

logident[®]

UDL120

**Installation & Operating
Instructions**

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#896068

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1. General

The UDL120 contains an integrated RFID antenna for contactless reading of transponders fixed on storage racks. It has been designed for fast and faultless electronic recognition of goods in transit (i.e. palettes) and is increasingly used within electronic inventory control systems.

The reader can be mounted directly onto the fork carrier between the forks of a forklift. Due to its flat mounting height (installation depth only 40 mm) any contact to the transported goods will be avoided. Solid metal side cheeks (optionally available) prevent the reader from being damaged by the transported goods and mounting on buffers provides reasonable absorption of shocks and vibrations.

An ultrasonic sensor in the middle of the housing (optional) detects loading of the forks and reports it to the control unit (terminal) of the forklift. This will initiate a reading process, in which the transponder fixed to the storage rack is being read.

The reading result contains the defined storage position of the rack using the specific transponder ident number and is instantly being reported to the terminal.

The communication between antenna and terminal can either be carried out via cable using RS485 or wireless via Bluetooth™.

For power supply the reader requires a power connection directly at the fork carrier of the lift mast (12...24 V/DC).

As this document is solely intended for application of the UDL120 on forklifts, the metal steel sides (Protection Set 1) are included into all image presentations for reasons of clarity.

2. Technical Data

Dimensions (mm):	172 x 148 x 40
Weight:	approx. 730 g (without steel sides) approx. 1500 g (with steel sides)
Material:	PA6, black (front of housing) PMMA (back of housing) steel (sides; PS1 optional)
Protection Class:	IP 65
Operating Temperature:	-25 °C...+50 °C
Storage Temperature:	-40 °C...+85 °C
Voltage Supply:	12...24 V/DC via M8 (4-pole)
Power Consumption:	7 W (operating status) / 2.5 W (standby)
Transmission Frequency:	865-868 MHz (EU) 902-928 MHz (US)
Antenna:	
Beam Width:	90°
Polarization:	circular (LHCP)
Reading/Writing Distance:	up to 1.5 m, depending on type of transponder and environmental conditions
Radiated Transmit Power:	max. 200 mW E.R.P. (ETSI EN 302 208), 330 mW E.I.R.P. (FCC Part.15), optional
Transponder Protocols:	ISO 18000-6 C EPC Class 1 Gen 2
Interfaces:	RS485 Bluetooth™ Class 1 (optional)
Anticollision:	simultaneous reading of several transponders
Reading Mode:	Dense Reader Mode can be activated
Ultrasonic Sensor:	range up to 70 cm distance
Signalling (optical):	LEDs (yellow, green, red)
Conformity:	
(Exposition of persons against EM fields)	EN 50364
EMV	EN 301 489
Air interface (EU)	EN 302 208 (DRM)

3. Mechanical Dimensions

(All dimensions in mm.)

