DATA TECHNOLOGY

# Instruction Manual

## Data Logger
## NivuLevel Mobile / NivuLevel Mobile Ex

Firmware Version: 4.1.x

Revised Instruction Manual

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**Translation**

If the device is sold to a country in the European Economic Area this instruction manual must be translated into the language of the country in which the device is to be used.

Should the translated text be unclear, the original instruction manual (German) must be consulted or a member company of the NIVUS group must be contacted for clarification.

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# Revision History

| Rev. | Modifications | Responsible Editor | Date |
|---|---|---|---|
| | | | |
| 03 | Firmware version updated; Chap. “2 Connections and Control Elements”, “3.2 Warning Notices on the Device (optional)”, “8 Ex Protection”, “15 Return”, “17 Device ID”, “18 Specifications” and “19.1 Product Structure” updated; Chap. “19.2 Add-On Function Licences” and “22.2.3 Insert included Batteries/Battery Packs (only for NFM-0050xCxx/NFM-0050x0xx)” added; Chap “23.3 Rechargeable battery block” updated; Chap. “23.4 Battery pack (for NFM-0050xCxx/NFM-0050x0xx with battery packs)” added; “Fig. 26-2 Terminal wiring Connector Box” updated; Chap. “29 Lighting System of the Status LED on NivuLevel Mobile”, “Main Screen”, “36 Setting Parameters via Quick Start”, “37.2.3 Menu - System”, “37.2.6 Menu - Battery”, “37.2.7 Menu - Quick Start”, “38.4 Menu Diagnostics”, “39.2 Menu Data Memory”, “40.1 Menu Information” and “40.4 Menu Error Messages” updated; Chap. “40.5.5 Feature Unlock” added; Chap. “40.5.6 Update NivuLevel Mobile”, “40.5.7 Update Bootloader”, “40.6 Menu Storage Mode”, “41 Parameter Menu Communication”, “43 Parameter Menu Battery (12V)”, “45 Parameter Menu Alarm” and “Maintenance and Cleaning” updated; Chap. “46.2 Maintenance Tasks” and “49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)” added; Chap “50 Accessories” and “Approvals and Certificates” updated; minor changes regarding words and layout | MoG | 2020-08-12 |
| 02 | Chap. “8 Ex Protection” and “18 Specifications” updated;<br>Chap. “27 (T-Shape) Antenna for GPRS Remote Data Transmission”: Important Note added; Index updated | MoG | 2020-08-12 |
| 01 | Chap. “5 Warranty” added; Chap. “19 Configuration/Device Types” updated; Chap. “23.1 Battery Block” changed; Chap. “25.2 Sensor Connection”: Fig. 25 3 changed; Chap. “26 Connecting the Connector Box for Inputs/Outputs” changed; Chap. “45.2 Power Adapter/Battery Charger” added; Chap. “46 Dismantling/Disposal”: note text on WEEE Directive of the EU changed; Chap. “Approvals and Certificates” updated; minor changes regarding text and layout | MoG | 2020-05-27 |
| 00 | New creation on the basis of the German-language instruction manual | MoG | 2019-04-10 |

# Table of Contents

# General

## 1 About this Manual

***Important***

*READ CAREFULLY BEFORE USE.*

*KEEP IN A SAFE PLACE FOR LATER REFERENCE.*

This instruction manual is a translation of the original German instruction manual. It is for the NivuLevel Mobile data logger and serves its intended use. This instruction manual is oriented exclusively to qualified expert personnel.

Read this instruction manual carefully and completely prior to installation or connection since it contains relevant information on this product. Observe the notes and particularly follow the warning notes and safety instructions.

If you should have problems to understand information contained within this instruction manual either contact a member company of the NIVUS group or one of the distributors for further support. The member companies of the NIVUS group cannot be held responsible for damage to persons or material due to incorrectly understood information in this instruction manual.

### 1.1 Applicable Documentation

For the installation and operation of the complete system extra instruction manuals or technical descriptions may be required apart from this manual.

- Instruction manuals for intelligent i-Series sensors
- Instruction manuals for pressure and level probes: NivuBar Plus II, NivuBar G II, NivuBar H III, HydroBar G II, UniBar E II, AquaBar

These manuals are provided with the auxiliary units or sensors and/or are available as download on the NIVUS homepage.

### 1.2 Signs and Definitions used

| Representation | Meaning | Remarks |
|---|---|---|
| ➲ | (Action) Step | Execute action steps.<br>Should action steps be numbered observe the specified order of the steps. |
| ⇨ | Cross-Reference | Refers to further or more detailed information. |
| >Text< | Parameter or menu | Indicates a parameter or a menu that is to be selected or is described. |
|  | Refers to a documentation | Refers to an accompanying documentation. |

**Tab. 1 Structural elements within the manual**

## 1.3 Abbreviations used

### 1.3.1 Colour code for wires and single conductors

The abbreviations of colours for wire and single conductor labelling follow the international colour code according IEC 60757.

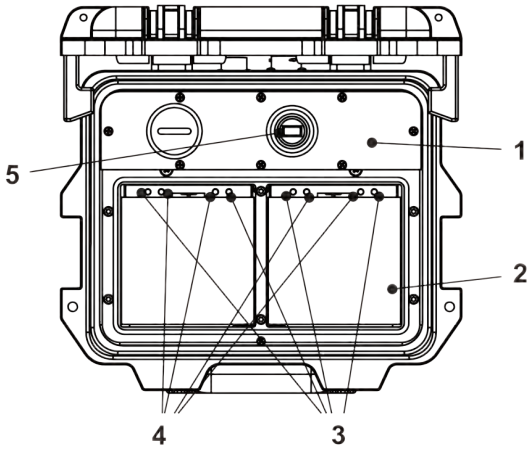
| | | | | | |
|---|---|---|---|---|---|
| BK | Black | BN | Brown | RD | Red |
| OG | Orange | YE | Yellow | GN | Green |
| BU | Blue | VT | Violet | GY | Grey |
| WH | White | PK | Pink | TQ | Turquois |
| GNYE | Green/Yellow | GD | Gold | SR | Silver |

# 2 Connections and Control Elements

## 2.1 Power Supply

### 2.1.1 Data Logger

The NivuLevel Mobile (Fig. 2-1 Pos. 1) is powered via the rechargeable battery blocks or the battery packs. When plugged into the enclosure, these are connected to the data logger via the contact pins (Fig. 2-1 Pos. 4) and provide the required operating voltage.




1 Data Logger

2 Battery compartment (for two battery packs/blocks; no image)

3 Guide pins for battery packs/blocks

4 Contact pins/plug-in connections for battery blocks (AC power supply) or battery packs

5 USB-A Interface

**Fig. 2-1 Power supply by rechargeable/battery packs (top view)**

### 2.1.2 Rechargeable battery blocks (for NFM-0050x0xx/NFM-0050xExx)

The battery blocks are charged either when installed or when removed with the aid of the charger (available as an accessory).

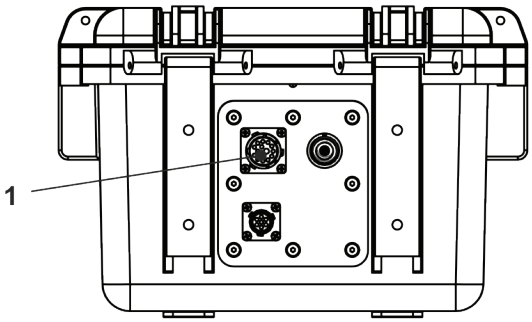
**WARNING**

***Risk of explosion when charging the battery pack in Ex areas***

*The battery pack may only be charged outside the Ex area. Never within Ex areas.*

There are two different variants for charging the battery blocks when they are installed:

- Mains adapter 110...230 V AC via the multifunction socket (Fig. 2-2 Pods. 1) on the rear of the enclosure
- External power source 12...14 V DC (e.g. battery, solar module, fuel cell etc.) with connection cable via the multifunction socket




1 Multifunction socket

**Fig. 2-2 Charging the rechargeable battery block via multifunction socket**

⇨ Connection diagrams for the sensors can be found in Chapter “25 Connection of Sensors”.

### 2.1.3 Battery packs (for NFM-0050xCxx/NFM-0050x0xx)

The NFM-0050xCxx or NFM-0050x0xx data logger is designed for use with two battery packs simultaneously. Trouble-free operation and use of the full energy capacity is only guaranteed with two battery packs.

The batteries can be purchased from a supplier other than NIVUS. However, only batteries approved by NIVUS are permitted (see Chap. “18 Specifications” and “49 Installation of Spare Parts and Wearing Parts”).

The battery life depends not only on the operating mode and the battery capacity, but also on the ambient temperature, any battery batch tolerances, the reception quality at the installation site, etc.

***Standard batteries are not rechargeable***

*The batteries **cannot** be recharged.*

## 2.2 NivuLevel Mobile Control Elements

The NivuFlow Mobile is activated by the reed contact on the front. This is done by the enclosed ring magnet *ZUB0 NFM MAGNET* (Fig. 2-3).

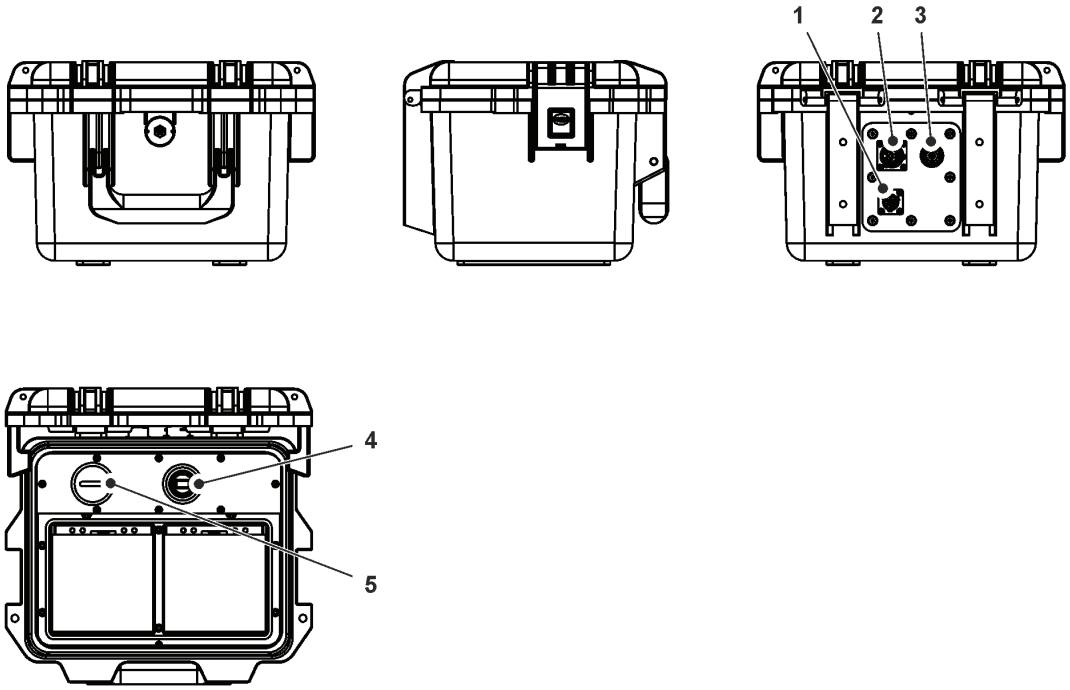
Beyond that, the NivuLevel Mobile has no other control elements. The entire operation and parameterisation is carried out via the respective smartphone, tablet, notebook and PC.

Also observe the instruction manuals for the smartphone, tablet, notebook or PC you are using.

**Fig. 2-3 Ring magnet**

## 2.3 Interfaces

The data logger has several interfaces (may vary depending on the type). These are on the back of the enclosure and on the top of the unit respectively.




1 Connection socket for sensors, analogue inputs 1 and 2

2 Multifunction socket I/O / connection socket digital input

3 2G/3G/4G Antenna socket

4 USB-A interface (accessible when the enclosure cover is open)

5 2G/3G/4G-SIM card slot (in connection with 2G/3G/4G antenna; accessible when the enclosure cover is open)

**Fig. 2-4 Available interfaces**

# Safety Instructions

## 3 Used Symbols and Signal Words

### 3.1 Information on the Valuation of Accident Levels

*The general warning symbol indicates the risk of personal injuries or death. In the text section the general warning symbol is used in combination with the signal words described below.*

**DANGER**

***Warning in high degree of risk***

*Indicates a high-risk, imminently hazardous situation which will result in death or serious injury if not avoided.*

**WARNING**

***Warning in medium degree of risk and personal injury***

*Indicates a possible danger with medium risk which may result in a life-threatening situation or (severe) bodily injury if not avoided.*

**CAUTION**

***Warning in personal injury or property damage***

*Indicates a possible danger with moderate risk which may result in minor or moderate personal injury or property damage if not avoided.*

**WARNING**

***Danger by electric voltage***

*Indicates a medium-risk, imminently hazardous situation caused by electric shock which will result in death or (serious) injury if not avoided.*

***Important Note***

*Contains information that needs to be highlighted.*
*Indicates a potentially harmful situation that may damage the product or something in its environment if not avoided.*

***Note***

*Contains tips or information.*

## 3.2 Warning Notices on the Device (optional)

### 3.2.1 Common

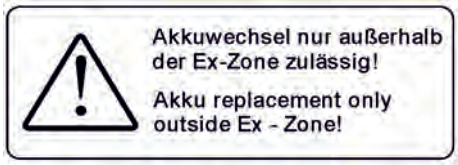
***General Warning Notice***

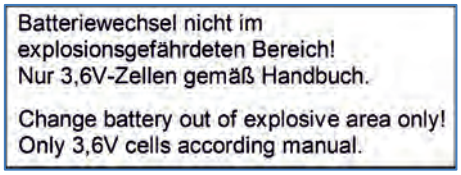
*This symbol refers the operator or user to content in this manual.*
*Consideration of the information contained herein is necessary to maintain the protection provided by the unit for installation and in operation.*

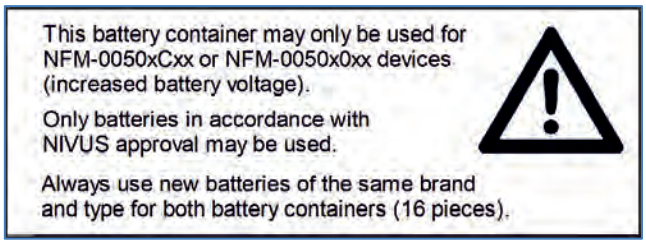
***Protective earth connection***

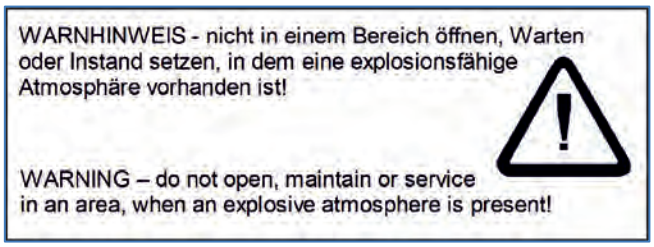
*This symbol refers to the protective conductor terminal of the device.*
*Depending on the type of installation, the unit may only be operated with a suitable protective earth connection in accordance with applicable laws and regulations.*

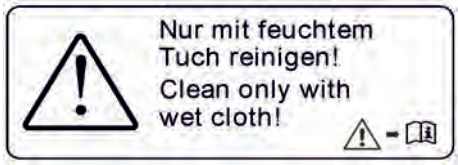
### 3.2.2 Special/type-related (Ex-relevant, rechargeable/battery, cleaning)



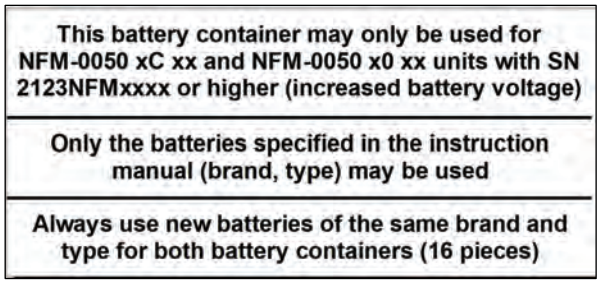




### 3.2.3 Warning notices directly on the battery pack




# 4 Special safety and Precautionary Measures

**When working with the NIVUS equipment, the following safety and precautionary measures must be observed and followed generally and at all times. These warnings and notes are not repeated for each description within the document.**

**WARNING** ***Check danger due to explosive gases***

*Before starting assembly, installation and maintenance work, be sure to check that all regulations on safety at work have been observed and that there is no possible risk of explosive gases. Use a gas warner for the check.*

*When working in the sewer system, make sure that no electrostatic charge can occur:*

- *Avoid unnecessary movements to reduce the building-up of static charges.*
- *Discharge any static electricity present on your body before you start installing the sensor.*

*Disregarding may result in personal injury or damage to the system.*

**WARNING** ***Open the device only out of Ex areas***

*Do not open, service or repair in an area where an explosive atmosphere is present.*

**WARNING** ***Germ Contamination***

*Due to the frequent use of the sensors in the waste water sector, parts can be contaminated with dangerous germs. Therefore, appropriate precautions must be taken when coming into contact with cables and sensors.*

*Wear protective clothing.*

**WARNING** ***Observe Occupational Safety Regulations!***

*Before and during mounting works, compliance with all work safety regulations must always be ensured.*

*Disregarding may lead to personal injury.*

**WARNING** ***Do not disable Safety Devices!***

*It is strictly forbidden to disable the safety devices or to change their mode of operation.*

*Disregarding may result in personal injury or damage to the system.*

**WARNING** ***Disconnect the System from Mains Power***

*Disconnect the instrument from mains power (if connected) before you begin maintenance, cleaning and/or repair works (qualified personnel only).*

*Disregarding may lead to electric shock.*

***Commissioning only by qualified Personnel***

*The entire measuring system may only be installed and commissioned by qualified personnel.*

***Built-In Buffer Battery***

*The backup battery integrated in the data logger may only be replaced by NIVUS or personnel authorised by NIVUS. Otherwise the warranty becomes void.*

# 5 Warranty

The device was functionally tested prior to shipping. When used for the intended purpose (see Chap. “7 Intended Use”) and in compliance with the instruction manual, the applicable (see Chap. “1.1 Applicable Documentation”) and the safety information and instructions contained therein, no functional restrictions are to be expected and flawless operation should be possible.

⇨ Please also refer to the following chapter “6 Disclaimer”.

***Limitation of Warranty***

*In case of disregarding the safety notes and instructions in this document, the companies of the NIVUS-Group reserve the right to limit the warranty.*

# 6 Disclaimer

**The companies of the NIVUS-Group assume no liability**

- for consequential damages resulting from a change in this document. The companies of the NIVUS-Group reserve the right to change the contents of the document including this disclaimer without prior notice.

- for personal injury or damage to property resulting from **failure to comply** with the **applicable regulations**. For connection, commissioning and operation of the devices, all information and higher-level legal regulations of the country (in Germany e.g. the VDE regulations), such as valid Ex regulations as well as the safety and accident prevention regulations applicable to the respective individual case shall be observed.
- for personal injury or damage to property resulting from **improper handling**. For safety and warranty reasons, all work on the equipment that goes beyond the installation and connection measures may only be carried out by NIVUS personnel or by persons or companies authorised by NIVUS.
- for personal injury or damage to property resulting from the operation of the equipment in a **technically faulty** condition.
- for personal injury or damage to property resulting from **improper use**.
- for personal injury or damage to property resulting from failure to observe the **safety instructions** in this instruction manual.
- for missing or incorrect readings due to **improper installation** and for any consequential damage resulting therefrom.

# 7 Intended Use

***Note***

*The device is intended exclusively for the purpose mentioned below. Any other use beyond this, any conversion or modification of the instrument without written agreement with the companies of the NIVUS-Group is considered improper use.*
*The companies of the NIVUS-Group are not liable for any damage resulting from this.*
*The operator alone bears the risk.*

The NivuLevel Mobile data logger incl. associated sensors is intended for the temporary recording of filling levels or analogue signals.

The use is independent of the degree of contamination of the medium. Depending on the sensor selection, the level measurement is carried out from above via ultrasound (only for part filled tanks/basins) or from the bottom of the tank/basin via pressure.

The NivuLevel Mobile is designed and produced according to the current state of the art and the recognised safety rules at the time of publication of this document. Nevertheless, risks of personal injury or damage to property cannot be completely ruled out.

The permissible maximum limit values in Chapter “18 Specifications” must be observed. All cases of use deviating from these limit values, which have not been approved by NIVUS GmbH in writing, are excluded from the liability of the NIVUS-Group.

# 8 Ex Protection

The portable data logger NivuLevel Mobile incl. associated sensors is designed for use in areas with explosive atmospheres of zone 1 or 2.

**The conditions in the following tables must be observed depending on the data logger type.**

| # | **Special conditions when using the data loggers NFM-0050x Cxx in Ex zone 2** |
|---|---|
| 1 | An electrostatic charge must be avoided for the enclosure parts and the padlock; see Chap. “4 Special safety and Precautionary Measures”. |
| 2 | Operation with external power supply is not permitted in potentially explosive atmospheres. |
| 3 | The batteries/battery packs may only be changed outside the potentially explosive area. |

| | |
|---|---|
| 4 | Only batteries in accordance with NIVUS approval may be used; see Chap. “18 Specifications” and “49 Installation of Spare Parts and Wearing Parts”. |
| 5 | Only operation with two fully equipped battery packs (with battery pack holder/battery compartment) is permitted. All 16 batteries must be replaced together with batteries of the same type and state of charge. |
| 6 | The memory stick (USB stick) may only be operated on the USB port outside the potentially explosive area. |
| 7 | The SIM card may only be changed outside the potentially explosive area. See “Connection Specifications Data Logger NFM-0050x Cxx (for Ex-Zone 2)” for operation in potentially explosive areas; see Chap. “18.2 NFM-0050x Cxx”. |
| 8 | Operation may only take place in vertical position (plug connections downwards). |
| 9 | Before closing the battery compartment and the device cover, check the proper fit and elasticity of the seals to ensure that the device is vapour-proof.<br>Explosion protection is not guaranteed if gaskets are leaking or defective, the front panels, the cover for the SIM compartment and the enclosure cover are not properly closed or the enclosure is otherwise damaged.<br>The gaskets must be replaced at the latest after the interval specified in Chapter “46.1 Maintenance Interval” in this instruction manual. |
| 10 | If the device and the gaskets are in proper condition, a pressure test in the field is not necessary.<br>The device can be equipped with a test connection via a special adapter that is screwed onto the opening to the SIM card slot.<br>See also Chap. “46 Maintenance”. |
| 11 | The device must not be opened, serviced or repaired in an area where an explosive atmosphere is present. |
| 12 | The housing must be additionally secured with the padlock provided by NIVUS (holes on the side of the enclosure); see Chap. “11 Scope of Delivery” and “50 Accessories”. |
| 13 | The internal connection X8 of the modem module may only be used by NIVUS for firmware updates; see also Chap. “40.5.6 Update NivuLevel Mobile”. |
| 14 | Parameterisation of the data logger under Ex conditions is permissible:<br>- with the programmer **inside** the Ex-area, provided that the display and control unit used **has an** Ex-approval<br>- with the programmer **outside** the Ex-area, when the display and control unit used **has no** Ex-approval |

**Tab. 2 Ex-Zone 2 (only Type NFM-0050x Cxx)**

| # | **Special conditions when using the data loggers NFM-0050x Exx in Ex zone 1** |
|---|---|
| 1 | An electrostatic charge must be avoided for the enclosure parts and the padlock; see Chap. “4 Special safety and Precautionary Measures”. |
| 2 | The supply batteries may only be charged outside the potentially explosive area with the NIVUS charger; see Chap. “23.3.2 Charging the battery block”. |
| 3 | The supply batteries (rechargeable battery blocks) may only be replaced outside the potentially explosive area; see Chap. “23.3.1 Removing/installing the battery block” as well as the important note on the buffer battery in Chap. “4 Special safety and Precautionary Measures”. |
| 4 | Only approved batteries (rechargeable batteries) in accordance with the NIVUS instruction manual may be used; see Chap. “18 Specifications” and “49 Installation of Spare Parts and Wearing Parts”. |
| 5 | The memory stick (USB stick) may only be operated on the USB port outside the potentially explosive area. |

| | |
|---|---|
| 6 | The SIM card may only be changed outside the potentially explosive area. See Type Examination Certificate in Chap. “Approvals and Certificates”. |
| 7 | Operation may only take place in vertical position (plug connections downwards). |
| 8 | The housing must be additionally secured with the padlock provided by NIVUS (holes on the side of the enclosure); see Chap. “11 Scope of Delivery” and “50 Accessories”. |
| 9 | The battery (rechargeable battery block) in the right-hand part of the housing (connections MP1/MP2) must not be connected if the external supply is used. |
| 10 | The connections on X8 (the modem board) may only be used by NIVUS for firmware updates; see also Chap. “40.5.6 Update NivuLevel Mobile”. |
| 11 | Parameterisation of the data logger under Ex conditions is permissible:<br>- with the programmer **inside** the Ex-area, provided that the display and control unit used **has an** Ex-approval<br>- with the programmer **outside** the Ex-area, when the display and control unit used **has no** Ex-approval |

**Tab. 3 Ex Zone 1 (only Type NFM-0050x Exx)**

**Approval for Data Logger**

⇨ See Chap. “18 Specifications”.

***Validity of the Ex Approval***

*The Ex approval is only valid in conjunction with the corresponding marking on the name-plate of data logger and the sensors.*

***Declarations of Conformity and Test Certificates***

*For installation and commissioning, the EU declarations of conformity and test certificates of the approving body must be strictly observed.*

***Ex Approval for Sensors***

*The Ex approvals of the sensors are included with the “Instruction Manual for intelligent i-Series Sensors” or the “Instruction Manuals for Pressure and Level Probes: NivuBar Plus II, NivuBar G II, NivuBar H III, HydroBar G II, UniBar E II, AquaBar”.*

# 9 Duties of the Operator

***Important Note***

*In the EEA (European Economic Area), the national transposition of the Framework Directive (89/391/EEC) as well as the associated individual directives and, in particular, the Directive (2009/104/EC) concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, must be observed and complied with.*
*In Germany, the Ordinance on Industrial Safety and Health must be complied with.*

Obtain the local operating licence and observe the associated conditions. In addition, you must comply with environmental protection requirements and local legal requirements for the following:

- Safety of personnel (accident prevention regulations)
- Safety of work equipment (protective equipment and maintenance)
- Product Disposal (Waste Management Act)
- Materials Disposal (Waste Management Act)
- Cleaning (Cleaning Agents and Disposal)

**Connections**

As the operator, before activating the device, make sure that the local regulations (e.g. for the electrical connection) have been observed during installation and commissioning.

**Keep the Instruction Manual for future Reference**

Keep the instruction manual in a safe place and ensure that it is always available and can be consulted by the user of the product.

**Hand over the Instruction Manual**

When selling the data logger, this instruction manual must be handed over with it. The manual is part of the standard delivery.

# 10 Requirements for the Personnel

Installation, commissioning and maintenance may only be carried out by personnel who fulfil the following conditions:

- Qualified personnel with appropriate training
- Authorisation by plant operator

***Qualified Personnel***

*in the sense of these instructions or the warnings on the product itself are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the qualifications appropriate to their job, such as*

*I. training and instruction or authorisation to switch circuits and devices/systems on and off, to earth and to label them in accordance with the standards of safety technology.*

*II. Training or instruction in accordance with safety technology standards in maintenance and use of appropriate safety equipment.*

*III. First Aid Training*

# Delivery, Storage and Transport

## 11 Scope of Delivery

The standard delivery of the NivuLevel Mobile comprises:

- Data logger Type NivuLevel Mobile (according to delivery documents)
- Ring magnet
- USB Stick
- Screwdriver for hexagon socket screws
- PU adhesive plates (two pieces; 31x17x3.5 mm) to avoid negative pressure in the case of a possible return (by air freight) to NIVUS (e.g. for maintenance)
- T-shape antenna (only for versions with internal 2G/3G/4G modem)
- Padlock (only for Ex versions)
- Instruction manual (with EU Declarations of Conformity) including all information required for connection, installation and operation of the NivuLevel Mobile

Check additional accessories according to the order against the delivery note.

## 12 Inspection upon Receipt

Check the delivery for completeness and apparent intactness immediately after receipt. Report any transport damage immediately to the delivering carrier. Also send a written report to NIVUS GmbH in Eppingen.

Incomplete deliveries must be addressed in writing within two weeks to your responsible representative or directly to the head office in Eppingen.

***Observe the two-week deadline***

*Complaints received later will not be recognised.*

➲ Before the first use:

1. Open the enclosure cover.
2. If present, remove the PU adhesive plates (two pieces; 31x17x3.5 mm) on the right and left of the enclosure frame. (Fig. 15-1 Pos. 1). These were fitted prior to shipment (for air freight) to prevent the enclosure from closing and to eliminate the formation of vacuum in the event of extreme temperature fluctuations during the shipping phase.

# 13 Storage

Observe the minimum and maximum values for external conditions such as temperature and humidity according to Chapter “18 Specifications”.

Protect the instrument from corrosive or organic solvent vapours, radioactive radiation and strong electromagnetic radiation.

➲ To store the device:

1. Remove rechargeable/battery packs.
2. If the hoop guards for mounting the Connector Box are fitted, remove them (if space is limited) and fit the rubber buffers instead.

***Rubber buffers***

*Be sure to screw on the rubber buffers,*

- *so that the concealed screw-on plates on the back of the NFM do not get lost inside the screw-on channels; the screw-on plates are indispensable as they contain the fastening threads for the protective brackets and additionally serve to stabilise them on the NFM;*
- *because the rubber buffers are designed as shock protection for the NFM connections and protect them from possible damage.*

# 14 Transport

Protect the NivuLevel Mobile from strong impacts, blows, shocks or vibrations by using appropriate safety measures such as straps or similar.

Otherwise, the same conditions apply with regard to external influences as for storage (see Chap. “13 Storage”).

# 15 Return

In the event of a return, send the unit to NIVUS GmbH in Eppingen carriage paid and in the original packaging.

Items that have not been sufficiently franked will not be accepted!

**CAUTION**

***Returning the data logger with inserted/defective $LiSOCl_2$ batteries is not permitted***

*If the data logger is to be sent to NIVUS for inspection, then only without batteries. Remove the batteries from the battery holder/battery pack beforehand.*

*As a general rule, defective batteries must not be shipped individually or in a battery holder. in accordance with the Dangerous Goods Regulations (DGR) 61st edition 2020 UN 3090 / 3091 Lithium Metal Batteries A154.*

➲ Before shipment (for air freight):

1. Stick the PU adhesive plates (two pieces; 31x17x3.5 mm) on the right and left of the enclosure frame (Fig. 15-1 Pos. 1). This measure prevents the enclosure from closing and excludes vacuum formation during extreme temperature fluctuations.
2. For transport, place the NivuLevel Mobile safely in the original packaging.

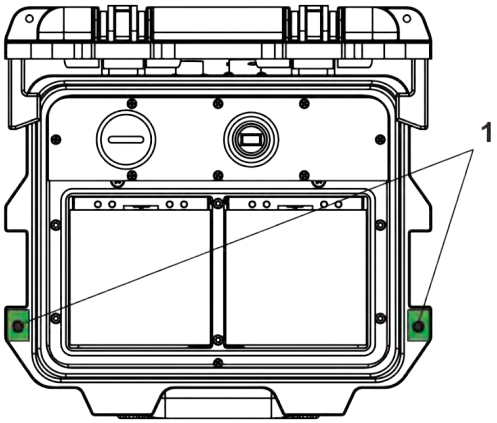
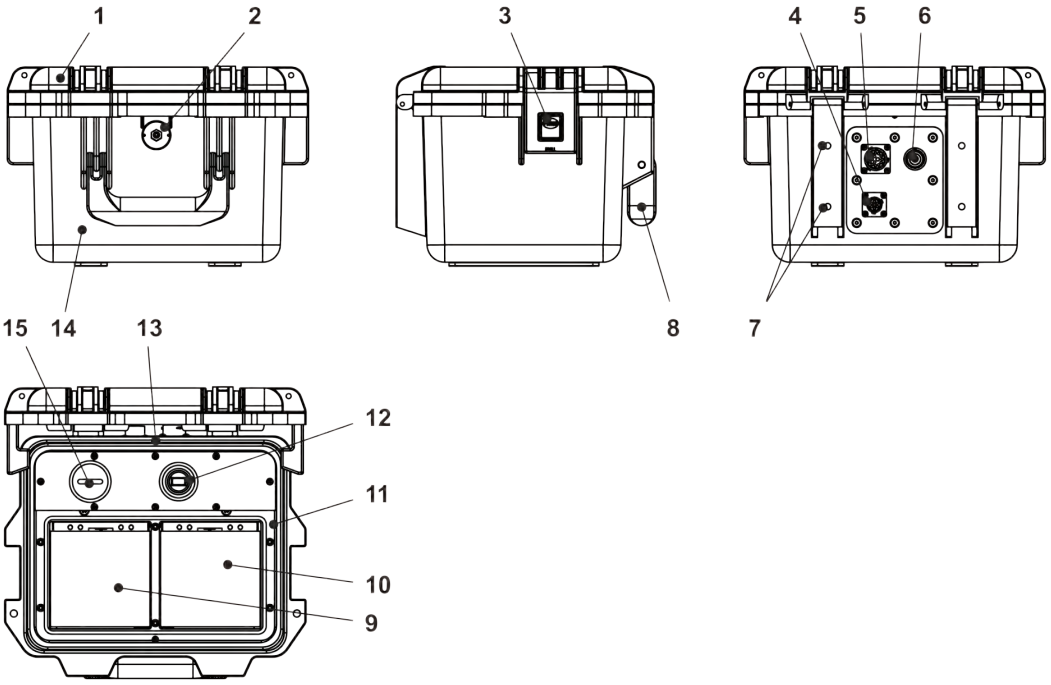



**Fig. 15-1 Position to stick on the PU adhesive plates**

# Product Description

## 16 Product Construction and Overview




1 Enclosure cover

2 LED (status display) and Reed contact (wake-up via magnet)

3 Lock (both sides)

4 Connection socket for sensors, analogue input 1 and 2

5 Multifunction socket I/O / connection socket digital input

6 2G/3G/4G Antenna socket

7 Mounting holes for spacer buffers or hoop guards

8 Carrying handle

9 Left insertion compartment for battery block/battery pack

10 Right insertion compartment for battery block (possible charging position for re-chargeable battery block) or battery pack

11 Cover (not shown) over battery block/battery pack with six captive hexagon socket screws

12 USB-A Interface

13 Data logger NivuLevel Mobile (IP67)

14 Enclosure (IP68 with closed enclosure cover)

15 2G/3G/4G SIM card slot (in connection with 2G/3G/4G antenna)

**Fig. 16-1 Device construction NivuLevel Mobile with enclosure**

## 16.1 Enclosure dimensions

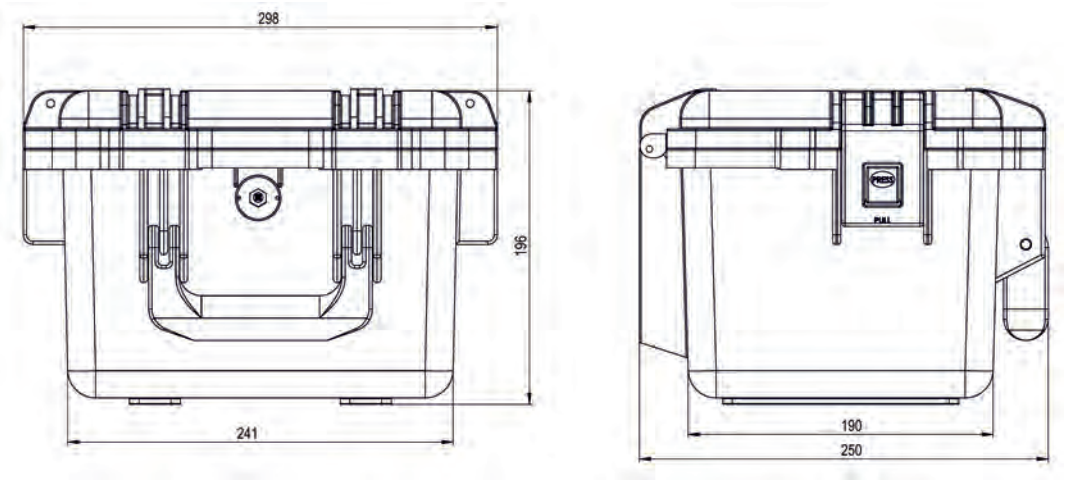



**Fig. 16-2 Enclosure**

## 16.2 Connectable Sensors/Probes

In the following illustration you will find an overview of the connectable level sensors/probes.


