

# Instruction Manual

BZ7002 Calibration Software

BE6034-13

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# Chapter 1

# **BZ7002** Calibration Software

March 2019

### 1. Introduction

In some situations, it may be an advantage to calibrate the gas monitor connecting it to a PC. The procedure to use the Gas-Monitor as a stand-alone instrument is covered in the User Manual for the Gas Monitor.

Please consult the User Manual for the Gas Monitor for guidance in how to Install Optical Filters, Set- up and calibrate the Monitor.

This Manual only describes the use of the BZ7002 Calibration Software during calibration, control measurements and back-up of the calibration data.

BZ7002 will utilize the **USB** interface in the newer 1412i, 1314i 3434i, 3433i and 1512 Gas Monitors:

To use the USB interface the Monitors serial number must be from:

- 1412i: 713-001
- 1512: 110-001
- 1314i: 702-001
- 3434i: 952-001
- 3433i 140-001

BZ7002 will also be able to run via the **RS232** interface using the older 1412i, 1314i, 3434i with lower serial numbers.

Furthermore, the BZ7002 also runs via the **RS232** interface with the 1412A, 1314A, 3434A models.

# Chapter 2

### Installation of the BZ7002

March 2019

# 2. Installation of the BZ7002

When taking delivery of the Gas Monitor the BZ7002 Calibration software is delivered on an USB memory stick.

### 2.1 Installing the BZ7002 Calibration Software.

#### 2.1.1 **Computer requirements**

The Software is targeted to work on a Desktop/Laptop PC environment running a Microsoft Windows Operating System.

Before installing the Software the PC must meet the following minimum requirements:

Processor	Intel dual-core i3 or compatible.
Operating System	Windows 7 (Service Pack 1) Windows 8 Windows 10
RAM	Minimum: 512 MB (XP) 2048 MB (7+8) 4096 (10)
Hard Disk	Up to 500 MB of available space may be required.
Display	HD resolution monitor 1366 x 768 pixel or higher with small fonts.
Total port connections	1 USB port Or 1 RS232 port
Connection to Gas Monitor	1 USB port Or 1 RS-232 port

Table 2.1 Computer requirements

#### 2.1.2 Installing BZ7002

Please refer to <u>Appendix A</u> how to perform the installation of the BZ7002 Calibration software.

After the installation is successfully completed the LumaSense -> BZ7002 menu is created.

The BZ7002 program icon (Figure 2.1) is also placed on your desktop for easy access to the program.



Figure 2.1 BZ7002 Calibration desktop shortcut

# Chapter 3

# **Using the Program**

March 2019

# 3. Using the Program

The **BZ7002 Calibration** startup window will appear after starting the application.



### 3.1 Program configuration



The very first time BZ7002 is started the **Communication Interface** and **Units** needs to be configured.

The Configuration menu pull-down contains the **Communication Interface** and **Units** menu items.

After making these configurations it is normally not necessary to change them again, as the communication interface or the units is by preference.

The chosen configuration will be stored so they need not to be set when restarting BZ7002.

#### 3.1.1 Communication interface

+ Communication In	nterface				
Communicat	tion Interface				
USB	C COM10				
C COM1	C COM11				
C COM2	C COM12				
С СОМЗ	C COM13				
C COM4	C COM14				
C COM5	C COM15				
C COM6	C COM16				
C COM7	C COM17				
C COM8	C COM18				
С СОМЭ	C COM19				
ок					

The **USB** interface or a serial (RS232) **COM** port can be chosen.

When using the new 1412i, 1314i, 3434i, 3433i and 1512 the **USB** interface should be used.

When using the older 1412i, 1314i, 3434i or the 1412A, 1314A, 3434A the serial (RS232) **COM** interface should be used.

The selected communication interface setting will be retained when restarting the BZ7002 Calibration.

#### 3.1.2 Units



The selected units will be used when calculating the respective values for:

- Humidity
- Pressure
- Gas Concentration
- Temperature
- Length

The selected normalization temperature will be used when calibration is performed.

#### 3.1.2.1 The default unit values are:

- Humidity : Tdew
- Pressure : mBar
- Gas Concentration : ppm
- Temperature : °C
- Length : m

The default normalization temperature is 20 °C.

The selected unit and normalization temperature settings will be retained when restarting the BZ7002 Calibration.

### 3.2 Gas monitor connect



In order to connect to the Gas Monitor the file menu item **Connect** can be used.

The configured communication interface will be used when connecting to the gas monitor.

In case of a failed connect a popup error message box will be displayed.

After a successful connection to the Gas Monitor the **Calibration Setup** tab (see next section) becomes visible.

The **Configuration** file menu will be inactive (not changeable) after connecting to the Gas Monitor, implying that neither the **Communication Interface** nor the **Units** can be changed while the BZ7002 Calibration is connected with the Gas Monitor.

While connected the Gas Monitor keyboard will be inactive.

+ BZ7002	Calibration	[140-617]							
Configurat	Configuration Disconnect Service About								
Setup Cal	ibration Meas	surement Val	ues Measurement Values Documenta	tion/Backup 🗍 🤇	Gas Monitor Calib	ration Data			
Filters Set	up								Calibration Type
Filter	UA no.	Active Bank	Gas Name	Mol Weight [kg/mol]	Cal. 1-/2- Points	Conc. High [ppm]	Conc. Low [ppm]	S.I.T. [s]	Zero +Humidty Interference     Zero
A:	UA0973	1 💌	Ammonia	17.03	1-point 💌			5 💌	C Humidity Interference
B:	UA0982	1 💌	Carbon dioxide	44.01	2-point 💌			5 💌	C Water Span
C:	UA0985	1 -	Dinitrogen oxide	44.01	1-point 💌			5 💌	C Gas Span
D:	UA0988	1 -	Sulfur hexafluoride	146.06	1-point 💌			5 💌	Perform Cross Interference Calibration
E:	UA0969	1 💌	Methane	16.04	1-point 💌			5 💌	Zero and Humidity Interference
W:	SB0527		Water Vapour	18.02	1-point	18.00	[Tdew °C]	5 💌	Copy Active Bank to all other Banks
- Flushing 1	Setup	1	Fixed Time:     Chamber Flush Time:     Tube Flush Time:	8 s 3 s	Reasurement	t Setup A Enabled B Enabled C Enabled D Enabled E Enabled W Enabled	Water Comper Cross Compen	isation	
	Accept		Cancel Operation						Start Calibration Start Measurement

### 3.3 Calibration Setup

The main purpose of the **Setup** tab is to configure and select the different calibration types.

