



PAULWEGENER
MESSTECHNIK SEIT 1921

Operating manual

Data acquisition system

PWBlogg

Type: MPK 2



Paul Wegener GmbH
Marienstraße 24
D-06493 Ballenstedt

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Design and specifications are subject to change without notice.

Please read this operating manual before using the PWBlogg MPK first. This operating manual includes close information on operating the mobile data acquisition system PWBlogg MPK. If you desire further information or if there are any problems which you are not able to solve by means of this operating manual, please contact the Paul Wegener GmbH.

Before first use, the rechargeable battery must be charged for about 8 - 12 hours (see chapter 5.4).

General safety instructions

The present device was produced and checked considering the safety instructions on electrical measuring devices. The functional reliability of the device can only be guaranteed if national safety and accident control regulations as well as the safety instructions of this manual are followed.

- The PWBlogg MPK must only be used by skilled and authorized staff.
- When operating the MPK, please take note of the ambient conditions described in the chapter „Technical specifications“.
- The PWBlogg MPK must always be treated with care necessary for an electronic precision measurement device: protect from humidity, shocks, strong magnetic fields, static electricity and extreme temperatures! Do not insert any items into the device including its openings! Device and system sensors must be handled with care (do not throw! do not strike! etc.) Plugs and sockets must be protected from contamination.
- When carrying the PWBlogg MPK from cold to warm environment, a failure of the device function can happen by condensate formation. In such case, you must wait until the device temperature has adapted itself to the ambient temperature before restarting.
- The measurement signal of the system sensors can be influenced by strong electromagnetic radiation and displaying the signal can fail.
- If it is assumed that the device can not be safely operated any more, then it must be shut down. The device's functional safety can be influenced by e.g. being visibly damaged, by not operating as destined or after being stored for a long time under inappropriate conditions. In case of doubt, you should generally send the device for repairing to the Paul Wegener GmbH.
- No modifications or repairs must be carried out at the device by the user. For maintenance or repair, the device must be sent to the Paul Wegener GmbH.

Safety advice on the MPK rechargeable battery

The PWBlogg MPK's power supply is done by means of a lithium-ion accumulator. Pay attention to the following safety advice when operating the device:

- Do not short-circuit the lithium-ion accumulator!
- Only the delivered charger must be used for recharging.
- Do not charge near easily inflammable items.
- Never extinguish burning accumulators using water! **EXPLOSION HAZARD!**
- Do not throw it into fire! **EXPLOSION HAZARD!**
- Do not recharge unattendedly!
- Do not store discharged accumulators (store accumulators ideally with 20% charge)!
- Never open cells! **EXPLOSION HAZARD!**
- Do not use damaged accumulators!
- In case of skin contact to the electrolyte, immediately rinse with water and soap and see a doctor.
- In case of eye contact, immediately rinse and see an ophthalmologist.
- Dispose thoroughly discharged accumulators only.
- Temperature range (charging/operating): 0.. +45°C/-20..+60°C

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1 Start-up instruction

Please note the following references during first initiation of the data measuring- and storage devices:

- Install the software PWB-Soft RLB first.
- Then connect the case at a serial USB interface of the PC by means of data cables for online connection.
- Start software.
- Set up serial interface in the dialog box „Settings“ of menu item „File“.
- Establish communication between PC and case via „Connection“.
- Make all necessary settings in the dialog field „Configuration“. In particular, note that a **1 minute sample rate** is adjusted at the delivery of the device in order to take care of the battery.
- After pressing „OK“, the controller will be configured again and the memory will be cleared. Measurement can start now.
- Note that the data logger must be turned on for activating measurement and the adjusted measurement start time must be reached!

Attention: The relative pressure transducer on devices with delivery date as of July 2005 are equipped with venting device in mint condition. This small circular-shaped venting device is on the sealing cap of the transducer. **Pay attention that the venting device is not removed or damaged!**

2 Test system MPK

The test system MPK is used for carrying out tests in pipeline and duct construction subject to different standards.

2.1 Components of the PWBlogg MPK

The test kit MPK includes following components which facilitate examining guided test procedures.

