

DENG KAI



EBQ

Electronic Breaker with Charge

Wireless-powered electronic circuit breaker with IoT-ready feature

Specification

| | | | |
|---------------------------------|------------------------------------|---|-----------------------|
| Electrical Features | Number of Poles | 1 (Live In Live Out) | |
| | Tripping Characteristics | Custom Curve | |
| Rated Value | Rated Load | 16A 250VAC | 40A 250VAC |
| | Current Accuracy | 0.01A (Starts from 0.06A) | |
| | Switching Capacity | 5000VA | 12500VA |
| | Contact Resistance (initial) | ≤20mΩ (1A 6VDC) | ≤2mΩ (1A 6VDC) |
| | Rated Voltage | 110~250VAC | |
| | Rated Frequency | 50Hz & 60Hz | |
| Cut-Off | Short-circuit Operate Time | 20~30ms | 25~35ms |
| | Mechanical Life | 100k ops | |
| | Electrical Life (On/OFF: 1s/9s) | 16A 250VAC 100k ops 20A 250VAC 20k ops | 50A 250VAC 50k ops |
| Operate Condition | Ambient Temperature | -40~85°C | |
| | Humidity | 5%~85%RH | |
| Internet of Things (IoT) | NFC | ISO/IEC 14443 | |
| | BLE | Bluetooth v5.2 | |
| | Wi-Fi | 802.11b/g/n Support WPA/WPA2 | |
| | LTE/ Cellular 4G | LTE B1/3/5/7/8/20/28 | |
| Certification | | UL, CE on going | |
| Unit Weight | | Approx. 75g | Approx. 95g |
| Dimension | L x W x H | 83 x 18 x 70 mm | |

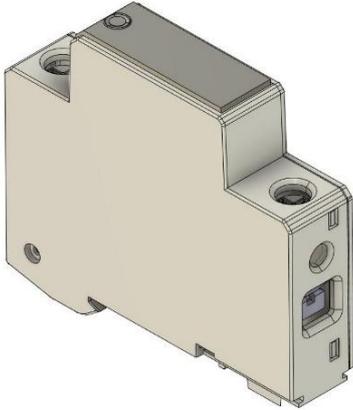
For references, https://youtu.be/9NkwtMJO2Q4?si=D6OG-83JFF_5_ax8



Product Overview

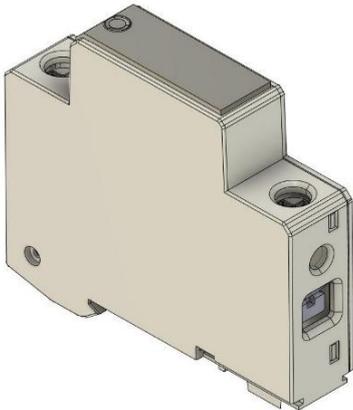
EBQ Tag & Din Rail

EBQ-TAG01-16A



For all application up to 16A
With custom tripping characteristics

EBQ-TAG01-40A



For all application up to 40A
With custom tripping characteristics

EBQ-RAIL01-12 (to be released)

EBQ-RAIL01-15

EBQ-RAIL01-18

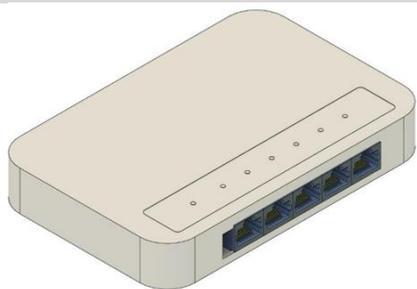
EBQ-RAIL01-20



| Specification | Remarks |
|---------------|--------------|
| Slots | 1 - 20 unit |
| Length | 28mm + 18(N) |
| Height | 35mm |

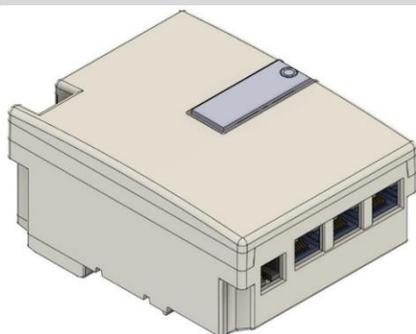
*N = No of unit

EBQ-MASTER01



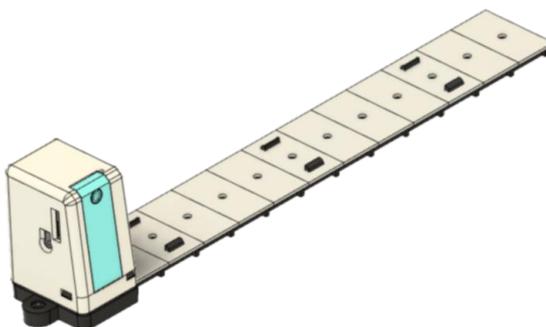
| Specification | Remarks |
|----------------|--------------------|
| Model | Master 01 (5 RJ45) |
| Input Voltage | 110Vac ~ 275 Vac |
| Maximum Output | 12W |

