



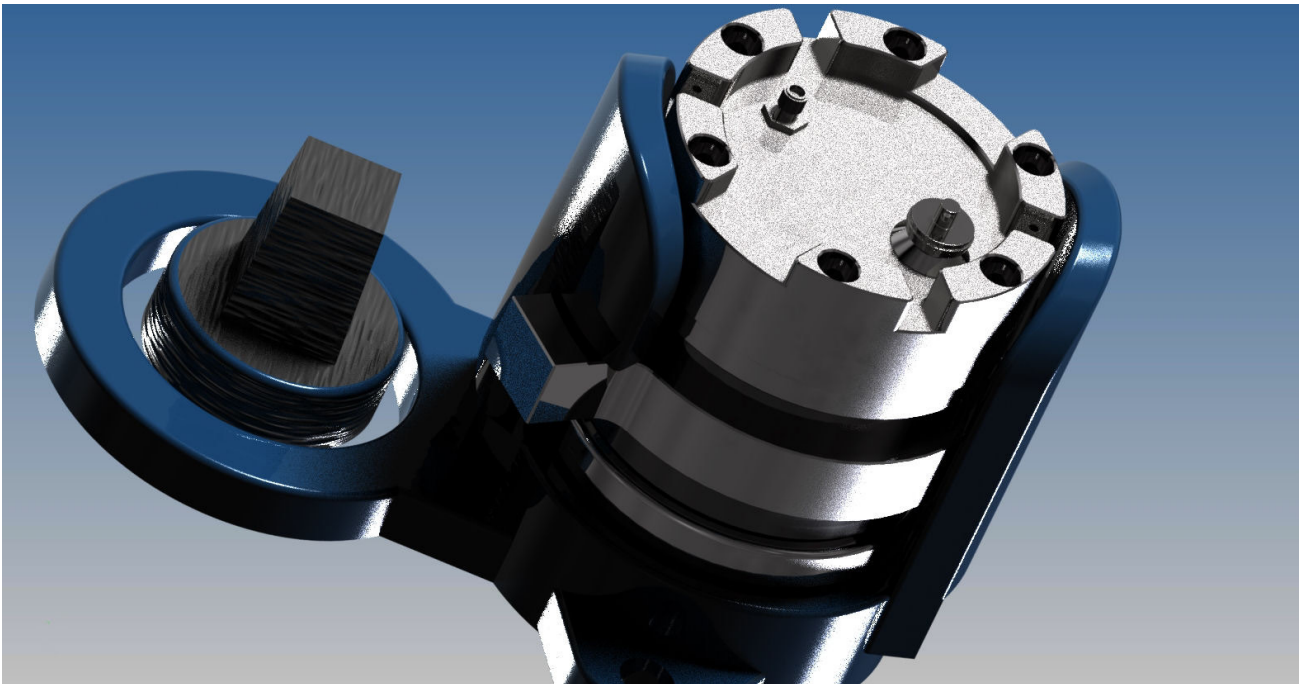
PAULWEGENER
MESSTECHNIK SEIT 1921

Operating manual

Data acquisition system

PWBlogg

Type: N6/80H



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Design and specifications are subject to change without notice.

Safety precautions

Power supply of the data measurement and storage device is provided by a built-in lithium ion accumulator. Please consider the following notes on safety during operation of the devices:

- Charging must only be done by the provided charger
- Charging must be done away from easily inflammable items
- Do not short circuit lithium ion accumulator
- Burning accumulators must never be extinguished by water! **EXPLOSION HAZARD!**
- Do not throw into fire! **EXPLOSION HAZARD!**
- Do not charge unattended
- Do never open battery cell! **EXPLOSION HAZARD!**
- Do not use damaged accumulators!
- If electrolyte touches skin, immediately rinse skin with plenty of water and soap and consult a doctor.
- If electrolyte touches eyes, immediately rinse the eyes with plenty of water and consult an ophthalmologist.
- Recycle completely discharged accumulators only.



Attention: The device consists of electrostatically sensitive components. Opening the device must only be done by manufacturer or by authorized persons.

