

Carelock Config Light

User guide for ID-Lock UZ configuration
version 1.0, for version 2.6.x of the app



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Getting started

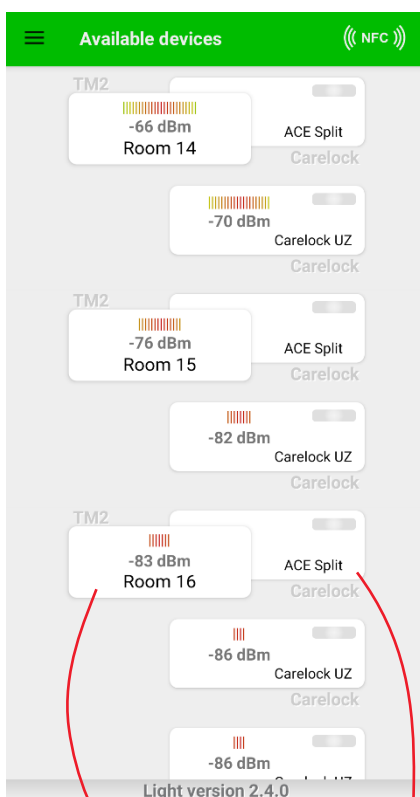
Where do I find the Carelock Config Light app?

The Carelock Config Light app is only available for Android phones, running Android 7 or later. The app can be downloaded from <https://tunstalldownload.com/carelock/uz>. This is also where you will find any updates to this guide, as well as installation guides for ID-Lock UZ.

The easiest way to install the app is to use your Android phone's browser and navigate to the above URL or scan the QR code here. To be able to install the app via your phone's browser, you must first enable installing "unknown apps" (in some phones known as "install from unknown sources").



Brief overview / Quick start



This is the first view you see when you start the app. The white squares represent TM2 boxes (to the left) and locks (to the right).

Two white boxes that are attached to each other symbolize a TM2 and a lock that are paired and connected with each other.

Clicking on a TM2 representation will open a view where you can edit the TM2-settings.

Clicking on a lock representation will open a view where you can edit the lock-settings.

The devices shown in this view are sorted according to their Bluetooth signal strength, with the device that gives the strongest signal on top. Normally, stronger signals mean closer distance, but this may vary slightly depending on Bluetooth output power and environmental circumstances.

While this brief overview may be enough to get you started, it is recommended that you read the complete guide before you start configuring the system.

Background

High-level explanation of the ID-Lock UZ system

ID-Lock UZ is made for dementia patients and elderly in a group-living environment. It is designed for ease of use and a low cost of installation, where the purpose is to prevent accidental access rather than burglary. It is not designed for high security applications, such as external doors to a resident home or office.

You can always open doors in an ID-Lock UZ installation from the inside by just using the door handle without any key or transmitter, while the outside handle only works when the door is unlocked. Many locks for hotel rooms have similar functionality.

The residents only need to wear a small pendant transmitter to automatically unlock the doors they have access to, without any manual interaction.

The staff can unlock all doors they have access to with a special staff transmitter, or with a regular (physical) key. However, the staff transmitter will not automatically unlock doors, it requires you to manually press a button on the transmitter to open the door in front of you. This is to avoid a scenario where all doors are unlocked as the staff walks by.

A door that has been unlocked by the staff or resident will automatically return to the locked state a few seconds after the unlock event, keeping out people without the required access.

The ID-Lock UZ system consists of a position transmitter (IDT), a control box (TM2), staff- and resident transmitter pendants (Tx75), and an electronic lock (Carelock UZ). See the system overview picture on the next page for a more visual understanding of the components.

Carelock UZ is powered by a battery (CR123A). When it is time to change the battery, the LEDs on the lock will flash red and it will emit a beeping sound every time a staff is accessing the lock (but not when accessed by the residents). If the battery is even more depleted, the lock will finally stay in engaged (unlocked) mode to make sure the doors can always be opened.

When the ID-lock system is connected to the building's fire alarm, all locks will automatically enter the engaged (unlocked) state a few seconds after the fire alarm is triggered, which will make it easier to quickly open all doors and evacuate the residents.

