

Application note

Pressure calibration

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Document history

The Observator range is in continuous development and so specifications may be subject to change without prior notice. When in doubt about the accuracy of this document, contact the Observator Group.

Reference documents

Type of document / tool	Product type and name (incl. url)
Application note	Pressure calibration
	Shroud installation
	Temperature calibration
	Wiper replacement

Revision history

Date	Amendments	Company, position
2018-03-11	Initial document creation	Observator Australia, Document Controller
2018-04-09	Introduced document control	Observator Australia, Document Controller
2019-04-12	Removed unused headers	Observator Australia, Document Controller
2019-07-01	Quality review	Observator Australia, Operation Manager
2020-01-30	Updated document format	Observator Australia, Document Controller

Procedure sign-off:

Date	Company, position	Status
2018-04-09	Observator Australia, Document Controller	Finished
2019-12-06	Observator Australia, Managing Director	Approved
2020-03-03	Observator Group, Communication Officer	Approved

Distribution list

Date	Company, position

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1 Features in secondary sense options

NEP-5000 can offer temperature and liquid pressure measurements as secondary options. This document is an application note for NEP-5000 sensors pressure option calibration (when selected by the customer). This application note explains how to calibrate the pressure sensor on NEP-5000 Analite series turbidity probes.

The built-in pressure option can offer absolute pressure measurement range from 0psi to 100psi and can provide accuracy of +/- 0.01fso.

When ordered, with the pressure option, the sensor will be built into the side of the sensor body. Pressure measurement can only be read from Serial Digital Interface SDI-12, polled-mode output options. In SDI-12 mode, the pressure measurements will be read using (aM1!) command.

Note: The SDI-12 address of the pressure sensor will be different to turbidity SDI-12 address.

In polled-mode, the pressure measurement will be updated when invoked by “Read” command or “Measure” command.

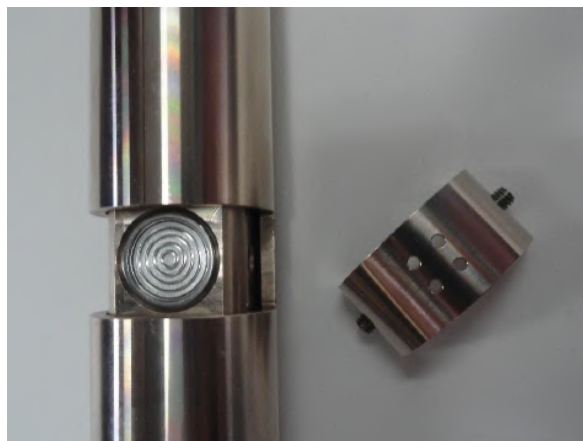


Figure 1.A: Pressure sensor

2 Pressure calibration

2.1 Communication information

1. Plug the appropriate calibration plug in to the calibration module.



2. Go to “Tools”, “Calibration” and select “OEM Calibration Pressure”.

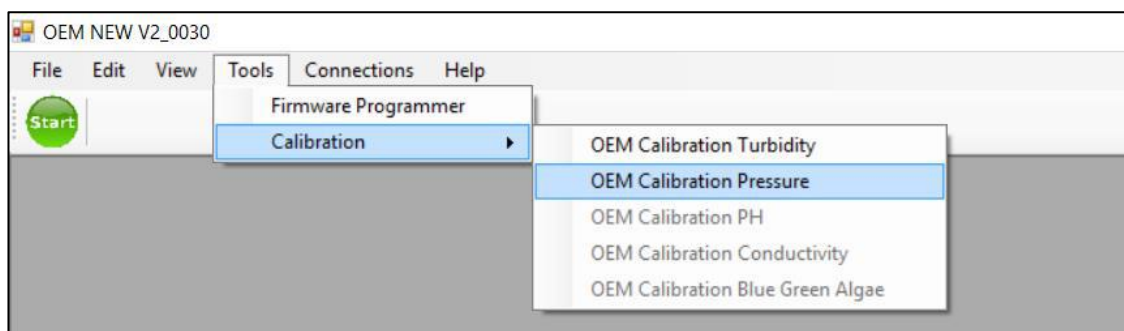


Figure 2.A: Select Original Equipment Manufacturer (OEM) calibration pressure option

