

# BAPPU

## evo

The multi-measuring device  
for workplace analysis

Compact manual



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**BAPPU**   
**evo**



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# 1. BAPPU-evo

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The product is a multi-measuring device for the orienting measurement of environmental characteristics at workplaces.

The following parameters can be measured: air temperature, globe temperature, relative humidity, air speed, class 2 noise level with C-peak to 137 dB, illuminance class C, flicker frequency, luminance, luminance ratio, CO<sub>2</sub> Value (optional sensor = opS), TVOC (opS), CO value (opS) and particulate matter sensor PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> (opS).

Developed and manufactured by:



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The contents of this manual are subject to unannounced changes that reflect technical progress.

Technical questions please send to: [support@bappu.de](mailto:support@bappu.de)

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The instructions for use contain the most important information for operating the product safely. The instructions for use must always be kept close at hand and always accessible near the product.

This instruction manual meets the requirements of the Product Safety law (ProdSG)

When operating the product, follow the instructions for use and the product specifications.

The contents of the important instructions for use must be read, understood and followed in all respects by anyone responsible for the assembly and operation of the product. This is especially for the safety instructions in Chapter 2. Following the safety instructions and instructions will help to prevent accidents, malfunctions, faults and property damage.

## 1.1. Symbols

The following symbols are used in this operating manual:



*This note indicates the risk of injury and / or death as well as health hazard, if certain rules of conduct are disregarded.*

### **Tipp:**

*Important notes and information for installation, operation and maintenance.*









*Please note and read the instructions for use.*

## 1.2. Security alert

During assembly and operation, the following safety instructions must be observed:

### *Use personal protective equipment (PPE)*

	When using the product, it may be necessary to wear safety shoes.
	When using the product, wearing protective clothing may be required.
	When using the product, it may be necessary to wear protective gloves.
	When using the product, wearing an industrial helmet may be required.
	When operating the product for noise measurement, it may be necessary to wear ear protection.
	While charging, do not leave the device unattended.

### 1.3. General information



**Risk of burns:** The product is subjected to an operating temperature of up to 50 ° C. There is a risk of burns on housing parts.



**Avoid installation errors:** The installation of the product is only permitted by qualified personnel . Assembly errors can lead to malfunction!

### 1.4. Qualification of the operating personnel

Work with and on the product may only be carried out by instructed persons of the operator with the requisite knowledge and experience.

### 1.5. Observe accident prevention regulations

The relevant accident prevention regulations as well as the other generally accepted safety rules must be observed.

### 1.6. Intended use

The product may only be used to measure the above measured variables at workplaces according to ArbStättV (see location) within the scope of the environmental conditions and permissible measuring ranges below.

The various sensors may only be used for intended measurements or for measurements within the calibrated or permissible measuring range. For measurements outside the calibrated range, readings may be outside the allowable tolerance; measuring unintended readings or taking readings outside the acceptable range may damage the sensors or even the entire product.

The product can be used at workplaces. Workplaces are workspaces or other places in buildings on the premises of an establishment, places in the open air on the premises of an establishment, places on construction sites, if they are intended for use for workplaces.

A workplace includes, in particular, places on the premises of an establishment or construction site to which workers have access in the course of their work, traffic routes, escape routes, emergency exits, warehouses, machines and ancillary rooms, sanitary facilities, canteens, breaks and preparedness rooms, first aid rooms, accommodation as well Facilities for the operation of the workplace, fire-extinguishing equipment, utilities, lighting, ventilation and air conditioning, signaling, power distribution systems, doors and gates, moving walks, escalators, loading ramps and ladders.



Any use beyond its intended use is deemed to be contrary to the intended purpose. The manufacturer is not liable for resulting damages.

Proper use also includes observing and following all instructions in this documentation.

## 1.7. Technical changes

The manufacturer assumes no liability for technical changes by the operator or by another manufacturer.

If technical changes are made to the experimental unit by the operator or by another manufacturer, this must be considered as a safety-related consideration.

## 1.8. Initial assembly

The initial assembly and all related work will be carried out by the manufacturer.

## 1.9. Delivery contents

BAPPU-**evo** comes equipped with an integrated data-counter for long-term recording, a sturdy case, batteries (4 x Mignon (HR6, NiMh), power supply, USB cable, carrying strap, a mini tripod and operating instructions.

### 1.10. Optinal Sensor

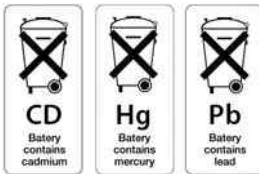
Anemometer-**evo**, Globe-Thermometer, Vocoo-**sx**

## 1.11. Optional accessories

A **calibration unit** for checking the accuracy of and for adjusting the noise level measurements on site.

- An additional **battery** pack
- A high-quality **charger** for charging external batteries. This unit helps you get the maximum capacity from the battery. It can even be used for charging an additional battery pack.

## 1.12. Disposal



Please dispose of all packaging and obsolete devices in the correct manner. In the interest of the environment, the device must not be thrown away as normal household waste. You should arrange for the proper disposal of the device.

Your local government will be able to provide you with the respective collection points and their opening hours.

## 1.13. Support

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## 1.14. Calibrating BAPPU-*evo*

Detectors and sensors are prone to drifting and change. In order to guarantee high-quality results with BAPPU-*evo*, we recommend that a factory calibration of the unit should be carried out every twelve months.

BAPPU-*evo* displays a corresponding message in the main menu one month before the end of the calibration interval. This can be deactivated under "Settings / Display". However, it is then possible that the results of the measurements are outside the tolerance range.

## 1.15. Technical data and measuring range

### *Permissible operating conditions*

Temperature: range from -10 °C to +50 °C | Relative humidity: range from 0 to 95% (non-condensing) | The optional sensors might have deviating operating conditions: With the optional CO sensor (only in BAPPU-VOCOO to serial number xxx/05): temperature: range from -0 °C to +50 °C (this also applies for storage)



**Caution:** Storage below 0 °C can permanently **damage** the CO sensor.

With option particular matter (in BAPPU-VOCOO-sx):  
temperature: from -0 °C to +40 °C (this also applies to storage)

## Measuring range and tolerances

Measurement Range		Tolerance	Sensor	Resolution
Air temperature	-20...50 °C	+/- 0,5 °C	PT 1000 Sensor	0,1 °C
Globe temperature**	0...70 °C	+/- 0,5 °C	Integ. temperature semiconductor sensor	0,1 °C
	-20...70 °C	+/- 2 °C		
Rel. humidity	10...90%	+/- 4% r.H.	Capacitive humidity sensor	0,10 %
Air speed*	0,0...5 m/s	+/- 10 % f. MV.** +/- 3 Digit	Thermo-anemometer	0,01 m/s
Noise level <small>(Class 2) in accordance with DIN EN 61672-1: 2014</small>	30...135 dB(A) A-evaluation Slow/Fast c-peak= 137 dB	+/-1 dB(A) at 1 kHz inherent noise <25 dB(A)	Precision electret condenser microphone	0,1 dB
Illuminance <small>(Class C) in accordance with DIN 5032-7: 2017</small>	50...30.000 Lux  1...50 Lux	V-lambda adjustment 7,5 % Cosine-correction 4 % Linearity 3 %  plus +/- 1 Lux	Silicon photo-element with adapted spectral sensitivity	1 Lux
Flicker frequency	0...1000 Hz	+/- 0,2 Hz	Silicon photodiode	0,1 Hz
Luminance  Maximum display brightness  Luminance contrast	10 ... 2000 cd/qm  1/60...60/1 (under typical workplace lighting conditions)	+/- 10% f. MV.**  +/- 10 cd/qm  as for the luminance	Silicon photo-element with adapted spectral sensitivity	0,1 cd/qm  1 Digit
CO <sub>2</sub> (carbon dioxide)*	0...10.000 ppm	+/- 75 ppm +/- 5 % f. M.V.**	Non-dispersive infrared	1 ppm
TVOC (total volatile organic compounds)*	100...2000 ppb (isobutylenäq.)	+/- 100 ppb +/- 15 % v.M.**	metal	1 ppb
CO (carbon-monoxide)*	0...500 ppm	+/- 5 ppm +/- 5 % v.M.**	electrochemical (Lifespan up to to 10 years)	1 ppb
Particular Matter (pm)*	PM <sub>1</sub> : 0...1000 µg/m <sup>3</sup>  PM <sub>2,5</sub> : 0...1000 µg/m <sup>3</sup>  PM <sub>10</sub> : 0...1000 µg/m <sup>3</sup>	PM <sub>1</sub> , PM <sub>2,5</sub> : 0...100 µg/m <sup>3</sup> +/-15 µg/m <sup>3</sup>  101...1000 µg/m <sup>3</sup> +/-15 % v.M.**  PM <sub>10</sub> : 0...100 µg/m <sup>3</sup> +/-30 µg/m <sup>3</sup> 101...1000 µg/m <sup>3</sup> +/-30 % v.M.**  at 0...40°C; 10...70 % rF	optical	0,1 µg/m <sup>3</sup>

BAPPU-*evo*: L = 260 mm, B = 94 mm, H = 40 mm  
modifications are subject to factory settings without prior notice.

