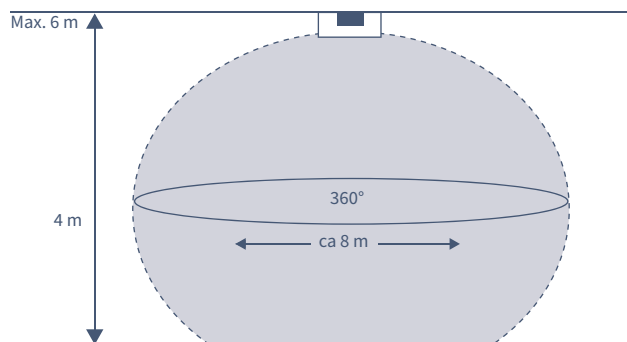# e-Sense **Flex**

MANUAL

FAGERHULT

Index

Introduction

e-Sense Flex is a smart lighting control system based on Bluetooth SIG Mesh technology. Luminaires have a built in sensor, DALI Function and wireless communication over BLE Mesh.

With a sensor based microwave technology it is possible to discretely fit the sensor within the luminaire; without affecting the luminaires design or classification. Fagerhult has a range of luminaires with this technology suitable for numerous applications and requirements. The system offers great possibilities for energy efficient installation thanks to the granular sensor coverage. e-Sense Flex provides a decentralised mesh network where all the intelligence of the system is saved to every node.

The e-Sense Flex app works as one of the user interfaces for e-Sense Flex lighting control solution: as the commissioning tool which allows commissioning agents, contractors, installers, and facility managers to configure, control and manage lighting infrastructures based on Bluetooth mesh.

This system refers to luminaires with an integrated sensor as devices.

Band width: 2,4 GHz Bluetooth Low Energy Mesh

Max number of sensors in a network: 100

Max distance between sensors: 15 m (open air)

Max mounting height: 6 m

Programming tool: e-Sense Flex app

App installation

The e-Sense Flex app works with iOS as well as Android and are free to download from Apple App Store and Google Play. Users can also download by scanning below Qr-code

Create account

Access the login page after app installation.

1. When logging in, a pop up window will appear which requires the mobile phone 's Bluetooth to be turned on in order to access the e-Sense Flex app.

2. First time opening the app you need to create an account, fill in and accept the terms and conditions as requested (see figure 1.1). If you forget your password, click "Forgot password?" and Fagerhult e-Sense Flex app will send the password to your email, which needs to be valid (see figure 1.2).

3. After the account is registered and you log in to the e-Sense Flex app, another pop-up window appears that request you to turn on locations for the app. Accept this in order to use features based on your location such as calculation of sunrise, sunset, and light intensity at your latitude. Continue the operation by select "Quick Setup" or "Advanced Setup".

4. If users already have an account, please login directly with an existing account (see figure 1.3).
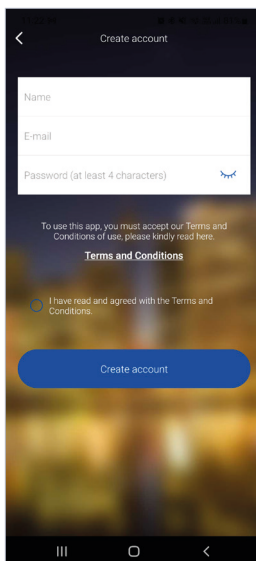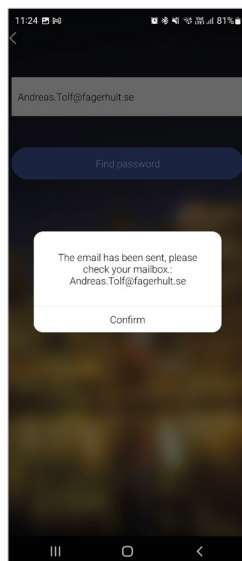

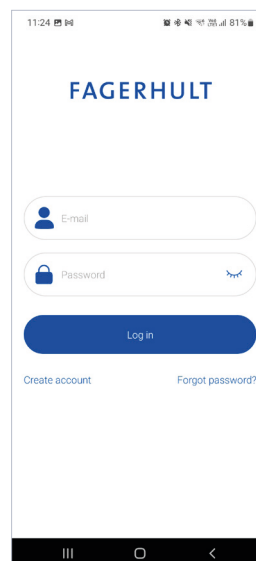Figure 1.1 Create account   Figure 1.2 Retrive password   Figure 1.3 Sign in app

>Each account can be accessed by one user at a time<

The accounts should be treated as personal accounts. Offline commissioning is possible and when the device used for commissioning is reconnected to internet, all the configuration will be uploaded and saved to the cloud. A project or network can easily be shared between different accounts, see page 6.

Change e-mail and password

Users can easily change their existing e-mail or password or delete accounts in the e-Sense Flex app. Go to settings and then press the symbol in the upper right corner (see figure 2.1).
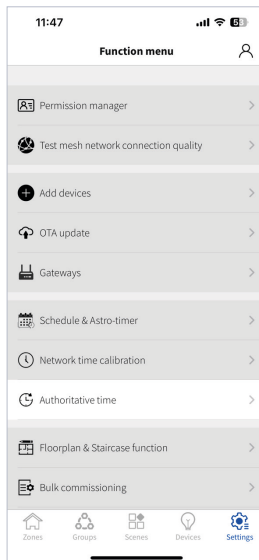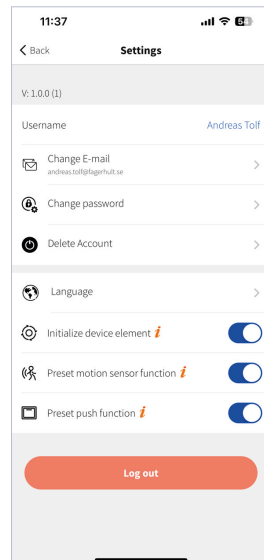

Figure 2.1 Setting page - 1

Figure 2.2 Setting page - 2

Network

1.1 Create and manage projects, networks and users

In order to commission a site the devices (sensors/luminaires) need to be added to network and a zone. The network needs to be added to a project before starting and one project can contain multiple networks.
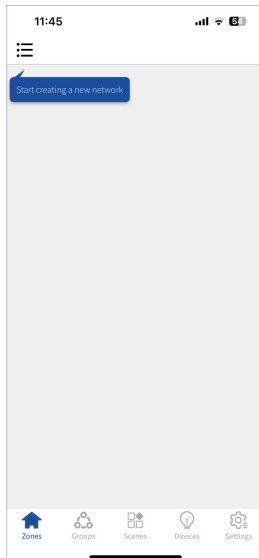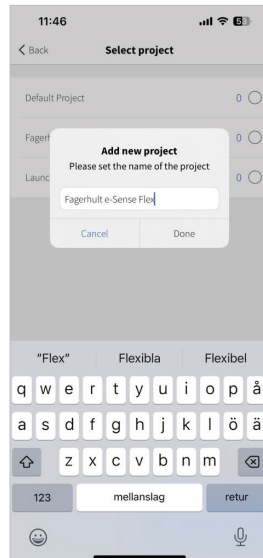

Figure 3.1 Zone page

Figure 3.2 Zone page

1. Create a network by clicking ☰ on the left corner of the zone (see figure 3.1) and create a network by klicking ⊕.

2. Create a project and name it, like "Demo" (see figure 3.2).

When creating a new network you must also select your role. Please select the administrator option even if you are not the facility owner. This role can later be passed on to the another person's account.

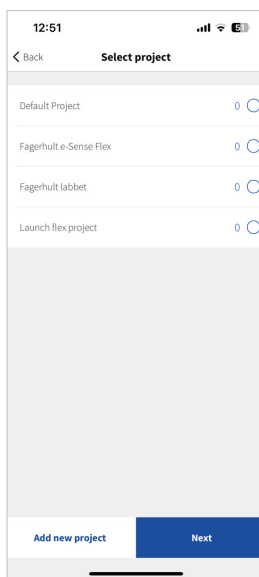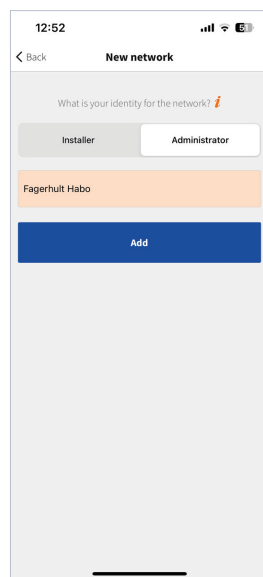
Figure 3.3 Select project

Figure 3.4 Add network

3. Select identity and "Add" (see figure 3.4).

Installers have almost the same permissions as administrators, except they can't delete any installer and users in the network.

Administrations own the highest permission, who can transfer the ownership to others and add and delete both installer and users, also can assign permission to users.

1.2 How to manage networks

When creating a new network it needs to be assigned to a project. Select the "default project" or create a new project and name it according to customer site. After creating the network, all the network, project information and managing of the network is done by clicking on the top left corner of the zone page on the e-Sense Flex app.

Click ☰ to view all the projects and networks to which the account has access to. You can also change the project name (see figure 3.5), switch between projects and networks, manage or delete networks from the account. This is also where you can create a new network or add a shared network.

1. Click ✎ to change the name of the project in "My networks" (see figure 3.7).
2. Click ⋯ for network management and modify owning projects and delete the network (see figure 3.6).
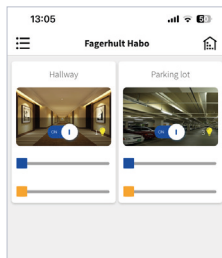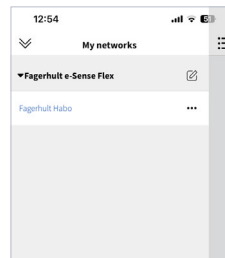

Figure 3.5 Home page

Figure 3.6 My networks
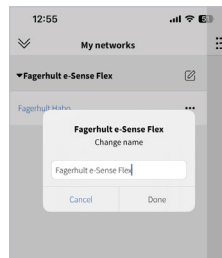
Figure 3.7 Change name
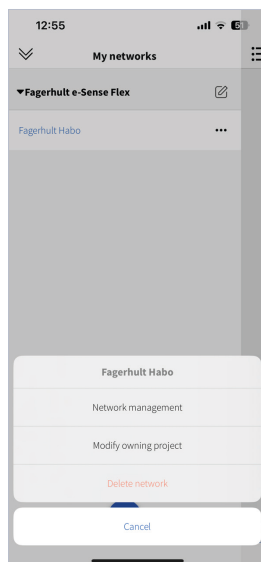
Figure 3.8 Modify project
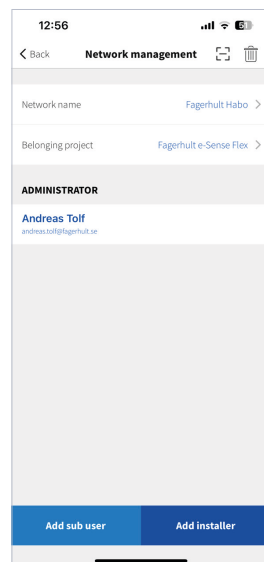
Figure 3.9 Permission manager

In "network management" you can rename the network and modify owned projects (see figure 3.8). The "Permission manager" view also shows other accounts which has access to the network. This is also where you can add sub users and installers (see figure 3.9).

