C.A 1510

**CHAUVIN®
ARNOUX**
CHAUVIN ARNOUX GROUP

Calibration procedure

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1. PRESENTATION

1.1 INTRODUCTION

Your kit is intended for in situ calibration of the C.A 1510's C02 measurement function. This calibration should be performed at least once a year or whenever drift is found.

The calibration requires calibration software and a tool capable of injecting a gas having a known CO2 content. The software is an application running on a PC using the Windows XP, 32-bit Windows 7*, 64-bit Windows 7*, or Windows 8 operating system. It communicates with the C.A 1510 via its USB cord and allows calibration of the sensitivity (gain) and zero (offset) of the C02 measurement.

The gas injection adapter for the C.A 1510 also allows verification before use. If the verification is satisfactory, the calibration is not necessary.

Attention: The calibration operations must be performed by a qualified individual. Incorrect execution could result in measurement errors.

1.2 PRINCIPLE

The gas injection adapter is placed over the inlets of the C.A 1510 in order to inject a gas having a known C02 content. After stabilization of the measurement on the C.A 1510 (a few minutes due to the sensor's response time), it is possible to verify or adjust the measurement.

The verification can be performed on the desired number of points.
The calibration is performed either on a single point (ideally at 2500 ppm), for the sensitivity calibration, or on 2 points, starting with calibration of the zero, if possible with a gas at 0 ppm, followed by calibration of the sensitivity

2 parameters are likely to influence the measurement:
- The flow of gas must be sufficient to impregnate the sensor, but not so high as to risk an overpressure of the sensor. The recommended flow rate is 0.5 ± 0.2 L / minute.
- The ambient atmospheric pressure influences the measurement as follows:

$$CO_{2meas} = CO_2 * (1 + \Delta P_{(mbar)} * 0.14\%)$$

Where CO_{2meas} = level of CO_2 measured by the sensor

$\Delta P_{(mbar)} = P_{atm} - 1013$

$CO_2 = CO_2$ value of the gas injected

1.3 EXECUTION

Connect the calibration kit (injection adapter with the connecting tube) to the pressure reducing valve of the cylinder of reference gas, via a flow meter. Then place the injection adapter on the top of the C.A 1510, so as to cover the air inlets.
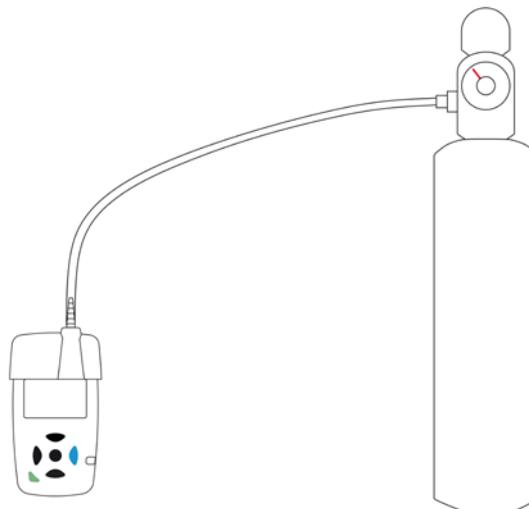
Note: The C.A 1510 must be used in portable mode in order to obtain a stable measurement as rapidly as possible. The ECO mode and recordings are prohibited for verification or calibration. The 1D and 3D modes are not recommended because they query the CO_2 sensor once a minute.

