

EVALUATION KIT LCPB

DESCRIPTION

- Standard sensor system for the level measuring of aqueous media
- Scope of delivery
 - USB cable
 - Interface Box
 - Sensor cable
 - KIT-LCP001: 1x LCPB025D, 1x LCPB096D



BASIC TIPS ON ESD

Electrostatic Discharge (ESD) can damage electronic components during the handling of circuit boards. The following tips help to reduce the probability of ESD events:

- Avoid charge separation
 - Do not wear (layers of) polyester clothes
 - Carpets – bad \leftrightarrow wood, tile or concrete flooring – good
- Support charge decay
 - Do not wear shoes with insulating (rubber) sole (e.g. Crocs)
 - Higher humidity dissipates static charge (dry heater air in winter \rightarrow bad)
- If possible: Before touching the PCB, users should “ground” themselves, e.g. by touching the protective conductor of a socket or a bare part of a radiator.

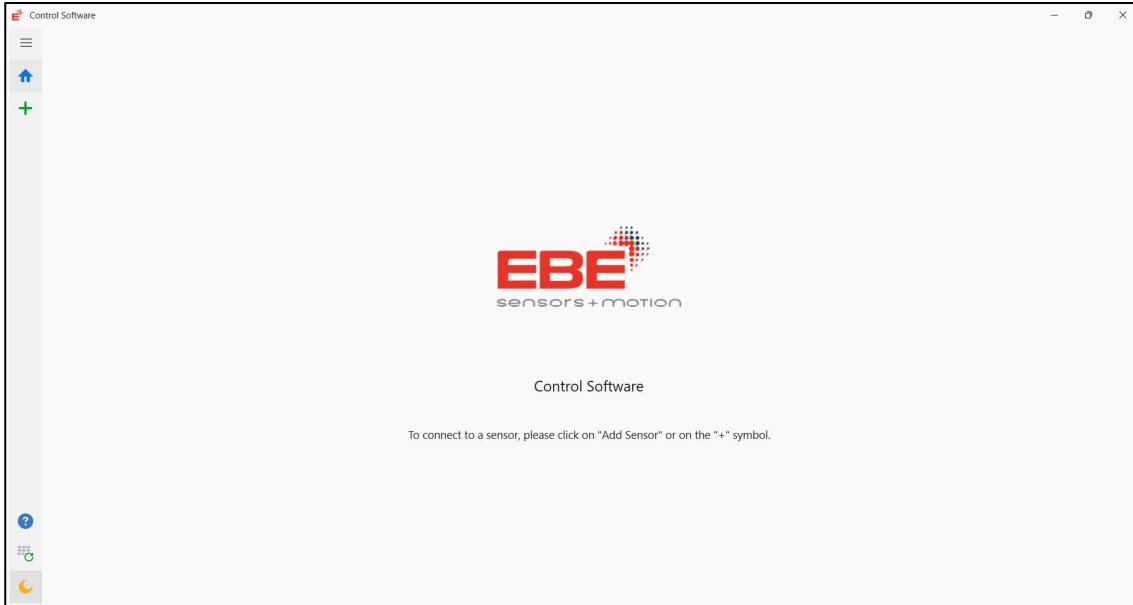


PREPARATION








- Download of EBE Control Software via EBE website <https://www.ebe.de/de/media-download-center.html>
- Software requirements: Win 7, Win 8, Win 10, Win 11
- Connecting the interface box via USB cable to the computer
- Connecting the sensor via sensor cable to the interface box

OPERATION

Starting the Control Software will lead to the following starting page:



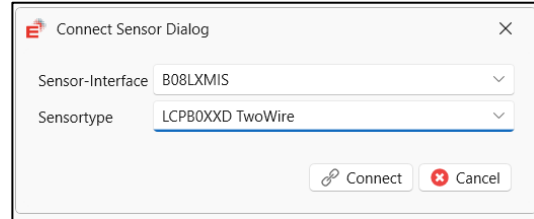
On the left side the menu band is located:

-  Allows to expanding the menu band
-  Home - Guiding back to the starting page.
-  Sensors can be added to the Control Software. Measurements can only be realised with added sensors.
-  Sensor symbol – a sensor is connect to the Control Software. General information and measurement options are shown.
-  Help - Contact information of EBE.
-  This option checks if there is a new version of the Control Software available. If so, the EBE homepage will open for downloading the new version.
-  The day/night mode can be changed.

TAKING A SENSOR INTO ACCOUNT

With clicking on the green cross symbol or “Add Sensor” sensors can be connected to the Control Software.

A “connect sensor dialog” appears where the applied interface box and the sensor are preselected.