3.1 Dimensions UDL120 with steel sides

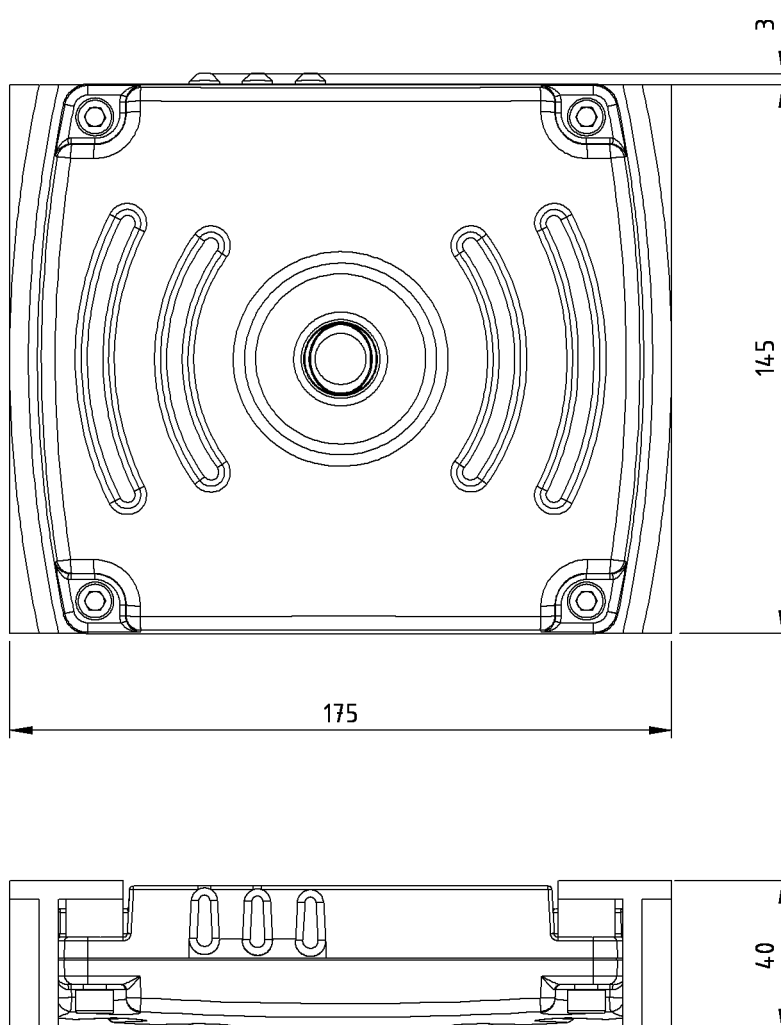


Figure 3.1.1: Mechanical Dimensions of UDL120 with steel sides

3.2 Dimensions UDL120 without steel sides

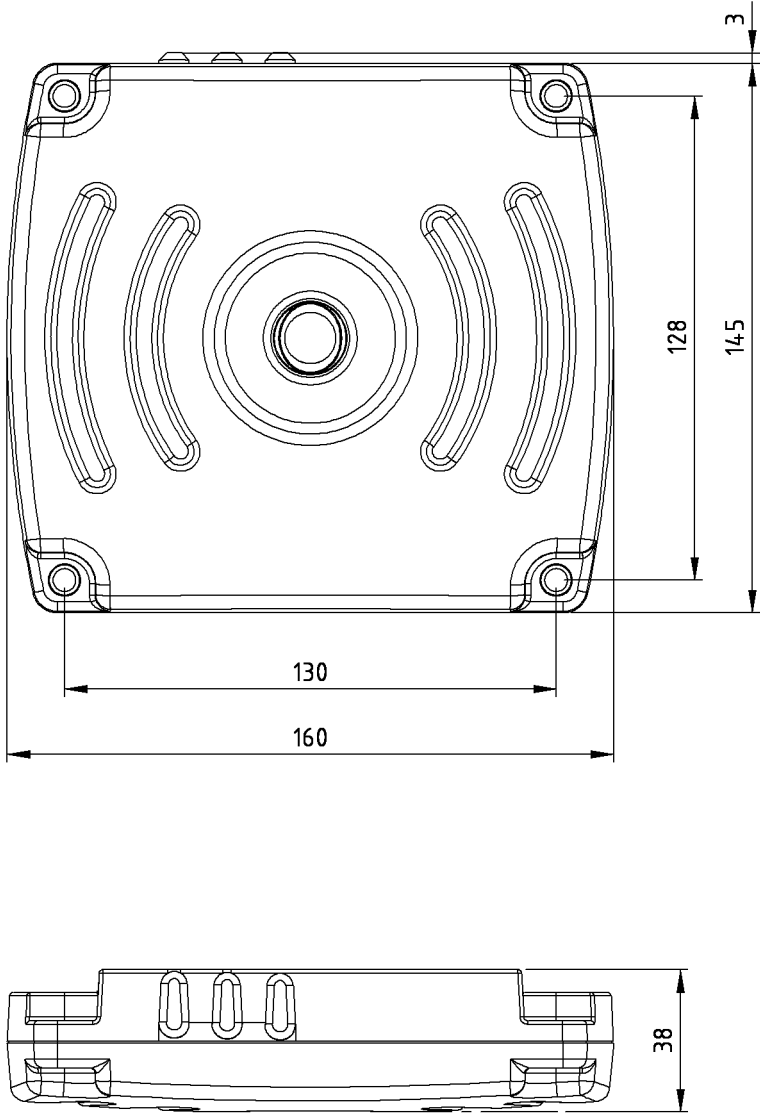


Figure 3.2.1: Mechanical Dimensions of UDL120 without steel sides

3.3 Picture UDL120

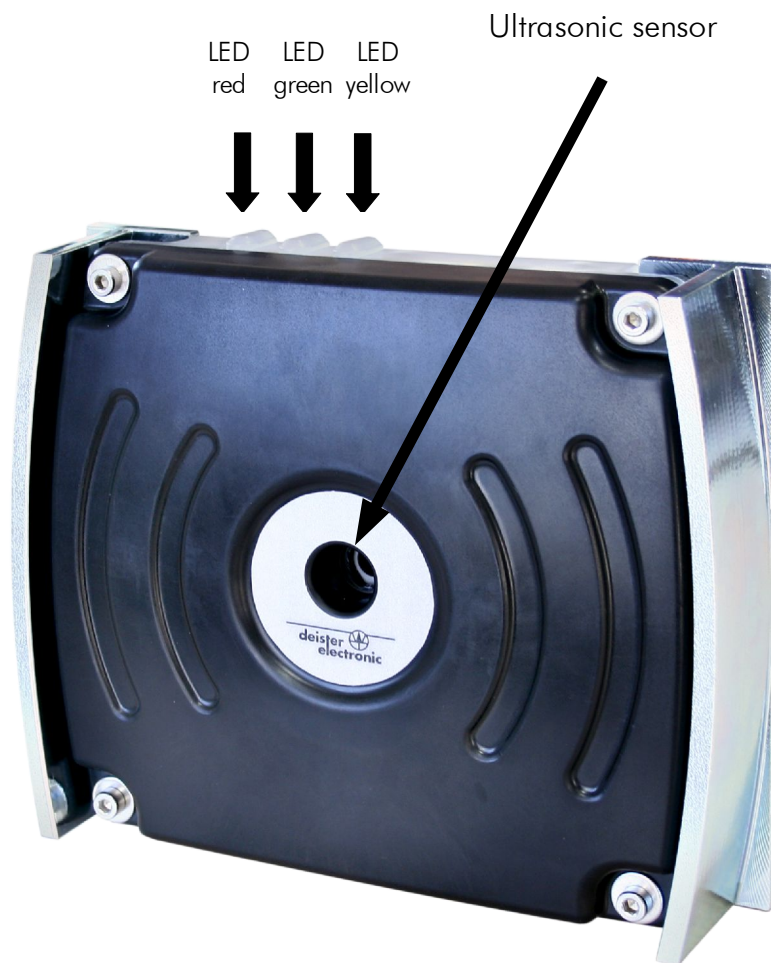


Figure 3.3.1: Picture of UDL120 with LEDs and ultrasonic sensor

4. Wiring

4.1 RS485

The pin assignment for the voltage supply and data transfer via RS485 is as follows:

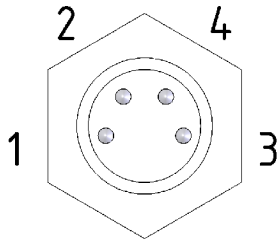


Figure 4.1.1: Pin assignment M8 connector (RS485)

pin assignment (M8):	PIN 1: VCC	(brown)
	PIN 2: RS485 A	(white) --> (optional*)
	PIN 3: GND	(blue)
	PIN 4: RS485 B	(black) --> (optional*)

* In case of communication solely via Bluetooth™ PIN 2 and 4 do not have to be assigned.

5. Mounting on Forklift

5.1 Mounting of UDL120 with steel sides (Protection Set 1)

5.1.1 Mounting steel sides

The mounting of the two steel sides has to be carried out by the customer between the forks of the fork carrier with 3 countersunk head screws (M6) on each side (drilling distances see per drawing):

