Application Note: Understanding a Certificate of Calibration
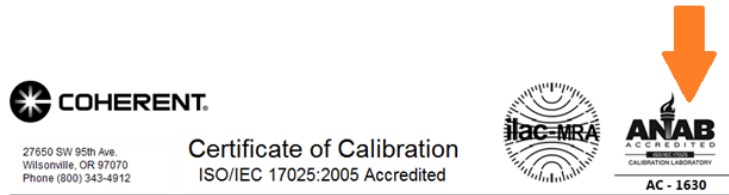
Introduction

This Application Note describes information in the various sections of a Certificate of Calibration so you can better understand how a meter or sensor is calibrated by Coherent.

Following is an example of a Certificate of Calibration:

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Certificate of Calibration
ISO/IEC 17025:2005 Accredited

27650 SW 95th Ave.
Wilsonville, OR 97070
Phone (800) 343-4912

AC - 1630

Date:	09 Feb 2018	Certification Number:	180209142613
Part Number:	1097901	Temperature (°C):	22.8
Description:	PM10	Relative Humidity (%):	27.2
Serial Number:	0257H13R	Procedure:	QI-19.70revGE

Instrument Condition As Received

Wavelength	Responsivity	Responsivity Uncertainty (k=2)	Laser Power	Measured Power	Measured Power Uncertainty* (k=2)	Tolerance Limits	Status
514 nm	1.670E-3 V/W	±1.0 %	1.016W	1.016W	±1.4 %	1.002W - 1.030W	In Tolerance

Instrument Condition As Shipped

Wavelength	Responsivity	Responsivity Uncertainty (k=2)	Laser Power	Measured Power	Measured Power Uncertainty* (k=2)	Tolerance Limits	Status
514 nm	1.670E-3 V/W	±1.0 %	1.016W	1.016W	±1.4 %	1.002W - 1.030W	In Tolerance

*The "Measured Power Uncertainty" includes the uncertainty of the meter used for this measurement.

Standards	Asset #	Calibration Due
MOLECTRON PM10	0011W00	Mar 2018
Coherent LabMax-TO	2128T14	Sep 2018
HP 34401A	0124T97	Nov 2018

Comments:

Calibrated By:

T EVANS   Test Technician

Calibration Interval Start Date: _____   Due Date: _____

The calibration interval begins when the equipment is placed into service. The "Due Date" may be established (by the customer) by adding the calibration interval to the "Start Date". Contact Customer Service for recommended calibration intervals for Coherent products.

The results listed on this calibration certificate relate only to the item serial number listed above. Coherent hereby certifies that the above item has been calibrated using standards traceable to a National Metrology Institute within the limitations of the Institute's calibration services, or has been derived from accepted values of natural physical constants, or has been derived by the ratio type of self-calibration techniques. This certificate complies with the requirements of ISO/IEC 17025:2005. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.

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Coherent Accreditation

The header section displays the site address and standards to which Coherent is accredited, including the ISO/IEC 17025:2005 standard. The ANAB logo verifies that Coherent is accredited and certified.

Instrument Condition As Received

The first section identifies units returned to the factory from the customer for calibration, lists the operating conditions under which the unit is tested, and lists the status of returned units.

Date: 09 Feb 2018				Certification Number: 180209142613			
Part Number: 1097901				Temperature (°C): 22.8			
Description: PM10				Relative Humidity (%): 27.2			
Serial Number: 0257H13R				Procedure: QI-19.70revGE			

Instrument Condition As Received   ①   ②

Wavelength	Responsivity	Responsivity Uncertainty (k=2)	Laser Power	Measured Power	Measured Power Uncertainty* (k=2)	Tolerance Limits	Status
514 nm	1.670E-3 V/W	±1.0 %	1.016W	1.016W	±1.4 %	1.002W - 1.030W	In Tolerance

1. Coherent tests and reports the instruments data collected as the "As Received" condition.
2. Coherent reports the uncertainty at the k=2 (95%) confidence level. For some sensor models, both Responsivity (V/W) and Power (W) measurements are recorded.

Instrument Condition As Shipped

This section describes the final test condition of the unit when shipped back to the customer. This data set may include adjustments made to the instrument to ensure it meets specified tolerances.

Instrument Condition As Shipped

Wavelength	Responsivity	Responsivity Uncertainty (k=2)	Laser Power	Measured Power	Measured Power Uncertainty* (k=2)	Tolerance Limits	Status
514 nm	1.670E-3 V/W	±1.0 %	1.016W	1.016W	±1.4 %	1.002W - 1.030W	In Tolerance

                              ③   ④   ⑤   ⑥

3. The Laser Power is the standard power level for this specific measurement.
4. The actual Measured Power in watts as measured by sensor.
5. The Uncertainty values for the 'Measured Power' includes both the meter and sensor, which is why these values are slightly higher than the Uncertainty value for the sensor Responsivity value (Rv) only.

See the Note on the Certificate that the "Measured Power Uncertainty" includes the uncertainty of the meter used for this measurement.

6. Lists the allowable range of power or the "tolerance limits". This is the allowable range of measured power for the unit to still be considered within tolerance.

Equipment Used for Calibration

This section lists the equipment at Coherent used to perform the calibration and against which the calibration is measured.

Standards	Asset #	Calibration Due
MOLECTRON PM10	0011W00	Mar 2018
Coherent LabMax-TO	2128T14	Sep 2018
HP 34401A	0124T97	Nov 2018

7. Identifies calibration equipment used for measurements, including the calibration date for each piece of equipment.

Contact Coherent

For assistance or additional information, contact Coherent Technical Support as follows:

- Contact your local Coherent Service Representative (or visit www.Coherent.com to view a list of contacts worldwide)
- Send an e-mail to: LSMservice@Coherent.com
- Call the Coherent Technical Support Hotline
    - Within the USA: 1-(800)-343-4912
    - Outside of the USA: 1-(408)-764-4042

For additional information about **sensor products**, go to:

https://www.coherent.com/measurement-control

For answers to **frequently asked questions**, go to this link, scroll down and click FAQ, then select Ask a Question or Read the Answers:

https://www.coherent.com/measurement-control/measurement/laser-measurement-and-control-help-center

To download the **current software** for sensor products, go to this link and scroll down to the Software, Drivers & Manuals section:

https://www.coherent.com/measurement-control/measurement/laser-measurement-and-control-help-center

To arrange for **warranty service or annual recalibration**, contact your regional Coherent service center to obtain a Return Material Authorization (RMA) number. Use the shipping box and packaging materials you retained to safely transport the sensor back to the factory, and ship to this address:

Coherent, Inc.
Attn: RMA #
27650 SW 95th Ave.
Wilsonville, OR 97070