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1 Start-up instruction

Please note the following references during the first initiation of the data logger:

- Install the software PWB-Soft including driver for the USB cable on your PC/laptop.
- Thereafter, connect the data logger to the PC/laptop using the provided PC data cable. For that, take an unused interface of your PC.
- Start the software.
- Set up the serial interface in the dialog box „Settings“ of menu item „File“. You will recognize the interface by the indication (USB).
- Establish connection between PC and data logger via „Connection“.
- Make all necessary settings in dialog field „Configuration“. In particular, note that upon delivery a **1 minute sample rate** is adjusted to conserve the device's accumulator. Furthermore, note that to conserve the battery/accumulator the sniff mode of the pressure channel is activated and adjusted to a pressure value of 0,1 bar as standard, unless otherwise agreed (see chapter 2.3).
- After confirming by „OK“, the data logger will be configured again and the memory will be cleared. Measurement can start now.
- Note that measurement starts only when the adjusted time of measurement start is exceeded. If the sniff mode is activated, measurement starts only after the adjusted threshold is exceeded.

Note: The device must only be mounted when the valve is closed. Cable and aerial should be removed and their dedicated ports should be closed.

- put the device with down-screwed clutch nut on the cleaned sealing face
- tighten it clockwise using the supplied tool and a hydrant wrench
- if required, fix the antenna
- valve can be opened now
- **Before dismounting, close the valve.** Remove cable/aerial and closeports using caps. Now the device can anti-clockwise be unscrewed.

2 Data logger PWBlogg N6/80H

The data logger has been particularly developed for logging pressure and temperature readings. Because of its solid stainless steel case, the data logger is particularly suitable for net analysis in the field of water. The measurement range begins at 3 bar.

Data logger

The pressure and temperature values, recorded by the data logger, are stored in the data memory which in its highest expansion stage is able to log 3.8 million values. Data logger parameterizing as well as reading and evaluating performance data is done on any PC, laptop or netbook with Windows operating system by using PWB-Soft 3.0. Just a USB interface for connecting the reading cable is necessary.

2.1 Device alternatives

The N6/80H can optionally be equipped with a built-in modem. For this purpose there is an antenna input at the top face of the housing which is used for connecting the delivered antenna.

2.2 Data logger parameters

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

- Identification (e.g. company address)
- Short text (location, project number)

- Start measurement (date/time)
- Intervall 1 and interval 2
- Threshold defaults for analog channels
- Way to store performance data (ring memory / linear memory)

Start measurement

The start measurement determines date and time of measurement commencement. Hence, this field undertakes two important tasks. On the one hand, a synchronous measurement start for land measuring can be set (all loggers commence measurement at the same time). On the other hand, this field is used for permanent deactivating measurement. As long as start measurement is not reached, the logger is in energy saver mode. When the logger is not used, that way it can be simply deactivated.

Identification/Short text

The fields Identification and Short text can be used for saving any descriptive information eg location or project. The Short text can additionally be useful as default for saving performance data on PC, laptop or netbook.

Interval 1 und interval 2

Two increments (sample rate) for logging and saving performance data can be set. Interval 1 is adjustable from 1s up to 1h and is used for logging performance data during normal operation. Interval 2 can be set from 1s (optional 10ms) up to 1min. It will be activated once a threshold violation is recognized.

Threshold monitoring

The data logger provides specifying thresholds and records threshold violations by means of a second sample rate. Additional to the threshold, a hysteresis can be specified.

Sniff mode

Furthermore, the data logger has an implemented sniff-mode. Related on this mode, one channel of the logger (generally the pressure channel) has the additional parameter *Turn-on level*. If this value exceeds, the logger will start data recording. If it is fallen below, the logger will stop recording. Different turn-on and turn-off levels can be realised by hysteresis. Further information is provided in chapter 2.3.

Storage mode

The storage mode specifies whether performance data are supposed to be always recorded or in case of an alarm only. That way it provides event-driven data recording.

Sample mode

The sample 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 measuring is carried out as long as 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 an immediate identification of threshold violations. Thereafter, the memory interval 1 will be 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!

Shorted alarm storage

In case of a threshold violation normally data recording will be 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 for storage is used. The storage is limited to a maximum of 2 x interval 1 (eg 2 x 5 min). Subsequently, it is continued to measure in interval 2 but recorded just with the cycle of interval 1.

Password protection

The configuration can be protected via password against unauthorized access. Without knowledge of password, it is not possible to clear stored data or to change configuration of the data acquisition system.

