Phos4.0

Wireless Emergency Lighting

Quick installation

Important Notes:

- **Even if the wireless system stops working, the luminaires will light up in emergency normally.**
- **The master PC which runs the "Phos4.0" software application must be operating uninterruptedly (energy saving plan disabled).**
- **Tablet PC battery operation for 4h**
- **To maintain communication when mains power is down, connect this master PC and the "GR-7603/V2" Gateways to a UPS.**
- **The master PC or tablet must use a static IP permanently.**
- **When using Ethernet gateways, an ethernet switch must always be used between PC-Gateway connection.**
- **"WelAPI", "WelDbmaker", "WelReceiver" and "WelModbus" are 4 essential services running in the background. Do not block or stop these services by any means.**
- **Consult an IT technician for local network addressing, setting up static IPs if needed.**
- **Keep all the passwords for future use (backup – restore procedure).**
- **Create documentation and plannings for all the devices in the installation.**
    - **Create a floor plan with the device's UID. It is very important to know the exact location of each device.**
    - **Create a document and record the network parameters (SID / NKEY / RF Channel) for all the devices (luminaires, gateways etc.), IP address for the Gateways and IP address of the Master PC.**

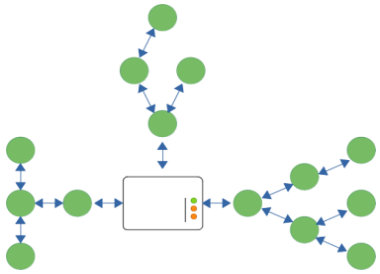
- **Be sure about the device's parameters. To join a device to a gateway's network, SID, NKEY, RF channel values MUST MATCH.**

- **After the addition of the Ethernet / Wi-Fi gateway in the wireless software, you can press the button BT2 to force the gateway to send a status to the software. Be aware that the first registration may require up to 5 min.**

- **Confirm if a wireless emergency luminaire has joined the wireless network by observing the LED indicators of the wireless modules located inside the luminaires. Blinking of both LD2 and LD3 (green) indicates successful**

connection, while the blinking rate indicates quality (the faster the rate the better the signal reception). When LD3 is turned off there is no connection.

- **It is highly recommended to install the Gateway at a central point, where there is at least 1 wireless device (e.g. luminaire) within Gateway's range (directly connected) for every 15 wireless devices.**



- **It is highly recommended during the technical study and prior to the installation, to predict and create alternative routes for most of the wireless devices in order to ensure proper communication even when a wireless node (luminaire, repeater) breaks. Avoid in-line connections when possible. In-line connections do not provide alternative routes for signal to pass when a link is broken.**

Contents

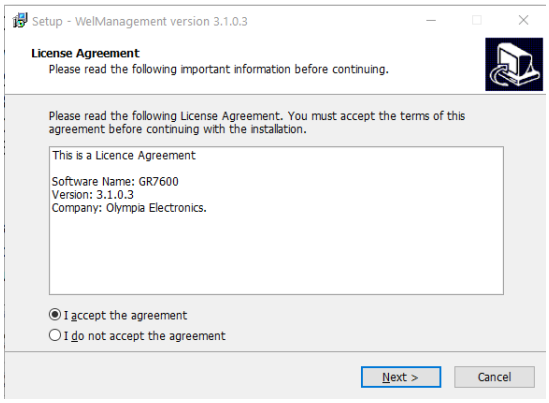
Important Notes: 2
Advance version (PC) 5
Software Installation 5
SQL server account 6
Static IP for the PC (IP Master) 6
Fist Launch - Certificate 7
Software Login (default credentials) 7
Create your admin credentials 8
Account for services 8
Standard version 9
USB gateways 9
Ethernet/Wifi gateways 9
Software Login (default credentials) 9
Wireless signal 9
Signal measuring (RSSI Tester) 9
Spectrum Analyzer 10
Network commissioning 11
Single gateway 11
Multiple gateways 11
Step by Step configuration 12
A. Power off the gateways 12
B. Connect a USB gateway to the laptop 12
C. Create a new network profile. 12
D. Scan the (default) devices 14
E. Pair the devices (luminaires) to the network (gateway) 14
F. Pairing results 15
Add gateways to the software 17
Add the ethernet / Wi-Fi gateway 17
For ethernet connectivity 18
For Wi-Fi connection 18
For Wi-Fi WPS connection 19
Configure gateway's network parameters 19
Devices registration 20
Single gateway commissioning 20

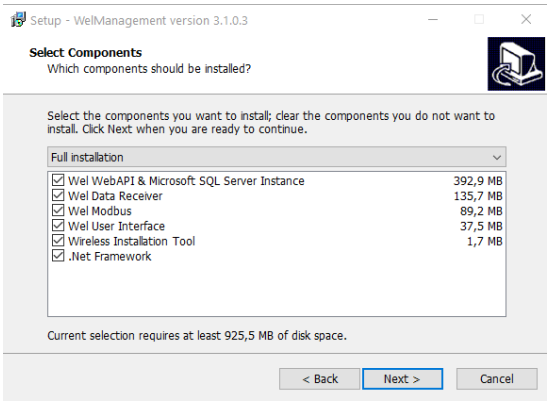
Advance version (PC)

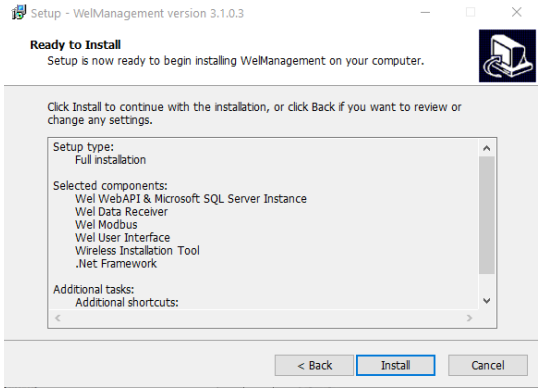
In order to use a Windows PC as the master PC of the wireless emergency lighting system, start by installing the software application.

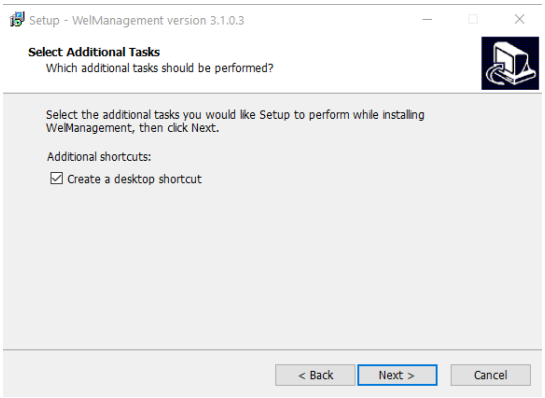
Software Installation

For the master PC, which is responsible of monitoring and controlling wireless network traffic and holding the system database, please do install all pre-selected packages (full installation).

