

Instruction Manual for the self-sufficient Level Measurement System NivuLevel 150



starting with Firmware Revision No. 1.41

Revised Instruction Manual

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measure analyse optimise

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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

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General

1 About this Manual



Important

READ CAREFULLY BEFORE USE.

KEEP IN A SAFE PLACE FOR LATER REFERENCE.

This instruction manual is for the NivuLevel 150 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.

1.1 Signs and Definitions used

Representation	Meaning	Remarks
	(Action) Step	Execute action steps. 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

1.2 Abbreviations used

1.2.1 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	Turquoise
GNYE	Green/Yellow	GD	Gold	SR	Silver

Safety Instructions

2 Used Symbols and Signal Words

2.1 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.

2.2 Warning Notices on the Device (optional)



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 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

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 system from the mains power before starting maintenance, cleaning and/or repair work (only by qualified personnel). Disregarding may lead to electric shock.

***Commissioning only by qualified Personnel***

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

4 Warranty

The device was functionally tested prior to shipping. When used for the intended purpose (see Chap. "6 Intended Use") and in compliance with the instruction manual 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 "5 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.

5 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.

6 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 self-sufficient level measurement system NivuLevel 150 consists of the following components:

- Data acquisition module Type NL10150
- Submersible probe NivuBar I²C

The submersible probe is used for level and temperature measurement of slightly to heavily contaminated media in channels, basins and containers. The submersible probe can also be used in stormwater overflow tanks.

The complete measurement system works independently of the mains. The recorded and measured data is stored on a non-volatile storage medium (SD card).

The NivuLevel 150 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.

7 Ex Protection

DANGER



Danger to life due to Explosion

The USB connection for reading out data must not be used if there is a risk of explosion.

*Make sure that the data acquisition module NL10150 is **outside** the Ex area during programming or reading out the data.*

The prevalence of the explosion hazard must be checked e.g. with a gas warning device.

CAUTION



The Ex protection expires due to damage

Damage invalidates the explosion protection.

The NivuLevel 150 may then no longer be used in Ex zone 1.

Protect the NivuLevel 150 from shocks, falls or other damage.

The level measurement system NivuLevel 150 must **not** be programmed via the connected USB cable under Ex conditions.

Make sure that the data acquisition module NL10150 is outside the Ex area during programming or reading out the data.

The self-sufficient level measurement system NivuLevel 150 incl. the associated submersible probe NivuBar

I²C is designed for use in areas with Zone 1 explosive atmospheres. In addition to the submersible probe, the data acquisition module may also be installed in the Ex area.

The safety-related values of the connected NivuLevel 150 must correspond to the specifications in the technical data or the EU type examination certificate.

If several active devices are interconnected in an intrinsically safe circuit, other safety-related values may result. Here, intrinsic safety may be endangered!

Approval for Data Acquisition Module



See Chap. "18.1 Data acquisition module NL10150".

Approval for Submersible Probe



See Chap. "18.2 Submersible probe NivuBar I²C".



Validity of the Ex Approval

The approval is only valid in conjunction with the corresponding marking on the nameplate of data NL10150 data acquisition module and the associated submersible probe NivuBar I²C.



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.

8 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.

9 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

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

Delivery, Storage and Transport

10 Scope of Delivery

The standard delivery of the self-sufficient level measurement system NivuLevel 150 comprises:

- Data acquisition module NL10150
- Submersible probe NivuBar I²C
- USB cable A-B, length 2 m
- CD with programming and read-out software, type NivuLevel 150 for the operating systems Windows Vista or Windows 7 and 8
- Instruction manual (with EU Declaration of Conformity) including all information required for the operation of the NivuLevel 150

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

11 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.

12 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.



Store the device and batteries correctly

Remove the batteries from the data acquisition module before longer storage.

Store the batteries in a dry and frost-free place.

13 Transport

The self-sufficient Level Measurement System NivuLevel 150 is designed for rough industrial use. Anyway, protect the NivuLevel 150 from strong impacts, blows, shocks or vibrations by using appropriate safety measures such as straps or similar.

Transport must be carried out in the original packaging.

Otherwise, the same conditions apply with regard to external influences as for storage (see Chap. "12 Storage").

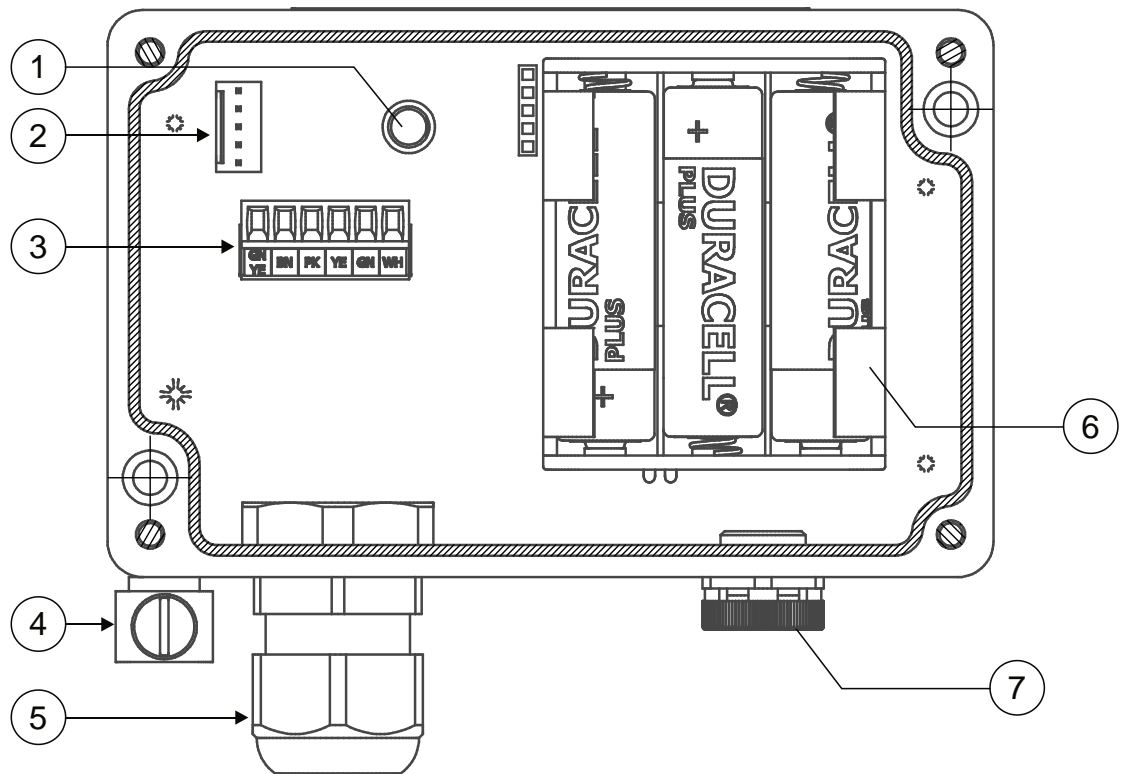
14 Return

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!