Furthermore, the measurement can be setup.

The serial number of the connected gas monitor is shown in brackets in the title bar of the BZ2002 application.

### BZ7002 Calibration [140-617]

The UA filters available in the Gas Monitor are automatically detected, when connecting to the Gas Monitor.

This means that the UA filters needs to be predefined, by beforehand setting the filter UA numbers in the Gas Monitor itself Please consult the Gas Monitor User Manual for further instructions.

The table column **UA no.** will display the detected UA filter numbers. Furthermore, the **Gas Name** and **Mol. Wgt.** values will be displayed if they are available in the Gas Monitor.

For the filters A-E, where an UA filter is detected, the following columns becomes active (changeable):

- Active Bank
- Gas Name
- Mol. Wgt. (Molecular weight of the gas)
- Cal. 1-/2-Points (Single or two-point calibration)
- Conc. High
- **Conc Low** (if a 2 point calibration is selected)
- S.I.T. (Sample integration time)

For the rest of the filters A-E, where an UA filter is not detected the respective column values, becomes inactive (not changeable).

Any illegal input entered in the numeric data fields (like the **Mol. Wgt.** or **Conc. High**) will be marked with red color and a PC beep will be heard.

#### 3.3.1 Gas Name

Gas Name
æøå
Dinitrogen oxide

The **Gas Name** cannot contain illegal characters like special country characters and the maximum length is 29 characters.

Illegal **Gas Name**'s will be marked with red color and a PC beep will be heard.

#### 3.3.2 Active Bank

Acti Ban	ve k
2	1
1	
2	
<b>1</b> 3	i i
4	
<u>15</u>	i
1	<b>Y</b>
1	-

For each of the filters A-E the **Active Bank** can be chosen by using the **Active Bank** pull-down for the filter in question. The selected row (1-5) in the **Active Bank** pull-down determines the active bank (1-5) for the filter.

Each active bank (1-5) will contain its own set of the following parameters:

- Gas Name
- Mol. Wgt. (Molecular weight of the gas)
- Cal. 1-/2-Points (Single or two-point calibration)
- Conc. High
- Conc. Low

#### 3.3.3 Single or two-point calibration

Cal. 1-/2- Points	Conc. High [ppm]	Conc. Low [ppm]
1-point 🔻	10000	800
1-point 2-point	5.02	
1-point 💌		
1-point 💌		
1-point 💌		

Single point or two-point calibration can be chosen for every bank for each filter.

When two-point calibration is chosen, the **Conc. Low** field becomes active (changeable).

#### 3.3.4 Water Vapour Concentration

18.00	[Tdew °C]

The concentration used when span calibrating the Water Vapour filter can be defined.

The default concentration comes predefined as 18 Tdew °C / 291.15 Tdew K / 64.40 Tdew °F / 15254.15 mg/m<sup>3</sup> / 20361.55 ppm / 2.06 kPa.

#### 3.3.5 S.I.T. (Sample Integration Time)

![](_page_15_Figure_6.jpeg)

The S.I.T. (Sample Integration Time) can be set individually for each of the filter A to W, with a predefined value of 5 seconds.

The choice of S.I.T. values are

- 0.5 second
- 1 second (Fast)
- 2 seconds
- 5 seconds (Normal)
- 10 seconds
- 20 seconds (Low noise)
- 50 seconds

### 3.3.6 Flushing

Flushing Setup			
<ul> <li>Auto:</li> </ul>		C Fixed Time	
Tube Length:	<u>1</u> m	Chamber: Tube:	8 s

Auto(matic) or Fixed Time flushing of the gas can be selected.

For **Auto**-flushing the **Tube Length** can be defined.

For **Fixed Time**-flushing the **Chamber**- and **Tube**-flush time can be defined.

The default, minimum and maximum values for all the flush settings are:

		Default	Minimum	Maximum
Flushing		Auto		
Auto	Tube Length	1 meter	0 meter	99 meter
Fixed Time	Chamber flush time	8 seconds	2 seconds	60 seconds
	Tube flush time	3 seconds	3 seconds	120 seconds

The flush settings will **not** be retained after restarting the BZ7002 Calibration.

When **Auto**-flushing is selected the **Chamber:** and **Tube:** settings for **Fixed Time**-flushing will be in-active (not changeable, and vice versa when **Fixed Time**-flushing is selected.

### 3.3.7 Calibration Type

![](_page_17_Picture_2.jpeg)

In the **Calibration Type** group box the type of calibration to be performed can be selected.

Only one of the calibration types can be selected at a time.

The **Zero+Humidity Interference** calibration is a combined zero and humidity interference calibration performed in the same session. This combined calibration should be performed on a new Gas-monitor the first time it is to be calibrated and also if a new optical filter is installed.

Gas Span	A: Carbon monoxide	
Perform Cr	A: Carbon monoxide B: Carbon dioxide	
	C: Sulphur Hexaflouride D: TOC ref. Toluene	

For the **Gas Span** calibration the choice of gasses (already set-up in the Gasmonitor) will show the filters A-E, where a UA number is set in the gas monitor. For each filter the active bank determines a specific gas.

The **Perform Cross Interference Calibration** tick-box becomes active, when the **Gas Span** calibration is selected.

The **Perform Cross Interference Calibration** checkbox is to be ticked (Cross interference compensation is on), if 2 or more of the filters A-E have UA filters installed and if cross interference compensation is to be used during measurement. If only one filter is installed then the **Perform Cross Interference Calibration** checkbox will be un-ticked and inactive (not changeable).

Zero and Humidity Interference Copy Active Bank to all other Banks

By clicking the **Copy Active Bank to all other banks**-button you are able to copy the Zero-calibration and Humidity Interference-calibration, from the active

bank to all the other banks for a filter. This will be done for all of the filters A-E, having UA filters installed.

