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Roaming Assisted Discovery (RAD) Wireless Provisioning Guide

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Document Supports: Echo and Metropolitan V2 Keypads

Roaming Assisted Discovery Overview

RAD stands for Roaming Assisted Discovery and is Savant's fastest method of provisioning Savant Echo and Metropolitan V2 keypads and dimmers.



How it works: Once the RAD Primary device is provisioned via the Savant Power & Light app, the rest of the keypads are provisioned simply by pressing and holding buttons on other keypads to be onboarded to the wireless network. The network information is passed to the next keypad via secure Bluetooth; no need to enter the network SSID credentials for every keypad.

Before Beginning

- All keypads must be mounted and wired before provisioning. For wiring instructions, refer to the documentation for the specific product in use.
- This process assumes all keypads are in factory default mode.
- A local Wi-Fi network must be available, and the network SSID and password must be known.
- Savant Power and Light App (SP&L) - Must be installed and functional on a device available on the project site. Available on iOS and Android for download from the Apple App Store and Android Play Store.

RAD Terms

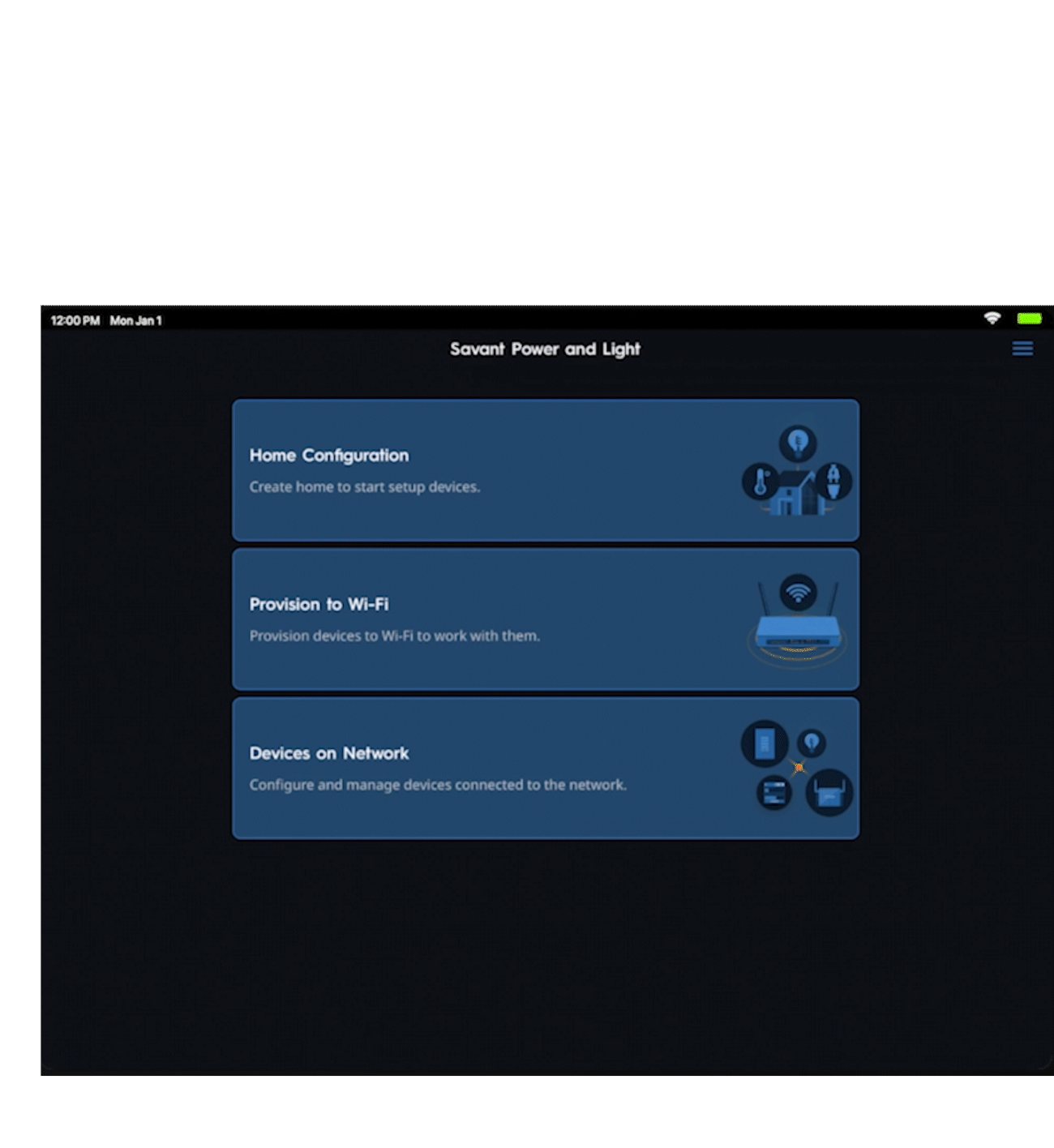
- **RAD Primary:** The primary device that was initially provisioned via the Savant Power & Light app and is responsible for running the RAD provisioning process. This device acts as the "Primary Broadcast" and verifies if other devices successfully joined the network.
- **RAD Subordinate:** These devices are searching for a secure RAD broadcast and have not yet received the network information.
- **RAD Subordinate Broadcast:** A device that successfully joined and is working to onboard other devices to the system by passing the RAD primary device network information via BLE.

