

ADEV

Analytical Process Instrumentation

MAP Series

EasyCheck

User Manual



Reliable Analysers!

*mnEasyCheck rel. 1.0_en
issued 04/08/2015*

[Inside cover]

EasyCheck

Oxygen / Carbon Dioxide Handheld Analyser
for Quality Control in MAP

User Manual

mnEasyCheck rel. 1.0_en

Issued 04/08/2015



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All specifications are subjected to variations
for products improvement without notice

Preface

Scope of this manual is to explain all necessary information about components, functions, installation and maintenance of the ADEV instrument you have purchased.

Some sections may describe parts or functions not present in your configuration. In any case, it's suggested to completely read the manual prior to operating on the analyser.

Safety Information

ADEV designs, manufactures and tests all its products in accordance to highest quality standards and to meet European directives, Harmonized standards and normatives which ensure the safe employ.

Because gas analysers are sophisticated and high-technology content instruments, they must be properly installed, used and maintained to ensure the proper operation along the time.

WARNING: Carefully read all instructions written on this manual prior to operating on the analyser. If some parts are not clear, contact ADEV to get more details.

WARNING: When spare parts are required, ensure that qualified personnel use parts provided by ADEV. Unauthorized parts not provided by ADEV may affect the product's performance, place the safe operation of your process at risk and VOID YOUR WARRANTY.

WARNING: It's the responsibility of the user to ensure that all local codes, regulations, rules and laws related to safety and safe operating conditions are met.

IMPORTANT

For safety reasons, any analyser returned for repair or refurbishment must be accompanied with a declaration stating that the goods has not been used or exposed to any process or application which is likely to give raise to contamination by any substance likely to be detrimental to human health.

Unless the analyser is accompanied by such declaration, ADEV reserves the right to refuse to undertake any repair or refurbishment.

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Chapter 1 EasyCheck

EasyCheck is a portable measurement device which, depending on the model, is designed for the analysis of Oxygen and Carbon Dioxide. A measurement range of 0 to 100 % volume can be covered for both gases.

EasyCheck has an internal memory for up to 1000 measured values, which are retained even after the device is switched off. The measurement data can be transmitted to your PC with the evaluation software that is included.

Caution! The device is not suitable for use in potentially explosive areas and may not be used for measurements in which combustion gases are involved.

Chapter 2 Scope of Delivery

Number	Description
1	EasyCheck
1	Charger with plug adapters for different systems
2	Filter
1	Suction needle
1	Suction hose
40	Foam rubber platelets
1	USB cable
1	USB stick with software and user manual as a PDF file
1	Convenient carrying case for measuring device and accessories



Chapter 3 Function

With the help of the built-in pump the EasyCheck draws a gas sample into the integrated measuring chamber and on to its measuring cells. Threshold values can be set so that the device produces an optical signal for measurement results that are outside the specified range.

After completion of the analysis, the measured concentrations are saved automatically with the date, time and the specified threshold values. If the memory is full, the oldest value is overwritten when new measurements are stored.

The measurement value memory can be read-out and deleted by the user at any time with the software supplied. Refer to the chapter 15 of this manual (dedicated to the software) for more detailed information on processing the stored measurement readings.

Chapter 4 EasyCheck ONE

EasyCheck ONE has an electrochemical Oxygen measuring cell. The O₂ content in the measured gas mixture produces a low level of voltage in the measuring cell. This voltage is measured and converted into a concentration value which is then indicated on the display. The life of the O₂ measuring cell may be 12 - 18 months, but this depends heavily on the Oxygen content and the number of measurements taken. Therefore, we recommend regular maintenance of the analyzer at a minimum of every 12 months.

Chapter 5 EasyCheck TWO

The EasyCheck TWO also has a O₂ measuring cell with the described properties. In addition, a NDIR measuring cell, which is responsible for determining the CO₂ concentration, is installed in the device. This measuring cell operates with infrared light, emitted from a special source. The light is absorbed by the Carbon Dioxide present in the measuring chamber. The non-absorbed light is captured by a sensor behind the measuring chamber. Based on the intensity of the light captured, the concentration of Carbon Dioxide located in the measuring chamber can be calculated.

The CO₂ sensor has a long service life and shows only slight signs of wear. However, the sensor is sensitive to impact and thermal stress (temperatures above 50°C). Therefore, regular inspection is a necessity. The period of recommended maintenance depends on the lifetime of the CO₂ measuring cell. We recommend regular maintenance of the analyzer at a minimum of every 12 months.

Chapter 6 N2 Display

Regardless of the model, the EasyCheck is also equipped with the option to display the N₂ value (Nitrogen concentration) during a measurement. Otherwise the N₂ concentration is not displayed. The value indicated during a measurement in the display is a calculated value. The value is calculated from the measured gas concentrations (from O₂ or O₂/CO₂ depending on the model).

The display of the N₂ value is optional and can be activated or deactivated by the service partner. Display of the N₂ value is recommended only where N₂ exists in addition to the gas (O₂/CO₂) being measured. Only in this case will the displayed value coincide with the real concentration.

Chapter 7 Power Supply

Power is supplied by a battery pack. The charge status of the battery is indicated by a battery symbol on the display. Use only the original power supply unit that was delivered to charge the battery. If the analyzer is connected to the USB port, the battery is charged at the same time. However, the power supply is preferable for a pure charging since the charging time is significantly shorter than charging via the USB cable.

