



**PAULWEGENER**  
MESSTECHNIK SEIT 1921

**Operating manual**

Data acquisition system

**PWBlogg**



Device alternatives: N6/4 to N6/7



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# 1 Safety instructions on installation, start-up, maintenance and trouble shooting

## 1.1 Installation and start-up

The data acquisition system PWBlogg N6 is destined for intended use within gas explosion hazardous areas of zone 1 only if there is the respective safety marking on the identification label.

Before installing the device within the hazard area, please check whether the ambient conditions meet the safety level of the data logger (ambient temperature, gas group, temperature classes etc). The applicable installer- and operating regulations must be observed.

The dedicated junction at the housing of the data logger must be used for integration into the potential equalisation of the unit or the system.

Pluggable external transducers must only be used with the data logger with which they were delivered (compare identification number in the identification label).

If the device is equipped with an external infrared online port, that port can be temporarily as well as permanently used outside of the hazard area for connecting laptop/PC or modem. That infrared online port is even with pluggable connection part of the measurement instrument and must only be used with the data logger with which they were delivered (compare identification number in the identification label).

If the use of one or both alarm outputs is destined, the specified connection values for maintaining intrinsic safety must be adhered.

## 1.2 Maintenance

Maintenance jobs at the data logger restrict themselves to doing battery changes, cleaning the device and visual check up of connecting cables of components of the measurement system.

If the connecting cables are damaged, please contact manufacturer for purpose of repair.

The housing should be simply cleaned by wet cloth to avoid electrostatic charge.

The devices are designed in such a way which facilitates safe battery change within Ex zone 1. Please note following safety instructions when changing battery:

- Only battery packs BP7.2N5Ex or BP16.5N5-Ex1 supplied by manufacturer must be used. Using other batteries or battery packs may cause danger of fire or explosion.
- The battery pack is fixed inside the device by Velcro fastener. Make sure that the new battery pack is firmly fastened at its dedicated position.
- Do not rub or clean the battery pack using dry items. There is a danger of electrostatic charge.
- The battery pack used inside the device can be a danger of fire or burn in case of mishandling. Do not charge, open, heat over 100°C or incinerate it.
- Do not try to open the battery pack by force. It contains components which heat themselves to high levels due to a short circuit.
- If the battery connecting cable is visibly damaged, you must not use it anymore, but replace it by a new one. Please note that the cable is not caught when closing the device.
- Do not use pointed or sharp-edged tools when working to avoid damages to the electronics of the device.
- Do dispose of batteries promptly. Keep them out of reach of children. Do not open them or throw them into fire.



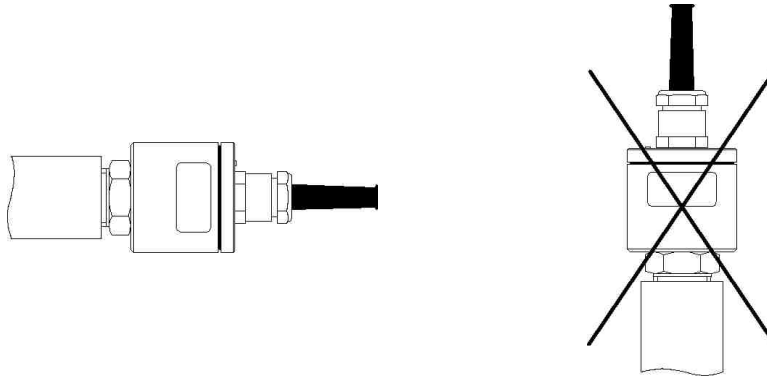
**Attention: The electronics consists of electrostatic sensitive components. Pay attention to ESD-operation instructions when handling with this electronics!**

### 1.3 Trouble shooting

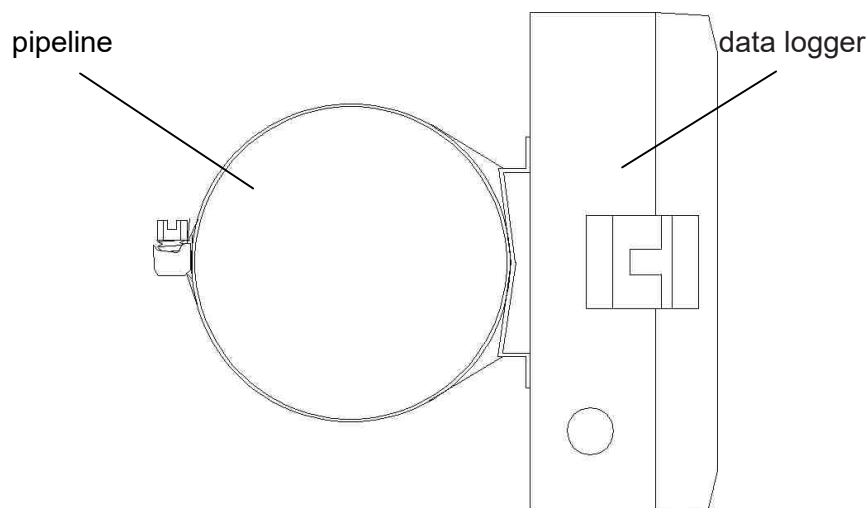
No modifications are allowed to devices which are designed for intended use in explosion hazardous areas. Repairs of devices must only be done by purpose-trained specialists.

If the measurement system is equipped with pluggable transducer ports (optional), the defect measurement module or pressure transducer can be forwarded to its manufacturer for checking or repair. A complex dismantling of the connecting cables between transducer and measurement module is not applicable.

