Avrio Link User Manual

A-to-Z customer setup and monitoring guide

Important: Keep the phone BMS app closed while Avrio Link is pairing with the BMS over Bluetooth.

Product	Avrio Link Remote BMS Monitoring
Platform	Avrio Link Dashboard and ESP32 setup wizard
Power	ESP32 DevKit powered through USB Type-C / standard 5 V USB supply
Support	info@avrio.lk
Document	Customer user manual

Quick Start Overview

Follow this order for a clean customer installation:

1. Create and verify the customer account.
2. Add the Avrio Link device in the dashboard.
3. Generate the device activation code.
4. Connect to the Avrio Link setup hotspot.
5. Configure WiFi, BMS Bluetooth, pairing PIN, and cloud activation.
6. Save and restart the Avrio Link device.
7. Confirm online status and live BMS data in the dashboard.
8. Configure Smart Alert recipients and verify each email by OTP.
9. Hard Reset Avrio Link

Before You Start

- Avrio Link device powered from a stable USB Type-C 5 V supply.
- Customer 2.4 GHz WiFi SSID and password available.
- Avrio Link supports 2.4 GHz WiFi only. It will not connect to 5 GHz-only networks.
- BMS powered on and within Bluetooth range.
- Phone BMS app closed during Avrio Link BLE scan and pairing.
- Customer email inbox available for account and Smart Alert verification.

1. Create And Verify Customer Account

Create the customer account, verify the email address, then log in to the Avrio Link dashboard.

Step 1: Open the Register page

Go to https://smart.avrio.lk

Select the Register tab on the Avrio Link dashboard.

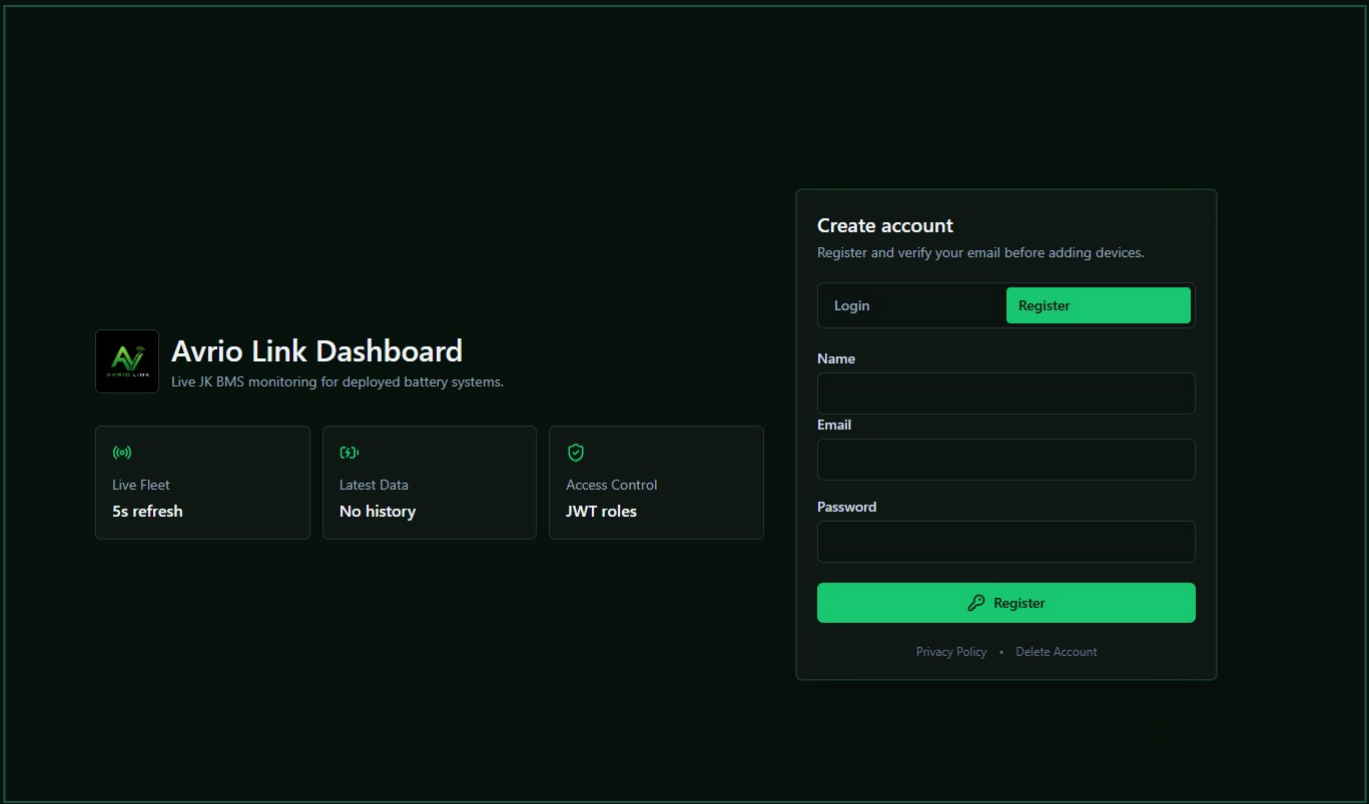

Figure 1. Register Page

Step 2: Enter registration details

Type the customer name, email address, and password, then press Register.

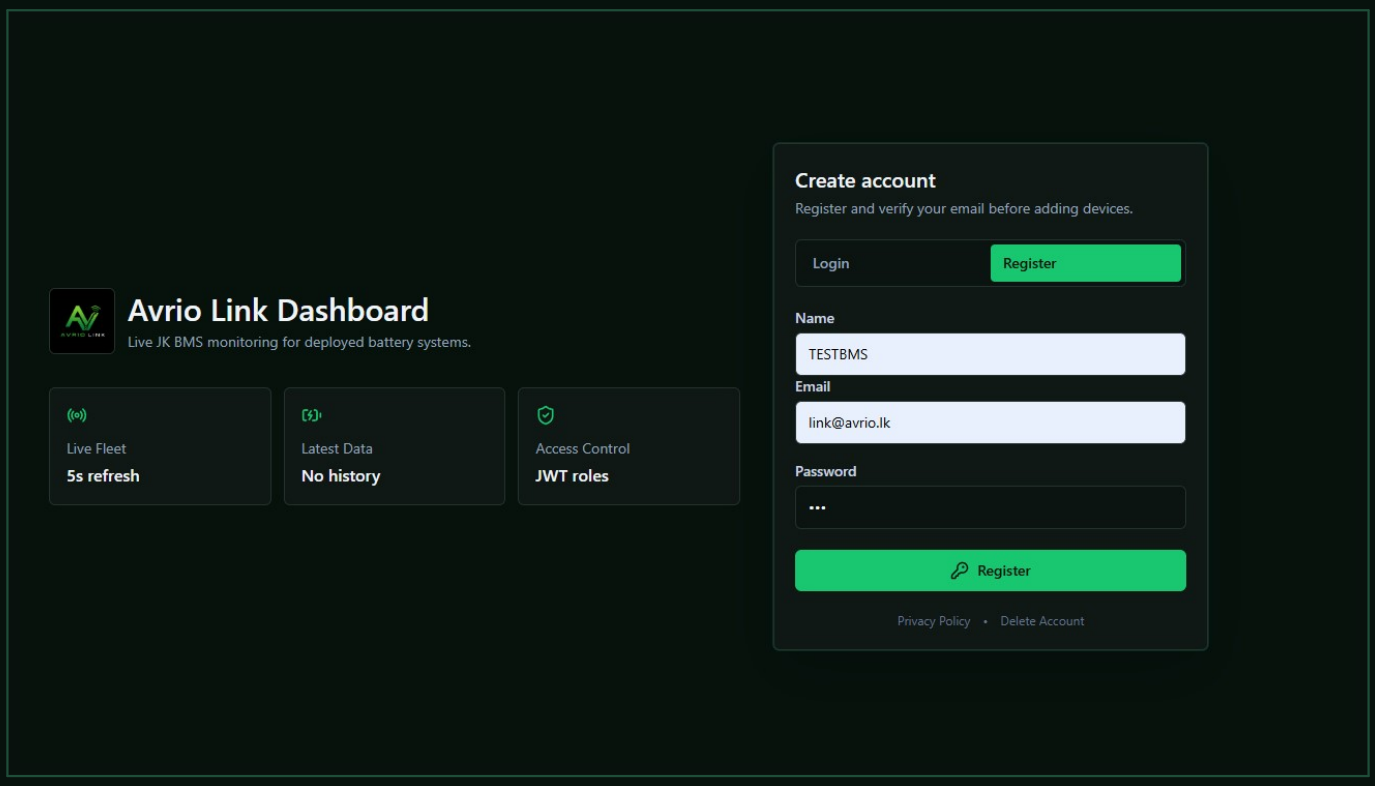

Figure 2. Add registration details

Step 3: Verification notice

Check the registered email inbox for the verification message.

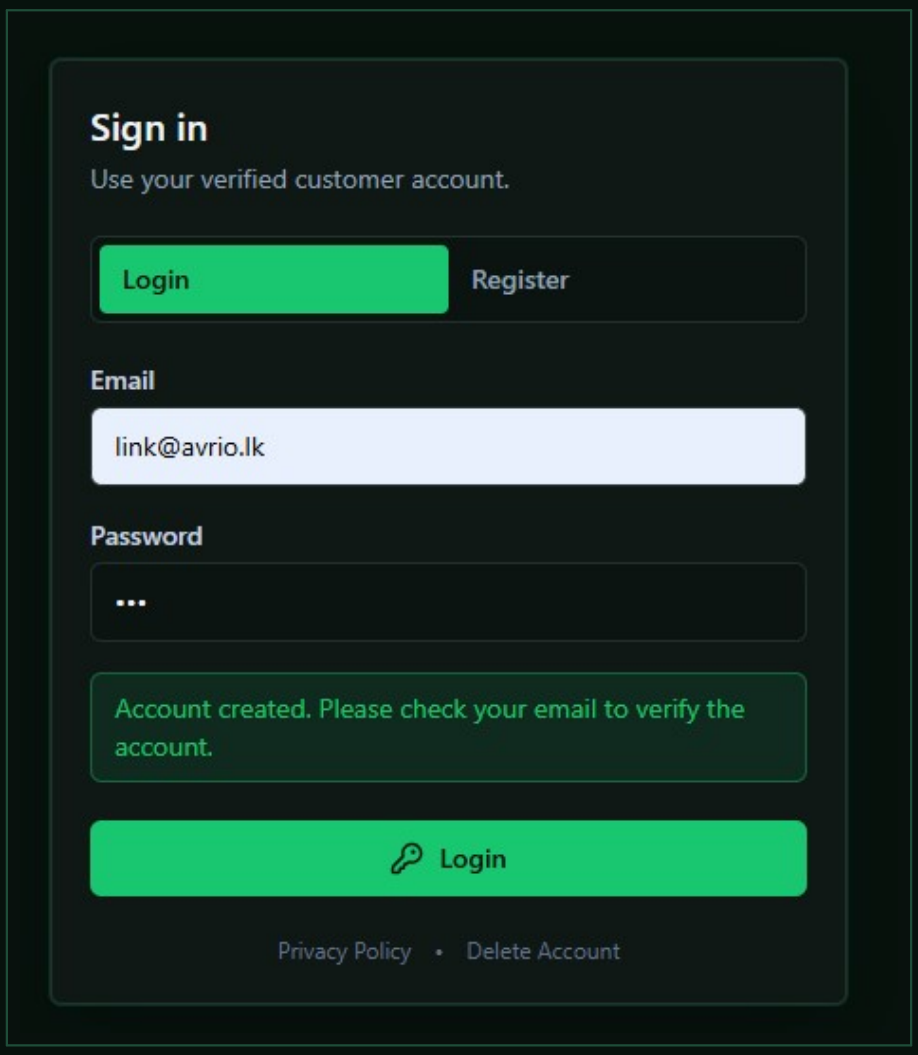

Figure 4. Account veridication notice

Step 4: Open verification link

Open the verification link from the Avrio Link email.

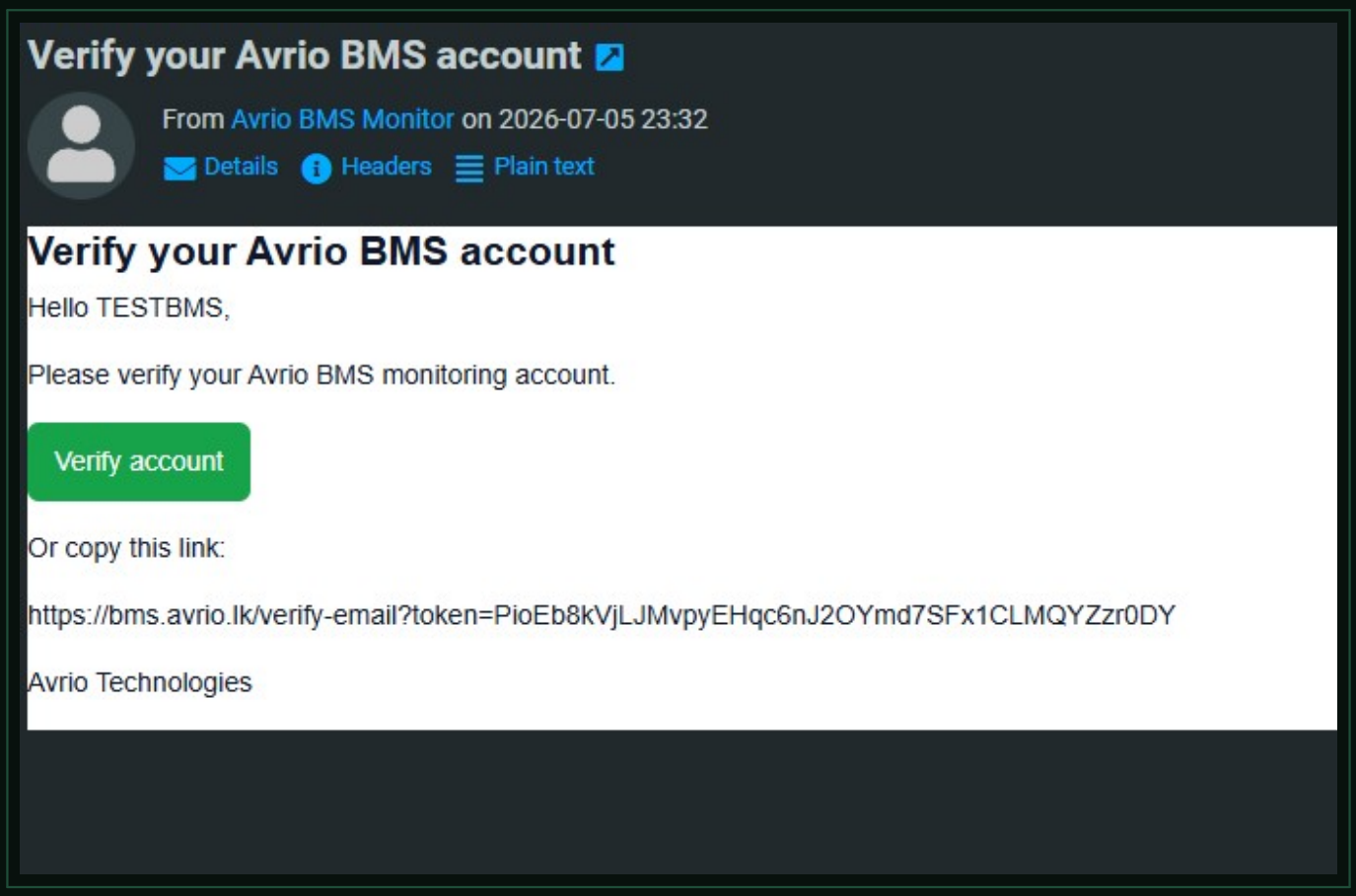

Figure 5. Verification link on email

Step 5: Verification success

After successful verification, return to the dashboard login page.

