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Gen2 Console Assembly

1. Purpose

To describe the assembly steps for generation 2 laser console to ensure minimal time and effort used in the process.

2. Equipment needed

- M3 hex screwdriver
- M4 hex screwdriver
- Phillips head screwdriver

3. Parts needed

- 2x Wavelength Electronics wtc3243/wtc3293 1000-0097
- 1x Wavelength Electronics LD10CHA 1000-0099
- 1x Wavelength Electronics MPL500 1000-0098
- 1x Electronics Bracket 3000-0469
- 1x OpenWater PDU
- 1x OpenWater MLIB
- 1x D3 TDA4Vx
- 1x LCD Screen
- 1x GHA500 AC/DC Converter 1000-0068
- 1x completely assembled and tested laser assembly, 7000-0242
- 1x Console Front Case 3000-0472
- 1x Console Back Case 3000-0473
- 1x Cable Block 3000-0474
- 1x Tube Bushing 3000-0471 (2 parts)
- 1x Fan
- 1x Fan Filter
- 1x Case Exhaust Panel 3000-0476
- 1x Exhaust Panel Clamp 3000-0493
- 1x Power Entry Module
- 1x Base Plate 3000-0470
- 2x Fiber Rack 3000-0477
- 2x Rear Hook 3000-0478
- 1x Pole Clamp 3000-0479
- 1x Knob .312-16 UNC X 1.25 LG STUD



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- 1x Switch, ESTOP OMRON A22-10
- 4x Bumper, Domed

3. Assembly Steps E-sub

1. Mount the AC/DC Converter - GHA500 1000-0068 module to the Electronics Bracket 3000-0469 with 4x M3x20 hex cap screws as shown below.

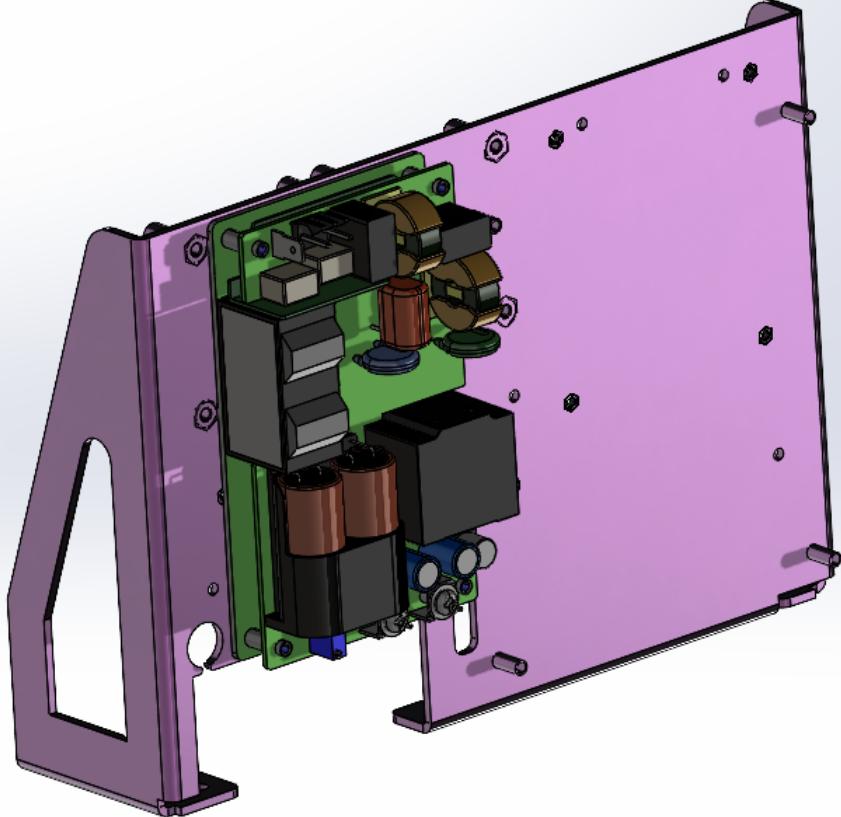


Fig. 1: Mounting AC/DC Converter to Electronics Bracket

2. Mount Wavelength Electronics MPL500 1000-0098 to the Electronics Bracket 3000-0469 with 4x M3x6 hex cap screws as shown below.



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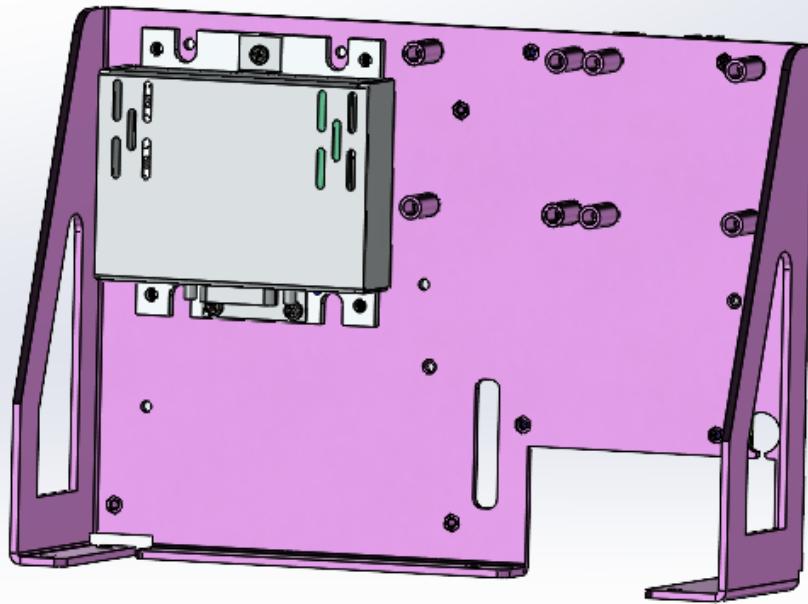


Fig. 2: Mounting MPL500 to Electronics Bracket

3. Mount Wavelength Electronics LD10CHA 1000-0099 to the Electronics Bracket with 2x M3x6 hex cap screws and screw 5x M3x35 standoffs with 5x M3x6 hex cap screws as shown below.



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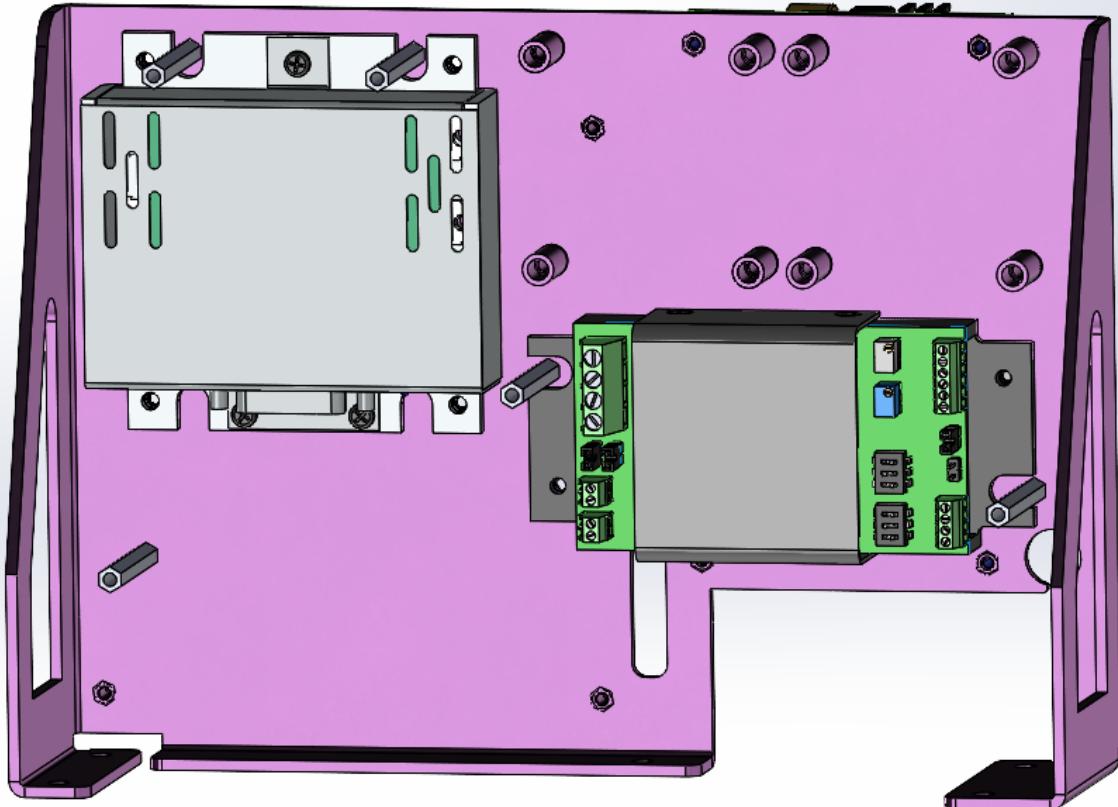


Fig 3: Mounting LD10CHA and M3x35 standoffs to the Electrical Bracket

4. Mount 2x Wavelength Electronics wtc3243/wtc3293 1000-0097 (TEC) to the Electrical Bracket with 8x M4x6 hex cap screws as shown below. Mark TEC at the proximal end of the MPL500 as Seed Laser TEC, and the TEC at the distal end of the MPL500 as TA TEC.
5. Set TEC configuration switches.



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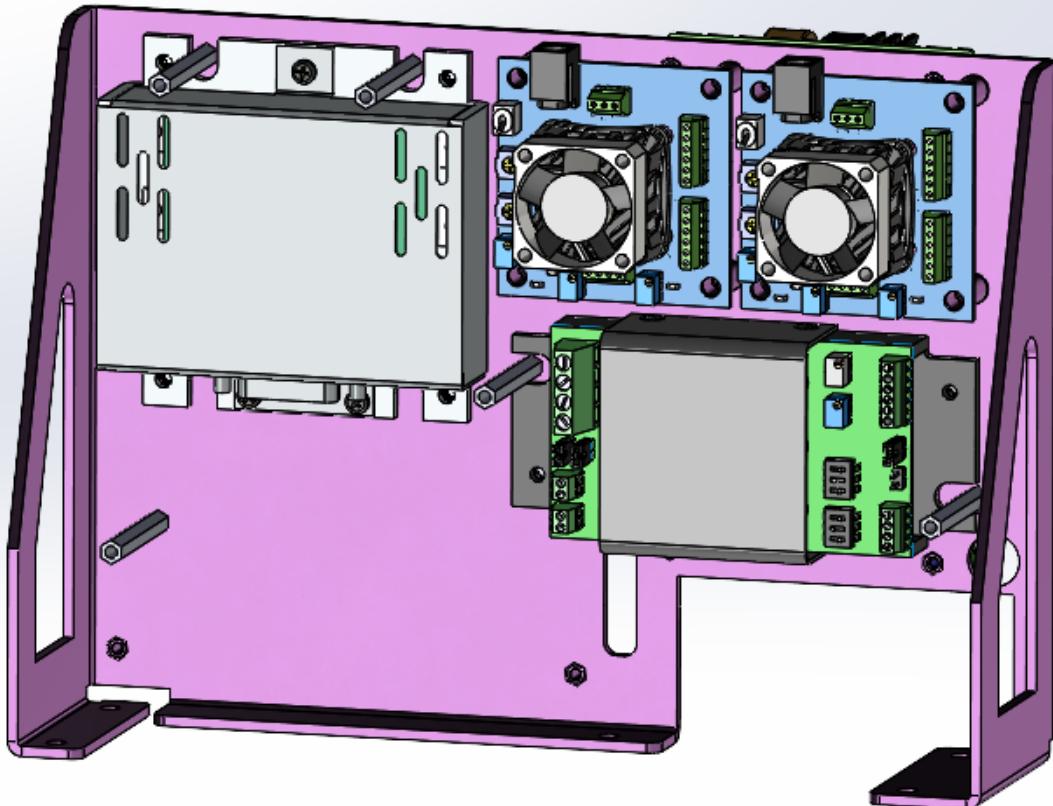