#### Mounting notes:



Relative pressure transducers contain a venting device and should be horizontally positioned.



Data loggers (side view) can optionally be mounted on pipelines or the like by band clamp.

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## 2 Start-up instruction

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

- Install evaluation software PWB-Soft on your PC/laptop firstly.
- Subsequently, in observance of the safety instructions mentioned, connect data logger to PC/laptop by infrared data cable.
- Start the evaluation software. Follow instructions on screen (see also operating manual on PWB-Soft)
- Set interface in dialog box „Settings“ of menu item „File“.
- Establish communication between PC and data logger via „Connection“.
- Make all necessary settings in the dialog field „Configuration“. Please note that the data logger is delivered with battery power-saving sample rate.
- After confirmation by pressing „OK“, the controller will be configured again and the data memory will be deleted. Measurement can start now.
- Please note, the data logger must be turned on for activating measurement and the adjusted measurement start time must be reached!

**Attention:** Relative pressure transducers on devices with delivery date **from 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!**

## 3 Data acquisition system PWBlogg

### 3.1 Components of data logger PWBlogg N6/x

Data loggers PWBlogg N6-Ex1 consist of following units. These allow in their entirety reading acquisition and -storage, evaluation of measuring data on PC/laptop/PDA and adaptation to specific measuring problems. Figure 1 describes components at data logger N6/7-Ex1.

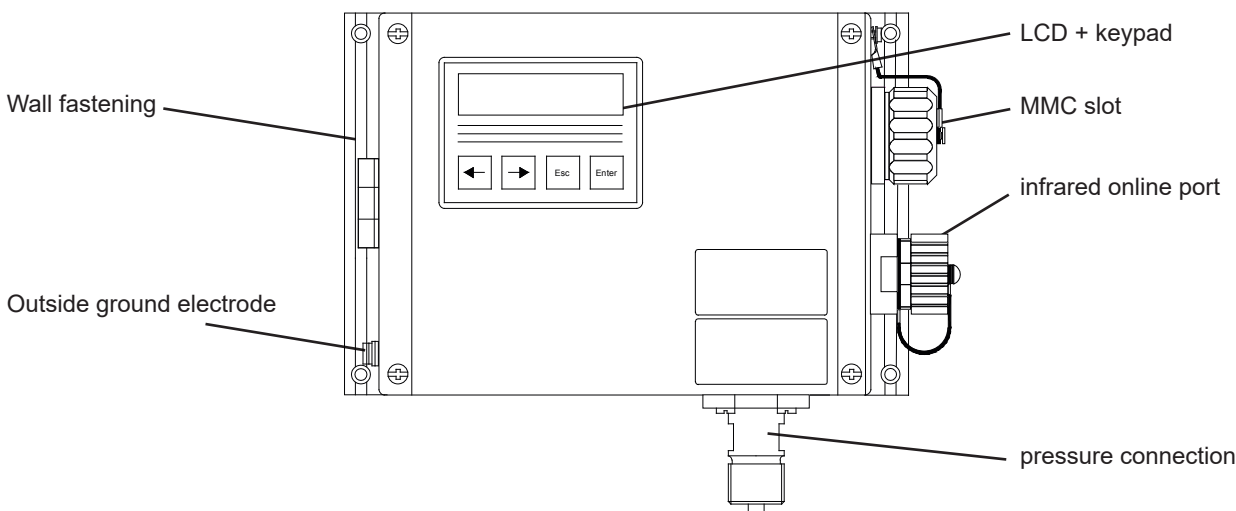


Bild 1 Ausführung N6/7-Ex1

#### *Controller*

It controls all features of the data logger such as data acquisition and -storage, display control and evaluation of keypad commands, backup by MMC/SD card as well as activation of peripherals (PC, printer or modem). The controller contains an internal memory which can store approx. 260.000 up to 500.000 readings.

#### *Transducers*

The transducers record physical measurement quantities such as pressure or temperature and convert them into electrical signals which can be processed by measurement system. Only potential-free contacts are deployed as transducers for status- and pulse signals.

### LCD and keypad

The control of data logger functions is menu-driven by LCD and keypad. In addition to the online feature of checking current readings, numerous settings can be made on data logger directly.

### Online connection

The communication of the data logger to a connected PC/laptop/Pocket-PC or modem is done by infrared online port which is equipped with a sealing cap to keep the degree of protection of the housing.

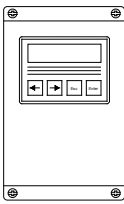

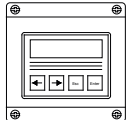
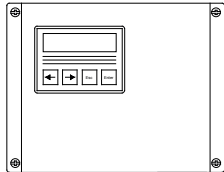
### Software

The software PWB-Soft 2.1 is used for readout of measuring data, for configuring measurement and erasure of memory. Data can be shown in tabular form and as chart. Data acquisition can also be observed online at PC.