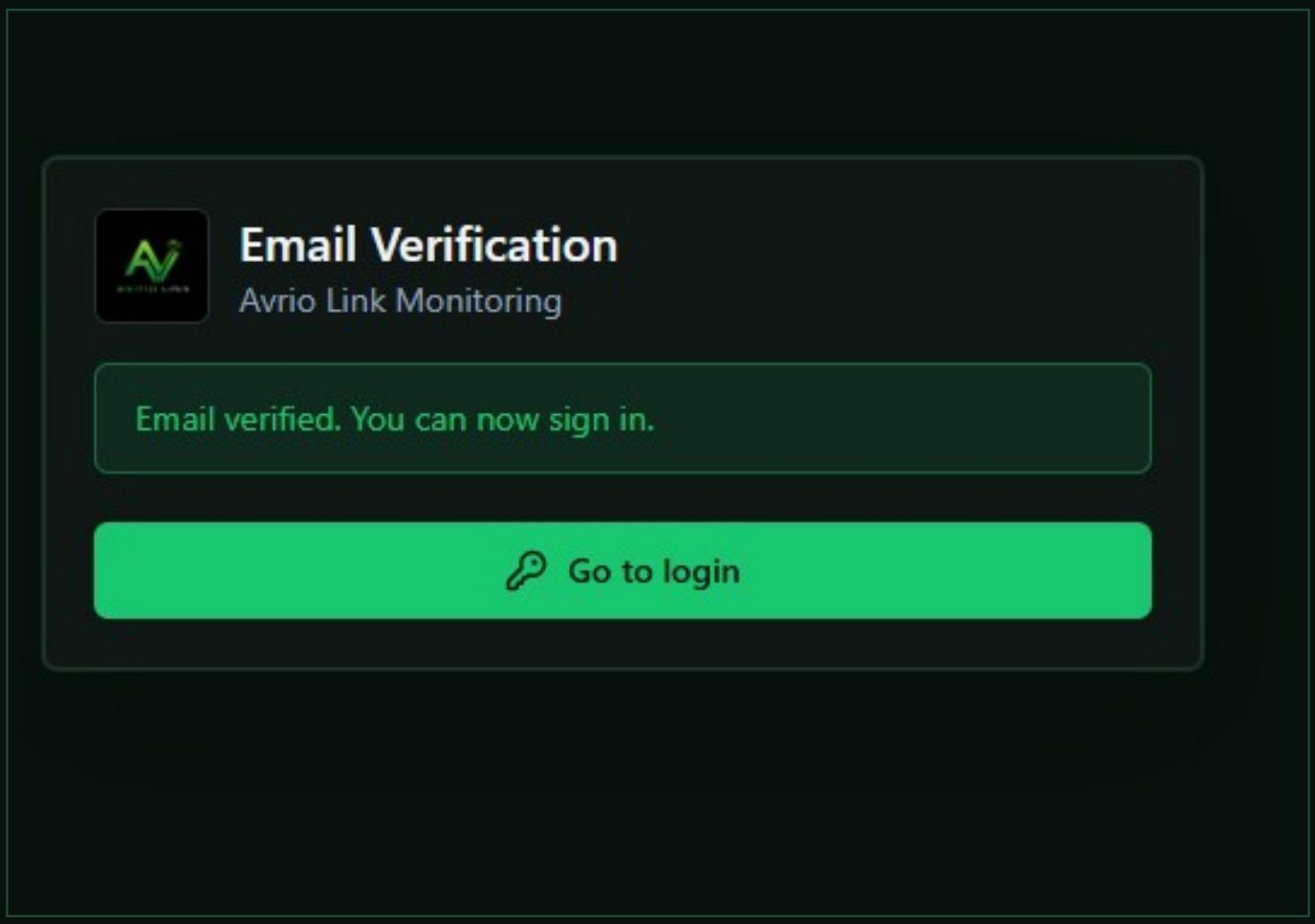

Figure 6. Account verification success

Step 6: Log in

Enter the verified customer email and password, then press Login.

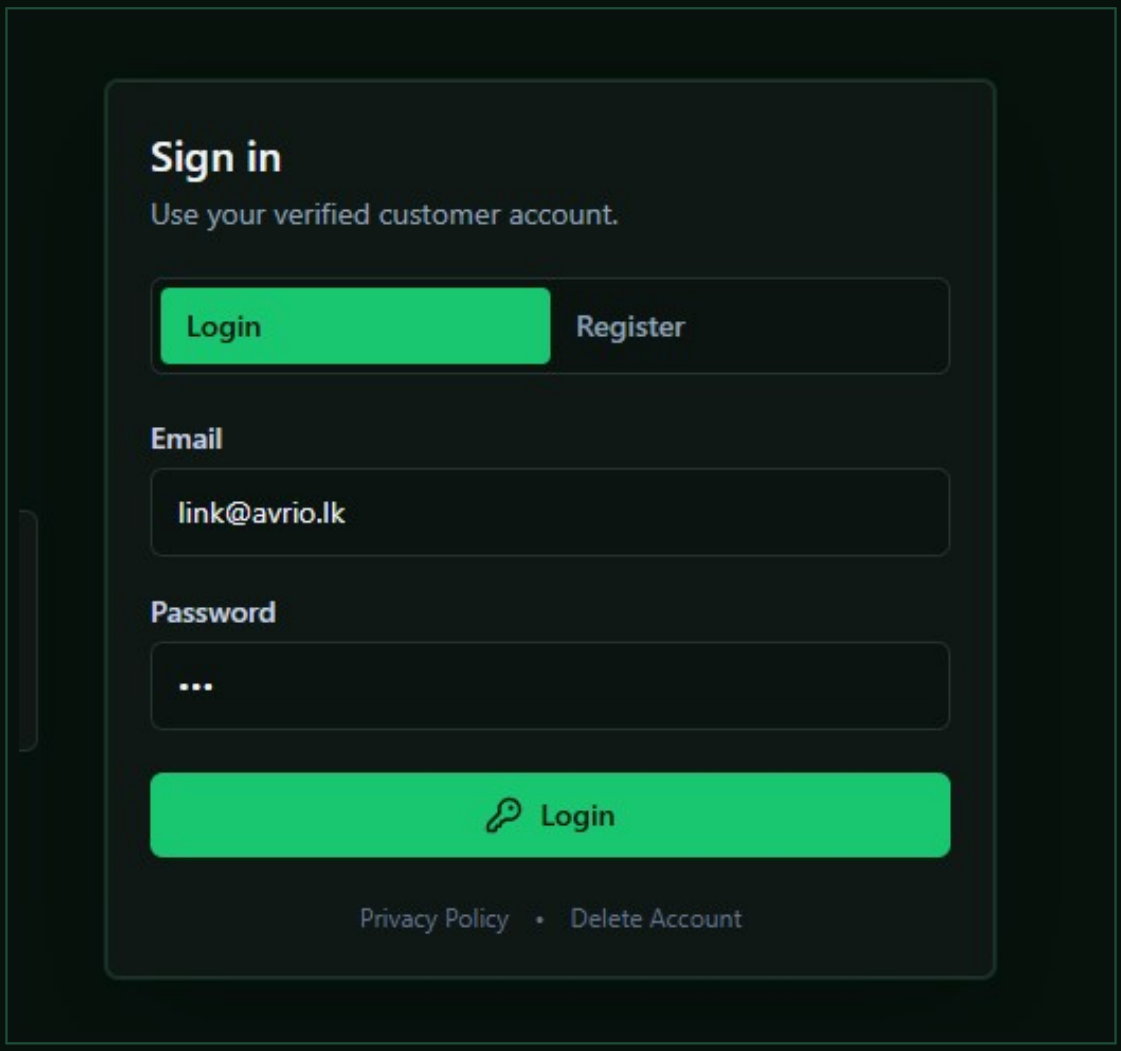

Figure 7. Login page and add credentials

Step 7: First time account login

The dashboard shows no any devices in the DEVICE drop down.

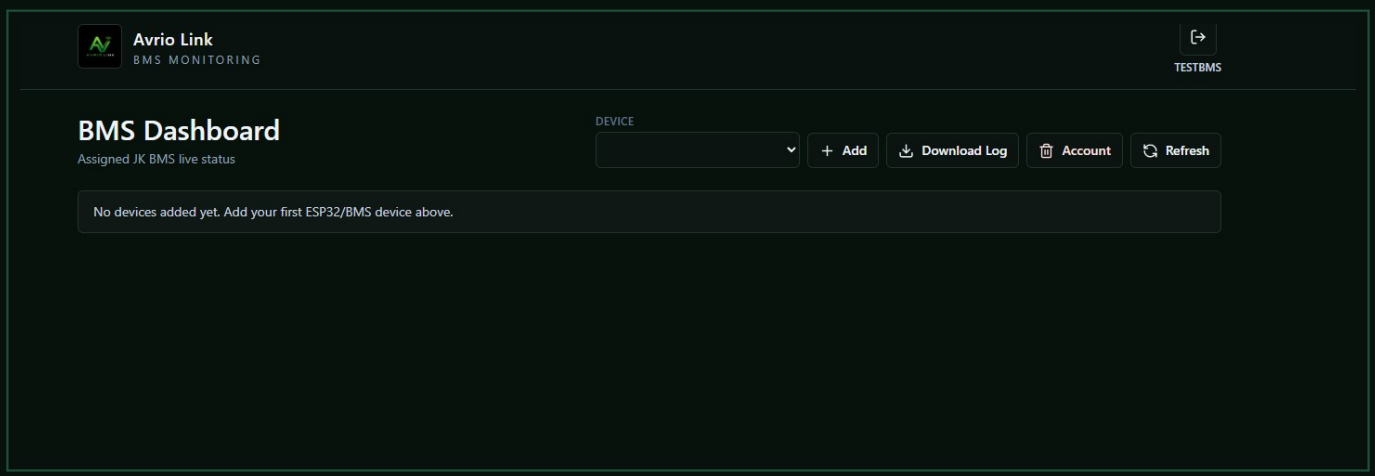

Figure 3. Successful account creation

2. Add Device And Generate Activation Code

Each Avrio Link ESP32 device must be added to the customer account before setup. The dashboard generates the activation code used by the ESP setup wizard.

Step 8: Open Add Device

Press Add to open the device creation area.

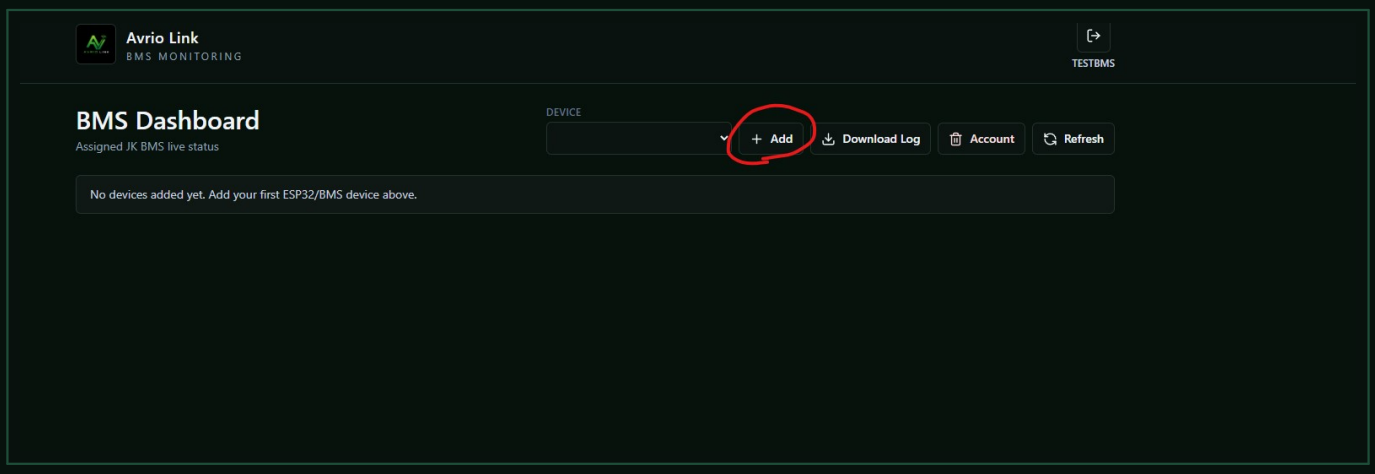

Figure 8. Click on add buttonto add device

Step 9: Enter device name

Type a clear device name, then click Add device.

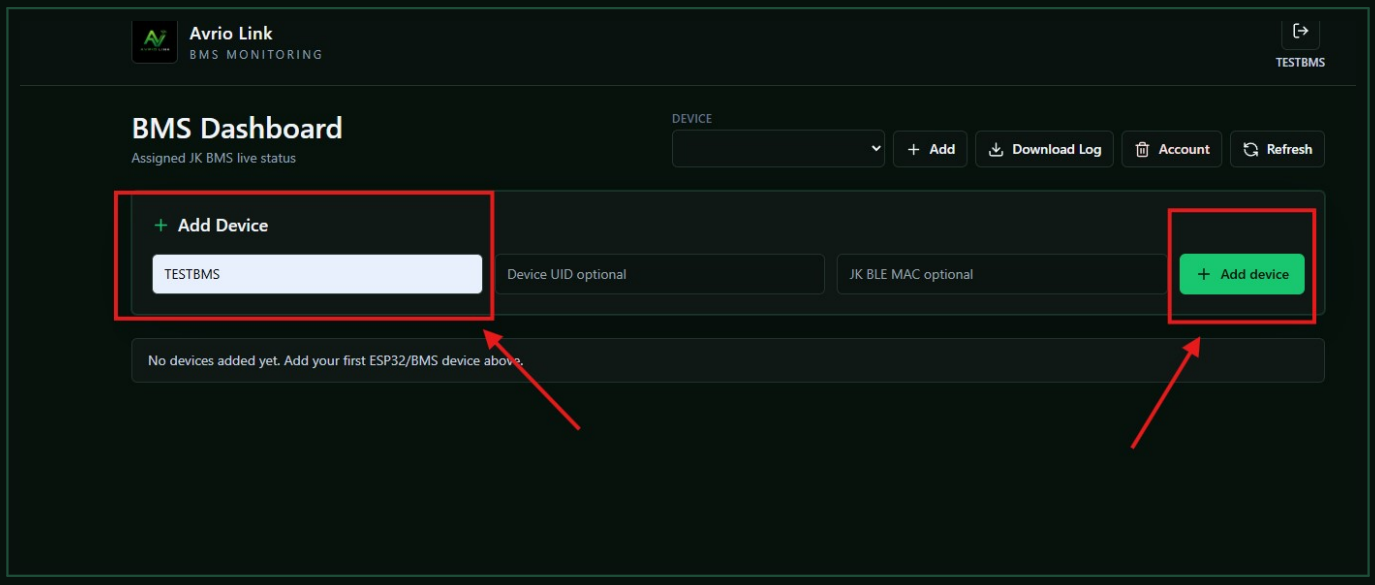

Figure 9. Add device name and click on add device button

Step 10: Device created

After creation, the dashboard shows the new device in the device selector.

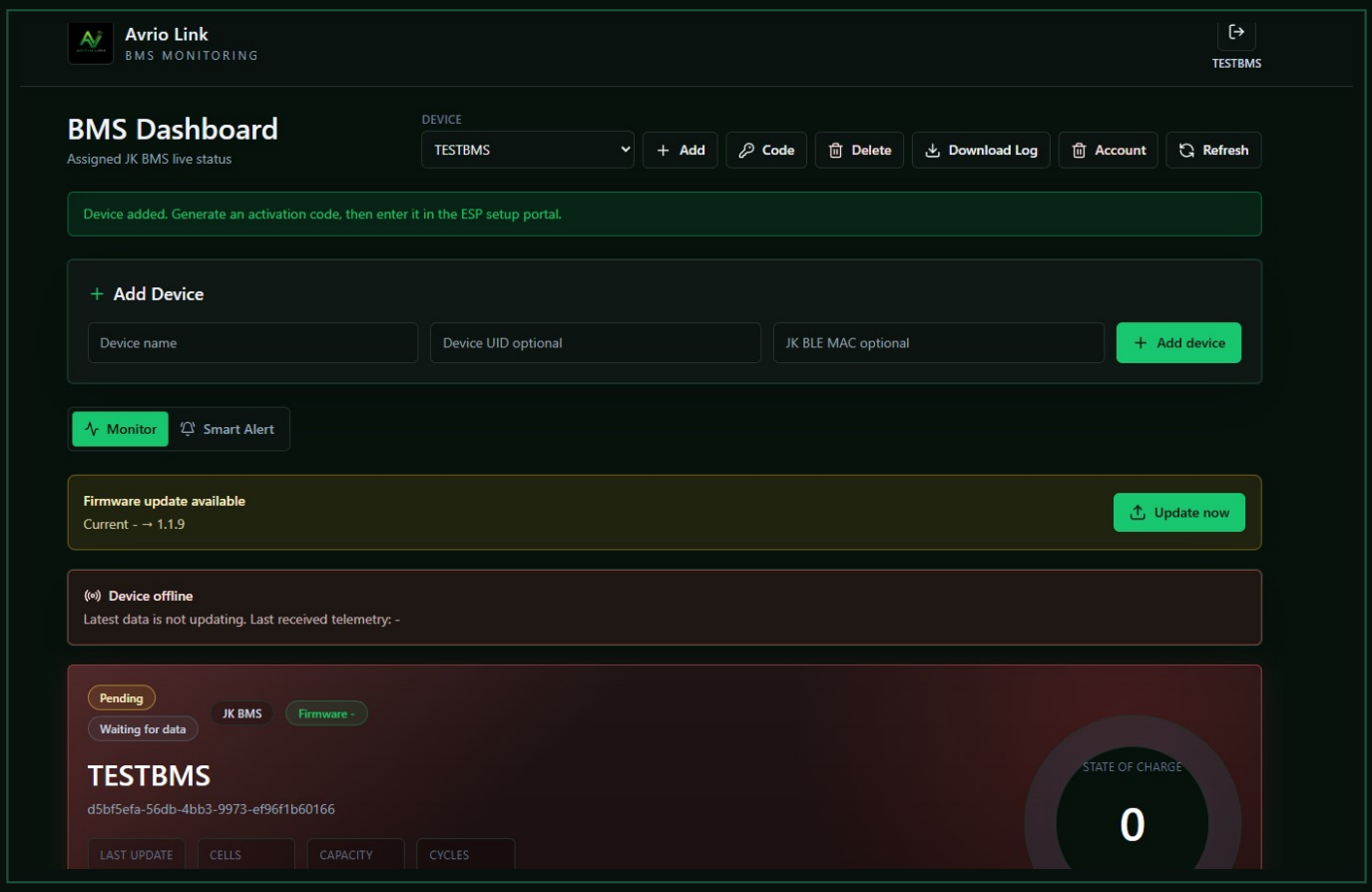

Figure 10. Device created successful on the dashboard

Step 11: Select the device and generate code

Choose the created BMS device and click Code to generate the activation code.

