

# CX8946

Clex Online module LAN  
Bluetooth® Low Energy



## Operating and assembly instructions

Valid from: HW 1.5.3\_U | NRF-MOD 1.6.1 | ESP-MOD 5.0.1

**Legal Notice**

Operating and installation instructions (translated version)  
CX8946 Clex online module LAN Bluetooth® Low Energy

Document number: 16AC

Version: 1.2

Date: 16.08.2023

**Manufacturer**

Uhlmann & Zacher GmbH

Gutenbergstraße 2–4

97297 Waldbüttelbrunn

Germany

Tel.: +49 931 40672-0

Email: [contact@UundZ.de](mailto:contact@UundZ.de)

[www.UundZ.de](http://www.UundZ.de)

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# 1 About this document

These operating and installation instructions describe the CX8946 Clex online module LAN. They are part of the product and contain important information required for correct operation and maintenance.

These operating and installation instructions apply for all versions of the CX8946 and are intended both for specialist personnel responsible for assembly and disassembly and for end customers.

- ▶ To ensure trouble-free and safe operation, read these operating and installation instructions carefully and observe the information contained there before putting the online module into operation.
- ▶ Keep the operating and installation instructions.
- ▶ After installation, give the instructions to the end customer and familiarize them with operation.

Uhlmann & Zacher GmbH accepts no liability for malfunctions, such as impossible access to injured persons, operational malfunctions, damage to property or other damage resulting from non-observance of these operating and installation instructions or from incorrectly configured online modules.

- ▶ If you still have any questions after reading these operating and installation instructions, please contact your specialist dealer or Uhlmann & Zacher GmbH directly.

## 1.1 Warnings

Warning notices warn of hazards that may occur when using the online module. There are two hazard levels, recognizable by the signal word:

Signal word	Meaning
CAUTION	Indicates a low-risk hazard that may result in minor or moderate injury if not avoided
ATTENTION	Indicates a hazard that results in damage to property

## 1.2 Symbols

The following symbols may appear in this manual:

- ▶ This symbol marks an instruction that has to be carried out by the user.
- ▶ This symbol marks an entry in a list.



This symbol indicates useful and important information.

## 2 Safety

### 2.1 Proper use

The CX8946 online module LAN is used as an interface between Bluetooth® Low Energy-capable Uhlmann & Zacher products and a third-party system via LAN.

### 2.2 Improper use

Products from Uhlmann & Zacher GmbH must not be used to lock up persons or animals, as well as aids that are vital in an emergency (for example defibrillators, emergency medication, fire extinguishers, etc.).

It must not be used in potentially explosive atmospheres.

If the housing or the electronics is damaged, the product must not be operated any longer. Modifications or additions to the product are not permitted. The use of the online module outside the stated specifications is not permitted.

### 2.3 General safety information

Observe the following basic safety instructions when handling the product:

- ▶ Electrical equipment may only be installed and mounted by qualified electricians. Installation may only be carried out by trained specialists in accordance with these instructions.
- ▶ These instructions should be passed on to the user by the person carrying out the installation.
- ▶ There is an increased risk of injury (electric shock!) if the connecting cables are touched when the power supply is switched on. Only perform installation and maintenance work when the power supply is switched off. Observe VDE guidelines!
- ▶ Do not use products in potentially explosive atmospheres.
- ▶ No modifications of any kind are permitted to the products of Uhlmann & Zacher GmbH, with the exception of those described in a corresponding manual.
- ▶ The online module must not be brought into contact with paints or acids.
- ▶ Only operate the products within the defined temperature range. Do not heat the product above the specified storage temperature.
- ▶ To avoid malfunctions and damage, only use original parts and accessories from Uhlmann & Zacher GmbH.
- ▶ No liability is accepted for incorrectly programmed units. Uhlmann & Zacher GmbH accepts no liability for malfunctions, such as impossible access to injured persons, damage to property or other damage.
- ▶ Uhlmann & Zacher accepts no liability for damage resulting from incorrect installation.

### 3 Product description

The Clex online module LAN in the Clex public system is used as an interface between Bluetooth® Low Energy-capable Uhlmann & Zacher products and a third-party system via an Ethernet LAN connection.

The product is used for the realization of radio opening, design of authorization changes and transfer of event protocols for Clex public or Clex private locking units.