EBQ-MASTER02



| Specification | Remarks |
|----------------|-----------------------------|
| Model | Master 02 (6 RJ45 + 1 RJ11) |
| Input Voltage | 110Vac ~ 275 Vac |
| Maximum Output | 12W |

EBQ-MASTER03 (to be released)



| Specification | Remarks |
|----------------|--------------------|
| Model | Master 03 (1 RJ45) |
| Input Voltage | 110Vac ~ 275 Vac |
| Maximum Output | 12W |

EBQ IoT Module

EBQ-4G01

EBQ-4G02 (to be released)



| Specification | Remarks |
|-----------------|---------|
| Maximum Current | 3A |

EBQ-WIFI01

EBQ-WIFI02 (to be released)



| Specification | Remarks |
|-----------------|---------|
| Maximum Current | 3A |

For references, <https://youtu.be/uYrVgYU-ZNk?si=9f-DGmDkbW6EmPhp>



Precaution

Measure taken beforehand to prevent unwanted issues happening

1. Ensures each of the EBQ din rail must have at least 12cm gap¹ within each other.
2. Always the EBQ din rail from metal at least 15mm gap length².
3. Short charging time required. The start time is around 2 minutes for 16A model and 2.5 minutes for 40A model.

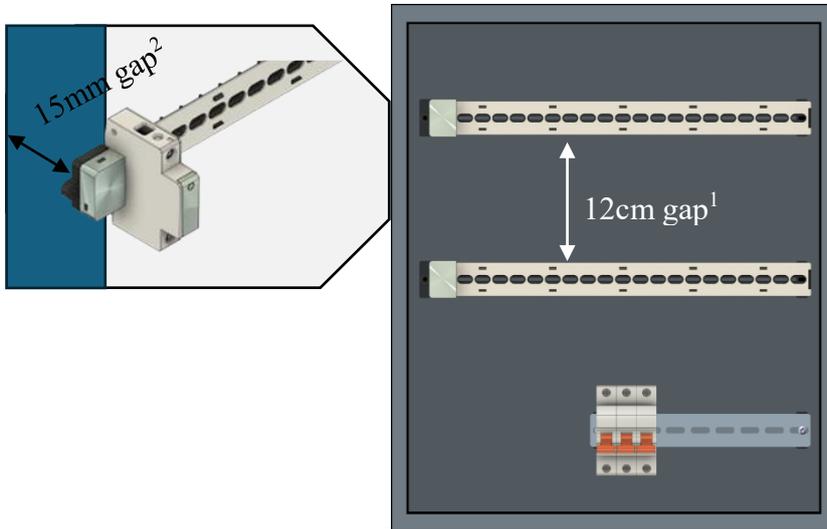


Figure 1 EBQ din rail in DB Box with safety gaps

Simplicity

How to install EBQ?

Simple and easy installation with a short learning cycle.

1. Screws the din rail(s) on a distribution Board/ panelboard (DB Box).
2. Places and screws EBQ master on rail as shown in the Figure 2.

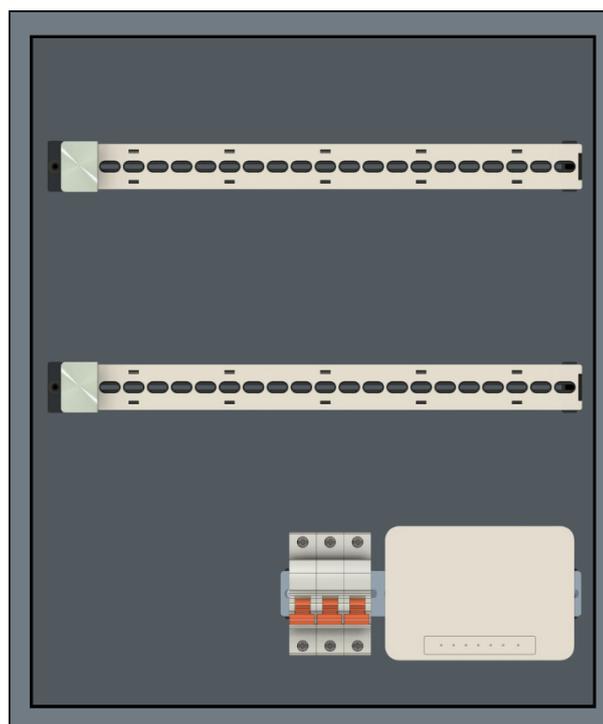


Figure 2 EBQ placement in DB Box

3. Places the labeled and setup EBQ tags on the din rail(s), then connect the live wires to the tags and Ethernet cable from EBQ master to the din rail(s) as shown in Figure 3.
4. Completes all wiring to all breakers in DB Box as shown in Figure 4.
5. Suggests the power of EBQ power from MCB/Main Power Switch.
6. For references, <https://youtu.be/9kroEF1sfyU?si=D0mRFKT7BBGeVQTq>