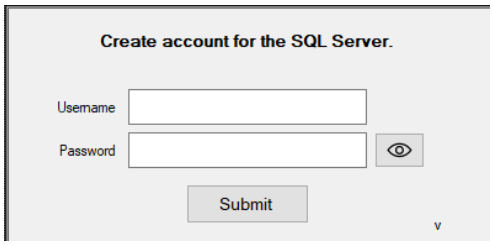








SQL server account



<u>During the installation you must create a user for the SQL server. That user is **only** for SQL server, and you **can't use those credentials to login in the "Phos4.0"** software after installation.</u>

- Username can't be empty, can't have digits, can't contain spaces, can't be the letter combination of '**sa**' or '**admin**', must be at least 7 characters long

- Password can't have spaces, can't contain the given username. Must be at least 10 characters long, contain a number, an uppercase letter and at least one allowed special character (!,@,#,$,%,^,&,*)

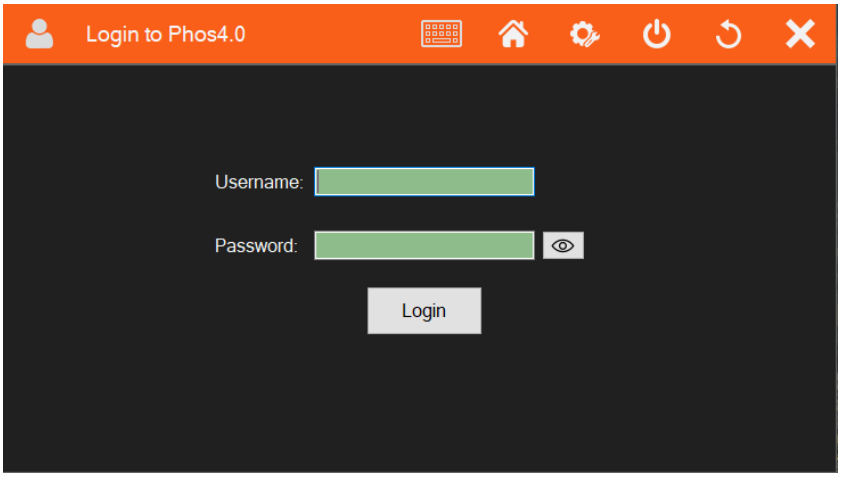
Static IP for the PC (IP Master).

Set up a static IP in the PC that will run the software. You will find those options in windows Control Panel > Network and Internet > Change Adapter Options. Consult an IT technician if you need more help with setting up a static IP.

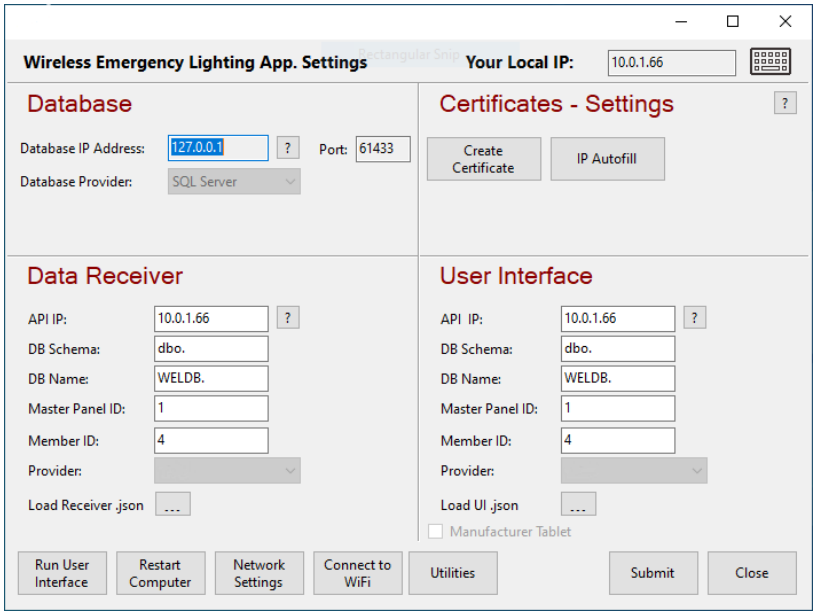
Fist Launch - Certificate

Launch "**Phos4.0**" from the desktop shortcut. At first launch, the application settings window will show up. A certificate needs to be created in order to provide safe communication of the "API" service.

- Press the Settings icon.



- Local IP must be the same with the API IP. If not press IP autofill
- Press Create Certificate and, in the popup, windows select OK.
- Press Submit and restart computer.



Software Login (default credentials)

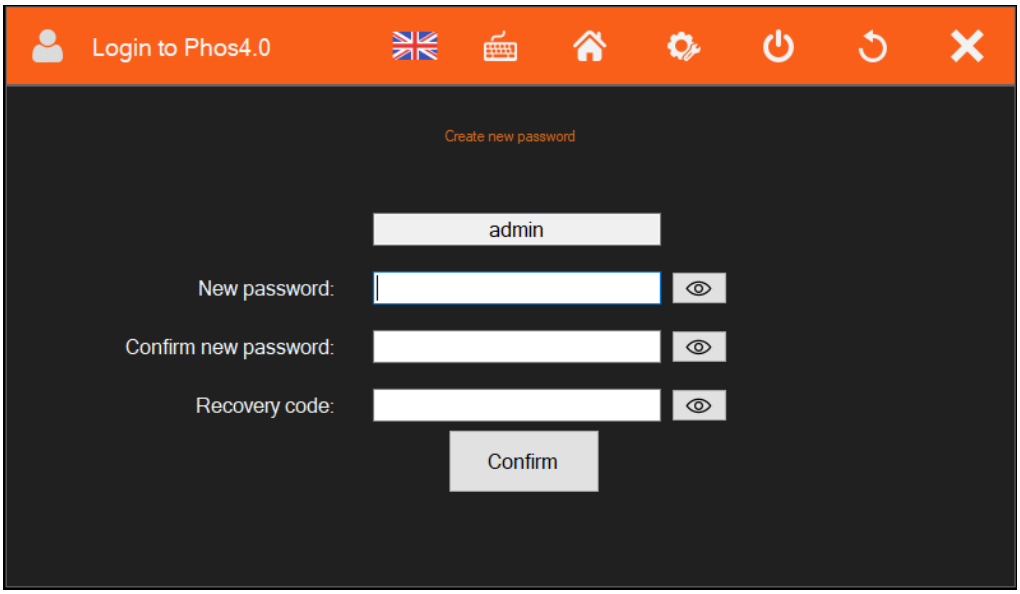
Log in to the software.

