



GE Daintree EZ Connect User Manual | V2.0



Networked



Simple
Commissioning



Upgradable



Wireless

GE Daintree EZ Connect

User Manual | V2.0

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GE Daintree EZ Connect

Getting Started

Compatibility

Compatible WIT100 firmware version: v4.6.21

Compatible EZ Connect App version: v1.6.3

Pre-Commissioned Operation

When fixtures are first installed in the ceiling, according to installation instructions and electrically energized, the integral WIT100 sensors that are built into those fixtures will begin operating.

Since the fixtures will not yet have been commissioned, they will act independently in a **Standalone Mode** of operation (known as Daintree One). The fixture will adjust its light level according to its own sensor and its behavior will not be affected by the behavior of any neighboring fixtures.

This is the simplest mode of operation and will provide only a basic level of lighting control until the commissioning process has been performed. Such control may not meet state or local code building and therefore may not be adequate for long term fixture control needs.

There are three possible operating states that the fixture may assume during standalone operation. These are:

1. **Standby State** – Lighting level is fixed at 0% and can automatically transition to **Background State** if occupancy is detected beneath the fixture.
2. **Background State** – Lighting level is at a pre-programmed level (50%) and can transition automatically to either a **Task State** (100% lighting level) or **Standby State** (0% lighting level) depending on whether occupancy is detected.
3. **Task State** – Lighting level is at a pre-programmed level (100%) and can transition to a **Background State** (50% lighting level) depending on whether occupancy is detected. The fixture will stay in **Task State** for as long as occupancy is detected.

The state (**Standby, Background, & Task**) changes that will occur based on occupancy detected by the integrated sensor are illustrated in Figure 1.

A fixture will light up from **Standby State (0%)** to **Background State (default 50%)** immediately when occupancy is detected by the sensor. If occupancy continues to be detected under that fixture for a period equal to or greater than a pre-defined **Settling Time (default of 5 seconds)**, the fixture will illuminate further to **Task State (default 100%)**.

A fixture that is in **Task State** will transition back to **Background State** if no occupancy is detected for a time greater than or equal to **Hold Time (default 10 minutes)**. And a fixture that is in Background State will transition back to a Standby State if no occupancy is detected for a time greater than or equal to the **Group Hold Time (default 10 minutes)**.

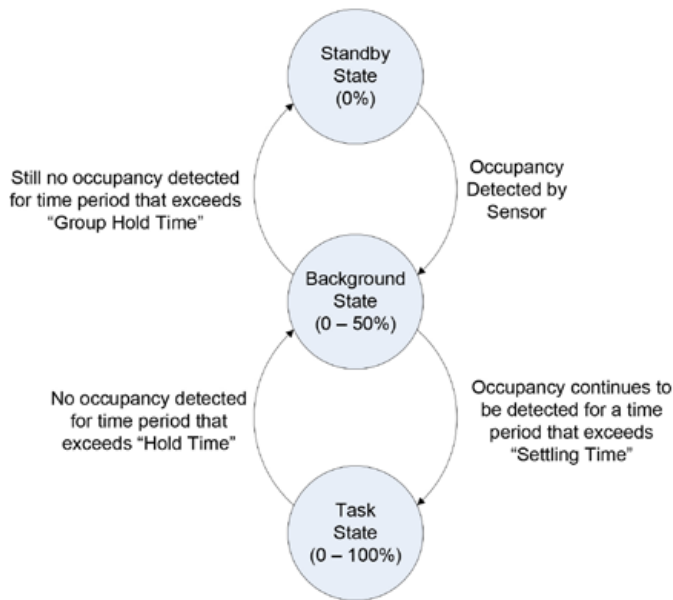


Figure 1. State Changes in the **Standalone Mode** of Operation (Pre-Commissioned)

Commissioned Operation

After the fixtures are installed, the next step in the commissioning process is to connect fixtures logically together into room-based networks (groups).

Operating modes

A room network can be programmed to operate in either Automatic Mode or in Vacancy-Detection Mode. In both modes of operation, fixtures can transition to any one of four different operating states.

These states are:

1. **OFF State** – Lighting level is fixed at 0% and can only be turned on (to **Task State**) using a manual switch.
2. **Standby State** – Lighting level is fixed at 0% and can automatically transition to **Background State** if occupancy is detected or transition to an **OFF State** if the network is commissioned in Vacancy-Detection Mode and no occupancy is detected.
3. **Background State** – Lighting level is at a user programmed level (50% is default) and can transition automatically to either a **Task State** or **Standby State** (0% lighting level) depending on whether occupancy is detected underneath that specific fixture in the room-based network.
4. **Task State** – Lighting level is at a user programmed level (100% is default) and can automatically transition to **Background State** if no occupancy is detected underneath that fixture.

The significant difference between these two operating modes has to do with the ability of the room lights to transition from a Standby State (0% level) to an OFF State (0% level).

Automatic Mode: When the room network is programmed to operate in Automatic Mode, then the room lighting cannot automatically transition from a Standby state (0% level) to an OFF State (0% level). Only manual control from a switch will allow this state change.

Vacancy-Detection Mode: When the room network is programmed to operate in Vacancy-Detection Mode, a fixture can transition automatically from a Standby state (0% level) to an OFF state (0% level) if occupancy is not detected by any fixture in that room network for a pre-programmed Grace Time. Once this grace period has been exceeded, the lighting will go to an OFF State and remain this way regardless of whether occupancy is detected. The only way to turn the lights back on again is to manually switch to a Task Level using a wirelessly paired compatible wall switch. The system will again operate automatically provided occupancy continues to be detected. Of course, a switch can still be used to manually put the fixtures into an OFF State when operating in Vacancy Detection Mode.