1 NivuBar Plus II
2 NivuBar G II
3 NivuBar H III
4 HydroBar G II
5 AquaBar II
6 AquaBar BS
7 UniBar E II (with display)
8 UniBar E II
9 i-Series i-15
10 i-Series i-10
11 i-Series i-6
12 i-Series i-3

**Fig. 16-3 Connectable Sensors/Probes**

# 17 Device ID

## 17.1 Nameplates NivuLevel Mobile

The information in this instruction manual only applies to the device type indicated on the title page. The nameplates are attached to the side of the enclosure and contain the following information:

- Name and address NIVUS GmbH
- CE label
- Marking of the series and type with article number and serial number
- Year of manufacture: the first four digits of the serial number refer to the year of manufacture and the week number (2111…..)
- Ex Protection Label
- Ambient conditions in operation

It is important for all queries and spare parts orders that the article number and serial number of the respective device are specified correctly. This is the only way to ensure proper and fast processing.

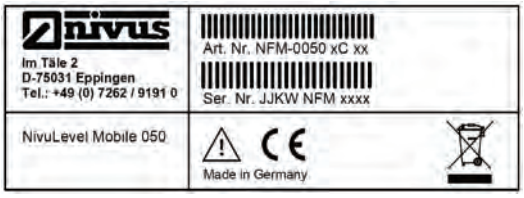



**Fig. 17-1 Nameplate (Part 1) NivuLevel Mobile (Example Ex Device NFM-0050x Cxx)**


**Fig. 17-2 Nameplate (Part 2, only for Ex Devices) NivuLevel Mobile (Example NFM-0050x Cxx)**

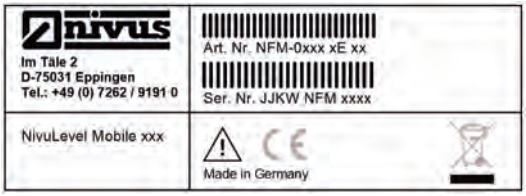



**Fig. 17-3 Nameplate (Part 1) NivuLevel Mobile (Example Ex Device NFM-0050x Exx)**

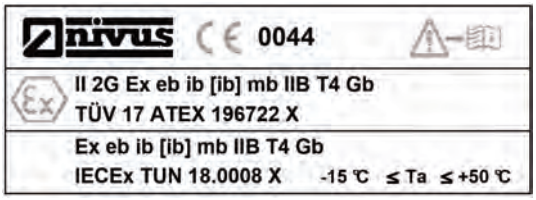



**Fig. 17-4 Nameplate (Part 2, only for Ex Devices) NivuLevel Mobile (Example NFM-0050x Exx)**

***Check nameplates***

*Check by means of the nameplates whether the supplied device corresponds with your order.*

The EU Declaration(s) of Conformity and the EU Type Examination Certificate can be found at the end of this instruction manual.

## 17.2 Nameplates Rechargeable Blocks/Battery Packs

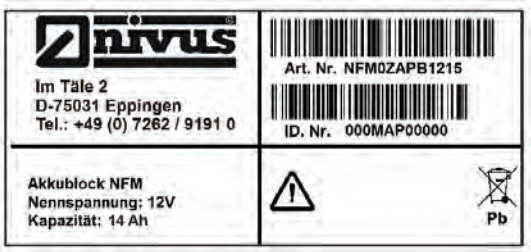



**Fig. 17-5 Nameplates for Rechargeable Battery Block (for NFM-0050x0xx)**

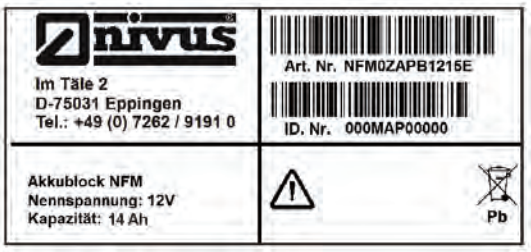



**Fig. 17-6 Nameplates for Rechargeable Battery Block (for NFM-0050xExx)**


**Fig. 17-7 Nameplates for Battery Pack (for NFM-0050xCxx/NFM-0050x0xx)**

# 18 Specifications

## 18.1 NFM-0050x 0xx

| | |
|---|---|
| **Measurement Principles** | 3-channel Data Logger (2x analogue inputs and 1x digital input) |
| **Power Supply with Rechargeable Battery Block** | - Internal: 1...2x rechargeable battery block 12 V / 14 Ah, VRLA-AGM<br>- External: partial ext. power supply via NIVUS charger possible; see Chap. “49 Installation of Spare Parts and Wearing Parts”.<br>See also Chap. “23.1 Power supply depending on rechargeable battery block/battery pack”. |
| **Power Supply with Battery Pack** | - Internal: 2x battery pack: 8x Li-$SOCl_2$ each, 3.6 V, type D; four batteries each connected in series; $U_n$ = 4x 3.6 V = 14.4 V; see Chap. “49 Installation of Spare Parts and Wearing Parts”.<br>- External: none<br>See also Chap. “23.1 Power supply depending on rechargeable battery block/battery pack”. |
| **Enclosure** | - Material: HPX high-performance synthetic resin<br>- Weight: approx. 4.7 kg (without rechargeable blocks/battery packs and hoop guards)<br>- Protection: IP68 closed / IP67 with open enclosure cover |
| **Operation Temperature with Rechargeable Battery Block** | -15…+50 °C<br>Permissible charging temperature rechargeable battery block VRLA-AGM: 0…+40 °C |
| **Operation Temperature with Battery Pack** | 0…+30 °C permanently recommended;<br>-15…+50 °C only permissible for a short time |
| **Storage Temperature with Rechargeable Battery Block** | -15…+45 °C |
| **Storage Temperature with Battery Pack** | -15…+30 °C permanently recommended;<br>-15…+70 °C only permissible for a short time |
| **Max. Humidity** | 90 %, non-condensing |
| **Indication** | Status LED (RGB) |
| **Operation** | Magnet switch;<br>via WLAN with display and operating module (smartphone, tablet, notebook etc.) |
| **Inputs** | - 2x 0/4...20 mA (active/passive) (for level measurement with i-Series sensors or probes; 2-wire level sensor)<br>- 1x active digital input (switch against GND, internal pull-up (5.2 kΩ) to 3.3 V) |
| **External Power Supply / Charging Socket with Rechargeable Battery Block** | 1x Connection socket for power adapter or alternative power supply (only when rechargeable battery blocks are used) |
| **Outputs** | 1x USB-A for read-out of measurement values via USB stick |
| **Storage Cycle** | 5 sec. to 60 min., time-cyclical or event-dependent |

| | |
|---|---|
| **Data Memory** | Internal; 182.398 measurement cycles |
| **Data Transmission/ Communication** | - Via plug-in USB stick<br>- Via WLAN<br>- Option: via 2G/3G/4G |
| **Battery Charger (only in connection with the use of rechargeable battery blocks)** | - Input voltage 100...240 V AC / 50...60 Hz / 50 VA<br>- Protection Class II<br>- Overvoltage Category II<br>- Pollution Degree 2<br>- Ambient Temperature 0 °C…+40 °C |

**Tab. 4 Specifications NFM-0050x 0xx**

## 18.2 NFM-0050x Cxx

| | |
|---|---|
| **Measurement Principles** | 3-channel Data Logger (2x analogue inputs and 1x digital input) |
| **Power Supply with Battery Pack** | - Internal: 2x battery pack: 8x Li-$SOCl_2$ each, 3.6 V, type D; four batteries each connected in series; $U_n$ = 4x 3.6 V = 14.4 V; see Chap. “49 Installation of Spare Parts and Wearing Parts”.<br>- External: none<br>See also Chap. “23.1 Power supply depending on rechargeable battery block/battery pack”. |
| **Enclosure** | - Material: HPX high-performance synthetic resin<br>- Weight: approx. 4.7 kg (without rechargeable blocks/battery packs and hoop guards)<br>- Protection: IP68 closed / IP67 with open enclosure cover |
| **Ex Approvals / other Approvals** |  II 3G Ex ic [ic Gc] nR IIB T4 Gc<br>The enclosure cover must be kept closed in potentially explosive areas. |
| **Operation Temperature with Battery Pack** | 0…+30 °C permanently recommended;<br>-15…+50 °C only permissible for a short time |
| **Storage Temperature with Battery Pack** | -15…+30 °C permanently recommended;<br>-15…+70 °C only permissible for a short time |
| **Max. Humidity** | 90 %, non-condensing |
| **Indication** | Status LED (RGB) |
| **Operation** | Magnet switch;<br>via WLAN with display and operating module (smartphone, tablet, notebook etc.) |
| **Inputs** | - 2x 0/4...20 mA (active/passive) (for level measurement with i-Series sensors or probes; 2-wire level sensor)<br>- 1x active digital input (switch against GND, internal pull-up (5.2 kΩ) to 3.3 V) |
| **Outputs** | 1x USB-A for read-out of measurement values via USB stick |
| **Storage Cycle** | 5 sec. to 60 min., time-cyclical or event-dependent |
| **Data Memory** | Internal; 182.398 measurement cycles |
| **Data Transmission/ Communication** | - Via plug-in USB stick<br>- Via WLAN<br>- Option: via 2G/3G/4G |

| **Connection Specifications Data Logger NFM-0050x Cxx (for Ex-Zone 2)**<br>**II 3G Ex ic [ic Gc] nR IIB T4 Gc** | | | |
|---|---|---|---|
| **Supply Voltage (internal plug connections)** | $U_n$ = 14.4 V DC;<br>4x Li-$SOCl_2$, 3.6 V, type D, in series / four separate parallel strands | | |
| **Analogue Input No. 1 /2 (connector X7C, X7E, X7B, X7D)** | in ignition protection type intrinsic safety Ex ic IIB<br>Max. values:<br>$U_o$ = 22.2 V<br>$I_o$ = 33 mA<br>R = 48 Ω<br>$P_o$ = 624 mW<br>Characteristic: trapezoid | | |
| **Ex ic** | **IIB** | | |
| **Max. permissible external Inductance** | 20 mH | 1 mH | 0.1 mH |
| **Max. permissible external Capacitance** | 0.52 µF | 0.56 µF | 1 µF |
| | | | |
| **Digital Input (connector X1N, X1P)** | in ignition protection type intrinsic safety Ex ic IIB<br>Only for connection to intrinsically safe circuit<br>Max. values:<br>$U_o$ = 3.7 V<br>$I_o$ = 7.95 mA<br>$P_o$ = 7.35 mW<br>Characteristic: linear | | |
| **Ex ic** | **IIB** | | |
| **Max. permissible external Inductance** | 100 mH | 1 mH | 0.1 mH |
| **Max. permissible external Capacitance** | 19 µF | 38 µF | 81 µF |
| | | | |
| **Digital Input (connector X1N, X1P)** | in ignition protection type intrinsic safety Ex ic IIB<br>Only for connection to intrinsically safe circuit<br>Max. values:<br>$U_i$ = 6.23 V<br>$I_i$ = 13.25 mA<br>$P_i$ = 20.64 mW<br>The effective internal capacitances and inductances are negligibly low. | | |
| | | | |
| **SIM-CARD Circuit (SIM-CARD Connector)** | in ignition protection type intrinsic safety Ex ic IIB<br>Only for connection to intrinsically safe circuit<br>Max. values:<br>$U_o$ = 4.5 V<br>$I_o$ = 283 mA<br>$P_o$ = 319 mW<br>Characteristic: linear | | |
| **Ex ic** | **IIB** | | |
| **Max. permissible external Inductance** | 1 mH | 0.1 mH | 0.02 mH |
| **Max. permissible external Capacitance** | 21 µF | 51 µF | 120 µF |

| | |
|---|---|
| **Antenna Output (connector BU1)** | In ignition protection type intrinsic safety Ex ic IIB<br>Only the connection with a passive mobile phone antenna is permitted.<br>The permissible value combinations exceed the internal reactances of the mobile phone antenna by several orders of magnitude. It is therefore not necessary to specify these values for $L_o$ and $C_o$ for the intrinsically safe antenna socket. |
| **The rules for interconnecting intrinsically safe circuits must be observed.** | |

**Tab. 5 Specifications NFM-0050x Cxx**

## 18.3 NFM-0050x Exx

| | |
|---|---|
| **Measurement Principles** | 3-channel Data Logger (2x analogue inputs and 1x digital input) |
| **Power Supply with Rechargeable Battery Block** | - Internal: 1...2x rechargeable battery block 12 V / 14 Ah, VRLA-AGM<br>- External: partial ext. power supply via NIVUS charger possible; see Chap. “49 Installation of Spare Parts and Wearing Parts”.<br>See also Chap. “23.1 Power supply depending on rechargeable battery block/battery pack”. |
| **Enclosure** | - Material: HPX high-performance synthetic resin<br>- Weight: approx. 4.7 kg (without rechargeable blocks/battery packs and hoop guards)<br>- Protection: IP68 closed / IP67 with open enclosure cover |
| **Ex Approvals / other Approvals** | ATEX: TÜV 17 ATEX 196722 X<br>IECEx: TUN18.0008X<br>  II 2G Ex eb ib [ib] mb IIB T4 Gb |
| **Operation Temperature with Rechargeable Battery Block** | -15…+50 °C<br>Permissible charging temperature rechargeable battery block VRLA-AGM: 0…+40 °C |
| **Storage Temperature with Rechargeable Battery Block** | -15…+45 °C |
| **Max. Humidity** | 90 %, non-condensing |
| **Indication** | Status LED (RGB) |
| **Operation** | Magnet switch;<br>via WLAN with display and operating module (smartphone, tablet, notebook etc.) |
| **Inputs** | - 2x 0/4...20 mA (active/passive) (for level measurement with<br>i-Series sensors or probes; 2-wire level sensor)<br>- 1x active digital input (switch against GND, internal pull-up (5.2 kΩ) to 3.3 V) |
| **External Power Supply / Charging Socket with Rechargeable Battery Block** | 1x Connection socket for power adapter or alternative power supply (only when rechargeable battery blocks are used)<br>See also Chap. “23.1 Power supply depending on rechargeable battery block/battery pack”. |

| | |
|---|---|
| **Outputs** | 1x USB-A for read-out of measurement values via USB stick |
| **Storage Cycle** | 5 sec. to 60 min., time-cyclical or event-dependent |
| **Data Memory** | Internal; 182.398 measurement cycles |
| **Data Transmission/ Communication** | - Via plug-in USB stick<br>- Via WLAN<br>- Option: via 2G/3G/4G |
| **Battery Charger (only in connection with the use of rechargeable battery blocks)** | - Input voltage 100...240 V AC / 50...60 Hz / 50 VA<br>- Protection Class II<br>- Overvoltage Category II<br>- Pollution Degree 2<br>- Ambient Temperature 0 °C…+40 °C |
| **Connection Specifications Data Logger NFM-0050x Exx (for Ex Zone 1)**<br>**II 2G Ex ib [ib] mb IIB T4 Gb see Type Examination Certificate in Chap. "Approvals and Certificates"** | |

**Tab. 6 Specifications NFM-0050x Exx**

## 18.4 Sensors

The structure and description of the associated sensors as well as their technical data can be found in the corresponding instructions or technical descriptions.

# 19 Equipment/Device Versions

## 19.1 Product Structure

The portable data logger is manufactured in different versions. The table below provides an overview on the different versions.

The version determines the article number. The article number can be found on the name-plate.

Conversely, the exact equipment/device version can be specified on the basis of the article number.

| NFM- | Version | |
|---|---|---|
| | **00500** | Portable battery-operated data logger for external level measurement; depending on sensor type via air ultrasound/pressure, alternatively other 4-20 mA sensors; 1x digital input; function extension via software licences |
| | | **000** Standard unit; power supply: rechargeable batteries or battery packs |
| | | **C00** With ATEX approval, zone 2; power supply: battery packs |
| | | **E00** With ATEX approval, zone 1; power supply: rechargeable batteries |
| | **0050G** | Portable battery-operated data logger for external level measurement; depending on sensor type via air ultrasound/pressure, alternatively other 4-20 mA sensors; 1x digital input; with remote data transmission; function extension via software licences |
| | | **0E0** With internal modem; modem board Europe *[1]; with T-shape antenna *(NFM0 Z ANT1)*; power supply: rechargeable batteries or battery packs |

| | | | |
|---|---|---|---|
| | | **0G0** | With internal modem; modem board Global [*2];<br>with T-shape antenna *(NFM0 Z ANT1*);<br>power supply: rechargeable batteries or battery packs |
| | | **0GG** | With internal modem; modem board Global [*2];<br>incl. NIVUS Connectivity;<br>with T-shape antenna (*NFM0 Z ANT1*);<br>power supply: rechargeable batteries or battery packs |
| | | **0EG** | With internal modem; modem board Europe [*1];<br>incl. NIVUS Connectivity;<br>with T-shape antenna *(NFM0 Z ANT1);*<br>power supply: rechargeable batteries or battery packs |
| | | **CE0** | With ATEX approval, zone 2<br>with internal modem; modem board Europe *[1];<br>with T-shape antenna *(NFM0 Z ANT1*);<br>power supply: battery packs |
| | | **CG0** | With ATEX approval, zone 2<br>with internal modem; modem board Global [*2];<br>with T-shape antenna *(NFM0 Z ANT1*);<br>power supply: battery packs |
| | | **CGG** | With ATEX approval, zone 2<br>with internal modem; modem board Global [*2];<br>incl. NIVUS Connectivity;<br>with T-shape antenna (*NFM0 Z ANT1*);<br>power supply: battery packs |
| | | **CEG** | With ATEX approval, zone 2<br>with internal modem; modem board Europe [*1];<br>incl. NIVUS Connectivity;<br>with T-shape antenna (*NFM0 Z ANT1*);<br>power supply: battery packs |
| | | **EE0** | With ATEX approval, zone 1<br>with internal modem; modem board Europe *[1];<br>with T-shape antenna *(NFM0 Z ANT1*);<br>power supply: rechargeable batteries |
| | | **EG0** | With ATEX approval, zone 1<br>with internal modem; modem board Global [*2];<br>with T-shape antenna *(NFM0 Z ANT1*);<br>power supply: rechargeable batteries |
| | | **EGG** | With ATEX approval, zone 1<br>with internal modem; modem board Global [*2];<br>incl. NIVUS Connectivity;<br>with T-shape antenna (*NFM0 Z ANT1*);<br>power supply: rechargeable batteries |
| | | **EEG** | With ATEX approval, zone 1<br>with internal modem; modem board Europe [*1];<br>incl. NIVUS Connectivity;<br>with T-shape antenna (*NFM0 Z ANT1*);<br>power supply: rechargeable batteries |
| **NFM-** | | | |

[*1] Areas of use: Europe, Middle East, Africa, Korea, Thailand, India

[*2] Areas of use: Global

**Tab. 7 Product Structure**

⇨ Accessories see Chapter “50 Accessories”.

## 19.2 Add-On Function Licences

The data logger can be equipped with supplementary functions at extra charge.
The following function extensions are currently available as (software) licences:

- FTP/SMTP client for data transmission via FTP server (*NFM LIZENZ FTP*), see Chap. “41 Parameter Menu Communication”: >FTP< / >E-Mail<

⇨ The functions are activated according to Chap. “40.5.5 Feature Unlock”.

# Function Description

## 20 Areas of Use

The NivuLevel Mobile is a portable data logger for the acquisition and transmission of analogue and digital signals. Depending on the equipment, use in Ex zone 1 or Ex zone 2 is also possible.

The device works independently of the mains and has a 19.2 V voltage output for supplying the connectable sensors and probes. To save energy, the voltage output can be configured so that it is only activated shortly before and during the measurement.

The measured and recorded data is temporarily stored in an internal data memory and sent to a central server at a freely selectable interval for further processing via the mobile network. An integrated SIM card is required for this.

The data logger is designed mainly for use in the measurement of clear to heavily contaminated, aqueous liquids of the most varied compositions.

It is used in part filled and full tanks and basins of the most varied geometries and dimensions.

An overview on connectable sensors/probes can be found in Chapter “16.2 Connectable Sensors/Probes”.

## 21 Functional Principle

### 21.1 Level Measurement

#### 21.1.1 2-wire Level Sensor

For level measurement, 4...20 mA 2-wire sensors can be connected to the data logger directly or via a junction box, which are supplied by the NivuLevel Mobile (e.g. NivuBar Plus or i-Series sensor).

***Measurement Ranges of i-Series Sensors***

*The i-Series sensors have pre-programmed measurement ranges. Observe the exact specifications in the instruction manual for i-Series sensors.*
*The i-Sensor can also be put into operation without a HART modem.*
*Enter the max. possible measuring span of the sensor in the “Value at 20 mA” parameter.*
*Depending on the mounting height of the sensor, a negative offset must also be set.*

| | i-3 | i-6 | i-10 | i-15 |
|---|---|---|---|---|
| **Distance to sensor face in [m] at 4 mA (empty) 0 %** | 3.0 | 6.0 | 10.0 | 15.0 |
| **Distance to sensor face in [m] at 20 mA (full) 100 %** | 0.125 | 0.300 | 0.300 | 0.500 |
| **Max. possible measurement span (value at 20 mA) in [m]** | 2.875 | 5.7 | 9.7 | 14.5 |

**Tab. 8 Measurement Span of i-Series Sensors**

# Installation and Connection

## 22 General Installation Information

**WARNING**

***Check danger due to explosive gases***

*Before starting assembly, installation and maintenance work, be sure to check that all regulations on safety at work have been observed and that there is no possible risk of explosive gases. Use a gas warner for the check.*
*When working in the sewer system, make sure that no electrostatic charge can occur:*

- *Avoid unnecessary movements to reduce the building-up of static charges.*
- *Discharge any static electricity present on your body before you start installing the sensor.*

*Disregarding may result in personal injury or damage to the system.*

### 22.1 Mounting Place

**The following precautions must be taken at the mounting place for safe installation:**

- Protect the data logger from direct sunlight. If necessary install a sunshade.
- Observe the permissible ambient temperature (see Chap. “18 Specifications”).
- Do not expose the data logger and the connected sensors to strong vibrations or mechanical shocks.

**Necessarily avoid when selecting the mounting place:**

- Corrosive chemicals or gases
- Radioactive radiation
- Installation close to footpaths or travel ways

### 22.2 Before Installation

**CAUTION**

***Rope down data logger only with suitable safety belts***

*The data logger may only be lowered into shafts using the carrying handle and suitable straps, ropes or similar.*

*Lowering the unit by the sensor cable is not permitted and can lead to cable breakage, leaking plug connection or tearing off the data logger.*

#### 22.2.1 PU Adhesive Plates on the Enclosure Frame

- Before using the NivuLevel Mobile for the first time, make sure that the PU adhesive plates on the enclosure frame have already been removed. If not, remove and clean the enclosure frame if necessary.

⇨ See Chapter “12 Inspection upon Receipt”.

#### 22.2.2 Gaskets

- Check the gaskets on the enclosure cover.
  Before closing the enclosure cover, make absolutely sure that the gasket is clean and undamaged. Therefore:

- Remove foreign bodies and dirt.

- Replace defective gaskets.
- Treat the seals with silicone grease if necessary.

***Gaskets***

*Damage to equipment caused by leaking or defective gaskets shall be excluded from the liability of the companies of NIVUS GmbH.*

⇨ See also Chap. “46.2 Maintenance Tasks”.

### 22.2.3 Insert included Batteries/Battery Packs (only for NFM-0050xCxx/NFM-0050x0xx)

Depending on the regional regulations in the recipient country, the data loggers are delivered either with two empty battery holders or with two fully equipped battery packs (incl. batteries).

- **Empty battery holders** must first be fitted with appropriate batteries (2x 8 pieces) as described in Chapter “49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)”. Then these battery packs can be inserted into the re-chargeable battery/battery compartments of the data logger (see Chapter “2.1 Power Supply”).
- **Fully equipped battery packs** can be inserted directly into the rechargeable battery/battery compartments of the data logger (see Chapter “2.1 Power Supply”).

### 22.2.4 Securing the Data Logger

➲ Secure the data logger against being washed away.
When installing the data logger in shafts or channels that are at risk of flooding, it must be secured against being washed away unintentionally (use a suspension bracket, plastic/stainless steel cable, chain or similar).

### 22.2.5 Connection Sockets

➲ Screw open, unused connection sockets on the back of the data logger with the attached covers to protect against dirt or against impacts before installation.

The protection class of the (closed) device is IP68 even with open connection sockets.

Damaged or lost covers can be reordered from NIVUS at extra costs.

### 22.2.6 Padlock

➲ Secure the NFM-0050xExx and NFM-0050xCxx data loggers for operation in hazardous areas with the supplied padlock for compliance with the legal requirements (see EU Declaration of Conformity or Chapter “8 Ex Protection”).

If a data logger is already suitably protected in another way, the padlock can be dispensed with. The responsibility for this lies with the operator.

# 23 Electrical Installation/Power Supply

## 23.1 Power supply depending on rechargeable battery block/battery pack

The data loggers can be operated either with rechargeable batteries or with battery packs, depending on the respective device type.

The data logger NivuLevel Mobile NFM-0050x **Cxx** (see Tab. 9 #2) is intended for operation with **battery packs only**.

Der Datenlogger NivuLevel Mobile NFM-0050x **Exx** is designed to operate with **rechargeable batteries** and must not be operated with the battery packs.

The NivuLevel Mobile NFM-0050x **0xx** data logger can be operated either with **rechargeable batteries** or with the **battery packs**.

**The following list shows combinations tested and approved by NIVUS. Other variants beyond this are not permitted and are excluded from the liability and warranty of the NIVUS GmbH. See also Chap. “5 Warranty” and “6 Disclaimer”.**

| # | Operation in | Device Type (according to nameplate) | Rechargeable Battery/ Battery Pack (Quantity/Type) | External Power Supply (NIVUS Charger) / UPS (Uninterruptible Power Supply) |
|---|---|---|---|---|
| 1 | Ex zone 1 / Ex zone 2 / Non-Ex area | NFM-00500 E00<br>NFM-0050G EE0<br>NFM-0050G EG0<br>NFM-0050G EGG<br>NFM-0050G EEG | Battery block(s): 1x or 2x *NFM0 ZAPB 1215 E* | Charging only permissible in the non-Ex area.<br>Only rechargeable battery operation is permitted in the Ex zone. |
| 2 | Ex zone 2 / Non-Ex area | NFM-00500 C00 *1<br>NFM-0050G CE0 *1<br>NFM-0050G CG0 *1<br>NFM-0050G CGG *1<br>NFM-0050G CEG *1 | Battery packs: 2x *NFM0 ZBPL 01C* | Low-Power version of the device.<br>Only for battery operation. |
| 3 | Non-Ex area | NFM-00500 000<br>NFM-0050G 0E0<br>NFM-0050G 0G0<br>NFM-0050G 0GG<br>NFM-0050G 0EG | Battery block(s): 1x or 2x *NFM0 ZAPB 1215* | Rechargeable Battery Operation.<br>Battery block in the left slot cannot be charged (inside the data logger). |
| | | | Battery block: 1x *NFM0 ZAPB 1215* righthand slot | Mains-powered via NIVUS charger; battery block serves as UPS |
| | | | Battery packs: 2x *NFM0 ZBPL 01C* | Battery Operation.<br>Devices starting with serial no.: 2123NFMxxxx (see nameplate) |
| *1) | These devices are only intended for operation with battery packs. The battery packs are not rechargeable. Operation with external supply via the NIVUS charger is not possible. If necessary, the batteries in the battery packs can be replaced with new batteries (see Chap. “49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)”). | | | |

**Tab. 9 Device types and possible power supply**

⇨ For approved batteries see Chap. “49 Installation of Spare Parts and Wearing Parts”.

## 23.2 General Information on the Power Supply

**WARNING**

***Danger by electric voltage***

*Remove the rechargeable blocks/battery packs from the device.*
*If the NFM-0050x0xx/NFM-0050xExx data loggers are currently connected to the mains via the multifunction socket, disconnect it.*
*When working on the electrical connections, there is a risk of electric shock. Observe the electrical data given on the nameplate.*

*Disregarding may lead to personal injury.*

***Note***

*Observe the national installation instructions.*

➲ Make sure that the following requirements are met:

1. Please note that installation may only be carried out by qualified personnel.
2. For the electrical installation, comply with the legal regulations of the respective country (such as VDE 0100 in Germany).
3. Follow further (country-specific) legal standards, regulations and technical codes.
4. Complete the installation of the data logger and the sensors before applying the operating voltage. Check whether the installation is correct.

⇨ You can find a description on how to connect the sensors starting on page 48.

**CAUTION**

***Do no loosen screws***

*Do not loosen any screws on the data logger other than the captive hexagon socket screws of the battery compartment cover!*

***Keep the battery compartment closed during operation.***

## 23.3 Rechargeable battery block (for NFM-0050x0xx/NFM-0050xExx)

The NivuLevel Mobile NFM-0050x0xx/NFM-0050xExx can be operated with only one battery block, but two battery blocks are recommended for transmitter operation to ensure the maximum possible battery life.

⇨ Rechargeable battery blocks can be purchased from NIVUS (see Chap. “50 Accessories”).

The rechargeable battery is placed in the battery compartment. A second slot is provided directly next to it for a second battery block. Which slot is used when using only one rechargeable battery is freely selectable, but restrictions must be expected in charging mode:

- In **charging mode**, only the battery block in the right-hand slot is charged and only up to approx. 75 %.
- In **battery mode**, the fuller rechargeable battery (regardless of the slot) is used until both are at the same voltage level, then both are used simultaneously.

In addition, in the menu >Battery (12V)< the battery type used or the number of rechargeable batteries installed should be entered so that the remaining battery power is correctly displayed in the menu >System< / >Information<.

The battery compartment is closed with a cover and six captive hexagon socket screws.

***Installation of Spare Parts / Wearing Parts***

*The use of spare/wear parts (e.g. rechargeable battery blocks) that are not approved by NIVUS is generally not permitted.*

*Non-compliance may have negative consequences in terms of warranty and liability. See Chap. “5 Warranty” and “6 Disclaimer”.*

### 23.3.1 Removing/installing the battery block

**WARNING**

***Risk of explosion when removing/installing the battery block in Ex areas***

*The battery pack may only be removed/installed outside the Ex area.*
*Never within Ex areas.*

*When removing the battery block, make sure that the poles are not short-circuited by an external object. This could cause very high short-circuit currents to flow, which could lead to excessive heat or fire and destruction of the rechargeable battery block.*

*Observe the specifications on the rechargeable battery block.*

The battery pack can also be replaced in wet weather and rain.
The battery compartment is completely separate from the electronic part of the data logger.

➲ Procedure:

1. Loosen the six captive hexagon socket screws of the cover.
2. Remove the cover.
3. Take out the inserted battery pack on the grip strap.
4. When refitting the battery block, put on the cover and hand-tighten the captive hexagon socket screws of the cover.

### 23.3.2 Charging the battery block

The battery pack is usually delivered empty and must be charged **before first use**.

**NIVUS recommends charging outside the unit via the mains adapter/charger to ensure 100 % charging performance. When installed, the battery pack is only charged up to approx. 75 %.**

**WARNING**

***Risk of explosion when removing/installing and charging the battery block in Ex areas***

*The battery pack may only be removed/installed and charged outside the Ex area. Never within the Ex area, as explosion protection is not guaranteed here.*

***Power Adapter/Charger***

*Only the mains adapter/charger (Fig. 23-1 Pos. 1; NFM0 ZLAD) (available at a charge from NIVUS GmbH) may be used to charge the battery pack. Observe the specifications on the power adapter/charger.*

*Permissible charging temperature for the rechargeable battery block VRLA-AGM: 0…+40 °C*

*The use of chargers of other types can lead to the destruction of the rechargeable battery (e.g. through cell leakage, explosion, etc.).*


1 Power adapter/charger with connection cable for the multifunction socket on the NFM or charging tray

2 Indicator LED for charging status

**Fig. 23-1 Power adapter/charger**

Before connecting or disconnecting the power pack/charger (Fig. 23-1 Pos. 1) to or from a battery pack, disconnect it from the mains voltage.

The charging status is indicated with the built-in LED (Fig. 23-1 Pos. 2).

| Light colour/indication of the LED | Meaning |
|---|---|
| Yellow | The rechargeable battery is being charged |
| Green | Trickle charge |
| LED not lit | Reverse polarity, short circuit or no mains connection; fuse in the unit has blown *1 |

**Tab. 10 Light colours of the LED**

*1) If the condition persists, contact the NIVUS customer service (see Chap. “46.3 Customer Service Information”).

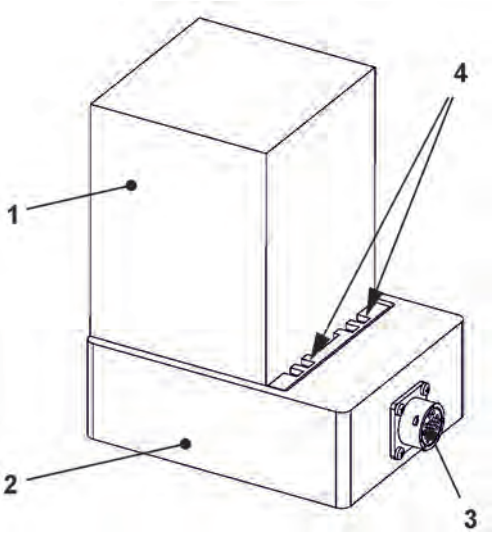
### Charging the inserted battery block

See Chapter “23.3.4 Operation/charging with direct mains power connection”.

### Charging the removed battery block

➲ Procedure:

1. Place the charging tray in a protected, dry place on a stable, horizontal surface. Make sure that the charging tray itself is also dry.
2. Take appropriate measures to ensure that no unauthorised persons have access to the units during the charging process.
3. Insert the rechargeable battery (Fig. 23-2 Pos. 1) upside down into the charging tray (Fig. 23-2 Pos. 2).
4. Connect the power adapter/charger (with connection cable for the multifunction socket) via the charging socket (Fig. 23-2 Pos. 3) and connect to the mains voltage. The battery block is charged via the charging contacts (Fig. 23-2 Pos. 4). Note the light colour/indication of the LED on the power adapter/charger.
5. At the end of the charging process, to avoid a short circuit at the charging contacts/poles, first disconnect the power adapter/charger from the mains voltage, then remove the battery pack.




1 Rechargeable battery (inserted upside down)

2 Charging tray

3 Charging socket to connect the power adapter/charger

4 Charging contacts

**Fig. 23-2 Battery block in the charging tray**

Over time, the battery loses its maximum capacity. This affects the battery life, which cannot be taken into account by the battery life calculation integrated in the NivuLevel Mobile.

At high or low ambient temperatures as well as longer service life, the capacity of the battery block used is reduced.

*Tips to extend battery life*

- *Store the battery at room temperature:*
  - *Higher temperatures lead to faster battery ageing.*
  - *Lower temperatures lead to a loss of capacity.*
- *Store battery fully charged; fully charge every 6...12 months.*
- *Keep the rechargeable battery clean (dust-free) and dry.*

***Battery Life***

*Rechargeable battery blocks are wearing parts and must be replaced when the charging capacity decreases significantly. The battery life depends on the frequency of use.*

*Note the previous "Tips to extend battery life".*

***Measurement***

*The battery should be charged before each NivuLevel Mobile measurement.*

*Unused battery packs must be removed from the battery compartment after the last measurement and stored in a dry, frost-free room (see also "Tips to extend battery life").*

***Installation of Spare Parts / Wearing Parts***

*The use of spare/wear parts (e.g. rechargeable batteries) that are not approved by NIVUS will invalidate the warranty.*

***Disposal of the battery block***

*Always ensure that the battery blocks are disposed of in an environmentally friendly manner.*

*Used battery packs can be returned to the manufacturer or handed in at suitable collection points.*

### 23.3.3 Operation/charging via an alternative voltage source (for NFM-0050xExx/ NFM-0050x0xx with battery blocks)

**WARNING**

***Risk of explosion when charging the battery pack in Ex areas***

*The battery pack may only be removed/installed outside the Ex area.*
*Never within Ex areas.*

The NivuLevel Mobile can also be powered by alternative voltage sources (e.g. external rechargeable batteries, solar panels, supply via an external power supply unit) via the multifunction socket.

**WARNING**

***Explosion hazard during operation with direct external power supply in Ex areas***

*The unit may **only** be operated **outside** the Ex area with direct **external** power supply.*
*Never within Ex areas.*

In addition to operation, the battery block in the right-hand slot is also charged here. However, only up to approx. 75 % of the total charging power, which is why NIVUS recommends using the charging tray for charging the battery block (see chapter "23.3.2 Charging the battery block").

NIVUS offers a special 2-core connection cable (*NFM0 ZVER PS*) for the alternative power supply with open cable ends on one side and plug for the multifunction socket on the other side.

