

6. VELOCITY/TEMPERATURE CALIBRATION

The EE75 can be calibrated / adjusted using either the buttons on the optional display module or the USB interface and configuration software provided.

6.1 Selecting the appropriate calibration method (1-point or 2-point calibration)

The EE75 transmitter series can be calibrated in 2 different ways:

- 1-point v/T calibration:
Quick and easy option for obtaining precise measuring results at a specific working point. 1-point calibration should only be used for very limited working ranges.
- 2-point v/T calibration:
With 2-point calibration, precise measuring results can be obtained over the entire v/T measuring range. The more complicated 2-point calibration procedure is preferable to 1-point calibration, if higher precision or a wider working range is required.

6.1.1 General information on 1-point v/T calibration:

If possible the selected calibration point should be similar to the working point (of the limited working range) of the transmitter.

Example: Working range v 8 - 12m/s (1600 - 2400ft/min) > calibration point at 10m/s (2000ft/min); working range T 18 - 22°C (64.4 - 71.6°F) - > calibration point at 20°C (68°F).

- If the selected calibration point is < 50% of the max. measuring range, V/T-CAL LOW should be selected for calibration / adjustment.
- If the selected calibration point is > 50% of the max. measuring range, V/T-CAL HIGH should be selected for calibration / adjustment.

Example: v measuring range 0 - 10m/s (0 - 2000ft/min); actual working range 6 - 8m/s (1200 - 1600ft/min); selected calibration point 7m/s (1400ft/min); perform 1-point calibration, selecting V-CAL HIGH.

6.1.2 General information on 2-point v/T calibration:

With 2-point calibration, v/T calibration / adjustment is performed at 2 different calibration points.

To ensure the smallest possible deviation in measuring results over the entire measuring range, the two calibration points should be selected as follows:

- The low calibration point should be in the lower third of the measuring range. Calibration / adjustment must be performed using the V/T-CAL LOW function.
- The high calibration point should be in the upper third of the measuring range. Calibration / adjustment must be performed using the V/T-CAL HIGH function.

Example: EE75 vT**1 - measuring range = 0 - 2m/s (0 - 400ft/min).
Low calibration point (V-CAL LOW) should be around 0.4 m/s (0...0.7).
High calibration point (V-CAL HIGH) should be around 1.8 m/s (1.4...2).

6.2 Velocity calibration

6.2.1 Calibration procedure using configuration software

See Configuration Software, Section 4.9.3 - v calibration process using a configurator

6.2.2 Calibration procedure using buttons on the display module (optional)

1. Position the sensor head in the middle of the reference system (wind tunnel).
2. Stabilise the probe at the reference velocity (for at least 1 minute). The temperature of the measuring probe and the reference system must be approximately the same.
3. Press both buttons for approx. 5 s to display the menu window.
4. Use the buttons and cursor so select the menu item "CALIBRATION" and confirm the selection.
5. Select "V-Cal" and confirm the selection.
- 6.1 "1-point calibration":
 - Select the calibration point as described in Section 6.1.1.
 - If calibration point > 50% of measuring range, select "V-CAL HIGH" and confirm the selection.
 - If calibration point < 50% of measuring range, select "V-CAL LOW" and confirm the selection.
- 6.2 "2-point calibration":
 - Select the low (high) calibration point as described in Section 6.1.2.
 - Approach the low (high) calibration point in the reference system, select "V-CAL LOW" ("V-CAL HIGH") on the transmitter and confirm the selection.
7. The status line should display either CAL LOW (CAL HIGH).
8. The measuring value can now be adjusted with the reference value in 0.1 m/s (20ft/min) increments by pressing the UP or DOWN button. The updated value is displayed immediately and present at the analogue output.
9. To save the adjusted measuring value in the instrument, press both buttons simultaneously for approx. 5 s, then select "YES" in the "SAVE" menu and confirm the selection. This exits the calibration routine and the transmitter returns to normal operating mode.

Selecting "NO" in the "SAVE" menu exits the calibration routine without saving the adjusted measuring value.
10. In the case of 1-point v calibration, the procedure is now complete.
11. For 2-point v calibration, repeat steps 6.2-9 with the (high) calibration point.

6.3 Temperature calibration

6.3.1 Calibration procedure using configuration software

See Configuration Software, Section 4.9.4 - T calibration procedure using a configurator

6.3.2 Calibration procedure using buttons on the display module (optional)

1. Insert the sensor head in the temperature reference system.
2. Allow it to stabilise (min. 15 minutes). The greater the difference in temperature between the measuring probe and the reference system, the longer the required stabilisation time.

3. Press both buttons for approx. 5 s to display the menu window.
4. Use the buttons and cursor to select the menu item "CALIBRATION" and confirm the selection.
5. Select "T-Cal" and confirm the selection.
- 6.1 "1-point calibration":
 - Select the calibration point as described in Section 6.1.1.
 - If calibration point > 50% of measuring range, select "T-CAL HIGH" and confirm the selection.
 - If calibration point < 50% of measuring range, select "T-CAL LOW" and confirm the selection.
- 6.2 "2-point calibration":
 - Select the low (high) calibration point as described in Section 6.1.2.
 - Approach the low (high) calibration point in the reference system, select "T-CAL LOW" ("T-CAL HIGH") on the transmitter and confirm the selection.
7. The status line should display either CAL LOW (CAL HIGH).
8. The measuring value can now be adjusted with the reference value in 0.1°C (32.18°F) increments by pressing the UP or DOWN button. The updated value is displayed immediately and present at the analogue output.
9. To save the adjusted measuring value in the instrument, press both buttons simultaneously for approx. 5 s, then select "YES" in the "SAVE" menu and confirm the selection. This exits the calibration routine and the transmitter returns to normal operating mode.