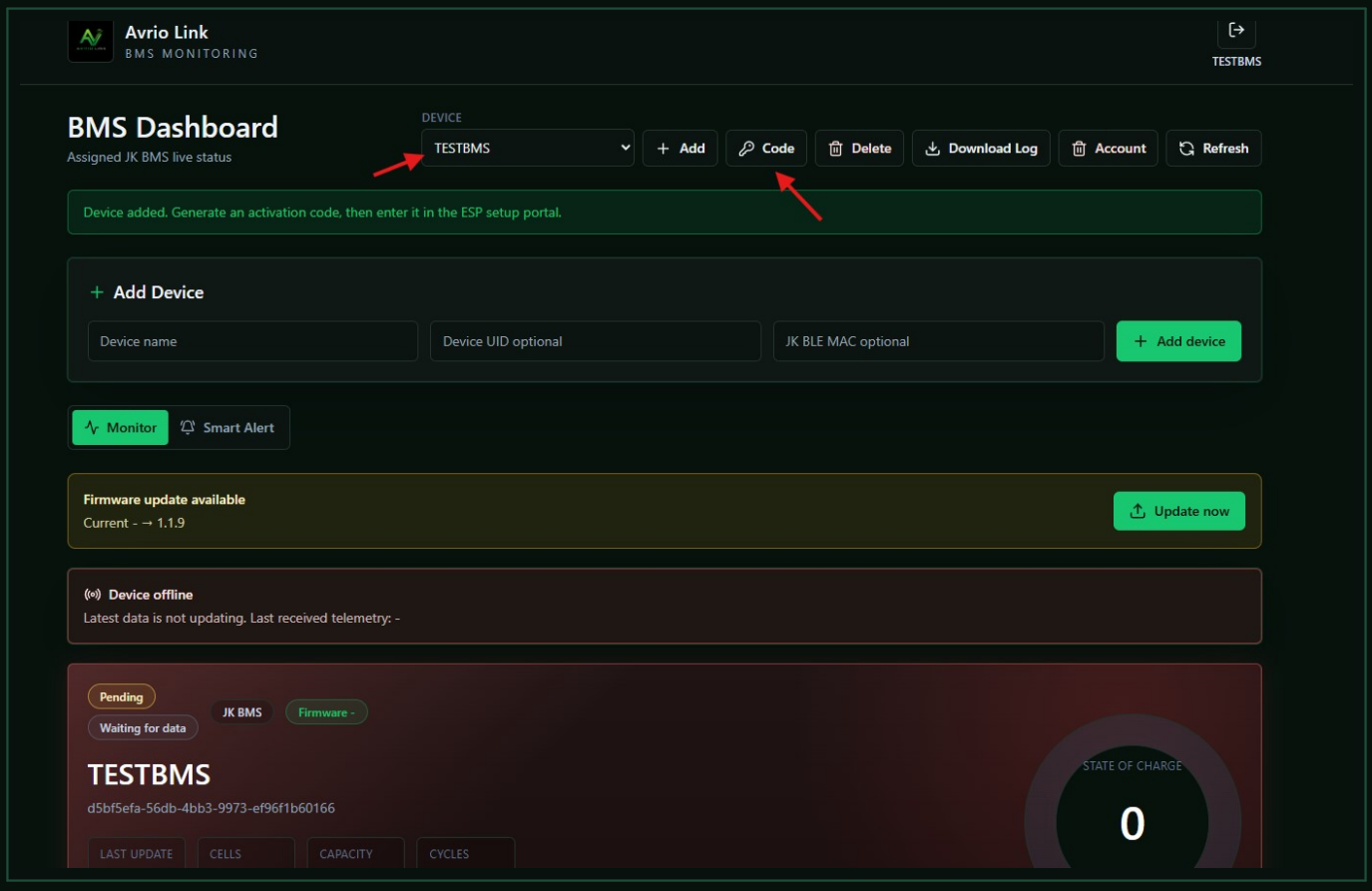

Figure 11. Select created BMS device then click on code button to generate the authenticate key

Step 12: Copy the activation code

Keep this code ready for the Avrio Link setup wizard.

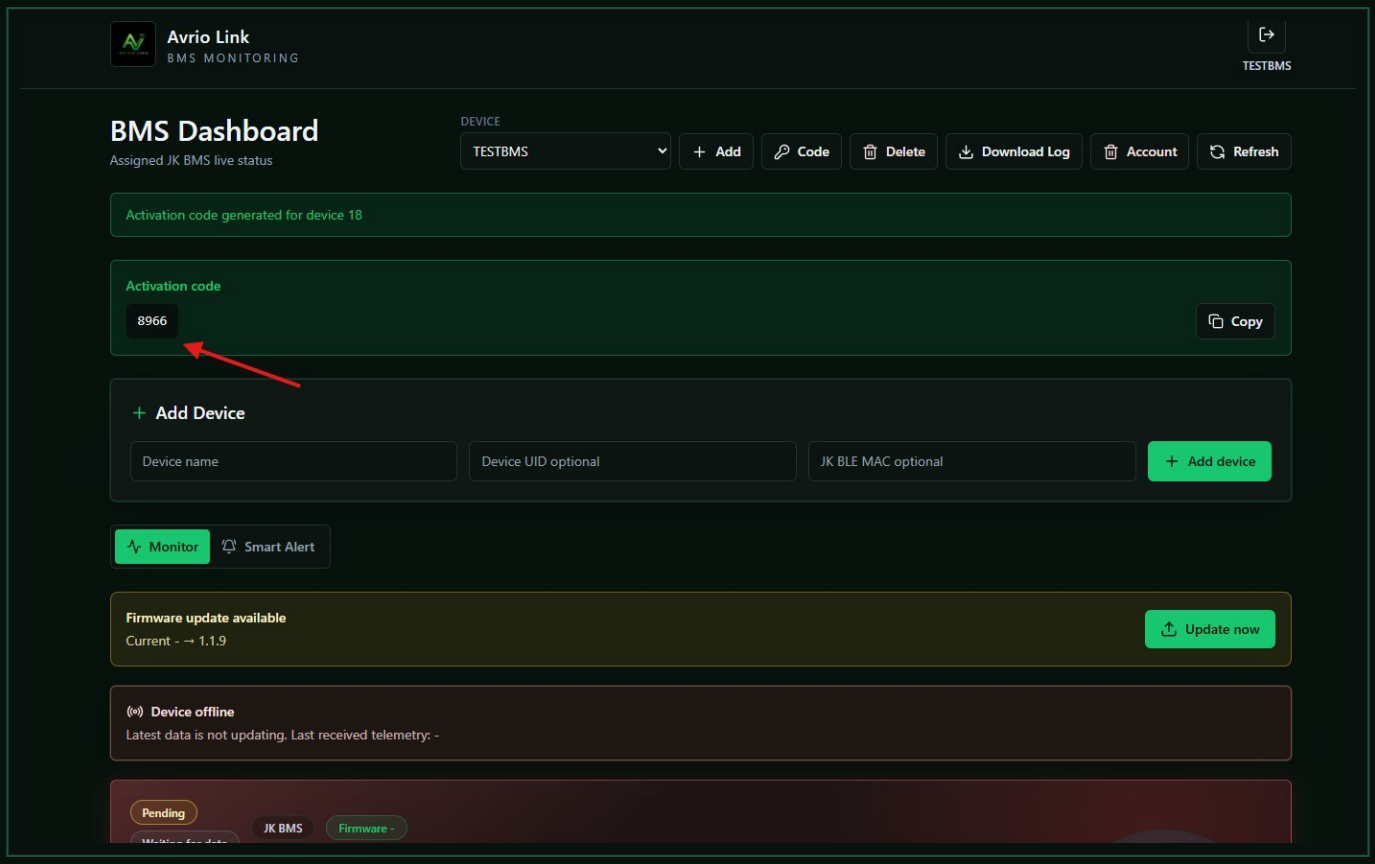

Figure 12. Take the code for configure Link

3. Configure Avrio Link Device

On first boot or setup mode, Avrio Link creates a WiFi hotspot. Connect to it, open the setup portal, configure WiFi, pair the BMS, activate cloud connection, and restart.

Step 13: Connect phone to Avrio Link hotspot

Connect the phone or computer to the AVRIO LINK setup access point.

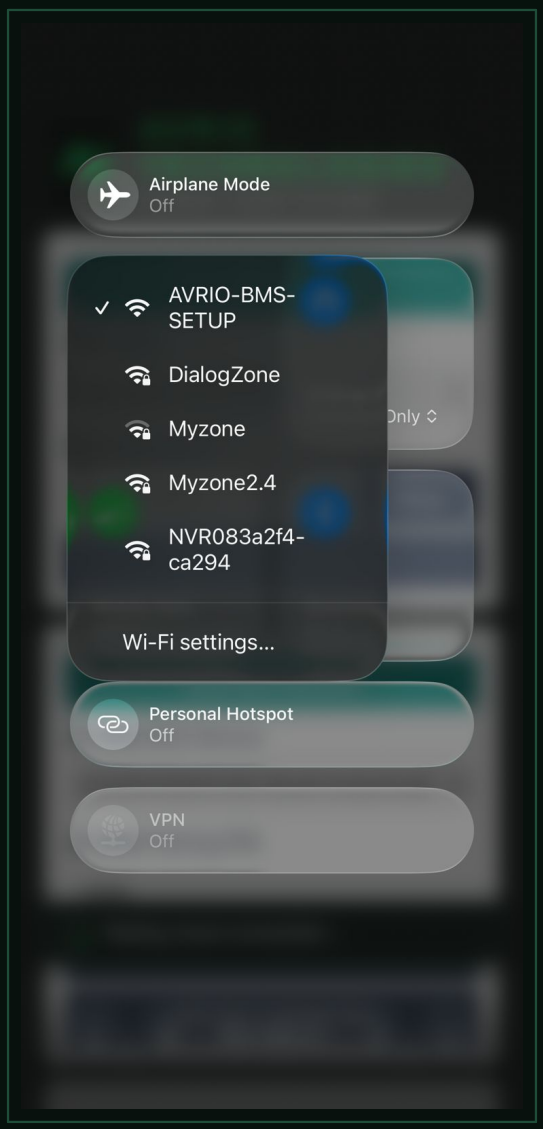

Figure 14. Connect phone to AVRIO LINK Access point

Step 14: Open setup portal

Open 192.168.4.1 in the browser and press Scan WiFi.

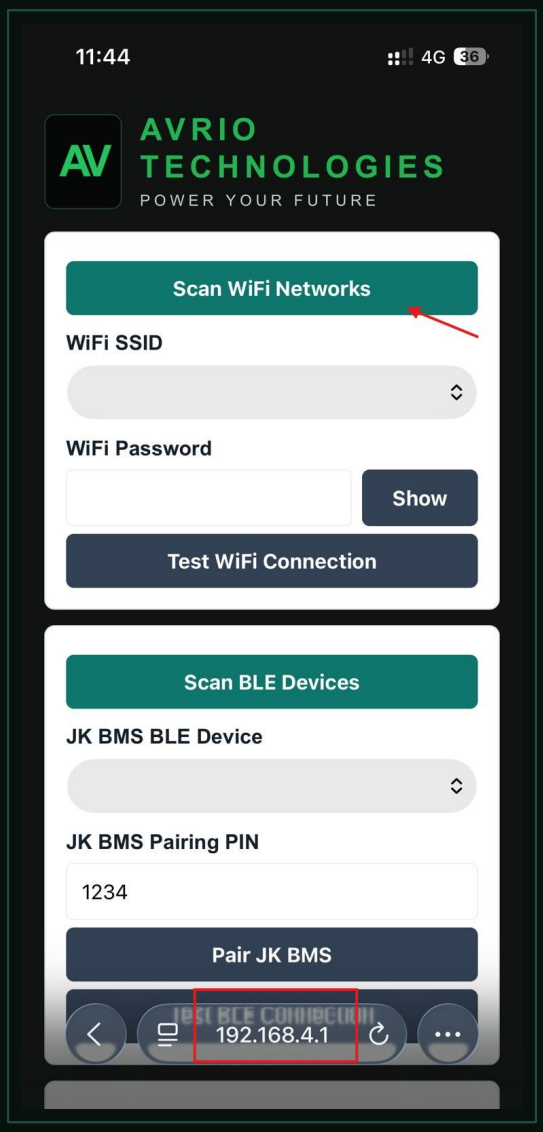

Figure 15. Log in to 192.168.4.1 then press on scan wifi button

Step 15: Scan WiFi networks

Wait while nearby WiFi networks are detected.

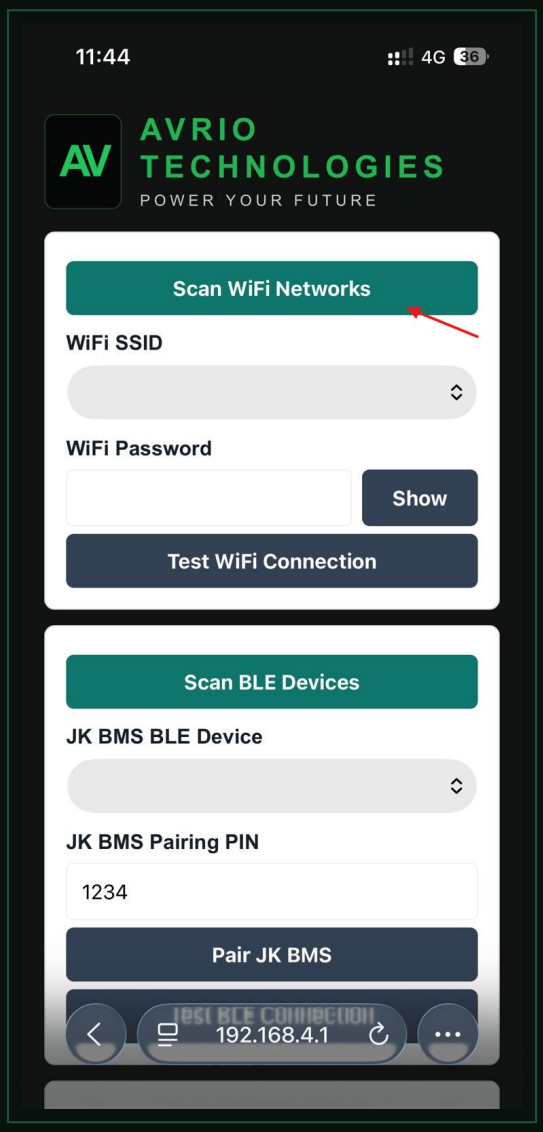

Figure 16. Press on scan wifi button

Step 16: Select WiFi network

Select the customer 2.4 GHz WiFi network that Avrio Link should use after setup. Avrio Link does not support 5 GHz-only WiFi networks.

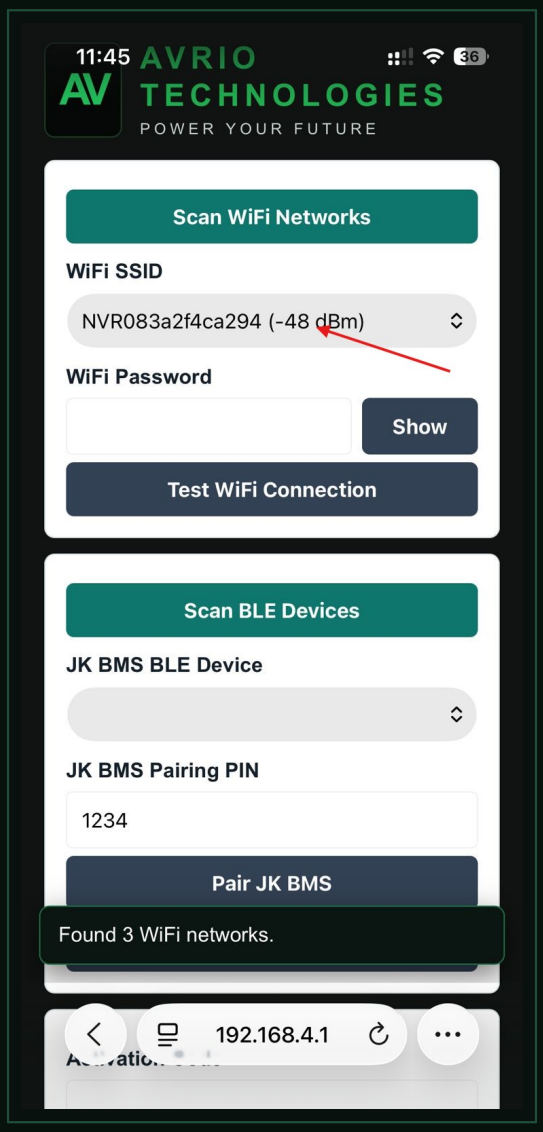

Figure 17. Select wifi connection that youneed to connect the LINK

Step 17: Enter Wi-Fi password and test

Enter the 2.4 GHz WiFi password and press the Test WIFI Connection Button to confirm connectivity.

