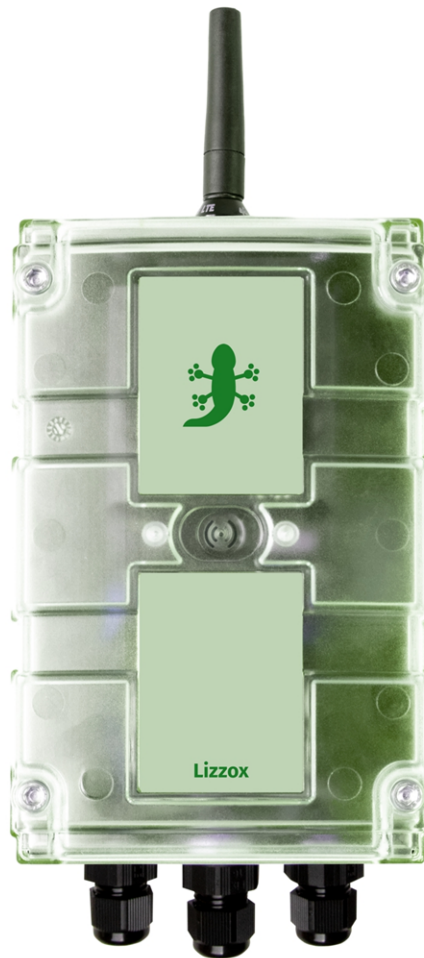


Operating manual

D050-1Z00140LZ09

Valid from:

- **Firmware version:** 02v000
- **Server version:** ---
- **Hardware version:** ---



Chapter 1 Table of contents

Cover	1
Chapter 1 Table of contents	3
Chapter 2 Declaration of conformity	7
Chapter 3 Specifications	9
Chapter 4 General specifications	13
4.1 Translation	13
4.2 Copyright	13
4.3 General descriptive names	13
4.4 Safety instructions	13
4.4.1 Use of the hazard warnings	14
4.4.2 Safety symbols on the device	14
4.4.3 General safety instructions	15
4.4.4 Specific safety instructions	15
4.4.5 Safety and preventative measures for handling devices with mobile network modems	15
4.4.5.1 Safety and precautionary measures for devices with mobile network modem	16
4.4.5.2 Safety measures for installing the antenna	16
4.5 Overview	17
4.5.1 Block diagram	18
4.6 Limitations of use	19
4.6.1 Intended use	19
4.6.2 Type of use	19
4.6.3 Field of application	20
4.6.4 Unauthorised use	20
4.7 General product information	20
4.8 Device labelling	21
4.9 Installation of spare and wear parts	22
4.10 Storage of the product	22
4.11 Warranty	22
4.12 Disclaimer	23
4.13 Obligation of the operator	23
4.14 Personnel requirements	24

Chapter 5 Storage, delivery and transport	25
5.1 Inspection of incoming deliveries	25
5.2 Storage	25
5.3 Transport	26
5.3.1 Transporting power supply units	26
Chapter 6 Installation	29
6.1 Dimensions	29
6.2 Assembling the D050-1Z00140LZ09	29
6.3 Inserting/replacing the SIM card	31
6.3.1 Using the external SIM slot	31
6.4 Installing the D050-1Z00140LZ09	32
6.4.1 Wall mounting	33
6.4.2 Pipe mounting	34
6.4.3 Outdoor installation	35
6.4.3.1 Attaching the housing for outdoor installation to a wall	35
6.4.3.2 Attaching the housing for outdoor installation to a pipe	36
6.5 Safety instructions for cabling	37
6.5.1 Information on preventing electrostatic discharges (ESD)	38
6.6 Electrical installation	38
6.6.1 Supply concepts	38
6.6.2 Connecting the sensors, actuators and power supply	39
6.6.2.1 Earthing of sensor cables	41
6.6.2.2 Mains operation (230VAC)	41
6.6.2.2.1 External power supply unit "Power supply housing "	42
6.6.3 Connecting the mobile network antenna	43
6.6.4 Technical details about the universal inputs	44
6.6.4.1 0/4 to 20mA mode	44
6.6.4.2 0 to 2V mode	44
6.6.4.3 0 to 10V mode	44
6.6.4.4 Standard digital modes (PWM, frequency, digital, counter)	44
6.6.5 Technical details about the PT100/1000 interface	45
6.6.6 Technical details about the RS232 interface	45

6.6.7 Technical details about the RS485 interface	45
6.6.8 Technical details about the USB interface	47
6.6.9 Technical details about the local radio interface	47
6.6.10 Technical details about the outputs	47
6.6.10.1 Switchable sensor supply VOUT	47
6.6.10.2 Switchable sensor supply VEXT	49
6.6.10.3 Switchable sensor supply VEXTRS232	49
6.6.10.4 Isolated switch contact (NO, CC)	50
6.6.11 Technical details about energy management	50
6.6.12 Technical details about the energy supply	51
6.6.12.1 PSU413D+ AP (300524)	52
6.6.12.2 PSU713 BP (300526)	52
6.6.12.3 PSU DC (300529)	53
6.6.12.4 PSU DC+ (300798)	53
6.6.13 Technical details about the system time	53
Chapter 7 Operating elements	55
7.1 Solenoid switch	55
Chapter 8 Maintenance	57
8.1 General maintenance	57
8.2 Replacing the power supply unit	57
8.2.1 Charging the power supply unit	58
8.3 Power supply units with integrated energy store	59
8.4 Services	59
Chapter 9 Repair & return	61
Chapter 10 Removal & disposal	63
Chapter 11 Contact information	65

Chapter 2 Declaration of conformity

EU-Konformitätserklärung EU Declaration of Conformity / Déclaration de conformité UE

Type: D050-1Z00140LZ09
Type code :
Type:



Hersteller: Microtronics Engineering GmbH
Manufacturer : Hauptstrasse 7
Fabricant: A-3244 Ruprechtshofen

Das bezeichnete Produkt stimmt mit den folgenden Europäischen Richtlinien überein. The designated product is in conformity with the following european directives. Le produit décrit est conforme aux directives européennes suivantes.			
		Europäische Norm	
(2014/30/EU)	EMC Directive		
		EN61326-1	
(2014/35/EU)	LVD Directive		
		EN61010-1	
(2014/53/EU)	RED Directive		
	Safety & Health 3.1a	EN62368-1 EN62368-1+A11:2017 EN62311 EN62479	
	EMC 3.1b	EN301489-1 V2.2.3 EN301489-52 V1.2.1 EN301489-1 V2.1.1 EN301489-17 V3.1.1	
	Radio spectrum efficiency 3.2	EN301511 V12.5.1 EN301908-1 V15.2.1 EN301908-13 V13.2.1 EN300328 V2.2.2 EN300330 V2.1.1	
	Cybersecurity 3.3	EN18031-1	
(2015/863/EU)	RoHS Directive		
	Prevention 4.1	EN IEC 63000	

Klaus Potzmader

Klaus Potzmader, Director Product
Unterschrift
name and signature of authorised person
Nom et signature de la personne autorisée

Stefan Pfeffer

Stefan Pfeffer, Managing Director Finance
Unterschrift
name and signature of authorised person
Nom et signature de la personne autorisée

Martin Mayer

Martin Mayer, General Managing Director
Unterschrift
name and signature of authorised person
Nom et signature de la personne autorisée

Ruprechtshofen, den 23.03.2026
Ort und Datum der Ausstellung
Place and date of issue
Lieu et date d'établissement

Chapter 3 Specifications

Voltage supply	Rechargeable battery: • PSU413D+ AP : 13,6 Ah, Li-Ion , 2 kV overvoltage protection Battery: • PSU713 BP : 13 Ah Direct power supply: • PSU DC : 2 kV overvoltage protection and reverse voltage protection • PSU DC+ : 900 mAh, Li-Po , 2kV overvoltage protection and reverse voltage protection Additional information is provided in "Technical details about the energy supply" on page 51.
Supply or charging voltage	12...32 VDC (max. 12 W)
Housing	Material: ABS / PC (housing/cover) Weight:: 400 g (without Power Supply Unit) Protection class: IP66 / IP67 / IP68 (IP68: max. immersion depth 1 m for min. 105 days) Dimensions (WHD): 130 x 250 x 84 mm (without antenna)
Operating temperature	-20...+60 °C
Air humidity	15...90 % RH , non-condensing
Max. operating altitude	≤ 2000 m
Pollution degree	PD2
Storage temperature	-30...+60 °C
Display	Three-colour LED
Operation	Solenoid switch
Antenna connector	FME-M
Universal inputs ¹⁾	4 x analogue or digital ²⁾ Modes: • 0/4...20 mA: Resolution 6,3 µA, max. 23,96 mA, load 96 Ω • 0...2 V: Resolution 610 µV, max. 2,5 V, load 10k086 • 0...10 V: Resolution 7,97 mV, max. 32 V, load 4k7 • PWM: 1...99 %, max. 100 Hz, min. pulse length 1 ms, load 10k086 • Frequency: 1...1000 Hz, 10k086 • Digital: max. 32 V, low <0,99 V, high >2,31 V, load 10k086 • Counter: min. pulse length 1 ms, load 10k086 Additional information is provided in "Technical details about the universal inputs" on page 44.

External temperature sensor ¹⁾	1 x PT100/1000 (including auto detection) Additional information is provided in "Technical details about the PT100/1000 interface" on page 45.
Serial interfaces ¹⁾	1 x RS232 (4-Leiter) • Baud rate: 600-115200 • Stop bits: 1, 2 • Parity: N, E, O • Data bits: 7, 8 • Flow control: Off, RTS/CTS 1 x RS485 (2-wire) ³⁾ • Baud rate: 600-115200 • Stop bits: 1, 2 • Parity: N, E, O • Data bits: 7, 8 • Load resistance: Off, 120 Ω Additional information is provided in "Technical details about the RS485 interface" on page 45 bzw. "Technical details about the RS232 interface" on page 45
Outputs ¹⁾	2 x switchable 3,3 V supply (max. 180 mA) 1 x switchable and adjustable sensor supply (5...24 V) • 5V_{nominal}: 4,75 V at I_{out} = 50 mA • 12V_{nominal}: 11,7 V at I_{out} = 50 mA • 15V_{nominal}: 14,7 V at I_{out} = 50 mA • 24V_{nominal}: 23,4 V at I_{out} = 50 mA 1x isolated switch contact: • I_{max}: 130 mA • U_{max}: 32 V • R_{on}: 35 Ω • f_{max}: 1000 Hz Modes: • Digital • Frequency: Adjustment range 1...1000 Hz, pulse duty factor 1...100 % • PWM: Adjustment range 0...100 %, Frequency 0...1000 Hz • Pulse: Pulse duration 1...500 ms , Pulse interval 1...500 ms • Pulse/min Additional information is provided in "Technical details about the outputs" on page 47.

Internal sensors	Internal housing temperature • Measurement range: -20...+60 °C • Resolution: 0,1 °C Humidity in the housing • Measurement range: 0...100 % RH • Resolution: 0,1 % RH
Local radio interface ¹⁾	Low energy module
USB interface	1 x Mini-USB-B (USB 2.0 , device) for the connection to a PC. The DeviceConfig configuration program must be installed on the PC to enable communication with the D050-1Z00140LZ09 . Additional information is provided in "Technical details about the USB interface" on page 47.
System time	Hardware real-time clock with its own buffer battery (service life >10 years) and automatic time synchronisation with the server. Additional information is provided in "Technical details about the system time" on page 53.
Data memory	3 MB internal flash memory
Data transmission	Local radio connection: ¹⁾ Range: up to 20 m ⁴⁾ 2G/M1/NB1 modem 2G: 2G GPRS 900 MHz / 1800 MHz 2G GPRS 850 MHz / 1900 MHz M1/NB1: LTE B1, B2, B3, B4, B5, B8, B12, B13, B20, B25, B26, B28, B66, B85
SIM ¹⁾	The following options can be selected using the DeviceConfig configuration program: • integrated SIM chip • SIM slot Additional information is provided in "Using the external SIM slot" on page 31

¹⁾ This functions is not fully available on all devices that are based on the "D050-1Z00140LZ09 " hardware platform. Please refer to the relevant user manual to find out whether the feature is available and to what extent.

²⁾ The universal inputs 3 and 4 are only available if the onBoard RS485 interface is not used

³⁾ The RS485 interface is only available if the universal inputs 3 and 4 are not used.

⁴⁾ Depending on ambient and structural conditions

Chapter 4 General specifications

The information in this manual has been compiled with great care and to the best of our knowledge. The manufacturer, however, assumes no liability for any incorrect specifications that may be provided in this manual. The manufacturer is not responsible for direct, indirect, accidental or consequential damages which arise from errors or omissions in this manual even if advised of the possibility of such damages. In the interest of continuous product development, the manufacturer reserves the right to make improvements to this manual and the products described in it at any time and without prior notification or obligation.

Tip: The specifications in this manual are valid as of the versions listed on the front page. Revised versions of this manual are available via the manufacturer's website (see "Contact information" on page 65).

4.1 Translation

For deliveries to countries in the European Economic Area, the manual must be translated into the language of the respective country. If there are any discrepancies in the translated text, the original manual (German) must be referenced or the manufacturer contacted for clarification.

4.2 Copyright

The copying and distribution of this document as well as the utilisation and communication of its contents to others without express authorisation is prohibited. Contraventions are liable to compensation. All rights reserved.

4.3 General descriptive names

The use of general descriptive names, trade names, trademarks and the like in this manual does not entitle the reader to assume they may be used freely by everyone. They are often protected registered trademarks even if not marked as such.

4.4 Safety instructions

For the connection, commissioning and operation of the D050-1Z00140LZ09, the following information and higher legal regulations of the country (e.g. ÖVE), such as valid EX regulations as well as the applicable safety and accident prevention regulations for the respective application case must be observed.

Read this manual completely before unpacking, setting up or operating this device. Observe all hazard, danger and warning information. Non-observance can lead to serious injuries to the operator and/or damage to the device.

Ensure that the safety equipment of this measurement instrument is not impaired. Install and use the measurement system only in the manner and method described in this manual. Do not make any changes to the measurement system under any circumstances.

Important: The manufacturer's products that are designed for use outdoors include extensive protection against penetrating moisture and dust. If these products are connected to the power supply or sensors by cables with connectors rather than permanently installed cables, the susceptibility of the connector and socket to moisture and dust penetration is significantly higher. The operator is responsible for protecting the connector and socket against penetrating moisture and dust in a suitable way and complying with local safety regulations.

4.4.1 Use of the hazard warnings



Danger: Indicates a potential or threatening hazardous situation that will result in death or serious injuries if not avoided.



Attention: Indicates a potential or threatening hazardous situation that can result in death or serious injuries if not avoided.



Caution: Indicates a potential hazardous situation that can result in minor or moderate injuries or damage to this instrument.

Important: Indicates a situation that can result in damages to this instrument if it is not avoided. Information that must be particularly emphasised.

Note: Indicates a situation that does not result in any injury to persons.

Tip: Information that supplements the specifications in the main text.

4.4.2 Safety symbols on the device

	Devices marked with this symbol must be disposed of in accordance with the requirements of Directive 2012/19/EU on waste electrical and electronic equipment.
	This symbol on a device indicates the location of the earth connection.
	This symbol on a device indicates the location of a fuse or current limiting circuit.

