

# BACVis

## Manual for BACVis for Sensors and Milligascounter

**Attention!**

**Read this instruction carefully!**



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## 1 System requirements

You need the following components:

- BACCom12 for up to 12 gas sensors
- Sensors (CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub> etc.)
- Computer with min. 1,6 GHz and 512 MB RAM
- Windows XP or newer
- One free serial port
- 100 MB free disk space
- Monitor with a resolution of 600x800 pixel

Optional

- BACCom 12CB for 12 Milligascounter (precision volume meter)

## 2 Installation of BACVis

To install BACVis you have to create a new directory for example with Windows-Explorer® that called “BACVis”. Then you copy the file *BACVis.exe* from disk to this directory. The installation is completed.

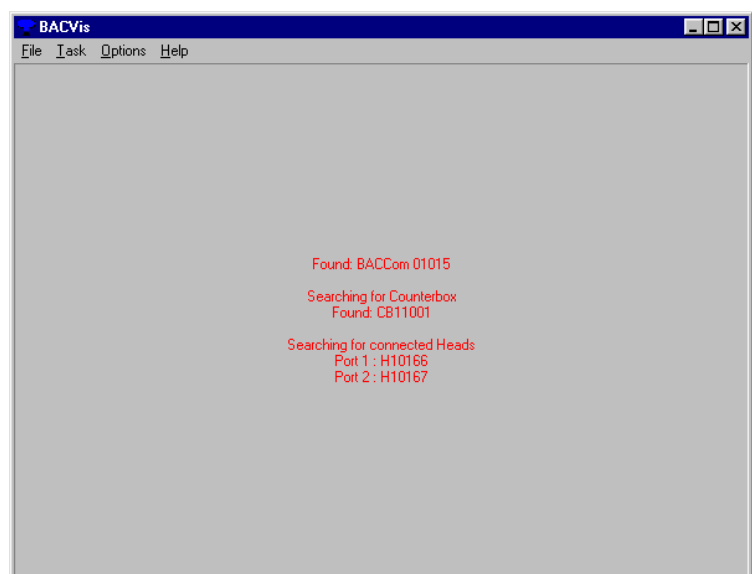
Using the program you double click *BACVis.exe* or you create a link on your desktop.

During the first measurement the measuring data are saved in the directory *.../data*.

## 3 Functions

### 3.1 Start BACVis

Start Windows-Explorer® and double-click on the symbol „BACVis.exe“ or click on your link on the desktop and the program will start. It's looking for a connected BACCom 12, BACCom 12CB and the sensor heads.



## 3.2 Input by user

### 3.2.1 Select Com-Port, sensors and milligascounter

At first the used **Com-Port** has to be chosen.

The Com-Port selection could be done under **Options/Settings** in the displayed window. Also you can minimize the number of heads, so BACVis is only looking for the chosen heads during the start phase.

Selecting the field *Counterbox* activates the connected milligascounter. Because the milligascounter is precision volume meter each counter have three calibration factors that could be specify in the field *Counter calibration factors*.

**The shown volume is normalized to 273,15K, 1,013 bar and dry gas.**

Counter	SNR	C1	C2	C3
1	0.526.IEE/2006	1,000	0,000	0,000
2	0.526.IEF/2006	2,000	0,000	0,000
3	0.527.IHQ/2006	3,000	0,000	0,000
4	0.527.EQH/2006	4,000	0,000	0,000
5	0000	1,000	0,000	0,000
6	0000	1,000	0,000	0,000
7	0000	1,000	0,000	0,000
8	0000	1,000	0,000	0,000
9	0000	1,000	0,000	0,000
10	0000	1,000	0,000	0,000
11	0000	1,000	0,000	0,000
12	0000	1,000	0,000	0,000

COM-port	Selection of the Com-port
Max. number of heads	Number of connected sensors Input of the proper number minimizes the search time
Counterbox	Data acquisition of the volume if BACCom 12CB and milligascounter® are connected <b>The first port of the BACCom 12CB will be allocated to the first gas sensor!</b>
Intervall	Selection of the measuring interval ( 2 minutes are recommended!)
Counter calibration factors	Input of the Serial number (SNR) and the three calibration factors (certificate at the bottom side of the counter) of the milligascounter for the accurate display of the volume <b>The shown volume is normalized to 273,15K, 1,013 bar and dry gas.</b>

### 3.2.2 Start the measurements

With **Task/New** a new measurement could be started. Through selecting the check box in front of the sensors these are activated for this measurement. If the option **Counterbox** under **Options/Settings** is selected the milligascounter®

(connected at BACCom12 CB) are allocated to the sensors (Sensor 1 = Counter 1).