Detailed explanation of the ID-Lock UZ system

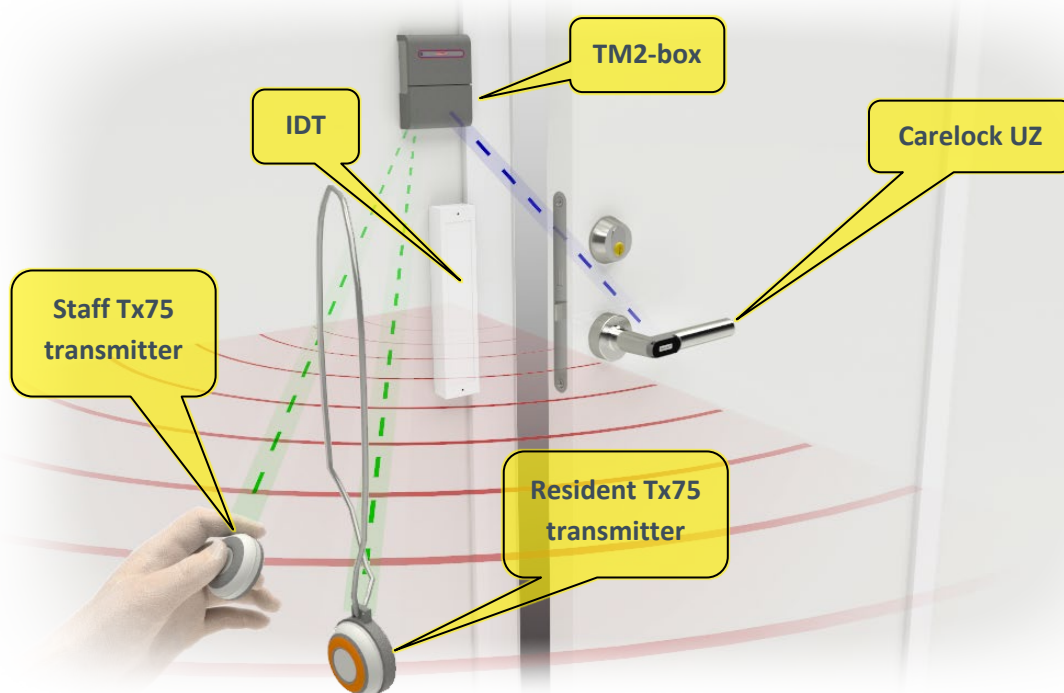
The IDT, which is mounted next to each door, is transmitting an RFID signal with a zone-ID that is unique to each door. The signal has a maximum range of approx. 1 to 1.5 meters (adjustable down to a few centimeters).

When a resident's Tx75 transmitter detects the IDT signal, it will automatically transmit its own ID together with the detected zone-ID from the IDT to the TM2-box. This automatic transmission will normally be repeated every 5 seconds for as long as the Tx75 transmitter is within range of an IDT signal (the exact behavior and timing differ between different types of Tx75 transmitters). The Tx75 transmitter has an ID that is unique for each transmitter on a site.

The staff Tx75 transmitters work the same way, except they do not automatically transmit anything; you must push the transmitter's button to trigger the transmission.

With the Carelock Config Light app, you configure the TM2-box to accept certain combinations of Tx75 IDs and IDT zone-IDs. When an accepted combination is received by the TM2, it will send a Bluetooth signal to the lock which will engage the door's outer handle, and the door can be opened.

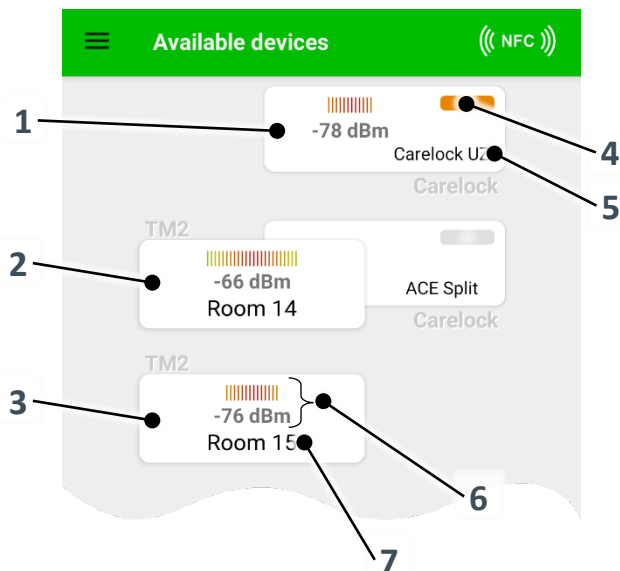
The fire alarm feature is achieved by installing the TM2-box such that its power supply is turned off when the fire alarm is triggered. Carelock UZ is normally always connected via Bluetooth to the TM2-box, and when the connection is broken (such as when the TM2's power supply is turned off), Carelock UZ will automatically enter the engaged (unlocked) state.



Using the Carelock Config Light app

Scanning for devices

For a brief explanation of scanning for devices, see “Brief overview / Quick start” on page 3.