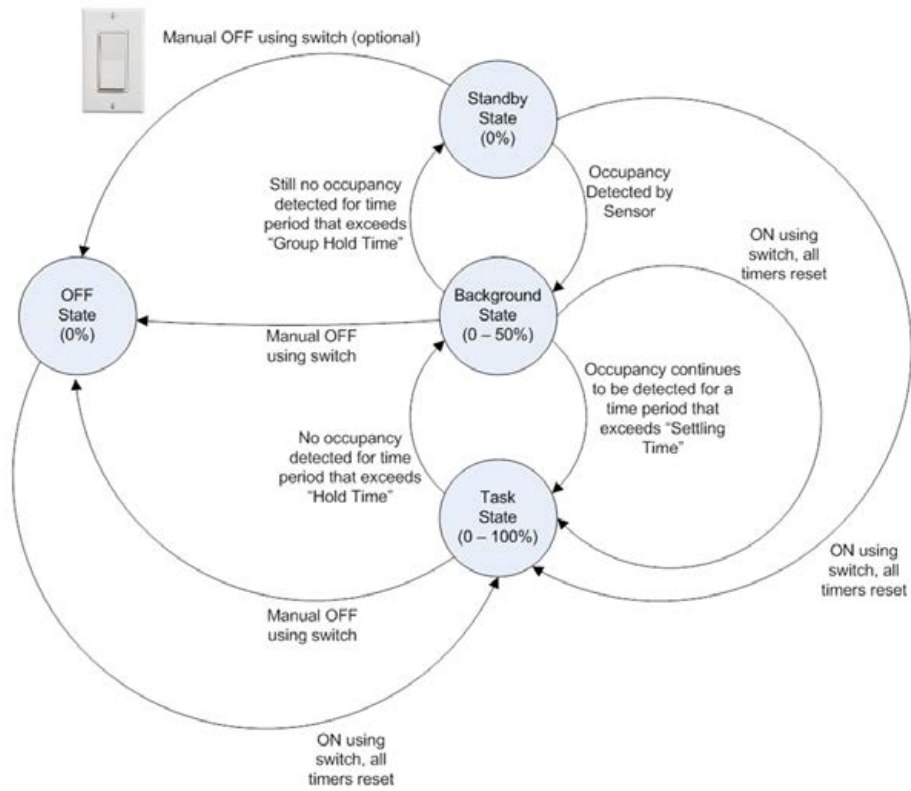


Figure 2: State Changes in **Automatic Mode** after commissioning

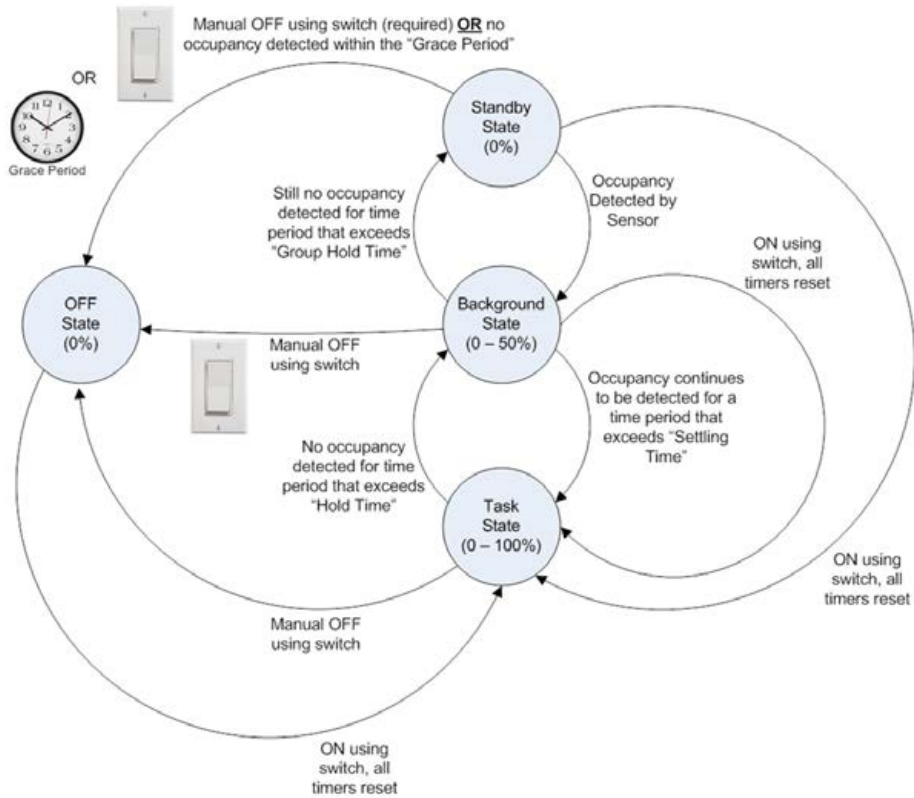


Figure 3: State Changes in **Vacancy-Detection Mode** after commissioning

Summary of Operating Parameters

Settling Time

The time (measured in sec) that occupancy must be detected for a fixture to transition from **Background state** to **Task state**.

- Minimum value: 0 sec.
- Maximum value: 300 sec.
- Default value: 5 sec.

Hold Time

The time (measured in minutes) that occupancy must NOT be detected for a fixture to transition from **Task state** back to **Background state**.

- Minimum value: 1 min.
- Maximum value: 30 min.
- Default value: 10 min.

Group Hold Time

The time (measured in minutes) that any fixture in a network of fixtures must NOT detect occupancy for the entire network of fixtures to transition from **Background state** to **Standby state**.

- Minimum value: 0 min.
- Maximum value: 15 min.
- Default value: 10 min.

Grace time

When the room network is programmed to operate in **Vacancy-Detection Mode**, a fixture can transition automatically from a **Standby state (0% level)** to an **OFF state (0% level)** if occupancy is **NOT** detected by any fixture in that room network for a pre-programmed Grace Time.

- Minimum value: 15 secs.
- Maximum value: 30 secs.
- Default value: 20 secs.

Background Level

The output power level in Background state – in percentage of the full power.

- Minimum value: 0%.
- Maximum value: 50%.
- Default value: 50%.

Task Level

The output power level in Task state – in percentage of the full power.

- Minimum value: 0%.
- Maximum value: 100%.
- Default value: 100%.

DLH Enabled

This parameter enables the Daylight Harvesting functionality.

- Minimum value: 0 (disabled)
- Maximum value: 1 (enabled)
- Default value: 1

Operating Mode

This parameter switches between Automatic and Vacancy modes.

- Minimum value: 0 (Automatic)
- Maximum value: 1 (Vacancy)
- Default value: 0

Sensitivity

The sensitivity of the motion sensor.

- Minimum value: 0%
- Maximum value: 120%
- Default value: 80%

DLH Reference

The reference value measured in lux, controlled by the daylight harvesting function.

- Minimum value: 1 lx
- Maximum value: 2000 lx
- Default value: 500 lx

Sensitivity & Motion Detection

Algorithm sensitivity can be set via EZ Connect application, the default sensitivity is 80%.