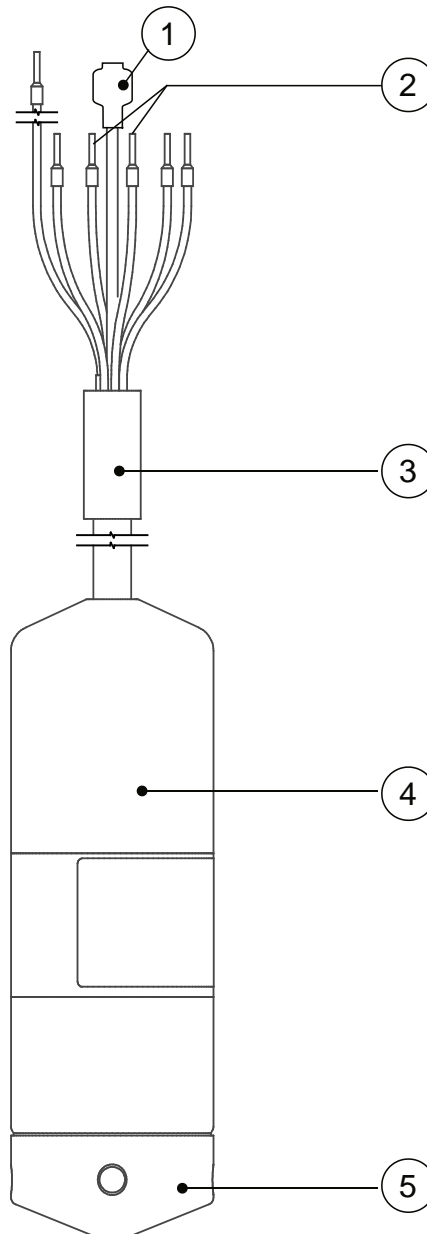
Product Description

15 Product Construction and Overview



1. LED for status display of the data acquisition module NL10150
2. Socket for the cable to the USB interface in the enclosure cover
3. Terminal block for connecting the submersible probe NivuBar I²C
4. Connection screw for external grounding of the enclosure up to a cross-section of 4 mm²
5. Cable gland M20x1.5 for submersible probe NivuBar I²C
6. Battery compartment for three AA batteries
7. Pressure compensation element

Fig. 15-1 Overview data acquisition module NL10150



1. Filter
2. Communication of the submersible probe with the data acquisition module via I²C protocol
3. 5-wire cable + shield
4. Sensor enclosure, stainless steel 1.4404 (AISI 316 L)
5. Transport cap (can also be used as a protective cap when the water is clean)

Fig. 15-2 Overview submersible probe NivuBar I²C

16 Enclosure Dimensions

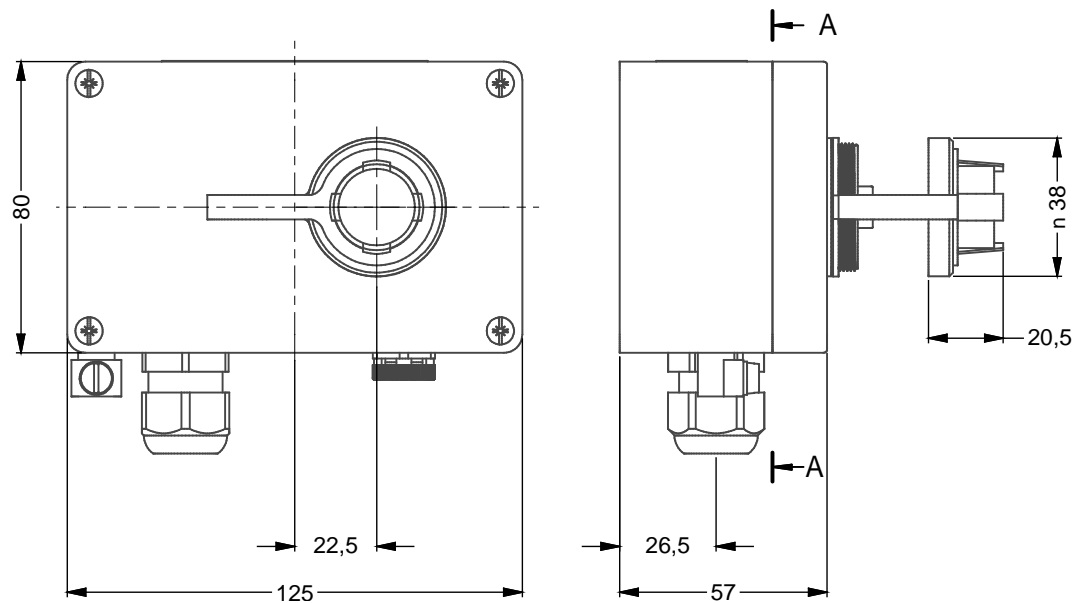


Fig. 16-1 Dimensions data acquisition module NL10150

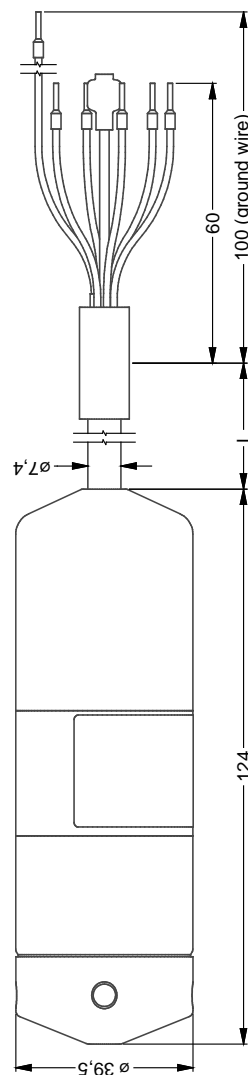


Fig. 16-2 Dimensions submersible probe NivuBar I²C

17 Device ID

The information in this instruction manual only applies to the device type indicated on the title page.

The nameplate is attached to the underside of the data acquisition module NL10150 or to the enclosure of the submersible probe NivuBar I²C, and contains 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 (2134.....)
- Ex Protection Label
- Special notes on the batteries

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 data acquisition module NL10150




Fig. 17-2 Nameplate submersible probe NivuBar I²C

18 Specifications


18.1 Data acquisition module NL10150

Supply Voltage	4.5 V DC (3x Type AA batteries)
Enclosure	Material: Metal/Plastic
Protection	IP66 with the cover closed and screwed
Weight	Approx. 500 g (without submersible probe)
Dimensions	LxWxD: 125x80x57 mm

Ex Approval	 II 2G Ex ia IIB T4 Gb
Operation Temperature	-10...55 °C
Storage Temperature	-20...85 °C
Max. Humidity	80 %, non-condensing
Display	No Display
Operation	Programming/data transfer via USB interface and enclosed programming and readout software (CD) to PC
Measurement Uncertainty	0.25 % FSO applicable for submersible probe NivuBar I ² C
Storage Cycle	Configurable from 1/min up to 1/day or event-dependent
Data Memory	Internal SD card for approx. 1.000.000 readings (level/temperature)
Data Format	csv
Input Interface	1x I ² C (submersible probe NivuBar I ² C)
Output Interface	1x USB (FDTI-Chip)

Tab. 2 Specifications data acquisition module

18.2 Submersible probe NivuBar I²C

Connection Cable	Polyurethane, 6x 0.14 mm ² shielded
Enclosure	Stainless steel 1.4404 (AISI 316 L)
Protection	IP68
Weight	1200 g (incl. 10 m cable)
Dimensions	Length: 124 mm Diameter: 39.5 mm
Ex Approval	 II 2G Ex ia IIB T4 Gb
Operation Temperature	-25...70 °C (PUR cable -25...70 °C)
Measurement Ranges (Standard)	0...4 m / 0...10 m H ₂ O
Cable Length (Standard)	10 m, max. 30 m
Measuring Diaphragm	Ceramics, AL ₂ O ₃ 96 %

Measurement Principle

Capacitive ceramic measuring cell

Tab. 3 Specifications submersible probe

19 Equipment/Device Versions

The measurement system NivuLevel 150 is manufactured in several versions. The table below provides an overview on the different versions.

NL10 150	Data acquisition module with Ex approval for zone 1		
	Probe		
	NBI 04	Hydrostatic submersible probe NivuBar I ² C, measurement range: 4 m	
	NBI 10	Hydrostatic submersible probe NivuBar I ² C, measurement range: 10 m	
	Cable length (max. 30 m possible)		
	10	10 m	
	20	20 m	
	30	30 m	
	Ex Approval		
	E	Zone 1	
NL10150			E

Tab. 4 Product structure level measurement system NivuLevel 150

Function Description

20 Level Measurement System NivuLevel 150

The self-sufficient level measuring system NivuLevel 150 consists of a data acquisition module (NL10150) and a hydrostatic submersible probe. This submersible probe is connected to the digital I²C interface of the NL10150 and is used to record the parameters >Level< and >Temperature<.