3. Press “Connect” button.

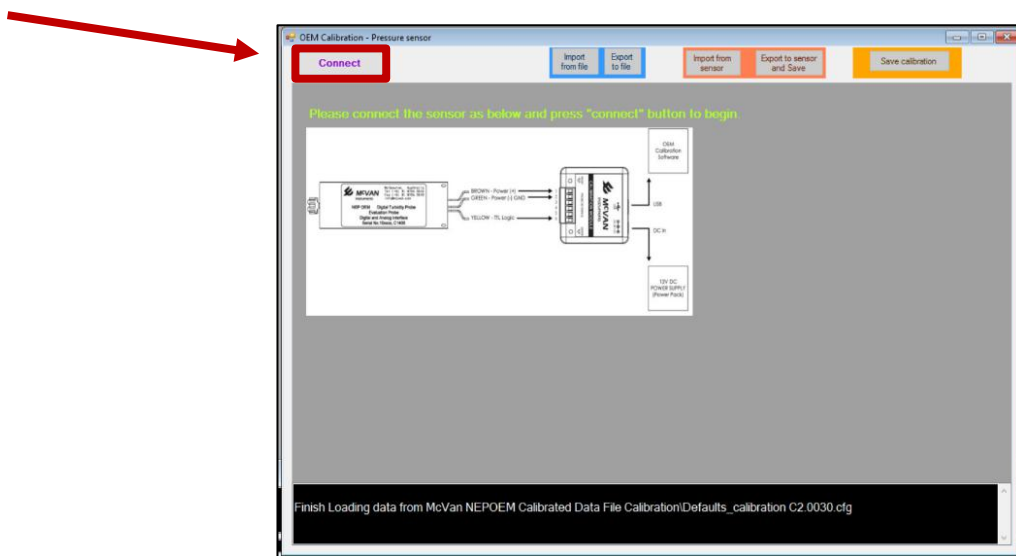


Figure 2.B: Connect to the probe

4. Press “RESET” button in the calibration module.

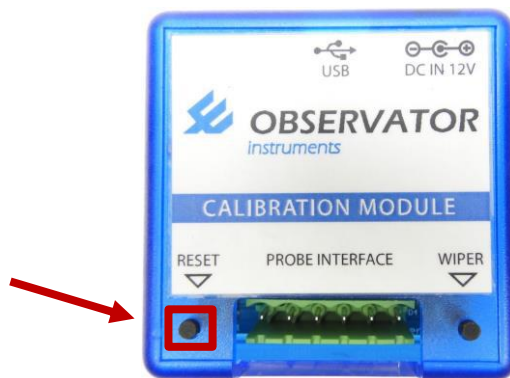


Figure 2.C: Calibration module reset

5. Output window should show the following when successful.

The sensor is now in the calibration mode (SN – 111111). Calibration & configuration data has been imported from the attached sensor. Compensation data tables have been imported from the attached sensor.

When the sensor establishes the connection to the pc software, software will then attempt to synchronize with the sensor. This will transfer all the calibration and configuration data to Personal Computer (PC) software.

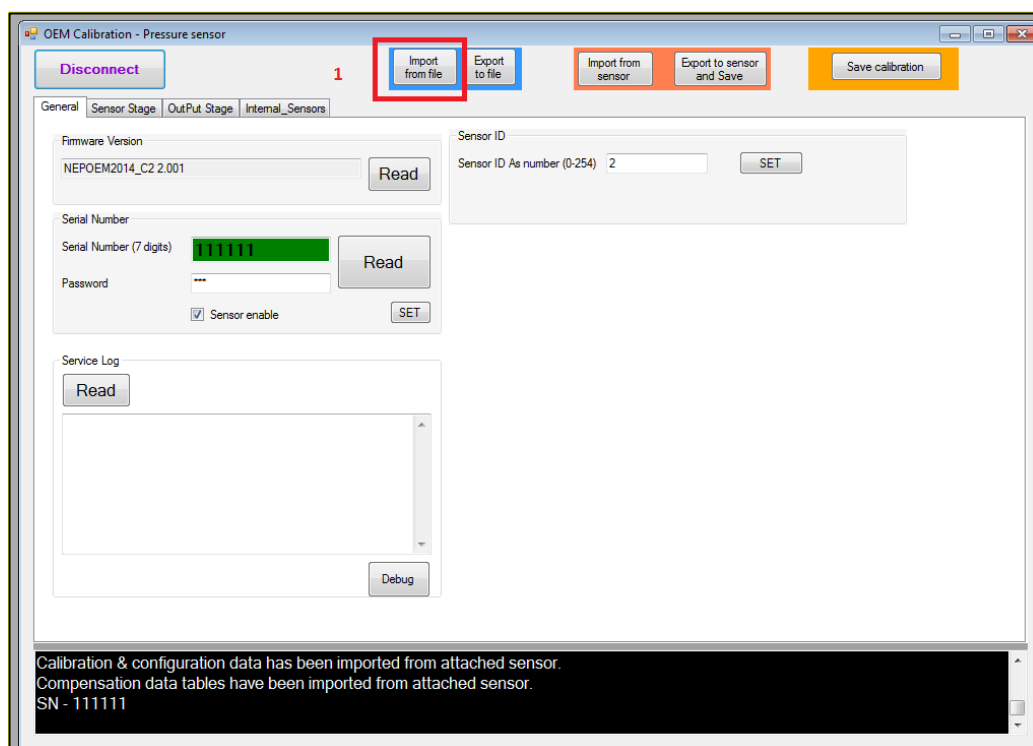


Figure 2.D: Load supplied calibration & configuration file supplied by the factory calibration

6. The sensor is now in the calibration mode (SN – 111111). Calibration & configuration data has been.
7. Press “Import Config Data” button. Select and open the correct calibration “[Serial Number].cfg” file.