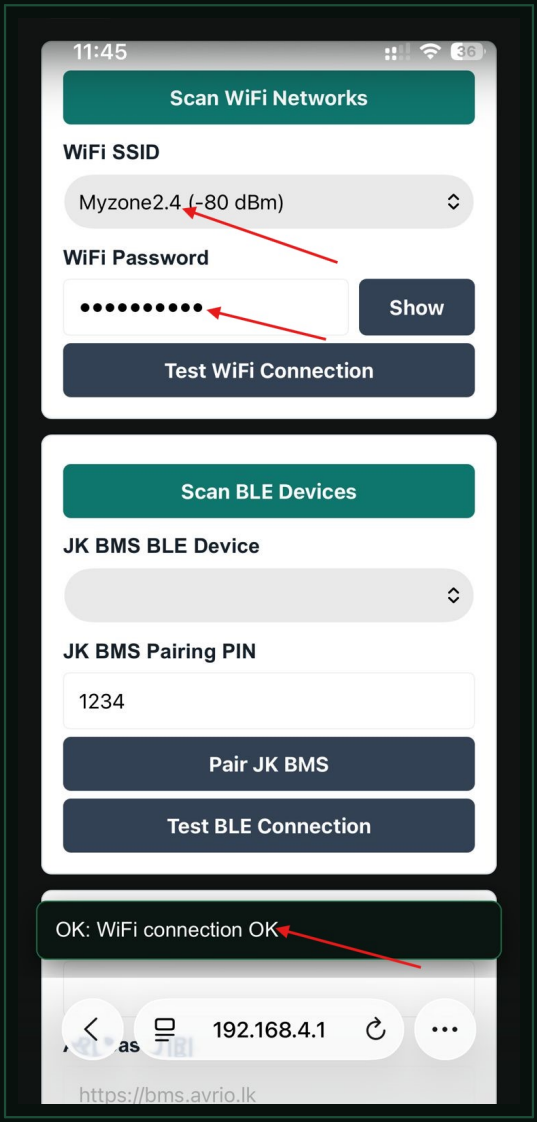

Figure 18. Enter wifi password and check the wii connectivity is working

Step 18: Scan BLE devices

Press Scan BLE Devices Button. Keep the phone JK BMS app closed and phone Bluetooth disconnected from the BMS during setup.

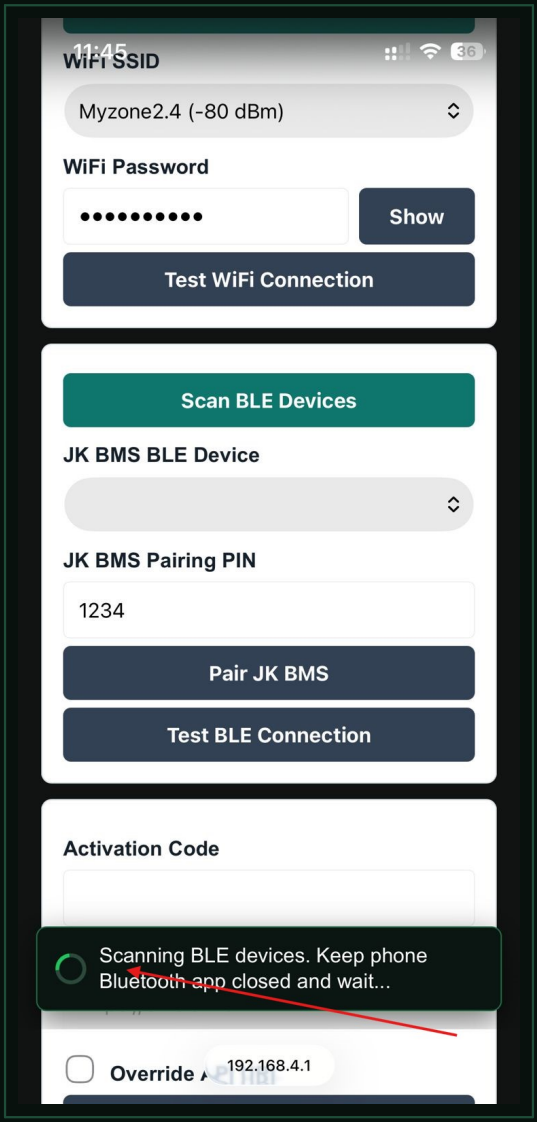

Figure 19. Scaning bluetooth device sing the scan ble button

Step 19: Select the BMS BLE device

Choose the JK BMS name that appears in the Bluetooth device list.

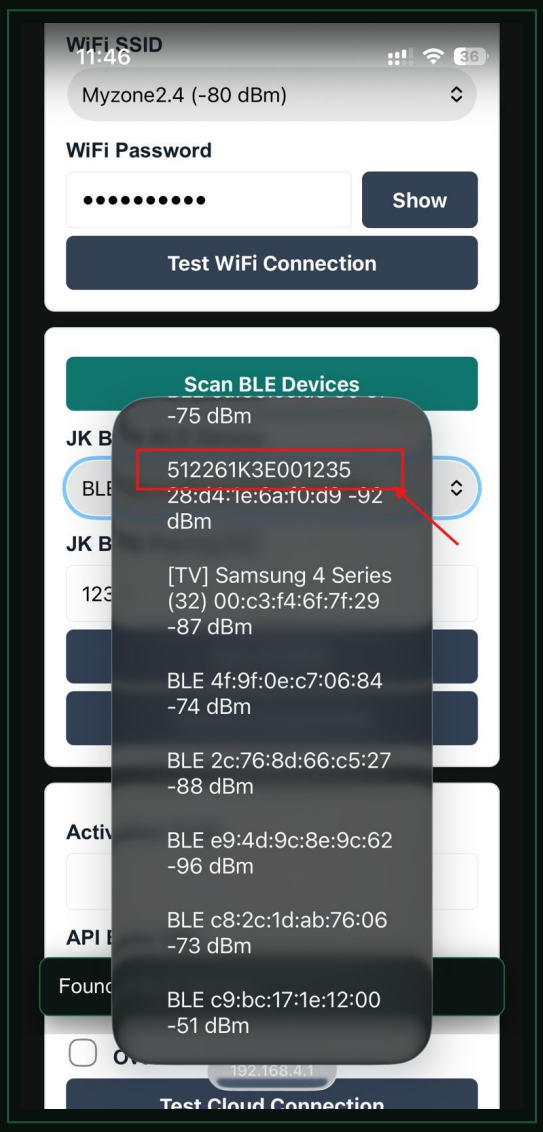

Figure 20. Find the JK BMS name that appear on the bluetooth device list

Step 20: Confirm pairing PIN

The default BMS pairing PIN is 1234. If the customer changed the PIN, replace it before pressing Pair JK BMS Button.

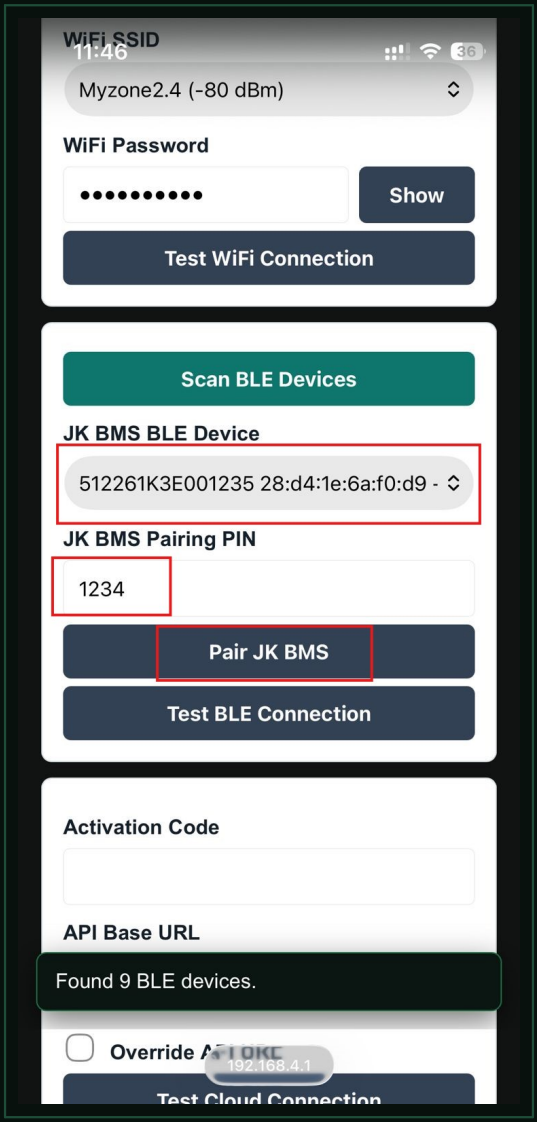

Figure 21. Default pair pin is 1234 automatically shown, if it changed with your device pls add it over default one , then press the pair button

Step 21: BLE pair success

Continue only after the setup wizard shows that pairing is successful.

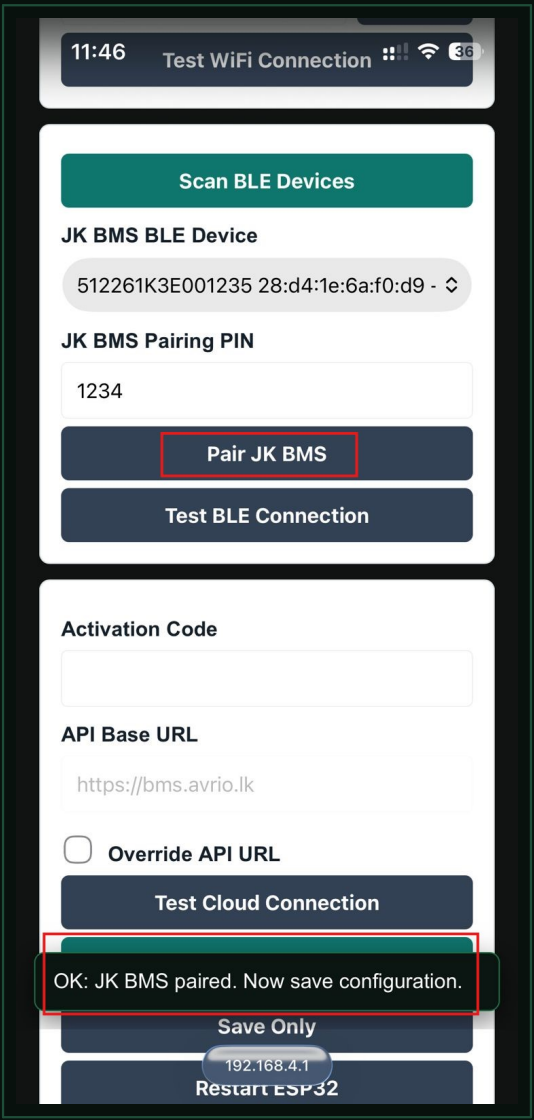

Figure 22. Success fully paired shows if all are ok

Step 22: Enter activation code

Paste the activation code generated from the dashboard and press Test cloud connection.

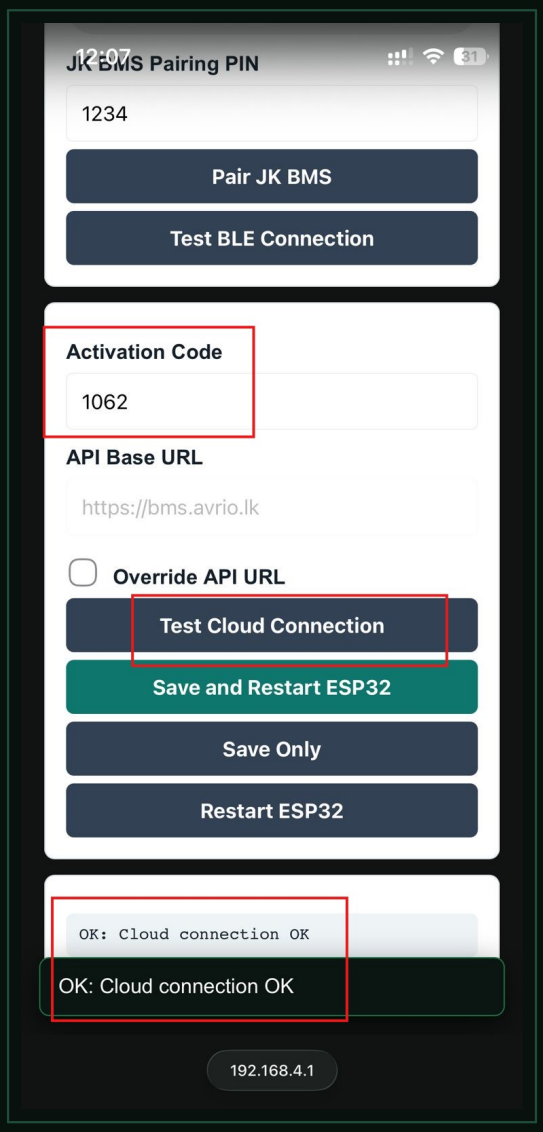

Figure 23. Now you have to put that generated code from your account created device ,then press test cloud connection button to verify the connection

Step 23: Alternative activation guidance (multiple device connections)

If setting up another device, use the new code generated for that device and repeat the same cloud test. Note: One Avrio Link for one JK BMS

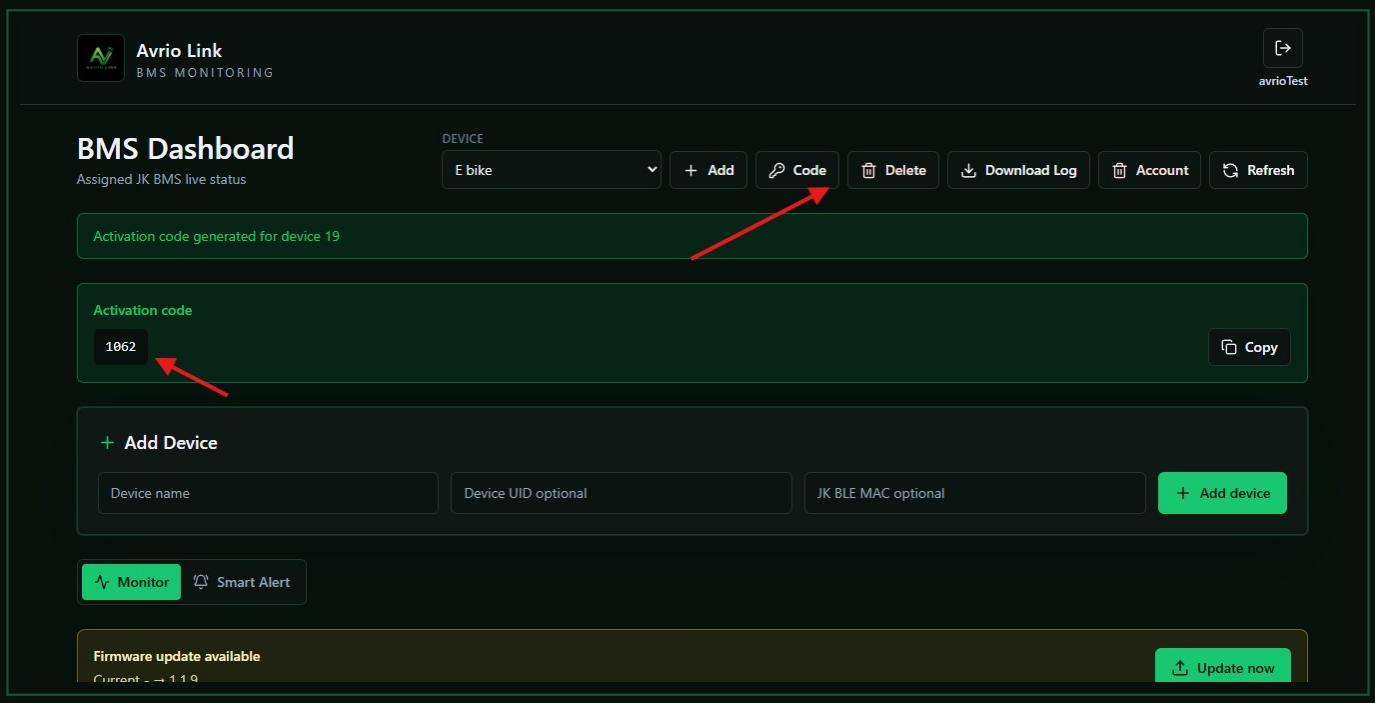

Figure 24. As same as give the code generated by dashboard to the avrio link device code field then do same as previous guided

Step 24: Save and restart

After WiFi, BLE, and cloud tests pass, press Save and Restart.

