

# PowerBox BT Manual

Created by Kenneth Nilsen

Email: [Kennethnilsen69@gmail.com](mailto:Kennethnilsen69@gmail.com)

Made in Norway



## What is an intelligent PowerBox BT and how does it work:

An intelligent PowerBox is a tuning box made for the Renault Twizy, which can increase your Twizys power (Torque) from 55Nm up to 100Nm. This is an increase of 82%!

In addition to being a tuning box, it also has a Bluetooth interface so you can connect to your smart phone. You use the app to perform the tuning and various configurations if you want a little more out of the tuning. It also comes with a remote control for easy use without an app.

## What can the intelligent PowerBox BT do?

1. It automatically tunes the car according to the engine temperature (in Auto mode).
2. You can choose between Light Tuning, Medium Tuning, and Max Power Tuning or set it back to the default factory setup. You can even convert a T80 to a T45 if you wish.
3. You can choose between Auto mode and Manual mode.
4. You can choose from 3 different driving profiles: ECO, Normal and Sport, even while you are driving.

5. Turn on or off regeneration while driving.
6. You can choose how much regeneration you want in the Regen Setup menu.
7. You can adjust how high it should charge the battery. For example, if you charge only 90% SOC then the battery will last much longer.
8. The PowerBox also provides additional battery protection by monitoring its temperature.
9. Powerbox BT is designed for use with a Smart phone or tablet. everything happens via the app but also simple things can do with the remote control.
10. The PowerBox can show you various detailed status information about the battery.

The PowerBox is a smart tuning box that can tune your Twizy to its maximum in a safe way.

In Auto mode, it sets the profile to Sport when the engine temperature is between 0 to 89 degrees.

If the engine becomes 90 degrees, it automatically switches to Normal and if the engine reaches 100 degrees it switches down to ECO, which is basically the same mode as an original, un-tuned Twizy uses.

The motor temperature must drop below 80 degrees before it switches back to Normal and it must drop below 70 degrees before it switches back to Sport.

The Twizy motor should be able to withstand temperatures up to 160 degrees, so the PowerBox is keeping your motor temperature well below the maximum range.

In Manual mode, choose between ECO, Normal or Sport by pressing button A, B or C on the remote control. As an added security, the PowerBox will always adjust the profile automatically if the engine gets too warm, just like it does in Auto mode. This is done to prevent your engine from overheating.

In Manual mode though, you have to switch up to a higher profile yourself once the engine has cooled down below the temperature limits.

### **The remote controls**

The PowerBox comes with one remote control. The remote control is a universal control that have a learning function and must be programmed before use. Kenneth will do this for you.

The remote controls have four buttons: A, B, C and D to control the PowerBox.

### **The remote control button features are:**

Button A has one function:

1. Press the A button shortly to switch to the ECO profile when using the Manual mode.

Button B has one function:

1. Press button B shortly to switch to the normal profile when using the Manual mode.

Button C has one function:

1. Press button C shortly to switch to the Sport profile when using the Manual mode.

Button D has two functions:

1. Press the D button shortly to switch regeneration ON or OFF
2. Hold button D for five seconds to switch between Auto and Manual Mode

The button functions can be changed by future firmware updates ☺

## **Installing the app**

At present time, the app is not available via Google store so it must be manually installed. First you need to allow of third party apps on your phone/tablet.

The procedure can vary slightly on the different phones. if you have problems then goggle "allow of third party apps" for your phone brand.

How to enabling installation of third party apps on an Android™-based smartphone:

Go to Settings on your phone and switch to the "general" tab, if needed.

Tap on the "Security" option.

Tick the checkbox next to the "Unknown Sources" option.

Confirm the warning message by tapping on "OK".

Now you can download the app [here](#)

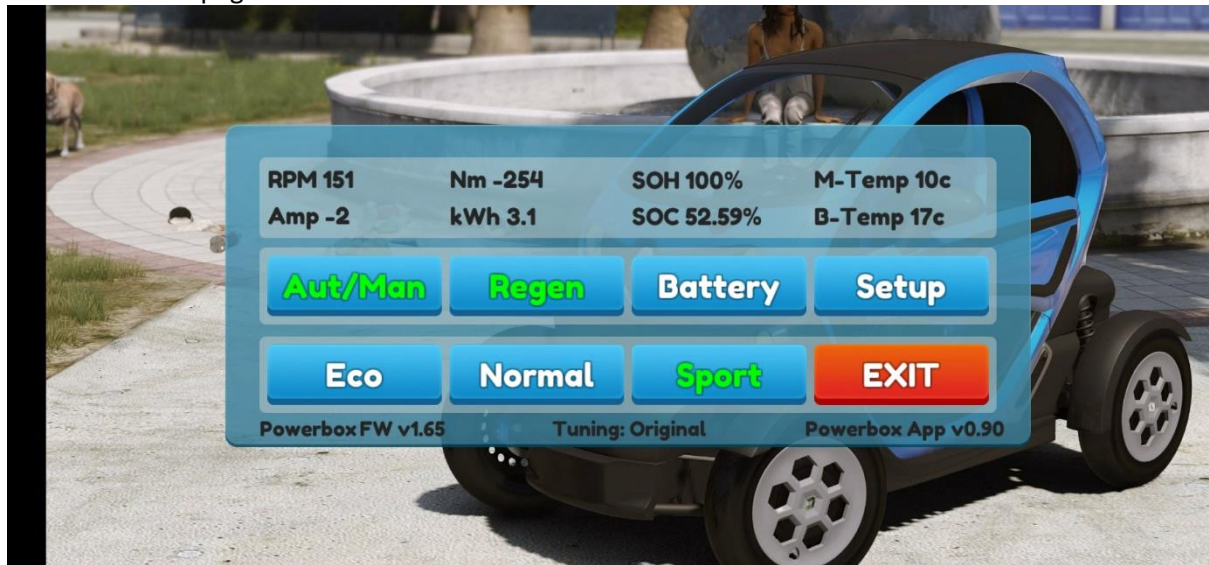
The easiest way is to use your phone to download the app. then it will be easier to install since you do not have to transfer it from your PC to the phone first.