Note 1: The factory will supply this unique “[Serial Number].cfg” file with each probe and this contains the factory calibration data and configuration data specific to each probe.

Note 2: Please select “Advance” in the top left drop down window to display all available options.

Note 3: Press “Read” button under the serial number group in “General” to read attached probes serial number.

2.2 Requirements prior to calibration

Pressure sensor calibration is required at a constant pressure chamber which is to apply various air or hydraulic pressures to the sensor while it's in calibration mode.

A reference pressure sensor is required to monitor and to get the calibration data.

2.3 Pressure sensor calibration

After establishing the calibration connection with the PC software please open the “sensor calibration” tab to begin calibration.

2.3.1 Calibration step 1: Low end pressure calibration

Expose the pressure sensor to normal sea level pressure (~14.3PSI) and press “get live data”. Check box and allow 1-minute settling time. If raw value appears to be stable, enter the raw data to “pressure low set point” text box.

The screenshot shows the 'Sensor calibrations' window with the 'Pressure sensor calibration' tab selected. The 'Pressure low set point (Input RAW)' field is highlighted with a red box and contains the value 618. The 'Pressure high set point (Input RAW)' field contains the value 1989. A red arrow points from the 'RAW 615' value in the 'live data' section to the 'Pressure low set point' field. The 'live data' section also features a 'Get live data' checkbox (labeled 1) and a dropdown menu set to '1000'. The 'Pressure measurement' is shown as 0.029. At the bottom, there are two 'High end pressure calibration value' fields with dropdown menus set to '14.69' and '39.81' respectively, both with units set to 'PSI'.

Figure 2.E: Calibration step 1

2.3.2 Calibration step 2: High end pressure calibration

Expose the pressure sensor to maximum pressure point and press “get live data”. Check box and allow 1-minute settling time. If raw value appears to be stable enter the raw data to “pressure high set point” text box.

The screenshot displays the 'Pressure sensor calibration' window. It features four tabs: 'Sensor calibrations', 'Sensor operating parameters', 'Sensor stage compensations', and 'Sensor stage live data'. The 'Sensor calibrations' tab is active, showing a 'Pressure sensor calibration' section with a 'Set' button. This section contains two input fields: 'Pressure low set point (Input RAW)' with the value 618, and 'Pressure high set point (Input RAW)' with the value 3520. Below these are two 'High end pressure calibration value' fields, each with a dropdown menu showing 14.69 and PSI. The 'Sensor stage live data' tab is also visible, showing a 'live data' section with a 'Get live data' checkbox (1), a 'RAW' value of 3520 (2), and a 'Pressure measurement' of 0.029. Red boxes highlight the 'Get live data' checkbox, the 'RAW' value, the 'Pressure high set point' field, and the 'High end pressure calibration value' field. Red arrows indicate the flow of data from the 'RAW' value to the 'Pressure high set point' field (3) and from the 'High end pressure calibration value' field to the 'RAW' value (4).

Figure 2.F: Calibration step 2

Then type reference pressure sensor value in “high end pressure calibration value” text box (step 4).

2.3.3 Calibration step 3: Apply pressure calibration

Press “Set” button in “pressure sensor calibration” window to apply to above values to the sensor. After completion of the setup, press “live data” checkbox again to check pressure measurement, “in green” shows as the same as the reference probe.

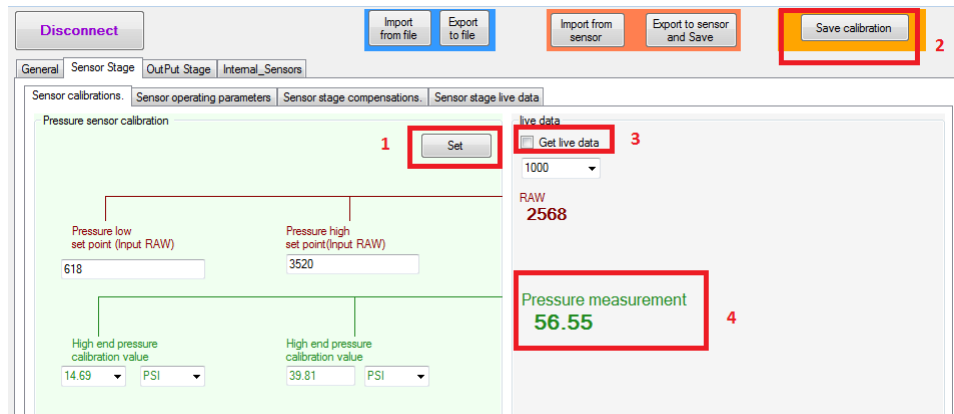


Figure 2.G: Calibration step

Note: At this point, applied data is saved in the probes temporary memory and press “Save calibration” button to store calibration permanently.

2.3.4 Calibration step 4: Save calibration

If sensor readout is within 0.02 Full Scale Output (FSO) from the reference, then the probe is assumed to be calibrated. Press “Save Calibration” button and exit.

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