#### 3.3.8 Operation

Accept	Cancel Operation	progress bar	Start Calibration Start Measurement	

The selected **Calibration Type** will be performed when pressing the **Start Calibration**-button and the **Calibration Measurement Values** tab will be shown. Furthermore the **Accept**- and **Cancel Operation**-buttons becomes active. The **Calibration Measurement Values**-tab is described in the next section.

When pressing the **Start Measurement**-button, the **Measurement Values**-tab will be shown. Furthermore the **Cancel Operation**-button becomes active. The **Measurement Values**-tab is described in the **Measurement Values**-section.

During calibration measurement or calibration check the **progress bar** becomes active.

The **Calibration Status** list-box will display progress information and ask the user to connect a particular gas when needed during a calibration.

The **Cancel**-button aborts the current job and the actual calibration was not performed.

+ BZ7002	Calibration (	[710-142]												
Configurati	on Disconr	nect Service	About											
Setup Cali	up Calibration Measurement Values   Measurement Values   Documentation/Backup   Gas Monitor Calibration Data													
	Zero-point Calibration in progress													
		Carbon dio	xide	Dinitrogen	oxide	Ammonia		Acetylene		Methane		Wa	ter	
No	Temp ['C]	A mean [µV]	A StDev [µV]	B mean [µV]	B StDev [µV]	C mean [µV]	C StDev [µV]	D Mean [µV]	D StDev [µV]	E mean [µV]	E StDev [µV]	W mean [µV]	W StDev [µV]	
	23.50	38.70	0.00	18.40	0.00	9.18	0.05	10.13	0.07	/4.69	0.55	194.23	2.50	
2	23.70	38.44	0.36	10.35	0.06	9.14	0.05	10.08	0.07	/5.08	0.55	195.04	2.56	
	23.30	30.30	0.27	10.37	0.04	3.13	0.05	10.05	0.06	70.34	0.00	137.13	2.70	
L														
-														
<u> </u>														
<u> </u>														
I														
PRESS ACC	EPT TO APP	ROVE THE CAL	LIBRATION											
	Accept		Ca	ancel Operation								Start Calibration		Start Measurement

### 3.3.9 Calibration Measurement

The purpose of the **Calibration Measurement Values**-tab is to monitor the filter calibration values and accept the current calibration in progress, when within the necessary limits.

During calibration measurement the following parameters will be shown (for available filters only) in a table list:

- Number: Measurement number
- **Temp**: Chamber Temperature
- **A mean**': Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the A filter.
- **A StDev**: Standard deviation µV value for the A filter.
- **B mean**: Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the B filter.
- **B StDev**: Standard deviation µV value for the B filter.
- **C mean**: Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the C filter.
- **C StDev**: Standard deviation µV value for the C filter
- **D mean**: Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the D filter.
- **D StDev**: Standard deviation µV value for the D filter.
- **E mean**: Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the E filter.
- **E StDev**: Standard deviation µV value for the E filter.

- **W mean**: Mean  $\mu$ V value (rolling average for up to the last 6 measured values) for the Water filter.
- W StDev: Standard deviation µV value for the Water filter

In order to make it easier distinguish between the individual filters, the text color for every second filter is blue. Also the actual gas name is shown above each corresponding filter columns.

In the **Calibration Status** list-box, status information will be shown.

Furthermore the user will be prompted to connect a certain gas, by a message in the **Calibration Status** list-box. When the gas is connected to the gas monitor, the user acknowledges this by clicking the **Accept** button.

When the user is satisfied with the calibration measurement values, the current calibration can be accepted by clicking the **Accept** button.

After accepting a calibration the Gas Monitor will signal, whether the actual calibration is approved or not and the result is presented in the **Calibration Status** list-box.

At any time the user can abort the calibration by clicking the **Cancel Operation** button and the actual calibration was then not performed.

During a calibration measurement by **BZ7002 Calibration** the buttons on the gas monitor will be locked, meaning that the Gas Monitor itself cannot be operated during a calibration. When calibration is finished the gas monitor buttons are unlocked again.

### 3.4 Check Measurements

#### 3.4.1 Measurement Setup

After calibrating one or more gases the calibration can be validated by performing a check measurement.

The **Measurement Setup** selects which of the filters A-W shall be included in the check measurement and whether Water or Cross compensation shall be performed during the check measurement.

Measurement Setup	
Filter A Enabled	Water Compensation
Filter B Enabled	Cross Compensation
Filter C Enabled	
Filter D Enabled	
Filter E Enabled	
Filter W Enabled	

-	IDIALION Meas	Check in Pro-			Unit Fi	ter A-E: [ppm]	Unit Filter	W: [Tdew]	1				hand Day						
	Sul	phur Hexaflou	ride		Freon 134a	tor r tal pproj	Crine r Incor	Carbon dioxide	,	Ne	start measurer		Insert EVe	nt Mark	ļi.		Water		
[	A Inst	A Mean	A StDev	B Inst	B Mean	B StDev	C Inst	C Mean	C StDev	D Inst	D Mean	D StDev	E Inst	E Mean	E StDev	W Inst	W Mean	W StDev	Event N
	2.44E+00	2.44E+00		4.31E+03	4.31E+03		375E+03	375E+03								8.30E+00	8.30E+00		
	2.44E+00	2.44E+00	778E-06	4.31E+03	4.31E+03	70.7E-03	376E+03	375E+03	170E+00							8.32E+00	8.31E+00	12.0E-03	
	2.44E+00	2.44E+00	1.31E-03	4.31E+03	4.31E+03	321E-03	376E+03	376E+03	167E+00							8.28E+00	8.30E+00	20.3E-03	
	2.45E+00	2.44E+00	3.79E-03	4.31E+03	4.31E+03	906E-03	376E+03	376E+03	136E+00							8.26E+00	8.29E+00	27.7E-03	
	2.44E+00	2.44E+00	3.86E-03	4.31E+03	4.31E+03	1.44E+00	377E+03	376E+03	555E+00							8.27E+00	8.28E+00	26.0E-03	
	2.45E+00	2.44E+00	3.67E-03	4.31E+03	4.31E+03	1.52E+00	377E+03	376E+03	583E+00							8.24E+00	8.28E+00	30.3E-03	
	2.44E+00	2.44E+00	3.40E-03	4.32E+03	4.31E+03	2.23E+00	377E+03	376E+03	703E+00							8.26E+00	8.27E+00	28.4E-03	
	2.45E+00	2.44E+00	3.22E-03	4.32E+03	4.31E+03	4.46E+00	378E+03	376E+03	949E+00							8.25E+00	8.27E+00	28.1E-03	
		1	1	1															
			·																Ī

### 3.4.2 Measurement Value

The purpose of the **Measurement Values**-tab is to be able to make check measurements, after having calibrated the gas monitor.