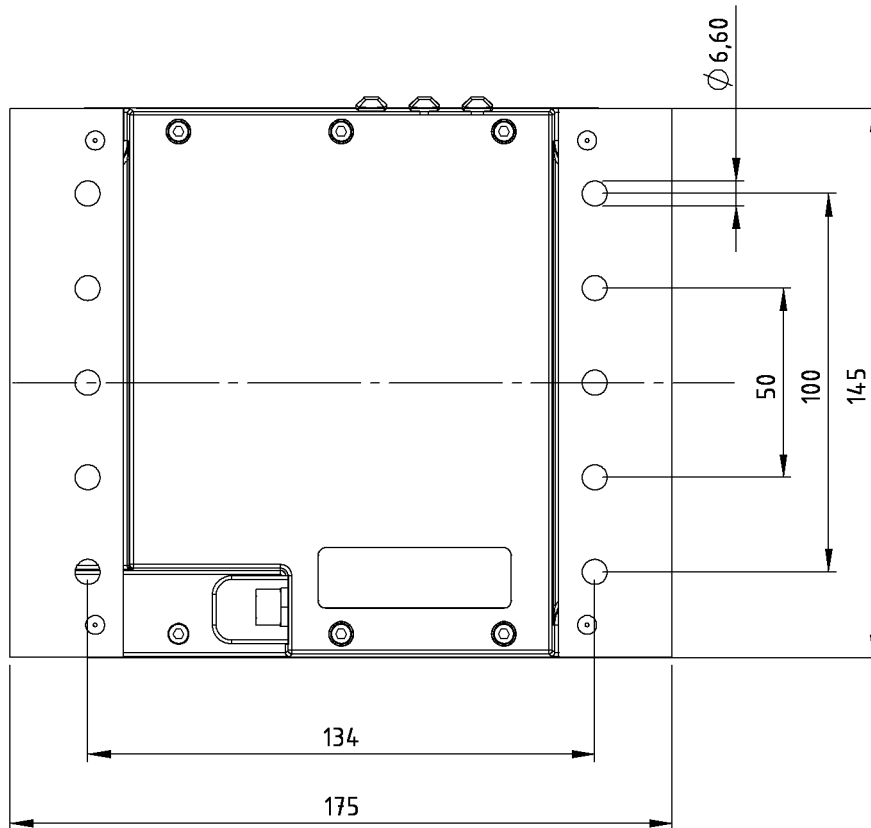


Figure 5.1.1: Mounting UDL120 with steel sides (Protection Set 1)

5.1.2 Drilling Pattern for mounting steel sides

For the drilling pattern scale 1:1 see extra instruction leaflet inside the package.