## 3.2 Device types

The basic version of data loggers PWBlogg N6/x consists of following components:

- Aluminium housing
- Wall fastening and outside ground electrode
- 64 kB data memory
- Intrinsically safe battery pack with 7200 mAh or 16500 mAh
- Backup battery for data backup
- LCD with keypad
- Infrared online interface

Typ	Bauform
<p><b>PWBlogg N6/4-Ex1</b></p> <ul style="list-style-type: none"> <li>– Housing 100x160x60 mm</li> <li>– Degree of protection IP 65</li> <li>– Ex-Lithium battery with 16500 mAh</li> <li>– MMC/SD card slot (optional)</li> <li>– Alarm output (optional)</li> <li>– Logging of <b>up to 6 Measurement signals</b></li> </ul>	
<p><b>PWBlogg N6/5-Ex1</b></p> <ul style="list-style-type: none"> <li>– Housing 80x80x60 mm</li> <li>– Degree of protection IP 65</li> <li>– Ex-Lithium battery with 7200 mAh</li> <li>– Logging of <b>up to 2 Measurement signals</b></li> </ul>	
<p><b>PWBlogg N6/6-Ex1</b></p> <ul style="list-style-type: none"> <li>– Housing 100x100x60 mm</li> <li>– Degree of protection IP 65</li> <li>– Ex-Lithium battery with 7200 mAh</li> <li>– Logging of <b>up to 4 Measurement signals</b></li> </ul>	
<p><b>PWBlogg N6/7-Ex1</b></p> <ul style="list-style-type: none"> <li>– Housing 180x140x70 mm</li> <li>– Degree of protection IP 65</li> <li>– Ex-Lithium battery with 16500 mAh</li> <li>– MMC/SD slot (optional)</li> <li>– Alarm output (optional)</li> <li>– Logging of <b>up to 8 Measurement signals</b></li> </ul>	

### 3.3 Transducers

The possibility of flexible adaptation to most different measurement tasks is a characterising for the data acquisition system PWBlogg. For this purpose, we offer specific transducers which are supplied directly by the measurement system without additional power supply.

Standard transducers and/or measurement inputs are available for following measurement signals:

- Pressure
- Temperature
- Pulse/Count signals
- Status signals

#### *Analog inputs*

Up to 4 analog transducers (pressure, temperature etc.) can be connected. For each transducer the resolution 8 bit, 12 bit, 14 bit or 16 bit can be adjusted separately. For example, a temperature signal can be recorded with 8 bit and a pressure signal can be resolved with 16 bit at the same time. For each analog input can be adjusted a lower and an upper limit as well as a hysteresis. Fluctuations of the alarm output within the threshold between the adjusted limit value and the standard operating range can be inhibited by means of a hysteresis. So that simple control tasks can be put into effect.

#### *Status inputs*

Up to 4 status inputs are provided. The input is configured as digital input for logging state of contacts, switches etc. The user can assign a text with up to 5 characters to any state. Hence, eg it is possible to mark an SAV with „open“ or „closed. That state can be easily read on display of the data logger and in tabular evaluation. If a freely selectable state is marked as alarm state, that quality can be used to realise event-driven logging.

#### *Pulse inputs*

Data loggers of type series N6/x record up to 4 pulse signals. The operator can freely adjust the pulse value. Pulses can be recorded in terms of meter reading as well as flow signal or as combination of both.

Pulse inputs can be operated as NF-inputs ( $f < 2 \text{ Hz}$ ) or as HF-inputs ( $2 \text{ Hz} < f < 100 \text{ Hz}$ ). According to this configuration, the flow is determined from medium number of pulse per interval 2 or from time lag of 2 successive pulses.

### 3.4 Data logging and storage

The measuring ranges of the connected transducers on the data logger PWBlogg are configured by manufacturer and can not be modified by user.

Following settings relevant to data logging can be adapted to the requirements of measurement by means of configuration dialog of PWB-Soft on PC/laptop/Pocket-PC:

- Identification (eg company address)
- Short text (location/time)
- Measurement start (date/time)
- Sample rate (min 1ms; max 1h)
- Alarm rate (if required)
- Threshold defaults for analog channels
- Alarm state for state inputs
- Way of reading storage (cycle memory, straight memory)

Following settings can be changed on device:

- Start measurement
- Interval 1 and 2 (sample rate)
- Memory type (cycle memory/straight memory)
- Short text
- Module time



### *Start and interrupt measurement*

The reading recording can be started or interrupted by Enter key. The adjusted start time must be reached to start measurement.

When using Enter, an authentication mechanism (if activated by respective configuration) inhibits deactivating measurement by mistake.

### *Interval 1 and Interval 2*

Two interval increments (sampling rate) to acquire measuring values can be set. Interval 1 can be set from 1s to 1h and is used for recording of readings during standard operation. Interval 2 can be adjusted from 1ms to 1min and is activated once a threshold violation is detected.

### *Threshold monitoring*

The data logger provides specifying thresholds and records threshold violations by means of a second sample rate. This leads to improved logging and evaluation of such events. Additional to the threshold, a hysteresis can be specified. Therefore, it is possible when using an alarm output to realise a simple control. At digital channels (status) an alarm can be triggered at any status change of the signal.

Parameters important to monitor thresholds are described as follows:

### *Memory saving mode*

The memory saving mode specifies if measuring data are **always** recorded or **in case of an alarm only**. So it provides event-driven data recording.

### *Sample mode*

The sampling mode can be set to „limit value monitoring“ or „standard“. At „standard“ mode, interval 1 values are measured and recorded (depending on memory saving mode). In case of a threshold violation a redirection to interval 2 is done where measurement is carried out till the threshold violation is cancelled (in consideration of adjusted hysteresis values).

The setting „permanent limit value monitoring“ means permanent sampling in interval 2. This leads to immediate identification of threshold violations. Thereafter, the memory interval 1 is redirected to interval 2. Please note that frequent sampling of transducers increases power consumption of data logger and decreases economic life-time of the battery!

Digital signals and pulses are always monitored in interval 2, independent of adjusted sampling mode, because of a low power consumption. That means eg if there is a threshold violation of flow rate or a monitored safety valve operates, the alarm mode is switched on directly. Now, all data are measured and recorded in interval 2.

