1. Melt M3 Thread Inserts (4x) into the XY Motor Mount
2. Melt M3 Thread Inserts (2x) into the Light Tower | Bottom
3. Melt M3 Thread Inserts (4x) into the Sample Stage Holder
4. Melt M3 Thread Inserts (4x) into the Mounting Plate
5. Melt M2 Thread Inserts (2x) into the End Switch Mount Bottom
6. Melt M2 Thread Inserts (2x) into the End Switch Mount Top
7. Melt M2 Thread Inserts (2x) into the End Switch Mount Front
8. Melt M2 Thread Inserts (2x) into the End Switch Mount Back
9. Melt M2 Thread Inserts (2x) into the End Switch Mount Left
10. Melt M2 Thread Inserts (2x) into the End Switch Mount Right
11. Mount metal frame profiles together by means of connecting the corner brackets (16x)by means of M4x8 bolts (64x) and M4 sliding nuts (64x)
12. Connect the bottom plate by means of M4x8 bolts (4x) and M4 sliding nuts (4x)
13. Drill a hole with a diameter of 6 mm in both of the two corner brackets on the back of the device, that cover the holes in the bottom plate
14. Place the rubber legs (4x) through the bottom plate and fasten them by means of M4 nuts (8x)
15. Place the longer stepper motor on the bottom plate with the motor facing towards the back of the device, and fasten it with M3x8 bolts (4x) and M3 nuts (4x)