The data acquisition module can store and manage up to 1,000,000 measurement values.

21 Hydrostatic Submersible Probe NivuBar I²C

The submersible probe NivuBar I²C has a ceramic capacitive measuring cell and works according to the relative pressure principle. The pressure of the stationary water column above the sensor is directly proportional to the filling level.

The immersion probe also records the temperature of the medium. Both measured values (level and temperature) are transmitted digitally to the data acquisition module via the I²C bus.

Installation and Connection



Important Note

The installation may only be carried out by qualified personnel. This is to prevent damage to the device.

22 Mounting Instructions

- Ensure proper installation.
- Follow applicable legal or operational guidelines.
- Improper handling may lead to personal injuries and/or equipment damage.

23 Selecting the Mounting Place Data Acquisition Module NL10150



Important Note

When installing the data acquisition module in floodable shafts or channels, be sure to secure it against being accidentally washed away.

Select the place to mount the NL10150 data acquisition module according to the given criteria.

Make sure to avoid:

- Direct sunlight (use weatherproof cover if necessary)
- Objects that radiate strong heat
- Objects with a strong electromagnetic field (frequency converters, contactors, electric motors with high input power or similar)
- Corrosive chemicals or gases
- Mechanical shocks
- Constant, strong vibrations
- Radioactive radiation

The place for mounting the NivuBar I²C submersible probe must be selected according to the same criteria.

Be sure to secure the level measurement system NivuLevel 150 against unintentional washing away if the level measurement system NivuLevel 150 is used in floodable shafts or channels.

Fasten the data acquisition module using the mounting holes shown in Fig. 23-1.

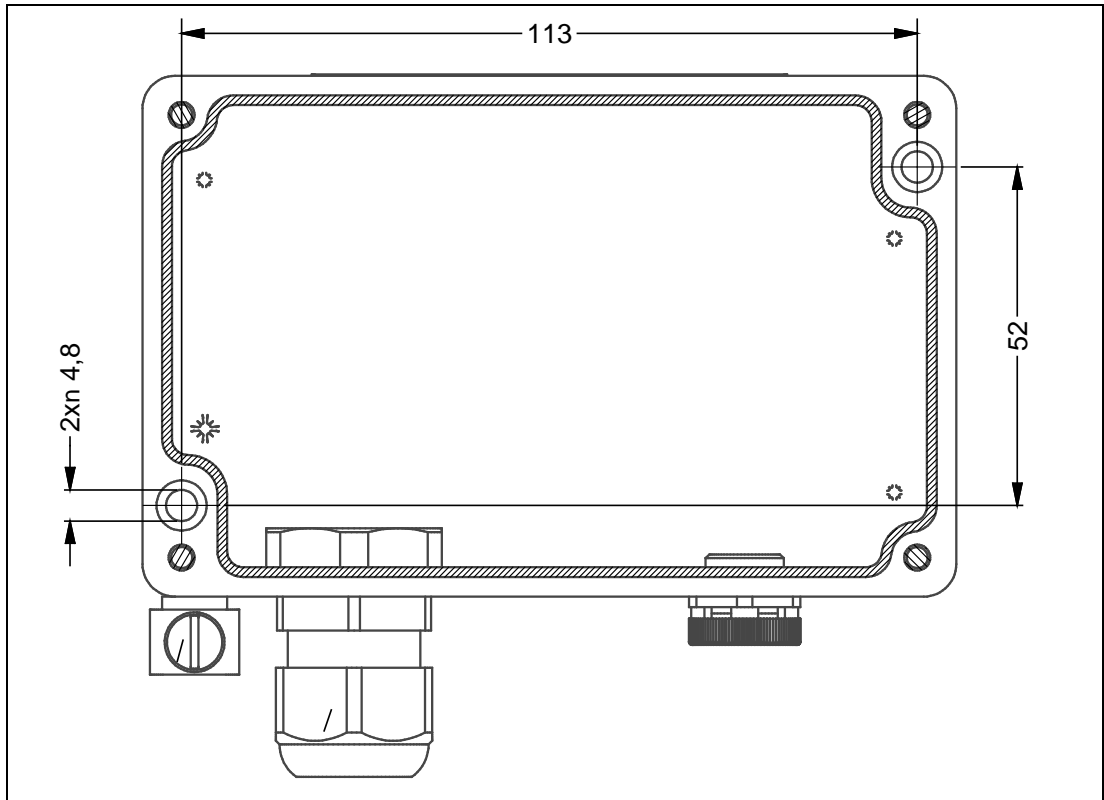


Fig. 23-1 Mounting holes on data acquisition module

Instructions for avoiding electrostatic discharge (ESD)

The sensitive electronic components inside the unit can be damaged by static electricity. The performance of the device may be impaired and the measuring system may even fail. NIVUS recommend the following steps to prevent damage to the device due to electrostatic discharge:

- Discharge any static electricity present on your body before you touch electronic components of the device.
- Avoid unnecessary movements to reduce the building-up of static charges.

24 Electrical Installation

DANGER



Explosion hazard due to electrostatic charge

Make sure that the NL10150 data acquisition module is reliably earthed at the earthing screw. The cross-section of the earthing cable must be at least 1.5 mm², ideally even 4 mm².

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. It can cause the ignition of an explosive atmosphere.

Complete the installation of the data acquisition module and submersible probe before switching on for the first time. Check whether the installation is correct.

Please note that installation may only be carried out by qualified personnel.

Make absolutely sure that the data acquisition module is reliably earthed via the earthing screw (see Fig. 15-1, Pos. 4).

Follow further legal standards, regulations and technical codes.

24.1 Connection submersible probe NivuBar I²C

24.1.1 General

When connecting, make sure that the wire colours match the designations on the terminal block.

The PTFE filter at the end of the cable (Fig. 15-2, Pos. 1) must not be damaged or removed. Connect the submersible probe as shown in the connection diagram (Fig. 24-1).



Important Note

Check the gaskets of the enclosure cover for cleanliness and integrity before closing the enclosure.

Remove foreign bodies and/or dirt.

Equipment damage caused by leaking or defective gaskets is not covered by NIVUS' liability.

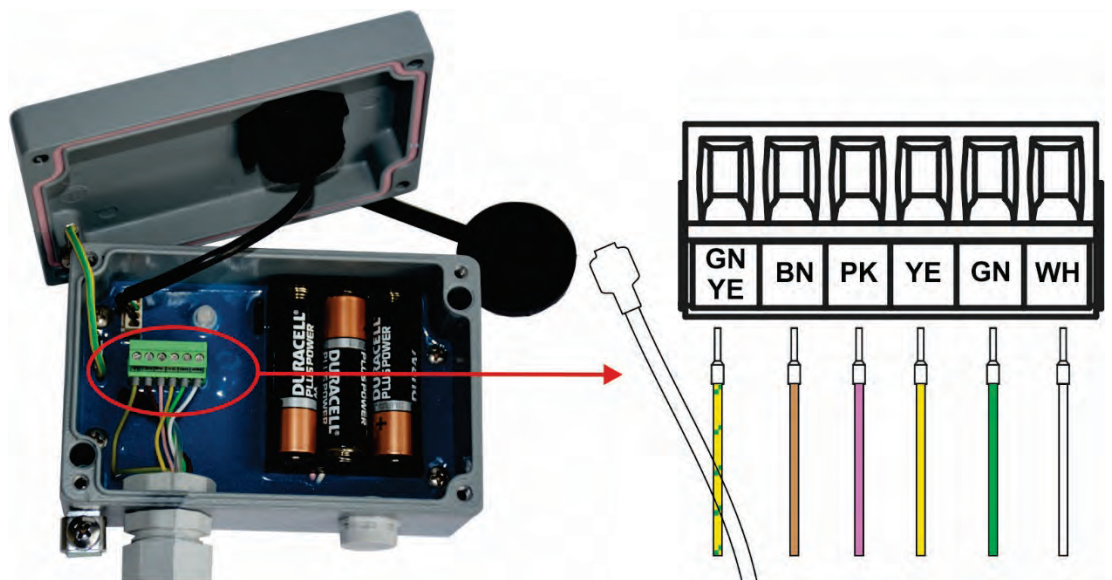


Fig. 24-1 Connection NivuBar I²C to data acquisition module

24.2 Power Supply/Battery Change at the Level Measurement System



Important Note

Only use the batteries specified by NIVUS to operate the level measurement system NivuLevel 150:

DURACELL Plus Power AA

Batteries from other manufacturers must not be used and may lead to loss of Ex protection.