2.3 Sniff mode

This device can be adjusted in a way that measurement does not start until an adjusted threshold is reached. This function is called sniff mode. The user can adapt the threshold to individual properties of the point of measurement. Shall the device always measure (once the measurement starting time has been reached), then the threshold can simply be set to the start of measurement range. The sniff mode at pressure channel is activated by specification. Optionally, e.g. the temperature channel can also be used. The channel must be factory-adjusted!

The sniff mode checks every 15 minutes whether the adjusted threshold has been reached. The search interval is specified and can not be modified. It is independent of both adjustable measurement intervals (interval1, interval 2). If you remove the device when the sniff mode is activated at pressure channel, then the state of falling below the pressure level will be detected and measurement will be deactivated.

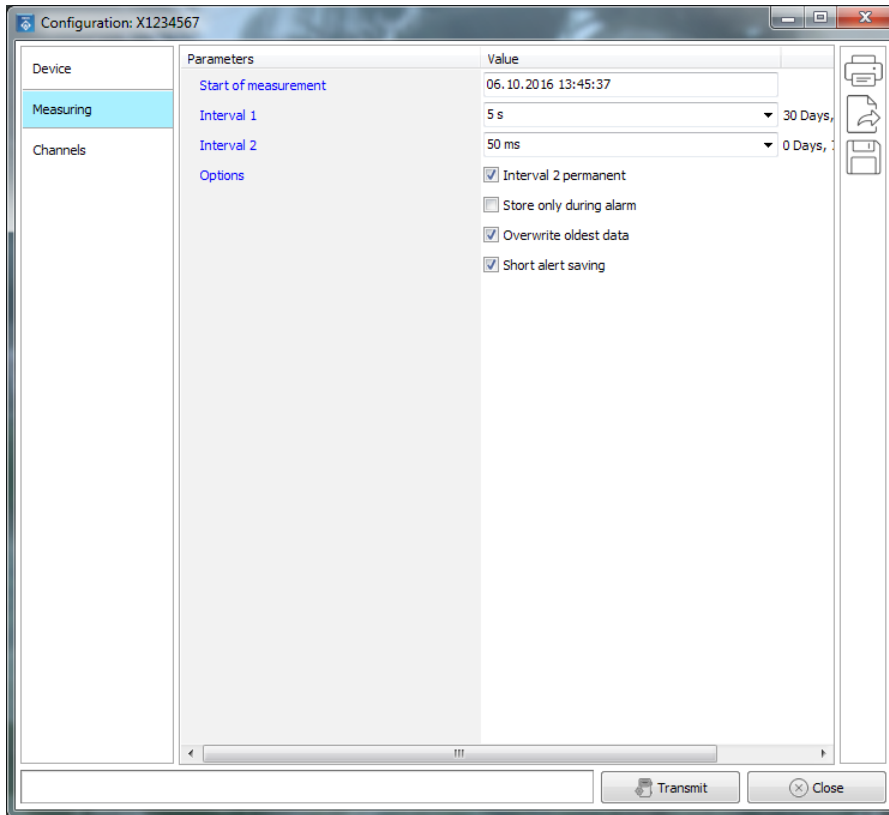
When mounting again, measurement will start again once the pressure exceeds the threshold again. When using devices equipped with built-in modem, activating measurement can also be used to send an event message e.g. per SMS. For that purpose, there is the event „threshold“ given in the settings of the integrated modem. The event can be used for e.g. indicate successful measurement start. That way you will be able to check whether there are appropriate reception conditions for modem communication at mounting location. This message will be sent 2 minutes after start measurement.

Parameters	Value
Device	
Address	0
Password	
Clock change	<input type="checkbox"/> Automatic ST/WT switch
Description	
Long text	Paul Wegener GmbH
Short text	N6_80H
Battery	
Date	18.09.2016
Capacity	16500 mAh
State	100 %

