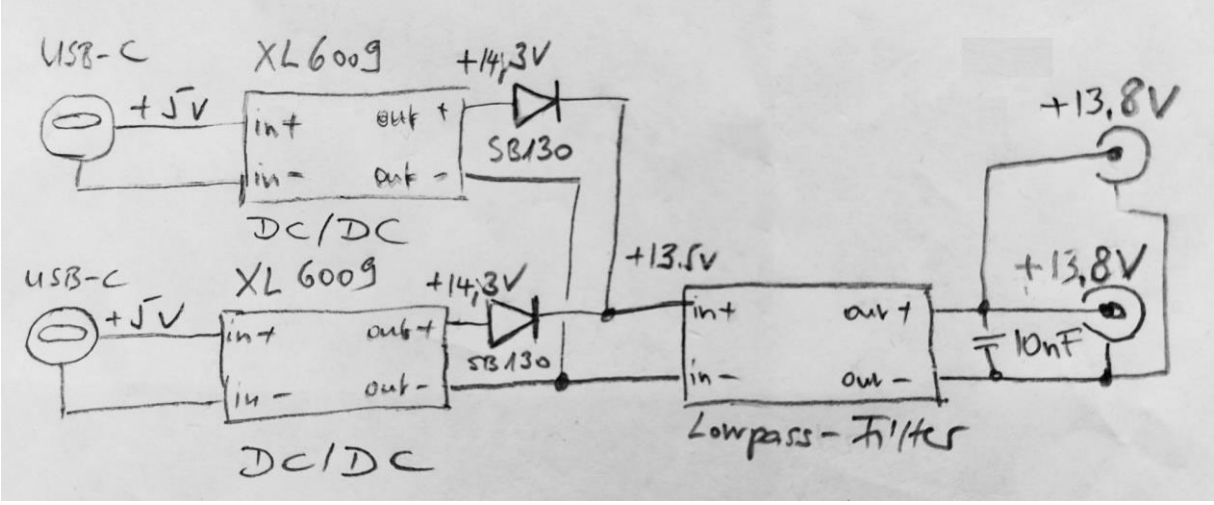
A 5V-12V DC-DC-Converter for power packs

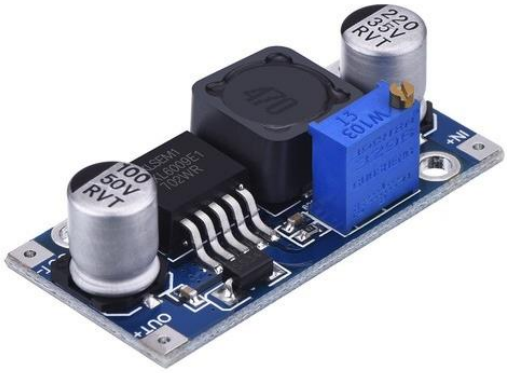
Matthias, DD1US, June 19th 2025, rev 1.0

For portable operations with my IC-705 and 24 GHZ-transverter I was looking for a lightweight solution to provide power to the transverter and also charge my IC-705.

I decided to use two powerpacks which feature an output voltage of 5V. The ones I am using can be charged and loaded at the same time. Thus, I can charge them using a small portable solar cell panel with two 5V outputs.



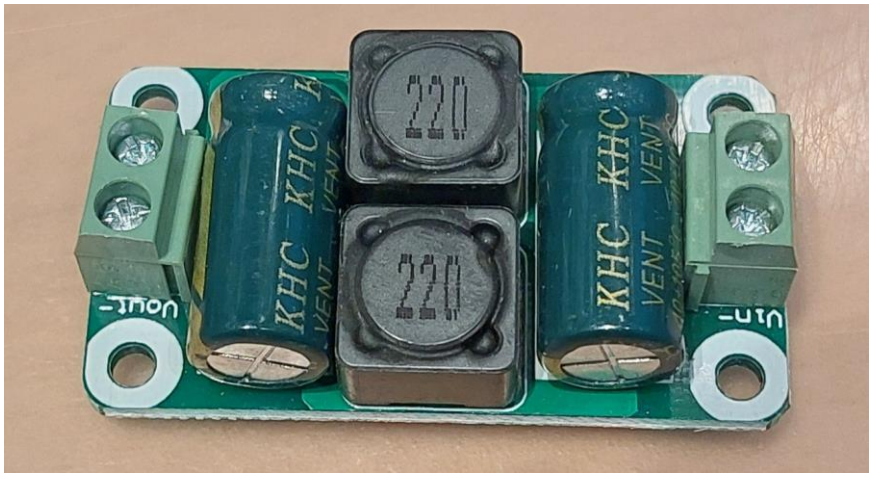
The DC-DC-Upconverters are from China and look like this:



This is its specification:

Model specifications	DSN6009 Boost converter Module
Module nature	Non-Isolated Boost
Rectification method	Non-synchronous rectification
Input voltage	3V ~ 30V(optimum operating voltage range: 5V to 30V)
Output voltage	5V ~ 35V
Input Current	4A (max), No-load: 18mA (5V input, 8V output, no load less than 18mA. The higher the voltage, the greater the no-load current.)
Conversion efficiency	<94% (the greater the pressure, the lower the efficiency)
Switching frequency	400KHz
Output ripple	50mV (the higher the voltage, the greater the current, the larger the ripple)
Load Regulation	± 0.5%
Voltage regulation	± 0.5%
Operating temperature	-40 ℃ ~ + 85 ℃
Dimensions	43mm * 21mm * 14mm (L * W * H)

After combining the output voltages of the two upconverters using two Schottky diodes I added a lowpass filter which I also bought in China in order to clean up the DC power supply output. The filter looks like this:

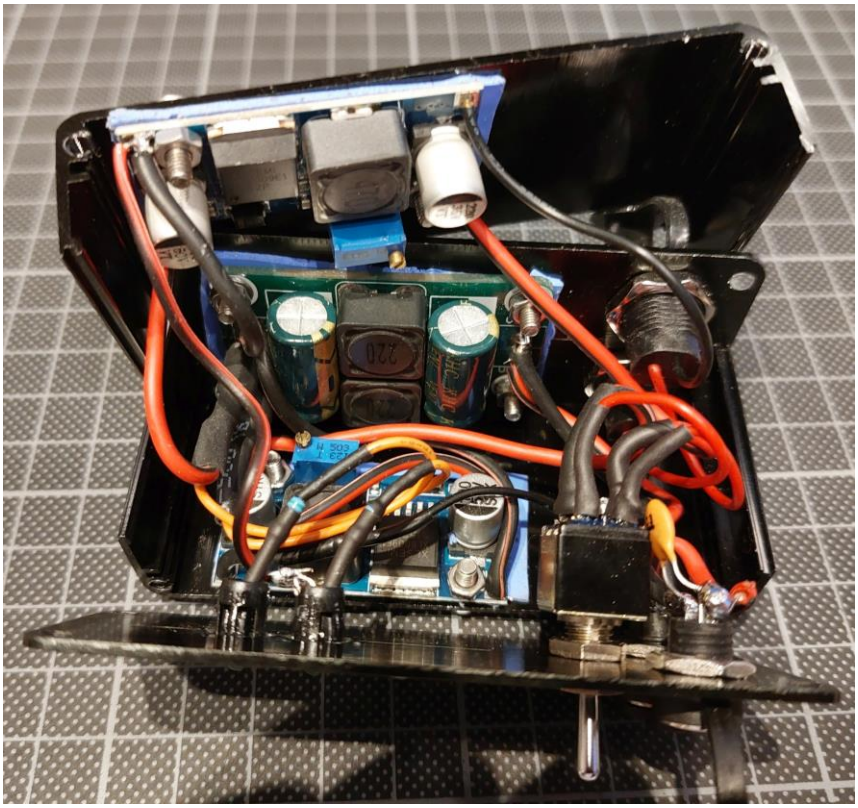


This filter is specified for a maximum voltage of 50V and a maximum current of 4A.

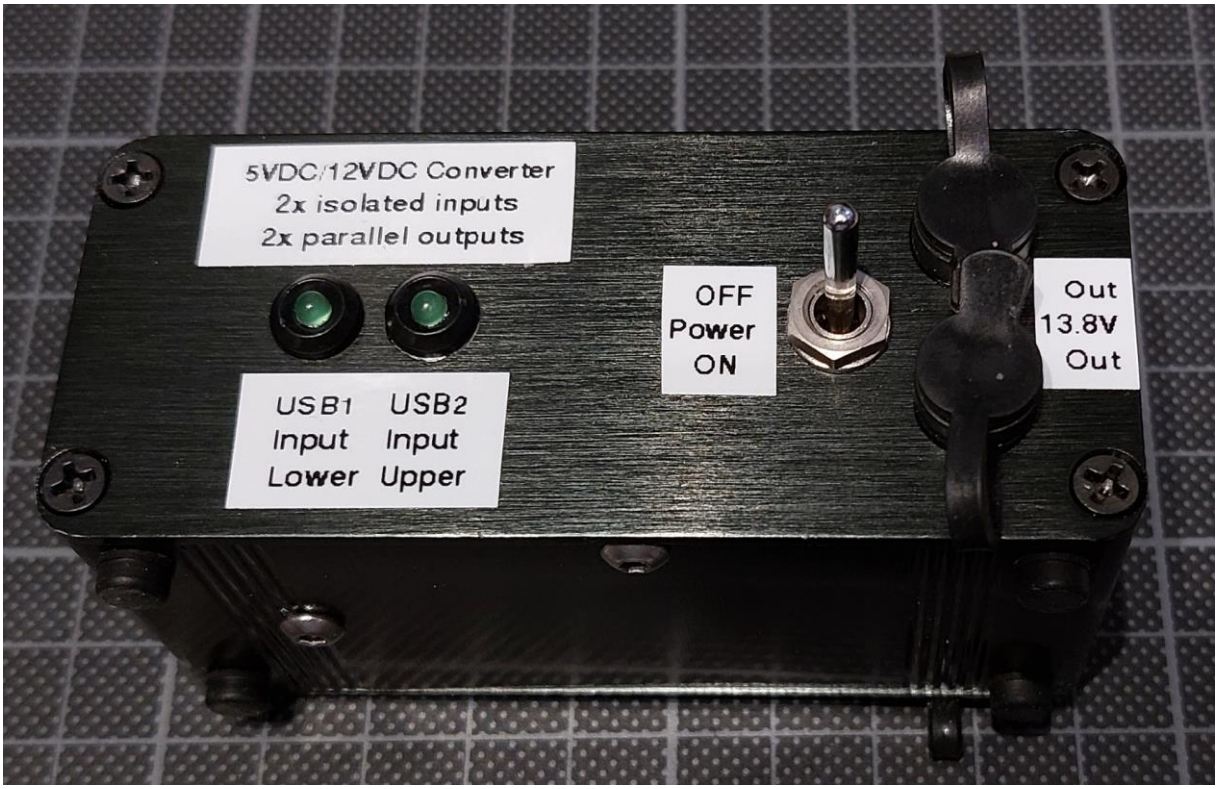
I mounted the 3 boards and the connectors in a small aluminium encasing which also acts as a heatsink. Th boards were mounted to the metal encasing with a thermal pad providing the isolation and a low thermal resistance.