- Default administrator username: **admin**

- Default administrator password: **1000**

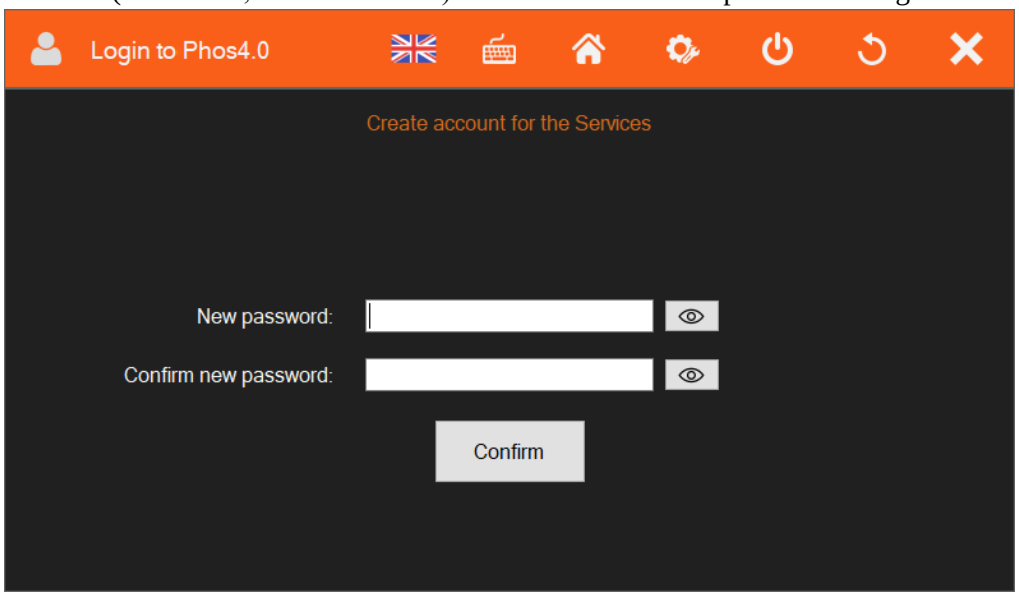
Create your admin credentials

Create your own password and recovery code.



Account for services

Create an account for the services. This account ensures the communication between the services (“WelAPI”, “WelReceiver”)and the API. Enter a password using at least 8-digits



Note! Do not use the services account to login to the software

Standard version

The standard version is pre-installed in the Tablet PC.

USB gateways

When you are going to use the standard version with a USB gateway, it is not necessary to create a certificate.

Follow the procedure below to create your **Login password** and then connect the USB gateway to the tablet.

Ethernet/Wifi gateways

When you are going to use the standard version with Ethernet / Wi-Fi gateway, follow the procedure below for setting up a static IP and creating **Login password** and **certificate.**

Software Login (default credentials)

Follow the below chapters:

- Static IP for the PC (IP Master) page 6
- First Launch – Certificate page 7
- Software Login (default credentials) page 8
- Create your admin credentials page 8
- Account for services page 9

Wireless signal

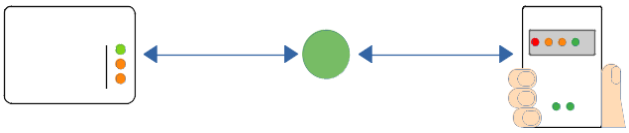
During installation of a wireless network, it is recommended to use the GR-7605/V2 RSSI Tester to check signal reception level before installing and activating a wireless device (luminaire) at that position.

Signal measuring (RSSI Tester)

Start with measuring the first installation area near to the Gateway. Stay on position for at least 1 minute for more precise measurements.

When the indication level is 3 and above the position is good to install. Proceed to the next installation position.

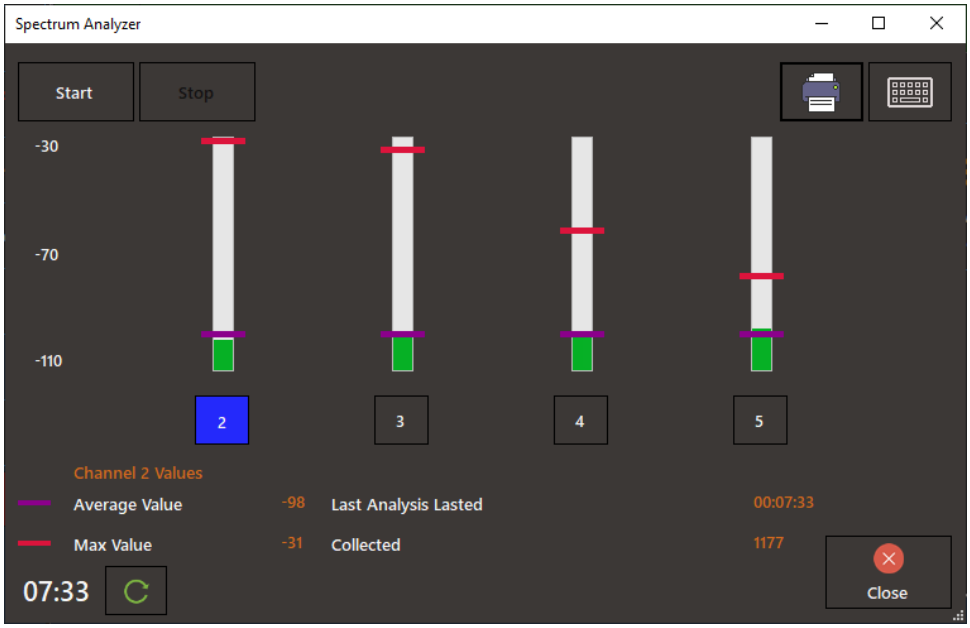
The wireless signal is capable of traveling through interior brick walls and conventional furniture (wood or synthetic), covering distances of 20 to 25 meters in a building's interior.



Spectrum Analyzer

If another wireless system operating at 868 MHz is present in the area, prior to installation, use the **'Wireless Installation Tool'** application along with a GR-7605/V2 or GR-7607/V2 to check the frequency spectrum (Spectrum Analyzer) on RF channels 2, 3, 4 and 5

- Connect a "GR-7605/V2 RSSI Tester or GR-7607/V2 USB Gateway"
- go to "**InstallationTool**"
- select "**Scan**".
- Select "**Connect**" and wait until you see the "**UID**
- select "**SpectrumAnalyzer**"
- click "**Start**"



Let the procedure run for at least one minute (according to the timer bottom left). It is recommended to run the test into many areas of the installation for better results, reset the timer on each new position and count at **least 1 minute of scanning**, until you cover the area of a wireless network. In areas that another independent wireless network will be installed, run a new measurement by stopping the previous first.

***IMPORTANT**: Note that the scale is in negative range, therefore -50dBm is higher than -100dBm, therefore, in average, a channel with -100dBm is considered to have less traffic than a channel with -50dBm.*

Network commissioning

Single gateway

In case of using ONLY one gateway go to chapter Single Gateway commissioning page 21

Multiple gateways

Use a laptop with the installation tool installed (standalone version) and one USB gateway (which will act as a tool) to set up each gateway's network, one gateway at a time.

Move close to the first gateway having the recorded lists of devices with you, set up the network and the luminaires and move on to the next gateways.

With the **installation tool** and the USB gateway you can separate and change each network's parameters (**SID, Channel, NKEY**) for every device. After the procedure is done, the luminaires will be connected to the proper gateway (**with same SID, Channel, NKEY**).