If app install does not start automatically then you will usually find the app in your download folder.

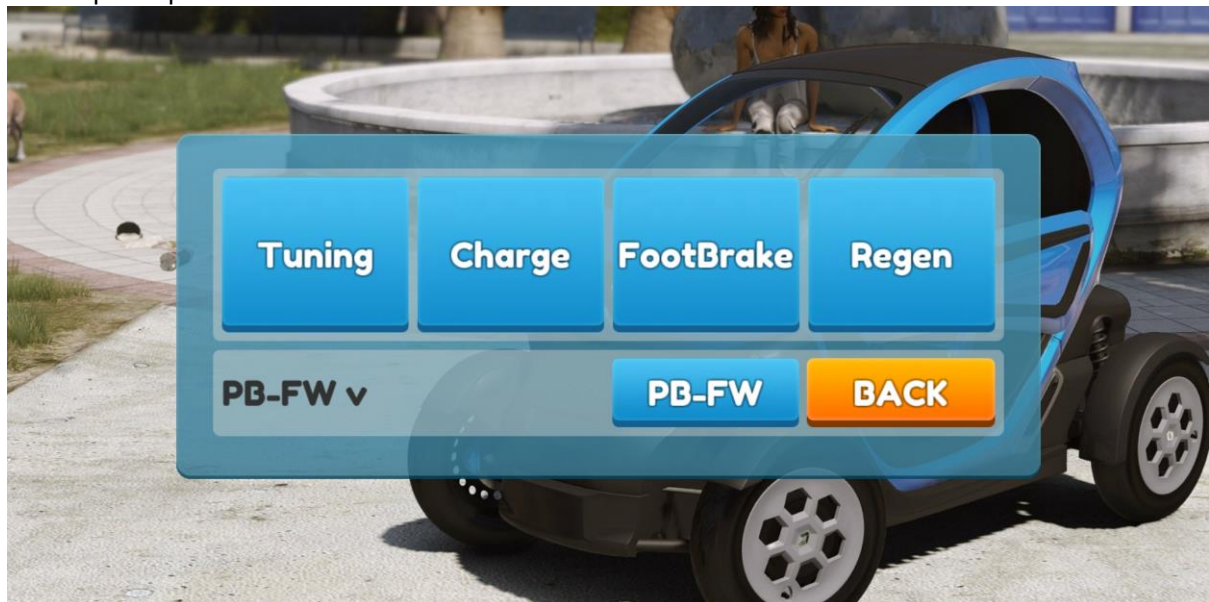
### Tuning the car for the first time:

Turn the ignition key to the ON position, then plug the OBD2 connector into diagnostic port which can be found in left glove compartment.

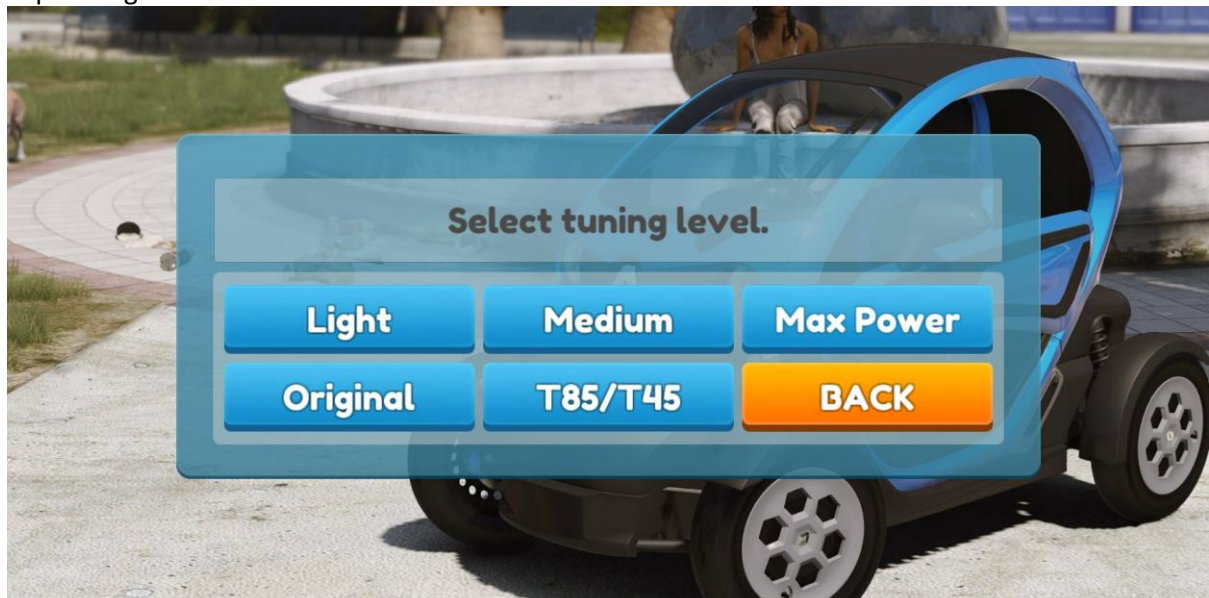
Now start the Twizy Powerbox app and it will automatically search for Powerbox and connect. This is the Main page.



Now tap Setup



Tap Tuning



Now select the desired tuning option and wait for it to finish when it is completely done you will get the text "Exit Tuning Menu" tap Back and Back until you are

back on the Main page.

**Important! When done, turn the ignition key off and on again.**

**You are now ready to drive.**

Some info on the Main page.

meaning of color on the buttons text:

Green Rain = Regeneration ON Red Rain = Regeneration OFF

Green Aut / Man = Auto Mode Red = Manual Mode

Green ECO, Normal or Sport = Active. White = deactive.

B-Temp = Battery temperature

M-Temp = Motor temperature

You can only select the ECO, Normal and Sport driving profiles when in Manual Mode. In Auto Mode, Powerbox selects the best choice in terms of temperatures

### **Tune your Twizy without app**

It is also possible to tune your Twizy without an app by only using the remote control. You can choose between Medium, MaxPower and Original Tuning.

