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Silvair Gateway

User Guide

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SILVAIR

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1. Overview

The Silvair Gateway connects Bluetooth mesh networks that have been commissioned using the Silvair Commissioning tools to the Silvair cloud, to allow the scheduling of events and delivery of services based on the data generated by these networks.

Please note:

- Silvair Gateways can only be added to projects commissioned using the Silvair Commissioning tools.
- One gateway can control multiple areas (an area as defined in the Silvair Commissioning tool)
- We recommend that each gateway serves around 200 Bluetooth mesh devices - there is no hard limit as there are many factors on site that can affect the effectiveness of transmission.

1.1 Silvair Gateway Services

The services currently available via the Silvair Gateway are:

- Scheduling:
 - Schedule-based lighting control and the recall of predefined scenes at specified times / on specified days.
 - This service is available out-of-the-box as soon as the gateway is added to the project.
 - One gateway is required per area in a project.
- Energy & Occupancy Monitoring (beta):
 - Energy and occupancy monitoring services are available as beta services.
 - Calculated energy consumption is based on the brightness and rated power consumption of a driver. It can be visualized in a heatmap in the Silvair Commissioning web app and accessed via an API.
 - Occupancy monitoring based on PIR status. It can be visualized in a heatmap in the Silvair Commissioning web app and accessed via an API.
 - These services are enabled per gateway. Please contact us at business@silvair.com to find out more.
- Remote Monitoring & Control (private beta):
 - API for low-latency control of mesh devices in one or multiple areas.
- Remote Maintenance and Upgrades:
 - Regular maintenance updates delivered remotely.
 - Key performance metrics such as CPU load and connectivity status are displayed in the Silvair Commissioning web app.
- Updates and Security:

- Linux Operating System.
- High level of hardware and software security (secure boot & encrypted file system that can only be accessed with the management platform).
- Secure provisioning with secure IDs and encrypted keys.
- Automatic security updates.
- Prompt releases of OS updates & fixes to vulnerabilities.

2. Gateway Requirements

For proper operation, the Silvair Gateway needs to be:

- Connected to a power supply
- Connected to the Internet
- Installed as close as possible to the geometrical centre of the network (within radio range 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.)

2.1 Network Requirements

The Silvair Gateway requires the specific configuration of local IT networks to allow the correct connections to be created:

- IP address configuration via DHCP (default configuration, with optional Static IP configuration available)
- DNS servers to resolve external web addresses
- The following hosts & ports must be whitelisted on your network:

Remote Host	Protocol	Port	Notes
ntp.ubuntu.com	UDP	123	Time server
0.ubuntu.pool.ntp.org	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
cloudfront.cdn.snapcraft.io	TCP/HTTPS	443	Software updates
fastly.cdn.snapcraft.io	TCP/HTTPS	443	Provisioning
provision.rigado.com	TCP/HTTPS	443	Provisioning
serial-vault.rigado.io	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 this port will not be required.
mcfly-bc026f47.influxcloud.net	TCP/HTTPS	8086	Energy and occupancy information database

IMPORTANT: Networks (in particular those in corporate environments) that utilize SSL or TLS Man-in-the-Middle (MiTM) traffic decryption must be configured **NOT** to decrypt traffic to the gateways as this will prevent proper update and gateway management. Please ask your IT department to verify this **before** installation!

Many of the hosts resolve to multiple IP addresses that may change over time, so the system administrators should use hostnames and not rely on whitelisting individual IP addresses for these services.

2.2 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 other network configurations in your gateway please contact support@silvair.com.

3. Gateway Operations

Before you begin, see [2. Gateway Requirements](#).

3.1 Gateway Initialization States

Once the gateway is connected to a power supply and the Internet, the status LED will go through the following sequence:

LED Color	LED Behaviour	Gateway Behaviour
	Solid yellow	Gateway is booting up.
	Blinking yellow	Blinking once every 2 seconds: The gateway is initializing the connection to the management portal.
	Blinking yellow	Blinking twice a second: The gateway is performing authentication in the management portal.
	Solid green	Connection was successful.

NOTE: The gateway boot time should **not** exceed 5 minutes. If the gateway is stuck in either one of the blinking yellow states, it can indicate a network issue.

3.2 Gateway Access

Depending on the assigned role, the level of access to the gateways in the Silvair web app will vary:

- All user roles (Installer, Manager, Owner, End User) can see the **Gateways** tab and the list of gateways added in a project.
- Only the Installer, Manager, and Owner can add, remove, or reconfigure the gateways.