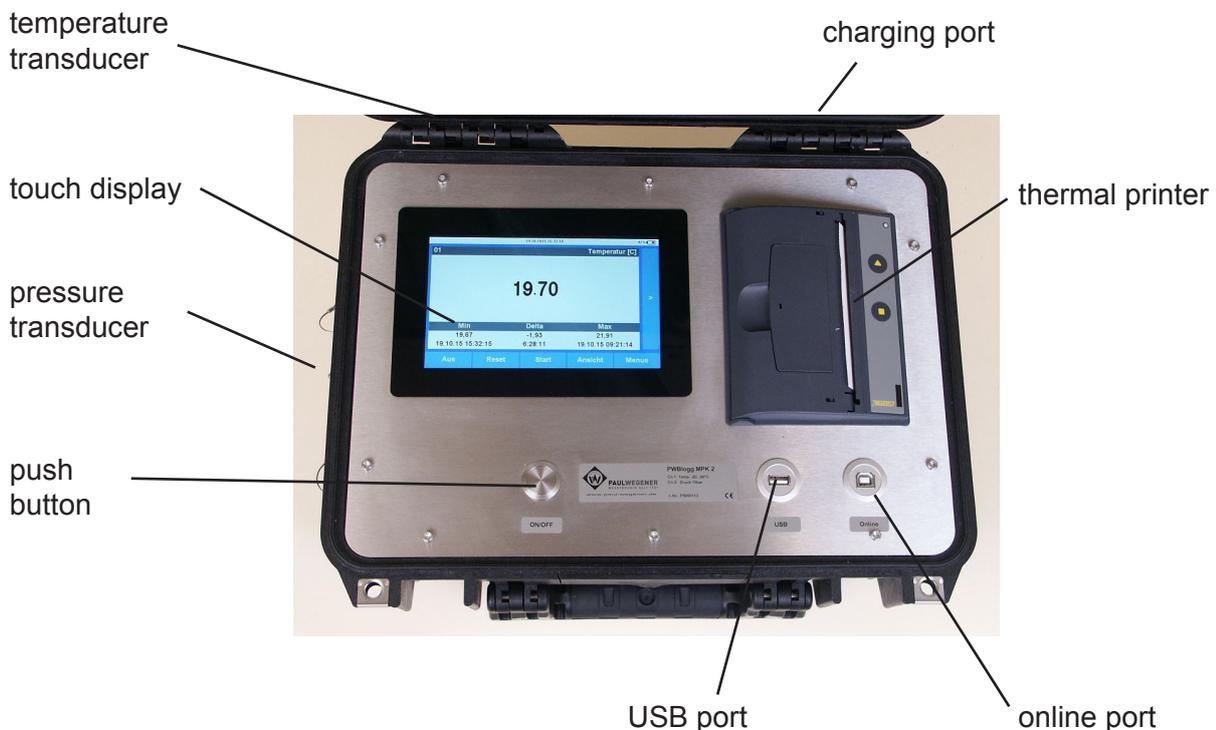


Figure 1 PWBlogg MPK

Touch-Display: Start and monitoring measurement and test processes. Adapting configuration and evaluation of results on-site.

Push button:

Activating/deactivating the device. Activating the display out of standby.

Thermal printer:

Printout of test and measuring results

Online port:

Connection to PC/laptop as interface for the PWBlogg software, and as direct access to performance and configuration data in mass storage mode.

USB port:

External backup option combined with customary USB mass storage devices and as update source using the same media.

Charging port:

For charging the internal accumulators using the provided mains adapter.

Transducer system:

Depending on type, built-in measurement transducers or interfaces for external transducers.

2.2 Transducers

The data acquisition system PWBlogg provides flexible adaptation to different measurement tasks. We provide particular transducers which can be operated by measurement system without additional power supply. Standard transducers are available for following measurement signals:

- Pressure
- Temperature
- Level

2.3 Settings

Following settings, relevant for performance data acquisition and storage, can be adapted to measurement requirements by means of the configuration dialog of the PWB-Soft on PC/laptop:

- Identification (eg company address)
- Abbreviation (location/time)
- Measurement start (date/time)
- Sample rate (min 1ms; max 1h)
- Threshold defaults for analog channels
- Storage mode

Following settings can be changed on device:

- Start measurement
- Interval 1 and 2 (sample rate)
- Storage mode
- Channel parameters
- Short text
- Module time
- Test parameters

Parameters important to monitor thresholds are described as follows:

Due to low power consumption, digital signals and pulses are always monitored in interval 2, independent of adjusted sample mode. If e.g. a flow threshold exceeds or a monitored safety valve switches, it will immediately switch over to the alert mode and, hence, any data are measured and stored in interval 2.

2.4 Channel information

- Threshold exceeding or falling below will be shown on reading display by a red reading.
- Incorrect connection to digital transducers/tubes is indicated by yellow readings. Connecting attempts to this transducer are cancelled after one minute. The reading will be replaced by a „-“. Connection can be established again using the button „*“.

3 Operating the MPK

The test kit is operated by touch display and push button.

3.1 Functionality push button

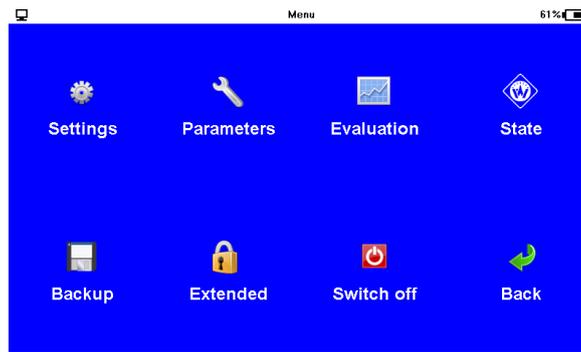
Depending on device's state, the push button has different tasks.

Activating/deactivating: When deactivated, pressing the push button starts the device. The push button is for activating device and display.

Furthermore, when activated, the push button is used as home button to quit menus. Using the top level menu (reading display), the push button deactivates the display. When pushing the button more than 5 seconds, measurement will be stopped and the device will be deactivated.