Housing versions:

- Housing in grey
- Oval housing in white
- Rectangular housing in white

#### 3.1 Technical data

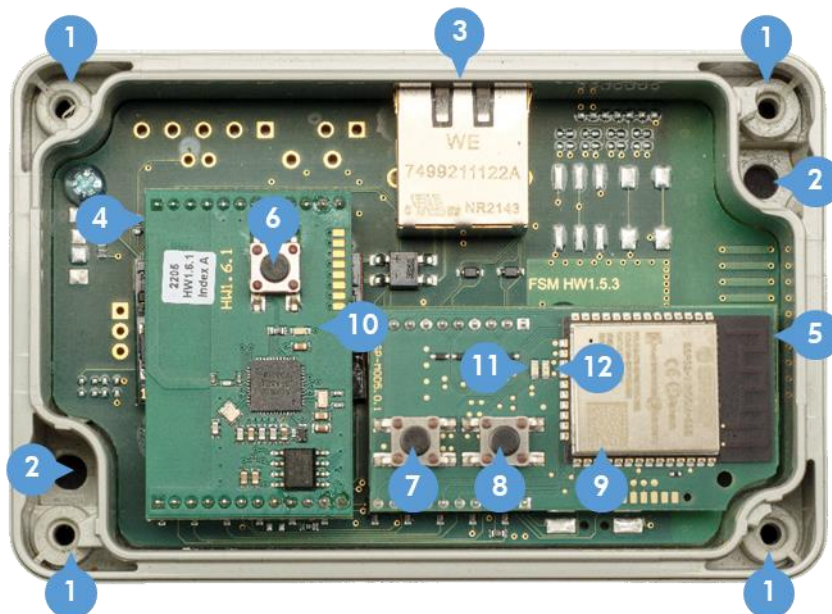
##### 3.1.1 General technical data

Designation	Value
Number of coupleable locking units	8
Frequency range	2402 to 2480 MHz
Transmission power	4 mW
Power supply	PoE, class 0 via RJ45 socket
Power consumption	Max. 0.4 W
Standards	2014/53/EU

##### 3.1.2 Ambient conditions

Designation	Value
Operating temperature	+10 °C to +55 °C
Storage temperature	-40 °C to +65 °C
Installation location	Indoors

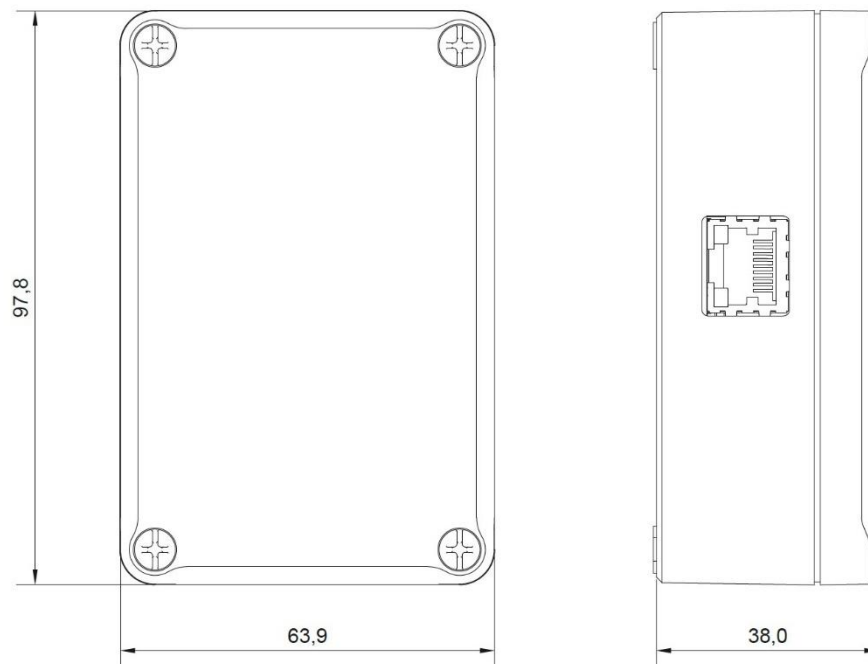
### 3.2 Overview



- 0. Without figure: Housing cover and screw(s)
  - 1 screw for Article number 8946 0000 0000
  - 4 screws for Article numbers 8946 0000 0004 and 8946 0000 0005
- 1. Screw connection for housing cover
- 2. Mounting holes (screws not included in the scope of delivery)
- 3. RJ45 socket (Ethernet with PoE for power supply) with green LED - flashes during network traffic
- 4. Bluetooth module
- 5. LAN module
- 6. Button for pairing
- 7. Delete button
- 8. Reset button
- 9. Data Matrix with MAC address (last 12 characters of the coded text)
- 10. Blue LED
- 11. Green LED
- 12. Red LED