2. USING THE SOFTWARE

2.1   DESCRIPTION OF THE SOFTWARE

The software has one main screen and 3 menus.
- Calibration: Used to adjust the zero and the sensitivity, to reset to the factory settings and to exit from the software
- Language: Used to select the language of the software (French or English)
- Help: Used to access the help file.
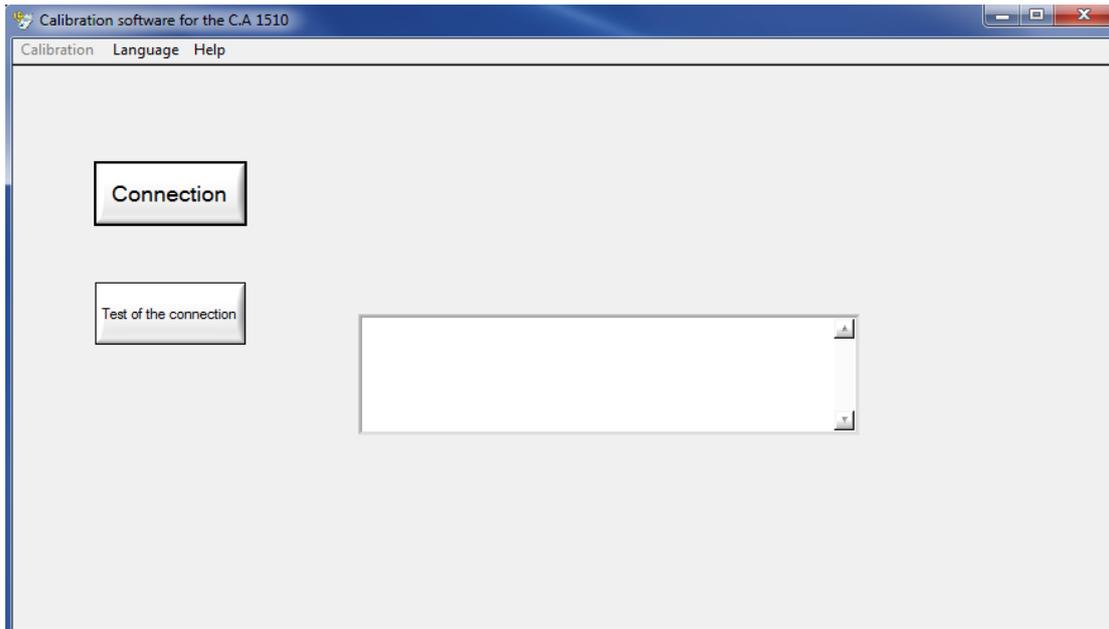
2.2   CONNECTION

When the C.A 1510 is connected to the PC via the USB cable, the "Connection" command button serves to initiate communication between the software and the C.A 1510.

When the connection succeeds, the "Connected" state is indicated in green:
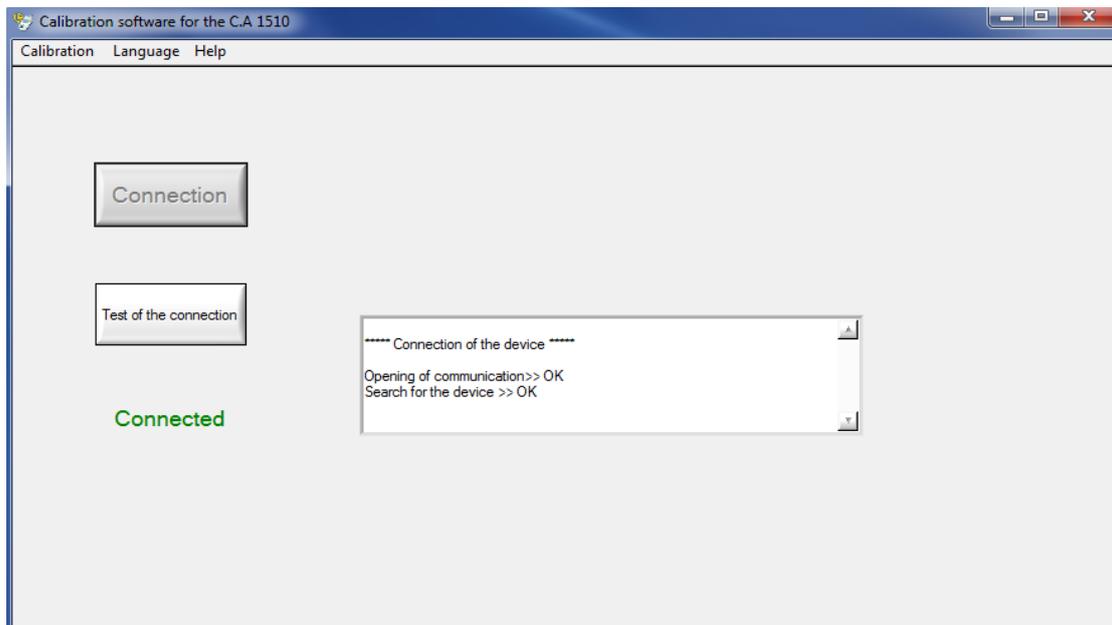
If it has not been possible to establish the connection, the status "Not connected Error" is indicated in red:
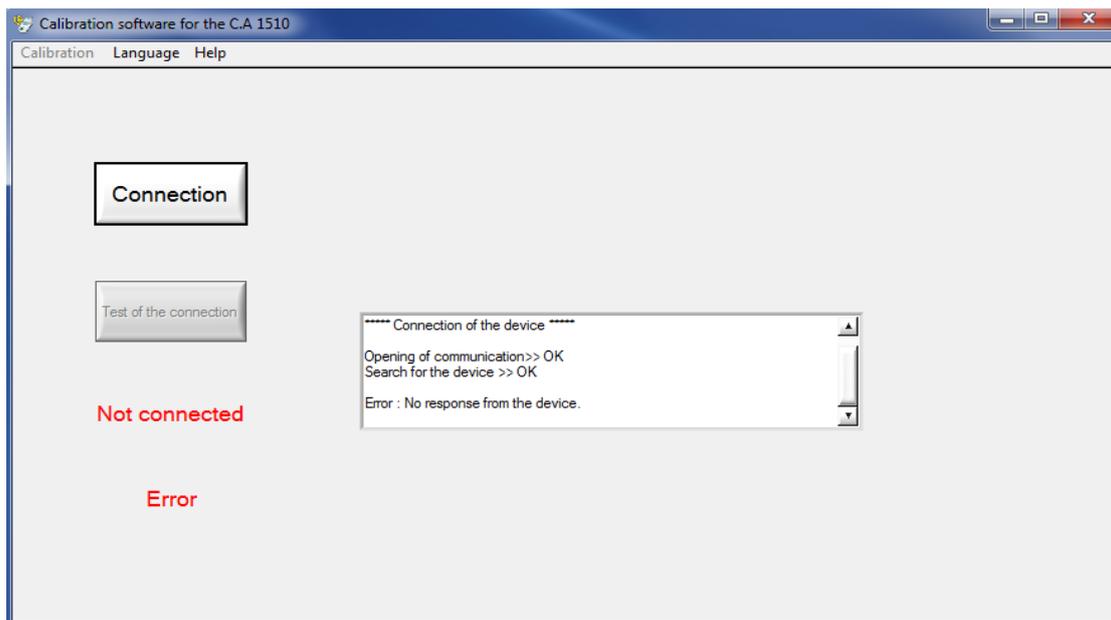
2.3 "CALIBRATION" MENU

