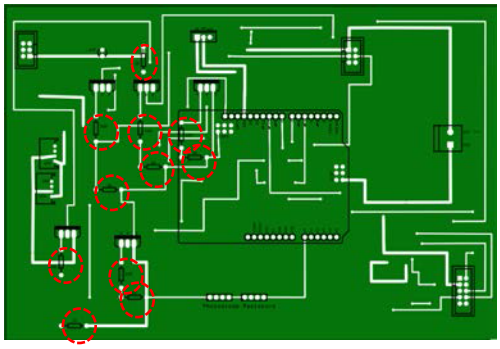
OSP

An Open-Source Plate reader

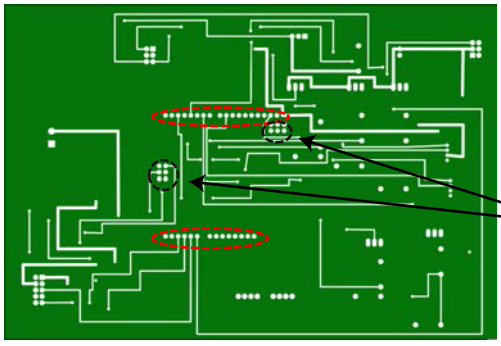
PCB AND PHOTODIODE ASSEMBLY GUIDE

Main Power Board

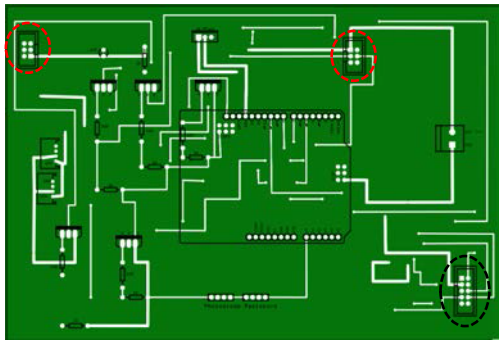
Numbers refer to Parts List numbering



1. Solder all resistors to their respective places (red dashed circles). Resistor values are printed on the boards. There are 11 resistors total.

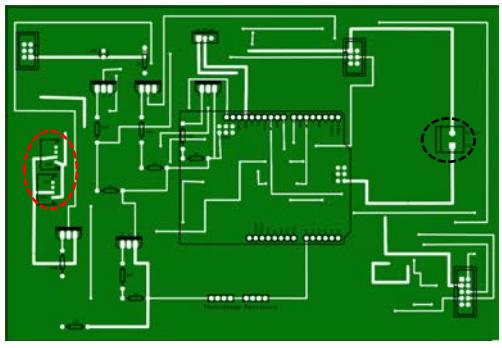


2. Flip the board over. Solder all standard male headers (#E21) into their positions (red dashed circles). Solder all standard female headers (#E22) into their positions (black dashed circles). There are two headers each.



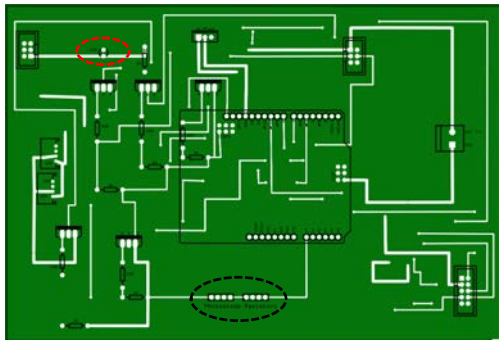
3. Flip the board right-side. Solder the 2x3 IDC headers (#E17) to their positions (red dashed circles), with the orientation of the tab on the header matching the PCB silkscreen. There are two headers.

4. Solder the 2x5 IDX header (#E18) to its position (black dashed cirlce), with the orientation of the tab on the header matching the PCB silkscreen. There is one header.



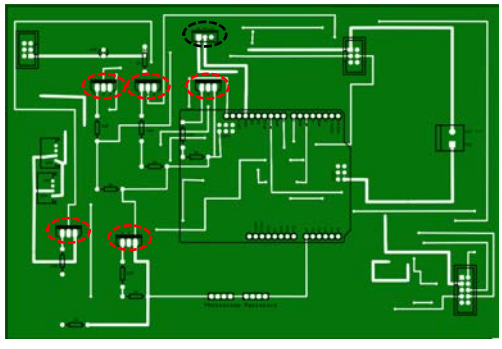
5. Solder the 4-pin JST-headers from the JST connector kit (#E12) to its positions (red dashed circles). There is one header.

