# Absolute vs. Gauge Pressure Data Loggers

Many of the available pressure ranges for the Monarch Track-It™ Pressure Data Loggers can be ordered with absolute or gauge sensors. The question of which type of sensor to use for a particular application comes up frequently enough that it warrants explanation.

What's the difference between PSIA and PSIG?

<u>PSIA (Absolute):</u> Absolute pressure is measured relative to a full vacuum. The pressure of a vessel completely void of any air molecules would be equal to 0 PSIA. Atmospheric pressure (at sea level) is roughly 14.7 PSIA. This means that all Track-It pressure loggers with PSIA sensors will indicate approximately 14.7 PSI at sea level when the pressure port is open to atmosphere (i.e., sitting on a desk or bench during set up). This reading will fluctuate slightly with atmospheric pressure changes and will be more noticeable on sensors with smaller pressure ranges.
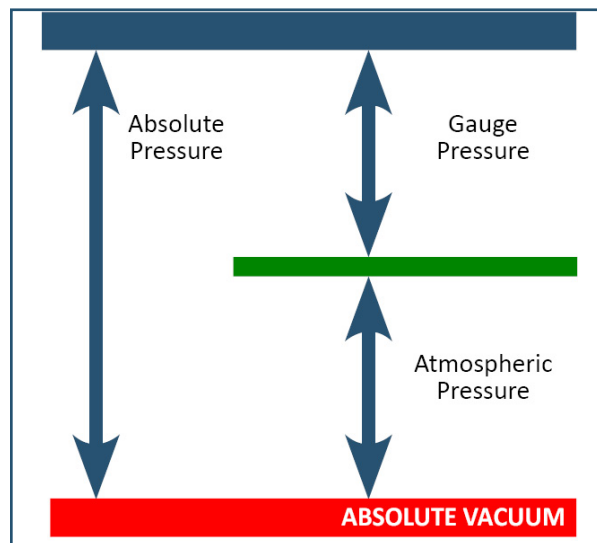
<u>PSIG (Gauge):</u> Gauge pressure is measured relative to ambient atmospheric pressure. A vessel completely void of any air molecules (at sea level) is roughly -14.7 PSIG, and ambient air pressure is always measured as 0 PSIG. Therefore, all Track-It pressure loggers with PSIG sensors will read 0 when the port is open to atmosphere (i.e., sitting on a desk or bench during setup). The reading will NOT vary with barometric pressure.

Which sensor type should I use?

PSIG sensors are most commonly used in industrial processes where barometric pressure has no affect, such as in hydraulic or pneumatic control systems, liquid or gas distribution systems, liquid level systems that are "open" to atmosphere, etc. PSIA sensors are most commonly used in sealed systems or vessels and in sealed low pressure (or vacuum) systems where slight changes in barometric pressure can significantly affect the system. They are also very common in aerospace applications.

Track-It digital PSIA pressure loggers can be configured to behave like PSIG loggers.

Do you have a Track-It PSIA data logger that you want to set up as a PSIG logger? This can be easily accomplished by entering a pressure offset equal to the atmospheric pressure where you are located.

Applying an Offset

When the pressure point is open to the atmosphere, an absolute unit will read atmospheric pressure of about 14.7 psia at sea level; the atmospheric pressure will have slight variations due to weather and altitude. On the other hand, when open to the atmosphere, a gauge pressure unit will read "0" just like a standard water pressure gauge. To compensate for atmospheric pressure, we can apply an offset.
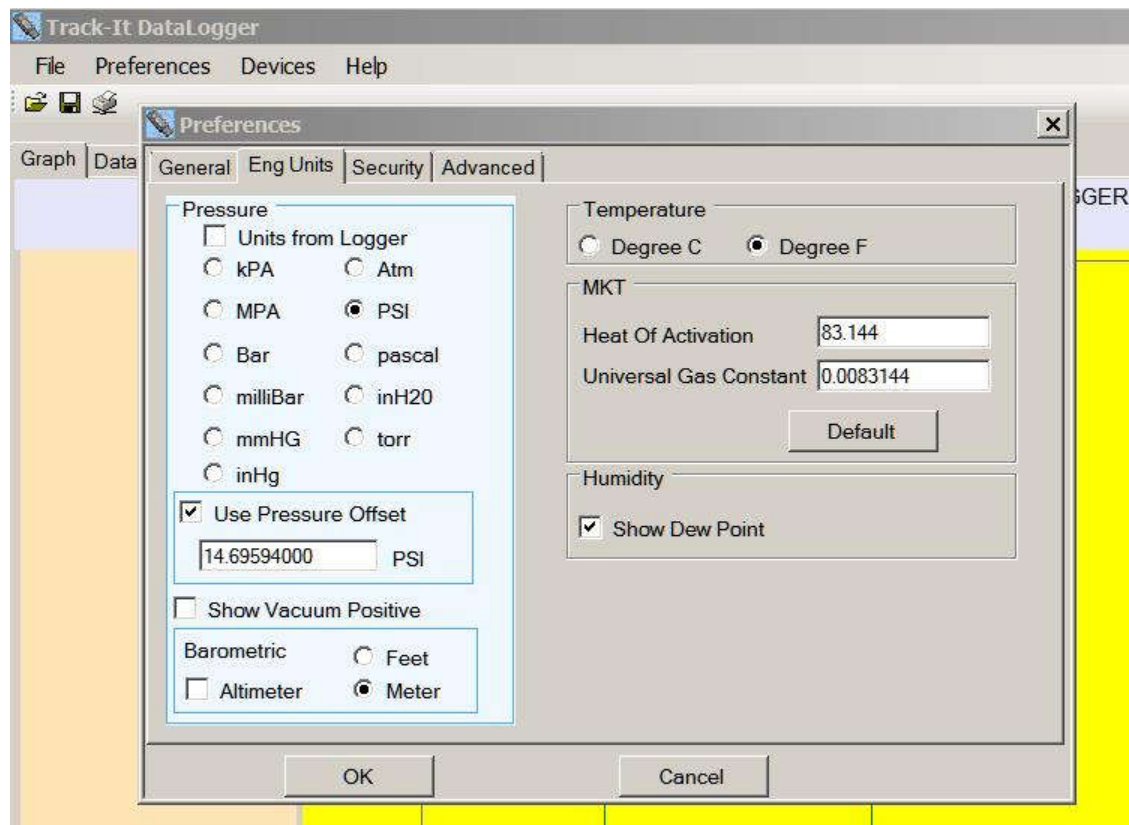
Using Track-It™ Software, do the following:
- ◄ Select *Preferences*
- ◄ Select *Eng Units* (here you will see "Use Pressure Offset")Select the preferred unit measurement
- ◄ Check the box noting Using Pressure Offset
- ◄ Type in the local atmospheric pressure registered at this time; this replaces the default setting.
- ◄ Click *OK*

