ADDING SLAVE BATTERY MODULE TO FOX ENERGY CUBE

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Procedure to follow for adding one or more slave battery units to existing Fox Energy cube battery system:

Fig 1.

Before you make a start, make sure you have your gloves, standard size screw driver, and a mini screw driver to change dip switch position ready.

Important: Make sure you have your battery roughly at around 50-60% charged.

Depending on your existing setup your system should look like the one pictured in Fig1 here.

This document shows the upgrade of ECS2900 cube as that's the one I have. The procedure is same for both ECS2900 and ECS4100 cube systems.

Disclaimer: This document is only to help people with enough skills to do the job. If in doubt, please stop and get the job done by a qualified professional.

Fig 2. Existing connections before the upgrade is done. (Battery terminals, CAN network cable and Earth cable)

Fig 3. Existing module setup before the upgrade is done. (Battery Master and Slave module(S))

As shown above I have one master and one slave module in my system, your system probably would have more number of slaves, but the procedure is same for adding new slave(s).

Fig 4. My new Slave battery module.

Let us now proceed with the upgrade process. Follow the steps below:

Step 1. The first step is to force stop inverter

Navigate to Settings menu. To navigate press the down arrow to ‘settings’ then enter right arrow (Enter button) , input 0000 for password by pressing right arrow four times.

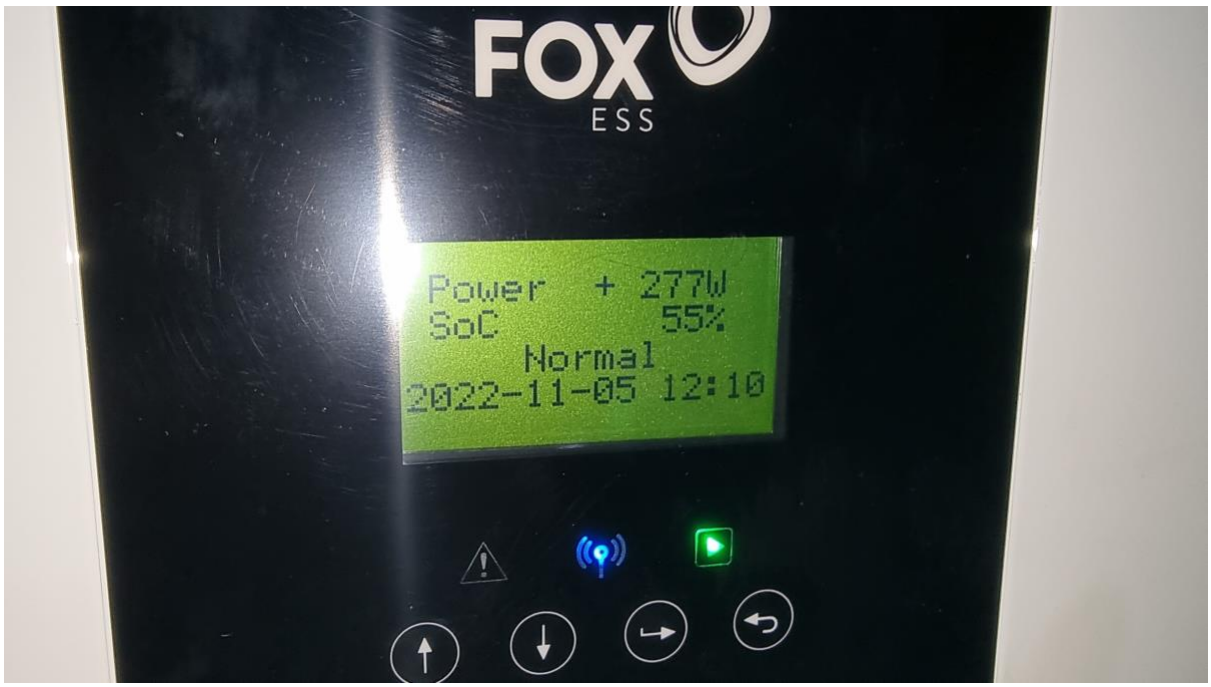

Fig 5. The default display before the upgrade, SoC at 55%.

Fig 6. Settings menu with Start/Stop option.

The screen should look like the one in Fig6. Now press enter (right arrow) to go into options and select ‘Stop’ as shown in Fig7.

Fig 7. Stop option in ‘Start/Stop’ menu.

Fig 8. Confirm Stop screen.

Once you select Stop option, the above screen will appear. Confirm again by pressing enter.

Fig 9. The success screen for stop action.