This menu includes 4 items:
- Zero calibration (Offset)
- Sensitivity calibration (Gain)
- Factory configuration (Offset & Gain)
- Exit
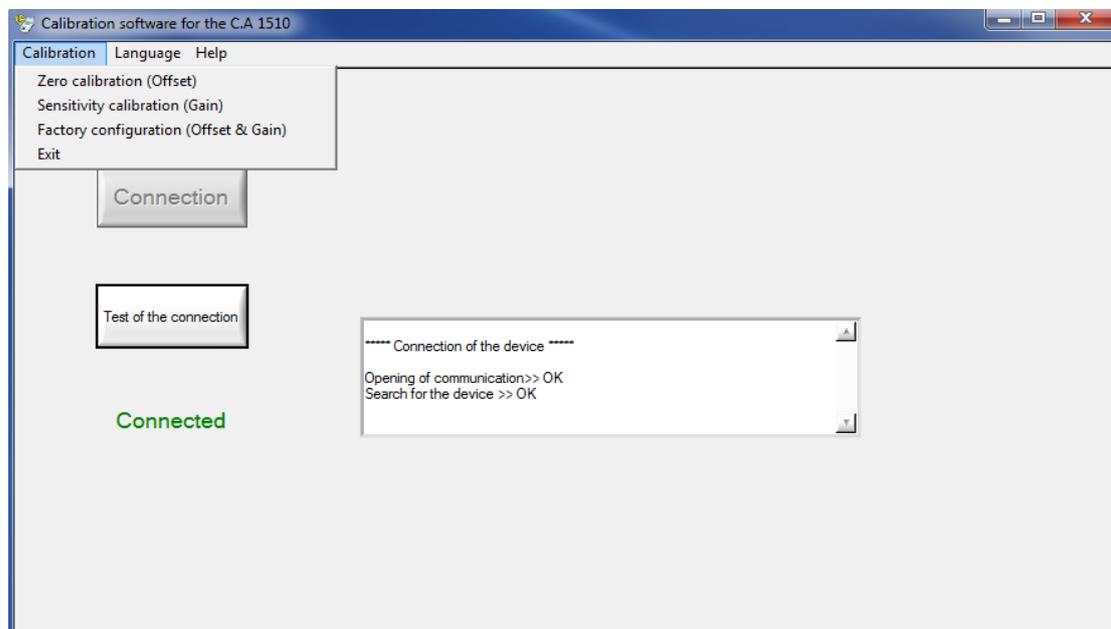
2.3.1   Zero calibration