According to the measurements the motion detection area under a corresponding node is the following in case of 80% sensitivity:

- Major movements: in 6 feet (1.82 m) radius
- Minor movement: in 3 feet (0.91 m) radius

When the sensitivity is set to a lower value, the detection radius will decrease – 6 feet (1.82 m) in case of 40% sensitivity. It is advised to keep the sensitivity at 80% by default – change this setting only if there is a special need.

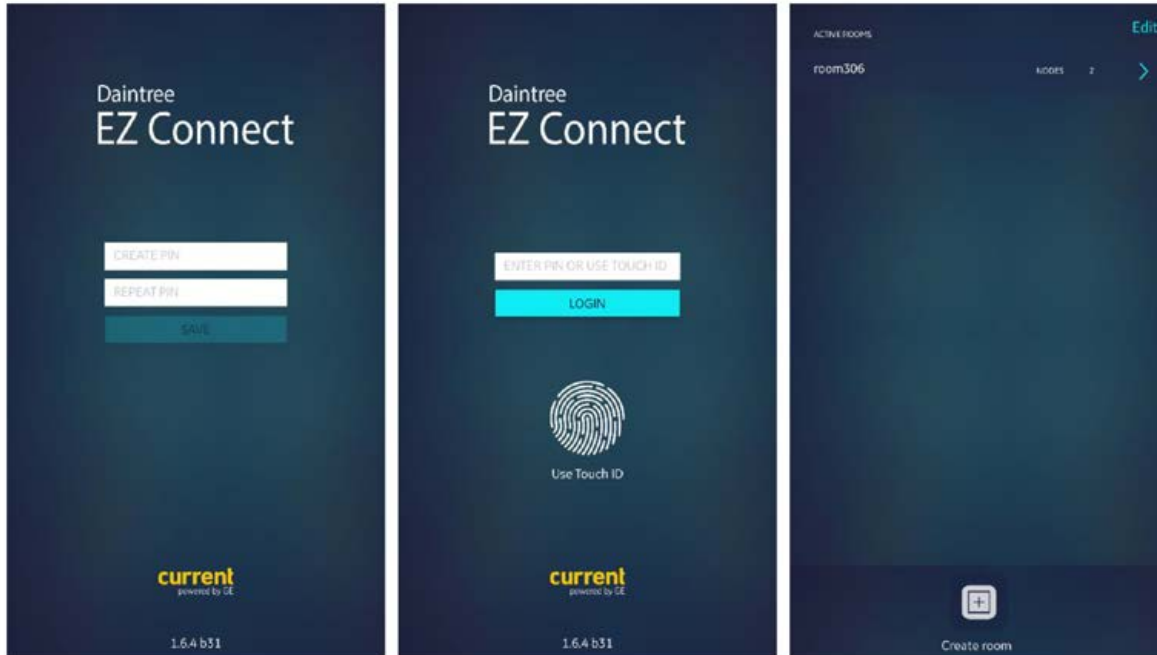
Sensors are generally located at one edge of the fixture. It is therefore possible to change the coverage in a room depending on how the fixtures are oriented during installation. It is recommended that the fixtures are oriented so that sensors properly cover the room. If minor movements are expected to be detected in entire area. According to the radius, the sensors shall be 6 feet from each other.

Daylight Harvesting (DLH) Feature

The integrated WIT100 sensor has a daylight sensor. This enables the lighting to be turned off in fixtures that detect that adequate natural lighting is available to light the area without the need for artificial lighting. DLH is enabled or disabled for the entire room network, however, each fixture will act independently according to its own daylight sensor. Therefore, it will be normal to find only some fixtures turned off when DLH is enable. It is important to note that the fixtures do not transition to another state when DLH causes that fixture to turn off. The threshold ambient light level required to turn a fixture off is preset at 500 lux.

Using the Commissioning Application: Logging in

When the application is launched for the first time the user has to create a minimum 4 digit long PIN, which cannot contain consecutive numbers.




The TouchID can be used for authentication after the PIN has been created. After a successful authentication the homescreen appears, which shows the active rooms in the area. Rooms can be created, modified or deleted from this page.