\*optional sensor Technical  
\*\*from Measured Value

Independent from the classification of individual measurements, the BAPPU-*evo* has been designed as a measuring device for performing indicative measurements. Therefore, BAPPU-*evo* should be used according to these prerequisites.

## Specifications of the measurement with VOCOO-sx



**Caution:** The VOC sensor needs after switching on about 3 minutes to stabilize. During the heating phase, the LED of the VOC- sensor is flushing.

### Available sensors in VOCOO-sx

When switched on, the LEDs signal the available sensors.

### Specifications for noise level measurement

Properties	Value
Measurement tolerance	+/- 1dB <i>Reference conditions: 87,5 dB at 1 kHz</i>
Resolution	0,1 dB
Level range	30 – 95 dB and 80 – 110 dB
Frequency range	31,5 – 8 kHz
Frequency weighting	A
Reference frequency/range	1000 Hz / 87,5 dB
Direction of reference	<i>Perpendicular to the middle of the microphone</i>
Acoustic centre	<i>Centre of microphone diaphragm</i>
Screen refresh	0,33 s

The noise level measurement values are made using frequency weighting A. For carrying out frequency weightings, “slow” (1 second) and “fast” (125 milliseconds) are available (please refer to page 25, chapter 8.3, “Measurement settings (measurement)”).

The standard configuration of the level range is “auto”. We recommend using this setting. Changing the level range to “Low” or “High” can be selected in the main menu under properties/settings (please refer to chapter 8.3, “Measurement settings (measurement)”).

When the range is exceeded, it will be indicated - depending on how long this takes - at least every second. All specifications for noise level measurements refer to a BAPPU-evo that is **not** fitted with extra accessories and optional sensor devices.

## Frequency weighting and permissible errors


Nominal frequency in Hz	A-evaluation in dB	Permissible error class 2 in dB
31,5	-39,4	+/- 3
1000	0	+/- 1,5
4000	1	+/- 3
8000	-1,1	+/- 5


## Using the optional noise level measurement calibrator

The screenshot shows the device's interface during a noise level measurement. At the top, there are icons for 'target +/-', 'view +/-', and 'adj.'. Below this, a battery level indicator, a signal strength icon, and the time '12:30:42' and date '03.08.22' are visible. The word 'Measuring' is displayed in green. The main display shows 'Noise (A) adjust' with a large '93.5 dB' value. Below this, a 'Target:' section shows '94.0 dB' with minus and plus buttons. An 'adjust' button is shown with '0.0 dB' next to it. At the bottom, there is a 'back' button and two greyed-out buttons.

For checking the accuracy of the noise level measurement, especially in cases when the device hasn't been used for some time, we recommend recalibrating the device using the optional calibrator.

In cases of special environmental conditions, such as high ceilings or high humidity levels, BAPPU-*evo* should be checked using the calibrator before and after the measurement has been made.

In order to recalibrate BAPPU-*evo*, please follow the following steps: When you are in the process of using the measurement designation "Noise" to take a measurement (please refer to page Fehler: Referenz nicht gefunden, chapter Fehler: Referenz nicht gefunden "Fehler: Referenz nicht gefunden"). By clicking  you will access noise level calibration mode.

In order to carry out the calibration, the calibrator should be connected to the front side of the housing, at the pointed end of the device using the adaptor. Following this, press  or "adjust" on the display and the recalibration will start.



**Caution:** Please ensure you deduct the correction factors pertaining to the calibrator. These are printed on the corresponding adaptor.

## Special features for the measurement of illuminance


BAPPU-evo is used to measure lighting conditions at a typical work place, including, for example, those specified in DIN 5035-6:2006-11. With other conditions, larger measuring tolerances may occur.

Description	BAPPU-evo	Permissible error class C
		DIN 5032-7
<i>V(λ)-Adjustment</i>	7,5 %	9,0 %
<i>Cosine correction</i>	4,0 %	6,0 %
<i>Linearity</i>	3,0 %	5,0 %
<i>Calibration error</i>	1,0 %	2,0 %
<i>Display device errors</i>	1,0 %	7,5 %
<i>Total errors*</i>	18,0 %	20,0 %


\*The total of all errors allowed is larger than the total errors allowed (DIN 5032-7).

In order to get the best results, it is advisable to place the illumination sensor in a horizontal position at the work place to be measured. The table mounting pin can be used for positioning the device correctly.

## Special features for temperature measurement

With the key  a dew point calculation is available. This is calculated on the basis of the determined measured values of air temperature and relative humidity. At the dew point temperature, the maximum saturation of the air with steam is reached. If it falls below, liquid water, condensation falls on surfaces that fall below this temperature, down.

## Supply Voltage

The voltage can be supplied from a power supply unit, rechargeable battery or, in special cases, a battery. If the voltage supply is too low, the device will turn itself off. In order to guarantee smooth operation, we recommend using GP ReCyko+ NiMH HR6 210AAHCB 2050mAh 1.2V rechargeable battery packs. The external voltage supply for using the power supply unit provided or the USB port of the PC is indicated by  on BAPPU-evo.



**Caution:** We recommend the use of rechargeable batteries.  
**Caution:** If the symbol for external power supply does not flash or flashes, the power supply of the USB port is insufficient.  
**Caution:** Do not leave the device unattended while charging.


## Charging function

Using the rechargeable batteries delivered with the device, the integrated charging function can charge a fully discharged rechargeable battery in eight hours. In order to do this, your BAPPU-evo must be turned on and connected to the power supply unit via the USB connection.



**Caution:** Please make sure that the rechargeable batteries are placed in the battery compartment before commencing charging.

Using the USB port of a PC or laptop to charge the batteries will result in a charging time of 16 hours. In order to guarantee a longer operating time with the BAPPU-evo, we recommend using a high-quality external charger (please refer to page 7, chapter 1.11 „Optional accessories“), and charging the batteries in long intervals (30 to 50 charging cycles). This will help to greatly prolong the service life and the capacity of the rechargeable batteries

The charging state of the battery is indicated on BAPPU-evo screen by the battery icon  that gradually fills up.

**Tip:** The charging will commence approximately one minute after the device has been connected to the USB power supply. In cases where the rechargeable batteries in the battery compartment are not recognised, you have the possibility to start the charge programme manually by pressing the battery icon.

## 2. Glossary

---

### 2.1. BAPPU-measurement

The term BAPPU-measurement refers to sample measurements taken from currently recorded measurement values carried out by BAPPU-evo and their subsequent storage in a pre-defined location in the memory.

Apart from sample measurement characteristics, single measurements that can last several minutes can be carried out (noise levels, air speed).

### 2.2. Work place list

The work place contains all of the information necessary for assigning a name to the measurement sequence, as well as organising the value profiles and the selected measurements (profile). The information includes:

- work place number (memory filing number)
- work place name (the desired sequence of characters that identify the work place, with a maximum of 20 characters)
- The type of work place assigned
- The assigned measurement sequence (profile)

The work place list provides an overview of all existing work places, numbering them from 1 – 99. Names and profiles can be assigned to the numbers. The list is displayed by selecting the option “Measurements” in the main menu field.

### 2.3. Type of work place

The work place type is where the threshold values and set values measurement ranges are stored. The results of the individual measurements are indicated as either red, amber, or green in the evaluation bar.

### 2.4. Measurement profile (profile)

This allows you to select the measuring ranges that are to be used and to select the individual work places (please refer to page 18 „Modifying the measurement profile (Profile)“).


The measurement sequence profile gives the user the opportunity to switch individual measuring ranges on or off. Up to nine different measurement sequence profiles can be defined.

Each work place can be assigned an individual measurement sequence profile. Therefore, it is possible to carry out measurements that are relevant for a specific work place.

### 2.5. Overview of measurement results (overview)

This screen displays the most important measuring ranges and measurement data pertaining to a specific work place.

### 2.6. Measurement value details

The detailed view shows all of the values and results stored in the memory for a specific measuring range. Moreover, a repeat measurement can be started from this screen. You can search the measurement ranges using . In addition, the measurement ranges that have been deactivated in the measurement sequence profile are indicated here. Pressing “hold” during a measurement will also take you to the detailed view.



## 2.7. Repeat measurement

When carrying out a repeat measurement, individual measurement ranges can be called up, deselected, or shown again. The remaining measurement ranges in the measurement sequence are not affected.

## 2.8. Recording

When carrying out a long-term recording, the device allows you to set the intervals when the selected measurement ranges are to be recorded in the internal memory. The progress of the measurement values being recorded is shown in the thumbnail view.



**Important information:** In order to be able to utilise the data that has been recorded, you will need to purchase a licence for “BAPPU-time” software!

# 3. Operating instructions

---

## 3.1. Display and touch screen


The device features a touch screen. This means that in most cases the user is able to operate the device using on-screen commands.

No	Name	Type
01*	Stamm	BAP
02	Lehmann	BAP
03	Wahl	BAP
04	Krause	BAP
05	Name #05	BAP
06	Name #06	BAP
07	Name #07	BAP
08	Name #08	BAP
09	Name #09	BAP
10	Name #10	BAP

menu	current	edit
------	---------	------

### Sensitive areas

Apart from the keyboard, the functions of the D-pad are available on the screen (see diagram  )

### Function buttons

The F1, F2 and F3 function buttons, which are labelled according to their function, can be found on the lower display.