The voltage input on the NivuLevel Mobile operates from 12...14.5 V and is protected against short-term overvoltage, overcurrent and reverse polarity.

***Battery slots when charging/discharging***

*In charging mode, only the battery block in the right-hand slot is charged.*

*In battery mode of the battery blocks, the fuller rechargeable battery (regardless of the slot) is used until both are at the same voltage level, then both are used simultaneously.*

### 23.3.4 Operation/charging with direct mains power connection (for NFM-0050xExx/ NFM-0050x0xx with battery blocks)

The NivuLevel Mobile can also be operated directly on a mains voltage of 100...240 V AC by means of the combined power supply unit/charger (see Fig. 23-1).

**WARNING**

***Explosion hazard during operation with direct mains power connection in Ex areas***

*The unit may only be operated outside the Ex area with direct mains power connection. Never within Ex areas.*

In addition to operation, the battery block in the right-hand slot is also charged here. However, only up to approx. 75 % of the total charging power, which is why NIVUS recommends using the charging tray for charging the battery block (see chapter “23.3.2 Charging the battery block”).

**WARNING**

***Risk of explosion when charging the battery pack in Ex areas***

*The battery pack may only be removed/installed outside the Ex area. Never within Ex areas.*

To charge, insert the battery pack to be charged into the right-hand battery slot and connect the plug of the mains adapter/charger (Fig. 23-1) to the multifunction socket of the NivuLevel Mobile. The battery pack can remain in the NivuLevel Mobile during mains operation, which charges it and also serves as a buffer in the event of a mains failure.

***Battery slots when charging/discharging***

*In charging mode, only the battery block in the right-hand slot is charged.*

*In battery mode of the battery blocks, the fuller rechargeable battery (regardless of the slot) is used until both are at the same voltage level, then both are used simultaneously.*

## 23.4 Battery pack (for NFM-0050xCxx/NFM-0050x0xx with battery packs)

The NivuLevel Mobile NFM-0050xCxx is operated with two battery packs to ensure the maximum possible service life and trouble-free (battery) operation.

The NivuLevel Mobile NFM-0050x0xx can also be operated alternatively with two battery packs. However, unlike the rechargeable battery blocks, these are **not rechargeable**.

⇨ Battery packs can be purchased from NIVUS (see Chap. “50 Accessories”).

The battery packs are placed in the rechargeable/battery compartments (see Fig. 2-1 on page 11).

In the Battery menu, the battery types used (battery blocks or battery packs or customer's own batteries) and their number are selected.

If battery packs (instead of rechargeable batteries) are used, no battery capacity is shown in the main display and in the >System< / >Information< menu. The data logger cannot reliably calculate the capacity of the battery packs.

The battery compartment is closed with a cover and six captive hexagon socket screws.

***Installation of Spare Parts / Wearing Parts***

*The use of spare/wear parts (e.g. batteries) that are not approved by NIVUS is generally not permitted.*

*Non-compliance may have negative consequences in terms of warranty and liability. See Chap. “5 Warranty” and “6 Disclaimer”.*

### 23.4.1 Removing/installing the battery pack

**WARNING**

***Risk of explosion when removing/installing the battery pack in Ex areas***

*The battery pack may only be removed/installed outside the Ex area.*
*Never within Ex areas.*

*When removing the battery pack, make sure that the poles are not short-circuited by an external object. This could cause very high short-circuit currents to flow, which could lead to excessive heat or fire and destruction of the battery pack.*

*Observe the specifications on the battery pack.*

***The following applies to the use of batteries:***

- *All batteries used in a battery pack must be date stamped together by the manufacturer and must be new.*
- *The replacement of individual cells of a battery pack is not permitted.*
- *Strict attention must be paid to the correct orientation of the cells when inserting them.*
- *All batteries must bear the ® mark.*

➲ Procedure:

1. Loosen the six captive hexagon socket screws of the cover.
2. Remove the cover.
3. Take out the inserted battery pack on the grip strap.
4. When refitting the battery pack, put on the cover and hand-tighten the captive hexagon socket screws of the cover.

⇨ The replacement of the batteries in the battery packs is carried out according to Chap. “49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)”.

## 24 Installation of Sensors

This chapter describes the sensors that can be used and their usual locations. The exact description for mounting the sensors is included in the relevant (mounting) instructions.

***Note***

*During assembly work, ensure that all work safety regulations are observed.*

### 24.1 Sensor Installation Principles

The placement of the sensors on the system is decisive for the reliability of the measurement results. Therefore, care must be taken to ensure good hydraulic conditions and a sufficient calming section at the installation site. The sensor types and their mounting must be determined individually, depending on the measuring point.

The conditions for selecting a calming section and mounting the sensors are described in the respective (mounting) instructions.

The measurement place must be parameterised before installation. The corresponding preparation of the measurement place and its dimensions can be taken from the documents of the respective facility.

⇨ The parameterisation of the measurement places is described in Chapter “Setting Parameters” starting on page 72.

## 25 Connection of Sensors

### 25.1 Cable for Sensor Connection

Depending on the number of connected sensors/probes and the possibly required use of the junction box, these are equipped with different accessories/cables ex works.

If only 1 sensor/probe is to be connected, this/these can be ordered with a permanently connected cable and matching plug for the socket on the NivuLevel Mobile.

When connecting 2 sensors/probes, they are supplied with an open cable end (for connection to the junction box). The junction box is supplied with a permanently connected cable and matching plug for the socket on the NivuLevel Mobile.
In this case, existing level sensors could also be used, provided they are listed in Chapter "16.2 Connectable Sensors/Probes".

⇨ See also Chapter “50 Accessories” starting on page 128.

### 25.2 Connecting Sensors

List of connectable level sensors see Chapter “16.2 Connectable Sensors/Probes”.

The sensors are connected to the lower socket on the back of the NivuLevel Mobile unit (below the multifunction I/O socket). When connecting only one sensor/probe, the lower socket (in connection with the matching plug) is used directly (Fig. 25-1). A total of two sensors can be connected at the same time, in which case the junction box (*NFM0 ZUB0 AZD 01*) must also be used for connection to the lower socket (Fig. 25-2). The junction box is connected via the matching plug on the NivuLevel Mobile, the sensors/probes must be connected to the junction box according to Fig. 25-3.

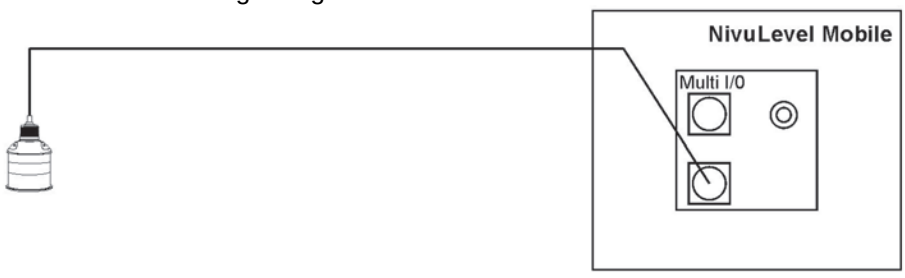



**Fig. 25-1 Connection of 1 level sensor**

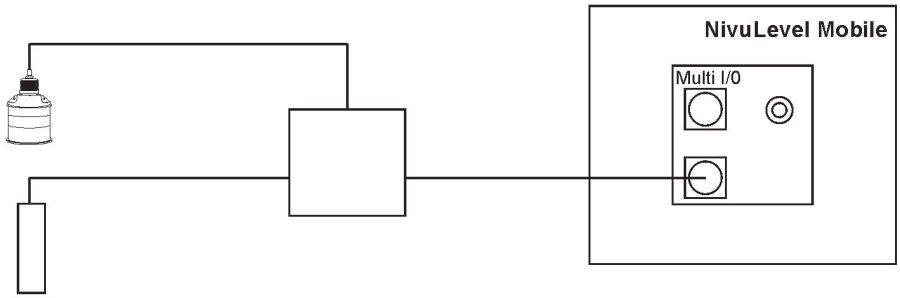



**Fig. 25-2 Connection of 2 level sensors via junction box**

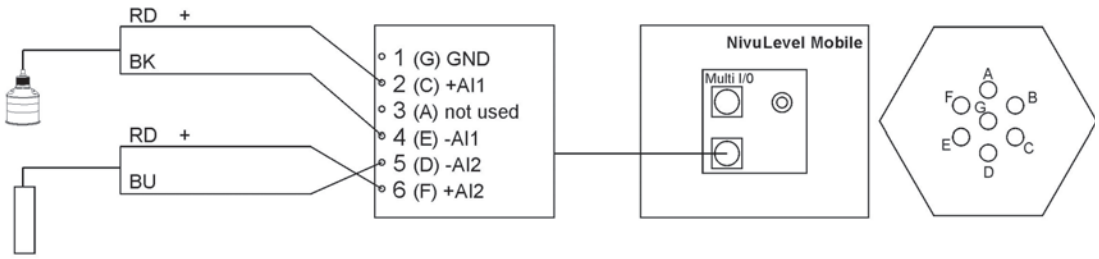



**Fig. 25-3 Connection of level sensors to the junction box**

When using **1 i-Sensor** and **1 probe**, always connect the i-Sensor to analogue input 1 to enable communication via HART.

If, **in addition** to the sensors/probes, a **signal** is to be connected to the NivuLevel Mobile **via the digital input** (e.g. for a rain gauge or a level switch), this connection must be made via the multifunction socket.

## 25.3 Overvoltage Protection Measures (only for NFM-0050x0xx/ NFM-0050xExx with rechargeable battery block)

For effective protection of the NivuLevel Mobile with external power supply, it is necessary to secure the unit by means of overvoltage protection devices.

***Only when using rechargeable battery blocks***

*The NFM-0050x0xx data loggers with battery packs cannot be supplied externally.*

**WARNING**

***Explosion hazard during operation with direct connection in Ex areas***

*The unit may only be operated outside the Ex area with a direct mains connection (e.g. plug-in power supply) or direct external power supply (e.g. solar power supply).*
*Never within Ex areas.*

When using a **plug-in power supply unit**, NIVUS recommends the types EnerPro 220Tr / 20kA or EnerPro 220Tr / 5kA (Fig. 25-4) for the mains side.

For **direct external power supply** via 12 V DC (e.g. for solar power supply), use the types DataPro 2x1 12V/12V-11mH-Tr(N) for non-Ex areas. (Fig. 25-5).

⇨ See Chap. “50 Accessories”.

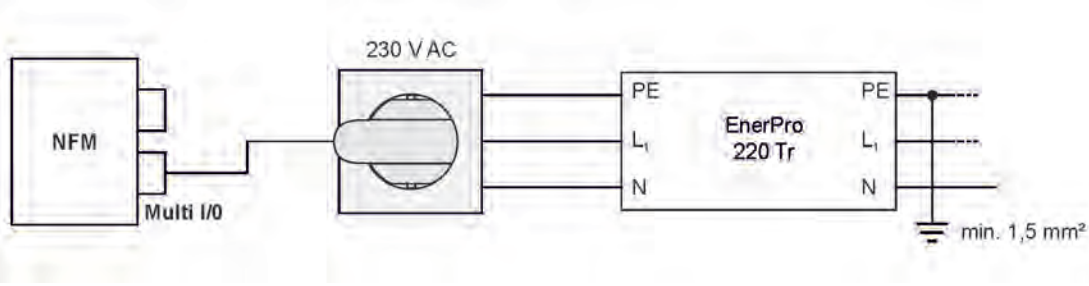



**Fig. 25-4 Overvoltage protection for power supply AC general**

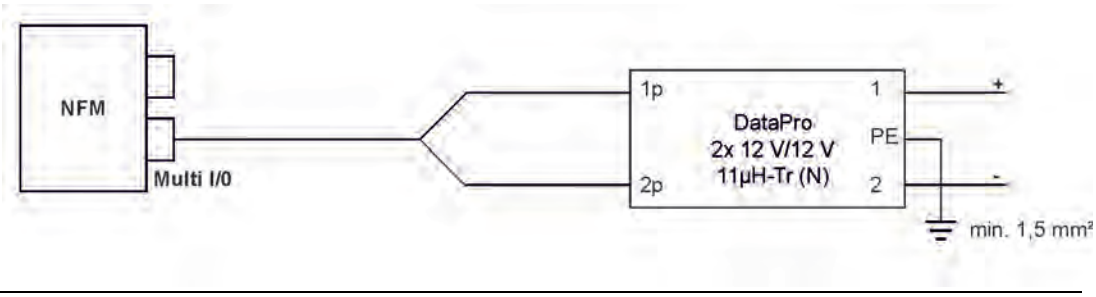



**Fig. 25-5 Overvoltage protection for power supply DC general**

## 26 Connecting the Connector Box for Inputs/Outputs (only for NFM-0050x0xx/NFM-0050xExx with rechargeable battery block)

A Connector Box (Fig. 26-1 Pos. 6) is used if the data logger (Fig. 26-1 Pos. 1) is to be supplied externally and the digital input is to be used at the same time.

***Only when using rechargeable battery blocks***

*The NFM-0050x0xx data loggers with battery packs cannot be supplied externally.*

***Important Note***

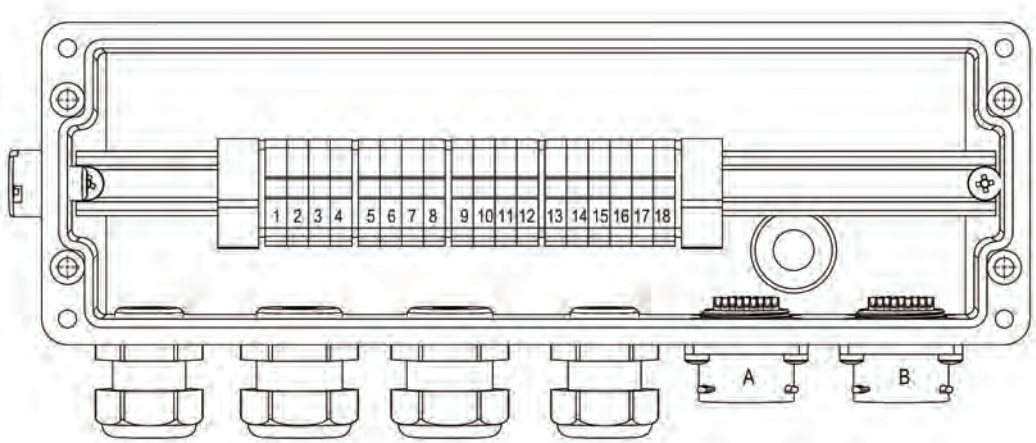
*The Connector Box can either be mounted directly on the NivuLevel Mobile in conjunction with the hoop guards (Fig. 26-1 Pos. 2) or attached/stored at another location.*


**Fig. 26-1 NFM with Connector Box**

➲ Procedure for fastening the Connector Box on the NivuLevel Mobile:

1. Unscrew the rubber buffers (not shown) on the back of the NivuLevel Mobile (Fig. 26-1 Pos. 1).
   The two screw-on plates (Fig. 26-1 Pos. 3) (now loose) in the screw-on channels (Fig. 26-1 Pos. 4) and the rubber buffers are needed again in the next step.
2. Attach the hoop guards (Fig. 26-1 Pos. 2) and the screw-on plates to the NivuLevel Mobile with the rubber buffers.
3. Fasten the Connector Box (Fig. 26-1 Pos. 6) to the hoop guards with the screws supplied.
4. Connect the sensors in the Connector Box according to the terminal wiring plan (Fig. 26-2).
5. Insert the plug (Fig. 26-1 Pos. 5) of the Connector Box connection cable into the multifunction socket on the NivuLevel Mobile.

⇨ Article numbers see Chapter “50 Accessories”.




| | |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | DE 3,3 V |
| 14 | GND |
| 15 | |
| 16 | |
| 17 | |
| 18 | |

A = no performance
B = 12...14 V DC

**Fig. 26-2 Terminal wiring Connector Box**

**Connection B** on the Connector Box is used for the external supply of the data logger NFM (with 12...14 V DC) when the Connector Box is plugged in via the power supply unit/charger (see Chap. “23.3.2 Charging the battery block”) or via the 2-wire connection cable (see Chap. “23.3.3 Operation/charging via an alternative voltage source”).

# 27 (T-Shape) Antenna for 2G/3G/4G Remote Data Transmission

For 2G/3G/4G remote data transmission, the supplied T-Shape antenna is required.

***Only connect antennas approved for this product***

*The antenna socket is designed to be intrinsically safe. Only the enclosed antenna or the types NFM0 ANTx with the longer connection cables may be connected to the NivuLevel Mobile.*

➲ Procedure for connection and installation:

1. Plug the antenna cable into the socket on the unit (Fig. 27-1) and tighten the screw connection manually.

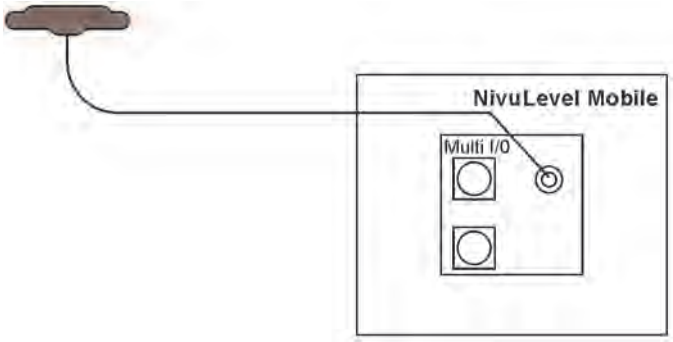



**Fig. 27-1 Connecting the 2G/3G/4G Antenna**

2. Place the antenna at the highest possible position in the shaft or on the dirt trap.
   *Note:*
   *The T-Shape mobile phone antenna must be positioned to ensure that no person is permanently (longer than 6 minutes) at a distance of less than 25 cm from the antenna.*
   *When the device is operating normally, there is usually no health risk even at smaller distances, as the device only transmits for a short time on the mobile radio interface, but this distance should still be observed as a precautionary measure.*
3. If the unit is used in the manhole, close the manhole cover to check whether the data transmission also works when the manhole cover is closed.
4. Use the parameterisation menu Communication to set up a test connection (see Chap. “41 Parameter Menu Communication”, >Modem Status< / >Set Up Test Connection<) to check the data transmission. If the connection is poor, change the position of the antenna until data transmission works.

# Commissioning

## 28 Notes to the User

Before connecting and operating the NivuLevel Mobile, the instructions below shall be followed.

This instruction manual contains all information required for parameterisation and use of the data logger. The instruction manual is intended for qualified expert personnel. Appropriate knowledge in the areas of measurement systems, automation technology, control engineering, information technology and wastewater hydraulics are preconditions for putting the NivuLevel Mobile into operation.

Read this instruction manual carefully to ensure proper functioning of the NivuLevel Mobile. Connect the NivuLevel Mobile according to Chapter “25.2 Connecting Sensors”.

If you have any questions regarding installation, connection or parameter setting, please contact our hotline at:

- +49 7262 9191-955

**General Principles**

Commissioning of the measurement system shall not be carried out before installation has been finished and verified.

Observe the information in this instruction manual to prevent incorrect or faulty or parameterisation. Familiarise yourself with the operation of the data logger before you start with the parameterisation.

After connecting the data logger and sensors (according to Chapters “24 Installation of Sensors” and “25 Connection of Sensors”) the measurement place is parameterised.

To do this, in most cases it is sufficient to specify:

- Measurement place geometry and dimensions
- Sensors used and their positioning
- Display units
- Storage mode settings

The user interface of the NivuLevel Mobile is easy to understand. You can quickly make the basic settings yourself.

For faster commissioning, a start assistant is also available. This guides the user in simple steps through the most important points of parameterisation (see Chapter “44 Parameter Menu Quick Start”).

## 29 Lighting System of the Status LED on NivuLevel Mobile

The status LED (Fig. 29-1) on the front of the NivuLevel Mobile lights up during operation according to a predefined system that allows conclusions to be drawn about the current status of the device.

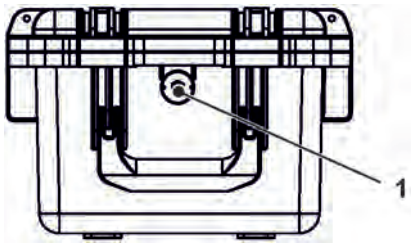



**Fig. 29-1 LED on the front of the NFM**

If the NFM works without restrictions, the LED lights up **green**: 1x long, pause, 5x short (Tab. 11 Nr. 1).

If at least one error message is present, the same rhythm applies, but the LED then lights up **red** for a long time (1.5 s), followed by an error code (Tab. 11 Nr. 9).

**Blue** light in the pause between the first long light and the five consecutive ones indicates the number of user logged in: 1x for each user (up to max. four logged-in users are possible) (Tab. 11 Nr. 2…5).

⇨ See also Chap. “35 General Programming”.

The LED lights up **white** (Tab. 11 Nr. 14 Special code: Switch-on sequence without USB stick) when the system is booted, e.g. after plugging in the rechargeable/battery pack or after a firmware update.
*Background info:*
*The colour white is generated by simultaneously illuminating the colours red, green and blue. So white also shows that all colours of the LED are working correctly.*

⇨ See also Chap. “40.5.6 Update NivuLevel Mobile”.

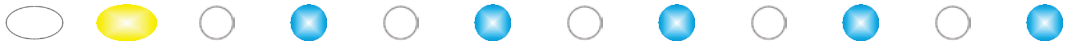
Depending on the status of the transmitter, the colours **yellow**, **magenta/pink** and **cyan/turquoise** are also possible. Details see Tab. 11 No. 6, 10 and 11.

**Explanation** of the following table of possible light combinations:

- LED oval means 1.5 s active (on or off)
- LED round means 0.5 s active (on or off)
- Each message consists of a start identifier (LED 1.5 s off / 1.5 s on) and a sequence of five short flashing codes (LED 0.5 s on / 0.5 s off) containing the actual information.
- The special codes (Tab. 11 No. 12, 13 and 14) consist of a start identifier (LED red 0.5 s / green 1.5 s) and a sequence of long phases (LED 1.5 s on or off).

**Possible light combinations of the status LED**

| | |
|---|---|
| 1 | OK: Normal operation; no WLAN or modem connections (0 users) |
| 2 | OK: 1 WLAN or modem connection (1 user; blue) |
| 3 | OK: 2 WLAN or modem connections (2 users; blue) |
| 4 | OK: 3 WLAN or modem connections (3 users; blue) |
| 5 | OK: 4 WLAN or modem connections (4 users; blue) |
| 6 | Error: Automatic sensor detection |
| 7 | Error: Battery |

| | |
|---|---|
| 8 | Error: HART  |
| 9 | Error: Other, undefined error  |
| 10 | Warning: Data backup (export) to USB stick is being carried out  |
| 11 | Warning: Firmware update (bootloader ext. FLASH) is being carried out  |
| 12 | Special code: Start bootloader without USB stick  |
| 13 | Special code: Firmware update (bootloader int. FLASH) is being carried out  |
| 14 | Special code: Switch-on sequence without USB stick  |

**Tab. 11 Lighting system of the status LED**

# 30 Connection Setup

## 30.1 Common

The entire operation of the NivuLevel Mobile is done via a commercially available smartphone/tablet or via a notebook/PC. The operation of the display and operating module used is carried out in accordance with the manufacturer's instructions for the respective unit.

The procedure for establishing a connection for the Android, iOS and Windows operating systems is described below.

## 30.2 Android Operating System

➲ Preparations on NivuLevel Mobile:

1. Ensure power supply: at least one charged rechargeable battery/battery pack in the unit or alternatively via the multifunction socket (see Chapter “23.3.3 Operation/charging via an alternative voltage source”).
   If the rechargeable/battery pack is now plugged in or the voltage is newly added and the connection setup is continued within the following approx. five minutes, the following work step with the “Wake-Up” can be skipped.
2. “Wake up” NivuLevel Mobile: to do this, hold the supplied magnet (Fig. 30-1 Pos. 2) in front of the Reed contact (Fig. 30-1 Pos. 1; at the front of the NFM) until the LED lights up.

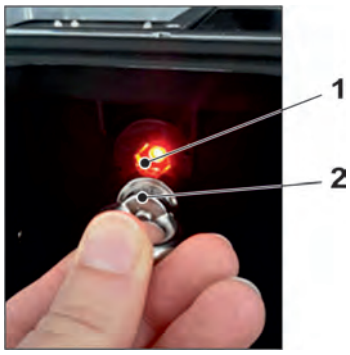



**Fig. 30-1 Waking up the NivuLevel Mobile**

➲ Work steps on the display and operating module (smartphone, tablet, notebook, PC, etc.):

1. Start the display and operating module.
2. Open the corresponding menu using the Settings symbol (Fig. 30-2 Pos. 1).

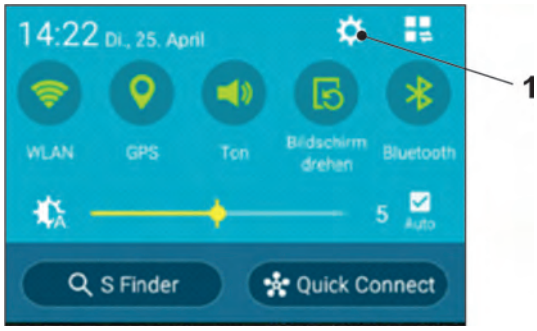



**Fig. 30-2 Settings symbol**

3. Select WLAN (Fig. 30-3 Pos. 1).

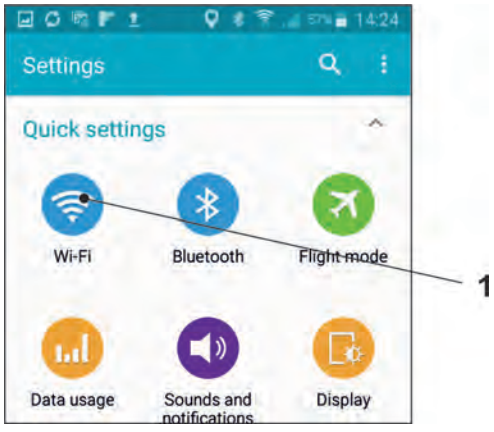



**Fig. 30-3 WLAN symbol**

4. In the WLAN list select the NFM (Fig. 30-4 Pos. 1) with the corresponding SSID (delivery status = serial number).

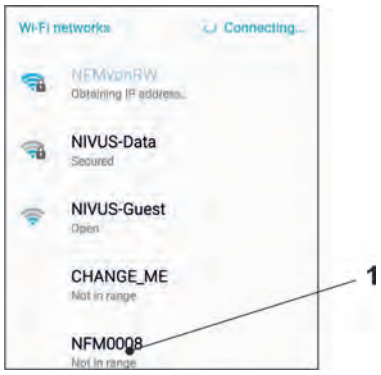



**Fig. 30-4 WLAN list**

5. Enter the password for server access (delivery status = PUK) (Fig. 30-5 Pos. 1) and connect (Fig. 30-5 Pos. 2).

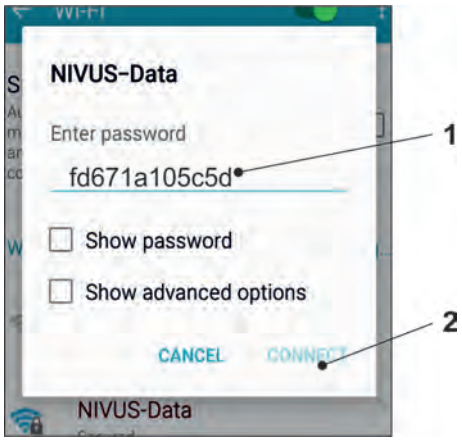



**Fig. 30-5 Enter password (here fd671a105c5d as example) and connect**

6. Start Internet browser.
7. Enter the IP address “192.168.1.1” in the address field and open.
   After successful connection the display of the NivuLevel Mobile (Fig. 30-6) is shown.

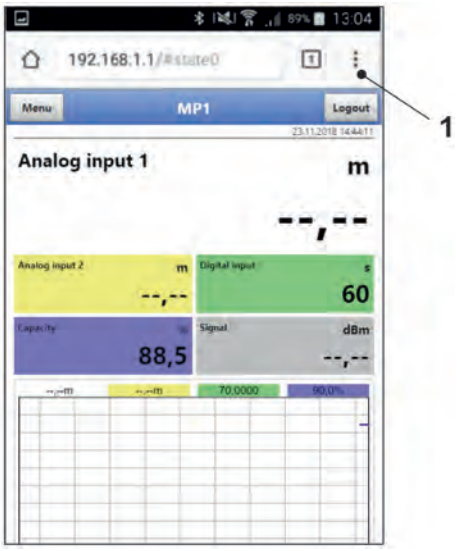



**Fig. 30-6 Indication of NFM display in the browser**

8. To set up a link on the "Home screen" (for direct access), tap the icon for more tabs (Fig. 30-6 Pos. 1) and settings and select “Add to start screen” (Fig. 30-7 Pos. 1).

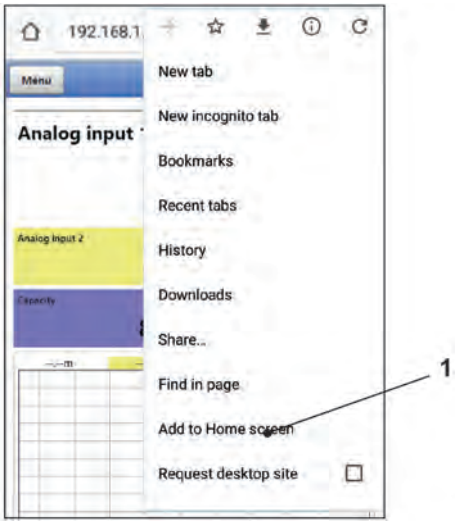



**Fig. 30-7 Add to start screen**

9. Confirm with “Add” (Fig. 30-8 Pos. 1).

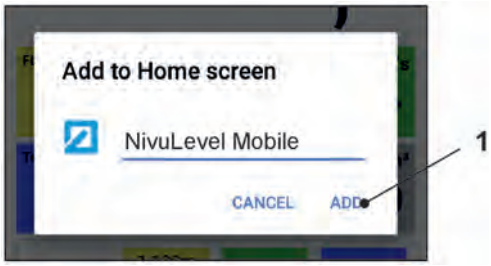



**Fig. 30-8 Confirm adding**

The shortcut (Fig. 30-9 Pos. 1) appears on the start screen and can be used for immediate entry without entering the IP address.

This link can also be used with any other NivuLevel Mobile data logger after the respective selection in the WLAN list.

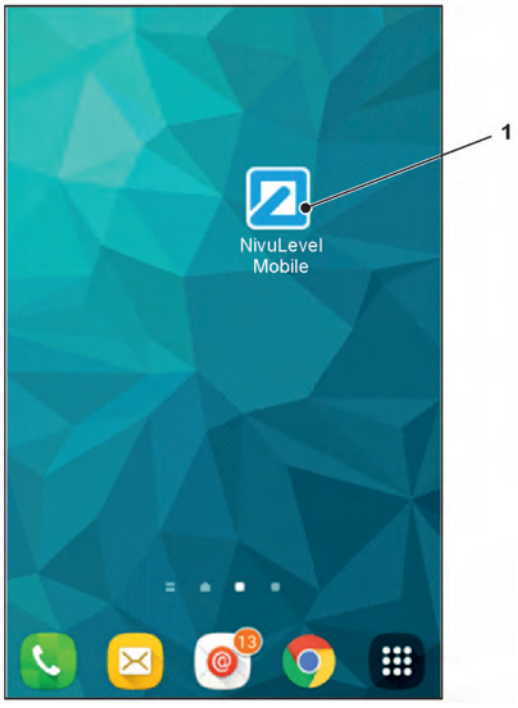



**Fig. 30-9 Link on the start screen**

## 30.3 iOS Operating System

➲ Preparations on NivuLevel Mobile:

1. Ensure power supply: at least one charged rechargeable battery/battery pack in the unit or alternatively via the multifunction socket (see Chapter “23.3.3 Operation/charging via an alternative voltage source”).
   If the rechargeable/battery pack is now plugged in or the voltage is newly added and the connection setup is continued within the following approx. five minutes, the following work step with the “Wake-Up” can be skipped.
2. “Wake up” NivuLevel Mobile: to do this, hold the supplied magnet (Fig. 30-10 Pos. 2) in front of the Reed contact (Fig. 30-10 Pos. 1; at the front of the NFM) until the LED lights up.

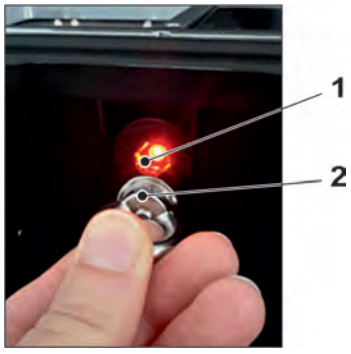



**Fig. 30-10 Waking up the NivuLevel Mobile**

➲ Work steps on the display and operating module (smartphone, tablet, notebook, PC, etc.):

1. Start the display and operating module.
2. Open the corresponding menu using the Settings symbol (Fig. 30-11 Pos. 1).


**Fig. 30-11 Settings symbol**

3. Select WLAN (Fig. 30-12 Pos. 1).


**Fig. 30-12 WLAN symbol**

4. In the WLAN list select the NFM (Fig. 30-13 Pos. 1) with the corresponding SSID (delivery status = serial number).


**Fig. 30-13 WLAN list**

5. Enter the password for server access (delivery status = PUK) (Fig. 30-14 Pos. 2) and connect (Fig. 30-14 Pos. 1).

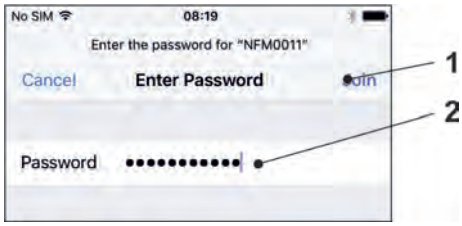



**Fig. 30-14 Enter password and connect**

6. Start Internet browser.
7. Enter the IP address “192.168.1.1” in the address field and open.
   After successful connection the display of the NivuLevel Mobile (Fig. 30-15) is shown.


**Fig. 30-15 Indication of NFM display in the browser**

8. To set up a link on the Home screen (for direct access), tap the “Provide” icon (Fig. 30-16 Pos. 1).

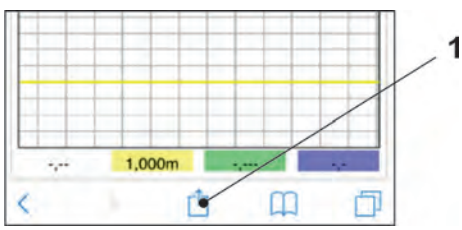



**Fig. 30-16 Set up link**

9. Select “To Home screen” (Fig. 30-17 Pos. 1).


**Fig. 30-17 To Home screen**

10. Confirm with “Return” (Fig. 30-18 Pos. 1).

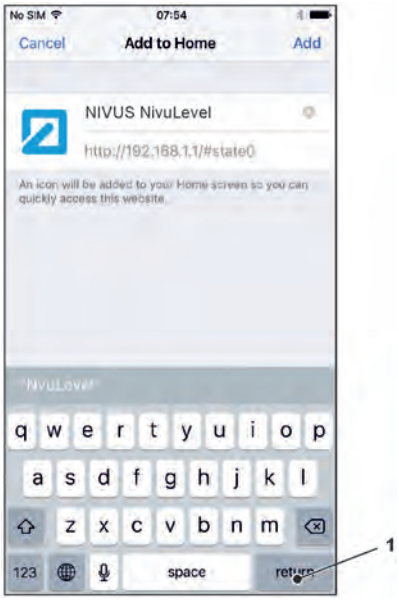



**Fig. 30-18 Confirm adding**

The shortcut (Fig. 30-19 Pos. 1) appears on the start screen and can be used for immediate entry without entering the IP address.

This link can also be used with any other NivuLevel Mobile unit after the respective selection in the WLAN list.


**Fig. 30-19 Link on the start screen**

## 30.4 Windows Operating System

➲ Preparations on NivuLevel Mobile:

1. Ensure power supply: at least one charged rechargeable battery/battery pack in the unit or alternatively via the multifunction socket (see Chapter “23.3.3 Operation/charging via an alternative voltage source”).
   If the rechargeable/battery pack is now plugged in or the voltage is newly added and the connection setup is continued within the following approx. five minutes, the following work step with the “Wake-Up” can be skipped.
2. “Wake up” NivuLevel Mobile: to do this, hold the supplied magnet (Fig. 30-20 Pos. 2) in front of the Reed contact (Fig. 30-20 Pos. 1; at the front of the NFM) until the LED lights up.