You should now see the above message as shown in Fig 9. Once you exit to the master screen, the screen should display the inverter mode as ‘Off Mode’ as shown in the Fig 10 below.

Fig 10. Display showing Power at 0, mode as ‘Off Mode’.

Step 2. Turn off PV (DC)

For this step please turn off the isolator switch(es) for your PV setting. There might be one or more depending on your inverter model, I have one on the inverter as shown in the picture below.

Fig 11. PV isolator switch to ‘Off’

Step 3. Turn off AC

Turn off your AC connections, this might mean more than one Isolator and a breaker switch in your consumer unit.

Fig 12. AC isolator switch next to the inverter to ‘Off’ position.

Fig 13. Breaker switch to ‘Off’ position.

Fig 14. Isolator switch next to consumer unit to ‘Off’ position.

Step 4. Turn off Battery module

On the main module there is a power switch and a breaker switch as shown below. Press and release power switch which should result in shutting down of the BMS and your inverter display should now be completely blank confirming no power in the setup. Go ahead and also throw the breaker switch to ‘Off’ position.

Fig 15. Location of ‘Power’ button, and unscrew the protective cap to locate DC breaker switch as above. Turn both of these off, you should see no LEDs lighting up.

Step 5. Disconnect battery module

On the rear side of the master battery module you see three cables plugged in, disconnect these carefully, don't forget your gloves. The battery terminals can be pulled out easily if you manage to press the side tabs as shown in the image with arrows. Don't use force, these tabs are little difficult to access but very easy to press once you get to them. The CAN cable is like normal CAT cable and easy to un clip.

Fig16. Battery terminal clips and CAN cable ports.

Now proceed with removing the earth cable as shown below.

Fig 17. Unscrew the yellow earth cable from Master module.

Step 6. Remove mounting screws

There are two mounting screws on each module both Master and Slave. You only need to remove the two screws on the Master module. There is one screw in front as shown in the image below (Fig 18), and one to which the earth cable is normally connected (Fig 17).

Fig 18. Mounting screw located on the front side bottom left corner.

Step 7. Remove Master module

With the mounting screws and all cable connections removed, the top ‘Master’ module is free to remove, so carefully lift it up and place it in a secure place.

Fig 19. Master module separated.

Step 8. Add new Slave(s)

With Master module removed, the existing slave(s) are accessible as shown below.

Fig 20. Existing stack of Slave(s) before the upgrade.

Carefully lift the new slave modules off the packaging, and place them on top or existing Slave stack, make sure you align the black DC plugs and slowly lower down the modules. There is no chance you go wrong with these as they are designed to stack only one direction. Go ahead and add all new slave modules you have on top of existing stack. I have added only one slave module as shown below.

Fig 21. New slave module added to the existing stack of slave(s).

Step 9. Replace Master module on top

With all slave modules added, you can now replace the master module (BMS unit) on the top. As said before, be very gentle while lowering the module as these are quite heavy and might cause damage if handled rough. Final setup should look like one below. You can use this exercise to change the position or add any support for the cube as I did by placing a wooden plank below the stack.

Fig 22. All battery modules in place.

Step 10. Fix mounting screws

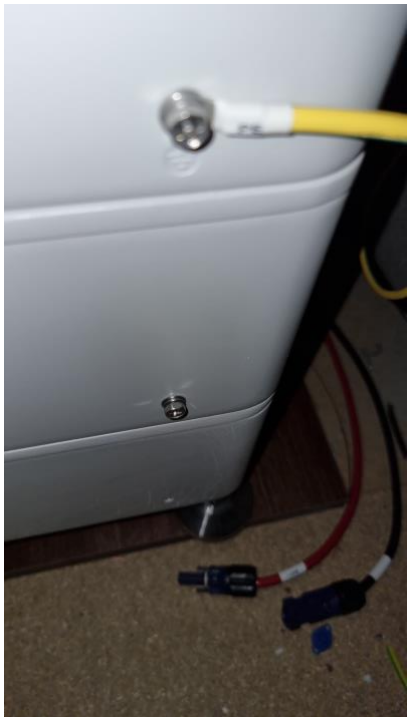

Fig 23. Mounting screw with Earth cable attached.

Now fix the mounting screws two for each slave you have added and two for the top Master module. Remember to attach the earth cable to the Master module mounting screw at the rear bottom right. Check Fig23.

The front mounting screws are to be fixed as well. Fig 24.

Fig 24. Mounting screws on the front bottom left corner of all modules.

Step 11. Set dip switch

Now change the dip switch to the number depending on the number of slave units you have added. In my case I have gone from one slave (Dip position 0) to two slaves (Dip position 1) as can be seen in the images below.