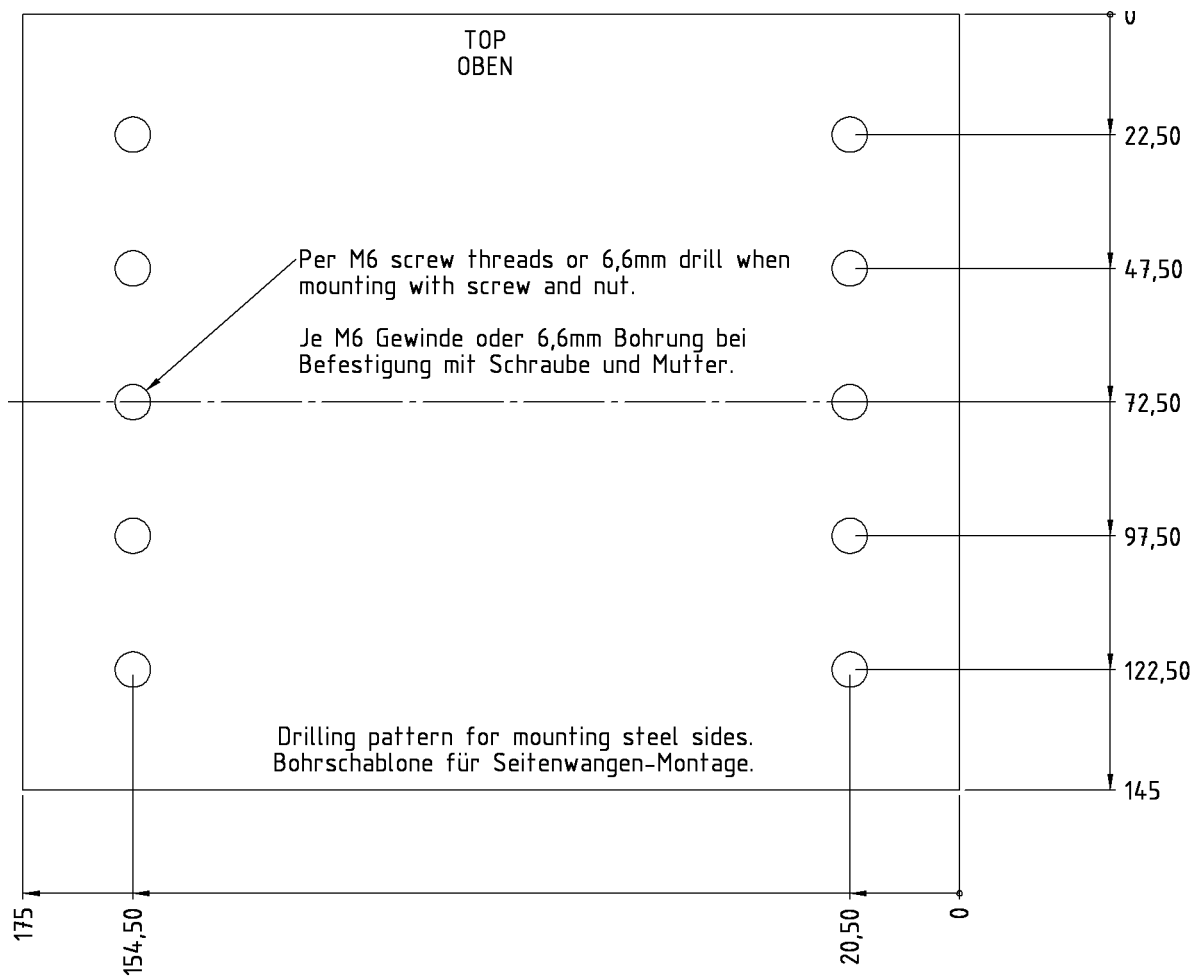


Figure 5.1.2: Drilling Pattern for mounting steel sides to UDL120

5.2 Mounting of UDL120 without steel sides

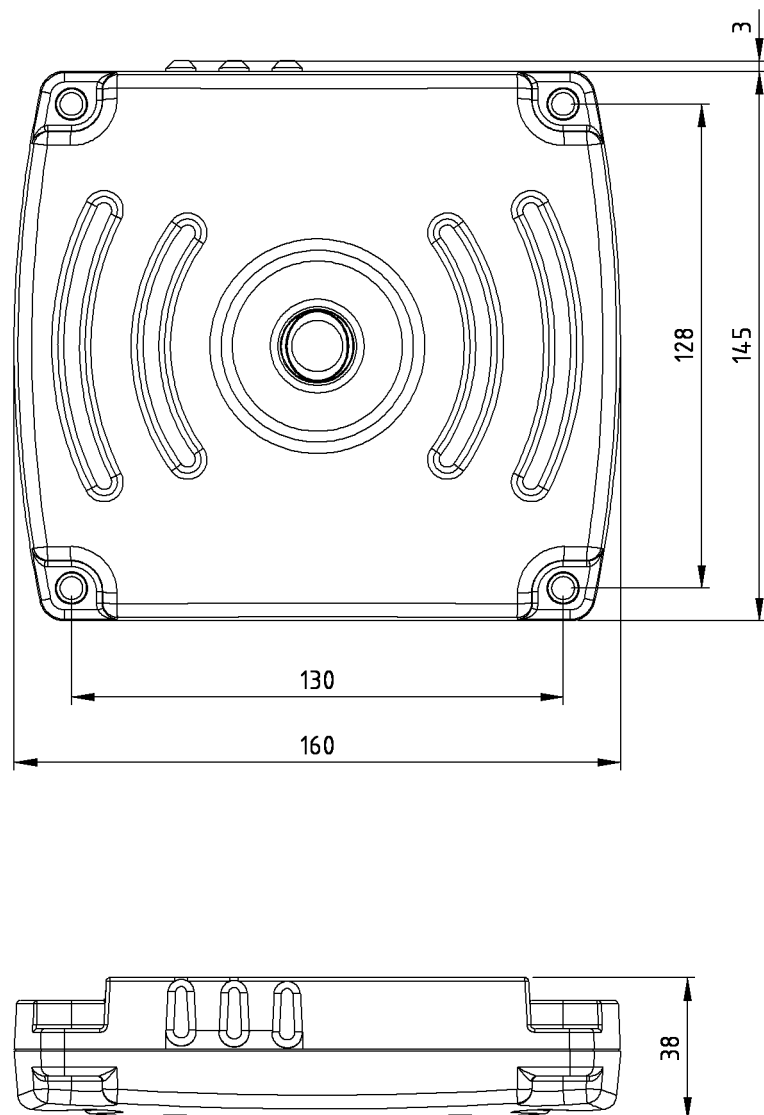


Figure 5.2.1: Mounting UDL120 without steel sides

5.2.1 Drilling Pattern for direct mounting of UDL120

For the drilling pattern scale 1:1 see extra instruction leaflet inside the package.