24.2.1 General

First remove the insulation foil from the batteries.

The voltage of new AA batteries is approx. 4.8 V DC.

If the voltage drops below 3.5 volts, the LED lights up permanently red. The batteries then must be replaced.

Do not attempt to recharge the batteries as they are not rechargeable and would be damaged!

Replace the batteries as follows:

- Loosen the fixing screws with a suitable screwdriver.
- Carefully remove the cover.
Make sure that the cables do not break off.
- Replace all three batteries (3x 1.5 V AA, Type DURACELL Plus Power).
- Close the NL10150 data acquisition module properly again.



Important Note

Never combine used and new batteries.

Do not use rechargeable batteries.



Important Note

Ensure that the batteries are disposed of in an environmentally friendly manner.

Used batteries can be returned to the manufacturer or handed in at suitable collection points.

Commissioning

25 Notes to the User

Before putting the level measuring system NivuLevel 150 into operation, it is essential to observe the following instructions for use.

This instruction manual contains all information required for parameterisation and use of the device. 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 measurement system into operation (see also Chap. "9 Requirements for the Personnel"). If you have any questions regarding installation, connection or parameter setting, please contact our hotline at:

- +49 7262 9191-955

26 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 measurement system before you start with the parameterisation.

After connecting the submersible probe NivuBar I²C to the data acquisition module NL10150 (according to Fig. 24-1) the parameterisation of the measurement system follows.

27 PC Connection

Connect the data acquisition module NL10150 to a PC as follows:

- Unscrew the protective gland of the USB communication interface.
- Connect the USB plug of the connection cable (cable type A-B, length 2 m; included in delivery) to the interface socket of the data acquisition module. Connect the other end of the cable to a free USB port on the computer.
- Install the COM driver and the supplied programming and readout software, type NivuLevel 150, on the computer.
- Follow the instructions on the screen during the installation.

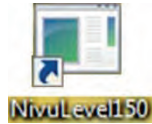
After successful installation of the parameterisation and readout software, an ICON is created on the desktop. By using this ICON, the connection of the data acquisition module to the PC can be established by double-clicking.

Operation and Configuration

28 First Steps

Make sure that the data acquisition module NL10150 is connected to a free USB port of the PC with the enclosed USB A-B cable.

Then start by double-clicking on the ICON:



ICON of the parameterisation and readout software

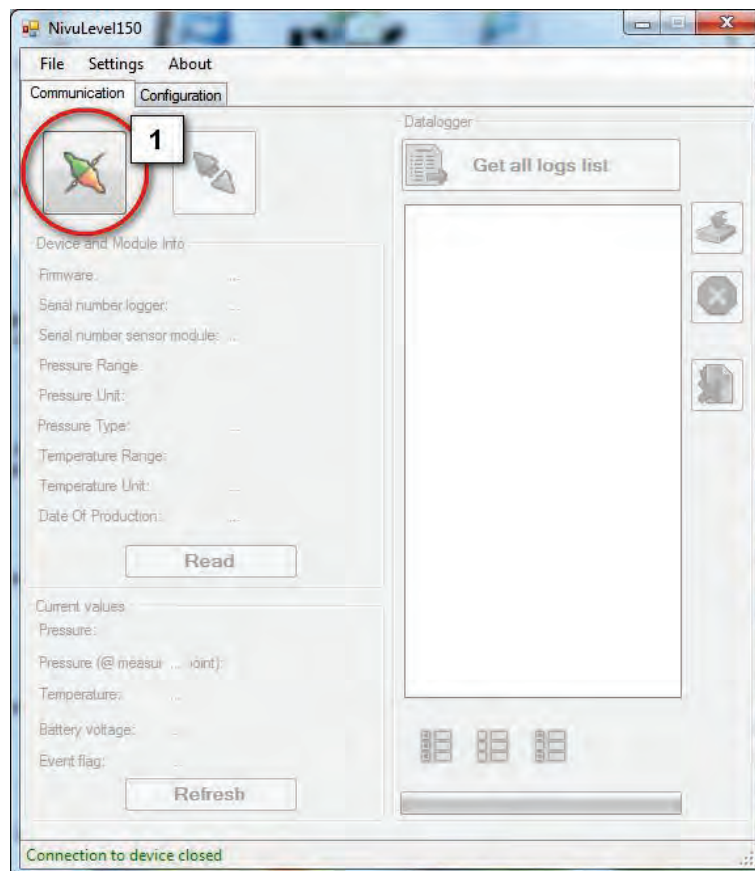
29 Start Screen PC

After clicking on the ICON, the start screen of the parameterisation and readout software appears.



Click on the connection icon at the top left margin.

The connection to the data collection module is established online.

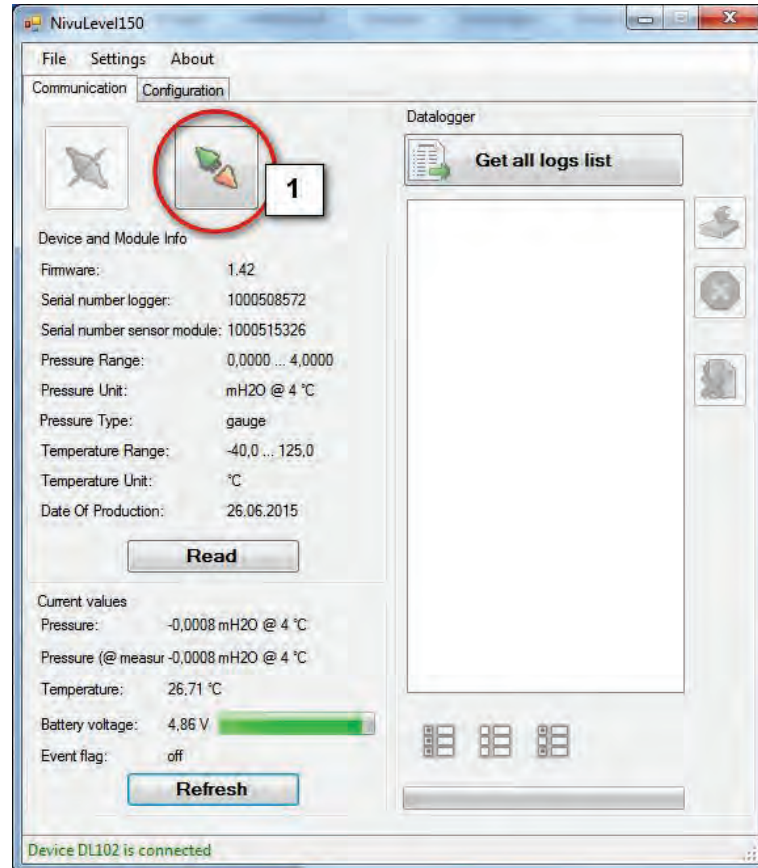


1 Establishes the connection to the data acquisition module

Fig. 29-1 Start screen of the parameterisation and readout software



As soon as the online connection is established and active, the 2nd symbol at the top left turns coloured.



