Driesen – Kern

Bedienungsanleitung / User Manual

DKCO2-Log

618 PPM CO²
23.4 °C 51.3 %
1017.1 hPa

CO_2-Logger

Set

INFRALOG *for Windows*

Thank you very much for purchasing one of our data loggers!

We hope that you will be happy with our product and will find using it to be convenient. Should you have any questions, please find the most important FAQs in our Support section on www.driesen-kern.com >> Service & Support
If you experience problems which cannot be solved with the FAQs, you can also download our support form on the same page. Just fill it out and send it to us via e-mail at support@driesen-kern.de.

Trademarks

Windows is a registered trademark of the Microsoft Corporation. All other prduct names are trademarks or registered trademarks ofthe respective owners.

1   Box Content

Included in delivery are:

- Data logger DKCO2-Log
- 3x alkaline batteries (type AA)
- 1x USB cable (USB-A to USB-C)
- 1x table stand
- InfraLog Basic software
  Downloadable at www.driesen-kern.com/infralog

Other options may also include:

- Certificate of calibration
- Concealed wall holder
- InfraLog Light/Enhanced license (serial key)

2   Getting Started – Quick Start

Take your first measurement in only 6 easy steps:

► Install InfraLog for Windows. Go to **www.driesen-kern.com/infralog** and download the latest InfraLog version. Unzip the files and install InfraLog.

► Open the battery compartment and insert the three type AA batteries included in delivery. Connect the logger to your computer using the USB cable.

► Automatic hardware detection by the OS. Wait for the notification that the device is now ready to use.

► Upon start InfraLog automatically detects the logger. (If this does not happen **Search devices**, see **chapter 4.4**.) Select your logger in the main window.

► Change the selected language in the **Preferences** menu under the **Program** option.

► Right click on the logger image and select **MeterMode**. After a few seconds real-time readings from your logge rare shown on the screen.

Start logging your measurements in just 2 more steps

► Right click on the logger icon and hit **Start logger**.

► Confirm by clicking the button **Sart logger now**. Unless manually changed the logger will record readings in a preset interval of 5 minutes. The multicoloured LED below the Set button flashes accordingly. The traffic light style LEDs will indicate the CO2 concentration in green, amber or red.

Graph measured data in another 2 steps

► Click **Download data**. Logged readings will now be transferred and converted into a spreadsheet, and optionally charted. **InfraLog Basic** does not offer charts/graphs. You can easily upgrade to more advanced versions of InfraLog for Windows. Refer to **chapter 4.15** for more information regarding spreadsheets.

► In order to upgrade your InfraLog version, when prompted, enter the serial number and license keys (key1/key2) from the included certificate. Done.

3   General Informationen

The DKCO2-Log is a data logger for recording and indicating CO2, ambient temperature, relative humidity and barometric pressure readings.

The logger's memory can hold up to 4 million readings. Please note that saved readings will be overwritten after restarting the logger!

The DKCO2-Log has an LCD indicating the readings as well as a button for navigating menus.

The battery compartment is located on the bottom of the device. Open it and insert the included batteries according to polarity as indicated in the compartment. Exclusively use type AA alkaline batteries.
If you wish to use mains operation connect the USB adapter (5V/>2A) to the USB port. The USB port is also used for configuring the logger and downloading data.

3.1   Battery Life

Battery life depends heavily on the chosen interval. The following table shows approximate battery life expectancies.

Interval [h]	Life Expectancy
	LCD off
10 Minutes	ca. 9 Months
1 Minute	ca. 6 Months

3.2   Manual Configuration

The most important features of the DKCO2-Log can be used with the SET button at the top. Pressing it will be accompanied by the status LED flashing up.

> **Note:** **Before its first use the logger needs to be connected to InfraLog in order for the automatic time synchronisation to take effect. Interval can also only be configured using InfraLog.**

When first pushing the button, the display will wake up and show the current measurements (**Meter Mode**).

A **short push** on the button lets you scroll through the menu items or toggle between options within a menu.

