** or similar)
- An air line fit-kit
 - part# **AIR-K38** for 3/8" air lines
 - part# **AIR-K14** for 1/4" air lines
- Pipe sealant
- A suitable length of 3/8" or 1/4" plastic D.O.T. tubing

NOTE: The correct size of tubing and air line fit-kit should be based on existing axle group suspension tubing.

1.2 Where to mount the sensor

When locating the sensor on the frame, better range can be achieved if the sensor is mounted on the outside frame rail. Preferably the driver's side.

Note: When installing sensors, keep them away from excessive heat and locations where oil and or fuel may spill on them. Also allow some room for the battery cap to be removed and the batteries to be changed.

1.3 How to mount the sensor

The sensor should be mounted with a suitable clamp (part# **MT-K01**) to an existing hole in the frame of the tractor trailer near the axle group being measured. Apply a strip of weather seal around the narrow section of the sensor and then place the clamp over the seal then pass the bolt through the frame hole followed by the spacer nut then the clamp and finally the locking nut. Tighten to 20 ft-lb.

1.4 Connecting the sensor to the air lines

With the sensor mounted, apply a small amount of pipe sealant to the threads of the reducer bushing and thread into the sensor.

CAUTION: DO NOT OVER-TIGHTEN THE SENSOR THREADS ARE ABS PLASTIC AND MAY STRIP!

Thread on and tighten the D.O.T. fitting on to the reducer.

Find a suitable location for the Tee in the axle group air line. Then cut and insert the tee.

Cut a suitable length of correct size tubing (1/4" or 3/8") to connect the tee to the D.O.T. fitting on the sensor.

Repeat all steps for all other sensors on the truck.

1.5 Changing the batteries

Batteries are installed at the factory. When changing batteries the polarity of the battery is indicated as 'up' or as facing you when looking at them. i.e. the (+) barrel means the positive of the battery must be out, facing you.

2.0 Getting to know the PSIsScale Handheld Receiver

The function of your Handheld is to receive the pressure and temperature data from each Sensor and convert it to a weight. A total weight is displayed by adding all the weights from each configured Sensor. The Handheld also has an easy to set clock built in to provide just another source of time.

The Handheld is capable of monitoring up to 8 Sensors at once. If your configuration requires it you can install as many as 8 Sensors and be able to monitor all of them at a glance. The Handheld can also manage calibration data for up to 84 different Sensors. This allows you to have different Sensors on different trailers without the need to re-enter the calibration data each time you connect to that trailer. You simply set the serial number for the Sensor(s) and the calibration information is set automatically.

It is important to understand that each Sensor only sends its pressure and temperature data once per minute. The time that the Sensor sends the data is a function of when the batteries were installed on that sensor. If the data is missed for one reason or another, you must wait for the next data transmission within the next 1 minute period.

The question as to why the Sensor provides temperature data can be answered by the fact that, to measure pressure accurately the temperature must be known to make corrections to the pressure reading. So, the temperature data is shown on the Handheld to give you feedback as to the ambient temperature at the point Sensor is mounted.

To 'wake up' the Handheld, you simply press and hold any one of the 5 buttons until the display becomes active. This could take as long as one second. The Handheld will go back into sleep mode after approximately 10 minutes if no button has been pressed. This is done to save valuable battery power. There is no other way to put the Handheld into sleep mode.

Once you have the Handheld 'awake' will notice that the graphics LCD screen will show opening banner with text lines on top and bottom and the PSIsScale logo in the middle for 3 seconds, or as long as you continue to hold down the button you woke the Handheld up with. During the opening banner on the right hand side of the PSIsScale logo section is a bar graph that indicates the strength of the Handheld batteries. When the bar is at the top the batteries are full and when the bar is at the bottom, they need to be changed.