During check measurement the following parameters will be shown (for available filters only) in a table list:

- Number: Measurement number
- **A Inst**: Instantaneous gas A concentration value.
- **A mean**: Mean gas A concentration value (current unit, 10 value rolling average).
- **A StDev**: Standard deviation value for gas A.
- **BInst**: Instantaneous gas B concentration value.
- **B mean**: Mean gas B concentration value (current unit, 10 value rolling average).
- **B StDev**: Standard deviation value for gas B.
- **CInst**: Instantaneous gas C concentration value.
- **C mean**: Mean gas C concentration value (current unit, 10 value rolling average).
- **C StDev**: Standard deviation value for gas C.
- **D Inst**: Instantaneous gas D concentration value.
- **D mean**: Mean gas D concentration value (current unit, 10 value rolling average).
- **D StDev**: Standard deviation value for gas D.
- **E Inst**: Instantaneous gas E concentration value.

- **E mean**: Mean gas E concentration value (current unit, 10 value rolling average).
- **E StDev**: Standard deviation value for gas E.
- WInst: Instantaneous water concentration value.
- W mean: Mean water value (current unit, 10 value rolling average).
- W StDev: Standard deviation value for water.
- **Event Mark**: Events marks added by the user.

The idea behind the **Measurement Values**-tab is to be able to connect Zero-, Water Vapour- and Span-gasses one at a time, while checking that the concentration values being measured is within expected limits.

When the user is finished checking the gas and water values, the check operation can be finished by clicking the **Cancel Operation-** button.

Unit Filter A-E: [ppm]	Unit Filter W: [Tdew]
------------------------	-----------------------

The gas concentration unit for the filters A-E and the water (filter W) concentration unit will be shown in the header of the **Measurement Values**-tab.

In order to make it easier distinguish between the individual filters, the text color for every second filter is blue. Also the actual gas name is shown above each corresponding filter columns.

Insert Event Mark		Mark	CO2 800 ppm connected		
W Inst	W Mean W StDev		Event Mark		
5.464	5.464		CO2 800 ppm connected		

In order for the user to be able to mark measurements with specific events during the calibration check measurement, the **Insert Event Mark-**button and the accompanying text-box can be used.

The event mark will be added to the next measurement.

#### Restart Measurement

The check measurement can be restarted by using the **Restart Measurement**button. This could be used if the wrong control gas was connected to the gas monitor and the user wants to restart the check measurement.

### 3.5 Documentation/Backup

+ BZ7002 Calibration [713-400]			
Configuration Disconnect Service About			
Setup Calibration Measurement Values Measurement Values Documentation	(Backup Gas Monitor Calibration Data		
- Decempentation	- Calibration Packup / Postore		
Documentation	Calibration backup/nestore		
Measurement Log	Backup Gas Monitor Calibration Data		
Save & Print Calibration Data			
Gas Monitor Shortform Overview	Restore Gas Monitor Calibration Data		
Print Measurements			
Calibration aborted.			
Accept Cancel Operation		Start Calibration	Start Measurement

The purpose of the **Documentation/Backup**-tab is to document and backup/restore a gas monitor calibration.

The **Measurement Log**-button makes a log file of all the calibration- and checkmeasurements results, during the session with the gas monitor. The log file will be saved as a text file.

The **Print Calibration Data**-button gives a **detailed** report-view of all the filter calibrations in every bank. It will be possible to print and save the report-view as a file. See Appendix C for a sample of the **Print Calibration Data**.

The **Gas Monitor Shortform Overview**-button gives a **short** report-view of all the filter calibrations in every bank. It will be possible to print and save the report-view as a file. See Appendix B for a sample of the **Gas Monitor Setup**.

The **Print Measurements**-button gives a printout of the gas monitor settings and all the measurements available in the display memory of the gas monitor.

The **Backup Gas Monitor Calibration Data**-button makes a backup of all the calibration data in the Gas Monitor. The name of the backup file will be the serial number of the gas monitor and file type will be .cal.

This gas-monitor backup is saved to a file, which can be later restored using the **Restore Gas Monitor Calibration Data-**button, if for example the gas monitor calibration is lost. The serial number and filter UA numbers of the gas monitor must match the same in the backup file, in order for the restore to be possible. Furthermore this gas-monitor backup is checksum-protected, making it invalid if it has been tampered with.

After the calibration data has been restored the Gas Monitor stores the calibration data in a non-volatile memory. The user is warned (message below) not to switch off the power supply of the Gas Monitor, but is prompted to wait 10 seconds, while the calibration data is being stored in the non-volatile memory.

![](_page_24_Picture_2.jpeg)

### 3.6 Gas Monitor Calibration Data

BZ7002 Calibration [713-400]						_ <b>_ _</b> ×
Configuration Disconnect Service About						
Setup Calibration Measurement Values Measurement Value	es Documentation/Backup	Gas Monitor Calibration Data				
Filter B UA nummer 0971		Read Calibration Data		Write Calibration Data		
Bank	1	2	3	4	5	
Gas Name	Freon 134a		<u></u>	_		
Molecular Weight	102.0300E+00	1.000000E+00	1.000000E+00	1.000000E+00	1.000000E+00	
Span Calibration Performed on Date	"2017-05-17"	""	""	""	""	
Type Of Span Calibration	Single Point	Single Point	Single Point	Single Point	Single Point	
Conversion Factor 1	185.8949E+03					
Conversion Factor 2						
Zero Calibration Performed on Date	"2017-05-17"	"2017-05-17"	"2017-05-17"	"2017-05-17"	"2017-05-17"	
Concentration Offset Factor	5.826589E-06	5.826589E-06	5.826589E-06	5.826589E-06	5.826589E-06	
Humidity Interference Calibration Performed on Date	"2017-05-17"	"2017-05-17"	"2017-05-17"	"2017-05-17"	"2017-05-17"	
Humidity Gain Factor	113.2320E-03	113.2320E-03	113.2320E-03	113.2320E-03	113.2320E-03	
Cross Interference Calibration Performed on Date	"2017-05-17"					
Interference on Filter A	3.825041E+06					
Interference on Filter B						
Interference on Filter C	44.47732E+06					
Interference on Filter D						
Interference on Filter E						
	·	r	P		P	
Calibration aborted						
Calibration aborted.						
Accept Cano	el Operation				Start Calibration	Start Measurement

The purpose of the **Gas Monitor Calibration Data**-tab is to inspect/modify the calibration data for the gas monitor.