I adjusted both DC-DC-Boost-Converter to the same output voltage so that a final voltage of 13.8 V at the output of the complete unit was available.

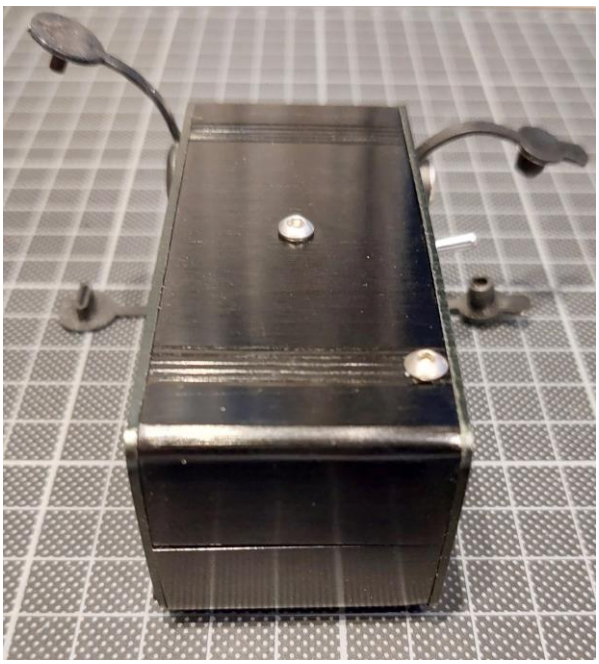
Here is a picture of the tight integration into the aluminium encasing:

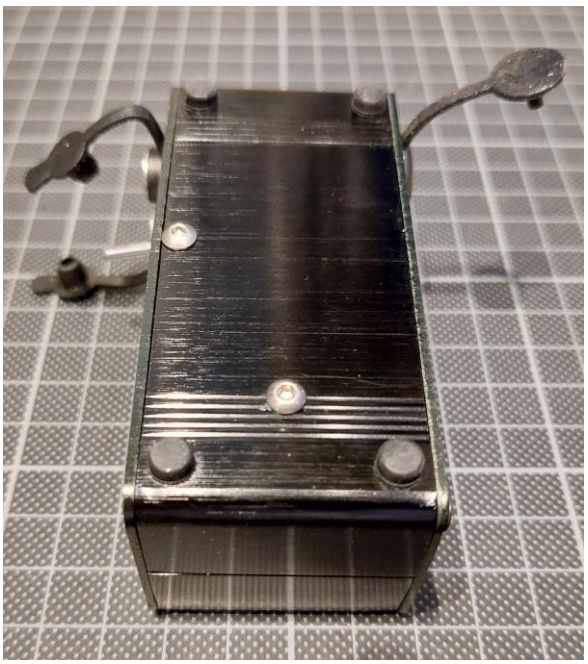


Here are some pictures of the finished unit:



USB2
+5V
Input
5VDC/12VDC Converter
2x isolated inputs
2x parallel outputs
USB1
+5V
Input
Output ports:
Voltage +13.8V
Max. current 4A





I am always grateful to get feedback and will be happy to answer questions.

Please direct them to my Email address, which you find on my website.

Best regards

Matthias DD1US Homepage: http://www.dd1us.de