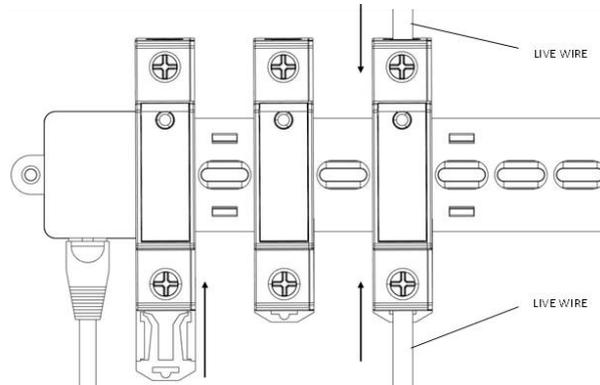


Figure 3 Wire connection of EBQ tags

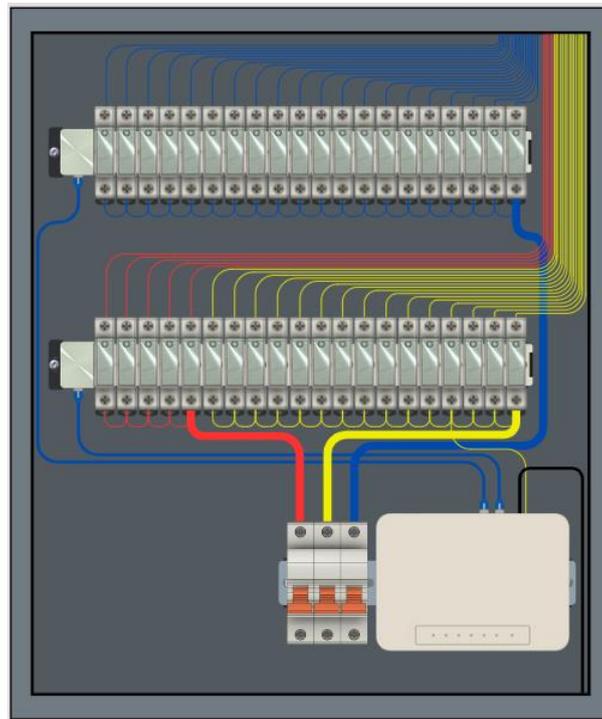


Figure 4 EBQ full placement in DB box



Start to Use

Operation of EBQ starter kit/set

1. Switches on the MCB/ Main Power Switch after installation.
2. Waits EBQ tags be fully charged to power on.
3. This feature is to ensure the over-draw current from Power Station in sudden.
4. **Red** LED start blinks indicate EBQ tags are charging, it switches on (fully charged) by showing Green blinking light and producing a “Tik” sound as shown in Figure 5.

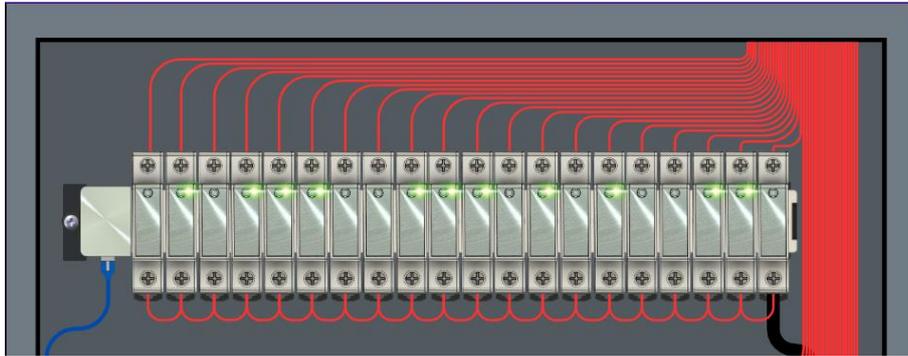


Figure 5 Fully Charged EBQ tags show Green blinking lights

5. Opens and configures EBQ tags through mobile application “EBQ Control”.
6. For references, <https://youtu.be/H8wuDIC0kMk?si=IqNm88AlRcwZTXPF>
7. Further information will be provided in next topic.



