

March 2020

Gateway

Set up and connection instructions

Date: March 10, 2020	Ver 2.2
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SILVAIR

1. Overview

The Silvair gateway is a mesh enabled product that enables mesh-devices to cloud communication. The feature set in current gateway offer is:

Features & services

<p>Scheduling (service)</p>	<ul style="list-style-type: none"> ✓ Enables schedule-based recall of lighting control features and predefined scenes at specified time / on specified days. ✓ Built-in the gateway. Can be used after gateway is added to the project.
<p>Energy Monitoring & Occupancy Sensing (Beta service)</p>	<ul style="list-style-type: none"> ✓ Energy monitoring and Occupancy Sensing are beta services used in devices in the bluetooth mesh network. ✓ Gathering energy monitoring data in the cloud. ✓ Data visualization on a heatmap inside the web application. ✓ To use Energy Monitoring and Occupancy Sensing with gateway, user must contact our business representatives at business@silvair.com to request Energy Monitoring configuration.
<p>Mesh devices control</p>	<ul style="list-style-type: none"> ✓ Control up to 200 mesh devices in a single or in multiple areas.
<p>Areas control</p>	<ul style="list-style-type: none"> ✓ One gateway can control mesh devices in single, or multiple areas. ✓ Single area control: 1 area with 200 mesh nodes. ✓ Multi-area control (example): 4 areas with 50 nodes each.
<p>Simple unboxing</p>	<ul style="list-style-type: none"> ✓ Intuitive interface to add a gateway to lighting project. ✓ More than one gateway can be added to a single project. ✓ Needs to be added to existing area(s) in an existing project, created in Silvair Commissioning (Web) or branded applications.

Network requirements

The gateway requires a power supply and an Internet connection to function.

Customers have to ensure that their IT networks allows for the correct connections to be made (see below for details), as the gateway requires the following to function:

- IP address configuration via DHCP (default configuration, with optional Static IP configuration available)
- DNS servers to resolve external web addresses

Custom network configurations

The gateway supports the following network configurations:

- Ethernet - Static IP, gateway, DNS, and subnet addresses
- WiFi - Wireless networks supporting WPA2-PSK

To enable custom network configurations in your gateway please contact support@silvair.com.

2. Installation process

The gateway should be

- ✓ installed as close as possible to the geometrical centre of the network within radio contact of as many nodes as possible
- ✓ placed as far away as possible from any possible sources of interference (e.g. high power electrical equipment, strong transmitters, any building features that could block radio transmissions etc.)
- ✓ connected to a power supply & the network

Whitelist the following hosts & ports on your network

Remote Host	Protocol	Port	Notes
ntp.ubuntu.com	UDP	123	Time server
geoip.ubuntu.com	TCP/HTTPS	443	Determine local timezone
login.ubuntu.com	TCP/HTTPS	443	Software updates
api.snapcraft.io	TCP/HTTPS	443	Software updates
dashboard.snapcraft.io	TCP/HTTPS	443	Software updates
fastly.cdn.snapcraft.io	TCP/HTTPS	443	Provisioning
provision.rigado.com	TCP/HTTPS	443	Provisioning
api.rigado.com	TCP/HTTPS	443	Posting logs
diagnostics.rigado.com	TCP/HTTPS	443	Error Reporting
a2fyo1pewinh1f.iot.us-west-2.amazonaws.com	TCP/MQTT	8883	Metrics and control
api.platform-prod.silvair.com	TCP/HTTPS	443	Silvair Commissioning API communication
silvair.eu.auth0.com	TCP/HTTPS	443	Silvair Commissioning authentication (NOTE: future versions will

authenticate via our API so then this port will not be required).

mcfly-bc026f47.influxcloud.net

TCP/HTTPS

8086

Energy and motion information database





NOTE:

- Please be aware that many of the hosts resolve to multiple IP addresses which may change at any time.
- System administrators should use hostnames and not rely on whitelisting individual IP addresses for these services.

3. Connecting gateway to a project

3.1 Add gateway to a project

1. Check that the gateway is online - the status LED will go through the following sequence:

LED color	Presence	Role
	Solid	Gateway is booting up.
	Blinking	Blinking once every 2 seconds. Gateway is initializing the connection to the management portal.
	Blinking	Blinking twice a second. Gateway is authenticating itself in the management portal.
	Solid	Connection was successful.

