EBMX Battery Troubleshooting Guide

Classification: Open document for Dealers and Customers

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Procedure Document Authorisation

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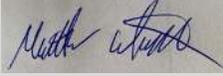
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1.0	Final	29-Nov-22	M. Wauters	Final version for distribution

1   Document Objective

This document has been created to assist EBMX customers with troubleshooting EBMX batteries for SurRon and Talaria bikes using the ANT BMS and Apple devices (Android devices can also be used but you will need to be sent the .APK file for the app as it cannot be downloaded on the google play store).

The key areas explained in this document are:

- Battery layout and features
- Opening the app and connecting to your battery
- Battery errors and troubleshooting

Use the table of contents as a guide to quickly find the section of this document relevant your needs.

2   Battery layout and features

The layout, shape and size of EBMX batteries vary across the range of 60v and 72v batteries, however many of the features are the same. Please see the pictures below to help you locate the key features of your battery:

Voltage and charge % display – Used on the SruRon batteries only; this display will show the battery voltage and % charge remaining. To turn it on, press the button and cycle throught the options (% charge, voltage, off).

BMS Wakeup Button – All batteries are shipped from the factory with the BMS in hibernation mode to ensure the BMS does not draw down on the charge during long transport times. To wake your battery up when using for the first time, press and hold this button for 2-3 seconds, until you hear it beep, then release.

Charge port – This is where you will connect your charger to charge the battery. All EBMX 60v batteries use 3 pin plugs and are compatible with OEM chargers and aftermarket EBMX fast chargers. All 72v batteries use 4 pin plugs and are designed to work with EBMX chargers.

Serial Number – The battery serial number is a unique number given to each battery. It will be used when registering for warranty and will need to be referenced when contacting your dealer for assistance.

SurRon 72v42Ah & 60v53Ah

Charge port

BMS wakeup button

Voltage & charge % display

Serial Number

SurRon 72v57Ah & 60v65Ah

Voltage & charge % display

BMS wakeup button

Charge port

Serial Number

Talaria 72v42Ah & 60v53Ah

Talaria 72v57Ah & 60v65Ah

Serial Number

Charge port

BMS wakeup button

3 Opening the App and connecting to your battery

You will need to find the ANT BMS APP on the Apple App store by searching for "ANT BMS". You will see the ANT BMS app show up (see screenshot below)
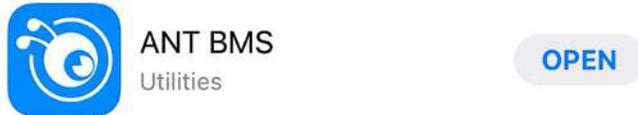
The app is free to download and install on your apple device.

Ensure you have "bluetooth" and "location services" turned on, on the device you are using to connect to the battery, if you do not, you will not be able to connect.