Press the button for **2 seconds** to either enter or leave a menu.

Press and hold the button for **10 seconds** in order to trigger options or confirm selections within menus. (Not available in all menus!)

3.2.1 Main Menu

"T" icon indicates that the internal real-time clock is working correctly.
"L" icon indicates that the logger is currently recording readings.
"A" indicates that the alarm is enabled.
A lightning icon indicates that an alarm has previously been triggered but is not active anymore. This resets after the logger is restarted.

Battery icon has 3 states: "full", "half full", "empty".

3.2.2 MeterMode

Shows the current readings of all parameters.

3.2.3 LoggerTime

This menu shows the currently set logger time and date. Make sure this time is correctly set so that recorded data has the proper time reference. Setting the time requires the InfraLog software. Upon program start InfraLog automatically synchronises time and date of connected data loggers.

3.2.4 Battery

This menu shows the battery power represented as a bar graph as well as in Ampere.

3.2.5 Log Mode (Start/Stop Logger)

In this menu you can start and stop the logger. Thus, it either shows "Start Datalogging" or "Stop Datalogging" which you have to confirm as follows.

> **WARNING:** **All previously saved data will be overwritten once the DKCO2-Log starts logging.**

If you do not want to start the logger right now (e. g. because you accidentally entered this menu), toggle from **<Yes>** to **<No>** by shortly pressing the button. Selecting **<No>**, press the button for 2 seconds to return to the main menu.

If you want to start the logger now, confirm **<Yes>** by pressing the SET button for 10 seconds, during which both the blue status LED at the bottom and the green Indicator

LED will flash simultaneously, indicating that the command is being executed, until they stop and the amber light flashes.

Please note that the logging interval needs to be configured with InfraLog beforehand.

Stopping the logger works exactly the same way.

3.2.6   AlarmMode

Enable or disable alarm settings which have been previously configured with InfraLog. You will be prompted to confirm or cancel the command with **<Yes>** or **<No>**.
Shortly pressing the button toggles between both options.
Confirm your selection by pressing and holding the button for 10 seconds during which both the blue status LED at the bottom and the green Indicator LED will flash simultaneously, indicating that the command is being executed, until they stop and the amber light flashes.
The "A" icon indicates that the alarm mode is enabled.

3.2.7   Device Setup

In this menu you will find information about the serial number of the logger as well as display and LED settings.

3.2.7.1 Device Setup – Display

Section **Display** has three options: **<timed LCD>**, **<LCD always on>** and **<disable LCD>**.

By default, **<timed LCD>** is selected which means that the display will turn off automatically after 5 minutes when not in use.

<disable LCD> permanently disables the display and it cannot be reactivated using the SET button.
In order to deactivate the display, toggle to **<disable LCD>** and press/hold the SET button for ca. 10 seconds during which both the blue status LED at the bottom and the green Indicator LED will flash simultaneously, indicating that the command is being executed, until they stop and the amber light flashes.
Press SET shortly and the DKCO2-Log reads **Display off**, now press SET for **2 seconds** again to finally turn the LCD off.

Reactivating the display requires the following procedure:
Disconnect the logger from mains operation or your computer and remove all three batteries. Wait for 10 seconds.

Press and hold the SET button while inserting the batteries again. The three LEDs subsequently flare up and the display shortly lights up showing manufacturer's name before turning off again.
Pressing the SET button now turns on the display and lets you enter the menu again.

Selecting **<LCD always on>** keeps the display permanently on.
Please note that this drastically reduces battery life!

3.2.7.2 Device Setup – CO2 Indicator

The DKCO2-Log uses its LEDs in a traffic light style to indicate the CO2 levels. Refer to **chapter 6** for more information.

If the LED indication is not needed, it can be disabled.
CO2 Indicator hast wo options **<disable LEDs>** and **<enable LEDs>**.
Toggle **<disable LEDs>** and press the SET button for 10 seconds until the LEDs change from green to amber.
The LCD notifies you that the LEDs and their CO2 level indication are deactivated.