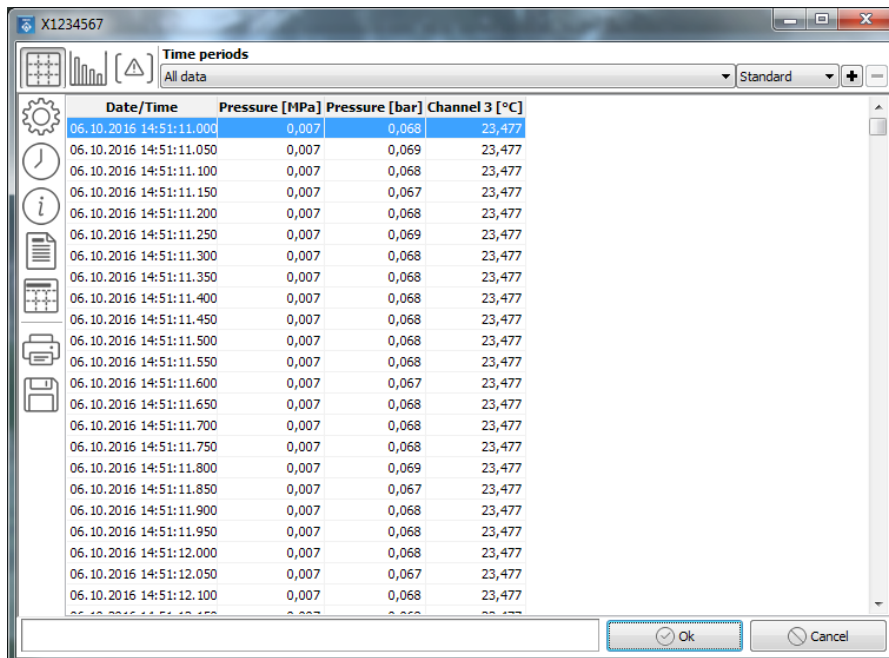
Buttons: Transmit, Close

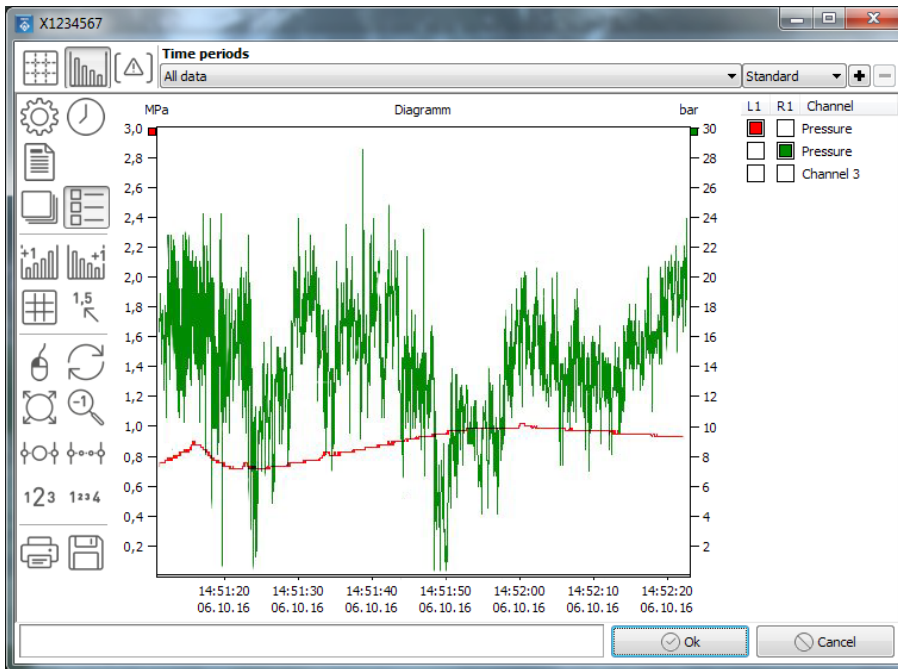
3 PC software

The software PWB-Soft provides direct data communication with the data logger and evaluation of the data which have been transmitted by the device via modem. For that purpose this software provides different dialog windows.



Performance data evaluation can be done in tabular form or as chart.



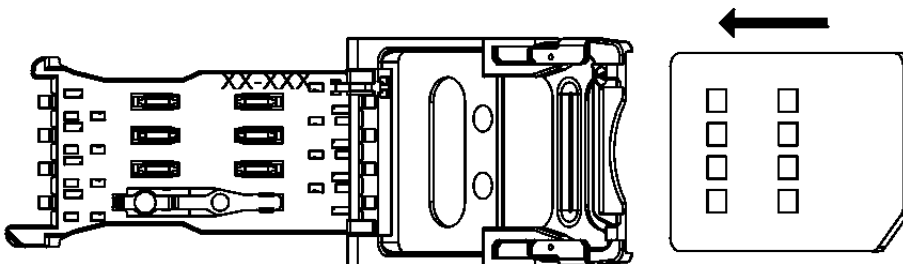


Individual periods can be enlarged by the integrated zoom function.