How it is done:

1. Switch OFF the PowerBox with the switch on the Y cable.
2. Start your Twizy.
3. Turn ON the PowerBox.
4. When all 3 LEDs light up, hold down the red D button and hold it until all three lights up again and then release the button.
5. Now the red and yellow diode flashes and you are now in the Tuning Menu.

The button functions in Tuning Menu are:

A = Medium Tuning

B = maxPower Tuning

C = Original Tuning

D = Exit Tuning Menu

6. Select the desired tuning option and wait until the red and yellow diode goes off.

7. Turn OFF and ON the ignition key and you are ready to drive.

PS: If you select original tuning then the diodes will not turn off because the PowerBox must be disconnected after a reset.

Just wait until the Service lamp disappears and you can disconnect the Power Box. Then OFF and ON with the ignition key and you are ready to drive

### Setup Menu:

Here you can adjust:

(Charge button) How much you want it to charge main battery. Default value 100

(FootBrake button) How much footBrake regeneration. Default value 250

(Regen Button) How Much Regeneration at Neutral Braking. Default value 181

Regen Button = Neutral regeneration.

Here you see the Regen value in per mille. The default value is 181 per mille, which equals 18.1%.

Enter a value between 0001 to 1000

FootBrake Button = FootBrake regeneration.

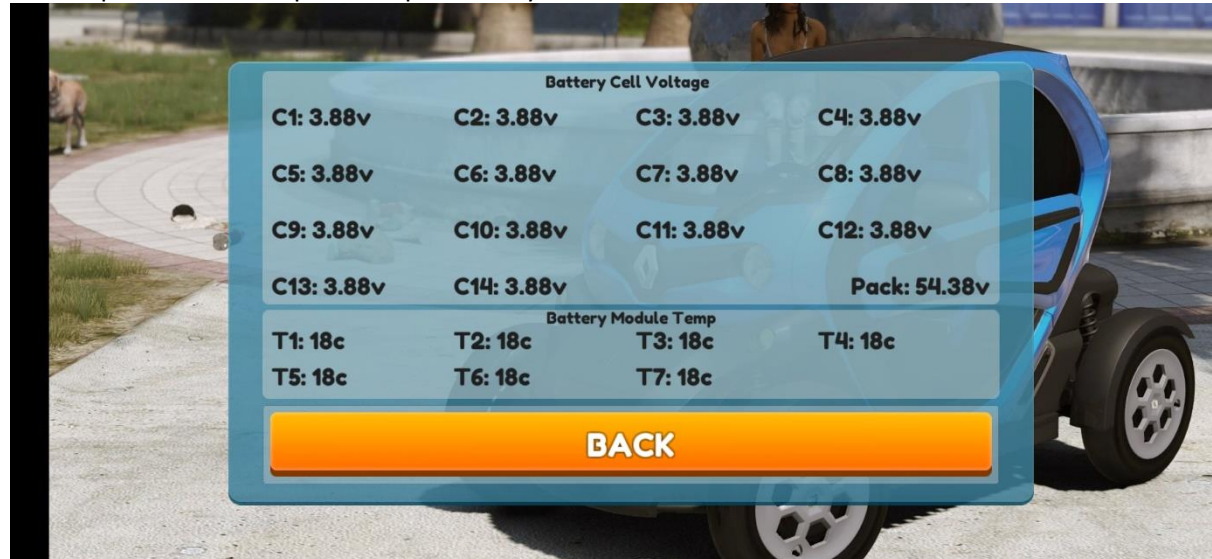
Here you see Regen value in per mille, default value is 251 per mille which is the same as 25.1%.

Enter a value between 0001 to 1000

### Battery Menu:

Here we could read out a lot of info from the battery.

As Volt per cell and temperature per battery bank. Here it will come much more later.



### Tuning Menu:

Here you choose which tuning power you want.

Light Tuning (Up to 80Nm)

Medium Tuning (Up to 90 Nm)

MaxPower Tuning (Up to 100Nm)

Original Tuning (This will reset your twizy to the original tuning)

T80 to T45 Tuning (This quotes a T80 to T45)



### **Should PowerBox always be connected?**

If you have selected Medium or Max Power tuning, it should always be connected. This is because the PowerBox must protect your motor against overheating. In addition, the BMS function should be on to enable the Regen reduction function.

If you have selected Light tuning, you can remove the PowerBox if desired.

If you do not use the car for several days, you should disconnect from the PowerBox or better, disconnect your 12v battery. If not, you risk draining the 12v battery. A 12v battery should never fall below 10.5 volts, because it might damage it.

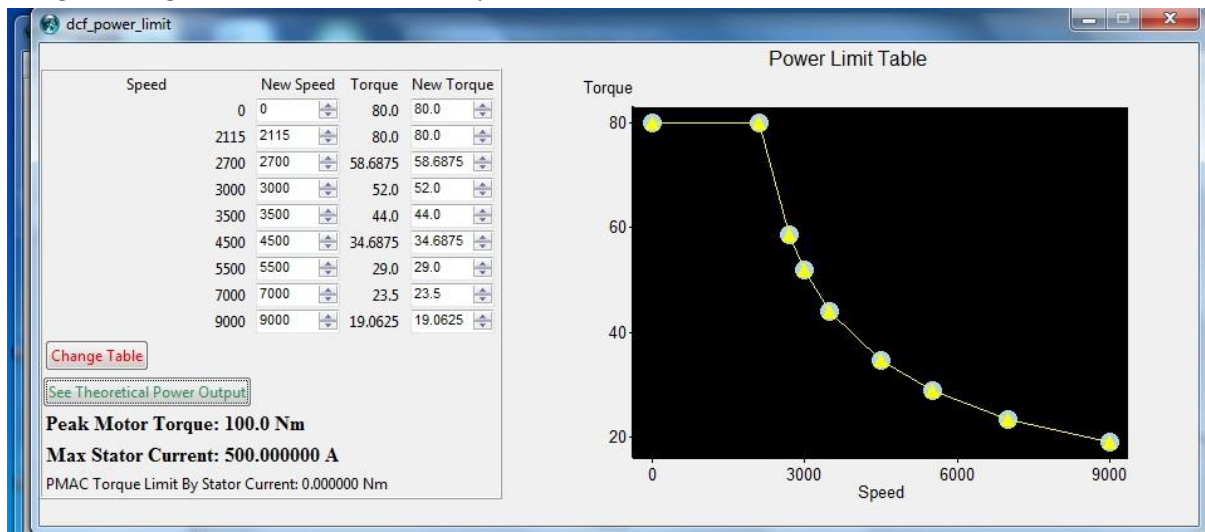
The PowerBox BT uses approximately 100mA in standby which will be about 2.4 amps a day.