In order to reactivate them, navigate to the same sub menu and toggle <enable LEDs>. Press the SET button for 10 seconds, during which both the blue status LED at the bottom and the green Indicator LED will flash simultaneously, indicating that the command is being executed, until they stop and the amber light flashes.
The LCD notifies you that LEDs and their CO2 level indication are activated.

3.2.7.3 Device Setup – CO2-Zerogas

The DKCO2-Log uses a self-correcting feature making it unnecessary for you to manually calibrate it under normal conditions.
Should it become necessary to calibrate the DKCO2-Log you can perform a calibration at fresh air conditions.

- Place the logger in a well ventilated location – ideally outside, but without direct sun exposure! Surrounding conditions should not exceed 22°C ±7°C and 70% RH.
- Before calibration the sensor must show a stable reading. How long it takes the sensor to settle depends on the ventilation. We recommend waiting at least 30 minutes before starting to calibrate.

WARNING: Make sure not to get too close to the logger before and during calibration, and, by all means, avoid breathing directly into its direction as this could already affect the measurement.

- Once the CO2 value is settled, the calibration can be started. Press the SET button for 10 seconds until the LEDs change from green to amber.

The logger now assumes 400 ppm as the new current CO2 level and is adjusted!
It may take another minute until the newly adjusted measurements are displayed.

3.2.7.4 Device Setup – Nitrogen

In addition to a calibration using fresh air, you can also perform a zero point calibration on the DKCO2-Log using Nitrogen.

It may be necessary in locations where a fresh air calibration is either not possible or too inaccurate.

The procedure works exactly like the one with fresh air, except that you need to purge the housing with 100% Nitrogen or put it in a sealed box or chamber with 100% Nitrogen content. It may take a while until the remaining components of the air are purged from the enclosure and a 100% Nitrogen level is achieved.

A calibration using Nitrogen should only be performed by trained personel and after consultation with Drisen + Kern.

3.2.8 DisplayOff

Manually turn off the display to save energy. Not permanent.

4   InfraLog for Windows

4.1   Installation

Hard-/Software	Minimum Requirements	Recommended Configuration
Computer:	Intel Pentium, 1 GHz	Intel Pentium III, 2 GHz
Operating system:	Windows 7	Windows 8 / 10
RAM:	512 MB	1 GB or more
Monitor:	Any PC display	Display with 1024x768 resolution or above
Port:	1 free USB port	1 free USB port

Download the zipped setup file from our website: **www.driesen-kern.com/service-and-support/updates/infralogupdate.php**.
Run **Setup_InfraLog_ForWindows.exe**.
The setup is in English, but you can choose another language later.

Select the directory in which the application is to be installed. The Installation Wizard will guide you through the installation process.

You will be asked to install the USB driver. Click Install and wait until installation is complete
After drivers have successfully been installed you can start InfraLog.

4.2   Main Menu
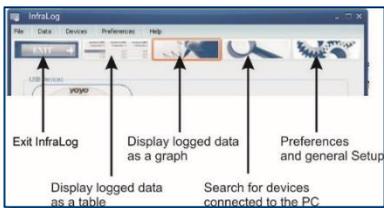
The main window of InfraLog offers a range of important items.

4.2.1 Preferences

In this section you can set up preferences for the InfraLog software.
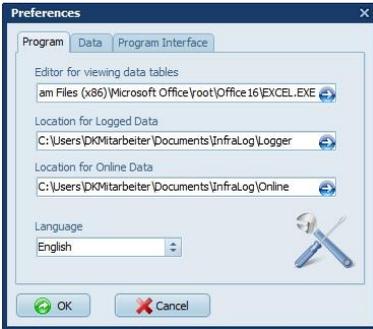
Click on the **Program** tab and enter general settings.

Select a program to view measurement tables. Files are in *.ASC format.

You can also specify a location to save **Logged and Online Data** and change the program's **Language**.