By clicking 🗑 you erase your own accounts access to a network. This step also requires that you enter your account's password.

*Note that if there are devices left in a network which have been deleted, these devices need to be reset to factory default settings before any changes can be made, see page 17.

You can change which project a network belongs to under the "Modify owning project" option after clicking the next to a network.
To change name of a project, press and hold the name of the project and a pop-up will appear.

Create and manage zone

After creating a network and assigning it to a project a zone needs to be created to which devices are added. Each network can have multiple zones and a device can only belong in one zone but in multiple groups, see next chapter for groups. You can name and take a picture of your zone to match your room type or select a preset cover picture and name from the app. To change the photo of the zone, click ⊡ to either take a new picture or chose a photo from the device album. Hit "done" to create the zone.(see figure 4.1)

After a zone is created, proceed and add devices to the zone. The e-Sense Flex app will search all nearby devices and list them according to Bluetooth signal strengths. The device with the strongest signal will appear on the top of the list and the device with the weakest signal on the bottom, see figure 4.2.
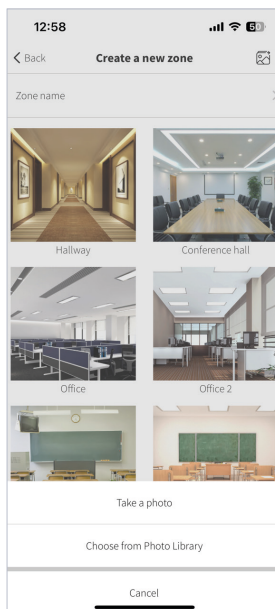
Figure 4.1 Create zone   Figure 4.2
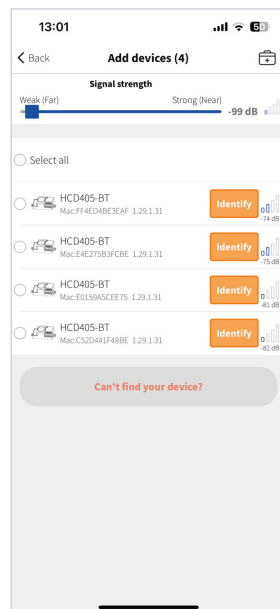
Click "identify" to make the luminaire blink in order to visually confirm that it's the correct one. Make sure to identify each device to avoid adding devices in an adjacent room by mistake. In order to add devices, select them either one by one or several at once and click "Add". When adding them one by one you will also have the possibility to rename the device at this stage. When adding several at once you can rename them later.

The app will also let you know if there's an available Firmware update and ask if the device should be updated before adding it to the network. The update is optional and will take between 20-60 s/device depending on network stability. This step can be skipped and devices can be updated later.

Once a device has been added to a zone, that zone is visible in the app's zones page (figure 4.4). Zones without any devices are still visible through in the zone management view, (figure 4.5). This is also where you can change a zones picture, rename or remove the zone, (figure 4.6) Before removing a zone, all the devices currently in that zone needs to be removed.
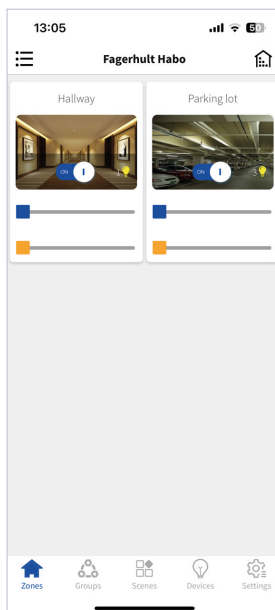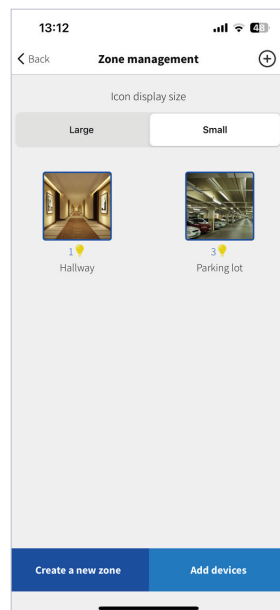

Figure 4.4

Figure 4.5
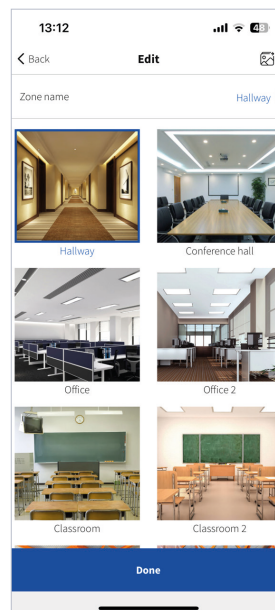
Figure 4.6

Groups

One method of organising devices is assigning them to groups in the Luminaire groups page. All devices connected to a luminaire will be visible on this page as luminaires. This can make it easier to control the device, especially in larger networks. Groups can be considered a physical collection of luminaires in one area or groups of luminaires in a row or in one room.
Every luminaire in a group can be set to common dim level and or colour temperature.
A single luminaire can exist in multiple groups but only in one zone.
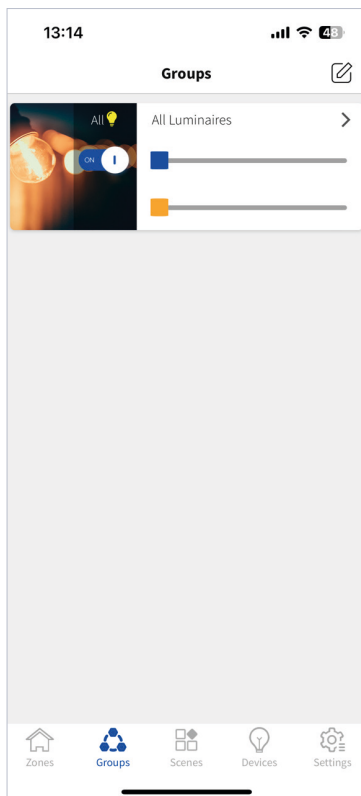
Figure 5.1 Luminaire groups
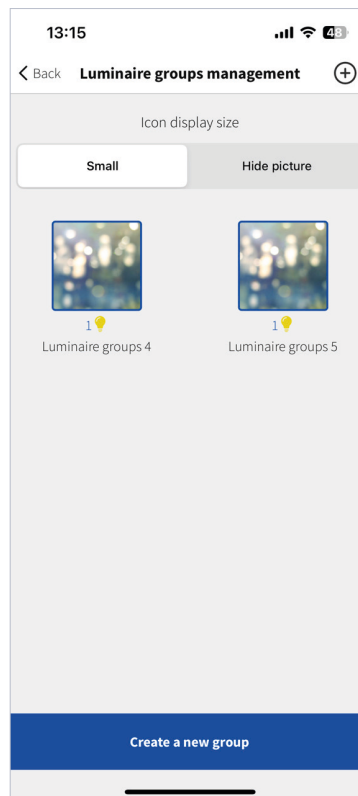
Figure 5.2 Groups management

Click ✎ in the top right corner of the groups page to create a new group. Name the group and then proceed to add luminaires to the group, (figure 5.1)

Press and hold the image of a group to hide, edit or remove it.

This symbol ⌀ means that a group is hidden and can't be seen by other users and installers. By pressing and holding any other groups image any hidden groups will appear.

Scenes

The system also supports creation and recollection of lighting Scenarios, or Scenes. A scene can control any variation of luminaire in the Network. There's no limit on how many scenes can be created in each network and a luminaire can be used in multiple scenes. One luminaire can exist in maximum of 16 scenes. There's 3 default scenes:

– All On
– All 50% brightness (50% dim level)
– All Off

These default scenes are applied to all devices in the network.
A scene needs to be activated and there's three different ways the system can recall a scene.

1. By manually recalling a scene from:
    a. The e-Sense Flex apps scenes page
   b. EnOcean switches (Requires configuration)

2. Automatically from the integrated sensor:
After configuring the motion sensors a scene can be triggered upon detected movement. This is the recommended setting.

3. By a schedule:
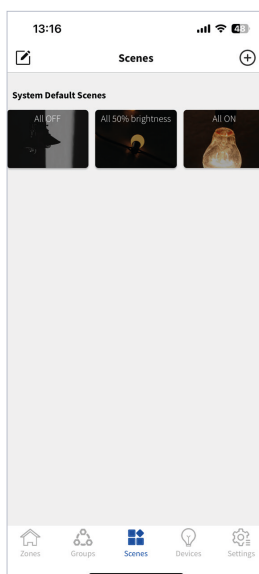A scene can be activated at a certain time of the day after a schedule has been configured.
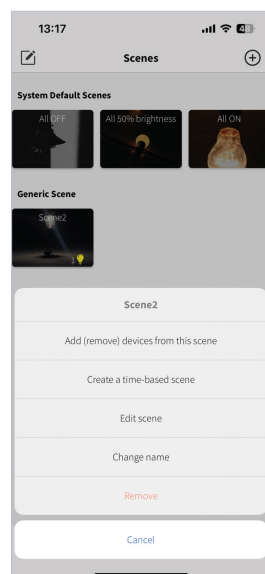

Figure 6.1 Scenes

Figure 6.2 Create scenes

Create a new scene by clicking ⊕ in the top right corner of the scenes page.

Edit an existing scene by pressing ✐ in the top left corner or by pressing and holding a scene image. When pressing and holding a scene image a new screen appears with options, (figure 6.2)

1.1 Types of scenes

There are in total 5 different types of scenes to choose from depending on wanted function. (figure 6.3)
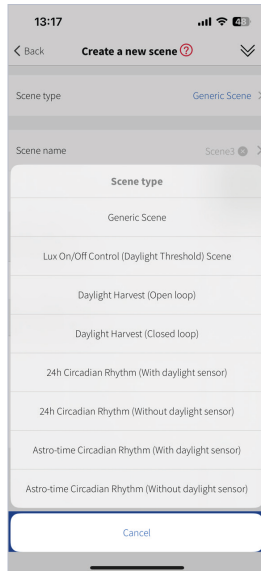
Figure 6.3 Type of scenes   Figure 6.4 Lux on/off scene
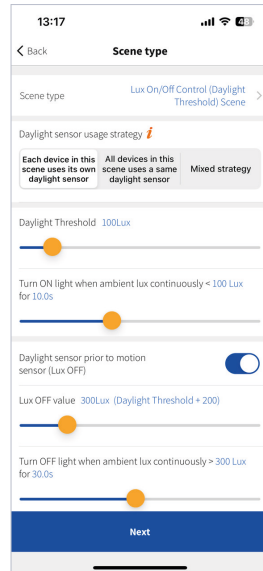
1. Generic scene
This is the most simple and easy to use lighting scenario usually containing several luminaires configured with different light output and/or colour temperature.