4 Main menu of the MPK

4.1 Menu structure



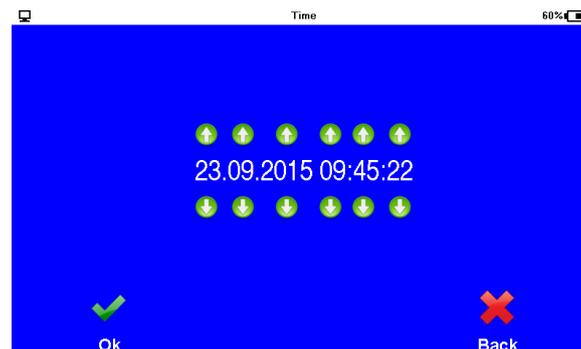
The main display level of the MPK is the measurement menu. If measurement is off, the message “No measurement planned” will appear. Short touching „Menu“ opens the main menu which includes following submenu items:

Settings

Changes of device settings, which do not have any influence on the measurement procedure but, as the case may be, on operating and evaluation, can be made here. Changes of any setting dialog are saved by „Save“ or not accepted by „OK“. The real saving process of any collected changes will be confirmed when quitting the setting menu.

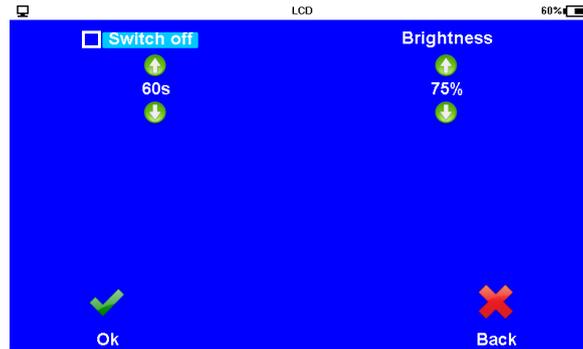


Time



Individual items of current time can be changed by arrow keys.

Display



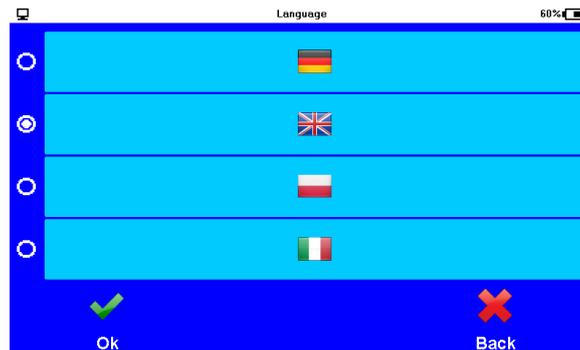
The automatic deactivating time after last key actuation is adjusted here. After activating the option „Switch off“, this time will become invalid. Now, the display will only be activated by the push button. The brightness can be adapted by 25% steps.

Printer

The printer to be used can be selected in this menu item.

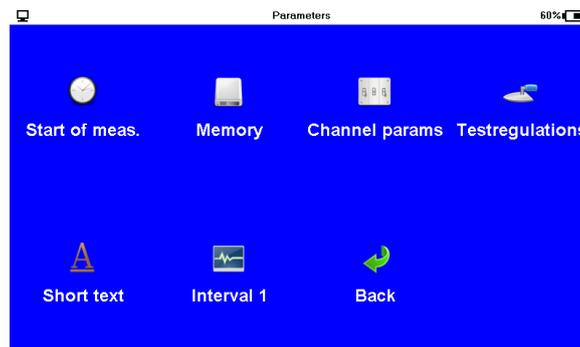
Language

The menu navigation language can be adapted via this menu item. German, English, Polish and Italian are available.



Parameters

The parameter menu of the MPK provides following options.

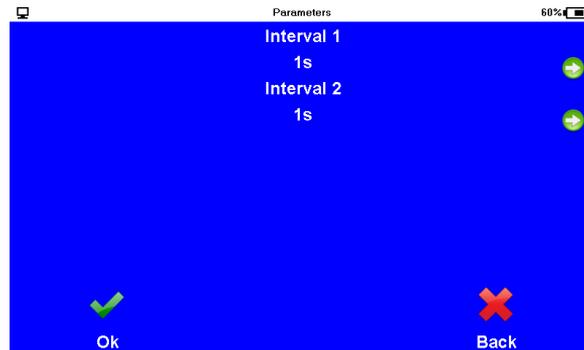


Current changes of any setting dialog are saved by „OK“ or not accepted by „Back“. The collected changes will be saved when quitting the parameter dialog. In case of made changes a confirmation prompt will appear whether saving and restart shall be done. That way, if applicable, current performance data will get lost.

Start measurement

Entering start measurement is done just as setting the time.

Intervals



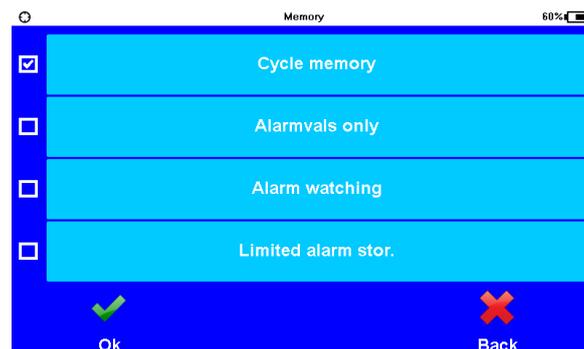
Interval 1 and interval 2 can be adjusted by the arrow keys.