The unit has an electronic system that turns off the power supply when the battery is fully charged. The unit can remain permanently connected to the power supply without causing any damage. The battery pack has a service life of approximately 2-3 years. If necessary, the battery pack can be replaced. Only use original spare parts.

Chapter 8 Power Supply Units

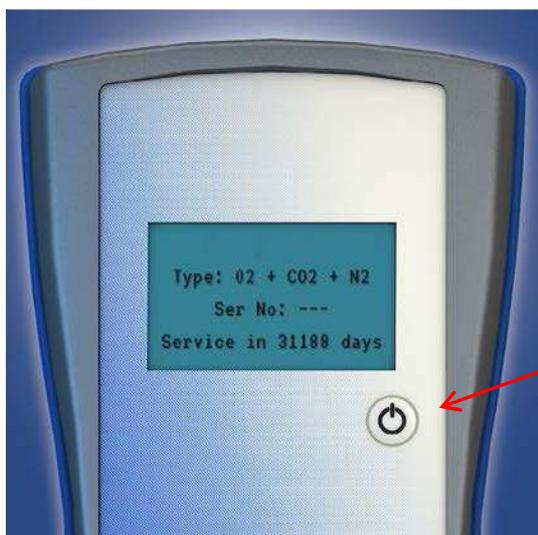
Unsuitable power supply units, such as 9, 12 or 24 V, cause defects in the charging circuit. Then the EasyCheck will have to be shipped to the manufacturer for service.

Power supply units with 5VDC > 1.2 A hollow plug with a 2.1 or 2.5 mm hole are suitable.

Chapter 9 Operation

All of the following examples in the figures are based on using the EasyCheck TWO. The functions of the EasyCheck ONE correspond roughly with the devices shown here. The displays may deviate however from those indicated in the figures below.

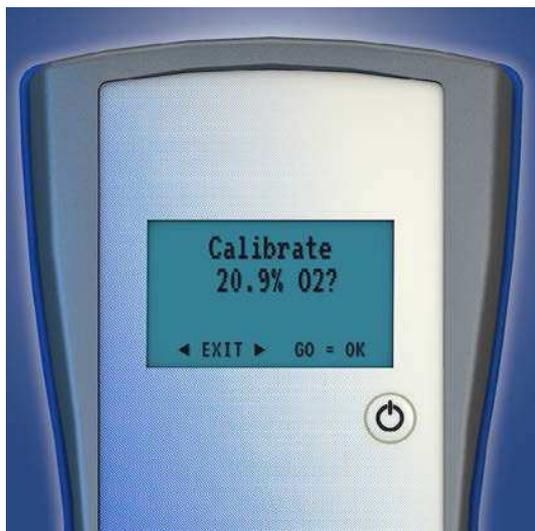
9.1 Starting and Measuring



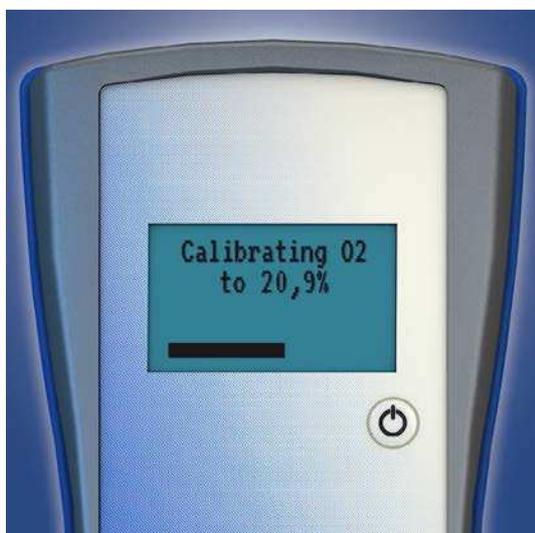
Press the „START“ button.



EasyCheck automatically starts with a selfcheck of the sensors.

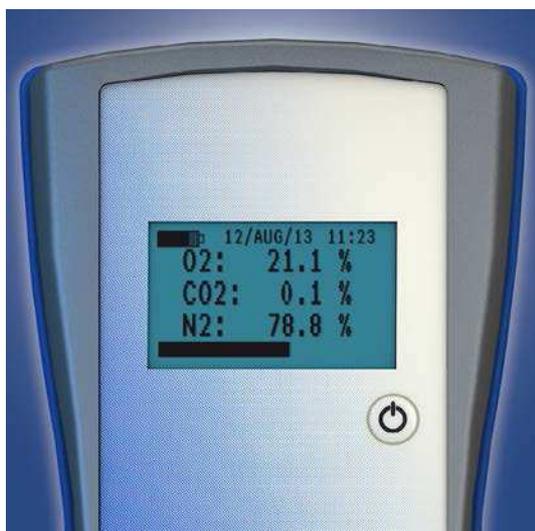


A calibration of the O₂ sensor is automatically requested at first start of the day. For high measurement accuracy we recommend daily calibration prior to conducting measurements. Automatic calibration is started by pressing the "Go" button.



EasyCheck automatically carries out the calibration with ambient air (20.9% O₂).

Attention: Make sure that you only use the ambient air.

