

# Backup Battery

For Studer A810/A812/  
A816/A820/A827 with  
V150H battery or equivalent

- Low risk of leakage.
- Intelligent battery management and charging.
- 160mAh capacity. More with supercap.
- Status LEDs for charging and status.
- Easy installation & testing.
- Fits in same space as original battery.
- Just one extra wire connection required.
- Available as Li-ION only, or with additional super capacitor (0.22F or 0.47F).



## A better backup battery for Studer A810 / A812 / A816 / A820 / A827

My Studer A812 showed significant signs of damage after spending a few years in storage. The RS/ Varta V150H 3.6V Nickel metal hydride had leaked quite badly, corroding the tracks on the MPU board, and even the steel card frame. Major surgery had to be performed on the MPU board!

As battery technology has improved dramatically since 1985, I decided to find a way to make a better battery using modern components.

The first step was to examine the circuit diagrams and board layouts for all the Studer machines that use this type of backup battery. The Varta V150H is common to Studer A812/A816/A820/A827 and all but the earliest version of Studer A810 with MPU 1.810.752.00. With the exception of Studer A810 MPU type 1.810.780.xx, they all use a single diode to charge the battery from the 5.6V power rail. See attached pics. It was clear that it would be possible to design a battery module to fit the above tape machines, provided that it could fit in the same physical space as the existing battery.

The new battery module is a multi-layer assembly that fits neatly in the existing space. It is possible to charge a larger Li-Ion battery fitted in a battery holder nearby, and also a larger supercap.

### Fitting the new battery module:

1. Connect a micro USB cable to connector on the battery management PCB and allow it to charge. This can take up to 30 minutes, depending on the state of the battery. The red LED will be on when it is charging, and the blue LED will come on when it is fully charged.
2. Remove the old battery, and suck the solder out of the holes on the MPU PCB.
3. Insert the module into the MPU PCB leaving a gap of 4mm(5/32") between the bottom of the module and the surface of the MPU. Solder the 3 wires and trim flush with the PCB.
4. Solder the orange flying lead to the anode/5.6V of the appropriate diode rail pad on the PCB. See sheet 2 for further information
5. Test the voltage between the positive and negative connections on the main PCB. It should be 3.5V to 4.3V, depending on the state of charge.
6. If the voltage test is successful, the MPU board is ready to go back into your machine. Power up and the blue LED should be illuminated.

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