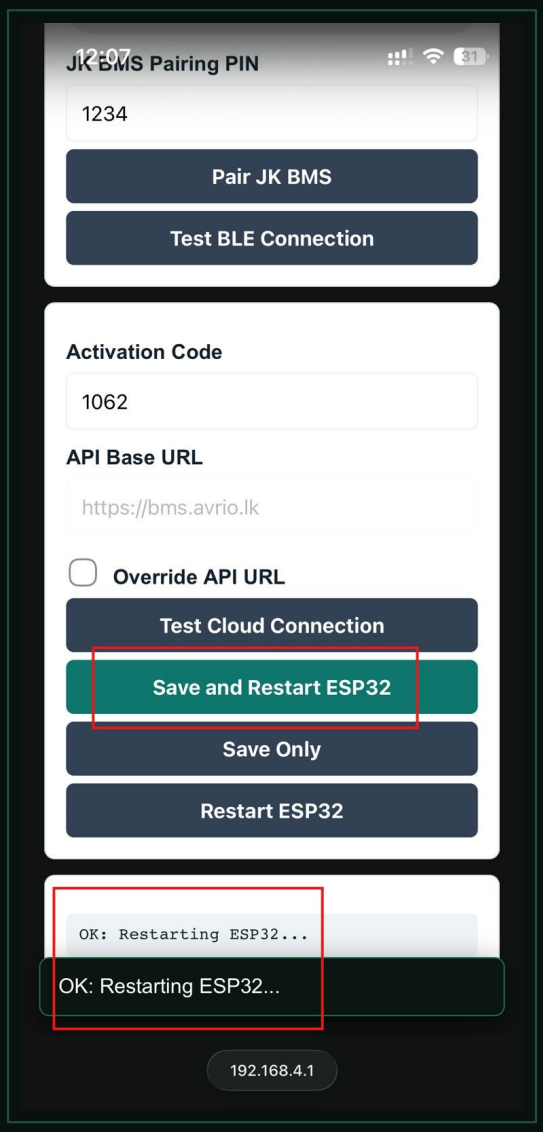

Figure 25. Now all are ok, we should save and restart

4. Monitor Live BMS Dashboard

After restart, Avrio Link connects to WiFi, connects to the BMS over BLE, and sends latest BMS data to the dashboard.

Step 26: Initial active state

The device may first show active or Pending state while the first BMS packets are received.

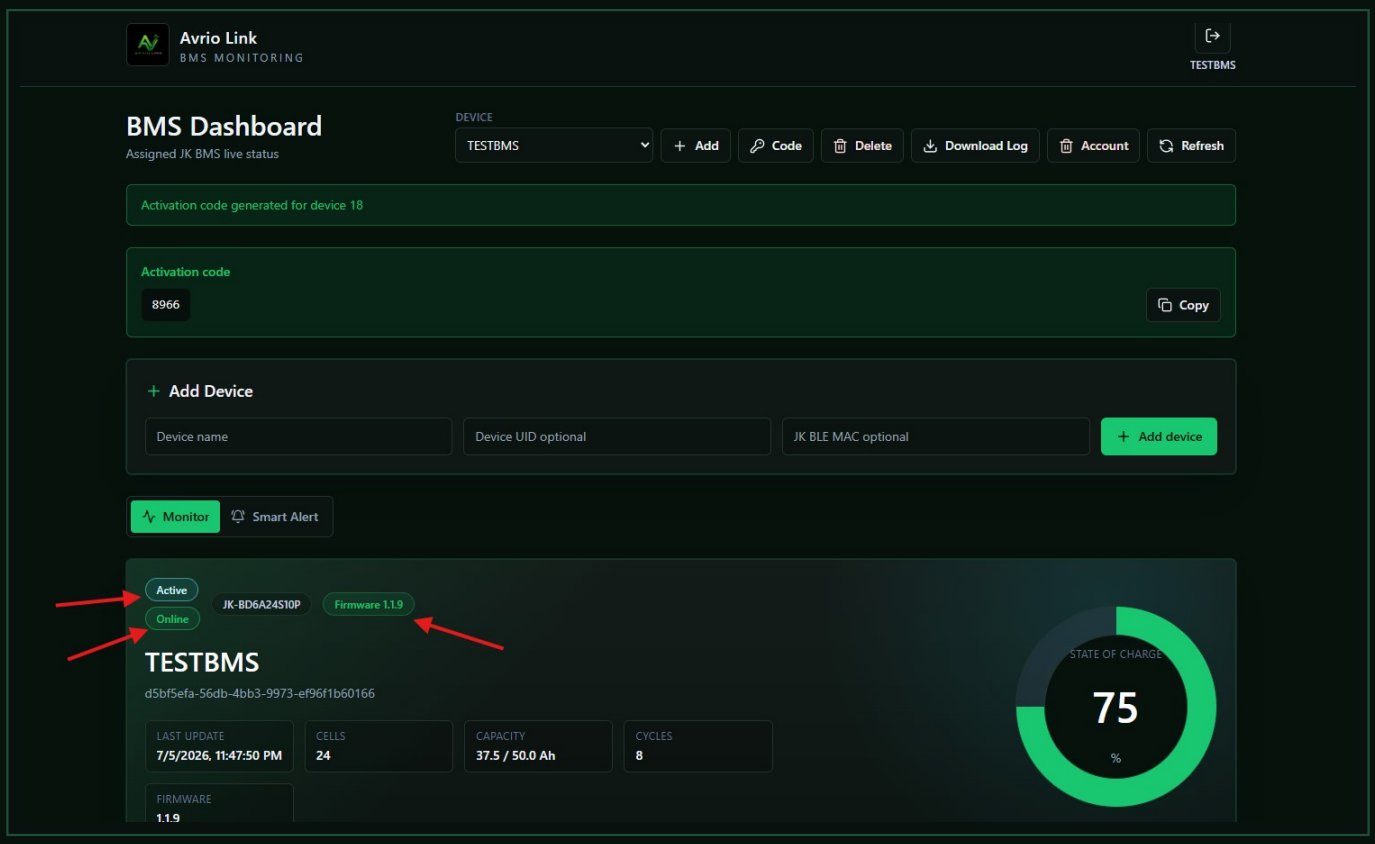

Figure 26. Just sending and show actibve mode

Step 27: Online state

After a few seconds of valid data, the device should show online.

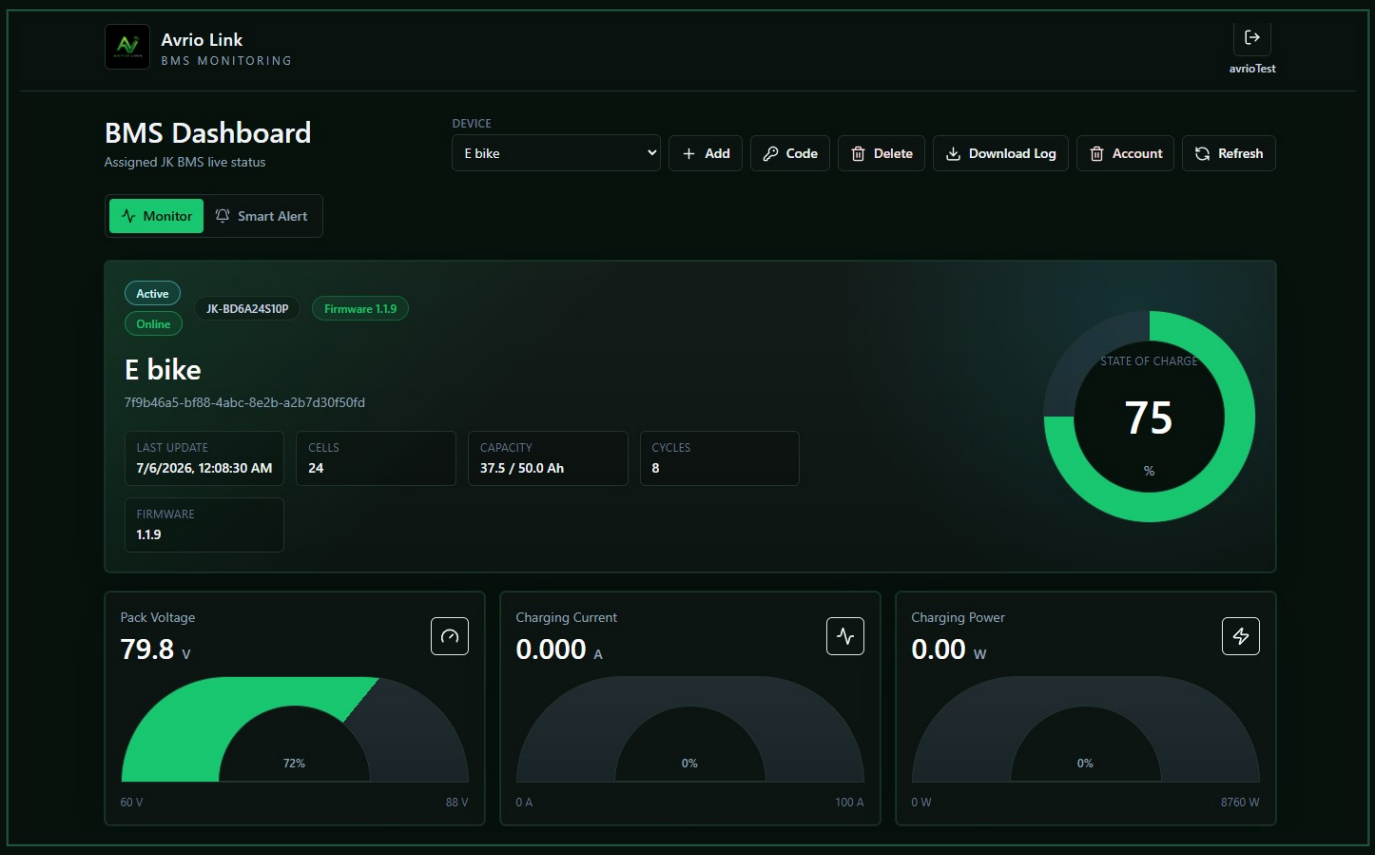

Figure 27. Few second after it sill getting online

Step 28: Choose device

Use the top device selector to choose which Avrio Link device to view.

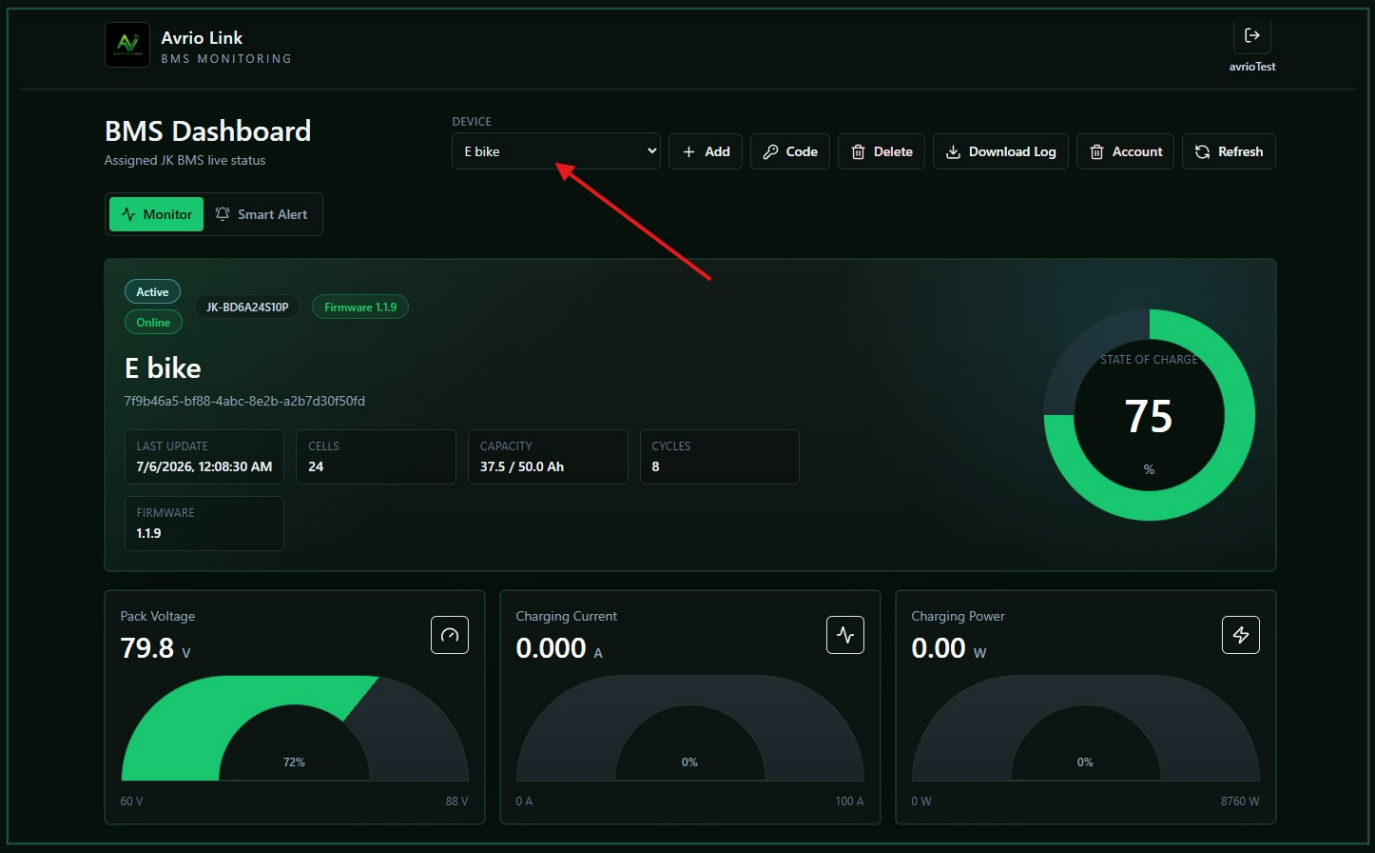

Figure 28. You can chose which to see

Step 29: Main widgets

Review voltage, current, SOC, power, temperature, firmware version, and live status.

Figure 29. Main widgets

Step 30: Secondary widgets

Review additional BMS values such as current limits, balancing current, cycle count, and telemetry information.

Figure 30. Secondary widgets

Step 31: Cell details

Open Cell Details to view cell-by-cell voltages and resistance values.

Figure 31. Cell wise details

Step 32: Offline state

If the device stops sending data, the dashboard changes to offline/red state.

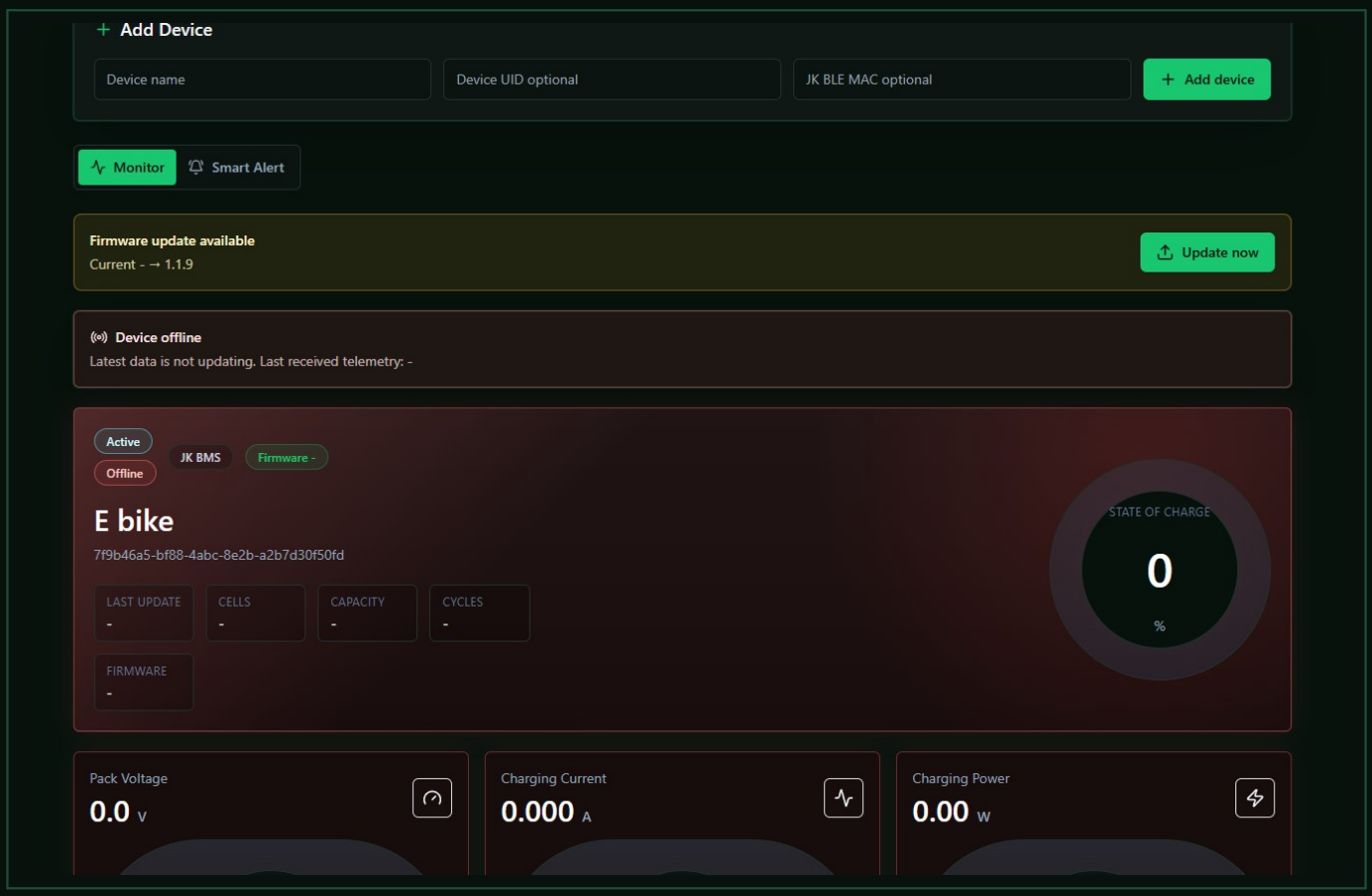

Figure 32. Offline state

5. Configure Smart Alert

Smart Alert sends email notifications when configured voltage, SOC, temperature, or cell limits are crossed. Email recipients must be verified by OTP.