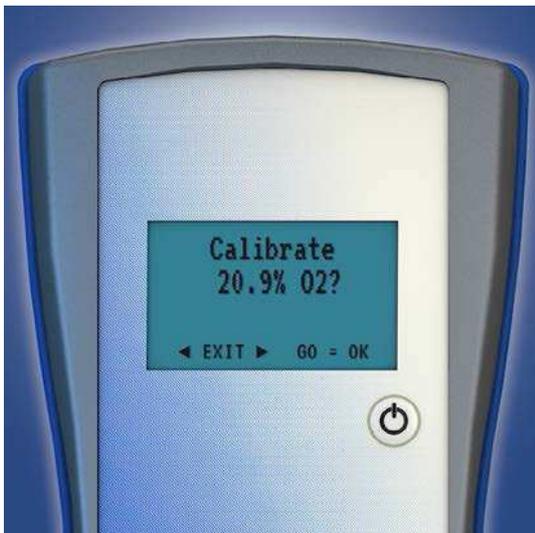


After calibration you can take measurements. Press the „GO“ button for this purpose.

9.2_Manual SPAN Calibration O₂

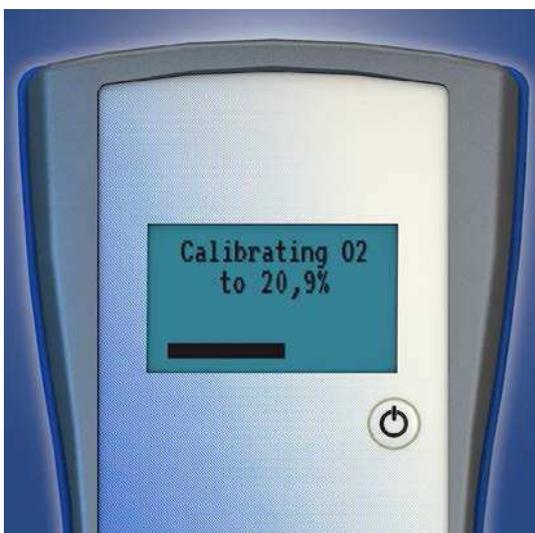


Press the arrow key „left“ or „right“ to enter the calibration menu. For the ambient air calibration, select „Span O₂ 20.9%“ and press the „GO“ button. To exit the calibration menu, press the arrow key „left“ or „right.“



To start the ambient air calibration, press the „GO“ button.

Attention: Make sure that you only use the ambient air.



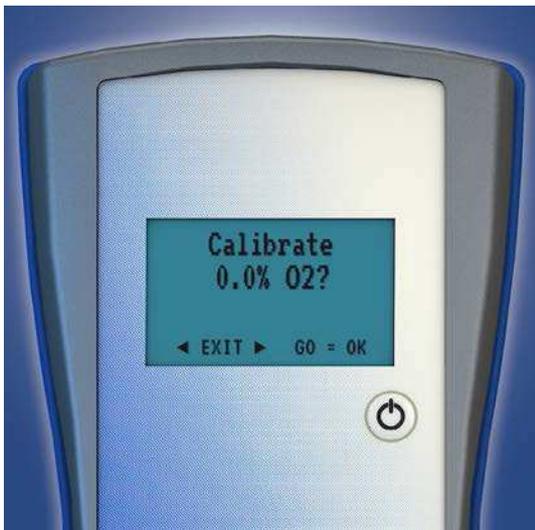
The calibration now starts automatically. The calibration progress is displayed by a progress bar in the display.

After calibration, the measurement menu automatically reappears.

9.3_Manual Zero Point Calibration O₂

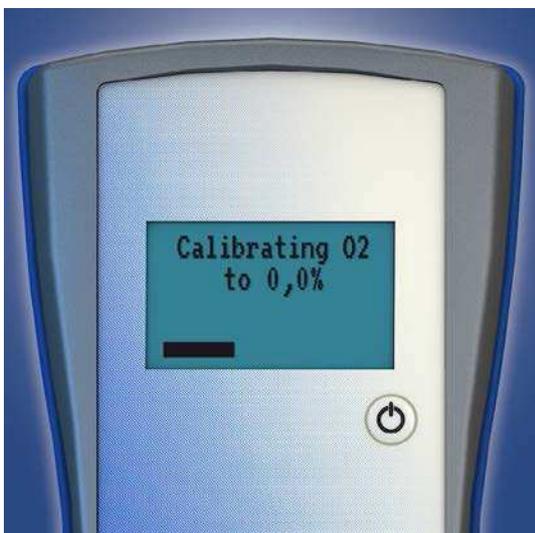


For zero point calibration use 100% N₂. Press the arrow key „left“ or „right“ to enter the calibration menu. For the zero point calibration, select „Zero O₂ 0.0%“ and press the „GO“ button. To exit the calibration menu, press the arrow key „left“ or „right.“



To start the zero point calibration, press the „GO“ button and draw-in the zero gas with the suction needle pressure free (refer to paragraph 11.3 for details). Make sure that no secondary air is withdrawn.

Attention: Make sure that you only use 100% nitrogen (N₂).



