



White Paper

Title: Configuring the Model 900131 for Hi-Ox or Lo-Ox Case-Ready Meat Packaging Process Evaluation

TSN Number: 35

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SRV1\Metron\Bridge_Analyzers\Customer_Service_Documentation\White_Papers\35 Hi-Ox Lo-Ox config.docx

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Overview:

The 900131 MAP Analyzer is a very flexible multi-gas analyzer that can be configured to measure the package headspace gas concentrations for either **Hi-Ox (80% O₂ / 20% CO₂)** or **Lo-Ox (0.40% CO, 35.0% CO₂, 0.00% O₂)** processes. This TSN discusses the configuration method.

O₂ Sensors for Hi-Ox and Lo-Ox:

Bridge Analyzers offers two oxygen sensors for Case-Ready Meat MAP Analyzer applications - the P/N 001140 sensor is used for the Hi-Ox process, and the P/N 001057 sensor is used for the Lo-Ox process as shown below.



Hi-Ox (Green P/N 001140) and Lo-Ox (Red P/N 001057) Oxygen Sensors

As can be seen, the sensors are mechanically very similar, and designed to be interchangeable in the analyzer. The configuration of the 900131 to either Hi-Ox or Lo-

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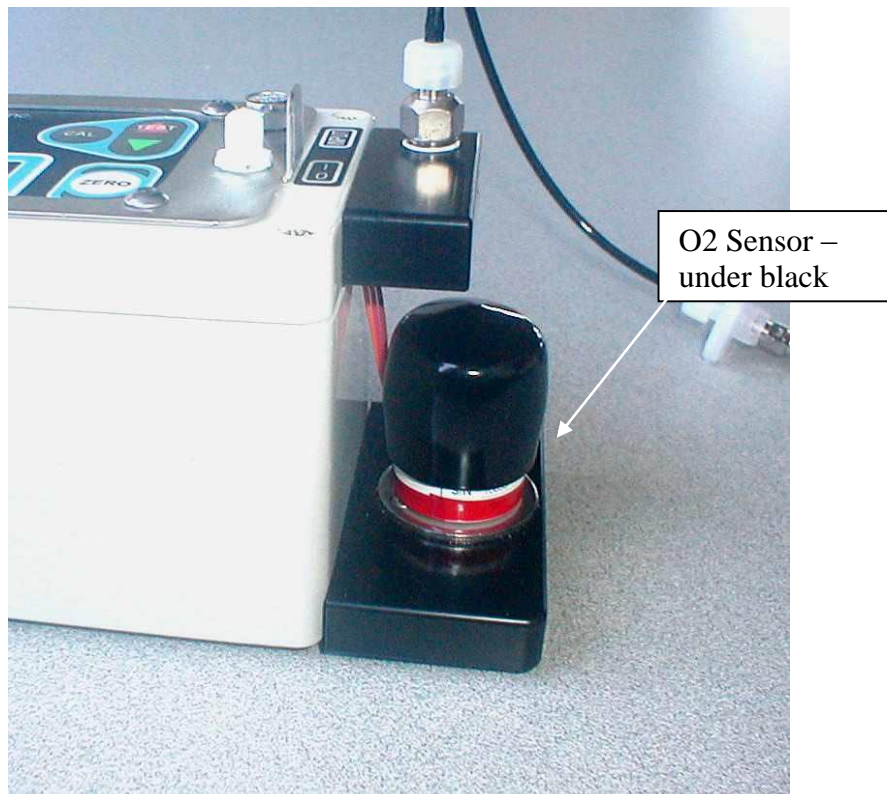
Ox is automatic and totally dependant on the oxygen sensor installed. To change configurations from one process to the other, all that is required is that the O₂ sensor be changed in the unit. Once the sensor is changed, it is automatically calibrated during the next Zero/Calibrate sequence and the analyzer is set to measure the relevant process gas.

Periodic Sensor Replacement:

The oxygen sensors are chemical in nature, and are consumed during use. The 001140 (Hi-Ox) sensor above has a 9 to 15 month service life when used on Hi-Ox process gas continually. The 001057 Lo-Ox sensor has a 18 to 24 month service life when used on Lo-Ox process gas continually. The analyzer tests the oxygen sensor during the Zero/Calibration cycle, and will prompt the user that replacement is due ('Lo' will appear on the Oxygen display after the Zero) if it detects significant degradation. The sensors are field replaceable, and may be ordered from Bridge Analyzers, Inc. when the prompt appears – which is 30 days before reading degradation will occur.

Changing the O₂ sensor:

The O₂ sensor is located under the gas input manifold at the right side of the unit as shown below.