1. Representing a lock that is *not* connected to a TM2.
2. Representing a TM2 connected to a lock.
3. Representing a TM2 that is *not* connected to a lock.
4. Icon to indicate if a lock is in admin mode or not; orange means the lock is in admin mode.
5. Type of lock (model name) *.
6. The received Bluetooth signal strength from that device, measured by the phone. Illustrated by a bar graph and a number in dBm. Note that these are negative numbers, i.e., -80 dBm is a weaker signal than -70 dBm.
7. The name given to this TM2-box. If no name is given, this defaults to the TM2-box serial number.

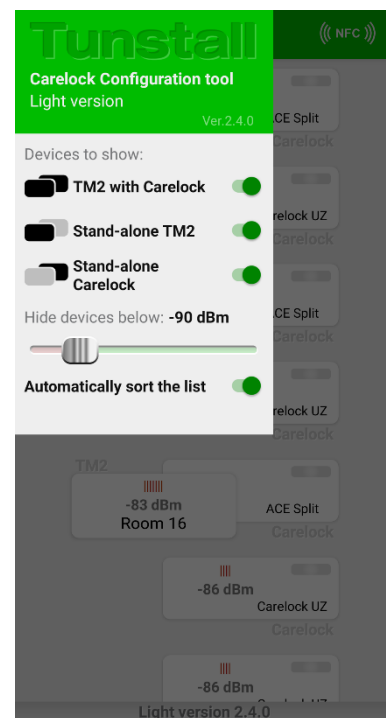
* The lock model name for a Carelock UZ lock connected to a TM2-box will be “ACE Split” if the firmware in the TM2-box is 1.2.3 or earlier.

The list of available devices may be quite long in a normal group living environment with many locks and TM2-boxes within Bluetooth range. To make it easier to find relevant devices, the list can be filtered. To access the filter view, slide your finger on the screen from the left edge or click on the three horizontal lines in the top left corner of the screen.

One way of filtering the list is based on types of devices. The types you can select between are: TM2 connected to a lock, stand-alone TM2, and stand-alone locks (stand-alone means devices that are currently not connected to other devices).

Another way of filtering the list is based on signal strength. Drag the slider to only include devices with stronger signal than the selected threshold.

In this view you can also disable the automatic sorting of the device list. When automatic sorting is disabled, you must manually swipe down on the list of devices if you want to sort the list according to signal strength.



Locating (scanning for) a device

Sometimes it may be difficult to know which device to click on in the list of devices, i.e., which device in the list corresponds to which physical device. The signal strength indicator may of course be a valuable guide, as it is somewhat related to the proximity of the device. See below for other ways of identifying the correct device.

TM2-boxes

When you are connected to a TM2 with the Carelock Config Light app, the LED on the TM2 will turn to a steady orange light, giving you clear feedback to which physical device you have connected to. But if the TM2 is mounted above the ceiling or inside another box, that indication is not visible to other users of the app.

It is recommended that you give each TM2 a name that corresponds to its location, e.g., a room number, when installing ID-Lock UZ. That way, it will be much easier for anyone to connect to the correct TM2, even if the physical TM2 is not visible.

Locks

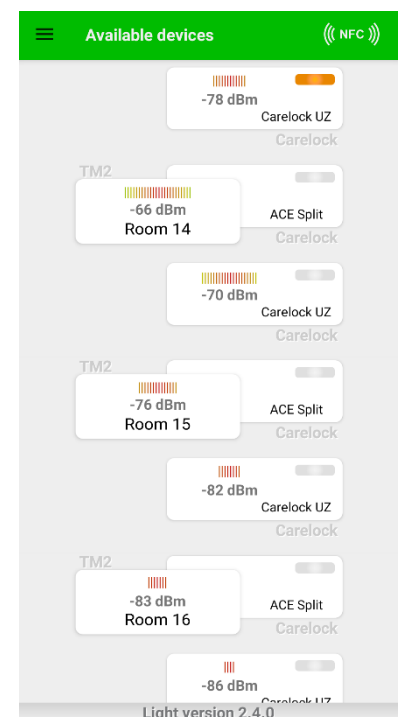
There are two ways you can make it easier to connect to the correct lock; put the lock in admin mode or use NFC.

To put a lock in admin mode, make a “long click” on the lock representation in the list of devices (i.e., press your finger and keep it there for more than 1 second). The lock will turn on its LEDs to a steady orange/yellow light for 1 minute, and the lock representation in the device list will get an orange symbol to indicate which lock is in admin mode.