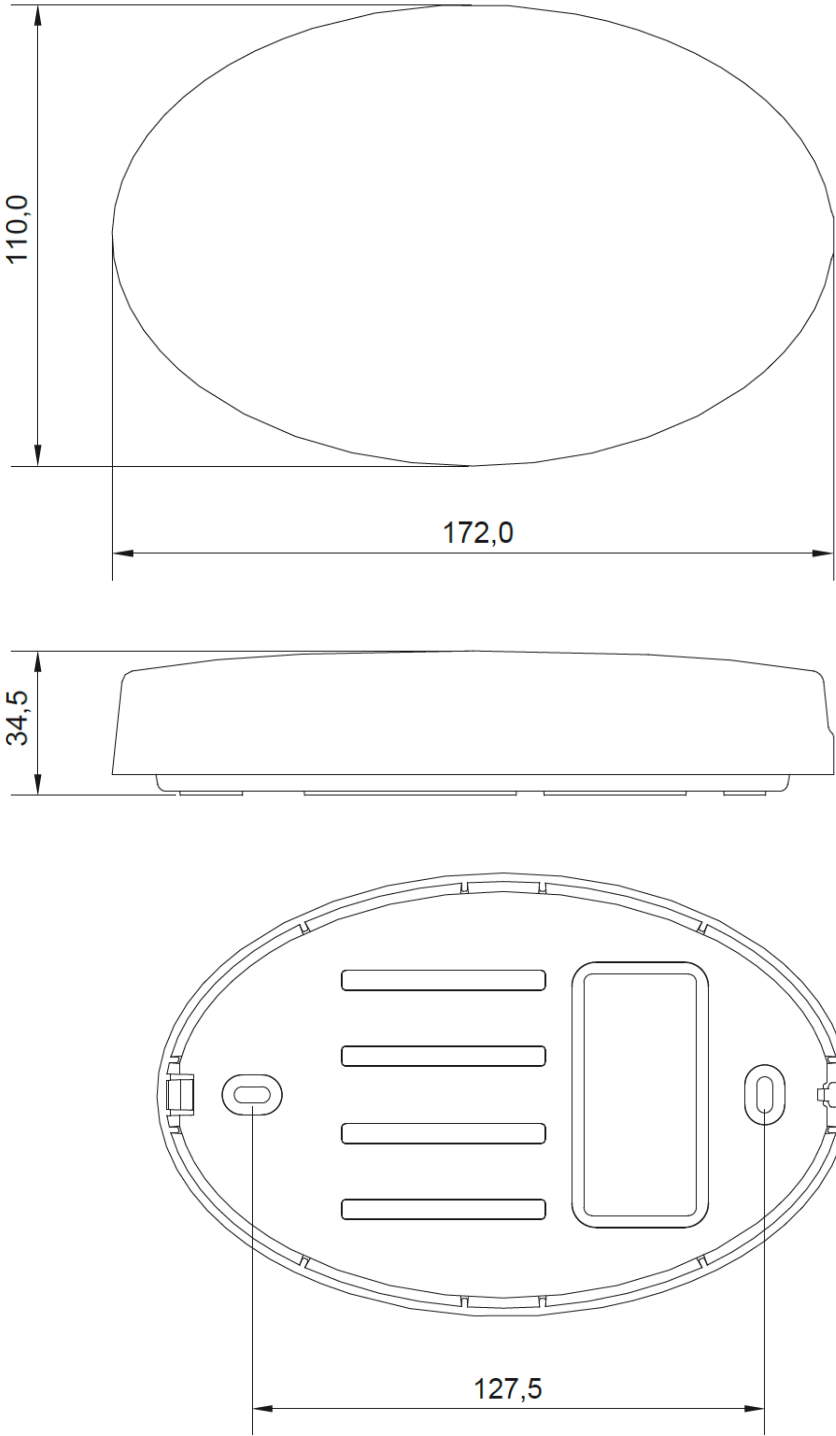
### 3.3 Structure and scope of delivery

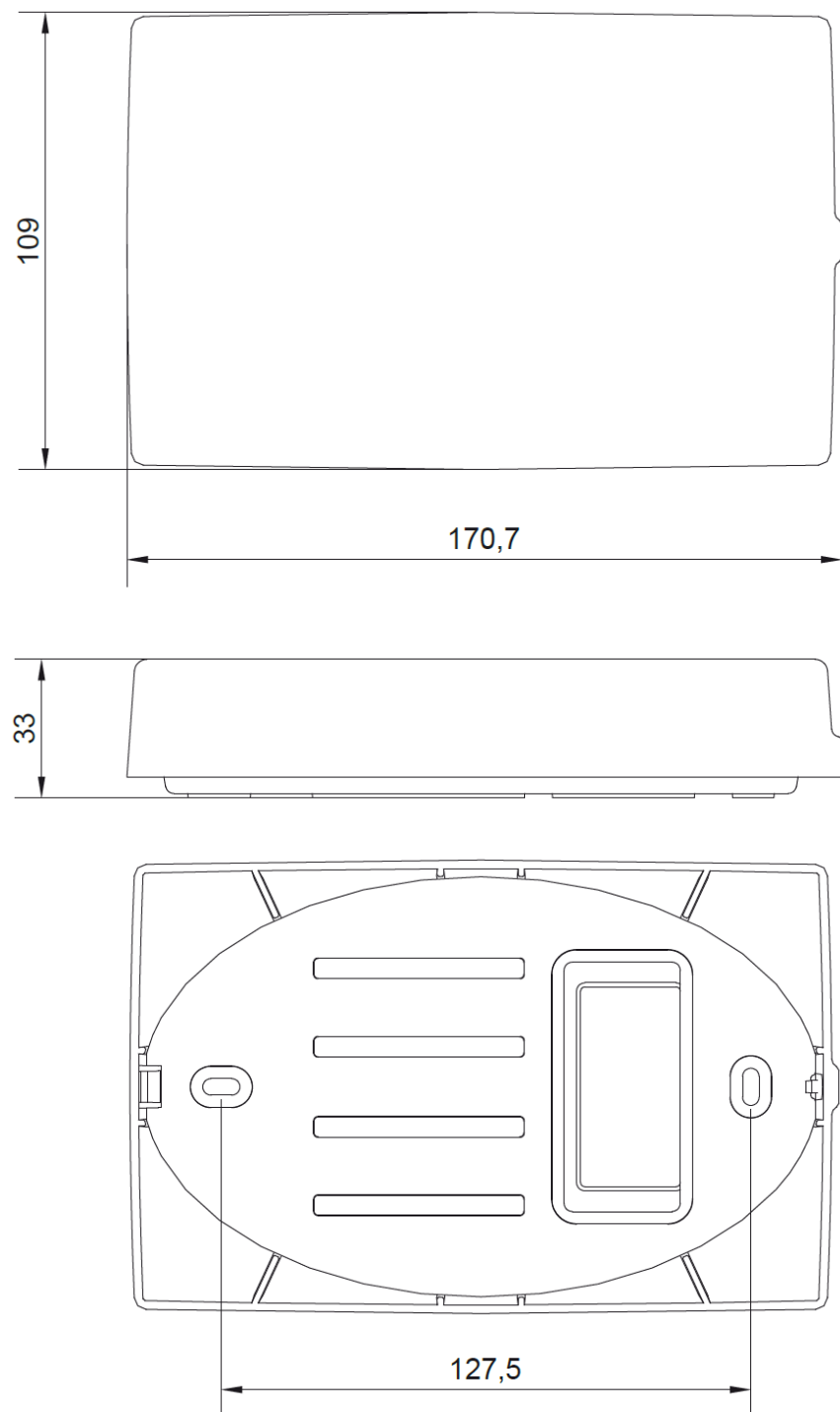
Variant gray  
rectangular housing





**White oval housing**



**White rectangular housing**

## 4 Connection and installation

### 4.1 General installation information

- The valid national regulations for electronic installations (e.g. VDE regulations) must be observed.
- The connecting cables must be available and laid.
- In the case of installation on metal surfaces or in direct proximity to metals, the range as well as the communication between product and connected locking units may be influenced negatively.
- Avoid direct exposure to strong electromagnetic fields.
- Do not paint over, paste over or cover the online module.