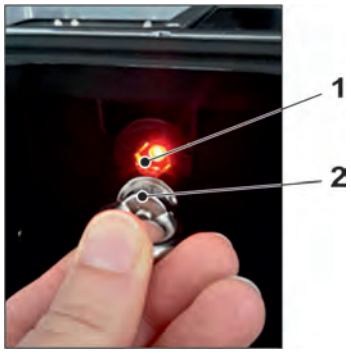



**Fig. 30-20 Waking up the NivuLevel Mobile**

➲ Work steps on the display and operating module (smartphone, tablet, notebook, PC, etc.):

1. Start the display and operating module.
2. Go to the overview of the available (WLAN) networks (Fig. 30-21 Pos. 2).
3. In the WLAN list select the NFM (Fig. 30-21 Pos. 1) with the corresponding SSID (delivery status = serial number).


**Fig. 30-21 (WLAN) Network list**

4. Enter security key (password) (delivery status = PUK; here fd671a105c5d as example) (Fig. 30-22 Pos. 1) and connect.

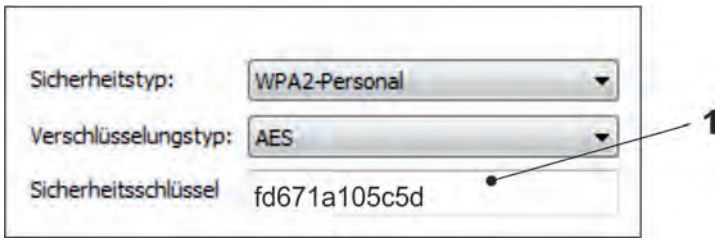



**Fig. 30-22 Enter security key and connect**

5. Start Internet browser.

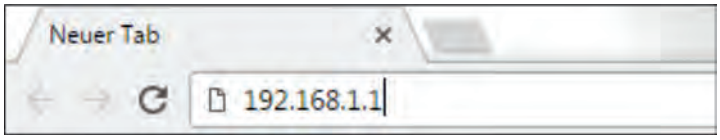



**Fig. 30-23 Address field**

6. Enter the IP address “192.168.1.1” in the address field (Fig. 30-23) and open.
   After successful connection the display of the NivuLevel Mobile (Fig. 30-24) is shown.


**Fig. 30-24 Indication of NFM display in the browser**

7. To set up a favourite in the browser (for direct access), tap the star for “Favourites” (Fig. 30-25 Pos. 1) (Google Chrome is used as an example) and confirm with “Done” (Fig. 30-25 Pos. 2).


**Fig. 30-25 Setting up favourite**

The bookmark appears on the bookmark bar (Fig. 30-26 Pos. 1) and can be used for immediate access by simply selecting it without entering the IP address.

This link can also be used with any other NivuLevel Mobile unit after the respective selection in the WLAN list.

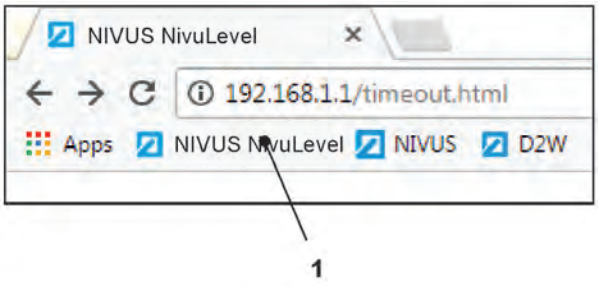
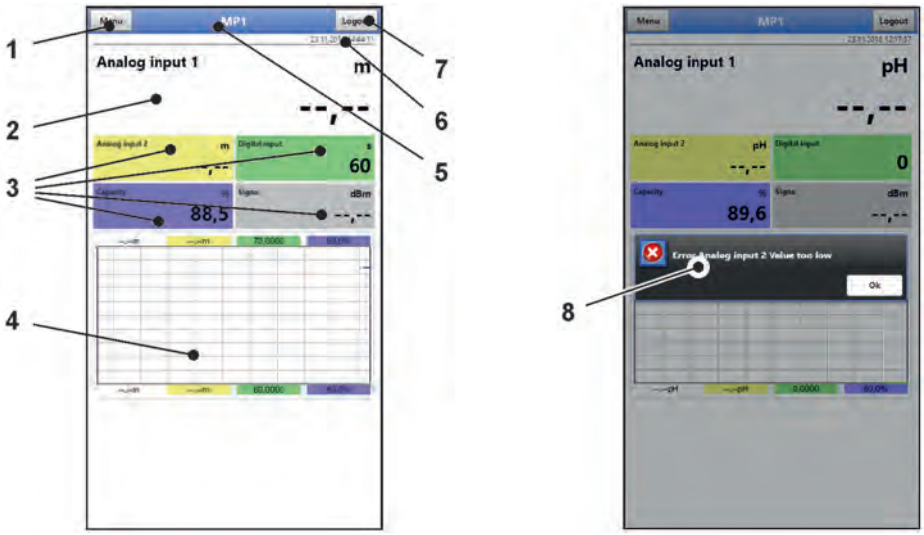



**Fig. 30-26 Link in the bookmarks bar**

# 31 Menu Control/Overview

## 31.1 Overview Display

Via the NIVUS display you can see at any time where you are in the menu and which entries you are currently editing.




1 Menu / Back (depending on the display view)

2 Display Area 1 (output field 1 for analogue input 1)

3 Display Area 2 (output field 2...5 for analogue input 2, digital input 1 and capacity)

4 Display Area 3 (trend hydrograph of analogue input 1, analogue input 2, digital input 1 and capacity)

5 Name of the measurement place

6 Date and Time

7 Logout (disconnecting the operating and display module from the data logger; the data logger continues to run with the last saved settings)

8 Possible error message, information or display for active service mode (one-time display, directly after opening as a separate window in the centre of the display; close with “Ok”)

**Fig. 31-1 Display view**

## 31.2 Save Parameters

After changing parameters and scrolling back via the menu field, the changed parameters must be saved before the changes take effect. After saving, the status message “Successful” appears (Fig. 31-2).

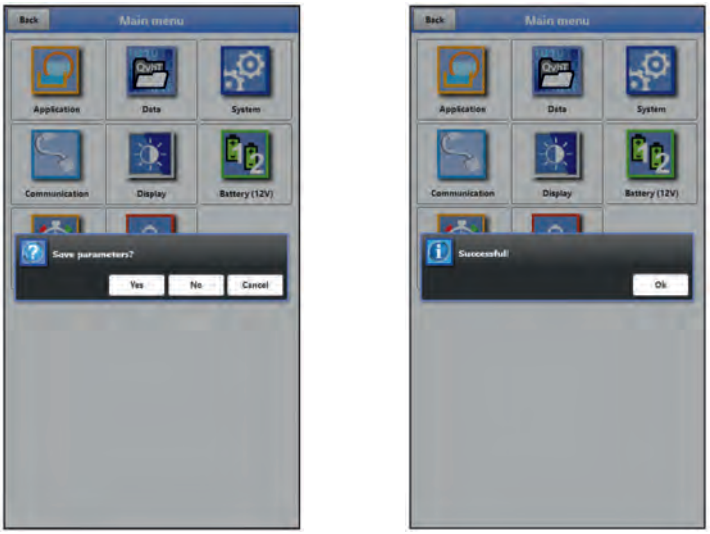



**Fig. 31-2 Save parameters**

➲ Procedure for saving see Chapter “35.1 Save Parameters”.

## 31.3 Menus

All menus are described in a logical programming sequence in chapter “Setting Parameters” starting on page 72.

There are eight basic menus available in the main menu. These become visible and selectable by selecting the “Menu” field (from the main display) or the “Back” field (from within the submenus).

**In detail these are:**

| | |
|---|---|
| **Application** | Guides commissioning personnel through the complete parameterisation of sensor selection, analogue and digital inputs and diagnostics |
| **Data** | - Graphical representation of the measurement values history<br>- Saving of data<br>- Saving and loading of parameters |
| **System** | - Retrieval of basic information (serial number, version, item number, etc.) on the data logger (required for queries with NIVUS GmbH)<br>- Setting the language and date format under >Country Settings<<br>- Setting the system time and time zones under >Time/Date<<br>- Error messages under >Error Messages<<br>- Service Levels<br>- Configure Storage Cycle<br>- Parameter/System Reset<br>- Feature Unlock<br>- Shut Down Device (Powerdown)<br>- Information about the rechargeable battery blocks and the current capacity |
| **Communication** | Setting parameters for the communication interfaces of the NivuLevel Mobile |
| **Indication** | Setting the output fields (text, decimal places etc. ...) |
| **Battery (12V)** | Selection of the battery(ies) of the rechargeable battery block/battery pack(s) used |
| **Quick Start** | Guided, quick parameterisation of simple measuring points |
| **Alarm** | Activate the alarm for sensor errors and set the upper and lower limits/thresholds at which an alarm is sent by e-mail via the NIVUS WebPortal |

**Tab. 12 Menu overview**

# Main Screen

## 32 Functions of the Main Screen

**Quick Access**

In addition to displaying the values themselves, the main screen also allows for direct access to the most important setting parameters.

The quick access enables to directly jump to important individual menus without having to go through the (sub)menus of the parameterisation. It hence serves as quick and uncomplicated check of the individual sensors involved in the measurement.

Quick diagnosis, uncomplicated parameter adjustment and adjustment are possible by using the quick access. Direct queries for basic device data such as serial and article numbers as well as the firmware version of the transmitter and the connected sensors are also possible in just a few steps.

## 33 General Overview

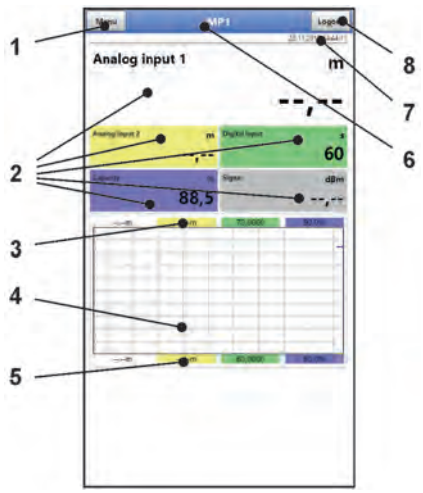
The following information is provided in the **top area** of the display:

- Menu and Logout Icons
- Name of the measurement place
- Date and Time

In operation mode the NivuLevel Mobile displays the following important measured values in the **main area**:

- Analogue input 1
- Analogue input 2
- Digital input 1
- Capacity
- Signal

The **bottom area** of the display shows a diagram for analogue inputs 1 and 2, digital input 1 and capacity.




1 Icon to open the main menu

2 Output fields of the values for analogue inputs 1 and 2, digital input 1, capacity and signal

3 Upper scaling range for the diagram

4 Diagram showing analogue inputs 1 and 2, digital input 1 and capacity

5 Lower scaling range for the diagram

6 Name of the measurement place

7 Date and Time

8 Icon for logging out the operating and display module

**Fig. 33-1 Main screen overview (example without measurement values)**

A pop-up menu with the most important settings and information can be accessed directly via the fields of the main display with a mouse click (left button). A further mouse click on the selection opens the respective pages and offers the possibility to parameterise or view current states.

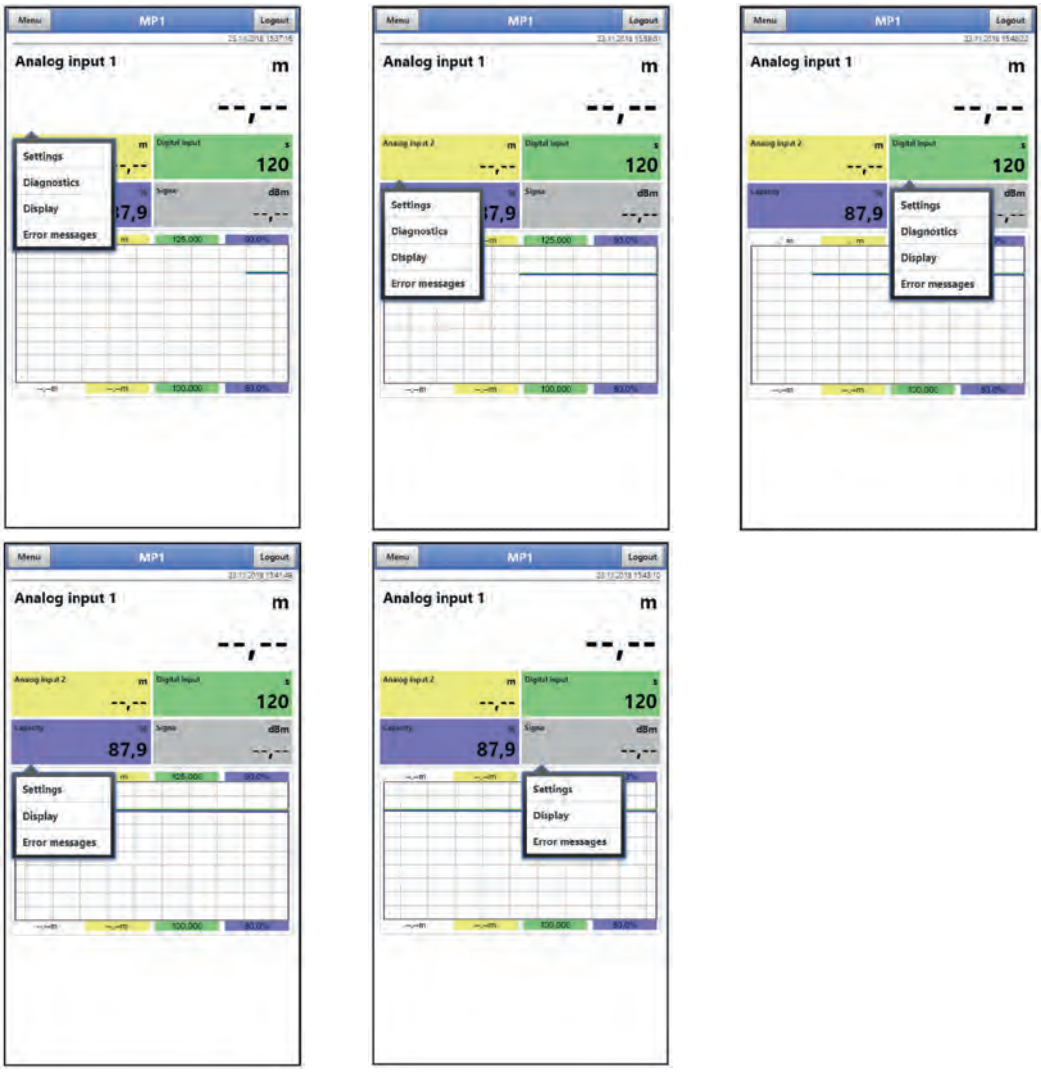



**Fig. 33-2 Pop-up menus**

***Save Parameters***

*After changing system-specific parameters, the changes must be saved for them to take effect.*

# 34 Display Fields

## 34.1 Display fields analogue input 1 and analogue input 2

When clicking on the pop-up menus, the data logger opens the following pages:

- Settings: >Application< / >Analogue Inputs<;
  see Chapter “38.2 Menu Analogue Inputs”
- Diagnostics: >Application< / >Diagnostics< / >Analogue Inputs<;
  see Chapter “38.4 Menu Diagnostics”
- Display: >Display<;
  see Chapter “42 Parameter Menu Display”
- Error Messages: >System< / >Error Messages< / Active Error Messages;
  see Chapter “40.4 Menu Error Messages”


**Fig. 34-1 Opened display fields with analogue input 1/2**

## 34.2 Display field digital input 1

When clicking on the pop-up menus, the data logger opens the following pages:

- Settings: >Application< / >Digital Inputs<;
  see Chapter “38.3 Menu Digital Inputs”
- Diagnostics: >Application< / >Diagnostics< / >Digital Inputs<;
  see Chapter “38.4 Menu Diagnostics”
- Display: >Display<;
  see Chapter “42 Parameter Menu Display”
- Error Messages: >System< / >Error Messages< / Active Error Messages;
  see Chapter “40.4 Menu Error Messages”

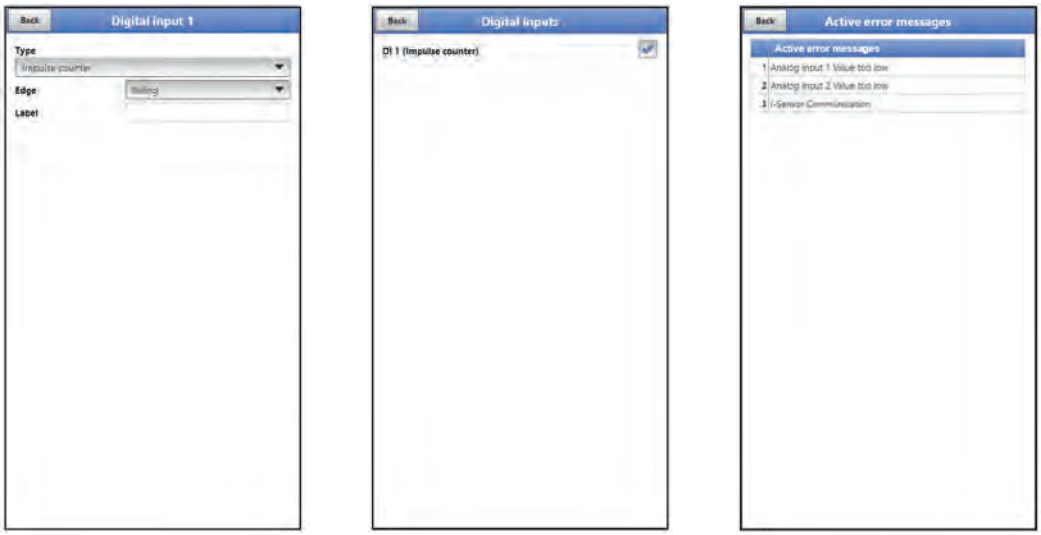



**Fig. 34-2 Opened display fields with digital input 1**

## 34.3 Display Field Capacity

When clicking on the pop-up menus, the data logger opens the following pages:

- Settings: >Battery<;
  see Chapter “43 Parameter Menu Battery (12V)”
- Display: >Display<;
  see Chapter “42 Parameter Menu Display”
- Error Messages: >System< / >Error Messages< / Active Error Messages;
  see Chapter “40.4 Menu Error Messages”

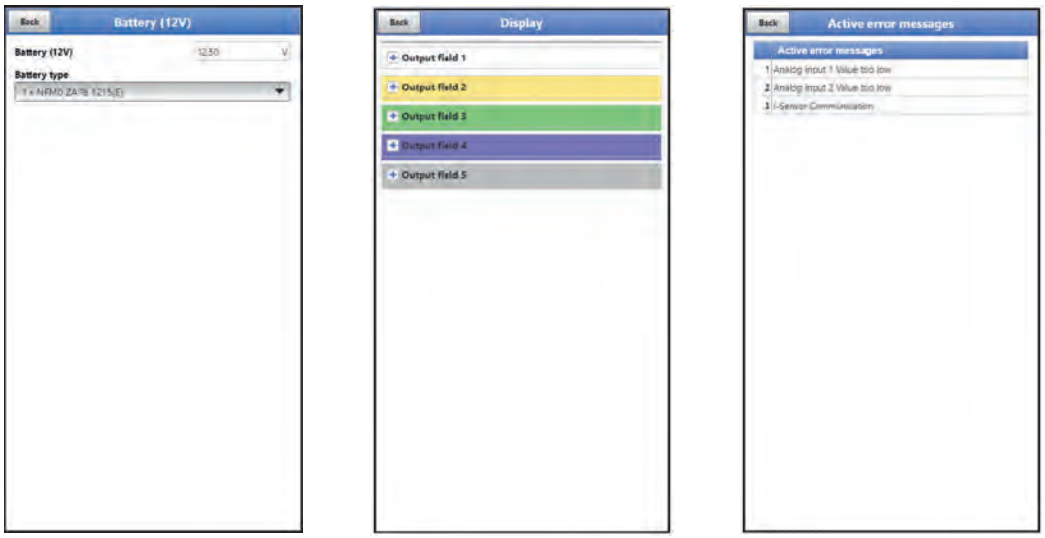



**Fig. 34-3 Opened display fields with capacity**

## 34.4 Display Field Signal

When clicking on the pop-up menus, the data logger opens the following pages:

- Settings: >Communication< / >GPRS<;
  see Chapter “41 Parameter Menu Communication”
- Display: >Display<;
  see Chapter “42 Parameter Menu Display”

- Error Messages: >System< / >Error Messages< / Active Error Messages; see Chapter “40.4 Menu Error Messages”

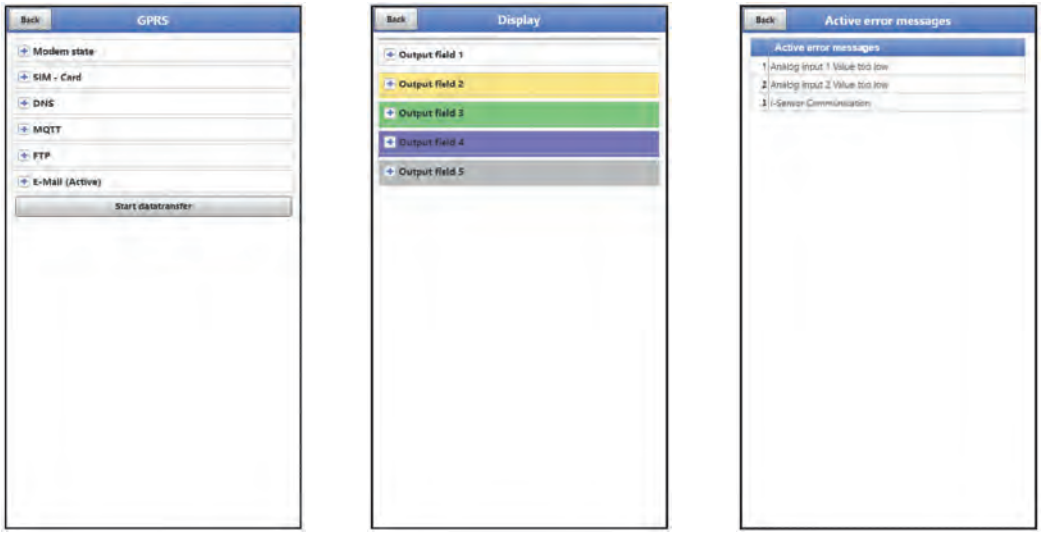



**Fig. 34-4 Opened display fields with signal**

# Setting Parameters

## 35 General Programming

In principle, changed parameters do not become effective before they have been saved.

When exiting all menus via the “Back” field, the data logger checks whether parameters have been changed. Finally, you are asked whether the parameters should be saved.

- >Yes<: the changed parameter setting is accepted and saved.
- >No<: the changes to the parameters are discarded and the device exits the menus.
- >Cancel<: You exit the query. The parameters remain changed, but are not yet effective and not saved.

***Tip for repeated measurement of the same measurement places***

*If measuring points are not only measured once but repeatedly, it is recommended to save the parameterisation of the measuring point and, if necessary, also the measurement data on a USB stick. During the next measurement at the measuring point in question, these can then be quickly reloaded onto the data logger and there is no need for renewed parameterisation.*
*See Chapter “39.2 Menu Data Memory” starting on page 93.*

***Multiple users can access simultaneously***

*Up to four users can access the data logger and its parameterisation simultaneously via the WLAN access. Simultaneous access is only indicated via the status LED.*

*If changes in the parameterisation are necessary, make sure that this is done in consultation and that there is no simultaneous access. The last saved parameter is always valid.*

### 35.1 Save Parameters

After entering all necessary (measurement place) parameters, these must be saved to become effective.

➲ Procedure:

1. Select “Back” 3 times: a window opens with the message >Save Parameters?<. Confirm with >Yes< *.
   The message “Successful!” indicates the completed saving of the parameters.

   * >Yes< saves the new parameters; >No< cancels the saving process and the last saved parameters are active again; >Cancel< cancels the saving process, the last changed parameters remain active and the initialisation process can be continued.

***Multiple users can access simultaneously***

*Up to four users can access the data logger and its parameterisation simultaneously via the WLAN access. Simultaneous access is only indicated via the status LED.*

*If changes in the parameterisation are necessary, make sure that this is done in consultation and that there is no simultaneous access. The last saved parameter is always valid.*

### 35.2 Change WLAN Password

The WLAN password is set **per default** to an individually determined identifier for the device. This is attached as a sticker on the top of the data logger (inside the enclosure).

This factory-assigned password can be changed as described below. The new password must have between 8 and 32 characters.

➲ Procedure:

1. Open the main menu via “Menu”.
2. Open the >Communication< menu.
3. Open the >WLAN< menu.
4. Select the >Password< field.
5. Enter the new password and confirm.

Up to four users can access the data logger and its parameterisation simultaneously via the WLAN access. Simultaneous access is only indicated via the status LED.

If changes in the parameterisation are necessary, make sure that this is done in consultation and that there is no simultaneous access. The last saved parameter is always valid.

***Keep your password safe***

*Only give the password to authorised persons.*

*If you write down the password, keep it in a safe place.*

## 35.3 Change the device SSID

The SSID is set **per default** to the serial number of the unit. This is written on the nameplate on the side of the enclosure.

This factory-assigned SSID can be changed as described below. The new SSID must have between 8 and 32 characters.

➲ Procedure:

1. Open the main menu via “Menu”.
2. Open the >Communication< menu.
3. Open the >WLAN< menu.
4. Select the >SSID< field.
5. Enter the new name and confirm.

## 35.4 Loss of the Password

Each NivuLevel Mobile is delivered with a PUK (“Personal Unblocking Key” or also Super PIN). This allows the unit to be reactivated if the password is forgotten and a new password can be assigned.

This PUK is identical to the default WLAN password which is attached as a sticker on the top of the data logger (inside the enclosure).

➲ Procedure:

1. Open the cover.
2. Loosen the hexagon socket screws on the cover above the battery compartment and remove the cover.
3. Take out the rechargeable battery blocks/battery packs.
4. Hold the magnet against the Reed contact and at the same time insert a rechargeable battery block.
   The magnet must be held against the Reed contact for at least 15 seconds until the LED flashes red several times. The NivuLevel Mobile will be “woken up”.
5. The NFM appears in the WLAN list with the default SSID (identical to the serial number of the respective device according to the nameplate).
6. Enter the default PUK as password.

7. Enter new password and possibly also the SSID according to Chapters “35.2 Change WLAN Password” and “35.3 Change the device SSID”.
8. To adopt the new password/SSID, reinitialise the unit by removing and re-inserting a rechargeable battery block/battery pack.
9. Activate the NFM within five minutes, otherwise the password changes will not be accepted and the unit will continue to report under the default identifier and will only respond to the factory-assigned password.
10. If necessary, insert a second rechargeable battery block/battery pack.
11. Replace the cover over the battery compartment with the hexagon socket screws and close the cover.

## 35.5 Automatic Data Transmission to USB Stick

Normally, data stored on the NivuLevel Mobile is transmitted to the display and control module via WLAN.

⇨ See Chapter “39.2 Menu Data Memory”.

If, in exceptional cases, this is not possible because, for example, a WLAN connection cannot be established, the display and operating module is not functioning correctly or its battery is empty, it is possible to automatically read out the data memory with the measurement data via an inserted USB stick.

***Use of the USB interface is only permitted outside the Ex area.***

➲ Procedure:

1. Open the enclosure.
2. Insert the USB stick.
3. “Wake up” the NivuLevel Mobile by using the magnet.
   If no WLAN connection is established within 5 minutes, the data logger automatically transfers the complete contents of the measurement data memory to the inserted USB stick. The status LED on the data logger flashes green during this time.
4. After the status LED has stopped flashing, the data transfer is complete and the USB stick can be removed.

# 36 Setting Parameters via Quick Start

This menu enables quick parameterisation of simple measurement places using the factory settings for various parameters.

⇨ The individual pages of the >Quick Start< menu are described in detail in the Chapters “37.2.7 Menu - Quick Start” and “44 Parameter Menu Quick Start”.

➲ Procedure:

1. Open the main menu.
2. Select the menu >Quick Start<.
   The query “Create new Measurement Place?” is made.


**Fig. 36-1 Quick start with query**

3. Either select >No<: the >Country Settings< page of the >Quick Start< menu opens.
   Or select >Yes<: the security question “Sure? Old parameters and archive data are deleted!” is asked.
   If confirmed here with >Yes<, the data logger deletes the old parameters and archive data and indicates the completion with the message “Successful!”. However, if you confirm with >No<, nothing is deleted and the >Country Settings< page opens.

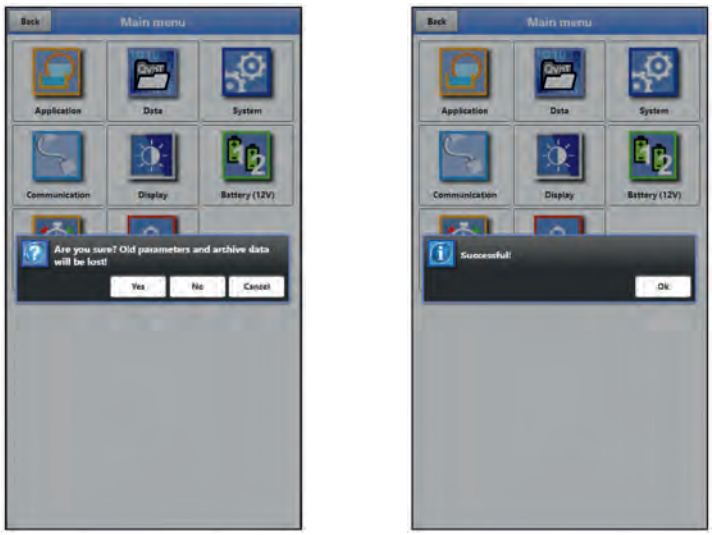



**Fig. 36-2 Security query “Deleting Parameters and Data”**

4. On the >Country Settings< page, set the language, the date format, the different units, the system time and the memory mode (operating mode and storage cycle).

See also Chapters “40.2 Menu Country Settings”, “40.3 Menu Time/Date” and “40.6 Menu Storage Mode”.


**Fig. 36-3 Menu >Country Settings<**

5. Continue with the arrow keys to go the next page >Measurement Place<.
6. Parameterise the measurement place: Enter the name of the measurement place and, if “Continuous Operation” was selected for >Operating Mode< on quick start page 1, enter the system times >Damping< and >Stability< of the measurements.

See also Chapter “38.1 Menu Measurement Place”.

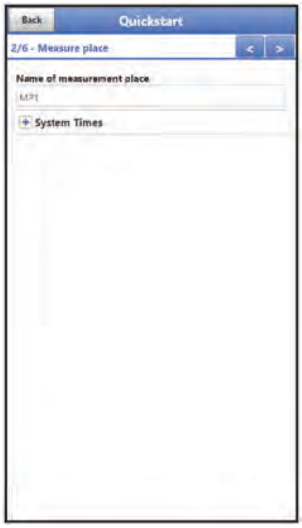



**Fig. 36-4 Menu >Measurement Place<**

7. Continue with the arrow keys to go the next page >Analogue Input 1<.
8. Set the parameters of analogue input 1 accordingly.

See also Chapter “38.2 Menu Analogue Inputs”.

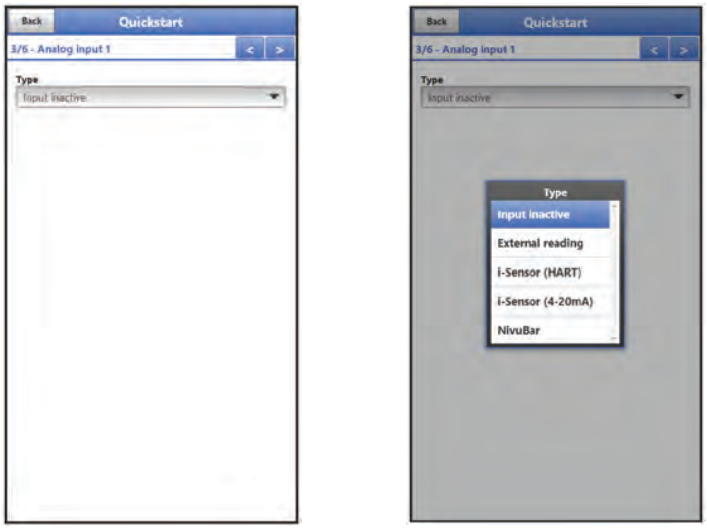



**Fig. 36-5 Menu >Analogue Input 1<**

9. Continue with the arrow keys to go the next page >Analogue Input 2<.
10. Set the parameters of analogue input 2 accordingly.

⇨ See also Chapter “38.2 Menu Analogue Inputs”.

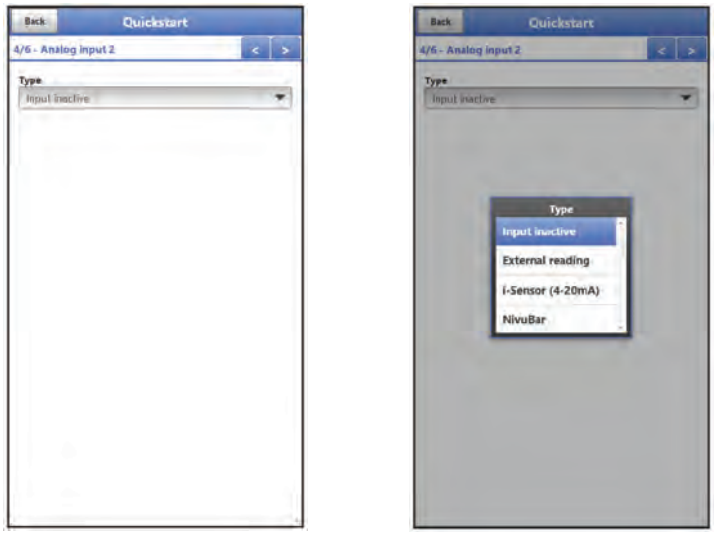



**Fig. 36-6 Menu >Analogue Input 2<**

11. Continue with the arrow keys to go the next page >Digital Input 1<.
12. Set the parameters of digital input 1 accordingly.

⇨ See also Chapter “38.3 Menu Digital Inputs”.

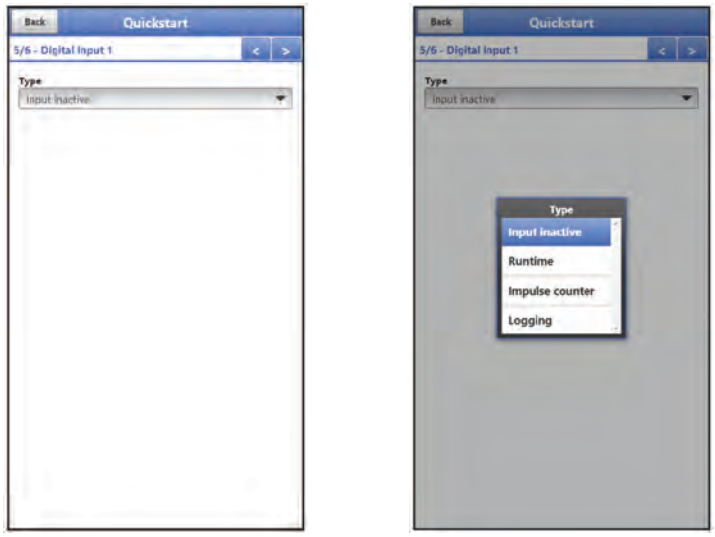



**Fig. 36-7 Menu >Digital Input 1<**

13. Continue with the arrow keys to go the next page >Communication<.
14. Set the communication parameters via GPRS accordingly.
    **Make sure** that the unit automatically searches for the GPS coordinates (latitude/longitude) and that these are then entered in the menu. This may well take a few minutes.

⇨ See also Chapter “41 Parameter Menu Communication”.


**Fig. 36-8 Menu >Communication<**

15. Return to the main menu with “Back”: The query for saving the parameters is made.
    If >Yes< is selected, saving is confirmed with the message “Successful!”. Press >OK< to open the main menu.
    If >No< is selected, nothing is saved and the main menu is opened.
    With >Cancel< the current page >Communication< remains open and the parameterisation on this page can be continued.
    OR
    Complete the quick start parameterisation by clicking on the small arrow pointing upwards at the top right of the menu:

    The prompt for saving the parameters appears.
    If >Yes< is selected, saving is confirmed with the message “Successful!”. Press >OK< to open the main menu.

If >No< is selected, nothing is saved and the main menu is opened.
With >Cancel< the current page >Communication< remains open and the parameterisation on this page can be continued.

16. Use “Back” (again) to go back to the main screen.

# 37 Parameter Functions

## 37.1 Main Menu

The NivuLevel Mobile is parameterised via the total of eight settings menus.