### *Shorted alarm storage*

In case of a threshold violation normally data recording is continued with interval period 2. The period of data recording can be much shorter than expected. To avoid it, the option „shorted alarm storage“ can lower that period of time where interval 2 is used for storage. The storage is limited to a maximum of 2 x interval 1 (eg 2 x 5 min). Subsequently, measuring in interval 2 will continue, but recorded just with the cycle of interval 1.

### *Reading recording and backup on MMC/SD card (optional)*

Reading recording occurs optionally at cycle memory or at straight memory mode. The measurement ends at straight memory mode once memory is filled completely. At full memory when using cycle memory mode, the oldest data in each case will be overwritten with current values so that continuous recording is possible.

If memory is full, devices with MMC/SD memory extension will transmit the entire data content into the MMC/SD card before overwriting the oldest reading. But it is only possible at cycle memory mode! The MMC/SD creates a reading file which can be opened and evaluated by the software PWB-Soft.

**Depending on type and factory setting, data backup can be done in day files and in one year file!**

### Password protection

The configuration can be protected via password against unauthorized access. Without knowledge of password, it is not possible to delete stored data or to change configuration of the data acquisition system. This also applies to configuration changes on device.

Note that the password on data logger can only be entered as numeric string. Shall it be possible to change configuration on data logger, the password must be entered as numeric string as well.

### Error sources

The analog signals of transducers are converted into a digital value with resolution of 8 bit, 12 bit, 14 bit or 16 bit. The following table demonstrates the difference between resolutions by means of a 16 bar transducer. The values, represented in PWB-Soft program or on LCD must be rounded to the defaulted number of decimal places so that the increment between two neighbouring values is not always identical.

ADU	digital steps	resolution
8 Bit	256	62,5 mbar
12 Bit	4096	4 mbar
14 Bit	16384	1 mbar
16 Bit	65535	0,25 mbar

Table: AD-conversion, resolution

Potential sources of error are non-linearities of AD-converter which are irrelevant on resolution of 8 bit or 12 bit. However, another important one is the digital step at small resolutions. At the limit of two sequent digital values, the tolerance between the measured (in digital steps presentable) and the real value (other sources of error excluded) already amounts  $\frac{1}{2}$  resolution step. As in the table 8 bit is equivalent to 31,25 mbar. Additionally, there are device-dependent sources of error such as temperature drop or deterioration of components. At resolutions as 14 bit and 16 bit, they have much importance.

### 3.5 Threshold signalling

If there is an exceeding of the threshold or it falls below, an online-presentation (triangle symbols) will appear on display. Furthermore, the data loggers possess 2 separate alarm outputs for signalling threshold violations. If there is an identification of an exceeding of the limit or the opposite way round, so the respective alarm output will be activated. Once the signal is in regular range again (in consideration of hysteresis), the respective alarm output will be deactivated again. While alarm state is on, it will switch over from interval 1 to interval 2 so that in case of an alarm state the measurement signal can be terminably finer resolved.

Shall the alarm state be signalled far from measuring location, there are different options:

- Use of floating switch and activation of available monitoring equipment
- Alarm message by SMS to a mobile phone via connected GSM-modem
- Alarm message by voice output by a threshold signalling device

At locations without telephone jack or any other connection to the place of alarm signalization, the wireless transmittance of the alarm message via GSM modem can be used. An alarm signalling by voice output is possible everywhere, where a phone connection is available. The threshold signalling device is connected to the phone and must be supplied via delivered AC-adapter. Subsequently, the configuration in accordance with separate instruction is done. Four telephone numbers which are dialed in alarm case can be entered at the most. While answering the phone, a speech alarm up to 20 sec is sent. If a complete device system is available consisting of data logger, threshold monitoring system and optional modem, the threshold signalling device is supported on a short-duration with the battery of the data logger to keep the entered data.







Further technical solutions of the alarm message can also be implemented to customer requirement.

## 4 Operating the data logger N6

Controlling data logger functions is done by keypad and LCD. Different functions are arranged in a menu structure with several levels which facilitates retrieving of functions desired as well as expanding of the existing system to customer specifications.

### 4.1 Notes on key operation

#### *Standard key functions*

	previous menu item, previous channel ...
	next menu item, next channel ...
	short: one menu level back, cancel
	long: cancels inputs
	short: calls menu item
	long: special function


#### *Special key functions at input/setting of text/periods*

		cursor keys:
------------------------------------------------------------------------------------	------------------------------------------------------------------------------------	--------------

The character to be entered / value to be set can be reached by bidirectional paging within one character selection. If the respective cursor key is pressed longer, the selection of characters runs by themselves till the key is released.

	- key short:	<b>= cursor to the right</b>
-------------------------------------------------------------------------------------	--------------	------------------------------


Short pressing Enter completes the entire input of the character selected and moves to the next digit. When entering text, the next character can be entered this way. If time is entered, the next place will be positioned.

	- key long (approx. 2s)	<b>= OK</b>
-------------------------------------------------------------------------------------	-------------------------	-------------

Long pressing ,Enter' completes the entire input and after confirmation request, it adopts changes as the case may be.

	- key short	<b>= cursor to the left</b>
-------------------------------------------------------------------------------------	-------------	-----------------------------

The Esc key moves the input cursor one digit backward. If the time is entered, thereby the cursor is moved only. If text is entered (short text, password), the ,Esc'-key operates as delete key as well. It deletes the character at cursor position.

	- key long (approx. 2s)	<b>= cancel</b>
-------------------------------------------------------------------------------------	-------------------------	-----------------

Long pressing ,Esc' cancels input and rejects all changes.