2. Lux On/Off Control (Daylight Threshold) Scene
This scene makes the luminaires turn on and off depending on measured ambient light. The ambient light sensor is integrated in the luminaire and the luminaires light output level is always defined by the dimming levels set in the scene. This scene requires that the Daylight threshold value is set. In order to enable the scene to turn the lights off, the Lux Off value must also be set. There's several options available for this scene (figure 6.4)

– Daylight sensor usage strategy:
This scene works with each luminaire measuring the ambient light or using only one sensor to control all the luminaires in the scene. We recommend that all devices in the scene is control-led by the same sensor for a coherent behaviour.

– Daylight Threshold
When the ambient light levels falls below the set target value, the light will turn on. The light will remain on until the ambient light level exceeds the Lux Off value.
The sensors measuring time can also be increased if the ambient light often varies, for a more stable function.

– Daylight sensor prior to motion sensor (Lux Off)

The system prioritises the daylight sensor over the motion sensor which enables it to turn off when the ambient light exceeds the "Lux Off value"

– Lux Off value

When the ambient light levels exceeds the set target value, the light will turn off. The sensors measuring time can also be increased if the ambient light often varies, for a more stable function.

2.1 How to use a daylight threshold scene triggered by a schedule?

Requirements: The light shall turn on at 8:00 in the morning if the natural light isn't sufficient enough (<300 lux). The light shall remain on until the natural light is sufficient (>500 lux).

1. Create a Lux ON/Off (Daylight Threshold) Scene (figure 6.5)
2. Create an 8:00 am schedule to recall this scene (figure 6.6–6.7)
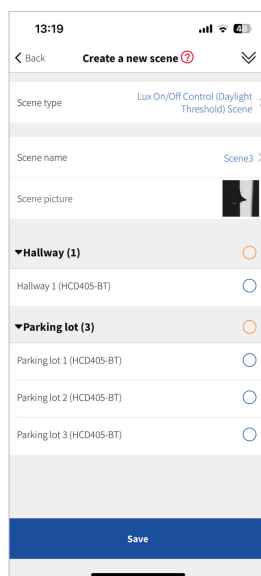
Figure 6.5 Create lux on/off scene   Figure 6.6 Time setting in schedule   Figure 6.7 Add schedule
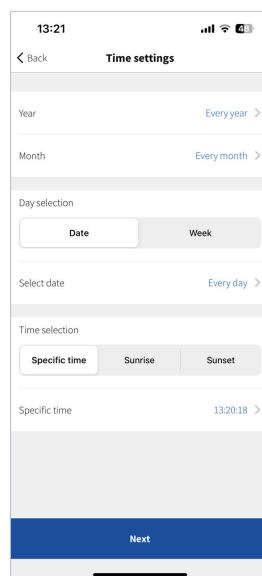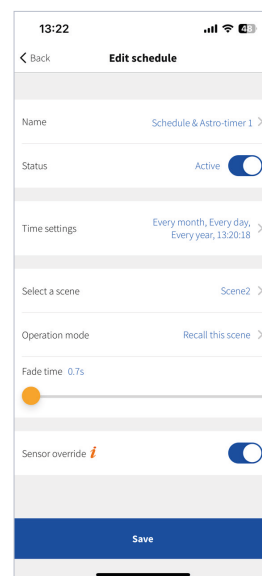
3. Daylight Harvest Scene (Daylight dimming)

Daylight Harvesting enables the sensor to control the light output automatically according to lux readings provided by the sensor. The idea is to maintain a set lux level by using the natural light and electrical light together. This makes it possible for the luminaires to save more energy without falling below set value, e.g. 500 lux thanks to the addition of natural light. When using daylight harvesting it is recommended to always calibrate the sensor, see page 32.

There are two types of daylight harvest scenes in the app:

Open loop – Used when sensor is placed behind louvre

Closed loop – Used when sensor is mounted stand alone (not yet available)

3.1 Open loop

With open loop the luminaires light output is dependent on natural light levels and should not be affected by any electrical light by the luminaires. This option requires an advanced photo-cell which all e-Sense Flex enabled luminaires have as standard.

Figure 6.8 Daylight harvest setup

There are two ways to set up a daylight harvesting profile in the e-Sense Flex app:

A, Quick setup

A quick way of setting up the function. Select how far from a window the sensor is by selecting any of the five options. Depending the distance from the window the parameters of the function will change under the "Advanced setup" header.

B, Advanced Setup

This option enables a customization of each value relevant to daylight harvesting open loop. Simple select any of the red markers and move them to select the correct values for the specific project.
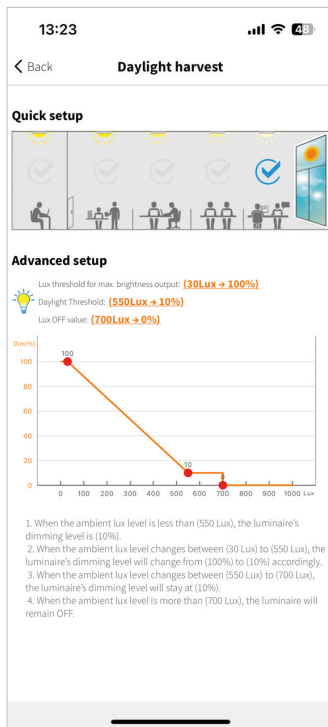
Example regarding figure 6.8:

When the measured natural light level is between 0-30 lux the luminaires output is 100%. If the natural light level exceeds 550 lux the light output will be 10%. The luminaires light output will dim between 10-100% linearly according to the natural light between 30-550 lux. If the natural light exceeds 700 lux the luminaire will turn off.

Daylight sensor usage strategy (figure 6.9)

It's possible to select if a sensor should only control its own luminaire or all the devices in the same scene. It is recommended to only use one sensors lux readings so all luminaires are controlled in unison. When selecting "all devices in this scene uses the same daylight sensor" you will automatically be moved to the next page where you select which sensor to be used in the scene.
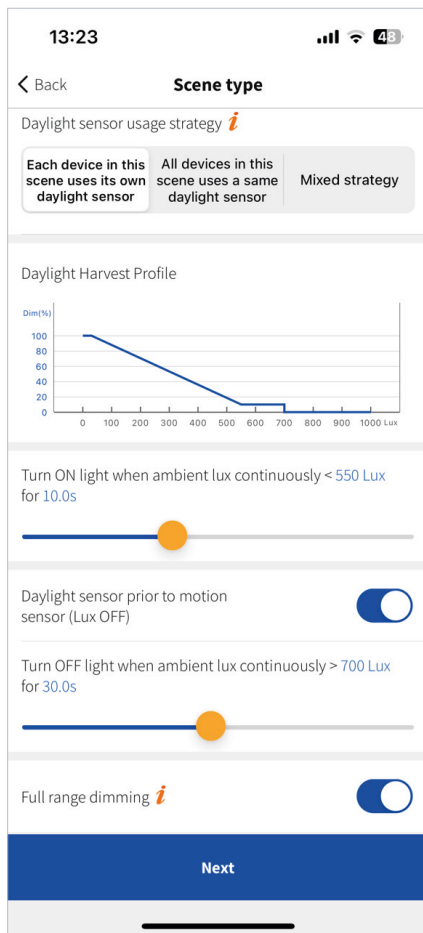
Figure 6.9 Open loop

Measuring time

Defines the time the sensors measures light levels. It sets how long the sensor needs to continuously measure a change in order for it to take effect. A shorter time makes the system react to changes in the light more rapidly and a longer time decreases the risk of light levels jumping back and forth around the set limit value.

Daylight sensor prior to motion sensor (Lux Off)

Enables the possibility to turn the light off based on ambient light measured by the photocell even if the motion sensor still detects presence.

Full range dimming

It defines the dimming range of the scene. If it is turned on the output level range from the devices min. brightness to the devices max brightness. When turned off the level will range between the devices min. brightness and the scenes brightness level.

3.2 Closed loop

The closed loop option is the more common option and is widely used in office buildings to control pendent lighting with daylight harvesting. It measures the combined lux level from both natural and electrical light and dim the luminaire to maintain the set target level on the desk e.g. 500 lux. This option requires that the sensor isn't mounted behind a louvre and can measure the light on a surface without any obstacles for example a plastic cover. e-Sense Flex is currently only used in IP rated luminaires and therefor is closed loop not a viable option at the moment.

4. Circadian rhythm scene

Automatically controls luminaires output and colour temperature over the day. This requires luminaires with Tunable White LEDs and at least one real time clock in the network which is not applicable to Fagerhult e-Sense Flex products at this moment.

Devices

In the Device page the e-Sense Flex app lists all devices by zone in the selected network. From this page a luminaire can be identified by clicking [Identify]. The settings of an individual devices or luminaire can also be changed by clicking the name of the device. (Figure 7.1-7.2)
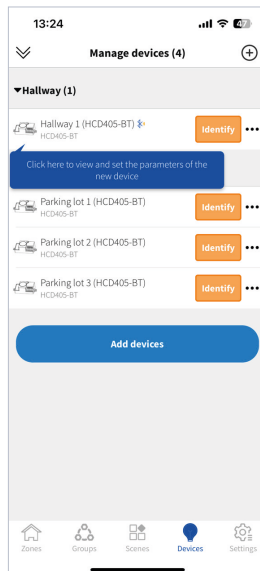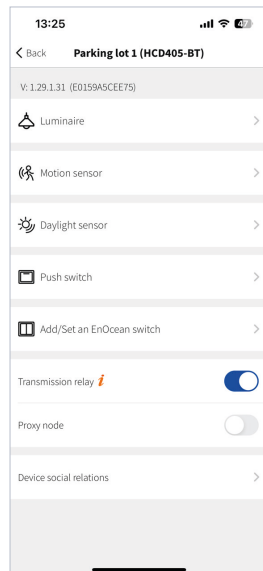

Figure 7.1 Devices - 1   Figure 7.2 Parameters settings

Please refer to the respected chapter for information regarding Luminaires, Motion sensor and Daylight sensor.

– Authoritative Time
When enabled, all devices in the network will base its time on the device with the authoritative time enabled. When connected to a network via the app the device will sync its time based on the phone/tablet. If the sensors are controlled by a schedule it is recommended to always have one device with this setting enabled in order to decrease the risk of time deviations between sensors for a better consistency in scheduled light control.

– Transmission Relay
This is default set to ON and enables the device to relay all Bluetooth commands. It can be turned off to decrease network traffic in areas with a high density of devices. Devices with transmission relay set to off will only receive commands from other devices in the network but will not transmit signals to others.

From the Device page in the app there are two ways to add devices to the network:

1. Click ⊕ in the top right corner.
2. Click "Add devices" below the listed devices already in the network.

The maximum number of devices in a network is largely dependent on the installation environment but a good guideline is to add no more than 100 pcs in one network while maintaining the recommended distance between devices, 15 m. Each device can only be added to one network.

– Reset device
If a device have been added to the wrong network it can be switched by resetting the device in one of two ways:

1. Log in to the network to which the device currently belongs to and reset it.
2. Search the device by clicking "Can't find your device". In the next page, devices already configured in other networks are listed. Select the device and press reset. The selected device will indicate by blinking. The device needs to be power cycled within 30 s for the reset to take effect.

– Replace device – healing function
If a device fails it can be replaced with new device of the same model without having to configure it. After replacing the device physically, open the app and go to the device page. Select the faulty device and press "replace device". The app will search for unconfigured devices. Make sure the correct device is selected by identifying it and then press "start updating" to finish the process.