3.3 Adding a Gateway to an Existing Project

Before you begin, ensure the gateway status LED is solid green.

Considerations when planning to add a gateway to a project commissioned using the Silvair

Commissioning tools:

- A gateway can control multiple areas within a project.
- It is possible to have more than one gateway added to multiple areas within a project.
- One gateway can be assigned only to one project.
- Adding gateways to a project and commissioning devices in the project are two independent processes and can be performed independently of each other.

- If monitoring or remote control services are required, we strongly recommend that the total number of nodes in the selected areas is limited to about 200 to maintain a reasonable message transmission rate (the 'message completion rate' visible in the web app will give you an indication of the gateway loading).

Adding a gateway:

1. Log in to <https://platform.silvair.com/>.
2. Select the project you want to add a gateway to.
3. From the top menu, select the **Gateways** tab.
4. From the bottom-right side of the screen, click the + icon.
5. If the location of the project has not been set, add coordinates.

NOTE: You can obtain the latitude and longitude from digital maps such as Google Maps or OpenStreetMap.

The coordinates should be entered with at least 2 decimal places (more accurate coordinates allow for more precise sunrise and sunset times to be set for the project).

6. Enter the gateway serial number.

Example: C099988877-66554

HINT: You can usually find the gateway's serial number on the back of its case.

NOTE: If the gateway has the wrong serial numbers or you have made a mistake, you will not be able to add it to the project.

7. (optional) Select the areas to be connected to the gateway.

Add gateway

Gateway S/N
C099988877-66554
e.g. C123456789-12345

Areas (optional)

Ground Floor

First Floor






Second Floor

CANCEL ADD


8. Click **ADD**.
9. The “Gateway added” message appears.

3.4 Gateway Statuses

Once the gateway is added to the project, one of the following gateway statuses may be displayed in the web app:

Status	Role
 Ready	Gateway has been successfully added and is 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 is in progress.
 Error	<p>There was a problem with the configuration and/or backend services while the gateway was being added. Try the following steps to resolve the issue:</p> <ul style="list-style-type: none"> ● Click the gateway context menu to retry configuration ● Make sure that the gateway is connected to the Internet ● Make sure that the required ports on your network are open <p>If the gateway still fails after trying these steps, please contact support@silvair.com.</p>
 Removing	<ul style="list-style-type: none"> ● The gateway is being removed from the project. ● When completed, the gateway will be removed from the project and will not appear on the gateways list. ● It is only when a gateway has been successfully removed from one project that it can be re-provisioned into another project.


3.5 Adding a New Area to a Project with a Gateway

1. Log in to <https://platform.silvair.com/>.
2. Select the target project.
3. From the bottom-right side of the screen, click the + icon.
4. Enter the area name.
5. (optional) Upload a floorplan or image for the area.
6. Click **CREATE**.
7. From the top menu, select the **Gateways** tab.
8. Click the  icon next to the target gateway and select **Edit**.
9. Select the newly created area and click **ADD**.
The gateway status icon will change to yellow, signaling that network configuration is in progress.

Once the network configuration is finished, the gateway status icon will change to green to signal that the gateway is ready to use.

3.6 Removing a Gateway from a Project

Before you begin, ensure the target gateway is online.

1. Log in to <https://platform.silvair.com/>.
2. Select the target project.
3. From the top menu, select the **Gateways** tab.
4. Click the  icon next to the target gateway and select **Remove**.
5. (optional) To add the gateway to another project, follow [3.3 Adding a Gateway to an Existing Project](#).

3.7 Resolving Gateway Configuration Issues

If the gateway status LED is solid green and the gateway status indicates an error, the issue is most probably related to an error in the backend or configuration.

1. Log in to <https://platform.silvair.com/>.
2. Select the target project.
3. From the top menu, select the **Gateways** tab.
4. Click the  icon next to the target gateway and select **Retry configuration**.
5. If the issue persists, remove the gateway from the project.
See [3.6 Removing a Gateway from a Project](#).
6. Re-add the gateway to the project.
See [3.3 Adding a Gateway to an Existing Project](#).
7. If the issue still persists, please contact support@silvair.com.

4. Document Revisions

Rev	Date	Editor	Changes
2.7	05.05.2021	ES, ZZ	Added the Document Revision section and made general updates of the document.

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