### 4.2 Power supply

The CX8946 can only be supplied with current via the Ethernet cable PoE class 0.

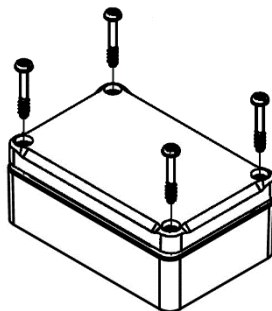
### 4.3 Requirements for Ethernet cabling

When using the white oval housing and the white rectangular housing, a highly flexible flat cable or a patch cable with RJ45 angle plug should be used angled against the latching lug.



## 4.4 Installation

- ▶ Specify the installation position. Ensure that the surface is smooth, dry and firm enough. Do not place the units close to each other, to avoid radio interferences.
- ▶ Unscrew and remove the housing cover.



- ▶ Mark the fastening points through the bottom of the housing.
- ▶ If required, drill mounting holes into the mounting surface.

Hand-tighten the lower part of the device at the planned location using suitable flat-head screws. Installation material is not included in the scope of delivery. In case of cable feeding from the side, use additional fitting rubber or plastic spacers, if necessary. Ensure that the cable is not pinched.

- ▶ Perform commissioning (see the "Commissioning" chapter).
- ▶ Put on the housing cover and screw it tight.

## 5 Commissioning

### 5.1 Connecting locking units

To connect a locking unit with the online module, you have to perform the following steps:


#### Manual pairing

To this purpose users must have access to the circuit board of the module to be able to press the button.

- ▶ Set the locking unit which you want to connect into the service mode by holding the service key in front of the locking unit.
- ▶ Pairing button **6** Keep pressed between 1 and 4 seconds. In the case of successful coupling the locking unit leaves the service mode before expiration of the regular duration of the mode.
- ▶ The addresses are assigned automatically in the case of manual coupling. Please note the information on addressing in the current protocol description.

#### Function overview of the pairing button **6**

valid as of FW 2.8.36

Keystroke 🕒 (in sec.)	LED Signaling	Function
0-1	Rapid flashing during pairing (see also section Signaling)	If pressed in sleep mode: <b>Pairing mode</b> Locking unit in service mode within reach is being coupled. Otherwise: Briefly pressing the button ends the service - or manufacturer test mode.
1-4	Rapid flashing during the service mode (see also section Signaling)	<b>Service mode</b> Device can be configured.
4-6		No function
6-10	 4x	<b>Delete mode</b> All locking units are uncoupled.
10-12		No function
12-16	In mode flashing 1/second	<b>Manufacturer test mode</b> without function for user
16-20		No function
>20°s		<b>Resetting to factory settings</b>

### Command-driven coupling

In this case coupling is performed via a command to the online module. This provides the possibility to assign an address explicitly to the knob. Furthermore this possibility is practical if the online module has been mounted in places that are difficult to access (e.g. false ceiling). The locking unit to be connected must be brought to programming mode by using the service key card. Now the bus master must send the coupling command to the online module, which initiates a coupling.

## 5.2 Network identification and authentication

### 5.2.1 Port

The device uses port 1470. On most systems, this port can be used by normal users without special rights.

### 5.2.2 MAC address


The online module always has four different directly consecutive MAC addresses, one for each of the basic functions of the installed LAN module.

Example:

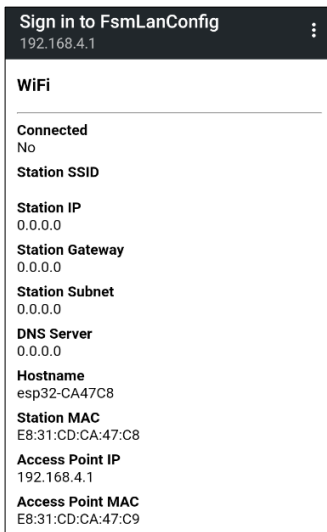
1	E8:31:CD:CD:79:5C = MAC address Station (Wi-Fi)
2	E8:31:CD:CD:79:5D = MAC address Access Point (hotspot for configuration)
3	E8:31:CD:CD:79:5E = MAC address Bluetooth
4	E8:31:CD:CD:79:5F = MAC address LAN

The MAC address of the online module can be determined in different ways:

#### Data matrix

- ▶ You can find the MAC address of the device coded in the data matrix installed on the LAN module. 
- ▶ Scan the data matrix with a suitable mobile device (e.g. QR code reader of a smartphone). The last 12 digits of the determined text show the lowest of the MAC addresses ("MAC address Station (Wi-Fi)").