A first window is used to enter the C02 content of the gas injected.
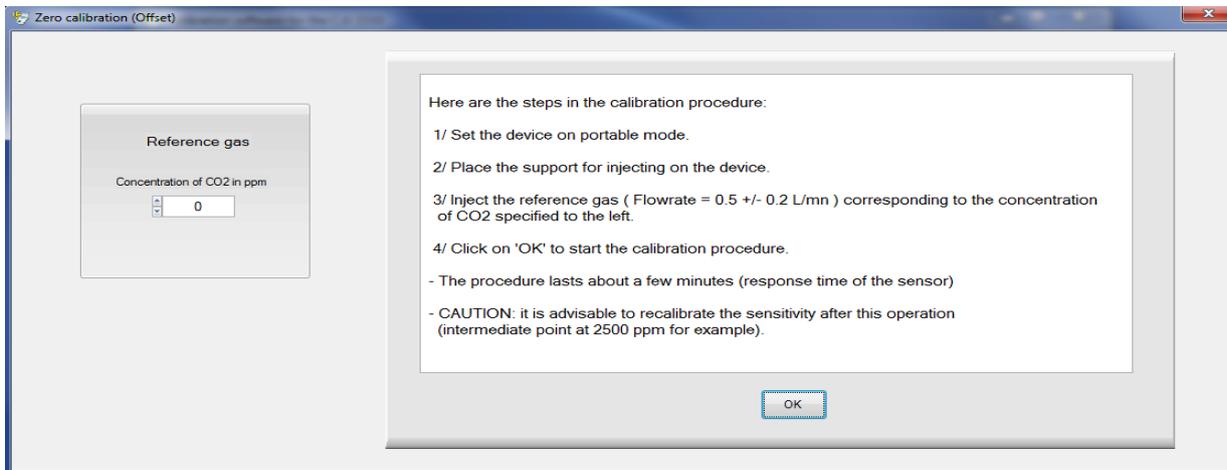
Notes:
-    We strongly recommend using a gas at 0 ppm for the zero calibration. With a gas having a concentration other than 0, any error in the sensitivity calibration would lead to an incorrect result. It would then be necessary to perform repeated cycles of "Zero" and "Sensitivity" calibrations.
-    After a "zero" calibration, a sensitivity calibration is strongly recommended.

After validation, the software allows enough time for the C.A 1510 to stabilize the measurement, then acquires the measurement(s) and programs the calibration parameters.
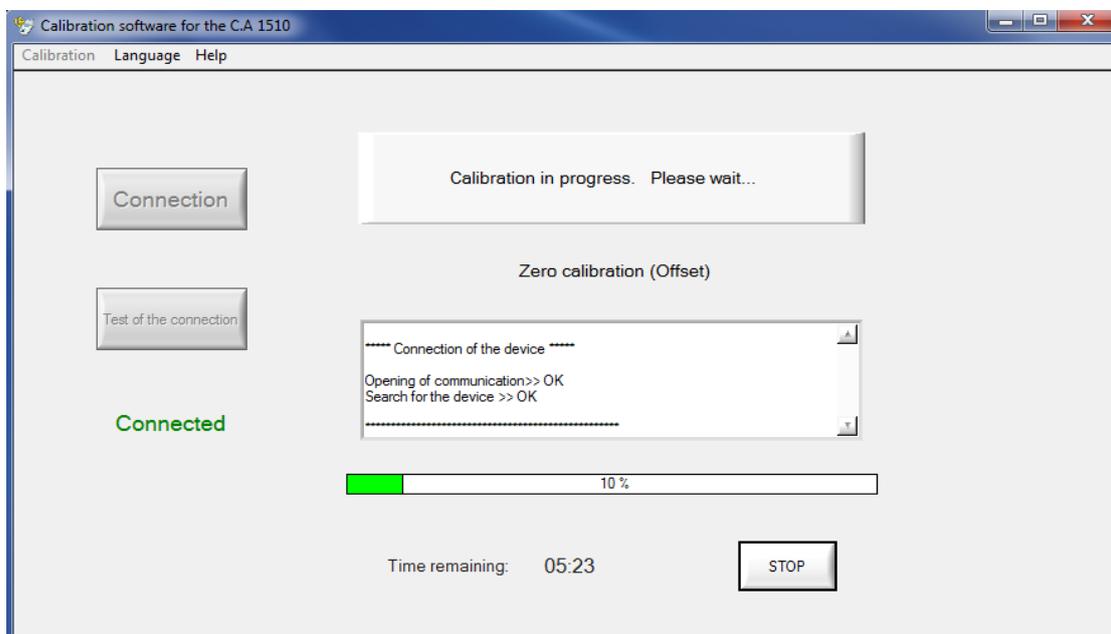
The end of the calibration is reported by the following window:
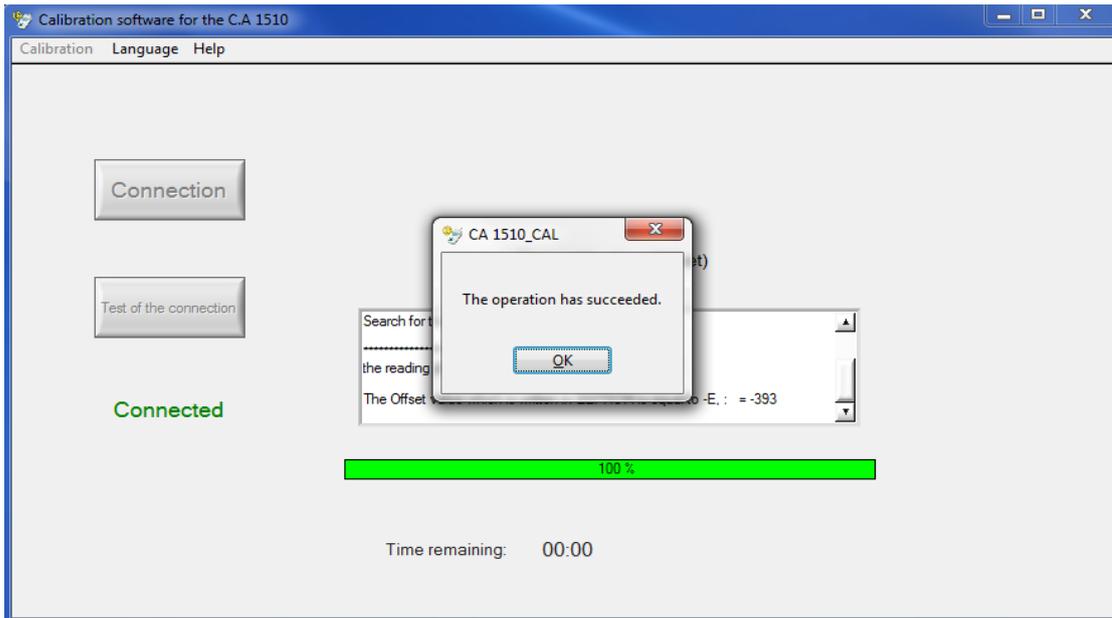
Characteristics:

The zero calibration is limited to the range from -1000 ppm to +1000 ppm. Outside this range, an error message is displayed and the software leaves the previous calibration parameters in place.
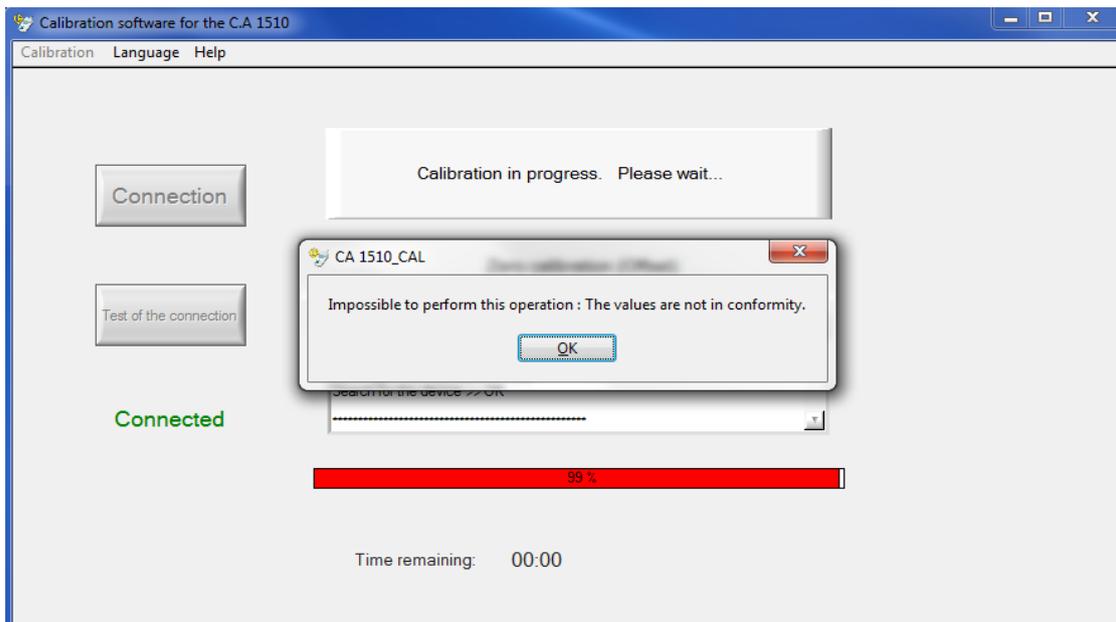
2.3.2   Sensitivity calibration