Step 33: Open Smart Alert tab

Select Smart Alert from the dashboard tabs.

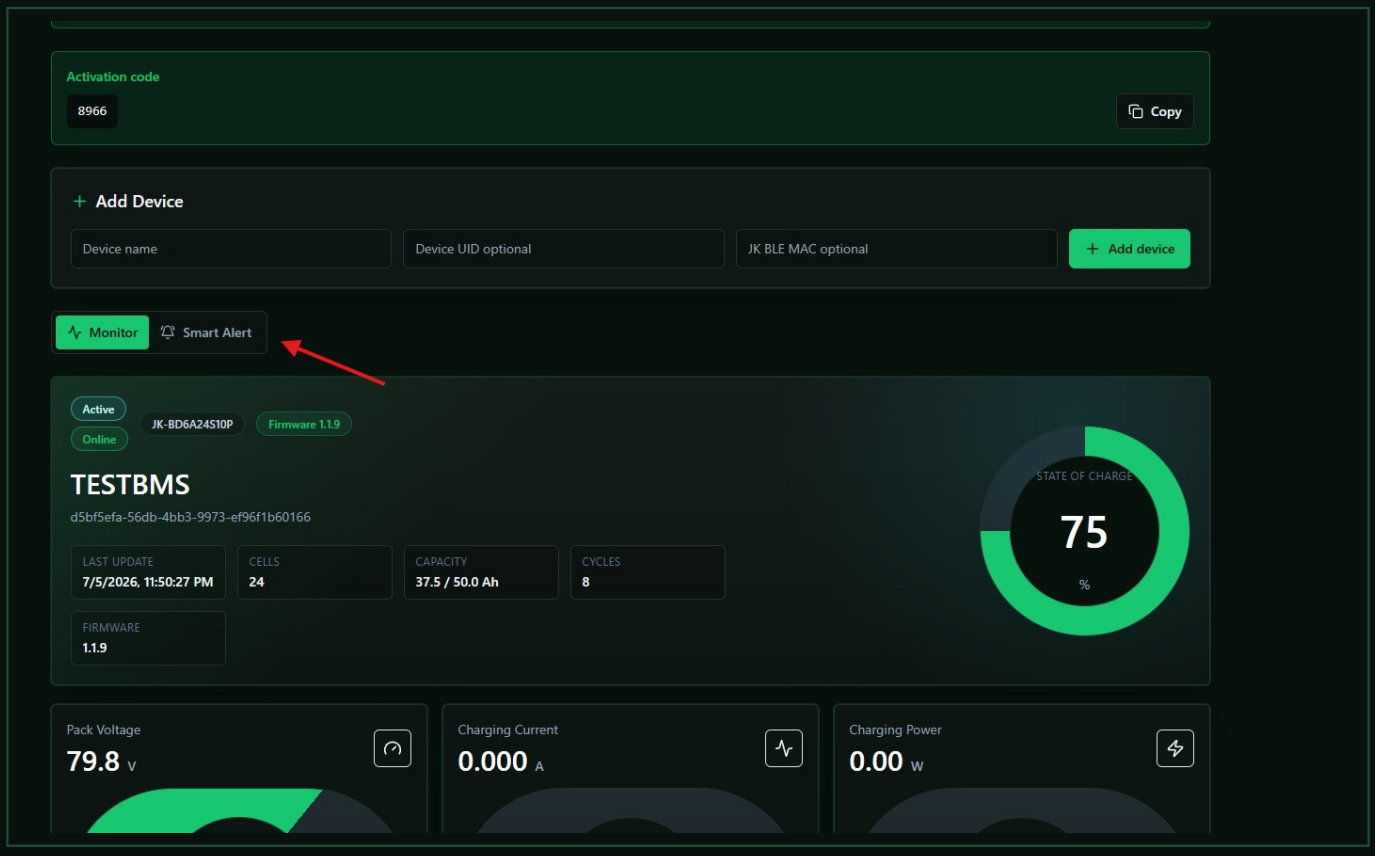

Figure 33. Smart alert tab

Step 34: Review alert settings

Enable email alerts and review the default threshold values.

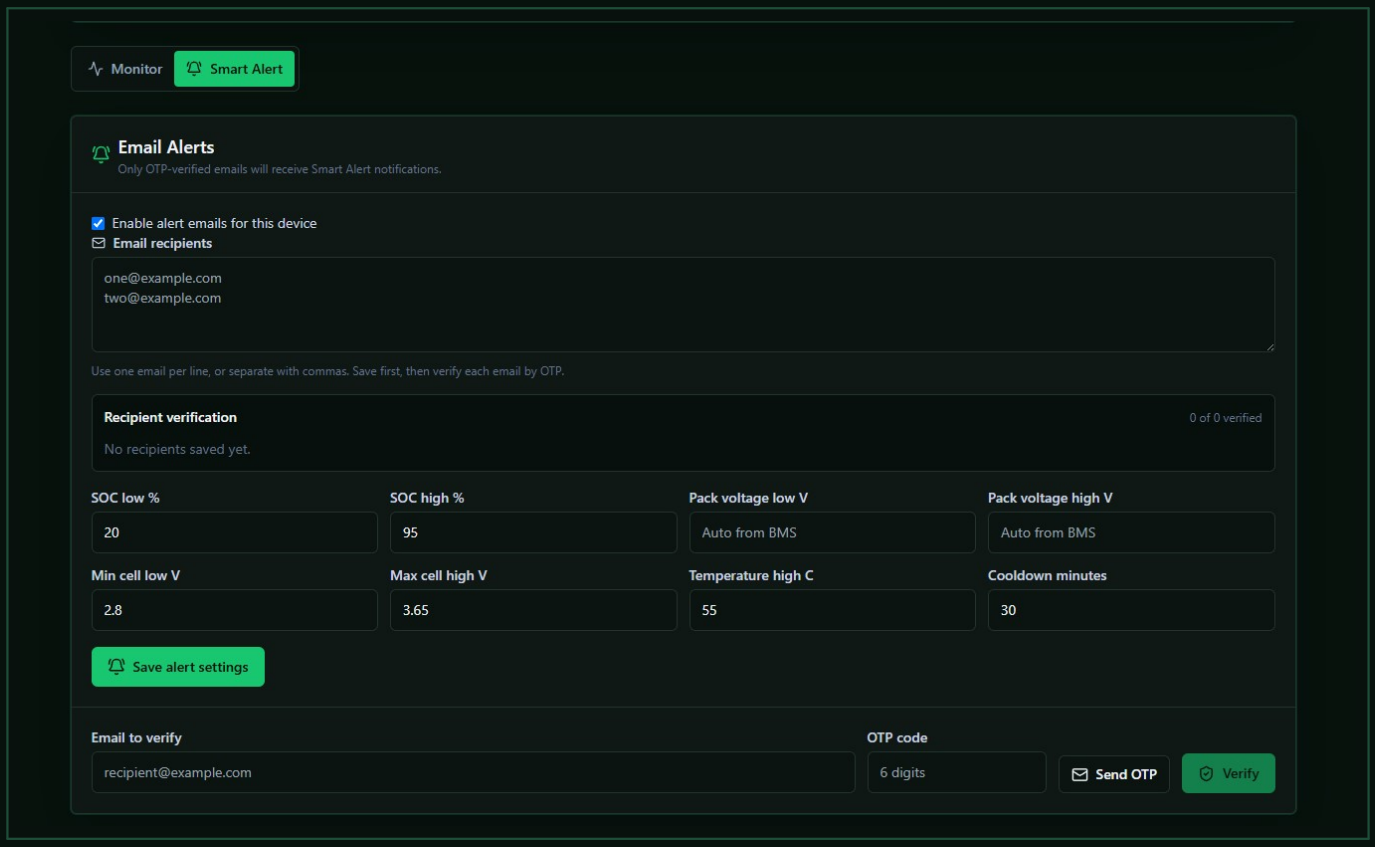

Figure 34. Smart allert tab

Step 35: Add recipients and thresholds

Enter one or more alert recipient email addresses, adjust thresholds if needed, and save settings.

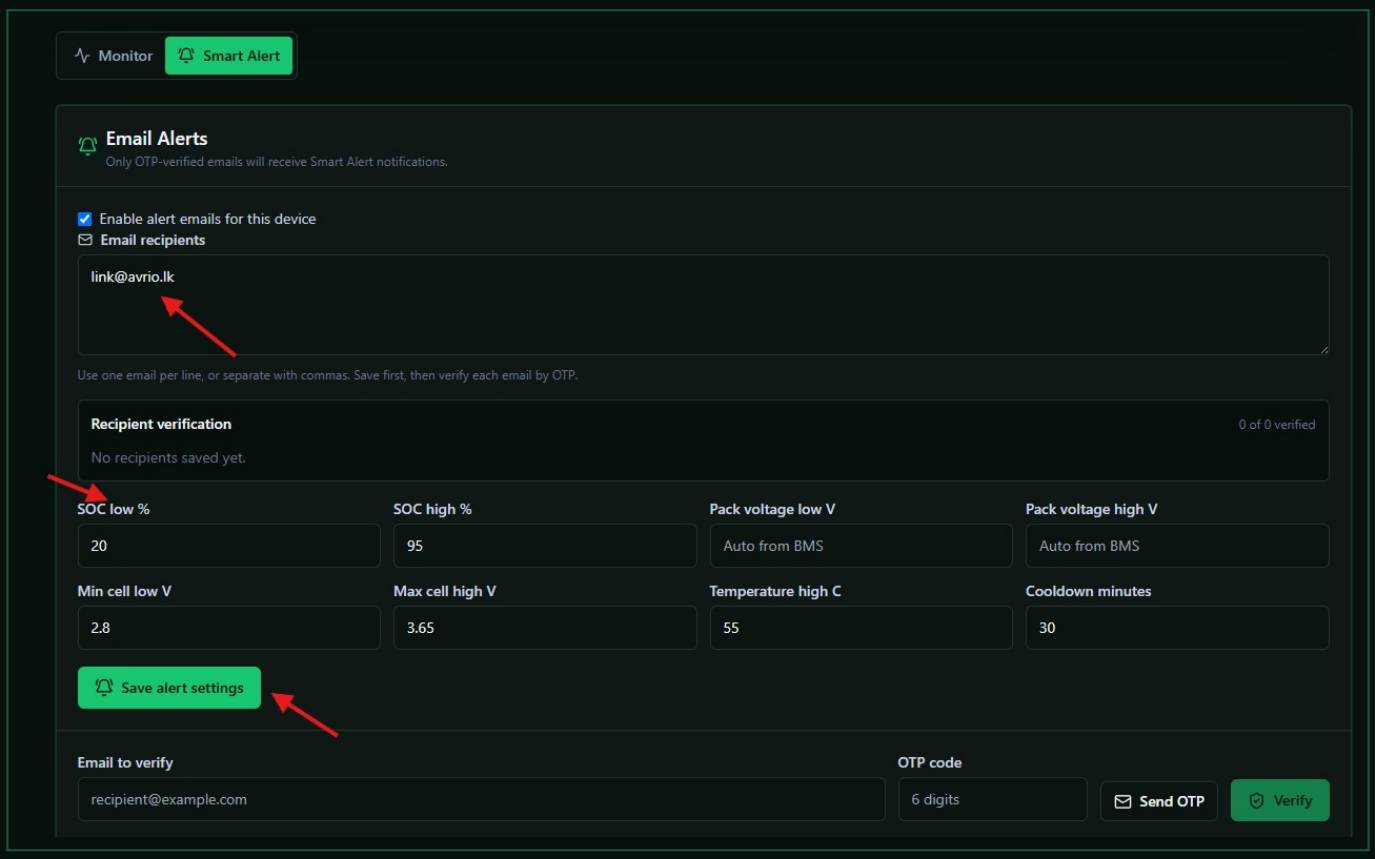

Figure 35. Add email list or one to configure recipient of smart alert service then configure threshols and save alert settings button

Step 36: Send OTP

Send OTP to the alert notification email address.

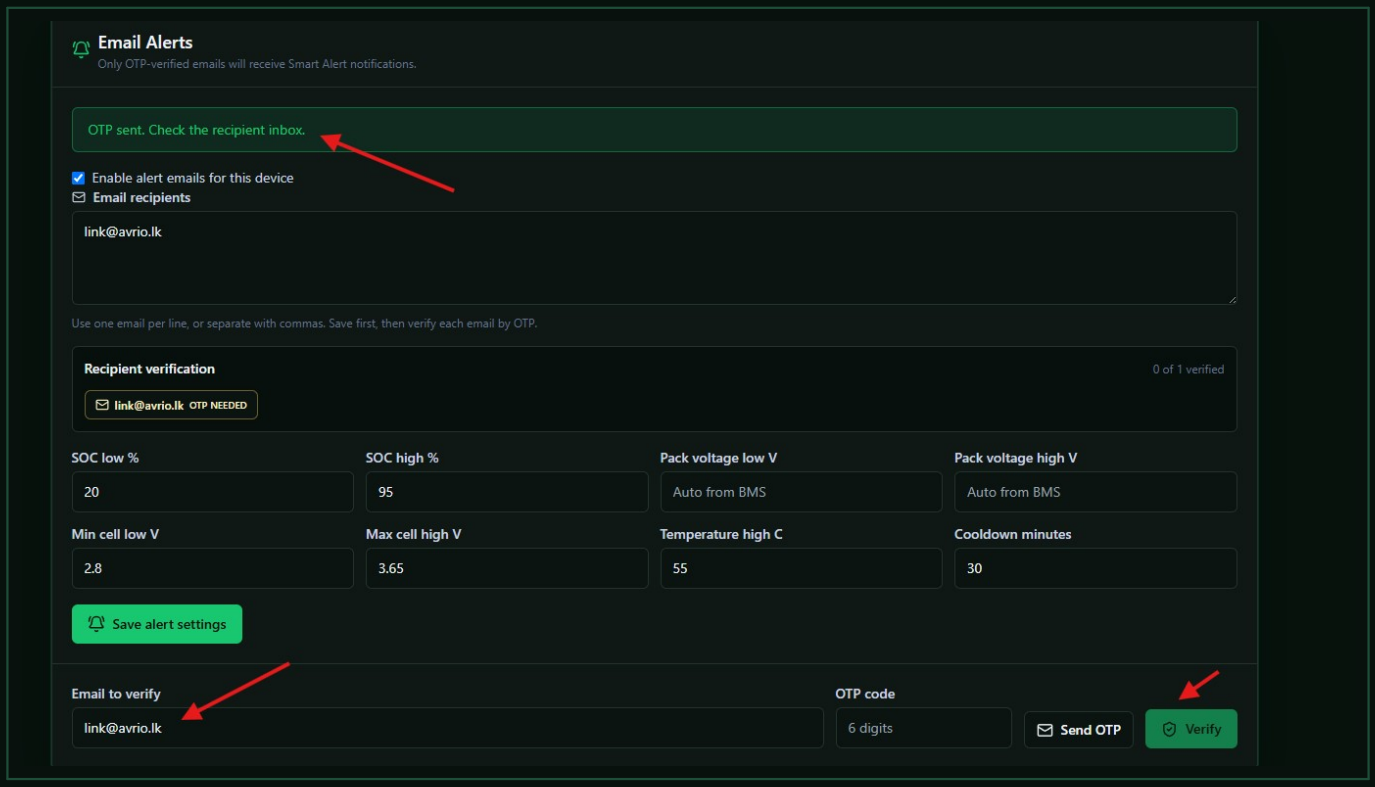

Figure 36. Otp sent to smart alert notification email

Step 37: Receive OTP email

Open the recipient inbox and copy the OTP code.

