



OmniTrak™ IAQ Modules

User Calibration Guide

For VOC Sensors, Gas Sensors,
and the CO2 Sensor In-Field Calibration

Why Span?

Purpose: To verify and adjust the sensor's sensitivity so it provides accurate readings to a known concentration across its full measurement range – especially at low concentrations or tracking small changes.

What does spanning do?

- Confirms that when a known concentration is introduced, the sensor reports a value as close as possible to the certified concentration
- Correct for sensor aging, drift, or environmental exposure (i.e.; humidity, temperature, off-gassing, or background contamination)
- Ensure that small but meaningful variations in indoor air quality or industrial environments are measured precisely.
- Compliance for QA/QC protocols or environmental standards
- Confidence in reported values used to make ventilation or health-related decisions

Why Zero?

Purpose: Sets the sensor baseline when gases or other compounds are not present.

What does zeroing do?

- To remove drift caused by environmental exposure or sensor aging.
- Especially important in low-VOC environments or when tracking small changes (i.e., in clean rooms or labs)



User Calibration Guide

1. Safety & Handling Notes

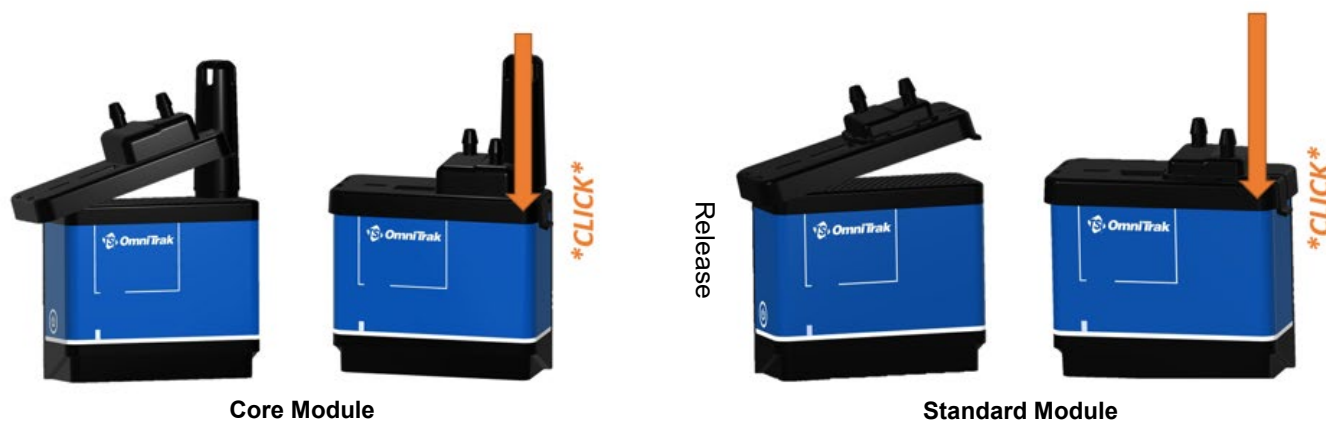
- Use calibration gases in a well-ventilated area.
- Do not exceed recommended gas concentrations or pressures.
- Secure gas cylinders upright and use appropriate regulators.
- Always wear PPE when handling compressed gases.

2. When to Calibrate

- Factory calibration – ensures initial accuracy
 - Annually
- Field calibration – compensates for real-world influences and aging over time
 - Daily, before each study as appropriate, or follow the suggested user cal interval in Section 8: Appendix
 - More frequently if:
 - Readings appear inaccurate or drift beyond expected range.
 - It's exposed to high concentration environments, high humidity, dust, or pollutants.
 - Regulatory or certification programs require it.

3. Required Equipment

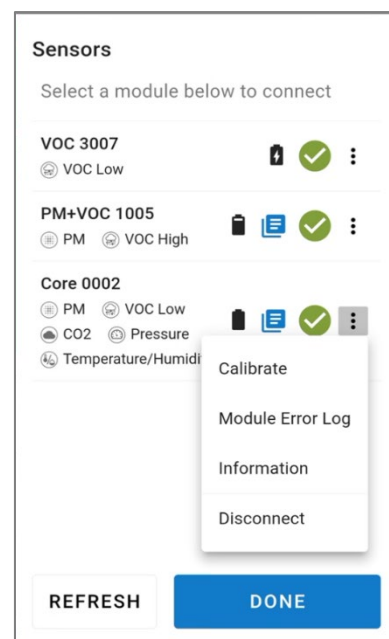
- **OmniTrak™** module calibration shroud
 - 7590-84: Shroud for VOC-EC and CO₂ in the Core module
 - 7590-85: Shroud for VOC-PID on standard module
 - 7590-86: Shroud for CO on standard module
 - 7590-87: Shroud for Cl₂ and NH₃ on standard module
 - 7590-88: Shroud for O₃ and HCHO on standard module



- Zero air source and/or span gas (see Recommended Gases and Concentrations table)
- Gas regulator for ≤ 0.3 L/min
- FEP lined tubing and regulator
- Plastic bag (recommended for CO, HCHO, O₃, Cl₂, and NH₃ calibrations)
- **OmniTrak™** Smart Station