4.4.3 General safety instructions

- This manual is intended to be used by qualified personnel (see "Personnel requirements" on page 24). Read this manual thoroughly before unpacking, setting up or operating the device..
- If you encounter difficulties in understanding the information contained in this manual (or parts thereof), please contact the manufacturer or authorised distributors (see "Contact information" on page 65).
- Keep this manual on hand so that you can refer to it whenever you need information.
- Before installation or commissioning, ensure that the device is in good condition. For this purpose, check for visible defects on all important components. Pay particular attention to fastenings, connections, cable connections, seals, moving parts (e.g. hinges or joints), battery packs, power supply units, etc., if present.
- If defects are found that jeopardise operational safety, all further work must be stopped immediately. This applies regardless of whether the defects are found before installation or commissioning, or during installation, commissioning or ongoing operation.
- Before carrying out maintenance and/or cleaning work, the device must be disconnected from the power supply.
- Do not attempt to repair the device yourself, either mechanically or electrically. In the event of damage, return the device to the manufacturer in its original packaging (see "Repair & return" on page 61).
- The device must not be disposed of with household waste under any circumstances. Information on correct disposal can be found in the chapter "Removal & disposal" on page 63.

4.4.4 Specific safety instructions



Attention: Hazardous electric voltage can cause electric shock or burns. Always switch off all of the used power supplies for the device before installing it, completing any maintenance work or resolving any faults.



Attention: Ensure that the device is fully deactivated and cannot activate automatically when sending/returning it as air freight. Information on this is provided in chapter "Storage of the product" on page 22. If you have any unanswered questions, contact the manufacturer (see "Contact information" on page 65).



Attention: Never use this device in areas where the use of wireless equipment is prohibited. The device must not be used in hospitals and/or in the vicinity of medical equipment, such as heart pacemakers or hearing aids, as their functionality could be compromised by the mobile network modem contained in the device.



Attention: Never use this device in potentially explosive atmospheres and in the vicinity of highly combustible areas (fuel stations, storage areas for combustible material, chemical plants and detonation sites) or in the vicinity of flammable gases, vapours or dust.

4.4.5 Safety and preventative measures for handling devices with mobile network modems

The following safety and preventative measures must be observed during all phases of installation, operation, maintenance or repair of a mobile network modem. The manufacturer is not liable if the customer disregards these preventative measures.



Caution: The mobile network connection must not be used in hazardous environments.

No guarantee of any kind, whether implicit or explicit, is given by the manufacturer and its suppliers for the use with high risk activities.

In addition to the following safety considerations, all directives of the country in which the device is installed must be complied with.

Important: *No liability shall be assumed at any time and under no circumstances for connections via a mobile network modem for which wireless signals and networks are utilized. The mobile network modem must be switched on and operated in an area where sufficient signal strength is present.*

4.4.5.1 Safety and precautionary measures for devices with mobile network modem

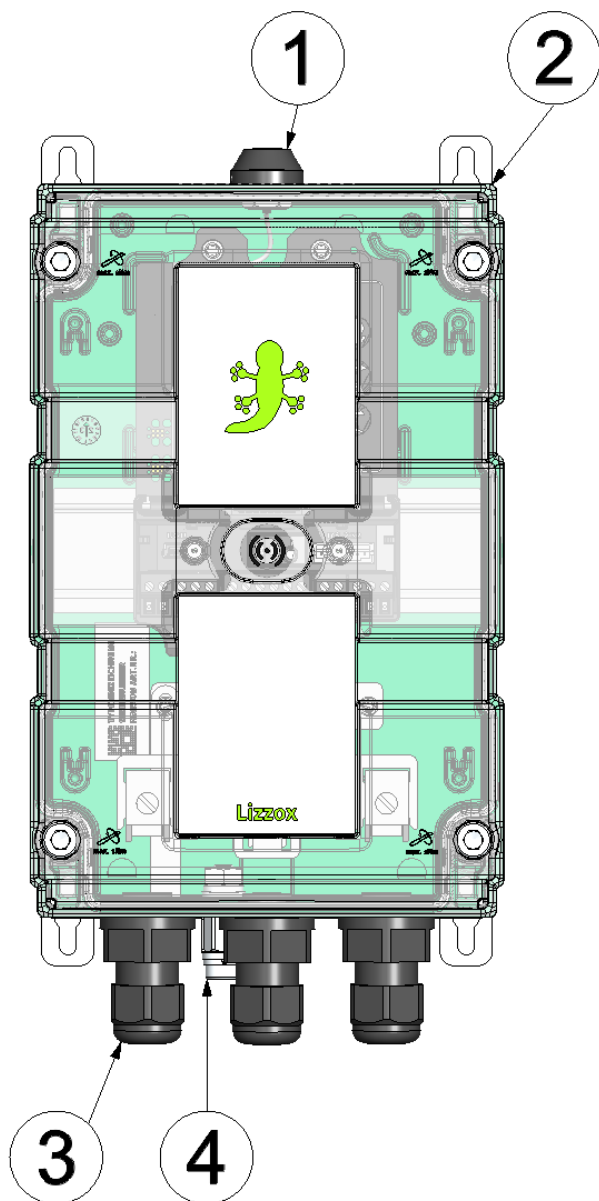
- This device must only be installed by a trained technician who applies the recognised installation practices for a radio frequency transmitter including the correct grounding of external antennas.
- The device must not be operated in hospitals and/or in the vicinity of medical equipment such as heart pacemakers or hearing aids.
- The device must not be operated in highly flammable areas such as petrol filling stations, fuel storage sites, chemical factories and explosion sites.
- The device must not be operated in the vicinity of flammable gases, vapours or dusts.
- The device must not be subjected to strong vibrations or impacts.
- The mobile network modem can cause interferences if it is located in the vicinity of television sets, radios or computers.
- Do not open the mobile network modem. Any modification to the device is prohibited and will result in the operating licence being revoked.
- The use of mobile network services (text messages/data communication/GPRS, etc.) may incur additional costs. The user is solely responsible for any resulting damages and costs.
- Do not install the device in any other way to the one described in the operating instructions. Improper use will invalidate the warranty.

4.4.5.2 Safety measures for installing the antenna

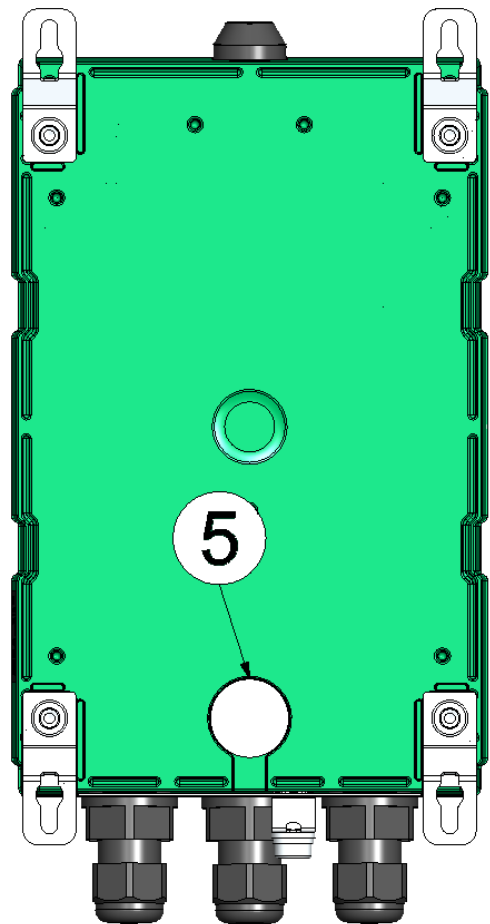
- Only use antennas that are recommended or supplied by the manufacturer.
- The antenna must be installed at a distance of at least 20 cm from individuals.
- The antenna must not protrude beyond the lightning-protected area of buildings and must be protected against lightning strikes.
- The voltage supply must be switched off before replacing the antenna.

4.5 Overview

Note: As the D050-1Z00140LZ09 is split into several components when delivered, it must be assembled before use (see "Assembling the D050-1Z00140LZ09 " on page 29).



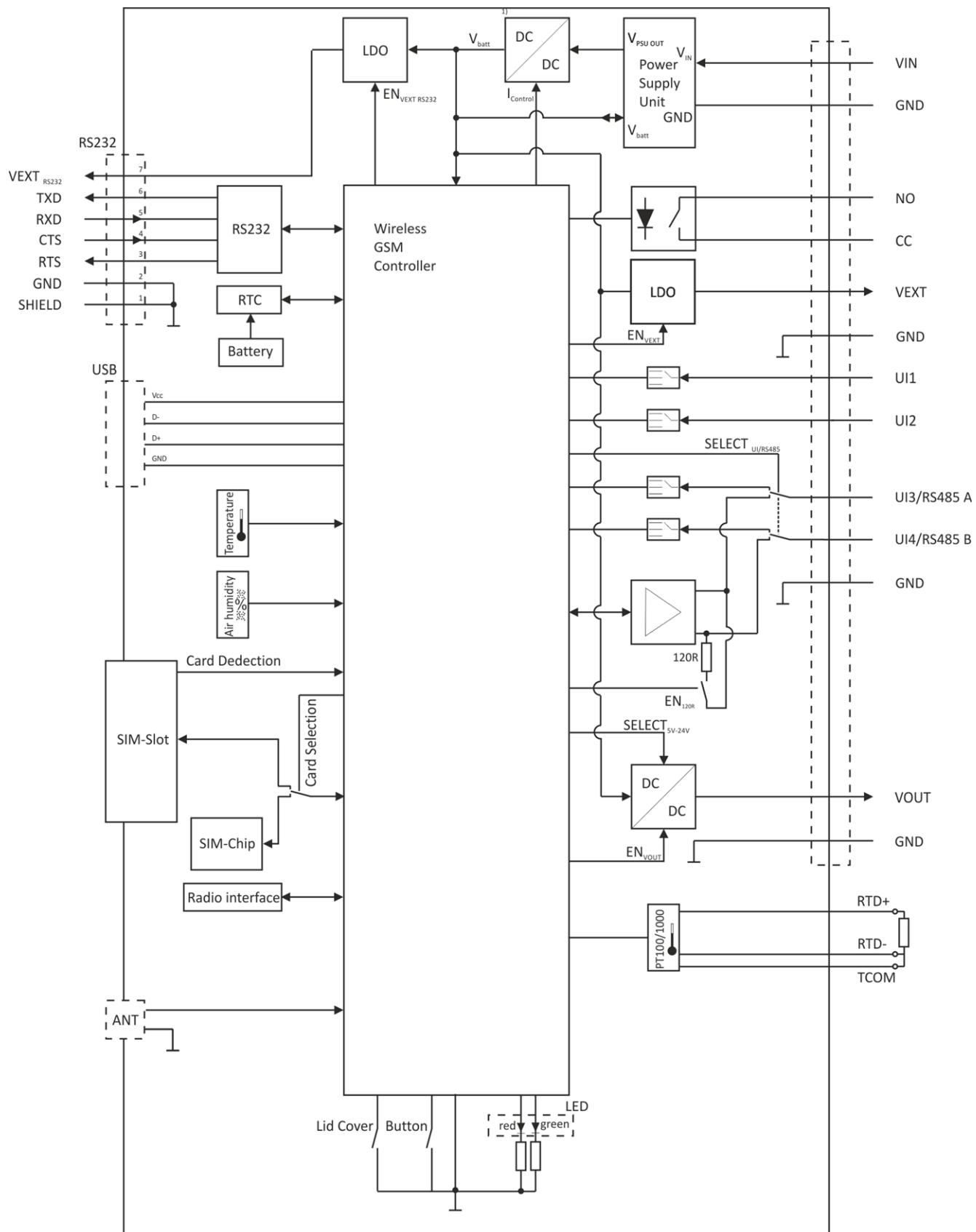
Front of the D050-1Z00140LZ09
(view of a device after assembly)



Rear of the D050-1Z00140LZ09
(view of a device after assembly)

1 Antenna connector	4 Earth connection (min. requirement for earth cable: 4 mm ²)
2 Housing cover	5 Pressure compensation
3 Cable gland (cable diameter of 5-10 mm)	

4.5.1 Block diagram



Block diagram of the D050-1Z00140LZ09

¹⁾ It is a DC/DC converter with controllable output current. A power supply unit (e.g. PSU413D+ AP) that is equipped with a rechargeable battery can thus be charged via the V_{Batt} in-/output.

Note: Detailed block diagrams of the most common power supply units are provided in chapter "Technical details about the energy supply" on page 51.

4.6 Limitations of use

The following chapters describe the limits within which use of the device is permitted. Reasonably foreseeable misuse is also listed and the use of the device in this way is explicitly excluded.

Note: Any use of the device that is not specified in chapters "Intended use" on page 19, "Type of use" on page 19 and "Field of application" on page 20 is not permitted. This also applies if the device is used in a way that is not explicitly excluded as unauthorised in the chapter "Unauthorised use" on page 20. The manufacturer is not liable for any damage or consequential damage resulting from unauthorised use. The risk is borne solely by the operator.

4.6.1 Intended use

The stationary measurement instrument is designed for determining, processing and transferring measurement data that is acquired via various industrial interfaces or provided by remote sensor modules. The device can operate without mains power. The measured and recorded data is stored on a non-volatile memory medium. This saved data can be read out locally via radio connection or automatically transmitted to a central server for further processing via the mobile network. The device is equipped with an integrated SIM chip for this purpose. To read out the data via local radio connection and simultaneously forward it to a central server, the smartphone app provided by the manufacturer can be used. The device is intended for operation within the limits specified in chapter "Specifications" on page 9 only.

Note: This device is exclusively intended to be used for the purposes as described before. Any other use or use beyond what is specified or a modification of the device shall be deemed to be not for the intended purpose and is not permitted without the express written consent of the manufacturer. The manufacturer shall not be held liable for any damages that may result from such unauthorised use or modification. The operator alone bears the associated risk.

Note: The manufacturer is not liable for data loss of any kind.

Note: The integrated SIM chip provides a mobile communications connection to a variety of international service providers. In order to be able to utilise all functions of the device, you must ensure that the device is located in the service area of one of these service providers. A Managed Service contract with Microtronics Engineering GmbH is required for use of the mobile data transmission (see www.microtronics.com/managedservice). This includes the provisioning of the mobile communications connection via the network of the service provider included in the above-mentioned list.

4.6.2 Type of use

Installation, commissioning and maintenance may only be completed by qualified personnel (see "Personnel requirements" on page 24). The device is only approved for use in areas without explosive atmospheres.

4.6.3 Field of application

It is only authorised for use in the industrial sector, business/commercial sector or in small businesses.

4.6.4 Unauthorised use

Note: The following describes the types of use of the device that are not permitted. This is not a complete list, but rather a list of reasonably foreseeable misuse. Only the use specified in chapters "Intended use" on page 19, "Type of use" on page 19 and "Field of application" on page 20 is permitted. The manufacturer is not liable for any damage or consequential damage resulting from unauthorised use. The risk is borne solely by the operator.

- The device must not be exposed to direct sunlight or direct weather influences (rain, snow, ...).
- The device must not be installed in locations that are permanently flooded.
- The device is not authorised for use in sewers.
- The device must not be mounted hanging from the connection cable.
- The device must not be operated with the lid open.
- The device must not be operated without antenna.
- When using antennas with a connection cable, neither the device nor the antenna may be suspended from the antenna cable.
- Only one cable may be fed through each of the cable glands.
- The cable glands must not be used in the field without the cable threaded through. If a cable gland is not used, it must be protected with a dummy plug.
- No traction may be exerted on the connection cables (sensors and supply). Straining clamps must be used to secure the cables in a suitable manner.