### **So what is the difference between the three tuning options Light, Medium and Max Power tuning?**

The biggest difference between the three tuning options is the torque (Nm) from 0-70 km/h. Above 70 km/h they are all the same and they all have a top speed of max 115 km/h. On flat roads, a realistic speed is between 95 to 105km/h depending on the wind force and direction.

### Light Tuning Power Map:

In Light tuning mode the maximum torque set to 80Nm.



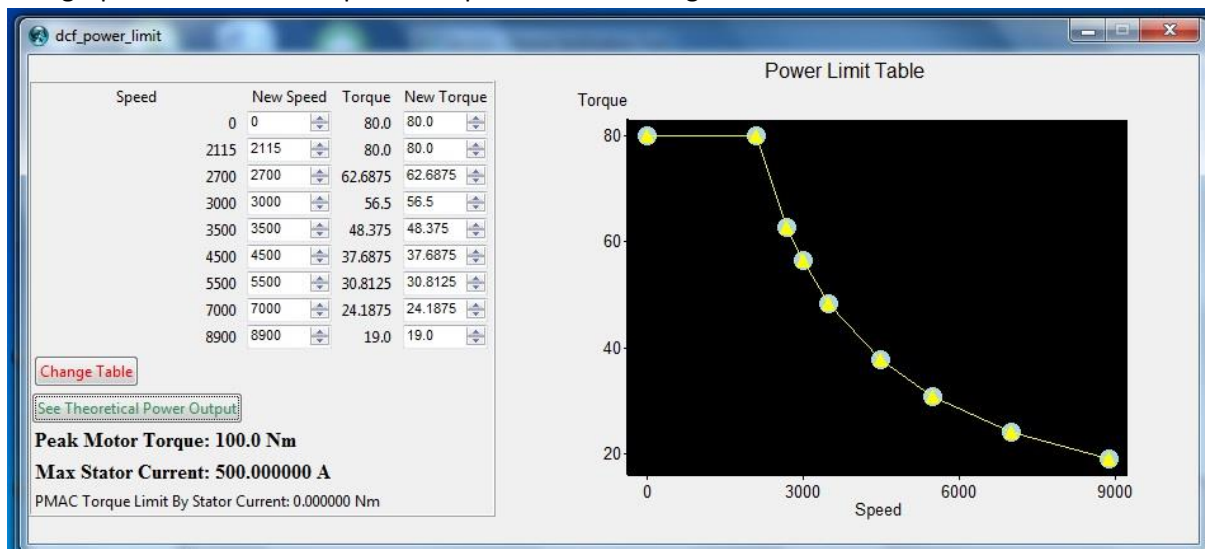
### Medium Tuning Power Map:

In Medium tuning mode the maximum torque set to 90Nm.

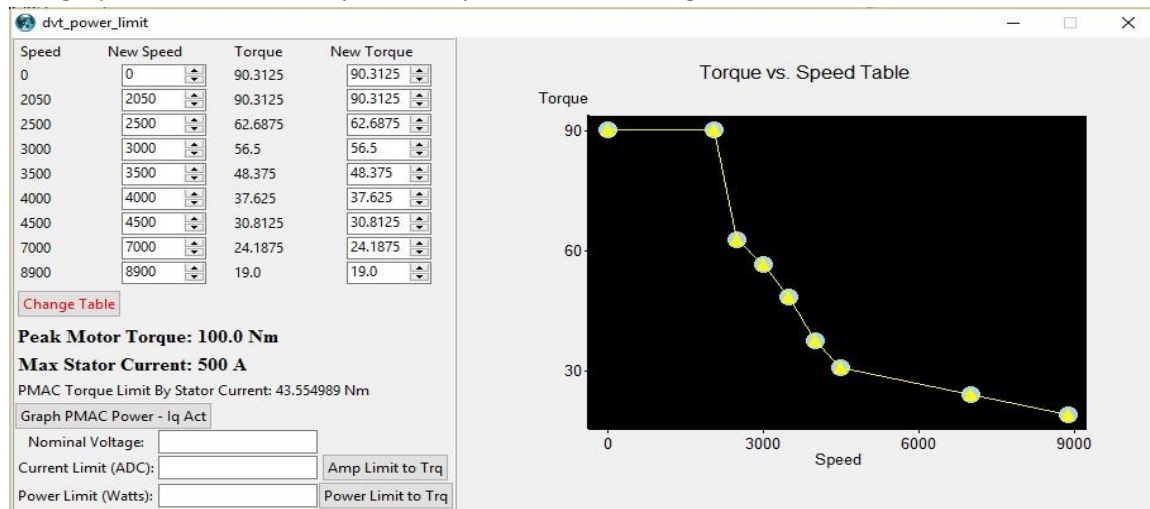
With this setup you may occasionally get a STOP notification on your Twizy screen from the BMS controller included in the battery pack. This will happen when the engine starts to get a little warm, but not dangerously warm.

When the engine temperature rises above 70 degrees, you will be able to draw almost 500 Amp in this tuning mode and because the battery has to deliver more than 450 Amp, it sends out a STOP alert. You can safely ignore this warning.