16. Place the XY-motor mount on the longer stepper motor and fasten it with M3x16 countersunk bolts (4x)
17. Place one of the shorter stepper motors on the XY-motor mount and fasten it with M3x8 bolts (4x)
18. Solder the LED on the heatsink, make sure that the positive and negative pins of the LED are on the allocated place
19. Strip both ends of the 22AWG | 550 mm wires (2x)
20. Solder one end of the wires on the heatsink, one on the positive pins, one on the negative pins
21. Mount the heatsink on the Light tower | Bottom by means of M3x8 bolts (2x)
22. Place Light tower | Spacer 1 on top of the Light tower | Bottom
23. Place the first of the Asymmetrical condenser lenses in the Light tower | Spacer 1
24. Place Light tower | Spacer 2 on top of Light tower | Spacer 1
25. Place the second of the Asymmetrical condenser lenses in the Light tower | Top
26. Place Light tower | Top on Light tower | Spacer 2
27. Connect all Light tower parts by means of M4x60 bolts (3x)
28. Place the Light tower assembly on the Light tower plate and fasten it with M4 nuts (3x)
29. Place the Light tower plate on the assembled structure and fasten it with M4x8 bolts (4x) and M4 sliding nuts (4x)
30. Place the Z-motor mount on the assembled structure and fasten it with M4x8 bolts (2x) and M4 sliding nuts (2x)
31. Place the other smaller stepper motor on the Z-motor mount and fasten it with M3x8 bolts (4x)
32. Place the Clamp Mount on the Smaller Stepper Motor and fasten it with M3x16 countersunk bolts (4x)
33. Place the Clamp on the Clamp Mount and fasten it with M3x12 bolts (4x)
34. Place the Thorlabs C-mount in the Clamp and tighten it with M4x24 bolts (2x) and M4 nuts (2x)
35. Screw the 50 mm Spacer on the Thorlabs C-mount
36. Screw the 4X Objective on the 50 mm Spacer
37. Screw the Raspberry Pi HQ camera on the Thorlabs C-mount
38. Place the heatsinks on the DRV8825 motor controllers (3x)
39. Solder the 1x20 Male Header Pins on the Raspberry Pi Pico (2x)
40. Upload the code to the Raspberry Pi Pico
41. Solder the 100uF capacitors on the Custom PCB
42. Solder the 1x20 Female Header Pins on the Custom PCB (2x)
43. Solder the 1x8 Female Header Pins on the Custom PCB (6x)
44. Strip both sides of the 22 AWG | 120 mm wire (2x)
45. Connect the JST XH Female Connector on one side of the wire (2x)
46. Place JST XH Female Connectors in the JST XH4P plug like depicted in the image below
47. Solder the other end of the cables to the MOSFET modules. Pay attention to polarity
48. Strip both sides of the 22 AWG | 200 mm wire (2x)
49. Connect the female Du-Pont Connector to one side of the wire (2x)
50. Slide the Du-Pont plug over the Du-Pont Connector (2x)
51. Connect the other side of the wire to the screw terminal of the MOSFET. Pay attention to the polarity.
52. Connect the USB-C to wire cable to the large connector of the RS Connector set
53. Strip both sides of the 10 AWG | 300 mm wire (2x)
54. Connect the 10 AWG | 300 mm wire to the large connector of the RS Connector set
55. Place the large connector of the RS Connector set on the RPD-60A Power supply
56. Strip both sides of the 10 AWG | 500 mm wire (2x)
57. Connect a 10 AWG | 6.3 mm Spade Connector on one side of the wire (2x)
58. Strip both sides of the 10 AWG | 350 mm wire (1x)
59. Connect a 10 AWG | 6.3 mm Spade Connector on one side of the wire (1x)
60. Connect a 10 AWG | M3 Ring Connector on the other side of the wire (1x)
61. Connect the 10 AWG | 500 mm wire to the small connector of the RS Connector set
62. Connect the small connector of the RS Connector set to the RPD-60A Power supply
63. Place a 10 mm spacer on the RPD-60A Power supply and connect it with a M2 screw (4x). Make sure to connect the M3 Ring Connector of the 10 AWG | 350 mm wire to the ground connector which is indicated by the ground symbol
64. Place the Silicon Power NAND SD Card inside the Raspberry Pi 3 or 4
65. Connect the ribbon cable to the Raspberry Pi 3 or 4, with the blue print pointing towards the USB terminals
66. Mount the fans from the Raspberry Pi Cooler set to the top part of the Raspberry Pi Cooler set
67. Stick the heat dissipation pads (3x) on the chips of the Raspberry Pi 3 or 4
68. Place the top part of the Raspberry Pi Cooler set on top of the Raspberry Pi 3 or 4
69. Connect the fan plugs to the Raspberry Pi 3 or 4
70. Connect the Custom PCB on the Electronics Plate by means of 15 mm spacers (4x), M2x8 bolts (4x) and M2 nuts (4x)
71. Connect the MOSFET on the Electronics Plate by means of 5 mm spacers (2x), M2x8 bolts (2x) and M2 nuts (2x)
72. Connect the RPD-60A Power supply on the Electronics Plate by means of M2 nuts (4x)
73. Place the bottom part of the Raspberry Pi Cooler set on the Raspberry Pi 3 or 4 and mount it to the Electronics plate by means of M2x16 mm bolts (4x)
74. Mount the Electronics Plate to the structure by means of M4x8 bolts and M4 sliding nuts (4x)
75. Mount the Sample Stage to the Sample Stage Holder by means of the M5x15 Springs (4x), M3x20 countersunk bolts (4x) and M3 rings (8x)
76. Mount the Sample Stage to Y-motor by means of M3x12 bolts (4x)
77. Connect the other side of the ribbon cable to the Raspberry Pi HQ camera, with the blue print facing upwards
78. Connect the other end of the 22AWG | 550 mm wires to the output screw terminal of the MOSFET module. Pay attention to the polarity
79. Cut and strip the cables of the Z-motor to 200 mm (4x)
80. Connect the JST XH Female Connectors to the wire (4x)
81. Place JST XH Female Connectors in the JST XH4P plug like depicted in the image below
82. Cut and strip the cables of the Y-motor to 500 mm (4x)