## 3.2. Keyboard

The F1, F2 and F3 function buttons, which are to be found beneath the display, offer different functions according to the information being displayed.

The D-pad is used for navigating the cursor, while the OK button is used to confirm the selection. The user can find additional commands for the D-pad on the upper task bar.

### 3.3. Connections

The connection socket is located on the lower side of the device housing.



- **Headphone** – Headphone/Analogue Line Out
- **micro SD slot** – Card reader for microSD card for memory expansion
- **USB Device/DC IN** – Connection to PC or power supply (for data transfer)
- **USB Stick** – flash drive – receptacle for USB flash drive
- **External sensor (2x)** - Globe temperature / CO<sub>2</sub> / Anemometer-evo / from version: 4000/10
- **MiniSaver** – Kensington compatible

### 3.4. Help bar



The help bar, which is at the top edge of the

screen, describes the keyboard functions that are available. The function of the right/left and up/down arrow keys as well as the function of the OK button is shown.

Please note that under certain circumstances the three function keys at the bottom edge of the screen can be used for additional functions.

### 3.5. Background Colour

The background colour indicates the operating mode of the device. A dark grey background indicates either menu items or data from the memory. During the measuring process a light background is used.

The changing background colours make it easy to see if the device is currently measuring (light background) or if values that have already been measured are displayed (dark background).

## 4. Main menu



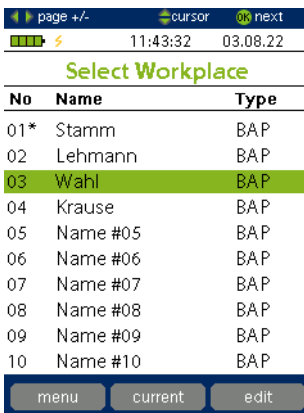
After switching on the device – after a start message and a self-test – the main menu will appear.

**Tip:** You can access the main menu any time by holding the **OK** button.

From the main menu you can access the functions described below.

### 4.1. BAPPU-measurement

By selecting the menu item “measurement”, you are presented with an overview of the work place and the work place list. Edit the work places (name, type of work place, measurement sequence profile) and/or start measuring.



Measurement sequences that are marked with “\*” already store measurement data.

By pressing the “Current” softkey, the user is presented with an up-to-date overview of the current measurement values.

The “Edit” softkey is used for editing the work place name and the type of work place as well as the measurement sequence profile.

**Tip:** The “current” view does not represent all available measuring ranges. All available measuring ranges are only visible during the complete run of a series of measurements.

### 4.2. Recording

Here the user can access the settings for the counter and commence the internal long-term recording. After a short time, and depending upon the intervals that have been selected, the user will be able to see the progress of the selected measuring range.



**Caution:** In order to be able to utilise the data that has been recorded, you will need to purchase a **licence** for “**BAPPU-time**” long-term recording software. This is available as an option and is not provided with the standard delivery.

### 4.3. Settings

All settings, such as language, display and energy functionality, profile settings, to name but a few can be carried out here (please refer to page 25, chapter 8 „Settings“).

## 5. Recording preparation


### 5.1. Modifying the measurement profile (Profile)

The measurement sequence profile is where you can define which measuring ranges are available in the measurement sequence. Two profiles, namely “All” (all measuring ranges) and “Standard”, are available. However, the user can set up eight additional user-defined profiles. The default setting is that all measuring areas are activated for all profiles. You can customise the profiles in accordance with your needs.








**Tip:** Measuring ranges from external sensors, which are not connected, **do not appear** in the measurement sequence, even in cases when they are activated.

In order to be able to edit additional profiles, select “Settings” in the main menu and select “Profile”.

Confirm the selection by pressing . Profile “01 ALL” is permanently assigned and contains all measuring ranges.

All other profiles can be changed according to your requirements. Simply select the profile you wish to

change and then press . You can use the   and  cursor buttons to navigate the measuring ranges.

You can use  to select or deselect a specific measuring range. Alternatively, you can make the selection using the touch screen.

The measurement sequence profiles can be managed using “BAPPU-Standard” software (please refer to page 33, chapter 9.11, „Measurement profile (Profile)“).

## 5.2. Editing the work place



Each work place is assigned with a (memory) number, and can also be given a name and can be arranged according to the type of work place. By default, the work place type is “BAP” (on screen work place) as well as the profile name “Standard”.



WP-No.: 02  
 Name: Name #02  
 Type: BAP  
 Profile 02 - Standard  
 Delete Measurements (this WP)  
 Delete measurements (all WP)




Information pertaining to setting up and editing the work place types can be found on page 30, chapter 9.7, „Defining the type (defining the type of work place)“

Select the specific work place in the list (   ) and press “edit” (F3).

**Tip:** All editing functions can be easily carried out using the software and can be transferred to the device. (please refer to page 32, chapter, 9.8 “Work place names and type definition (data retrieval)”). Editing the work place type can be carried out only using “BAPPU-Standard” software. Assigning a work place name Enter workplace name


To assign a name, select “Name” and press . Using the screen keyboard, the user can enter a name with up to a maximum of 20 characters.

### Allocating the work place type

Select an existing type using . This had already been created and transferred to the BAPPU-evo (please refer to page 30, chapter 9.7, „Defining the type (defining the type of work place)“).

**Tip:** When you do not wish to select specific results, please select work place type “NONE”.

### Allocating the work place type profile

Select an existing profile using . In doing so, the user defines which measuring ranges are to included in the measurement sequence (please refer to page 18 chapter 5.1 “Modifying the measurement profile (Profile)”).

## Deleting measurement data

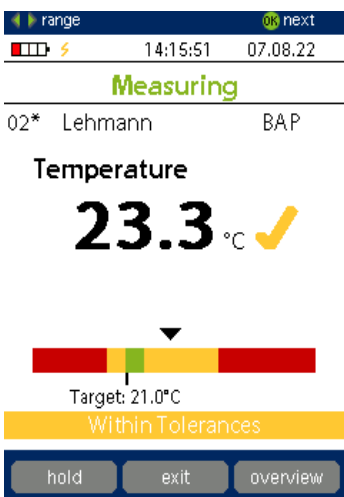
It is possible to delete data from either the current work place or alternatively of all work places.

**Tip:** Measurement data of the currently displayed workplace can also be deleted via the measurement result overview.

If you have edited the workstation as desired, select "Back" (F1) to go to the list view to configure further workstations or to start a BAPPU measurement series.

# 6. Measurement sequen

## 6.1. Perform measurement




In order to carry out the measurement sequence, select the work place from the work place list. To start measuring, press **OK**. According to the profile selected, you will now start your first measurement. By default, this will be the measurement of the air temperature.

**Tip:** Work places that are marked with "\*" already have measurement data. In this case, you will firstly get to the overview of the respective work place (please refer to 6.2, „Measurement result overview“).



## Evaluation

The coloured evaluation bars positioned under the measurement result provide information as to whether the measured values are within the defined limits. The set values show the optimum value. Moreover, the evaluation is represented by **✓**, **✓** or **✗**. The settings for the set values and the evaluation limits can be set using "BAPPU-Standard" software (9.7 „Defining the type (defining the type of work place)“)

## Saving measured values


To save the measured value, you must press . Following this, the next measuring range is shown. Information pertaining to the individual measurement areas and the correct measuring procedure can be taken from the quick start guides.



## Hold / freeze readings

While carrying out a measurement, the current measured value can be recorded with “hold” (F1) for view. Pressing the “hold” key (F1) again will repeat the measurement, by pressing the keys  or  you can switch to the previous or the next measured range. The held value is saved.

**Tip:** The background colour of the display always shows you the current mode (light background = measuring mode, dark background = save mode).



During the illuminance measurement, the self-timer function can be activated by pressing “hold”. The “hold” button activates a countdown that shows the time until the measurement value is recorded. When the measurement is complete, the user can change to the next measuring range using . Alternatively, the measurement can be repeated by pressing “measure”.

At any time during a measurement sequence or detailed view, you can change to the next or previous measuring range by simply pressing  or .

## Finishing or cancelling a measuring range

You can cancel a measuring range by pressing the “exit” (F2) button. Following this, you will be prompted to either discard or save the measured values. Pressing “overview” (F3) will show the measurement result overview. All measured values will be saved, overwriting the previous measurements.

## 6.2. Measurement result overview

After carrying out a measurement sequence, you are presented with an overview of the measurement data that has been saved. The grey background indicates that the data is being read from the memory.

Measurement	Value	Unit
Temperature	21.0	25.8 °C
Rel. Humidity	55.0	53.6 %
Air Speed	0.01	0.08 m/s
Air Speed 0,1m	0.01	0.04 m/s
Air Speed 0,6m	0.01	0.04 m/s
Air Speed 1,1m	0.01	0.04 m/s
Noise (A)	55.0	91.8 dB
Leq(A)/min	55.0	79.9 dB
Illuminance	500	1504 Lux
Refresh-Rate	85.0	200.1 Hz
Max. Screen Br	100.0	109.5 cd/qm

Should data pertaining to a work place already exist when beginning a new measurement (this is indicated in the work place list by “\*”), the device shows the measurement result overview before a new measurement can commence.

Of course, a measurement sequence or a single measurement range (repeat measurement) can be carried out.

The measurement result overview shows all of the measured values that have been saved for a particular work place. The evaluation of the individual results is indicated by the colour of the figures.