SSID Guidelines

- Local Wi-Fi® Network supporting 2.4 GHz and 5 GHz (802.11 b/g/n)
- Local Wi-Fi® Network Security - WPA1™, WPA2™, WPA1™ + WPA2™, WEP
- SSID Guidelines:

Maximum SSID Length	32 Characters
Maximum Passphrase Length	WPA/WPA2: 8-50 characters WEP: 10-26 characters
SSID and Passphrase Special Characters	! # @ \$ % ^ & * () _ - ' ~ = + , ; : ? / . < > [] { } ' \

1. Provision the Primary keypad via the Savant Power & Light App

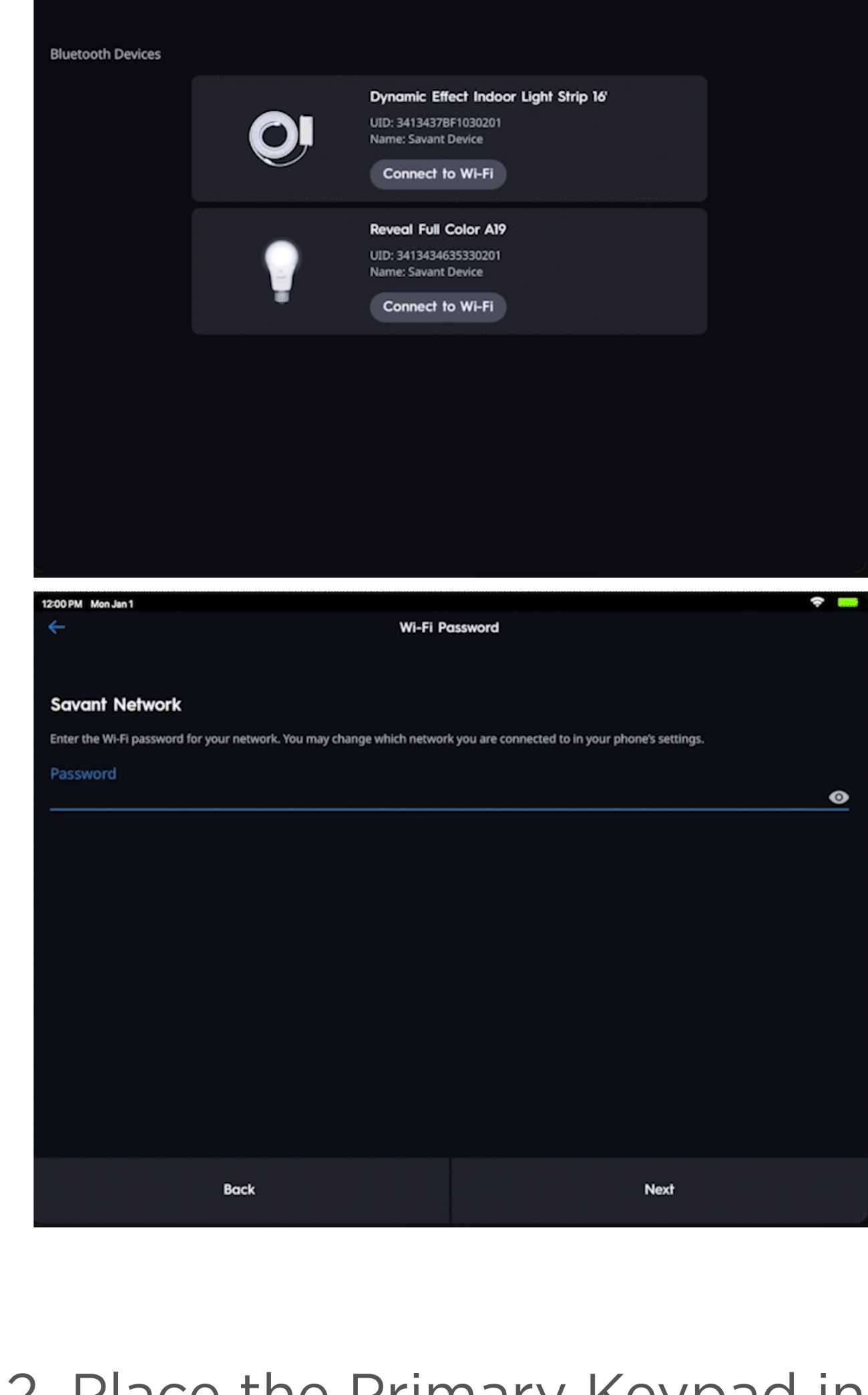


1. Open the Savant Power & Light app, available from the Apple App Store or Google Play Store on a mobile device.
2. Provision one V2 keypad to Wi-Fi by selecting the **Provision to Wi-Fi** option. Going forward, this will be referred to as the RAD Primary device.
3. The Savant Power & Light app will search for devices to provision through Bluetooth.

IMPORTANT: Do not provision other V2 devices to the network. Only one Primary device can be active when using the RAD method.

It is suggested to open the Service Switch (Air-Gap) on all keypads, but for the single keypad intended for use as the RAD Primary onboarding device. This ensures only a single keypad appears during Savant Power & Light app discovery.