Interval 1, during normal operation, the period between two reading samples can be set between 1 second and 1 hour.

Interval 2 determines the period between two reading samples in alert case and provides setting options between 1 second and 1 minute. It must always be set shorter than interval 1. During normal operating state, readings are measured and logged using interval 1 (depending on storage mode). If a threshold violation is detected, it will be switched over to interval 2. Thereafter it will be measured and saved in interval 2 until threshold violation is over (considering the adjusted hysteresis values). If „Limited Alarm stor.“ is selected, sampling is permanently done in interval 2. Threshold violations will be quicker detected that way. Thereafter, the storage interval will immediately switch over from interval 1 to interval 2. Please note that the power consumption of the logger rises and battery life decreases by more frequent sampling of the transducers!

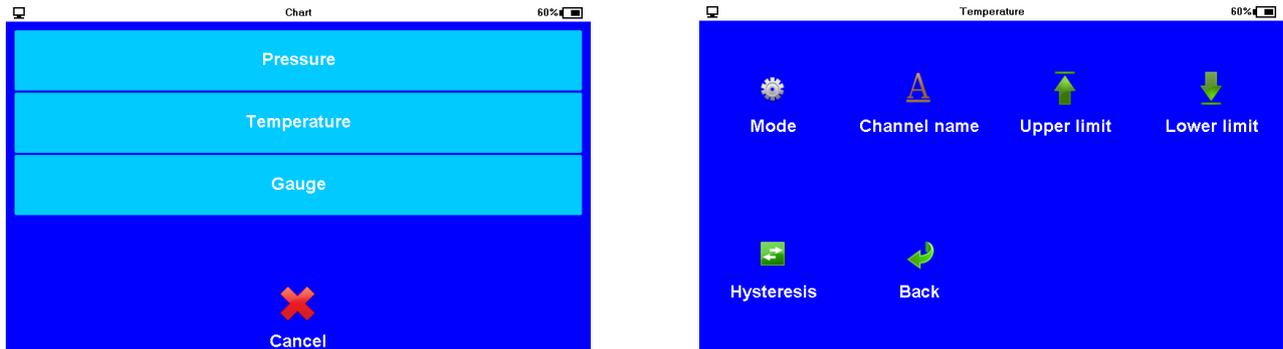
Memory

To use the memory more efficiently, this menu provides several options. If „Cycle memory“ is activated and the memory is full, oldest values will be overwritten by current ones. The option „Alarmvals only“ specifies that performance data logging is only be done in alert case. „Alarm watching“ means readings are permanently recorded in interval 2. „Limited Alarm stor.“ causes recording in alert case in interval 2 for a short period only.



Channel parameters

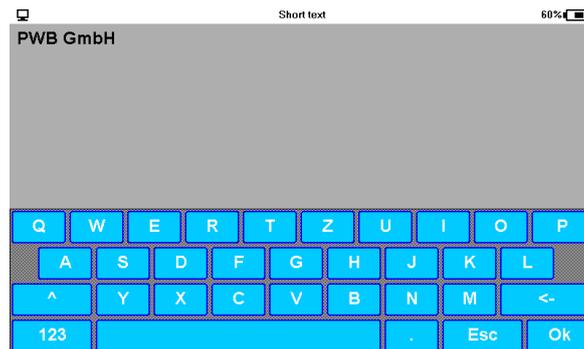
Channel-specific parameters for any channel can be set under „Channel parameters“. Just the channel to be adapted can be selected in figure 1.



The subsequent option menu facilitates mode, channel name, hysteresis as well as both thresholds. The mode specifies whether the channel will be shown on the measurement screen and whether performance data of this channel shall be saved.

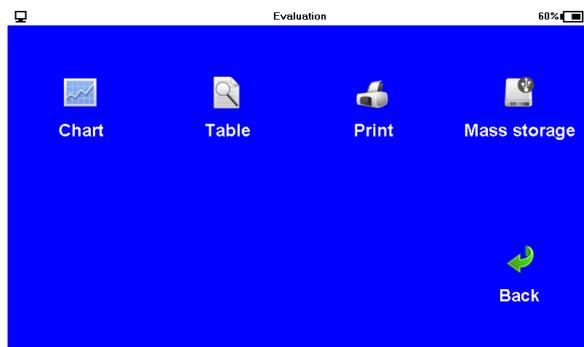
Short text/test parameters

These both menu items facilitate to adapt texts of the test kit configuration. The item *short text* immediately calls the entry mask. When using the item *test parameters*, the desired text field must be selected in advance.