Fig. 4: Mounting wtc3243/wtc3293 1000-0097 to the Electrical Bracket

6. Mount the MLB onto the 5x M3x35 standoffs with 5x M3x4 hex cap screws as shown below.



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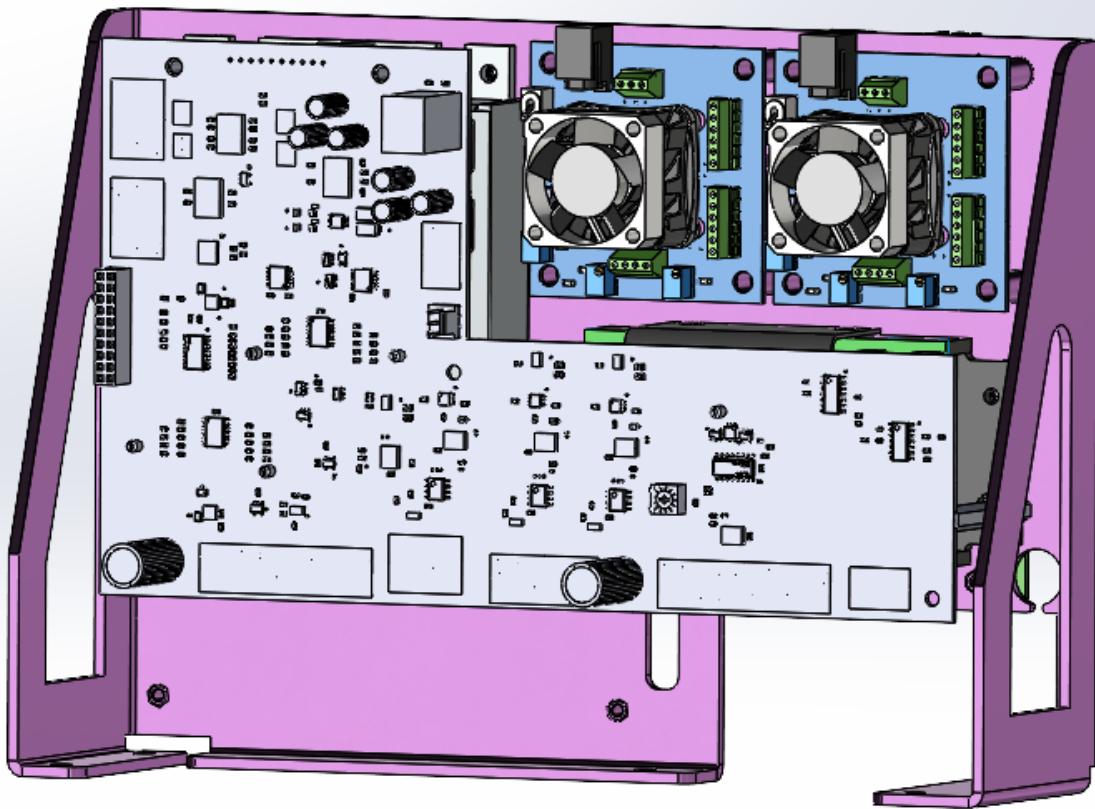


Fig. 5: Mounting MLB to the Electrical Bracket

7. Mount OpenWater PDU Rev 1.5 onto the Electrical Bracket by first placing M2.5x6 standoffs then mounting the board onto them with 4x M3x6 screws as shown below.



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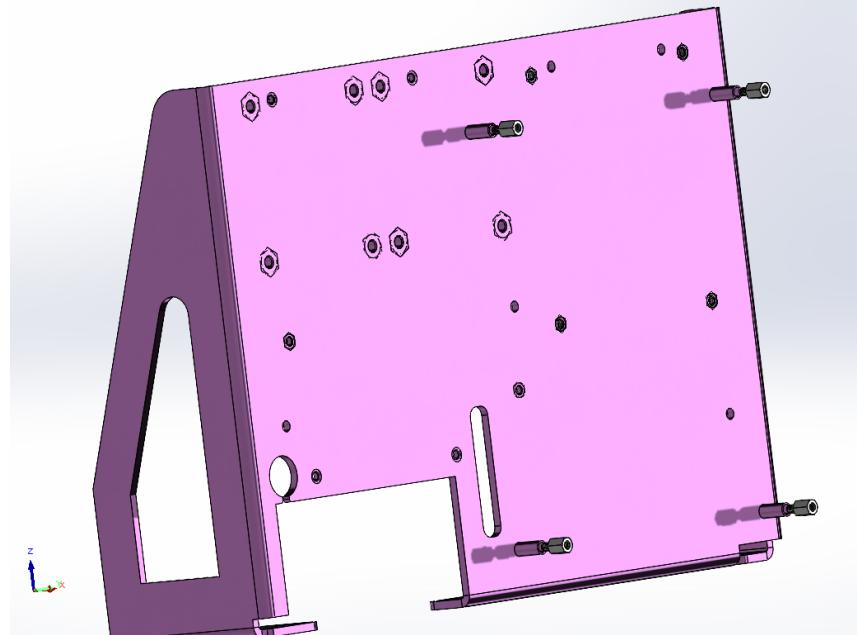


Fig.7: M2.5x6 Male Female Standoffs on Electrical Bracket

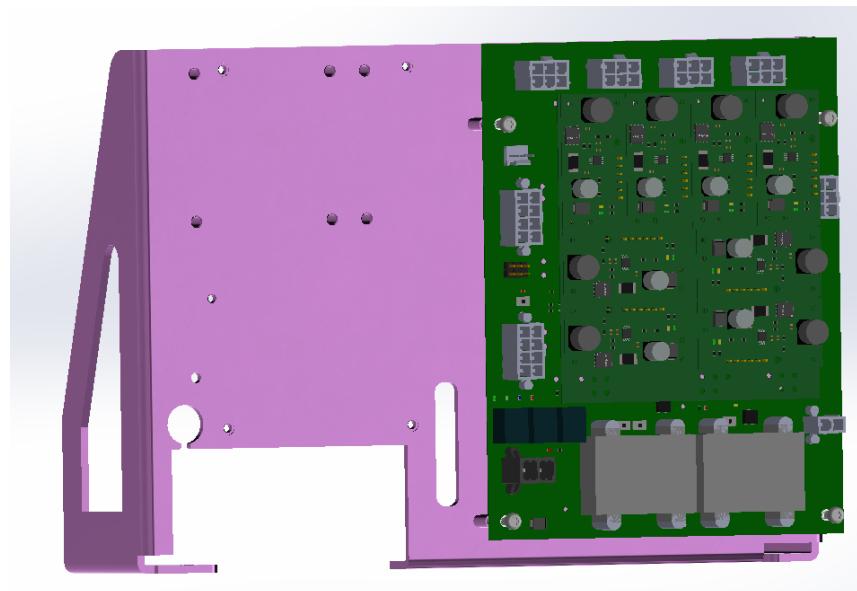


Fig.8: PDU Rev 1.5 onto the Electrical Bracket



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8. Mount the Electrical Bracket (with electronics on it) to the Base Plate 3000-0470 with 4x M4x10 screws as shown below.

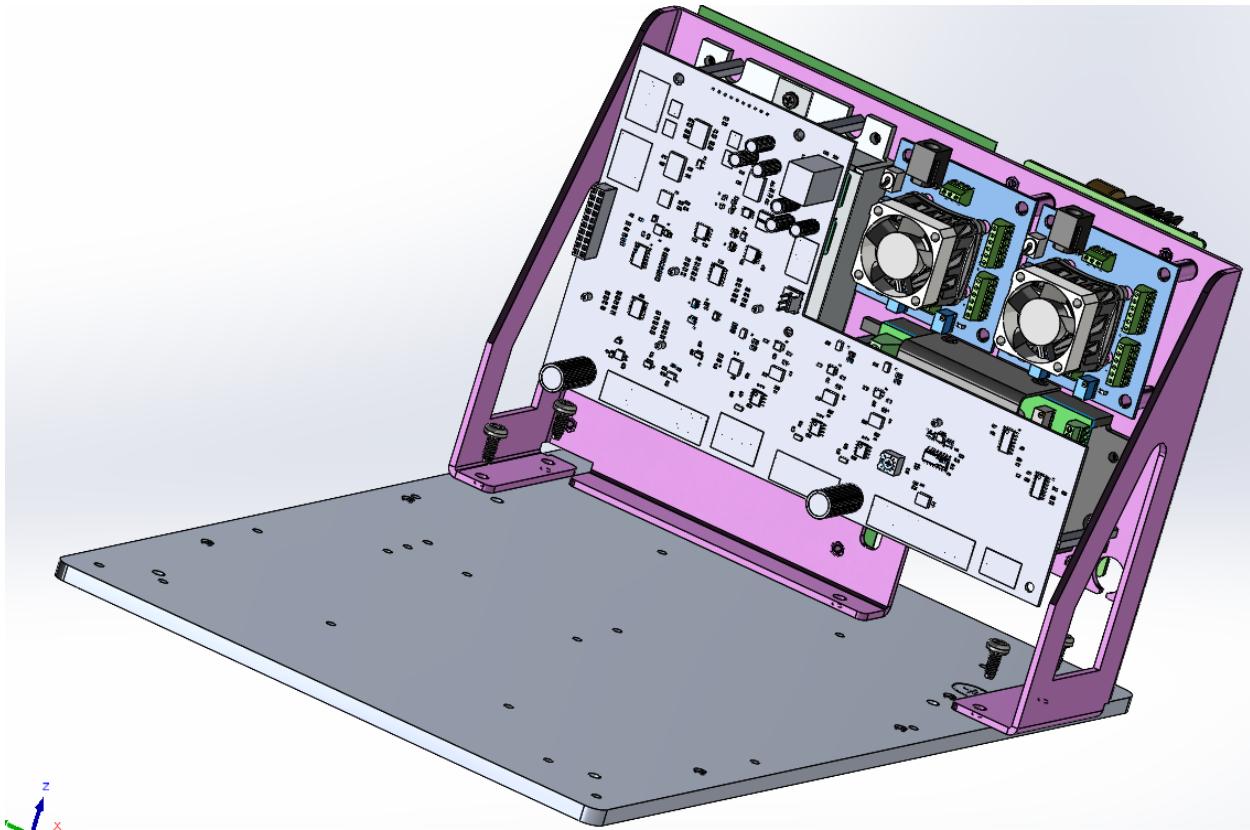


Fig. 9: Mounting Electrical Bracket subassembly to the Base Plate

9. Place the D3 unit on top of the Base Plate, align with its mounting holes and screw it in place with 4x M4x10 screws.
10. Testing E-sub here