– Change name
A devices name can be changed.

– Proxy node
The e-Sense Flex app will always connect to the device with the strongest Bluetooth connection which normally means it's the closest one. The connected device is indicated by a bluetooth logo next to the name. You can manually change which device you are connected to by pressing "Proxy node".

Luminaires

All luminaires with e-Sense Flex are listed in the Luminaires page in the app which is found in the Settings page. The luminaires are listed according to zone and groups. Click any luminaire to access its luminaire settings.
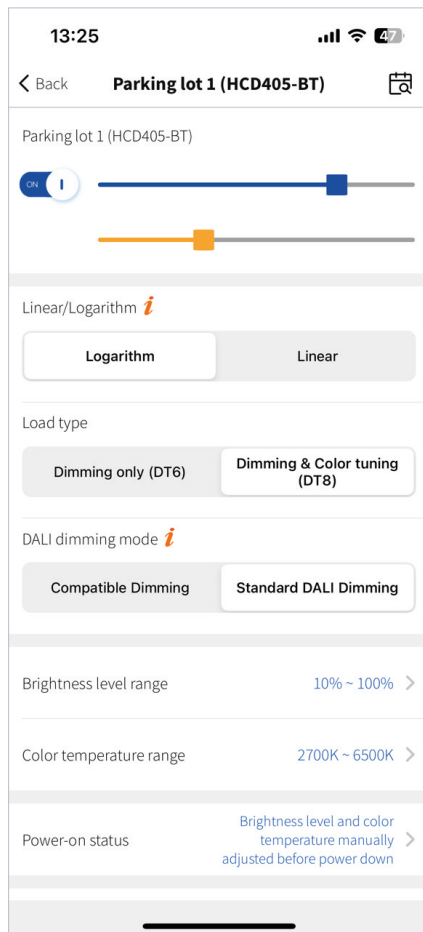

Figure 8.1 Luminaire settings

Linear/Logarithm
All Dali drivers are default configured for logarithmic dimming but can be switched to a linear dimming method.

Brightness level range
Select the dimming span on the luminaire. The default setting is 10-100% but can easily be changed according to customer preferences.

Power-on status
Select the status of the devices when they are powered back on after a power failure. Note that these settings will only take effect if "automatically send sensor signal when power is restored" is disabled on the motion sensor settings page.

A. Keep lights off
This option keeps the luminaire turned off after power is restored no matter what state they had before the failure.

B. Brightness level and colour temperature manually adjusted before power down
This option recovers the last manually set light level the luminaires had before the power failure. Note that it does not recall scenes, only manually set light levels.

C. Recall this scene

Select a scene that the luminaire should go to after a power cycle.

D. Stay at a defined brightness level and colour temperature

Define what light level (colour temperature not available at the moment) the luminaire should go to after power is restored.

1.1 Manual control

Any changes made manually from example the app or an EnOcean switch will put the devices in manual control mode.

How to quit manual override?

There are a few options available for how long the luminaires should stay in the manual control mode.

1. Do not quit automatically

The luminaires will stay in manual control mode indefinitely.

2. Quit after hold time (default)

Luminaires will quit manual control mode after the set hold time.

3. Quit after standby time

Luminaires will quit manual control mode after the set stand-by time.

4. Quit after specific time

Select a specific time luminaires shall quit manual control e.g. 2:00 pm.

5. Quit after count down time

Select how long after the last manual command the luminaire shall remain in manual control mode.

6. When using a switch it is also possible to return to auto mode by configuring it in the push settings.

When the luminaires exit the manual control mode they will enter auto mode and return to motion detection.

Figure 8.2 Quit mode - 1   Figure 8.3 Quit mode - 2   Figure 8.4 Quit mode - 3

Motion sensor

All devices with sensors are listed in the Motion sensor page which is found in the Settings page. From this page all motion based functions are configured (figure 9.1). When a sensor detects presence a small red dot flashes next to the image on the left side. On the right side it is displayed which zone, group or luminaire/s are controlled by the sensor.
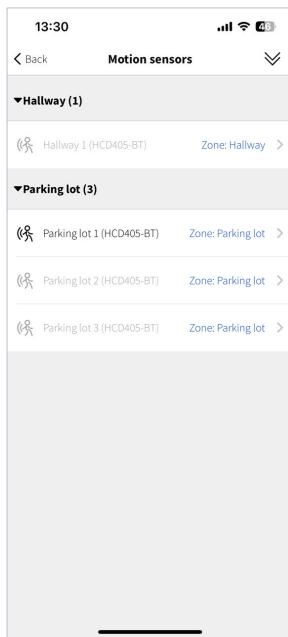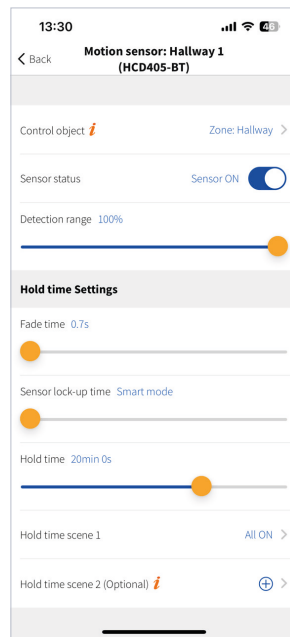

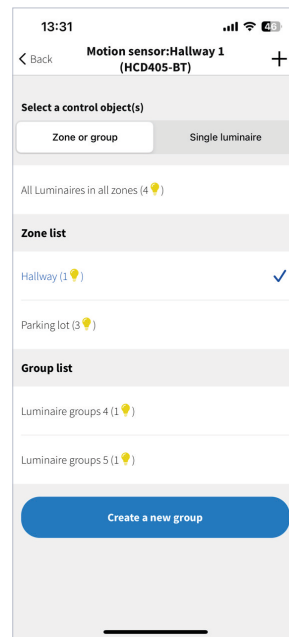Figure 9.1 Motion sensors

Figure 9.2 Sensor settings - 1

Figure 9.3 Control object setting

Control Object

Select which object you would like this sensor to control, e.g. a luminaire, a group or a zone.

Sensor status

Enable or disable the motion sensor. Enabled means that the motion sensor detection function is on and motion detection will work as normal. When disabling the sensor status it will not detect any motion in any conditions. The microwave detection range can also be changed by dragging the slider.

Fade time (Hold time settings)

The time it takes the luminaires to transition from the initial light level to the hold time scene level.

Sensor lock-up mode

Defines the intervals between motion detection signals being sent on the mesh network. Smart mode is the default setting and results in half of the set hold time. This is also the recommended setting. A shorter interval in motion signals results in an increase of network congestion and will decrease network stability.

Hold time (Dwell time)

Defines the time for the hold/dwell time scene after the last detected motion. After the hold time expires it will activate the stand-by time and stand-by time scene

Hold time scene

Select which scene to be activated during the hold time. The scene needs to be selected from the existing scenes or click plus to create a new scene.

Fade time (stand-by time settings)

The time it takes the luminaires to transition from the hold time scene to the stand-by time scene.

Stand-by time

Defines the time for the stand-by time scene. After the stand-by time expires the luminaires will turn off. The stand-by time can be 0 and infinity if the luminaires shall remain on a low light level indefinitely.

Stand-by time scene

Select which scene to be activated during the stand-by time. The scene needs to be selected from the existing scenes or click plus to create a new scene.

Sensor mode

A. Auto (presence detection) – when the sensor is triggered the scene is automatically activated. Luminaires will turn off after hold time and stand-by time expires.

B. Semi-auto (absence detection) – requires that the light is manually triggered by the app or switch. The light will remain on as long as there's motion detected but luminaires will turn off after hold time and stand-by time expires.

Mode in priority

Manual prior to sensor; the sensor will not interrupt the manual override mode.

Sensor prior to manual; when the sensor is triggered, it will quit manual control mode and activate a scene according to motion sensor setting.

Enable staircase function

Enables to possibility to configure a staircase function. If it's on, when entering a floor, the luminaires on this floor will go to full ON, while the neighboring upper and lower floor will go to dimming level according to the scene pre-set. To activate this function, a staircase function needs to be configured, see page 33.
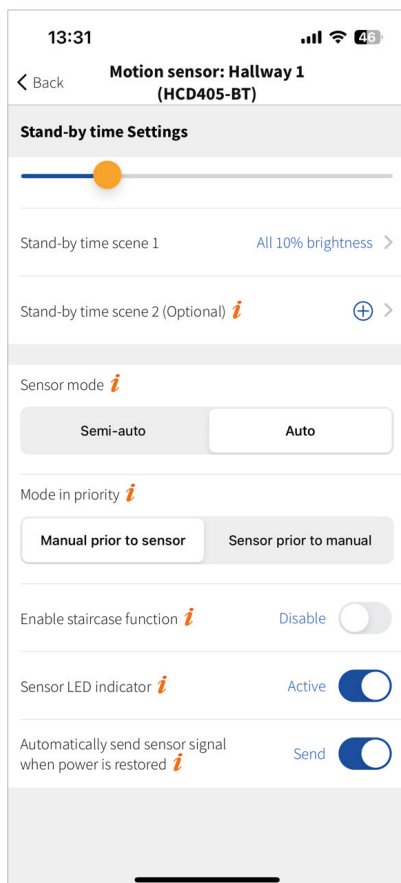

Figure 9.4 Sensor settings - 2

Sensor LED indicator

Enables a status LED to indicate presence.
Not applicable on current range of e-Sense Flex products.

Automatically send sensor signal when power is restored

When activated, a virtual motion command will be sent to activate the hold time and hold time scene according to motion sensor setup. If deactivated, the sensors will behave according to "power on status".