Fig 25. Dip switch position highlighted with red arrow before upgrade.

Fig 26. Dip switch position after the upgrade.

Step 12. Connect battery module

Make sure you connect both battery terminal cable plugs and also the CAN network cable firmly. There should be no slack.

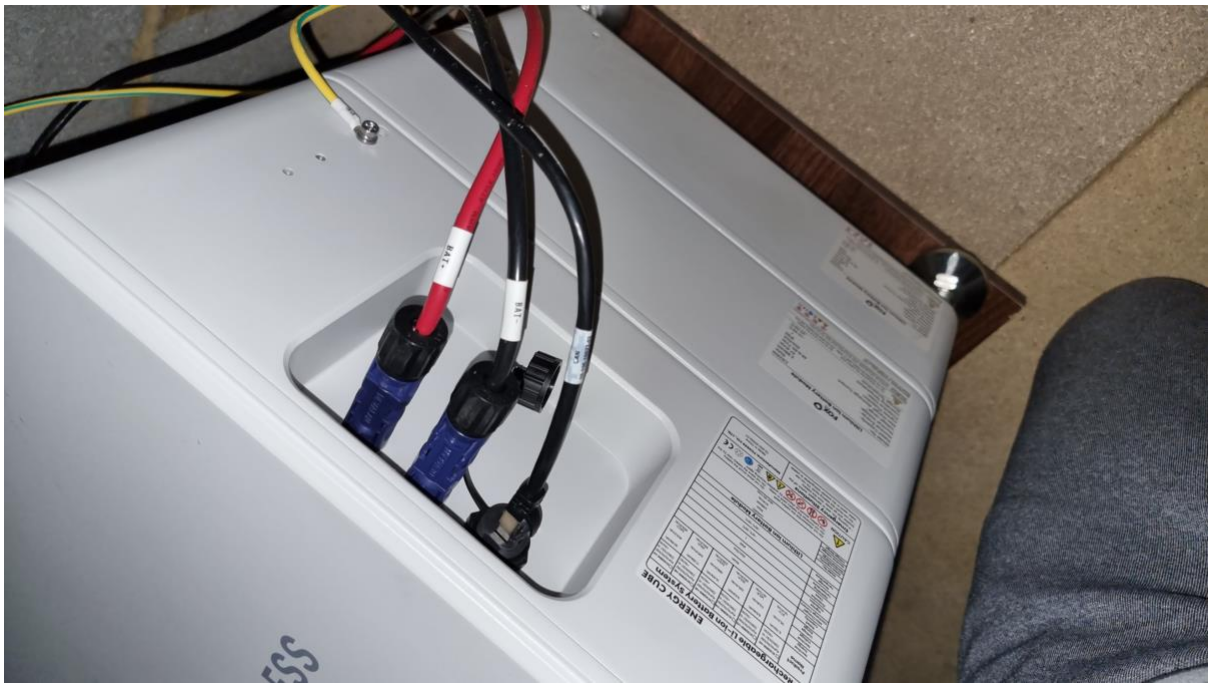
Fig 27. Re connect all cables to the battery module.

Step 13. Turn on PV (DC)

Turn on the PV (DC) isolation switch(es). In my case, one on the inverter as shown below.

Fig 28. Turn on the PV isolator switch.

Step 14. Turn on AC

Turn on your AC connections, this might mean more than one Isolator and a breaker switch in your consumer unit.

Fig 29. Breaker switch in consumer unit to ‘On’ position.

Fig 30. AC Isolator switch near the consumer unit to ‘On’ position.

Fig 31. AC Isolator switch near the inverter unit to ‘On’ position.

Step 15. Turn on Battery module

This is the crucial bit, we need to power on the battery module by switching on the breaker switch first and then by pressing the power switch. I got panicked when I heard intermittent beeps with all LEDs flashing green and red rapidly first and finally a solid beep with master battery module displaying red LEDs. The inverter also flashing red with error messages. Probably some cache from previous settings in BMS not accepting the new slave caused this. I did not start the inverter, and shut down the battery module by pressing the power button and switched off the breaker switch. Checked all connections once again and just did the power up of battery module after a minute. This time the LEDs flashed briefly with some beeps and then all good with battery module and slaves flashing green.

Fig 32. Battery module turned ‘On’.

Step 16. ‘Start’ the inverter.

Follow the same procedure as before and navigate to Start/Stop menu and select the ‘Start’ option as shown below.

Fig 33. Start/Stop menu with ‘Start’ option.

Fig 34. Screen showing successful start operation on the inverter.

