Bluetooth Mesh Commissioning Platform: Cloud Software + Mobile App (Android, iOS)

Overview: Bluetooth Mesh Commissioning is a mobile platform that consists of (1) a cloud software and (2) mobile applications for Android and iOS (iPhone or iPad). It allows you to work with the bluetooth mesh smart lighting networks, smart buildings, and industrial IoT sensor networks. The platform allows you to configure bluetooth mesh networks in the office using a graphic interface to access cloud software, and then apply preset configuration on site using a smartphone and bluetooth mesh mobile application.

Why Use Bluetooth Mesh Technology For Wireless Communication

Bluetooth mesh is a new technology based on many-to-many communication between the bluetooth low energy devices. Originally designed for the smart lighting applications, it is now used for a variety of IoT (Internet of Things) applications. BLE mesh is used for the heating, ventilation, air conditioning, lighting, and security in the smart buildings. It is used for the industrial sensor networks in the manufacturing and warehousing, for the indoor navigation systems, for the indoor asset tracking, and other applications.

Once you install a bluetooth mesh network, you can use it for a variety of applications at the same time. For example, you can use a bluetooth mesh lighting network for the indoor navigation, BLE mesh industrial sensor network for the indoor asset tracking, etc.

Bluetooth mesh devices can be commissioned (provisioned, configured and controlled) by the regular smartphones and tablets that have a bluetooth mesh commissioning application installed. An option to configure and control network with

the regular smartphones gives bluetooth mesh a big advantage as compared to other IoT technologies.

Bluetooth Mesh Network Configuration: Configure On The Web, Apply On The Job Site

Commissioning of the bluetooth mesh networks starts on the web. System administrators / engineers use a web interface to manage projects, BLE mesh networks within each project, and major configuration parameters for the BLE mesh networks.

Within each network you define devices groups, and how these groups interact with each other (that is assign publisher / subscriber roles and designate which publisher group controls which subscriber group). The same device can belong to multiple groups, allowing you to easily create complex relationships between network devices. You can use configuration templates that can be applied to the similar bluetooth mesh networks to speed up the process of networks configuration.

In addition to the BLE mesh networks applications and groups, a configuration may include creating of the pre-defined parameter settings that should be applied to on site devices, such as, setting default light levels and levels range, creating pre-defined scenes and scheduling.

Regular users, such as installers and customers, use a mobile application to apply

Secure Bluetooth Mesh Interaction

preset configuration to the actual BLE mesh devices on site.

System administrators have a complete control of the system users, their privileges and access rights. They control who can access a web dashboard and bluetooth mesh commissioning mobile application, and which actions they can perform. System administrators give users access to all or selected projects.

Multiple users within the organization can provision and configure bluetooth mesh networks based on the assigned privileges. The system ensures that users do not interfere with each other, that is system makes sure that multiple users do not make configuration changes to the same BLE mesh network at the same time.

You can decide how much leverage on site users have when applying preset configuration to the BLE mesh network devices: should they be able to do any ad-hock changes to the preset configuration (and if so, which ones), or apply it as-is without any changes or deviations.

Bluetooth Mesh Data Is Synced On All Authorized Devices

Bluetooth mesh networks configuration and control does not depend on a specific mobile device or a computer. Configuration data for the bluetooth mesh networks is stored in a secure centralized cloud location, and is synced with the authorized devices of the logged-in users in real time.

No user can access or do anything with the BLE mesh network if s/he does not have a valid login / password, even if user gets a possession of the mobile device that has been used for the BLE mesh network configuration before. On the other hand, authorized users of the system can work with the BLE mesh networks based on their

assigned privileges, regardless of which smartphone, tablet or computer they are currently using.

Bluetooth Mesh Commissioning: Mobile Application

Regular users, such as installers and / or customers, use BLE Mesh Commissioning mobile application for on-site BLE mesh networks commissioning: provisioning devices into the network, applying preset configuration (applications and groups) to the actual BLE mesh network devices, and controlling various devices settings (such as default light level, light level range, timing, scheduling, etc.)

Bluetooth Mesh Nodes Provisioning

Provisioning is the process of adding a new device, for example, a light fixture, switch or a sensor, to a bluetooth mesh network. It is done on site using a smartphone or tablet and a mobile application (available for android and iOS).

Mobile application scans for the unprovisioned BLE mesh network devices and creates a list. Users can match a device on the list with the actual on site device by clicking Identify button. In response to the identify command the device identifies itself, in the way it is capable of (for example the light fixtures can start blinking).

After a user confirms that the device is the correct one, s/he can provision it into the BLE mesh network with one click. Once a device is provisioned, a user can access the detailed information on the device (device capabilities, number of elements,

installed models, etc.) and apply configuration parameters (applications and groups) to this device.

Bluetooth Mesh Nodes Configuration

Once BLE mesh devices are installed and provisioned, the next step is to define how they interact with each other. For example, in a smart lighting network you may want to define what switch controls which group of the lighting fixtures, which group of light fixtures reacts to what sensor, etc.

In technical terms, a user should distribute application keys to the BLE mesh network devices, bind each application key to the correct models installed on each device, set device to publish to a node or a group, and / or to subscribe to one or more publishers. However, on site installers / customers do not need to know any of these details or understand how the BLE mesh works.

The network applications, groups and groups interactions were already defined via the web dashboard. The only thing the on site users should do is to apply this configuration to the actual BLE mesh devices using a mobile application. In practical terms, they click on the application / group name in the mobile application, see a list of the BLE mesh devices in this network that could belong to the selected application / group, check off all the devices that should be a part of the selected application / group and submit. All required actions are performed under the hood by the mobile application, and the configuration is done.

As with the provisioning, users can click Identify button to match the device in the list with the actual network device.

Bluetooth Mesh Device Control

After you provisioned BLE mesh devices into the network and set up network applications and groups, you have a functioning BLE mesh network that can be used. However, often you also need to adjust setup parameters of the bluetooth mesh network devices (for example default light level, timing for the light control time machine, if a sensor should broadcast the obtained data and how often, etc., etc.). The exact adjustable parameters depend on your specific BLE mesh application, what type of devices it includes and what models are installed on the BLE mesh devices.

In a more complex scenario, you may want to have predetermined scenes - the state of the group of fixtures that can be recalled or repeated. You may also need to create an automatic schedule for changing the state of the network devices (for example, automatically changing light levels during the day, turning A/C unit on and off, or recalling the scenes at the certain times).

A mobile application can be used by installers or customers to either apply preset configuration to the BLE mesh network devices, and / or to do ad-hock parameters adjustments on the bluetooth mesh network devices. You can decide how much leverage to give to on site users in controlling bluetooth mesh devices settings.