

Report on the Pressure Calibration of a COREInsight STD003 Tag, Serial Number 0000301442

Report No. Pressure/2024/679, 18 April 2024

ISSUED BY:

Measurement Standards Laboratory of New Zealand.

Established under the Measurement Standards Act 1992 and the Measurement Standards Regulations 2019 to provide uniform measurement of physical quantities throughout New Zealand.

All results quoted in this report are directly traceable to the national measurement standards held by the Measurement Standards Laboratory of New Zealand (MSL). MSL is New Zealand's national metrology institute and operates within Callaghan Innovation.



This certificate is consistent with the capabilities that are included in Appendix C of the MRA drawn up by the CIPM. Under the MRA, all participating institutes recognise the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C.
For details see www.bipm.org



Accreditation Number 1

All measurements reported herein, unless otherwise noted, have been performed in accordance with the laboratory's scope of accreditation. *For details see www.ianz.govt.nz*

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Description

The COREInsight Bluetooth Low Energy (BLE) STD003 tag with an embedded MEMS nano absolute pressure sensor has a range of 260 hPa to 1260 hPa and a resolution of 0.01 hPa. A COREInsight Reader was used to read the data output from the tag.

Identification

The tag was identified by the serial number '0000301442' and MAC address 'FB:C4:03:BB:3B:50'. The reader was identified by the serial number '4C046FDAC75D9AA279C-6C85'.

Client

Core Transport Technologies NZ Ltd, 105 Trafalgar Street, Nelson 7010.

Dates of Calibration

4, 5 and 10 April 2024.

Objective

Calibration of the pressure sensor embedded in the COREInsight Bluetooth Low Energy (BLE) STD003 tag at points specified by the client.

Method of Calibration

The tag was calibrated following the technical procedure "Pressure Measuring Device Calibration" MSLT.P.001.011.

The tag was calibrated using standard pressures generated by one of the laboratory's pressure balances (DH Instruments 10 kPa/kg pressure balance) at five pressures covering the range 400 hPa to 1000 hPa. The pressure was cycled between 350 hPa and 1050 hPa, and the tag was calibrated at each measurement point following rising and falling pressure.

The tag had been on for over 1 hour before calibration. Air was used as the pressure transfer medium and the tag was sitting horizontal during calibration.

Conditions

The ambient temperature was (20.0 ± 0.3) °C and the ambient pressure was (102.0 ± 0.5) kPa.

Results

Nominal Pressure /hPa	Average Tag Correction /hPa	
	Rising Pressure	Falling Pressure
400	0.61	0.42
550	-0.54	-0.53
700	-1.57	-1.71
850	-2.42	-2.71
1000	-3.28	-3.40

Notes

- 1 The tag was not adjusted.
- 2 The sense of each correction tabulated above is:

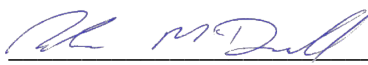
Corrected Tag Reading = Tag Reading + Tag Correction
- 2 Tag corrections were calculated as the average of two calibration cycles and are calculated using 1 kPa = 10 hPa.
- 3 The Tag readings were taken from the COREInsight Reader output.
- 4 The reference height for the tag corrections was taken as the white circular reference port on uppermost flat surface of device when sitting horizontal.
- 5 The calibration is only valid for the range of nominal pressures shown in the table above.

Uncertainty

The expanded uncertainty in each Tag correction tabulated above is 0.27 hPa.

This expanded uncertainty was calculated by combining the uncertainties associated with the reference standards and the calibration process using coverage factor $k = 2.2$ for a 95% level of confidence (see the "Guide to the expression of uncertainty in measurement JCGM 100:2008" (BIPM, 1st edition, 2008) for an explanation of terms).


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 Pressure Standards


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