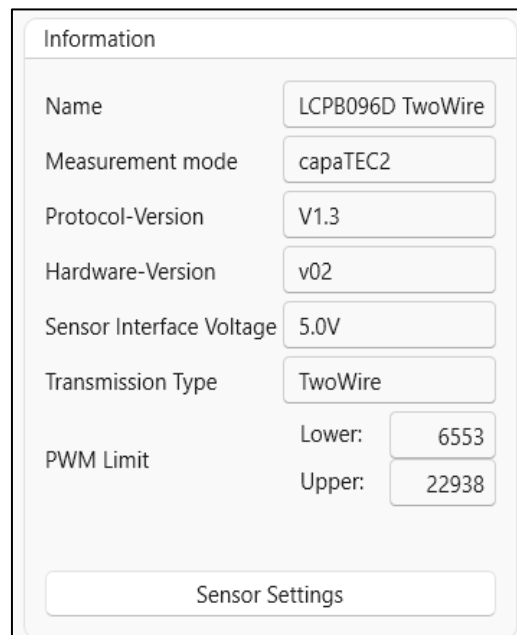
After clicking on “connect” the Control Software will establish a connection to the sensor. If this operation is successful the sensor is added to the menu band, detected by sensor symbol in the menu band.

With the selection of the sensor symbol, three windows will appear: Information window, Sensor Data window, Measurement and logging window.

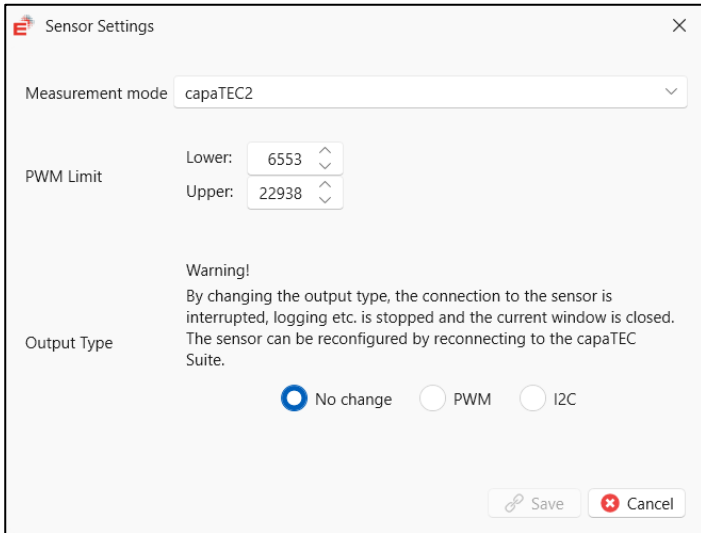
Information window

This window provides general information about the actual used sensor:

- **Name**
The EBE name of the sensor (here a 96mm LCPB) sensor is used with I2C TwoWire output.
- **Measurement Mode**
The selected Measurement Mode while PWM is used (only one capaTEC® value via PWM).
- **Protocol Version**
The internal EBE protocol which is applied.
- **Hardware-Version**
The hardware version of the used PCB.
- **Sensor Interface Voltage**
The voltage output the interface box supplied the sensor with.
- **Transmission Type**
The EBE internal transmission type how the sensor data is communicated.
- **PWM Limit**
The lower and upper PWM Limits are shown.

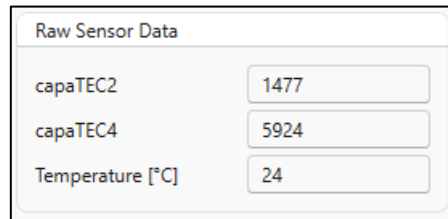


At the bottom of the Information window the sensor settings are stated. The measurement mode (capaTEC2 or capaTEC4), the PWM limits and the output type (I2C or PWM) can be changed.



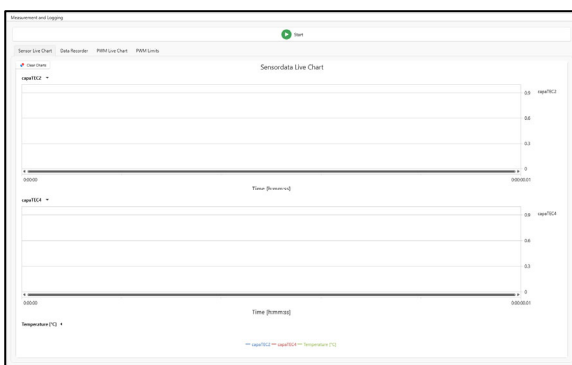
Sensor Data window

The actual sensor output values – capaTEC2, capaTEC4 and temperature – are displayed.