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4. Move on to the processor integration

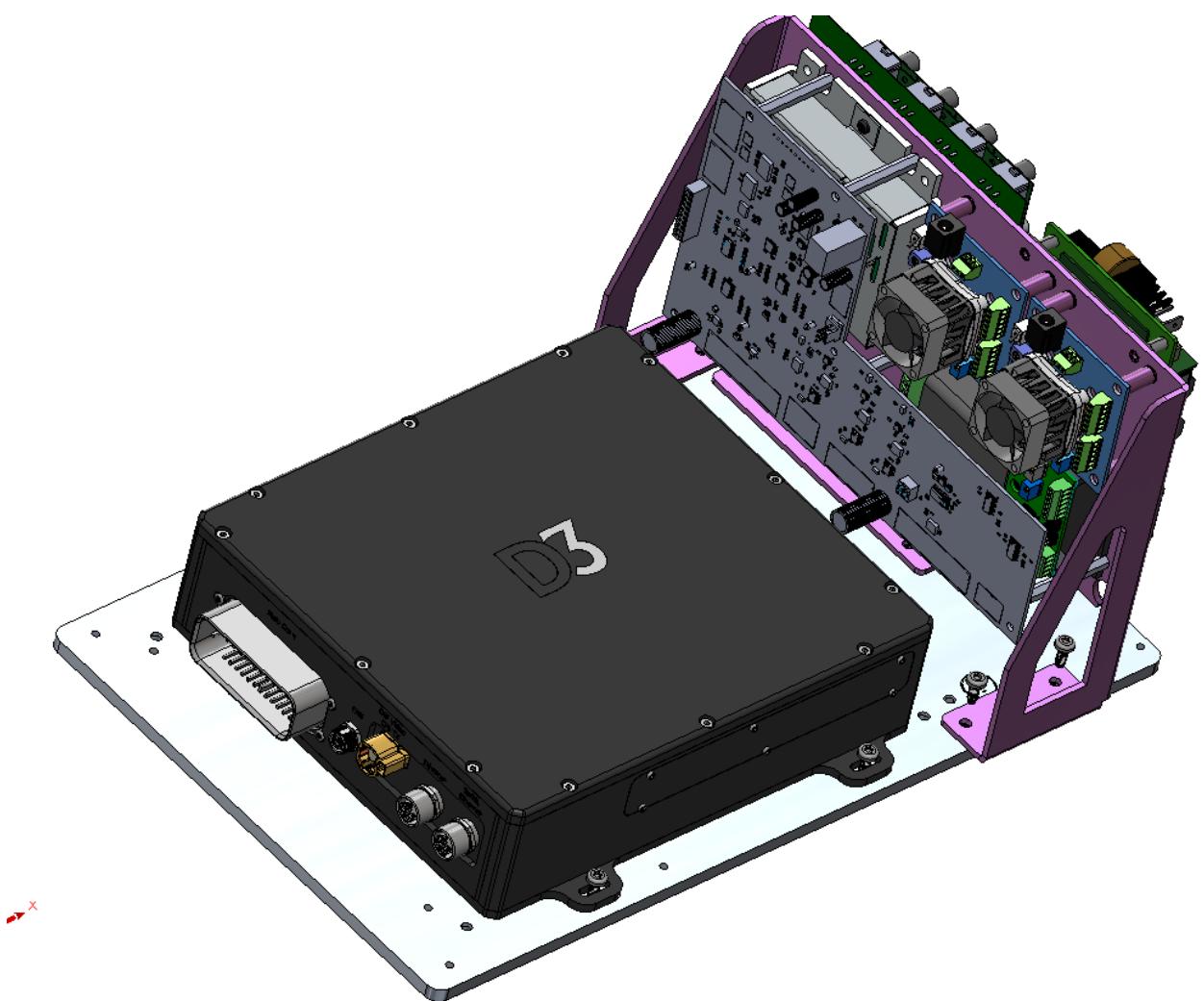


Fig.10: Mounting D3 to the Base Plate



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1. Unscrew the side panel on the D3 and expose the interface ports as shown below.

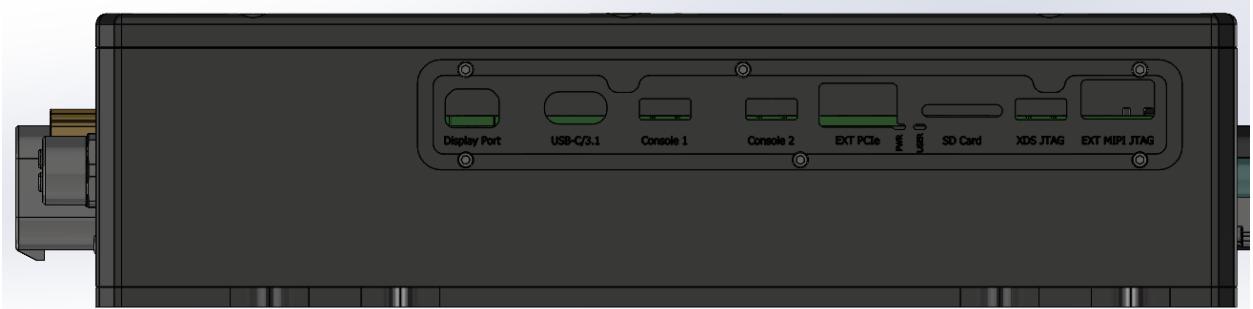


Fig. 11: Interface Ports panel on D3

2. Place the laser optical subassembly on Base Plate aligning the poles with its corresponding through holes (4x counterbore through holes) and screw in place with 4x M3x10 screws as shown below.



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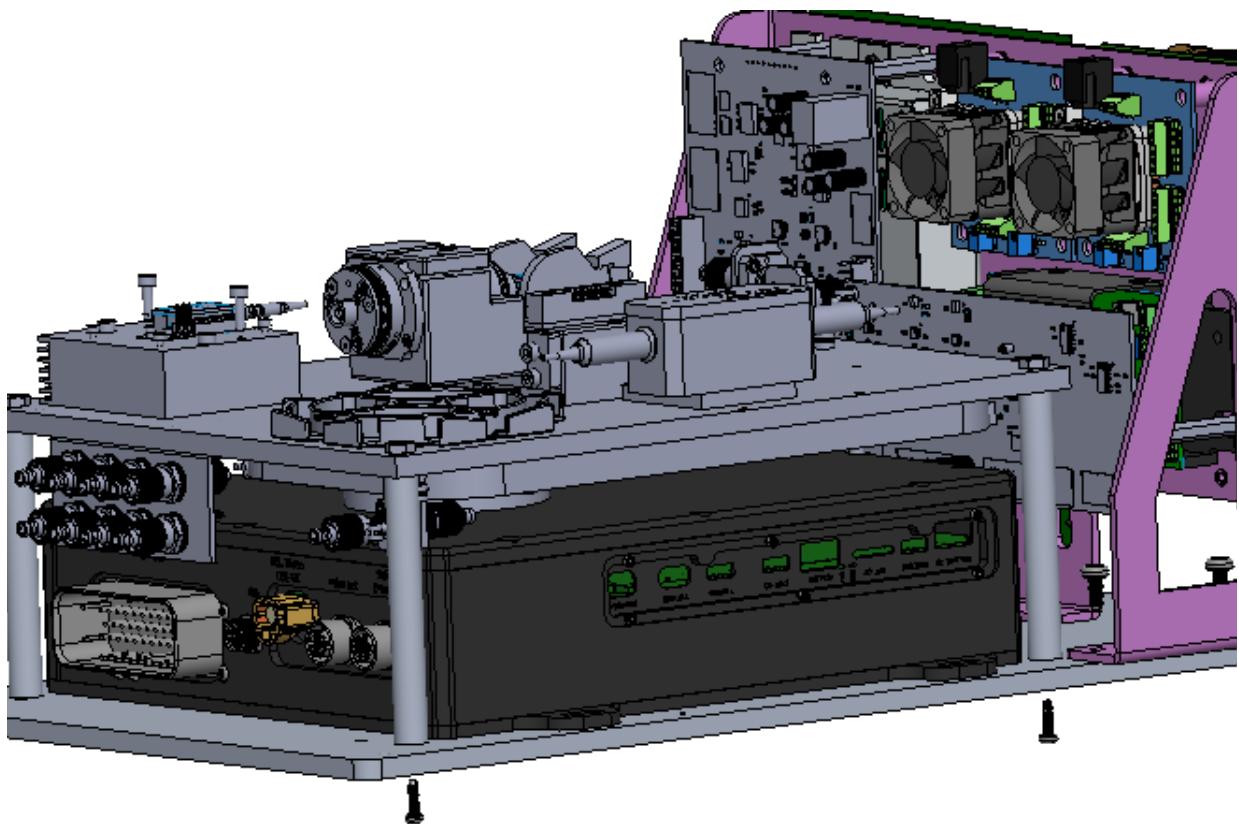