4 Modem parameters

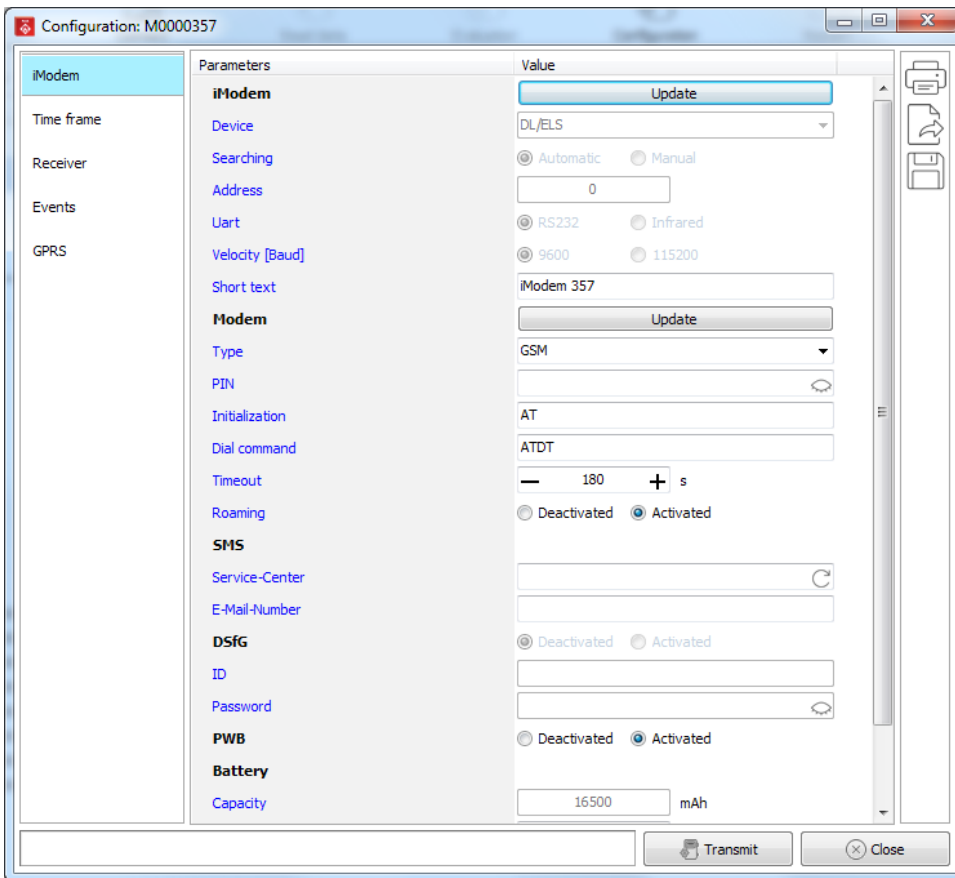
4.1 Inserting the SIM card

- Open the case (see chapter 6).
- Release the SIM card holder by moving the metal fastener to the cover plate edge.
- Insert the card in a way that the chamfered edge points to the middle of the cover plate and the contacts point to the circuit board.
- Lock the holder by moving the fastener to the middle of the cover plate.
- Close the device (see chapter 6).



4.2 Modem parameters

Devices equipped with a built-in modem provide, in addition to the logger parameters, the modem configuration.



Following parameters can be adjusted:

PIN

The *PIN* is usually the 4-digit PIN number which belongs to the SIM card to be used for data transmission via GSM modem.

Initialization

The field *initialization* is designed for particular modem settings and should not be changed. The default setting is „AT“.

Timeout

The *timeout* specifies the period after which modem connection will automatically be disconnected if there is no more data transmission.