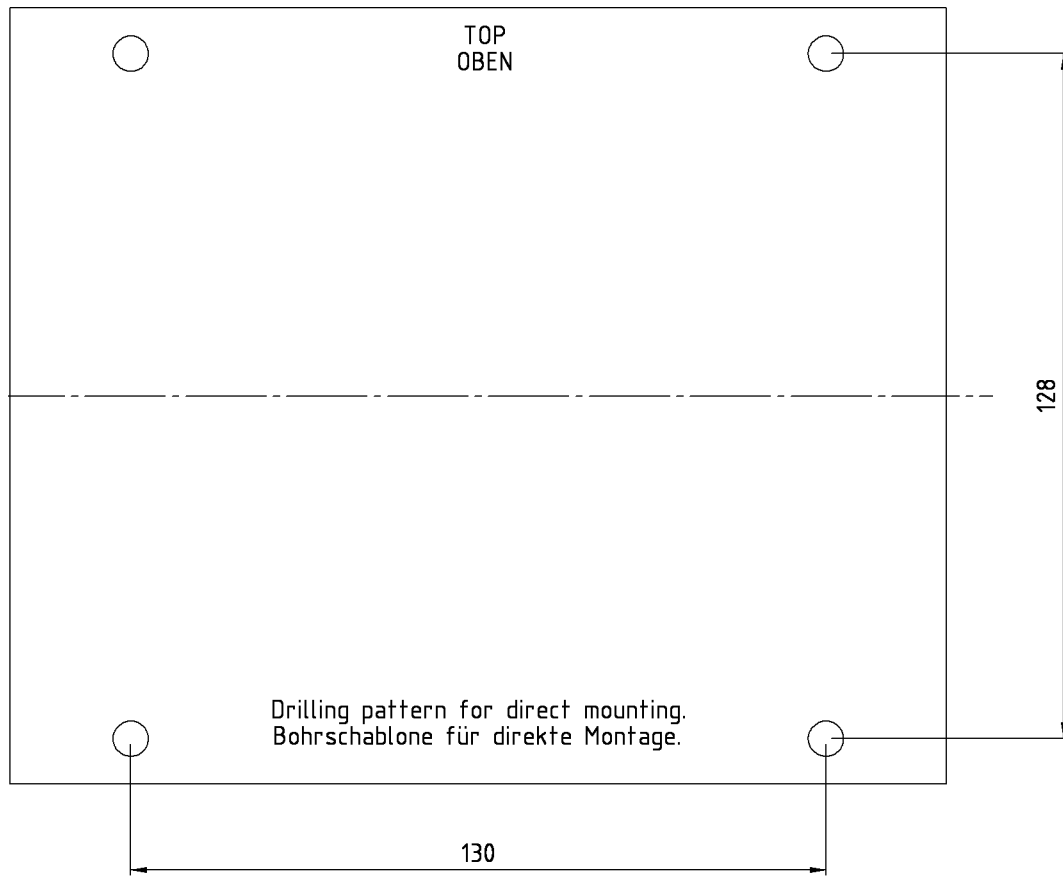


Figure 5.2.2: Drilling Pattern for direct mounting of UDL120

5.3 Mounting UDL120 onto steel sides

Mounting of the reader onto the metal bracket has to be carried out using the 4 supplied screws (DIN 912 cylinder head bolt, allen head screw) and the according washers. For additional absorption of shocks and vibrations the reader has to be mounted onto the steel sides using the four supplied buffers (see picture below):