After the banner screen is displayed the LCD content will be divided into 3 basic sections: -Top line -Middle content (usually the rig image) -Bottom line

2.1 Operating Modes

The content of those sections, and what you can do, is determined by the mode that the Handheld is in. There are 2 modes: -Configure Mode -Locked Mode

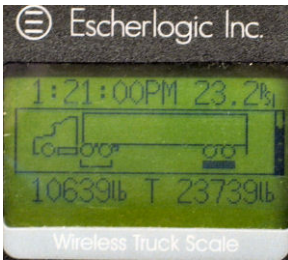


Fig 2.1.0 Handheld w/Display Locked



Fig 2.1.1 Handheld w/Display Unlocked

The mode is determined by a jumper that is located in the back of the Handheld when you have the battery cover removed. Located just above the battery area is a small opening that has in the middle of it the 'LOCK' jumper. If a (black plastic) jumper is installed, the Handheld is in Configure Mode. If the jumper is removed, then the Handheld is in Locked Mode.

When the Handheld is in Configure Mode the Top line will show 6 Menus, M1, M2, M3, M4, M5, M6 and an Escherlogic Logo. The rest of the screen contents are controlled by the current Menu selected. Each of the 6 menus provides you access to different functions of the Handheld.

To move around to the different Menus, you must have the Top line selected. A section is selected by whether it is white on black or black on white. The Menus are selected when the line is white characters with a black background and a specific Menu item is selected when its background is white.

The left and right arrows are used to move to the different Menus. Pressing the Escherlogic Logo (centre button), when in the Menu selection, will bring up the PSIsScale website address and the Handheld code revision number. Pressing the left or right arrow will return you back to the Menus. Use the down arrow to move down into that specific Menu content. When you do this you will notice that the Menu line will change to black characters on white background and the LCD screen section that has the focus will be black background with white image/characters. At this point the function of the Handheld buttons will reflect what need to be done, indicated usually with arrows or the Escherlogic Logo on the display.

In Configure Mode the Handheld allows you to:

- Set the clock (M6)
- Select the image of your rig (closest match) (M3)
- Assign the Sensor serial numbers to the corresponding axle group on the rig image and calibrate the sensor (M2)
- Show the diagnostic information for the Sensors assigned to your rig (M4)
- View calibration data and delete Sensors for the stored list in the Handheld (M5)
- Select/show the weight of the selected Sensor (Axle Group) and the total weigh (M1)

When the Handheld is set to Locked Mode, the time is displayed and you can only view the weight/pressure/temperature of any Sensor. Pressing and holding the Escherlogic Logo will show the PSIsScale website address and the Handheld revision number. When you release the button, the display will return to the rig image and its related data.

When the Handheld is in Configure Mode and on M1 or, when the Handheld is in Locked Mode, you will notice bars under the configured axle groups. These bars will indicate the status of the Sensors in the Handheld. The selected axle group (Sensor) will have a thick solid bar while all the other bars

will be hollow. If data from any of the Sensors for the axle group have not been received by the Handheld in the last minute then the bar will be flashing. If the selected axle group (Sensor) is flashing, a '->NO NEW WEIGHT<-' is displayed on the lower line as well. If any data from any, one or all, Sensor(s) has not been received the total weight (indicated by a 'T') will show up as 'T *****lb'. The bar graph on the right hand side of the image will indicate the 'age' of the weight data. When the bar is at the top the data from the selected Sensor has just been received and when the bar is at the bottom the data from the selected Sensor is expected to be received.

3.0 Configuring your Handheld Receiver

In this section we discover how to the configure the handheld receiver to suit your own particular requirements.

3.1 Selecting a Tractor/Trailer configuration.

The first thing you need to do when configuring the handheld receiver is to select the tractor/trailer configuration that most closely matches the one you are installing.

1. Select the M3 menu on the handheld receiver.



Fig 3.1.0 The M2 menu

2. Press  to enter the M3 menu.
3. Using the  and/or  select the tractor trailer combination that suits your requirements.