The individual menus are explained in greater detail starting with Chapter “38 Parameter Menu Application”. In the main menu there are eight icons with the functions described below:


**Fig. 37-1 Overview Main Menu**

## 37.2 Functions of the first Menu Level

### 37.2.1 Menu - Application


**Fig. 37-2 Menu Application**

This menu is the most comprehensive and important within the parameterisation of the NivuLevel Mobile. The application menu includes four submenus.

The measurement place name is entered here and the connected sensors are defined for the analogue and digital inputs:

- Input range
- Mounting height
- Measurement duration

Within this menu there is the possibility of diagnosing the inputs.
Possible entries or changes within this menu:

- Damping of signal evaluation/output
- Stability of signal evaluation/output

### 37.2.2 Menu - Data


**Fig. 37-3 Menu Data**

The data menu includes all internally saved measurement values.
The following functions are available:

- Graphic representation of the measurement values
- Communication and transmission options of internal files
- Transfer of set parameters from and to USB stick
- Setting and deleting options of the internal data memory

### 37.2.3 Menu - System


**Fig. 37-4 Menu System**

This menu contains information on the data logger:

- Firmware version
- Article Number
- Serial Number
- Information on battery voltage and credits/licences

In addition, the following settings are possible:

- Language
- Units
- Correction of date and time
- Read active messages
- Delete error memory
- Configure Storage Cycle
- Shut Down Device (Powerdown)
- Execute parameter reset
- Unlock licenced functions
- Carry out firmware updates

### 37.2.4 Menu - Communication


**Fig. 37-5 Menu Communication**

This menu contains the setting options for communication with other systems:

- WLAN
- GPRS

### 37.2.5 Menu - Display


**Fig. 37-6 Menu Display**

This menu defines the five display fields of the main display.

### 37.2.6 Menu - Battery

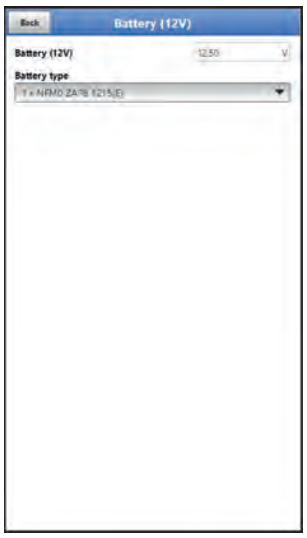



**Fig. 37-7 Menu Battery (12V)**

In the Battery menu, the battery types used (battery blocks or battery packs or customer's own batteries) and their number are selected.

If battery packs (instead of rechargeable batteries) are used, no battery capacity is shown in the main display and in the >System< / >Information< menu. The data logger cannot reliably calculate the capacity of the battery packs.

***Correct display of the capacity indicator***

*The capacity display in the >System< / >Information< menu only works reliably if fully charged battery blocks are used and the battery type and number of rechargeable battery blocks used are entered here.*
*At voltages <11.5 V (capacity 20 %), voltage dips and undervoltage shutdown may occur during remote data transmission.*

*NIVUS recommends replacing the battery blocks at the latest when the remaining capacity is 20 %.*

*Tip:*
*By using two rechargeable battery blocks, storing and using them at non-critical temperatures (such as room temperature) and storing them dust-free, clean and dry, their capacity can be maintained for longer.*
*This means that even remote data transmission can often still function well at values below the threshold of 20 %.*

### 37.2.7 Menu - Quick Start

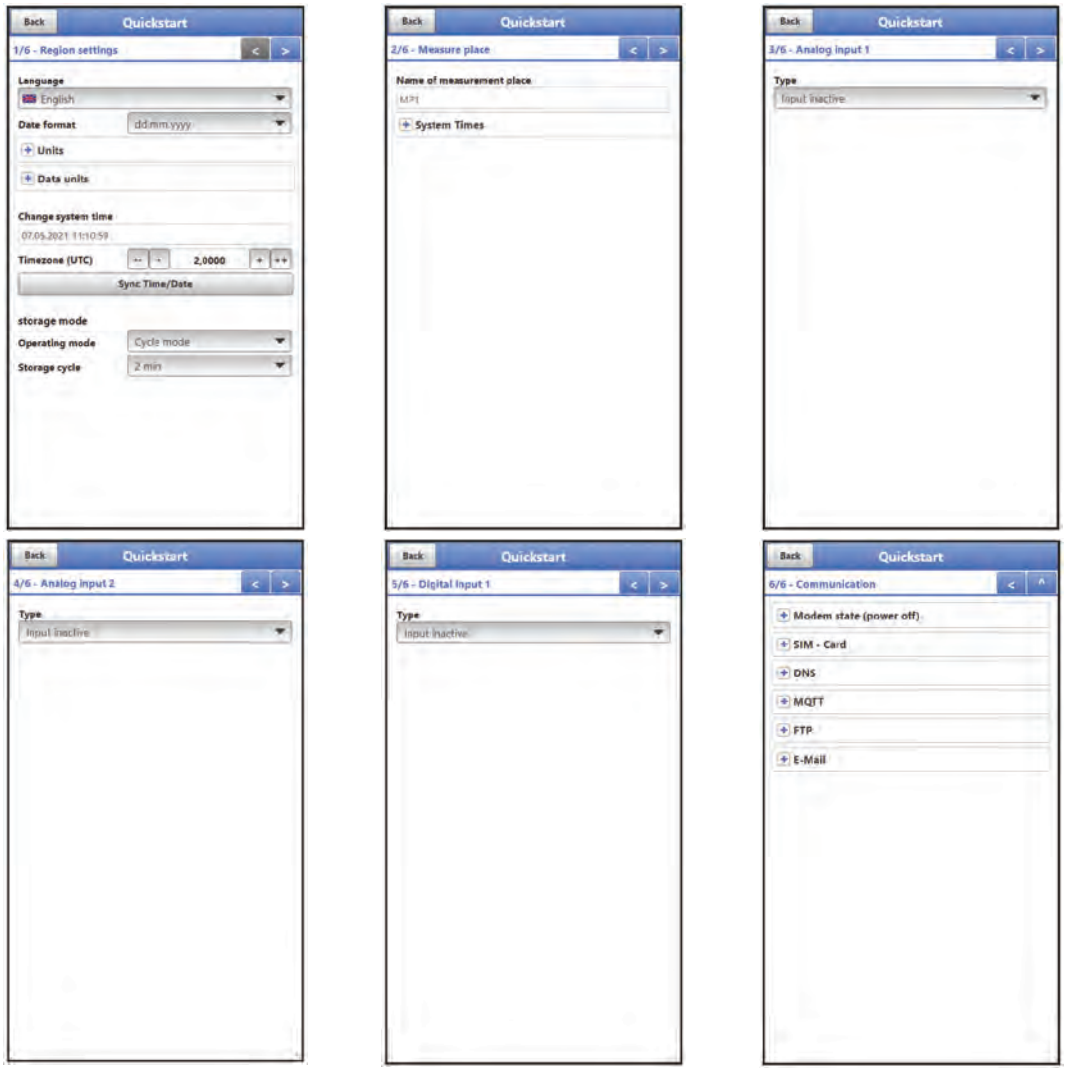



**Fig. 37-8 Menu Quick Start 1...6**

This menu enables quick parameterisation of simple measurement places using the factory settings for various parameters.

- Page 1 >Country Settings<
- Page 2 >Measurement Place<
- Page 3 >Analogue Input 1<
- Page 4 >Analogue Input 2<
- Page 5 >Digital Input 1<
- Page 6 >Communication<

### 37.2.8 Menu - Alarm

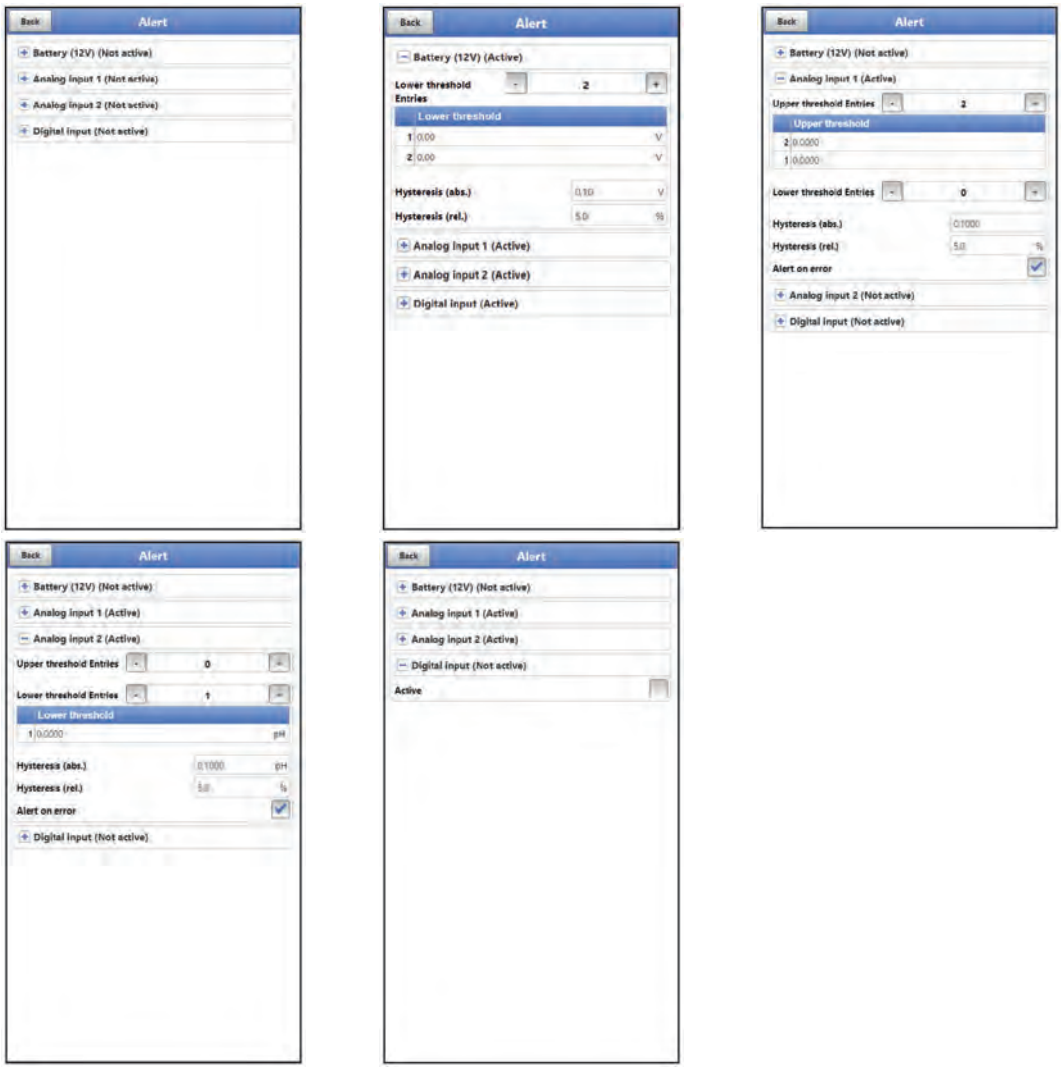



**Fig. 37-9 Menu Alarm**

The Alarm menu consists of up to four sub-items, depending on the parameterisation of the data logger: >Battery (12V)<, >Analogue Output 1<, >Analogue Output 2< and >Digital Input<.

The upper and lower limit values/thresholds and error messages can be set here. When these are reached or occur, the data logger sends an alarm e-mail to the pre-set e-mail address via the NIVUS WebPortal.

# 38 Parameter Menu Application

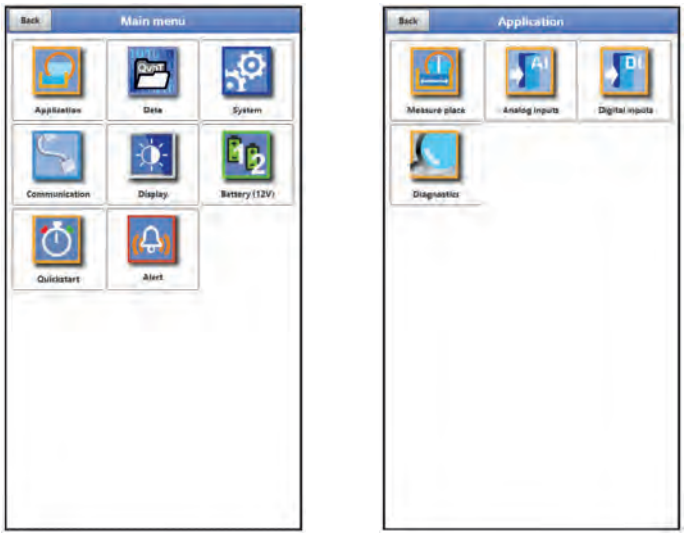



**Fig. 38-1 Menu Application**

The general parameterisation is described below.

## 38.1 Menu Measurement Place

The parameter settings of the measurement place include the following basic settings:

- Name of the measurement place
- Damping and stability

### 38.1.1 Name of the measurement place

The measurement place name can be changed here.

**Default setting**: MP1

When initialising the measurement place name, the default name is automatically deleted after the first letter or number is selected.

➲ Write the desired measurement place name in the text field and confirm with “Enter”. The measurement place name is transferred to the main menu and displayed there.

### 38.1.2 Damping

This menu point allows you to change the damping of the display in seconds.

***This setting is only possible in >Storage Mode< “Continuous Operation”.***

The damping refers to all values that are available as input values. Individual values cannot be selected and damped differently.

The time range is entered in steps of 1 second.

**Default setting**: 30 s

### 38.1.3 Stability

Stability is the time span within which the data logger bridges the values without correct data, i.e. when receiving invalid data.

***This setting is only possible in >Storage Mode< “Continuous Operation”.***

The data logger operates during this period with the last valid measured value. If the specified time span is exceeded without a correct value being recorded, the data logger goes to the measured value “0”, taking into account the set damping. The data logger does not save a value.

The time range is entered in steps of 1 second.

**Default setting**: 30 s

## 38.2 Menu Analogue Inputs

In this menu, the functions of the analogue inputs are defined.

➲ Open menu >Analogue Inputs< via >Main Menu< / >Application<.

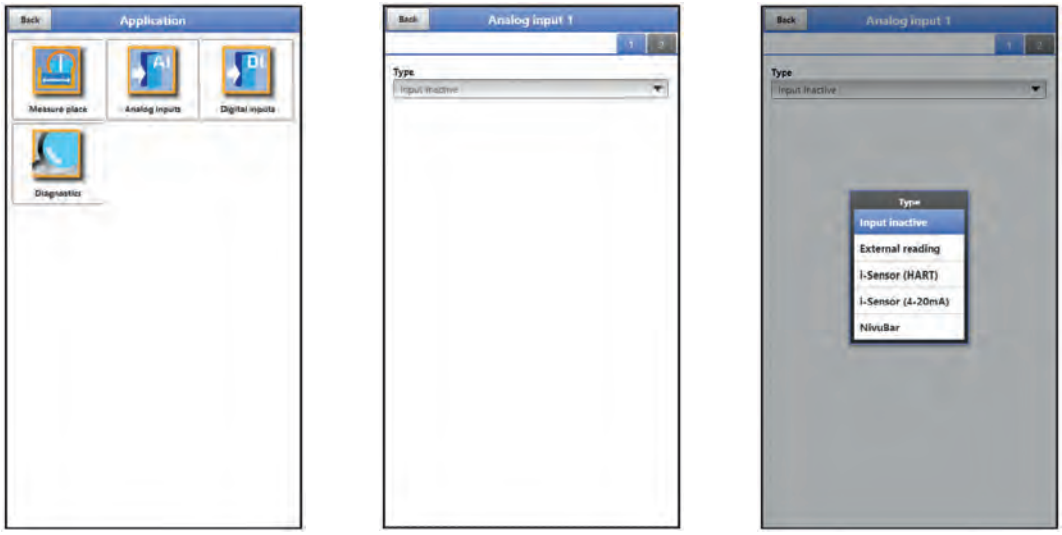



**Fig. 38-2 Menu Analogue Inputs**

The data logger is equipped with two analogue inputs. These are shown in the top right corner of the display and can be selected individually. The selected analogue input is highlighted in colour and the name in the title bar is highlighted with analogue input 1 or 2.

The parameters of each analogue input can be set individually. Select the type by using the pop-up menu and then set the parameters.

**Default setting**: Input inactive

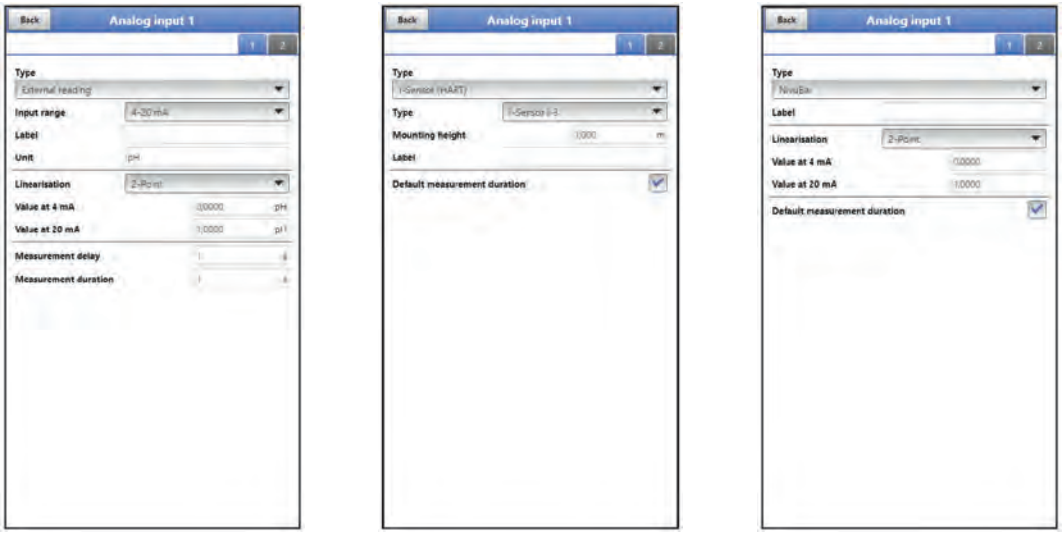



**Fig. 38-3 Analogue input as External Measurement Value / i-Sensor (HART) / NivuBar**

- **External Measurement Value**
  - Selection/input options:
    Input range: >0-20 mA< or >4-20 mA<
    Designation: manual input
    Unit: manual input
    Linearisation: >2-Point< or >Table<
    For >2-Point< linearisation: manual input of the values for 4 or 20 mA
    For >Table< linearisation: enter the number of >entries< via the “+” and “-” keys, then select >table<, fill in and confirm
    Measurement delay: manual entry in seconds
    Measurement duration: manual entry in seconds

- **i-Sensor (HART) (only for analogue input 1)**
  - Selection/input options:
    Mounting height: manual input
    Designation: manual input
    Standard measurement duration: with or without tick
    With tick: no further settings required
    Without tick: manual entry of measurement delay and measurement duration in seconds

- **i-Sensor (4-20 mA)**
  - Selection/input options:
    Designation: manual input
    Linearisation: >2-Point< or >Table<
    For >2-Point< linearisation: manual input of the values for 4 or 20 mA
    For >Table< linearisation: enter the number of >entries< via the “+” and “-” keys, then select >Table<, fill in and confirm
    Standard measurement duration: with or without tick
    With tick: no further settings required
    Without tick: manual entry of measurement delay and measurement duration in seconds

- **NivuBar**
  - Selection/input options:
    Designation: manual input
    Linearisation: >2-Point< or >Table<
    For >2-Point< linearisation: manual input of the values for 4 or 20 mA
    For >Table< linearisation: enter the number of >entries< via the “+” and “-” keys,

then select >Table<, fill in and confirm
Standard measurement duration: with or without tick
With tick: no further settings required
Without tick: manual entry of measurement delay and measurement duration in seconds

## 38.3 Menu Digital Inputs

The data logger is equipped with one digital input.

**Default setting**: Input inactive

The following different functions can be assigned to the digital input.

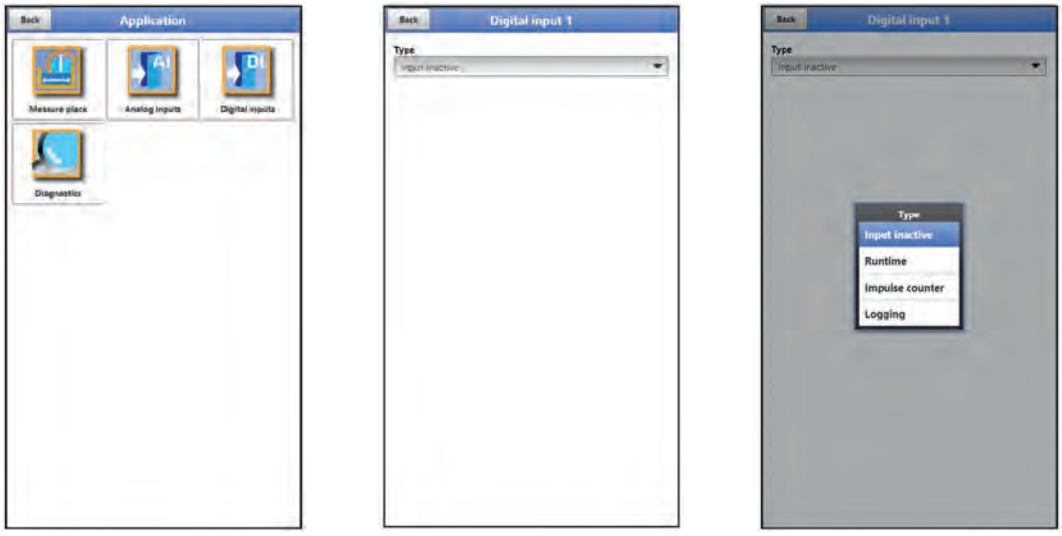



**Fig. 38-4 Menu Digital Inputs**

- **Runtime**
  The duration of the signal present at the digital input is recorded and stored by the system. This recording is used, for example, for pump or device running times.
  - Selection/input options:
    Logic: >not inverted< or >inverted<
    Designation: manual entry
- **Impulse Counter**
  The number of the signals present at the digital input is counted and stored by the system. The evaluation of the counting impulse is done by detecting the change of state of the digital input (1->0 or 0->1).
  - Selection/input options:
    Edge:
    >rising< (change of state from “0” to “1”) or
    >falling< (change of state from “1” to “0”)
    Designation: manual entry
- **Recording**
  Recording of the measurement values and their status changes for diagnostic purposes.
  The evaluation is done by detecting the change of state of the digital input (1->0 or 0->1)
  - Selection/input options:
    Logic: >not inverted< or >inverted<
    Designation: manual entry

## 38.4 Menu Diagnostics

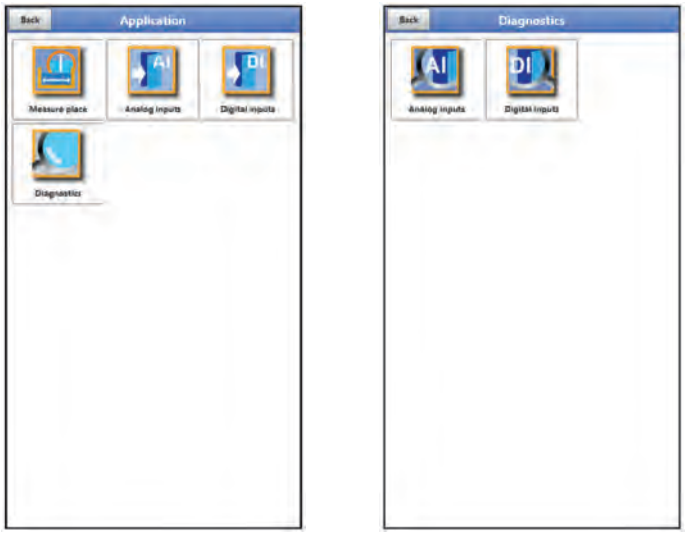



**Fig. 38-5 Menu Diagnostics**

The menu >Diagnostics< can be found in the >Application< menu.

In the Diagnostics menu and the two submenus, current settings of the analogue and digital inputs can be displayed.

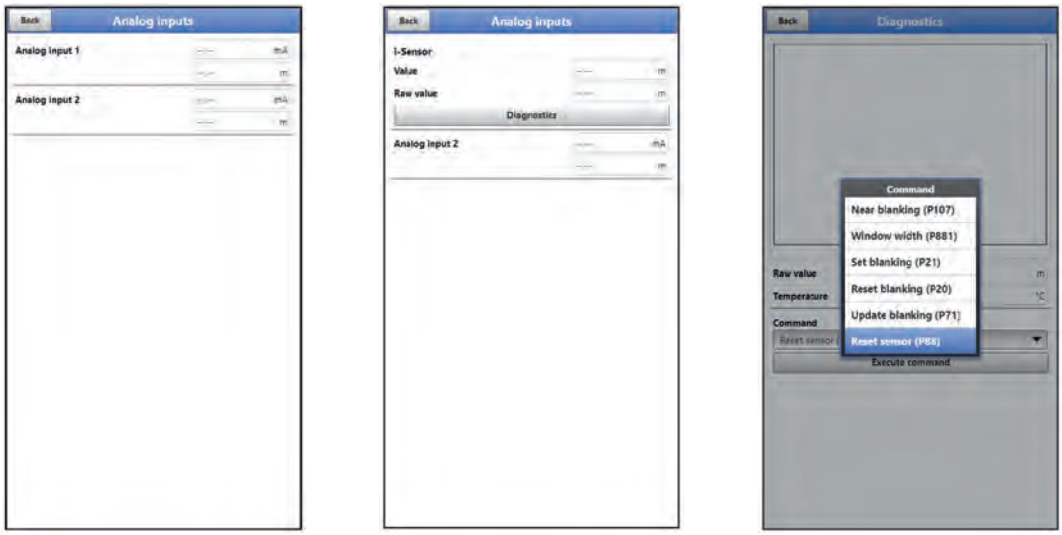



**Fig. 38-6 Different analogue inputs**

Depending on the previous selection under >Application< / >Analogue Inputs< or >Digital Inputs<, different data and values are displayed.

For the **>Analogue Inputs<,** the value and the raw value are displayed for the **>i-Sensor (HART)<**:

- Value: output value
- Raw value: value actually measured

Various commands such as “Near Blanking (P107)”, “Window Width (P881)”, “Set Blanking (P21)”, “Reset Blanking (P20)”, “Update Blanking (P71)” and “Reset Sensor (P88)” can be chosen and executed accordingly.

For the other selection types **>External Measurement Value<**, **>i-Sensor (4-20mA)<** and **>NivuBar<**, two current values are indicated in each case.

For the **>Digital Inputs<**, a check mark indicates that the digital input (as parameterised in advance) is active.

# 39 Parameter Menu Data

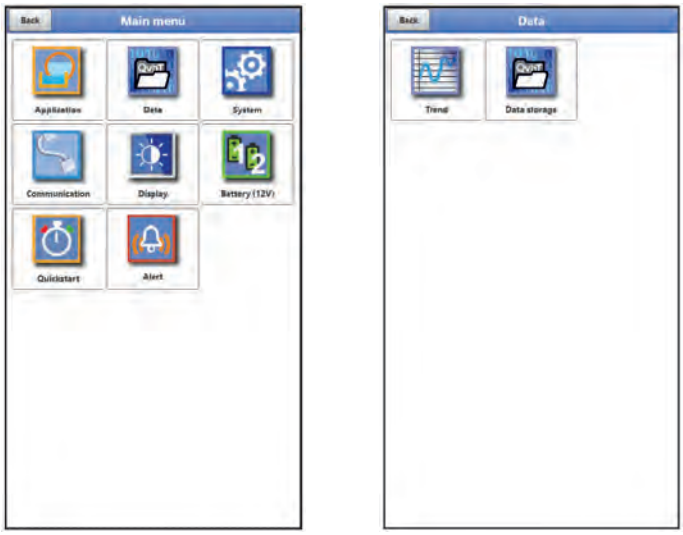
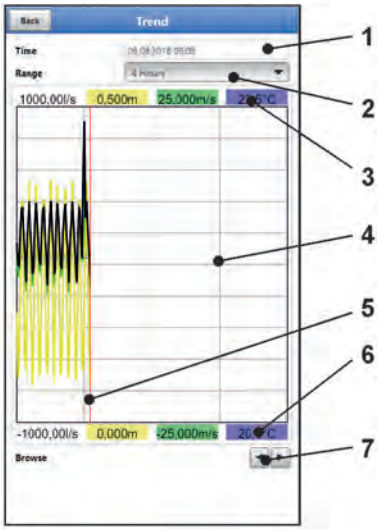



**Fig. 39-1 Menu – Data**

## 39.1 Menu Trend

The trend display is a visualising recorder function. When the trend display is selected, current and previously stored (historical) measurement data can be accessed.




1 Date/Time Selection
2 Range of representation
3 Automatic scaling for max. range
4 Representation screen with guides
5 Date/timeline (selected point in time)
6 Automatic scaling zero point
7 Browse (back/next)

**Fig. 39-2 Representation Trend Graph**

### Current Measurement Data

➲ Procedure for the representation of current readings:

1. Select the desired range (range of representation; Fig. 39-2 Pos. 2).
   The selected range is displayed. During the display, there is no automatic updating of the measurement data (the current measurement data is shown in the lower third of the main screen).
2. If necessary, use the arrows (Fig. 39-2 Pos. 7) to scroll forwards and backwards with the same basic display setting.
3. Back to the main screen via “Back” (3x).

**>Date/Time Selection<**

When the Trend menu is opened, the current date and time are displayed. If historical measurement data or a specific point in time is to be displayed, this can be set via the date/time selection (Fig. 39-2 Pos. 1). The selection mask shown below opens here (Fig. 39-3). If a start date is selected, (depending on the range set) the measurement data is shown in the display area below.

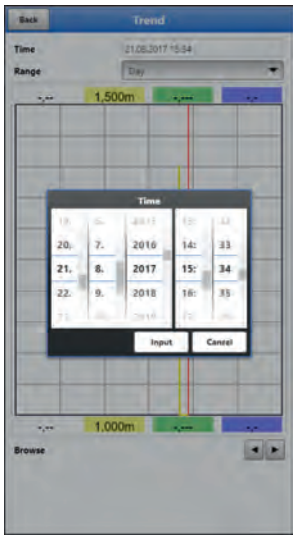



**Fig. 39-3 Selection Date/Time**

**>Range (Period of representation)<**

The selection of the range determines which period is to be displayed in the display area.

| Selection | Representation in the Display Area | | |
|---|---|---|---|
| | **Left Margin** | **Right Margin** | **Guides** |
| **Hour** | 0 Minutes | 59 Minutes | 15 Minutes each |
| **4 Hours** | 0/4/8/12/16/20 o'clock, depending on the set time | 4 Hours later | 1 Hour each |
| **Day** | 0 o'clock | 24 o'clock | 4 Hours each |
| **Week** | Monday, 0 o'clock | Sunday, 24 o'clock | 1 Day each |
| **4 Weeks** | Monday, 0 o'clock | 4 Weeks later, Sunday, 24 o'clock | 1 Week each, time reference point for the start: 29.12.1969, 0 o'clock |

**Tab. 13 Explanation of the periods displayed**

Below the display you can find the **>Browse< function**.

➲ Browse forwards or backwards using the arrow symbols: by one selected period unit (Hour, 4 Hours, Day, Week or 4 Weeks) each time the button is pressed.

## 39.2 Menu Data Memory

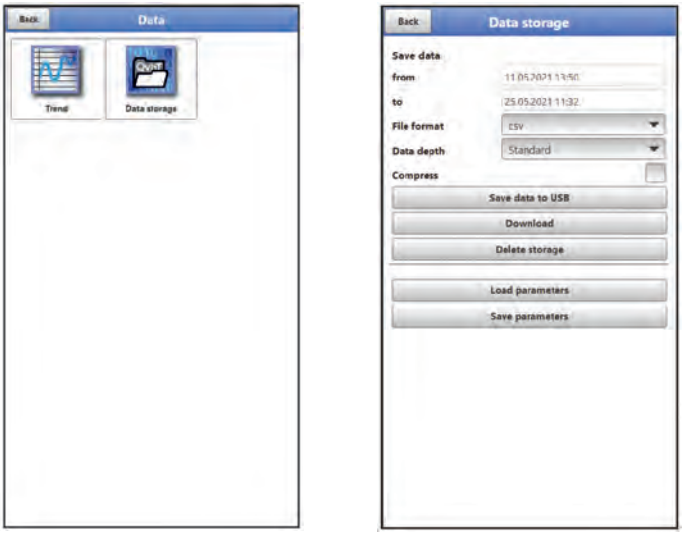



**Fig. 39-4 Menu Data Memory**

The data logger has an internal data memory (max. 182,398 measuring cycles, after which it is overwritten). The data stored in it can be transferred partially or completely to a file or to a USB stick.

Conversely, files can also be (re)transferred to the data logger via the USB stick.

***Use of the USB interface is only permitted outside the Ex area.***

**Requirements for the USB stick used**

- Supports USB 2.0
- Formatted as FAT 32 (or FAT 12 or FAT 16)
- Maximum permissible memory size 32 GB

➲ Procedure:

1. Open the enclosure cover and screw cover above the USB-A interface (see Fig. 2-4 on page 13).
2. Insert the corresponding USB stick into the USB-A interface.
3. Transmit data.
4. Remove the USB stick and close the screw cover and the enclosure cover.


**Fig. 39-5 Set start/end time**

- **>from< / >to<**
  Sets the start and end time of the period from which the data to be transmitted originates. The selection is made in a kind of calendar (Fig. 39-5).
  Per default, the data logger offers the transmission period since the last data transmission up to the current time.

- **>File Format<**
  >csv< or >txt<

- **>Data Depth<**
  The data depth is divided into three areas. See also Tab. 14 on page 96.
  The two data depths >Extended< and >Expert< are additionally bookable function licences and are only available after purchase and activation (see Chap. “19.2 Add-On Function Licences” and “40.5.5 Feature Unlock”).

  - **>Standard<**
    This memory format is sufficient for most applications and corresponds with the default setting.
    The stored data records contain the following information:
    - Date and time
    - Current values as well as the values calculated from them for the activated analogue and digital inputs
    - Battery voltage
    - Current consumption of the NFM

  - **>Extended<**
    In this software version, the data depth >Extended< is identical to the data depth >Standard<. As part of the usual further development of the devices, subsequent software versions may well contain other functions and data.

  - **>Experte<**
    Such data sets should only be activated by specially trained service personnel or developers of the NIVUS GmbH. These data sets can quickly become very large. If necessary contact NIVUS.

- **>Compress<**
  This function is only useful for transmitting large amounts of data. In such a case, the selected files are zipped into the “.zip” format.

- **>Save Data on USB<**
  With this function, the measurement values of the predefined period can be saved to a USB stick.

- **>Download<**
  With this function, the measured values of the predefined period can be saved to a file on the operating device (smartphone, tablet, notebook, etc.). The memory format is ".csv".
- **>Delete Memory<**
  The complete data of the internal data memory can be deleted here. After selecting, you will be asked whether you want to delete. After confirming with >Yes< the data is deleted, with >No< the process is cancelled.

***Important Note***

*Deleted data cannot be resored!*

- **>Load Parameters<**
  With this function a previously saved parameter file can be loaded from the USB stick or the operating device to the data logger.
- **>Save Parameters<**
  Here the set parameterisation of the measurement place can be loaded onto the USB stick. Here two files are created and saved.
  The files have the following formats:
  - **XXXX_DOC_AABBCCDDEE.pdf**
    This file is for documentation purposes and contains basic settings and parameter changes made.
  - **XXXX_PAR_AABBCCDDEE.xml**
    This file contains the complete parameter set of the data logger. It is used to save the parameterisation that has been set.

    **Information on File Naming:**

    XXXX = Programmed name of the measurement place
    AA = Year
    BB = Month
    CC = Day
    DD = Hour
    EE = Minute

**Information on the Data Depth Tables**

| Name | Data Depth | Meaning |
|---|---|---|
| **Date** | Standard, Extended, Expert | Date of the table entry (time of storage) |
| **Time** | Standard, Extended, Expert | Time of the table entry (time of storage) |
| **app1_U_batt [V]** | Standard, Extended, Expert | Supply Voltage |
| **app1_I_batt [mA]** | Standard, Extended, Expert | Current in measuring mode |

| | | |
|---|---|---|
| **ain1_val [m]** | Standard, Extended, Expert | Measurement value analogue input 1 |
| **ain2_val [m]** | Standard, Extended, Expert | Measurement value analogue input 2 |
| **din1_val [-]** | Standard, Extended, Expert | Recording of the digital signals at digital input 1 |
| **ain1_curr [mA]** | Standard, Extended, Expert | Current value present at analogue input 1 |
| **ain2_curr [mA]** | Standard, Extended, Expert | Current value present at analogue input 2 |
| **diag_badlocks [-]** | Expert | NIVUS-internal analysis channels |
| **diag_mappedblocks [-]** | Expert | NIVUS-internal analysis channels |

**Tab. 14 Information on the data (data depth)**

# 40 Parameter Menu System

## 40.1 Menu Information


**Fig. 40-1 Menu - System - Information**

The menu >Information< is a display menu. It contains the following information on the device:

- Serial number and article number.
- MAC Address
- Firmware version of the data logger.
- Specifications on the bootloader and the WLAN version.
- Date of the software update (firmware) and the latest storage of the parameter sets.
- Current charging status of the rechargeable battery blocks (when using two battery blocks, the fuller one is first discharged to the same voltage level, then both are discharged simultaneously).