#### *Setting predefined parameters / options*

If parameters / settings are selected from a list (eg sample rate), the call of the respective dialog is identified by a check mark. To change the setting, the new value is shown by using the arrow keys. Thereafter, it has to be marked (check mark) by short ,Enter'. That setting will be adopted as the dialog is quitted by continuous ,Enter'. Two subsequent questions have to be confirmed by ,yes'.

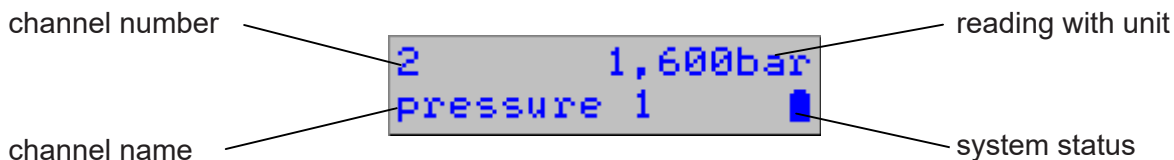
## 4.2 Online display

The major task of the device is to display and store readings. Hereinafter display of readings is called online display.

### 4.2.1 Online display when measurement is activated

When activating display (if measurement is on), the current reading of the last selected channel will be displayed. Change-over between transducers connected is done by arrow keys. Special information on reading can be displayed by ‚Enter‘ and ‚Esc‘.

*Example display:*



The Online display consists of real reading display with unit and channel number as well as of an infoline of several layers (line 2 of display).

#### **Channel number and reading**

The first line of the online display shows channel number and reading. The channel number corresponds to the number of the channel indicated on the identification label. The reading is shown including dedicated unit.

Status signals display the respective status text (as specified in configuration) instead of a value.

A current threshold exceeding/falling below at the channel displayed is indicated by an arrow symbol (up, down) after the channel number!

If transducers with Live-Zero-Signal (eg pressure transducer) are used, the reading flashes in case the transducer is not connected or defect.

#### **Infoline**

Channel name and system status are shown in the Infoline of the main level. The next level can be called by ‚Enter‘. The previous one is activated again by ‚Esc‘. The Infoline consists of 5 levels:

- description of the transducer displayed
- current reading difference to the first value since last reset of minima and maxima or since activating measuring (delta-value); in particular helpful e.g. when pressure test are carried out!
- measuring period since last reset of minima and maxima or after activating measuring, the ♥ symbol indicates the ongoing measuring (symbol frequency equates to sample rate)
- minimum reading with dedicated measuring period (is indicated by turns)
- maximum reading with dedicated measuring period

The Infoline is also used to indicate following warning messages:

- in case of a threshold violation: ‚!!! Alarm !!!‘ is indicated and the transducer which triggered it will be displayed
- if the battery is lower than 10%, every time if the display is activated, the message ‚!!! Battery !!!‘ will be shown!

The warning messages can be switched-off by ‚Esc‘.

### 4.2.2 Online display if measurement is off

If measurement is off, the device type is displayed in the upper line. The current status is displayed in the second line.

Measurement can (still) be deactivated, because:

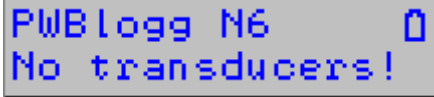
1. the on/off switch of the device is in off-position or measurement was switched off by menu



— system status

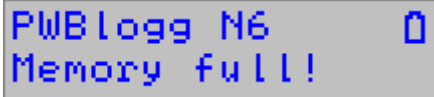
→ In this case measurement can only be acticated by user!

2. all transducers are deactivated



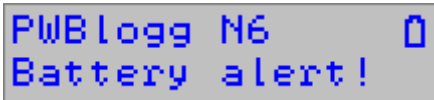
→ To start measurement, at least one transducer has to be activated by PWB-Soft!

3. memory of the device is full (at storage mode ,straight memory')



→ The memory of the device has to be read out and the device has to be restarted.

4. the battery of the device has been removed or recognized as entirely discharged



→ Battery has to be replaced and the battery date has to be refreshed if necessary!

5. start time for the measurement not reached yet (start time is displayed by turns)



→ Measurement starts automatically once start time is reached.

### 4.2.3 System status

The system status indication is used to display most important pieces of status information of the data logger. Normally, the battery symbol is displayed here. Following further symbols are shown flashing:

- ⌵ PC/printer etc. connected
- ▀ GSM level indication if iModem is connected (the taller the bar the better the reception)
- Access to MMC/SD card - do not remove the card!

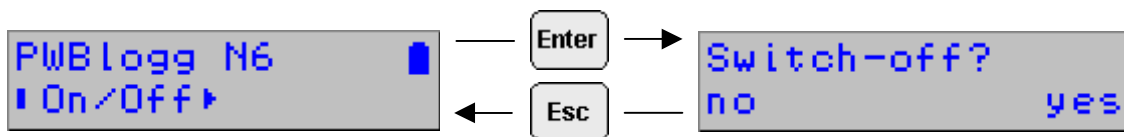
### 4.3 Menu

Special settings and function calls are made by the menu of the device. The menu can be reached from reading display by pressing ,Esc' or ,Enter'. The menu can be quitted by ,Esc' to return to the online display.

The menu appears in the second line of the display and provides following functions:

- On/Off
- Set to zero
- Reset Min/Max
- Print
- Parameters
- Settings
- Backup
- Status

Change-over between several menu items (in several submenus too) is done by arrow keys!

**On/Off**

The menu item ,On/Off' enables switching on/off measurement.

