QUICK DEPLOY GUIDE

High-Grade Calibration Kit for CS120A or CS125

05/2022
CSL I.D - 1393
www.campbellsci.eu/40062

Info Link

1. Introduction

Campbell Scientific High-Grade Calibration Kit for the CS120A/CS125 allows the user to perform a calibration check without adjusting the output. The calibration check compares the CS120A/CS125 MOR/TMOR output with reference values. This allows the user to determine if they should adjust the calibration of the CS120A/CS125 output to the reference values.

Campbell Scientific recommends doing a calibration check during other site maintenance. Check the calibration every six months if sensor accuracy is especially important. Check the calibration at least every two years.

CAUTION:
Do not adjust the calibration without checking it first. Campbell Scientific ensures ideal conditions exist in the laboratory to adjust the sensor to read as accurately as possible. The calibration should remain valid for at least three years. Adjusting the calibration in the field may worsen the calibration accuracy unless the utmost care and attention to detail is followed during the calibration adjustment process.

2. Initial requirements

Only do the calibration check when the following environmental conditions are met:

- Good visibility (> 10 km as determined by the CS120A/CS125)
- No precipitation
- Ambient air temperature range of 0 to 50 °C
- Outdoors; contact Campbell Scientific if an outdoor check is not possible.

Sensor requirements:

- Sensor working properly. Do any required maintenance before the calibration check, such as cleaning the sensor and windows or checking data output and status.
- Sensor output and settings. The sensor settings and output must be known by the person doing the calibration check. The user should be able to request data from the sensor if it is set in polled mode or have access to the data output if the data is output continuously. Use the default 60 second averaging and output. Other timing settings may reduce the accuracy of the check and prolong the process.
- Optional high-grade calibration kit. The calibration disc and bungs must be undamaged. If the bungs or the calibration disc are damaged or the bungs have gaps around the edges when fitted into the hoods, contact Campbell Scientific for further guidance.

3. Information needed before doing the calibration check

Calibration discs show specific MOR/TMOR reference values unique to that calibration disc; see FIGURE 3-1. Contact Campbell Scientific if the MOR/TMOR is not shown on the disc.

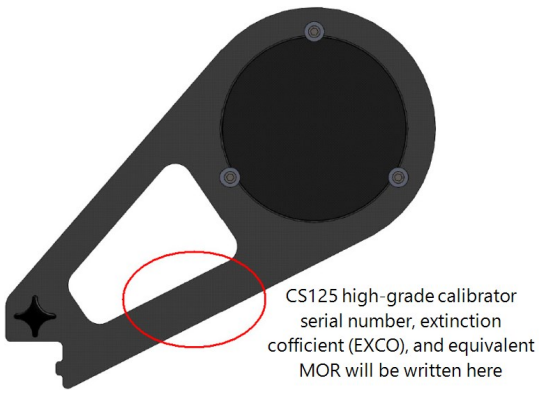

FIGURE 3-1. Red circle shows location of label with the MOR/TMOR reference value

Record these values in a notebook or computer log. These will be the reference values the sensor should replicate when the calibration check is performed.

> **NOTE:**
> You will need to know if the sensor is set to output MOR or TMOR. Sensors manufactured after December 2020 will be set to TMOR by default; check older sensors according to the *Functions of the internal switches* section in the CS120A/CS125 manual.

4. Calibration check procedure

1. Insert the calibration disc into the appropriate central mounting point so that it is secure as shown in FIGURE 4-1.
2. Place the foam bungs into the sensor hoods so that they cover the optical lenses completely. The foam bungs block light from reaching the inside of each optical assembly. Check the data strings to ensure the window contamination alarm has not been activated.
3. Wait for 5 minutes for the sensor to settle.
4. Check the sensor output in the data string and record the MOR/TMOR value. For a new sensor, the MOR/TMOR should read maximum visibility of 75 km. A sensor that has been in the field for a few years may read lower values due to drift or subsequent calibrations.
5. Remove the foam bungs from both optical hoods and wait for 5 minutes for the sensor to settle.

   > **CAUTION:**
   > Avoid standing in front of the sensor. Stand at least 3 m away from it.

6. Check the sensor output in the data string and record the MOR/TMOR produced by the sensor. The MOR/TMOR value should be within 5% of the MOR/TMOR value listed on the disc.

   > **NOTE:**
   > Variations in atmospheric conditions will cause the measured MOR/TMOR value to be slightly different than the MOR/TMOR value listed on the disc.

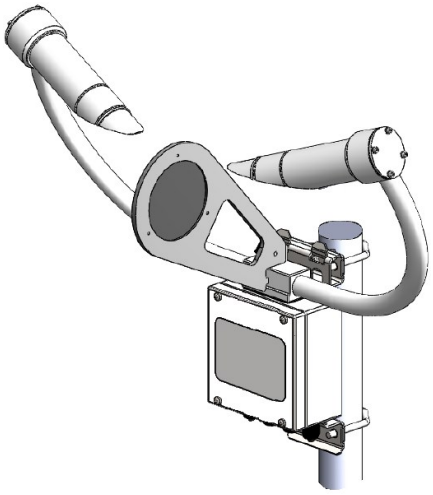

FIGURE 4-1. Calibration disc mounted securely in the central mounting point

5. Calibration adjustment

The values for the two calibration check points (maximum visibility and a low [fog] condition visibility) have now been checked and recorded and can be compared to the reference values.

Maximum visibility reference value is 75 km. This value is universal and does not change from sensor to sensor when new; however, this value may drift with time to a lower value and require an adjustment with time.

Low (fog) condition visibility is typically < 1 km. This value is unique and printed on your calibration disc.

If the values are within the 5% recommended threshold, the sensor is working correctly and does NOT require a calibration adjustment. Remove the calibration disc and return the sensor to the operational state.

If the values are NOT within 5% of the reference values, inspect and, if necessary, clean the sensor, sensor windows, calibration kit, and bungs. It may be necessary to adjust the timing setting. Ideal timing settings are 60 seconds for averaging and for data output (whether polled or continuous). Redo the calibration check (Calibration check procedure [p. 2]) and see if the values are now within the 5% recommended thresholds. If they are within the threshold, return the sensor to its operational state.

If the second calibration check results in values that are more than 5% of the reference values, adjust the calibration (see the *Visibility calibration* section in the CS120A/CS125 manual).