4.7 General product information

The device is a stationary device for determining, processing and transferring measurement data. Depending on the selected supply concept, the D050-1Z00140LZ09 can also be operated without mains power. The following supply concepts are available:

- Supply by primary battery
- Supply by PV module (in combination with rechargeable internal buffer battery)
- DC supply (12...32 VDC)

The following interfaces are available for recording measurement data:

- 4 universal inputs that can be operated in various analogue and digital modes ¹⁾
- An interface for connecting a PT100 or PT1000 with automatic detection as to which of the two types of temperature sensors is being used
- An RS232 interface
- An RS485 interface ²⁾
- A local interface for connecting remote sensor modules

The D050-1Z00140LZ09 is also equipped with internal sensors (internal housing temperature and air humidity in the housing) and 3 switchable voltage outputs to supply sensors and an isolated switch contact to directly control an actuator. The output voltage for one of the switchable sensor supplies can be varied between 5...24 V using the software. The output voltage for the other 2 switchable sensor supplies is 3,3 V and cannot be changed. The isolated switch contact can also be operated in different modes (frequency, PWM, pulse, pulse/min.).

The determined measurement data is recorded in the internal 3 MB data memory and can be read out locally via radio connection or automatically transferred to a central myDatenet server using the mobile

network connection. The D050-1Z00140LZ09 is equipped with an integrated SIM chip for this purpose. To read out the data via local radio connection and simultaneously forward it to a central myDatanet server, the smartphon app "OnSite Companion" can be used.

1) The universal inputs 3 and 4 are only available if the onBoard RS485 interface is not used

2) The RS485 interface is only available if the universal inputs 3 and 4 are not used.

Tip: Not all of the functions described here are available on all devices that are based on the "D050-1Z00140LZ09 " hardware platform. Please refer to the relevant user manual to see which functions are available.

4.8 Device labelling

The specifications in this manual apply exclusively to the D050-1Z00140LZ09 device type. The type plate is located on the right side of the device and contains the following specifications:

- Product designation
- Serial number
- Item number
- Type key
- Specification regarding the voltage supply
- Environmental conditions during operation
- Week and year of production
- Degree of protection
- Product revision
- CE marking
- Logo for the EU WEEE Directive
- Name and address of the manufacturer



Type plate D050-1Z00140LZ09

The correct specification of the product designation and serial number is important for all queries and spare part orders. Only then can we process requests promptly and properly.

Note: These operating instructions are part of the device and must be available to the user at all times. The safety instructions contained therein must be observed.



Attention: It is strictly prohibited to disable the safety equipment or modify its mode of operation.

4.9 Installation of spare and wear parts

Be advised that spare and accessory parts that have not been supplied by the manufacturer have also not been inspected or approved by the manufacturer. The installation and/or use of such products can possibly have a negative impact on the specified constructional properties of the device. The manufacturer shall not be liable for any damages that arise from the use of non-original parts and non-original accessory parts.

4.10 Storage of the product

To store the D050-1Z00140LZ09, ensure that all relevant data was transferred to the myDatanet server. Then deactivate the device. If necessary, initiate a transmission directly on the device or wait until the next scheduled data transmission for all of the data to be sent to the myDatanet server. Once the mobile network connection has been terminated, the power supply unit can be removed and subsequently the cables and the antenna can be disconnected. If possible, switch off the supply or charging voltage before disconnecting the cables from the V IN and GND terminals (see "Connecting the sensors, actuators and power supply" on page 39). Store the D050-1Z00140LZ09 and the power supply unit in the original packaging.

The configuration and most recently determined data are retained. The system time also continues to run thanks to the hardware real-time clock equipped with its own buffer battery. This means that a valid time basis is available immediately following recommissioning (see "Technical details about the system time" on page 53).

***Tip:** For information on how to deactivate the device, how to trigger a transmission and how to recognise that the mobile network connection has been terminated, please refer to the manual for the respective device.*

4.11 Warranty

The device has been functionally tested before delivery. If it is used as intended (see "Intended use" on page 19) and the operating instructions, the applicable documents and the safety notes and instructions contained therein, are observed, no functional restrictions are to be expected and perfect operation should be possible.

***Tip:** Please also note in this regard the next chapter "Disclaimer" on page 23.*

Note: Limitation of warranty

In the event of non-compliance with the safety instructions and instructions in this document, the manufacturer reserves the right to limit the warranty.

4.12 Disclaimer

The manufacturer assumes no liability

- for damages owing to **a change** of this document. The manufacturer reserves the right to change the contents of this document and this disclaimer at any time and without any notice.
- for damages to persons or objects resulting from **failure to comply** with applicable **regulations**. For connection, commissioning and operation of the devices/sensors all available information and higher local legal regulations (e.g. in Austria ÖVE guidelines) such as applicable Ex regulations as well as safety requirements and regulations in order to avoid accidents shall be adhered to.
- for damages to persons or objects resulting from **improper use**. For safety and warranty reasons, all internal work on the instruments beyond from that involved in normal installation and connection, must be carried out only by qualified Microtronics personnel or persons or companies authorised by Microtronics .
- for damages to persons or objects resulting from the use of instruments in technically **imperfect** condition.
- for damages to persons or objects resulting from the use of instruments **not in accordance with the requirements**.
- for damages to persons or objects resulting from **failure to comply** with **safety information** contained within this instruction manual.
- for missing or incorrect measurement values or resulting consequential damages due to **improper installation** or **incorrect parameterisation/programming**.

4.13 Obligation of the operator



Attention: In the EEA (European Economic Area), the national implementation of the framework directive (89/391/EEC) as well as the associated specific directives and from these in particular, the directive (2009/104/EC) about the minimum safety and health requirements for use of work equipment by workers at work, each in their respective version are to be complied with.

The operator must obtain the local operating licence and the associated documents.

In addition, the operator must comply with the local legal requirements for

- the safety of the personnel (accident prevention measures),
- the safety of the equipment (protective equipment and maintenance),
- the product disposal (waste disposal law),
- the material disposal (waste disposal law),
- the cleaning (cleaning agents and disposal) and
- the environmental protection amendments.

Before commissioning, the operator must ensure that the installation and commissioning – provided these were performed by the operator himself – are in compliance with the local regulations.

4.14 Personnel requirements

Installation, commissioning and maintenance may only be completed by personnel who meet the following conditions:

- Qualified specialist personnel with the relevant training
- Authorised by the facility operator

Tip: Qualified personnel

In the context of these instructions and the warnings on the product itself, individuals responsible for the setup, installation, commissioning and operation of the product must have gained relevant qualifications relating to their activities, including, for example:

- *Training, instruction and authorisation to activate/deactivate, ground and label electric circuits and devices/systems in accordance with the standards of safety engineering.*
- *Training or instruction on the maintenance and use of suitable safety equipment in accordance with the standards of safety engineering.*
- *First aid training*

Chapter 5 Storage, delivery and transport

5.1 Inspection of incoming deliveries

Check the shipment immediately upon receipt to ensure it is complete and intact. Immediately report any discovered transport damages to the delivering carrier. Also notify Microtronics Engineering GmbH in writing about this without delay. Report any incompleteness of the delivery to the responsible representative or directly to the company headquarters of the manufacturer within two weeks (see "Contact information" on page 65).

Note: Any claims received thereafter will not be accepted.

5.2 Storage

The following storage conditions must be observed:

D050-1Z00140LZ09	Storage temperature	-30...+60 °C
	Humidity	15...90 % RH
PSU713 BP (300526)	Operating temperature	-20...+50 °C
	Storage temperature	+20...+25 °C
PSU413D+ AP (300524)	Operating temperature	-20...+60 °C
	Charging temperature	-20...+60 °C
	Storage temperature	0... +30 °C
PSU DC (300529)	Operating temperature	-20...+60 °C
	Storage temperature	0... +35 °C
PSU DC+ (300798)	Operating temperature	-20...+60 °C
	Charging temperature	0...+40 °C
	Storage temperature	0... +35 °C

Tip: The table above only contains the storage conditions for the energy sources used most frequently for the D050-1Z00140LZ09. Please consult the appropriate factsheet for information about the storage conditions of other power supply units.

Note: If a Li-Ion rechargeable battery is to be stored for a longer period, it is recommended to ensure that the charge level is 40 % to 60 % of the maximum charge.

Important: Remove the power supply unit from the D050-1Z00140LZ09 prior to storage.

Store the measurement technology so that it is protected against corrosive or organic solvent vapours, radioactive emissions as well as strong electromagnetic radiation.

5.3 Transport

Protect the D050-1Z00140LZ09 against heavy shocks, bumps, impacts or vibrations. The original packaging must always be used for transport.

5.3.1 Transporting power supply units



Attention: With the exception of the PSU DC (300529), the power supply units required to operate the D050-1Z00140LZ09 are classified as hazardous goods due to the installed rechargeable batteries or battery packs for which the following conditions must be observed during transport.

The guidelines that must be observed when transporting hazardous goods are dependent on the selected transport route and are designed as follows:

- Transport by road: ADR Directive
- Transport by air: IATA guideline
- Transport by rail: RID guideline
- Transport by ship: IMDG guideline

The following parties must observe these guidelines:

- Shipping and packaging company
- Haulage contractors
- Air carriers and ground handling service providers (only if the IATA guideline is applied)
- Security personnel (particularly if the IATA guideline is applied)

When it comes to transporting hazardous goods, the most important tasks of the shipping and packaging company are:

- Classification / identification
- Packaging
- Marking and labelling (e.g. transport stickers)
- Documentation (e.g. ADR transport documents or Dangerous Goods Declaration)

The energy stores of the power supply unit are lithium batteries. The following points must therefore be observed in conjunction with transporting lithium batteries:

- Type of lithium battery
 - Lithium ion battery
 - Lithium metal battery
- Battery energy content
 - If the energy content is within the "exempt" level, this will make the transportation process easier.
 - If the energy content is above the "exempt" level, the battery is classed as a "complete" hazardous material in accordance with the relevant guideline.
- Scope of the delivered package
 - Battery packed individually
 - Battery packed with or in the equipment

Other matters that must be taken into consideration during transport preparation and processing:

- Net weight per package
- Involved air carrier (only if the IATA guideline is applied)
- Destination country (only if the IATA guideline is applied)

Important: All of these points must be observed when compiling each delivery (including the interdependencies).

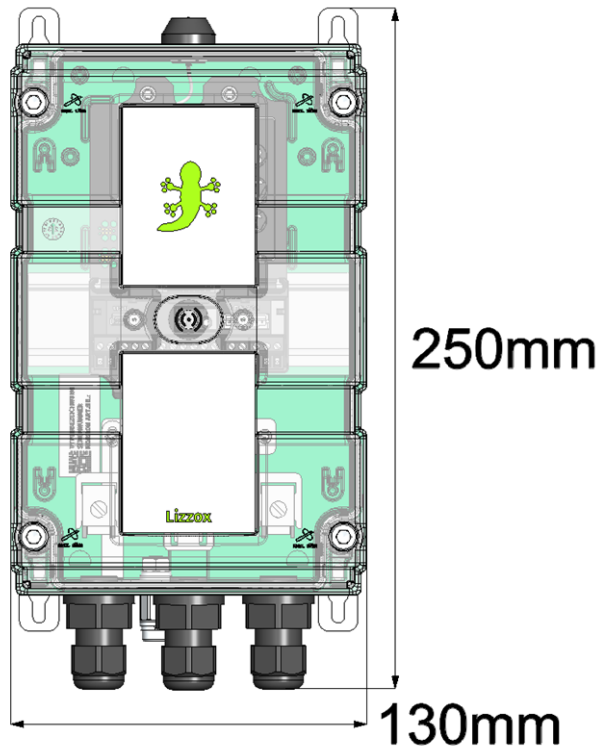
The "shipping and packaging company" can refer to the information provided in the following table to classify the power supply units and subsequently determine which transport guideline to apply.

Title of the PSU	Order number	Type of lithium battery	Energy [Wh]	Lithium content [g]	UN number
PSU413D+ AP	300524	Lithium ions	50,32 Wh		UN3480
PSU713 BP	300526	Lithium metal		6,6 g	UN3090
PSU DC+	300798	Lithium ions	3,33 Wh		UN3480

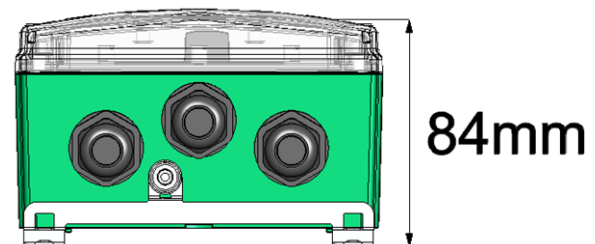
Chapter 6 Installation

Important: To prevent any damage to the device, the work described in this section of the instructions must only be performed by qualified personnel.

6.1 Dimensions



Dimensions: width and height
(view of a device after assembly)



Dimensions: depth
(view of a device after assembly)

6.2 Assembling the D050-1Z00140LZ09

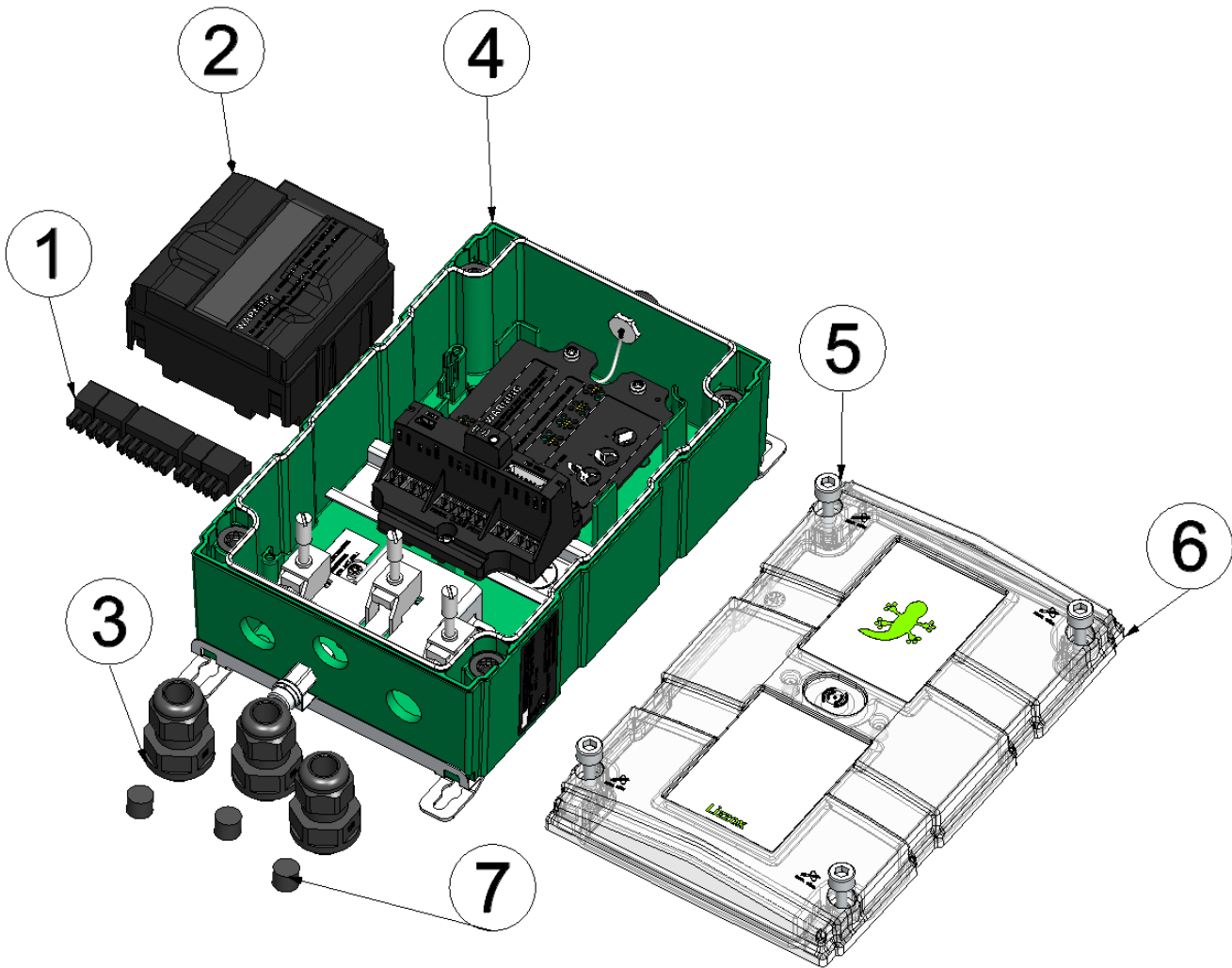
Important:

- All wiring work must be performed in the de-energised state.
- Ensure installation is completed correctly.
- Improper handling can cause injuries and/or damage to the instruments.
- The D050-1Z00140LZ09 must not be operated in the field with the lid open.
- To ensure the housing is properly sealed, each of the cable screw connections must only hold a single cable.