*Info:*
*When using standard battery packs, the coloured bar for the capacity is not displayed.*

- Information on credits and licences

## 40.2 Menu Country Settings

In this menu you can make the following settings:

- (Operating) Language
- Date Format
- Units of the measurement values
  Here it is possible to distinguish between displayed and stored measured values.


**Fig. 40-2 Country Setting - Language - Date Format**

### 40.2.1 (Operating) Language

All listed languages (Fig. 40-2) provide texts in the national language or the substitute language English.

### 40.2.2 Date Format

The following date formats can be set:

- DD.MM.YYYY (Day/Month/Year)
- MM/DD/YYYY (Month/Day/Year)

### 40.2.3 Units

At this point, various country-specific and unit system-dependent settings for the measurement values can be set.

**>Decimal Separator<**

- Comma
- Dot

The decimal separators entered here are only used for the display of the display and operating module.

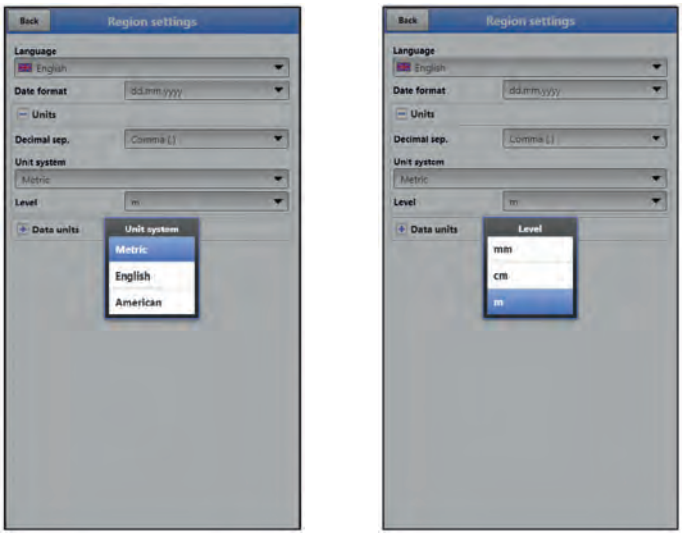



**Fig. 40-3 Units system**

**>Units System<**

The choices are:

- Metric
- English
- American

The **adjustable units** depend on the previous selection of the unit system:

- In the metric system: l, $m^3$, cm/s etc.
- In the English system: ft, in, gal/s etc.
- In the American system: fps, mgd etc.

**Units for the representation in the display**

- For Level

### 40.2.4 Data Units

The settings >Data Units< are analogous to the settings of the >Units<.

In **>Data Units<** the recorded measurement values are **converted and stored** according to the selected unit.

**>Decimal Separator<**

- Comma
- Dot

The specification of the decimal separators is important for the correct reading of the data. This is especially important when evaluating the measurement data with a software in a different language (e.g. English Excel), that the decimal separators are correctly selected.

**Units for the Storage**

- In the metric system: l/s, $m^3$/s, $m^3$/d, cm/s etc.
- In the English system: $ft^3$/s, in, gal/min, Mgal/d, in/s, yd/s etc.
- In the American system: gps, gpm, cfs, cfm, cfh, cfd, mgd etc.

**Units for the Storage of Measurement Data**

- For Level

## 40.3 Menu Time/Date

In this submenu, the current date and the system time of the data logger can be changed manually. The system time is based on the coordinated universal time UTC (en.: “Universal Time Coordinated”). The time zones are defined by “plus” or “minus” hours compared to UTC.

**NIVUS** strongly **recommends** keeping the system time of the data logger and defining the respective time zone and also summer/winter times by the >Time Zone (UTC)<.

Via **>Sync Time/Date<,** the date and system time are automatically synchronised with the display and operating module.

Using the >Time/Date< menu may be necessary for the changeover from summer time to winter time, after a failure of the internal back-up battery or after a power failure.

If the data logger is operated for a longer period of time, the internal clock may deviate. These deviations can be corrected here.

***Effects of a System Time Change***

*Changing the system time affects the storage of the data. If data storage is activated, duplicate data or data gaps may occur after system time changes.*

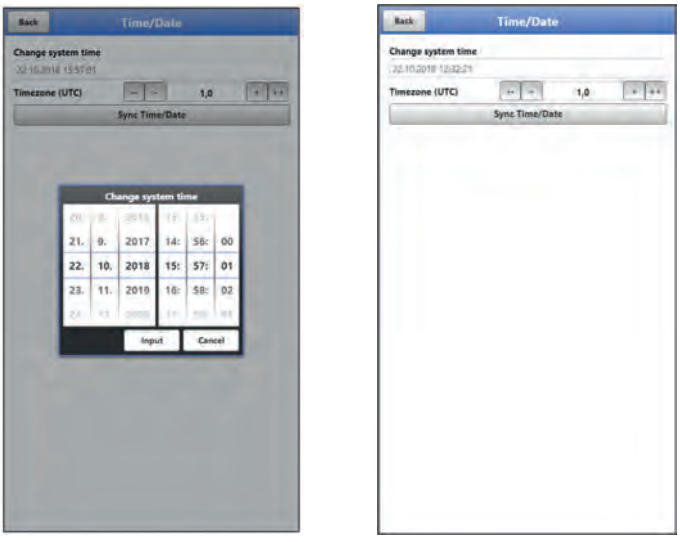



**Fig. 40-4 Change system time: manually and automatically**

The current system time is set via the selection menu (Fig. 40-4).

The time deviation (UTC or GMT) from the prime meridian is done via the “+” and “-” fields:

-- = Decrease by 1 hour each
- = Decrease by ½ hour each
+ = Increase by ½ hour each
++ = Increase by 1 hour each

## 40.4 Menu Error Messages

In this menu, the current pending error messages can be called up and the error memory can be erased.

The data is password protected to prevent accidental deletion.

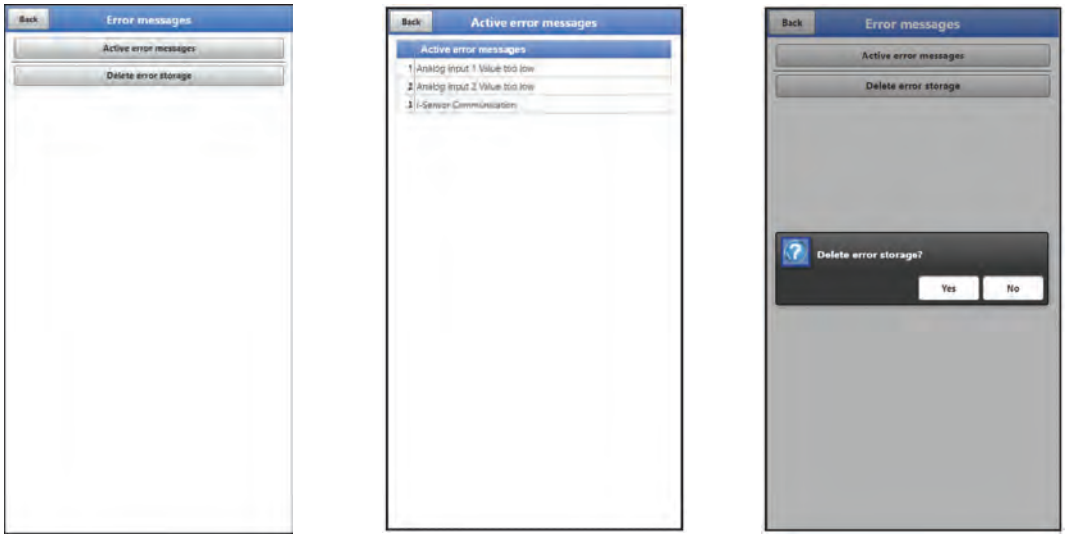



**Fig. 40-5 Error messages**

## 40.5 Menu Service

This submenu contains the following functions:

- Service levels (secured with passwords); the service levels are exclusively reserved for the NIVUS service
- Restart (of system)
- Powerdown (switching off the data logger to energy-saving mode)
- Parameter reset (back to default settings)
- Feature Unlock
- Update NivuLevel Mobile
- Update Bootloader


**Fig. 40-6 Service NivuLevel Mobile**

### 40.5.1 Service Level

The service levels are divided into different access levels and protected accordingly with passwords.

The settings possible there and the information stored require extensive specialist knowledge and are not required for the usual applications. Therefore, they are reserved exclusively for NIVUS service personnel.

### 40.5.2 Restart

A restart of the data logger interrupts the current measurement process.

The system boots using the set (saved) parameters. After booting, the system behaves as when it is switched on (analogous to the PC).

This menu point replaces switching the system off and on again. All saved parameters, counters and stored data are retained.

### 40.5.3 Powerdown

The >Powerdown< function switches the data logger into an energy-saving mode. The unit will not resume its measuring function until it is “woken up”.

### 40.5.4 Parameter Reset

During parameter reset, all parameters are reset to the default settings. Counter readings, changed passwords and stored measurement data are retained in the system.

The actual resetting of the parameters is only carried out after exiting the service menu (back to the main menu) and confirming the storage. The process can still be cancelled at this point.

### 40.5.5 Feature Unlock

Special (optionally available) functions can be enabled via the feature unlock, provided these have been ordered from NIVUS.

*Info:*
*The following is an example of the procedure for activating the licence “FTP/SMTP Client” (NFM LIZENZ FTP). The procedure for all other optionally available functions is similar.*

**Function Description “FTP/SMTP Client”**

The remote data transmission can be transmitted via different channels. Basically possible:

- Via MQTT to the NIVUS WebPortal or to a customer system via NIVUS DataKiosk
- Via FTP to the NIVUS D2W data portal to a customer FTP server
- Via e-mail to a per-defined address


**Fig. 40-7 Menu Communication**

All NivuLevel Mobile devices are delivered in the basic version with the version for “MQTT Data Transmission”. This variant is automatically activated and available immediately after the initial commissioning and corresponding activation of MQTT.

Data transfer via FTP and e-mail is additionally available via a combined licence and can either be ordered when placing the order or subsequently at any time.

The link to the NIVUS WebPortal (for the activation of this licence) will be sent by e-mail to the customer or the responsible country representative [*1]) after dispatch of the ordered device or following the subsequent licence order. Manual activation is carried out by the user [*1]) (see Chap. “Activation of the **Licence**”). As soon as the NivuLevel Mobile is parameterised accordingly, the data transmission variant can be selected and the data transmission started.

⇨ Parameter settings see Chap. “41 Parameter Menu Communication” (for the described example).

**One licence** is only valid for exactly **one device** and is permanently assigned to it through the **serial number**.

[*1]) *Depending on the recipient country, the licence is activated by the responsible country representative even before the unit is shipped to the customer; all ordered features are then immediately available to the customer.*

**Activation of the Licence**

➲ Procedure for **ordering a device with a licence** using the example of “FTP/e-mail data transfer”:

1. Place order for NivuLevel Mobile device with the respective licence(s) for remote data transmission.
   Internally at NIVUS, processes are started which, on the one hand, concern the production of the NFM device and, on the other hand, initiate the licensing process.
2. After receiving the NFM device, log in to the NIVUS WebPortal and open the “Licences” tab. The access data was sent in advance by NIVUS via e-mail to an agreed e-mail address.

***Assignment of the licence to the device unchangeable after being carried out***

*One licence is only valid for exactly one device and is permanently assigned to it through the serial number. This assignment **cannot be changed** or **cannot be undone**.*

*Before assigning, check exactly which device must/should be linked to which licence so that the correct device also receives the licence and can use this feature.*

3. The existing NFM device(s) is/are listed in the NIVUS WebPortal. The ordered licences are displayed in the right-hand display field. These licences must be linked to the units via the serial numbers.
   To do this, select the corresponding licence and click on “Activate”. The selected licence disappears from the right-hand display field, but the associated licence number with the activation code is displayed on the unit. This activation code is subsequently required (once) for the parameterisation of the individual devices.
4. Proceed in the same way with other licences.
5. Log out from the NIVUS WebPortal and exit the application.

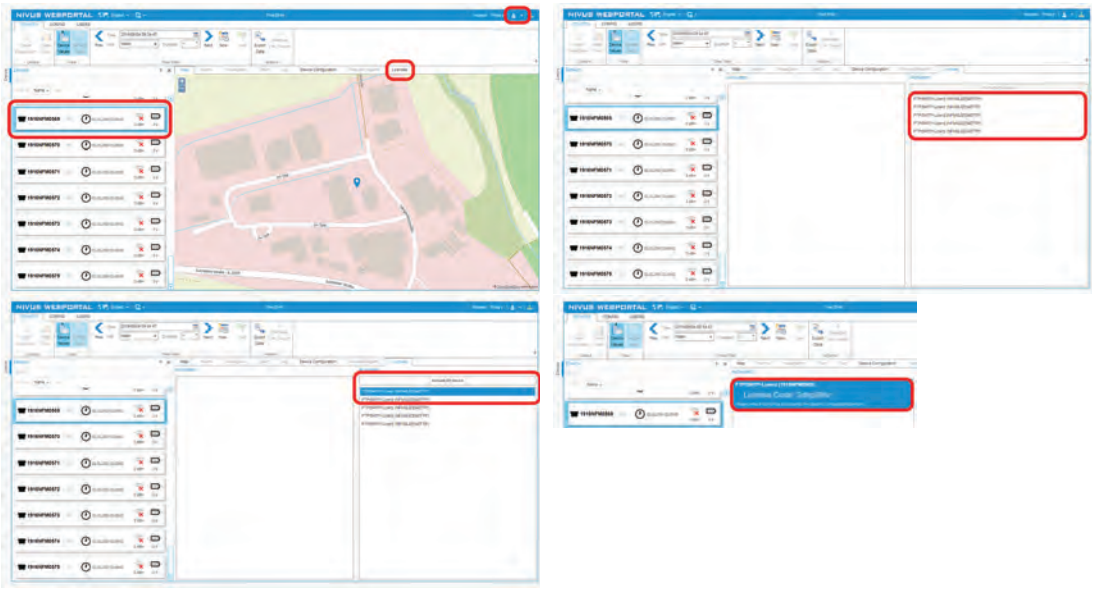


**Fig. 40-8 Activation and licence in the WebPortal**

6. Open the display and operating module (smartphone, tablet, notebook, PC, etc.) for the respective NFM and select >Feature Unlock< (Fig. 40-9) in the Service menu.
7. Click the >Feature Unlock< button.
8. Enter the corresponding activation code and confirm with Enter. The linked licence is shown in the display.


**Fig. 40-9 Activation of the licence in the NFM display tool**

9. The NFM confirms the activation and requests a device restart. In the menu Communication GPRS, the data transfer via FTP / e-mail option is now available.
10. Select/enter and save parameters in the >Communication< menu.

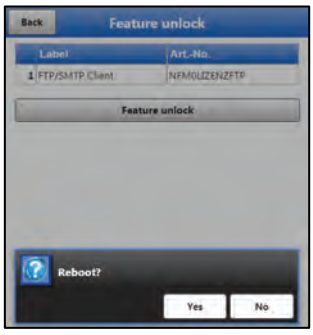



**Fig. 40-10 System restart after feature unlock**

➲ Procedure for **later ordering the licence** “FTP/E-Mail Data Transmission”:

1. Place order for the desired licence(s) for remote data transmission. Internally at NIVUS, processes are started which initiate the licensing process.
2. After receiving the access data, log in to the NIVUS WebPortal and open the “Licences” tab. The access data was sent by NIVUS via e-mail to an agreed e-mail address.
3. Proceed with step 3 from the description “Procedure for ordering a device **with a licence** using the example of the “FTP/E-Mail Data Transmission””.
   Please also note the important information on “Assignment of the licence to the device” on page 102.

### 40.5.6 Update NivuLevel Mobile

Upload of a NivuLevel Mobile firmware saved on USB.

***Important Note***

*Update only in consultation with NIVUS GmbH or the responsible local (country) representation.*

### 40.5.7 Update Bootloader

Upload of a bootloader software saved on USB.

*Information on the bootloader/data logger firmware version:*

*To update the bootloader to firmware version V2.00, at least firmware version V4.00 of the NivuLevel Mobile data logger must be available.*

*A firmware downdate of the bootloader is not permitted.*

***Important Note***

*Update only in consultation with NIVUS GmbH or the responsible local (country) representation.*

## 40.6 Menu Storage Mode

In the >Storage Mode< menu, at least the >Operating Mode< and the >Storage Cycle< are set. Depending on the selected operating mode, the further settings described below are possible.

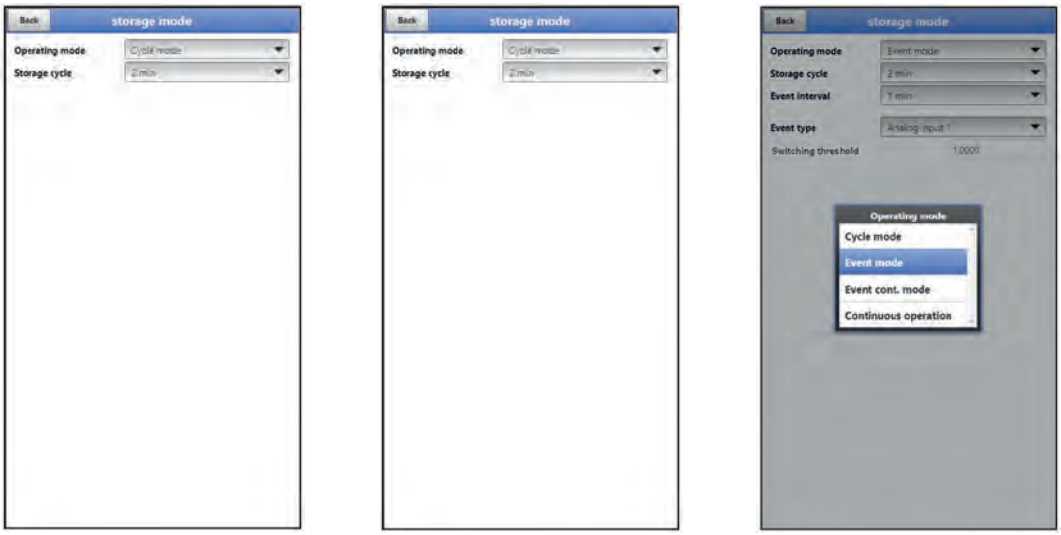



**Fig. 40-11 Storage Mode – Operating Mode**

**Operating Mode, Storage Cycle and Event Interval**

The selected operating mode determines when and how often the data logger should take measurements and also save them. Depending on the operating mode, the storage cycle and the event interval can be set.

The choices for **>Operating Mode<** are:

- **>Cycle Mode<**
  The data logger wakes up at the intervals of the set storage cycle, measures for a short time and stores the determined measurement values. After that, the data logger goes back into the “Sleep Phase” until the next measurement.

- **>Event Mode<**
  The event mode is an extended cycle mode. It has the same parameters and functionality as the cycle mode. In addition, it is possible to switch to the >Event Interval< by recognising that a definable measurand has been exceeded or undershot (see page 106). The measurand that triggers event operation is defined via the >Event Type< (see page 106).
  In the event interval the data logger measures cyclically. The event interval can contain much shorter measuring cycles than the cycle mode. This achieves a better measurement value resolution in important time ranges.
  *Example:*
  *Measurement at a normally dry stormwater overflow tank. Here it is sufficient for the data logger to measure the value “0” in a storage cycle of 15 minutes and to spend the rest of the time in the sleep phase. If impoundage or a discharge is then detected (e.g. using a float switch on digital input 1), the data logger starts, triggered by the event that occurred, and measures in the set event interval/measurement cycle (e.g. 2 minutes). In the time between measurements, the data logger goes back to sleep to save energy. For all other event types, the system always checks only at the specified storage cycle whether the specified threshold value has already been exceeded.*

- **>Event Continuous Mode<**
  The event continuous mode and its parameter settings are largely identical to the event mode.
  In contrast, the data logger does not switch off cyclically in the event interval during the event to save energy, but measures in continuous operation. The data is averaged over the entire time span of the event interval and stored in the cycle of the event interval. The event continuous mode thus consumes slightly more energy than the event mode, but leads to more consistent measurement results for events with strongly fluctuating measured values (e.g. due to waves).

- **>Continuous Operation<**
  The data logger measures continuously, but stores the measured values only at the

intervals of the set storage cycle. The permanently determined individual measured values are averaged internally. The average value of the measured values is saved.

**>Storage Cycle<**
Selection (depending on the operating mode set): (5 s, 10 s, 20 s, 30 s,) 1 min, 2 min, 5 min, 10 min, 15 min, 30 min and 1 h

**>Event Interval<**
Setting options: 1 min, 2 min and 5 min

**>Event Type< (only for Event Mode and Event Continuous Mode)**
In the operating modes “Event Mode” and “Event Continuous Mode”, the event types “Analogue Input 1”, “Analogue Input 2” and “Digital Input 1” can be selected.
For “Analogue Input 1” and “Analogue Input 2”, the **>Switching Threshold<** for the switch-over can be defined in each case.

# 41 Parameter Menu Communication

In this menu, communication is established with the display and operating module (smartphone, tablet, notebook, etc.) or other devices.

Communication is carried out via WLAN and GPRS.

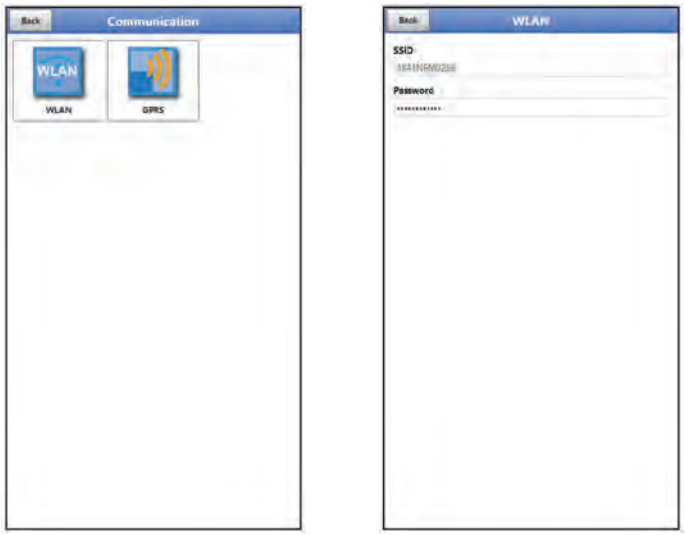



**Fig. 41-1 Menu - Communication**

Information on the SSID and the WLAN password is stored under **>WLAN<**. This menu is a display menu.

To change the WLAN password see Chapter “35.2 Change WLAN Password”.

**Preparing the device for data transmission**

The NivuLevel Mobile transmits data to the NIVUS WebPortal by using the >Start Data Transmission< button. The data can be selected/displayed there. In order for the respective measuring point to be displayed correctly on the overview map in the NIVUS WebPortal, i.e. with the correct GPS coordinates, their setting must be carried out correctly once at the beginning. There is no automatic update during measurement operation.

**Prerequisite**

The unit must be positioned so that it has a “clear view” up to the sky. So it is best to do this before placing it in the shaft or a room.

➲ Procedure

1. Activate MQTT by checking the box.
2. Turn on the modem under >Modem Status<.
3. Wait until the device has searched for the GPS coordinates (latitude/longitude) and these have been entered in the menu (see Fig. 41-3). This may well take a few minutes.
   Without these GPS coordinates, the measuring point will not be displayed correctly on the overview map in the NIVUS WebPortal, but the data will be assigned to the correct measurement place in any case.
4. Use the >Start Data Transmission< button to send data once to ensure that the connection is successfully established and the GPS coordinates are transmitted.
   The NivuLevel Mobile can then be positioned in its planned installation location.

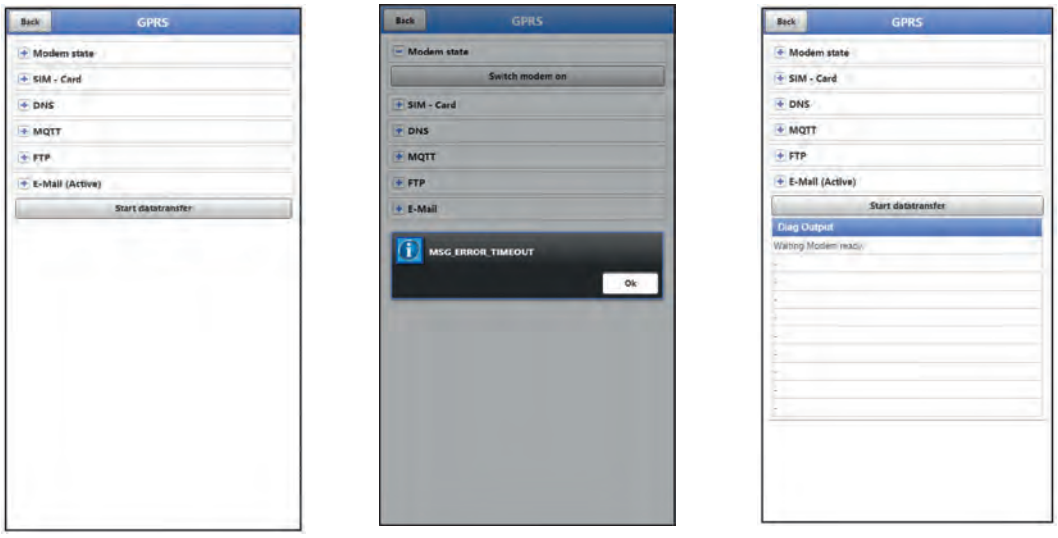



**Fig. 41-2 Menu GPRS / Error Message Modem / Diag Output**

The remote data transmission is set up and parameterised under **>GPRS<** .

After **inserting the SIM card**, the following submenus can be used correctly. Without a SIM card, the message “ERROR” or “MSG_ERROR_TIMEOUT” appears and a corresponding status message is displayed in the >Diag Output<.

- **>Modem State<**
  - **>Switch On Modem<**: Modem and SIM are initialised and the current status of the network is displayed (signal strength, network, frequency band, operator, latitude, longitude, altitude above sea level and number of satellites).
  - **>Set Up Test Connection<**: After successful switch-on, a test connection can be carried out.
    During the process, a current status info appears in the >Diag Output<.


**Fig. 41-3 Modem State / SIM Card State**

- **>SIM Card<**
  - **>Query Status<**: The status of the pin check is queried and displayed.
    - With the pin check activated, enter the corresponding PIN.
    - If the pin check is deactivated, the field can remain empty.
  - **>Activate PIN Check<**:
    - To activate, enter the PIN and select >Change PIN<.
    - To change the PIN with the pin check activated, enter the new PIN and then select >Change PIN<.
    - If the PIN was entered incorrectly 3 times, it must be entered via the PUK of the SIM card and a new PIN must be entered.

- **>Provider<**: Select the provider; available are NIVUS automatic mode (only in connection with NIVUS SIM cards), T-Mobile Germany, Vodafone Germany, O2, NIVUS, NIVUS Vodafone and user-defined (for all customer SIM cards, except those mentioned above);
  For user-defined, enter the access data of the provider: APN (Access Point Name), possibly user name, possibly password, possibly IP address.

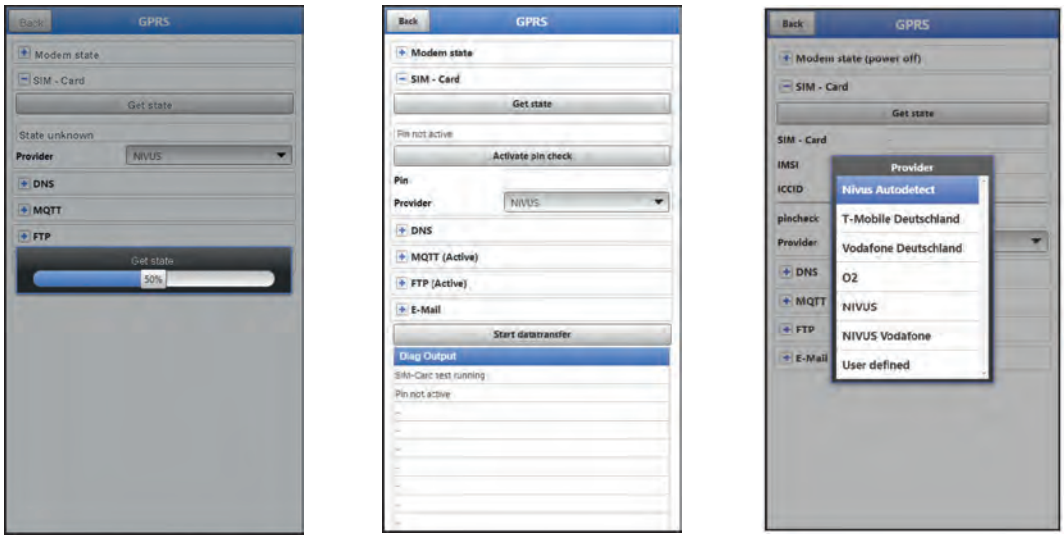



**Fig. 41-4 SIM Card**

- **>DNS<**:
  The names are usually assigned automatically (factory setting); if a specific DNS is required by the provider, enter it.


**Fig. 41-5 DNS / MQTT**

- **>MQTT<**
  Transmission to NIVUS WebPortal / NIVUS DataKiosk; you will receive the access data for the NIVUS WebPortal from NIVUS by e-mail.
  - If the transmission is to be carried out via MQTT, activate the checkbox. The settings >Broker< and >SSL Encryption< for transmission to the NIVUS WebPortal are already preconfigured and must not be changed.
  - **>Broker<**: nivuswebportal.com (do not change)
  - **>SSL Encryption<**: is activated (do not change).
  - **>Data<**: Selection of the data depth to be transmitted (Standard, Extended and Expert; partly only as additional function licence *NFM0 LIZENZ ERW* / *NFM0 LIZENZ EXP*) (see Chap. “39.2 Menu Data Memory”).
  - **>Time<**: Indication of the time of day at which a transmission is to be carried out.
  - **>Cycle time<**: Setting of the transmission cycle in hours (1, 2, 3, 4, 6, 8, 12 or 24h).
  - **>Check Settings<**: This can be used to check the settings; the result is output in >Diag Output<.
  - **>Start data transmission<**: Data (error information, archive data and current values) are transmitted, the result is output in >Diag Output<.

⇨ Observe the procedure under “Preparing the device for data transmission” on page 106.

- **>FTP<**
  Transmission to a customer FTP server or to the D2W data portal. This option is only possible with a customer SIM card.
  Available as additionally bookable function licence *NFM0 LIZENZ FTP* (see Chap. “19.2 Add-On Function Licences” and “40.5.5 Feature Unlock”).
  - For transmission to a FTP server, activate the checkbox.
  - **>Server<**: Specify server name or IP.
  - **>Port<**: enter FTP port (standard 21).
  - Encryption via SSL can be selected optionally.
  - **>Authentication<**: Activate with user and password-protected FTP access and specify in user name and password.

- **>Destination Folder<:** Enter the destination folder where the files are to be stored.
- **>Device to Web<:** Activate when transmitting to the D2W; the Device-to-Web compatible format is applied.
- **>File Format<:** There are csv and txt available.
- **>Data<**: Selection of the data depth to be transmitted (Standard, Extended and Expert; partly only as additional function licence *NFM0 LIZENZ ERW* / *NFM0 LIZENZ EXP*) (see Chap. “39.2 Menu Data Memory”).
- **>Time<**: Specifies the time of the regular transmission; the time entered serves as the start time for the cyclic transmissions.
- **>Cycle Time<**: Setting of the transmission cycle in minutes/hours (15min, 1h, 2h, 3h, 4h, 6h, 8h, 12h or 24h)
- **>Check Settings<**: This can be used to check the settings; the result is output in >Diag Output<.
- **>Start data transmission<**: Data (error information, archive data and current values) are transmitted, the result is output in >Diag Output<.

⇨ Observe the procedure under “Preparing the device for data transmission” on page 106.


**Fig. 41-6 FTP / E-Mail**

- **>E-Mail<**
  Transmission to an e-mail address. This option is only possible with a customer SIM card.
  Available as additionally bookable function licence *NFM0 LIZENZ FTP* (see Chap. “19.2 Add-On Function Licences” and “40.5.5 Feature Unlock”).
  You will receive the access data >SMTP Server<, >User Name< and >Password< from your e-mail provider.
  - For transmission to an e-mail address, activate the checkbox.
  - **>E-Mail Address<**:
    - >From<: E-mail sender address (needs to be accepted by the SMTP server)
    - >To<: Enter destination e-mail address
  - **>SMTP-Server<**: Enter e-mail server name (e. g. mail.gmx.net). Provider must support SMTP (Simple Mail Transfer Protokoll).
  - **>Port<**: Specify the port of the outgoing mail server.

- **>SSL Encryption<** can be selected:
  TLS, SSL or none.
- **>User Name<:** Enter the user name of the e-mail box.
- **>Password<:** Enter the password of the e-mail box.
- **>Device to Web<:** Activate when transmitting to the D2W; the Device-to-Web compatible format is applied.
- **>File Format<:** There are csv and txt available.
- **>Data<**: Selection of the data depth to be transmitted (Standard, Extended and Expert; partly only as additional function licence *NFM0 LIZENZ ERW* / *NFM0 LIZENZ EXP*) (see Chap. “39.2 Menu Data Memory”).
- **>Time<**: Specifies the time of the regular transmission; the time entered serves as the start time for the cyclic transmissions.
- **>Cycle Time<**: Setting of the transmission cycle in minutes/hours (15min, 1h, 2h, 3h, 4h, 6h, 8h, 12h or 24h).
- **>Check Settings<**: This can be used to check the settings; the result is output in >Diag Output<.
- **>Start data transmission<**: Data (error information, archive data and current values) are transmitted, the result is output in >Diag Output<.

⇨ Observe the procedure under “Preparing the device for data transmission” on page 106.

## 42 Parameter Menu Display

The display menu sets some attributes of the main display.
Can be modified:

- Name of the five display fields of the main display
- Decimal places of the individual values


**Fig. 42-1 Main display and output fields**

**Output Fields**

The five output fields of the main display (analogue input 1, analogue input 2, digital input, capacity and signal) can be freely defined in terms of designation and number of decimal places.

***Assignment of the values to the output fields***

*The assignment of the values to the fields can NOT be changed.*
***Example: Analogue output 1 is always output in analogue output 1, even if you have changed the designation e.g. to "Capacity".***

➲ Procedure to **change the name**:

1. Expand the output field.
2. Uncheck the >Default Label< box.
3. Enter a new name. This designation is freely selectable, but the number of characters is limited to 16.
   The new name enter does **not** change the value of the fields in the main display.
4. Go "Back" several times to save the parameters.

⇨ To save see Chapter "35.1 Save Parameters".

➲ Procedure to **change the number of decimal places**:

1. Expand the output field.
2. Uncheck the >Standard Decimal Places< box.
3. Specify the new number of decimal places.
   Any numbers can be entered, but only up to a maximum of five decimal places are accepted.
4. Go "Back" several times to save the parameters.

***Setting the decimal places***

*When setting the decimal places, observe the measuring accuracies of the sensors and the set units of measurement.*
*A temperature sensor, for example, can only resolve in a 0.1 K grid.*

# 43 Parameter Menu Battery (12V)

In this menu, the type of rechargeable/battery used and the corresponding number are selected.

***Correct display of the capacity indicator***

*The capacity display in the >System< / >Information< menu only works reliably if fully charged battery blocks are used and the battery type and number of rechargeable battery blocks used are entered here.*
*At voltages <11.5 V (capacity 20 %), voltage dips and undervoltage shutdown may occur during remote data transmission.*

*NIVUS recommends replacing the battery blocks at the latest when the remaining capacity is 20 %.*

*Tip:*
*By using two rechargeable battery blocks, storing and using them at non-critical temperatures (such as room temperature) and storing them dust-free, clean and dry, their capacity can be maintained for longer.*
*This means that even remote data transmission can often still function well at values below the threshold of 20 %.*

If battery packs (instead of rechargeable battery blocks) are used, the colour bar for the capacity display under >System< / >Information< is not shown because the data logger cannot reliably calculate the capacity.