Once you confirm ‘Start’ option, the inverter make a lot of ticking sounds and initiates the process of waking up the system, the progress is displayed on the screen with ‘Checking’ label displayed with ticking seconds count as shown below.

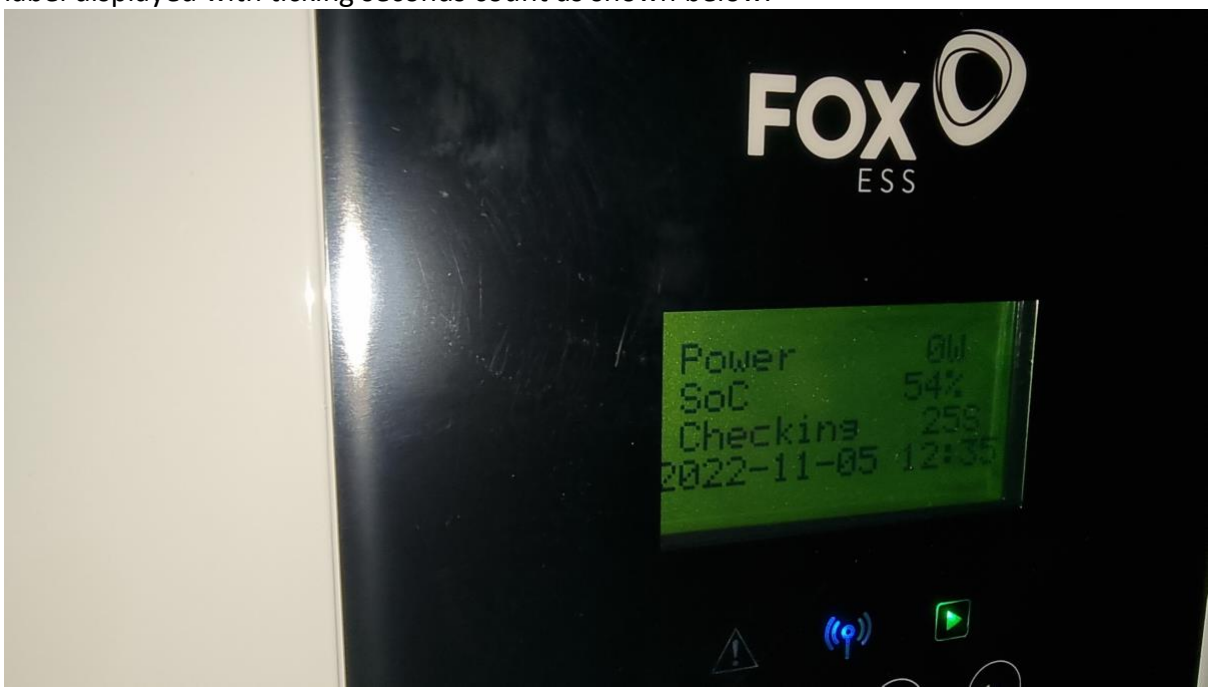

Fig 35. Inverter initialisation progress.

Once properly initialised, the inverter should display the standard default screen with ‘Normal’ status and green, blue LEDs flashing with no red warnings. Check image Fig 36

