

S4. DC-DC CONVERTER

A DC-DC converter is used to power of low-voltage consumers in the control unit. It is designed to operate from a wide range of input voltages. A factory-made DC-DC Converter NV25A15 was chosen. Its input voltage range is 100-650 volts. The value of 15 output volts was determined by the selected optocouplers in the power modules. We also had to separate the low-voltage power supply for the inclinometer and the PWM generator from the power supply to the optocouplers, to provide additional isolation. To avoid increasing the number of different components, it was decided to use two identical DC-DC converters. The inclinometer and PWM generator are powered from a wide voltage range (9-36 V) and can be operated without problems from 15 V.

Although a factory-made DC-DC converter was used, it requires external filtering (Fig. S15).

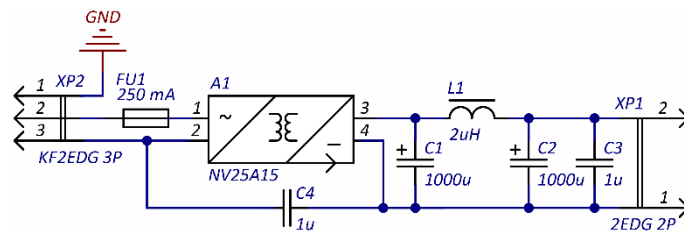


Fig. S15. Circuit diagram of DC-DC Converter

The housing for the resulting DC-DC converters was a standard compact housing from LED strip power supplies (Fig. S16 A).

(a)



(b)

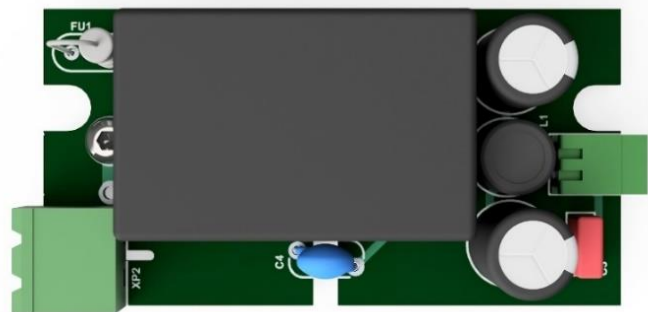
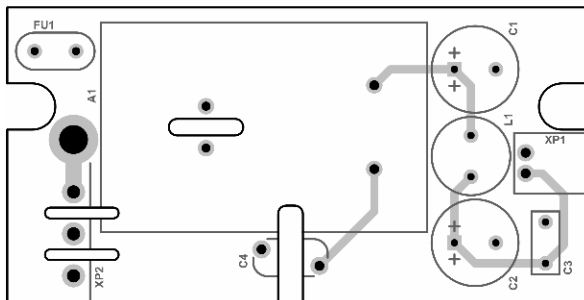


Fig. S16. DC-DC converter

A PCB was developed for this type of housing (Fig. S17).

(a)



(b)

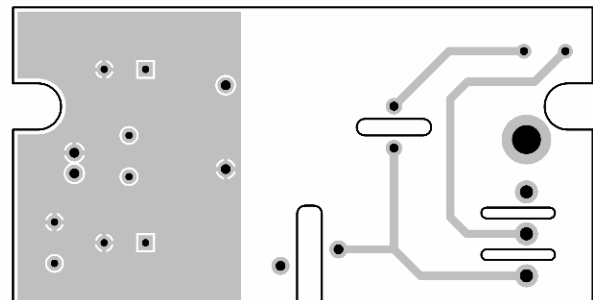


Fig. S17. PCB layout of DC-DC Converter: (a) top layout; (b) bottom layout.