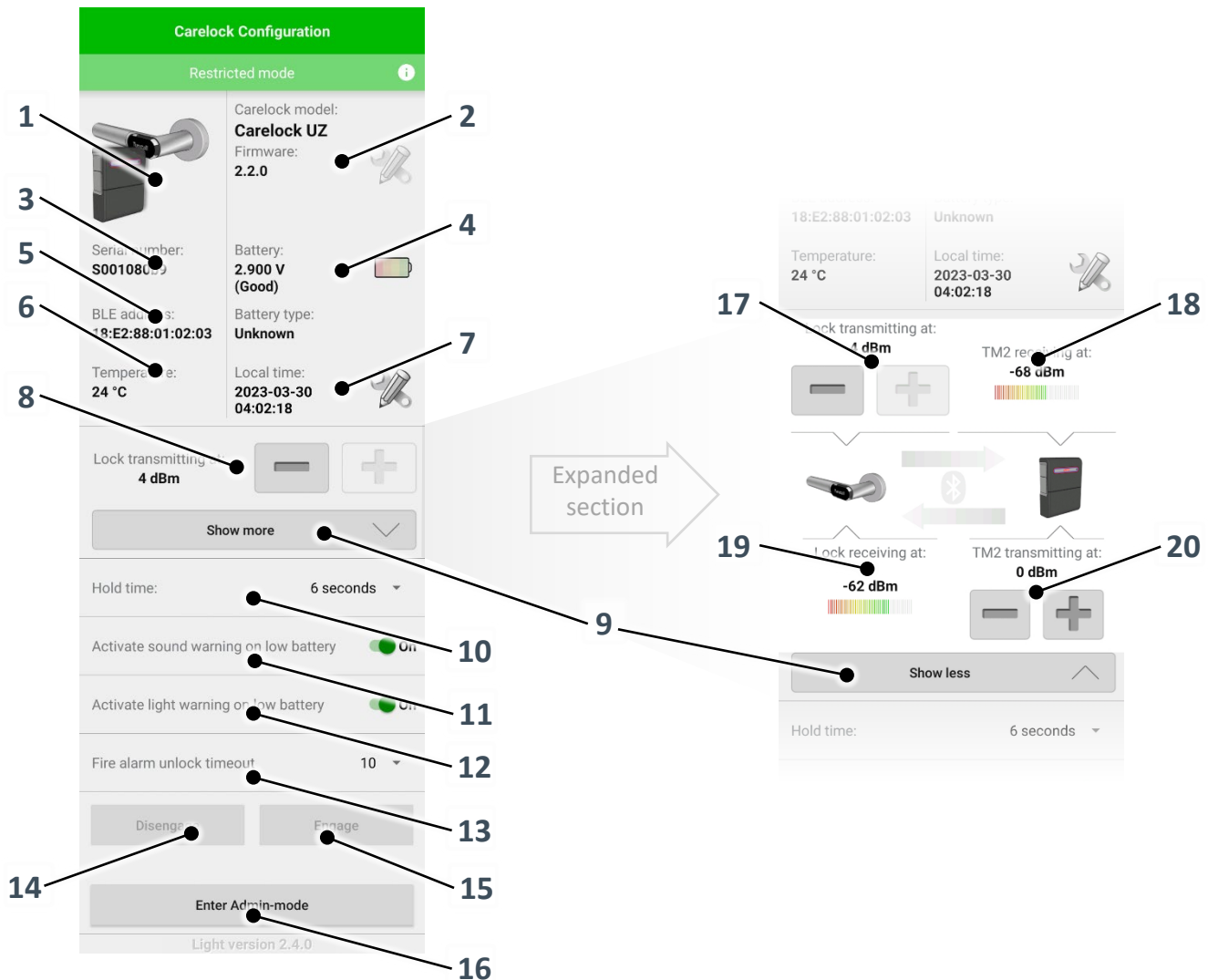
In the list of devices, any lock in admin mode will always be at the top of the list, regardless of its signal strength.

To use NFC, just touch the phone’s NFC reader (usually somewhere on the phone’s backside) to the black part of the lock (where the Tunstall logo is). The app will then connect to that lock and display the Carelock settings view. This also works when selecting a lock to pair with a TM2.

The NFC functionality in the app is somewhat experimental and may not work for all phones. In the top right corner of the screen, there is an NFC icon that should indicate if NFC is functional or not (a crossed-over icon means it does not work). But it may not work even if the icon indicates that it should.



