

Calibrating a sensor

Calibration lets you correct the values a sensor reports so they match a trusted reference — for example a hand-held meter, a laboratory result or a known reference concentration. In Consibio Cloud you calibrate the **element** that stores the measurement, and the calibration is automatically synced back to the device that produces the reading.

Calibration works the same way for any calibratable element, whether it measures velocity, level, flow, H2S, temperature or something else. This article describes the shared calibration tool.

Before you start

- You need **edit** permissions on the project. If you only have viewer or guest access, the tool tells you that you cannot change the calibration.
- Decide how you want to calibrate:
 - **Calibration points** — enter one or more pairs of *measured* and *correct* values and let Consibio Cloud calculate the slope and offset for you. This is the recommended method for most sensors.
 - **Slope and offset** — enter the slope and offset directly, if you already know them.

1. Open the calibration tool

1. Open the **element** you want to calibrate to show its settings.
2. Find the **Calibration** row and select **Calibrate**. The button only appears for elements that support calibration.

The calibration tool opens in a dialog. You are first asked to choose between **Enter calibration points** and **Enter slope and offset**.

2. Calibrate using calibration points

Choose **Enter calibration points**. A chart of the element's recent readings appears, with a time-range selector (for example **Last 1 day**) so you can zoom in on the period when the calibration was performed. Drag on the chart to zoom in, and double-click to reset the zoom.

There are two ways to add a calibration point:

- **Pick from the chart** — select a datapoint on the chart to add it as a calibration point. Select its marker again to remove it. This is handy when the sensor recorded known references earlier (for example while exposed to a calibration gas and then to fresh air).
- **Add a point manually** — select **Add point** to add a row, then either type the value in **Measured value** or, if the sensor is reading a known reference right now, select **Update** on the row to pull in the element's latest live reading. A row shows when the measured value was captured, or **Manual entry** if you typed it.

For every point, enter the value the sensor *should* be reading in **Calibrated value** — the value from your reference (for example 500 for 500 ppm calibration gas, or 0 for fresh air).

The number of points determines how the correction is calculated:

- **1 point** — a simple offset. The correction shifts every reading by the difference between the measured and calibrated value.
- **2 points** — a straight-line (linear) correction between the two points, giving both a slope and an offset.
- **3 or more points** — a best-fit straight line (least-squares linear regression) through all the points.

The **Confirm** button reflects what you have entered, for example *Confirm 2-point linear calibration*.

Assume same zero-point

Under the calibration points there is an **Assume same zero-point** option. When enabled, the tool automatically adds a fixed point where a measured value of 0 equals a calibrated value of 0. This turns a single entered point into a 2-point linear calibration through the origin. A row numbered **0** appears to show the added point; disable the option to remove it.

Do not also enter a 0 value manually while this option is on — the tool needs each measured and calibrated value to be unique.

3. Calibrate using slope and offset

If you already know the correction, choose **Enter slope and offset** instead:

- **Slope** — the factor the measured value is multiplied by to get the expected value.
- **Offset** — the value added after multiplying, to get the expected value.

The corrected value is calculated as $\text{slope} \times \text{measured} + \text{offset}$.

4. Review and confirm

The **Coefficients** table shows the current **Slope** and **Offset** and, when your input changes them, the new values in green next to an arrow. Check that the new values look right, then select the **Confirm** (or **Save slope and offset**) button.

The calibration is saved to the element and synced to the relevant device automatically. If the same calibration is changed in another window or session while you have the tool open, the tool warns you so you can re-check both the current and adjusted values before saving.

Resetting a calibration

To remove a calibration and return the element to its default (no correction), open the calibration tool and select **Reset now** under the calibration options, then confirm. The button is disabled when the element is already at its default slope and offset.

Caution

Resetting a calibration cannot be undone. The current slope and offset are deleted.

Troubleshooting

- **The Calibrate button is missing.** The element does not support calibration, or you do not have edit permissions on the project.
- **The Confirm button stays disabled.** Make sure every measured and calibrated value is a valid, unique number.
- **Values changed unexpectedly.** The calibration may have been updated in another session. Re-open the tool and check the **Coefficients** table before saving again.

If you still can't get the calibration to behave as expected, contact support@consibio.com.