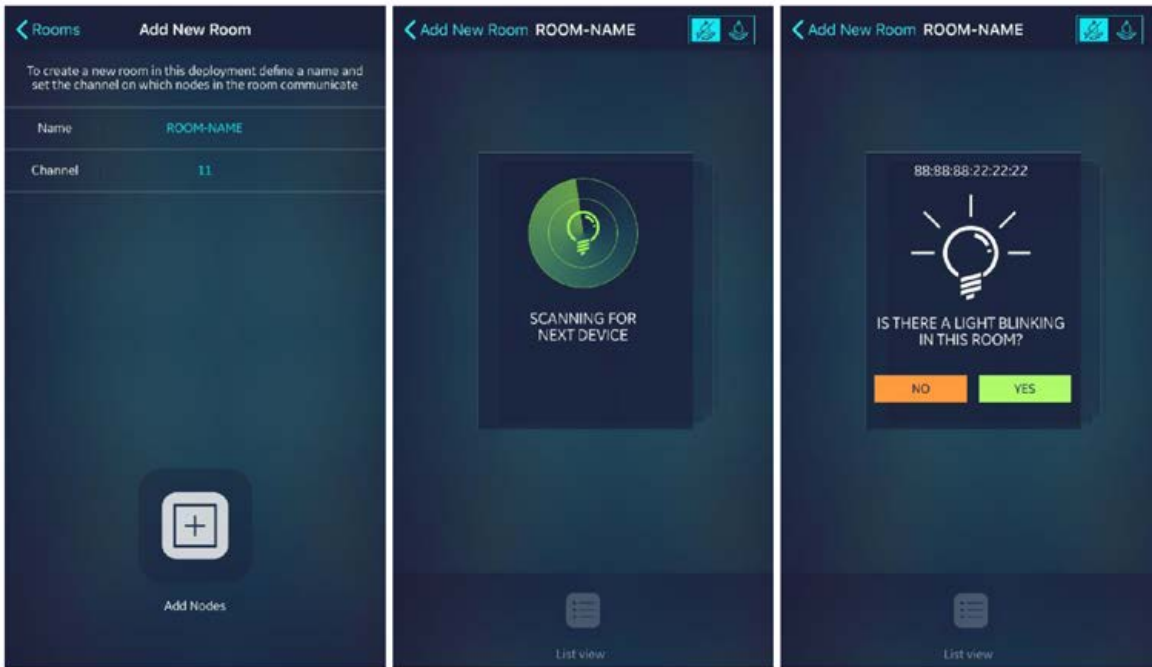
Commissioning of nodes

Create a network

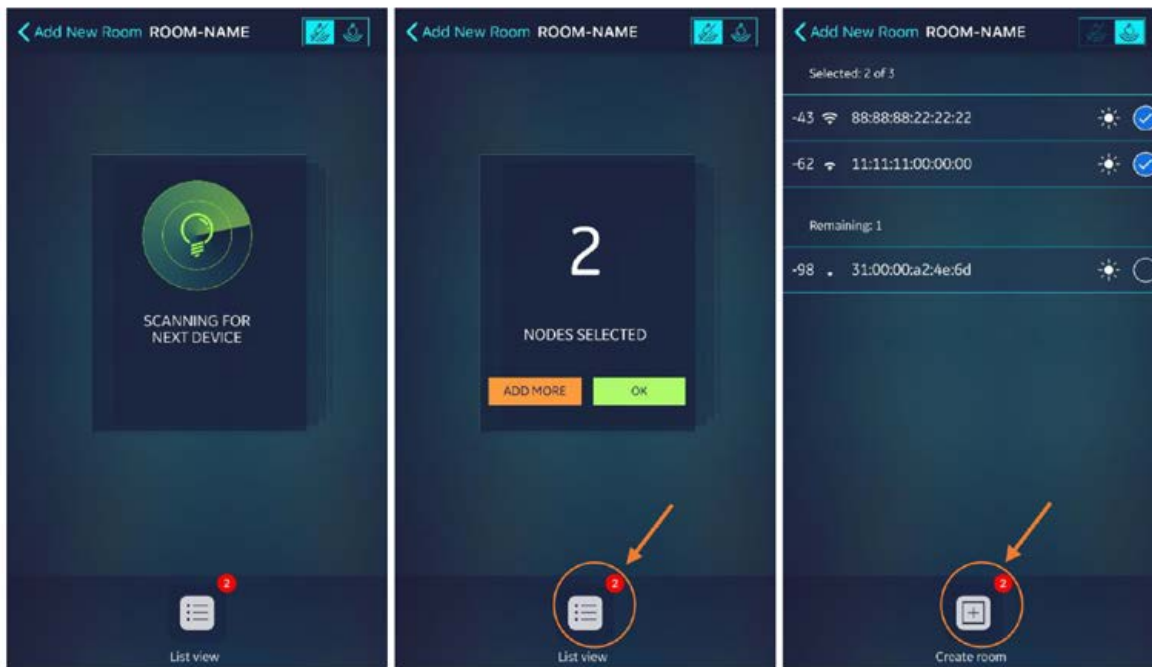
For creating a room, the user needs to tap on the “” button, which will bring the user to the “**Add New Room**” page.

The user can name the room and select the communication channel. After the selection the user need to tap on the “” button.

The “scanning for next device” message will appear and the application scans for available nodes. If a node is found the user can add that node to the network with the “**YES**” or ignore it with the “**NO**” button. (The node window can be swiped to left or right.) The maximum number of nodes (fixtures) that can join a single room network is 30, but the maximum number of room networks is in the thousands.

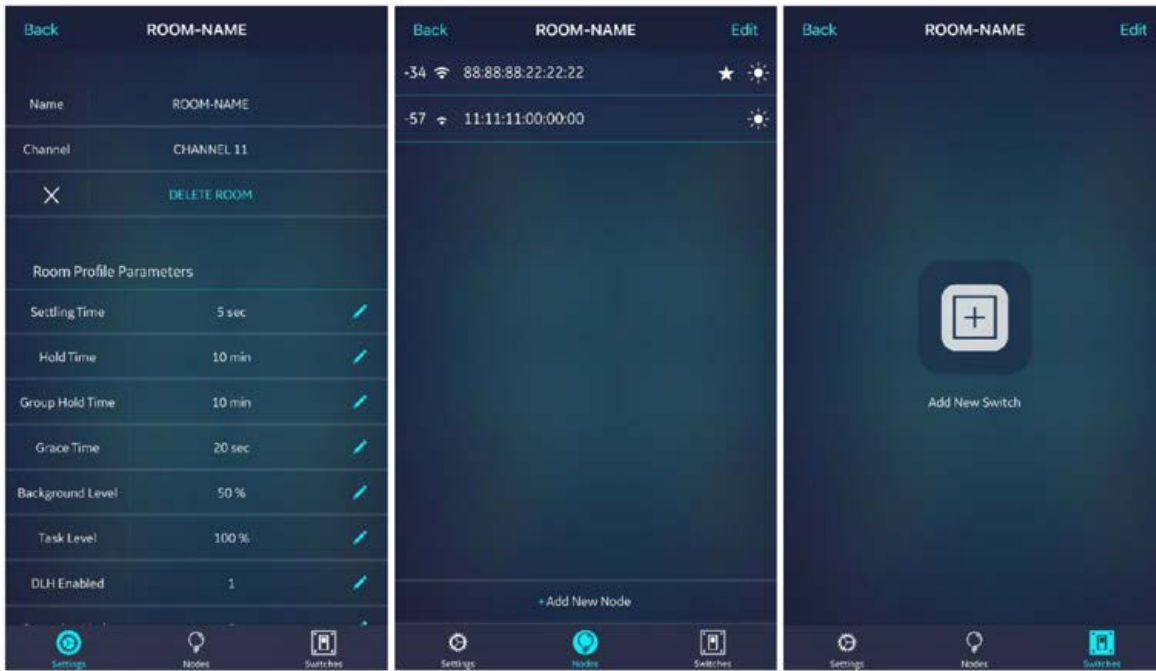


When all the requested nodes have been found or there are no remaining nodes, the user needs to press the “List view” button at the bottom of the screen, which will bring up the list view page with the selected nodes. There, additional nodes can be added or existing nodes can be removed. To finish the room creating the user needs to press the “create room” button at the bottom of the page.