If measurement is on, the question ,Switch off?' will appear. The query can be confirmed and measurement can be switched off by ,Enter', quitted without saving by ,Esc'.

If measurement is off, it can be activated in the same menu item. The question ,Switch on?' will appear.

**Please note: If a password is activated, engaging/disengaging can only be done after the correct password is entered.**

**Set to zero**

After confirmation by user, the current channel displayed will be set to zero, provided that it is a relative pressure channel which is calculated from absolute pressure connected to a device!

The transducer can be set to zero if it is pressureless and indicates a value different from zero or if based on current reading e.g. a potential pressure drop shall be logged (it is recommended to use the difference display in the infoline!).

**Reset Min/Max**

All minima and maxima of active channels are reset here to the current reading. At the same time the initial value of the difference display in the infoline is set and the measurement period is set to 00:00:00.

**Print**

Provides printout of the values by a connected printer.



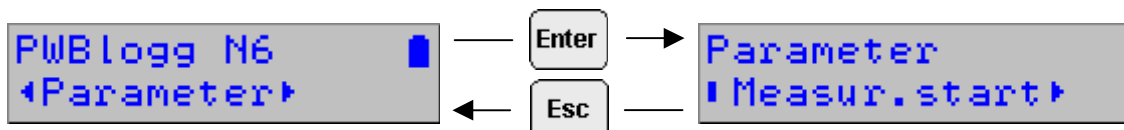
First of all, the choice between normal-, enlarged printout (zoom) or status reading is made. Subsequently, the channel to be printed has to be selected by arrow keys.

The ,Enter' key actuates print operation, ,Esc' cancels it at any time!

**Parameters**

The parameter entry for the data logger comprises primary parameters which can be set at measuring point. The dialog is password protected to prevent unauthorised access.

**The information given at section 4.1 applies to setting the parameters!**

**Start measurement**

The time of start measurement is set here. This parameter can be used e.g. for running measurement at several data loggers synchronously!

The single fields (day, month, year, hour, minute) are selected by ,Enter'/'Esc' and set by arrow keys.

Long pressing (2s) ,Enter' confirms input. The menu item is quitted without saving by pressing ,Esc'.

**Interval 1**

The period between two reading samples at normal operation (no threshold violation) is set here.

**Interval 2**

This interval determines the period between two reading samples in case of an alarm and serves as time basis for calculation and display of current flow values as well as for query status signals.

The connection between interval 1 and interval 2 requires that interval 1 is always an integer multiple of interval 2. The increments for setting interval 2 result therefrom. Interval 2 can not be longer than interval 1.

#### *Storage type*

Provides selection between linear memory and circular buffer. The linear memory stops reading logging once the memory is full. If circular buffer is used, the oldest readings are overwritten at full memory.

#### *Storage mode (in standard menu only)*

The storage mode determines at what time data are stored. It can be selected between ‚Store always‘ and ‚Alarmvals only‘ (threshold violations are logged only).

#### *Sample mode (in standard menu only)*

The sample mode defines sampling permanently in interval 2 in case of standard operation (alarm monitoring) or if it is switched over to sampling and logging in interval 2 only in case of alarm.

#### *Short text*

The ‚short text‘ entered can be changed here. Please note the details on entering texts (section 4.1).

#### *Load from MMC/SD*

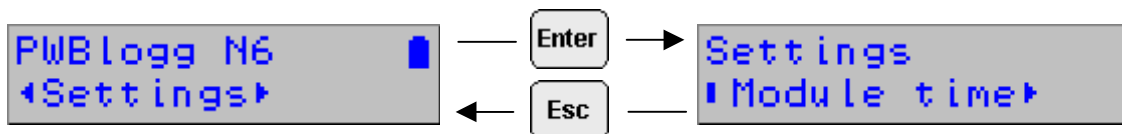
If data loggers are equipped with MMC/SD interface, a parameter record can also be loaded from a MultiMediaCard. For this purpose a configuration data file (kfg-file) has to be created initially. This menu item enables reading the file into the data logger.

Please note that the measurement start is not stored in the file. Hence a measurement start specification can only be done using measurement start dialog in parameter menu or online on PC!

#### *Restart*

Restart saves changed parameters and deletes data memory. Before data are deleted, an authentication mechanism appears to be confirmed by ‚Enter‘.

#### **Settings**



#### *Module time*

The system time of the data logger is set here (see also section 3.1).

**Note: The memory contents of the data logger have to be deleted in order to set time! Hence the new time will be saved not until the authentication mechanism is confirmed and a password is entered (if set).**

#### *LCD*

If turn-on-time is 90s, display automatically turns off 90s after last keypress. If ‚Permanent‘ is set, display remains on as long as measurement is on. This option leads to higher power consumption and should only be activated at devices which are intended for short-term deployment (e.g. pressure tests).

#### *LCD contrast*

The contrast of the LCD is slightly dependent on temperature and can directly be set on the data logger by means of the arrow keys. This setting is displayed in percent.

#### *Printer*

The type of printer to be used for optional printout of a thermal printer is set here.

#### *Battery*

Status is set to 100% here after battery change.

#### **Backup**

After authentication mechanism, a backup of measurement data on the memory card will be started. A flashing memory card symbol is displayed while saving. Access to submenu items is denied during storage process!





‘Save data started...’ appears as confirmation message on display. The memory card symbol flashes in the system status display of the online dialog while saving (3.2.3.).

**Submenus can not be called while saving!**

## Status

Most important system conditions are displayed here. Each piece of information can be shown by means of the arrow keys.