A first window is used to enter the C02 content (ideally approximately 2500 ppm) and the atmospheric pressure.
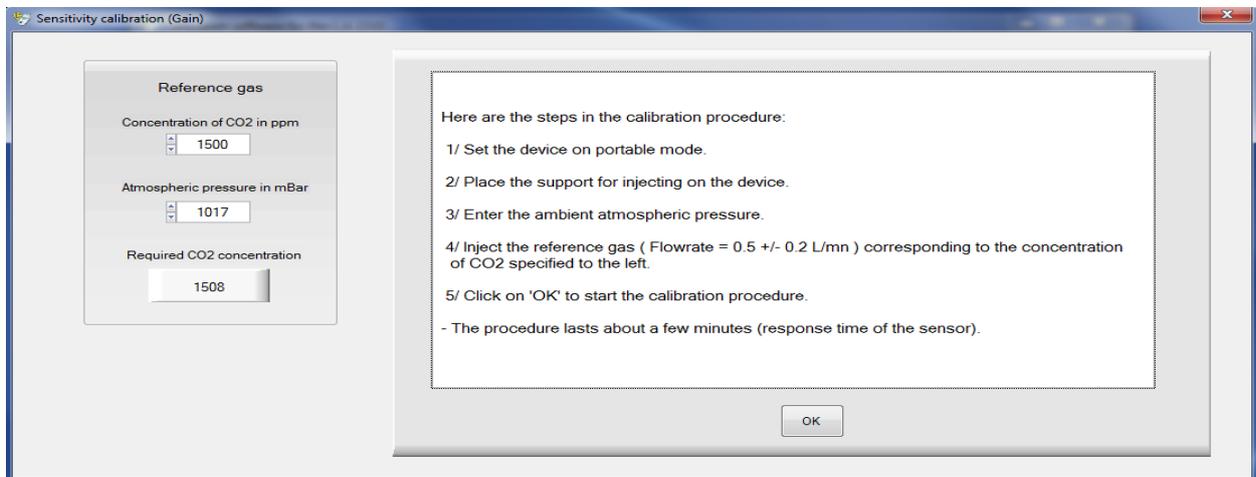
After validation, the software allows enough time for the C.A 1510 to stabilize the measurement, then acquires the measurement(s) and programs the calibration parameters.
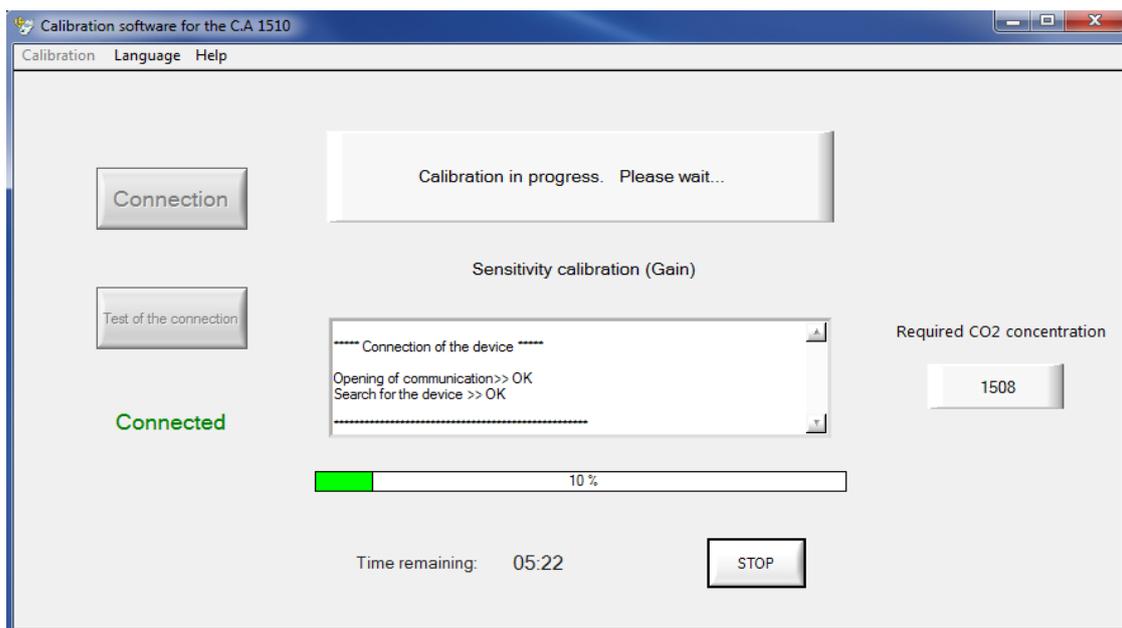
The end of the calibration is reported by the following window:
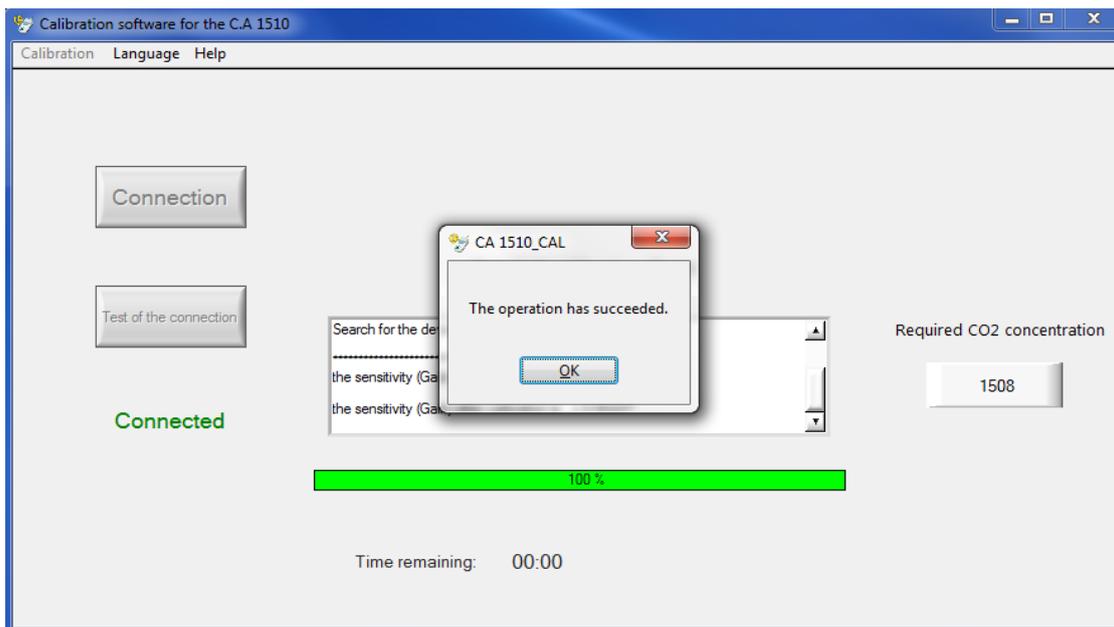
Characteristics:

The sensitivity calibration is limited to gains from 0.5 to 1.5. Outside this range, an error message is displayed and the software leaves the previous calibration parameters in place.
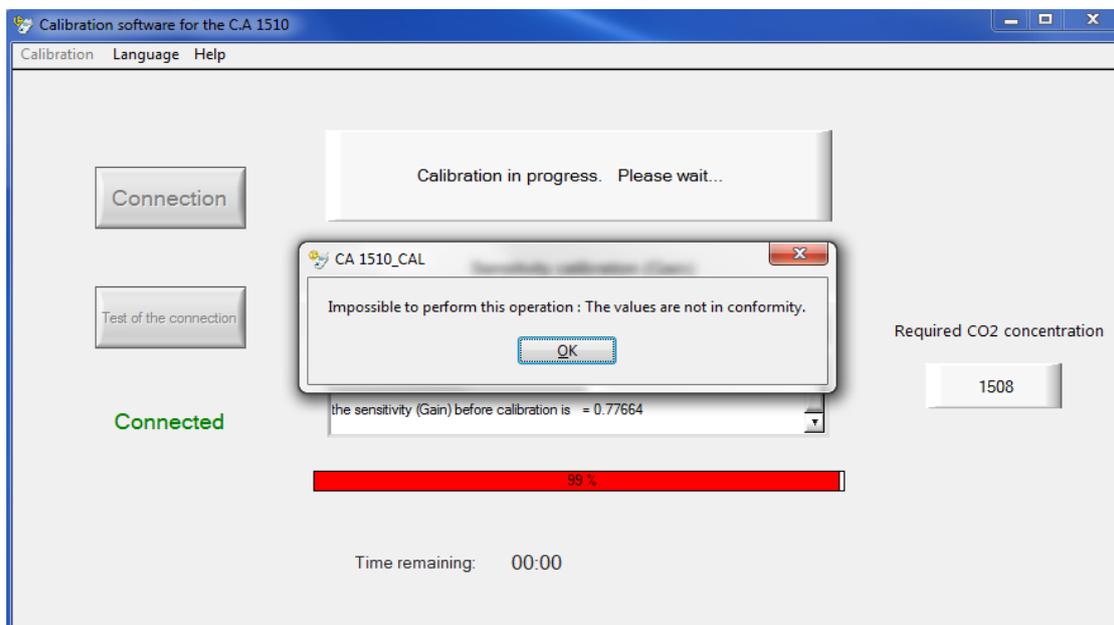
2.3.3 Factory configuration