The D050-1Z00140LZ09 is split into several components when delivered and must therefore be assembled before use.



How-To-Video: [Assembling the D050-1Z00140LZ09](#)



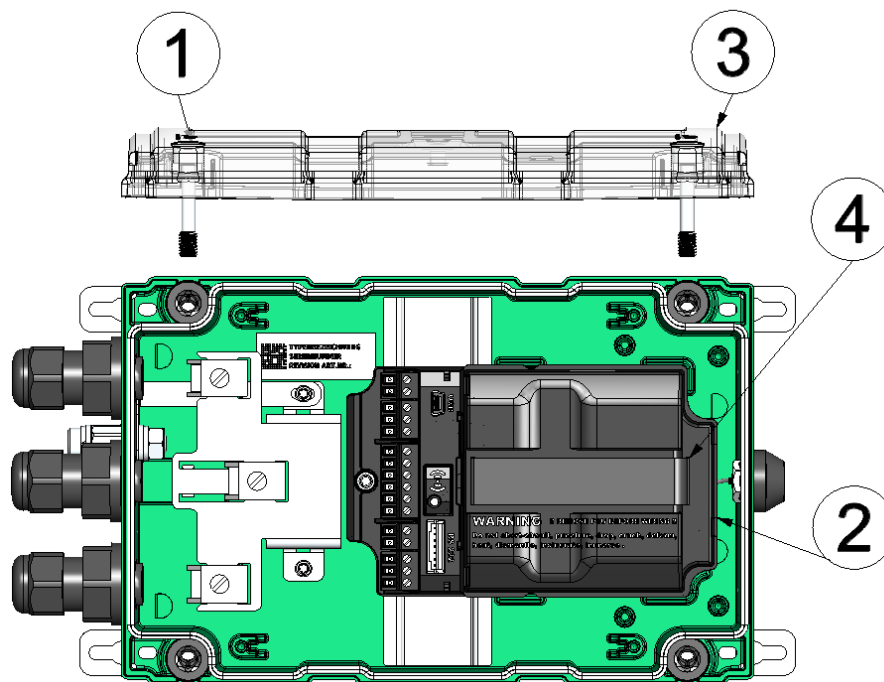
Components of the D050-1Z00140LZ09

1 Connector plug (2x 2-pin, 2x 3-pin, 1x 6-pin)	5 4x Hexagon socket screw M6x30
2 Power supply unit (not included in scope of delivery)	6 Housing cover
3 3x cable glands (cable diameter of 5-10 mm)	7 Blind plugs
4 D050-1Z00140LZ09 base unit	

6.3 Inserting/replacing the SIM card



How-To-Video: [Inserting the SIM card](#)



Opening the D050-1Z00140LZ09

1 Hexagon socket screw M6x30	3 Housing cover
2 Power supply unit	4 Strap to remove the power supply unit

6.3.1 Using the external SIM slot

The following two conditions must be met to activate communication via the external SIM card:

- The SIM card must be inserted in the external SIM slot (see "Inserting/replacing the SIM card" on page 31)
- The APN settings (APN, username and password) and the PIN code (if required by the SIM card) for the inserted SIM card must be transferred to the D050-1Z00140LZ09 using the DeviceConfig configuration program .

In the current implementation, using an external SIM card will not increase availability. This means that in the event of any communication problems relating to the external SIM card, the firmware will not automatically switch to the internal SIM chip. This cost-oriented approach helps to prevent any resulting charges for using the internal SIM chip as soon as the external SIM card has been activated.

To reactivate the internal SIM chip, it will not suffice to remove the external SIM card from the SIM slot. The APN settings must also be deleted from the D050-1Z00140LZ09 using the DeviceConfig configuration program.

The following table specifies under which conditions the external SIM card or internal SIM chip is used. The parameters are checked each time the modem is activated. "---" indicates a state where it is not possible to establish a connection.

External SIM card inserted	Correct APN settings stored in the device	SIM used
0	0	intern
0	1	---
1	0	---
1	1	extern

6.4 Installing the D050-1Z00140LZ09

Important:

- *Ensure installation is completed correctly.*
- *Comply with existing legal and/or operational directives.*
- *Improper handling can cause injuries and/or damage to the devices.*
- *The D050-1Z00140LZ09 must not be operated in the field with the lid open.*
- *The pressure compensation must be protected against contamination.*
- *The D050-1Z00140LZ09 is not approved for use in sewers.*

Note: *It is recommended that all metal mounting fixtures be properly earthed.*

The installation site must be selected according to specific criteria. The following conditions must be avoided in any case:

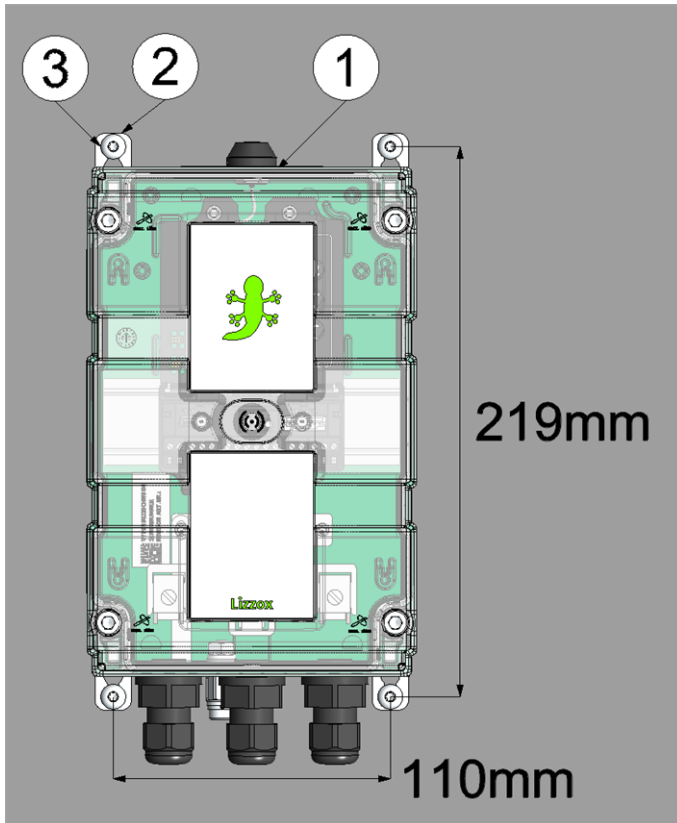
- Direct sunlight
- Direct weather exposure (rain, snow, etc.)
- Objects that radiate intense heat (maximum ambient temperature: -20...+60 °C)
- Objects with a strong electromagnetic field (frequency converter or similar)
- Corrosive chemicals or gases
- Mechanical impacts
- Direct installation on paths or roads
- Vibrations
- Radioactive emissions

Tip: *Leave sufficient space at the upper end to install the antenna. The space required depends on the antenna used. Approx. 15 cm of space must be left beneath the device for the cable connections. Further information regarding the installation dimensions can be found in the relevant sub-chapter.*

6.4.1 Wall mounting

The mounting brackets required for wall mounting have already been mounted on the D050-1Z00140LZ09 during production.

Note: The equalisation rail on the front of the D050-1Z00140LZ09 connects the earth terminal to the two lower mounting brackets. If you mount the device on a conductive, earthed pipe, no additional earthing is required.



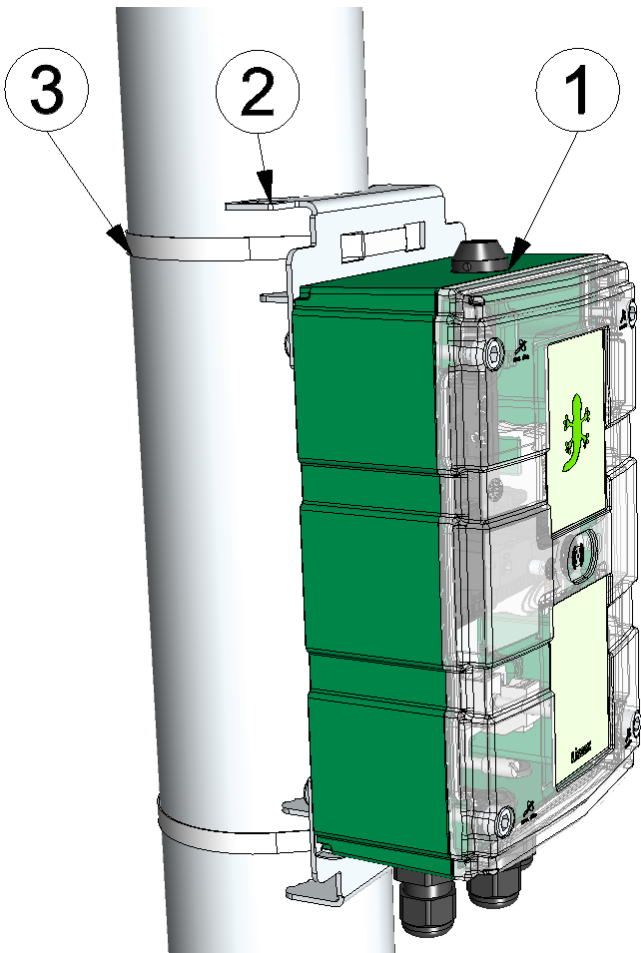
Wall mounting

1 D050-1Z00140LZ09	3 Screw (max. diameter: 4mm)
2 Mounting bracket	

6.4.2 Pipe mounting

For the installation on a pipe the optional accessory "Pipe mounting set 30-250 mm (301191)" is required. If the D050-1Z00140LZ09 and the Pipe mounting set 30-250 mm are ordered together, the mounting loops included in the standard scope of delivery are replaced by those for the installation on a pipe and are mounted on the D050-1Z00140LZ09 prior to shipment.

Note: The equalisation rail on the front of the D050-1Z00140LZ09 connects the earth terminal to the lower mounting bracket. If you mount the device on a conductive, earthed pipe, no additional earthing is required.



Pipe mounting

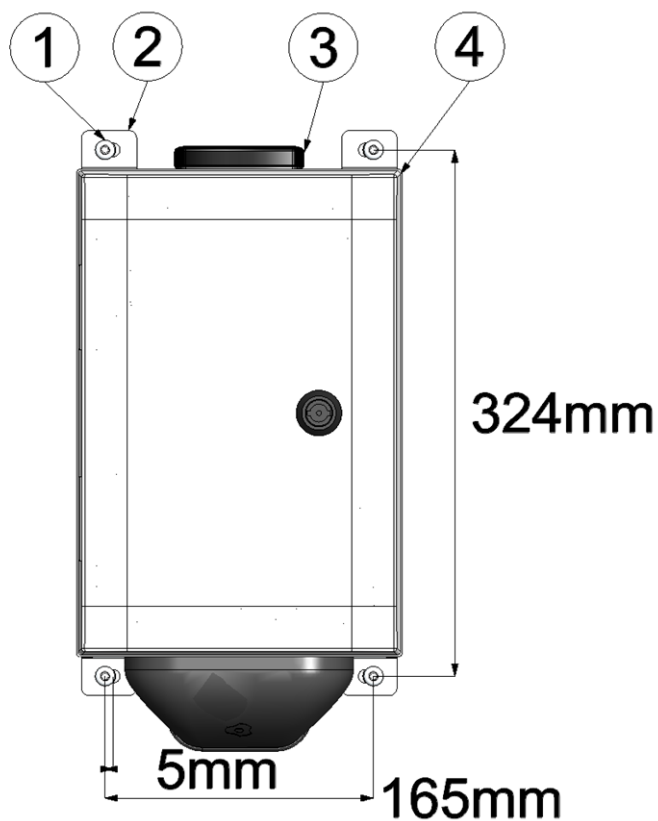
1 D050-1Z00140LZ09	3 Tightening strap (for pipe diameter 30-250 mm)
2 Loops for pipe mounting (for pipe diameter 30-250 mm)	

6.4.3 Outdoor installation

When installing the D050-1Z00140LZ09 outdoors, it needs to be protected from direct sunlight and direct weather exposure (rain, snow, ...). To do so, the "Housing for outdoor installation 300x200x150mm (301173)" can be used. The housing for outdoor installation already includes a multiband antenna suitable for all variants of the D050-1Z00140LZ09 .

6.4.3.1 Attaching the housing for outdoor installation to a wall

To attach the "Housing for outdoor installation 300x200x150mm (301173)" to a wall, the "Wall mounting set for housing 300x200x150mm(301185)" is required as an additional accessory. If the D050-1Z00140LZ09 , the Housing for outdoor installation 300x200x150mm and the Wall mounting set for housing 300x200x150mm are ordered together, the D050-1Z00140LZ09 is installed in the housing for outdoor installation (incl. connection of antenna cables) and the brackets for installation on a wall are mounted on the housing prior to shipment.

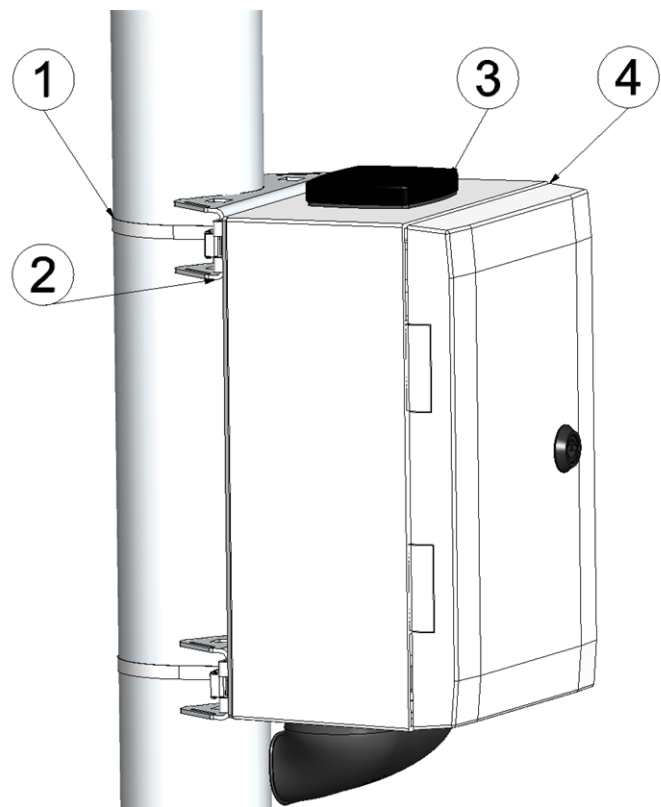


Wall mounting

1 Screw (max. diameter: 8mm)	3 Multiband antenna
2 Mounting bracket	4 Housing for outdoor installation 300x200x150mm

6.4.3.2 Attaching the housing for outdoor installation to a pipe

To attach the "Housing for outdoor installation 300x200x150mm (301173)" to a pipe, the " Pipe mounting set for housing 300x200x150mm (301184)" is required as an additional accessory . If the D050-1Z00140LZ09 , the Housing for outdoor installation 300x200x150mm and the Pipe mounting set for housing 300x200x150mm are ordered together, the D050-1Z00140LZ09 is installed in the housing for outdoor installation (incl. connection of antenna cables) and the brackets for the installation on a pipe are mounted on the housing prior to shipment.