In addition, the value of the capacity in the main display is then not shown. Instead of a concrete value, “--,--” is displayed in the capacity field.

The choices are:

- **1x NFM0 ZAPB 1215 (E)**
  One NIVUS rechargeable battery block installed. The exact data on the battery block are known and stored in the software.
  Setting the number of NIVUS battery blocks enables the correct display of the rechargeable/battery power (colour bar) in the menu >System< / >Information<.
- **2x NFM0 ZAPB 1215 (E)**
  Two NIVUS rechargeable battery blocks installed. The exact data on the battery block are known and stored in the software.
  Setting the number of NIVUS battery blocks enables the correct display of the rechargeable/battery power (colour bar) in the menu >System< / >Information<.
- **BATTERIE_MODE_USER**
  The capacity [Ah] must be specified for the correct display of the rechargeable/battery power (colour bar) in the menu >System< / >Information<.
- **2x NFM0 ZBPL 01C**
  Two NIVUS battery packs installed.
  *Please note:*
  *If battery packs (instead of rechargeable battery blocks) are used, the colour bar for the capacity display under >System< / >Information< is not shown because the data logger cannot reliably calculate the capacity.*

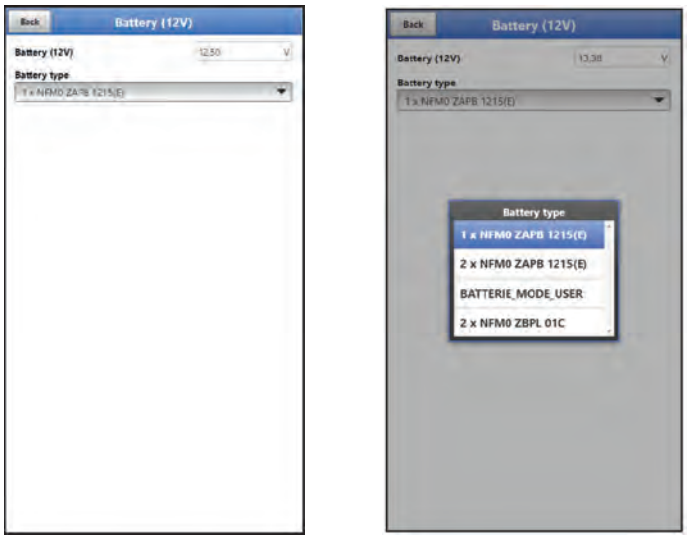



**Fig. 43-1 Menu Battery (12V)**

# 44 Parameter Menu Quick Start

The parameter menu >Quick Start< is divided into six pages. The pages >Country Settings< and >Measurement Place< are input pages and define the display of the measurement values, the storage mode and the measurement place itself. On the pages >Analogue input 1<, >Analogue input 2< and >Digital input 1< the connected sensors/devices can be selected and parameterised. The >Communication< page is an input page and defines the communication of the data logger via GPRS.

⇨ The procedure for setting the parameters is described in Chapter “36 Setting Parameters via Quick Start”.

## 44.1 Menu >Quick Start< / >Country Settings<


**Fig. 44-1 Country Settings**

Under >Country Settings< the following parameters are set:

- (Operating) Language
- Date Format
- Units and data units
- Change system time and time zone

- Storage mode
  - Operation Mode
  - Storage Cycle
  - Event interval, event type and switching threshold if required

The individual settings are explained in greater detail in the Chapters “40.2 Menu Country Settings”, “40.3 Menu Time/Date” and “40.6 Menu Storage Mode”.

## 44.2 Menu >Quick Start< / >Measurement Place<


**Fig. 44-2 Measurement Place**

Under >Measurement Place< the measurement place name and, in >Operating Mode< “Continuous Operation”, if necessary the values for the damping and the stability of the measurements are entered.

See Chapter “38.1 Menu Measurement Place”.

## 44.3 Menu >Quick Start< / >Analogue Input 1<

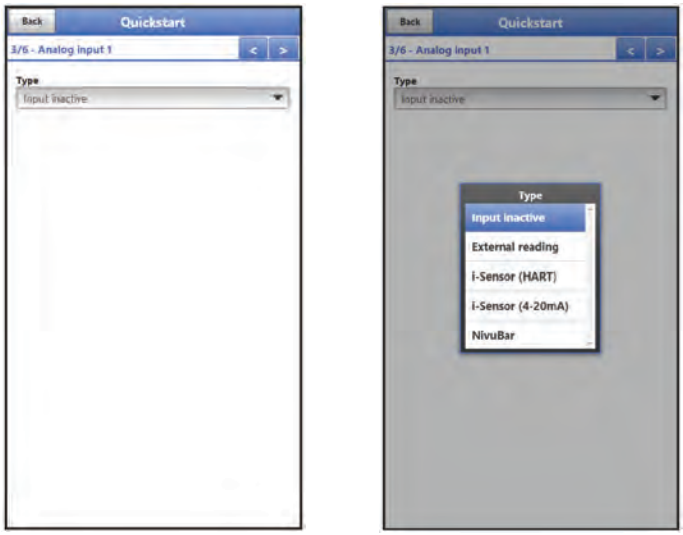



**Fig. 44-3 Analogue Input 1**

When selecting the page >Analogue Input 1<, the software checks the connected units and also enters their values directly as a preselection. These values, however, can be modified.

See Chapter “38.2 Menu Analogue Inputs”.

## 44.4 Menu >Quick Start< / >Analogue Input 2<

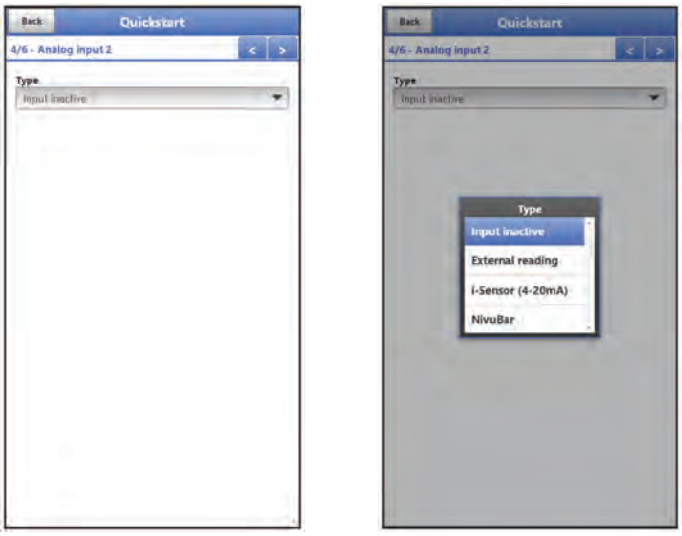



**Fig. 44-4 Analogue Input 2**

When selecting the page >Analogue Input 2<, the software checks the connected units and also enters their values directly as a preselection. These values, however, can be modified.

See Chapter “38.2 Menu Analogue Inputs”.

## 44.5 Menu >Quick Start< / >Digital Input 1<

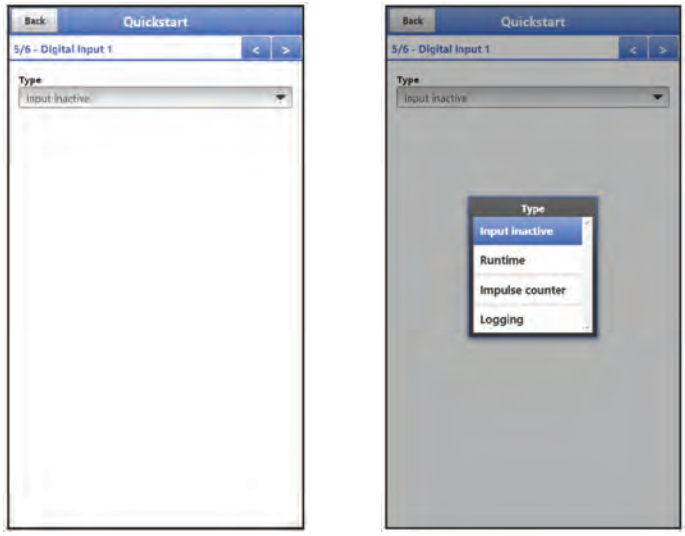



**Fig. 44-5 Digital Input 1**

When selecting the page >Digital Input 1<, the software checks the connected units and also enters their values directly as a preselection. These values, however, can be modified.

See Chapter “38.3 Menu Digital Inputs”.

## 44.6 Menu >Quick Start< / >Communication<


**Fig. 44-6 Communication**

When selecting the page >Communication<, all settings in the area of communication can be made via GPRS.



The individual settings are explained in greater detail in Chapter “41 Parameter Menu Communication”.

# 45 Parameter Menu Alarm

The >Alarm< parameter menu is divided into up to four sub-items. These sub-items are >Battery (12V)<, >Analogue Input 1<, >Analogue Input 2< and >Digital Input<.

The individual sub-items are only visible if the analogue and digital inputs have previously been assigned a type under >Application< and thus activated (see Chap. “38.2 Menu Analogue Inputs” and “38.3 Menu Digital Inputs”).

For details beyond these operating instructions, on alarm management, alarm messages, alarm overview, status information etc. see also the NIVUS WebPortal manual.

## 45.1 Menu >Alarm< / >Battery (12V)<

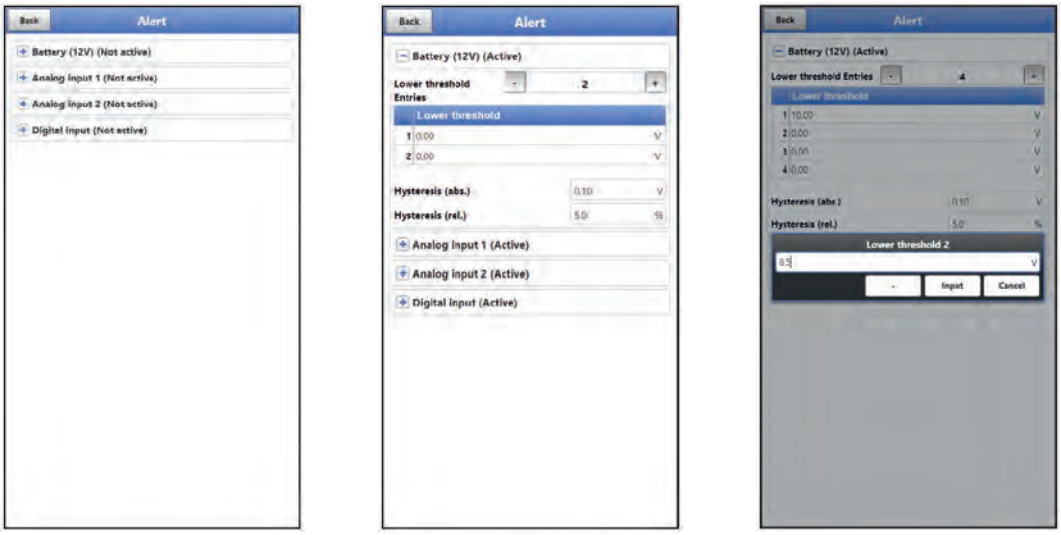



**Fig. 45-1 Sub-Item Battery**

For the >Battery (12V)< sub-item, up to five different threshold values can be entered using the “+” and “-” keys for **>Lower Thresholds Entries<**. When these are reached, an alarm e-mail (only in connection with the NIVUS WebPortal) is to be issued.

The threshold values are defined by clicking on the fields and typing in numerical values. The data logger sorts the entered threshold values in descending order. This is done independently of the input sequence.

For **>Hysteresis (abs.)<** and **>Hysteresis (rel.)<** values can be entered by clicking and typing. The data logger evaluates the two values and sends an e-mail (only in connection with the NIVUS WebPortal) at the highest limit upwards (highest possible value) and at the lowest limit downwards (lowest possible value). This e-mail contains the information that the alarm has been cancelled.

**Default Settings**:
Hysteresis (abs.): 0.10 V
Hysteresis (rel.): 5 %

## 45.2 Menu >Alarm< / >Analogue Input 1<

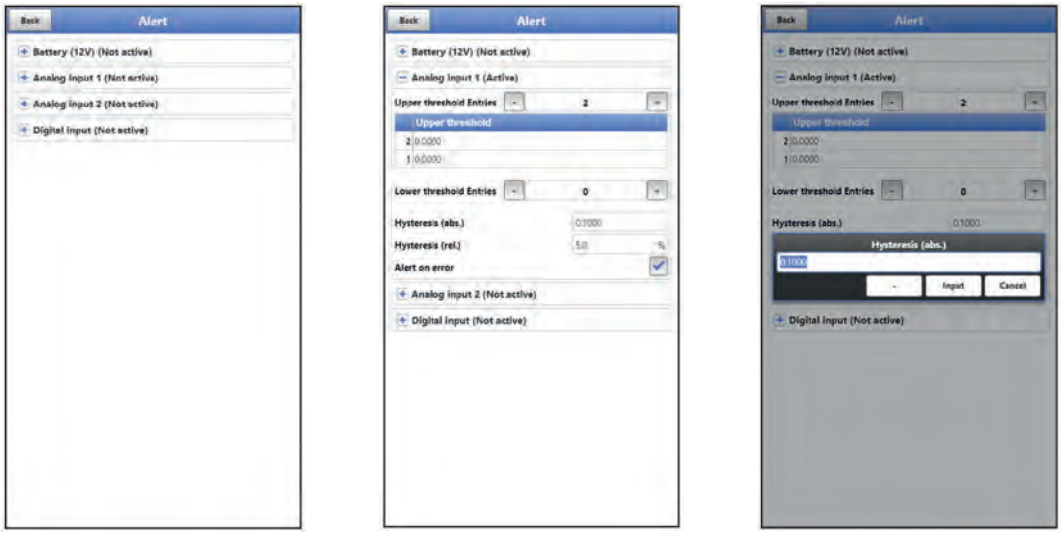



**Fig. 45-2 Analogue Input 1**

For the >Analogue Input 1< sub-item, up to five different threshold values can be entered using the “+” and “-” keys for **>Upper Thresholds Entries<** and for **>Lower Thresholds Entries<**. When these are reached, an alarm e-mail (only in connection with the NIVUS WebPortal) is to be issued.

The threshold values are defined by clicking on the fields and typing in numerical values. The data logger sorts the entered threshold values in descending order. This is done independently of the input sequence.

For **>Hysteresis (abs.)<** and **>Hysteresis (rel.)<** values can be entered by clicking and typing. The data logger evaluates the two values and sends an e-mail (only in connection with the NIVUS WebPortal) at the highest limit upwards (highest possible value) and at the lowest limit downwards (lowest possible value). This e-mail contains the information that the alarm has been cancelled.

**Default Settings**:
Hysteresis (abs.): 0.10 or 0.10 pH (whether and which unit is displayed depends on the selected type)
Hysteresis (rel.): 5 %

In addition, the checkbox **>Alert on error<** can be set. Then an alarm e-mail (only in connection with the NIVUS WebPortal) is sent in the event of an active pending error. Such errors are e.g. cable faults, interruptions, short circuits etc.

## 45.3 Menu >Alarm< / >Analogue Input 2<

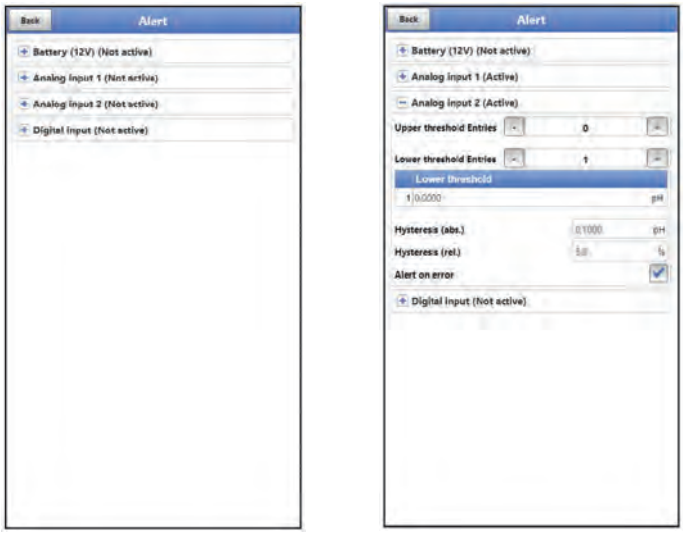



**Fig. 45-3 Analogue Input 2**

For the >Analogue Input 2< sub-item, up to five different threshold values can be entered using the “+” and “-” keys for **>Upper Thresholds Entries<** and for **>Lower Thresholds Entries<**. When these are reached, an alarm e-mail (only in connection with the NIVUS WebPortal) is to be issued.

The threshold values are defined by clicking on the fields and typing in numerical values. The data logger sorts the entered threshold values in descending order. This is done independently of the input sequence.

For **>Hysteresis (abs.)<** and **>Hysteresis (rel.)<** values can be entered by clicking and typing. The data logger evaluates the two values and sends an e-mail (only in connection with the NIVUS WebPortal) at the highest limit upwards (highest possible value) and at the lowest limit downwards (lowest possible value). This e-mail contains the information that the alarm has been cancelled.

**Default Settings**:
Hysteresis (abs.): 0.10 or 0.10 pH (whether and which unit is displayed depends on the selected type)
Hysteresis (rel.): 5 %

In addition, the checkbox **>Alert on error<** can be set. Then an alarm e-mail (only in connection with the NIVUS WebPortal) is sent in the event of an active pending error. Such errors are e.g. cable faults, interruptions, short circuits etc.

## 45.4 Menu >Alarm< / >Digital Input<

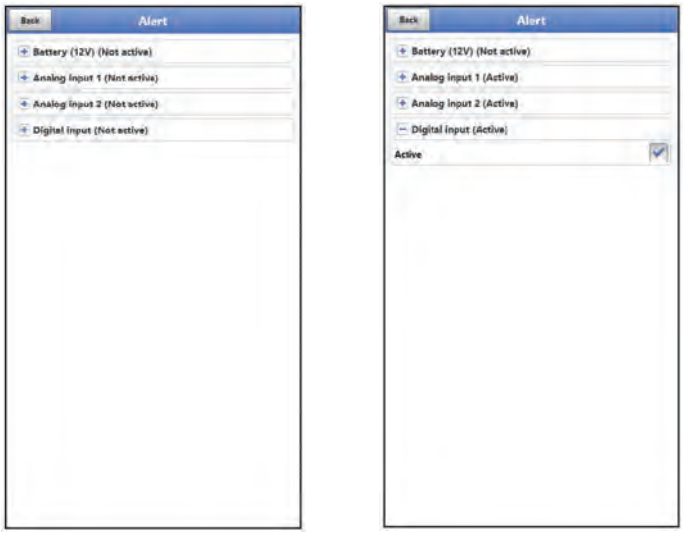



**Fig. 45-4 Digital Input**

In the sub-item >Digital Input< a check mark can be set to activate an alarm e-mail (only in connection with the NIVUS WebPortal) when a digital “high” occurs at the digital input.

**Default setting**: box unchecked

# Maintenance and Cleaning

**WARNING** ***Disconnect the System from Mains Power***

*Disconnect the unit from the mains (if connected) and secure the higher system against being switched on again before starting maintenance, cleaning and/or repair work (only by qualified personnel).*

*Disregarding may lead to electric shock.*

**WARNING** ***Check danger due to explosive gases***

*Before starting assembly, installation and maintenance work, be sure to check that all regulations on safety at work have been observed and that there is no possible risk of explosive gases. Use a gas warner for the check.*

*When working in the sewer system, make sure that no electrostatic charge can occur:*

- *Avoid unnecessary movements to reduce the building-up of static charges.*
- *Discharge any static electricity present on your body before you start installing the sensor.*

*Disregarding may result in personal injury or damage to the system.*

**WARNING** ***Open the device only out of Ex areas***

*Do not open, service or repair in an area where an explosive atmosphere is present.*

**WARNING** ***Germ Contamination***

*Due to the frequent use of the sensors in the waste water sector, parts can be contaminated with dangerous germs. Therefore, appropriate precautions must be taken when coming into contact with cables and sensors.*

*Wear protective clothing.*

## 46 Maintenance

### 46.1 Maintenance Interval

The type NivuLevel Mobile data logger is conceived as a low-maintenance and low-wear instrument.

Nevertheless, NIVUS recommend an **annual check** of the entire measuring system by the NIVUS customer service.

Depending on the area of application of the measuring system, the maintenance interval may vary. The scope of maintenance and its intervals depend on the following factors:

- Measurement principle of the sensors
- Material wear
- Measurement medium and channel hydraulics
- General regulations for the operator of the measurement system
- Environmental conditions

In addition to the annual maintenance, NIVUS recommend a complete maintenance of the measuring system by the NIVUS customer service after **ten years at the latest**.

Generally the verification of data loggers/sensors is a basic measure in order to improve operational reliability and to increase the lifetime.

Contact the NIVUS customer service to make an appointment (see Chap. “46.3 Customer Service Information”).

## 46.2 Maintenance Tasks

### 46.2.1 Clean, check and replace Seals

**Basic Maintenance for all Types**

The front panel seals (at the edge of the battery compartments) and the enclosure cover seals of the data logger must be maintained/checked (at least) **every time** the battery compartment or the housing cover **is closed**:

- Remove foreign bodies and dirt.
- Check elasticity.
- Check for damage.
- Ensure correct fit.
- Treat the seals with silicone grease if necessary.
- Replace defective seals (by NIVUS customer service).

For correct replacement of the seals, NIVUS recommend to return the data logger to NIVUS.

Contact the NIVUS customer service to make an appointment (see Chap. “46.3 Customer Service Information”).

**Supplementary Maintenance for Type NFM-0050xCxx**

For the data logger types **NFM-0050xCxx**, the “Basic Maintenance” and the “Supplementary Maintenance” are part of the approval for use in **Ex zone 2**.

- At an ambient temperature of 0...30 °C and a mounting position all year round without direct sunlight, the front panel and housing cover seals must be replaced after **15 years at the latest** in order to ensure the relevant properties for the ignition protection type “Restricted Breathing of gastight enclosures nR”.
- In the storage and operating temperature range of -15...50 °C, replacement should take place after **8 years at the latest**.
- Basically, the seals must be replaced if it is evident that they no longer seal correctly (by NIVUS customer service).

For correct replacement of the seals, NIVUS recommend to return the data logger to NIVUS.

Contact the NIVUS customer service to make an appointment (see Chap. “46.3 Customer Service Information”).

**DANGER**

***Explosion hazard due to defective/dirty/leaking seals***

*The restricted Breathing of the gastight enclosure must be ensured by sufficient and regular maintenance of the seals.*

*In case of disregard, the explosion protection of the device is no longer given.*

*The device then poses a danger to the life of the user and can cause the ignition of an explosive atmosphere.*

***Be sure to check the seals regularly***

*Non-compliance may have negative consequences in terms of warranty and liability. See Chap. "5 Warranty" and "6 Disclaimer".*

### 46.2.2 Pressure Test (only for type NFM-0050xCxx)

If the device is in proper condition (a. o. seals, enclosure parts, screw glands; see also Chap. "8 Ex Protection": Special conditions when using the data loggers NFM-0050x Cxx in Ex zone 2, #10) a pressure test in the field is not necessary.

If required, the device can be returned to NIVUS for pressure testing.

Contact the NIVUS customer service to make an appointment (see Chap. "46.3 Customer Service Information").

### 46.2.3 Replacing Batteries (for Type NFM-0050xCxx/NFM0050x0xx)

The batteries in the battery pack for the NFM-0050xCxx/NFM-0050x0xx data loggers must not be older than **ten years**. The approved batteries are marked by the battery manufacturer with an indication of the date of manufacture. It must be ensured that the batteries are removed in good time to avoid deep discharge.

⇨ Procedure to replace the batteries see Chap. "49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)".

***For use in potentially explosive atmospheres (zone 2), the following applies in particular:***

- *All batteries used in a battery pack must be date stamped together by the manufacturer and must be new.*
- *The replacement of individual cells of a battery pack is not permitted.*
- *Strict attention must be paid to the correct orientation of the cells when inserting them.*
- *All batteries must bear the ® mark.*

## 46.3 Customer Service Information

For maintenance measures to be carried out by NIVUS, the recommended annual inspection of the entire measuring system or complete maintenance after ten years at the latest, contact our customer service:

**NIVUS GmbH - Customer Centre**
Phone +49 7262 9191-922
customercenter@nivus.com

⇨ Observe Chap. "15 Return" prior to returning the data logger to NIVUS GmbH.

# 47 Cleaning

## 47.1 Data Logger

**WARNING** ***Disconnect the System from Mains Power***

*Make sure that the device is disconnected from mains power.*

*Disregarding may lead to electric shock.*

**DANGER** ***Danger by electrostatic Discharge***

*Clean the device only with a damp cloth.*

*In case of disregard, the explosion protection of the device is no longer given due to possible static charge.*

*The device then poses a danger to the life of the user and can cause the ignition of an explosive atmosphere.*

The NivuLevel Mobile enclosure complies with protection class IP68 when closed and is not very sensitive. Nevertheless, a high-pressure cleaner should **not** be used for cleaning.

Also, do **not** use harsh cleaning agents or solvents. Instead, it is better to use mild household cleaners or soap suds.

## 47.2 Power Adapter/Charger (only for NIVUS rechargeable battery blocks)

Clean the power adapter/charger and charging tray only with a **slightly damp** cloth. The components do not have any protection against the ingress of moisture.

## 47.3 Sensors

Be sure to follow the instructions for maintenance and cleaning of the sensors. These instructions can be found in the respective technical description or instruction manual.

These manuals are provided with the respective sensors and/or are available as download on the NIVUS homepage.

# 48 Dismantling/Disposal

Improper disposal may cause danger to the environments.

➲ Dispose of device components and packaging materials in accordance with the applicable local environmental regulations for electrical products:

1. Disconnect the device from mains power, if connected.
2. Remove conneted cables from the device.
3. Remove rechargeable battery blocks/battery packs and, if they are defective, dispose of them properly.
4. Remove the buffer battery from the data logger and dispose of it separately and properly.

***EU WEEE Directive***

*This symbol indicates that the requirements of Directive 2012/19/EU on waste electrical and electronic equipment must be observed when disposing of the device. Die NIVUS GmbH support and promote the recycling or environmentally sound, separate collection/disposal of waste electrical and electronic equipment to protect the environments and human health. Observe the local laws and regulations on disposal.*

*NIVUS GmbH are registered with the EAR, therefore public collection and return points in Germany can be used for disposal.*

***The device is equipped with a buffer battery (lithium button cell) that must be disposed of separately.***

# 49 Installation of Spare Parts and Wearing Parts

We expressly draw your attention to the fact that spare parts and accessories which have not been supplied by us have also not been tested and approved by us. The installation and/or use of such products may therefore negatively alter or invalidate the design properties of your measurement system.

NIVUS are not liable for damage caused by the use of non-original parts and non-original accessories.

## 49.1 Battery Replacement (battery pack for NFM-0050xCxx/NFM-0050x0xx)

The batteries (*NFM0 ZBPL 01C Z01*) in the NIVUS battery pack are **not** rechargeable.

New batteries can be purchased from NIVUS.

**Approved Batteries**

The following battery type is currently approved:

- SAFT LS 33600; Li-$SOCl_2$; 3.6 V; Type D

The batteries can be purchased from a supplier other than NIVUS, too. If applicable, ensure that the traceability of the batteries can be guaranteed by this supplier.

However, only battery types approved in writing by NIVUS are permitted.

In the future, other battery types may be approved.

For more questions contact the NIVUS customer service (see Chap. “46.3 Customer Service Information”).

***Replacement only by qualified personnel***

*The batteries may only be inserted or replaced by trained personnel.*

***Replace all 16 batteries at the same time***

*All batteries used must be replaced at the same time. The replacement of individual batteries of a battery pack is not permitted.*

**Before the first use**

For **newly delivered** NFM-0050xCxx or NFM-0050x0xx data loggers (if battery packs are to be used), depending on the regional regulations in the recipient country, appropriate batteries may first have to be inserted into the battery holders before first use.

➲ Proceed as described in “Replacing the used Batteries”, but without removing the used-up batteries from the work step 3.

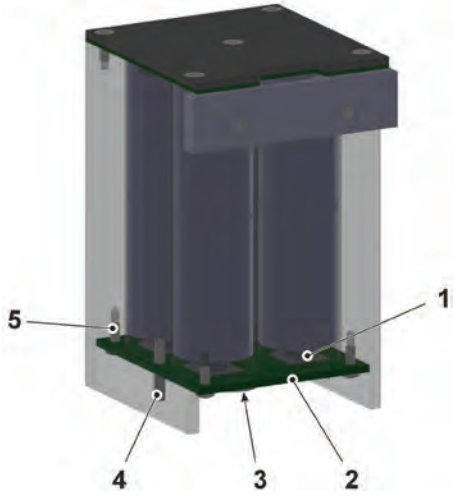
**Replacing the used Batteries**

➲ Procedure:

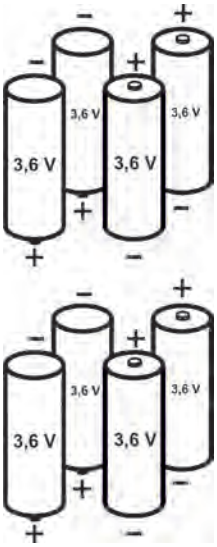
1. Open four pan-head screws M4x10 (pos. 5) on the underside of the battery pack.

2. Carefully unscrew the knurled screw M5x16 (pos. 3) centrally on the underside of the battery pack, making sure that the lower cover (pos. 2) is pressed outwards by four internal springs (pos. 1).

   Put the lower (bottom) cover aside.




3. Remove all eight used batteries from the battery pack and dispose of them properly. Individual replacement is not permitted.
4. Insert eight new batteries, strictly observing the **installation direction** (sticker in the battery pack). The negative poles go on the springs, the positive contacts on the surfaces.




5. Replace the bottom cover with the four springs using the guide pin (pos. 4) and the hole in the cover and fix it with the knurled screw.
6. Screw in and tighten the four pan head screws to close the battery pack.
7. Tighten the knurled screw.
8. Proceed in the same way with the second battery pack.
   All 16 batteries must be replaced at the same time.

**WARNING**

***Use battery packs and rechargeable battery blocks only for their intended purpose***

*Only use the batteries (Li-SOCl2) in the battery packs (with battery pack holder/battery container) and only with types NFM-0050xCxx/NFM-0050x0xx.*
*Use the rechargeable battery blocks (VRLA) only with types NFM-005x0xx and NFM-0050xExx.*

*Disregarding may result in personal injury or damage to the system.*

# 50 Accessories

| Article Number | Description |
|---|---|
| *NFM0 ZAPB 1215* | Rechargeable battery block with connection sockets for NFM; nominal voltage: 12 V; capacity: 14 Ah; for NFM-0050x0xx |
| *NFM0 ZAPB 1215 E* | Rechargeable battery block with connection sockets for NFM with ATEX approval zone 1; nominal voltage: 12 V; capacity: 14 Ah; for NFM-0050xExx |
| *NFM0 ZLAD* | Power adapter/charger for NFM / NFM rechargeable battery block supply voltage: 100...240 V AC, 50/60 Hz |
| *NFM0 ZBPH C* | Battery pack holder (designation according to EN 60079-0: battery container) with connection sockets for NFM-0050. For inserting 8x type D cells Li-$SOCl_2$ (3.6V) (*NFM0 ZBPL 01C Z01*); for NFM-0050xCxx/NFM-0050x0xx |
| *NFM0 ZBPL 01C* | Battery pack for NFM-0050, consisting of 1x battery pack holder (*NFM0 ZBPH C*) and 8x type D cells Li-$SOCl_2$ (3.6V) (*NFM0 ZBPL 01C Z01*); for NFM-0050xCxx/NFM-0050x0xx |
| *NFM0 ZBPL 01C Z08* | 8x (Spare) Battery for battery pack (*NFM0 ZBPL 01C*); for NFM-0050xCxx/NFM-0050x0xx |
| *NFM0 ZBPL 01C Z01* | 1x (Spare) Battery for battery pack (*NFM0 ZBPL 01C*); for NFM-0050xCxx/NFM-0050x0xx |
| *NFM0 ZVER PS* | Connection cable 2-wire for connecting an external supply voltage to the NFM (one side with plug for the multifunction socket, other side with open cable end); cable length 5 m |
| *NFM0 ZAB 01* | Display and operating module for NFM: IP67-certified 8“ outdoor display; resolution: 1280x800; OS: Android; Device communication: WLAN; other communication types: USB, Bluetooth, modem 2G, 3G and 4G |
| *NFM0 ZVER AEA* | Connection cable, NFM analogue input; power supply via NFM (one side with plug for the multifunction socket, other side with open cable ends); cable length 10 m |
| *NLM0 KAB 10* | Connection cable, NFM analogue input; power supply via NFM (one side with plug for the sensor connection socket, other side with open cable ends); cable length 10 m |
| *NLM0 KAB 20* | Connection cable, NFM analogue input; power supply via NFM (one side with plug for the sensor connection socket, other side with open cable ends); cable length 20 m |
| *NLM0 KAB 30* | Connection cable, NFM analogue input; power supply via NFM (one side with plug for the sensor connection socket, other side with open cable ends); cable length 30 m |
| *NFM0 ZVER DE* | Connection cable, NFM digital input; power supply via NFM (one side with plug for the multifunction socket, other side with open cable ends); cable length 10 m |
| *NFM0 ZUB0 AZD 01* | Junction box with connection cable and plug for connection to the sensor socket on the NFM-050; for connection of up to two sensors; with open cable end |
| *NFM0 ZVS1* | Connector Box, IP67 with NFM connection plug for connection to the NFM |
| *ZUB0 KAB NMC 10* | 2-pole, pre-assembled cable with open cable ends for connection to the Connector Box; cable length 10 m |
| *ZUB0 KAB NMC 20* | 2-pole, pre-assembled cable with open cable ends for connection to the Connector Box; cable length 20 m |

| | |
|---|---|
| *ZUB0 KAB NMC 30* | 2-pole, pre-assembled cable with open cable ends for connection to the Connector Box; cable length 30 m |
| *NFM0 ZSBL IRE* | Hoop guards (pair), for protecting the connector plugs and fixing the Connector Box to the NFM |
| *NFM0 ZHAK NFM 01* | Suspension bracket to fasten NFM on a step iron incl. hanging bracket for sensor cable; material: stainless steel 1.4571 |
| *NFM0 ZHAK NFM 02* | Suspension bracket to fasten NFM on a step iron;<br>material: stainless steel 1.4571 |
| *NFM5 GUMMI PUFFER* | Rubber buffer, set with 4 pcs. |
| *NFM0 Z ANT1* | NFM GPRS T-shape antenna Ex-It GSM/3G, cable length 2.5 m, for connection to NFM with GPRS remote data transmission |
| *ZUB0 NFM SCHLOSS* | Padlock for data logger in Ex version (to secure the device when used in Ex areas) |
| *BSL0 EP 220-20* | EnerPro 220 Tr / 20kA, mains line overvoltage protection |
| *BSL0 EP 220-5* | EnerPro 220 Tr / 5kA, mains line overvoltage protection |
| *BSL0 DP 2X12/12* | DataPro 2x1-12V/12V-11H-μTr(N), 20,000 A leakage current, 2-wire for sensor lines |
| | NIVUS WebPortal:<br>Data management system for storage and provision of measurement data. Multiple options for direct measurement data analysis, system verification, data forwarding and alarming, right up to complete log generation through processing in the cloud. For details, please contact your sales representative. |
| | NIVUS DataKiosk / Data Kiosk Client:<br>NIVUS DataKiosk is a web-based connectivity platform for the secure provision of measurement and process data to upstream or downstream systems such as a process control system. Due to its open architecture, NIVUS DataKiosk connects IoT solutions with a wide variety of IT systems and makes necessary data format adaptations.<br>DataKiosk fulfils the function of a gateway. It enables application programmes to read data from a wide variety of devices and pass on control signals to devices on the basis of standardised internet technologies. Through comprehensive networking and automation, processes can be improved overall and their utility can be increased.<br>The NIVUS DataKiosk Client is a graphical interface that retrieves the data from the DataKiosk and automatically stores the result in a configurable location.<br>For details, please contact your sales representative. |

**Tab. 15 Spare Parts and Accessories**

More accessories and spare parts can be found in the current NIVUS price list.