Using or , you can browse the overview, which always comprises two screens. Pressing the keys calls up the first screen of the following work place. Keying in “delete” will delete all of the measured values from the current work place.

### 6.3. Detailed view

Detailed view shows all of the values and results stored in the memory (as long as they are activated). When working in detailed view, you can use and to toggle

Measurement	Value	Target	Status
Rel. Humidity	53.6 %	55.0 %	Within Tolerances

between the previous or following measuring range. Moreover, you can start a new recording of the measuring range (repeat measurement).

### 6.4. Repeat measurement

When carrying out a repeat measurement with an already existing measurement sequence, you can rerecord a specific measurement range.

Select a measurement range in the measurement result overview and press . The next detailed view will appear. In order to start the recording, press .



## 7. (Long-term) recording

With the integrated data counter, you can record all of the measuring ranges simultaneously with BAPPU-evo. A preview of the recorded data can be viewed immediately.

When an analysis of the results needs to be carried out (please refer to page 10, „BAPPU-time software “), you will need to purchase “BAPPU-time” software for long-term recording.

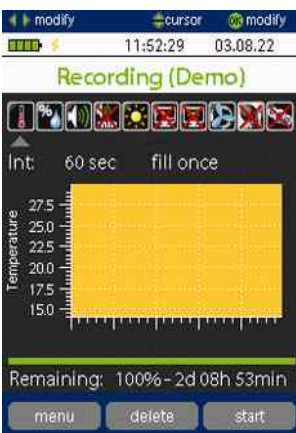
**Tip:** Generally speaking, when making a long-term recording with BAPPU-evo, we recommend powering the Anemometer - if available - with the power supply.




To begin with, select “recording” in the main menu. The measurement sequence symbol indicates which measuring ranges have been selected or deselected for the long-term recording.

On the line below the symbols, you can view the settings for the logging intervals and the memory type. In the middle there is a preview of the recorded data. The measuring range that is selected in the measurement sequence symbol list and that is indicated with the ▲ symbol, will only be shown in the preview screen.


The lower part of the screen shows you how much memory remains as well as the remaining time the selected configuration has to run.


### 7.1. Selecting the measuring range



Using the  buttons, select the measuring range you require and confirm the selection by pressing . When selecting a measuring range that requires an external sensor, please note that a recording can only be made when the sensor is connected. Use the  symbol to call up the settings for the intervals.

### 7.2. Adjusting the interval settings

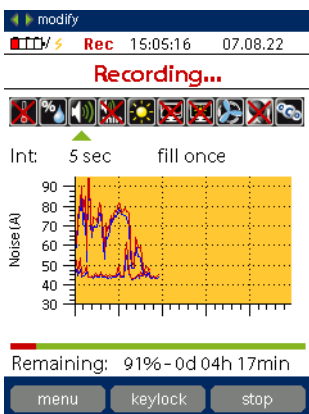
Using the  buttons, you can adjust the interval settings. In order to guarantee satisfactory data measurements, 60-second intervals are generally sufficient. Please note that all maximum and minimum values are recorded within an interval. Exceptional

values that are outside of the selected parameters (longer than 60 seconds) are also indicated. Use  to call up the settings for the memory type.

### 7.3. Memory type

The internal data counter offers two types of memory storage. “Fill” means that the recording is stopped when the memory capacity is reached. “Ring” means that when the memory capacity is reached, the oldest recording will be overwritten.

### 7.4. Starting and stopping the recording



To start the recording press “start” (F3). When the recording is running the background colour will change to white. In addition, the words “Recording” appear in red in the upper screen and the “REC” symbol, which is to be seen in the status bar next to the battery symbol, will blink. The display will remain visible even when the user leaves the menu.

The recording can be stopped by pressing “Stop” (F3) or when the memory capacity is reached.

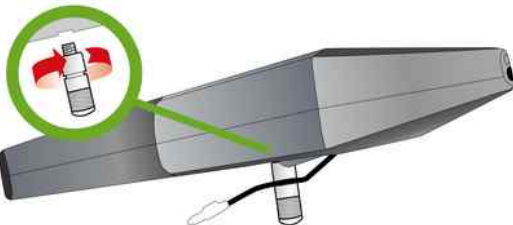
The data can be read using the optional “BAPPU-time” software (please refer to page 36., chapter 10.6, „Operating and reading the internal data counter“).

### 7.5. Keyboard lock

If you want to protect the recording from unwanted interference with the device, you can lock the keyboard of BAPPU-evo. Press "Lock" and enter a 4-digit key combination of your choice. To unlock the keyboard, reenter the combination. After restarting the device, the keyboard lock is unlocked.

### 7.6. table-mounting pin

When carrying out a long-term recording, we recommend using the table mounting pin to position the BAPPU-evo and securing the temperature sensor in the appropriate recess (please refer to the picture below).




In addition, the table-mounting pin is used to achieve the optimum position for the illuminance sensor.

## 8. Settings




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In order to make adjustments to the following settings, select “Settings” in the main menu.

### 8.1. Language

The available languages can be called up using the  button. Subsequently, you can select the language required.

### 8.2. Display/Energy

Here you will find the display and energy functions where you can select the option required with  . Using the  button, you can select the modes that are available

### 8.3. Measurement settings (measurement)

The following sections will explain how the settings to the individual measuring ranges can be made.

#### *Humidity compensation (rf-compensation)*

Due to the fact that the relative humidity is dependent upon temperature, the temperature of the housing will influence the values being measured; therefore, it is important for the housing to have the same temperature as that of the ambient air.

For BAPPU, this means that when a cold measuring device (for example, when a device has been left in the car) is brought into a heated room, the device will indicate results that are much too high. This will be the case until the temperature of the device housing is the same as that of the ambient air.

However, by implementing the temperature shock compensation on the humidity sensor, the BAPPU-evo can be acclimatized rapidly.

In the default setting, the humidity compensation is active.

#### *Time-weighting (time weighting noise)*

Time weighting for the measurement values is distinguished by “slow” (1 second) and “fast” (125 milliseconds). You can change between the time weighting during a measurement by pressing “slow” or “fast” on the touch screen. The default setting is “fast”.

## Area (area noise)

The default setting for the measuring area changeover for the noise level measurement is “Auto”. Therefore, when the value range overflows or underflows, the change is automatic. You also have the possibility to change the measuring area changeover manually. The settings available for measuring area changeover are “Hi” and “Low”.



**Attention:** If the level range is set manually, the occurrence of an overshoot or undershoot of the range is more likely.

## C-peak measurement (C-peak measurement)

Selecting "On" measures the c-weighted peak sound level (c-peak) of the past minute. In the custom sound level measurement, the c-peak of the measured time is displayed accordingly.

## Clothing insulation value (PMV CLO)

In each measurement sequence, the climate indices (PMV/PPD) for the three clothing values, which are present in the work place definition, are indicated. These are clothing values for light clothing (Summer), middleweight clothing and heavy clothing (Winter). Please select the appropriate values that should be used with BAPPU-evo.

**Tip:** The “BAPPU standard” software shows the PMV and PPD for **all** clothing insulation values.

## PMV–Calculation (PMV air velocity)

Due to the fact that different values for the air velocity may be present, please select the value for the PMV/PPD calculation which should be used.

Selecting the default setting “Auto” will result in all of the existing air velocity measured values being used in the calculation. Additional settings available include the single value measurement “Single” or “LG I”, “LG II”, “LG III”, which represent the three minute average value.



## 8.4. Time

When your BAPPU-evo hasn't been in operation for a certain length of time, the time and date will have to be adjusted. When the power supply or batteries are removed from the unit, the internal clock will run for approximately 14 days.

## 8.5. Firmware update

We recommend that you update your BAPPU-**evo** as soon as new firmware is available. The appropriate update data is available from our website.

Copy the data onto a USB flash device, and insert this into the USB port of your BAPPU-**evo**. In the “Settings” menu, select “Update”.

By pressing  BAPPU-**evo** will start to search for the data and check it. The  symbol indicates that the data has been checked. Press “Start” (F3) to install the firmware update.

## 8.6. User Init

By selecting User-Init, the factory settings can be restored thus returning the device to the original delivery status.



**Caution:** All data stored in the device will be deleted. Counter data is not deleted.

## 8.7. Measurement profile (Profile)

This allows you to select the measuring range that is to be shown in the measurement sequence. A comprehensive explanation of how the profile can be edited can be found on page 18, chapter 5.1 “Modifying the measurement profile (Profile).”

## 9. BAPPU standard software

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BAPPU-time software is a high-performance program for analysing and logging the long time studies carried out with the measurement devices making up the BAPPU product range.

Utilising BAPPU-time, all of the measuring ranges can be simultaneously logged as well as represented as tables or graphs, analysed and edited.

### 9.1. License general terms and conditions

When starting the "BAPPU-Software-CD", the following license terms and conditions shall be acknowledged:

- All rights, especially the right to reproduce (the exception being for the purpose of installing the program on the user's harddrive) and distribution as well as the processing of the program in any way whatsoever, remain at ELK GmbH.
- This version is intended as a multi-user application and can be installed on multiple devices (PCs). Each license is intended for use with a BAPPU multimeter. To operate an installation with several multimeters BAPPU you need several licenses. Licenses are only available from ELK GmbH.
- ELK GmbH shall not assume any liability for any editorial or technical mistakes as well as the accuracy of the information.
- This version is specifically a standalone application. Licenses are only available from ELK GmbH.
- The information included in this document does not represent any kind of obligation of ELK GmbH and can be changed without prior notice.
- Moreover, ELK GmbH reserves the right to change the software that is described in this document without prior notice.