6. Solder the 2-pin screw-terminal header (#E23) to its position (black dashed circle). There is one header.



7. Solder the 0.1uF capacitor (#E25) to its position (red dashed circle). There is one capacitor.

8. Solder two 4-pin female headers (#E22) to their positions (both within the black dashed line). Insert 100Mohm resistors into each of these headers. These serve as load resistors for the photodiode.



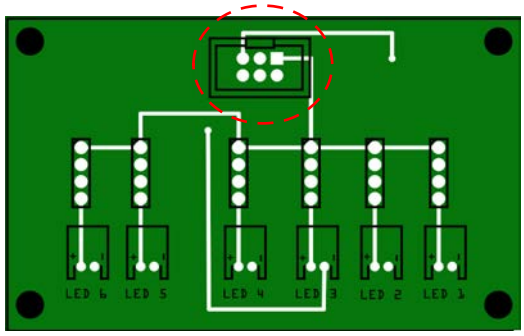
9. Solder all the MOSFETs (#E15) to the positions (red dashed circles) with orientation matching the silkscreen labels. There are five MOSFETs.

10. Solder the 5V regulator (#E16) to its position (black dashed circle) with orientation matching the silkscreen labels. There is one 5V regulator.

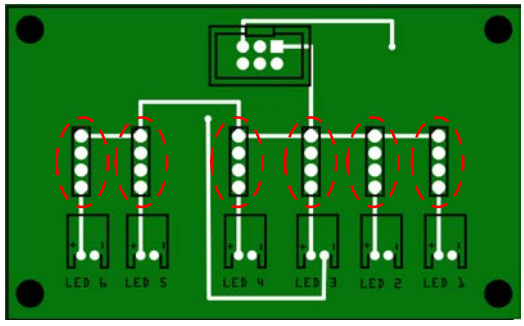
LED Connection Board

Numbers refer to Parts List numbering.

This board decouples the excitation source connections from the main board.

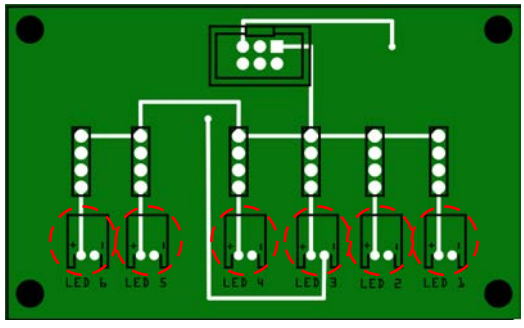


1. Solder the 2x3 IDC header (#E17) (red dashed circle).



2. Solder the 4-pin female headers (#E22) (red dashed circles). Place a resistor into each of the headers based on specific amperage needs for the LEDs to be used, given a 12V supply. Recommended values are:

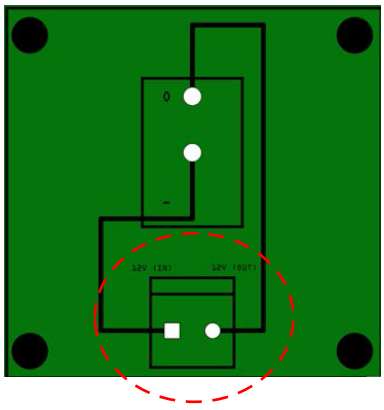
LED 1-3 (built-in excitation sources) - 330 ohm
LED 4 (auxiliary source) - 330 ohm
LED 5 (TOP White Light) - 330 ohm
LED 6 (TOP Violet Light) - 470 ohm



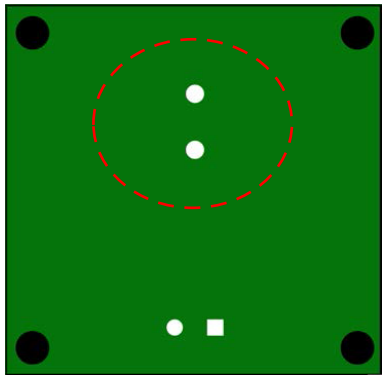
3. Solder the 2-pin JST headers from the JST connector set (#E12) (red dashed circles).