## Web interface



Two of the four MAC addresses (numbers 1+2) can be viewed in the web interface:

- ▶ Start the web interface as described in the chapter "Configuration of the network interface".
- ▶ Tap on the button "Info".
- ▶ Scroll to the "Wi-Fi" section. This contains the MAC addresses:
- ▶ Station MAC: MAC address Station (Wi-Fi) next to
- ▶ Access point MAC: MAC address Access Point

### 5.2.3 Configuration of the network interface

To carry out own settings of the IP addresses, the CX8946 has a web interface. This can be addressed either via the LAN interface or the Wi-Fi interface of the CX8946.

#### Starting via Wi-Fi

For the configuration the CX8946 acts as a Wi-Fi Access Point (hotspot). You require a mobile device with activated Wi-Fi for the configuration. To start the Access Point, button 7 must be held down while the unit performs a reset. **After that all LAN-specific settings are reset to the factory state.** The pairing of the locking units remains

- ▶ Open the Wi-Fi device menu of your mobile device.
- ▶ Keep the **7** button pressed.
- ▶ Tap the reset button **8** or optionally reconnect the LAN cable.
  
- ▶ Continue to hold down the **7** button until a Wi-Fi network with the SSID: "FSMLanConfig" is displayed in the Wi-Fi menu of your mobile device. This can take several seconds.
  
- ▶ Release the **7** button.
- ▶ Tap on the list entry "FSMLanConfig".
- ▶ Enter the password *StartConfig*

The web interface now starts automatically in a browser window. Alternatively, it can also be opened via the IP address 192.168.4.1 in a web browser.

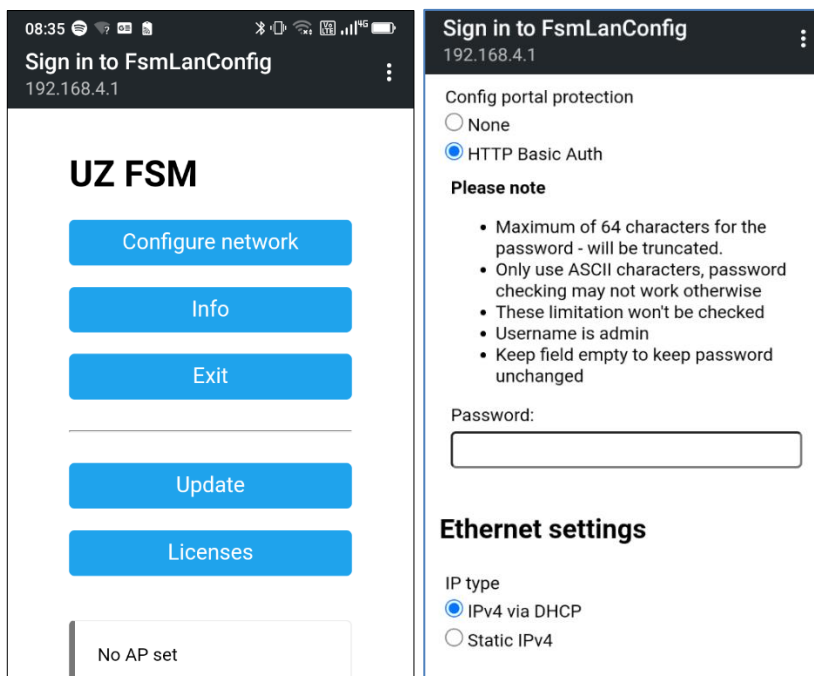


**For security reasons, be sure to assign a new secure password in the web interface.**



**Changing the password**

- ▶ Tap the button "Configure network".
- ▶ Select the "HTTP Basic Auth" under the item "Configure portal protection".
- ▶ Select a secure password for the user "admin".

**Access to configuration tool via LAN connection**

If the module is started by pressing the button in the Wi-Fi configuration mode as described above, the LAN interface is not active. If the module is started without pressing the button as described above, the website can be reached via the address received via DHCP.