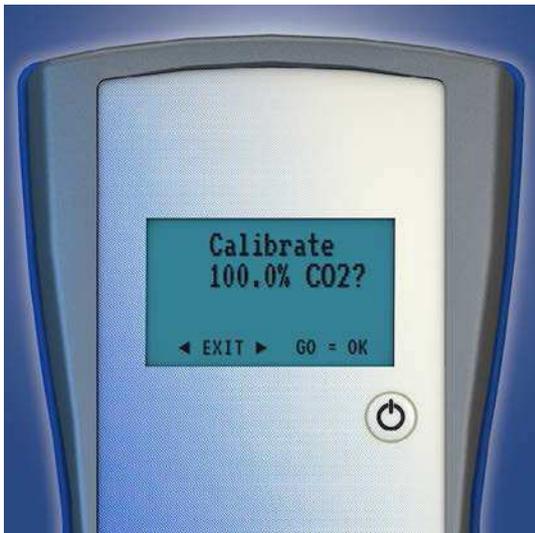
The calibration now starts automatically. The calibration progress is displayed by a progress bar in the display.

After calibration, the measurement menu automatically reappears.

9.4_Manual SPAN Calibration CO₂

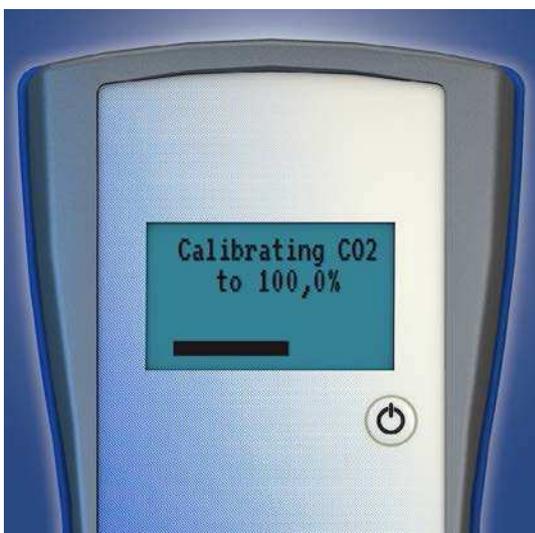


Use 100% CO₂ for the SPAN calibration. Press the arrow key „left“ or „right“ to enter the calibration menu. For the SPAN point calibration of the CO₂ sensor, select „SPAN CO2 100.0%“ and press the „GO“ button. To exit the calibration menu, press the arrow key „left“ or „right.“



To start the SPAN point calibration, press the „GO“ button and draw-in the calibration gas with the suction needle pressure free (refer to paragraph 11.3 for details). Make sure that no secondary air is withdrawn.

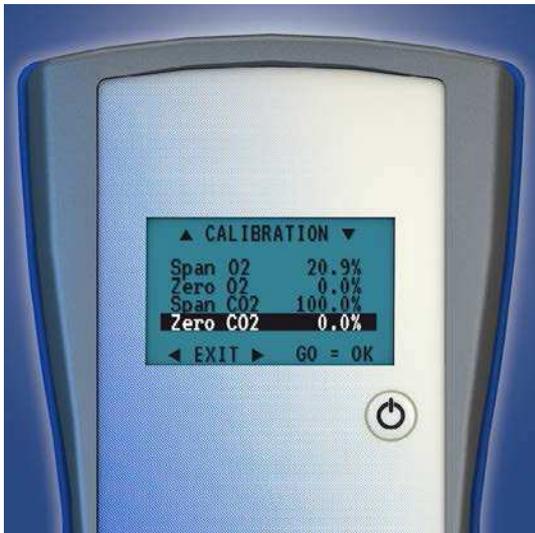
Attention: Make sure that you only use 100% carbon dioxide (CO₂).



Calibration now starts automatically. The progress is displayed by a progress bar in the display.

After calibration, the measurement menu automatically reappears.

9.5_Manual Zero Point Calibration CO₂



For zero point calibration use 100% N₂. Press the arrow key „left“ or „right“ to enter the calibration menu. For the zero point calibration of the CO₂ sensor, select „Zero CO₂ 0.0%“ and press the „GO“ button. To exit the calibration menu, press the arrow key „left“ or „right.“



To start the zero point calibration, press the „GO“ button and draw-in the zero gas with the suction needle pressure free (refer to paragraph 11.3 for details). Make sure that no secondary air is withdrawn.

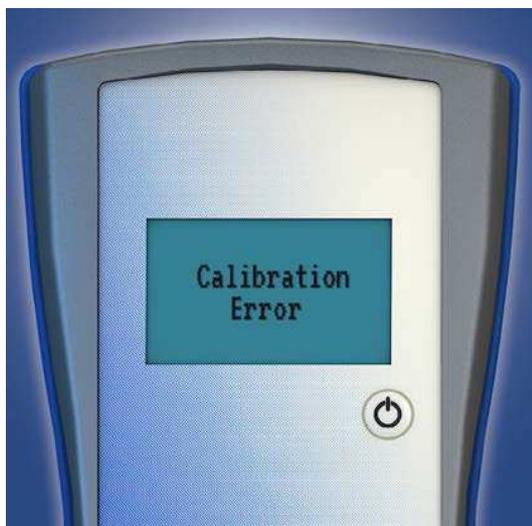
Attention: Make sure that you only use 100% nitrogen (N₂).



Calibration now starts automatically. The progress is displayed by a progress bar in the display.

After calibration, the measurement menu automatically reappears.