Fig. 12: Laser Optical Subassembly on Base Plate



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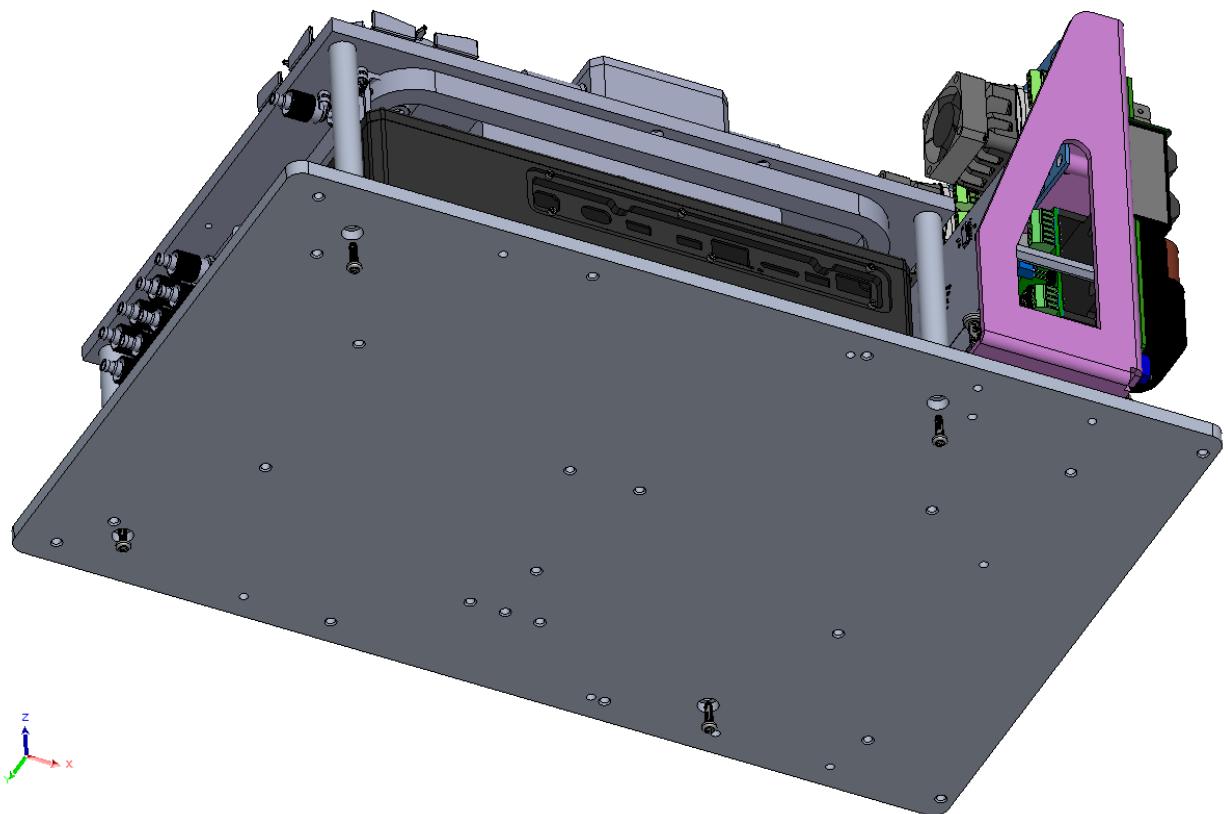


Fig. 13: Mounting screws for Laser Optical Subassembly



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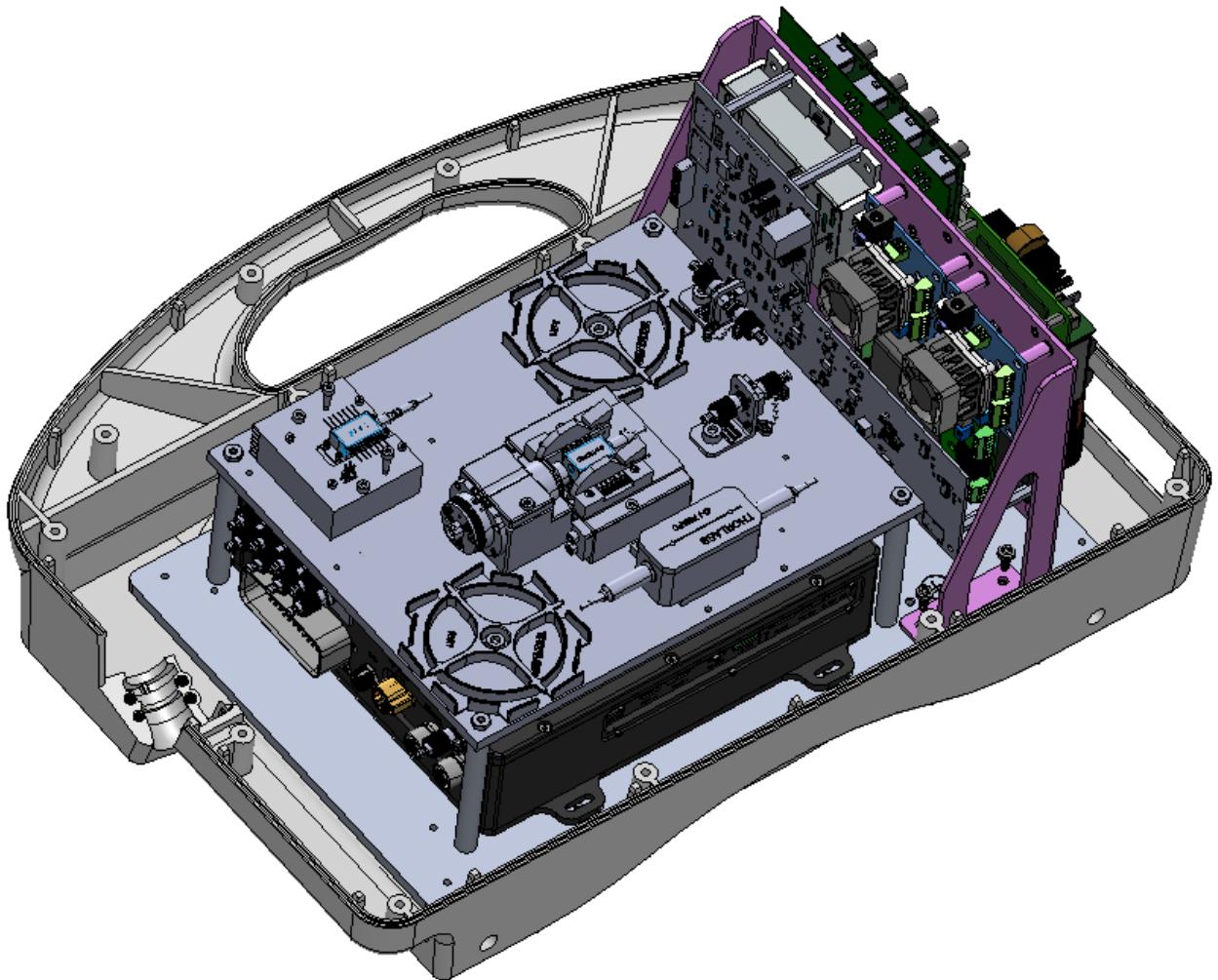


Fig. 14: Back Case mounted



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3. Mount the Base Plate/Electrical Bracket to the Back Case with 12x M4x14 screws as shown below.

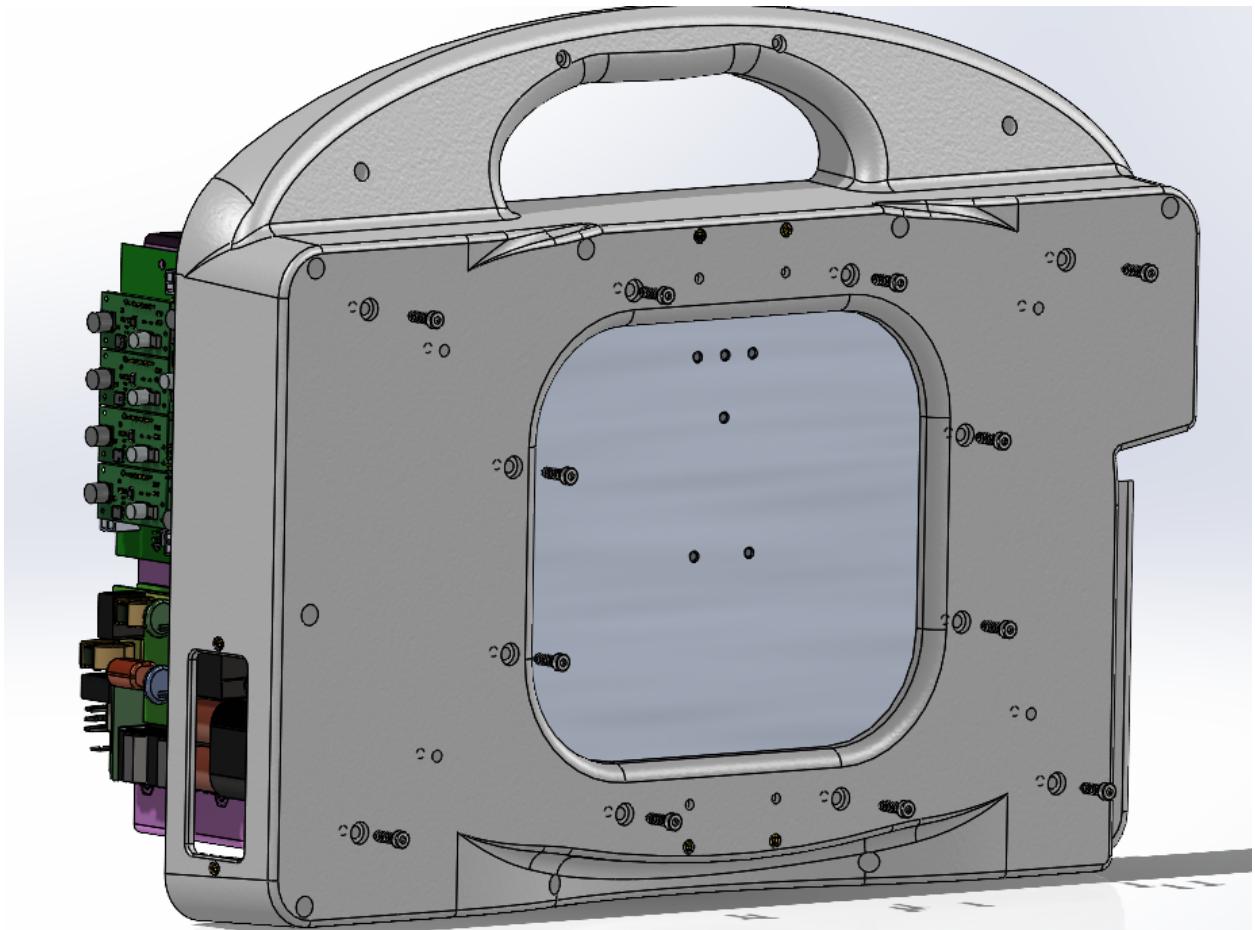


Fig. 15: Mounting Base Plate/Electrical Bracket to Back Case



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4. Mount Power Entry Module to Back Case and screw in place with 2x M3x10 screws.