SMS

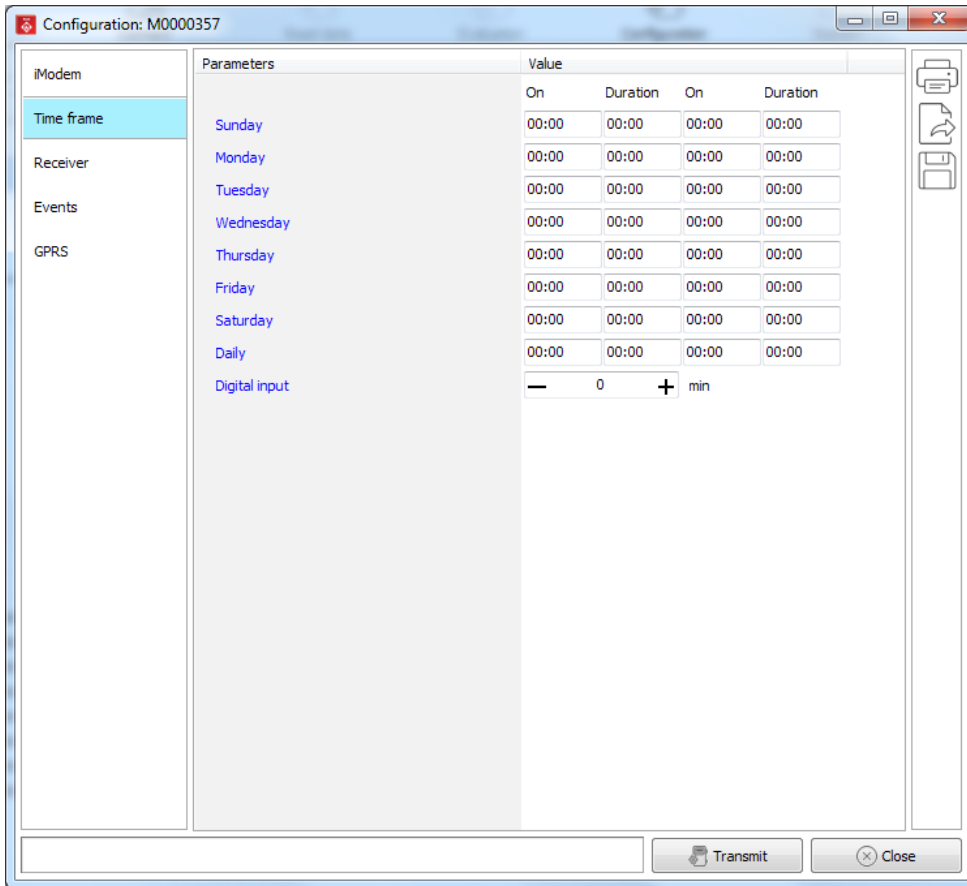
Service-Center address and, for sending SMS, the e-mail number of the e-mail recipient are adjusted here.

The call numbers for some providers are below:

Provider	Service-Center	Email number
t-mobile	+491710760000	8000
vodafone	+491722270333	3400

Time frame

2 time frames and another 2 regular time frames can be configured for each weekday, to specify the runtime of the built-in modem. These should be as short as possible to guarantee a maximum battery/accumulator durability. Automatic uploads can be made during this period and the device is accessible per SMS.



Events

A number of different event messages can be stored. Up to 8 different message recipients can be specified on these messages which can be notified per e-mail or SMS.

Potential events can be:

- Time frame: Is triggered when the modem is activated after it has reached turn-on time.
- Battery failure: Is activated if the modem battery falls below a particular voltage level.
- Power failure: Is activated if the external power supply of the modem fails. Only the accumulator-driven logger type is concerned where the accumulator is sufficiently charged at the failure moment.
- Alert message: Is triggered if a threshold violation is detected by the data logger.
- Thresholds: If a specified activating level for the device exceeds, and, hence measurement is activated, a message will be sent. For this purpose, measurement must have been activated for at least 2 minutes (see chapter 2.3).

Individual events can be activated/deactivated for the option „status“ and recipients can be specified by „Send message to“. Texts belonging to the respective event can be declared as static texts. However, current status and readings can be dynamically integrated in the text by parameter specifications.

When entering text and moving the cursor to desired position, a message text field including legend will be shown on the right with available function texts as support.

The hash symbol „#“ and a letter specified in the legend determine the dynamically generated text to be entered. If there are readings, the channel must also be specified.

Following example shows generating text messages:

Shall the current pressure (e.g. channel 1) be sent as SMS upon reaching activating time of an iModem in hydrant H1234, the respective message text can be:

„Alarm in hydrant H1234, it is #Z, pressure is #V1 bar“

At the moment when sending the SMS, „#Z“ will be replaced by the current time. „#V1“ will be replaced by the reading of channel 1.