1 Online connection is active

Fig. 29-2 Online connection to PC is active

30 Configuration Data Acquisition Module NL10150

30.1 Settings

Here you have the option of various settings:

- Units
- Language

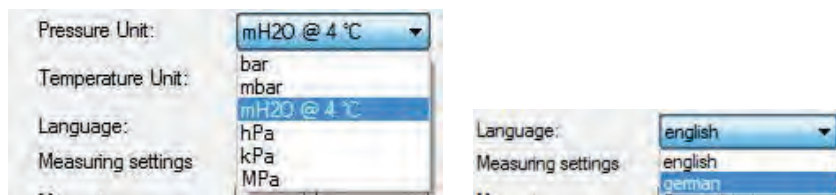
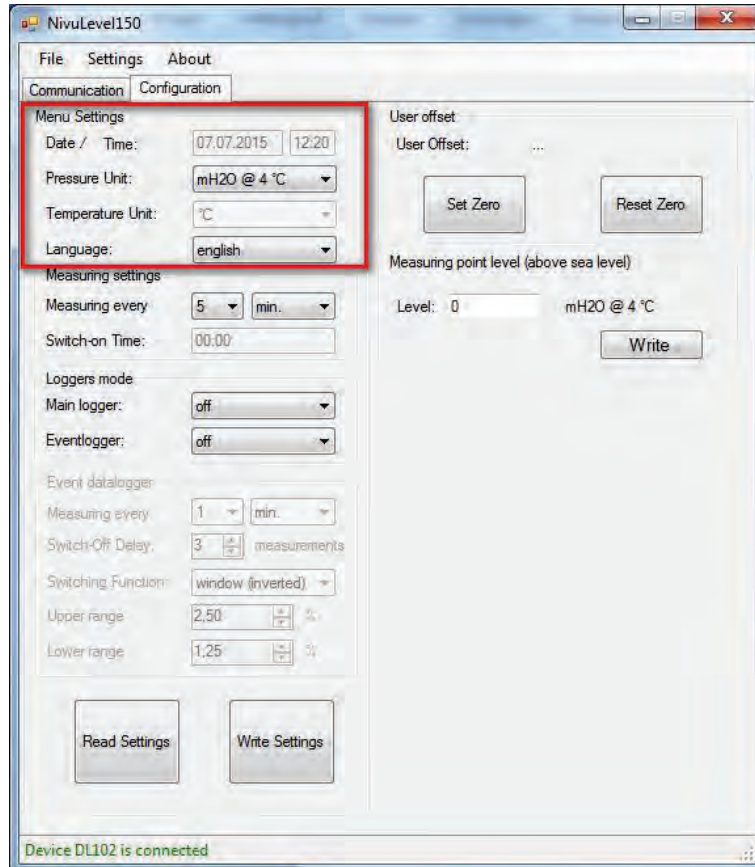


Fig. 30-1 Configuration menu – settings

30.2 Measurement Interval

Set the settings for the main logger:

- Interval: 0...255 [sec.] / [min.] / [hrs.] / [day]
- On-time: can be selected as desired with the setting Interval [day]

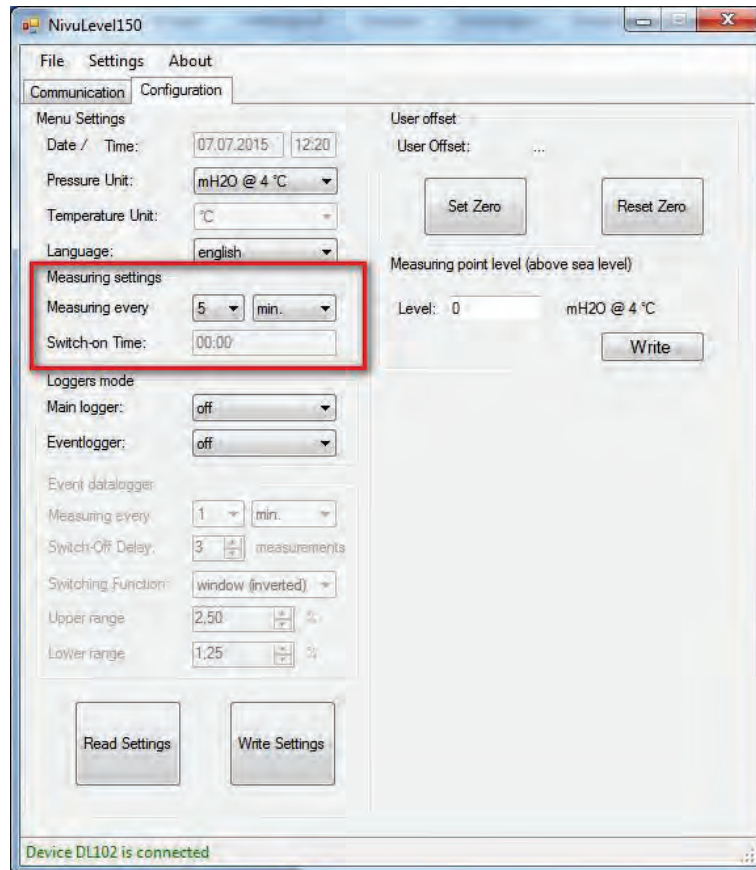


Fig. 30-2 Configuration menu – measurement interval

30.3 Data Logger Modes

Settings in log mode

- Main logger: [Off] / [Linear]
- Event logger: [Off] / [Threshold Value] / [External]

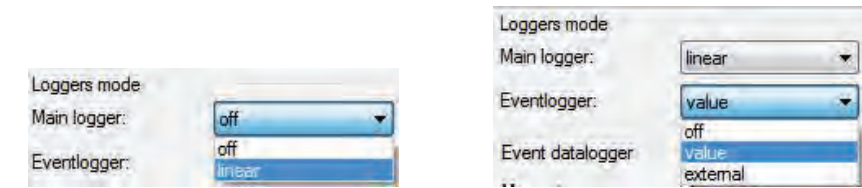
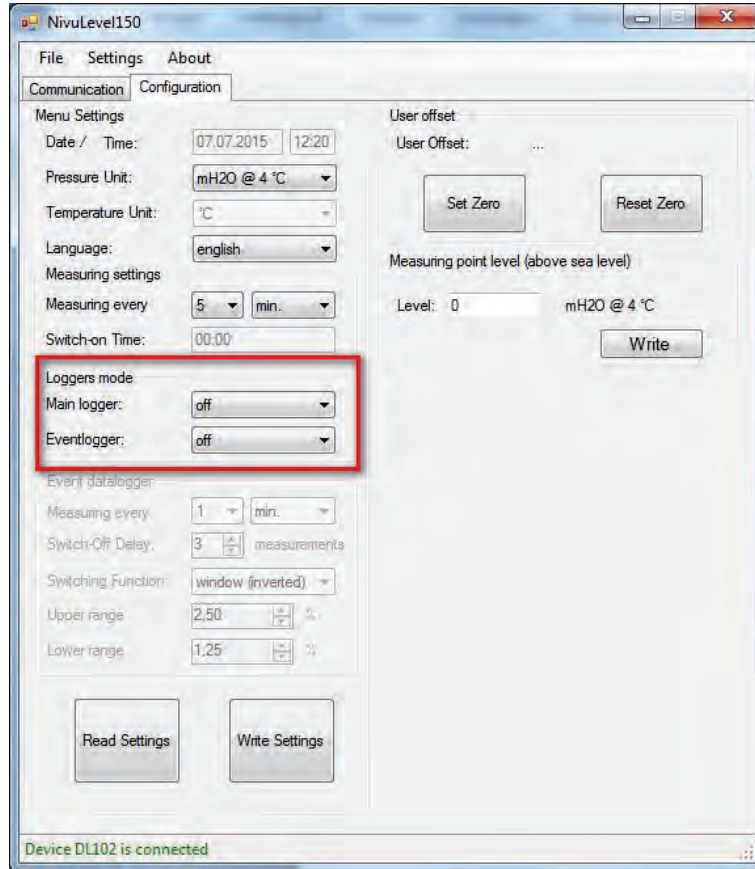


Fig. 30-3 Configuration menu – data logger modes

30.4 Event-Controlled Data Logger

During an event, the >Event-Controlled Data Logger< has priority.