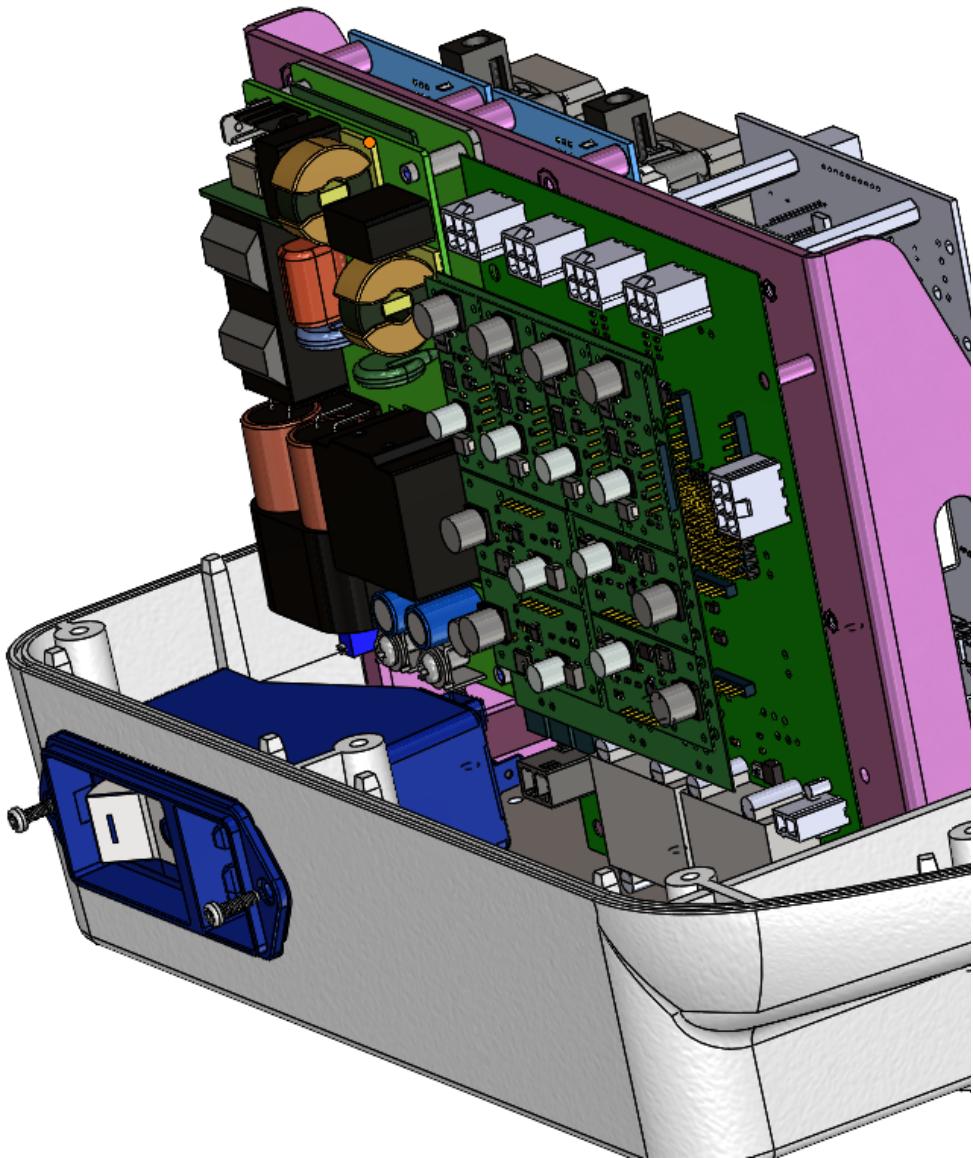


Fig. 16: Mounting the Power Entry Module to Back Case



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5. Acquire completely assembled patient contact cable assembly and insert the distal end (where internal cables/wires exit out of the jacket) of the cable into one of the tube bushing parts.

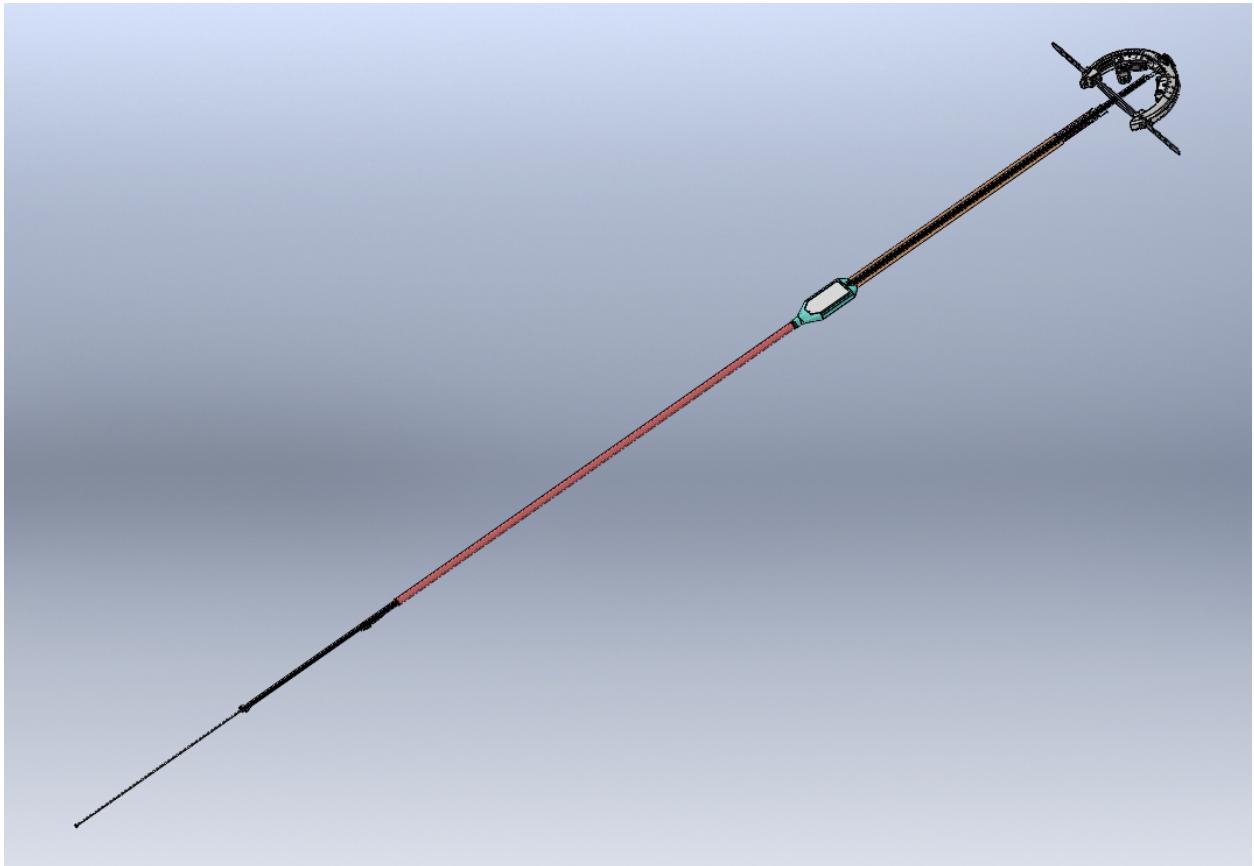


Fig. 17: Assembled Headset Cable

6. Mate the two pieces of the Tube Bushing 3000-0471 to each other around the patient contact cable distal end and place them into their nest so that the teeth of the tube bushing are in the back case grooving as shown below.



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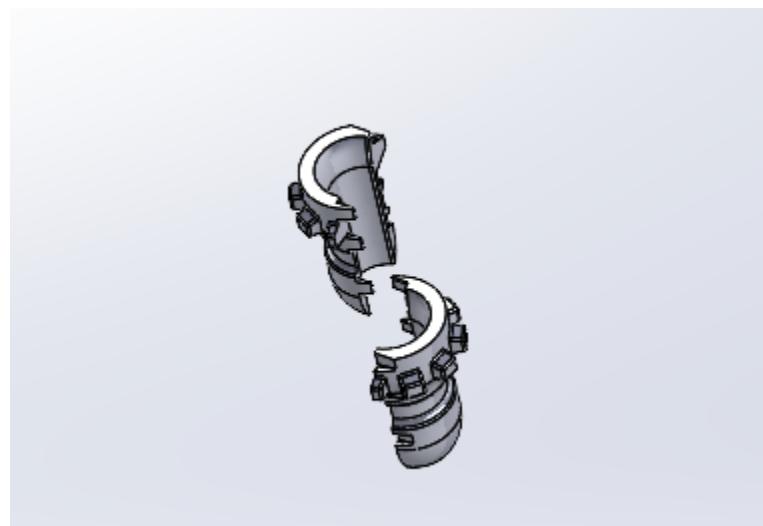


Fig. 17: Intermating Tube Bushings

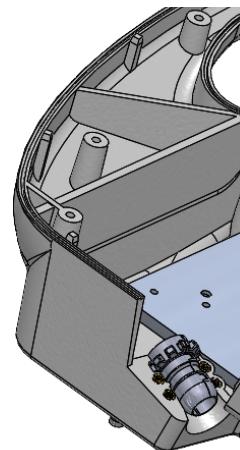


Fig. 18: Tube Bushing in its nest in the Back Case



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7. Place the Cable Block 3000-0474 over the Tube Bushing engaging the teeth with the Cable Block grooving then screw in place with 4x M3x8 screws as shown below.
8. After clamping the cable, apply a generous amount of UV adhesive around the end of the tube, so that is permanently attached to the clamping piece. Cure fully with UV gun.
9. Pull out the slack from the strength member wire, and clip excess length so that the end is close to the threaded hole shown below. Crimp an M3 eyelet to the end of the strength member, and secure to the threaded hole with a screw.

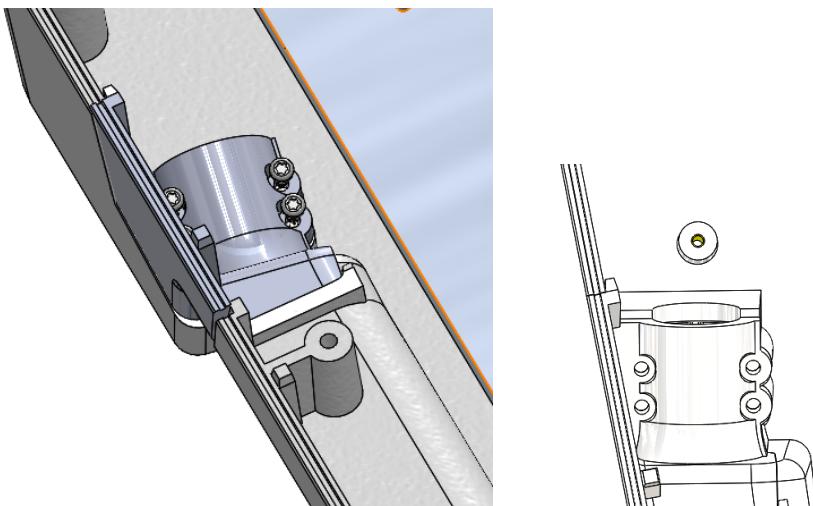


Fig. 19: Cable Block mounted Tube Bushing and Back Case. Threaded hole location for terminating strength member.