9.6_Calibration Errors



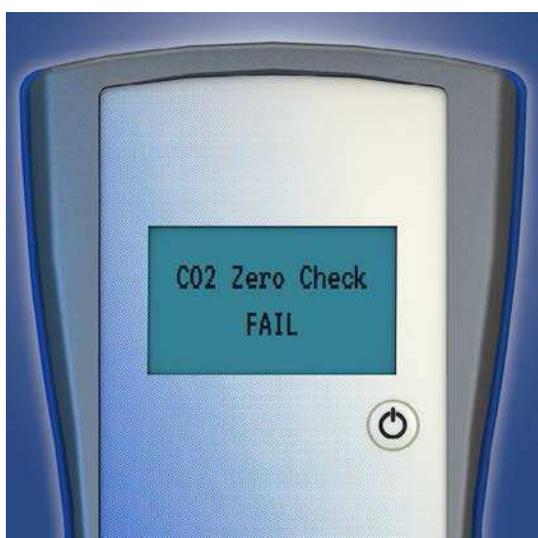
If after calibration, one of these errors („Calibration Error“ or „CO₂ Span Check FAIL“) appears, then check the following components for contamination:

- Suction needle
- Intake filter
- Suction hose

The message „Calibration Error“ also appears in case a wrong operation is performed, e.g. a Zero point calibration on O₂ sensor, while drawing-in ambient air.



If necessary, replace the contaminated components and restart the process. If the calibration still results in errors then send the device to your service partner for inspection.



If the error („CO₂ Zero Check FAIL“) is displayed then carry out a CO₂ SPAN calibration. If the calibration results in errors or if this error is displayed again then send the device to your service partner for inspection.

Chapter 10 Measurement

Start the measurement with the „GO“ button. Make sure that no foreign bodies or liquids can be sucked-in when inserting the needle into the package. A filter must always be installed upstream. The measurement is complete when the progress bar on the LCD display expires and the pump stops sucking sample gas. The measurement result is displayed on the LCD.

Chapter 11 Calibration

11.1_EasyCheck ONE

The O₂ measuring cell of the EasyCheck must be calibrated at regular intervals. Daily calibration is sufficient for most applications but for more accurate measurement results, calibration is recommended before the start of the actual measurement. Also, changes to the ambient conditions, such as after transport by courier or longer idle periods, make recalibration necessary.

11.2_EasyCheck TWO

The O₂ measuring cell of the EasyCheck must be calibrated at regular intervals. Daily calibration is sufficient for most applications but for more accurate measurement results, calibration is recommended before the start of the actual measurement. Also, changes to the ambient conditions, such as after transport by courier or longer idle periods, make recalibration necessary!

The CO₂ measuring cell has a very long service life. No regular calibration is required here. Only calibrate the measuring cell if a malfunction is detected when starting the system or if you receive significant deviations from the usual measurements. Such measurement errors can occur if the device was subjected to impact or thermal stress.

11.3_General

Attention! Make sure that EasyCheck is not over-pressured when conducting any measurement or calibration processes. The built-in pump must always suck the gas being analyzed at atmospheric pressure (= ambient pressure). Do not suck-in any liquid matter! Failure to comply may lead to false measurement results or to substantial damage to the device.

Make sure the device is stable before conducting each calibration. For the calibration of the zero point (ZERO calibration) please use only 100% N₂ or e.g. 100% Argon for both sensors. Use only inert gases. Use a suitable zero gas cylinder - for each gas - when calibrating the zero point.

Install a pressure regulator on the zero gas cylinder and connect a loose piece of hose on the outlet side of the pressure regulator. Allow the gas from the cylinder to flow out freely at minimum pressure into the ambient air. Make sure the pressure regulator/hose system is thoroughly flushed. Then place the suction needle of the EasyCheck into the hose so that the out-flowing gas can be sucked without pressure. Then start the zero-point calibration as described above.

Only insert the suction needle into the hose as far as necessary making sure that no gas or pressure builds up. Keep the needle in the hose until calibration is completed.

This is how you calibrate the ambient air (SPAN calibration) with fresh ambient air. Carry out the calibration with clean, oil-free and water free air; otherwise the chemical measuring cell will get damaged! Also make sure that no overpressure builds up on the suction needle since this may lead to false results. In large production facilities, it is recommended to calibrate outside the hall, and never directly on the production line.

Chapter 12 Switch-Off

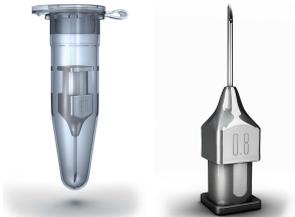
EasyCheck switches-off automatically after 15 minutes of inactivity. If you would like to turn off the device manually, press the arrow button “down” for approx. 5 seconds. EasyCheck flushes the measuring chamber with air and then switches itself off automatically.

Chapter 13 Service / Maintenance

EasyCheck works reliably with low maintenance and service costs for many years if the following points are observed:

- Use only original intake filters that are in perfect condition.
- Contaminated filters can obstruct the flow of sample gas through the measuring cell or not sufficiently clean solids from the sample gas.
- Check the passage point of the sample gas through the needle periodically.
- If the needle is clogged then the sample gas cannot reach the measuring cell. This leads to measurement errors. Replace clogged or bent needles immediately with new ones.
- Clean the housing only with a dry or slightly damp cloth.
- Do not use detergents. Never wash the device with water or other cleaning liquids.
- Avoid drastic changes in temperature and resulting condensation. If condensate has formed, remove the bottom of the housing and let the device dry out under normal ambient conditions (room temperature). Switch the device back on only after sufficient drying time.
- Do not subject the device to excessive vibration.
- Calibrate the O₂ sensor of the EasyCheck regularly. The best time is right before conducting a measurement.
- The battery must be recharged as quickly as possible after an automatic under-voltage switch-off. Prolonged storage with a fully discharged battery will lead to its defect.