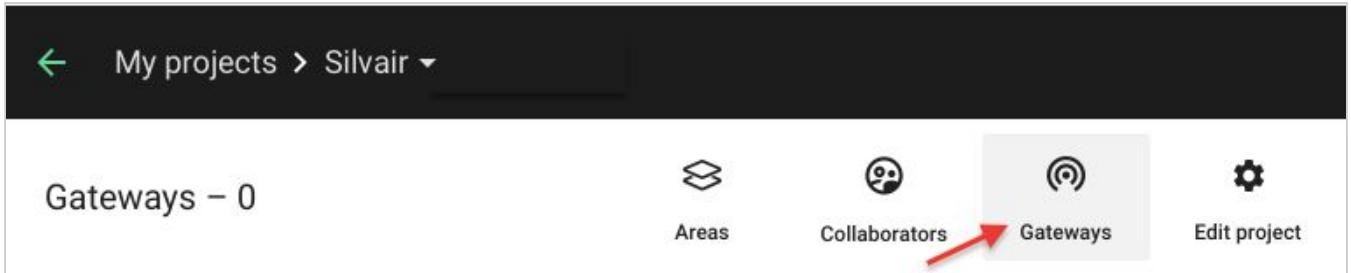
NOTE:

The gateway boot time should **not** exceed 5 minutes.

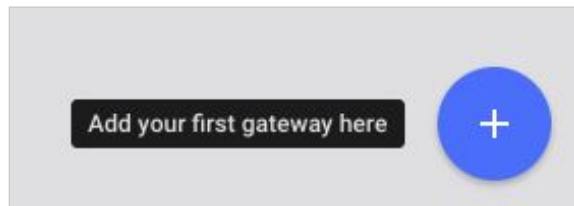
If it's stuck with either one of the blinking yellow states, it could indicate a network issue.

2. If gateway is connected properly, the gateway status LED should shine with a solid, green light.
3. Create area(s) in the project where the gateway will be connected to. You can also use existing area(s).
 - ✓ Commissioning your devices to the area can be done before or after adding the gateway to your project.
4. Next, add gateway to the correct project.¹
5. Open Silvair Commissioning web app and log in.
6. Select the correct project.
7. Click on the "Gateways" tab.

¹ Adding a gateway to project can be done only with the Commissioning **web** app.



8. Press the button in bottom-right corner of the page to add a gateway.



9. Add project location: geographical coordinates of the building in which gateway will be provisioned.

A screenshot of a form titled 'Project location'. It has two input fields: 'Latitude' and 'Longitude'. The 'Latitude' field contains the value '500,97395' and has a red error message below it that says 'Incorrect Latitude'. The 'Longitude' field is empty and has a blue error message below it that says 'e.g. 19.891613'. At the bottom of the form are two buttons: 'CANCEL' (grey) and 'NEXT' (blue).

For projects located in the Western hemisphere, users should enter negative longitude values e.g. -73.9917

9.1 Project coordinates

- ✓ The easiest way for the user is to read project's latitude and longitude from a digital map such as: Google Maps, OpenStreetMap.
- ✓ The coordinates should be entered with an accuracy of at least 2 decimal digits (e.g for longitude enter 19.89).
- ✓ Accurate coordinates allow for precise setting the time of sunrise / sunset for a given project.

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10. Add Gateway ID, which is a Gateway Serial Number. It is usually placed on the back of the gateway box.

Ex. gateway Serial Number: C099988877-66554

11. Select areas that will be controlled by the gateway and press “**ADD**” to confirm. The number of all nodes in selected areas should not exceed ~ 200.

Add gateway

Gateway ID
C031061830 - 00613

Areas (Optional)

Floor 1

Floor 2

Floor 3

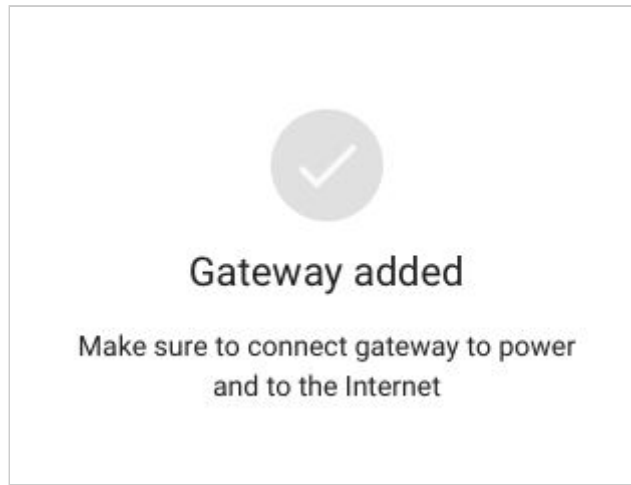
Floor 4

CANCEL ADD

NOTE:

- It is possible to have multiple areas controlled by one gateway device.
- It is also possible to have more than one gateway added to multiple areas.