10. Connect each of the two fiber ends from the Headset Cable to two Fiber Switch outputs.



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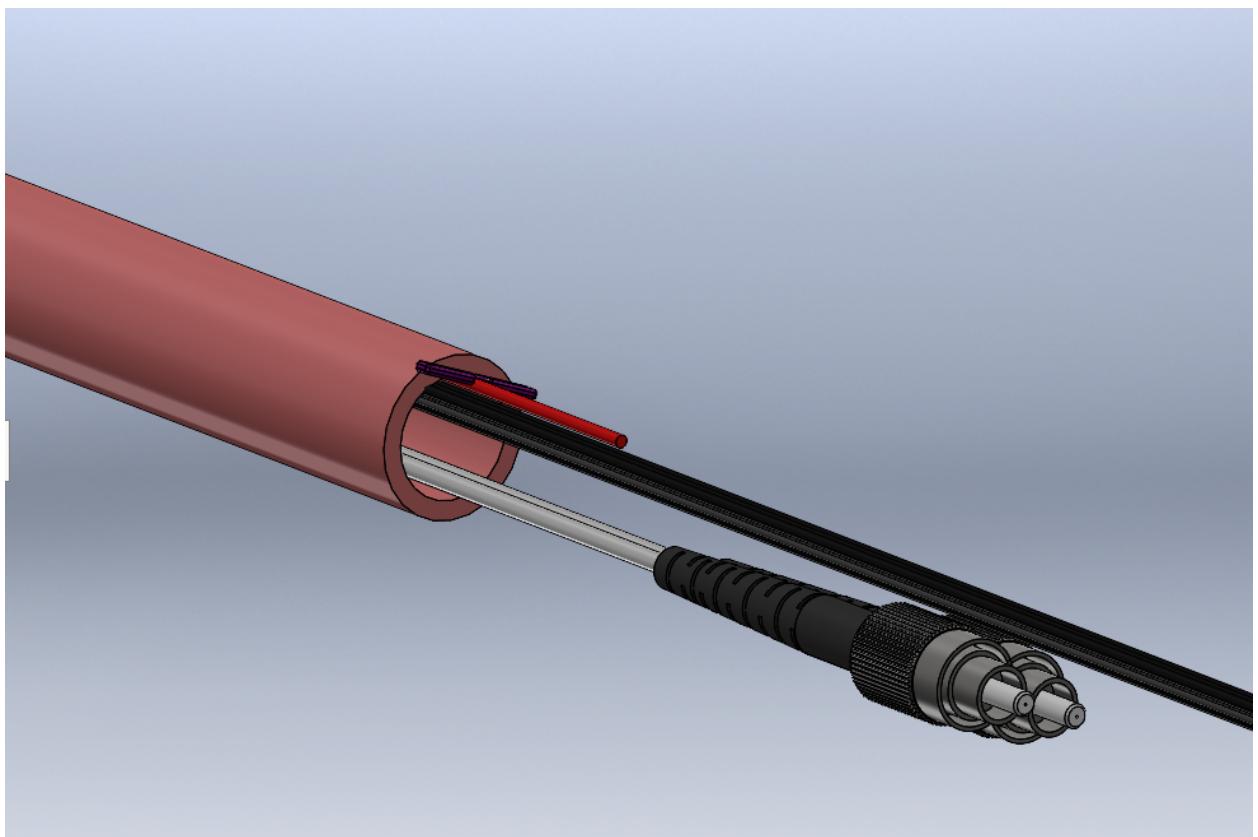


Fig. 20: Fiber inputs at Headset Cable distal end



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11. Mount the USB C cable to its place with 2x M3x4 screws and connect the opposite end to **Console 1** port on the D3.

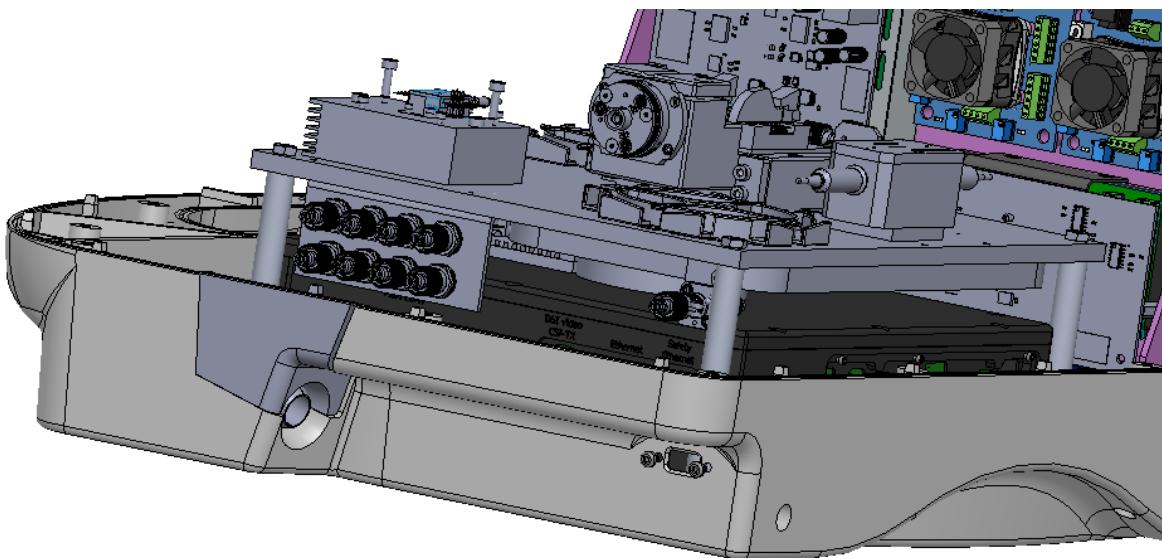
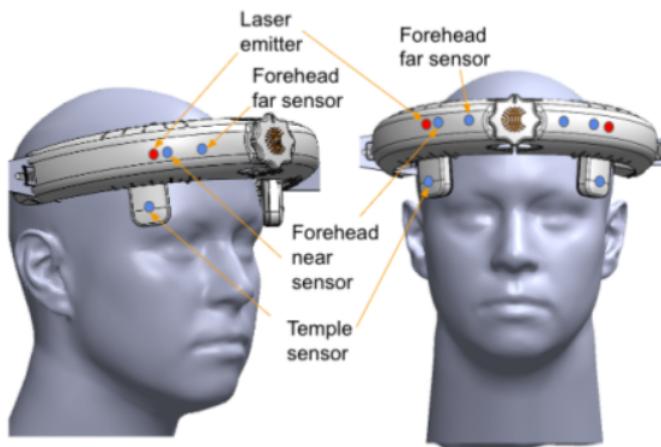


Fig. 20: USB C Mount on Back Case

12. Connect the Fakra Cables to the corresponding ports on the D3 then connect headset camera cables to the corresponding fakra cables (refer to the figure below for 6-camera headset configuration).

Sensor naming for reference



Physical Camera Ports:

- #1: Right Horizontal/Forehead
- #2: Left Near
- #3: Right Temple
- #5: Left Horizontal/Forehead
- #6: Right Near
- #7: Left Temple

Fig. 21: Camera to D3 connection mapping



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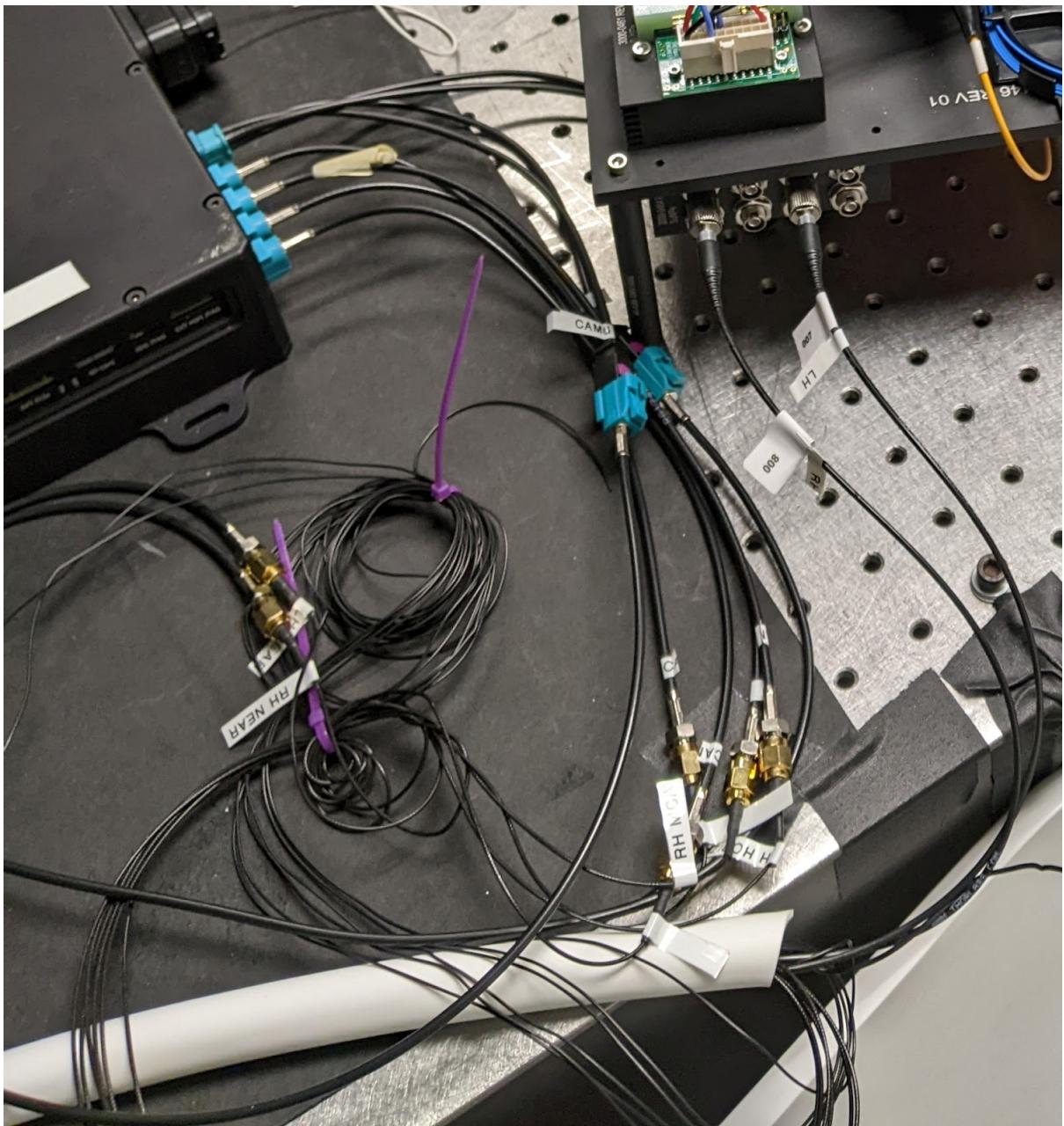


Fig. 22: Fakra Cables connecting D3 to headset



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13. Acquire D3-PDU-MLB-LCD-FibSW wire harness 7000-0208. Connect D3 Main Connector (TE Connectivity PN 776164-1) to its corresponding female mate on the D3, connect D3 Aux Connector (TE Connectivity PN 770680-3) to its corresponding mate on the D3, connect Fiber Switch connector (Molex PN 875681693) to its corresponding mate on the Fiber Switch, connect D3 Interface connector (Molex PN 15388100) to its mate J206 on the OpenWater MLB board, connect LCD RS232/Power connector (JST PN SHR-08V-S-B) to its corresponding mate on the LCD, connect LCD power connector (Molex PN 1727080002) to its corresponding mate J201 on the OpenWater PDU board, connect Fiber Switch power connector (Molex PN 39012060) to its corresponding mate J205 on the PDU, connect D3 power connector (Molex PN 39012085) to its mate J207 on the PDU.