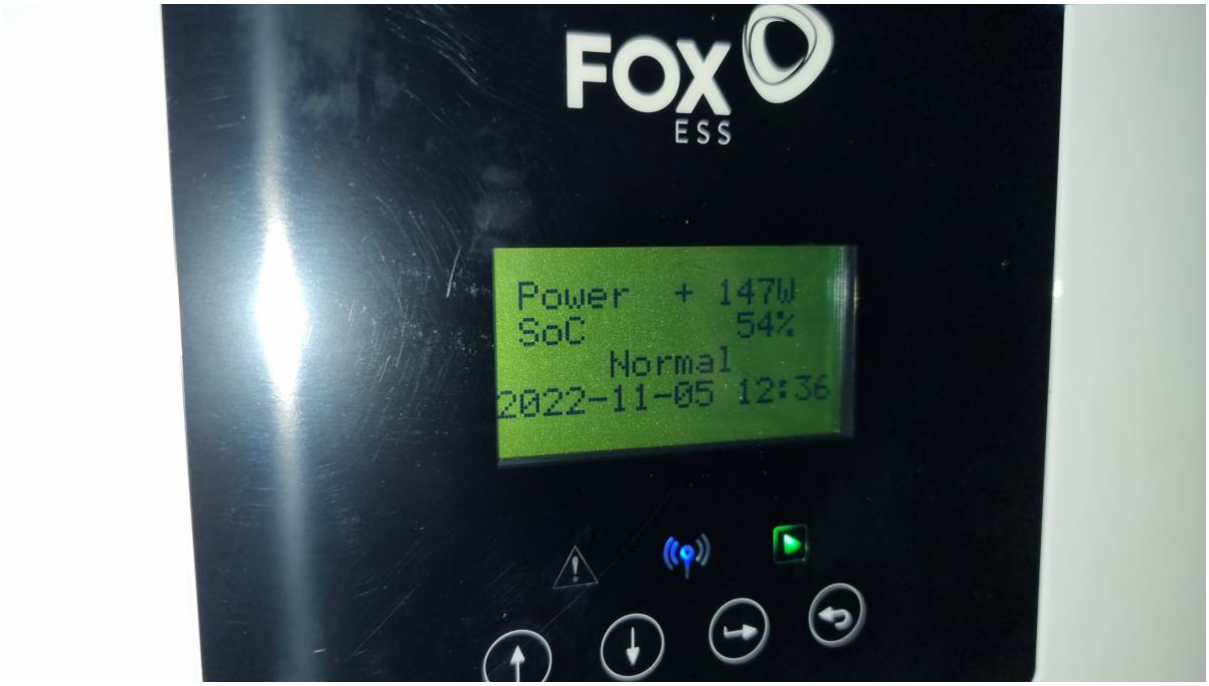

Fig 36. Inverter display with ‘Normal’ status and all stats displaying properly.

The battery module should now display the current charge by flashing green on the master module.

Fig 37. The battery module displaying 3 of the four LEDs flashing confirming the status of charge on the battery.

The final setup should look like the one I have here.

Congratulations, you have successfully upgraded your Energy cube with more storage power, Enjoy…

Just to confirm, check you see the voltage updated in the app or Fox ESS cloud. As you can see, after upgrade, I have 178.40v of battery power.

Fig 38. Final setup after upgrade.

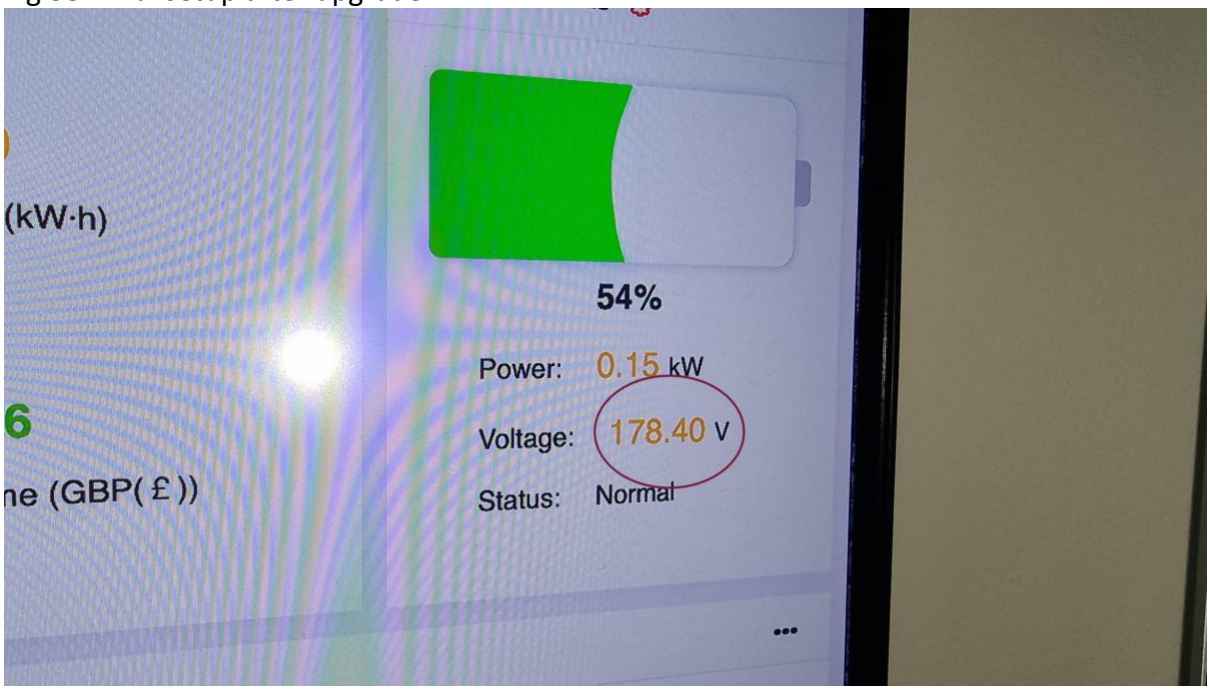

Fig 39. Battery voltage reflecting the new added slave(s) capacity.