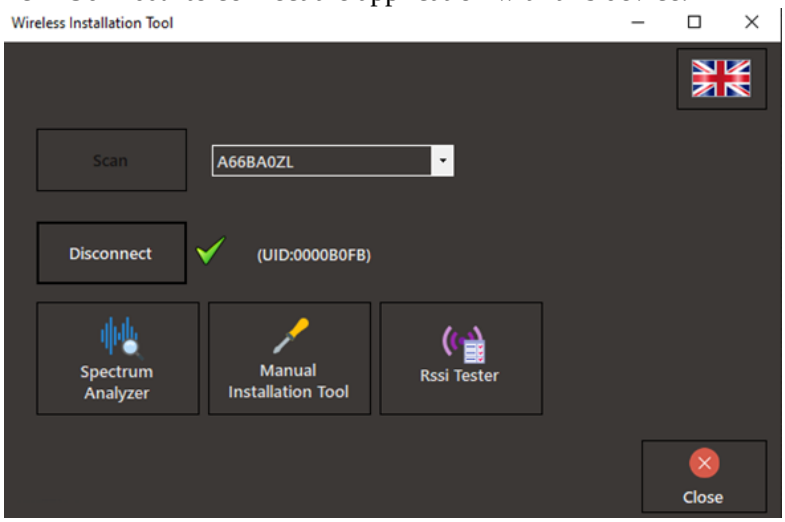
Step by Step configuration

A. Power off the gateways

Power off all the gateways in the installation. Only the usb gateway must be enabled, which will be used with the installation tool for the commissioning.

B. Connect a USB gateway to the laptop

- Move close to the gateway (of the installation) that will be set up.
- Connect a USB Gateway to a USB port of the laptop and run 'Wireless Installation Tool' (standalone version).
- Click on **'Scan'** and select the connected usb gateway device.
- Click **'Connect'** to connect the application with this device.

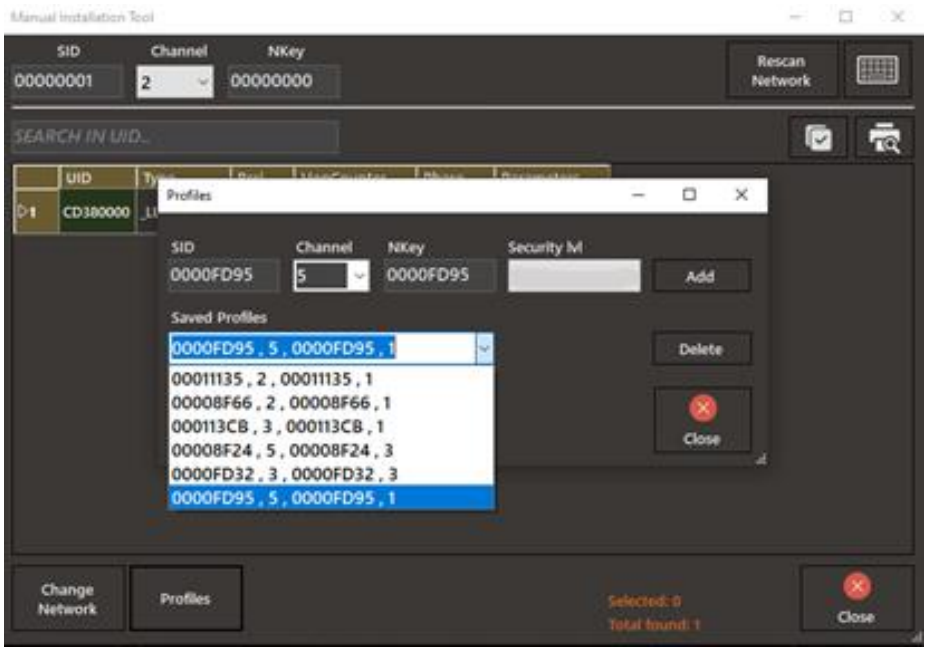


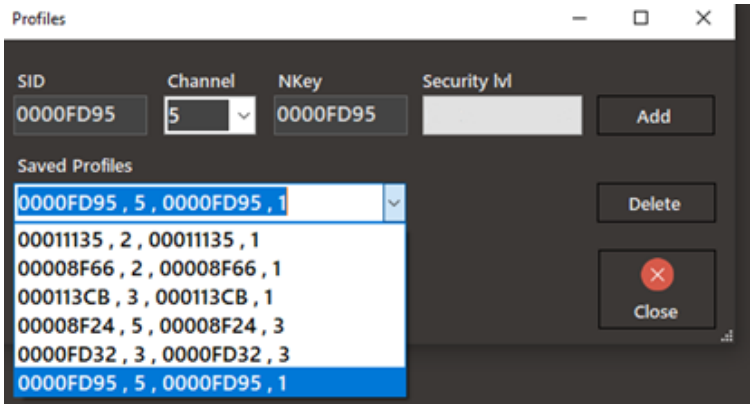
The **'UID'** of the selected device should appear.

- Click on **'Manual Installation Tool'**.

C. Create a new network profile.

- Input the new **SID, RF channel, Nkey** and press **"Add"**.
  If you want to create more networks (profiles for other gateways) repeat this step. (You can create all the networks for all the gateways now, or create them one by one after finishing setting up and connecting the luminaires to each one.)
- Press **"Close"** when you have finished with the new networks.

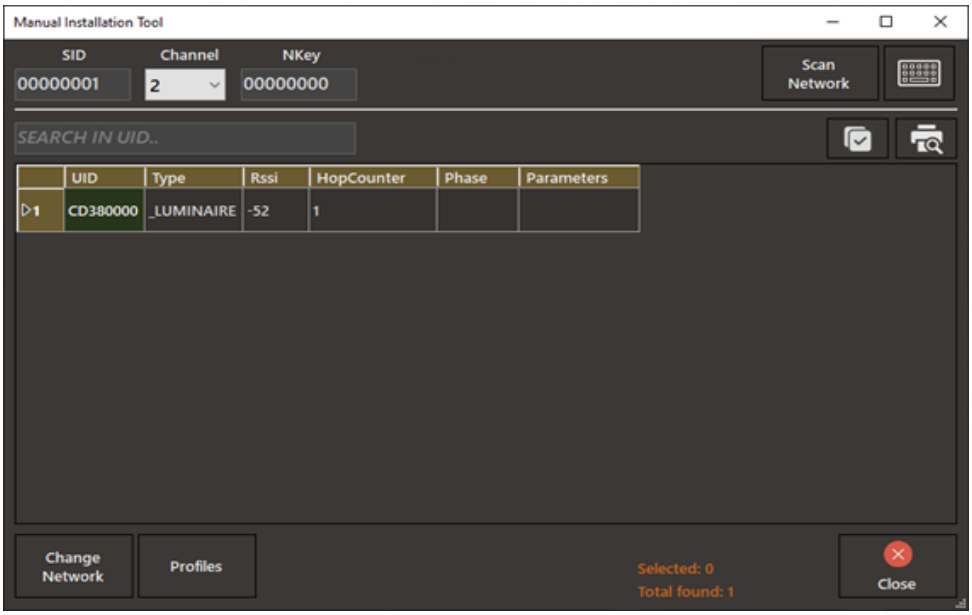

Manual Installation Tool
SID
00000001
Channel
2
NKey
00000000
Rescan Network
SEARCH IN UID..
UID
CD380000
Profiles
SID
0000FD95
Channel
5
NKey
0000FD95
Security lvl
Add
Saved Profiles
0000FD95 , 5 , 0000FD95 , 1
00011135 , 2 , 00011135 , 1
00008F66 , 2 , 00008F66 , 1
000113CB , 3 , 000113CB , 1
00008F24 , 5 , 00008F24 , 3
0000FD32 , 3 , 0000FD32 , 3
0000FD95 , 5 , 0000FD95 , 1
Delete
Close
Change Network
Profiles
Selected: 0
Total found: 1
Close