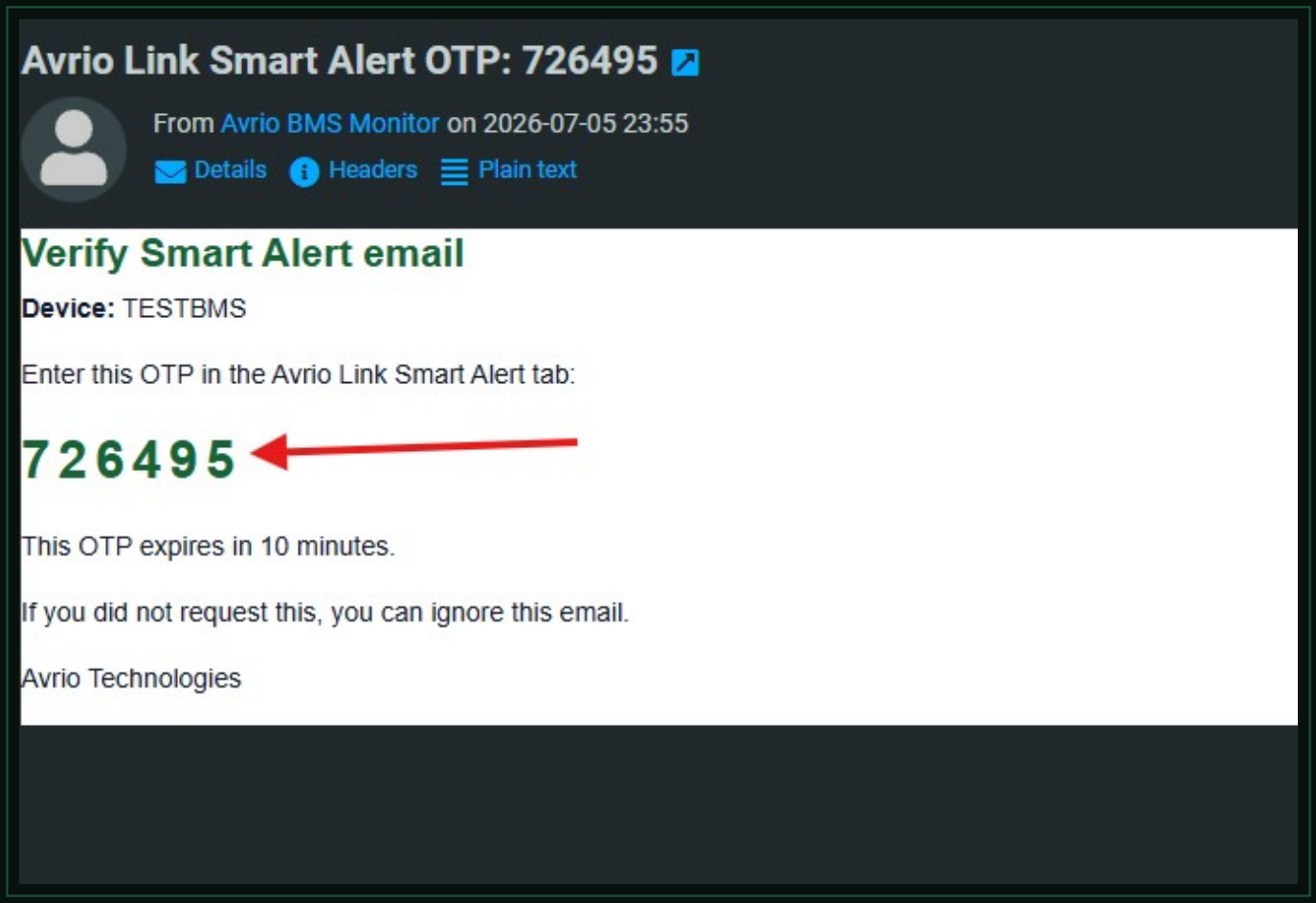

Figure 37. Otp came to email

Step 38: Verify OTP

Paste the OTP code into the dashboard and press Verify.

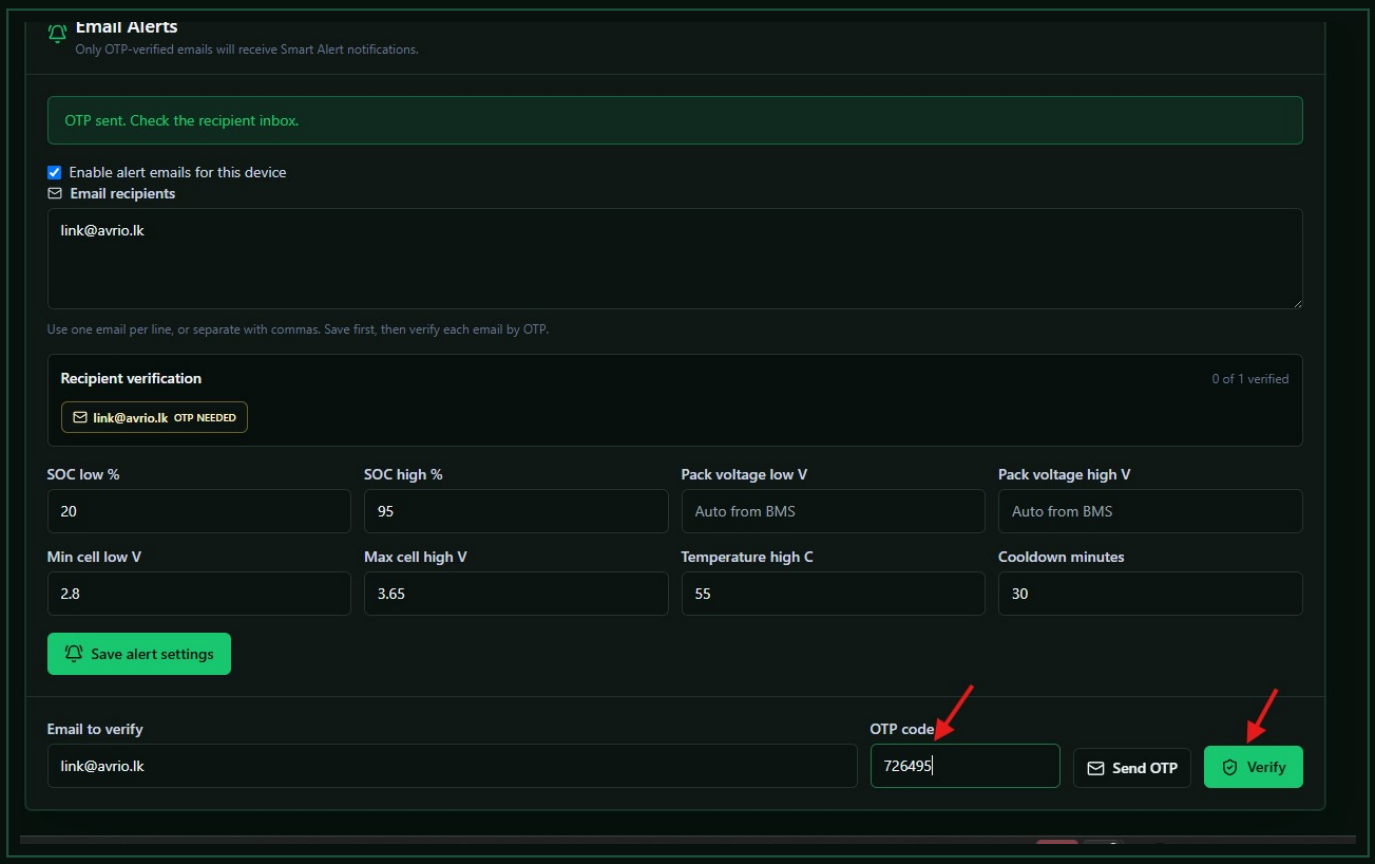

Figure 38. Put code into OTP code space then press verify button

Step 39: Recipient verified

After verification, the recipient email shows as verified.

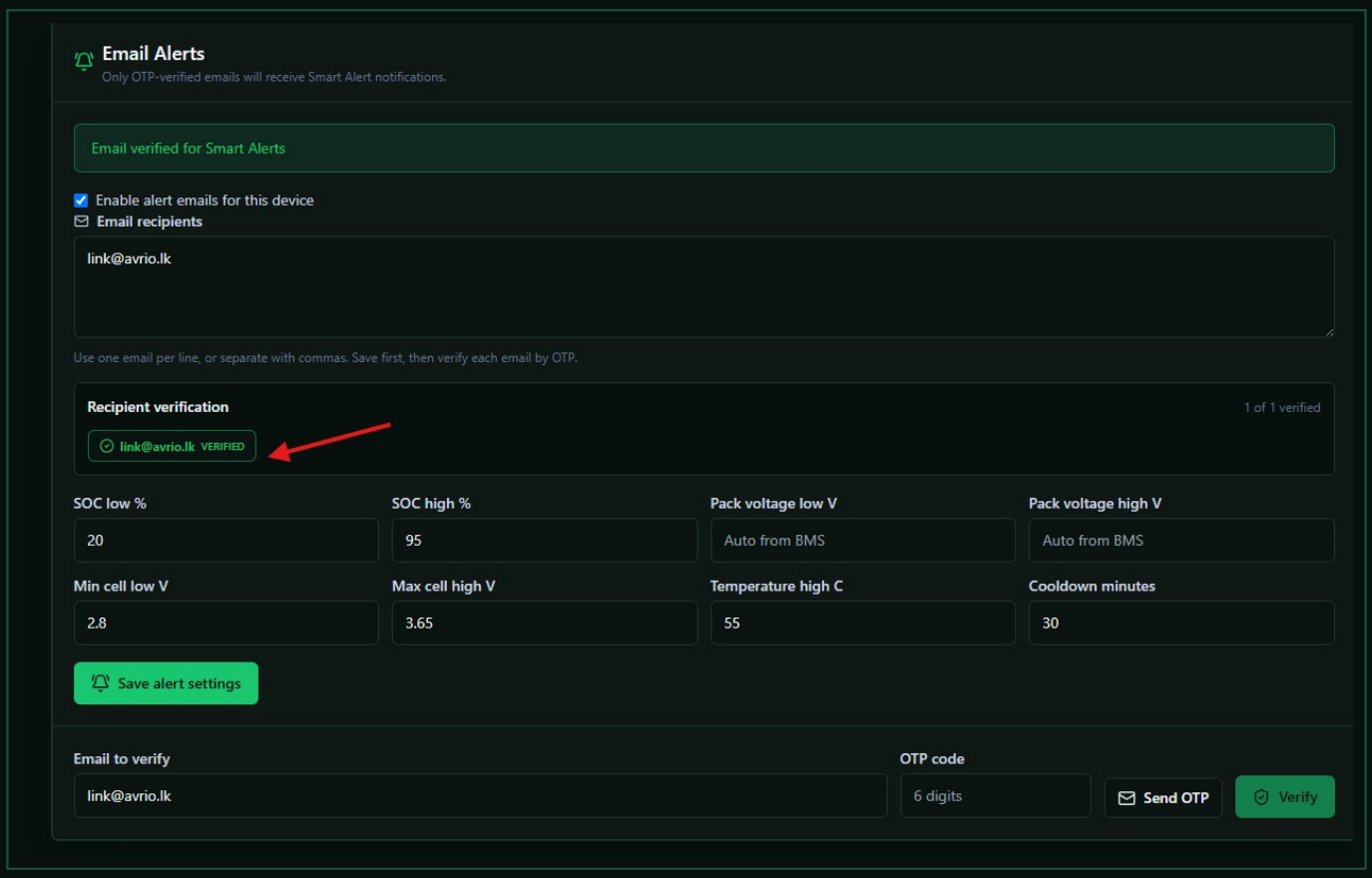

Figure 39. Recipient email now show as verified

Step 40: Alternative OTP reminder

If needed, send OTP again and repeat the verification step.

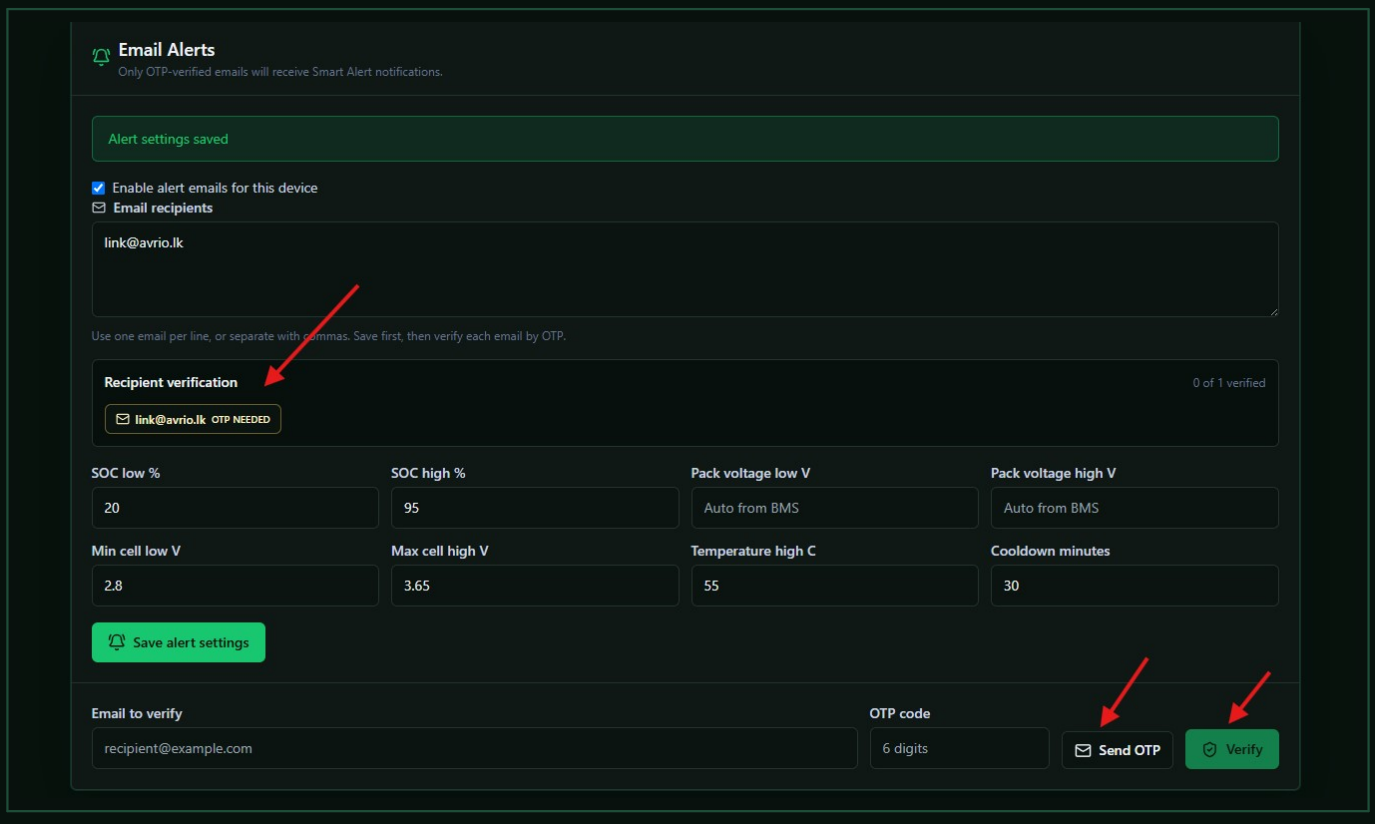

Figure 40. Then need to verify email by sending otp and get and put it in to otp code and click verify button

6. Delete Device Or Account

Customers can delete an individual Avrio Link device from their account, or delete the full customer account when required.

Step 41: Delete device option

Use the device Delete option to remove only the selected Avrio Link device.

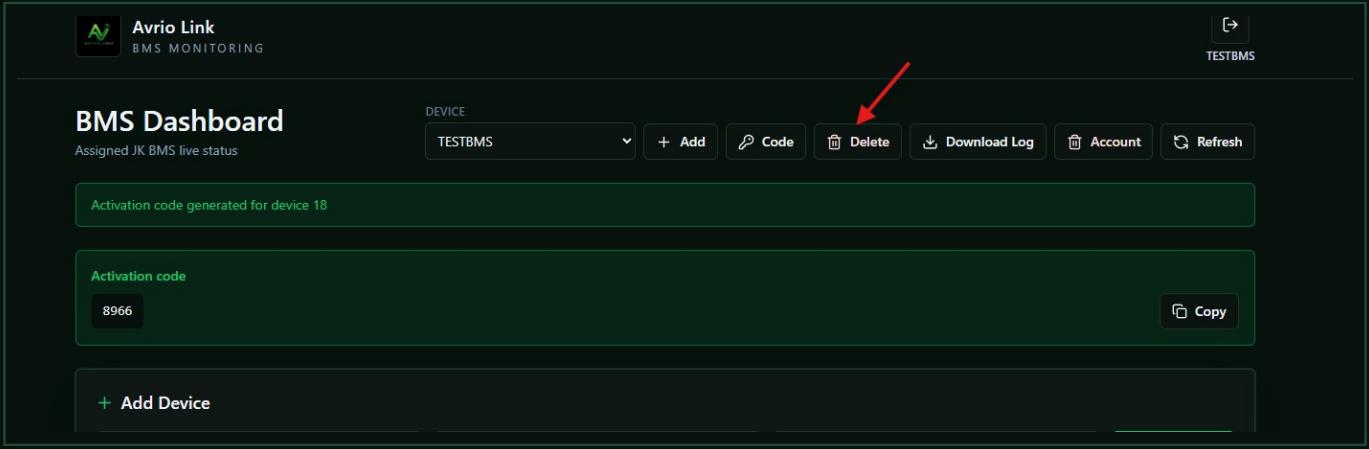

Figure 41. Delete device option to delete link device from the account

Step 42: Confirm device deletion

Confirm the browser popup to delete the selected device.