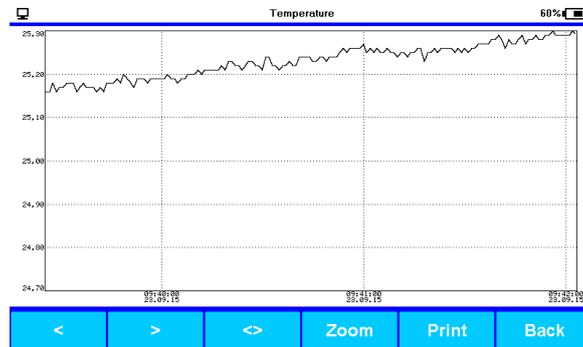
Evaluation

The menu item *evaluation* provides access and analysis of any performance data. Following menu items are accessible:



Chart

After selecting the channel to be displayed, its measurement history will be shown as chart. The keys „<“ and „>“ change the current cursor position. Switching over between both cursors can be done by „<>“. The function „zoom“ draws the chart new, according to the selected cursor range. The current chart can be printed out using the function „Print“.

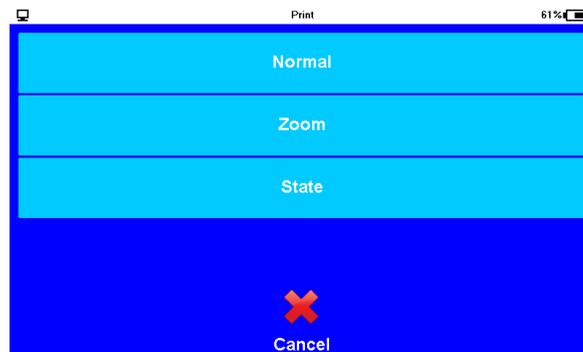


Table

Timestamp	Pressure
23.09.15 09:32:09	0,10
23.09.15 09:32:10	0,10
23.09.15 09:32:12	0,10
23.09.15 09:32:14	0,10
23.09.15 09:32:16	0,10
23.09.15 09:32:18	0,10
23.09.15 09:32:20	0,10
23.09.15 09:32:22	0,10
23.09.15 09:32:24	0,10
23.09.15 09:32:26	0,10

Alternative to graphical evaluation, readings can also be shown as table. The keys „<“ and „>“ switch over between channels and „^“ and „v“ navigate between data records.

Print



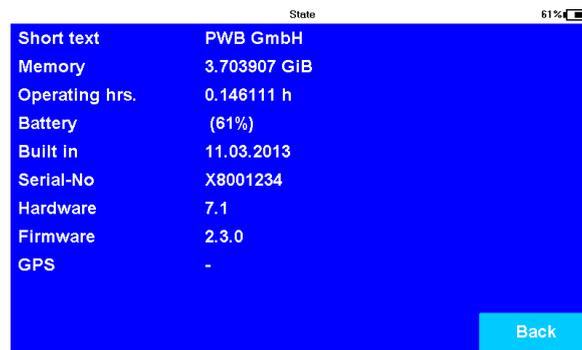
Readings can be printed out by the built-in thermal printer here. The printout can be done both normally and enlarged (zoom). Over and above, current status information can be printed out. „Protocol“ provides the results of a performed test as printout.

Mass storage

The mass storage mode can be used by this option. After making an optional backup, a message will appear on screen confirming that this mode was activated. You will not have access to any other menu items during this period, but measurement will go on in the background. If the MPK is connected to PC via online interface, in addition to the communication link, the internal memory of the device will be available as USB mass storage device where are all backups, copies of configuration files and any available test configuration. Any on PC compiled test configuration can be stored here to be selected prior to test start as needed. You can quit this mode again by the key „Done“.

State

This menu item shows the current adjusted time, the current location (if a GPS module is available only), the entered short text, the free internal memory, the operating hours of the logger, the battery state, the serial number of the device, the year of manufacture and the used hard and firmware version.



State		61%
Short text	PWB GmbH	
Memory	3.703907 GiB	
Operating hrs.	0.146111 h	
Battery	(61%)	
Built in	11.03.2013	
Serial-No	X8001234	
Hardware	7.1	
Firmware	2.3.0	
GPS	-	

Backup

This menu item is used for saving data. Data are written to the internal memory, and thereafter, an external storage medium will be searched. If available, the backup will be written there.

Advanced

The menu item „Advanced“ provides you the device’s developer options. Software updates to the device are transmitted there.



5 Measurement

5.1 Activating

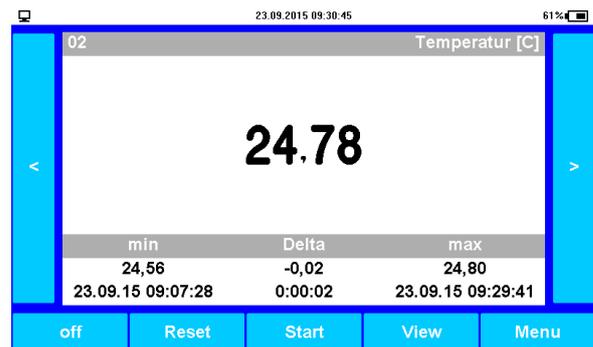
If measurement is off, the MPK screen provides the option to activate it (On) or to call the menu (measurement figure 1). After activating measurement, the current reading of one channel as well as information on measurement period and events will be shown. The channel can be switched over by „<“ and „>“. The key field „Off“ deactivates measurement again (measurement figure 2).