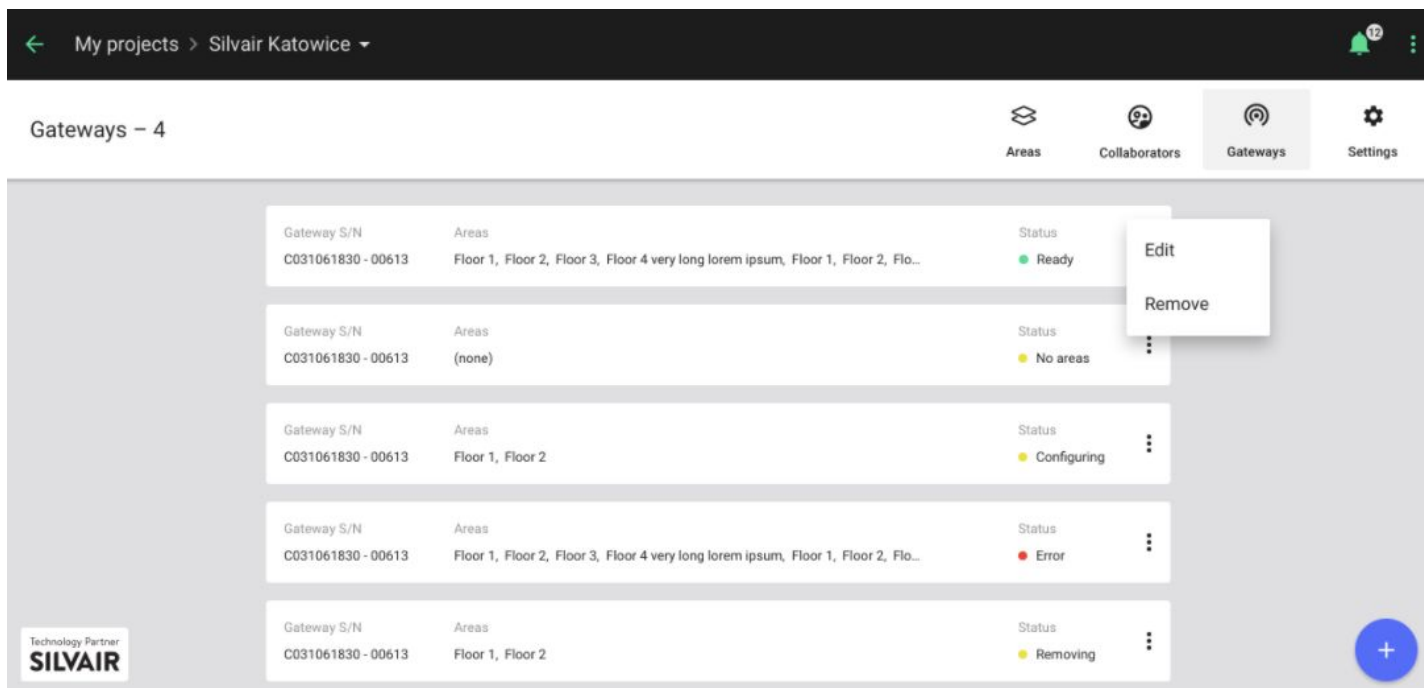
12. When adding gateway is successfully finished, you should see the below message.



3.2 Gateway status: web UI

Gateway added to the project may have one of the following statuses:

Status	Role
● Ready	Gateway is successfully added, ready to use.
● No areas	There are no areas in the project. You must add at least one area to the project to be able to use gateway-enabled services.
● Configuring	Network configuration in progress.
● Error	<p>This error is driven by configuration / backend services / problems when adding a gateway. Try the following solutions:</p> <ul style="list-style-type: none"> ● Click the gateway context menu to retry configuration ● Make sure that the gateway is connected to Internet and ● Make sure that the required ports on your network are open <p>If the gateway still fails multiple times, contact support@silvair.com.</p>
● Removing	<ul style="list-style-type: none"> ● Gateway is being removed from the project. ● When it's finished, the gateway is removed from the project and you will not see it on the gateways list. ● Only then the gateway may be re-used in another project after reprovisioning.



3.3 Adding a new area to a project with gateway

- Open the Silvair web app and select a project that you want to update
- Click the blue button in bottom-right corner to add a new area
- Enter area details, add image, and zones
- Open “Gateways” by clicking on the icon from the navigation bar
- Press the context menu next go the correct Gateway and click “Edit”
- Select additional area from the list and confirm with “ADD” button
- The gateway status icon will change to yellow (Network configuration in progress)
- When the network configuration is finished, the gateway status icon will change to green (Ready)
 - After status icon change, the Gateway will be ready to use with the new area successfully added.

3.4 Removing gateway from a project

- Open the project and click on “Gateways” from the menu
- Select the gateway that you will be removing and click on a gateway context menu
- Click “Remove”.
 - **NOTE:** The gateway will still be visible on the list with “Removing” status. To fully remove a gateway, user must make sure that the gateway will be online while doing the reprovisioning procedure by the gateway device provider (Rigado).
- Once the gateway is successfully unprovisioned by the gateway device provider, it will no longer be visible on Gateways list as it is deleted.