Click on **Data** to configure how readings are imported.
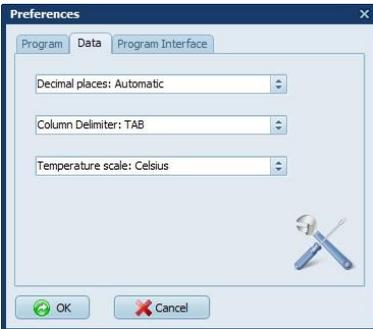
Select **automatic** (default) for **Decimal places** if you want the file to show as many decimal places as can be output from the sensor channel due to its resolution. Select another value to have shorter numeric values.

Choose between **TAB** and **Semicolon** as the **Column Delimiter**.

Choose from a range of style templates in the **Porgram interface tab** how InfraLog looks.

4.2.2 Search Devices

Connect the DKCO2-Log to your computer with the included USB cable.

When connecting a logger for the first time, Windows automatically installs USB express drivers to identify the device.

Upon completion windows shows the notification "**The device is now ready to use.**" Shortly after, an image of the logger is shown in the window. (This may take approx. 30 seconds.)
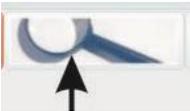
Usually connected loggers are being detected automatically. However, if your logger was not detected, click on **Devices/Search Devices** to scan all USB ports for connected loggers.

If your device is still not being detected successfully, make sure the cable is connected correctly and is undamaged. See **chapter 5** for Troubleshooting.

4.2.3 Logger Identification

As soon as you move the cursor on the logger image and wait for a second you will be prompted to left click or right click on it.
By left clicking on the image, you'll get device status information to identify the logger.

Serial number, **Description (Loggertype-SN)**, **Date Code**, **Short Ident** and **Manufacturer** are displayed.
Double click on a logger to establish active connection and see more detailed device informa-tion. An active device is framed blue.
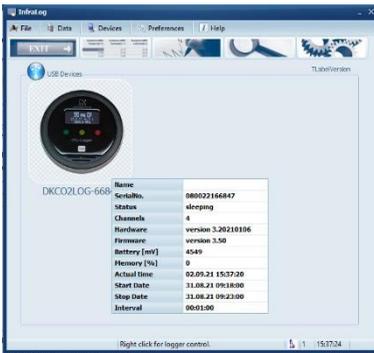
By left clicking on the image you now also get the following information about the logger:

Serial number, **Logger Status**, **Number of channels**, **Firmware version**, **Battery status**, **Memory%** and **current internal time**.

Logger Status can have one of two states:
"**sleeping**" means that measurements are not logged right now.
"**logging**" indicates that measurements are being recorded. In addition, the logging interval is shown.

Battery status indicates the remaining capacity of the battery. We recommend keeping track of battery life and using fresh batteries for important measurements.
Chapter 3.1 shows how the specified interval affects battery life.

Memory [%] shows the percentage of used memory.

Actual time shows the current internal time. Internal clock is automatically synchronised with your computer (option is enabled by default). Please make sure that your computer's date and time are set correctly.

4.3   Logger Controls
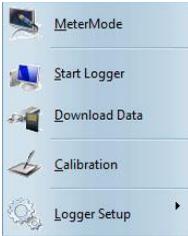
Right click on the selected logger to access the **Logger Controls**.

The following options are available:
MeterMode, Start Logger, Download Data, Calibration, Logger Setup

4.3.1 MeterMode
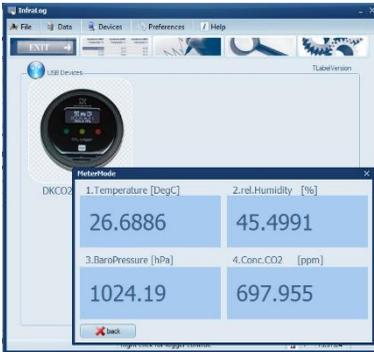
Click on **MeterMode** in the Logger Control to show the current readings in a pop-up window on your display.

Measurement channels are displayed according to their numerical value, that is first channel on Slot 1, second on Slot 2 etc.