Profiles
SID
0000FD95
Channel
5
NKey
0000FD95
Security lvl
Add
Saved Profiles
0000FD95 , 5 , 0000FD95 , 1
00011135 , 2 , 00011135 , 1
00008F66 , 2 , 00008F66 , 1
000113CB , 3 , 000113CB , 1
00008F24 , 5 , 00008F24 , 3
0000FD32 , 3 , 0000FD32 , 3
0000FD95 , 5 , 0000FD95 , 1
Delete
Close

D. Scan the (default) devices

By default, your USB gateway will be in **default values (SID:00000001, Channel: 2, NKey:00000000)** which will already be pre-filled. Assuming that this is the first installation, all the lights will also be in the **default values.**

- On the top of the window, input (if not already pre-filled) the default **SID, RF Channel** and **NKey** values for the wireless network (USB gateway) that will scan the devices with those values (default luminaires).
- Click **'Scan Network'** to run the scan process. The response from all the devices with those network values may take up to 10 minutes.

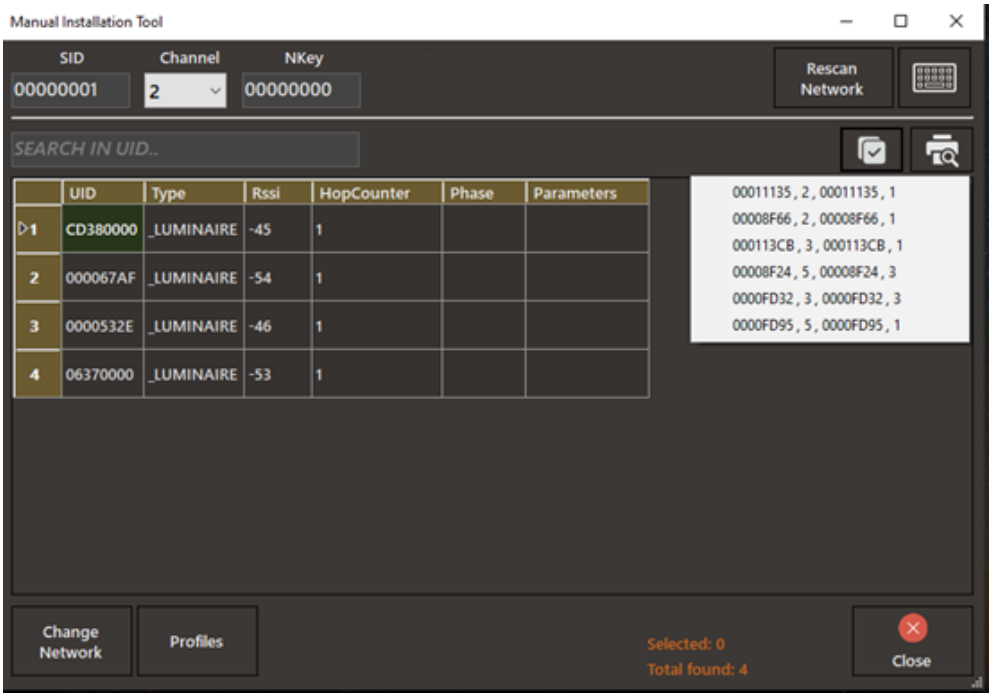


E. Pair the devices (luminaires) to the network (gateway)

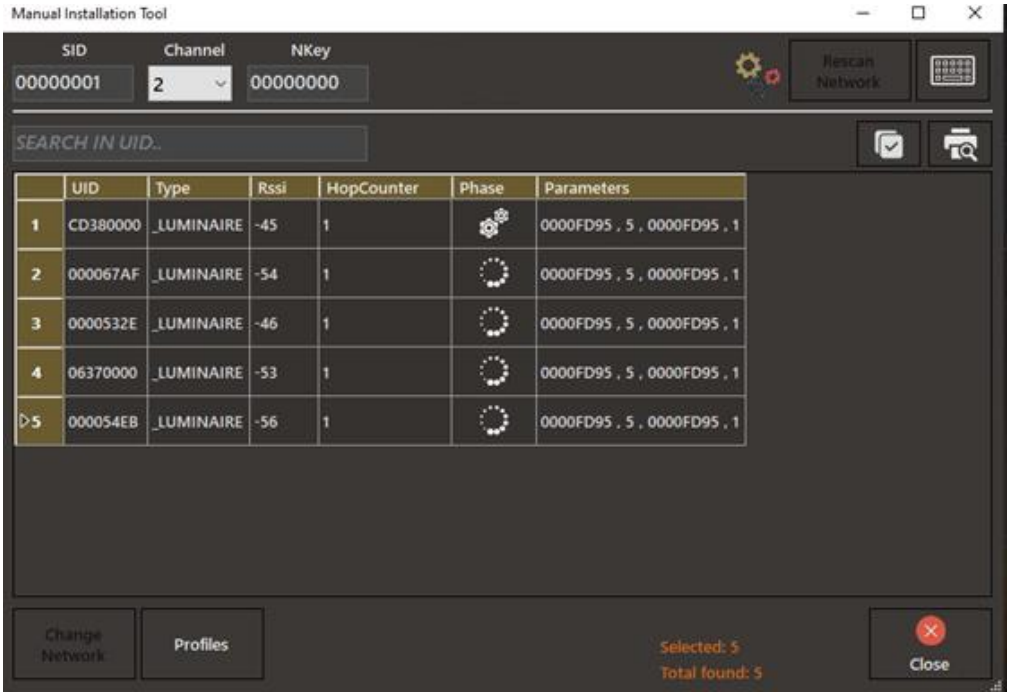
- Select the scanned devices one by one from the list, press right click and select the right profile to be assigned to.