Open the app and you will see the screen in the pic below. There is no need to create a login, the only icon you want to click on is the "bluetooth" icon.
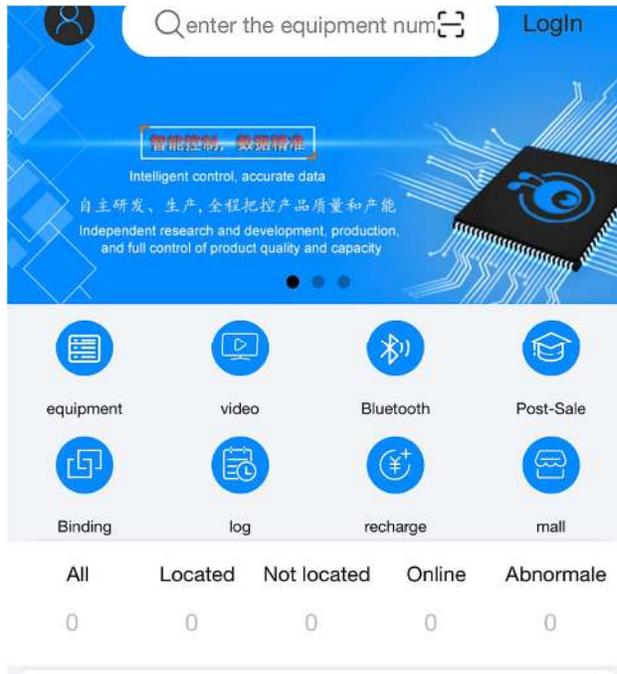
The app will then start searching for Bluetooth signatures near by, your battery BMS should be one of these. The name of the Bluetooth signature for your battery will start with "ANT-BLE....." and will end with the last 4 digits of the serial number of your battery. Find your battery Bluetooth signature on the list, click to highlight and then press the "confirm" button on the screen.
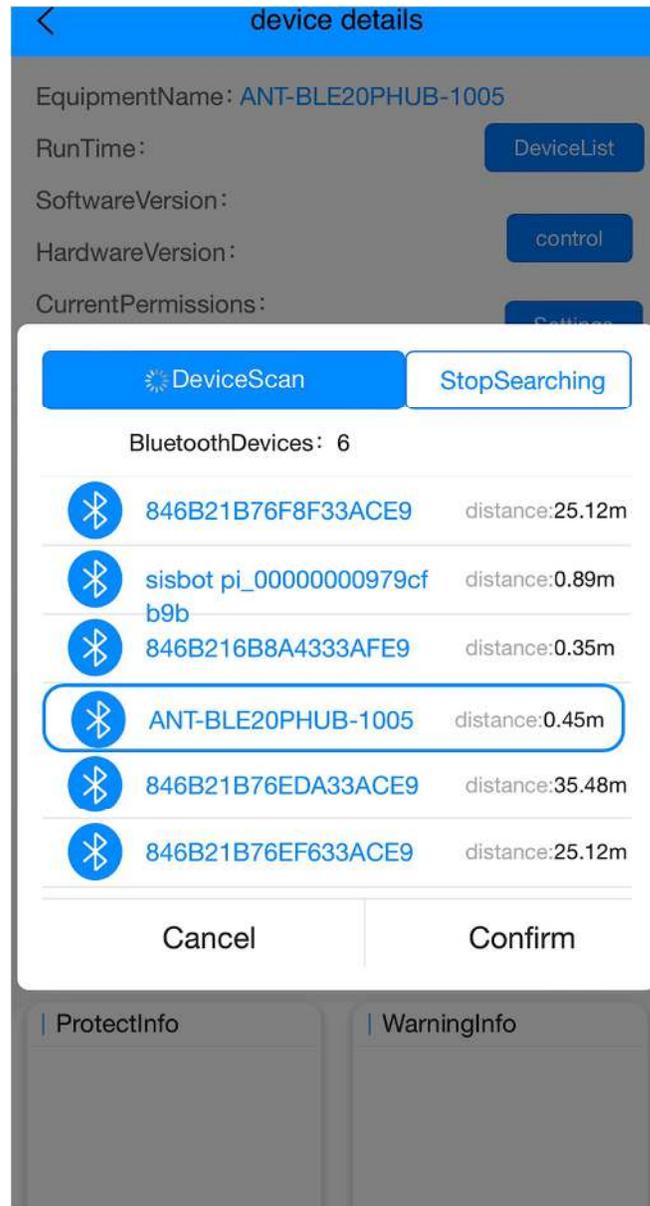
3.1 ANT BMS App Home Screen and battery info overview

If you have connected correctly, you will see a screen very similar to the one in the picture below. This is the main home screen for the ANT BMS app. From this screen you will have access to all of the relevant information about your battery, each cell and the status of the charge and discharge side of the BMS.

If there is an issue or error with your battery, this will be shown in the "WarningInfo" section and most likely your ChargeMOS and/or DisMOS status will have changed from Open (working) to Off, or it will list the error currently being experienced. The ChargeMOS is the charging side of the BMS and the DisMOS is the discharge side of the BMS.

3.2 Warning before making changes to your BMS

If the BMS is in a state or error, it is always best to contact the dealer you bought the battery from and provide the two screenshots as shown above.