The measurement screen can be switched over to a multi-channel view (measurement figure 3) by the key field „View“.

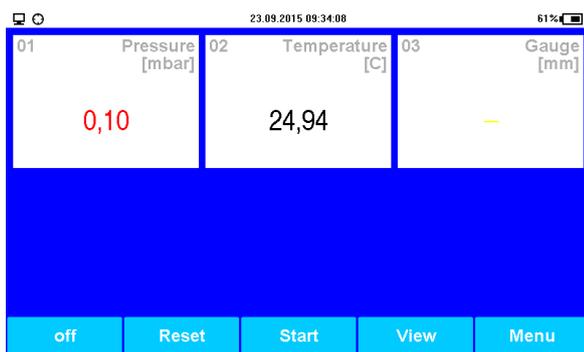
The function „Reset“ resets extreme values of the current measurement. This process must be confirmed again.



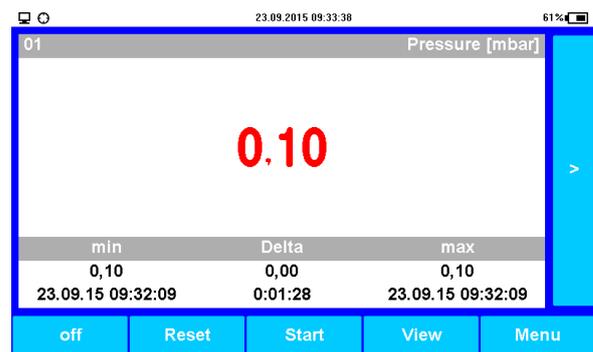
Measurement figure 1



Measurement figure 2



Measurement figure 3



Measurement figure 4

5.2 Alert message at threshold violation

If one threshold, specified in the menu item channel parameters, exceeds/falls below, this reading will be displayed red (Measurement figure 4). This symbol will disappear once the reading is back within normal range.

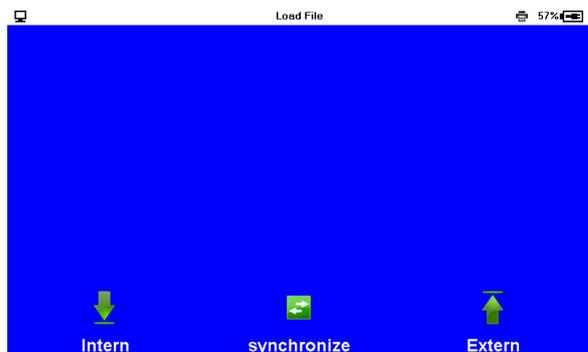
5.3 Performing a test

The starting point of a test is always the measurement screen when measurement is activated. Pressing the key field „Start“ opens the test dialog. After confirming with „Start“, the test can be started here using the last used test parameters. A prepared configuration can be loaded via key field „Load file“ (Test figure 1).

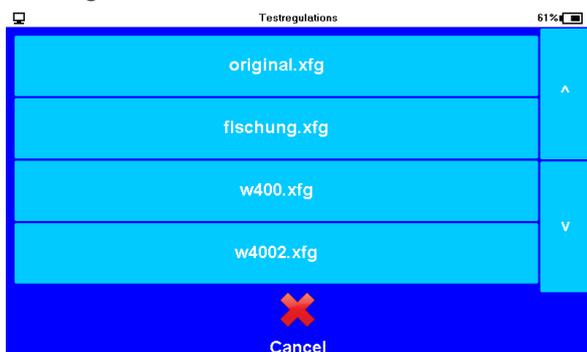
When loading a configuration, it will be asked from which memory the configuration shall be loaded (Test figure 2). After selecting, any configuration being there will be shown (Test figure 3). After a configuration has been chosen, you will arrive in an overview where its contents will be shown (Test figure 4). You will get back to the selection again by clicking „Back“. The configuration will be loaded by „OK“. You will arrive in the measurement screen and the test will start.