Shall the values of all channels of the logger be shown, the command „#N*“ will do. Hence all channels including channel name and unit will be shown. Individual channels are separated by semicolon.

Following message text is recommended for alert message:

„Alarm in hydrant H1234, #N!“

Here „#N!“ will be replaced by channel name, reading and unit of all channels which are in alert mode at this moment.

When compiling message texts, take note that an SMS must have no more than 160 characters! When using devices with many channels, it can make sense to use „#C“ for showing all readings since the shorter channel number (e.g. Ch1) is used instead of long channel names.

If detailed information on one channel is needed, please use the parameter „#M“. Additional to information of the parameter #N, minimum and maximum since last transmission are available here (e.g. (0,1 bar, 5,2 bar)).

The parameter #F can be used for embedding signal strength of the modem connection into the message text.

GPRS

Different login data are necessary to be able to use the data upload function.

GPRS: GPRS connection data of your provider

E-Mail: Account information of the e-mail address to be used by the logger to transmit data

FTP: Account information of the FTP server where data are supposed to be uploaded. This can be web database server for visualising data in the browser where parameters are specified by the Paul Wegener GmbH. Data upload can also be done on any FTP server for further processing of performance data e.g. in a control system.

SMS commands

If one of the below described SMS commands is sent to the N6/80H equipped with modem, following actions will be triggered:

„DATA“ An SMS including the text „DATA“ will get the response including the specified text for activating messages. This is e.g. meaningful if no recipient for activating messages is specified, but information on correct modem operation is needed on occasion.

„!!!“ This command triggers an alert message. Alert messages can be checked this way.

„FS“ Current reception strength is returned here.

5 Battery and rechargeable battery

The data logger PWBlogg N6/80H can be equipped with battery and rechargeable battery respectively.

5.1 Charging the rechargeable battery

- For charging the accumulator, use the provided original charger exclusively
- Make sure that the charger's specified input voltage corresponds to your local supply voltage.
- The used power socket must be accessible throughout entire charging process.
- While charging, temperature must be between +10°C and +45°C.
- The status LED's of the charger indicate charge state during process (red = charging, green = charging finished)
- Charging an empty accumulator takes about 3 hours.
- You can inform yourself on accumulator's residual capacity by means of the PC software PWB-Soft.
- To preserve the accumulator, you should deactivate measurement when not needed for some time by setting measurement start ahead. The ideal storage residual capacity for a data logger is about 20%, never store with an empty accumulator.

Note: Depth discharge damages the accumulator permanently.

When falling below minimum voltage, data logging will be stopped. The data logger will be operated in power-saving mode. If the accumulator's residual capacity falls below 20%, then, at the latest, it should be recharged. We recommend 100% charging prior to any operation.

The accumulator must not be replaced by user. If for your N6/80H a new accumulator is needed, forward the device to the manufacturer for replacement.

5.2 Battery change

We recommend to have the battery changed by manufacturer. If you change battery by yourself, please pay attention to following approach:

- The needed battery type is provided by manufacturer. The 3.9V battery is equipped with a special plug connector.
- Read the saved data.
- Open the case (see chapter 6).
- Carefully loosen the plug connector at the battery and remove it.
- Insert the new battery into the battery holder and fit it using the dedicated metal cramps.
- Use the „Bat“ key button for about 5 seconds to refresh battery date and set battery level to 100%.
- Close the case again (see chapter 6).

6 Opening the case

- Loosen the 6 screws on top of the device by a dedicated hexagon socket wrench.
- Lift the cover plate from the device. If it is not possible due to seal effect, it is recommended to knock carefully (using a non-damaging item such as a rubber mallet) at the sides of the cover plate to loosen the connection.
- When opening, note that you do not tear any cable.
- When closing later, tighten the screws equally to ensure the seal effect.
- When closing, make sure that no cable is crushed inside.