Pipe mounting

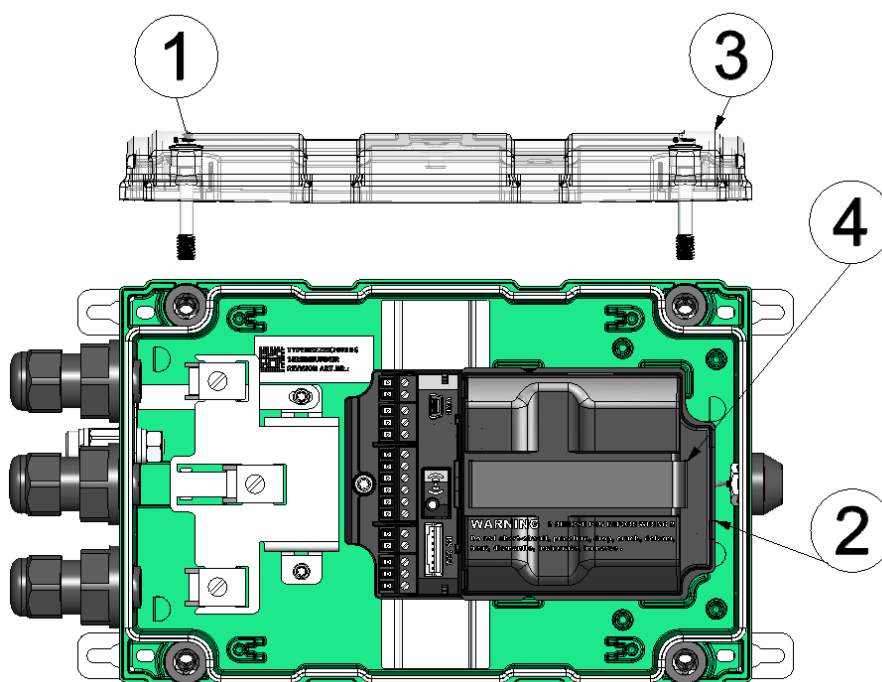
1 Tightening strap (for pipe diameter 60-300 mm)	3 Multiband antenna
2 Bracket for pipe mounting (for pipe diameter 60-300 mm)	4 Housing for outdoor installation 300x200x150mm

6.5 Safety instructions for cabling

Important: To avoid any damage, always switch off the voltage supply to the device when performing electrical connections.

When connections are made to the D050-1Z00140LZ09, the following warnings and information must be observed, in addition to the warnings and information found in the individual chapters on the installation. Further safety information is included in "Safety instructions" on page 13.

Remove the power supply unit from the device before completing any wiring work.



Removing the power supply unit

1 Hexagon socket screw M6x30	3 Housing cover
2 Power supply unit	4 Strap to remove the power supply unit

6.5.1 Information on preventing electrostatic discharges (ESD)

Important: Maintenance procedures that do not require the device to be connected to the power supply should only be performed once the device has been disconnected from the mains power supply to minimise hazards and ESD risks.

The sensitive electronic components inside the device can be damaged by static electricity, which can impair the device performance or even cause the device to fail. The manufacturer recommends the following steps to prevent any damage to the device caused by electrostatic discharges:

- Discharge any static electricity present on your body before handling the electronic components of the device (such as circuit boards and components attached thereto). To do this, you can touch a grounded metallic surface such as the housing frame of a device or a metal pipe.
- Avoid any unnecessary movements to prevent the build-up of static charges.
- Use antistatic containers or packaging to transport components that are sensitive to static.
- Wear an antistatic wristband that is grounded via a cable to discharge your body and keep it free of static electricity.
- Only touch components that are sensitive to electric charges in an antistatic working area. If possible, use antistatic mats and work pads.

6.6 Electrical installation

Important: Only qualified personnel should undertake the installation described in this chapter of the operating instructions to avoid any damage to the device.

6.6.1 Supply concepts

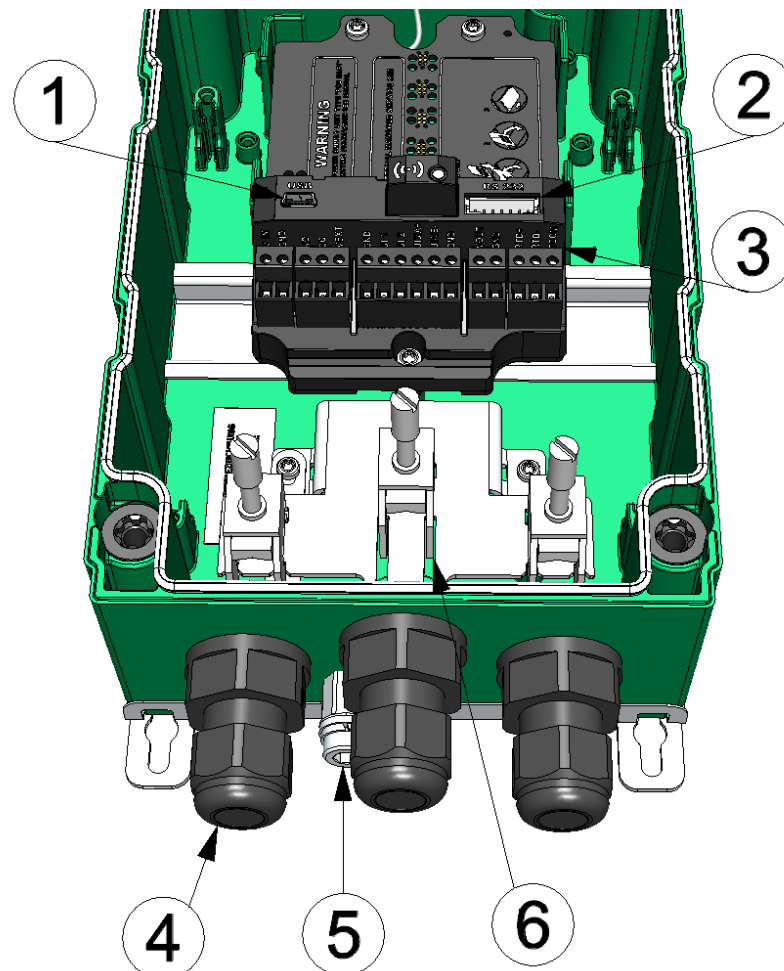
The following table gives an overview of the possible supply concepts including the respective advantages and disadvantages:

Supply concept	Advantages	Disadvantages
Supply by primary battery	• Minimal installation effort • No energy source required at the installation site	• Requires a cyclic replacement of the power supply unit
Supply by PV module	• Self-sufficient operation • No energy source required at the installation site	• Due to the energy supply using a PV module, there is a dependency on insolation
Mains operation (230 V AC)	• No cyclic passing by the measurement site needed • No dependency on insolation	• Energy source required at the installation site • External Power supply unit required • High installation effort
DC power supply (12...32 VDC)	• No cyclic passing by the measurement site needed • No dependency on insolation	• Energy source required at the installation site • High installation effort

6.6.2 Connecting the sensors, actuators and power supply

Important:

- All wiring work must be performed in the de-energised state.
- Ensure installation is completed correctly.
- Comply with existing legal and/or operational directives.
- Improper handling can cause injuries and/or damage to the instruments!
- Run all data and power cables so that they do not pose a trip hazard and ensure that cables do not have any sharp bends!
- Data and current cables must not exceed a length of 30m!
- The D050-1Z00140LZ09 must not be operated in the field with the lid open!
- The D050-1Z00140LZ09 cannot be operated without a power supply unit.
- To ensure the housing is properly sealed, each of the 3 cable screw connections must only hold a single cable.



Connection of the sensors and power supply (view without power supply unit)

1 Mini-B USB (only for debug)	4 Cable gland (cable diameter of 5-10 mm)
2 RS232 interface (7-pin JST connector)	5 Earth connection (min. requirement for earth cable: 4 mm ²)
3 Main terminal block (split into 2x 2pol., 2x 3pol., 1x 6pol.)	6 Shield connection terminal (cable diameter 3-8mm)

Assignment of the RS232 interface

1	SHIELD	Cable shielding
2	GND	Ground
3	RTS	RTS line of the RS232 interface
4	CTS	CTS line of the RS232 interface
5	RXD	RXD line of the RS232 interface
6	TXD	TXD line of the RS232 interface
7	VEXT _{RS232}	Switchable sensor supply (3,3 V)

Assignment of the main terminal block

V IN	External supply or charging voltage		
GND	Ground (external supply or charging voltage)		
NO		Isolated switch contact	
CC			
VEXT	Switchable sensor supply (3,3 V)		
GND	Ground		
UI 1	Universal input 1		
UI 2	Universal input 2		
UI3/A+	Universal input 3/ RS485 A ¹⁾		
UI 4/B-	Universal input 4 / RS485 B ¹⁾		
GND	Ground		
VOUT	Switchable and adjustable sensor supply (5...24 V)		
GND	Ground		
RTD+		Clamps for the external temperature sensor (two or three wires)	
RTD-			
TCOM			

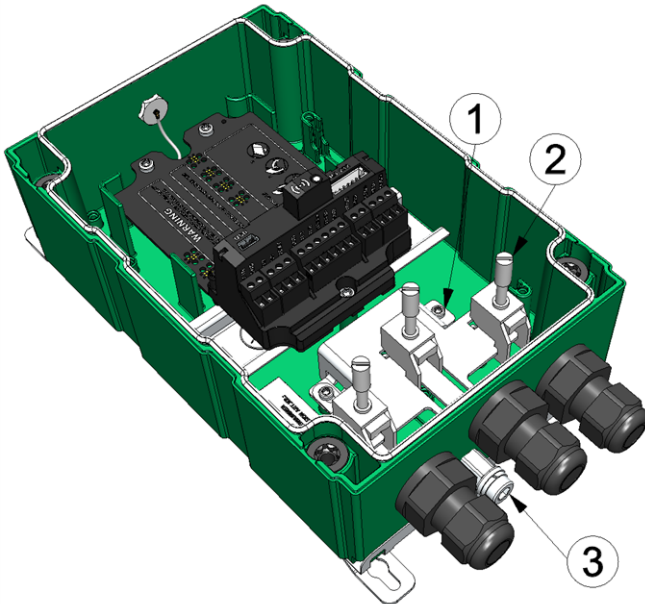
¹⁾ The RS485 interface is only available if the universal inputs 3 and 4 are not used.

The following table contains the conditions to be observed when connecting cables to the terminals of the D050-1Z00140LZ09 :

Nominal cross-section	1,5 mm ²
Cross-section for solid wire	0,14...1,5 mm ²
Cross-section for stranded wire	0,14...1,5 mm ²
Length to be stripped	9 mm
Torque	0,22...0,25 Nm

6.6.2.1 Earthing of sensor cables

If the shield of a sensor cable requires earthing or needs to be included in the earthing concept of the facility, the Electrical bonding and cable support for myDatalogEASY IoT can be used. This extension set installed in the clamping space includes 3 shield connection terminals and adds an external earthing connection for the connection with the earth potential of the facility to the D050-1Z00140LZ09 .



Earthing of sensor cables (view without power supply unit)

1 Electrical bonding and cable support	3 Earth connection (minimum requirement for the earth cable: 4 mm ²)
2 Shield connection terminal (cable diameter 3-8mm)	

6.6.2.2 Mains operation (230VAC)



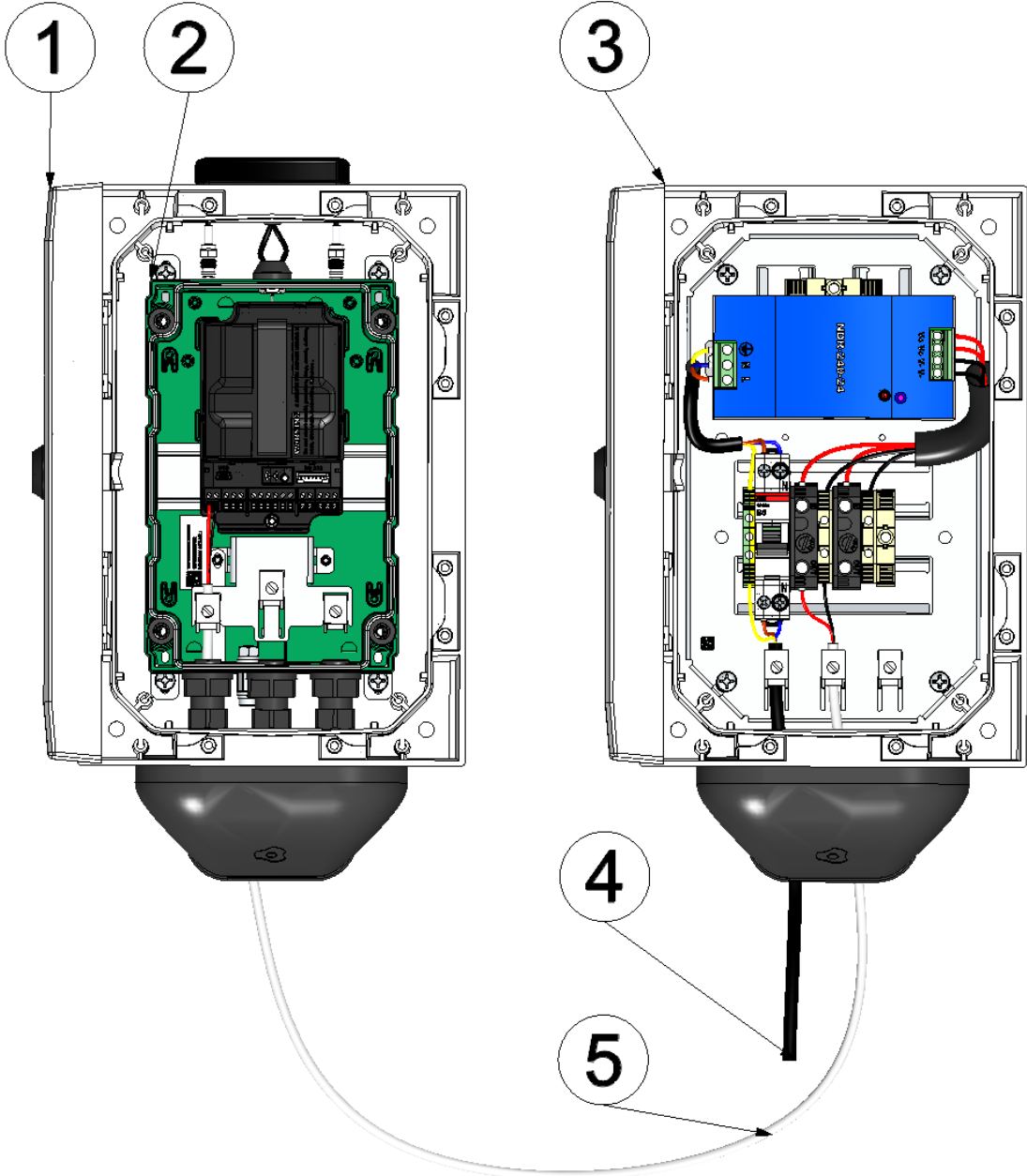
Danger: Deadly electric shock hazard. Only qualified personnel should undertake the installation described in this chapter of the operating instructions.