Warning! Making changes to your BMS without consent / instruction from your local EBMX Dealer may void the warranty on your battery. Please do not proceed until you are given instructions to do so.

4 Changing Authority level in BMS App

Before any changes can be made in the BMS app you must first gain the required Authority level within the app. To do this, you will need to click on "BMS Control" and then at the top click on the "Authority" icon.
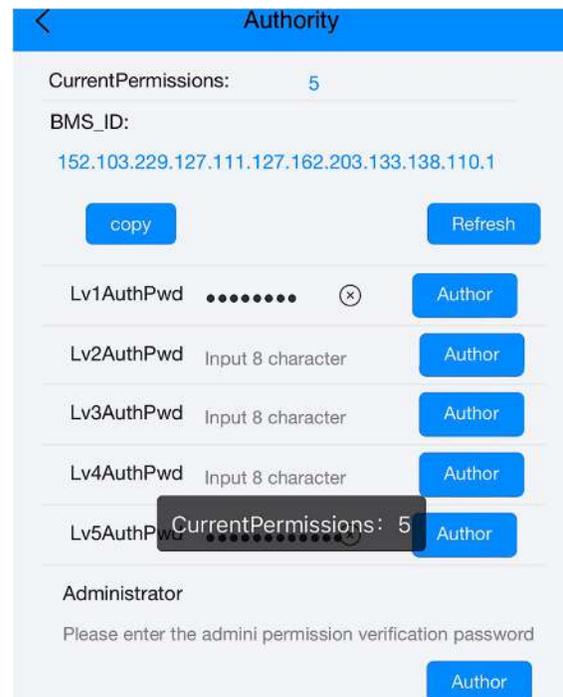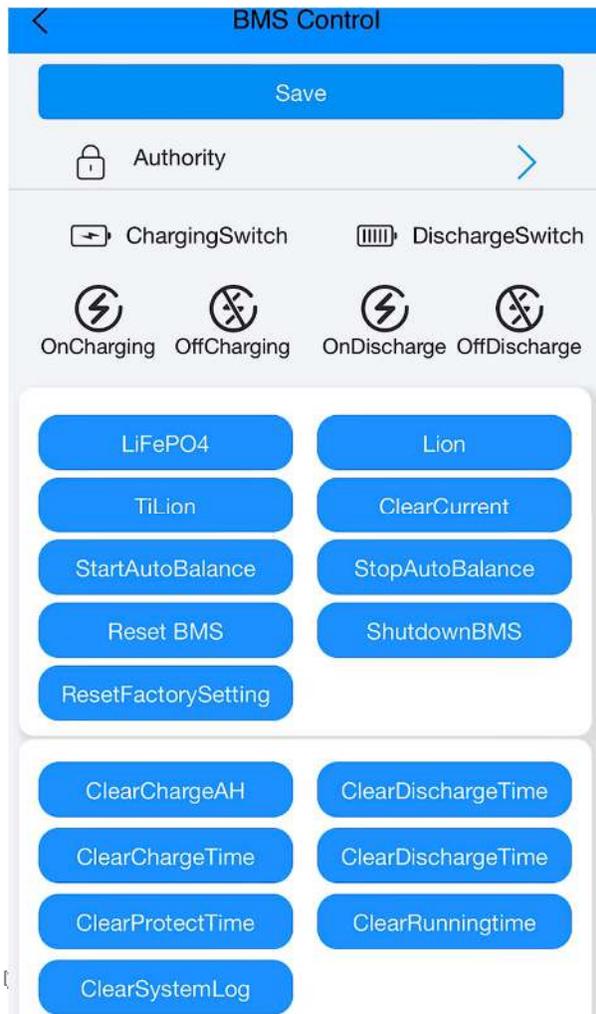
The level 5 Authority level password is:

123456789abc

Once the password is entered you must click "Author" and then you should see the CurrentPermissions level change from 1 to 5. You are now able to make changes to the BMS

Once you have gained level 5 permissions, you will be able to change just about every setting in the BMS. If this permission is misused by changing settings you have not been explicitly instructed to change, you could damage your BMS and battery cells. Your battery will not be covered by warranty if you do this.