Note: The logger has been designed for long-term and unsupervised operation specifiaclly which means the **MeterMode** should be used only for short-term monitoring and to check the connected probes.
While connected via USB the USB port warms up which causes the internal temperature sensors to show temperatures 2°C higher than what should be expected.

After unplugging the DKCO2-Log it can take from several minutes up to an hour, depending on ambient conditions, to reach specified accuracy again.

4.3.2   Start/Stop Logger
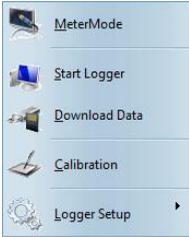
Clicking on **Start Logger** in the **Logger Controls** opens the following pop-up window.

Note:

If the logger has already been started, the option **Stop Logger** appears. The logger has to be stopped in order to start it again.

You can configure the following options: **Start Logger at**, **Stop Logger**, **Interval (Unit/Value)**. In addition, you can specify the measurement site by giving a **Description**.

The logger can be set to start logging **immediately** or at a **selected Date**.
If you select **immediately** the logger will start logging at the next full minute.

Um die Einstellungen zu ändern, klicken Sie mit der linken Maustaste rechts am Bildrand auf das Symbol neben der aktuellen Einstellung.
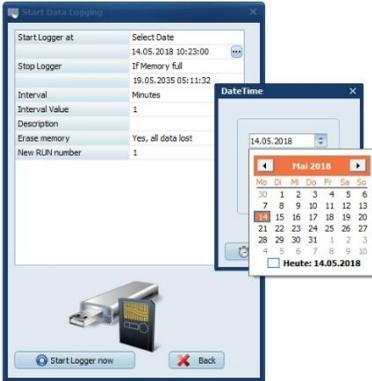
You can as well set the logger to start at a specific date/time. Change **Start Logger at** to **Select Date** and pick a start date from the **calendar.** Furthermore, you will find a **clock** with which you may change the **start time.** Confirm by clicking **OK**.

The next setting allows you to define a stop condition. You can choose between three options:

If Memory full:
Logger stops logging once the memory is full.
Never (cont. mode):
The loger overwrites the oldest data once the memory is full.
Select date:
Enter a date and time when the logger is supposed to stop logging. Once this option is selected, the preset date is based on the maximum measurement duration at the currently configured interval.

Enter a unit (**Hours, Minutes, Seconds, Hertz**) and a value for the logging **Interval**.

> **NOTE: We recommend intervals not shorter than 1 minute. For very short measurement tasks intervals as low as 10 seconds may be entered.**

Example: If you want readings to be recorded every 10 minutes, change **Interval** to **Minutes** and **Interval Value** to 10.
Enter a **Description** of up to 46 characters to specify the measurement location or purpose.
After every setting has been configured, click on **Start Logger now**.
After a few seconds InfraLog notifies you that the logger has been started successfully.

Warning:
Deleted measurement data cannot be recovered!

4.3.3 Download Data

Click on **Download Data** in order to transmit the saved measurement data to the computer. Measured data will be output in a ***.bin** file and afterwards converted into an **ASCII** file. The ***.bin** file is compressed and can be archived. The **ASCII** data are required for charting with the InfraLog Graph-Tool (only for Light/Enhanced versions) and for import into third party applications.

Once transfer is complete, GraphTool automatically opens.

On your certificate (supplied with InfraLog light and enhanced) you will find a **serial number** and **two license keys** (key 1 and key 2).

If you have entered these before you can immediately display the data in GraphTool. If you are using GraphTool for the first time, please enter serial number and license keys. (Find out more about the GraphTool software in its separate user manual which can be found in the help files of InfraLog for Windows.)