Control hierarchy

The control hierarchy allows manual lighting control and automatic lighting control to work together. Manual control is any physical action, like selecting a scene in the app or pushing a switch. Automatic control is, for example, commands generated by motion sensors and schedule. There are three parts of control in the e-Sense Flex system; motion sensor auto control, manual control and schedule control.
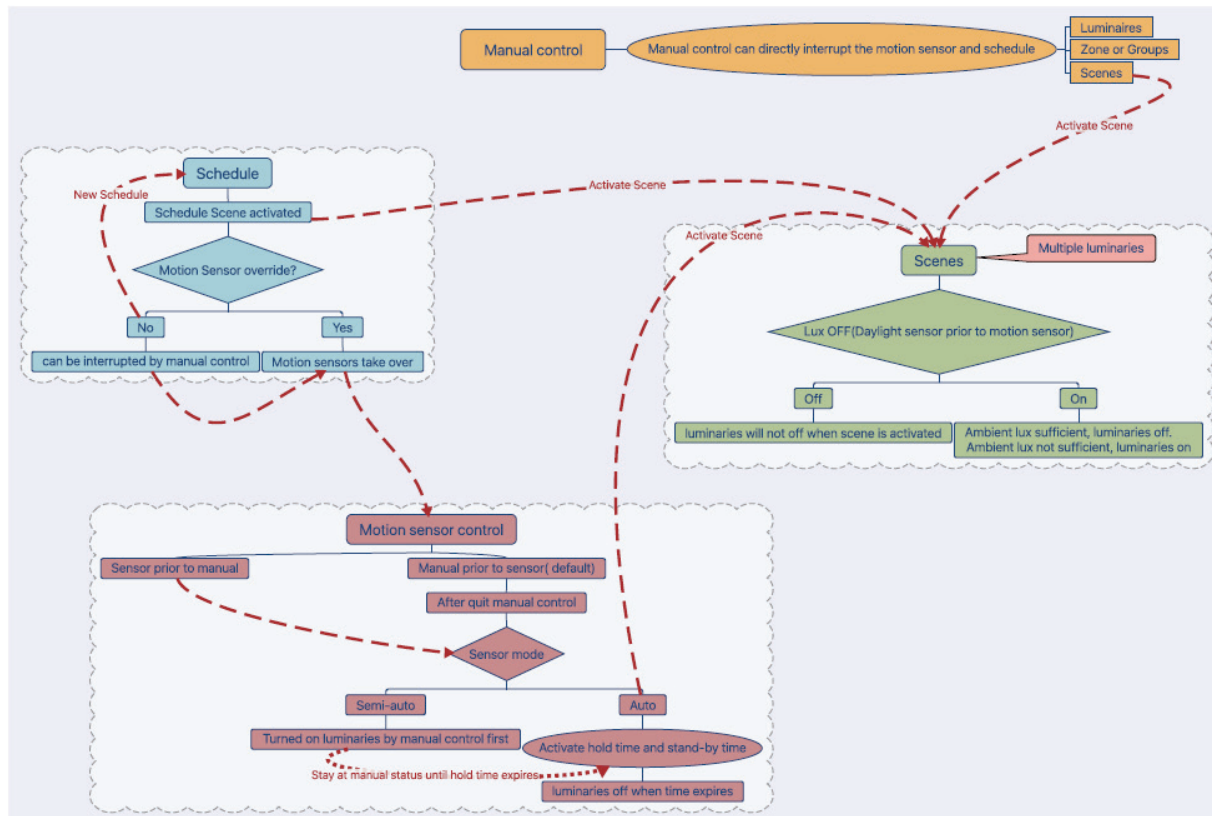

Figure 10.1 Control logic

Motion sensor auto mode
The behavior of the motion sensor can be divided into two different modes; auto mode and semi-auto mode (absence detection).

Manual control
Any physical action, like selecting a scene in the app or pushing a switch.

Schedule control
A schedule based on the date, week, time, or sunrise & sunset time to recall a specific scene.

Sensor mode and mode priority

Sensor auto + sensor prior to manual control

If there's no schedule involved, the motion sensor will be the highest priority in the system. When the motion sensor is triggered, it will activate the hold time scene immediately without regards to current status. For example, if the light has been dimmed down by a switch and the motion sensor are triggered, the luminaires will exit manual control mode and recall the hold time scene right away.

Sensor auto + manual prior to sensor control

If there's no schedule involved, the manual sensor will be the highest priority in the system. When the motion sensor is triggered, it will activate the hold time scene but if any physical action is taken e.g. push of an EnOcean switch, the luminaires will go into manual control mode. How luminaires exit the manual control mode is specified under "How to quit manual override?". When using a switch it is also possible to return to auto mode by configuring it in the push settings.

Semi-auto + sensor prior to manual control

If there's no schedule involved, the motion sensor is only activated by a physical action like push of a switch or via the app. This means that the motion sensor is only activated after users have manually turned the lighting on. When the light has been turned on and the motion sensor is triggered the hold time scene is activated. If no motion is detected the sensor will go to stand-by time and then turn off. The light needs to be manually switched back on to active the sensors again.

Semi-auto + manual prior to sensor control

If there's no schedule involved, the motion sensor is only activated by a physical action like push of a switch or via the app. After the light has been manually turned on and the sensor is triggered it will not activate the hold time scene due to "manual prior to sensor control". It will stay in the manual control mode until it exit the mode depending on "How to quit manual override" settings, default is hold time. After the hold time expires the luminaires enter stand-by time scene and stand-by time before turning off. In this scenario the hold time scene will not be activated, instead it will activate the stand-by time scene after the hold time expires.

Permission manager

The permission managers page provides a full overview of the whole network and permission management. All relevant accounts are displayed regardless of the type. For example, users can see who the admin of the network is as well as installers and sub-users. After a network is created, press ⛶ to share access to the network by either scanning a QR code or through a network sharing key. To delete the network press 🗑 and use the password for e-Sense Flex app login. It is also possible to transfer ownership of the network to another account, adding new installers or sub-users.
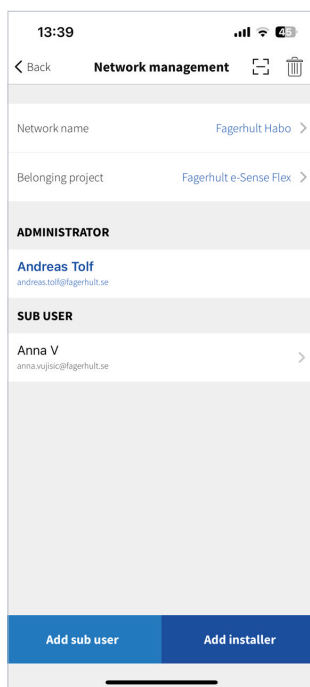
Figure 11.1 Permission manager

Administrator

1) Administrators have the highest privileges and can delete as well as share the network.

2) Responsible for the ownership of the network. This can be passed on to another account after commissioning is finished.

3) Can add and delete sub-users and installers and also assign privileges to sub-users.

4) Can use and modify all available parameters of any device in the network.

5) Can change the account type of installers and sub-users.

*One network can only have one administrator account but can have many installers and/or sub-users.

Installer

1) Can access all profiles of the devices. An installer can delete the network from its own account without affecting other accounts access to it.

2) Can add but not delete other installers to the network.

The authorization processes are protected and all encryption keys are generated randomly and unrepeated. All account data is encrypted and saved with a backup on the cloud server.

Sub-user

1) The sub-users identity/level does not usually have full access and permission to the network. Permission needs to be assigned by the administrator. Sub-users cannot transfer or add installers or other sub-users.

2) Can access all profiles of the devices. A sub-user can delete the network from its own account without affecting other accounts access to it.

Use case 1

The facility manager creates a network and chose the administrator role. Then proceeds to invite installers to do the commissioning on site by clicking "permission manager" on the settings page. Clicks "add installer" and a QR code is generated which the Installer scans through the e-Sense Flex app to gain installer level access to the network. The QR code is valid for one hour. The installers account will be visible on the permission managers page under installer. After the commissioning is done the installer can proceed to delete the network from its account or the administrator can delete the installer after approving the commissioning.
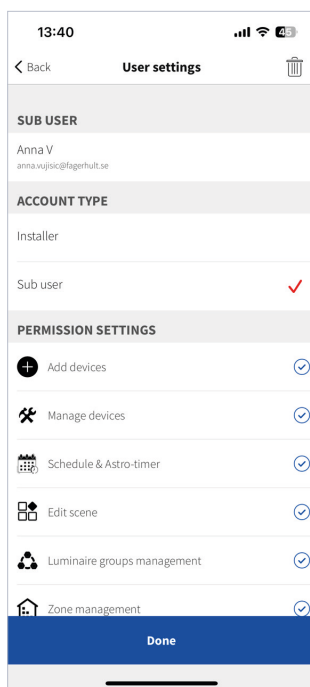
Figure 11.2 User settings
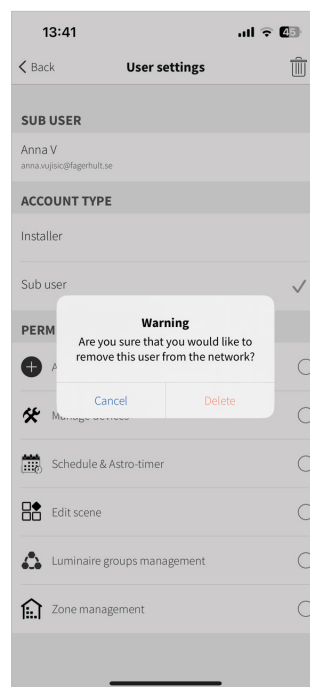
Figure 11.3 Delete installer

Figure 11.4 Add sub-user

Use case 2

Just like in use case 1 the administrator can also add sub-users. The privileges of a sub-user are limited and needs to be assigned by the administrator. The administrator can also transfer ownership of the network to a sub-user by typing in the accounts password. After the generated QR code has been scanned the ownership will be transferred to the new administrator.

Use case 3

If the person who created the network chose the installer role it is still possible to transfer the ownership after commissioning is done. This is done by adding a new sub-user and selecting "Transfer ownership" at the bottom of the QR code page. After the ownership has been transferred the installer will no longer have access to the network.

Test mesh network connection quality

It is difficult to put an exact number on the maximum distance between devices. Fagerhult recommend a maximum of 15 m between devices in open areas but it might vary depending on factors like attenuation by walls, ceilings, furniture and ventilation drums. To achieve the optimal performance, it might require some experimentation of distances in the project.
The "test mesh network connection quality" enables the possibility to test the network and node connection quality. This is to make sure all nodes are in range of the Bluetooth mesh.
In the test mesh network connection quality page all devices are listed and sorted by zone.
It is recommended to maintain 90–100% connectivity.

Over the Air (OTA) update

To improve user experience, Fagerhults e-Sense Flex app supports Over-the-Air upgrades. It enables the possibility for users to update the devices firmware. The "●" next to OTA update indicates that there's an available update. Select which device to update and press "start updating". It is not recommended to update devices unnecessarily on fully function devices without any bugs. The updates can be performed if a bug has been found and the new firmware fixes it or if new features have been added which are essential to the project.
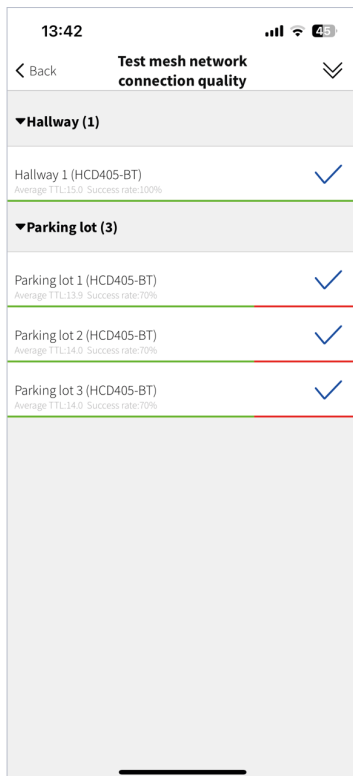
Figure 12.1 Mesh quality

Schedule

Schedules are used to trigger a scene based on time. It can be used to trigger the light on a specific time, date or week as well as sunrise and sunset.

1. Add a new schedule by clicking "+" on the top right corner of the schedule page.

2. Name the schedule and activate it.

3. Select the time setting. The settings include years, month, week, date, time of the day as well as sunset and sunrise. The time is based on the apps geo-location.