This graph shows the 80Nm power map in Medium tuning:



This graph shows the 90Nm power map in Medium tuning:

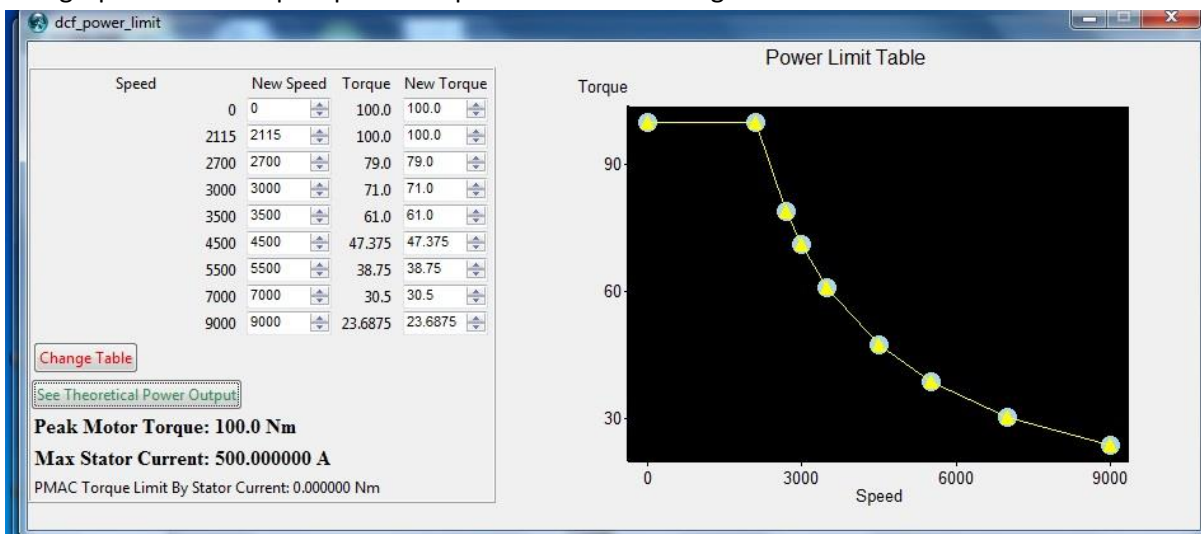


### Max Power Tuning Power Map:

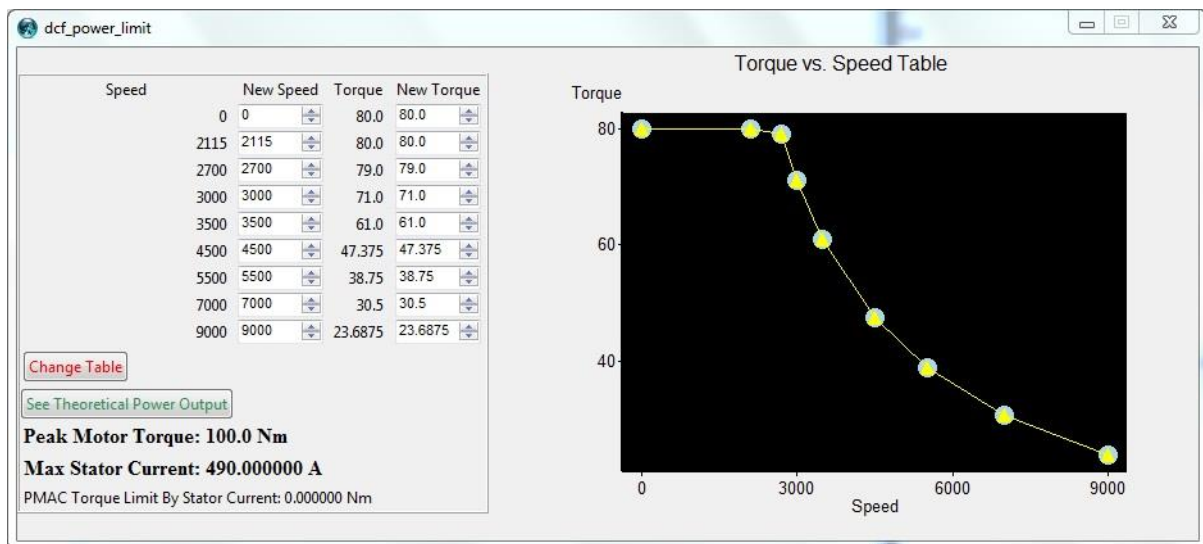
In the Max Power tuning mode the maximum torque is 100Nm, so you will always get a STOP alert when you give full throttle from standstill or low rpm. The Twizy uses all the power it has got and the engine can easily reach 90 degrees. Watch the temperature and drive carefully when it switches down to the Normal profile.

The Normal profile in this tuning mode is more powerful than the one in the Medium and Light mode, so you can easily drive the engine up to 100 degrees, in which case the PowerBox will switch back to the ECO profile.

This graph shows the Sport power map in Max Power tuning.



This graph shows the Normal power map in Max Power Tuning.