Measurement and Logging window

This window is divided in several tabs providing information and setting possibilities for the sensor data: Sensor Live Chart, Data Recorder, PWM Live Chart, PWM Limits.

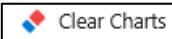


Sensor Live Chart

After pressing the Start Button located at the top of the window the Sensor Live Chart shows the capaTEC2 values, capaTEC4 values and the temperature values. While the temperature values are hidden by default.

These values are rolled up in a graph.

Features:

- While hovering with the mouse over a graph, the time stamp and the output data are displayed.
- Zoom in and out is possible (mouse wheel).
- Fade out and fade in of graphs.
- With the clear charts button  the live chart is cleared and the time stamp starting from 00:00:00 again.


Data Recorder

In this tab the recorded data is shown.

Data can be logged after pressing the stop button.



Features:

- Listed capaTEC2, capaTEC4 and temperature values with the particular time stamp.
- Clear previous logged data using the clear button .
- Export logging data to a .txt or .xls file.
- Possibility to provide further information in the Log File by using the operator and description window.

Operator	<input type="text"/>	
Description	<input type="text"/>	

PWM Live Chart

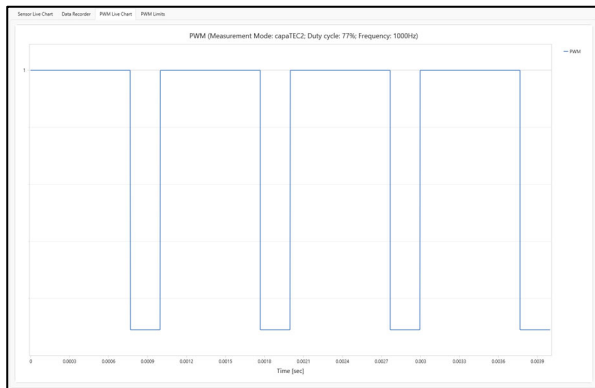
The PWM Live Chart tab simulates the actual duty cycle for the sensor output.

This can be used to roughly determine the fitting PWM settings to the application.

The PWM limits can be quickly altered with the Sensor Settings button in the information window.

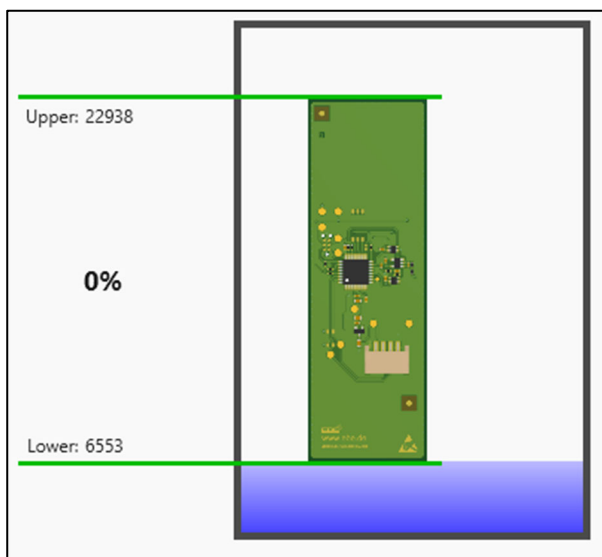
Note:

In PWM mode, the sensor can output capaTEC2 or capaTEC4 values.
The duty cycle of the sensor output can be varying between 10%-90%.

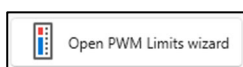


PWM Limits

The PWM Limits tab will help to set the optimal PWM limits to the sensor. In the middle of this tab the sensor with its actual PWM limits is displayed.