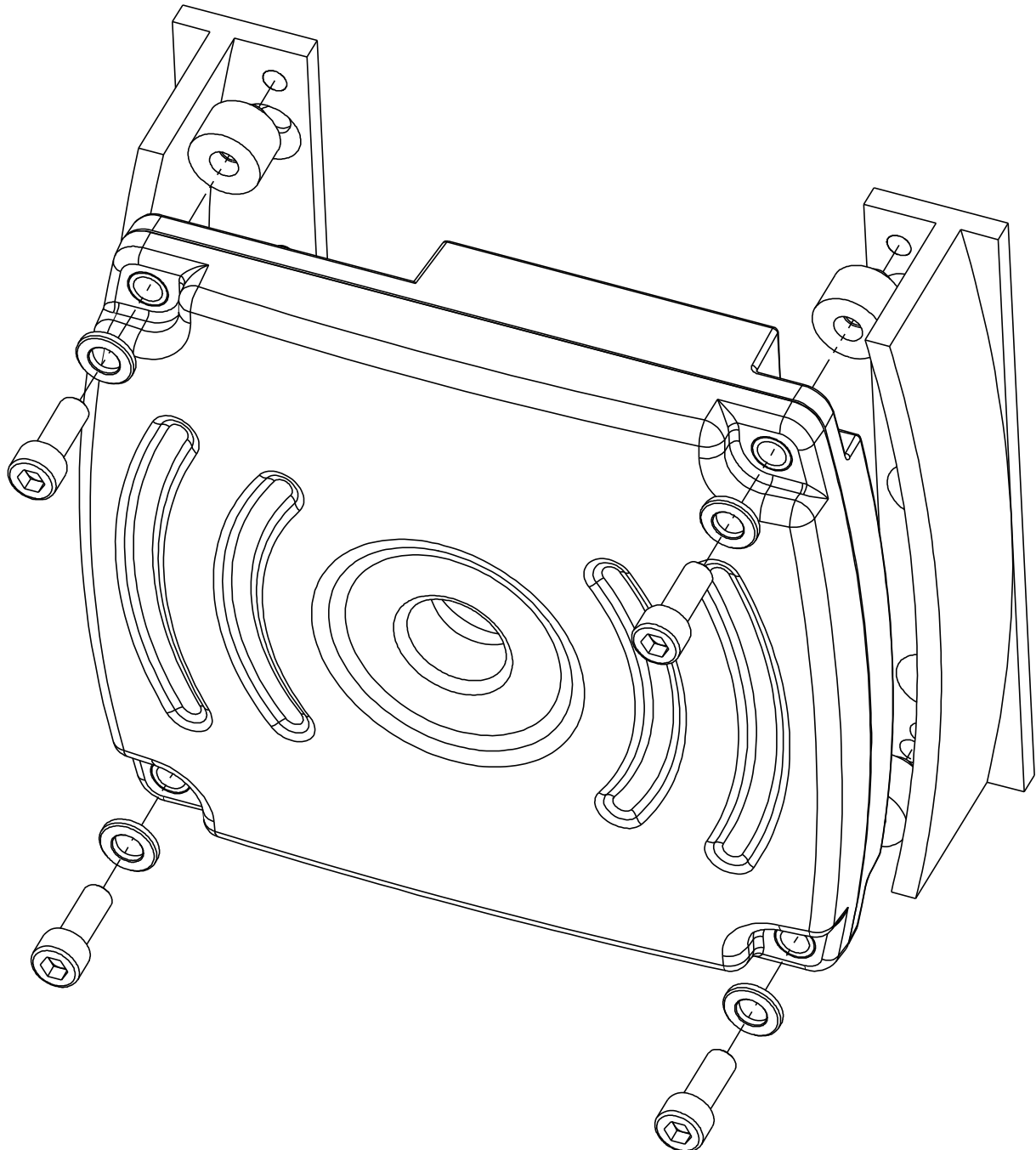


Figure 5.3.1: Mounting UDL120 onto steel sides

6. Function of LEDs

The function of the three LEDs on top of the reader (see also 3.1 Picture) is as follows:

<u>yellow LED</u> is blinking:	standard operating status in trigger mode; device is ready to read; RF field is switched <u>off</u>
<u>yellow LED</u> is permanently on:	standard operating status; device is ready to read; RF field is switched <u>on</u>
<u>green LED</u> shortly flashes:	shows successful reading of a transponder
<u>red LED</u> is active:	shows a general malfunction within the system

7. Communication

7.1 Communication via deBus protocol (standard)

The standard way of communication between UDL120 and Terminal (via CB2, CB1, SNG etc.) is carried out using the deBus protocol on the RS485 bus.

7.2 Communication via Bluetooth™ (optional)

Contactless communication is carried out via Bluetooth™ with an Ezurio BISM2 module.

This module provides a virtual serial interface for communication with the reader using the Bluetooth™ SPP (*Serial Port Profile*). The serial interface of the PC has to be configured as follows:

Data rate:	115200 Baud
Data bits:	8
Stop bits:	1
Parity:	none

7.2.1 Connecting to Bluetooth™ module (pairing)

A Bluetooth™ stick for the PC is needed, which contains SPP (*Serial Port Profile*). The according Bluetooth™ module can be found by scanning all available Bluetooth™ devices. The reader reports with „UDL120 #xxx“. The required PIN for the Bluetooth™ connection is „0000“ (default setting). As long as the memory capacity of the Bluetooth™ module is sufficient, the module stores the identification of the communication partner so that the pairing process does not have to be repeated.