The calibration data is read from the gas monitor by clicking the **Read Calibration Data**-button.

The calibration data can be modified by entering the editable calibration data fields.

The calibration **Date** fields will not be editable (not changeable).

The **Filter** combo-box can be used to switch between filter A, B, C, D, E and W.

When inspection/modification of the calibration data is finished, they can be written back to the gas monitor, by clicking the **Write Calibration Data**-button.

After the calibration data has been written back to the Gas Monitor, it stores the calibration data in the non-volatile memory. The user is warned not to switch off the power supply of the Gas Monitor, but is prompted to wait 10 seconds, while the calibration data is being stored in non-volatile memory.

![](_page_25_Picture_3.jpeg)

### 3.7 Service

+ BZ7002 Calibration									
Configuration	Connect	Service About							
		Create Debug Info Zip File							

For service use it is possible to create a file containing debug information by selecting the **Service** menu item **Create Debug Info Zip File**.

When selected an explorer window opens where you can select a folder for the file to be saved.

🔸 Select a zip File				×
😋 🕞 ⊽ 🚺 🔹 Libraries 🔹	Documents + BZ7002 + Service		👻 🔄 Search Service	2
Organize 🔻 New folder				:= • 🔞
Favorites	Documents library Service		Arrange by:	Folder 🔻
Downloads	Name	Date modified	Type ^	Size
Compbox	No i	tems match your search.		
🥃 Libraries				
Documents				
J Music				
Pictures				
Videos				
Computer				
Local Disk (C:)				
Local Disk (D:)				
CD Drive (H1)				
application ())tidkd				
arbeidsarkiver (\\t				
dataarkiver (\\tidk v	•			
File name: BZ700	2 debug info.zip			
Save as type: Zip File	s (*.zip)			<b>_</b>
Hide Folders			Save	Cancel

The file can then be emailed to LumaSense/Innova Service for inspection during support handling.

# Appendix A

# **Installation Guide**

March 2019

### **Installation of BZ7002**

- When installing the BZ7002 Calibration software you must be logged in as Administrator that means that you must have "administrator" rights.
   Please also note that you must have Administrator rights or Power User rights to run the BZ7002 Calibration application after installation.
- 2. Start the installation of BZ7002. Insert the USB memory stick containing the BZ7002 software into an USB port and open Windows Explorer. Locate the Removable Disk associated with the USB memory stick. Double-click the Index file in order to open its contents in your browser.

5 e			
Computer > Re	emovable Disk (D:)	✓ 4 <sub>2</sub> Search BQ0015-11	C
Organize 👻 👩 Open 👻	Print Burn New folder	8= - 1	
🔆 Favorites	Name	Date modified Type Size	
🧮 Desktop	퉬 Documents	4/14/2016 2:21 PM File folder	
Downloads	퉬 Index_files	4/14/2016 2:23 PM File folder	
💱 Dropbox 🗧	퉬 Manuals	4/14/2016 2:21 PM File folder	
🐔 OneDrive	퉬 Software	4/14/2016 2:22 PM File folder	
📃 Recent Places	🗐 Index.docx	4/14/2016 2:23 PM Microsoft Word Docum 36 KB	
-	💿 Index	6/10/2016 10:39 AM Chrome HTML Do 63 KB	
🕞 Libraries			
Documents			
a) Music			
Pictures			
Videos			
Computer			
Local Disk (C:)			
Removable Disk (D:)			
My Book Duo (F:)			
🙆 CD Drive (H:)			
annlikation (\\ltidkdc()?			
Index.htm	Date modified: 4/14/2016 2:23 PM	Date created: 4/14/2016 2:23 PM	
Chrome HTML Docum	nent Size: 62.9 KB	Offline availability: Not available	

Now click to select the appropriate **BZ7002** software for installation. You might get warned that this type of file can harm your computer, which can be skipped. At the bottom of your browser window you can start the installation by selecting the **Open** option.

	Open		
	Always open files of this type		
	Show in folder		
	Cancel		
+ 7650v1.0.0Installer.exe	~	ĺ.	

The installation file will automatically install all the necessary packages required to run the **BZ7002** application.

The installer will start unpacking with the following window.

Please wait.

WinZip Self-Extractor - BZ7002v0.0.20Installer.exe	
BZ7002 Calibartion Version 0.0.20 Installer	Setup
	Cancel
Unzipping dotnetfx35.exe	About

After a while the following window appears. Press the **OK** button to continue:

![](_page_28_Picture_5.jpeg)

**3.** First you are prompted to install the USB driver to enable the PC to communicate with the gas monitor through the USB interface.

If the USB driver has been installed due to a previous BZ7002 installation you can skip this by pressing the Cancel-button otherwise please press the OK-button to continue.

Lumasense	1412i USB driver Setup	×
?	To install Lumasense 1412i USB driver on th To skip the installation of Lumasense 1412i or if you already have installed the Lumasen machine, click Cancel.	iis machine, click OK. USB driver nse 1412i USB driver on this
		OK Cancel

#### Press Next to continue.

Device Driver Installation Wizard	d
	Welcome to the Device Driver Installation Wizard!         This wizard helps you install the software drivers that some computers devices need in order to work.
	To continue, click Next.
	< <u>B</u> ack Next > Cancel

#### Press Finish to continue

Device Driver Installation Wizard		
	Completing the Device Driver Installation Wizard	
	The device driver installation wi software for your hardware devi- the software you currently have	zard did not update any of your ces because it was not better than installed.
	Driver Name	Status
	Lumasense Inc. (WinUS	Ready to use
< <u>B</u> ack Finish Cancel		

**4.** Then you are prompted to install the driver for the JV0925 USB to RS232 converter.

If the USB driver has been installed due to a previous BZ7002 installation you can skip this by pressing the Cancel-button otherwise please press the OK-button to continue.