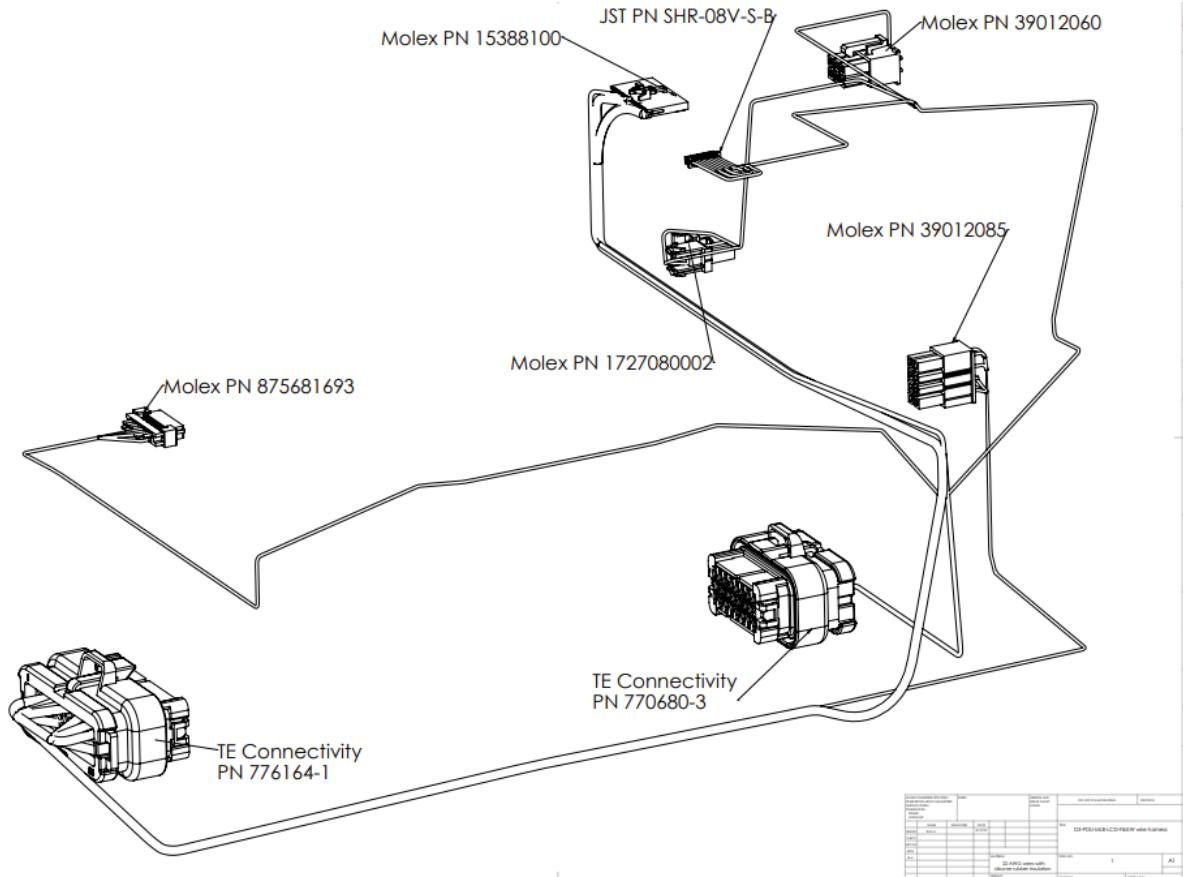


Fig. 23: D3-PDU-MLB-LCD-FibSW wire harness 7000-0208



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14. Acquire Seed-PDU-SeedDRV wire harness. Connect MPL500 connector (NorCamp PN 171-015-103L001) to its corresponding mate on the MPL500 Seed Laser Driver, connect Seed Laser connector (Samtec PN IPD1-10-D-K) to its corresponding mate on the Seed Laser PCB, connect Seed Laser control signals connector (Molex PN 390112120) to its corresponding mate J203 on the OpenWater MLB, connect Seed Laser power connector (Molex PN 39012060) to its corresponding mate J208 on the OpenWater PDU, strip off 5 mm of insulation from the 4 TEC wires and and insert into appropriate ports on Seed Laser TEC (blue-OUTA, green - SEN-, yellow-SEN+, red-OUTB).

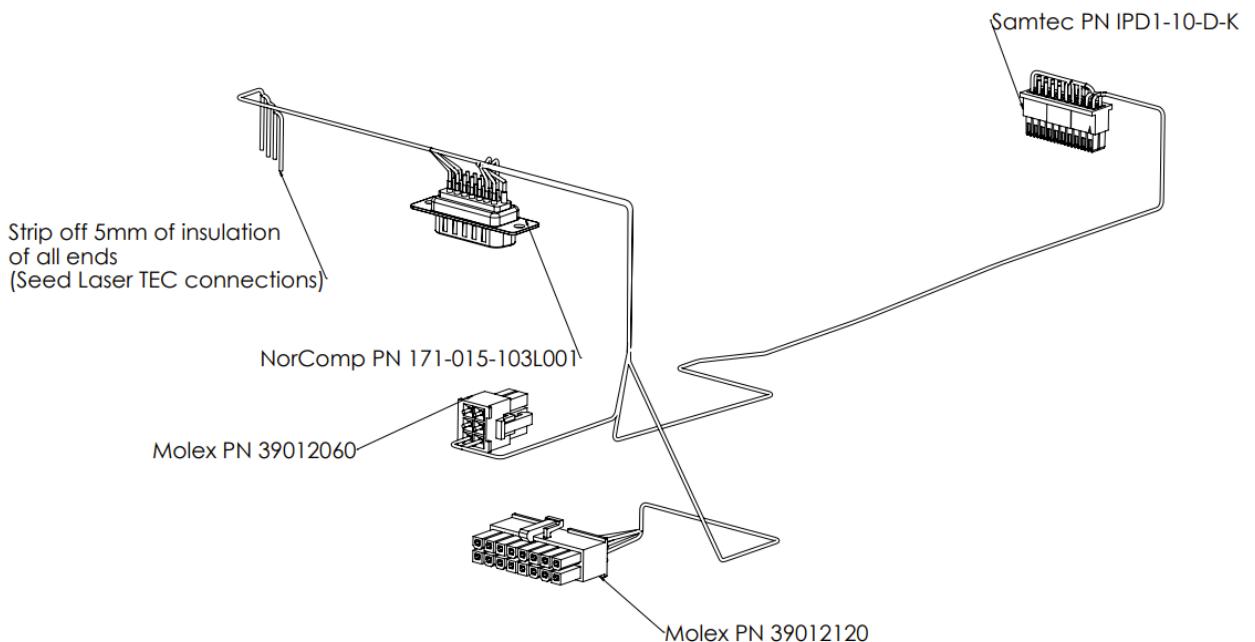


Fig. 24: Seed-PDU-SeedDRV wire harness

15. Acquire TADRV-PDU-MLB wire harness. Connect PDU connector (Molex 39012080 (2)) to PDU J203 mate, connect MLB connector (Molex 39012080 (1)) to MLB J200 mate, strip off 5 mm of insulation from the red and yellow wires and connect the red to J1, 3 pin and the yellow to J5, 1 pin on the LD10CHA.



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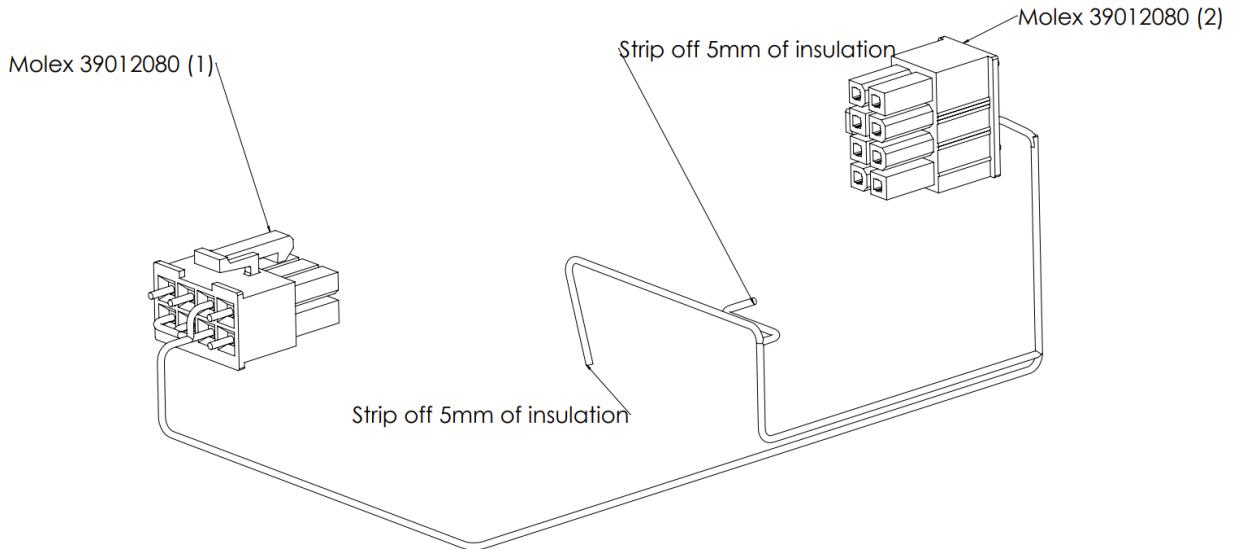


Fig. 25: TADRV-PDU-MLB wire harness

16. Acquire TA-TADRV-TATEC wire harness. Connect TA control signals connector (Samtec PN IPD1-08-D-K) to TA PCB connector, strip off 5 mm of insulation from TADRV wires and connect the black wire to J1, 1 and the red wire to J1, 2 on the LD10CHA. Strip off 5 mm of insulation from the TEC wires and connect them to the TA TEC in the following order: blue-OUTA, green - SEN-, yellow-SEN+, red-OUTB.

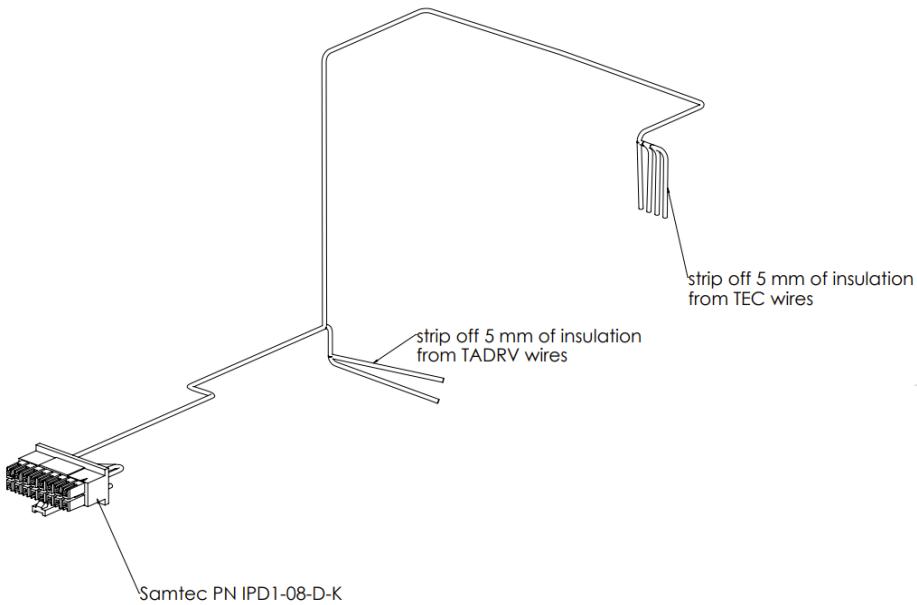


Fig. 26: TA-TADRV-TATEC wire harness



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17. Acquire MLB-LD10CHA wire harness. Connect the connector (Molex PN 39012120) to its mate J204 on the MLB. Strip off 5 mm of insulation from all the wires. Connect the white wire to J3, 1 and the yellow wire to J3, 2 on LD10CHA, connect the black wire to J2, 6, green wire to J2, 1, and the blue wire to J2, 3.