5   Troubleshooting common errors

If your battery is not working, reference section 3.1 of this document to find the likely cause of the issue.

5.1   Unable to connect to ANT BMS APP

There are several likely reasons why you may not be able to connect to the ANT BMS APP, please try each of the suggestions below:

5.1.1   Incorrect Phone Settings

You must ensure you have both the "Bluetooth" and "Location Services" enabled on your device to be able to connect to the ANT BMS APP.

5.1.2   Battery display not lighting up

Is your battery new? Have you pressed and held the BMS wakeup button on the side of the case?

If your battery display is not lighting up when you press the button (SurRon batteries) then your battery might be at a low level of charge and it may have gone into protection mode. To be able to get into the BMS settings and make the changes required, you may need to jump start your battery. The best way to do this is using a SurRon or Talaria bike with another battery that is functioning. Put the functioning battery into the bike and turn the air switch on for 20 seconds, then turn the switch off and disconnect, this will pre charge the controller and leave a little power in the system. Then, plug in the battery that is not working and flip the air switch on. You should see the battery display light up for a second and you should be able to connect via the app.

Depending on the type of charger you have, you may also be able to play with plugging in and unplugging the charger to get some power into the battery, however with high powered chargers, they often require seeing voltage from the battery to then give power for charging. If there is a low cell/cells and the BMS has shut off, this will not register and the charger will not work.

5.2 Error: CellLowProtect

This error can happen if a battery is left at a low state or charge for an extended period of time and the cells fall below the pre determined safe levels for discharge. The first thing to check are the cell voltages on the home screen of the app. Inspect the voltages to ensure the cells that are low are not below 2.400 volts (if they are, please contact your EBMX dealer and you will need to be remotely helped as the process to recover these cells is complex).

If the low cells are above 2.400v then the following process can be used to get the battery charging and get the cell voltages back to normal values.

Enter BMS Settings tab → ensure you have permission set to level 5 → click on Volt Params and then go down to the four values (for low cell protection) show below:

Change each of these values to 2.400v by typing 2.4 into the blank box then hitting the "setting" button next to it → once all four values have been changed, go to the top of the page and click "save".

Now, plug your battery into a charger and it should start charging.

Go back to the home screen of the app and watch the cell voltages start to climb up and once all cells are at 3.000v or above, you will need to go back into the same settings you changed before and reset them to the values shown in the screenshot above, do not for get to click the "save" button to lock in these changes.

Be sure to always store your battery around 50-60% if you are leaving it for a long time such as a winter season (a couple of months) and check on it every couple of weeks to ensure the % is not dropping too low, charge up a little if needed.

5.3 Error: Short Circuit

If the (+) and (-) terminals are accidentally joined you will notice a large spark and loud bang, then your battery will appear dead (this could also happen from a short located anywhere in the power leads, not just at the plug). The battery has shut off the DisMOS (Discharge Mosfets) to protect itsself. You first must make sure you know why the short happened (so it won't happen again) and then you can reset your battery BMS and it should clear the error.

To reset the BMS you must follow the process described below:

Enter BMS Control tab → ensure you have permission set to level 5 → click on reset BMS

You will hear the BMS beep and then it will reset itself.

5.4 Error: ChgMOSError

This is a charge mosfet error. This could have happened due to a surge in mains power or some other type or electrical surge in the system. The best thing to do is reset the BMS.

To reset the BMS you must follow the process described below:

Enter BMS Control tab → ensure you have permission set to level 5 → click on reset BMS

You will hear the BMS beep and then it will reset itself.

5.5 Error: CellDiffProtect

Somehow one of the cells in your battery has not balanced with the rest quick enough and this has caused an error. To get the pack re-balanced we will need to manually enable the "auto balance" feature in the BMS Control tab.

To start the Auto Balance feature, you must follow the process described below:

Enter BMS Control tab → ensure you have permission set to level 5 → click on Start Auto Balance

This may take some time for the cell to be balanced so give it a few hours or overnight. Then try charging the battery fully.