Chapter 14 Spare Parts List

Item	Illustration
Filter: 1 PU = 5 pcs	
Needle: 1 PU = 12 pcs	
Foam rubber sticks: 1 PU = 400 pcs (10 strips)	
Hose: 1 PU = 1 pcs	
USB-data cable: 1 PU = 1 pcs	
Power pack + adapter set: 1 PU = 1 pcs	

Chapter 15 Software

15.1_Scope of Delivery

The USB stick includes the drivers and the readout software

15.2_Setting Up the Readout Software

Connect the measuring device to the PC via the USB data cable provided. Windows automatically searches for device drivers. These are normally found automatically. If Windows cannot find the driver then the path to the folder that contains the driver must be specified (but only the first time you connect the measuring device to the computer). Once the drivers are installed, a COM port is assigned to the connected device. This must be selected later in the readout software.

Once the drivers are installed, the readout software can be started with „EasyCheck.exe“. The port assigned to the device during the installation of the driver is selected under the menu item „Device“ → “Com Port.“ This ensures that the device will be detected. The COM port for a device on a computer is always the same (unless manual intervention has occurred). When multiple devices are connected (either simultaneously or sequentially) each newly connected device receives a new COM port.

If many devices are connected to a computer then many COM ports are created. These can be deleted again manually if necessary. The steps for removing the COM ports can be found at the end of this manual. The startup screen is shown in Figure 1. The current port is displayed at the bottom in the left corner.

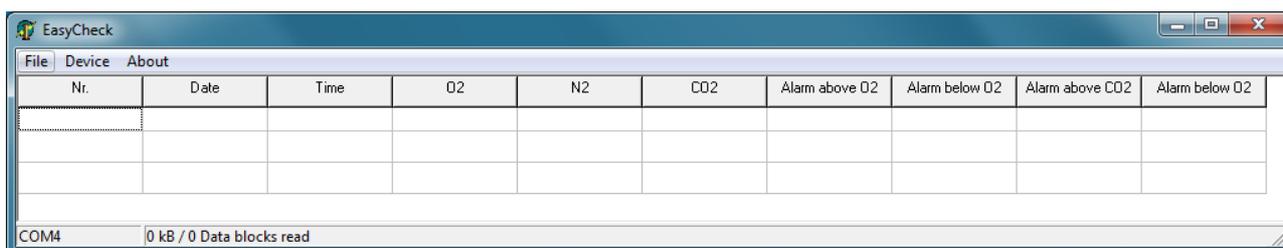


Fig. 1 – Startup screen read-out software „EasyCheck.exe“

15.3 Communication with the Measuring Device

Several functions can be selected under the menu item „Device“ (Figure 2). These functions are explained in the table below.

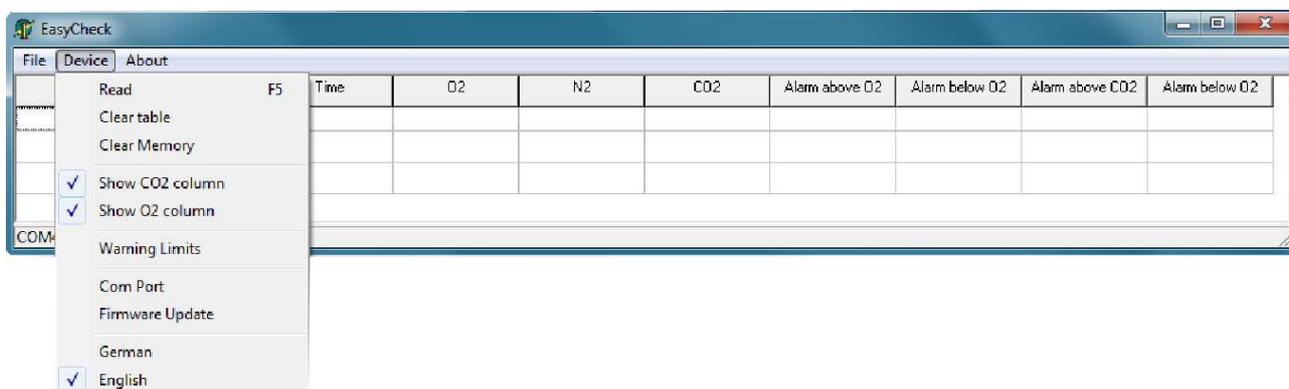
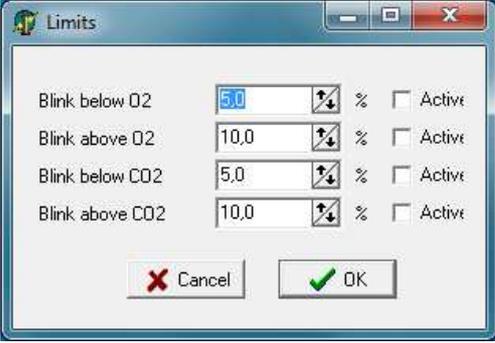


