Application Note: Network Settings

Best practices for Relay nodes, EnOcean adapter

and Mobile device proxy

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Overview

This document describes practical tips for network settings, i.e.:

- Appropriate Relay nodes placement in the mesh network.
- Mobile device proxy and EnOcean adapter behavior.

In general to ensure optimal performance, it is strongly recommended to have **at most one network option** (Relay, Mobile device proxy, EnOcean adapter) enabled on one mesh device at one time.

Relay nodes

- Relay nodes in a Bluetooth mesh forward received packages. In small spaces all nodes can be installed within range of each other (a range of 10m - 15m between nodes is reasonable) and there's no need to have Relay enabled nodes.
- Larger spaces of more than 20-30 mesh devices usually require flagging some nodes as Relays in order for the network to function reliably. In larger installations, it is recommended that approximately 10% of the total nodes should be enabled as Relays in order to maintain reliable message delivery between nodes.

Mobile device proxy

- The mobile device proxy allows the mobile device running the Fulham EliteBlue mobile app to connect to the mesh network and to configure devices the zone.
  - Enabling the proxy service allows the selected node to connect to the mobile app which can then send/receive messages on the mesh network via the proxy service.
  - One proxy service supports only one simultaneous mobile device (iPad / iPhone) connection.
    - If the mesh network zone has already one Mobile device proxy enabled, and there is another commissioner who wants to access the network with a second mobile device, Proxy needs to be enabled on the second device, on the same node.
- At least one device in a mesh network must have the proxy enabled. This is, by default, set up in the Fulham EliteBlue mobile app and requires no intervention from the user.

- It is **not** recommended to turn on / off the proxy manually, as in majority of cases the mobile app will do it automatically.
  - If there are any network problems, the Fulham EliteBlue mobile app automatically re-adjusts the proxy service to ensure the best connection.
  - If your mesh network is not responding correctly:
    - Ensure that there is at least one proxy device set per network.
    - Try to identify the proxy device in your zone (by tapping the icon in the mobile app) and observe if the device is responding (blinking).
    - Try to enable Mobile device proxy on another device in the zone (Select the desired device in the zone in the Fulham EliteBlue mobile app, expand the settings, and tap "GATT Proxy".).
    - Lastly, once you have more than one Mobile device proxy,
      - Select the device that is not responding.
      - Change the switch "GATT Proxy" to inactive, and then activate it again.
- Do not enable the Mobile device proxy and Relay functions in the same node.
  - In the above situation, after switching on the EnOcean switch, the node which has proxy and Relay enabled will respond instantly, while other nodes will be switched on with one second delay.
- Disabling or removing the only Mobile device proxy in a network will irreparably damage the network by removing the ability to connect to the mesh network via the Fulham EliteBlue Mobile app.
  - In this case, network reconfiguration can only be done by factory resetting and recommissioning all devices.

EnOcean adapter

- The EnOcean adapter option allows for the manual control of Bluetooth mesh lighting systems.
- Do not turn on the Relay option on a device with EnOcean adapter enabled.
    - Doing so will automatically switch of the EnOcean adapter.
- One EnOcean switch can be registered to simultaneously control two spaces, however registering one EnOcean switch to more than one node in a single space will cause very poor lighting control performance (flickering, oscillations)
- For more information regarding EnOcean adapter / switch see "SN-203: Application note: EnOcean switch".

Network settings

To maintain fast and efficient performance of the mesh network, use the following best practices:

1. Do not flag more than 10% of your nodes as Relays. Doing so causes a huge increase in mesh network traffic and will slow down and severely degrade the overall performance of the mesh network and lighting control.
2. If possible, position Relay nodes evenly across the mesh.
3. If issues such as erratic, uneven, or delayed lighting control arise within the mesh network, try adding or removing Relay nodes from the network.

> (i) **When to add a Relay node:**
>
> - Depending on the zone topology, the lighting control behaves in an erratic, uneven or delayed manner.
> - If the Zone is large, and nodes are placed far apart, problems may occur when transferring the message further into the zone. In such cases, some distant nodes should be enabled as "Relays" using the Fulham EliteBlue mobile app.
> - Consider the topology of your mesh network and the distance between individual nodes; check the below schematics for reference.