Carelock UZ configuration



1. Product picture. A picture of a TM2-box in front of the lock means the lock is connected to a TM2.
2. Firmware version. Click the icon to the right to prepare for firmware upgrading.
3. The lock's serial number.
4. The lock's battery status.
5. Bluetooth MAC address.
6. Current temperature in the lock.
7. Local time in the lock. This is currently not used for anything and will reset when the battery is replaced.
8. Change transmitted Bluetooth power from the lock.
9. Expand/collapse view for Bluetooth power and signal strength.
10. Set the time until the lock returns to locked state after being unlocked.
11. Enable sound warning (beep when unlocking) when the battery is bad.
12. Enable light warning (flashing red when unlocking) when the battery is bad.
13. Set the time until the lock enters unlocked state after the link to TM2 is lost.
14. Put the lock in disengaged (locked) state.
15. Put the lock in engaged (unlocked) state.
16. Enter admin mode (when disconnected from the phone).
17. Change transmitted Bluetooth power from the lock (same as point no. 8).
18. Signal strength measured by the connected device (phone or TM2).
19. Signal strength measured by the lock.
20. Change transmitted Bluetooth power from the TM2.

Safety restrictions

Some features are not available in the app when a lock is connected to a TM2, due to safety restrictions. Basically, all functionality that could lead to an unauthorized unlocking are disabled.

To access the disabled functionality, first make sure the lock is not connected to a TM2, and then re-enter the settings view. There are two ways to disconnect the lock from a TM2; Remove power to the TM2 or remove the pairing to the lock in the TM2 (the pairing information is stored in the TM2, not in the lock).

The TM2 settings view has similar limitations, which means you cannot remove the lock pairing information if a lock is currently connected.

This is (by design) a bit complicated, but not impossible. To remove the pairing information in the TM2, you would first need to remove the battery in the lock. Then enter the TM2 Configuration view (which will now be unrestricted since there is no connection to the paired lock) and remove the pairing. After you have put back the battery in the lock, you are free to connect to the lock with the app and access all settings and functionality.

Adjusting transmitted Bluetooth power

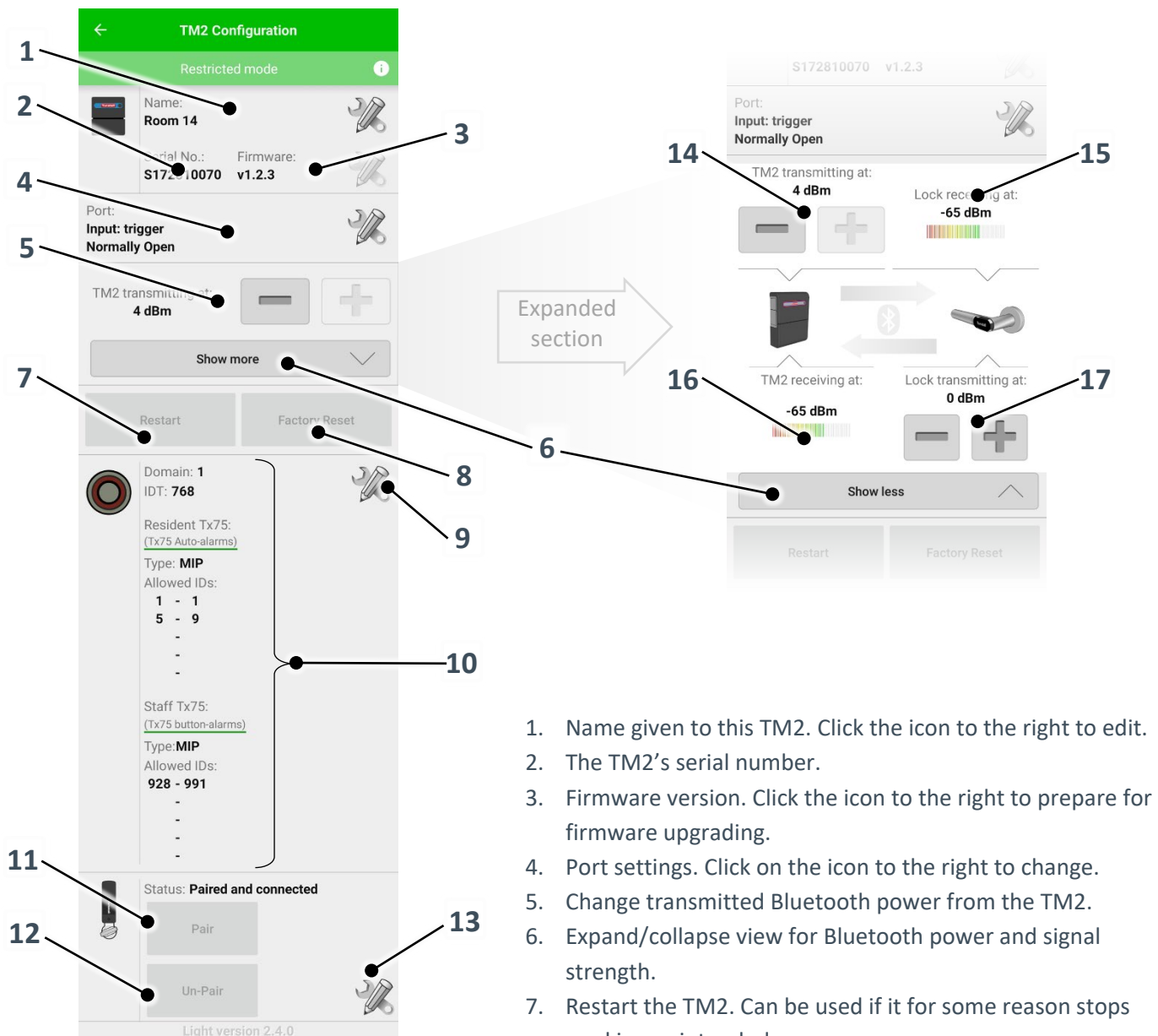
If needed, the transmitted Bluetooth power can be adjusted to achieve a robust Bluetooth link with the connected TM2. See “Transmitted Bluetooth power and link budget” below for more information.