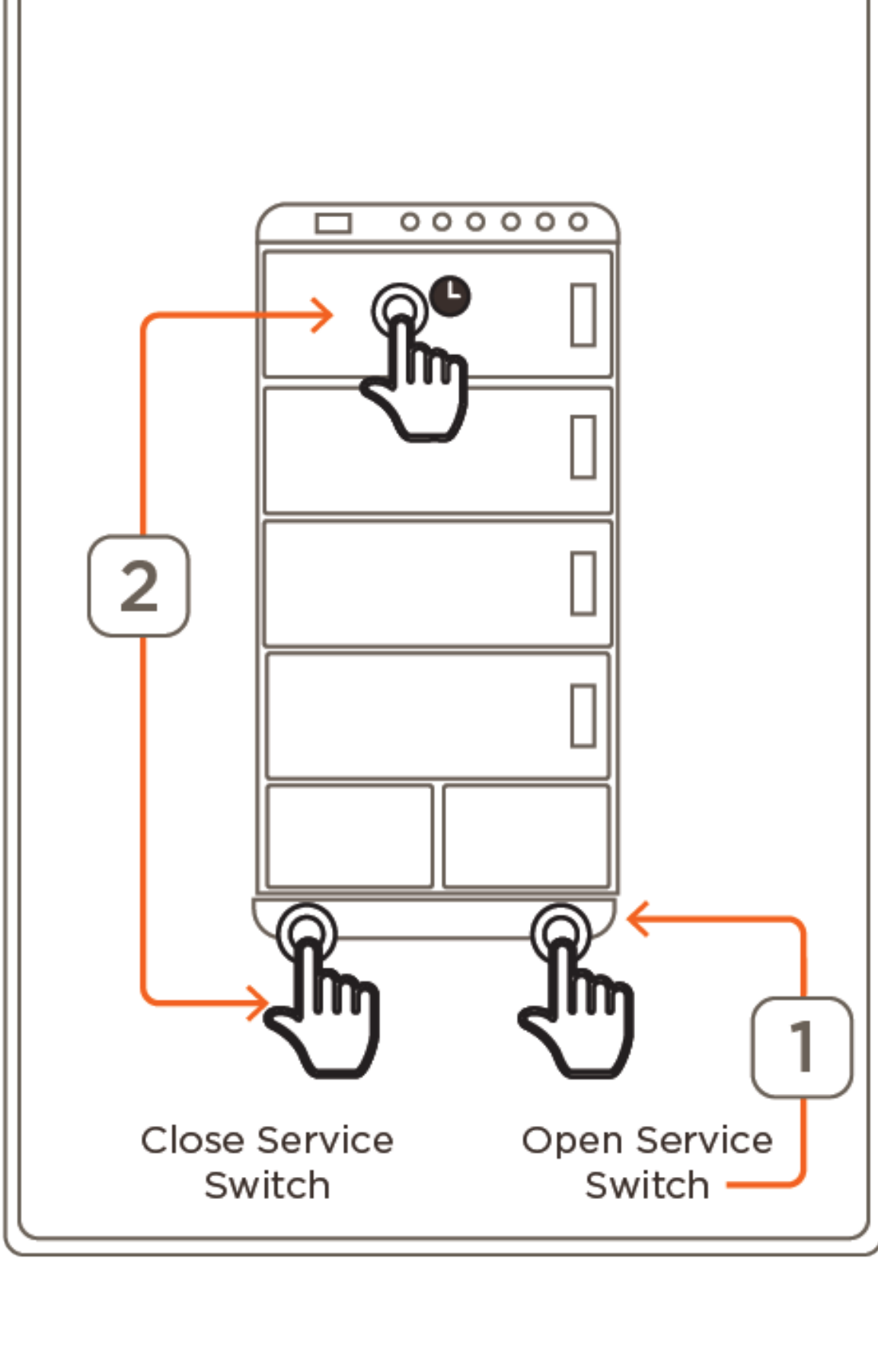
After successfully onboarding the intended RAD Primary device, the Savant Power & Light app can be terminated. If desired, the Service Switch (Air-Gap) on other keypads not on the wireless network can be closed before initiating any RAD sequence.



4. Select **Connect to Wi-Fi** on the device to be provisioned.
5. Once **Connect to Wi-Fi** is selected, the Preparing for Wi-Fi screen will appear. Ensure the mobile device is connected to the network intended to be used for keypad communication. Confirm Wi-Fi settings and select **Next**.
6. **Enter the Wi-Fi password** for the network and select **Next**. The network can be changed from the smart device's settings if needed.
7. A success message will appear when successfully connected to the network. Select **OK** to continue.

2. Place the Primary Keypad into RAD Primary Mode

IMPORTANT NOTE! There can only be one Primary RAD device active on a network. If two active Primary RAD devices are detected, an END RAD message is sent to all devices. Any RAD Primary device terminates broadcasting, and the devices reboot. Devices in Subordinate mode continue to search for a RAD broadcast as the devices are not yet provisioned to the network and will timeout after 15 minutes. To prevent accidental onboarding to the wrong wireless network, the reset button can be pressed, or the Service Switch can be opened.