4. "Sensor override" defines if a sensor should override the current scheduled scene based on detected motions. For example, a schedule can trigger the 50% light scene at 08:00. With the sensor override enabled the sensor will trigger the hold time and hold time scene. If no presence is detected the motion sensor will proceed to activate the stand-by time and scene before turning off.
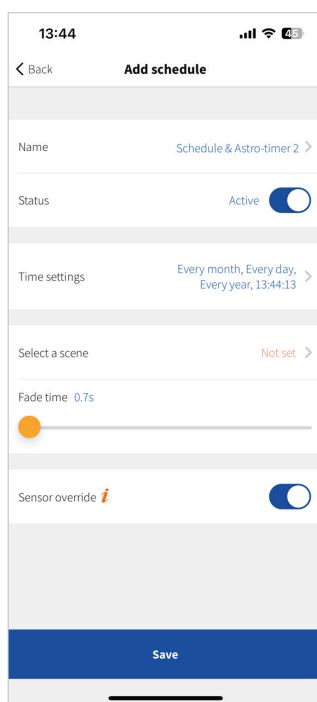
Figure 14.1 Add schedule
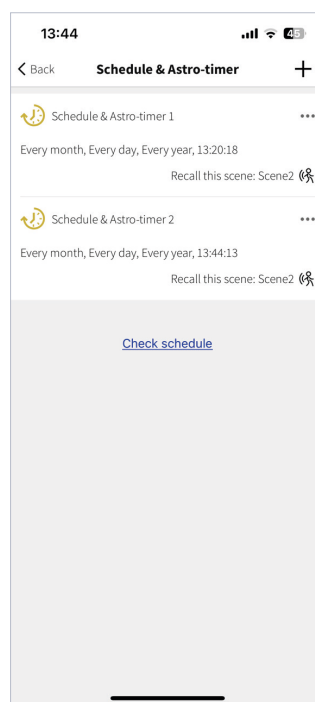
Figure 14.2 Schedule
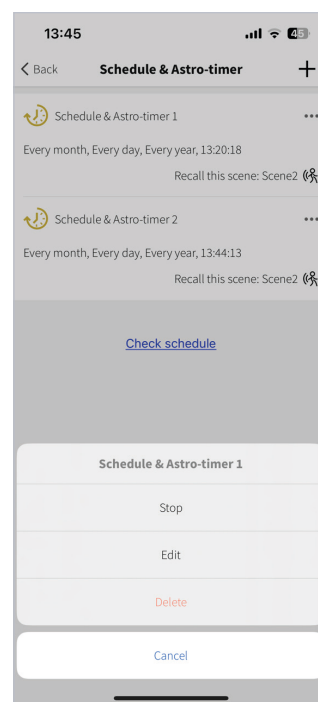
Figure 14.3 Edit schedule

All created schedules are listed on the schedules page. Click " • • • " to stop, edit or delete the schedule. (figure 14.3)

The "check schedule" can be used for troubleshooting. It will let you know if the luminaires are involved in the correct pre-set schedule or not.

Network time calibration

This section is used to check the phones and network time. You can also sync the network with the app s time by clicking "sync to phone time" as well as "sync to Astro time" if needed.
The e-Sense Flex app needs permission to access the phones location during the first log in. After that the app will automatically synchronise the local sunrise and sunset time according to geographic position. The "sync to Astro time" is only applicable if the location of the device has been changed.

The Network time is based on the phones time which can only be synced when connected via the e-Sense Flex app.

Do not modify the phones system time while connected to the network, it may cause data loss.
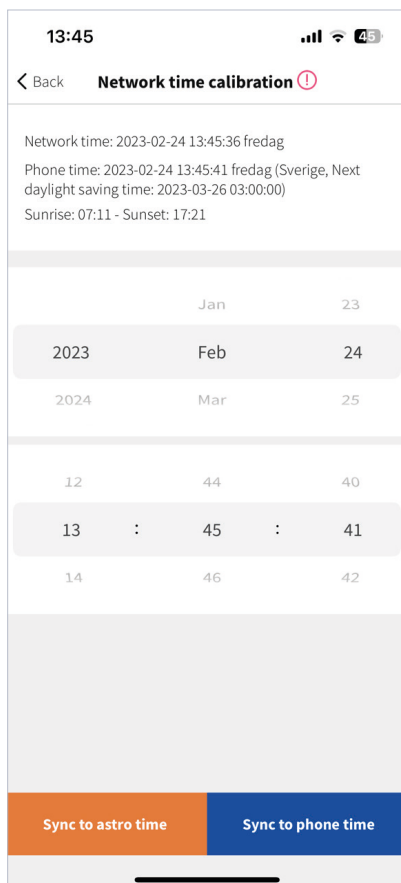
Figure 15.1 Network time calibration

Floorplan & Staircase function

The staircase function enables an easy and effective way of configuring staircases. A staircase function is a lighting control feature where light command signals are sent between floors in a staircase to turn on the lighting on the closest adjacent floors. For example, if motion is detected on the third floor, the light will go to 100% on that floor but at the same time activate the light to a pre-set light level on floors two and four simultaneously. To use the staircase function click the "Floorplan and Staircase function" on the Settings page.
*The floorplan settings is not available with e-Sense Flex enabled products at the moment and will not be described further in this user guide.

1. Select a zone to which the function should be added to.

2. Bind a configuration profile, there's two options available:
   a. Tri-level control (Staircase function)
   b. Daylight harvest (Staircase function)

Either bind the default profile or copy it in order to adjust the parameters to match the project (recommended). Note that it is also possible to modify the selected profile later.
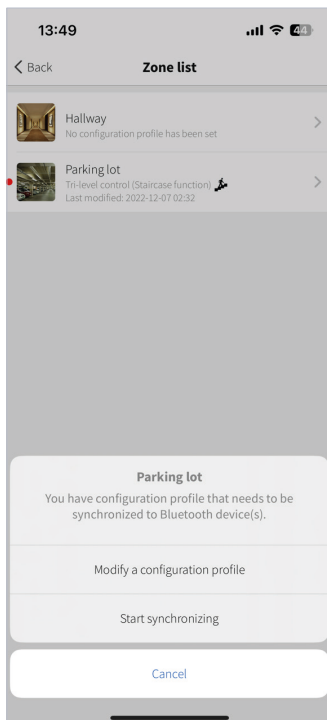
Figure 17.1 Zone list
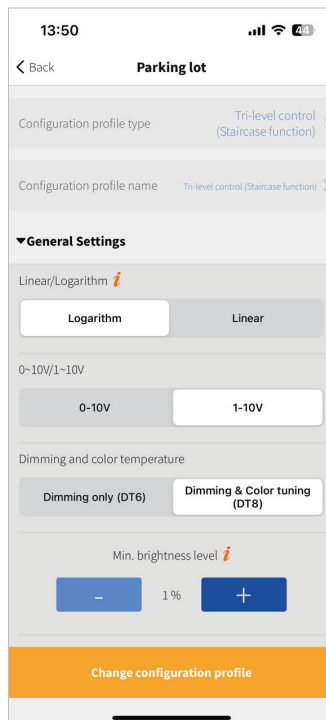
Figure 17.2 Modify profile
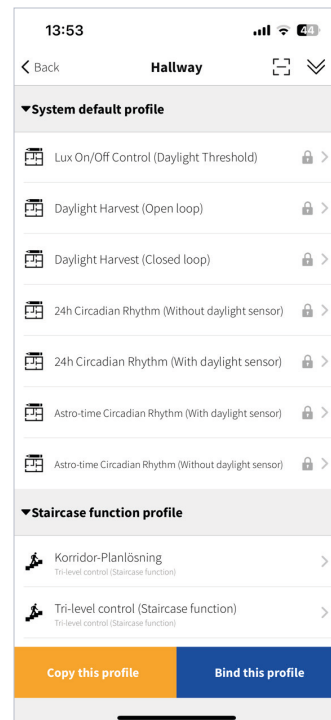
Figure 17.3 Change profile

3. After the profile have been adjusted to fit the project requirements it needs to be synced to the zone.

4. Assign devices to their corresponding floor.

5. Press "Save" to start synchronising the profile to the devices. The staircase profile will override any existing motion sensor settings that doesn't correlate with the profile.
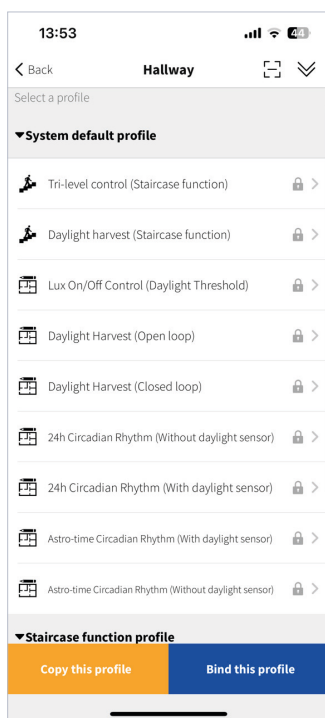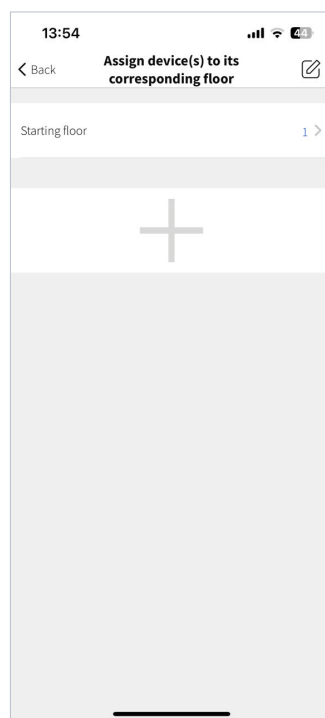

Figure 17.4 Select a profile
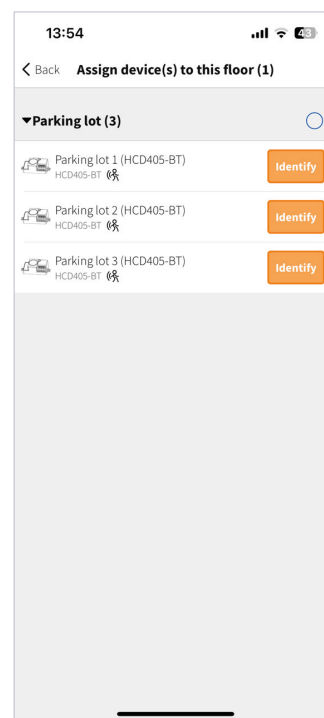

Figure 17.5 Assign device(s) - 1
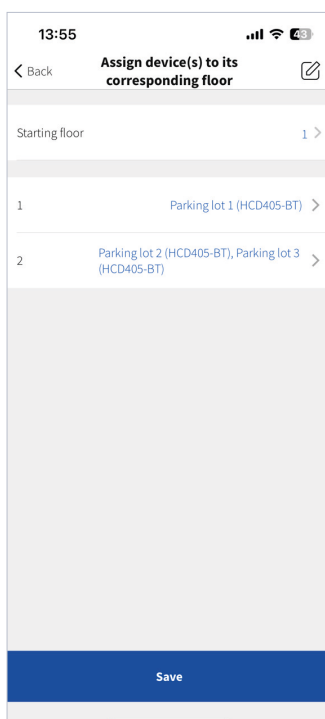

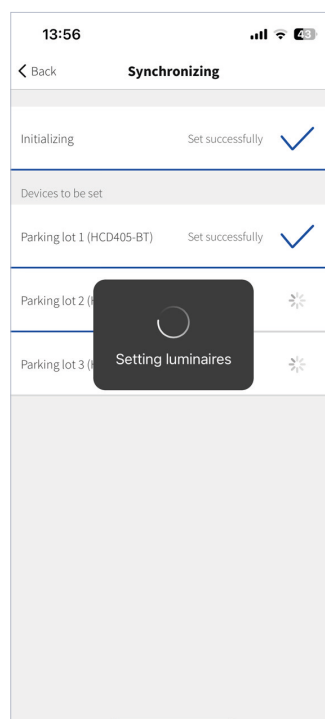Figure 17.6 Assign device(s) - 2

Figure 17.7 Assign device(s) - 2

Figure 17.8 Synchronizing

Bulk commissioning

The bulk commissioning feature is used to save an enormous amount of time during commissioning and is considered one of the best reasons to use e-Sense Flex. It is possible to configure Luminaire, Motion sensor and Emergency devices on multiple devices at the same time using Bulk commissioning. With bulk commissioning it is possible to use pre-set default profiles on each of the respective parts as well creating own profiles to match project requirements.