7.2.2 Configuration mode of Bluetooth™ module

Configuration of the Bluetooth™ module takes place via Bluetooth™ interface. The following parameters can be adjusted:

- transmitting power of the Bluetooth™ module

The Bluetooth™ module needs to be switched into the configuration mode first in order to change any of its settings. In order to do so, three consecutive quotation marks („!!!“) need to be sent with a time difference of 100 ms between each other using the Bluetooth™ interface. This can be done for example by help of the Windows program *Hyperterminal*, which can access the Bluetooth™ module on the PC using the virtual serial interface.

In order to leave the configuration mode the following command

```
ATO<Enter>
```

needs to be sent to the module. After any configuration process a Reset is required.

7.2.3 Transmitting power

The Bluetooth™ module can be configured for a transmitting power between -27 dBm and $+6\text{ dBm}$. The current transmitting power can be requested by using the following command

```
ATS541<Enter>
```

Configuration of the transmitting power is carried out using the command

```
ATS541?=m<Enter>
```

The parameter m can be configured with a value between -27 und $+6$. Changed settings become active immediately but are only stored within the volatile memory. In case the module can not be accessed any longer due to an incorrectly adjusted transmitting power, the original value can be restored by switching the reader on and off.

If all changes of the settings are correct, the configuration has to be transferred into the non-volatile memory by using the following command

```
AT&W<Enter>
```


8. Accessories

Further accessories such as necessary connection cables or peripheral devices (Connection Box CB1, Connection Box CB2) are shortly explained in the following table and the chart below will additionally illustrate the basic concept. For all peripheral devices mentioned below there are separate Wiring and Installation Instructions available which can be obtained on request from your local sales and service partner or directly at deister electronic GmbH.

CC1	Connection cable Art.No. 09287.000	M8 female connector 90° 4-pin with 3 m cable
PS1	Protection Set 1 Art.No. 09286.000	Steel sides for mounting the reader onto the fork carriage; weight approx. 767 g
CB1	Connection Box 1 Art.No. 09284.000	Interface converter; converts data from Host/PC on the USB bus into RS485 signals; serves as voltage supply for the entire RFID system by being connected to a DC/DC converter (see below)
CB2	Connection Box 2 (for up to 5 reader) Art.No. 09285.000	Acts as RS485 hub; serves as data transmitter from the Host/PC (via CB1) and as voltage supply (from the CB1) for all separately connected readers (see below)

Table 1: Accessories for UDL120

8.1 Basic principle of forklift application

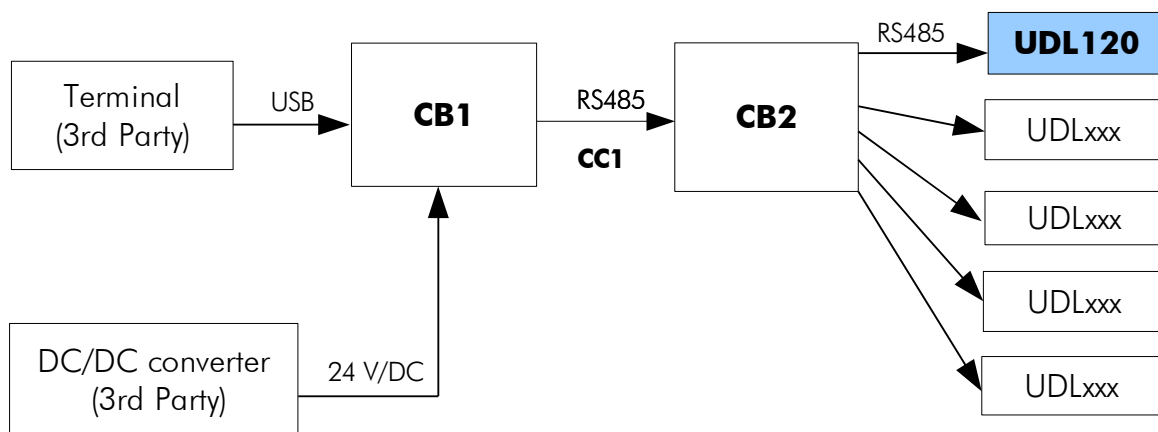


Figure 8.1.1: Basic principle of forklift application

9. Regulatory Notices

Hereby, deister electronic GmbH declares that this equipment - if used according to the instructions - is in compliance with the essential requirements and other relevant provisions of the RTTE Directive 1999/5/EC.

A full declaration of conformity can be requested at:

info@deister-gmbh.de



Approved for use in all European countries.

FCC Digital Device Limitations Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

Caution! Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

FCC Notice

To comply with FCC Part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

FCC Radiation Exposure Statement

This equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and the human body.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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