Displayed are:

- Module time
- Memory (internal, entire- and free memory)
- MMC (memory available on MMC/SD and free memory)
- Operating hours
- Battery date and calculated remaining capacity
- Serial number of the data logger
- Year of manufacture
- Hardware version
- Firmware state

## 5 Battery

### 5.1 Battery check

The battery state is checked by the firmware of the data logger. All activities of peripherals are taken into consideration, i.e. the length of times in which the display is on or the data logger is online. The activities are acquired and included to evaluation of battery capacity. **The influence of very low temperatures to the available capacity of the battery pack can not be considered in respect of evaluation.**

The manufacturer gives an estimate of durability of the measurement system on request.

Measurement is stopped after falling below minimum voltage and the data logger is operated by energy-saving mode. Thereafter, a back-up battery provides power supply to avoid loss of data over a longer period (even if battery is changed). If battery capacity falls below 20%, battery should be replaced. Recycling of used batteries/rechargeable batteries is described in the paragraph Recycling of batteries and old appliances.

### 5.2 Battery change

**We recommend, battery change should be done by manufacturer.** Please consider following procedure if you want to change it by yourself.

- Obtain the battery you need from manufacturer.
- Read out the stored data and deactivate measurement.
- Unscrew the cross-head screw of the housing.
- Loose pin-and-socket connector on battery pack carefully and remove the old battery.
- Place the new battery in the battery tray and fit it with the Velcro fastener which is designed for it.
- Connect battery with pin-and socket connector of the data logger.
- Close the housing again without crimping the connecting cable inside.
- Refresh battery date on menu of the data logger or by means of software PWB-Soft.

#### *General information note for battery change*

The battery change should be carried out without any loss of data when back-up battery is intact. Reading out of data is only used as guarantee in case of a discharged back-up battery. A change of the back-up battery can only be carried out by manufacturer!



## 6 Use of memory card (MMC/SD)

### 6.1 General

The optional memory card (MMC/SD) provides a backup option for data saved in the logger into a non-volatile external storage medium. As the memory card is automatically recognised by PC/laptop as removable medium, so measured data transmission is wireless.

Backup on memory card is optionally done by menu command or automatically. If an error occurs while saving data, the operation will stop and an error message will be shown. The result of the last automatical storage appears as error- or success message if measurement is engaged again.

If automatical storage is used, after 5 minutes the data logger tries to transfer data to the memory card again. This procedure is repeated 10 times at most. If no successful access possible, the card will be highlighted as invalid!

In order to rewrite the card, it has to be removed (if necessary after checking on PC) and inserted into the data logger again.

For purpose of evaluation of a reading file, the memory card including backup has to be inserted into the card reader of the PC/laptop. The reading file desired can be opened on your removable medium by means of the program PWB-Soft.

### 6.2 Notes on avoidance of loss of data

- When removing the card from the data logger, make sure that there is no access to the card at that moment (flashing card symbol on display)!
- Do not forget to use the Windows feature ‚Eject‘ before removing the memory card from your PC/laptop!
- A correct storage of collected measuring data on the external memory card is only guaranteed if memory cards supplied by Paul Wegener GmbH are used!

### 6.3 Use on data logger

The card should be formatted before using on data logger eg by means of the Windows feature ‚Format‘ in ‚My computer‘/‘File explorer‘.

Please note that the cards are only formatted using format FAT and FAT 32 respectively! Other file systems are not recognised by the data logger. Furthermore, older data loggers can only handle the FAT format. If the card shall also be used on older loggers, only FAT should be used.

After formatting, the card can be used on the data logger without any further preparations. Optionally, it is possible to transfer a configuration file (‚\*.kfg‘ which belongs to the data logger) to the memory card.

When inserting the card into the data logger, the free memory space on the card is automatically determined.

**Note: As this piece of information has to be determined by searching the free sections on the card, it can take some minutes, in particular, if cards with large memory capacity are used! During that time a flashing card symbol is shown on system status display.**

**You should not remove the card while searching!**

## 7 Technical specifications

### 7.1 Data logger

Analog inputs	max. 4 inputs recording when sample interval is adjusted
Pulse inputs	max. 4 inputs for potential-free contact pulse width > 10ms, max. 50 pulses per second, logging of meter readings and flows
Data memory	256kB, optional up to 496kB
Threshold	adjustable upper and lower limit value for each analog channel

Sample rate	freely adjustable 1s to 1h
AD-converter	8 bit (256 digital levels, $\pm\frac{1}{2}$ LSB) 12 bit (4096 digital levels, $\pm 1$ LSB) 14 bit (16384 digital levels, $\pm 1$ LSB) 16 bit (65536 digital levels, $\pm 1$ LSB)
Real time clock	deviation $5 \pm 23$ ppm ( $\Delta f/f_0$ ) at 25°C
Storage mode	cycle memory mode (overwrites oldest data at full memory or straight memory mode (stops at full memory)
Interface	infrared interface 9600 Bd maximum 57600 Bd when reading data minimum 2400 Bd when printing via mini printer 8 data bits, 1 start bit, 1 stop bit, no parity check
LCD	2 x 16 characters, contrast and display duration adjustable
Power supply	7,2V lithium battery pack, intrinsically safe capacity 7200 mAh (size 5 and 6), 16500 mAh (size 4 and 7)
Operating temperature	-10..60°C with display (2 x 16)
Storage temperature	-20..70°C with display (2 x 16)

## 7.2 Explosion protection

Intrinsically safe ATEX II2G Ex ib IIB T4 Gb according to DIN EN 60079-0 and DIN EN 60079-11 for intended use within the explosion-hazard area of zone 1.