This way you can separate and pair the devices in the correct gateway. In case you want to modify the whole list with the same parameters select the profile you want from the icon:

- **<u>Once you are done selecting the network profiles for each luminaire, press "Change Network" to assign them to selected gateway.</u>**



- Wait while the procedure is running (column “Phase” loading)



F. Pairing results

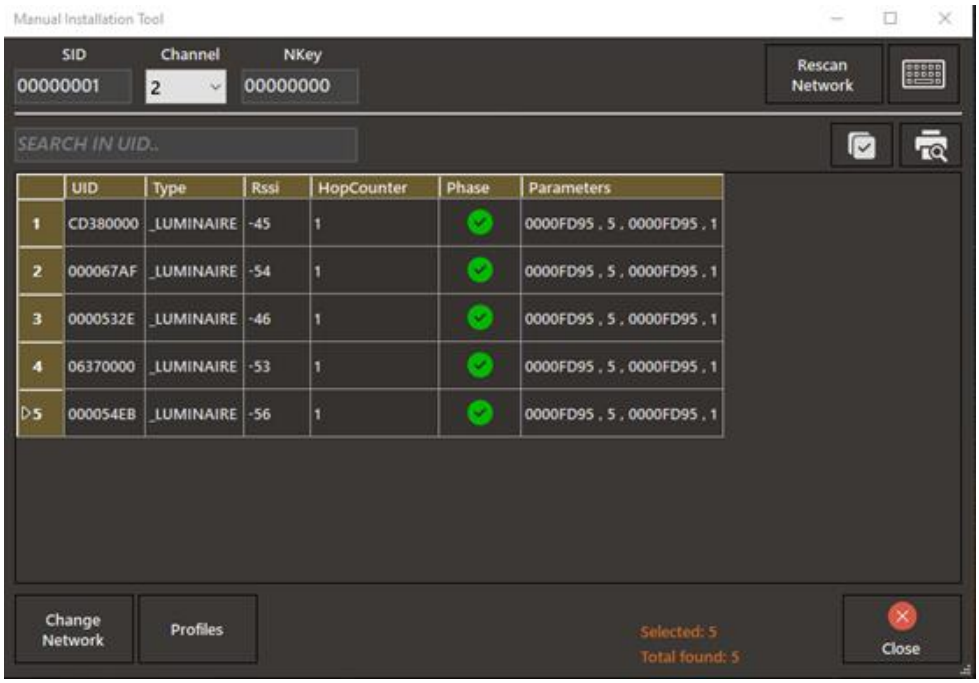
When the procedure finishes, check the column **“Phase”**.

If the device has received the new profile parameters successfully, the icon will turn green.

If the device did not receive the new profile parameters successfully the icon will turn red.

When some of the devices do not receive the new parameters successfully, you can move on to the next step.
Take note of this device in order check it again after you add the gateway in the software.

Usually, some luminaires do not manage to send the response on time and the tool marks them up with red as unsuccessful. After some time, the luminaire will communicate, and you will be able to check its status from the software. If you cannot find them in the software, go and check the luminaire as it may be faulty, disconnected module, powered off, marginal signal.
One you solve any possible issues in the devices, follow the “Pair device” procedure for the unassigned devices.



Add gateways to the software

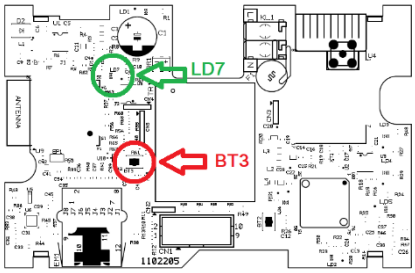
The last step will be to **power on** and **set up** the gateways.

Add the ethernet / Wi-Fi gateway

- First, via the software user interface, go to "**Installation**>**Add Gateway**" and click "**Start**". Software is ready to receive the gateway.

- While the gateway is powered on, open the front plastic cover and press the "**BT3**" button located on the middle left side of the PCB for **3 seconds**. *Avoid touching other areas of the devices electronics.*

- The "**LD7**" green LED will start blinking **2 times per second**, indicating the **Wi-Fi Access Point** of this gateway is turned on.



- Use your Wi-Fi device (laptop, smartphone) in order to connect to this Wi-Fi Access Point with the **SSID (name)**:

  "**WIRELESS_LIGHTING_GATEWAY**"

- Use the following password when asked:

  "**WIRELESSGW**"

- Open a web browser via your Wi-Fi device and in the browser's URL area type the address "**192.168.1.1**" and then press "Enter". The following page appears:

For ethernet connectivity

- In the "**IP static**" field enter the static IPv4 address for this Gateway device, or leave empty for dynamic addressing (DHCP option).
- In the "**NETMASK**" field enter the Network's desired mask. (optional)
- In the "**GATEWAY IP**" enter the gateway's IP. (optional)
- Write the IPv4 address of the master PC (that is hosting the software), in the "**IP Master**" field. This value is required.
- Select the "**Ethernet**" option and click "S**ubmit**" to apply changes.

For Wi-Fi connection

- In "**WiFi SSID**" field write the SSID (name) of the Wi-Fi network that the Gateway will join. The name is case sensitive.
- In "**WiFi PSWD**" field write the WPA2/PSK password of the Wi-Fi network.
- In "IP static" field write the static IPv4 address for this Gateway device or leave empty for dynamic addressing (empty → DHCP).
- Write the IPv4 address of the master PC (that is hosting the WelReceiver service) in the "**IP Master**" field. This value is required.
- Select the "**WiFi**" option and click "Submit" to apply changes.

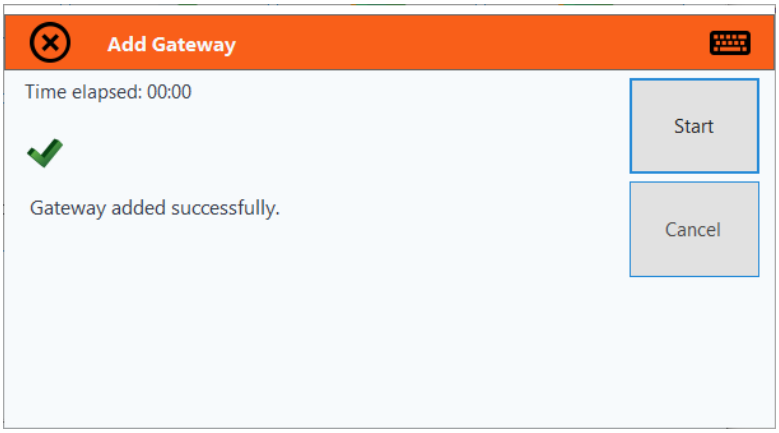
For Wi-Fi WPS connection

In order to connect the Gateway with the local network using **Wi-Fi - WPS** connectivity, a Wi-Fi network with WPS is needed. Gateway will join the Wi-Fi network as a client.

- Write the IPv4 address of the master PC (that is hosting the software), in the "**IP Master**" field. This value is required. Leave the rest empty.
- On your Wi-Fi router, click the "**WPS**" button to enable WPS invitation.
- Select the "**WPS**" option and click "**Submit**" to apply changes.

If your connection method succeeds, the "**LD7**" green LED will start blinking **1 time per second**, indicating a successful connection.

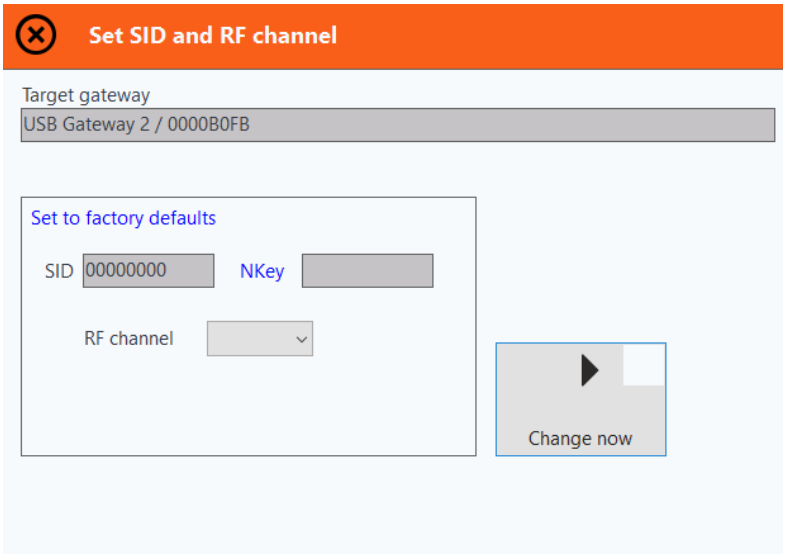
In the software the following message will appear indicating a successful connection.