LED Operation

Meaning of LED lighting

| LED lights | Description |
|-------------|---|
| Green Light | On mode EBQ |
| Red Light | Multiple feature: <ul style="list-style-type: none">• Slow Blinking: Off mode EBQ• Fast Blinking: EBQ detects Over Current |
| Blue Light | Selected EBQ |

For references, <https://youtu.be/FXBikIDPSww?si=mIqA092e8FxDCplw>



Bluetooth Pairing

First time bluetooth pairing to mobile phone

1. Downloads mobile application “EBQ Control” through Deng Kai Sdn Bhd official website or Google play (proceeding). The official website: <https://www.deng-kai.com/ebq/>
2. The apps is designed for Bluetooth Low Energy (BLE) devices which allow monitoring and controlling in a short-range distance.
3. Allows BLE permissions of the apps, presses and holds the pairing button of the EBQ master until Blue Light start blinking as shown in Figure 6.

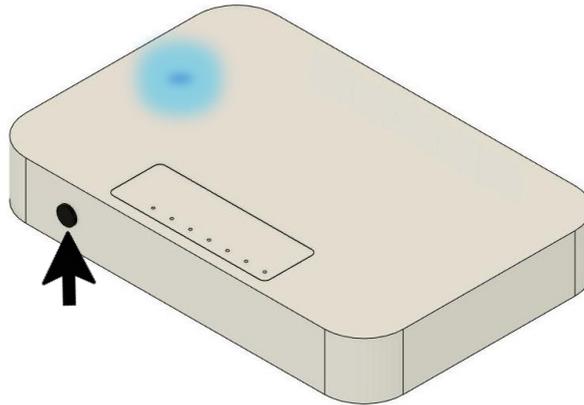


Figure 6 Pairing EBQ master

4. Searches and connects EBQ devices by pressing “Connet” button in the apps. A pairing notification is pop-up for user permissions as shown in Figure 7.
5. This **blue light** will stop blinking when successful pair with your moile phone or after 30 seconds bluetooth pairing timed-out.