About the Hold time

The hold time is the time that the lock will be unlocked (handle is engaged) before returning to the locked state (handle is disengaged), after the TM2-box instructs the lock to open (i.e., a valid Tx75 signal is detected).

It is recommended that this time is set to at least 8 seconds to avoid a situation where the lock is switching between lock states while a resident’s Tx75 transmitter is within the IDT range. Most Tx75 resident transmitters will send a signal approx. every 5 seconds while within an IDT range, and with some delays in the system, a Hold time of 8 seconds seems to be just enough for the lock to not switch back to locked state between each Tx75 signal transmission.

TM2 configuration



1. Name given to this TM2. Click the icon to the right to edit.
2. The TM2's serial number.
3. Firmware version. Click the icon to the right to prepare for firmware upgrading.
4. Port settings. Click on the icon to the right to change.
5. Change transmitted Bluetooth power from the TM2.
6. Expand/collapse view for Bluetooth power and signal strength.
7. Restart the TM2. Can be used if it for some reason stops working as intended.
8. Reset all parameters to factory settings.
9. Edit settings for accepted Tx75 transmitters.
10. Current settings for accepted Tx75 transmitters.
11. Pair this TM2 with a lock.
12. Remove an existing pairing with a lock.
13. Jump to the Carelock configuration view for the paired and connected lock.
14. Change transmitted Bluetooth power from the TM2 (same as point no. 5).
15. Signal strength measured by the connected device (phone or lock).
16. Signal strength measured by the TM2.
17. Change transmitted Bluetooth power from the lock.

Safety restrictions

Some features are not available in the app when a lock is connected to a TM2, due to safety restrictions. Basically, all functionality that could lead to an unauthorized unlocking are disabled.

To access the disabled functionality, first make sure a lock is not connected to the TM2, and then re-enter the settings view. To disconnect a paired lock from the TM2 you must remove the lock's battery.

Naming the TM2

To make it easier to connect to the correct TM2 later, you should always give the TM2 a name that indicates which door it is controlling, e.g., a room number.

Port settings

The TM2 can either detect a wired input signal or control a wired output signal through its I/O port. See the installation guide for TM2 for more information (available at <https://tunstalldownload.com/carelock/uz>).

By clicking on the Port settings icon (position 4 in the overview on the previous page), you may configure if the port shall be used as an input or output or being disabled, as well as the functionality of the port. As explained in the installation guide for TM2, you must also change the position of a physical switch located on the backside of TM2 if you want to change between input or output mode.

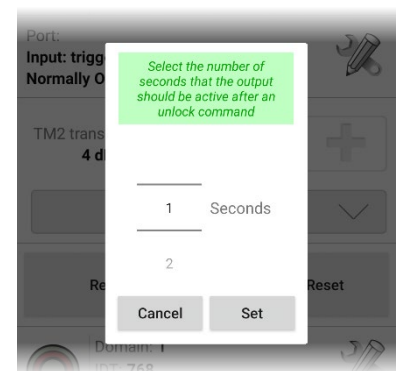
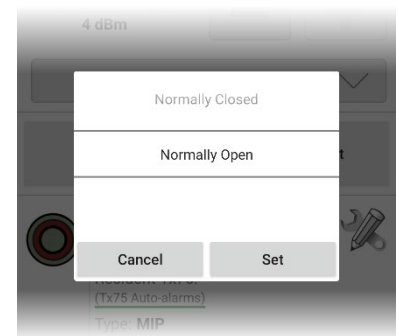
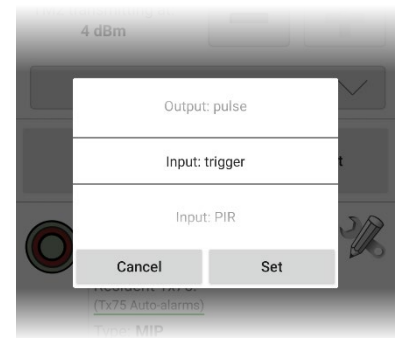
You can choose between two types of input modes for the I/O port: Trigger or PIR.