There are 14 different configuration images built into the handheld receiver program. They look like:



Fig 3.1.1 Rig #1



Fig 3.1.3 Rig #3



Fig 3.1.5 Rig #5

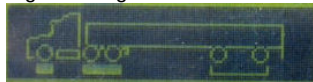


Fig 3.1.7 Rig #7



Fig 3.1.9 Rig #9



Fig 3.1.11 Rig #11



Fig 3.1.13 Rig #13



Fig 3.1.2 Rig #2



Fig 3.1.4 Rig #4

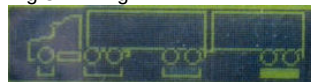


Fig 3.1.6 Rig #6



Fig 3.1.8 Rig #8



Fig 3.1.10 Rig #10



Fig 3.1.12 Rig #12



Fig 3.1.14 Rig #14

4. Press  to return to the main menu.

The brackets under selected wheel images represent the pre-assigned locations where sensors can be associated in the currently visible tractor/trailer configuration. For example: in **Fig. 3.1.3** the tractor can be assigned a sensor on the steering axle and on the drive axle. In addition it can have four (4) discrete sensors mounted on the trailer. This gives a possible total of six (6) sensors for this configuration.

3.2 Assigning sensor serial numbers to axle groups.

Now that the tractor-trailer configuration is in place we can start assigning sensor serial numbers to the axle groups as represented in the handheld. It is this step that controls from which sensor(s) the handheld receiver attempts to receive data.

1. Select the M2 menu on the handheld receiver.



Fig 3.2.0 The M2 menu

2. Press  to enter the M2 menu.

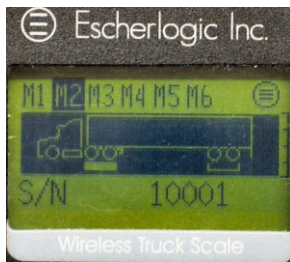


Fig 3.2.1 The M2 menu main screen

3. Select an axle group on the tractor trailer using the  and .
4. Press  to edit that axle group setting.



Fig 3.2.2 Edit the selected sensor

5. Press  to get to the sensor serial number screen.



Fig 3.2.3 Serial Number Editing

6. Using the  and/or  change the sensor serial number to match the serial number as printed on the side of the sensor.
7. When finished press the  followed by the  to return to the sensor selector screen.

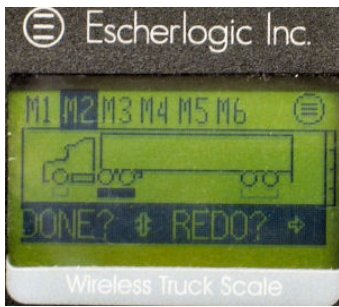


Fig 3.2.4 Finished assigning sensor serial number?

8. Select subsequent sensor axle groups and repeat the above steps as required.

4.0 Calibration

The Calibration steps need to be performed once, when you first install the system. Upon completion of both calibration steps, with load and without load, the PSIScale system will be properly calibrated.

Calibration may need to be repeated any time you change some element of your air suspension system.

4.1 What you need

Before you start the calibration process you should have the following:

- Completed your tractor trailer hardware installation and basic handheld configuration.
- Confirmed that each sensor is reporting to the handheld receiver.
- The scaled weight AND air pressure reading for each axle group. You will need the data for all axle groups with a load and without.

Note that the best and most accurate way to coordinate this information is to write the pressures for each axle group as indicated by the handheld on the weigh ticket as soon as you get it from the scale operator.

4.2 Calibration Without Load

1. Select the M2 menu on the handheld receiver.



Fig 4.2.0 The M2 menu

2. Press  to enter the M2 menu.



Fig 4.2.1 The M2 menu main screen

3. Select an axle group on the tractor trailer using the  and .
4. Press  to edit that axle group setting.



Fig 4.2.2 Edit the selected sensor

5. Press  to get to the sensor serial number screen.



Fig 4.2.3 Serial Number Editing

6. Press  again to go to the calibration screen.

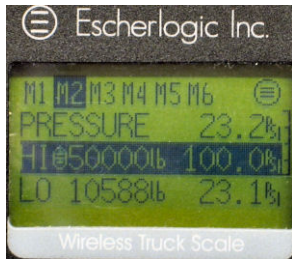


Fig 4.2.4 Sensor Calibration - Loaded Weight Value

7. Press  twice more to move the cursor/selector to the 'LO' weight parameters.



Fig 4.2.5 Sensor Calibration - Setting Empty Weight Value

8. Using the  and/or  change the value to represent the empty weight of the selected axle group as measured by the scale.
9. Press the  to move the selector to the pressure setting.