![](_page_30_Picture_3.jpeg)

Press **OK** to continue.

Now wait for the following window to disappear

![](_page_30_Picture_6.jpeg)

**5.** Finally the BZ7002 application is installed. Press **Next** to start installation of BZ7002 Calibration.

![](_page_31_Picture_2.jpeg)

#### Select install for Everyone and press Next

BZ7002 Calibration
Select Installation Folder
The installer will install BZ7002 Calibration to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Eolder:       C:\Program Files (x86)\LumaSense Technologies\BZ7002 Calibration       Browse         Disk Cost       Disk Cost
Evenuese
Sust me
Cancel < <u>B</u> ack Next >

![](_page_32_Picture_1.jpeg)

Select **Next** to confirm installation of BZ7002 Calibration

After installation of BZ7002 press Close.

BZ7002 Calibration		
Installation Complete		
BZ7002 Calibration has been successfully installed. Click "Close" to exit.		
Please use Windows Update to check for any critical updates to th Cancel	e .NET Framework. < <u>B</u> ack	Close

# Appendix B

### **Gas Monitor Short Form Overview**

March 2019

Sample of the Gas Monitor Short-form Overview with filter A and B installed:

The UA-numbers for the mounted filters is shown. For each filter the Gas Name's in each bank is presented where available. The A,B,C,D,E columns denotes available cross interference factors, where a 'X' means present and a '0' means that it is nulled. The '1/2'-column denotes whether a single- or two-pint calibration is available.

# **Print Calibration Data Report View**

March 2019

#### Sample of the Print Calibration Data report-view with filter A and B installed:

- 1412i Calibration Data ------ 712-008/9999 - 2014-07-01 13:58 - Page 1 -GENERAL CALIBRATION INFORMATION FOR FILTER A. \_\_\_\_\_ Installed Optical Filter:UA0983Active Filter Bank Number:1 OPTICAL FILTER FACTORS ----- 

 Back. temp. factor
 :
 17.449E-03

 Conc. temp. factor
 :
 5.9198E-03

 Hum. temp. 1 factor
 :
 -15.99E-03

 Hum. temp. 2 factor
 :
 -17.87E-03

 Hum. temp. 3 factor
 :
 0.0000E+00

 Hum. sqr. factor
 :
 -1.243E+03

 Hum. cub. factor
 :
 0.0000E+00

 ACTIVE CALIBRATION DATA \_\_\_\_\_ Gas name : Carbon dioxide Molecular weight:44.010E+00High Alarm limit 1:\_\_\_\_\_ ppmHigh Alarm limit 2:\_\_\_\_\_ ppm Span Calibration performed: 2014-07-01Type of Span Calibration: Single PointConversion factor: 19.222E+06Concentration: \_\_\_\_ ppmMicrophone Signal: \_\_\_\_ V Zero-Point Calibration performed: 2014-07-01Concentration offset factor: 813.81E-09Microphone Signal: \_\_\_\_\_V Hum. Interference Calibration performed : 2014-07-01 Humidity gain factor:42.821E-03Microphone Signal:\_\_\_\_\_V Cross Interference Calibration performed : 2014-07-01 Carbon dioxide interference on : : : : Filter B 1.9174E+06 Filter C \_\_\_\_\_ Filter D Filter E :

CALIBRATION DATA IN FILTE	R BANK NUMBER : 1
Gas name : Carbon dioxide	
Molecular weight	: 44.010E+00
High Alarm limit 1	mag
High Alarm limit 2	: maa
Span Calibration performed	: 2014-07-01
Type of Span Calibration	: Single Point
Conversion factor	: 19.222E+06
Concentration	: ppm
Microphone Signal	: V
Zoro Point Calibration porfor	mod · 2014.07.01
Concentration offset factor	11ed . 2014-07-01
Microphono Signal	. 813.812-04
Microphone Signal	: V
Hum. Interference Calibration	n performed : 2014-07-01
Humidity gain factor	: 42.821E-03
Microphone Signal	: V
Cross Interference Calibration	n performed : 2014-07-01
Carbon dioxide interference o	on :
Filter B	: 1.9174E+06
Filter C	:
Filter D	:
Filter E	:
CALIBRATION DATA IN FILTE Gas name : Carbon dioxide Molecular weight	: 44.010E+00
High Alarm limit 1	: ppm
High Alarm limit 2	: ppm
Span Calibration portarmad	
	: 2014-07-01
Type of Span Calibration	: 2014-07-01 : Two Point
Type of Span Calibration Conversion factor 1	: 2014-07-01 : Two Point : 5.8783E-03
Type of Span Calibration Conversion factor 1 Conversion factor 2	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : ppm
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : ppm : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : ppm : V : ppm : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : ppm : V : ppm : V med : 2014-07-01 : 813.81E-09
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : ppm : V med : 2014-07-01 : 813.81E-09 : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : V med : 2014-07-01 : 813.81E-09 : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V med : 2014-07-01 : 813.81E-09 : V h performed : 2014-07-01
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : ppm : V med : 2014-07-01 : 813.81E-09 : V n performed : 2014-07-01 : 42.821E-03
Span Calibration performedType of Span CalibrationConversion factor 1Conversion factor 2Low ConcentrationLow Microphone SignalHigh ConcentrationHigh Microphone SignalZero-Point Calibration performConcentration offset factorMicrophone SignalHum. Interference CalibrationHumidity gain factorMicrophone Signal	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : V med : 2014-07-01 : 813.81E-09 : V h performed : 2014-07-01 : 42.821E-03 : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : Ppm : V med : 2014-07-01 : 813.81E-09 : V h performed : 2014-07-01 : 42.821E-03 : V h performed : 2014-07-01
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration Carbon dioxide interference of	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V med : 2014-07-01 : 813.81E-09 : V med : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 2014-07-01
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration Carbon dioxide interference of Filter B	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V med : 2014-07-01 : 813.81E-09 : V med : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 : 42.821E-03 : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration Carbon dioxide interference of Filter B Filter C	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V med : 2014-07-01 : 813.81E-09 : V med : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 : 0.0000E+00 :
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perfort Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration Carbon dioxide interference of Filter B Filter C Filter D	: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V med : 2014-07-01 : 813.81E-09 : V med : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 : V
Type of Span Calibration Conversion factor 1 Conversion factor 2 Low Concentration Low Microphone Signal High Concentration High Microphone Signal Zero-Point Calibration perform Concentration offset factor Microphone Signal Hum. Interference Calibration Humidity gain factor Microphone Signal Cross Interference Calibration Carbon dioxide interference of Filter B Filter C Filter D Filter E	<pre>: 2014-07-01 : Two Point : 5.8783E-03 : 5.0755E-06 : ppm : V : V : V med : 2014-07-01 : 813.81E-09 : V med : 2014-07-01 : 42.821E-03 : V n performed : 2014-07-01 on : : 0.0000E+00 :</pre>