After the end of the event and the switch-off delay, the settings for the main logger apply again.

- Interval: 0...255 [sec.] / [min.] / [hrs.]
- Switch-off delay: 0...100 measurements (after end of event)
- Switching function: [Hysteresis] / [Hysteresis Inverted] / [Window] / [Window Inverted]
- Switching Point / Upper Limit: free selectable in [%]
- Switchback Point / Lower Limit: free selectable in [%]

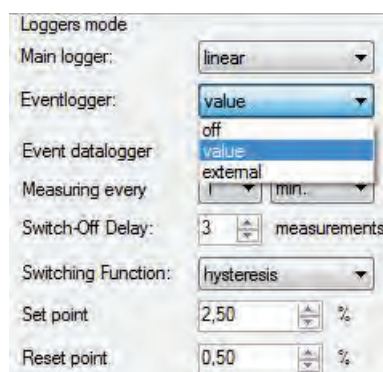
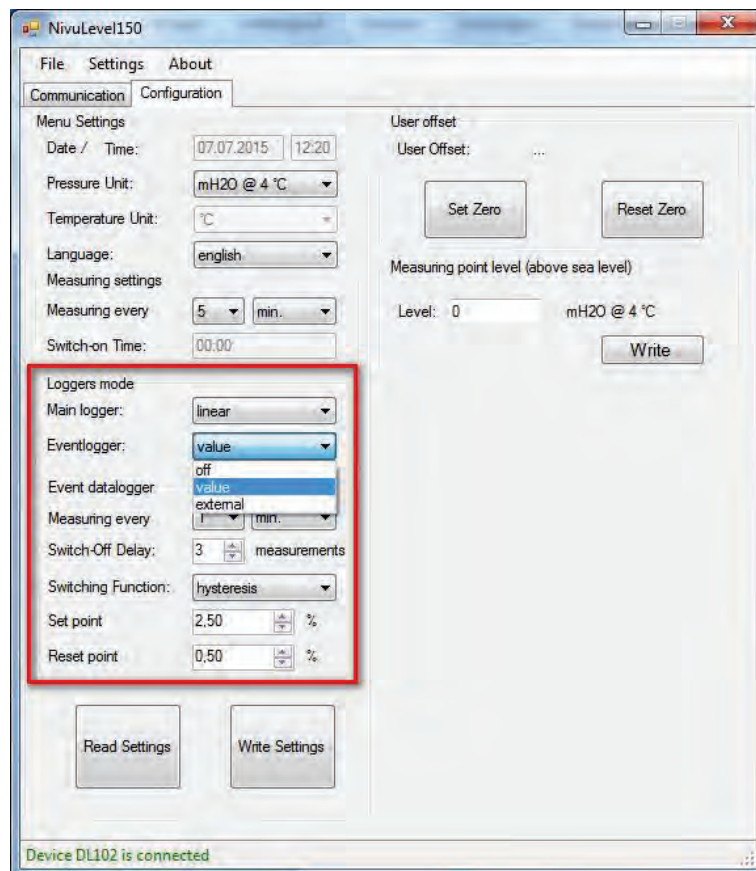


Fig. 30-4 Configuration menu – event-controlled data logger

Read / Write Settings:

Settings of the data logger are read and displayed.

Write Settings:

New settings can only be written to the unit when the data logger is switched off.

1. Read Settings.
2. Switch off main logger and event logger.
3. Write Settings.
4. Enter new settings.
5. Write Settings.

User Offset: Carry out zeroing

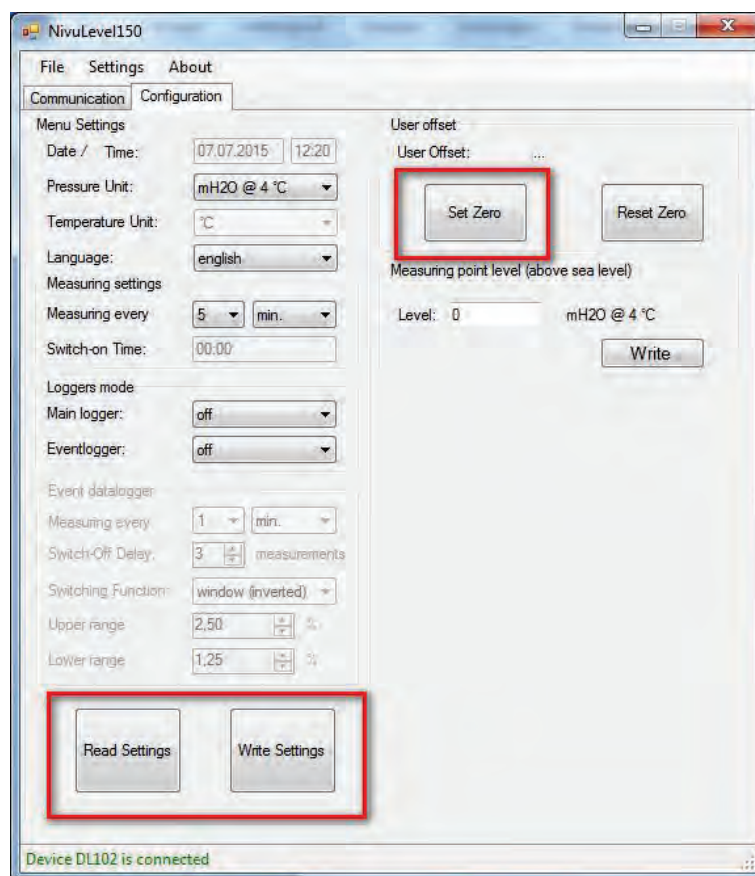


Fig. 30-5 Settings: read/write; user offset: zeroing

30.5 Saving and displaying Files

First switch to the >Communication< section.

Click on >List all Data<. The section can only be selected when a connection is established.

Select the desired files.



Download File

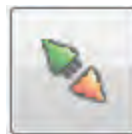
Select the desired files and click on the adjacent ICON - The file will be downloaded.

Select the storage location and confirm it.



Delete File from Device

Select the desired files and click on the adjacent ICON - The file will be deleted from the device.



Interrupt Online Connection

First interrupt the online connection to the data acquisition module NL10150 before disconnecting the device from the PC.