### Firmware update for Powerbox BT

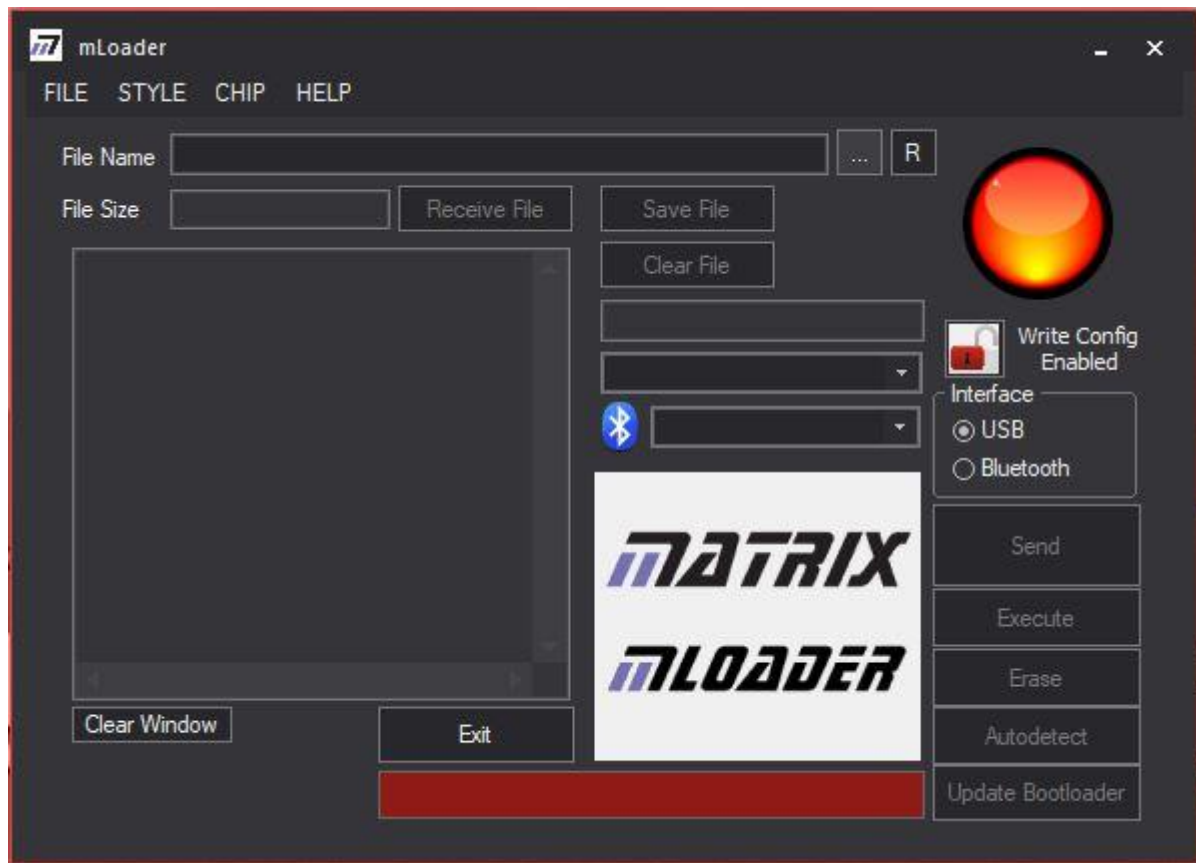
1. Start by removing the rubber lid on the Power Box (The newer BTs do not have a rubber lid and switch and can jump directly to 3.)



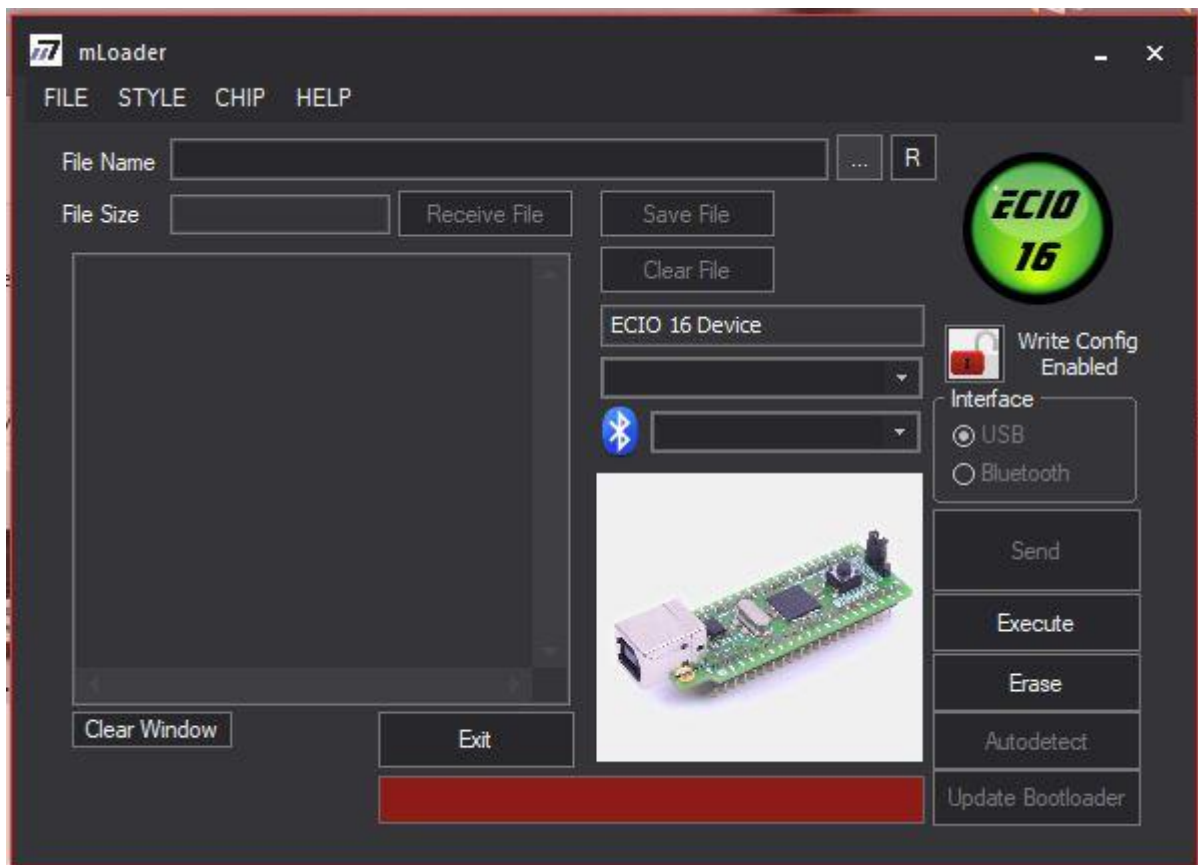
2. Here you will find a slide switch (move it over to USB)