- 1412i Calibration Data	712-008/9999 - 2014-07-0	1 13:58 - Page 3 -
CALIBRATION DATA IN FILTE	R BANK NUMBER :	3
Gas name :		
Molecular weight	: 1.0000E+00	
High Alarm limit 1	: ppm	
High Alarm limit 2	: ppm	
Span Calibratian parformed		
Type of Span Calibration	. 2014-07-01	
Conversion factor	. Single Point	
	·	
Microphone Signal	: ppm	
Zero-Point Calibration perform	med : 2014-07-01	
Concentration offset factor	: 813.00E-09	
Microphone Signal	: V	
Hum. Interference Calibration	n performed : 2014-07-0	1
Humidity gain factor	: 42.821E-03	
Microphone Signal	: V	
Cross Interference Calibration	n performed : 2014-07-01	
_ Interference on :		
Filter B	:	
Filter C	:	
Filter D	:	
Filter E	:	
CALIBRATION DATA IN FILTE	R BANK NUMBER :	4
Gas name : _		
Molecular weight	: 1.0000E+00	
High Alarm limit 1	: ppm	
High Alarm limit 2	: ppm	
Span Calibration performed	:	
Type of Span Calibration	: Single Point	
Conversion factor	:	
Concentration	: ppm	
Microphone Signal	: V	
Zara Daint Calibration parform	mod · 2014.07.01	
Concentration offset factor	· 912 00E 00	
Microphono Signal	· 813:00E-04	
Mici opriorie Signal	V	
Hum. Interference Calibration	n performed : 2014-07-0	1
Humidity gain factor	: 42.821E-03	
Microphone Signal	: V	
Cross Interference Calibration	n performed ·	
interference on	- performed	_
Filter B	:	
Filter C	:	
Filter D		
Filter E	:	

Gas name :	
Molecular weight	: 1.0000E+00
High Alarm limit 1	: ppm
High Alarm limit 2	: ppm
Span Calibration performed	:
Type of Span Calibration	: Single Point
Conversion factor	:
Concentration	: ppm
Microphone Signal	: V
Zero-Point Calibration perform	ed : 2014-07-01
Concentration offset factor	: 813.00E-09
Microphone Signal	: V
Hum. Interference Calibration	performed : 2014-07-01
Humidity gain factor	: 42.821E-03
Microphone Signal	: V
Cross Interference Calibration _ interference on :	performed : 2014-07-01
Filter B	
Filter C	
Filter D	:
Filter E :	
GENERAL CALIBRATION INFOR	RMATION FOR FILTER B.
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number	MATION FOR FILTER B.  : UA0985 : 1
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS	RMATION FOR FILTER B. : UA0985 : 1
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor	RMATION FOR FILTER B. : UA0985 : 1 : 2.6707E-03
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor	RMATION FOR FILTER B. : UA0985 : 1 : 2.6707E-03 : 7.6043E-03
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor	RMATION FOR FILTER B. : UA0985 : 1 : 2.6707E-03 : 7.6043E-03 : -9.427E-03
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor	RMATION FOR FILTER B. : UA0985 : 1 : 2.6707E-03 : 7.6043E-03 : -9.427E-03 : -1.483E-03
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor	RMATION FOR FILTER B. : UA0985 : 1 : 2.6707E-03 : 7.6043E-03 : -9.427E-03 : -1.483E-03 : 0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor	RMATION FOR FILTER B.         :       UA0985         :       1         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor ACTIVE CALIBRATION DATA	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor ACTIVE CALIBRATION DATA	RMATION FOR FILTER B.         :       UA0985         :       1         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :       0.0000E+00
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2 Span Calibration performed	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :       2014-07-01         :       2014-07-01
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2 Span Calibration performed Type of Span Calibration	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :       2014-07-01         :       Single Point         :       1469.625+02
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2 Span Calibration performed Type of Span Calibration Conversion factor	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       2014-07-01         :       2014-07-01         :       Single Point         :       168.62E+03
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. sqr. factor Hum. cub. factor Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 1 High Alarm limit 2 Span Calibration performed Type of Span Calibration Conversion factor Concentration	RMATION FOR FILTER B.         :       UA0985         :       1         :       1         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :       2014-07-01         :       Single Point         :       168.62E+03         :      ppm
GENERAL CALIBRATION INFOR Installed Optical Filter Active Filter Bank Number OPTICAL FILTER FACTORS Back. temp. factor Conc. temp. factor Hum. temp. 1 factor Hum. temp. 2 factor Hum. temp. 3 factor Hum. cub. factor Hum. cub. factor ACTIVE CALIBRATION DATA Gas name : Dinitrogen oxide Molecular weight High Alarm limit 1 High Alarm limit 2 Span Calibration performed Type of Span Calibration Conversion factor Concentration Microphone Signal	RMATION FOR FILTER B.         :       UA0985         :       1         :       2.6707E-03         :       7.6043E-03         :       -9.427E-03         :       -1.483E-03         :       0.0000E+00         :       -944.0E+00         :       0.0000E+00         :       0.0000E+00         :       2014-07-01         :       Single Point         :       168.62E+03         :