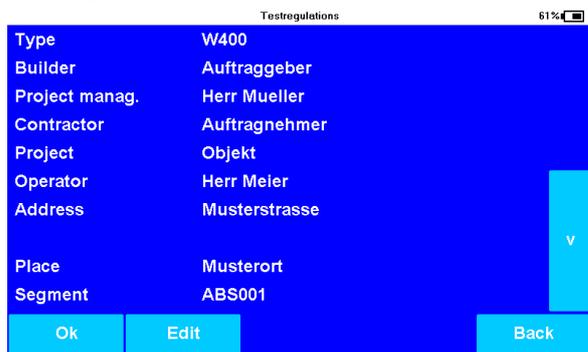
Test figure 1



Test figure 2



Test figure 3

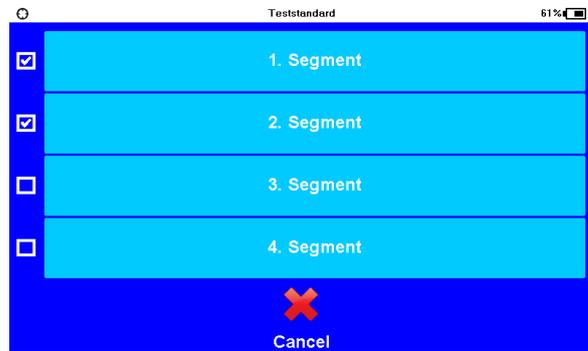


Test figure 4

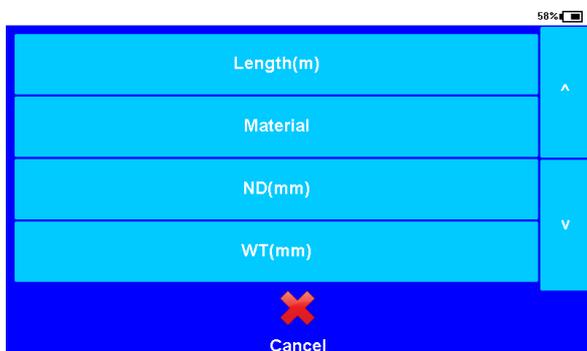
Furthermore, some types of tests such as W400 provide adapting test parameters. This is done by „Edit“. Test variables such as test type and individual segments can be adapted here. Segments of the length 0 are deactivated (visible at not activated checkmark in the section choice, see W400 figure 2).



W400 figure1

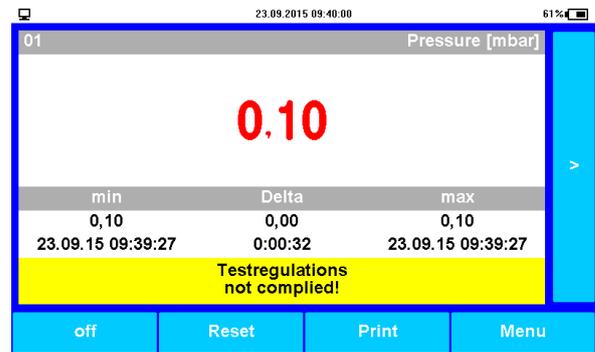
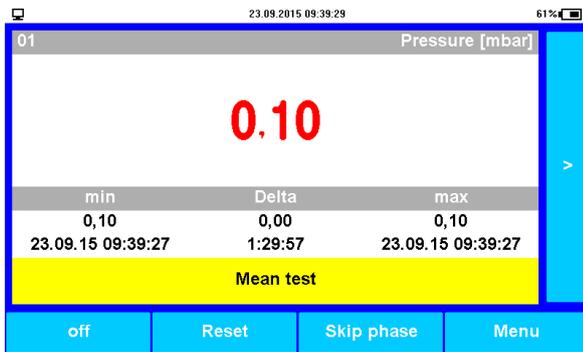


W400 figure 2



W400 figure 3

The current phase is shown below. According to requirements, phases can be skipped by „Skip phase“. The remaining time of the current phase is shown in „Delta“. After finishing the test, its results will also be displayed as text highlighted in colour. Any test-related information can be printed out by „Print“.



5.4 Status information

The status bar of the measurement screen also provides, besides current time, important information on device state as follows:

-  Battery condition: the accumulator's charging level is shown symbolically and as percentage text. A discharged accumulator is marked by „X“ at battery symbol. A connected charger is displayed as plug symbol. When charging, a rising battery level can be seen.
-  The MPK is connected to a PC and this connection has been recognised.
-  If a GPS module is available, it will be tried to determine the current location at measurement start. The searching process is indicated when this symbol flashes. After a position is localised, this symbol will permanently be illuminated. In case of failure, this symbol will disappear.

6 Evaluation on PC/laptop

6.1 Using the external medium

The external medium (preferred a USB drive) can be plugged at the USB port. It provides the backup option and data transmission to a PC/laptop.

Backups are saved in the internal memory upon finishing measurement or system shut-down. A current backup will be made and any available backup records will be copied into the external medium by the menu command „Backup“.

After connecting the data medium and clicking on the respective drive letter, all saved data will be shown. Now these data can be evaluated by the software PWB-Soft.

Before removing the data medium from PC/laptop, please click on the respective drive letter of the memory stick with right mouse key to open the context menu where you can apply the function „Remove“.

Please note, you can only use data media formatted with FAT32 since other file systems are not recognised by the MPK.

6.2 Created files

The backup file have names consisting of the text field „project“ of the test configuration, a „_“ and the measurement start in format DDMMYYHHmmSS. They have the ending „.pwb“.

6.3 Reading by PWB-Soft

A connection to PC/laptop will be established by the software PWB-Soft by using a USB cable connected at the online port. Thereafter, the most recent measurement of the device can be read by pressing the respective button.

6.4 Mode mass storage

If the reading files if the internal memory shall be used, it will be done via mass storage mode which is under the menu item *Evaluation* submenu item *Mass storage*. If the device is connected to PC/ laptop, an external removable storage medium will appear there. Any reading files of the system are stored on it. They can be opened by the software PWB-Soft and can be evaluated in the same way as the read data. After editing files has been done, use the field „Done“ at device to confirm it. The removable storage medium will disappear and the MPK can be operated again.