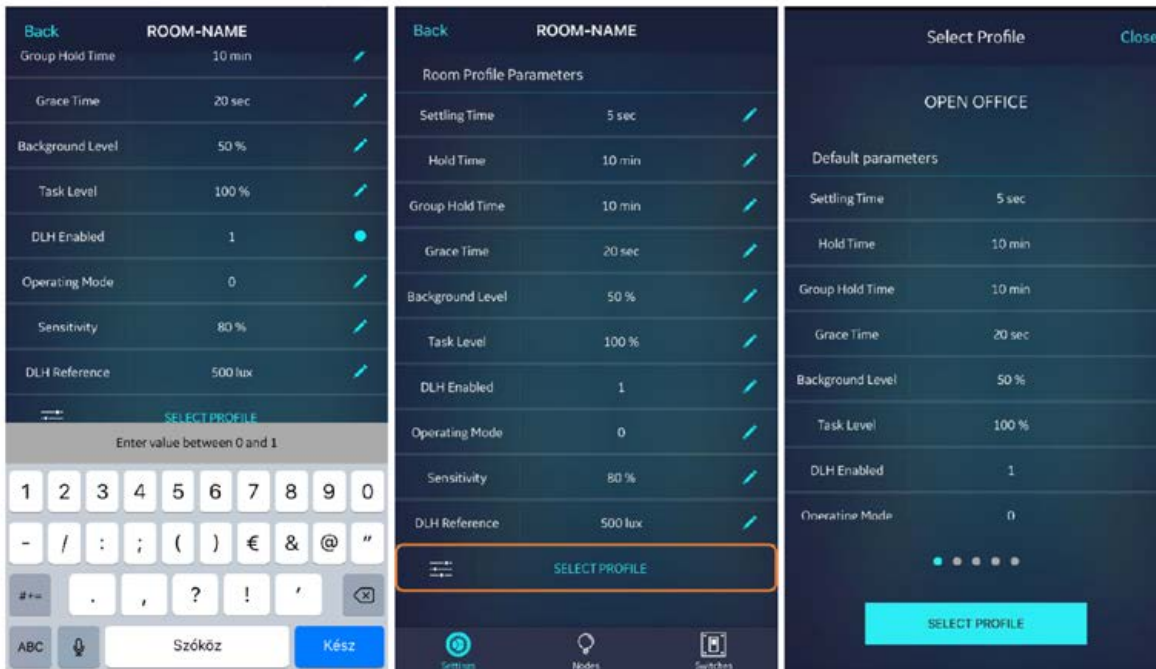


Modify network settings

After the room creation procedure has started the room’s details and parameters will appear. The user here can choose among the “settings”, “Nodes” and “switches” tabs. In the “Nodes” tab there are the nodes which are the part of the room. Next to the nodes’s address the spinning circle shows if the node has already joined to the network or still joining. The start next to the node’s address shows which node is the leader. With the “Add New Node” button the user can add new nodes to this room as described above.

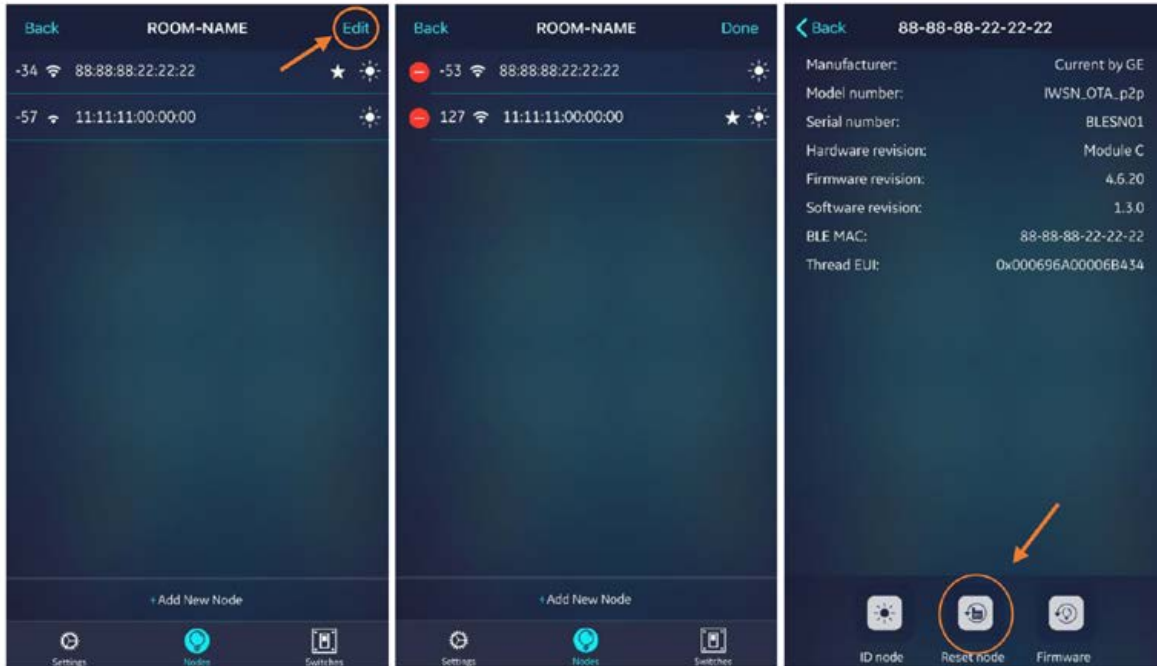


After all the nodes have joined to the network, in the “Settings” tab the user can change the room’s parameters. To change a specific parameter the user needs to tap on the parameter’s value. An information box will appear with the minimum and maximum applicable values. To finish the change the user can tap away or press the “return” button on the keyboard. The user can choose from predefined profiles with the “SELECT PROFILE” button.