Configure gateway's network parameters

In the software, configure the proper SID, Channel, and NKEY to the gateways.

- Go to "Gateways, double click to the desired gateway and set the correct **SID** and **RF channel**".
- Set up all the gateways network parameters of the installation.



The devices (luminaires) which have the same network parameters with the gateways (SID, Channel, NKEY) will be paired to the correct gateways. This will take some time which independents from the installation. Estimate time is around 15 minutes.

Devices registration

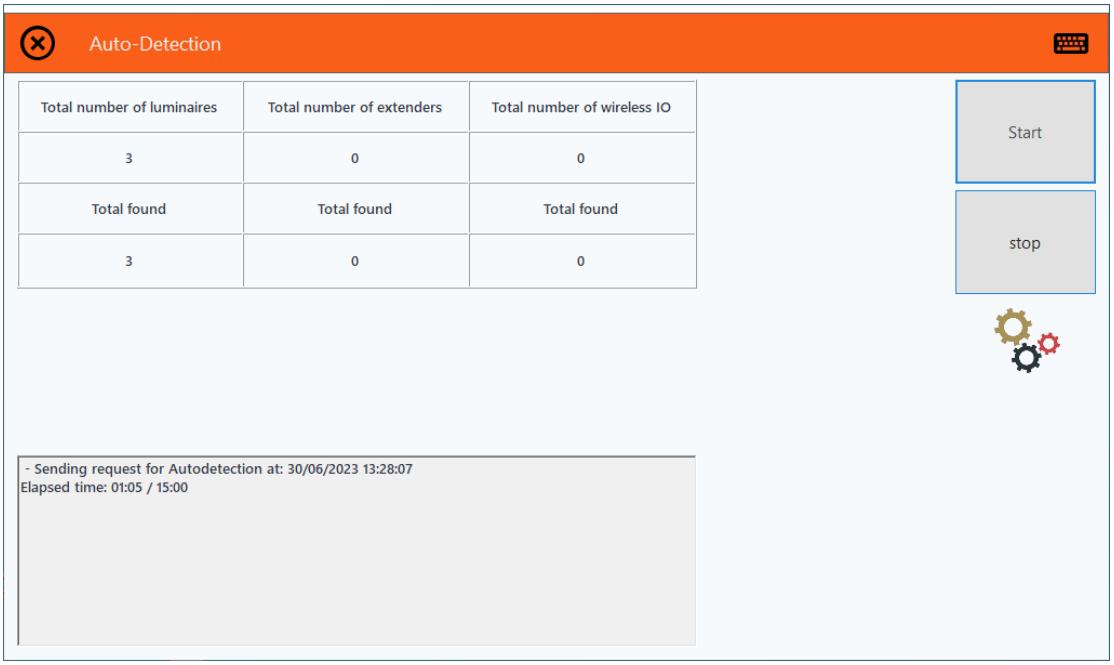
To register the new devices in the software, perform Auto detection procedure

- Go to **Installation>Auto detection**

Single gateway commissioning

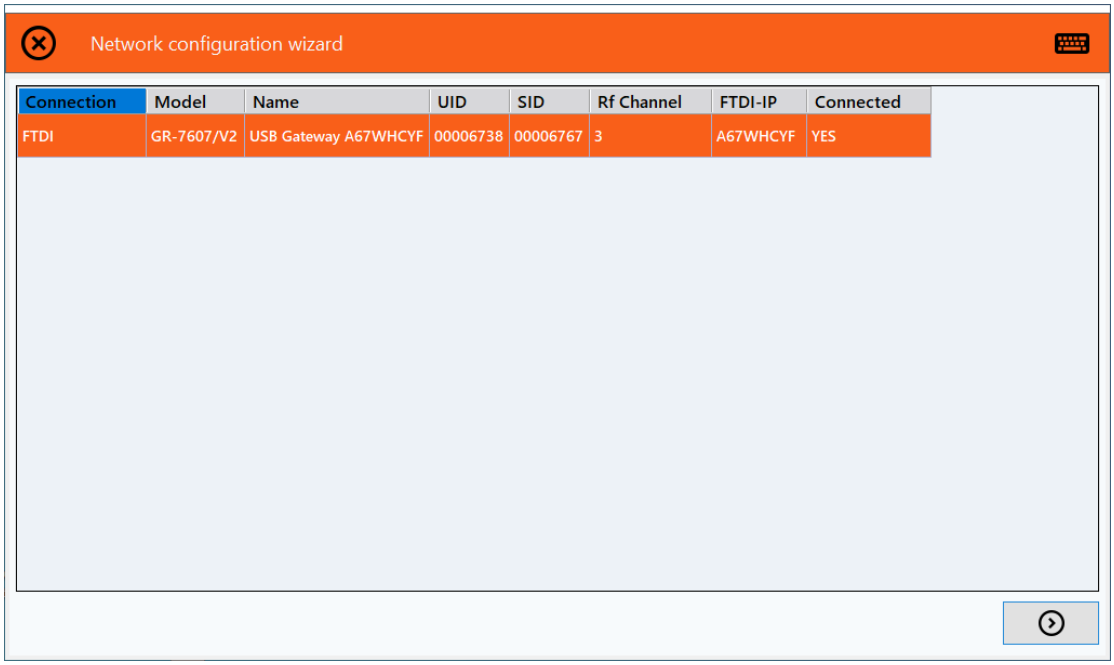
In case you are going to use only one gateway (ethernet/wifi or usb) to your installation, follow the below steps.

- **Add gateway** chapter *Add gateway to the software page 17.*
- **Autodetection:** In order to find and register all the devices automatically to the software you can use the "**Autodetection**" procedure from the **Installation menu**. When the procedure finds all the devices you can press "**Stop**" or the autodetection will stop automatically after 15 minutes.