### 9.2. Installation

In order to be able to install BAPPU time software, it is necessary that you are running Windows 7/8/8.1/10 operating systems. After placing the CD in the appropriate drive, the software start window will automatically open.

If this is not the case, open the start window by double clicking the "BappuTimeStart.exe" symbol in the root directory of the CD. The installation can be started by clicking "Install BAPPU time software" in the start window.

Continue by following the instructions given by the installation program.

### 9.3. Starting the programme and connecting BAPPU

You start the programme by clicking “Start”, “Program”, “BAPPU-time”. Subsequently, the start image will appear followed by the main window (refer to chapter 9.4 - 9.8).

When BAPPU-**evo** is correctly connected to a PC via the USB port, the message “Reading type of work place” will appear in the dialog window after a few seconds. This indicates that data pertaining to the type of work place is being read from the measurement device. If BAPPU is not recognised, you can choose the right device and port in the settings list.



### 9.4. Settings

In order to communicate with BAPPU-**evo**, please make sure that the appropriate device has been selected from the device list (see figure to the left). BAPPU-**evo** is the default setting.

When the programme starts, the software will suggest a possible path for the working directory (storage location) of your data. You can change the location of where you would like to store your data in the box “Working directory”. You can change the language by clicking on the “Language” box.

### 9.5. Online

If you would like to call up the current measurement data on your PC, press the “Online” button. When all of the previously mentioned settings have been correctly carried out, the measurement data will be listed in the dialog field.

### 9.6. Extra

Here you can clear the keyboard lock (see page 25 chapter 7.5 Keyboard lock) which you have activated during the long-term recording with the internal datalogger. You can also set the BAPPU internal clock under “Extra”.

## 9.7. Defining the type (defining the type of work place)

Of course, it goes without saying that every work place has its own unique set of conditions in terms of health and safety. Therefore, in order to be able to check and assess if the work places are in line with the existing regulations, the currently valid set values can be entered and transferred to BAPPU-evo for integrated conformity control.

	Range	Range	Range	Range	Target
Temperature /°C	20	21	22	25	21
Humidity /%	30	50	65	75	55
Noise current /dB/A	0	35	55	70	55
Noise / Min /dB/A	0	35	55	70	55
Illuminance /Lux	300	400	30000	31000	500
Refresh-Rate /Hz	73	84	456	460	85
max. Screen-Brightness /cd/m²	80	100	3000	3100	100
B/W Contrast	3	5	11	15	0
Mon/Env Contrast	0	0	3	20	3
Air-Velocity /m/s	0,00	0,00	0,10	0,20	0,01
CO2 /ppm	0	0	1000	1500	380

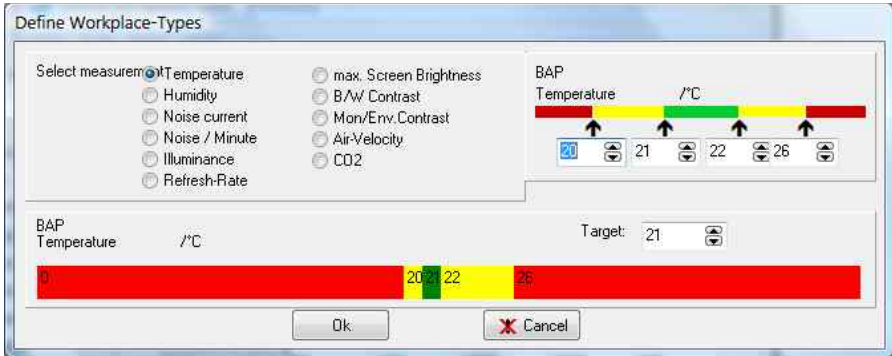
Extended (PMV)

The set values can be entered in the “Defining the type of work place” dialog field. This window can be opened by clicking the “Type definition” button in the main window.

Select the function “Data/new” from the menu item “File”, and enter a set of appropriate initials (a maximum of 4 characters) in the window to identify the type of work place. Finally, the set values for the existing regulations can be assigned to the appropriate measurement ranges.

With a double click, you can select the measurement value you would like to define or you can select the function “Editing the work place definition” from the menu item “Edit”.





The coloured blocks making up the value bar represent the areas where the “Traffic-light” function for conformity control is indicated. You can use the mouse to move the coloured blocks to the values where you would like to set the threshold values for the respective measurement range. The values are then shown as numbers in the fields.

The edited threshold values are also displayed in colour in the top right-hand field. The threshold values can also be entered here.

The set values, which will be indicated by BAPPU as the desired values of the selected measurement range of the work place, can be entered in the “Set value of the display (Target)” input field.

To display the PMV type definitions as well as the necessary clothing values and the Physical Activity Levels for the PMV calculation, click the “Adjusted (PMV)” button that can be found at the bottom of the window. The existing records represent the intermediate values for VDU work places and, as a rule, must not be changed.

**Tip:** In cases where no recording is to be made in a measurement range, the user should enter “0” in the set value of the display input field. BAPPU-*evo* will not show a set value for this measurement range (“NONE”) and will not carry out a conformity control check with this measurement range.

CO2 /ppm	0	0	1000	1500	380
PMV (Predicted Mean Vote) /1	-0,70	-0,50	0,50	0,70	0,01

Clothing light (Summer)	Clothing middle	Clothing heavy (Winter)	Metabolic Equivalent (Energieumsatz /Hautoberfläche)
0,60 clo	0,90 clo	1,20 clo	1,30 met
(1 clo <-> 0,155 m² °C / W <-> Isolation of normal work-clothing)			(1 met <-> 58 W/m²)

Reduced (No PMV)

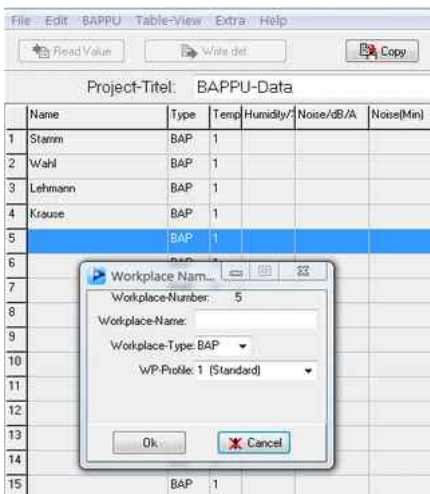
You can refresh all work place types in BAPPU-evo by pressing the “Refresh” function in the menu list. The work place definitions in BAPPU-evo will be updated according to the current status of the PC. All measured values that have been saved will remain unchanged. A newly created type will only be transferred when it is selected in the “Type/name” selection field.

## 9.8. Work place names and type definition (data retrieval)

Select “Data retrieval” in the main window of the program.

The data retrieval window is used in the preparation of the work place analysis and for presenting the measurement results. Assigning names to the memory storage locations, work place type definitions and allocating measurement sequence profiles can be sent to your BAPPU using this window; moreover, measurement sequences can be transferred from your PC to the BAPPU.

To begin a new project, select “File/New”, or if you want to make any changes to an existing project use “Open file”.



When you want to make changes select the “Edit” function in the main menu or double click the line in the table where you want to make the changes. The dialog box for entering the work place name and type of work place will open.

You can now enter the name of the employee who works at the work place or the location of the work place in up to 20 characters.

In the field designated work place type, you can select from the previously created work place definitions, such as BAP, CAD or LAGR, the suitable set values for the work place.

The “Write definition” button opens the window for transferring the work place definition to the measurement device.



**Caution:** Please note that when data is transferred to the measurement device, the data in BAPPU's memory will be deleted. We strongly advise you to make a back up of the existing data on your BAPPU on your PC

## 9.9. Reading and evaluating measurement values

In order to start the data transfer from BAPPU-evo, click on the “Read measurement values” button. In the “Select” dialog box you can select the data pertaining to the particular work place you would like to transfer

## 9.10. User-defined display

In order to prevent the data retrieval window from becoming too big, the system does not, by default, show all of the individual values. Select “Table view/Settings” (user defined), if you would like to set up the window to show additional information.

You can set up two definition tables, which, by default, will appear when you select specific measuring ranges.

For editing the tables, please click either “Definition 1” or “Definition 2”. In the “Column selection” section, mark the value for the measurement you would like to view.

Apart from the user-defined settings and standard settings, you also have the possibility to show the so-called “PMV view”, which can be found under “Table view”.