Files will automatically be saved to the directory specified in the Settings menu (by default **C:\Users\YourName\Documents\InfraLog**, Refer to **chapter 4.3**).
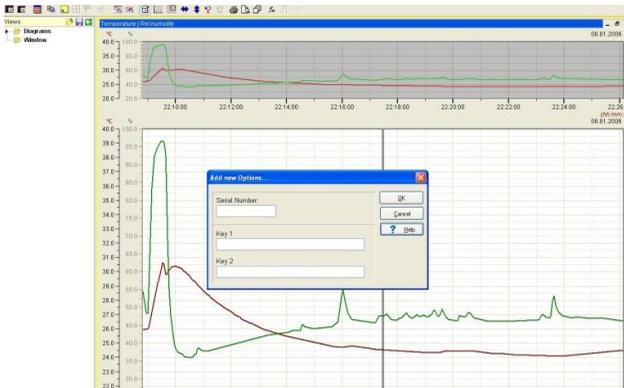
Should you have purchased InfraLog basic you can easily upgrade to InfraLog Light or Enhanced. Contact your local distributor or Driesen + Kern directly.

You can run InfraLog in a command line to convert binary files to ASCII files in the background. This allows running batches for conversion of entire directories full of files.

Command:

InfraLog.exe [SPACE] /convert [SPACE] „complete path to *.bin"

The *.asc files will be created and saved in the same folder.

GUI will not be visible. Successfull completion of conversion will be indicated by return value 0.

4.4   Logger Setup – Device Setup
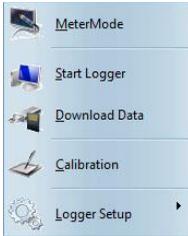
Click on **Logger Setup** to adjust general settings like **Alarm, Channel** settings and **More Values** (calculated variables**)**.

The available sensor inputs/slots are depicted on the logger image on the left.
In addition you can see the battery status. If the battery is green it is still in good shape and you can use the logger. A red battery indicates that the batteries should be replaced soon. In this case you should only make very short measurements

Enter a **Logger Name** in this tab for easier identification of measured data.

Note:
Logger name may include characters 'A-Z', 'a-z', '0-9', '_' or '-'. Blank may be included but not at the beginning or the end of the name

4.4.1 More Values
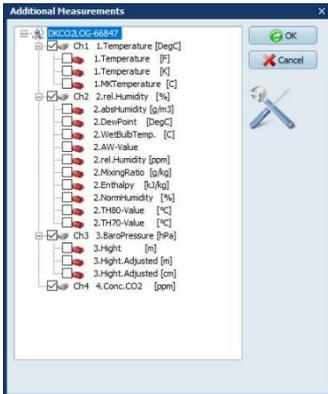
Click on **More Values** to define additional calculated variables for the logger.

Choose from the following pop-up window which parameters you want included in the ASCII file.

Note:
In case you have forgotten to define calculated variables before starting a measurement, you can also do it even after the measurement. Simply import the *.bin file and select the desired calculated values before the file is being converted into ASCII format.

4.4.2 CO2 Parameters

Go to CO2 Parameters to change the default settings of your CO2 measurement.
Settings **Activate ABC** and **Moving Average** should only be changed by experienced
users and after consultation by Driesen + Kern.

Change yellow and red LED thresholds in section **Activate indicator lights**.
Enable/disable the audible alarm (buzzer) – it triggers upon reaching the threshold of
the red LED.
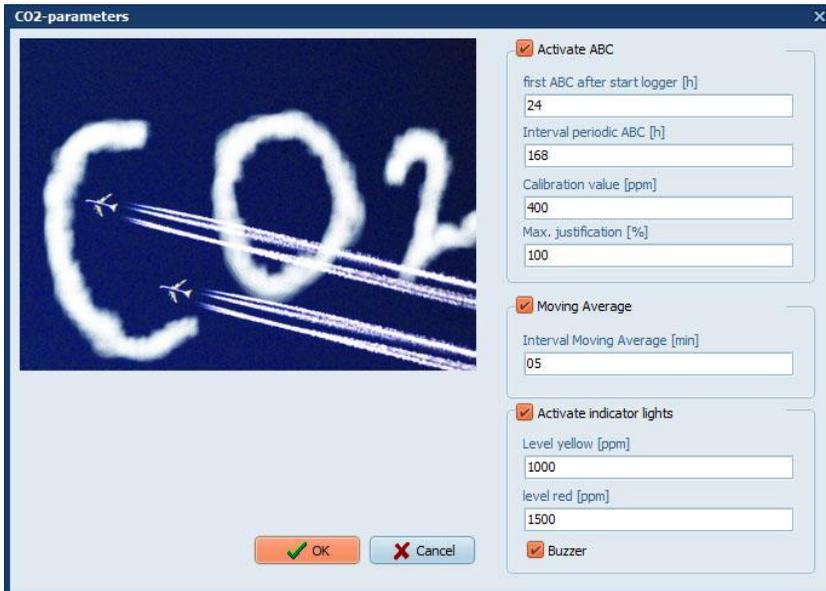
4.4.3 Setting up an Alarm