Alarm output	intrinsically safe subject to:	
	$U_i = 18,0$ V	$C_i =$ negligible
	$I_i = 50,0$ mA	$L_i =$ negligible
	$P_i = 100$ mW	

## 7.3 EMC

In accordance with EN 61000-6-3 (emitted interference in living quarters) and with EN 50081-2 (interference resistance in industrial field).

## 7.4 Standard transducers

Transducer type, dimensions	Measuring range	Class / Deviation
Temperature transducer, integrated in controller	-40..40 °C to -20..60 °C	$\pm 1$ K
Temperature transducer $\varnothing$ 6 mm	-20..60 °C	$\pm 1$ K
Pressure transducer, $\varnothing$ 40 mm, connection G $\frac{1}{2}$	0..50 mbar to 0..70 bar	$\pm 1,0\%$
Pressure transducer, $\varnothing$ 25 mm, connection G $\frac{1}{2}$	0..40 bar to 0..400 bar	$\pm 1,0\%$
Pressure transducer, $\varnothing$ 25 mm, connection G $\frac{1}{2}$	0..1 bar to 0..400 bar	$\pm 0,5\%$
Pulse input	( potential-free contact:	max. 50 Hz )

All transducers are delivered with 1m cable. Longer connecting cables are possible.

## **8 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.

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## EU-DECLARATION OF CONFORMITY

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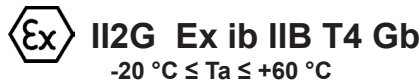
Herewith we declare that the data acquisition systems of type range

### PWBlogg N6-Ex1

complies with the directive **2014/30/EU** in reference to electromagnetic compatibility and **2014/34/EU** for equipment and protective systems for use according to regulations in consideration of explosion-hazard areas. The data acquisition system has been developed according to following harmonised standards:

<b>EN 61 000-6-3:2011-09</b>	subject basic standard for emitted interference – emitted interference for living quarters, business- and trade as well as small firms
<b>EN 61000-6-2:2011-06</b>	subject standard for interference resistance– industrial sector
<b>EN 60079-0:2019-09</b>	electrical equipment for explosion-hazard areas, section 0: general requirements
<b>EN 60079-11:2012-06</b>	potentially explosive atmosphere - section 11: equipment protection by intrinsic safety „i“

Marking as category 2 - equipment for use in explosion-hazard areas of the zone 1:



EC type-examination certificate:

**IBExU08ATEX1159**

The quality management system is monitored by:

IBExU Institut für Sicherheitstechnik GmbH  
Fuchsmühlenweg 7 – D-09599 Freiberg  
phone: 03731 3805 0 – Fax.: 03731 23650  
identification number 0637

Manufacturer:

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e-mail: [info@paul-wegener.de](mailto:info@paul-wegener.de)

**The safety advice of the product documentation must be followed!**

Ballenstedt, 02.03.2022

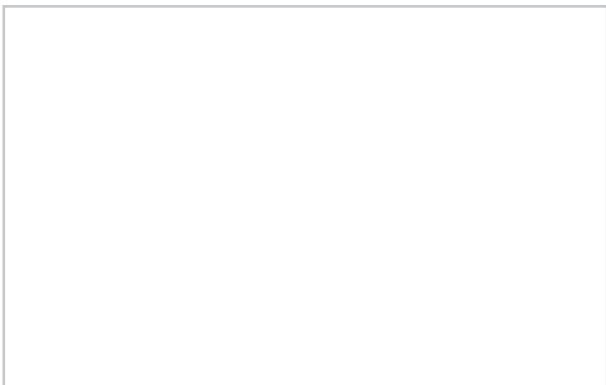
Wegener  
Managing Director

## 9 Troubleshooting

Problem	Measure
Software reports: „No modules found!“	Check the following: <ul style="list-style-type: none"> <li>• if correct interface chosen</li> <li>• if cable to data logger and PC is connected properly</li> </ul>
No data stored in controller	Check, if: <ul style="list-style-type: none"> <li>• a pre-set starting time is reached and measurement is activated</li> <li>• battery is functional</li> <li>• all transducers and cable are functional</li> <li>• readings are shown on LCD</li> <li>• moisture is intruded in the data logger</li> </ul>
Battery is low	Change battery or have it changed by manufacturer
Password forgotten	Read out measuring data, send reading file to manufacturer
No connection possible via modem	Check on PC as well as on data logger if: <ul style="list-style-type: none"> <li>• power supply of the modem is functional</li> <li>• modem and data logger or PC are connected properly</li> <li>• modem is initialized correctly on PC or on data logger</li> <li>• correct type of modem was selected in dialog „settings“ when configuring</li> </ul> <p>If you use a GSM modem, check in addition if:</p> <ul style="list-style-type: none"> <li>• the correct PIN number entered into configuration of data logger and/or in settings on PC</li> </ul> <p>In case of error messages in modem dialog of software, check if:</p> <ul style="list-style-type: none"> <li>• initialization parameters are supported by your modem</li> </ul>
Software does not read performance data completely or reports errors when reading out the data	Check, if: <ul style="list-style-type: none"> <li>• all cable connections are made properly</li> <li>• moisture is intruded in the data logger</li> <li>• battery of data logger is functional</li> </ul> <p>Connect it directly again (menu item „module/connect“) and start reading out of measuring data again</p> <p>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 characters sent. This leads to abort of reading out. If necessary, stretch times for activating standby functions or switch off the power management.</p>
Not enough memory	Data backup has to be done. Delete or rather format the card.
Could not create MMC file	General error message if write/read problems on the card occur. Maybe wrong file system or card is not readable.







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