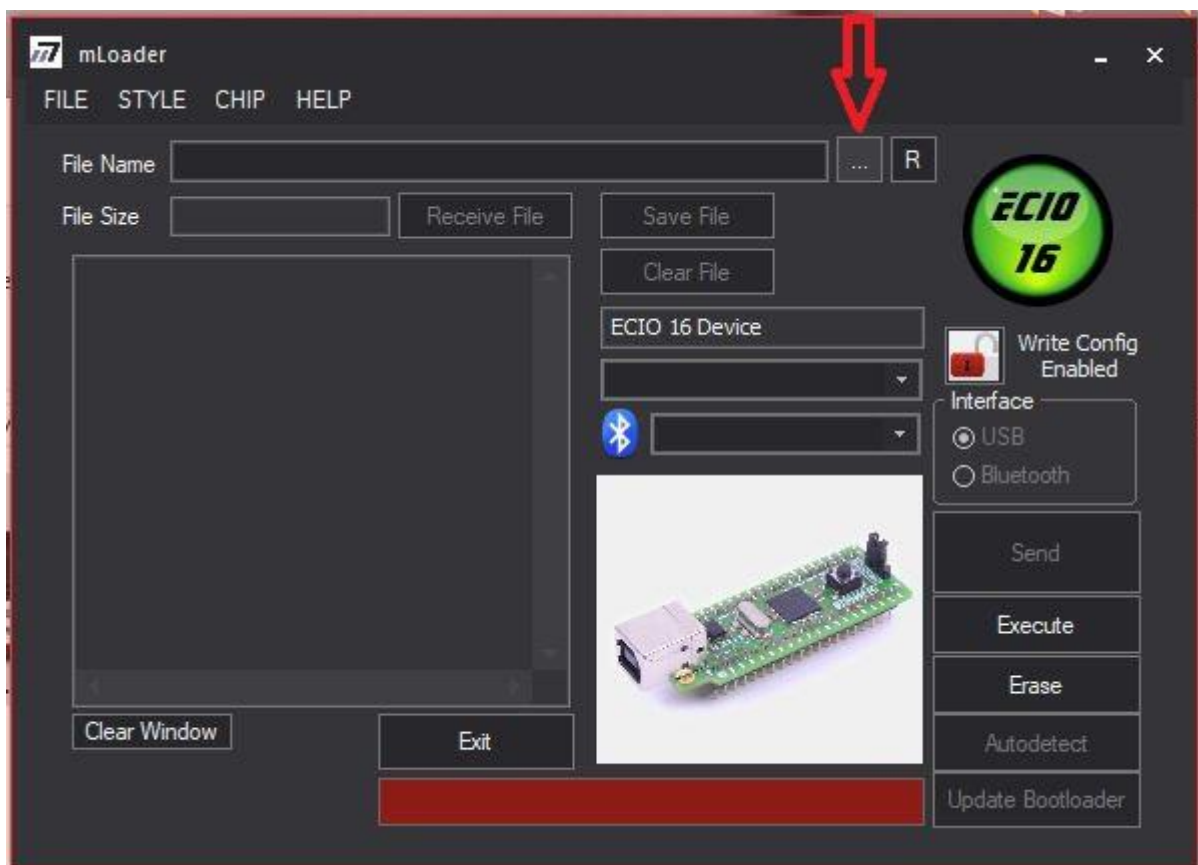
3. Start now mLoader ([mLoader can be downloaded here](#)) ([or here](#))  mLoader.exe

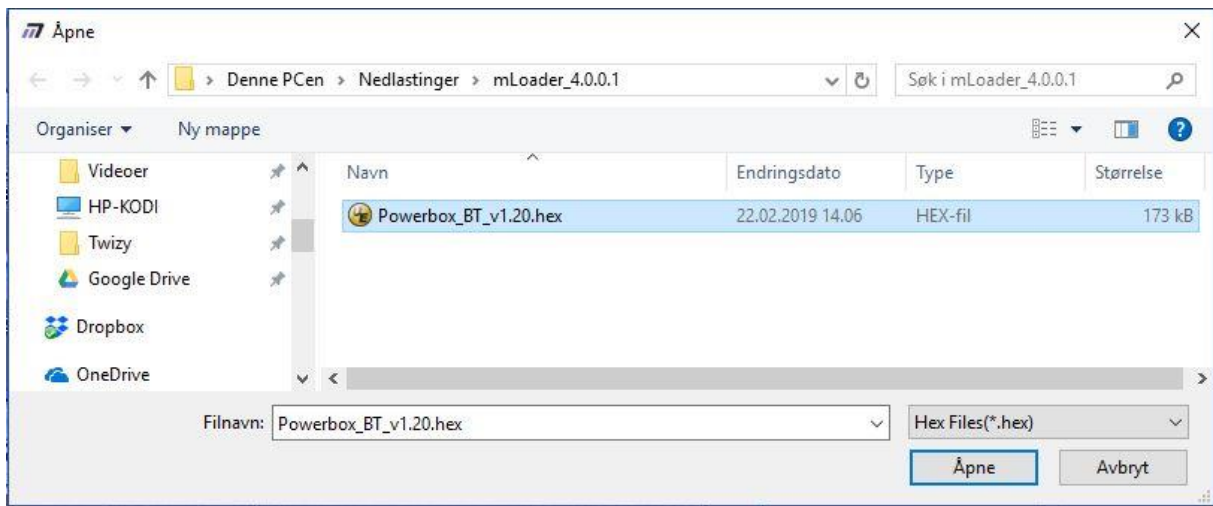


Now you can connect the USB cable to an available USB port on your computer and the PowerBox. It will now automatically find the Power Box like this.