The DKCO2-Log two types of alarm. While the settings for the indicating LEDs and the buzzer are exclusively for CO2, the internal alarm feature can also be used for parameters humidity, temperature and barometric pressure.

Once this alarm is triggered, the status LED below the SET button indicates an active or previously triggered alarm state.

Enable the alarm function by selecting **Alarm only active during logging**. Should you not require an alarm select **Alarm permanent deactivated**.
An enabled alarm is indicated by a lightning icon next the drop-down menu.

Enter **Thresholds**, the respective **Alarm mode** and a value for **Hysteresis**. In addition you can configure the LED to blink upon alarm with the

Action at alarm option

The **Alarm modes** work as follows:

One Alarm Area:

Only one alarm area active on selected channel. If sensor reading is higher than (Threshold1 ± Hysterese) and lower than (Threshold2 ± Hysterese) the alarm is active. Otherwise there is no alarm.

Two Alarm Areas:

Two alarm areas are arctive on selected channel. If sensor reading is higher than (Threshold1 ± Hysterese) and lower than (Threshold2 ± Hysterese) the alarm is inactive. Otherwise there is an alarm.

Confirm by clicking **Save to device** and leave the **Device Setup** by clicking on the **Back** button.
In order to start a measurement right click on the logger and click **Start Logger** (see **chapter 4.8**).

4.5   Display Logged Data as a Graph
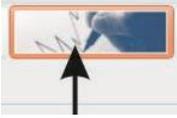
Click on the icon depicted on the left or go to **Data/Graph**. You will be prompted to select a file for graphing.
InfraLog automatically opens to the default folder (see **chapter 4.3**)

The following file types can be opened:
- Logged data as a graph (*:ASC)
- Saved GTF charts (exported from GraphTool)

As soon as the data have been successfully processed the GraphTool will open.
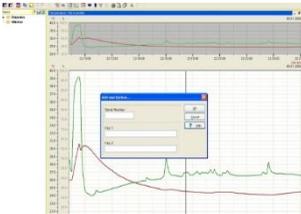
If you have purchased the InfraLog light/enhanced software you have received a serial number and two keys which you need to enter here. If these have already been entered you may now analyse the data.

Should you be using InfraLog basic you can easily upgrade to InfraLog light or en-hanced. Contact your local distributor or Driesen + Kern GmbH directly.

4.6   Display Logged Data as a Table

Click on the icon depicted on the left or go to **Data/Table**. You will be prompted to select an ASCII file. Readings will be opened with the program selected in **Preferences/Program**.

4.7   Exit

Click on the Exit icon or on **File/Exit** in order to quit the program.

5   Troubleshooting

Should you encounter problems when using the data logger, please try to solve them with the help of this manual first. Should our troubleshooting guide not help you solve your problem, please refer to **chapter 5.2** to learn how to contact our support team.

5.1   Causes & Solutions

A)   ***Logger is not listed or displayed***
Check if the USB cable is properly connected to the logger and to your computer, and is not damaged in anyway.
The cable needs to audibly snap into place. Please use the cable included in delivery.