1. After successfully onboarding the intended RAD Primary keypad, locate the keypad and open the Service Switch (Air-Gap).
2. Press and hold the top left-most button, keep the button pressed, and close the Service Switch (Air-Gap). Continue to depress the keypad button for 10 seconds until the keypad button LEDs blink white. The keypad LED array switches to WHITE and shows the RAD Primary LED Array pattern: White LEDs going left to right, illuminating each LED until all are lit. This pattern repeats.

3. Provisioning RAD Subordinate Devices

1. Locate additional keypads intended to be onboarded to the wireless network. Ensure the Service Switch (Air-Gap) is closed and the keypad is fully booted and active. With the keypad fully active and in factory default mode, press and hold the top left-most button for 10 seconds. **DO NOT** open and close the Service Switch (Air-Gap) during this process.

The keypad buttons switch to red. The keypad LED Array switches to red and shows the RAD Subordinate LED Array pattern: Red LEDs going right to left, illuminating each LED until all are lit. This pattern repeats.

2. Repeat step 1 on all desired devices that must be provisioned on the wireless network.

HELPFUL TIP! Multiple RAD Subordinate keypads can be provisioned simultaneously, all at once. Example: A three-gang keypad location can be provisioned in 10 seconds by pressing the top left-most button on all keypads simultaneously. The only limit is how fast the Integrator can physically get to each keypad and press and hold for 10 seconds.

3. Verify devices have joined the wireless network and switched to RAD Subordinate Broadcast Mode by observing the LEDs. The keypad LEDs switch to green and show the RAD Subordinate Broadcast LED Array Pattern: Green LEDs going left to right, illuminating until all are lit. This pattern repeats. When in RAD Subordinate Broadcast Mode, these keypads extend the onboarding range of the RAD broadcast.

HELPFUL NOTE: Each keypad is its own broadcast and does not rely on a "repeater function." This allows RAD to be terminated on any subordinate broadcast device and allows it to be bound and configured within Blueprint.