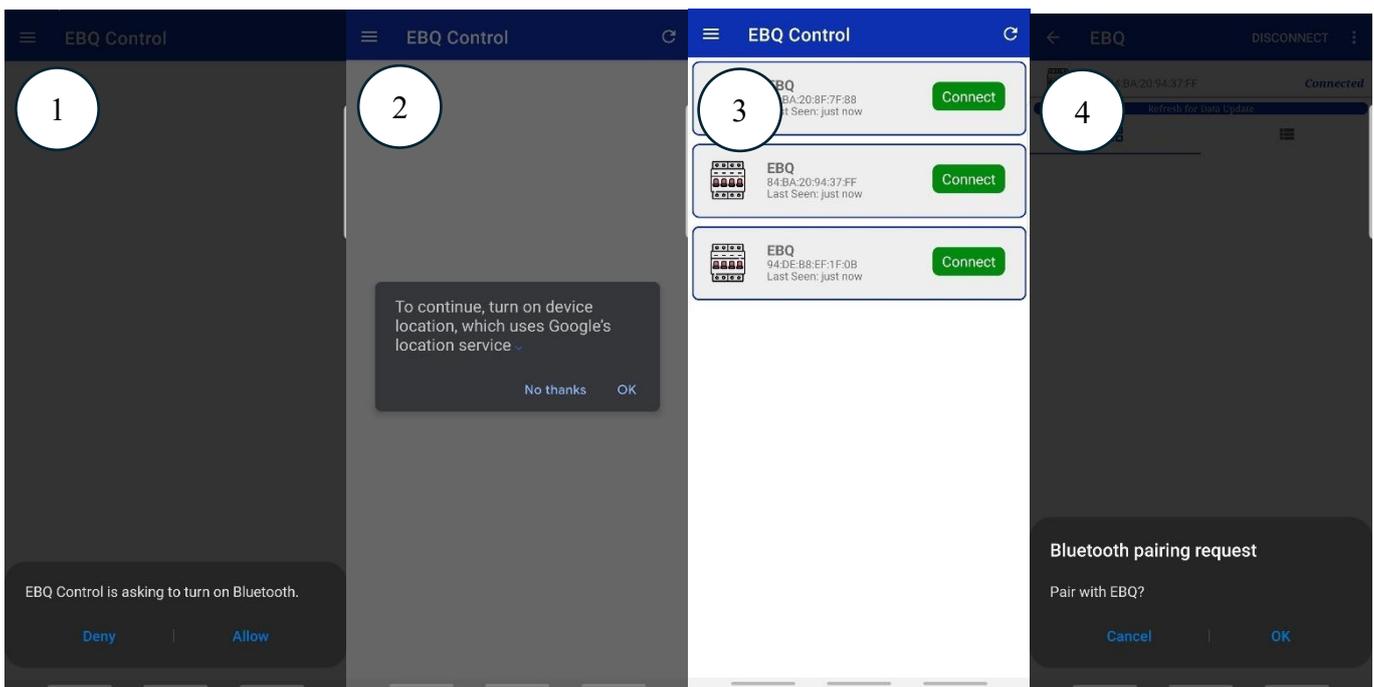


Figure 7 Settings and Pairing EBQ master request

6. For references, <https://youtu.be/H8wuDIC0kMk?si=IqNm88AlRcwZTXPF>



Bluetooth Pairing for existing user

1. Presses “Connect” button in the apps, user can control and monitor the EBQ tags in the dashboard page as shown in Figure 8.

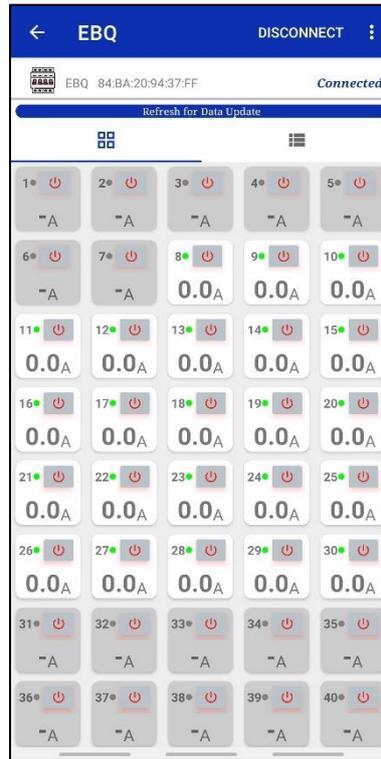


Figure 8 Dashboard page on EBQ Control Apps

2. Mis-deleted bluetooth pairing in mobile phone, Bluetooth connectivity becomes unstable, deletion of Bluetooth bonding is needed.
3. The error notice will pop-up in apps as shown in Figure 9.

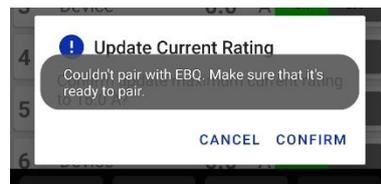


Figure 9 Error Notice if mis-deleted Bluetooth pairing in mobile phone

Deletion of Bluetooth Bonding

1. Unpair bluetooth from your mobile phone through bluetooth setting:
Setting > Bluetooth > Paired Devices> Select EBQ device> press **Unpair**
2. Next, presses and holds pairing button of EBQ master until **blue light** blinking then stop, releases the button.
3. Now all bluetooth bondings are deleted from EBQ master.
4. Now you become the **first time bluetooth pairing user** again.