Input mode Trigger means that TM2 will send an "open" command to the lock when the input is activated. Example of usage is attaching a keypad or card-reader to open the lock.

Input mode PIR means that the input will disable TM2's "open" command while the input is active. Example of usage is to attach a PIR detector on the inside of the door, to avoid any accidental opening of the door by a resident transmitter (auto-alarm) from inside the room. Note that the "open" commands from TM2 triggered by a staff transmitter ID (button alarm) will not be disabled, only those triggered by a resident transmitter ID.

The input can be set to be activated either by a high (normally closed) signal or a low (normally open) signal.

If the I/O operation is set to Output, the output relay will be activated every time an "open" command is sent from the TM2. You can set the hold time for the relay (i.e., how long time the relay will be active after each "open" command. The relay can either break (normally closed) or close (normally open) a connected circuit. Example of usage is to connect an electric strike lock through wires instead of the Carelock UZ lock through Bluetooth. Another example is to turn on a lamp for a while when somebody unlocks the door.



Adjusting transmitted Bluetooth power

If needed, the transmitted Bluetooth power can be adjusted to achieve a robust Bluetooth link with the connected lock. See “Transmitted Bluetooth power and link budget” below for more information.

Configuring the Tx75 settings

A Tx75 can transmit two different types of “alarms”: Auto-alarms and Button-alarms. Auto-alarms are transmitted when a Tx75 intended for residents detects an IDT field, without any interaction from the user. Button-alarms are transmitted when the button on a Tx75 transmitter is pressed.

A Tx75 alarm has a very long range; it can be detected by a TM2 across floors in a building.

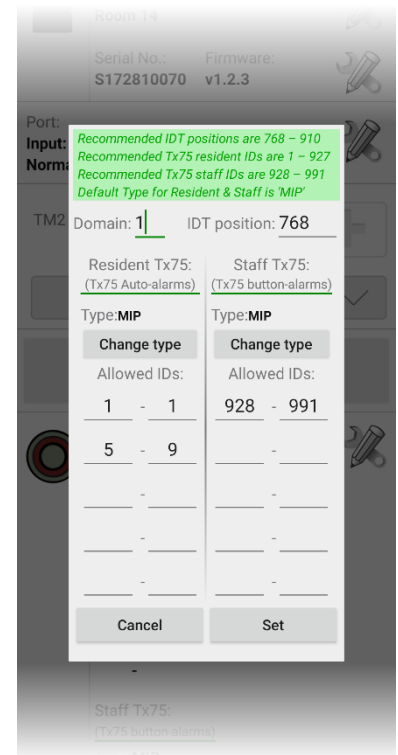
The alarm message transmitted for both Auto-alarms and Button-alarms contains 3 parts: Tx75 ID, Tx75 domain, and IDT zone-ID.

The Tx75 ID is a number between 1 and 1023. All Tx75 transmitters on a site should have a unique ID. TM2 has 5 positions each for accepted Auto-alarms (resident transmitters) and Button-alarms (staff transmitters). These positions are ranges, meaning you can enter a from-value and a to-value in each position. In the example view to the right, resident Tx75 transmitters with IDs 1, 5, 6, 7, 8, and 9 will unlock the door. And staff Tx75 transmitters from 928 to 991 (inclusive) will unlock the door.

The Tx75 domain is a number from 0 to 4 that works in conjunction with the Tx75 ID to make the combination of the two unique; they are both checked by the TM2 for a match. This allows you for instance to have two separate departments with a similar setup of Tx75 transmitters (using the same range of Tx75 IDs), but the two departments have different domain numbers in their Tx75s and therefore cannot open doors belonging to the other department. This can also be useful if two departments are on different floors, to prevent Tx75 transmitters on one floor to accidentally open doors on another floor.

The IDT zone-ID (called “IDT position” in the app) is a number that is unique for each door on a site and should match the actual zone-ID configured in the IDT that is mounted next to the lock being connected to the TM2. Since the IDT range is only about one meter, the IDT zone-ID gives a rather accurate indication of where the Tx75 transmitter is located, allowing only the door close to the transmitter to be unlocked.

In the Tx75 configuration view you can also change the type of Tx75. The default setting is “MIP”, which matches the kind of Tx75 transmitters normally being used for ID-Lock.