Fig 4.2.6 Sensor Calibration - Setting Empty Pressure Value

10. Using the  and/or  change the value to represent the pressure for this axle group that was recorded when the empty weight was measured.
11. Press  once more to move out of the calibration menu.

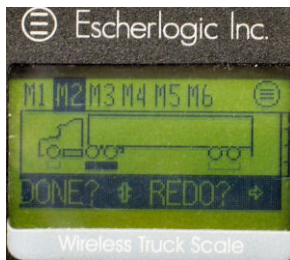


Fig 4.2.7 Finished editing the sensor

12. Press  to complete the calibration of the selected axle group.

Repeat this process for each of the remaining axle groups.

4.3 Calibration With Load

The best way to accomplish this step is to put a normal load on and head for the scale. Once you have a scaled value for each axle of your loaded tractor trailer you simply enter those values along with the measured pressure value into the handheld receiver.

Here are the steps:

1. Select the M2 menu on the handheld receiver.



Fig 4.3.0 The M2 menu

2. Press  to enter the M2 menu.



Fig 4.3.1 The M2 menu main screen

3. Select an axle group on the tractor trailer using the  and .
4. Press  to edit that axle group setting.



Fig 4.3.2 Edit the selected sensor

5. Press  to get to the sensor serial number screen.



Fig 4.3.3 Edit the selected sensor

6. Press  again to go to the calibration screen.

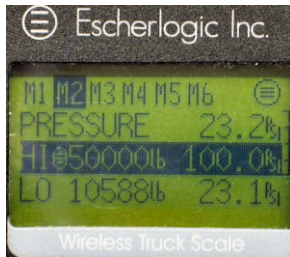


Fig 4.3.4 Sensor Calibration - Setting Loaded Weight Value

7. Using the  and/or  change the value to represent the **loaded** weight of the selected axle group as measured by the scale.
8. Press the  to move the selector to the pressure setting.



Fig 4.3.5 Sensor Calibration - Setting Loaded Pressure Value

9. Using the  and/or  change the value to represent the pressure for this axle group that was recorded when the **loaded** weight was measured.
10. Press  twice to move out of the calibration menu.

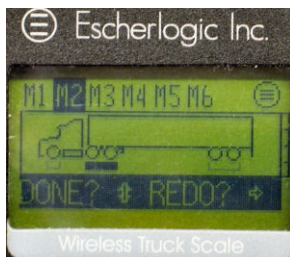


Fig 4.3.6 Finished editing the sensor

11. Press  to complete the calibration of the selected axle group.

Repeat this process for each of the remaining axle groups.

4.4 Congratulations!

The system is now calibrated

5.0 Appendix A – Troubleshooting

5.1 Installation

Q1 – I have waited for a couple minutes and I still have no data for sensor #xxxxx.

A1 – Verify that the sensor serial number (S/N) etched on side of the sensor is the same as the S/N you entered into the handheld configuration.

5.2 Normal Operation

Q2 – The handheld displays <No New Weight> instead of the weight.

A2 – The handheld displays this when the selected sensor has not provided a weight signal since the handheld was turned on. Since the sensor only transmits once per minute you may have to wait up to one minute for all sensors to report their data to the handheld.

Q3 – The handheld displays 'T ***** lbs' instead of the total weight.

A3 – Similar to Q1 the handheld cannot provide the total weight of the truck until all of the configured sensors have provided their information. Once all the sensors have reported the '*****' will change to the total weight reported.

5.3 Problem Solving

Q4 – I have waited for a couple minutes and I still have no data for sensor #xxxxx.

A4.1 – Verify that the batteries are still good. When you change the batteries the sensor will transmit within 5 seconds of having the battery cap reinstalled and every minute thereafter.

A4.2 – Verify that the unit has not been installed in a way that obstructs the signal for your normal use.