83. Connect the JST XH Female Connectors to the wire (4x)
84. Place the JST XH Female Connectors in the JST XH4P plug like depicted in the image below
85. Cut and strip the cables of the Y-motor to 500 mm (4x)
86. Connect the JST XH Female Connectors to the wire (4x)
87. Place the JST XH Female Connectors in the JST XH4P plug like depicted in the image below
88. Connect the JST XH4P plugs to the Custom PCB
89. Connect the Google Coral TPU to the WaveShare USB Hub Hat by means of USB-to-USB-C cables | 200 mm (2x)
90. Mount the Google Coral TPU (2x) to the structure by means of M3x12 bolts (2x) and M3 sliding nuts (2x)
91. Mount the WaveShare USB Hub Hat to the structure by means of the 3D printed spacers (2x), M3x16 bolts (2x) and M3 sliding nuts (2x)
92. Mount the WaveShare USB Hub Hat to the Raspberry Pi 3 or 4 by means of a USB-to-microUSB cable | 500 mm
93. Mount the USB Panel Mount Cables (2x) to the Mounting Plate by means of M3x8 bolts (4x)
94. Mount the Rocker Switch to the Mounting Plate
95. Mount the Power Socket to the Mounting Plate by means of M3x16 bolts (2x) and M3 nuts (2x)
96. Mount the HDMI Panel Mount Cable to the Mounting Plate by means of M3x6 bolts (2x)
97. Mount the Mounting Plate to the Backplate by means of M3x12 bolts (4x) and M3 nuts (4x)
98. Strip both sides of the 10 AWG | 150 mm wires (2x)
99. Connect 10 AWG | 6.3 mm Spade Connectors to both sides of the wires (4x)
100. Mount the Backplate to the structure by means of M4x8 bolts (4x) and M4 sliding nuts (4x)
101. Connect the USB panel mount cables to the Raspberry Pi 3 or 4
102. Connect the HDMI panel mount cable to the Raspberry Pi 3 or 4
103. Connect the spade connectors of the 10 AWG | 150 mm wires to the Power Socket and the Rocker Switch
104. Connect the spade connector of the 10 AWG | 350 mm wire to the Power Socket
105. Connect the spade connectors of the 10 AWG | 500 mm wires to the Rocker Switch
106. Connect the Raspberry Pi Pico to the Raspberry Pi 3 or 4 by means of the USB-to-microUSB | 300 mm
107. Strip both sides of the 22 AWG | 100 mm (1x), 22 AWG | 200 mm (1x) and 22 AWG | 250 mm (1x) wires
108. Solder the 22 AWG | 100 mm, 22 AWG | 200 mm and 22 AWG | 250 mm wires to the End Switches (2x) as depicted in the figure below
109. Connect the JST XH Female Connectors to the wire (2x)
110. Place JST XH Female Connectors in the JST XH2P plug like depicted in the image below
111. Mount the End Switches to the End Switch Mount Top and End Switch Mount Bottom by means of M2x10 bolts (4x)
112. Mount the End Switch Mount Top and End Switch Mount Bottom to the structure by means of M4x8 bolts (4x) and M4 sliding nuts (4x)
113. Align the End Switch Mount Top in such a way that the Raspberry Pi HQ Camera cannot hit the aluminium profiles at the top
114. Align the End Switch Mount Bottom in such a way that the objective cannot hit the glass sample slide on the stage
115. Connect the JST XH2P plug to Custom PCB
116. Strip both sides of the 22 AWG | 200 mm (1x), 22 AWG | 300 mm (1x) and 22 AWG | 400 mm (1x) wires
117. Solder the 22 AWG | 200 mm, 22 AWG | 300 mm and 22 AWG | 400 mm wires to the End Switches (2x) as depicted in the figure below
118. Connect the JST XH Female Connectors to the wire (2x)
119. Place JST XH Female Connectors in the JST XH2P plug like depicted in the image below
120. Mount the End Switches to the End Switch Mount Front and End Switch Mount Back by means of M2x10 bolts (4x)
121. Mount the End Switch Mount Front and End Switch Mount Back to the structure by means of M4x12 bolts (4x) and M4 sliding nuts (4x)
122. Align the End Switch Mount Front in such a way, so that it hits the aluminium profile
123. Align the End Switch Mount Back in such a way, so that it hits the aluminium profile
124. Connect the JST XH2P plug to Custom PCB
125. Strip both sides of the 22 AWG | 300 mm (1x), 22 AWG | 300 mm (1x) and 22 AWG | 300 mm (1x) wires
126. Solder the 22 AWG | 300 mm, 22 AWG | 300 mm and 22 AWG | 300 mm wires to the End Switches (2x) as depicted in the figure below
127. Connect the JST XH Female Connectors to the wire (2x)
128. Place JST XH Female Connectors in the JST XH2P plug like depicted in the image below
129. Mount the End Switches to the End Switch Mount Left and End Switch Mount Right by means of M2x10 bolts (4x)
130. Mount the End Switch Mount Left and End Switch Mount Right to the structure by means of M4x12 bolts (4x) and M4 sliding nuts (4x)
131. Align the End Switch Mount Left so that the Sample Stage cannot hit the Light tower
132. Align the End Switch Mount Right so that the Sample Stage cannot hit the Light tower
133. Connect the JST XH2P plug to Custom PCB
134. Mount the Top Plate on the structure by means of M4x8 bolts (4x) and M4 sliding nuts (4x)
135. Place the hinges (2x) on the Side Plate by means of M2x8 bolts (4x) and M2 nuts (4x)
136. Mount the Lock Mount on the Side Plate by means of M2x8 bolts (2x) and M2 nuts (2x)
137. Mount the Lock Hook on the Window by means of a M3x8 bolt (1x), a M3 nut (1x) and a M3 ring (1x)
138. Mount the Window to the Side Plate by means of M2x6 bolts (4x) and M2 nuts (4x)
139. Mount the Side Plate to the structure by means of M4x8 bolts (10x) and M4 sliding nuts (10x)
140. Connect the Power Cord to the Power Plug and connect it to the grid
141. Connect the Schistoscope to a monitor by means of an HDMI cable
142. Move the Light Tower plate until it is aligned perfectly with the objective as can be observed on the monitor
143. Set the DRV8825 Stepper Motor Controllers’ reference voltage (Vref) to 0.6V