7 Power supply

7.1 Accumulator checking

The power of the MPK is supplied by a lithium-ion accumulator.

The charge state of this accumulator is cyclically determined by the system and displayed as mentioned in chapter 5.4. The expected runtime depends on system state. States like activated display, active PC connection and short sample rates decrease the accumulator runtime.

If the accumulator capacity falls below 20%, a remaining runtime of 30 minutes will be ensured. Thereafter, a backup will be made and the system will shut down.

8 Technical specifications

8.1 MPK

Overall dimensions	406 x 330 x 174 mm, degree of protection IP 65
Analogue input	1 flange-mounted temperature channel, 1 built-in pressure channel 1 optional channel, 1 optional tube
Data memory	4 GB
Threshold	adjustable upper and lower limit value for each analogue channel
Sample rate	adjustable in discrete steps from 1s up to 1h
Real time clock	deviation ± 3 ppm ($\Delta f/f_0$) at -15°C up to $+80^\circ\text{C}$
Storage mode	ring buffer mode (oldest date are overwritten at full memory) or linear storage unit (stops at full memory)
Interface	USB, connection to PC as virtual Com interface, maximum 115200 Bd 8 data bits, 1 start bit, 1 stop bit, no parity check
Display	800 x 480 pixels, 65535 colours, touch interface, capacitive brightness and display period adjustable
Power supply	7,4 V lithium accumulator, 6200 mAh, 12 V mains adapter
Operating temperature	$-20..60^\circ\text{C}$
Storage temperature	$-20..70^\circ\text{C}$

9 Recycling of batteries and old appliances

Used electric appliances, batteries and rechargeable batteries are subject to particular statutory provisions. Batteries, rechargeable batteries and electric appliances must not be disposed with the household waste. The end user is obligated to return them by the law. Used electric appliances, batteries and rechargeable batteries can be disposed at collecting points, municipal disposal areas or by manufacturer / supplier.

The Paul Wegener GmbH as seller of batteries and electric appliances fulfills its take-back obligation and disposes used batteries and old electric appliances free of charge. This take-back obligation, however, limits itself to used electric appliances, batteries and rechargeable batteries which belong or belonged to the product range of the Paul Wegener GmbH and the amount which was delivered by the Paul Wegener GmbH. The end user bears the forwarding charges.

EU-DECLARATION OF CONFORMITY

Herewith we declare that the data acquisition systems of type range

PWBlogg MPK

complies with the directive **2004/108/EG** in reference to electromagnetic compatibility. The data acquisition system was developed according to following harmonizing standards:

- EN 61000-6-3:2011-09** subject basic standard for emitted interference – emitted interference for living quarters, business- and trade as well as small firms
- EN 61000-6-1:2007-10** subject standard for interference resistance - interference resistance for living quarters, business- and trade as well as small firms

Manufacturer:

Paul Wegener GmbH
Marienstraße 24
D-06493 Ballenstedt
Tel.: +49(0)39483 96 300
Fax.: +49(0)39483 96 400
Internet: www.paul-wegener.de
e-mail: info@paul-wegener.de

The safety advice of the product documentation must be followed!

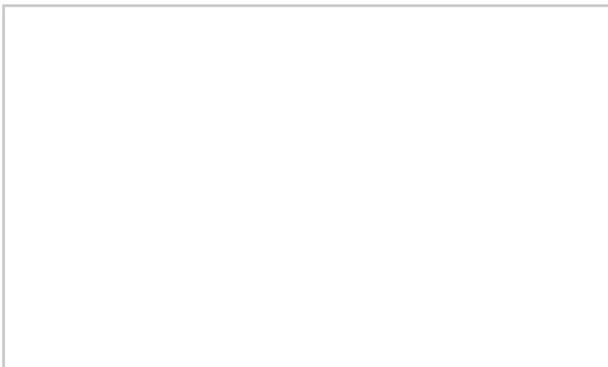
Ballenstedt, 20.04.2016



Wegener
Managing Director

10 Troubleshooting

Problem	Measure
Software reports: „No modules found!“	Check the following: <ul style="list-style-type: none"> • whether correct interface chosen • whether cable to data logger and PC is connected properly
No data stored in controller	Check, whether: <ul style="list-style-type: none"> • a pre-set starting time is reached and measurement is activated • battery is functional • all transducers and cables are functional • readings are shown on LCD • moisture has been intruded in the data logger
Password forgotten	Read out performance data, send reading file to manufacturer
Software does not read performance data completely or reports errors when reading data	Check, whether: <ul style="list-style-type: none"> • all cable connections are made properly • moisture is intruded in the data logger • battery of data logger is functional Connect it directly again (menu item „module/connect“) and start reading performance data again Modern computers have power management functions. During shutdown of hard disk or change into standby mode the CPU can be busy temporarily, so that it „oversleeps“ the sent characters. This leads to abort of reading. If necessary, prolong times for activating standby functions or switch off the power management.



Paul Wegener GmbH
Marienstraße 24
D-06493 Ballenstedt
Tel.: +49 (0) 39483 96 300
Fax: +49 (0) 39483 96 400
Internet: www.paul-wegener.de
e-mail: info@paul-wegener.de

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