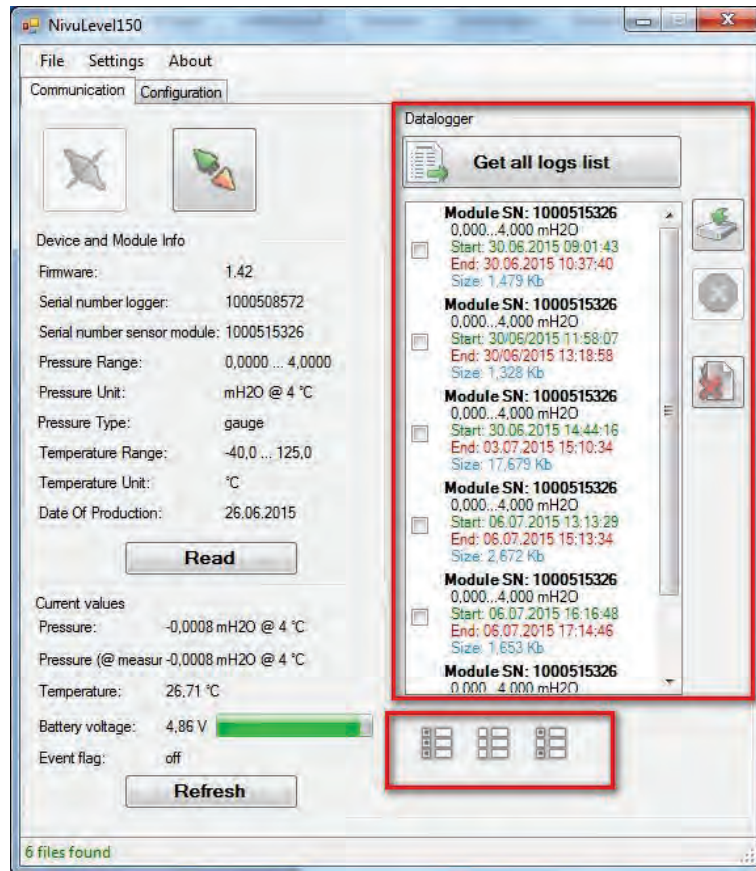


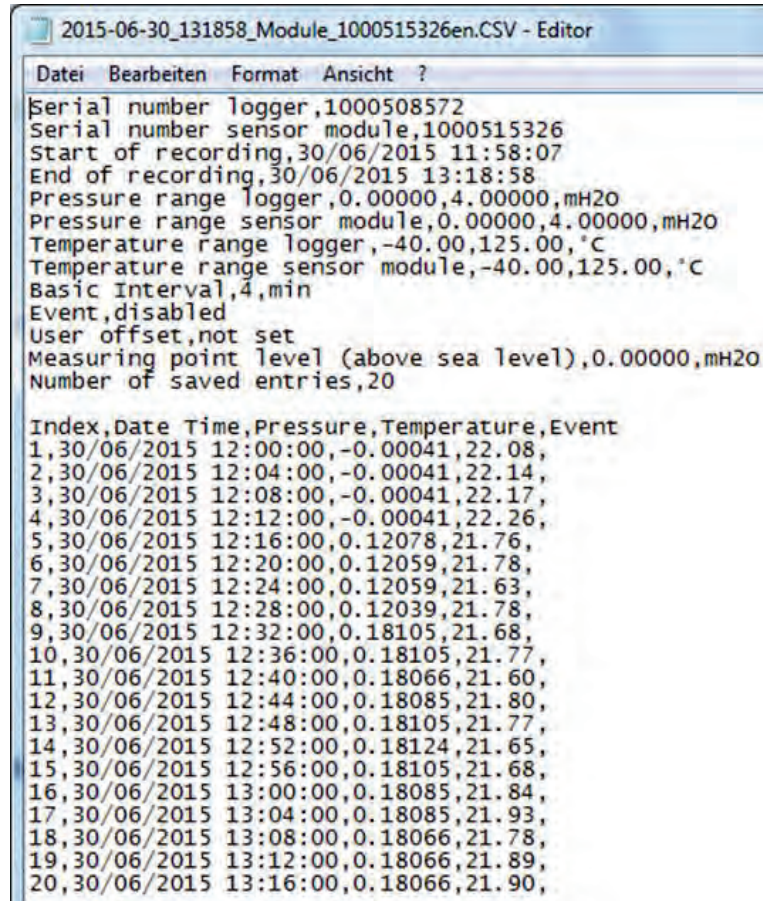
Fig. 30-6 Display and download of selected files

30.6 Data Set with active Event Control

Display of a logged data set with Excel

Event Column:

- 2 = Event active
- 1 = Switch-off delay



```
2015-06-30_131858_Module_1000515326en.CSV - Editor
Datei Bearbeiten Format Ansicht ?
Serial number logger,1000508572
Serial number sensor module,1000515326
Start of recording,30/06/2015 11:58:07
End of recording,30/06/2015 13:18:58
Pressure range logger,0.00000,4.00000,mH2O
Pressure range sensor module,0.00000,4.00000,mH2O
Temperature range logger,-40.00,125.00,°C
Temperature range sensor module,-40.00,125.00,°C
Basic Interval,4,min
Event,disabled
User offset,not set
Measuring point level (above sea level),0.00000,mH2O
Number of saved entries,20

Index,Date Time,Pressure,Temperature,Event
1,30/06/2015 12:00:00,-0.00041,22.08,
2,30/06/2015 12:04:00,-0.00041,22.14,
3,30/06/2015 12:08:00,-0.00041,22.17,
4,30/06/2015 12:12:00,-0.00041,22.26,
5,30/06/2015 12:16:00,0.12078,21.76,
6,30/06/2015 12:20:00,0.12059,21.78,
7,30/06/2015 12:24:00,0.12059,21.63,
8,30/06/2015 12:28:00,0.12039,21.78,
9,30/06/2015 12:32:00,0.18105,21.68,
10,30/06/2015 12:36:00,0.18105,21.77,
11,30/06/2015 12:40:00,0.18066,21.60,
12,30/06/2015 12:44:00,0.18085,21.80,
13,30/06/2015 12:48:00,0.18105,21.77,
14,30/06/2015 12:52:00,0.18124,21.65,
15,30/06/2015 12:56:00,0.18105,21.68,
16,30/06/2015 13:00:00,0.18085,21.84,
17,30/06/2015 13:04:00,0.18085,21.93,
18,30/06/2015 13:08:00,0.18066,21.78,
19,30/06/2015 13:12:00,0.18066,21.89,
20,30/06/2015 13:16:00,0.18066,21.90,
```

Fig. 30-7 Data set - example

31 Error Description

LED Status Display on Data Acquisition Module NL10150

Colour	Frequency	Status	Reason
Red or Green	Lights continuously	Initialisation	Lights up red when no SD card is detected
Green	Lights continuously	on, Data Logger inactive	No error
Red	Lights continuously	Battery Status	Battery below 3.5 V
Red	Flashing (2 Hz)	Battery Status	Logger off, Battery low (power-down) or other error (flashing quicker)
Red	Flashing (4 Hz)	Error	Memory Error
Green	Flashing slowly	Data Logger in Operation	No error
Red	Flashing slowly	Data Logger in Operation, Battery Status	Logger on, Battery below 3.5 V
Green	Flashing	USB Transmission active	No error
Off	Continuously off	Error	Hardware unable to initialise

Fig. 31-1 Status display of LED on data acquisition module

Maintenance and Cleaning

DANGER



Danger by electrostatic Discharge

In principle, the device is maintenance-free. If necessary, the enclosure of the unit can be cleaned with a damp cloth and a non-aggressive cleaning solution.

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.

WARNING



Germ Contamination

Due to the possible use of the level measurement system NivuLevel 150 also in the wastewater area, the data acquisition module as well as the associated submersible probe NivuBar PC can be contaminated with dangerous germs. Therefore, appropriate precautions must be taken when coming into contact with system, cables and submersible probe.

Wear protective clothing.

32 Maintenance

32.1 Maintenance Interval

The scope of maintenance and cleaning as well as the according intervals depend on the following factors:

- Build-up of dirt on the diaphragm of the submersible probe
- Material wear, ageing process of the submersible probe (zero point)
- Measurement medium (e.g. wastewater)
- Ambient Conditions

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

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. "32.2 Customer Service Information").

32.2 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

33 Dismantling/Disposal

Improper disposal may be harmful to the environment.

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 connected cables from the device.
3. Remove batteries and, if they are defective, dispose of them 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 is registered with the EAR, therefore public collection and return points in Germany can be used for disposal.

The device is equipped with batteries that must be disposed of separately.

34 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.

35 Accessories (optional)

Article Number	Description
HS00 ZUB AKL 10	Straining clamp made of stainless steel (V4A), for cable diameter 7.5 to 10.5 mm; for suspending the cable and fixing the submersible probe at a certain height
ZUB0 E-SVP-DURAPP	Replacement batteries DURACELL PLUS POWER AA; Only batteries of this type may be used!

Tab. 5 Spare Parts and Accessories




More accessories and spare parts can be found in the current NIVUS price list.