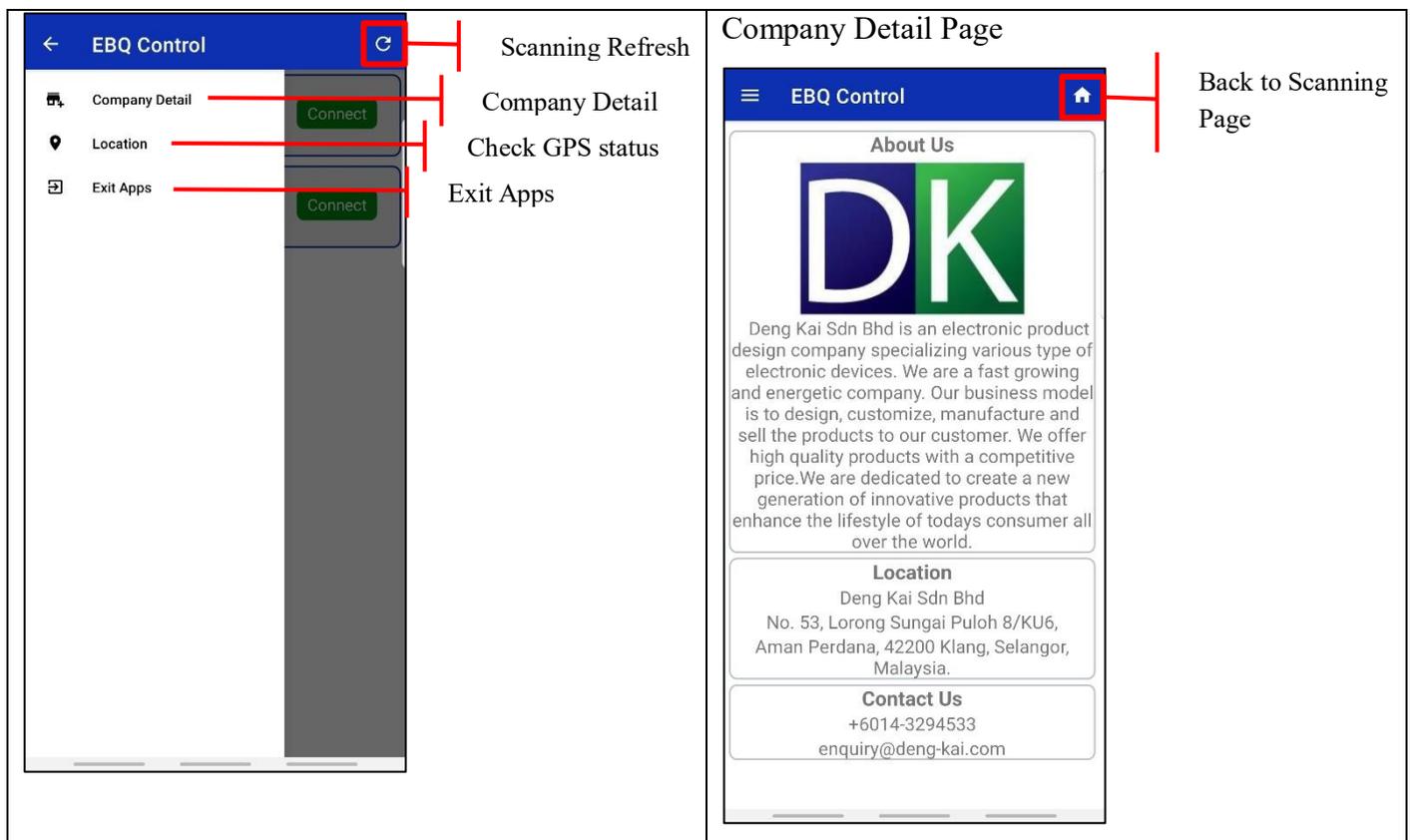
BLE mobile application

EBQ Control apps

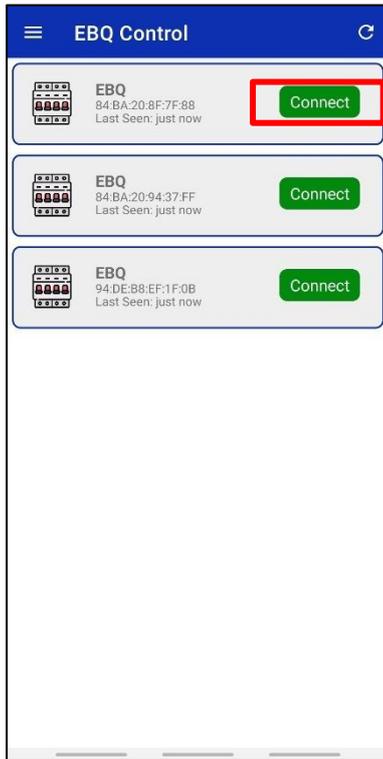
1. There are some features apps can do:

- Check EBQ current flow
- On/Off EBQ tags
- Select EBQ tags
- Label EBQ tags in phone
- Modify Current Rate of EBQ tags
- Configure IoT Setting (Wi-Fi connection)

EBQ Control Description



Scanning Page



Connect EBQ

Dashboard Page



Disconnect EBQ

Connection State

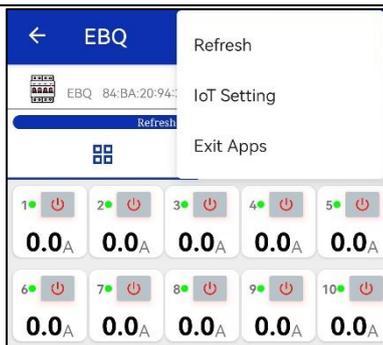
List View

Current Value

On/Off button

On/Off State

Tag ID



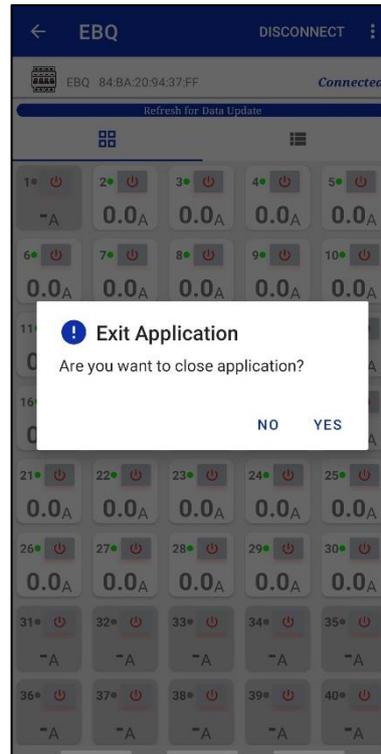
Operation:

“Refresh”: Fetch and update data

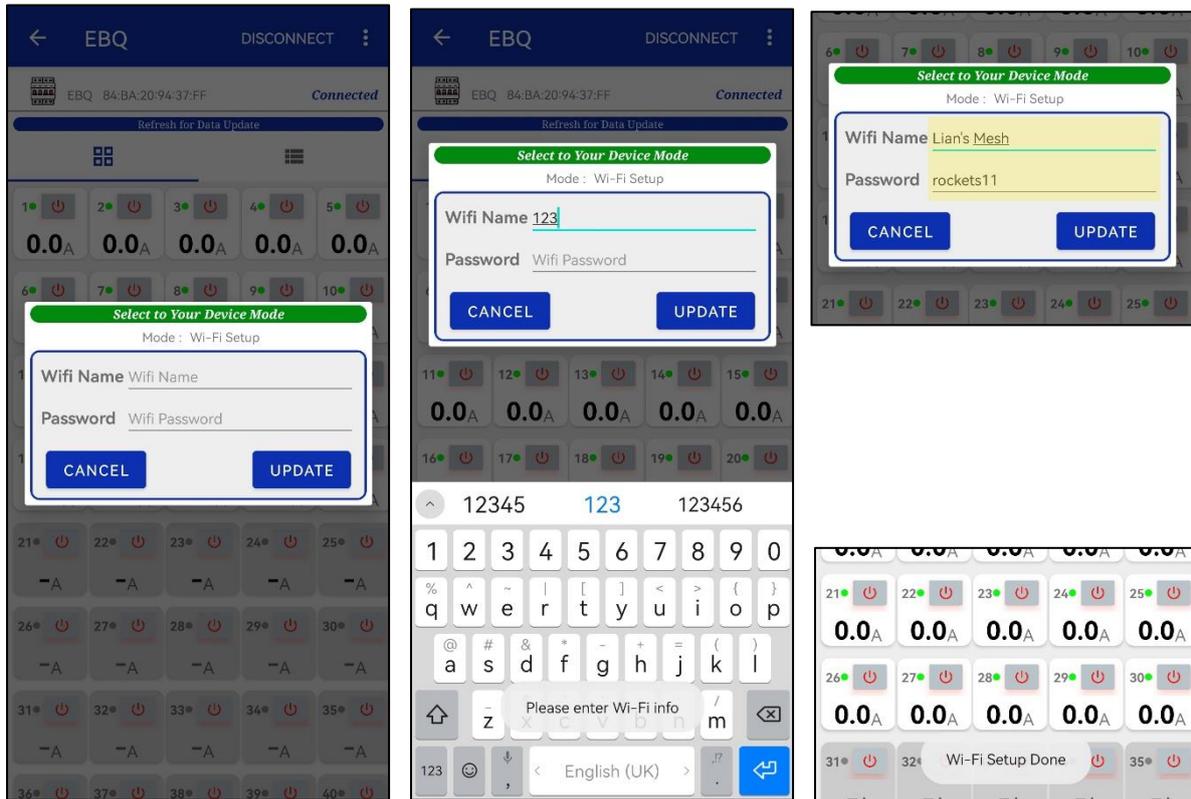
“Exit Apps”: Quit the apps

“IoT Setting”: Wi-Fi Setup

Exit Application Notification



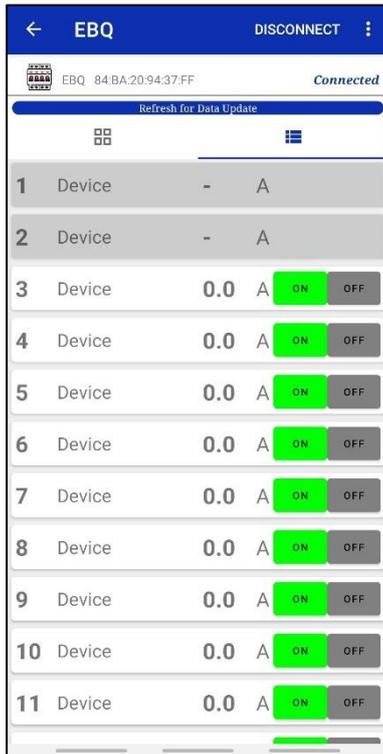
IoT Setting Dialog



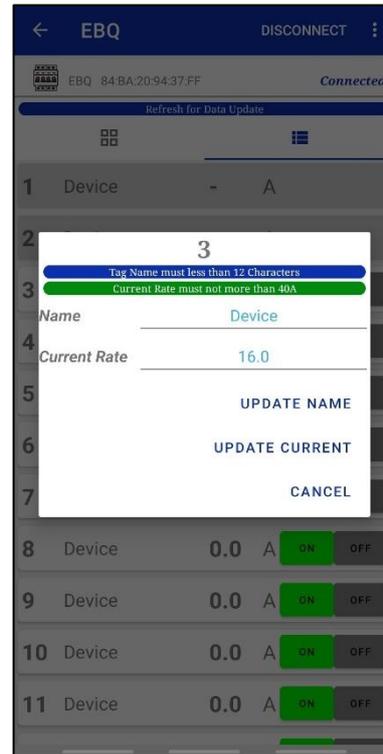
1. Ensures the Wi-Fi Name and Password are entered, if not, “Please enter Wi-Fi info” message will pop-up.
2. If done, “Wi-Fi Setup Done” message will po-up, the Wi-Fi module now is connecting to your Wi-Fi.