Selecting "NO" in the "SAVE" menu exits the calibration routine without saving the adjusted measuring value.
10. In the case of 1-point T calibration, the procedure is now complete.
11. For 2-point T calibration, repeat steps 6.2-9 with the (high) calibration point.

6.4 Resetting to factory calibration

If necessary the transmitter can be reset to the factory settings (factory calibration data), after a v or T customer calibration has been performed.

6.4.1 *Resetting v/T to factory calibration:*

1. Press both buttons for approx. 5 s to display the menu window.
2. Select "Factory settings" and confirm the selection.
3. Select "Restore Settings" and confirm the selection.
4. The customer calibration data (v, T) has now been reset to the factory calibration data.

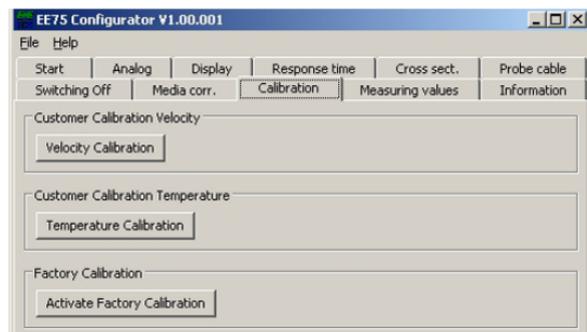
6.4.2 *Resetting v to factory calibration:*

1. Press both buttons for approx. 5 s to display the menu window.
2. Select "Calibration" and confirm the selection.
3. Select "V-CAL" and confirm the selection.
4. Select "V-FACTORY SETTINGS" and confirm the selection.
5. Select "Restore Settings" and confirm the selection.
6. The customer calibration data (v) has now been reset to the factory calibration data.

6.4.3 *Resetting T to factory calibration:*

1. Press both buttons for approx. 5 s to display the menu window.
2. Select "Calibration" and confirm the selection.
3. Select "T-CAL" and confirm the selection.
4. Select "T-FACTORY SETTINGS" and confirm the selection.
5. Select "Restore Settings" and confirm the selection.
6. The customer calibration data (T) has now been reset to the factory calibration data.

4.9 Calibration



Velocity and temperature calibration is not only possible using the buttons on the integrated display, the EE75 can also easily be calibrated / adjusted using the configuration software.



Note:

The configuration software automatically distinguishes between the low and high calibration points.

- If the selected calibration point is BELOW the centre of the measuring range, it is automatically recognised as the "low calibration point" (CAL LOW).
- If the selected calibration point is ABOVE the centre of the measuring range, it is automatically recognised as the "high calibration point" (CAL HIGH).

Example:

- EE75 VT**1: Measuring range = 0-2m/s (0-400ft/min) -> centre of measuring range = 1m/s (200ft/min)
- 0.5m/s (100ft/min) -> calibration point lies below 1m/s (200ft/min) -> CAL LOW
 - 1.6m/s (300ft/min) -> calibration point lies above 1m/s (200ft/min) -> CAL HIGH

4.9.1 Information on 1-point v/T calibration

If possible the selected calibration point should be similar to the working point (of the limited working range) of the transmitter.

Example:

Working range v 8 - 12m/s (1600 - 2400ft/min) > calibration point at 10m/s (2000ft/min);
working range T 18 - 22°C (64.4 - 71.6°F) > calibration point at 20°C (68°F).

4.9.2 Information on 2-point v/T calibration

v/T calibration / adjustment is performed at 2 different calibration points. To ensure the smallest possible deviation in measuring results over the entire measuring range, the two calibration points should be selected as follows:

- The low calibration point should be in the lower third of the measuring range.
- The high calibration point should be in the upper third of the measuring range.

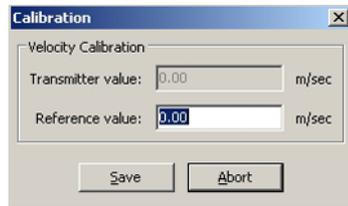
Example:

EE75 vT**1 - measuring range = 0 - 2 m/s (0 - 400ft/min)

- Low calibration point (V-CAL LOW) should be around 0.4 m/s (0...0.7).
- High calibration point (V-CAL HIGH) should be around 1.8 m/s (1...4-2).

4.9.3 v calibration procedure using the configuration software

1. Position the sensor head in the middle of the reference system (wind tunnel).
2. Set the required calibration point in the reference system (wind tunnel).
3. Stabilise the probe at the reference velocity (for at least 1 minute).
4. Clicking on the "Velocity calibration" button opens the menu window shown below.



5. Enter the velocity displayed by the reference system in the "Reference value" input field.
6. Clicking "Save" adjusts the EE75 measuring value with the reference value.
7. In the case of 1-point calibration, the process is now complete.
8. For 2-point calibration, repeat steps 2-7.

4.9.4 T calibration procedure using the configuration software

Click on the "Temperature calibration" button. The 1 or 2-point temperature calibration procedure is similar to the velocity calibration (see Section 4.9.3 - v calibration process using a configurator).

4.9.5 Activating factory calibration

Clicking the "Activate factory calibration" button deletes the customer calibration data set for velocity and temperature and restores the factory settings.