Fig. 2 – Menu „Device“

„Device“	
Readout:	If measured values are stored in the device, they are read-out and displayed in a table.
Clear table:	Deletes the measured values from the table, but not from the internal memory of the device.
Clear memory:	Deletes the measured values from the internal memory of the device. Note: Thereafter, the measured values can no longer be retrieved. Save the readings, if you want to access them again later.
Show CO2 column:	If this function is selected the value of the CO ₂ sensor will also be read-out. If this function is not selected the value of the CO ₂ sensor will not be read-out. The value of 0.0 will then be found in the corresponding columns of the table. The function should be deactivated for devices without a CO ₂ -sensor.
Show O2 column:	If this function is selected the value of the O ₂ sensor will be read-out. If this function is not selected the value of the O ₂ sensor will not be read-out. Normally, this function must be always activated.

„Device“	
Warning limits:	<p>This is where threshold values can be set which may not be exceeded or fallen below when measuring the designated gasses.</p> <p>By selecting „Active“ an optical signal is displayed on the screen of the handheld device if the threshold value is exceeded or fallen below.</p>  <p style="text-align: center;">Fig. 3 – Threshold Values</p>
Com Port:	<p>Here, the Com Port can be selected for communication between the computer and the measuring device. The last used interface is saved. The interface only has to be set the first time if only one EasyCheck is administered with the computer.</p> <p>Note: This is the first step that must be carried out after the readout software started, otherwise the device cannot be accessed.</p>
Firmware update:	<p>The firmware on the device is updated. A firmware file is required in order to update the firmware successfully.</p> <p>Note: This function should only be carried out after consultation with the manufacturer of the equipment.</p>
German / English:	<p>The language of the readout software can be set here.</p>

15.4 Storing the Measuring Values

Under the menu item „File,“ data read-out previously from the measuring device can be stored on the hard drive and the readout software can be exited (Figure 4). The readout software supports two file formats, which are explained in the table below.

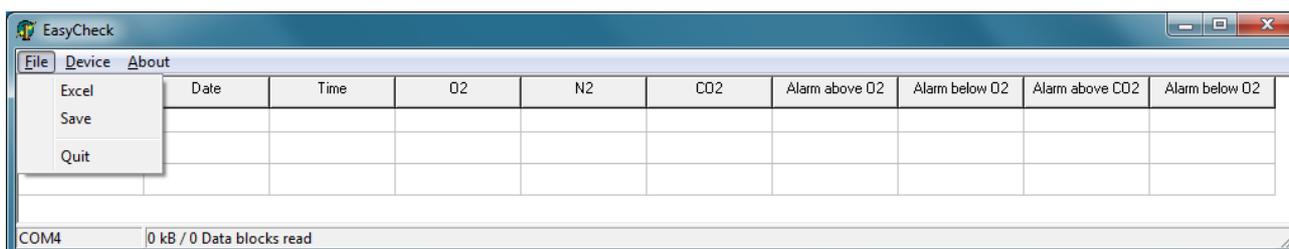


Fig. 4 – Menu „File“

„File“	
Excel:	Stores the measured values in an Excel file. This type of file has the extension .xls and can be opened by spreadsheet programs. Note: Microsoft Excel is required for this function. Other spreadsheet programs cannot be used for this purpose.
Store:	Stores the measured values in a CSV file. The data is written in a text file and separated by commas. This type of file has the extension .csv and can be opened with the Windows editor. It is also suitable for importing into spreadsheets or databases.
Exit:	Closes the readout software on your computer.

15.5_Software Information

Information about the readout software can be accessed under the menu item „About“ (Figure 5).

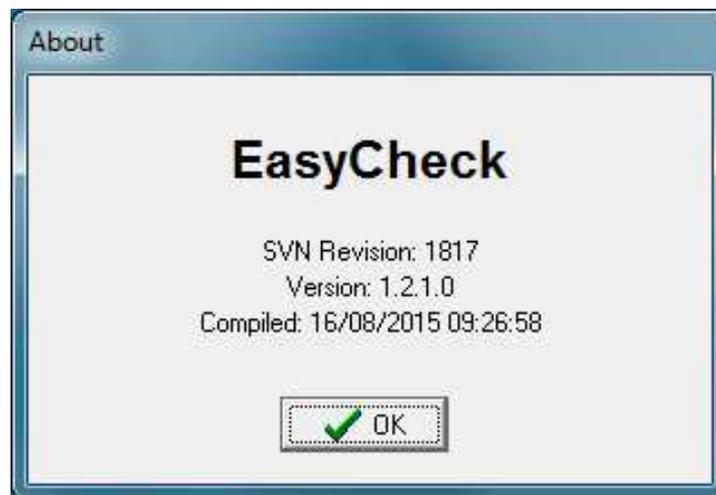


Fig. 5 – Menu „About“

15.6_Removing Redundant COM ports

The following steps must be performed to remove COM ports that are no longer required. These instructions apply to Windows 7.