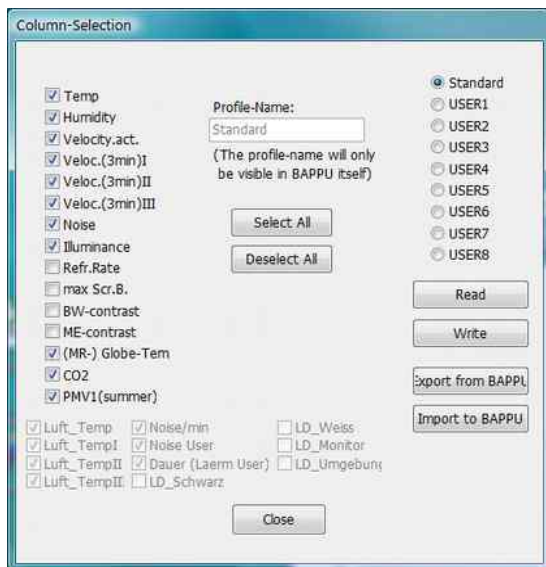
This view includes solely the climate data and the calculation of the climate index (ISO 7730) PMV und PPD\* (\*predicted mean vote und predicted percentage of dissatisfied).



**Caution:** Regardless of the view that has been selected, all of the data is retained.

## 9.11. Measurement profile (Profile)

Using the measurement profile, you can determine which measurement ranges in the BAPPU measurement sequence should be recorded. You also have the opportunity to manage and edit different profiles. To edit the profile, the BAPPU-evo must be connected to a PC.



In the left column, you can select or deselect the specific measuring ranges. In the upper middle part of the screen, you will see the name that BAPPU-*evo* has designated to the profile

You can designate the profiles “User 1” to “User 8” with new names. You can select the profile you would like to edit in the right-hand column.

The “Read” button will call up the profile that has already been saved in BAPPU-*evo* and display it in the software. When changes to the profile have already been made using the software, a message box will appear explaining that this data will be lost.

“Write” means that the profile is being transferred from the software to your BAPPU-*evo*. The profiles in your BAPPU-*evo* will be overwritten.

If you want to save the profiles from your BAPPU-*evo*, click the “Export from BAPPU” button. A dialog box will prompt you to enter a name for the data. You can confirm this by clicking “Save”.

If you want to transfer saved profiles to your BAPPU-*evo*, click the “Import to BAPPU” button.

## 10. BAPPU-time software

BAPPU-time software is a high-performance program for analysing and logging the long time studies carried out with the measurement devices making up the BAPPU product range.

Utilising BAPPU-time, all of the measuring ranges can be simultaneously logged as well as represented as tables or graphs, analysed and edited.

### 10.1. License general terms and conditions

Same as paragraph [9.1. License general terms and conditions](#)

## 10.2. Installation

In order to be able to install BAPPU time software, it is necessary that you are running Windows 7/8/8.1/10 operating systems. After placing the CD in the appropriate drive, the software start window will automatically open.

If this is not the case, open the start window by double clicking the “BappuTimeStart.exe” symbol in the root directory of the CD. The installation can be started by clicking “Install BAPPU time software” in the start window.

Continue by following the instructions given by the installation program.

## 10.3. Starting the programme



You start the programme by clicking “Start”, “Program”, “BAPPU-time”. Subsequently, the start image will appear followed by the main window.

In the dialog box “License” that automatically opens, please enter your BAPPU-time license number that has been assigned to every BAPPU.

To register additional devices, select “Settings/register additional BAPPU devices” in the main menu.

**Tip:** When the license number has been entered and the BAPPU-evo has been connected for the first time, demo mode in BAPPU-evo is deactivated. The respective dialog window will not appear again.

## 10.4. Computer test

When the programme is started for the first time, a computer test is automatically carried out. This function checks if your PC has sufficient memory and if there is enough space on the hard drive. The computer test detects the optimum settings for the visualisation of a long-term recording. It is advisable to carry out the test.

## 10.5. Working with BAPPU-time

**Tip:** Generally, working with BAPPU-time can be divided into either carrying out a long term recording directly on your PC or reading recorded data from the internal data counter in your BAPPU-evo. These two different processes are explained in chapters 10.6 and 10.11.

## 10.6. Operating and reading the internal data counter



### Data Logger port

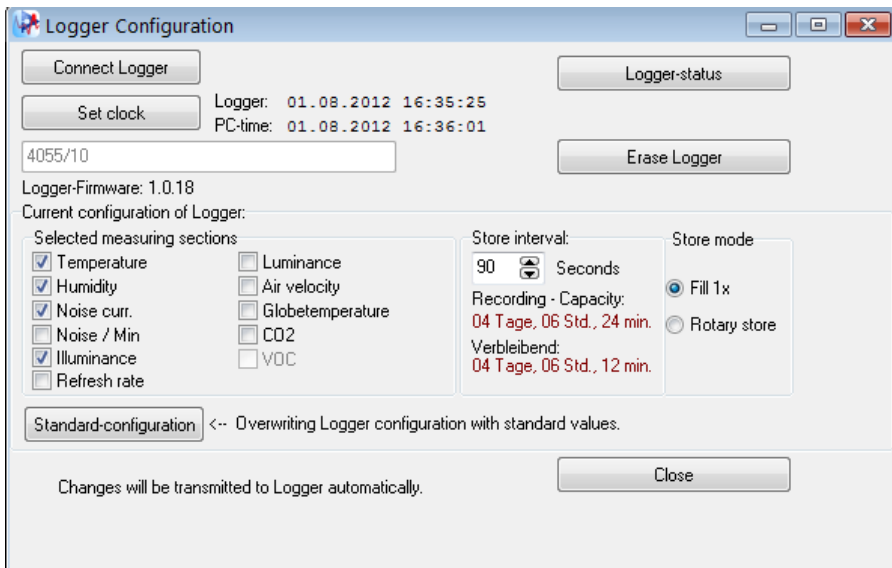
To configure or read the BAPPU-evo internal data counter (which will be referred to as “counter”), the correct port has to be selected and the BAPPU-evo should be selected as the device of choice.

This can be achieved by selecting “Logger-Comport” in the menu list. Select BAPPU-evo, as shown in the diagram on the left.

### Configuring the data logger

The configuration window, which is to be found in the main window, is used for entering the settings for the measurement specifications and the configuration data. To open the window, select “Logger/Configure Logger” in the menu list.

The “Connect Logger” button is for checking the ports (an automatic system connection process is carried out by the system every ten seconds). When a counter (BAPPU-evo) has been found, its serial number is shown in the dialog box below the time setting button.



**Tip:** Before a new recording, the data in the counter should be deleted in order to be able to get the maximum recording time. You can see if there is any data in the counter by clicking “Counter status”.

The “Logger status” button is used for calling up details pertaining to the status of the memory content (existing long term recordings, data memory OK). “Erase Logger” is used for deleting all of the data saved in the counter. The counter’s internal clock is also reset.

The data logger’s “Selected measurement range” dialog box is used to select the measurement range, whose measurement values are to be recorded during the measurement.

The “Standard configuration” button automatically deselects the measurement range noise level/min, display refresh rate and luminance density, because the recording of these measurement areas is only of limited use as shown below.

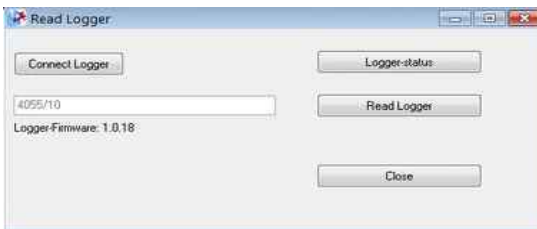
Through specifying the memory data capture intervals, the user defines the chronological gaps between two successive saved measurement values and thus the averaging time period. This also affects the maximum amount of time available for the recording. When the recording time increases, memory data capture intervals should be increased in respect to memory resources and clarity.

Due to the fact that the minimum, maximum, and mean values of all selected measurement ranges to be saved are recorded, it is possible to document the data of individual measurement ranges with larger intervals.

“Store mode” is used to define whether a long-term recording is to be automatically stopped once the counter memory is full or if the long-term recording should continue (ring memory).

Data to be found at the beginning of the recording will be continually overwritten. For example, this only makes sense when the end of the recording cannot be terminated exactly, however, the current values are required.

## Reading the BAPPU-evo data counter



To read the data, select “Logger/Read Logger” in the menu list.

By clicking the “Connect Logger” button, you can establish a connection manually (an automatic system connection process is carried out by the system every ten seconds).

The "Logger status" button is used for calling up details pertaining to the status of the memory content. The "Read counter" function is for transferring data stored on the counter to your PC.

A progress bar shows the status of the transfer. When the transfer is complete, the recordings already stored in the memory will be listed in the "Readout window" indicating the respective recording period.

When several data records have been stored, an additional window will appear.

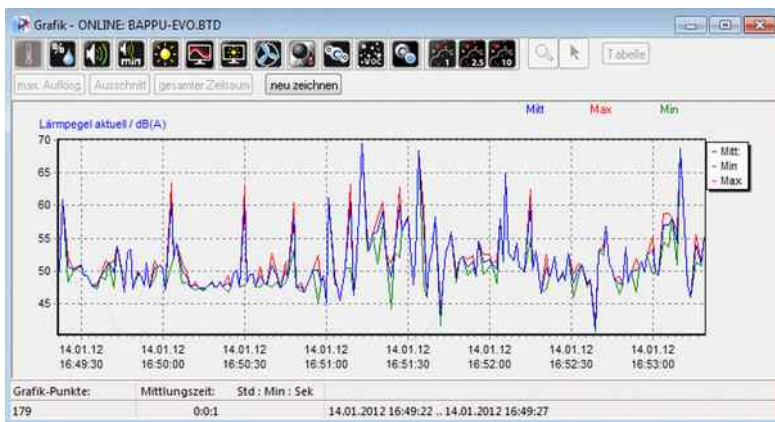
Individual data records can be selected by marking them with the left mouse button. Several data records can be selected by simultaneously pressing the left mouse button and the control key on your keyboard, or by selecting "Select all".