**5.2.4 IP address in network****Assignment via DHCP**

By default, the online module can automatically obtain an IP address via DHCP when it is connected to a network. The automatically assigned address can then, for example, be displayed with the test application of the UZReader protocol "ClexSerUZ\_ReaderTest". In addition, the module should also appear in the web interface of the router. The address can be viewed there as well.

**Manual input of a static IP address**

Select the option "Static IPv4" in the web interface under "Configure network" in the "Ethernet settings".

### 5.3 Configuring the online module

The configuration of the online mode normally takes place through the connected third-party system and the corresponding function of the respective protocols. Individual parameters of the online module can also be set directly via a BLE connection or bus commands in the service mode.

- ▶ Carry out the settings (e.g. LAN/WLAN communication) by means of the associated software tool (details are available in the respective protocol description).

## 6 Operation


If an authorized transponder is held in front of the connected locking unit, a BLE connection is established with the online module and, depending on the version, the authorization is requested via the corresponding protocol of the third-party system.

If no BLE connection can be established, for example in case of a power failure or a wireless attack, the electronics of the locking unit drops back into offline mode. In this mode the door can be opened with any transponder with offline authorization.

In this case the electronics of the locking unit warns the user, however, before opening with a distinctive visual and acoustic signaling.

When the locking unit is woken up, for example by a knob cylinder being turned or a door handle or knob module being actuated, a wireless connection is also established.

### 6.1 Reset

- ▶ Tap the reset button  or disconnect the device from the power supply (here LAN connection).

### 6.2 Resetting the configuration (factory reset)

Restarting configuration tools via Wi-Fi, as described in more detail in chapter 5.2.3 "Configuration of the network interface", resets the settings made. To this

purpose the  button must be held down while the unit performs a reset.

### 6.3 Firmware updates

The update tool "Clex FW Prog" is available to update the firmware of the module. Contact your respective Integration partner.

The LAN interface has its own firmware, which can be updated via the web interface (see section 5.2.3).

## 6.4 Signaling

	LED	Meaning
10	Blue 1x lighting up after reset	Normal signaling after a reset
	Blue 2x/s flashing	Module tries to wake up a locking unit in the "wake on radio" mode (WOR) or service mode
	Blue 1x/s flashing, but with more time "on"	Module has connection to at least one paired locking unit, but is simultaneously scanning for further paired devices
	Blue constant lighting up	All paired locking units are connected
	Blue 1x/s flashing	Module is scanning for paired locking units
11	Green rapid flashing	Network connection is established and IP address is being called
	Green slow flashing	The module can be reached as a Wi-Fi access point to carry out the initial configuration (see section 5.2.3 Configuration of the network interface)
	Green constant lighting up	Network connection has been established (Only for initial connecting. No function for disconnection during operation)
12	Red LED	Is currently not used

## 6.5 Malfunctions during operation/error signaling

	LED	Meaning
10	Blue lights up 4x quickly after a reset; after that service mode	Mode wrong for the available firmware: Perform a firmware update or set the mode manually.
	Blue lights constantly after a reset	Micro-controller of the device is in boot loader mode. Perform a suitable firmware update.

## 6.6 Maintenance

Since the device is not protected specially against dust, the product should be checked regularly for dust deposits. The frequency depends on the dust level at the operation site.

## 6.7 Cleaning

Clean the housing with a soft, lint-free and only slightly moistened cloth. When cleaning do not use corrosive liquids or liquids that decompose plastic such as benzine, turpentine, etc.

Sharp detergents may damage or discolor the surface. Do not use any detergents which act on a mechanical basis (e.g. scouring milk, scouring sponge).

Free the electronics from dust with a suitable brush or by careful use of compressed air at a sufficient distance.

## 7 Disassembly and disposal

### 7.1 Disassembly

### 7.2 Disposal



- ▶ Do not dispose of the device with household waste, but at a municipal collection point for special electrical waste in accordance with European Directive 2002/96/EC.
- ▶ Dispose of packaging as environmentally friendly recycling.

## 8 Glossary

Term	Meaning
BLE	Bluetooth® Low Energy
VDE	German "Verband der Elektrotechnik" [Registered Association of the Electrical, Electronic and Information Technology]
PoE	Power supply via Ethernet (abbreviation of: Power over Ethernet)
phg_crypt	Standard protocol of the company phg Peter Hengstler GmbH + Co. KG, Deißlingen in Germany