Attention: Hazardous electric voltage can cause electric shock or burns. Always switch off all of the used power supplies for the device before installing it, completing any maintenance work or resolving any faults.

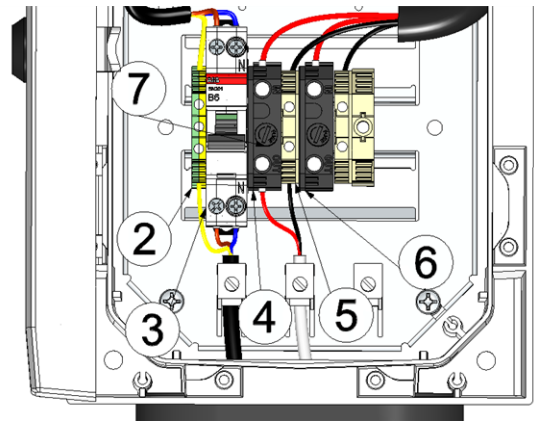
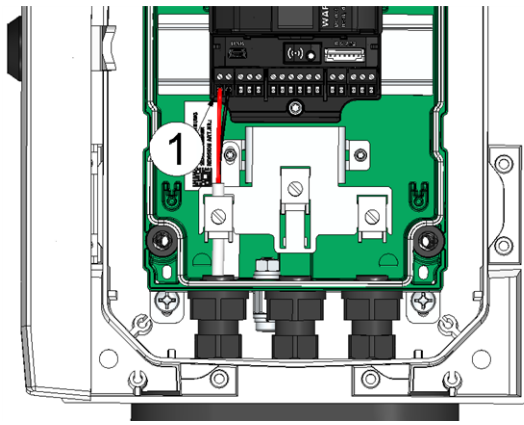
6.6.2.2.1 External power supply unit "Power supply housing "

If an existing 230VAC supply circuit should be used to supply an additional device (e.g. the heating of a rain sensor) besides the D050-1Z00140LZ09 with DC voltage, the "Power supply housing "(301442) can be used. It has two separately secured 24VDC voltage outputs (T2A 250V for transmission devices, T10A 250V for e.g. heating).



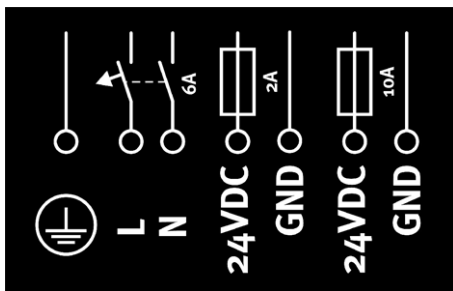
Connecting the Power supply housing to the D050-1Z00140LZ09

1 Housing for outdoor installation 300x200x150mm (optional)	4 230VAC supply lines
2 D050-1Z00140LZ09	5 24VDC line to supply the D050-1Z00140LZ09
3 Power supply housing	



Connecting the Power supply housing to the D050-1Z00140LZ09 (detailed view)

1 Connection for the external supply or charging voltage of the D050-1Z00140LZ09	5 Ground connection
2 Earthing connection	6 24VDC voltage output for heating
3 Circuit breaker	7 Fuse recess
4 24VDC voltage output for transmission device	



Connection diagram

Assignment of the terminals

	230VAC input voltage	Protective conductor
L		Phase
N		Neutral conductor
24VDC	Transmission device	24VDC voltage output (T2A 250V fuse)
GND		Ground
24VDC	Heating	24VDC voltage output (T10A 250V fuse)
GND		Ground

6.6.3 Connecting the mobile network antenna**Important:**

- To ensure the correct functionality, only use antennas that are supplied by the manufacturer.
- When using extension cables, the total length of the cable connection to the antenna must not exceed 30 m.

The standard antenna (Portable antenna multi band FME-F , 206.826) is directly attached to the antenna connector (see "Front of the D050-1Z00140LZ09 " on page 17) of the D050-1Z00140LZ09 . In the event of a low radio signal strength, you can use the Dome antenna multi band FME-F 3m(301211).

If the distance between the antenna position and the D050-1Z00140LZ09 is too great, you can use a 5 m Extension cable for antenna FME-F/FME-M 5m (206.805).

6.6.4 Technical details about the universal inputs

Note: The universal inputs 3 and 4 are only available if the onBoard RS485 interface is not used

Tip: The universal inputs are not electrically isolated.

6.6.4.1 0/4 to 20mA mode

Tip: Above 23,96 mA, the relevant input becomes highly resistive (safety shutdown to prevent damage to the universal input).

Resolution	6,3 μ A
I _{max}	23,96 mA
Load	96 Ω

6.6.4.2 0 to 2V mode

Resolution	610 μ V
U _{max}	2,5 V
Load	10k086

6.6.4.3 0 to 10V mode

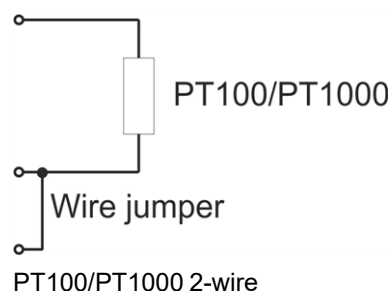
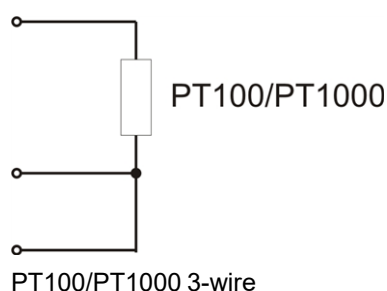
Resolution	7,97 mV
U _{max}	32 V
Load	4k7

6.6.4.4 Standard digital modes (PWM, frequency, digital, counter)

General	U _{max}	32 V
	Low	<0,99 V
	High	>2,31 V
	Load	10k086
PWM	Measurement range	1...99 %
	f _{max}	100 Hz
	Minimum pulse length	1 ms
Frequency	Measurement range	1...1000 Hz
Counter	Minimum pulse length	1 ms

6.6.5 Technical details about the PT100/1000 interface

The interface for the external temperature sensor automatically detects whether a PT100 or PT1000 is being used. It is also possible to use three- or two-wire sensors. An additional link is required on two-wire sensors (see "PT100/PT1000 2-wire" on page 45).



6.6.6 Technical details about the RS232 interface

Note: The RS232 interface of the D050-1Z00140LZ09 is compatible with standard TIA/EIA-232-F.

The output drivers are protected against overloading and are not damaged by a short circuit to the GND or +/-15 V. The inputs are equipped with a 5 kΩ load resistance.

Baud rate	600-115200
Stop bits	1, 2
Parity	N, E, O
Data bits	7, 8
Flow control	Off RTS/CTS

The direction of the signals corresponds to that of a DTE (e.g. PC).

Switching thresholds

Signal	Type	Low	High
TXD	O	-5,4 V	5,4 V
RXD	I	<0,8 V	>2 V
CTS	I	<0,8 V	>2 V
RTS	O	-5,4 V	5,4 V

6.6.7 Technical details about the RS485 interface

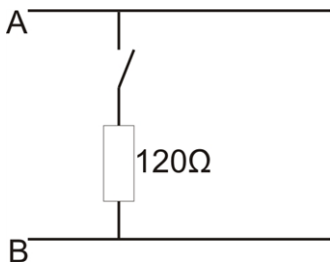
Note:

- The RS485 interface corresponds to standard EIA-485.
- The RS485 interface is only available if the universal inputs 3 and 4 are not used.

The RS485 interface of the D050-1Z00140LZ09 includes an input common mode range that covers the full area specified for RS485 (-7 V...+12 V). Higher voltages damage the interface. Differential signals of more than +/-200 mV within the specified input common mode range are detected correctly. In send mode, the output signal is in the range of 1,5...3,3 V.

Baud rate	600-115200
Stop bits	1, 2
Parity	N, E, O
Data bits	7, 8
Load resistance	Off 120 Ω

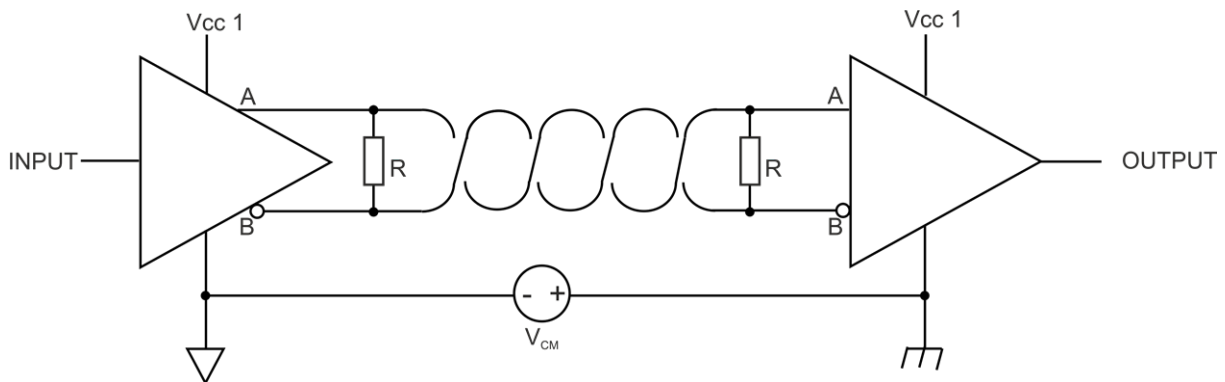
The 120 Ω load resistance between RS485 A and B can be activated using the software.



Schematic diagram of the switchable load resistance

The RS485 interface has no clamp resistances (pull up to RS485 A and pull down to RS485 B). Both connections of the RS485 interface are equipped with voltage and current limitations. The voltage limitation circuit ensures that in receive mode (i.e. inactive output driver), both data lines (RS485 A and RS485 B) are pulled to ground, provided that a connected Modbus server does not actively specify the voltage levels. This can be done by the output driver of the Modbus server or by clamp resistors built into the Modbus server.

Tip: Additional explanation regarding the connection of two RS485 bus participants



Schematic diagram: Connection of two RS485 bus participants

A problem occurs if there is no connection between the GND potentials of the sender and recipient. A common mode voltage (V_{CM}) occurs in this case. The GND potential difference must not exceed max. ± 7 V. Higher voltages will damage the interface. Temporary overvoltages (ESD, EFT and surge) are, however, absorbed by protective circuits.

Note: The common mode input voltage range of -7 V... $+12$ V specified for the RS485 is determined from the max. permissible GND potential difference (± 7 V) and the max. permissible output voltage range of $0...5$ V for RS485.

6.6.8 Technical details about the USB interface

The connection to a PC is established via the USB slave interface. It is only designated for the communication with the DeviceConfig configuration program. The DeviceConfig configuration program can be downloaded free of charge from the following website:

www.microtronics.com/deviceconfig

Important: *If the antenna of the device is earthed or connected to the ground potential of another object (e.g. installation on a control cabinet), remove the antennas before you connect the device with the USB interface of a PC. Otherwise, this can cause a potential displacement between the ground of the antenna and the ground of the PC, which could damage the USB interface of the device.*

6.6.9 Technical details about the local radio interface

The connection to a compatible smartphone is established via the local radio interface. Communication is only possible via the "OnSite Companion" smartphone app. However, the application can also be accessed as a progressive web app at the following address:

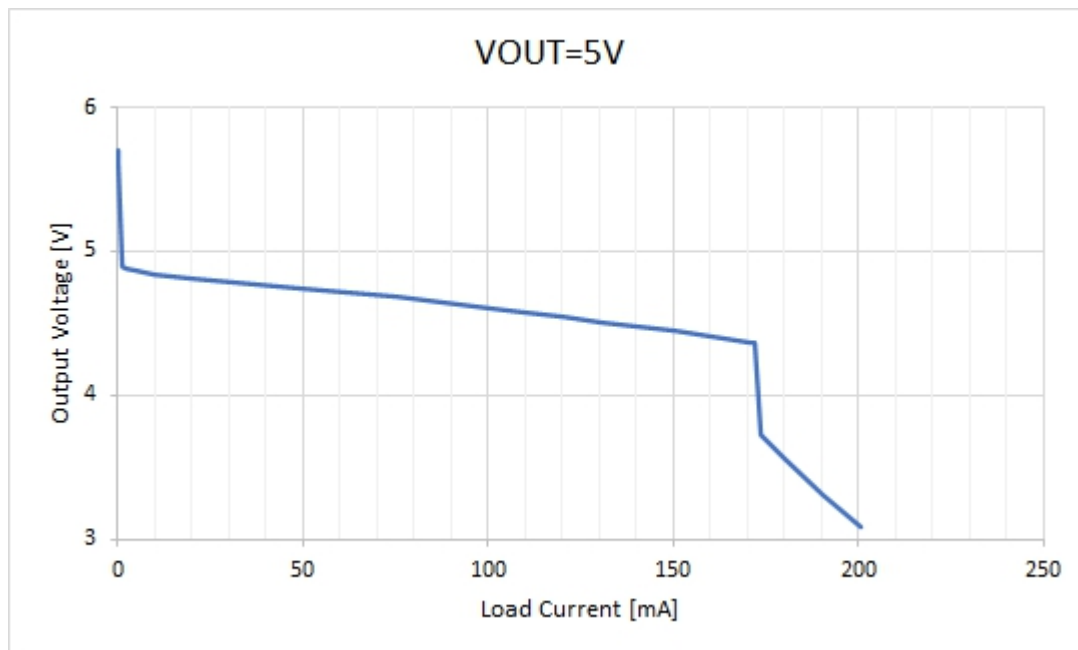
<https://companion.microtronics.com/>

6.6.10 Technical details about the outputs

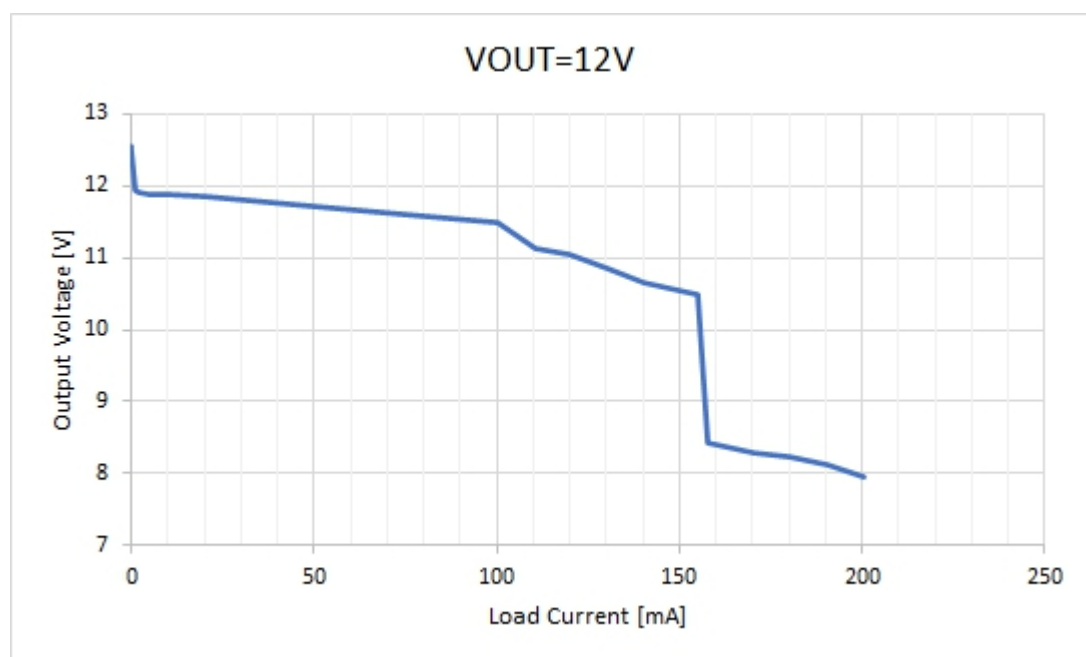
6.6.10.1 Switchable sensor supply VOUT

Tip: *The switchable sensor supply output is short-circuit-proof.*

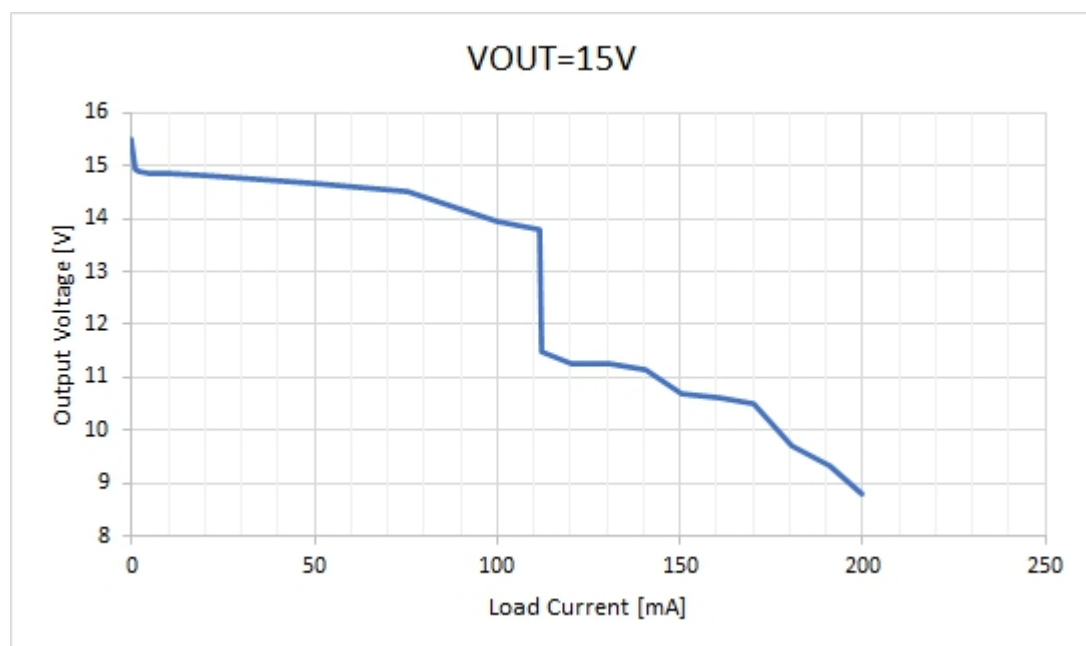
The output voltage can be varied in the range of 5...24 V using the software.



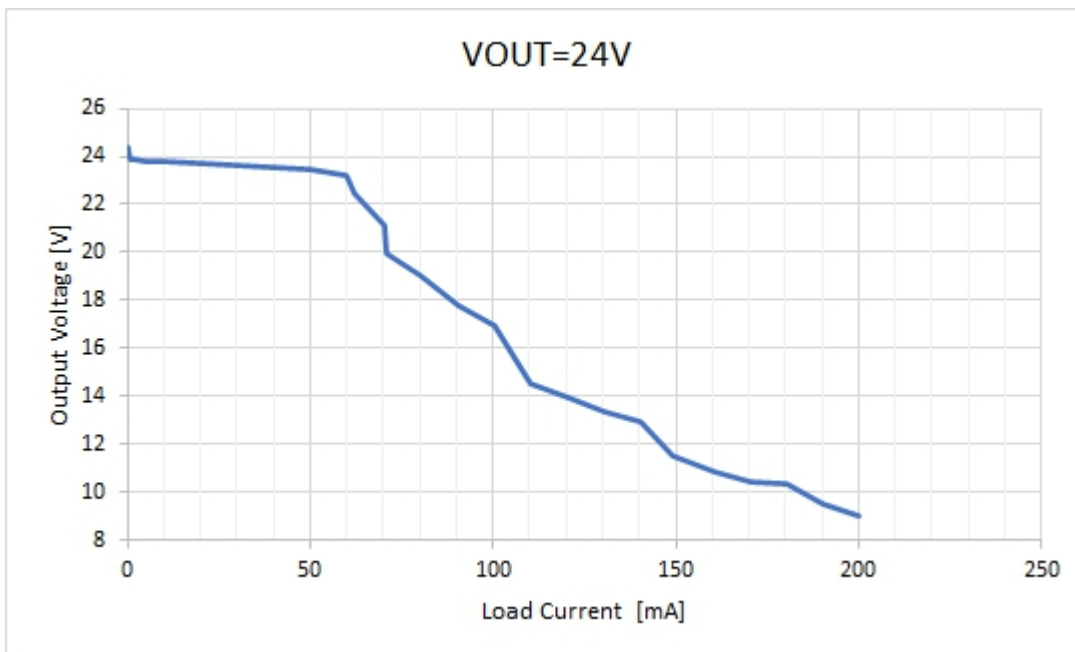
Output voltage characteristics subject to the load current for VOUT = 5V



Output voltage characteristics subject to the load current for VOUT = 12V



Output voltage characteristics subject to the load current for VOUT = 15V



Output voltage characteristics subject to the load current for $V_{OUT} = 24V$

6.6.10.2 Switchable sensor supply VEXT

Tip: The switchable sensor supply output is short-circuit-proof.

The switchable sensor supply VEXT is applied to the main terminal block (see "Connecting the sensors, actuators and power supply" on page 39).

U_{out}	3,3 V
I_{max}	180 mA

6.6.10.3 Switchable sensor supply VEXT_{RS232}

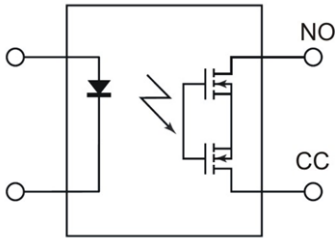
Tip: The switchable sensor supply output is short-circuit-proof.

The switchable sensor supply VEXT_{RS232} is applied to the connector of the RS232 interface (see "Connecting the sensors, actuators and power supply" on page 39).

U_{out}	3,3 V
I_{max}	180 mA

6.6.10.4 Isolated switch contact (NO, CC)

Important: The user must ensure that the current on the isolated switch contact does not exceed 130 mA .



Equivalent circuit diagram for the isolated switch contact

$I_{\max}$	130 mA
$U_{\max}$	32 V
R_{on}	35 Ω
$f_{\max}$	1000 Hz

6.6.11 Technical details about energy management

The device will work until 3,4 V as intended, if the D050-1Z00140LZ09 is operated without an external supply or charging voltage (V IN). The modem is deactivated from this threshold and the "UV MODEM LOCKOUT" log entry is entered in the device log. This means that the connection is disconnected if the device is in "online" mode or is logged in to the mobile network ("Interval & wakeup" mode). Once this threshold has been reached, a connection establishment cannot be triggered manually nor automatically via the system. The remaining functions are not affected by this.

Only once the internal supply voltage falls below 2,9 V , does the D050-1Z00140LZ09 switch to energy saving mode in which only the charge control is active. In this case, the charge control tries to charge the rechargeable battery up to 3,8 V . The "UV_LOCKOUT" log entry is also entered in the device log when activating energy saving mode. The rechargeable battery of the power supply unit can be recharged again if the device is in energy saving mode and an external supply or charging voltage (V IN) is connected. Otherwise the D050-1Z00140LZ09 remains in this energy saving mode until the rechargeable battery is completely discharged.

Energy saving mode is terminated and all of the functions except for the communication with the myDatenet server are resumed, once the rechargeable battery voltage exceeds 3,2 V when recharging. The modem continues to remain inactive until the rechargeable battery voltage exceeds 3,5 V . Only then can a mobile network connection be established again and the device resumes normal operation.

When an external supply or charging voltage (V_{IN}) is used, the charge control ensures that the rechargeable battery of the power supply unit is charged. The following operating states are possible:

- Active energy saving mode :

The charge control tries to charge the rechargeable battery to 3,8 V or to maintain the voltage at this level.

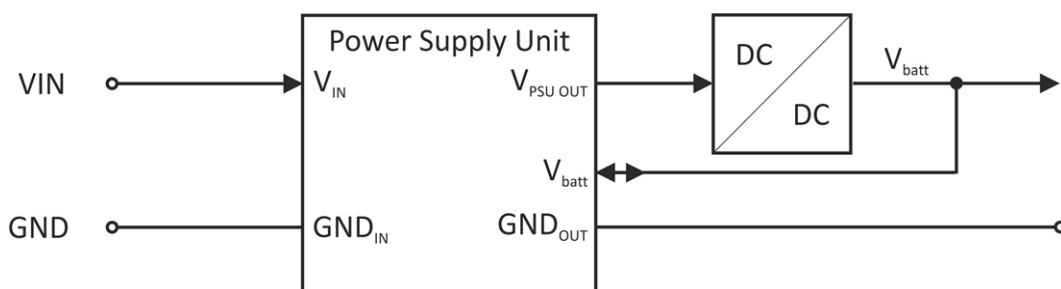
- Active mode:

The functionality of the charge control can be selected via software. There are three options available:

- Off: Charge control deactivated
- Normal: The charge control is activated and the rechargeable battery is charged to the maximum voltage if the state of charge of the rechargeable battery for the power supply unit falls below 50%. The charge control is then deactivated again. This is designed to optimise the service life of the rechargeable battery.
- Solar: The rechargeable battery of the power supply unit is charged to the maximum voltage if the supply or charging voltage V_{IN} exceeds 16 V . The charge control then remains deactivated for 12 hours unless the state of charge of the rechargeable battery for the power supply unit drops below 95%. This charge strategy is recommended if a solar field is used to charge the rechargeable battery.

The charge control reads out any additional information that is required, such as the maximum voltage and ambient temperature at which charging is permitted, directly from the memory of the power supply unit. In both charge strategies, recharging is only completed if the ambient temperature does not exceed the permissible range of the charging temperature. The permissible charging temperature is specified in the factsheet for the relevant power supply unit.

6.6.12 Technical details about the energy supply



Schematic diagram of the energy supply

V_{IN}	12...32 VDC
Power consumption (without sensors)	typ. <1 mW ¹⁾ max. 12 W
Reverse voltage protection	No ²⁾

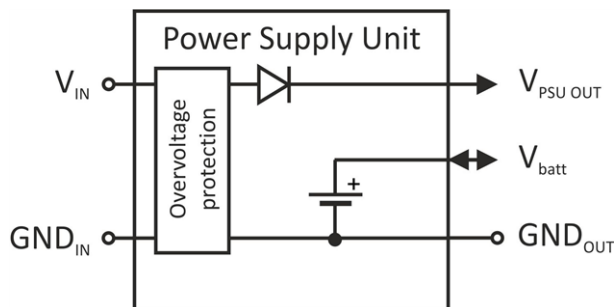
¹⁾ applies to continuous operation if the possibly available rechargeable battery of the power supply unit is fully charged

²⁾ The reverse voltage protection is part of the protective circuit in the power supply units.

Regardless of whether an external supply or charging voltage is provided (e.g. by a power supply unit), a power supply unit must always be installed in the device. Depending on the type, the power supply unit contains a rechargeable battery (PSU413D+ AP , a battery (PSU713 BP), or only a protective circuit (PSU DC). An external supply or charging voltage is not required if the power supply unit is equipped with a battery.

6.6.12.1 PSU413D+ AP (300524)

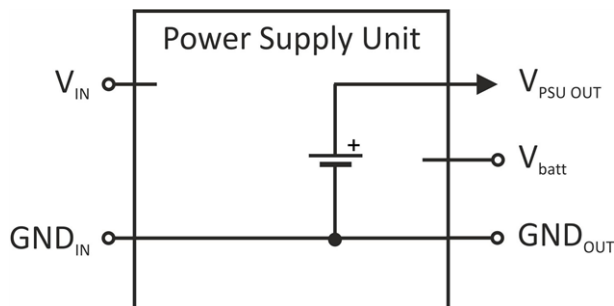
V IN	Optional
Protective circuit (V IN)	2 kV overvoltage protection Reverse voltage protection
Capacity	13,6 Ah 50,32 Wh
Type	Li-Ion
Rechargeable	Yes
Nominal voltage of the rechargeable battery	3,75 V
Operating temperature	-20...+60 °C
Charging temperature	-20...+60 °C
Storage temperature	0... +30 °C



Block diagram of the PSU413D+ AP

6.6.12.2 PSU713 BP (300526)

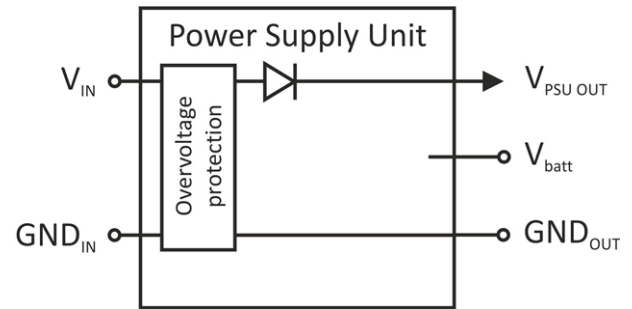
V IN	Not required
Protective circuit (V IN)	---
Capacity	13 Ah 93,6 Wh
Type	Li-SOCl2
Rechargeable	No
Nominal voltage	7,2 V
Operating temperature	-20...+50 °C
Charging temperature	---
Storage temperature	+20...+25 °C



Block diagram of the PSU713 BP

6.6.12.3 PSU DC (300529)

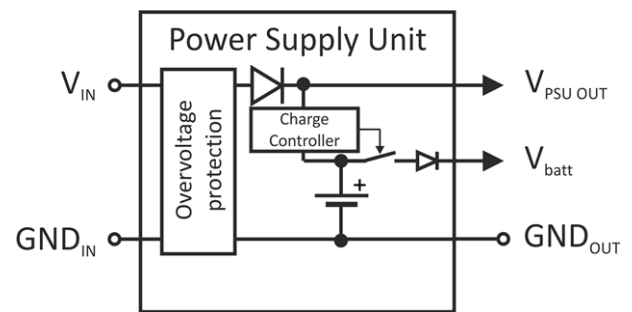
V IN	Required
Protective circuit (V IN)	2 kV overvoltage protection Reverse voltage protection
Capacity	---
Type	---
Rechargeable	no
Nominal voltage	---
Operating temperature	-20...+60 °C
Charging temperature	---
Storage temperature	0... +35 °C



Block diagram of the PSU DC

6.6.12.4 PSU DC+ (300798)

V IN	Required
Protective circuit (V IN)	2 kV overvoltage protection Reverse voltage protection
Capacity	900 mAh 3,33 Wh
Type	Li-Po
Rechargeable	yes
Nominal voltage	3,7 V
Operating temperature	-20...+60 °C
Charging temperature	0...+40 °C
Storage temperature	0... +35 °C