This command is used to restore the settings of the device when it left the factory, i.e. an offset of 0 ppm and a gain of 1.
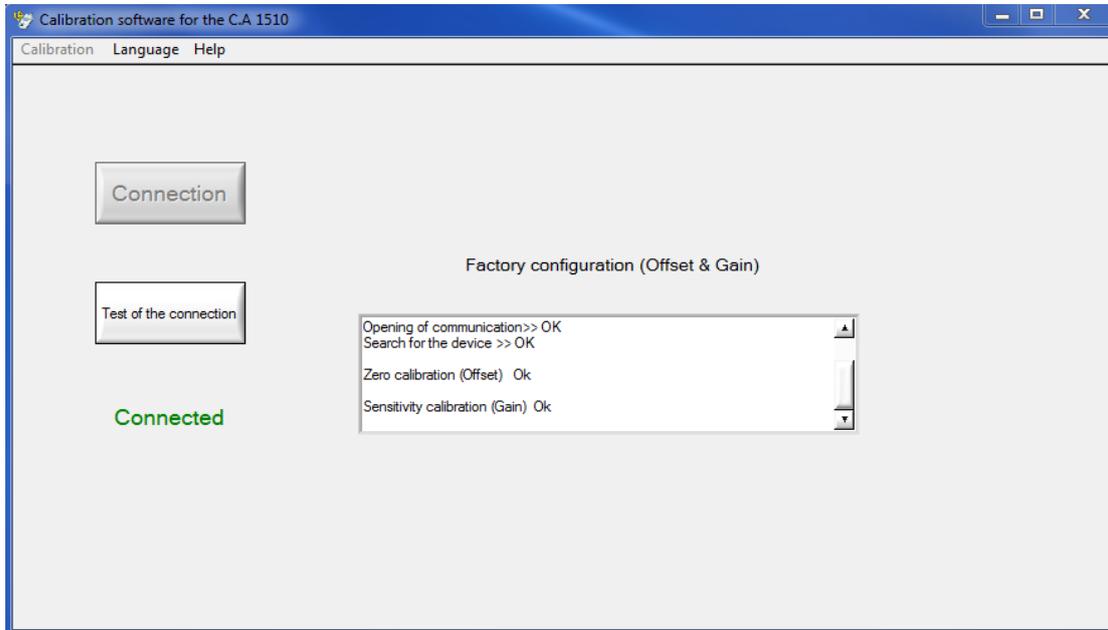
3. DELIVERY CONDITION

In-situ calibration kit for C.A 1510.. **P01651022**

Delivered with:
- Support for injecting the reference gas.
- Flexible hose.
- Calibration software.

DEUTSCHLAND - Chauvin Arnoux GmbH
Straßburger Str. 34 - 77694 Kehl / Rhein
Tel: (07851) 99 26-0 - Fax: (07851) 99 26-60

UNITED KINGDOM - Chauvin Arnoux Ltd
Unit 1 Nelson Court – Flagship Sq-Shaw Cross Business Pk
Dewsbury, West Yorkshire – WF12 7TH
Tel : 019244 460 494 – Fax : 01924 455 328

ITALIA - Amra SpA
Via Sant'Ambrogio, 23/25 - 20846 Macherio (MB)
Tel: 039 245 75 45 - Fax: 039 481 561

ÖSTERREICH - Chauvin Arnoux Ges.m.b.H
Slamastrasse 29/2/4 - 1230 Wien
Tel: 01 61 61 961-0 - Fax: 01 61 61 961-61

SCANDINAVIA - CA Mätsystem AB
Sjöflygvägen 35 - SE 18304 TÄBY
Tel: +46 8 50 52 68 00 - Fax: +46 8 50 52 68 10

SCHWEIZ - Chauvin Arnoux AG
Moosacherstrasse 15 - 8804 AU / ZH
Tel: +41 44 727 75 55 - Fax: +41 44 727 75 56

CHINA - Shanghai Pujiang Enerdis Instruments Co. Ltd
3 Floor, Building 1 - N° 381 Xiang De Road
Hongkou District - 200081 SHANGHAI
Tel: +86 21 65 21 51 96 - Fax: +86 21 65 21 61 07

ESPAÑA - Chauvin Arnoux Ibérica SA
C/ Roger de Flor N° 293, Planta 1- 08025 Barcelona
Tel: 902 20 22 26 - Fax: 934 59 14 43**MIDDLE EAST -**

Chauvin Arnoux Middle East
P.O. BOX 60-154 - 1241 2020 JAL EL DIB (Beirut) – LEBANON
Tel: (01) 89 04 25 - Fax: (01) 89 04 24

USA - Chauvin Arnoux Inc - d.b.a AEMC Instruments
200 Foxborough Blvd. - Foxborough - MA 02035
Tel: (508) 698-2115 - Fax: (508) 698-2118

http://www.chauvin-arnoux.com

190, rue Championnet - 75876 PARIS Cedex 18 - FRANCE
Tél. : +33 1 44 85 44 85 - Fax : +33 1 46 27 73 89 - info@chauvin-arnoux.fr
Export : Tél. : +33 1 44 85 44 86 - Fax : +33 1 46 27 95 59 - export@chauvin-arnoux.fr