7 Technical specifications

7.1 Data logger

Case	stainless steel, approx. Ø 104 x 130 mm (with clutch nut 150 x 130 mm), true to size für DN 80 underground hydrants
Degree of protection	68 (0,5 mWS)
Transducers	pressure transducer 0...30bar optional: temperature transducer (internal) -20...60°C
Data memory	512kB up to 3,8MB
Threshold	adjustable upper and lower limit value and hysteresis
Sample rate	freely adjustable 1s up to 1h
Accuracy	P $\pm 0,1\%$ v.E. (resolution 1mbar) T $\pm 0,2K$ (optional $\pm 0,1K$), (resolution 0,01K)
Real time clock	deviation ± 3 ppm
Storage mode	ring memory mode(overwrites oldest data at full memory or linear memory mode (stops at full memory)
Interface	serial interface, 9600 Bd, max. 115200 Bd when reading data
Power supply	3,9V lithium battery (16000 mAh) 7,2V lithium ion accumulator (3100mAh), optional
Operating/storage Temperature	-20..60°C

7.2 Data memory

Storage times of the internal memory result from the number of occupied channels, from specified sample intervals 1 and 2 as well as from storage and sample mode. If the reading resolution is > 8 bit (12, 14 or 16 bit), memory requirements will double per reading. The software PWB-Soft 3.0 provides the view of potential storage time depending on the selected storage interval. Thereby the interval can be optimally adapted to measurement requirements.

7.3 Estimation of accumulator service life

Subsequently described are accumulator durations depending on preset sample rate and based on following assumptions:

- constant ambient temperature of 20°C
- constant power consumption of built-in components
- no capacity loss by aging of the accumulator/self-discharge
- no fault current due to defective components

As the above-mentioned exceptions are unrealistic, to be on the safe side, we assume 60% of the real accumulator capacity is provided only. For calculation, the underlying standby current of the system will be increased by factor 2. Though deviations (positive, negative) can not be excluded from mentioned duration!

Assumed there is a device with one 16 bit channel and 15 s sample rate.

Following durations calculate themselves (without modem):

Battery:	5 years
Rechargeable battery:	6 months

Assumed there are 2 uploads daily on an FTP server using the built-in modem, following durations will arise:

Battery:	2 years
Rechargeable battery:	5 months

These values are subject to additional influencing factors such as received field strength on-site, accessibility of the server etc..

7.4 EMC

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

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.

EU-DECLARATION OF CONFORMITY

Herewith we declare that the data acquisition systems of type range

PWBlogg N6/80H

complies with the directive **2004/108/EG** in reference to electromagnetic compatibility. The data acquisition system was developed according to following harmonizing of 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 61000-6-2:2011-06 subject standard for interference resistance– industrial sector

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The safety advice of the product documentation must be followed!

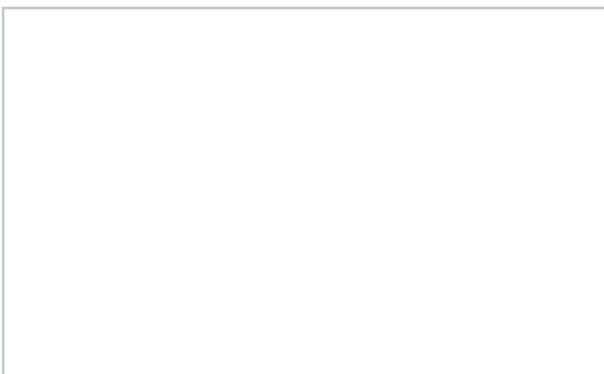
Ballenstedt, 20.04.2016



Wegener
Managing Director

9 Troubleshooting

Problem	Measure
Software reports: „No modules found!“	Check the following: <ul style="list-style-type: none"> • whether the correct interface has been chosen • whether the cable to data logger and PC is connected properly • A defective accumulator can not be charged, not even by mains adapter. The data logger can not be connected without power supply! In this case, have the accumulator replaced by manufacturer.
No data stored in controller	Check, whether: <ul style="list-style-type: none"> • a preset start time has been reached • all transducers and cables are functional Have checked by manufacturer, whether: <ul style="list-style-type: none"> • accumulator is functional • moisture has been intruded into the data logger
Accumulator is low	Have it replaced by manufacturer
Password forgotten	Read out performance data, send reading file to manufacturer
Software does not read performance data completely or reports errors when reading out the data	Check, whether: <ul style="list-style-type: none"> • the PC data cable is properly connected Have checked by manufacturer, whether: <ul style="list-style-type: none"> • moisture is intruded in the data logger • accumulator of the data logger is functional Connect it directly again (menu item „module/connect“) and start reading performance data again. <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 sent characters. This leads to abort of reading out. If necessary, extend periods for activating standby functions or switch off the power management.</p>



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