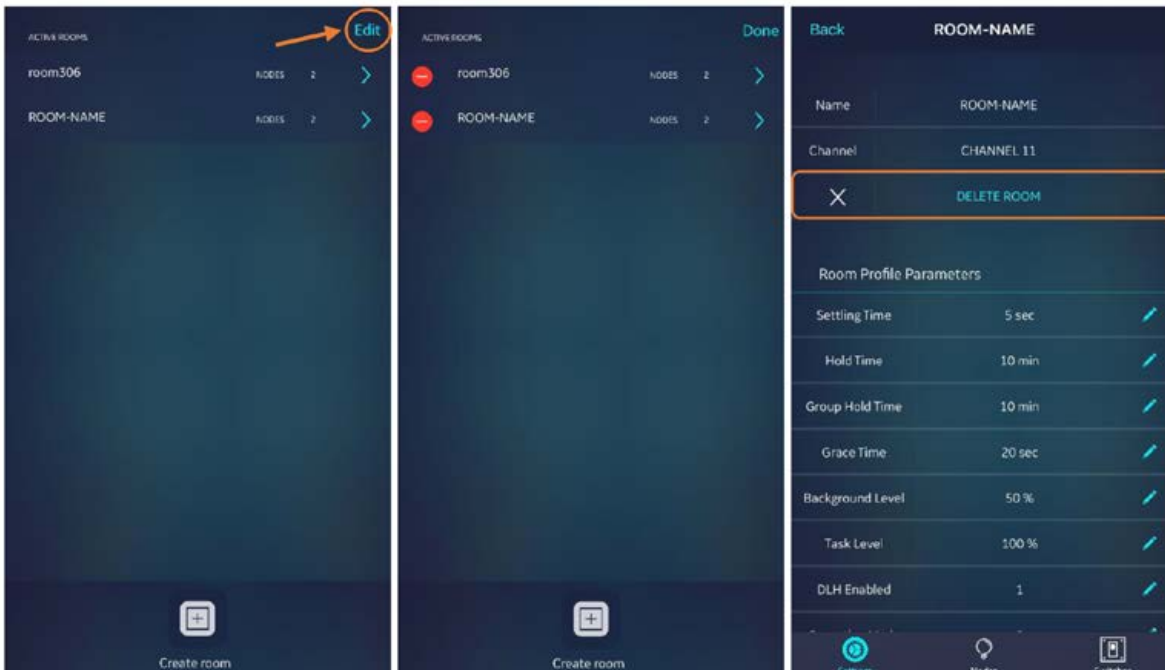
Remove nodes from network

To remove a node from a room the user needs to navigate to the “Nodes” tab. The user can press the edit button which is located on the top-right corner then press the red button or swipe left on the node’s address. The node can be deleted also if the user taps on the node’s address and taps the “Reset node” button.



Delete entire network

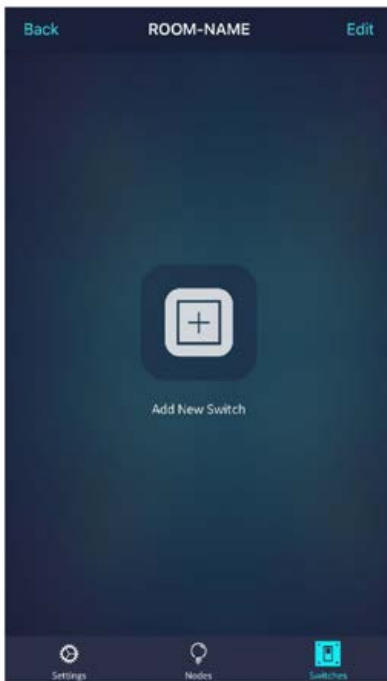
To delete an entire room the user needs to navigate to the home page. The user can press the edit button which is located on the top-right corner then press the red button or swipe left on the room’s name to delete the room. The room can be deleted from the Settings tab with the “DELETE ROOM” button.



Commissioning of switches

Add / remove a switch

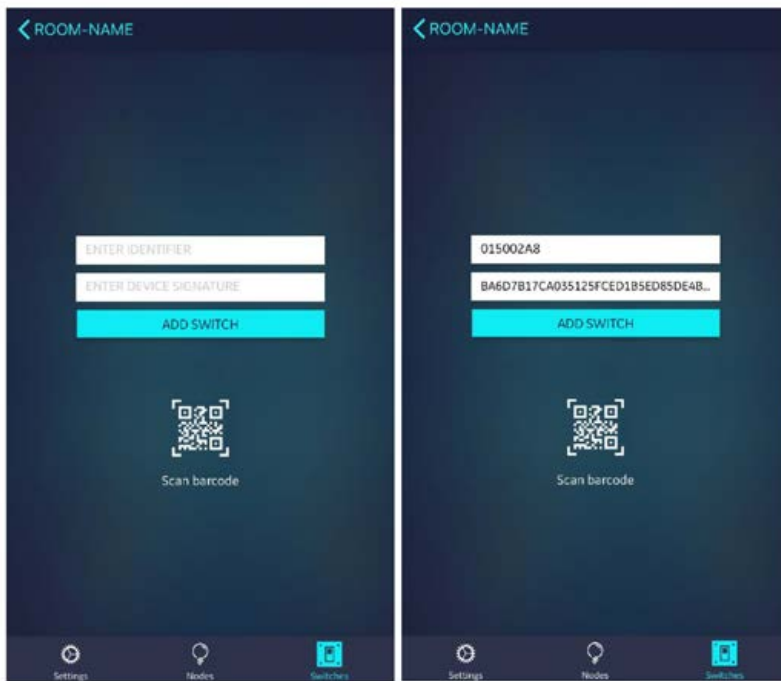
After the whole network has been successfully merged and set up, the user can add a switch to the room.



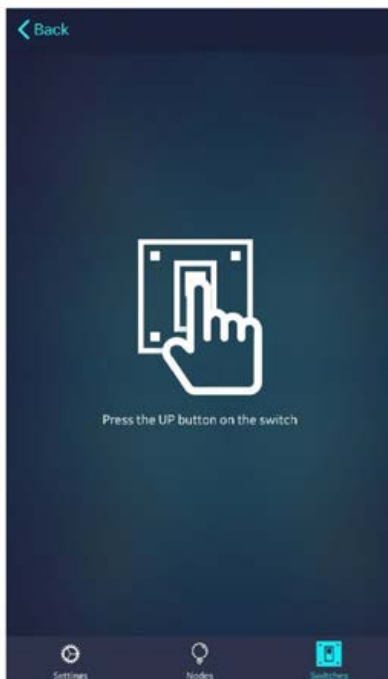
Adding a switch to a room means that the network will react to the switch short-long presses.

