

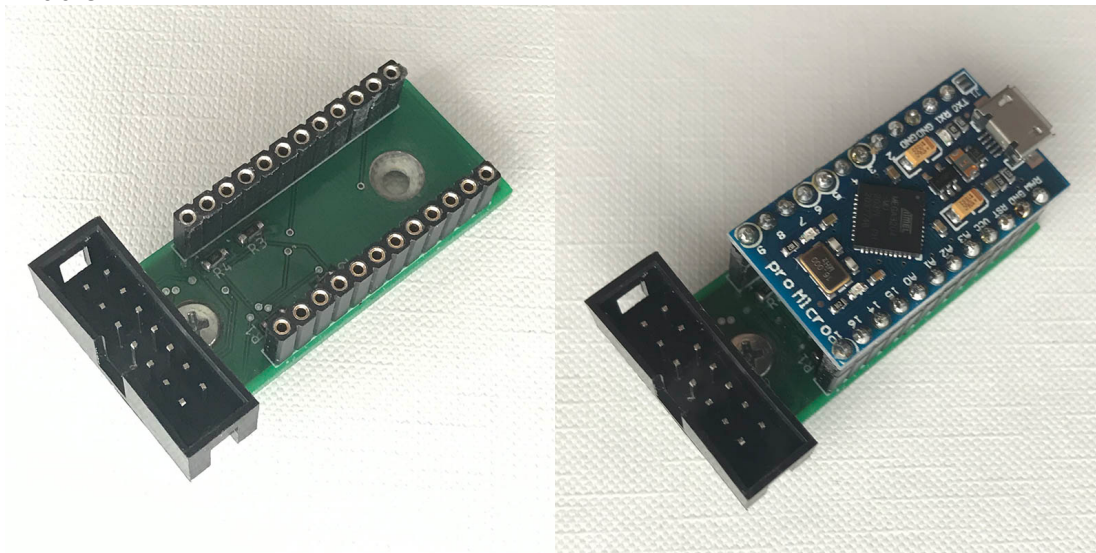
# Building manual for control unit with button and rotary encoder

## 1. General

Two encoders with push buttons and two buttons can be connected to the 14-pin box connector. The only difference between the larger circuit board and the smaller one is that it has an additional space for an RJ12 socket. Another encoder with a push button and 2 additional buttons can be connected to this. The pin assignment for the 14-pin box connector and the program for the Leonardo Pro Micro are completely identical.

## 2. Assemble the boards

- Solder 10kOhm SMD resistors with the socket 0805 on the 4 places for the resistors
- Solder the two socket strips 1x12, the box connector 2x7 and, if necessary, the RJ12 socket as shown in the figure
- Carefully plug the Leonardo Pro Micro onto the socket strips the right way round. On the underside there is again the lettering TxD, it marks the PIN on which the PIN TxD of the Leonardo Pro Micro should be!
- get the buttons with the right shaft length for you. You can find them on the internet under the term 6x6mm short-stroke button, e.g. at Reichelt.
- Now solder the buttons onto the small circuit board with the rectangular hole in the middle.



Finally, prepare your connection cable with the 2x7 box connector, lay it as neatly as possible and solder the individual wires to the provided PINs of the encoder or the soldering contacts of the push button board. For encoders, it is advisable to make shrink tubing over the soldered connections in order to avoid disturbances later.

### 3. Pinout

- RJ12:

- 1: Encoder PB
- 2: Encoder A
- 3: Encoder B
- 4: Button 1
- 5: Button 2
- 6: GND

- 2x7 box connector:

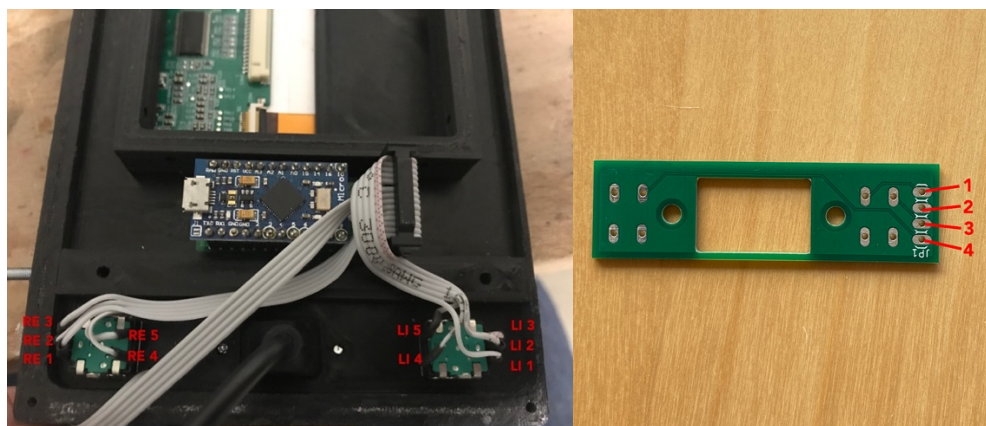
GND1, GND2 and GND3 are different ground pins on the Leonardo. I split it up a bit to be on the safe side!

- 1: right Encoder A (UP/DOWN)
  - 2: right Encoder PB (ENTER/QUICK MENU)\*
  - 3: GND 2 (right Encoder A und B)
  - 4: GND 2 (right Encoder PB)
  - 5: right Encoder B (UP/DOWN)
  - 6: right Button (WAYPOINT SELECT/FLARM RADAR)\*
  - 7: GND 1
  - 8: GND 1
  - 9: left Button (ESC/PAN MODE)\*
  - 10: left Encoder A (RIGHT/LEFT)
  - 11: left Encoder PB (SETUP ALTERNATES/ANALYSIS)\*
  - 12: GND 3 (left Encoder A und B)
  - 13: GND 3 (left Encoder PB)
  - 14: left Encoder B (RIGHT/LEFT)
- (\* short click/long click)

- 4-pole connection board with buttons: **(Orientation: you are looking at the circuit board from behind, i.e. contacts are on the right, buttons are then on the other side of the circuit board!)**

- 1(above): left Button (ESC/PAN MODE)\*
  - 2: GND 1
  - 3: GND 1
  - 4 (below): right Button (WAYPOINT SELECT/FLARM RADAR)\*
- (\* short click/long click)

### 4. Connect the circuit board to the front panel



1: RE 1  
2: RE 5  
3: RE 2  
4: RE 4  
5: RE 3  
6: PB 4  
7: PB 3  
8: PB 2  
9: PB 1  
10: LI 1  
11: LI 5  
12: LI 2  
13: LI 4  
14: LI 3

## 5. Programming the Leonardo Pro Micro

- if not available, install the Keyboard and Encoder libraries in your Arduino IDE. Keyboard is probably already included by default.
- You can download Encoder here:  
<https://github.com/PaulStoffregen/Encoder>
- Starts the Arduino IDE
- now you install the board library SparkFun AVR Boards by clicking on Tools -> Board -> Board Manager and looking for SparkFun AVR Boards. Then click Install.
- Restarts the Arduino IDE
- Then Arduino IDE is set appropriately.
  - Board: SparkFun Pro Micro
  - Prozessor: ATmega23U4 (3.3V, 8MHz) or ATmega23U4 (5V, 16MHz), depending on which version you have!
  - If you choose the wrong type you bricked the Pro Micro. If that happens, it has to be reset. How to do that later. You will notice that you have bricked the Pro Micro when the port no longer appears in the tools. Which version it is is usually not marked on the back. But you can find out by measuring the voltage between GND and VCC with the multimeter (3.3V or 5V).
  - Port: the device that appears when you connect the Pro Micro to the PC.
- Upload the sketch now.

## 6. Rescuing a bricked Leonardo Pro Micro

- If you have bricked the Pro Micro, you can restore it by soldering a button to the PIN RST with a cable, the other PIN of which is soldered to GND. Open the Arduino IDE and leave the standard sketch open. Now you press the button two times very quickly. Upload the standard sketch as soon as possible. You may need several attempts. I first clicked Upload and then very quickly clicked the button twice. The Pro Micro can then be programmed again.