- Step 1: Right click on „Computer“ (formerly „My Computer“)
- Step 2: Select „Properties“
- Step 3: Select „Change settings“ (this requires administrator rights)
- Step 4: Select the „Advanced“ tab
- Step 5: Select „Environment variables ...“
- Step 6: Select „New ...“ under „System variables“
Name: „devmgr_show_nonpresent_devices“
Value: 1
- Step 7: Confirm the „New system variable“ window with „OK“
- Step 8: Confirm the „Environment variables“ window with „OK“
- Step 9: Confirm the „System properties“ window with „OK“
- Step 10: Select „Device manager“ in open window „System“
- Step 11: Select „View“
- Step 12: Select „Show hidden devices“
- Step 13: Expand „Ports (COM & LPT)“
- Step 14: Select the COM Port to be removed with right click
- Step 15: Select „Uninstall“
- Step 16: Verify „Confirm uninstall device“ with „OK“

Thereafter, the COM port is enabled for other devices. It is no longer displayed in the device manager.

Chapter 16 Warranty

What is covered: Any defect in material and workmanship from normal use in accordance with the user manual. This warranty applies to all analysers purchased worldwide. ADEV Srl reserves the right in its sole discretion to invalidate this warranty if the serial number does not appear on the analyzer.

For how long: One year from shipment by manufacturer or purchase from a distributor with proof of purchase.

Who is warranted: This warranty is limited to the first customer who submits a claim. Under no circumstances will the warranty extend to more than one customer.

What we will do: If your ADEV analyser is defective with respect to material and workmanship, we will repair it or, at our option, replace it at no charge to you. If we choose to replace some components, we may use new or reconditioned replacement parts. If we choose to replace your analyzer, we may replace it with a new or reconditioned one of the same or upgraded design.

Limitations: ADEV will not pay for: loss of time; inconvenience; loss of use of your analyzer or property damage caused by your analyser or its failure to work; any special, incidental or consequential damages; or any damage resulting from alterations, misuse or abuse; lack of proper maintenance; unauthorized repair or modification of the transmitter; affixing of many attachment not provided with the analyzer or other failure to follow the user manual.

What is not covered: This warranty does not cover installation; defects resulting from accidents; damage while in transit to our service location; damage resulting from alterations, misuse or abuse; lack of proper maintenance; unauthorized repair or modification of the transmitter; affixing of any attachment not provided with the analyzer; fire, flood, or acts of God; or other failure to follow the user manual.

How to obtain warranty service: Call ADEV at +39 0362 641684 - 574775 between 8:30am and 5:30pm (GMT + 1h). Trained technicians will assist you in diagnosing the problem and arrange to supply you with the required parts. If warranty service is provided by a distributor, ADEV srl will provide all required parts under warranty at no charge to you, but the distributor is an independent business and may render a service charge for their services. ADEV will not reimburse you or otherwise be responsible for those charges. You may obtain warranty service by returning you analyser, postage prepaid to:

ADEV Srl
Via S. Eurosia n. 27/A
20811 Cesano Maderno (MB) – Italy
info@adev.it

Be sure to pack the analyzer securely. Include your name, address, telephone number, date of purchase and a description of the operating problem. After repairing or, at our option, replacing your analyzer, we will ship it to you at no cost for parts and labor.

Chapter 17 Return Policy

If an ADEV analyser malfunctions, the following procedure must be completed:

- Notify ADEV, giving full details of the problem, and provide model number and serial number of the analyser.
- The instrument must be shipped to the factory on customer responsibility.

WARNING: It's necessary to provide a suitable packaging to protect the analyser during transport. Damages produced by shock while in transit are NOT covered by warranty.

WARNING: For safety reasons, any analyser returned for repair or refurbishment must be accompanied with a declaration stating that the goods has not been used or exposed to any process or application which is likely to give raise to contamination by any substance likely to be detrimental to human health. Unless the analyser is accompanied by such declaration, ADEV reserves the right to refuse to undertake any repair or refurbishment.

- Upon the receipt, ADEV will evaluate the instrument to determine the cause and the entity of the malfunction.
- If damage is covered under the terms of the warranty, the instrument will be repaired by ADEV at no cost to the owner and returned at the conditions specified in section 16.
- If the cause of damage is not covered under the terms of warranty or if the warranty has expired, an estimate for the cost of the repairs will be provided. Upon receipt of the owner's approval to proceed, the analyser will be repaired and returned.

Appendix A

Decontamination Declaration

For safety reasons, any analyser returned for repair or refurbishment must be accompanied with a declaration stating that the goods has not been used or exposed to any process or application which is likely to give raise to contamination by any substance likely to be detrimental to human health. Unless the analyser is accompanied by such declaration, ADEV reserves the right to refuse to undertake any repair or refurbishment.

Please fulfil this form prior to this analyser or any component / subpart being returned to ADEV.

General information			
Instrument model		Company name	
Serial Number		Company address	
Original PO #		Telephone	
Contact person		e-mail address	
Reason for return / Description of the malfunction:			

Safety information		
Has this equipment been exposed to any of the following?		
Biohazard	YES	NO
Biological agents	YES	NO
Hazardous chemicals	YES	NO
Radioactive substances	YES	NO
Other hazards	YES	NO
Provide details of any hazardous material used with this analyser, component, subpart:		
Describe you cleaning or decontamination method:		
Has the equipment been cleaned and decontaminated?	YES	NOT NECESSARY

Declaration			
I declare that above listed information are true and it's safe for ADEV personnel to operate on the returned instrument.			
Name		Position	
Signature		Date	



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