Concentration offset factor	: 3.0503E-06
Microphone Signal	· V
Hum. Interference Calibration per	formed : 2014-07-01
Humidity gain factor	52 5745 02
Humarty gain factor	. 33.3742-03
Microphone Signal	· V
Cross Interference Calibration per	formad . 2014 04 24
cross milerrererice calibration per	10111eu . 2014-00-20
Dinitrogen oxide interference on :	
Filter A :	376.34E+06
Filtor C	
Filler C .	
Filter D :	
Filter F	
· intol E	
- 1412i Calibration Data 7	12-008/9999 - 2014-07-01 13:58 - Page 6 -
CALIBRATION DATA IN FILTER BA	NK NUMBER : 1
Gas name : Dinitrogen oxide	
Molecular weight	: 44.010E+00
High Alarm limit 1	
	ppm
High Alarm limit 2	: ppm
Care and Calibratian an anti-	2014.07.01
Span Calibration performed	: 2014-07-01
Type of Span Calibration	: Single Point
Conversion factor	· 168 62E+03
	. 100.022103
Concentration :	ppm
Microphone Signal	: V
1 5	
Zero-Point Calibration performed	: 2014-07-01
Concentration offset factor	: 3.0503E-06
Microphono Signal	
Mici opriorie Signal	· V
Hum. Interference Calibration per	formed : 2014-07-01
Humidity gain factor	E2 E74E 02
numulty gain factor	. 53.574E-03
Microphone Signal	V
Cross Interference Calibration per	formod : 2014.06.26
	IUTTICU . 2014-00-20
Dinitrogen oxide interference on :	
Filter A	376.34E+06
Filter C	
Filter D :	
Filter E :	
CALIBRATION DATA IN FILTER BA	NK NUMBER : 2
Gas name :	
Molecular weight	: 1.0000E+00
High Alarm limit 1	: maa
Lligh Alarm limit 2	
nigh Alarm limit 2	ppm
Span Calibration performed	·
	Circle Daint
Type of Span Calibration	: Single Point
Conversion factor	:
Concentration	nnm
Concentration .	ppm
wicrophone Signal	: V
Zero-Point Calibration performed	· 2011.07-01
Concentration offset factor	: 3.0503E-06
Microphone Signal	: V
Hum Interference Calibration per	formed · 2014-07-01

Humidity gain factor	: 53.574E-03
Microphono Signal	
wici opriorie Signal	v
<b>.</b>	
Cross Interference Calibration	on performed :
_ interference on :	
Filter A	
Filter C	
Filter D	
	·
Filter E	·
- 1412i Calibration Data	712-008/9999 - 2014-07-01 13:58 - Page 7 -
CALIBRATION DATA IN FILT	FR BANK NUMBER · 3
~	
Molecular weight	: 1.0000E+00
High Alarm limit 1	: ppm
High Alarm limit 2	: ppm
5	
Span Calibration porformed	
Type of Span Calibration	: Single Point
Conversion factor	:
Concentration	: ppm
Microphone Signal	: V
Zana Daint Ociliantian C	amod
Zero-Point Calibration perfor	mea : 2014-07-01
Concentration offset factor	: 3.0503E-06
Microphone Signal	: V
Hum Interference Calibratio	$n_{\rm performed}$ $\sim 2014.07.01$
Humaily gain factor	: 53.574E-03
Microphone Signal	
Cross Interference Calibration	on performed :
interference on :	·
Filler A	·
Filter C	
Filter D	·
Filter E	:
CALIBRATION DATA IN TIET	
Cooperation	
Gas name : _	
Molecular weight	: 1.0000E+00
High Alarm limit 1	: ppm
High Alarm limit 2	: ppm
Crean Calibration states	
Span Calibration performed	· · · · · · · · · · · · · · · · · · ·
Type of Span Calibration	: Single Point
Conversion factor	:
Concentration	
Microphone Signal	
	V
Zero-Point Calibration perfo	rmed : 2014-07-01
Concentration offset factor	: 3.0503E-06
Microphone Signal	: V
Hum Interforence Callbrat	$n$ performed $\cdot$ 2014 07 01
num. Interference Calibratio	
Humidity gain factor	: 53.574E-03
Microphone Signal	:V
Cross Interference Calibratio	n performed ·
interforence on -	
Filter A	

Filter C	:	
Filter D	:	
Filter F	•	
	·	
- 1412i Calibration Data	- 712-008/9999 - 2014-07-01 13:58 - Page 8 -	
	BANK NUMBER : 5	
Gas name : _		
Molecular weight	: 1.0000E+00	
High Alarm limit 1	: ppm	
High Alarm limit 2	: ppm	
Span Calibratian parformed		
Span Calibration performed	Cingle Deint	
	Single Point	
	:	
Concentration	: ppm	
Microphone Signal	:V	
Zero-Point Calibration perforn	ned : 2014-07-01	
Concentration offset factor	: 3.0503E-06	
Microphone Signal	: V	
Hum. Interference Calibration	performed : 2014-07-01	
Humidity gain factor	: 53.574E-03	
Microphone Signal	: V	
Cross Interference Calibration	performed ·	
interference on ·		
Filtor C	·	
Filter D	·	
	·	
Filler E	·	
1412: Collibration Data	712 009/0000 2014 07 01 12 E9 Dogo 0	
	- /12-006/9999 - 2014-07-01 13.36 - Page 9 -	
GENERAL CALIBRATION INFO	RMATION FOR WATER FILTER.	
WATER FILTER FACTORS		
Back. temp. factor	: 814.20E-06	
Conc. temp. factor	: -4.301E-03	
Hum. sqr. factor	: 2.4070E-06	
ACTIVE CALIBRATION DATA		
 High Alarm limit 1	: Tdew	
High Alarm limit 2		
ingit / tidi fit infit 2	10000	
Span Calibration performed	: 2014-06-17	
Conversion factor	: 24.263E-09	
Concentration	: mag	
Microphone Signal	:V	
Zero-Point Calibration perforn	ied : 2014-06-18	
Concentration offset factor	: 6.5934E-06	
Microphone Signal	: V	

# **BZ7002**

![](_page_44_Picture_1.jpeg)

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