The different profiles are listed in the bulk commission page. Profiles with a 🔒 symbol are default profiles or created by other users. These profiles cannot be deleted but they can be copied and changed.

1.1 Set Luminaire/Motion sensor/Emergency parameters in Batch volume

There are two ways to create a new profile:

1. Copy parameters from an existing device. Select which device the parameters should be extracted from and then press "Next". From there it is possible to rename the profile and change any of the parameters. The profile needs to be saved, before distributed to other devices. Once the new copy of the profile has been saved, click "next" and select which zones or devices the new profile shall overwrite. A saved profile can be re-used for other areas and networks.

2. Click "Add new profile" to name the profile and set all parameters of the profile and click save 💾 . Click "Next" to and select which zones or devices the new profile shall overwrite.
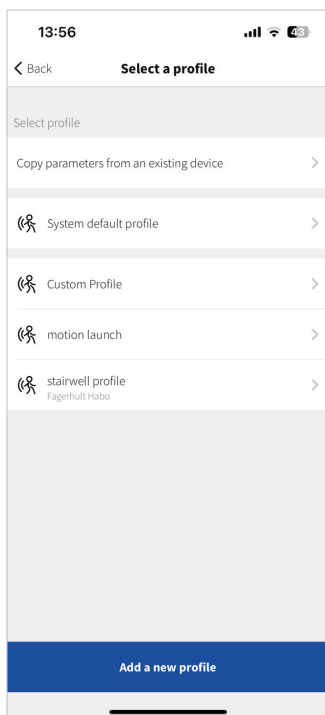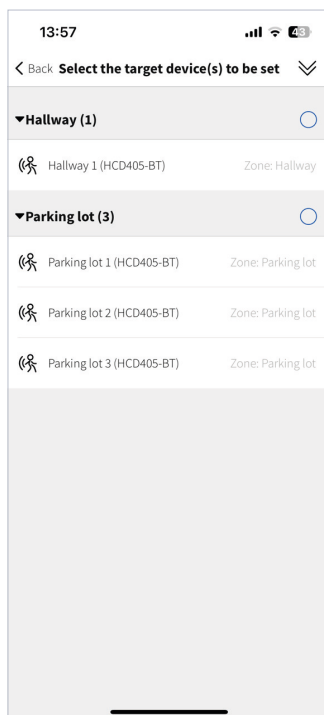
Figure 18.1 Set in bach volume
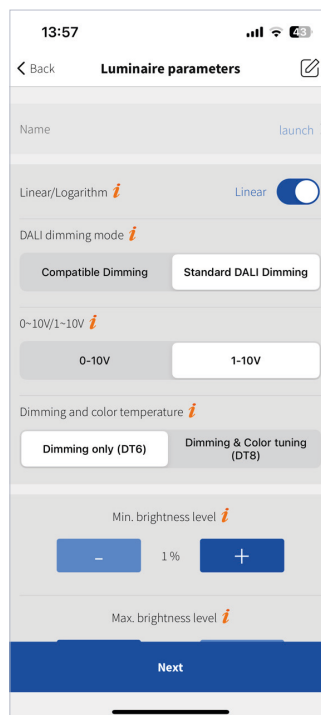

Figure 18.2 Copy parameters
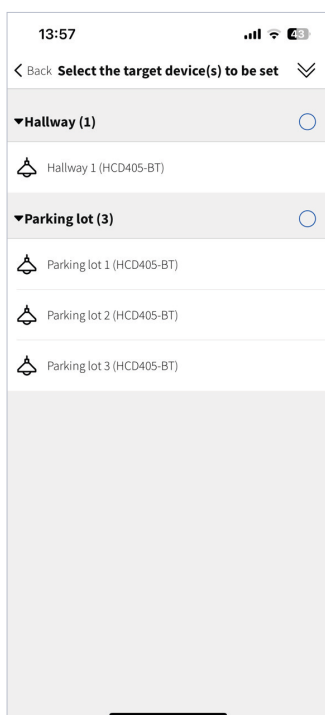

Figure 18.3 Parameters settings
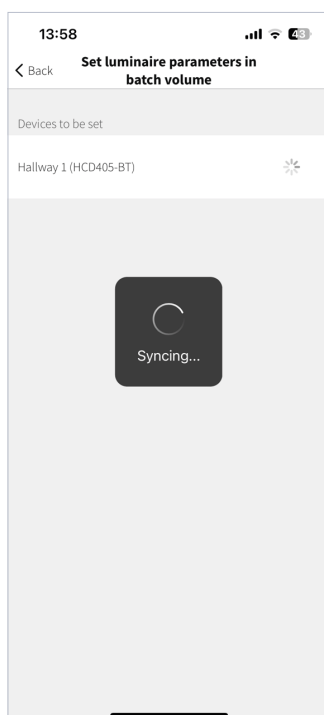

Figure 18.4 Set target device
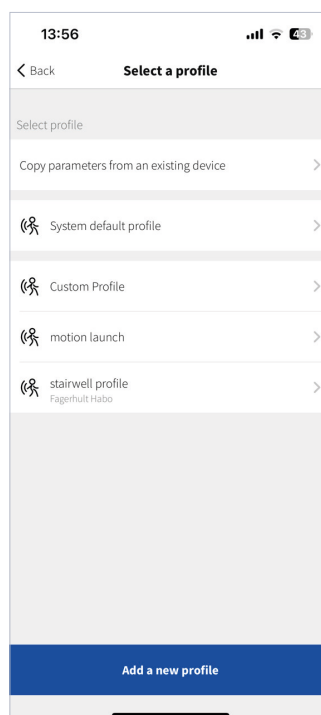

Figure 18.5 Syncing

Figure 18.6 Finished setting

Subject to change without notice

1.2 Clear data

With the "clear data" option it is possible to delete any scenes, schedules and modified parameters on devices and restore them to default settings. Only zones and group relationships are preserved.
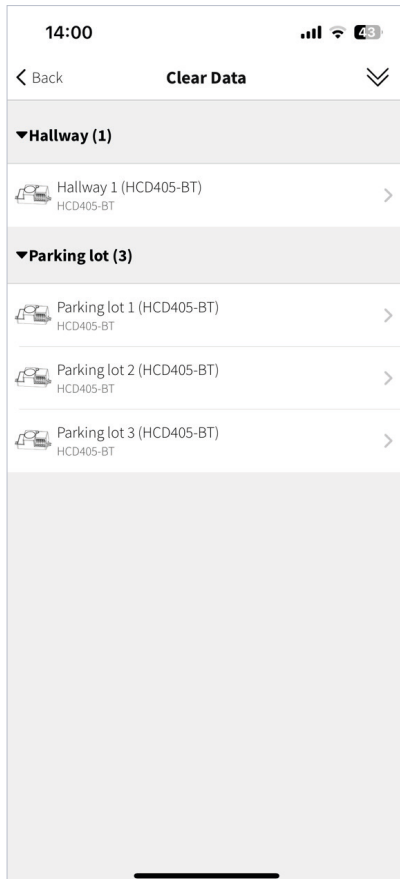

Figure 18.7 Device list

Device social relations

In this section, the e-Sense Flex app lists out all devices in the network according to zone. It's possible to check statuses, zones and control object.
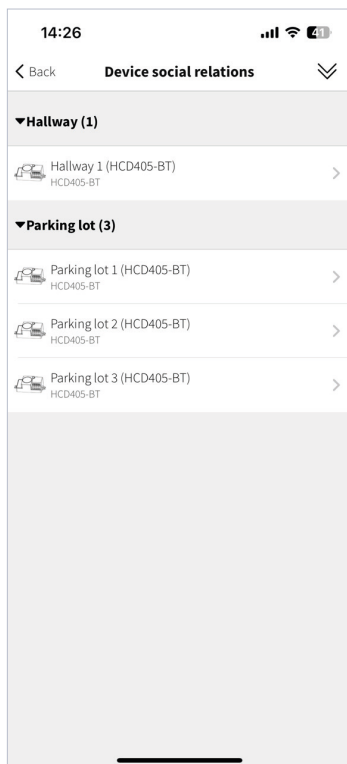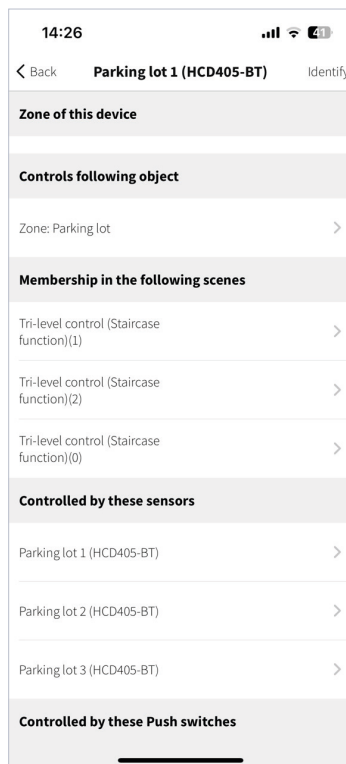

Figure 19.1 Device list

Figure 19.2 Social relations check

Daylight sensors

When configuring daylight sensor control for a zone it is always recommended to calibrate the daylight sensor/photocell. The sensor can be used to either control one luminaire in a zone or several.

The app lists out all devices equipped with a photocell on this page. Note that all e-Sense Flex enabled luminaires are equipped with the photocell advance which can differentiate the electrical and natural light.

"Lux" indicates electrical light and "PirLux" indicates natural light. The control object needs to be set in order for the sensor to start measuring.