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In order to change the sensor, perform the following steps:

1. If not done already, turn the analyzer power off, remove the external power plug (if attached) and remove the analyzer from its foam-filled compartment in the soft-storage case.
2. Locate the O₂ sensor as above and remove the round black cover on the O₂ sensor and remove the sensor wiring harness from the O₂ sensor.
3. Once the cable is released, unscrew the O₂ sensor counter-clockwise from its mounting block. **NOTE:** Generally, the sensor is installed hand-tight and is removed using manually. If it is very tight, it may be removed using an adjustable wrench on the housing end where the connector was just removed. (It has a flattened design feature on it.) The O₂ sensor has an O-ring gas seal at its base, so there may be considerable starting friction, but once released it should unscrew relatively easily.
4. Once the sensor is removed, screw the new sensor in the threaded hole in the sensor mount block, making sure that the O₂ sensor is installed against the O-Ring at the base of the sensor to make a good gas seal. Be careful not to over-tighten the sensor, as it will make future removal difficult – tighten it ¼ turn after O-ring engagement.
5. Install the cable connector (note the orientation of connector installation, it has an orientation tab cutout for the sensor header – but can be forced to be installed backwards. It should go on smoothly and not stick.) Install the black plastic cover, place the analyzer in the soft-case, and install operating accessories
6. Power up the analyzer and initiate a Zer/Calibrate sequence to confirm normal operation.

Hi and Lo O₂ Calibration:

NOTE: If you are installing a new sensor that has not been calibrated with the analyzer before, you may wish to calibrate the analyzer with the new sensor to assure accurate operation. If you are just changing Hi-Ox to Lo-Ox configuration or the reverse using an O₂ sensor that has already been calibrated with the analyzer, re-calibration should not be necessary, as the previous calibration should still apply. This is because the Hi-Ox calibration and Lo-Ox calibration are exclusive to each sensor and not interactive. That is, the Hi-Ox calibration is set to adjust the Hi-Ox sensor for 80% O₂ accuracy, while the Lo-Ox calibration is set to adjust the Lo-Ox sensor for 0.00% accuracy. The two gas levels are so different that one calibration method does not effect the other.

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To calibrate the analyzer on High-Ox and Lo-Ox test gas, refer to the product manual and/or PN 001246 Gas Test Stand for details. A summary of the Lo-Ox and Hi-Ox calibration process from the 900131 manual is given below for reference.

6.5 High O2 Mode - Adjusting the High O2 Span.

The O2 channel is automatically calibrated on ambient O2 during the Zero process. The factory default value shown at the end of the Zero process is 20.90% O2. High values of O2 are used for some headspace gases, and the analyzer should be recalibrated at high O2 gas levels to increase the high O2 accuracy in this application.

NOTE: This High O2 calibration function is automatically disabled at O2 readings below 2.000% - indicated by flashing the High O2 indication

When calibration gas containing greater than 2.00% O2 is delivered to the analyzer, the High O2 CAL function is enabled, and the O2 reading can be adjusted to the correct value.

NOTE: The high O2 reading is stabilized by occasionally Zero-ing the analyzer on room air – especially when first going from very low levels of O2.

Deliver test gas to the analyzer, and allow the O2 readings to stabilize. The displayed value can be changed to match the test gas by entering the CAL mode, selecting the HI-O2 calibration mode, and adjusting the O2 channel using the UP and DOWN arrows.

NOTE: After Hi O2 calibration, subsequent ZERO processes will result in a value different than 20.90% being displayed after subsequent room-air Zeros.

NOTE: Low O2 (Offset) and High O2 (Span) do not interact or effect each other, and may be performed independently.

6.4 Low O2 Mode – Adjusting the O2 Offset using calibration gas.

Often, the low oxygen reading is the most important to the customer – as it is used to test for residual air in the package headspace. The oxygen gas channel is very stable close to zero, but over time it may show a small positive or negative measurement error. The Low O2 Calibration feature allows the user to fine-adjust the analyzer close to 0.000% O2.

Use the CAL button Select LO O2 CAL for oxygen, and allow the display readings to stabilize.

(It may take a few minutes for the O2 reading to creep down to zero when moving from room air or the equivalent – be patient to provide enough time for the system to reach a stable zero gas level.)

Use the DOWN or UP arrows to make the reading as close to 0.000% as possible.

NOTE: The analyzer is capable of displaying negative gas values to assist the operator in making Low O2 trim adjustments.

NOTE: Gas Analyzer Calibration is a precise process. To facilitate re-calibration of a MAP analyzer, it is recommended that the user purchase a Gas Test Stand PN 001246 for gas delivery stability.

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