Pressing "selected separately", marked recordings can be saved separately. Pressing "Combine selected", several marked recordings can be compiled into one piece of data, as long as the data records required were recorded close together.

When "Connect selection" is selected, the recordings will be compiled under one file name.














## 10.7. Opening and displaying recorded data

To view a completed long-term recording, click "File / Open" in the menu bar or the "Open" icon below. Select the desired directory and the desired file. Open the highlighted "btd" file by double-clicking or pressing the "Open" button. In the main window, the progress of loading the file is displayed graphically. If the file is 100% loaded, the file name appears in the header bar of the graphics window. The settings for the default settings (averaging time, etc.) are displayed in the footer of the window. First, the measuring range temperature of the selected file is displayed.



The measured value symbols on the top left of the window (see figure on the left) allow you to switch between the representations of the different measuring ranges.



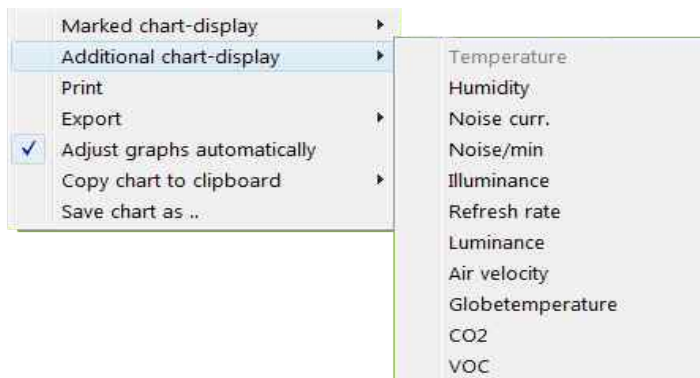
-  Air temperature /dew point
-  Rel. humidity
-  Noise Level
-  Noise Leq/min
-  Illuminance level
-  Flicker frequency
-  Display brightness
-  Air velocity
-  Globe temperature
-  CO<sub>2</sub>
-  VOC-indicator
-  CO
-  Particular matter

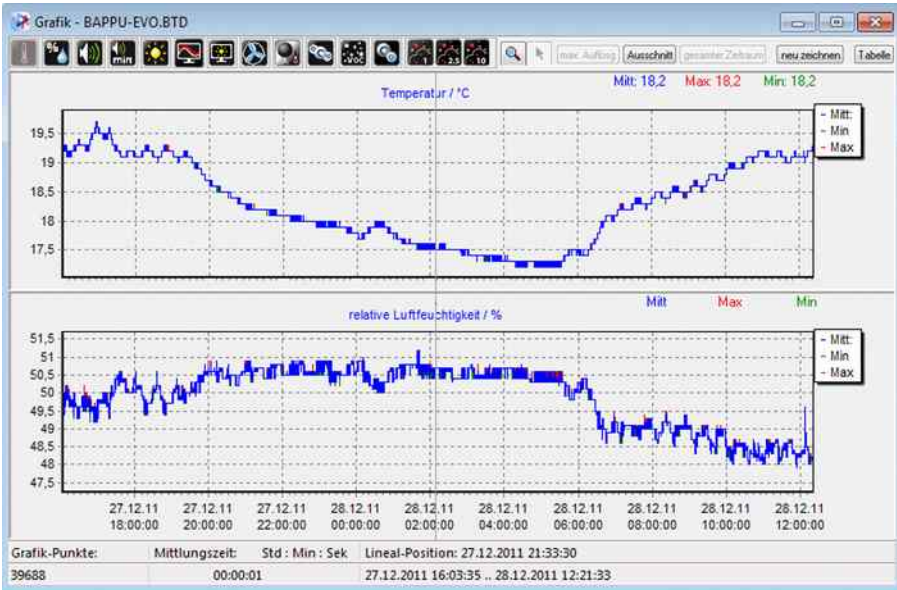
Clicking the respective measurement range symbol will enable you to display the separate recorded areas consecutively in the window. It is also possible to display several measurement ranges simultaneously.

The graphic window offers the possibility to present several graphs at the same time. You can select them by clicking the right mouse button to call up the dropdown menu or by clicking “View/Additional chart display” in the main menu.

A graphic display can be marked by mouse click and replaced with a new graphic.

The new measurement range can be selected by calling up a menu selection by right clicking the measurement value symbol or clicking “View” in the main menu. It is possible to hide a graph that has been marked.





## 10.8. Display options for the graphs

The white box at the top right hand side of the window shows the colour legend used for presenting curves. They can be displayed separately by clicking on the abbreviation in the white box or on the header.

- **Mean:** Display the average value with a blue curve
- **Min** Display the minimum value with a green curve
- **Max** Display the maximum value with a red curve

**Tip:** If you encounter problems displaying the data, select “View/new graph” in the menu list or press the “New graph” button.

### Specific selection

If you want to analyse a specific part of the graph, all you need to do is enter the time of the beginning and end of the specific area in the “Detail” dialog box. The selection criteria will shrink the timeline of the graph to the time you require.

## Zoom in/zoom out

When the zoom function has been selected, a “+” will appear next to the magnifying glass cursor. You can then click on a point that you want to enlarge or, with the left mouse button pressed down, move the mouse from left to right to draw a frame around the selection you would like to view.

If you would like to zoom out when the zoom function is activated, simply press the CTRL key on your keyboard. A “-“ sign will appear next to the magnifying glass cursor. If you would like to zoom out of a specific selection, simply click the left mouse button and press “CTRL” on your keyboard.

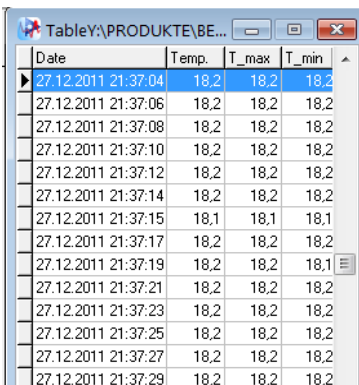
The “Total time period” button returns the selection to the original size. A drop down menu showing various display possibilities can be called up by clicking the right mouse button. The zoom factor always refers to the graphs open in the current window. Clicking on the arrow symbol will return you to “mark and move” mode.

## Ruler

In mark and move mode, you can use the moveable horizontal ruler in the graphic window to mark striking events and read all of the values of the measurement ranges on the graph up until that particular point in time.

The “average/maximum/minimum values” as well as the coordinates of the selected position are immediately displayed in the window and can be identified. All of the measurement values at this position can be displayed in the measurement value table.

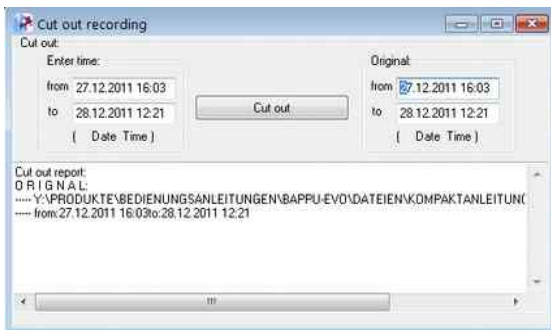
## Measurement value table



Date	Temp.	T_max	T_min
27.12.2011 21:37:04	18,2	18,2	18,2
27.12.2011 21:37:06	18,2	18,2	18,2
27.12.2011 21:37:08	18,2	18,2	18,2
27.12.2011 21:37:10	18,2	18,2	18,2
27.12.2011 21:37:12	18,2	18,2	18,2
27.12.2011 21:37:14	18,2	18,2	18,2
27.12.2011 21:37:15	18,1	18,1	18,1
27.12.2011 21:37:17	18,2	18,2	18,2
27.12.2011 21:37:19	18,2	18,2	18,1
27.12.2011 21:37:21	18,2	18,2	18,2
27.12.2011 21:37:23	18,2	18,2	18,2
27.12.2011 21:37:25	18,2	18,2	18,2
27.12.2011 21:37:27	18,2	18,2	18,2
27.12.2011 21:37:29	18,2	18,2	18,2

Click the “table” button on the menu list of the graphic window. All of the values of the measurement range are now displayed in a separate window according to the resolution you have selected. Moreover, every measuring point is presented in graphical form on the X and Y-axis according to the time it was acquired. Any value that has been selected with the ruler tool in the graphic window is marked by colouring the respective box. Vice versa, it is also possible to mark the exact position of a value in the graphic window by double clicking it with the cursor.

## 10.9. Selecting a recording



When part of a recording needs to be edited, you can select this in the “Cut” window.

Select “Recording/Cut out recording” in the main menu. Then enter the time frame of the selection you would like to work on in the dialog box.

As soon as you select “Cut”, the programme will prompt a file name for the selected time coordinates. In order to be able to open the newly created file, confirm the name by pressing “Save”.

## 10.10. Mean value calculator

The mean value for all of the recorded values of a freely definable section of a long-term recording can be generated for all measurement ranges. To generate the mean value, select “Recording/mean value calculator” in the main menu, and enter the time frame in the dialog box. By default, the setting encompasses the calculation of the entire time frame of the recording.