B)   ***InfraLog shows "Unknown Logger"***
Your software version is out of date and cannot identify your data logger. Download the latest InfraLog version from the Driesen + Kern website. Should the problem persist, please get in touch with Driesen + Kern Support.

C)   ***Cannot contact logger or no logger found***
The logger is properly connected and the correct logger type is shown in InfraLog but it can still not be contacted. This may be caused due to empty batteries or the batteries missing entirely. Replace batteries. Afetr inserting three fresh batteries, the three indicator LEDs on the top will subsequently flash up.
Reconnect the logger. If this does not solve the problem please contact Driesen + Kern.

D)   ***Logger stops taking readings after some time***
Check if you have set a specific time and date for the logger to stop at. Alternatively, this might be caused by an empty battery. Check battery and replace if necessary (see **chapter 3**).

E)   ***A sensor permanently, regularly or sporadically reads the lower or upper range limits.***
Either sensor or cable is defective.

F)   ***After inserting the batteries, the display lights up shortly but then turns off and pressing the button has no effect.***
LCD has been permanently disabled. Reactivate LCD as described in **chapter 3.2.7.1.**

5.2   Open a Support Ticket (Online)

Not every problem can be solved with the help of this user manual's troubleshooting guide. Both for support tickets as well as for calibration or repair orders Driesen + Kern offers online forms which help speed up the process.
Find the forms here:

www.driesen-kern.com ► Service & Support ► Support

The forms can be filled out on your computer and quickly emailed back to us at support@driesen-kern.de – or just include the filled-out form in your calibration or repair delivery.

6   LEDs Explained

The DKCO2-Logger has traffic light style LEDs in green, amber and red for CO2 level visualisation just below the display and multicoloured LED below the SET button.
The following table shows the meaning of the multicoloured LED.

State	LED
Logging in predefined interval	Flashes blue accordingly
Alarm condition is monitored	Flashes green every 8 seconds
Alarm active	Flashes red for 1 second every 8 seconds
Alarm not active, but was triggered before	Flashes red shortly every 8 seconds
Battery empty	Flashes red 0.5s every 15 seconds
System check OK after battery change	Running lights

The DKCO2-Log's traffic light style LEDs indicate indoor air quality. They are located below the display. Their default thresholds are:

	Green LED	Amber LED	Red LED
CO2 Concentraion (default settings)	<1000 ppm	1001-1500 ppm	>1501 ppm

Note: If powered by battery, the LEDs flash periodically whereas they are permanently lit in mains operation.

Note: Once the batteries are almost entirely consumed the red LED flashes quickly in battery operation and is permanently on in mains operation.

7   Regarding Humidity

Driesen + Kern instruments are based on reliable, long-term stable and precise humidity and temperature sensors. These capacitive sensors are suitable for measurements in indoor air and a variety of other applications. Used in clean air, it will deliver accurate measurements for many years. Yet, depending on location and surrounding conditions (dust, chemicals etc.) the sensor may be contaminated and effected after all.

Prevent condensation, as this may damage the sensor!

CO_2 measurements have cross-sensitivites with humidity, so ambient conditions should not exceed 85% RH.

8   Calibration/Maintenance

The logger requires only a minimum of maintenance. If the device will be unused for longer periods, please remove the batteries.

The DKCO2-Log's sensors are precise and long-term stable, which means they are mostly unaffected by drift. Yet, contaminants can still interfere with the humidity sensor measurements.
To ensure correct measurements of all parameters, the device should be recalibrated in our calibration lab every 12 months.

Certificate of Conformity

Driesen + Kern GmbH
Physikalisch-Technische-Messgeräte

Product:

Data Logger DKCO2-Log

This ist o certify that above products are calibrated using dediacted equipment which is calibrated by comparison against natural stand-ards, natural physical constants, consensus standards, or by ratio type measurements using self-calibration techniques.
All measuring and testing equipment is subject to regular inspec-tion.

Bad Bramstedt, August 2021

Driesen + Kern GmbH
(Managing Director)

Driesen + Kern GmbH
(Prüfmittelbeauftragter)