# Index

# Credits and Licenses

## 51 List of Sources of the Licences and Codes used

The data logger type NivuLevel Mobile uses code from the following open source projects:

- Freetype (http://www.freetype.org)
- Libharu (http://libharu.org)
- Libjpeg (http://www.ijg.org)
- Libpng (http://www.libpng.org)
- Zlib (http://www.zlib.net)
- Mini-XML (http://www.msweet.org)
- Nano-X/nxlib (http://www.microwindows.org)
- FLTK (http://www.fltk.org)
- Appendix1: LGPL
- Appendix2: MPL

***Licensing Issues***

*For questions on licensing contact opensource@nivus.com*

# Approvals and Certificates

DE / EN / FR

## EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **Portabler Durchflussmessumformer/-datenlogger, Standardausführung NivuFlow Mobile / NivuLevel Mobile** |
| *Description:* | *Portable flow measurement transmitter/data logger, standard version NivuFlow Mobile / NivuLevel Mobile* |
| *Désignation:* | *Débitmètre/enregistreur de données portable, version standard NivuFlow Mobile / NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxx00 00** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*

*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 61326-1:2013
- ETSI EN 301 489-17 V3.2.5
- EN 301 893 V2.1.1 (WLAN)
- EN 62311:2008
- ETSI EN 301 489-1 V2.2.3
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)

Diese Erklärung wird verantwortlich für den Hersteller:

*This declaration is submitted on behalf of the manufacturer:*

*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

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Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **Portable flow measurement transmitter/data logger, standard version NivuFlow Mobile / NivuLevel Mobile** |
| **Type:** | **NFM0xxx00 00** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2017 / 1206 The Radio Equipment Regulations 2017
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- BS EN 61326-1:2013
- ETSI EN 301 489-17 V3.2.5
- BS EN 301 893 V2.1.1 (WLAN)
- BS EN 62311:2008
- ETSI EN 301 489-1 V2.2.3
- BS EN 300 328 V2.2.2 (WLAN)
- BS EN 300 440 V2.2.1 (WLAN)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:
**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

*EU Declaration of Conformity*

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E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex II 3G" Portabler Datenlogger, Standardausführung NivuLevel Mobile für Zone 2** |
| *Description:* | *"Ex II 3G" Portable data logger, standard version NivuLevel Mobile for Zone 2* |
| *Désignation:* | *"Ex II 3G" Enregistreur de données portable, version standard NivuLevel Mobile pour Zone 2* |
| **Typ / Type:** | **NFM00500C00** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*

*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 62311:2008
- EN 61326-1:2013
- Draft ETSI EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-17 V3.2.5
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 893 V2.1.1 (WLAN)
- EN IEC 60079-0:2018
- EN 60079-7:2015/A1:2018
- EN 60079-11:2012
- EN IEC 60079-15:2010

Ex-Kennzeichnung / *Ex-designation / Marquage Ex* : Ⓔx II 3G Ex ic [ic Gc] nR IIB T4 Gc

Die Betriebsanleitung ist zu beachten. Im Kapitel „Technische Daten" sind die ex-technischen Anschlusswerte aufgeführt sowie besondere Bedingungen für die Verwendung des Gerätes genannt.

*The Instruction Manual must be observed. Chapter "Specifications" lists the electrical connection values regarding explosion protection as well as special conditions for the use of the unit.*

*Le Manuel d'instructions doit être respecté. Le chapitre «Données techniques» énumère les valeurs de raccordement électrique concernant la protection contre les explosions ainsi que les conditions particulières d'utilisation de l'appareil.*

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*
**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 25.10.2022

Gez. *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

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Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:
*For the following product:*
*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex" Portabler Durchflussmessumformer/-datenlogger, Standardausführung NivuFlow Mobile / NivuLevel Mobile** |
| *Description:* | *"Ex" Portable flow measurement transmitter/data logger, standard version NivuFlow Mobile / NivuLevel Mobile* |
| *Désignation:* | *"Ex" Débitmètre/enregistreur de données portable, version standard NivuFlow Mobile / NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxx0E 0x** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:
*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*
*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

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- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
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- Draft ETSI EN 301 489-17 V3.2.5
- EN 301 893 V2.1.1 (WLAN)
- EN IEC 60079-0:2018
- EN 60079-11:2012
- EN 62311:2008
- Draft ETSI EN 301 489-1 V2.2.3
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN IEC 60079-7:2015/A1:2018
- EN 60079-18:2015/A1:2017

Ex-Kennzeichnung / *Ex-designation / Marquage Ex* : Ⓔx II 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate / Attestation d'examen «UE» de type:*

TÜV 17 ATEX 196722 X issue: 01

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.) / Organisme notifié (№ d'identification)*

TÜV NORD CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*
**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
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Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **"Ex" Portable flow measurement transmitter/data logger, standard version NivuFlow Mobile / NivuLevel Mobile** |
| **Type:** | **NFM0xxx0E 0x** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2017 / 1206 The Radio Equipment Regulations 2017
- SI 2016 / 1107 The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
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- BS EN 60079-11:2012
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- Draft ETSI EN 301 489-1 V2.2.3
- BS EN 300 328 V2.2.2 (WLAN)
- BS EN 300 440 V2.2.1 (WLAN)
- BS EN IEC 60079-7:2015/A1:2018
- BS EN 60079-18:2015/A1:2017

Ex-designation: Ⓔx I 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Type Examination Certificate: TÜV 17 ATEX 196722 X issue: 01

Notified Body (Identif. No.):

TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:
**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

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Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **Portabler Durchflussmessumformer/-datenlogger mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile** |
| *Description:* | *Portable flow measurement transmitter/data logger with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile* |
| *Désignation:* | *Débitmètre/enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxxG0 Ex** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

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- EN 61326-1:2013
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- EN 301 893 V2.1.1 (WLAN)
- EN 301 511 V12.5.1 (GSM/2G)
- EN 301 908-2 V13.1.1 (UMTS/3G)
- EN 62311:2008
- EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- EN 301 908-13 V13.2.1 (LTE/4G)

Diese Erklärung wird verantwortlich für den Hersteller:

*This declaration is submitted on behalf of the manufacturer:*

*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

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Telefon: +49 07262 9191-0
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E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **Portable flow measurement transmitter/data logger with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile** |
| **Type:** | **NFM0xxxG0 Ex** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

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- BS EN 301 511 V12.5.1 (GSM/2G)
- BS EN 301 908-2 V13.1.1 (UMTS/3G)
- BS EN 62311:2008
- BS EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- BS EN 300 328 V2.2.2 (WLAN)
- BS EN 300 440 V2.2.1 (WLAN)
- BS EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- BS EN 301 908-13 V13.2.1 (LTE/4G)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:
**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

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Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **Portabler Durchflussmessumformer/-datenlogger mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile** |
| *Description:* | *Portable flow measurement transmitter/data logger with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile* |
| *Désignation:* | *Débitmètre/enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxxG0 Gx** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*

*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 61326-1:2013
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- EN 301 893 V2.1.1 (WLAN)
- EN 301 511 V12.5.1 (GSM/2G)
- EN 301 908-2 V13.1.1 (UMTS/3G)
- EN 62311:2008
- EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- EN 301 908-13 V13.2.1 (LTE/4G)

Diese Erklärung wird verantwortlich für den Hersteller:

*This declaration is submitted on behalf of the manufacturer:*

*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **Portable flow measurement transmitter/data logger with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile/NivuLevel Mobile** |
| **Type:** | **NFM0xxxG0 Gx** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2017 / 1206 The Radio Equipment Regulations 2017
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- BS EN 61326-1:2013
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- BS EN 301 893 V2.1.1 (WLAN)
- BS EN 301 511 V12.5.1 (GSM/2G)
- BS EN 301 908-2 V13.1.1 (UMTS/3G)
- BS EN 62311:2008
- EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- BS EN 300 328 V2.2.2 (WLAN)
- BS EN 300 440 V2.2.1 (WLAN)
- BS EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- BS EN 301 908-13 V13.2.1 (LTE/4G)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:
**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex II 3G" Portabler Datenlogger, mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuLevel Mobile für Zone 2** |
| *Description:* | *"Ex II 3G" Portable data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuLevel Mobile for Zone 2* |
| *Désignation:* | *"Ex II 3G" Enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuLevel Mobile pour Zone 2* |
| **Typ / Type:** | **NFM0050GCEx** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

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*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 62311:2008
- EN 61326-1:2013
- Draft ETSI EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- EN 300 328 V2.2.2 (WLAN)
- EN 301 893 V2.1.1 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 511 V12.5.1 (GSM)
- EN 301 908-1 V15.2.0 (UMTS, LTE)
- EN 301 908-2 V13.1.1 (UMTS)
- EN 301 908-13 V13.2.1 (LTE)
- EN IEC 60079-0:2018
- EN 60079-7:2015/A1:2018
- EN 60079-11:2012
- EN IEC 60079-15:2010
- EN 303 413 V1.2.1 (GNSS)

Ex-Kennzeichnung / *Ex-designation / Marquage Ex* : Ⓔx II 3G Ex ic [ic Gc] nR IIB T4 Gc

Die Betriebsanleitung ist zu beachten. Im Kapitel „Technische Daten" sind die ex-technischen Anschlusswerte aufgeführt sowie besondere Bedingungen für die Verwendung des Gerätes genannt.

*The Instruction Manual must be observed. Chapter "Specifications" lists the electrical connection values regarding explosion protection as well as special conditions for the use of the unit.*

*Le Manuel d'instructions doit être respecté. Le chapitre «Données techniques» énumère les valeurs de raccordement électrique concernant la protection contre les explosions ainsi que les conditions particulières d'utilisation de l'appareil.*

Diese Erklärung wird verantwortlich für den Hersteller:

*This declaration is submitted on behalf of the manufacturer:*

*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général*)

Eppingen, den 25.10.2022

Gez. *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex II 3G" Portabler Datenlogger, mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuLevel Mobile für Zone 2** |
| *Description:* | *"Ex II 3G" Portable data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuLevel Mobile for Zone 2* |
| *Désignation:* | *"Ex II 3G" Enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuLevel Mobile pour Zone 2* |
| **Typ / Type:** | **NFM0050GCGx** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

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*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 62311:2008
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- Draft ETSI EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- EN 300 328 V2.2.2 (WLAN)
- EN 301 893 V2.1.1 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 511 V12.5.1 (GSM)
- EN 301 908-1 V15.2.0 (UMTS, LTE)
- EN 301 908-2 V13.1.1 (UMTS)
- EN 301 908-13 V13.2.1 (LTE)
- EN IEC 60079-0:2018
- EN 60079-7:2015/A1:2018
- EN 60079-11:2012
- EN IEC 60079-15:2010
- EN 303 413 V1.2.1 (GNSS)

Ex-Kennzeichnung / *Ex-designation / Marquage Ex* : Ⓔx II 3G Ex ic [ic Gc] nR IIB T4 Gc

Die Betriebsanleitung ist zu beachten. Im Kapitel „Technische Daten" sind die ex-technischen Anschlusswerte aufgeführt sowie besondere Bedingungen für die Verwendung des Gerätes genannt.

*The Instruction Manual must be observed. Chapter "Specifications" lists the electrical connection values regarding explosion protection as well as special conditions for the use of the unit.*

*Le Manuel d'instructions doit être respecté. Le chapitre «Données techniques» énumère les valeurs de raccordement électrique concernant la protection contre les explosions ainsi que les conditions particulières d'utilisation de l'appareil.*

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 25.10.2022

Gez. *Ingrid Steppe*

DE / EN / FR

## EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex" Portabler Durchflussmessumformer/-datenlogger, mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile** |
| *Description* | *"Ex" Portable flow measurement transmitter/data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile* |
| *Désignation:* | *"Ex" Débitmètre/enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxxGE Ex** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*

*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- EN 61326-1:2013
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- EN 301 893 V2.1.1 (WLAN)
- EN 301 511 V12.5.1 (GSM/2G)
- EN 301 908-2 V13.1.1 (UMTS/3G)
- EN IEC 60079-0:2018
- EN 60079-11:2012
- EN 62311:2008
- EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- EN 300 328 V2.2.2 (WLAN)
- EN 300 440 V2.2.1 (WLAN)
- EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- EN 301 908-13 V13.2.1 (LTE/4G)
- EN IEC 60079-7:2015/A1:2018
- EN 60079-18:2015/A1:2017

Ex-Kennzeichnung / *Ex-designation / Marquage Ex :* (Ex) II 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate / Attestation d'examen «UE» de type:*

TÜV 17 ATEX 196722 X issue: 01

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.) / Organisme notifié (№ d'identification):*

TÜV NORD CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Allemagne**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **"Ex" Portable flow measurement transmitter/data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile** |
| **Type:** | **NFM0xxxGE Ex** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2017 / 1206 The Radio Equipment Regulations 2017
- SI 2016 / 1107 The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016
- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
- BS EN 61326-1:2013
- Draft ETSI EN 301 489-17 V3.2.5
- Draft ETSI EN 301 489-52 V1.2.1
- BS EN 301 893 V2.1.1 (WLAN)
- BS EN 301 511 V12.5.1 (GSM/2G)
- BS EN 301 908-2 V13.1.1 (UMTS/3G)
- BS EN IEC 60079-0:2018
- BS EN 60079-11:2012
- BS EN 62311:2008
- BS EN 301 489-1 V2.2.3
- Draft ETSI EN 301 489-19 V2.2.1
- BS EN 300 328 V2.2.2 (WLAN)
- BS EN 300 440 V2.2.1 (WLAN)
- BS EN 301 908-1 V15.2.0 (UMTS/3G, LTE/4G)
- BS EN 301 908-13 V13.2.1 (LTE/4G)
- BS EN IEC 60079-7:2015/A1:2018
- BS EN 60079-18:2015/A1:2017

Ex-designation:  II 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Type Examination Certificate: TÜV 17 ATEX 196722 X issue: 01

Notified Body (Identif. No.):

TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:

**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

# EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

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Für das folgend bezeichnete Erzeugnis:

*For the following product:*

*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **"Ex" Portabler Durchflussmessumformer/-datenlogger, mit internem Modem zur Datenfernübertragung über GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile** |
| *Description:* | *"Ex" Portable flow measurement transmitter/data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile* |
| *Désignation:* | *"Ex" Débitmètre/enregistreur de données portable avec modem interne pour la transmission de données à distance via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile* |
| **Typ / Type:** | **NFM0xxxGE Gx** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:

*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*

*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2014/53/EU
- 2014/34/EU
- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:

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- EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
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- EN 301 893 V2.1.1 (WLAN)
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- EN IEC 60079-0:2018
- EN 60079-11:2012
- EN 62311:2008
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- EN IEC 60079-7:2015/A1:2018
- EN 60079-18:2015/A1:2017

Ex-Kennzeichnung / *Ex-designation / Marquage Ex :* Ⓔx II 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate / Attestation d'examen «UE» de type:*

TÜV 17 ATEX 196722 X issue: 01

Notifizierte Stelle (Kennnummer) / *Notified Body (Identif. No.) / Organisme notifié (№ d'identification)*

TÜV NORD CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

abgegeben durch / *represented by / faite par:*

**Ingrid Steppe** (Geschäftsführerin / *Managing Director / Directeur général)*

Eppingen, den 21.10.2022

Gez. *Ingrid Steppe*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **"Ex" Portable flow measurement transmitter/data logger, with internal modem for data transmission via GPRS/UMTS/LTE NivuFlow Mobile / NivuLevel Mobile** |
| **Type:** | **NFM0xxxGE Gx** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

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The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
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- BS EN 300 440 V2.2.1 (WLAN)
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- BS EN 301 908-13 V13.2.1 (LTE/4G)
- BS EN IEC 60079-7:2015/A1:2018
- BS EN 60079-18:2015/A1:2017

Ex-designation:  II 2G Ex eb ib [ib] mb IIB T4 Gb

EU-Type Examination Certificate: TÜV 17 ATEX 196722 X issue: 01

Notified Body (Identif. No.):

TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:

**Ingrid Steppe** (Managing Director)

Eppingen, 21/10/2022

Signed by *Ingrid Steppe*

DE / EN / FR

## EU Konformitätserklärung

*EU Declaration of Conformity*

*Déclaration de conformité UE*

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

Für das folgend bezeichnete Erzeugnis:
*For the following product:*
*Le produit désigné ci-dessous:*

| | |
|---|---|
| **Bezeichnung:** | **Ladeschale NFM** |
| *Description:* | *charging station NFM* |
| *Désignation:* | *station de charge NFM* |
| **Typ / Type:** | **NFM02 LADESCH** |

erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:
*we declare under our sole responsibility that the equipment made available on the Union market as of the date of signature of this document meets the standards of the following applicable Union harmonisation legislation:*
*nous déclarons, sous notre seule responsabilité, à la date de la présente signature, la conformité du produit pour le marché de l'Union, aux directives d'harmonisation de la législation au sein de l'Union:*

- 2011/65/EU

Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug die nachfolgend genannten anderen technischen Spezifikationen:
*The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:*
*L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:*

- EN 50581:2012

Diese Erklärung wird verantwortlich für den Hersteller:
*This declaration is submitted on behalf of the manufacturer:*
*Le fabricant assume la responsabilité de cette déclaration:*

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Allemagne**

abgegeben durch / *represented by / faite par:*
**Marcus Fischer** (Geschäftsführer / *Managing Director / Directeur général)*

Eppingen, den 08.02.2018

Gez. *Marcus Fischer*

# UK Declaration of Conformity

NIVUS GmbH
Im Täle 2
75031 Eppingen

Telefon: +49 07262 9191-0
Telefax: +49 07262 9191-999
E-Mail: info@nivus.com
Internet: www.nivus.de

For the following product:

| | |
|---|---|
| **Description:** | **Charging station NFM** |
| **Type:** | **NFM02 LADESCH** |

we declare under our sole responsibility that the equipment made available on the UK market as of the date of signature of this document meets the standards of the following applicable UK harmonisation legislation:

- SI 2012 / 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:

- BS EN 50581:2012

This declaration is submitted on behalf of the manufacturer:

**NIVUS GmbH**
**Im Taele 2**
**75031 Eppingen**
**Germany**

represented by:
**Ingrid Steppe** (Managing Director)

Eppingen, 20/10/2022

Signed by *Ingrid Steppe*

For connection values and special conditions for the zone 2 data logger NFM-0050x Cxx, see “Specifications” in Chap. “18.2 NFM-0050x Cxx” and Chap. “8 Ex Protection”.

The certificates on the following pages are only valid for the zone 1 data logger NFM-0050x Exx.

TÜV NORD

Translation

(1) **EU-Type Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** **TÜV 17 ATEX 196722 X** **issue:** 01

(4) for the product: Portable Measuring Transformer NivuFlow Mobile Typ NFM-0xxx x E and NivuLevel Mobile Typ NFM-0050 x E

(5) of the manufacturer: NIVUS GmbH

(6) Address: Im Täle 2
75031 Eppingen

Order number: 8003009451

Date of issue: 2019-10-28

(7) The design of this product and any acceptable variation thereto are specified in the schedule to this EU-Type Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential ATEX Assessment Report No. 19 203 251874.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 EN 60079-11:2012 EN 60079-7:2015
EN 60079-18:2015

except in respect of those requirements listed at item 18 of the schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions for Use specified in the schedule to this certificate.

11) This EU-Type Examination Certificate relates only to the design, and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the product shall include the following:

Ex II 2 G Ex eb ib [ib] mb IIB T4 Gb

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

Roder

Hanover office, Am TÜV 1, 30519 Hannover, Tel. +49 511 998-61455, Fax +49 511 998-61590



P17-F-011 Rev. 01/04.16

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(13) **SCHEDULE**

(14) **EU-Type Examination Certificate No. TÜV 17 ATEX 196722 X issue 01**

(15) Description of product

Together with the belonging sensors, the Portable Measuring Transformer
NivuFlow Mobile type NFM-0xxx x E and
NivuLevel Mobile type NFM-0050 x E
are used for the measurement of the flow speed and the flow level in partly or fully filled pipes and channels via supersonic technology.
The Portable Measuring Transformer NivuFlow Mobile/NivuLevel Mobile type NFM... is operated stationary.

The permissible ambient temperature range is -15 °C ... +50 °C.

Electrical data

Supply voltage ..... $U_n$ = 12 V d. c.
(Internal plug connections) Powered with max. 2 x 12 V/15Ah VRLA-Pb-batteries;

External suppy circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(X1R [Uin],
X1B [GND]) Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 14.5 V
$I_i$ = 1.25 A
$P_i$ = 18.1 W
The effective internal capacitances and inductances are negligibly small.

1 wire circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(CSM connector X10E [GND],
X10F [1 wire];
DSM connector X8E [GND], X8F [1 wire]) Maximum values:
$U_o$ = 3.7 V
$I_o$ = 57.3 mA
$P_o$ = 53 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 65 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 9.4 µF | 21 µF | 37 µF |

5 V circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(CSM connector X10E [GND],
X10J [+5 V-Ex];
DSM connector
X8E [GND], X8J [+5 V-Ex]) Maximum values:
$U_o$ = 5.93 V
$I_o$ = 91.7 mA
$P_o$ = 135.9 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 1 mH | 0.2 mH | 0.1 mH |
| max. permissible external capacitance | 14 µF | 23 µF | 30 µF |

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**Schedule to EU-Type Examination Certificate No. TÜV 17 ATEX 196722 X issue 01**

RS485 interface pressure, output ..... (CSM connector X10G [- RxTx], X10H [+ RxTx])

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:

$U_o$ = 3.7 V
$I_o$ = 95.1 mA
$P_o$ = 88 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 25 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 11 µF | 18 µF | 36 µF |

RS485 interface pressure, input ..... (CSM connector X10G [- RxTx], X10H [+ RxTx])

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 7.21 V
$I_i$ = 176 mA
$P_i$ = 317.2 mW
The effective internal capacitances and inductances are negligibly small.

Radar sensor supply ..... (Connector X1A, X1B)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 9.87 V
$I_o$ = 629 mA
$P_o$ = 6.21 W
Characteristic line: rectangular

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 0.2 mH | 0.1 mH | 0.05 mH |
| max. permissible external capacitance | 5 µF | 8 µF | 11.9 µF |

RS485 interface, output ..... (Connector X1C, X1D)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = 95.1 mA
$P_o$ = 88 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 25 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 11 µF | 18 µF | 36 µF |

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**Schedule to EU-Type Examination Certificate No. TÜV 17 ATEX 196722 X issue 01**

RS485 interface, input .....
(Connector X1C, X1D)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 10.21 V
$I_i$ = 248.8 mA
$P_i$ = 633.8 mW
The effective internal capacitances and inductances are negligibly small.

Analogue input no. 1 /2 .....
(Connector X1G, X1F; X1H, X1J
NivuLevel Mobile type NFM-0050 x E:
Connector X7C, X7E; X7B, X7D)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 22.2 V
$I_o$ = 33 mA
R = 48 Ω
$P_o$ = 624 mW
Characteristic line: trapezoidal

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 20 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 0.52 µF | 0.56 µF | 1 µF |

Analogue input no. 3 .....
(Connector X1K, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = <1 mA
$P_o$ = <1 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 100 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 19 µF | 24 µF | 38 µF |

Analogue input no. 3 .....
(Connector X1K, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 5.53 V
$I_i$ = 33.5 mA
$P_i$ = 185.4 mW
The effective internal capacitances and inductances are negligibly small.

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**Schedule to EU-Type Examination Certificate No. TÜV 17 ATEX 196722 X issue 01**

Analogue output .....
(Connector X1L, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 15.78 V
$I_o$ = 177.4 mA
$P_o$ = 700 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 5.5 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 1 µF | 2.4 µF | 2.6 µF |

Digital input .....
(Connector X1N, X1P)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = < 1 mA
$P_o$ = < 1 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 100 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 19 µF | 38 µF | 81 µF |

Digital input .....
(Connector X1N, X1P)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 19.69 V
$I_i$ = 4.23 mA
$P_i$ = 83.3 mW
The effective internal capacitances and inductances are negligibly small.

Piezo circuits .....
(CSM connector X10 A/B and C/D,
DSM connector X8 A/B and C/D)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection
to the belonging sensors of the manufacturer
Max. output energy: 146 µJ

Relay output .....
(Connector X1S, X1T, X1U)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 26 V
$I_i$ = 100 mA
$P_i$ = 2.6 W
The effective internal capacitances and inductances are negligibly small.

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**Schedule to EU-Type Examination Certificate No. TÜV 17 ATEX 196722 X issue 01**

SIM-card circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(SIM-CARD connector)
Maximum values:
$U_o$ = 4.5 V
$I_o$ = 283 mA
$P_o$ = 319 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 1 mH | 0.1 mH | 0.02 mH |
| max. permissible external capacitance | 21 µF | 51 µF | 120 µF |

The rules for interconnection of intrinsically safe circuits have to be observed.

(16) Drawings and documents are listed in the ATEX Assessment Report No. 19 203 251874.

(17) Specific Conditions for Use

1. Electrostatic charge has to be avoided for all housing parts and the interlock; the manual of the manufacturer has to be observed.
2. Charging of the supply batteries is only permitted outside of the explosion hazardous area with the charger of the manufacturer or with a separately certified charger (intrinsically safe charge circuit); the manual of the manufacturer has to be observed.
3. Change of the supply batteries / backup battery is only permitted outside of the explosion hazardous area.
4. Only permissible batteries according to the manufacturer`s operating instructions are allowed to be used.
5. The memory stick is only permitted to be used outside of the explosion hazardous area at the USB port.
6. The change of the SIM card is only permitted outside of the explosion hazardous area. See "Electrical data" for operation in the explosion hazardous area.
7. Operation is only allowed in vertical position (plug-connectors downwards).
8. The housing has to be additionally secured by an interlock provided by the manufacturer.
9. The battery in the right-hand housing part (connections MP1/MP2) is not allowed to be connected, if the external power supply is used.
10. The connections at X8 are only permissible for use of the manufacturer for firmware-updates in the safe area.

(18) Essential Health and Safety Requirements

no additional ones

- End of Certificate -

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# IECEx Certificate of Conformity

**INTERNATIONAL ELECTROTECHNICAL COMMISSION**
**IEC Certification System for Explosive Atmospheres**

for rules and details of the IECEx Scheme visit www.iecex.com

| | | | |
|---|---|---|---|
| Certificate No.: | **IECEx TUN 18.0008X** | Page 1 of 4 | Certificate history: Issue 0 (2018-07-27) |
| Status: | **Current** | Issue No: 1 | |
| Date of Issue: | 2019-11-13 | | |
| Applicant: | **NIVUS GmbH**<br>Im Täle 2, 75031 Eppingen<br>**Germany** | | |
| Equipment: | **Portable Measuring Transformer NivuFlow Mobile type NFM-0xxx x E, NivuLevel Mobile type NFM-0050 x E** | | |
| Optional accessory: | | | |
| Type of Protection: | **Increased safety "e", intrinsic safety "i", encapsulation "m"** | | |
| Marking: | Ex eb ib [ib] mb IIB T4 Gb | | |

Approved for issue on behalf of the IECEx Certification Body: **Christian Roder**

Position: **Head of the IECEx Certification Body**

Signature: (for printed version)

Date: 2019-11-13

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

**TÜV NORD CERT GmbH**
**Hanover Office**
**Am TÜV 1, 30519 Hannover**
**Germany**

TÜV NORD

# IECEx Certificate of Conformity

Certificate No.: **IECEx TUN 18.0008X** Page 2 of 4

Date of issue: 2019-11-13 Issue No: 1

Manufacturer: **NIVUS GmbH**
Im Täle 2, 75031 Eppingen
**Germany**

Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

**STANDARDS :**
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

**IEC 60079-0:2011** Explosive atmospheres - Part 0: General requirements
Edition:6.0

**IEC 60079-11:2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

**IEC 60079-18:2014** Explosive atmospheres – Part 18: Equipment protection by encapsulation "m"
Edition:4.0

**IEC 60079-7:2015** Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
Edition:5.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

**TEST & ASSESSMENT REPORTS:**
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

DE/TUN/ExTR18.0013/00

Quality Assessment Report:

DE/TUN/QAR13.0011/06

# IECEx Certificate of Conformity

Certificate No.: **IECEx TUN 18.0008X** Page 3 of 4

Date of issue: 2019-11-13 Issue No: 1

**EQUIPMENT:**
Equipment and systems covered by this Certificate are as follows:

Together with the belonging sensors, the "Portable Measuring Transformer"

NivuFlow Mobile type NFM-0xxx x E and

NivuLevel Mobile type NFM-0050 x E

are used for the measurement of the flow speed and the flow level in partly or fully filled pipes and channels via supersonic technology.

The Portable Measuring Transformer type NivuFlow Mobile NFM is operated stationary.

The permissible ambient temperature range is -15 °C ... +50 °C.

For further information, see attachment.

**SPECIFIC CONDITIONS OF USE: YES as shown below:**

1. Electrostatic charge has to be avoided for all housing parts and the interlock; the manual of the manufacturer has to be observed.
2. Charging of the supply batteries is only permitted outside of the explosion hazardous area with the charger of the manufacturer or with a separately certified charger (intrinsically safe charge circuit); the manual of the manufacturer has to be observed.
3. Change of the supply batteries / backup battery is only permitted outside of the explosion hazardous area.
4. Only permissible batteries according to the manufacturer`s operating instructions are allowed to be used.
5. The memory stick is only permitted to be used outside of the explosion hazardous area at the USB port.
6. The change of the SIM card is only permitted outside of the explosion hazardous area. See "Electrical data" for operation in the explosion hazardous area.
7. Operation is only allowed in vertical position (plug-connectors downwards).
8. The housing has to be additionally secured by an interlock provided by the manufacturer.
9. The battery in the right-hand housing part (connections MP1/MP2) is not allowed to be connected, if the external power supply is used.
10. The connections at X8 are only permissible for use of the manufacturer for firmware-updates in the safe area.

# IECEx Certificate of Conformity

Certificate No.: **IECEx TUN 18.0008X** Page 4 of 4

Date of issue: 2019-11-13 Issue No: 1

**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**
-Mechanical changes

-Layout changes

-Electrical data partly changed

-Special Conditions partly changed

-New type with less components "NivuLevel Mobile type NFM-0050 x E"

**Annex:**

Attachment _Issue 1_NivuFlow Mobile.pdf

**TÜV NORD CERT GmbH**
**Hannover Office**
**Am TÜV 1**
**30519 Hannover**
**Germany**

TÜV NORD

**Page 1 of 5**
**Attachment to IECEx TUN 18.0008 X issue No.: 01**

Product:

Together with the belonging sensors, the Portable Measuring Transformer
NivuFlow Mobile type NFM-0xxx x E and
NivuLevel Mobile type NFM-0050 x E
are used for the measurement of the flow speed and the flow level in partly or fully filled pipes and channels via supersonic technology.
The Portable Measuring Transformer NivuFlow Mobile/NivuLevel Mobile type NFM... is operated stationary.

The permissible ambient temperature range is -15 °C ... +50 °C.

Electrical data

Supply voltage ..... $U_n$ = 12 V d. c.
(Internal plug connections) Powered with max. 2 x 12 V/15Ah VRLA-Pb-batteries;

External suppy circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(X1R [Uin],
X1B [GND]) Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 14.5 V
$I_i$ = 1.25 A
$P_i$ = 18.1 W
The effective internal capacitances and inductances are negligibly small.

1 wire circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(CSM connector X10E [GND],
X10F [1 wire];
DSM connector X8E [GND], X8F [1 wire]) Maximum values:
$U_o$ = 3.7 V
$I_o$ = 57.3 mA
$P_o$ = 53 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 65 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 9.4 µF | 21 µF | 37 µF |

5 V circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(CSM connector X10E [GND],
X10J [+5 V-Ex];
DSM connector
X8E [GND], X8J [+5 V-Ex]) Maximum values:
$U_o$ = 5.93 V
$I_o$ = 91.7 mA
$P_o$ = 135.9 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 1 mH | 0.2 mH | 0.1 mH |
| max. permissible external capacitance | 14 µF | 23 µF | 30 µF |

TÜV NORD CERT GmbH
Hannover Office
Am TÜV 1
30519 Hannover
Germany



RS485 interface pressure, output ..... (CSM connector X10G [- RxTx], X10H [+ RxTx])

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:

$U_o$ = 3.7 V
$I_o$ = 95.1 mA
$P_o$ = 88 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 25 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 11 µF | 18 µF | 36 µF |

RS485 interface pressure, input ..... (CSM connector X10G [- RxTx], X10H [+ RxTx])

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 7.21 V
$I_i$ = 176 mA
$P_i$ = 317.2 mW
The effective internal capacitances and inductances are negligibly small.

Radar sensor supply ..... (Connector X1A, X1B)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 9.87 V
$I_o$ = 629 mA
$P_o$ = 6.21 W
Characteristic line: rectangular

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 0.2 mH | 0.1 mH | 0.05 mH |
| max. permissible external capacitance | 5 µF | 8 µF | 11.9 µF |

RS485 interface, output ..... (Connector X1C, X1D)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = 95.1 mA
$P_o$ = 88 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 25 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 11 µF | 18 µF | 36 µF |

TÜV NORD CERT GmbH
Hannover Office
Am TÜV 1
30519 Hannover
Germany



RS485 interface, input ..... (Connector X1C, X1D)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 10.21 V
$I_i$ = 248.8 mA
$P_i$ = 633.8 mW
The effective internal capacitances and inductances are negligibly small.

Analogue input no. 1 /2 ..... (Connector X1G, X1F; X1H, X1J NivuLevel Mobile type NFM-0050 x E: Connector X7C, X7E; X7B, X7D)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 22.2 V
$I_o$ = 33 mA
R = 48 Ω
$P_o$ = 624 mW
Characteristic line: trapezoidal

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 20 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 0.52 µF | 0.56 µF | 1 µF |

Analogue input no. 3 ..... (Connector X1K, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = <1 mA
$P_o$ = <1 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 100 mH | 10 mH | 1 mH |
| max. permissible external capacitance | 19 µF | 24 µF | 38 µF |

Analogue input no. 3 ..... (Connector X1K, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 5.53 V
$I_i$ = 33.5 mA
$P_i$ = 185.4 mW
The effective internal capacitances and inductances are negligibly small.

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Analogue output .....
(Connector X1L, X1M)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 15.78 V
$I_o$ = 177.4 mA
$P_o$ = 700 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 5.5 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 1 µF | 2.4 µF | 2.6 µF |

Digital input .....
(Connector X1N, X1P)

in type of protection Intrinsic Safety Ex ib IIB
Maximum values:
$U_o$ = 3.7 V
$I_o$ = < 1 mA
$P_o$ = < 1 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 100 mH | 1 mH | 0.1 mH |
| max. permissible external capacitance | 19 µF | 38 µF | 81 µF |

Digital input .....
(Connector X1N, X1P)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 19.69 V
$I_i$ = 4.23 mA
$P_i$ = 83.3 mW
The effective internal capacitances and inductances are negligibly small.

Piezo circuits .....
(CSM connector X10 A/B and C/D,
DSM connector X8 A/B and C/D)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection
to the belonging sensors of the manufacturer
Max. output energy: 146 µJ

Relay output .....
(Connector X1S, X1T, X1U)

in type of protection Intrinsic Safety Ex ib IIB
Only for connection to an intrinsically safe circuit
Maximum values:
$U_i$ = 26 V
$I_i$ = 100 mA
$P_i$ = 2.6 W
The effective internal capacitances and inductances are negligibly small.

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SIM-card circuit ..... in type of protection Intrinsic Safety Ex ib IIB
(SIM-CARD connector)
Maximum values:
$U_o$ = 4.5 V
$I_o$ = 283 mA
$P_o$ = 319 mW
Characteristic line: linear

| Ex ib | IIB | | |
|---|---|---|---|
| max. permissible external inductance | 1 mH | 0.1 mH | 0.02 mH |
| max. permissible external capacitance | 21 µF | 51 µF | 120 µF |

The rules for interconnection of intrinsically safe circuits have to be observed.

Special Conditions for Safe Use:

1. Electrostatic charge has to be avoided for all housing parts and the interlock; the manual of the manufacturer has to be observed.
2. Charging of the supply batteries is only permitted outside of the explosion hazardous area with the charger of the manufacturer or with a separately certified charger (intrinsically safe charge circuit); the manual of the manufacturer has to be observed.
3. Change of the supply batteries / backup battery is only permitted outside of the explosion hazardous area.
4. Only permissible batteries according to the manufacturer`s operating instructions are allowed to be used.
5. The memory stick is only permitted to be used outside of the explosion hazardous area at the USB port.
6. The change of the SIM card is only permitted outside of the explosion hazardous area. See "Electrical data" for operation in the explosion hazardous area.
7. Operation is only allowed in vertical position (plug-connectors downwards).
8. The housing has to be additionally secured by an interlock provided by the manufacturer.
9. The battery in the right-hand housing part (connections MP1/MP2) is not allowed to be connected, if the external power supply is used.
10. The connections at X8 are only permissible for use of the manufacturer for firmware-updates in the safe area.