- Add it again to the project by repeating steps from p.3.1

3.6 Configuration error VS device error

Configuration error:

Example:

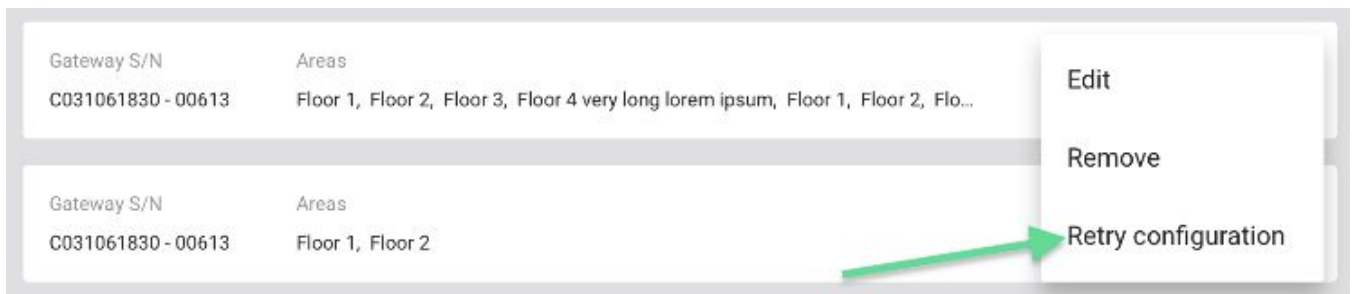
Gateway device (hardware) is flashing with a solid green light, while the web panel shows an error in gateway functioning.

Explanation:

Most probably, the gateway device (hardware) is working properly. The issue might be related to backend services or configuration problems.

Solution:

- Click the gateway context menu in the web app to retry configuration.



- If this doesn't help, try to reprovision the gateway (remove it from the project and add it again).
- If issue still persists, please contact support@silvair.com.

3.7 Changing gateways between projects

If you want to start using a gateway device in another project, you must:

- Remove it from the project where it is currently added to (see p.3.4. 'Removing gateway from a project').
- Open the project where you want to add this gateway device and proceed as with normal gateway adding described in chapter 3.1 'Add gateway to a project'.
- **NOTE:**
It is not possible to add a gateway that is already in use to another project. User will be blocked from this action and'll see an error message.

3.8 Who can see "Gateways" in project?

Depending on the assigned user role, access to Gateways varies.

- All user types (Installer, Manager, Owner, User) can see "Gateways" tab and gateways added in projects.
- Installer, Manager and Owner can manage gateways (add, remove, reconfigure).

4. Technical Specifications

Features & application	<p>An IoT gateway for the connection and management of Bluetooth mesh networks in commercial building applications. Access is via Silvar Commissioning. It delivers:</p> <ul style="list-style-type: none"> • Internet connectivity. • Data collection - i.e. routing data from the network to the Silvar Cloud. • Future functionality: Management (recommissioning) & control of lighting networks. • Future functionality: System status monitoring.
Capacity & performance	<p>The gateway provides full protection against power failure.</p> <p>The current hardware configuration allows the Silvar Gateway to process 450 Bluetooth mesh network messages per second with data transfer reliability of over 99%.</p>
DC power supply	12V, 1-1.5A
Operating System	Ubuntu Core
Processor	NXP i.MX6 UltraLite
Communication protocols	Bluetooth mesh, TCP/IP, IPv4
Security	<p>Secure boot with encrypted operating system (to protect the integrity and confidentiality of the data)</p> <p>Secure communication with Silvar Cloud over Internet (TLS)</p> <p>Secure communication with devices over Bluetooth Mesh</p>
RF information	<p>2.4 GHz BLE radio (IEEE 802.15.1) Tx/Rx</p> <p>Maximum radio frequency antenna power output: 10 mW (+10 dBm)</p> <p>Internal omni-directional trace antenna</p> <p>Communication range of 500m (over 1500 ft) line of sight</p>
Ports	1 x RJ45 10/100 Ethernet port (with PoE option)
Operating temperature	<p>RGB LED for status reporting</p> <p>Real time clock with super-capacitor</p> <p>0°C to +70°C</p> <p>32 °F to 158 °F</p>
Housing & Dimensions	<p>Material: ABS, PC</p> <p>120 x 120 x 25 mm (4.7 x 4.7 x 1 inches)</p>
Weight	0.254 kg (0.56 lbs)
Mounting position	Wall or surface mounted. As close to the geometrical centre of the lighting network as possible but as far as possible from potential sources of interference.