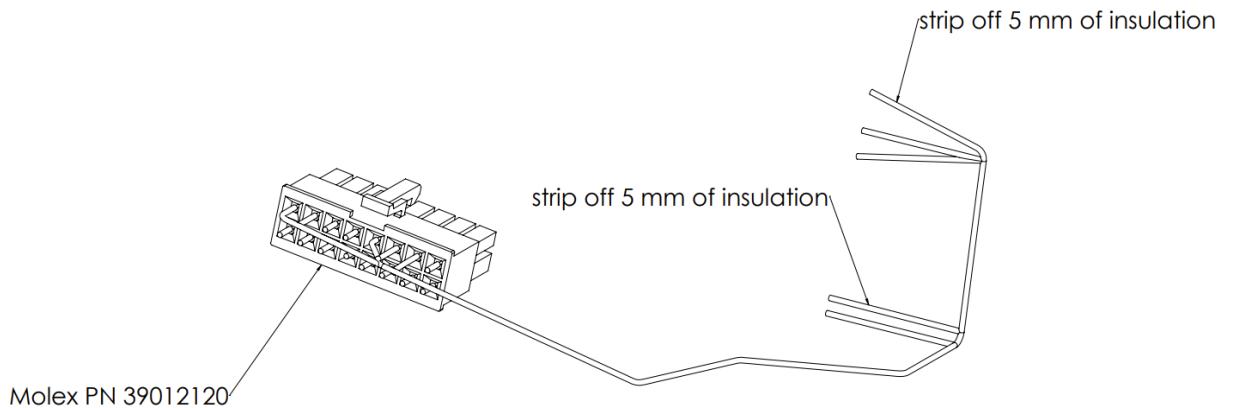


Fig. 27: MLB-LD10CHA wire harness

18. Acquire SeedTEC - PDU power cable. Connect the connector (Molex PN 39012060) to its mate J204 on the PDU. Strip off 5 mm of insulation from the wires and connect the black wire to PGND and the red wire to VDD on the Seed Laser TEC.

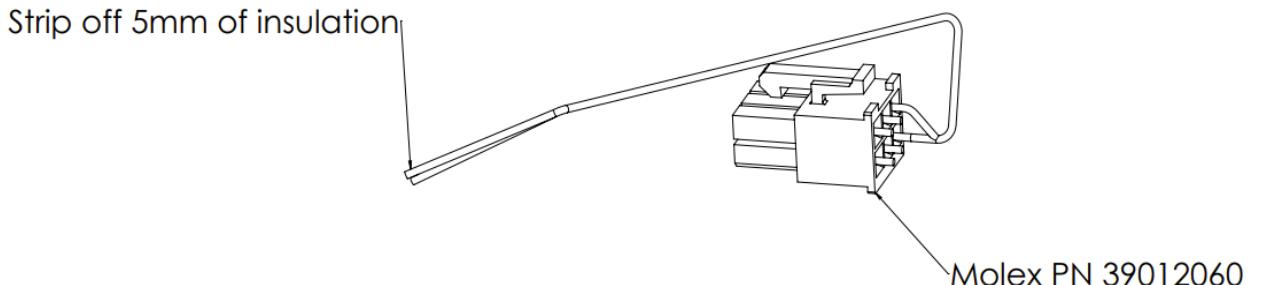


Fig. 28: SeedTEC - PDU power cable



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19. Acquire TATEC-PDU power cable. Connect the connector (Molex PN 39012060) to its mate J206 on the PDU. Strip off 5mm of insulation from the wires and connect the black wire to PGND and the red wire to VDD on the TA TEC.

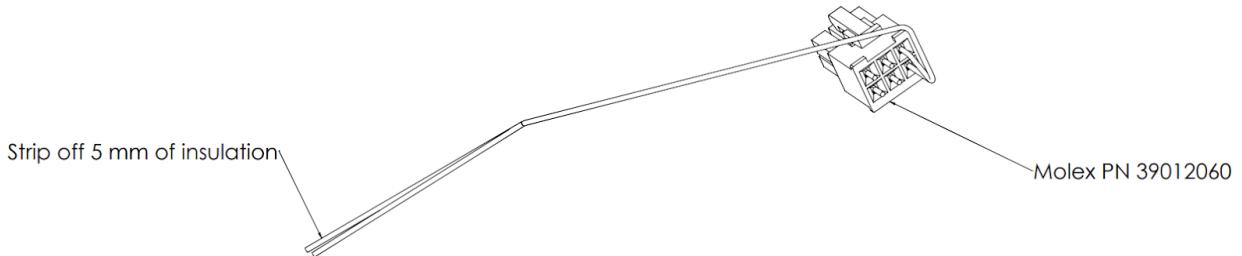


Fig. 29: TATEC-PDU power cable

20. Acquire PDU-PS cable. Connect the red wire to V+ and the black wire to V- on the GHA500 AC-DC converter.

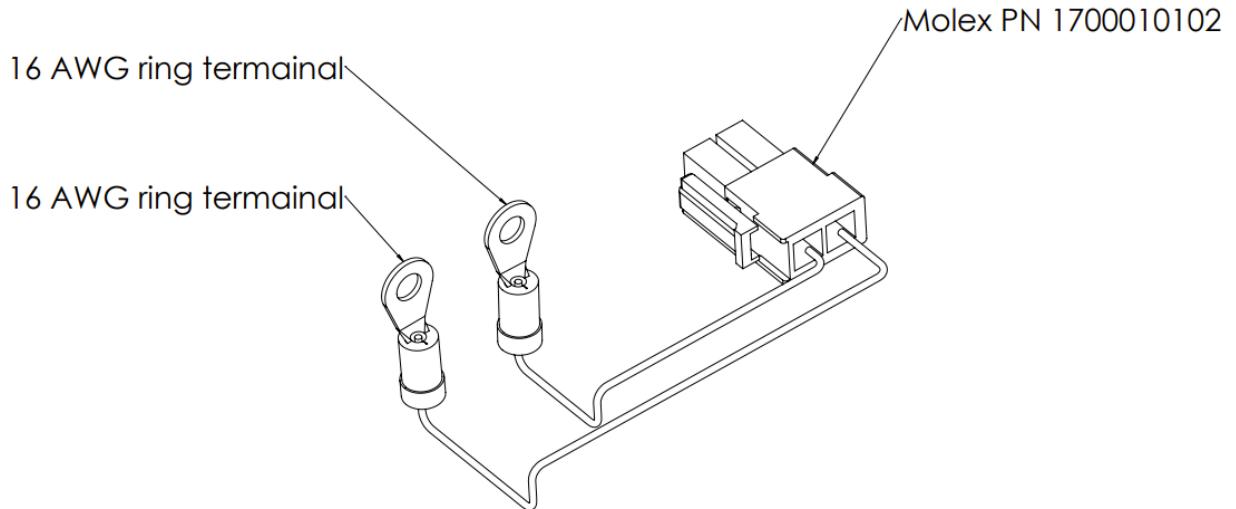


Fig. 30: PDU-PS cable



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21. Acquire ESTOP - MLB cable. Connect connector (Molex PN 1727080002) to J205 on the MLB.

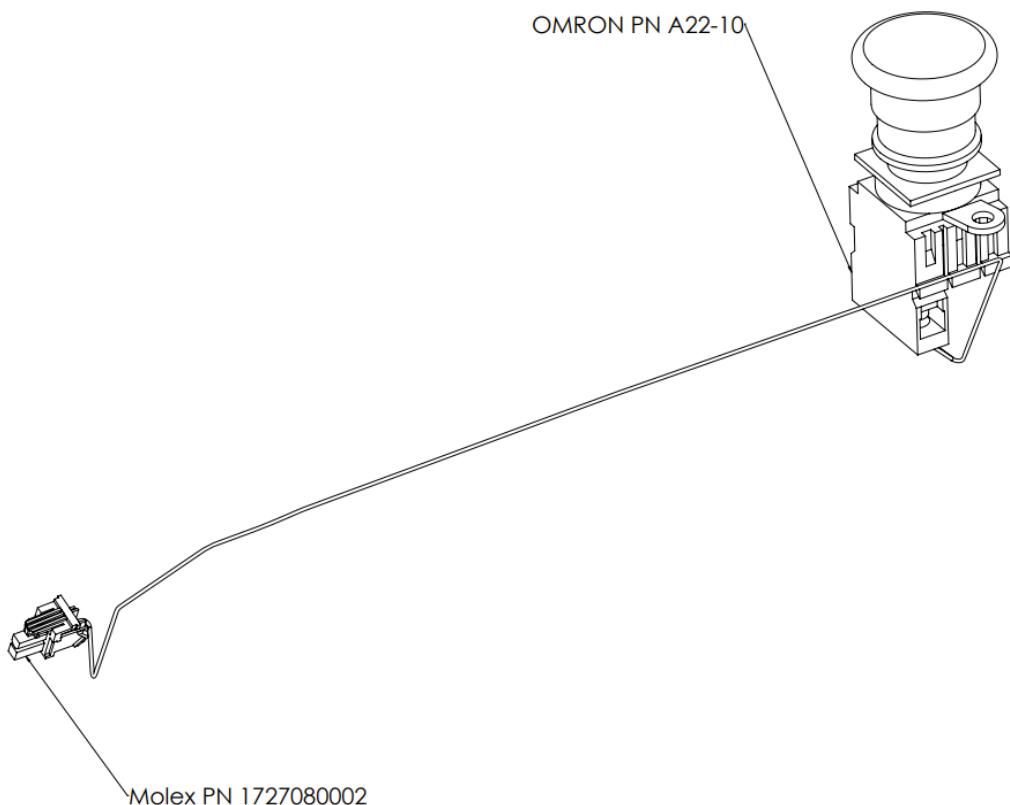


Fig. 31: ESTOP - MLB cable

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Display Electrical Connection Addendum

The following connectors on the display should be connected:

- Power/RS232
- Ethernet
- Debug USB
- Host USB (USB OTG)

Ethernet, Debug USB, and USB OTG should all be connected to independent harnesses that are broken out externally to the bottom of the device

Power/RS232 (Molex PN 1727080002 as shown in figure 23) should be connected to the internal harness coming from the D3.