Pairing with a lock

Pairing with a lock means that the TM2 stores a digital key called “FixedKey” together with the lock’s Bluetooth address, in its memory. TM2 will then always try to keep a Bluetooth connection with that lock, until the FixedKey or the Bluetooth address is erased from its memory (the lock is “un-paired”).

A TM2 can only be paired with one lock at a time, and that lock will be unlocked when TM2 detects a valid combination of Tx75 parameters.

The FixedKey is a unique random digital key generated by the lock. Every time the lock is requested (by this app) to generate a FixedKey, the previously generated key will be invalidated. Thus, if you pair a lock with a second TM2, the first TM2 will no longer be able to establish a connection to that lock, since the FixedKey stored in the first TM2 is no longer valid.

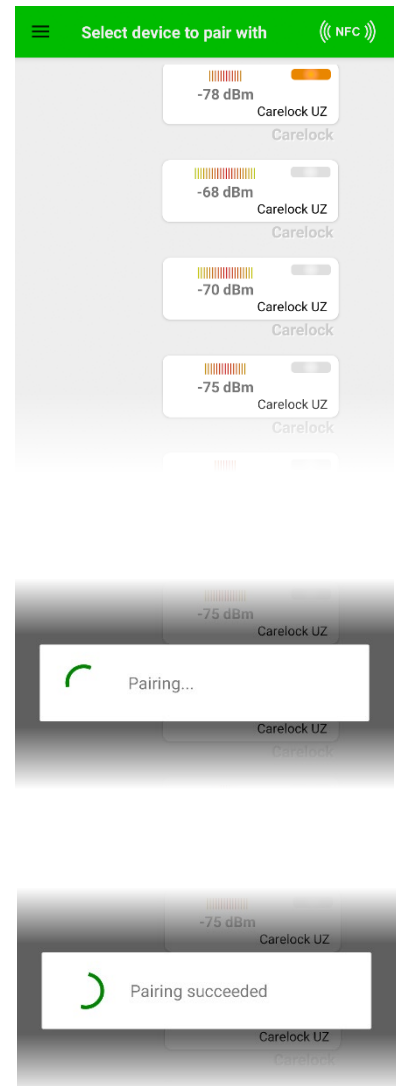
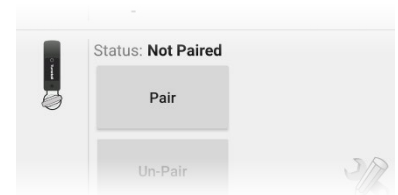
The pairing process contains quite a few steps, which makes it prone to failure if there is a poor Bluetooth connection between the lock, the phone and the TM2. When pairing to a lock, the app will: Connect to the lock and request a FixedKey, disconnect from the lock and connect to the TM2, store the FixedKey as well as the Bluetooth address retrieved from the lock in TM2’s memory, and finally disconnect from the TM2. The TM2 will then try to connect to the lock and authenticate with the FixedKey.

These are the steps you as a user take to pair with a lock:

1. Click on the “Pair” button in the TM2 configuration view.
2. Select the lock you want to pair with by clicking on its representation in the list of available locks.
3. Wait for the process to be completed, which normally takes a few seconds. The app will display the status of the pairing process.
4. If all goes well, you will be back to the same view as when you started the app (with the list of available devices). After a few seconds you should see the paired lock disappearing as a stand-alone lock and instead appear “behind” the TM2-box representation, indicating that the lock is now paired and connected to that TM2.

In case of failure, you may try again from step 2 above, or press the back button to return to the TM2 configuration view.

Reasons for failure may be too low transmitted Bluetooth power from the lock and/or from the TM2. Or a too long distance between the lock and the TM2 or between the phone and any of the two devices. To increase the Bluetooth power, connect to each device separately before pairing and increase their Bluetooth power.



Transmitted Bluetooth power and link budget

It is very important that the Bluetooth radio link between the lock and TM2 is stable, to secure a robust system. To achieve a stable link, you should first pair the lock and TM2, then try to adjust the transmitted power from the lock and the transmitted power from the TM2-box such that the received signal strength measured by both devices are always stronger than -85 dBm.

Note that the received signal strength will fluctuate over time and change when near-by objects and people move around. The fluctuation over time is because the Bluetooth radio link constantly changes between different frequencies, and different frequencies behaves differently.

The optimal goal is to have an even link budget, which means that the received signal strength on both ends is similar. By expanding the view (clicking on the “Show more” button) you can both change transmitted power as well as see the received signal strength on both ends (lock and TM2) at the same time, which makes the adjustment easier. For your convenience, this can be done either from the Carelock Configuration view or from the TM2 Configuration view.



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