If you want to display the average, maximum and minimum values in the window, select “averages calculator”. You can save the file as a text file (\*.txt) by selecting “Save”. The “Print” button opens the print preview screen for the file currently being displayed. Pressing “to clipboard” copies the file to the clipboard for other applications. The “clean evaluation window” deletes the data in the window.

## 10.11. Recording with the PC

Using the USB port, connect the BAPPU-**evo** to your PC. The relevant connection cable is supplied with the device. To begin the transfer of the data, the measuring device has to be switched on using the ON/OFF button.


Next, select BAPPU-**evo** as the relevant device in the “Settings/Interface” dialog box.

The appearance of the serial number of your device in the status bar of the main window indicates that a connection to the measuring device has been established.



**Caution:** In order to avoid the recording being interrupted, please deactivate the stand-by and auto sleep functions in Windows during the long term recordings!



When contact between BAPPU-**evo** and BAPPU-**time** software has been established, the next step is to select “Recording” and then “Start recording” in order to begin a long term recording. Alternatively, you can press . Following this, the “Recording settings” dialog box will appear.

Subsequently, enter the date and time in the “Terminating recording manually” dialog box to set the end of the recording. If you would like to stop the recording manually, select “Manually stop recording”. (This is also possible when you have set the end of the recording).

The next step is to enter the “Average time”. Finally, confirm this by pressing “OK”.

**Tip:** Generally, intervals of 30 seconds for the average time will give significant values and trends, due to the fact that **all** of the measurement values are factored in during this time.

## 10.12. Starting a recording

After pressing the “OK” button, the program will prompt you to enter a name and storage location for the recording. Intermediate storage on the local hard drive of your PC offers you the possibility to view data already stored during the recording and greatly improves data security.


**Tip:** The data format for long term recordings is “\*.btd” (BAPPU-**time** file). When the data is exported, it can be saved as a “\*.csv” file, which is compatible with Windows-based spreadsheet and word processing software .

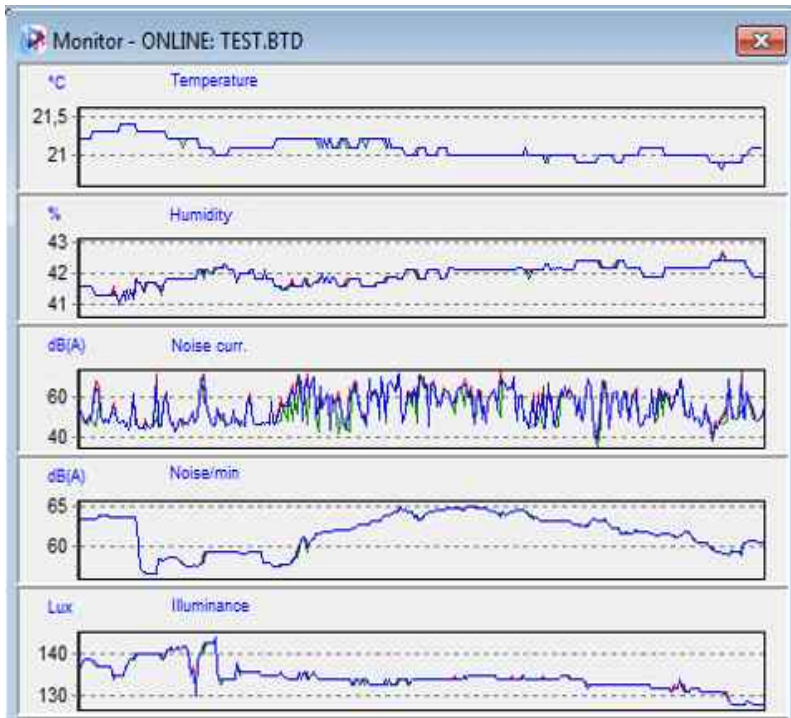
After confirming the file name, the recording will begin in accordance with the information that you have already entered in the “Recording settings” dialog box.

The time remaining before the recording starts is shown at the top of the screen; of course, this will remain so unless you select “Start recording now”. When the recording commences, the progress of the recording is shown in days, hours and minutes.

The recording mode will be indicated on the status bar of the program interface with the words “Recording running” and the amount of recorded data will be shown. At the same time, the “Measured values” window will pop up and show the current values.


### Online-Monitor

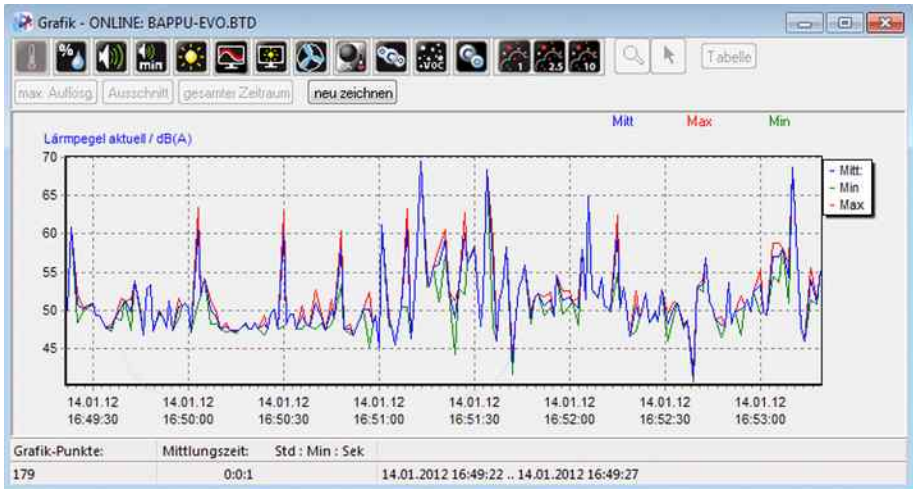
During the recording it is possible to view the measurement trend in the data monitor as well as call up the data which has already been stored in the graphic window. In order to call up the monitor function press  in the menu list.



The monitor window lets you view all of the measurement ranges on your measuring device in accordance with the order you have set, and shows the progress as a graphical curve.

## Graphic display

In order to view the data with a higher resolution in the monitor window, you can simply double click the specific measurement range in the monitor window. Alternatively, you can open this by clicking “View/Show window for recording chart” which can be found in the menu, or by clicking .



By clicking the measured values symbol in the top left hand side of the screen, you can switch between the different measurement range views.

## The end of the recording

A recording will end when the specified time frame expires. BAPPU-time confirms this with a pop up window that states: “The recording was terminated automatically”. If you want to stop the recording manually, click the “Stop recording” symbol, and confirm the pop up question “Are you sure you want to terminate the recording?” with “OK”.

## 10.13. General

### *Exporting files*

BAPPU-time files can be exported with the filename extension “\*.csv” file which can be read by Windows-based spreadsheet and word processing software. Select “Export” in the “File” menu heading or open the menu list by clicking the right mouse button. Following this, specify if you want to export all of the data or a specific amount. You can enter the name of the file in the export window, which appears on the screen.

### *Printing*

If you would like to print your BAPPU-time graphs, select either “Print file” in the main menu or right click your mouse and select “Print” from the list.

Additional options such as print layout and the print quality can be selected in print preview.

### *Right mouse button*

In many cases, clicking the right mouse button opens a context related menu that offers the user a number of functions such as exchange images or show additional images. Moreover, it is possible to call up the file export function, print a file and show the zoom functions.

## 10.14. Guarantee

BAPPU has been produced with utmost care and checked to guarantee a trouble free operation. However, should production-related problems occur, please notify us immediately upon occurrence within the guarantee period.

Wear parts, fragile parts as well as damage that occurs due to misuse or disregarding the manual are not subject of the guarantee. Opening the measuring device or removing or modifying the serial number inside the device shall lead to the guarantee claim being nullified.

The guarantee period is 24 months.

Claiming upon a guarantee shall not extend the guarantee period. Repairs and settings that are not covered by the guarantee as well as transport and packaging expenses shall be charged. Any guarantee outside the statutory liability, especially those for damage that are not related to the device, shall be excluded.



## *Operator responsibility*

The operator has to obtain information about the applicable occupational safety regulations and, in a risk assessment, has to also determine additional hazards resulting from the special working conditions at the place of use of the machine. He has to implement these in the form of operating instructions for the operation of the product.

The operator has to check, throughout the life of the product, that the operating instructions he has made are in line with the current state of the regulations and adjust them if necessary.

The operator has to regulate clearly and determine the responsibilities for operation, troubleshooting, maintenance and cleaning.

The operator has to ensure that all employees who handle the product have read and understood the instructions. In addition, he has to instruct the staff at regular intervals and inform them about the dangers.

The operator must provide the personnel with the necessary protective equipment and bind the wearing of the required protective equipment.



**Attention:** *The operator has to check all safety devices regularly for the functionality and completeness of all equipment.*

## *Instruction by the operator*

The operator has to instruct his employees before using the product in the following areas:

- Risk assessment
- Operating instructions
- Personal protective equipment
- Range of application of the product
- Environmental conditions of the product
- Setting up, operation and cleaning of the product
- Checking the product before starting work and after work
- Ergonomics in the workplace
- Hazards of the environment o

## 11. Notes

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**The new standard  
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