Placing Relays

fig.1 Correct placement of Relays and EnOcean adapter options

👉 NOTE: Don't flag more than 10% of your nodes as Relays. Doing so causes a huge increase in mesh network traffic and will slow down or severely degrade the overall mesh performance.
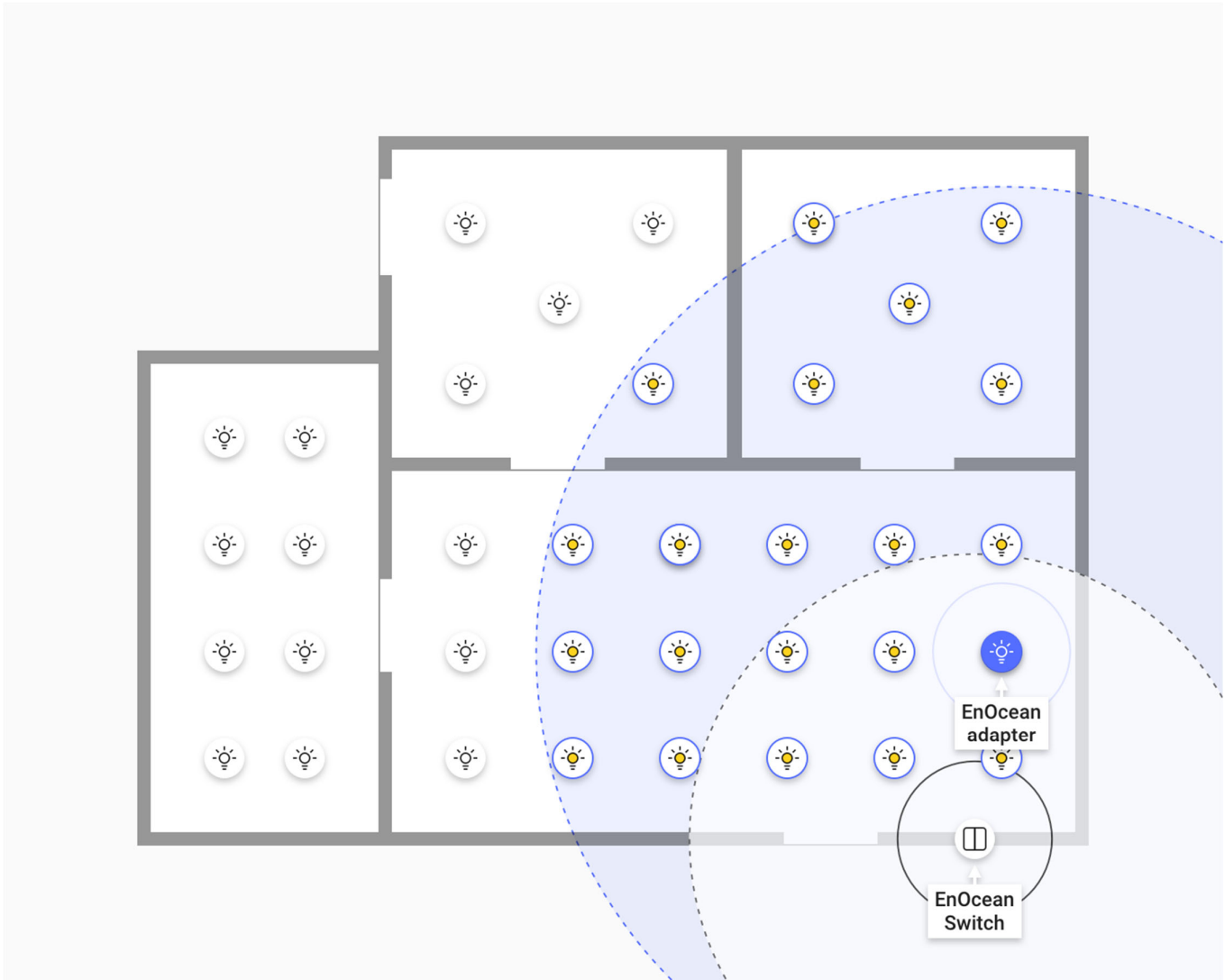
fig.2 Incorrect placement of Relays and EnOcean adapter options

Remember that the answer to "How many Relays should be placed in a mesh network?" is not fixed. The actual number of Relay nodes is based on the topology of each individual mesh network.

If enabling Relays does not fix your network issue, contact support for further troubleshooting and for advice on the proper use of the advanced settings available in the Fulham EliteBlue web application.

3. Contact Information

Support: **controlssupport@fulham.com**

For more information please visit: **www.fulham.com**

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