*Note that neither of these values actually indicates the lux level on the surface below the luminaire. The lux levels specified in the app should be considered as reference values which may or may not match the actual lux levels on the surface.
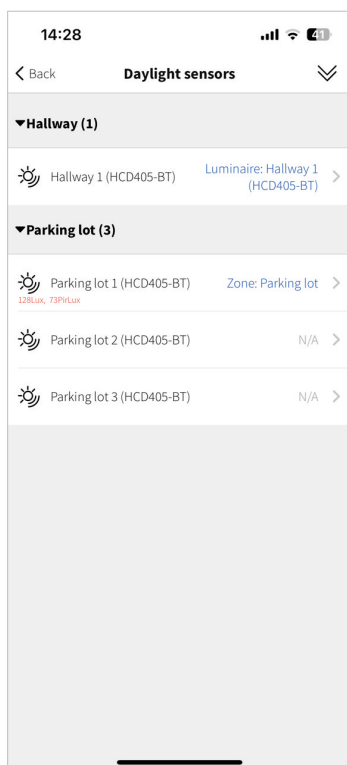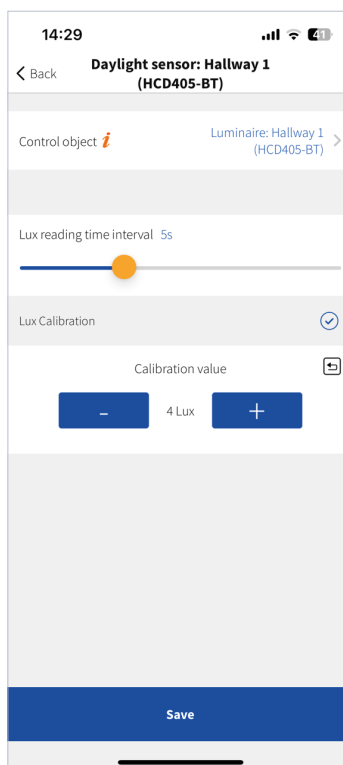

Figure 20.1 Daylight sensors

Figure 20.2 Parameters setting

Control Object

Control object defines which devices the daylight sensor controls. It can be an individual luminaire, group or zone.

Lux Calibration

The sensor is placed inside a luminaire and should always be calibrated before use. The lux values in the app should reflect the actual lux level on the surface under the luminaire. In order to achieve the closest relation between these values it needs to be calibrated using a lux-meter. Place the lux-meter on the surface underneath the luminaire facing upwards while the luminaire is lit. Enter the lux level measured by the lux meter in the app, using the "-" or "+" buttons, or manually enter the digits by clicking the lux value.

The reset button ⊡ is used to reset the calibration.

Switches

e-Sense Flex can also be controlled manually from EnOcean switches. When configuring an EnOcean switch it needs to be done in two steps. Both from the push switch page and from the EnOcean page.

Please not that switches previously used to control other systems such as Organic Response or e-Sense Stage might require resetting before added to the network.

1.1 Push switches

The push switch settings page is where the Control object is selected as well as setting the function on the different push functions.

– Control Object

Select what object the push switch should control. It can be a zone, individual luminaire or a group.

– Single press

Defines the function of a short single press e.g. On/Off, only On or Off, recall a scene or sensor take over.

– Press and hold

Defines the function of a long press, press and hold e.g. Brightness dimming and or colour temperature control.

– Double press

Defines the function of a double press e.g. only On or Off, recall a scene or sensor take over.
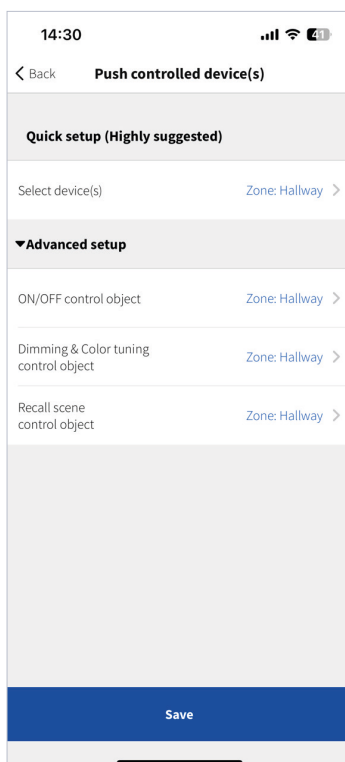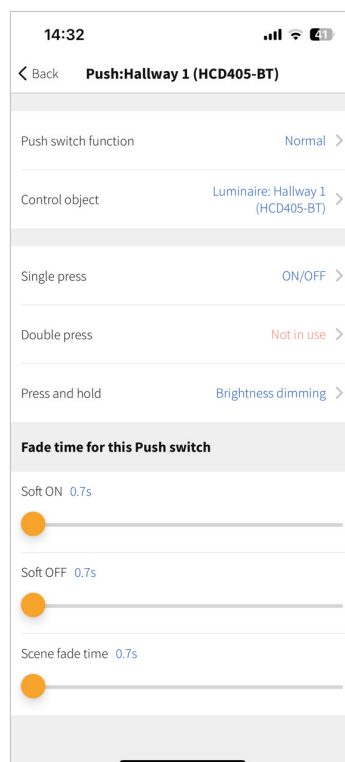

Figure 21.2 Push controlled device(s)   Figure 21.3 Push settings

1.2 EnOcean switches

After the push switch section has been configured, an EnOcean switch can be bonded with the push switch setting. Note that since there's only one simulated switch on the e-sense Flex enabled luminaires it is highly recommended to only use the 2 button switches, EWSSB.
The EnOcean page is only available from the advanced settings in the app.

Pair Enocean switch to a device

An EnOcean switch can be paired to a device in one of two ways. Either scan the QR code on the back of the switch or use the phones NFC to scan the switch. After a switch has been added to a device the EnOcean switch can be configured.
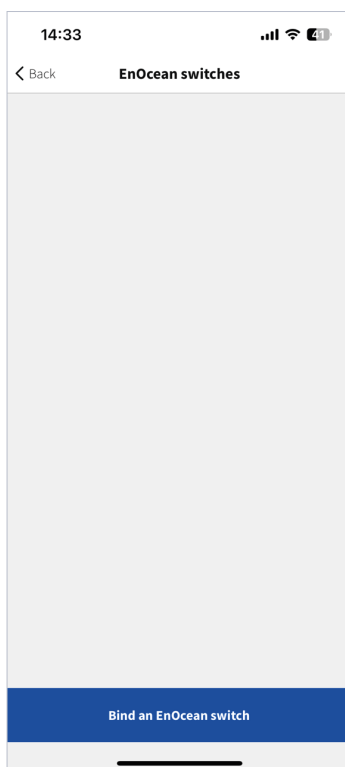
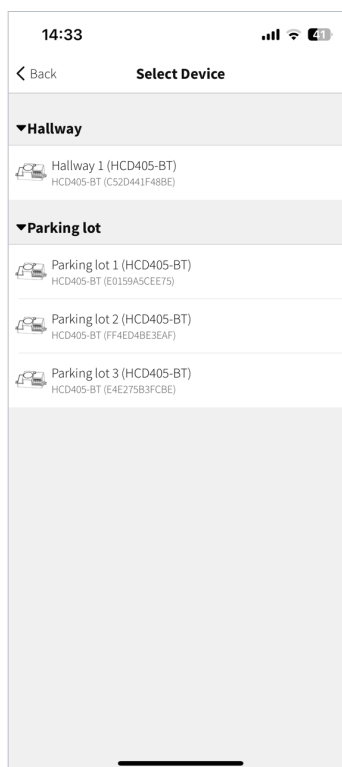Figure 22.1 Bind EnOcean switch

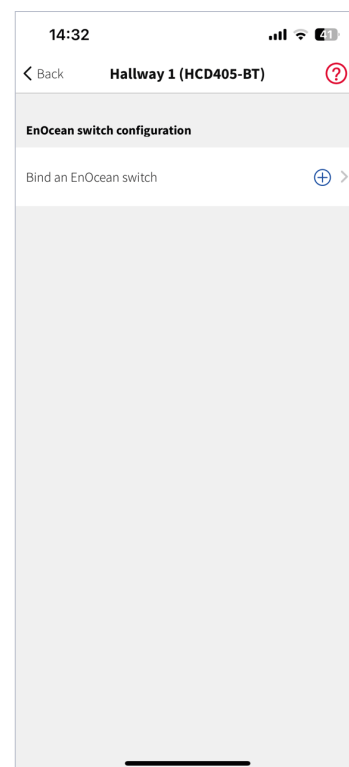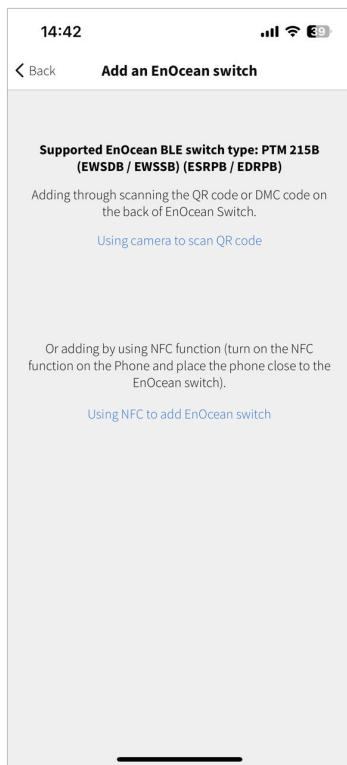Figure 22.2 Select device

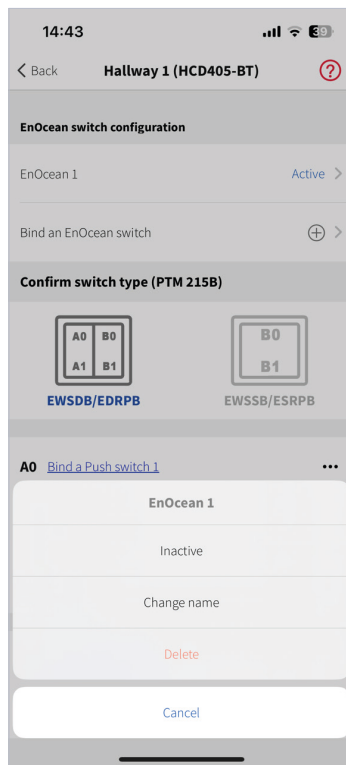Figure 22.3 Bind switch

Figure 22.4 Add EnOcean switch

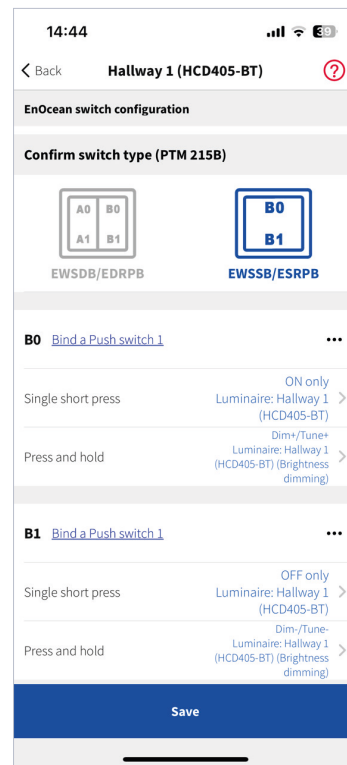Figure 22.5 Switch configuration - 1

Figure 22.6 Switch configuration - 2

Proceed and bind the buttons on the EnOcean switch, B0 & B1, to the push switch function previously configured in the push switch section.

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