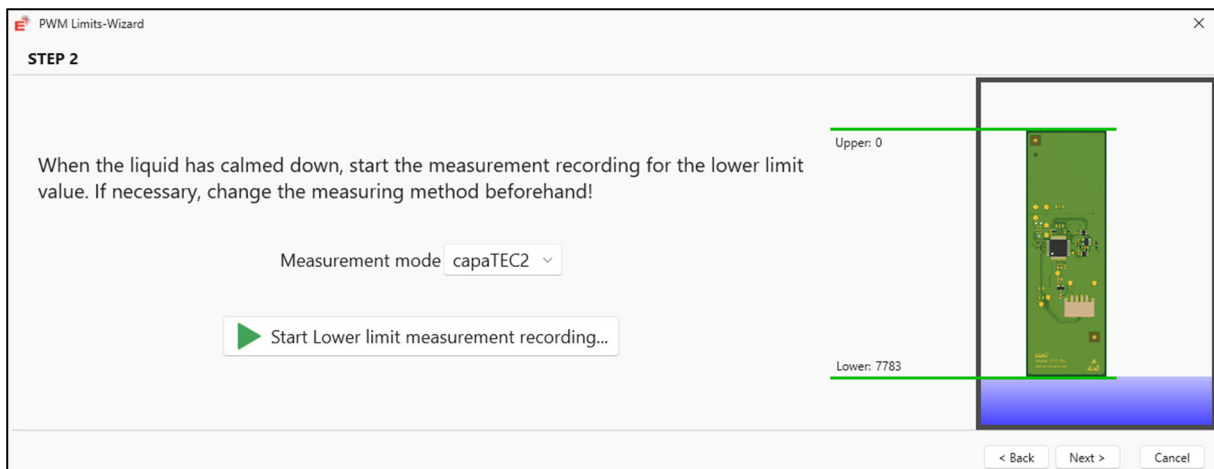


The Control Software supports the configuration of the PWM limits by using the PWM Limits Wizard.

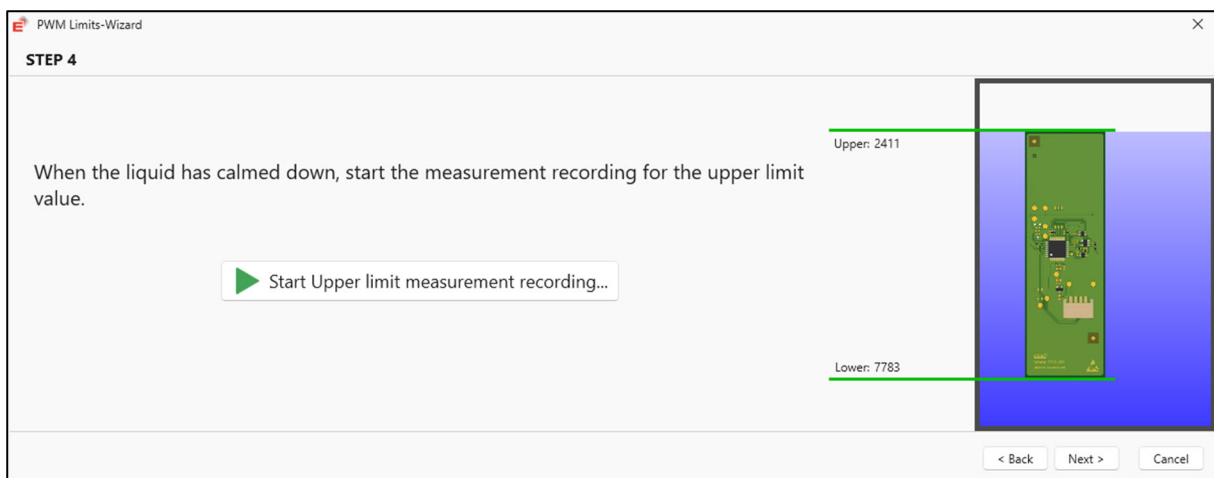


The PWM Limits Wizard opens a separated window, guiding through the individual steps to apply optimal conditions to the sensor in the application.

- Step 1: Fill the target medium in the application to the lower sensor electrode edge like shown in the picture above.
- Step 2: Choosing the measurement mode: capaTEC2 or capaTEC4. Start recording the lower PWM limit.



- Step 3: Fill the target medium in the application to the upper sensor electrode edge.
- Step 4: Start recording the upper PWM limit.

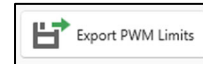


- Step 5: Sensor information and measured PWM limits are displayed.

Save the settings to the sensor:



The determined PWM limits can be saved as file.



This allows the PWM limits to be quickly uploaded to other sensors or for varying test cases.

After clicking the finish button the new PWM limits are applied. This changed can be detected in the information window on the left side of the Control Software where the new PWM limits are displayed.

Note

In general, the capaTEC values are inverted in relation to the fill level. Meaning that the lower fill level of your application the higher the capaTEC values are provided from the sensor.

ADVICES

- Long term measurement
The .csv data format is recommended for taking long term measurements. The .xls files could cause data error
- PWM usage
It is not recommended to place the sensor to the ground of the fill level container while measuring the PWM limits.
There is a significant impact to the measured capacity when a small amount of liquid is in the fill level container compared to an empty container.
Therefore, it is recommended to place the sensor higher than the lower edge of the fill level container or at least fill in a small amount of media before measuring the PWM limits.

DISCLAIMER

The information contained in this document is for general guidance only. The user is responsible for determining the suitability of the technical information referred to herein for his application. On delivery of the component, EBE is only obliged to implement those properties set out and agreed upon in this technical data sheet. Further properties are not included. No guarantee is given. The component has been designed for installation in our customer's products. Manufacturer of the resulting product and consequent liability according to the Product Liability Act lies with the customer.