Index

A		N	
Accessories	40	Nameplate	20
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Device Versions	22	Specifications	20
Disclaimer	10	Data Acquisition Module	20
G		Submersible Probe	21
Germs	9	Storage	15
I		T	
Inspection upon Receipt	15	Translation	3
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Mounting Place	24	Wires	
		Colour Code	7

Certificates and Approvals

DE / EN / FR	
	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
EU Konformitätserklärung	
<i>EU Declaration of Conformity</i>	
<i>Déclaration de conformité UE</i>	
Für das folgend bezeichnete Erzeugnis:	
<i>For the following product:</i>	
<i>Le produit désigné ci-dessous:</i>	
Bezeichnung:	"Ex" Autarkes Füllstandsmesssystem, bestehend aus Datenlogger NivuLevel 150 und Tauchsonde NivuBar i2C
<i>Description:</i>	<i>"Ex" Stand-alone Level system, consisting of data logger NivuLevel 150 and submersible probe NivuBar i2C</i>
<i>Désignation:</i>	<i>"Ex" Système de mesure autonome hauteur, composé d'un logger de données et d'une sonde de pression à immersion NivuBar i2C</i>
Typ / Type:	NL10150 + HSB0NBI2Cxxx
<p>erklären wir in alleiniger Verantwortung, dass die auf dem Unionsmarkt ab dem Zeitpunkt der Unterzeichnung bereitgestellten Geräte die folgenden einschlägigen Harmonisierungsvorschriften der Union erfüllen:</p> <p><i>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:</i></p> <p><i>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:</i></p>	
<ul style="list-style-type: none"> • 2014/34/EU • 2014/30/EU • 2011/65/EU 	
<p>Bei der Bewertung wurden folgende einschlägige harmonisierte Normen zugrunde gelegt bzw. wird die Konformität erklärt in Bezug auf die nachfolgend genannten anderen technischen Spezifikationen:</p> <p><i>The evaluation assessed the following applicable harmonised standards or the conformity is declared in relation to other technical specifications listed below:</i></p> <p><i>L'évaluation est effectuée à partir des normes harmonisées applicable ou la conformité est déclarée en relation aux autres spécifications techniques désignées ci-dessous:</i></p>	
<ul style="list-style-type: none"> • EN 61326-1:2013 • EN 60079-11:2012 • EN IEC 60079-0:2018 	
<p>Ex-Kennzeichnung / <i>Ex-designation / Marquage Ex</i> : Ⓔ II 2G Ex ia IIB T4 Gb</p> <p>EU-Baumusterprüfbescheinigung / <i>EU-Type Examination Certificate / Attestation d'examen «UE» de type:</i></p> <p style="margin-left: 40px;">IBExU15ATEX1049X Issue 1</p>	
<p>Notifizierte Stelle (Kennnummer) / <i>Notified Body (Identif. No.) / Organisme notifié (N° d'identification)</i></p> <p style="margin-left: 40px;">IBExU Institut für Sicherheitstechnik GmbH, 09599 Freiberg, Germany (0637)</p>	
<p>Qualitätssicherung ATEX / <i>Quality assurance ATEX / Assurance qualité ATEX:</i></p> <p style="margin-left: 40px;">TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)</p>	
<p>Diese Erklärung wird verantwortlich für den Hersteller:</p> <p><i>This declaration is submitted on behalf of the manufacturer:</i></p> <p><i>Le fabricant assume la responsabilité de cette déclaration:</i></p>	
<p>NIVUS GmbH Im Täle 2 75031 Eppingen Germany</p>	
<p>abgegeben durch / <i>represented by / faite par:</i></p> <p>Ingrid Steppe (Geschäftsführerin / <i>Managing Director / Directeur général</i>)</p> <p>Eppingen, den 25.10.2022</p>	
<p>Gez. <i>Ingrid Steppe</i></p>	

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" Stand-alone Level system, consisting of data logger NivuLevel 150 and submersible probe NivuBar i2C
Type:	NL10150 + HSB0NBi2Cxxx


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 2016 / 1091 The Electromagnetic Compatibility Regulations 2016
- 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 61326-1:2013
- BS EN IEC 60079-0:2018
- BS EN 60079-11:2012

Ex-designation:

 II 2G Ex ia IIB T4 Gb
IBExU15ATEX1049X Issue 1

EU-Type Examination Certificate:

Notified Body (Identif. No.):

IBExU Institut für Sicherheitstechnik GmbH, 09599 Freiberg, Germany (0637)

Quality Assurance Ex:

TÜV Nord CERT GmbH, Am TÜV 1, 45307 Essen, Germany (0044)

This declaration is submitted on behalf of the manufacturer:

NIVUS GmbH
Im Täle 2
75031 Eppingen
Germany

represented by:

Ingrid Steppe (Managing Director)

Eppingen, 25/10/2022

Signed by *Ingrid Steppe*

IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

[1] **EU-TYPE EXAMINATION CERTIFICATE - Translation**



[2] Equipment or protective systems intended for use in potentially explosive atmospheres, Directive 2014/34/EU

[3] EU-type examination certificate number **IBExU15ATEX1049 X** | Issue 1

[4] Product: **Level measurement system**
Type: NL10150 with submersible probe NivuBar I²C

[5] Manufacturer: NIVUS GmbH

[6] Address: Im Tale 2
75031 Eppingen
GERMANY

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] IBExU Institut für Sicherheitstechnik GmbH, Notified Body number 0637 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 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 test report IB-21-3-0077.

[9] Compliance with the essential health and safety requirements has been assured by compliance with: EN IEC 60079-0:2018, EN 60079-11:2012
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 of 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 product. These are not covered by this certificate.

[12] The marking of the product must include the following:

 II 2G Ex ia IIB T4 Gb

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

Tel: + 49 (0) 37 31 / 38 05 0
Fax: + 49 (0) 37 31 / 38 05 10

By order

Dipl.-Ing. Willamowski



Certificates without signature and seal are not valid. Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Freiberg, 2021-08-02

IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

[13] **Schedule**

[14] **Certificate number IBExU15ATEX1049 X | Issue 1**

[15] **Description of product**

The Level measurement system type NL10150 with submersible probe NivuBar I²C is used to display and record the pressures and levels. The power supply comes from three primary cells connected in series.

The equipment is intended for use in potentially hazardous areas, where category 2G devices are required. It provides internal intrinsically safe "ia" circuits and is operated without external connections. The covered interface is used only in a safe area and for configuration and transfer of data.

Technical data

Ambient temperature range	
Data recording module:	-10 °C to +55 °C
Submersil probe:	-20 °C to +70 °C

Electrical data

Supply circuit

Internal parameters (no external connections)	
Battery voltage:	3 x 1.5 V
Open circuit voltage according to EN 60079-0:	4.95 V
Power consumption:	max. 20 mA

Variations compared to the basic certificate:

- *The devices were modified, without influence on the explosion protection.*
- *The devices comply with the requirements of the current standards.*

[16] **Test report**

The test results are recorded in the confidential test report IB-21-3-0077 of 2021-07-30. The test documents are part of the test report and they are listed there.

Summary of the test results

The Level measurement system type NL10150 with submersible probe NivuBar I²C fulfils the requirements of type of protection Intrinsic safety 'ia' for an electrical equipment for equipment group II, category 2G, explosion group IIB and temperature class T4.

[17] **Specific conditions of use**

- The ambient temperature range is fixed from -10 °C to +55 °C for the data recording module and from -25 °C to +70 °C for the submersible probe.
- The operation of the Level measurement system type NL10150 is allowed only in combination with the submersible probe type NivuBar I²C.
- Opening the battery compartment cover and removal of the protective cover of the interface connector must not be done in a hazardous atmosphere.
- The operation of the communication interface in explosive areas is not permitted.
- Only use the batteries specified: 3x 1.5 V / AA Duracell Plus Power.

[18] **Essential health and safety requirements**

In addition to the essential health and safety requirements (EHSRs) covered by the standards listed at item [9], the following are considered relevant to this product, and conformity is demonstrated in the test report: none

IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

[19] **Drawings and Documents**

The documents are listed in the test report.

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

By order


Dipl.-Ing. Willamowski

Freiberg, 2021-08-02