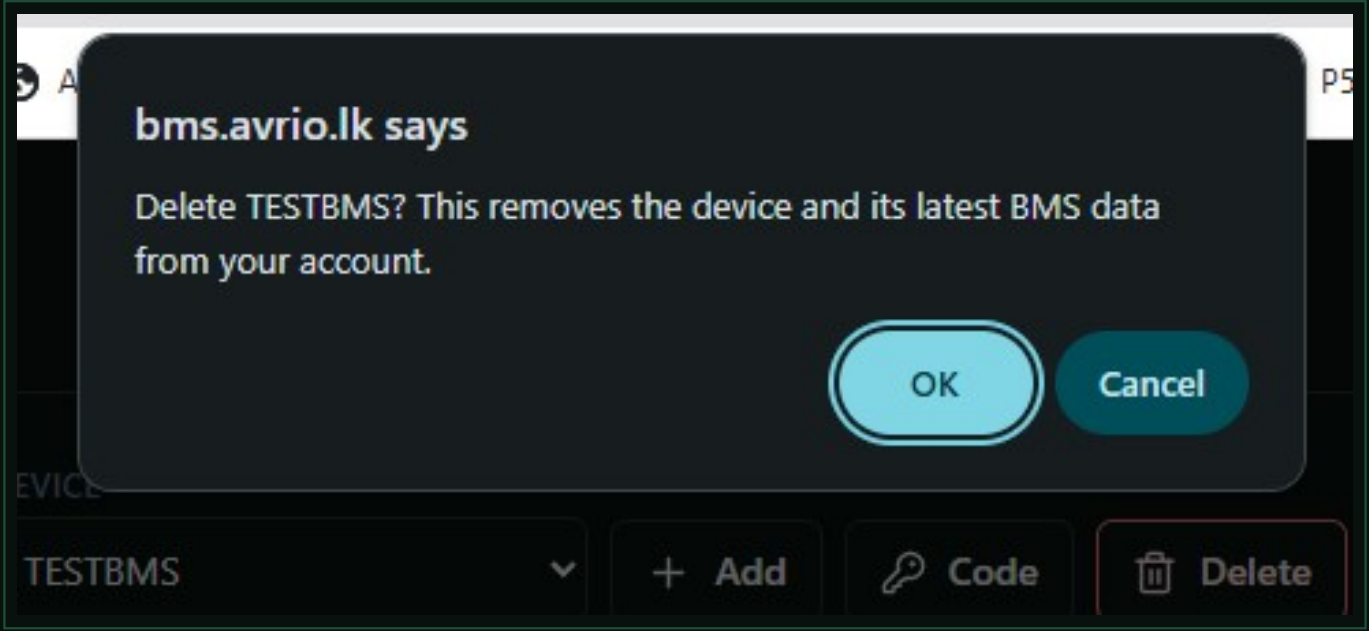

Figure 42. Popup confirmation to delete device

Step 43: Open account deletion

Open the Account delete area when the customer wants to delete the full account.

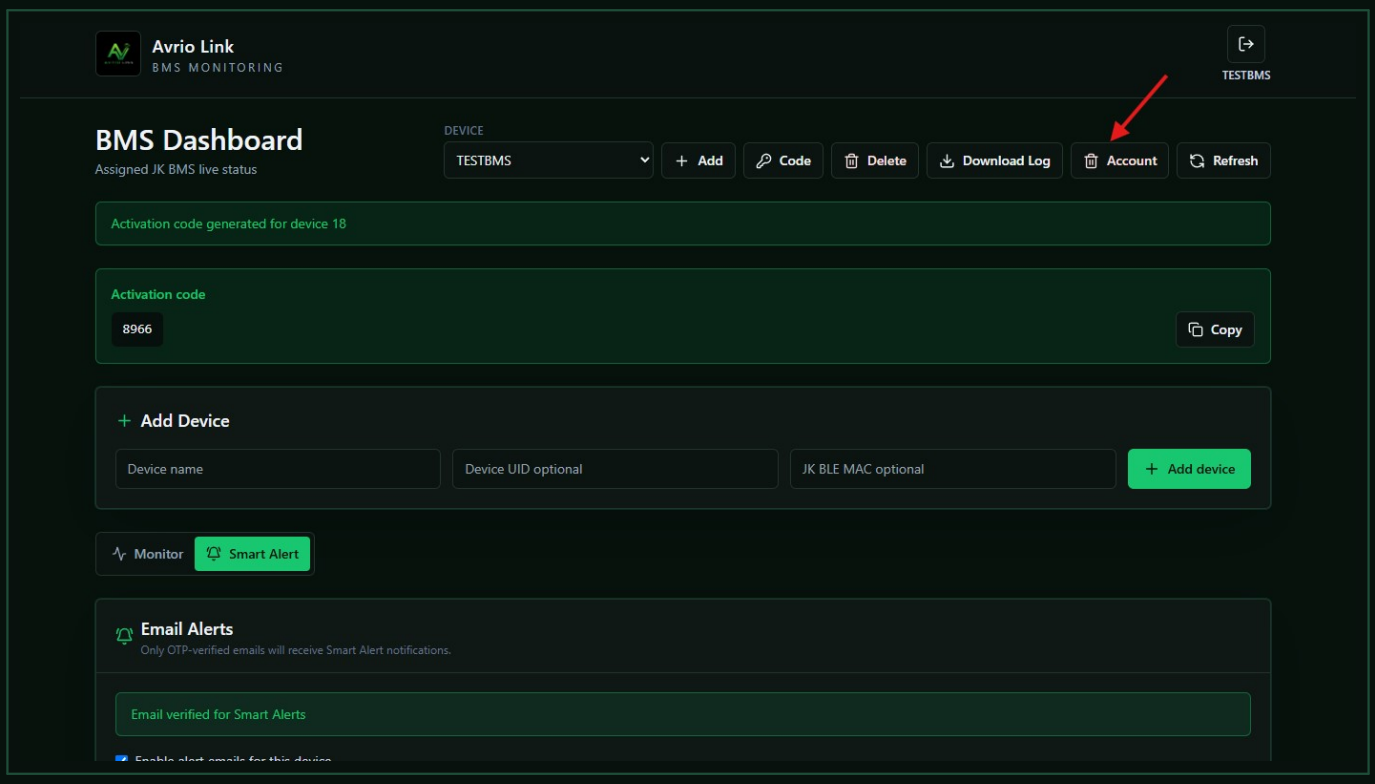

Figure 43. Delete account fully

Step 44: Enter account password

Enter the account password and click Delete my account.

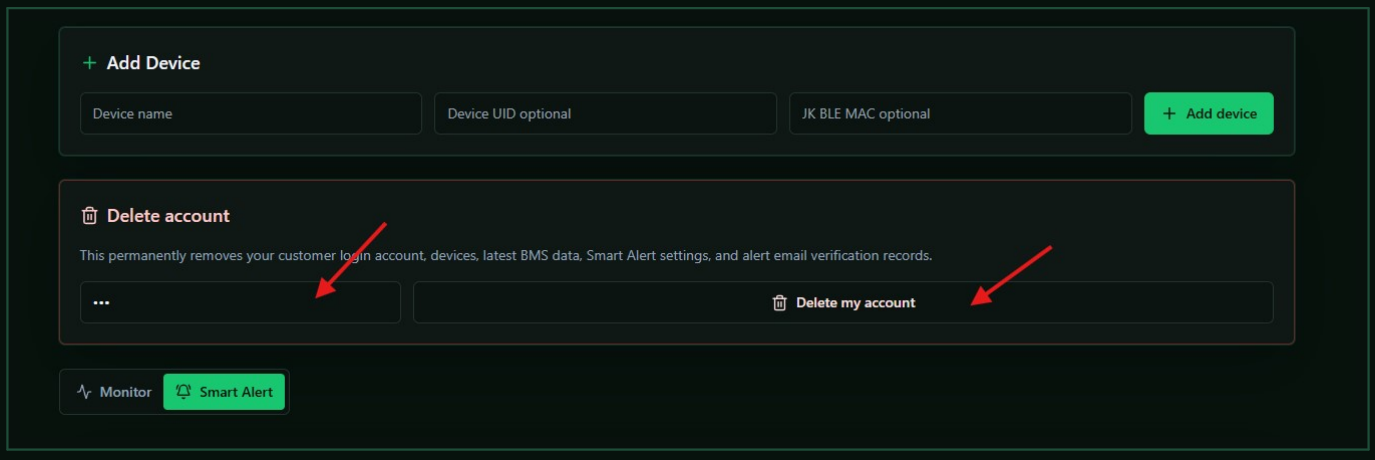

Figure 44. Put account password and click on the delete button to delete account fully

Step 45: Confirm account deletion

Confirm the final popup. This removes the customer account and related customer data.

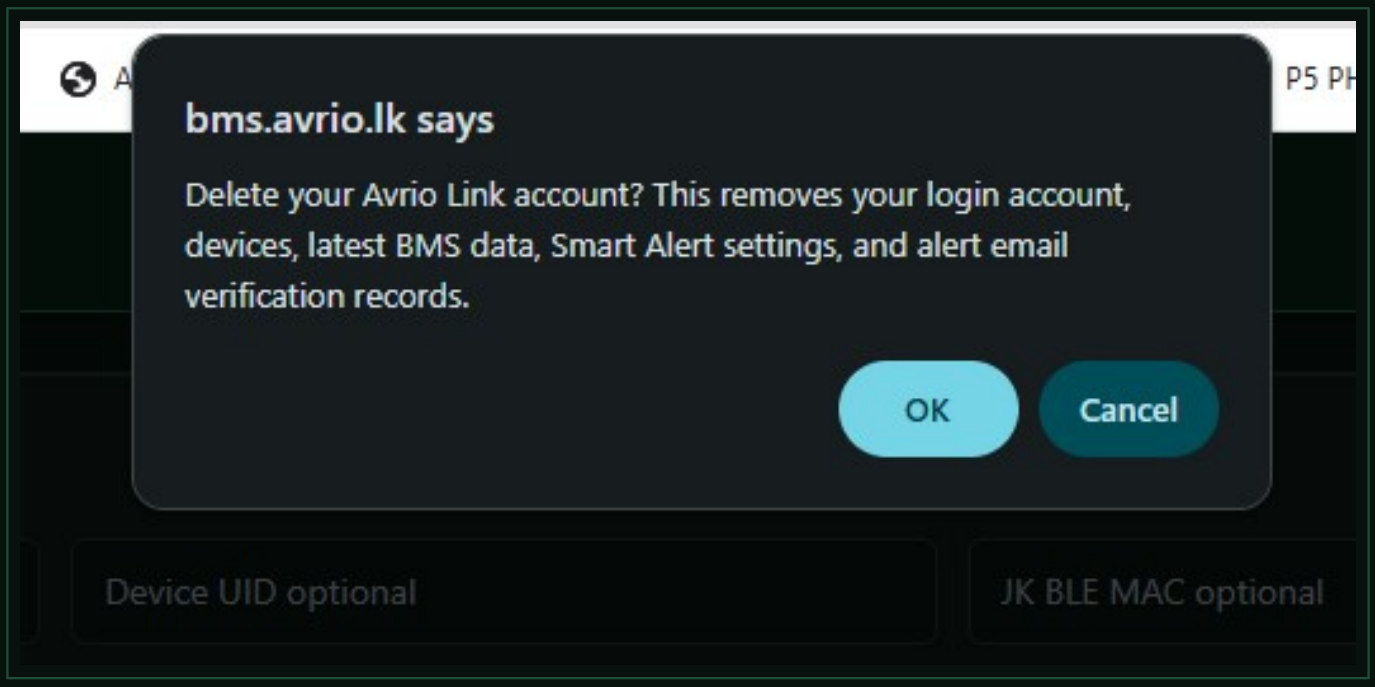

Figure 45. Popup confirmation to account deletion

9. Hard Reset Avrio Link

Step 46: Hard Reset

For Avrio Link hard reset:

Power on the Avrio Link device.

Wait around 5-10 seconds until the firmware is running.

Press and hold the ESP32 BOOT button.

Keep holding for about 5-15 seconds.

Release the button.

The device should clear saved settings and restart.

After restart, it should create the setup hotspot again:

Important: press BOOT after the device has started. If you hold BOOT while plugging in power, the ESP32 may enter flashing mode instead of clearing settings.

Figure 46. Avrio Link Hard Reset Button Hole

Troubleshooting Checklist

Issue	What to check
Cannot open setup portal	Confirm the phone/computer is connected to the Avrio Link setup hotspot and open http://192.168.4.1.
WiFi test fails	Check the WiFi password, router range, and whether the router allows 2.4 GHz IoT devices.
BLE scan does not show BMS	Close the phone BMS app, turn phone Bluetooth off if needed, keep Avrio Link close to the BMS, and scan again.
Pairing fails	Confirm the BMS pairing PIN. Default is usually 1234 unless changed by the user.
Cloud test fails	Confirm internet access, activation code, and API URL. Default production API should normally be used.
Dashboard offline	Check Avrio Link power, WiFi signal, BMS BLE connection, and wait for the next live data update.
Smart Alert email not verified	Send OTP again, check spam/junk folder, and enter the latest OTP before it expires.

Support

For support, contact Avrio Technologies at info@avrio.lk.

Status Light And Fault Diagnosis

Use the ESP32 blue status LED to identify setup, normal operation, Bluetooth/BMS faults, WiFi faults, cloud upload faults, and recovery activity without opening the serial monitor.

Question	Current implementation
Does Avrio Link send live data when BLE/BMS is disconnected?	No. If fresh BMS data is not available, telemetry upload is skipped. The dashboard becomes Offline after the latest data timestamp becomes stale.
Does it keep local logs?	Yes. Firmware records important boot, WiFi, BLE, cloud, OTA, and recovery events in the device event log and serial output.
Does it send a separate heartbeat/error log to cloud?	Not in this firmware phase. Cloud receives BMS telemetry when fresh BMS data is available. A future firmware can add a small heartbeat/error endpoint.

LED Pattern Reference

State	LED pattern	Meaning / action
Boot	Fast blink: 100 ms ON / 100 ms OFF	Firmware is starting. This should last only briefly.
Setup portal	Continuous blink: 500 ms ON / 500 ms OFF	Setup hotspot is active. Connect to AVRIO-BMS-SETUP and open 192.168.4.1.
Normal monitoring	Short heartbeat: 60 ms flash every 5 seconds	WiFi, BLE, BMS data, and cloud upload are healthy.
Data transfer pulse	Triple quick flash for about 1.2 seconds	Latest BMS data was sent successfully to cloud.
WiFi error	Slow blink: 700 ms ON / 700 ms OFF	Saved WiFi is not connected. Check 2.4 GHz WiFi, password, router range, or setup again.
BMS waiting	One short flash every 2 seconds	Bluetooth is connected, but Avrio Link is waiting for fresh live BMS data. Close phone BMS app and keep device near BMS.
BLE/BMS error	Two short flashes every 1.4 seconds	Bluetooth/BMS is disconnected or no useful BMS data is received. Check BMS power, distance, pairing PIN, selected MAC, and phone app connection.
Cloud error	Three short flashes every 1.7 seconds	BMS data is available but cloud upload failed. Check internet, router, backend availability, or activation/API key.
Recovery / OTA	Very fast blink: 60 ms ON / 60 ms OFF	Firmware is reconnecting WiFi/BLE, applying OTA, or performing recovery. Do not power off during OTA.

Recommended Field Check When BMS Data Stops

1. Confirm the phone BMS app is fully closed and phone Bluetooth is not holding the BMS connection.

2. Keep Avrio Link within short Bluetooth range of the BMS and avoid placing it behind metal or high-current cables.

3. Watch the LED pattern: two short flashes means BLE/BMS issue; three short flashes means cloud upload issue.

4. If setup is needed, hold the BOOT button during power-up to enter setup mode, then reselect WiFi, BMS MAC, pairing PIN, and activation code.

5. If the LED stops blinking completely for a long period, power cycle the device and check firmware/watchdog status in the dashboard.

Note: Avrio Link supports 2.4 GHz WiFi only. It will not connect to 5 GHz-only WiFi networks.