Power Switch Board

Numbers refer to Parts List numbering



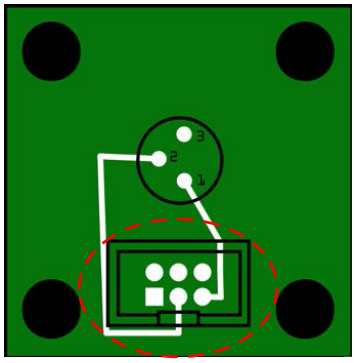
1. Solder the 2-pin screw terminal block (#E23) to its position (red dashed circle), with its orientation matching the silk screen.



2. Flip the board over. Solder the rocker switch (#E19) to the back of the PCB in its position (red dashed circle), with its pins matching the corresponding silk screen on the front side.

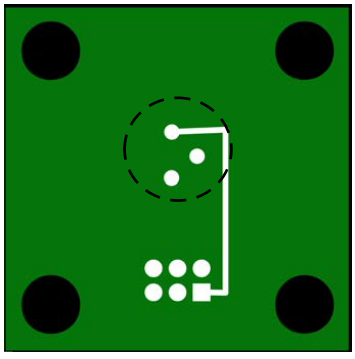
Photodiode Board

Numbers refer to Parts List numbering



1. Solder the 2x3 IDC connector (#E13) to the front of the PCB in its position (red dashed circle). with orientation matching the silk screen. Numbers on the silkscreen correspond to the pin numbers of the photodiode specification sheet.

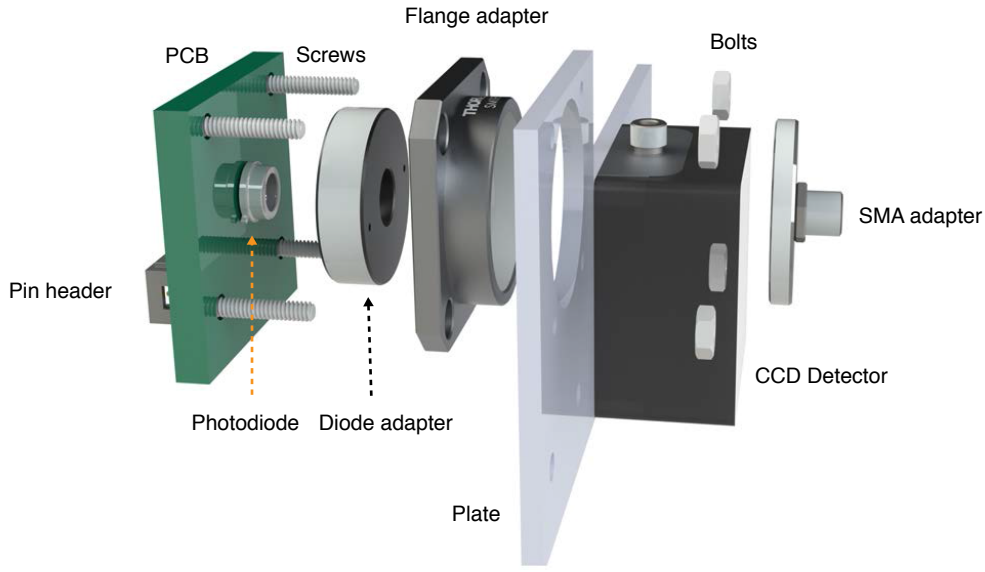
2. Place the photodiode (#O19) into the Thorlabs photodiode mount (#O13)



3. Flip the PCB over. Solder the photodiode to its position (black dashed circle).

Photodiode Mount Assembly

Numbers refer to Parts List numbering



[Skip to Step 4 if you have constructed the Photodiode board already]

1. Solder the 2x3 pin header (#E13) onto the photodiode PCB (#E29).

2. Place the photodiode (#O19) through the photodiode adapter (#O13).

3. Solder the photodiode to the PCB (#E29) such that the photodiode adapter is flush with the PCB.

4. Place the photodiode adapter and PCB assembly into the SM1-to-Flange adapter (#O21). The diode adapter should be inserted into the back end of the flange adapter. (side without the flange).

5. Place the SM1-to-SMA adapter (#O12) into the flange of the SM1-to-Flange adapter.

6. Place the entire SM1-to-Flange adapter into the acrylic wall mount (#L12) as shown above, and fix it into place with screws and hex nuts (#F29, F28).