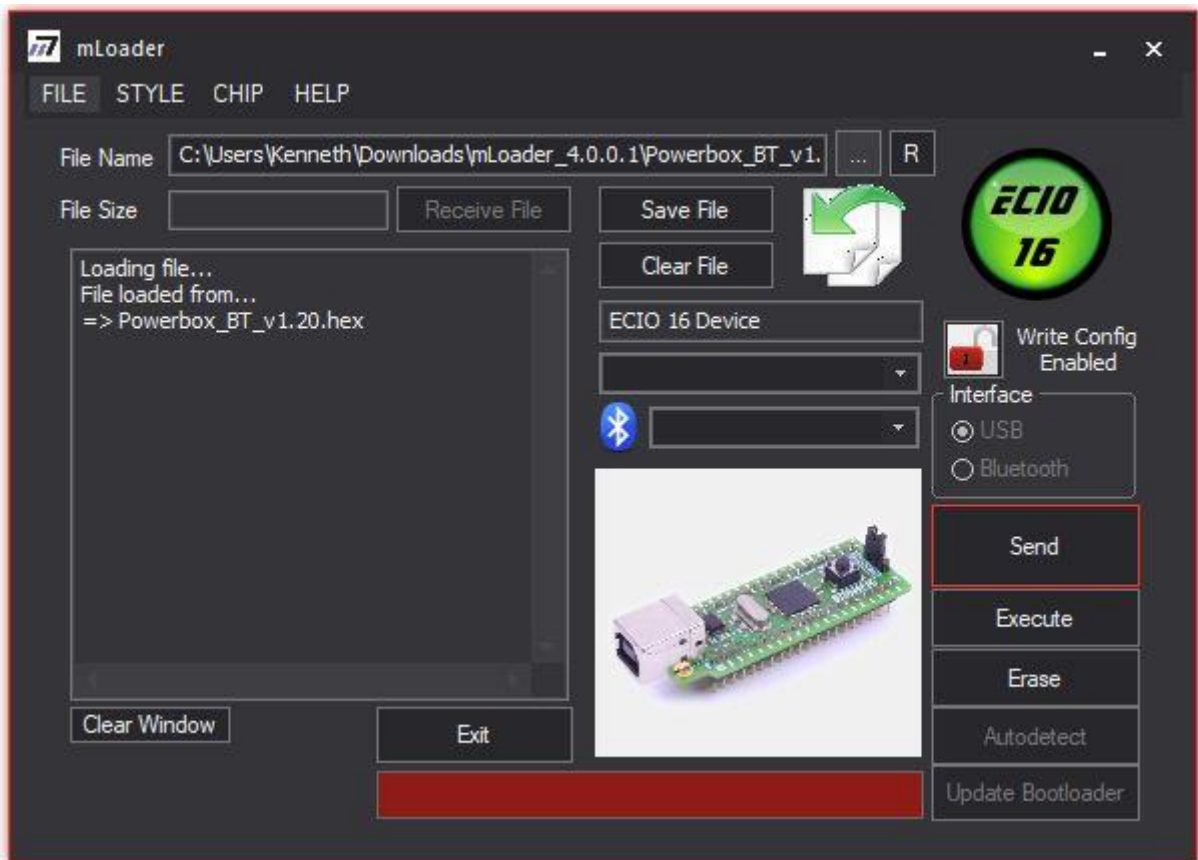


Press this button  to retrieve the hex file



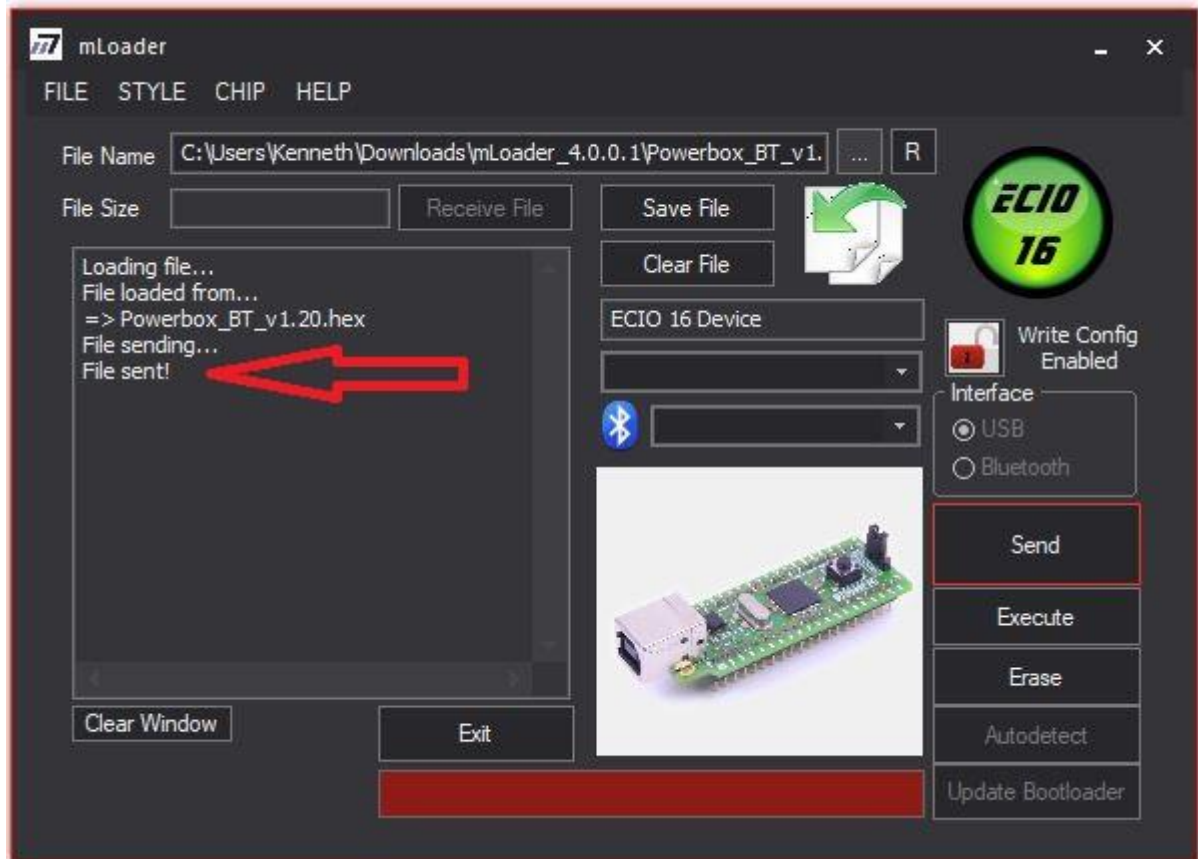


It should now look like this



Now press the Send button

If it was successfully sent then you will get the message File Sent! In the text window.



Press Exit.

Now move the slide switch back to the EXT position and set the rubber lid back on.



You are now done.