Switch data can be retrieved by

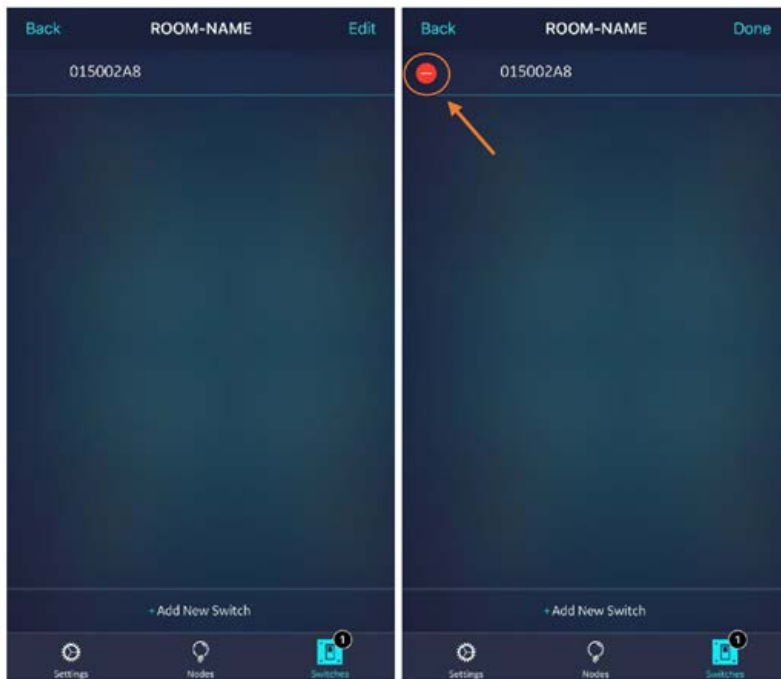
- Reading the Datamatrix Code of the switch label – this will fill up the ID and signature fields automatically.
- Adding the ID and the signature data manually



Right after adding the switch data the application asks the Commissioner to press the UP button.



By pressing the appropriate button the system will behave accordingly (up/down ways).



After the switch has been pressed, the application will react. If not, then the switch could not be added to the network. This may have the following reasons:

- The switch message was not caught by the network – in this case, another press may solve this problem.
- The switch does not operate on the same channel as the system does. For harmonizing the channels, user has to change the channel setting of the switch, or the network, or both.

In case a switch will be moved to another room, or network – it has to be removed.

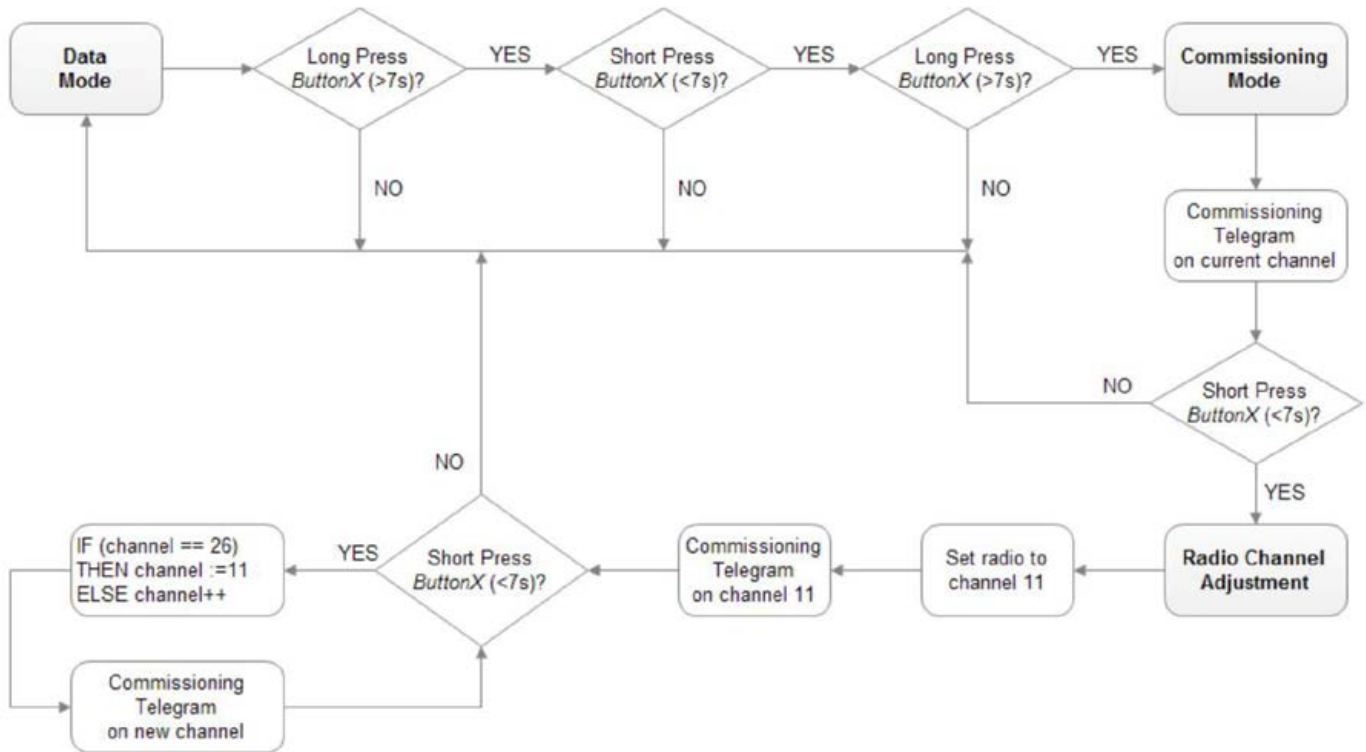
By clicking to the remove icon next to the appropriate switch – it will be removed.

Do not forget, that the switch has to be set to the appropriate channel prior to being added to a new network.

For ease of commissioning, all switches provided with EZ Connect will be pre-programmed to use channel 15 by default. Once the switch is reset using the programming instructions, it will default to channel 11. Please keep this in mind when you are commissioning, especially if you decide to program the switch to a different channel other than channel 15.

Change switch channel settings

To change the channel settings of the switch please do the following pattern with the buttons:



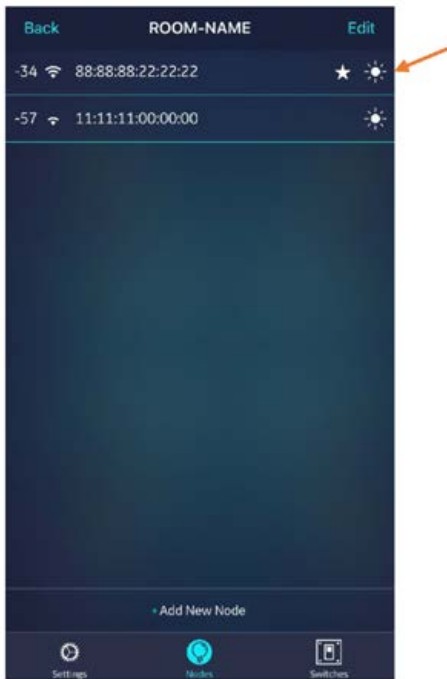
The default channel settings of the switches is the 11th.