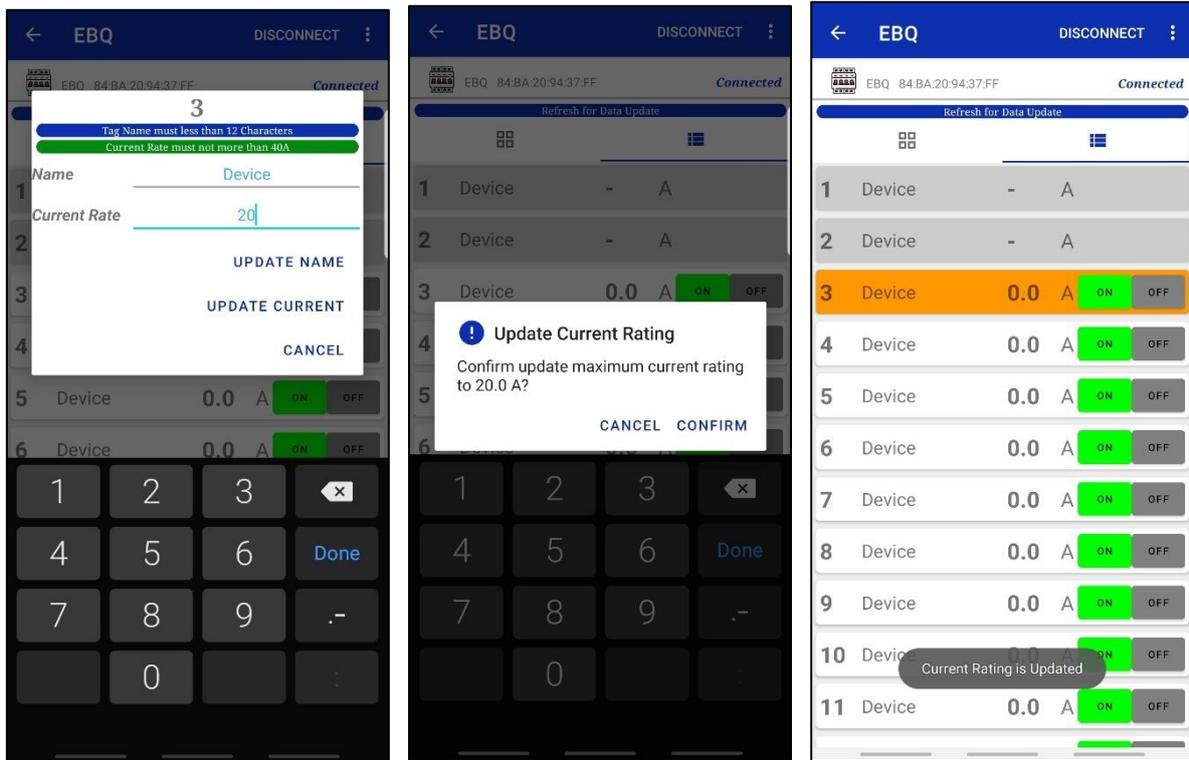
List View Dashboard Page



Check Tag Details



Update Current Rate of EBQ Tag



1. Keys in new current rate based on specifications.
2. Presses "UPDATE CURRENT".
3. User permission for confirmation of current rate changing.
4. Current rating updated and change the color of list view to orange (remain 24hrs on the same phone).

For references, <https://youtu.be/qGrHBVbtv2c?si=PSa3P7O5MQPC1LsC>