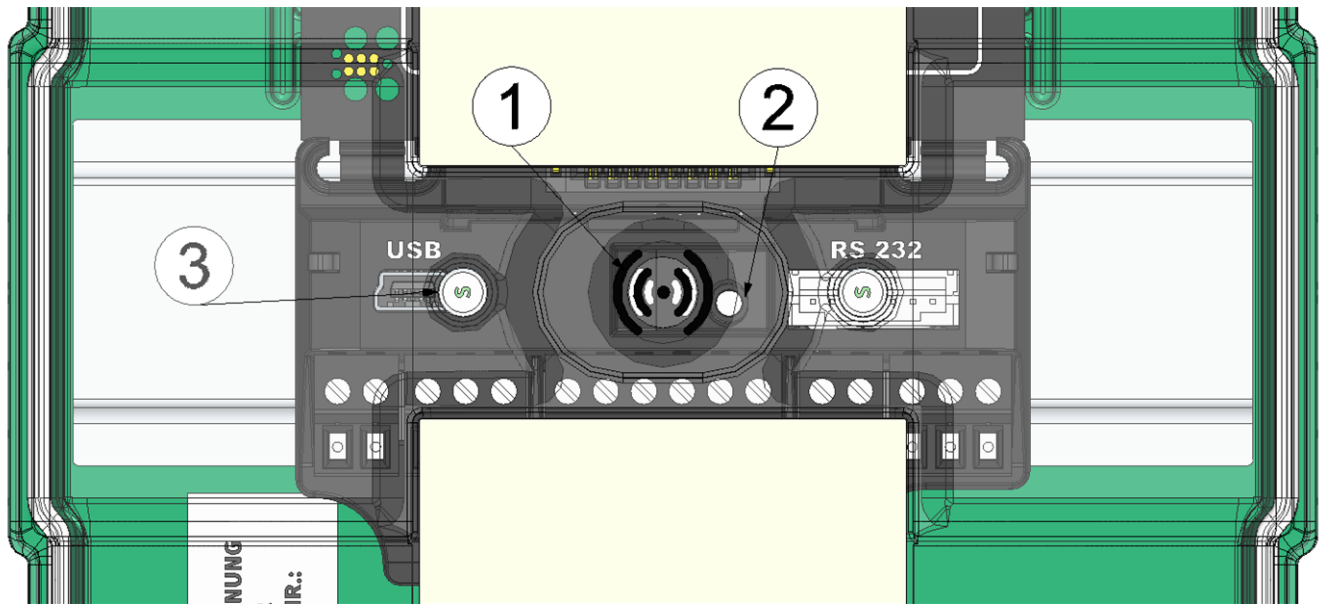
Block diagram of the PSU DC+

6.6.13 Technical details about the system time

The D050-1Z00140LZ09 is equipped with a hardware real-time clock that has its own buffer battery with an expected service life of >10 years. The system time continues to run even if the power supply unit is removed. This means that following recommissioning, valid time stamps for the measurement and log data can be generated immediately. Additionally, the system time is synchronised with the server each time a connection to the myDatenet server is established.

Chapter 7 Operating elements

The operating elements of the D050-1Z00140LZ09 can still be operated when the housing is closed.

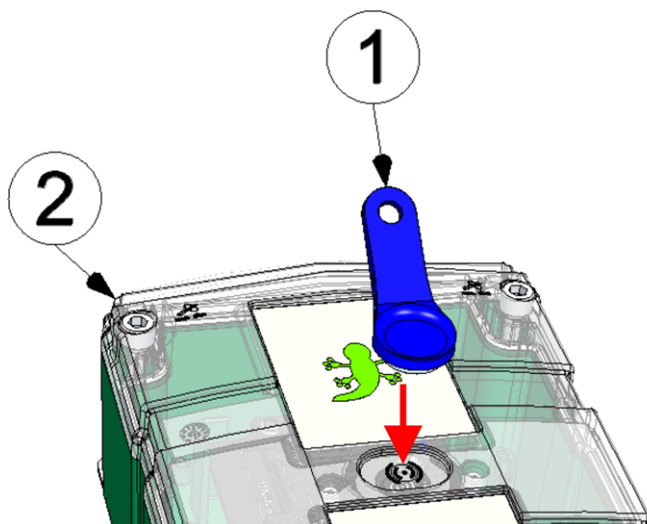


Operating elements

1 Solenoid switch	2 Three-colour LED
3 Lid reed contact	

7.1 Solenoid switch

The MDN Magnet (206.803) is required to operate the solenoid switch.



Operating the solenoid switch

1 MDN Magnet (206.803)	2 D050-1Z00140LZ09
------------------------	--------------------

Chapter 8 Maintenance

Important: To prevent any damage to the device, the work described in this section of the instructions must only be performed by qualified personnel.

The device must be deenergised before any maintenance, cleaning and/or repair work.

8.1 General maintenance

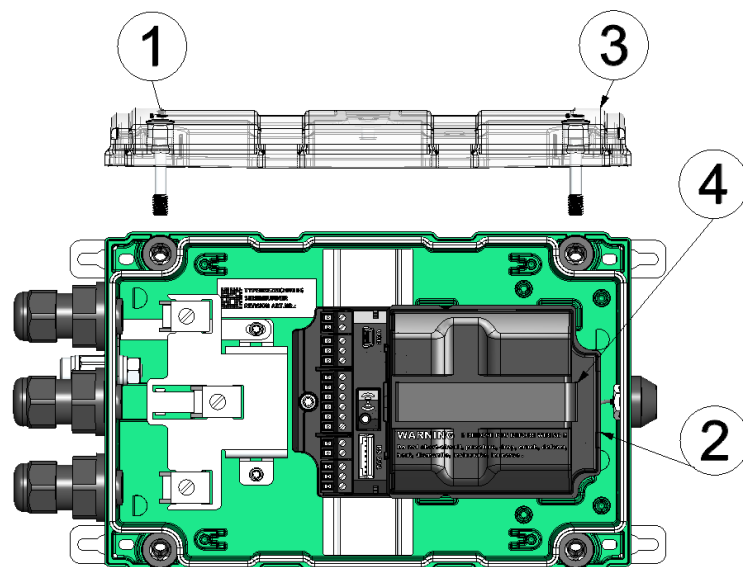
- Regularly check the D050-1Z00140LZ09 for mechanical damage.
- Check all of the connections for leaks or corrosion on a regular basis.
- Check all of the cables for mechanical damage at regular intervals.
- Clean the D050-1Z00140LZ09 with a soft, moist cloth. Use a mild cleaning agent, if necessary.

8.2 Replacing the power supply unit

Important: A dry location must be used to replace the power supply unit. If this is not possible, protect the opened device against penetrating moisture using suitable means.



How-To-Video: [Replacing the PSU and the silica gel pouch](#)



Opening the D050-1Z00140LZ09

1 Hexagon socket screw M6x30	3 Housing cover
2 Power supply unit	4 Strap to remove the power supply unit

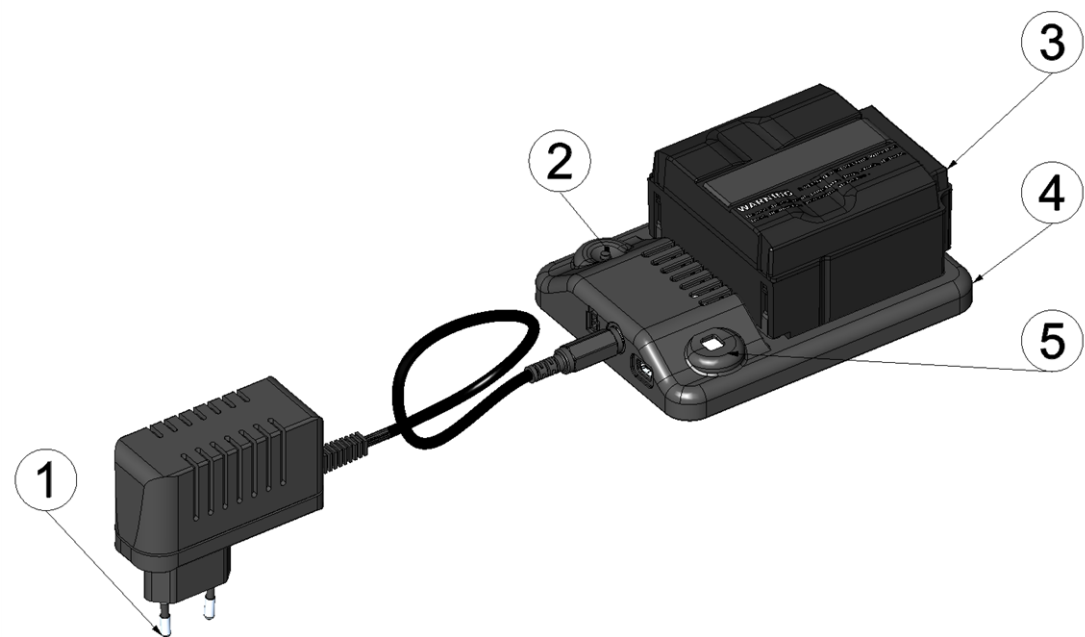
8.2.1 Charging the power supply unit

All power supply units with an integrated and rechargeable energy store are delivered with a maximum charge of 30% in accordance with applicable transport regulations. If you use an external charging voltage (V IN) during operation, the power supply unit is constantly charged by the charge controller integrated in the D050-1Z00140LZ09 .

If no external charging voltage (V IN) is available during operation, the power supply unit must be fully charged before initial use.

For instructions on removing the rechargeable battery, see "Replacing the power supply unit" on page 57.

Important: Only use the PSU Charger (300697) to charge the power supply units. The charger specifications must be observed. The use of other chargers can destroy the power supply unit, for example, causing the cells to leak or an explosion, etc.



Charger with power supply unit

1 Plug-in power supply (included in the scope of delivery of 300697)	4 PSU Charger (300697)
2 Button (reserved for extension)	5 Status LED of the PSU Charger Possible states of the status LED: off: no PSU inserted Flashing green: PSU is being charged Green: Charging completed Flashing red 1x every 5 seconds: PSU does not contain a rechargeable energy store Flashing red 2x every 5 seconds: PSU damaged Flashing red 3x every 5 seconds: Supply voltage of the charger is too low
3 Power supply unit e.g. PSU413D+ AP (300524)	

The charging process starts as soon as the power supply unit is inserted in the charger. If the status LED on the charger flashes red once every 5 seconds, the power supply unit inserted in the charger does not contain a rechargeable energy store. If the status LED flashes red three times every 5 seconds, the supply voltage of the charger is too low. In this case, check the cable connection between the plug-in power supply and the PSU Charger and check whether the plug-in power supply is correctly connected to an electric socket. If the status LED flashes green, a normal charging process is in progress. The charging process is complete when the status LED turns green.

If the status LED flashes red twice every 5 seconds, the power supply unit is faulty. Possible reasons for this include a broken cable, short circuit or defective cells. In this case, the used power supply unit must be replaced with a new one.

Tip: Rechargeable batteries are wear parts that lose capacity over time. The capacity is also reduced at high or low ambient temperatures and under intensive use.

Note: Ensure that power supply units, especially ones with integrated energy store (rechargeable battery or battery), are disposed of in line with environmental requirements. Power supply units with depleted rechargeable battery or battery can be returned to the manufacturer or handed in at suitable collection points.

8.3 Power supply units with integrated energy store

While power supply units with integrated batteries (e.g. PSU713 BP) are intended for single use and must be disposed of accordingly after depletion, power supply units with integrated rechargeable batteries (e.g. PSU413D+ AP) can be recharged and used again and again. However, the service life of rechargeable batteries is not indefinite. In addition to regular servicing and maintenance, its service life is also dependent on the frequency of use and the operating and storage conditions.

8.4 Services

Microtronics Engineering GmbH offers the following maintenance services for the D050-1Z00140LZ09 :

Description	Order number
Inspection fee	206.395
Cleaning flat	206.355
Software Update	206.555

Chapter 9 Repair & return

Microtronics products are manufactured using quality-assured processes. The Microtronics Engineering GmbH production site is ISO 90001 certified. All products are tested and/or calibrated before being shipped to the customer. This ensures that Microtronics Engineering GmbH products perform to their full capacity upon delivery.

Despite Microtronics Engineering GmbH's most rigorous quality assurance measures, malfunctions may occur as well within as outside the warranty period. In some cases, however, it is not necessary to return the product. Some issues can be resolved remotely by the Support & Service Centre (e.g. via OTA firmware update). If your device shows unexpected behaviour or malfunctions, please proceed as follows:

1. Contact the support & service center (support.microtronics.com)

In the Microtronics Help Center, select the category "Technical support (device)" to create a ticket. Please describe the problem in as much detail as possible to help our staff diagnose the issue. One of our staff members will then contact you and attempt to resolve the problem remotely with you.

2. Wait for the completed RMA form you will receive in response

If it was not possible to resolve the problem remotely, you will receive a completed RMA form that you must enclose with the return shipment. At the bottom of the form, you will also find more detailed information on how to return the product.

3. Return the D050-1Z00140LZ09

Do not dispatch the device until you have received the RMA form and the RMA number noted on it. Microtronics will not reject shipments that arrive without a clearly indicated RMA number or without the enclosed RMA form. However, processing will take significantly longer in such cases.

If you return the D050-1Z00140LZ09 for repair under warranty or outside of warranty, check with your national customs/tax authorities for applicable regulations, procedures and necessary documentation for tax-free return of products. Special customs tariff numbers are usually available to confirm that the item is being returned for repair and has no commercial value.

The customs invoice/shipping documents should clearly state: "Goods being returned to manufacturer for repair – No commercial value". It is mandatory that any returned goods are accompanied by a commercial invoice on headed paper. Microtronics reserves the right to charge the customer for time spent rectifying incorrect customs documents.

Note: *Ensure that the D050-1Z00140LZ09 is packed carefully and securely. Damage incurred during transport is not covered by the warranty and may be subject to a charge.*

Chapter 10 Removal & disposal

Material separation only by qualified personnel!

- Be careful when disassembling the device, you may injure yourself.
- Take the separated components to the appropriate recycling.

Incorrect disposal can cause environmental hazards.

Dispose of the device components and packaging material in accordance with the locally valid environmental regulations for electronic products (e.g. according to European waste code 16 02 14).

1. Disconnect any charging voltage that has been used.
2. Remove the power supply unit with the integrated energy storage (rechargeable or non-rechargeable battery) and dispose of it separately.
3. Disconnect any connected cables using a suitable tool.



Logo of the EU WEEE Directive

This symbol indicates that the requirements of Directive 2012/19/EU regarding the scrap disposal of waste from electric and electronic equipment must be observed. Microtronics Engineering GmbH supports and promotes recycling and environmentally friendly, separate collection/disposal of waste from electric and electronic equipment in order to protect the environment and human health. Observe the local laws and regulations on disposal of electronic waste at all times.

Microtronics Engineering GmbH releases goods brought onto the market in Austria from the obligations via ERA, which means that collection points that cooperate with ERA Elektro Recycling Austria GmbH (<https://www.era-gmbh.at/>) can be used for disposal in Austria.

The device contains a lithium button cell that has been soldered on. It must be removed before disposal or the disposal service must be informed that batteries are still located in the device.

The device includes a battery or rechargeable battery (lithium) that must be disposed of separately.

Chapter 11 Contact information

Support & Service:

Microtronics Engineering GmbH
Hauptstrasse 7
3244 Ruprechtshofen
Austria, Europe
Tel. +43 (0)2756 7718023
support@microtronics.com
www.microtronics.com

Microtronics Engineering GmbH

(Headquarters)

Hauptstrasse 7
3244 Ruprechtshofen
Austria, Europe
Tel. +43 (0)2756 77180
Fax. +43 (0)2756 7718033
office@microtronics.com
www.microtronics.com



Certified by TÜV AUSTRIA: EN ISO 9001:2015, EN ISO 14001:2015, ISO/IEC 27001:2013, EN ISO 50001:2011 for myDatenet | TÜV SÜD: ATEX Directive 14/34/EU

© Microtronics Engineering GmbH. All rights reserved. Photos: Microtronics, shutterstock.com