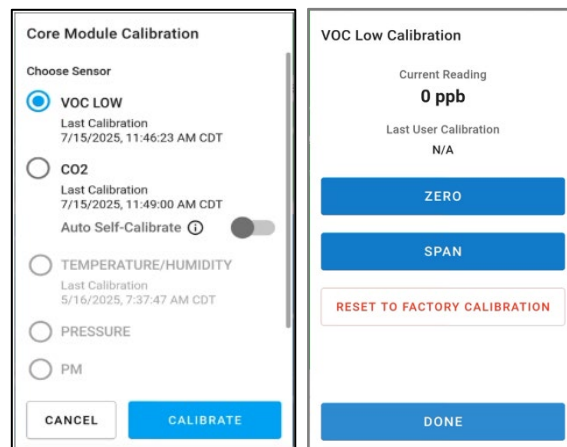
4. Setup Instructions

- Start with the module paired to the Smart Station
- Attach the appropriate calibration shroud to the module
- Connect tubing from gas source to the calibration shroud
- For CO, HCHO, O₃, Cl₂, and NH₃ sensor calibrations, place the module in a plastic bag to minimize the effect of ambient airflow during calibration. The bag does not need to be completely sealed. Loosely close the bag around the tubing and gently collapse the bag around the module.
 - NOTE: This step is not needed for VOC-PID, VOC-EC, or CO₂ calibrations due to different calibration flow requirements.
- On the Smart Station, tap the Connection menu (network icon in the top right corner). Find the module to calibrate and tap the kebab menu (three vertical dots) next to the module. Select 'Calibrate' and follow the instructions.



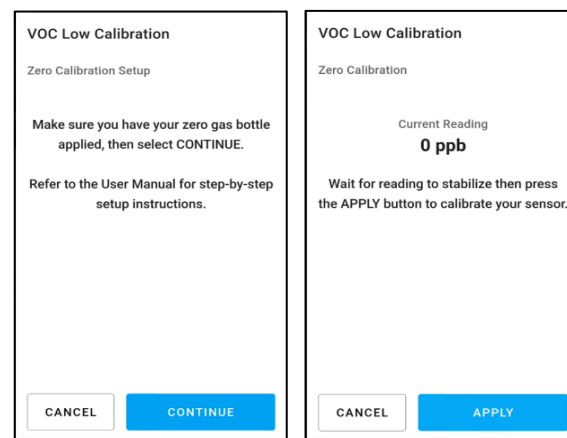
5. Calibration

Zero Calibration and Span Calibration are available for many sensors. If both are performed, Zero Calibration should be completed before Span Calibration.



Zero Calibration

- On the Smart Station Module Calibration screen:
 - Select the desired sensor to zero
 - Tap 'Calibrate'
 - Tap 'Zero'
- Apply the zero gas bottle. Tap 'Continue.'
- Flow zero air into the sensor at ≤ 0.3 L/min
- Wait 5-10 minutes for reading to stabilize, then press 'Apply'
- Wait for confirmation message that the zero calibration was successful.



Span Calibration

- On the Smart Station Module Calibration screen:
 - Select the desired sensor to span
 - Tap 'Calibrate'
 - Tap 'Span'
 - Note: Some VOC sensors have A and B span available for the low and high end respectively.
- Flow span gas (i.e., 10,000 ppb isobutylene) into the sensor at ≤ 0.3 L/min
- Wait 10 or more minutes for reading to stabilize, then press 'Apply'
- Enter Span Gas Concentration
- Wait for confirmation message that the span calibration was successful.

VOC Low Calibration

Span Calibration Setup

Make sure you have your span gas bottle applied, then select CONTINUE.

The recommended span concentration for VOC Low is 10,000.00 ppb.

Refer to the User Manual for step-by-step setup instructions.

CANCEL
CONTINUE

VOC Low Calibration

Span Calibration

Current Reading
0 ppb

Span Gas Concentration (ppb)

Recommended: 10000.00 ppb

Wait for reading to stabilize then press the APPLY button to calibrate your sensor.

CANCEL
APPLY

6. Post-Calibration Verification

- Flow gas again and confirm sensor is reading within +/- 10% of target
- Return to ambient air and confirm baseline sensor readings return to expected values.

7. Troubleshooting

Issue	Possible Cause	Solution
Calibration failed	Unstable readings	Let readings stabilize before retrying
Sensor reading too high post-zero	Contamination in zero air source	Replace or verify zero air source
Span fails	Incorrect gas concentration	Verify gas cylinder and regulator

8. Appendix

Recommended Gases, Concentrations, and Times

Gas	Calibration Gas	Shroud	Shroud PN	Span Conc. (ppm)	Zero Time (min.)	Span Time (min.)	Return to Zero (min.)	User Cal Interval (days)
Core CO2	Carbon Dioxide (CO ₂)	Core	7590-84	400	N/A	10	N/A	N/A
Core VOC	Isobutylene (C ₄ H ₈)			Blank	7590-85	10	10	30
VOC PID ppm		250, 2000	5			10	<5	90
VOC PID ppb		20	5			10	<5	90
CO	Carbon Monoxide (CO)	0.035" Orifice	7590-86	400	10	10	20	90
Cl2	Nitrogen Dioxide (NO ₂)	0.025" Orifice	7590-87	20	10	10	20	90
NH3	Ammonia (NH ₃)			100	10	60	120	60
O3	Nitrogen Dioxide (NO ₂)	Membrane	7590-88	20	10	15	30	30
HCHO*	Formaldehyde (HCHO)			5	10	30	60	60

*HCHO Note: The formaldehyde module has a linear measurement range of 0 to 10 ppm. Prolonged exposure to higher HCHO concentrations (>5ppm) may temporarily reduce sensor response and increase recovery time before stable low-level readings are restored. Performing user calibration with a 5 ppm span gas optimizes performance across the full sensor range, without negative impact of prolonged exposure to full range concentrations.

Zero Calibration: Recommending using Zero Air for all sensor zero calibrations

TSI Technical Support

Please contact TSI or your local channel partner to make service arrangements and to receive a Service Request number. To fill out an online Service Request form, visit TSI Incorporated's website at tsi.com/support.

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