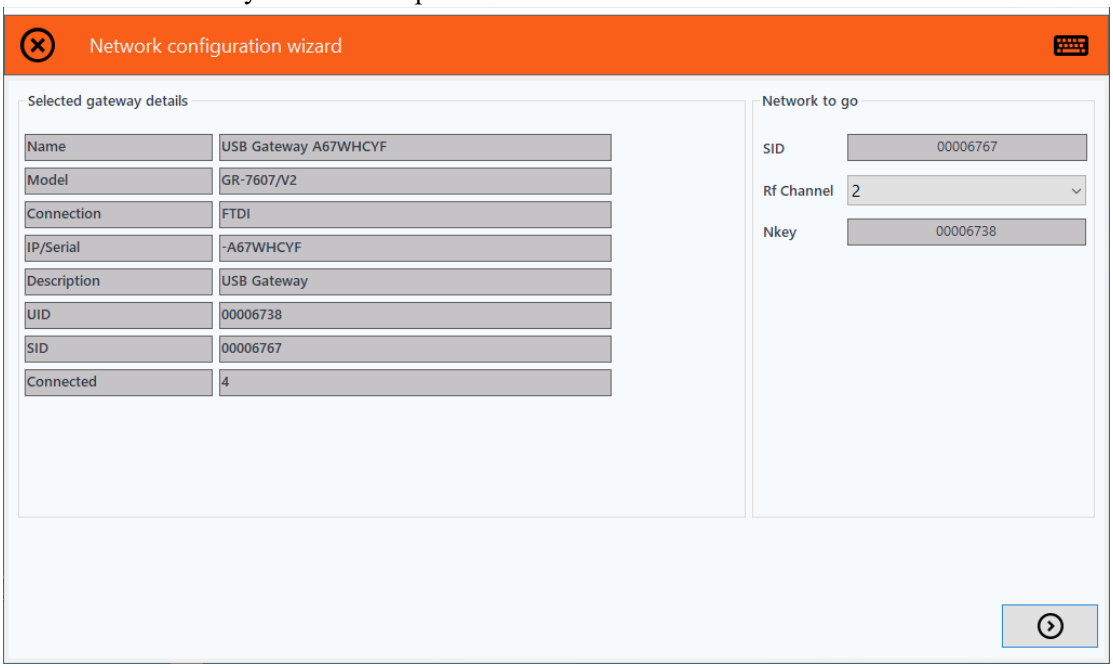
- **Network configuration wizard:** Recommended even in case of one gateway to change the parameters into the network. From "Installation" menu go to "**Network configuration wizard**" and follow the

1. Select your gateway

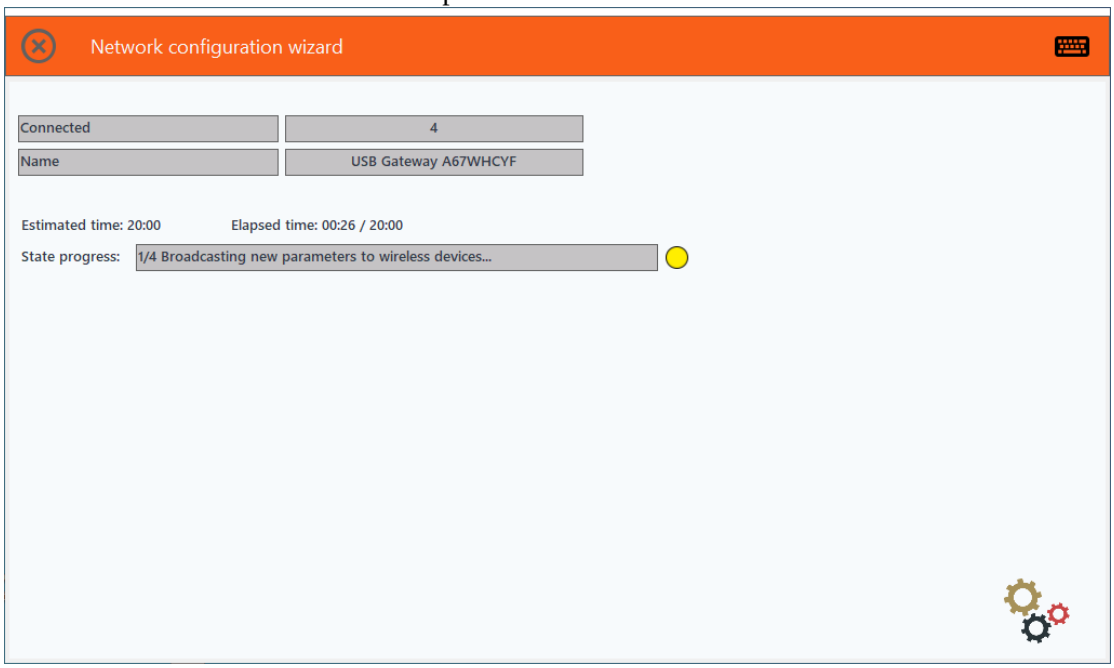


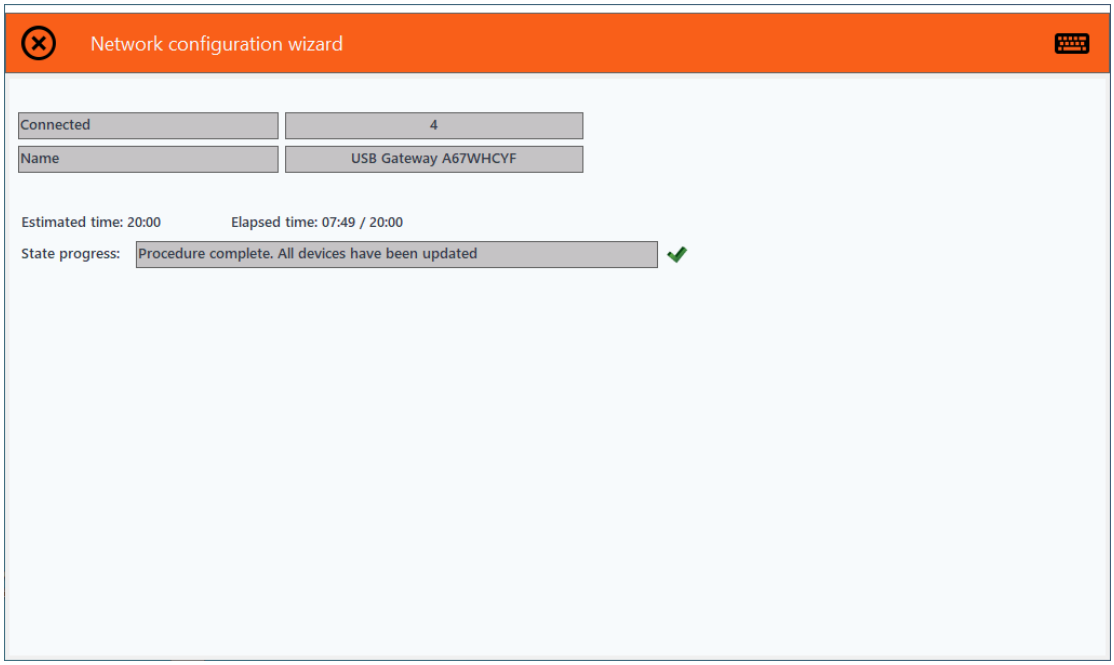
2. In the left column there is information regarding the gateway and the connected devices to this gateway.

In the right column you must fill in the new parameters for SID, RF Channel, Nkey and Security Level. Then press "**next arrow**"



3. The procedure will start. The average time needed is 8 minutes and it is independent of the network and the signal. When the procedure is finished, your network will have the new parameters.




Network configuration wizard
Connected
4
Name
USB Gateway A67WHCYF
Estimated time: 20:00
Elapsed time: 07:49 / 20:00
State progress:
Procedure complete. All devices have been updated