Heads	Selection of the connected sensors
Temperature	Input of the temperature that is used during the measurement with fermenters and sensors. By means of this value the dilution effect through humidity will be compensated at the gas sensors
Integration interval	Possibility for the smoothing of the measured data (The integration time is 16 seconds. 1 = 16, 2 = 32, 3 = 48)
Measuring Interval	The adjusted standard interval is one minute. To change these between 20 seconds and 120 minutes you could click on to arrows in the field Measuring interval
Autocalibration	Activating this check box the sensors will do a zero point adjustment. This lasts 30 minutes and the sensors have to be exposed nitrogen (0,00 Vol.% methane or other hydrocarbons)
Reset counter	Reset of the counter. Because the counter has an integrated memory this is necessary if you starts a new measurement. If you computer has a shut down the measurement could be continued without activating this check box. The produced volumes will be stored continuously.
Comments to task	The first line is the name of the measurements displayed in the headline of the measuring window. In the second and following rows you could write your personal notes.

### 3.2.3 1-Point calibration (Autocalibration)

The 1-point calibration is a zero adjustment of the connected and activated sensors. It is necessary each month or if the optical sensors are divided into two parts (measuring cap could be separated from the head).

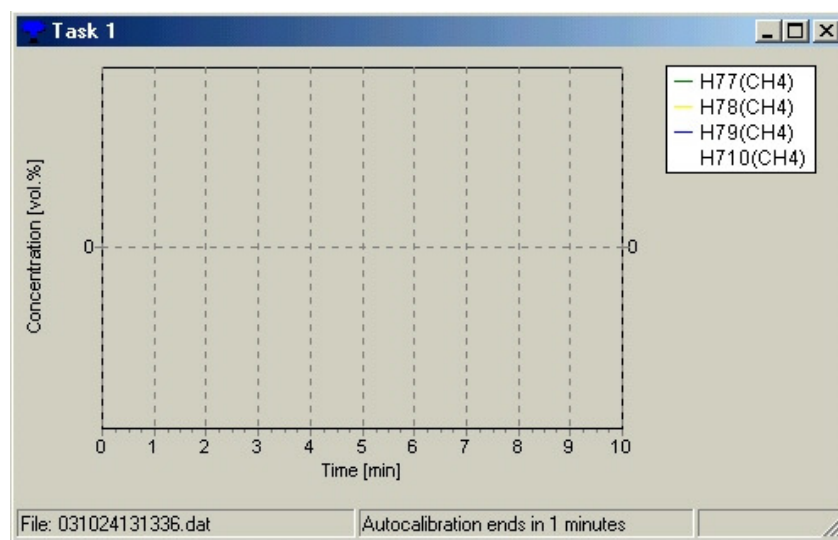
In addition to that, the head is heated to avoid condensing humidity.

In order that mechanical difference and temperature changes do not affect the results the autocalibration is done, which takes 30 minutes.

The heads will be calibrated e.g. at ambient air (0,04 Vol.% CO<sub>2</sub>, 0,00 Vol.% CH<sub>4</sub>). Therefore it is very important that you do not breath into the measuring adapter or in the sample vessel because the result will be high concentrations of CO<sub>2</sub> and you will receive false measuring results.

If possible the autocalibration should be done in a well-ventilated room.

During the autocalibration the measuring window appears.



At the bottom line you can see how long the calibration procedure is running any more. After it is ready the normal measurements continues and the measured concentration of the CH<sub>4</sub>-sensors will be shown in the graph and next to the sensor IDs.

### 3.2.4 Stop the measurement

To stop the active measurement close the window (cross at the right top of the **active** window)

The measuring data will be saved in the directory C:\....\Data in the following format:

Measurement begin 01.01.2002 at 12:00:01:

File format:           **020101120001.dat**



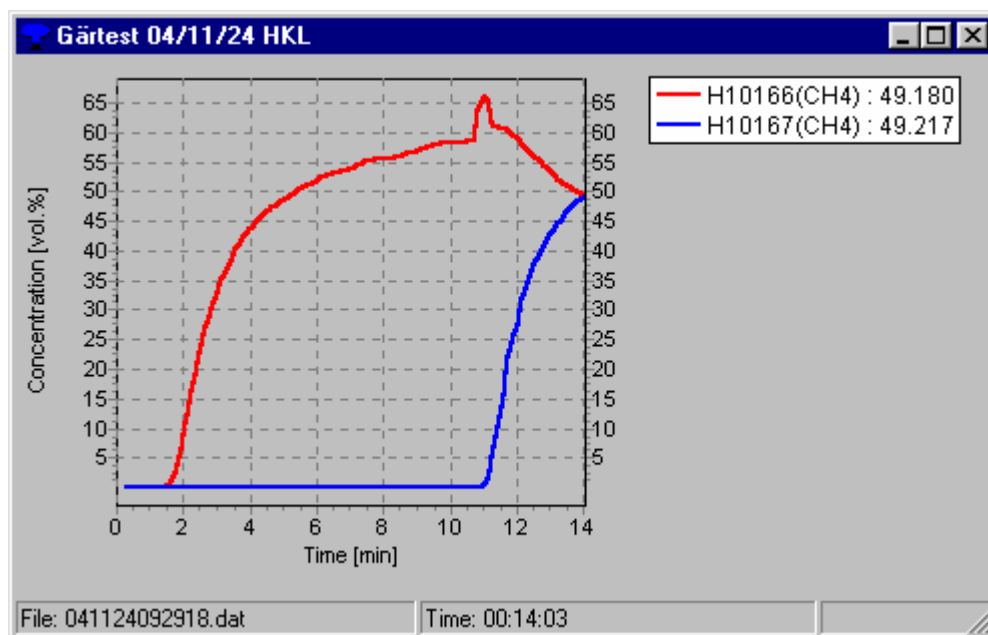
**You can copy the file to work with the data while the measurement is running. The measurement does not have to be stopped.**

## 4 Display

### 4.1 Concentration

After the measurement is started the data are visualized like shown in the figure below.

The window will be labelled like you do in the box for comments (Chap.3.2.2)



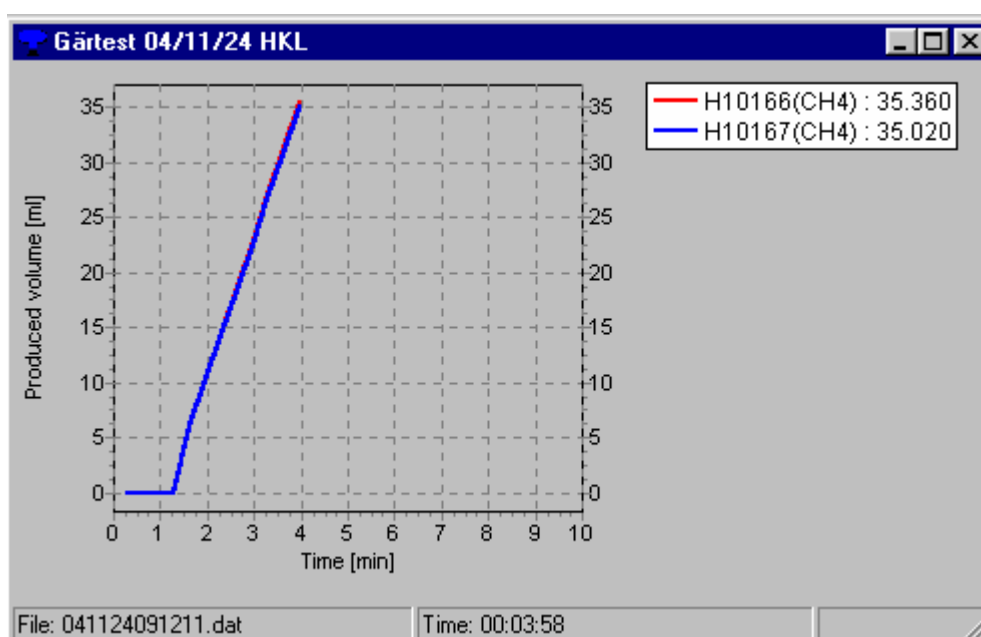
At the left side the concentration (Vol.%) is shown. The bottom axes show the time in minutes. To view the produced volumes (milligascounter®) you could click (left mouse button) on the curve in the graph or in the legend. Afterwards you could see the belonging volume in the right corner of the window bottom. To view the volume curve click on the left Y-axes (concentration) and the window will change into the volume mode. Clicking again the mode will change back to the concentration mode.



## 4.2 Volume

At the left side the produced Volume (ml) is shown. The bottom axes show the time in minutes. To view the corresponding gas concentrations you could click (left mouse button) on the curve in the graph or in the legend. Afterwards you could see the belonging concentration in the right corner of the window bottom. To view the concentration curve click on the left Y-axes (produced volume) and the window will change into the concentration mode. Clicking again the mode will change back to the volume mode.

**The shown volume is normalized to 273,15K, 1,013 bar and dry gas.**



## 4.3 Highlight a curve

Each display of heads is shown as a coloured line that can be highlighted through clicking the line with the left mouse button or clicking the head at the right side of the window.

To undo this highlight click on another part of the window.

## 4.4 Zoom

Inside the measuring window it is possible to enlarge the desired area of the curve by pressing the left mouse button and simultaneous movement of the mouse from the **right to the left** side of the window.

To undo this selection you have to move the mouse under simultaneous pressing of the left button from the **left to the right side** of the window.