4. Completing the RAD Process

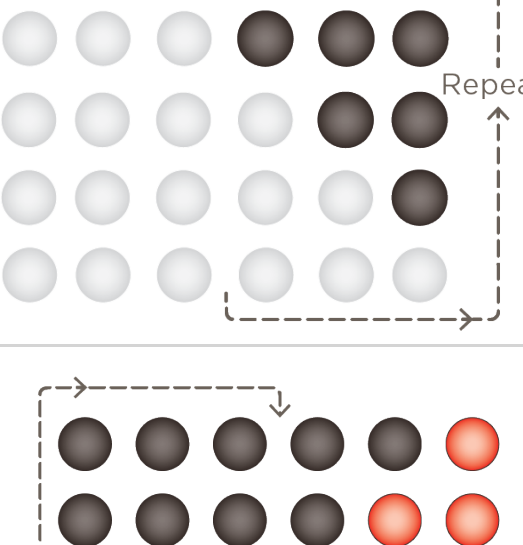
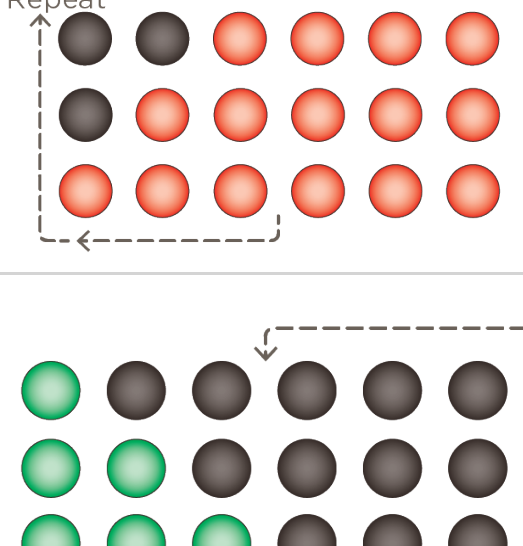
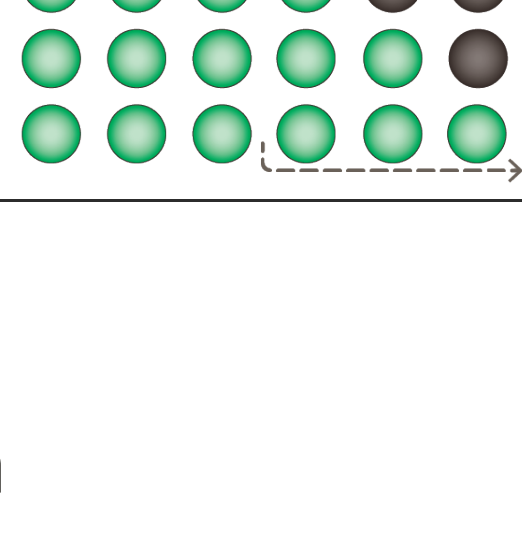
1. Press the reset button on the RAD Primary device. This will terminate the RAD Primary process and restart the keypad. Upon restart, the RAD Primary device will terminate the RAD Subordinate Broadcast process on all keypads successfully onboarded to the wireless network. These keypads will restart.
2. Devices that did not successfully join the network and that are in RAD Subordinate mode must be reset either by pressing the reset button or opening and closing the Service Switch (Air-Gap). If devices did not successfully join the network the RAD Primary process can be repeated by using a RAD Primary device in closer proximity to devices that failed to join. Keypads will also time out after 15 minutes.
3. Any device, both RAD Subordinate Broadcast or RAD Subordinate will also timeout after 15 minutes. Upon completion of RAD, if keypads fail to discover during keypad configuration in da Vinci RacePoint Blueprint, ensure devices have either timed out and restarted, or are manually restarted using the process defined in step 2.

RAD Timeout Sequencing

- **Primary Timeout:** The primary device will send an END RAD message and restart after NO DEVICES joining the RAD ecosystem. Every time a new device joins and sends a verification message, the timer resets.
- **Subordinate Timeout:** Devices that do not receive a RAD broadcast will restart after 15 minutes.
- **Subordinate Broadcast Timeout:** Subordinate Broadcast devices will cease broadcasting and will restart after 15 mins. If they enroll a Subordinate device, this timer restarts.