Note: The default is the average sea-level atmospheric pressure of 14.696 pounds per square inch. If needed, a quick internet search will provide the current atmospheric pressure at your location.

Now that the offset is in place, the data table in the Track-It Software will be corrected, showing zero (or very close to zero) when open to the atmosphere.

2.
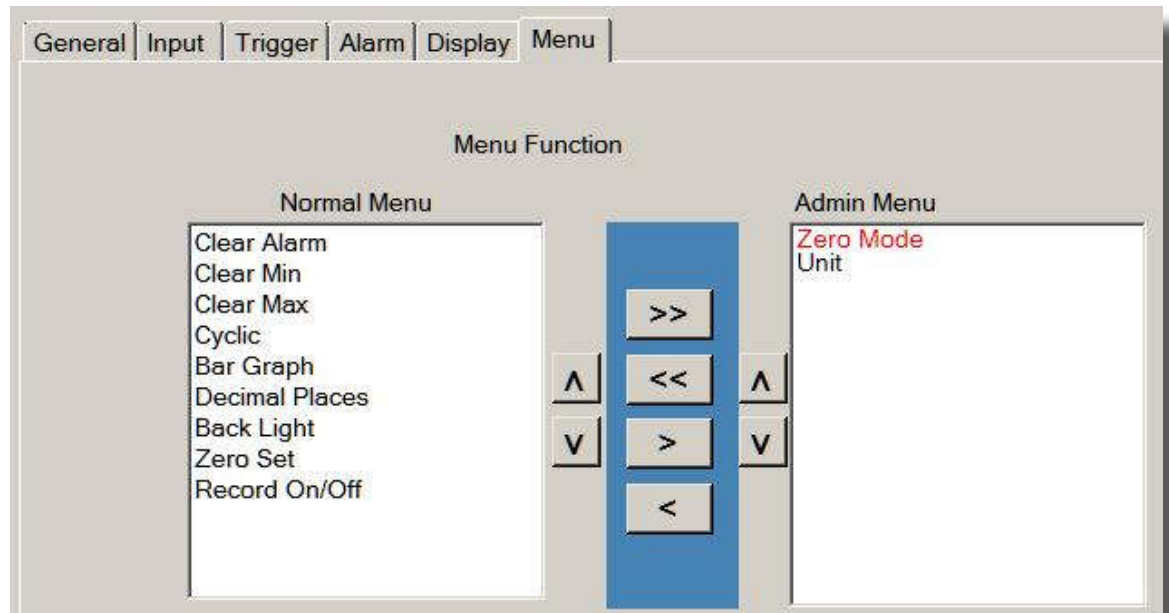
Additional Step for Absolute Pressure Loggers

Because the previous steps offset data retrieved in the graph and data table, it may not be necessary to perform an additional step for absolute pressure loggers. However, there is an additional step to zero if needed.

On an absolute digital display pressure logger, it will show 14.7 psia when open to the atmosphere. You can enable the setting of the display to read zero as on the device setup.

Notice that the Zero Mode is under the Admin Menu. Zero Mode must be enabled for the zero set to work.

To change the Zero Mode:
◄ Press and hold the left button while briefly pressing the menu button (center)
The center button will then cycle through the choices; you see the zero with either "Off" or "Enab" above it.
◄ Use the right button to toggle between the two; Enab must be above the word zero for the display to be zeroed.

Notice that the Zero Set is under the Normal Menu. If you repeatedly hit the middle button (menu) on the logger, you will get the word "Set" or "Off" above the word zero.
Use the right button to change between the two.

The goal is to see "Set" above Zero, and the display should read 0.

Option

If desired, you can move the items under the Normal Menu to the Admin Menu. In addition, you can move the Unit from the Admin Menu to the Normal Menu to get the measurement units to toggle.

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Monarch offers three Track-It Pressure/Temp data logger options:
- Pressure/Temp, Vacuum/Temp Data logger without a display (PN 5396-0304)
- Pressure Transmitter/Data Logger with Digital Display (PN 5396-1334)
- Pressure/Temp, Vacuum/Temp Data Logger with Display (PN 5396-0334)

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