It is advised to use the following channels: 15, 20, 25, 26. Using different channels may conflict with present WiFi solutions.

Node details

Identify

In Room view the nodes can be identified by touching the “lamp” icon area.



Right after pressing the identification area the node will start blinking – therefore the user can identify the exact location.

Factory reset

In case of a node will be recommissioned, or the whole commission procedure will be restarted, nodes have to be reset to factory defaults. By resetting, the node will forget all settings the user made – such as:

- Parameters, profile settings
- Network data (PanID, Network name)
- Switches it has managed



After the node has been reset, it will do a unique blinking pattern, then operate as a standalone node. It can be commissioned again if necessary.

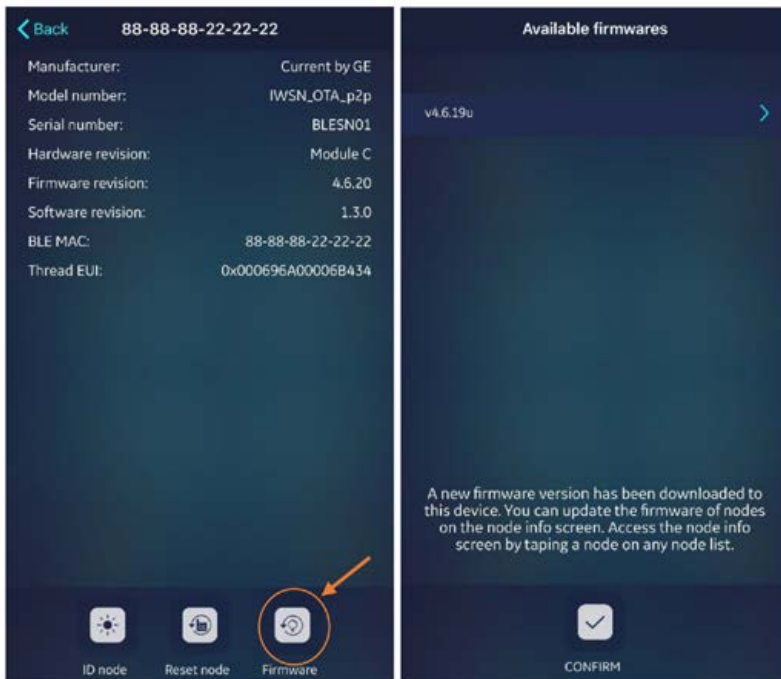
Firmware upgrade

Firmware image on the nodes can be updated manually one-by-one per node.

Prior to clicking to the firmware upgrade, the new image has to be selected, and assigned to the application.



By updating a node firmware it is intended to keep all the commissioning information it has been set to. User has to click to the “Firmware” button, then the list of the previously assigned firmware images will be seen.



OTA is going via BLE communication so keep the distance between the node and the phone – do not move further away from the node under updating – that may cause the abortion of the OTA procedure. In case the OTA has been aborted by any reasons, it can be restarted manually.

Troubleshooting guide

Commissioning / decommissioning

ID	Description	Primary Cause	Action
TR-000-001	After resetting an entire room the room still contains a certain number of nodes.	The reset command did not received by all the nodes.	Do the reset again – after a few cycles the room will dis appear.
TR-000-002	Joining nodes keep joining	Network failure	Reset them, then restart the commissioning
TR-000-003	Joining nodes keep joining	Maximum number of nodes in a network is 30.	Remove the rest of the nodes if there are more than 30.
TR-000-004	Joining procedure works, but slow.	The used 802.15.4 channel maybe overloaded.	Recommission the network on a different channel.
TR-000-005	Reset node keeps join to the previous network (it was commissioned to)	Neighbor networks operating on the same channels	Move the new network to a different channel
TR-000-006	Two nodes can be seen in a single room	Commissioning error	Reset the entire room and recommission the nodes.
TR-000-007	Application stucks into “scanning next device” view	BLE advertisement message scanning error	Restart the application and continue the commissioning by adding additional nodes if needed
TR-000-008	Application stucks into “configuring device” view	Communication error	Try to reconnect
TR-000-009	Application stucks into “creating room” view	Communication error	Swipe out the application and try again.
TR-000-010	“Current” network name appears	Commissioning error	Reset the room

Parameter settings

ID	Description	Primary Cause	Action
TR-000-001	After parameters are not synchronized properly if the user does not wait between parameter.	The network has to propagate the previously set parameters properly before the new ones.	User must wait at least 5 seconds between parameter settings.
TR-001-002	Not all the nodes behave according to the parameters been set.	The parameter settings must be set after the last node has been successfully joined to the network.	Wait until the last node joins the network.
TR-001-003	Not all the nodes behave according to the parameters been set.	The parameters are not synchronized with a joiner node — if the parameters have been added before a joiner joined.	In case of a new node is joined, the parameters shall be set again.

Switch handling

ID	Description	Primary Cause	Action
TR-002-001	Switch pressing does not have effect	Radio interference	Press again.
TR-002-002	Switch DataMatrix code cannot be read by the application.	The application is sensitive for cam-noise and distance.	Zoom to the picture, hide all other disturbing parts
TR-002-003	Cannot switch more networks with a single switch	The networks shall operate on the same channel.	Modify the channels to the right value
TR-002-004	Cannot add switch to the network – the label can be read, but the network does not react to the switch.	The switch must be operating on a different channel than the network does.	Harmonize the channels of the network and the switch to the same value.
TR-002-005	Previously added switch cannot be found in switches view	Switch handling problem in application	Try to open that view again

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Node-related

ID	Description	Primary Cause	Action
TR-003-001	Cannot find a node	The BLE advertisement message are not propagated by neighbor nodes.	Move closer to the node.
TR-003-002	OTA error	The OTA functionality works for the second try.	Try again, it works for the 2nd try.
TR-003-003	"Secure handshake error" message arrived	Communication problem during the connection to a node	Re-establish the connection
TR-003-004	"Connection timeout" message arrived	Communication problem during the connection to a node	Re-establish the connection
TR-003-005	"Error while reading credentials" message arrived	Communication problem during the connection to a node	Re-establish the connection
TR-003-006	"Invalid counter error" message arrived	Communication problem during the connection to a node	Re-establish the connection
TR-003-007	Node forgot commissioning information after OTA	OTA has been done between incompatible nonvolatile versioned images	Recommissioning is needed
TR-003-007	Node OTA has been aborted	Communication error	Restart OTA