LED Array Patterns

The following are LED patterns for the 6 LED Array and not the button LEDs.

RAD Primary LED Array Mode		(White LEDs going left to right, lighting each LED until all are lit, then it starts over again.) Indicated that the device is the Primary RAD device.
RAD Subordinate LED Array Mode		(Red LEDs going right to left illuminating until all are lit and restarting this pattern) Indicates the device is in RAD Subordinate mode and is ready to be provisioned to the network.
RAD Subordinate Broadcast LED Array Mode		(Green LEDs going left to right illuminating until all are lit and restarting this pattern) The device is been successfully provisioned to the wireless network.

Helpful Information

- RAD Primary can be executed on any device successfully connected to the wireless network at any time. This includes a period of significant inactivity of adding Savant keypad devices. This allows installers to place a device into RAD Primary for the purposes of adding or replacing Savant keypads even months after the initial configuration was completed.
- **Subnets:** The safety mechanism of incorrectly onboarding to the wrong network will be bypassed if the primary devices are on separate subnets. It is STRONGLY SUGGESTED NOT to execute two RAD primary devices simultaneously.
- RAD Subordinate devices send a "Verification Message" to the primary device upon joining the network to verify communication before switching to Subordinate Broadcast Mode. The RAD Primary device must always remain active and online to ensure successful enrollment to the network and RAD ecosystem.