



















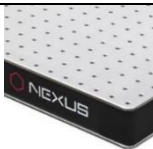


## P1– Shopping & Machining List

Item ID	Source	Accessibility	Description	Link	Image	Quantity
<b>General tools</b>						
a.	Thorlabs	purchase	Spanner wrench 1	<a href="#">SPW30</a>		1
b.	Thorlabs	purchase	Fiber stripping tool	<a href="#">FTS4</a>		1
c.	Thorlabs	purchase	Fiber cleaver	<a href="#">XL411</a>		1
d.	Thorlabs	purchase	Spanner wrench 2	<a href="#">SPW602</a>		1
e.	Thorlabs	purchase	UV Curing LED system	<a href="#">CD20K2</a>		1
f.	Thorlabs	purchase	Handheld laser source (635nm)	<a href="#">HLS635</a>		1
			Single mode patch cable	<a href="#">P1-630Y-FC-2</a>		1
g.	Thorlabs	purchase	Power and energy meter	<a href="#">PM100D</a>		1
			Photodiode power sensor	<a href="#">S121C</a>		1

h.	Thorlabs	purchase	Green LED (530nm)	<a href="#">M530F2</a>		1
			T-Cube LED Driver	<a href="#">LEDD1B</a>		1
			Power supply	<a href="#">KPS201</a>		1
i.	Thorlabs	purchase	NIR detector card	<a href="#">VRC4</a>		1
j.	Thorlabs	purchase	Lens cleaning tissues	<a href="#">MC-5</a>		1
k.	RS	purchase	Foam cotton bud & swabs	<a href="#">Swabs</a>		1
l.	Thorlabs	purchase	Optical adhesive	<a href="#">NOA61</a>		1
m.	Thorlabs	purchase	Splice protector sleeve	<a href="#">SPS60</a>		1-2
n.	Thorlabs	purchase	Distortion grid with 50um grid spacing	<a href="#">R1L3S3P</a>		1
o.	Winjee	purchase	Silicone rubber back glue	<a href="#">704</a>		1
p.	3M	purchase	Epoxy (black)	<a href="#">DP420</a>		1
	Loctite		Super glue	<a href="#">415</a>		1
q.	Ahlsell	purchase	Heat gun	<a href="#">link</a>		1

r.	APE	purchase	Pulsed Check autocorrelator	<a href="#">APE-NX</a>		1
s.	Thorlabs	purchase	Base to fixate Pulse Check on Optical Breadboard	<a href="#">MB2025/M</a>		1
t.	Fabory	purchase	M2x5H Philips 7985225	<a href="#">M2screws</a>		>10
u.	TRfastenings	purchase	M3x3mm Pan Head Pozidriv Machine Screw DIN7985	<a href="#">M3x3</a>		>3
v.	Thorlabs	purchase	M4 capscrews kit	<a href="#">HW-KIT1/M</a>		1
w.	Elfa Distrelec	purchase	Air duster Green PRF	<a href="#">PRF 4-44</a>		1
x.	Surface Solutions	purchase	Black rubber spray	<a href="#">SS black</a>		1
y.	Elfa Distrelec	purchase	Tweezers  Carbon Fibre Forceps	<a href="#">301-51-451</a> <a href="#">11270-20</a>		1 1
<b>Core optics module</b>						
<b>Mechanical components</b>						
1	Thorlabs	purchase	Nexus breadboard	<a href="#">B3045L</a>		1
2	Thorlabs	purchase	Sorbothane feet	<a href="#">AV6/M</a>		1






3	Thorlabs	purchase	Fiber adapter plate	<a href="#">SM1SMA</a>		1
4	Thorlabs	purchase	Adjustable mirror mount	<a href="#">POLARIS-K05S2</a>		2
5	Thorlabs	purchase	Rotation mount & M3 screw	<a href="#">MRM05/M</a>		1
6	Thorlabs	purchase	M6 cap screws kit	<a href="#">HW-KIT2/M</a>		>20
7	Wolida	purchase	Heat shrinkage tubings Wolida Ø0.6/0.4mm 2:1 ratio 2.5mm Distrelec 3mm	<a href="#">Tube1</a> <a href="#">Tube2</a> <a href="#">Tube3</a>		3
8	Thorlabs	purchase	3 axis Microblock stage	<a href="#">MBT616D/M</a>		1
9	Thorlabs	Purchase	XYZ Translation stage & right-angle bracket	<a href="#">MT3A/M</a> <a href="#">AB90E/M</a>		1
10	Thorlabs	Purchase	Compatible flexure stage mount	<a href="#">HCS020</a>		1
11	Thorlabs	Purchase	Fiber clamp holds fiber  Bare fiber adapter & Flat base to glue into (e.g.)	<a href="#">HFF001</a>  <a href="#">S140-BFA</a> <a href="#">XT95P3</a>	 	1 3 1
12	Thorlabs	purchase	Fixed mounting bracket	<a href="#">AMA007/M</a>		1






13	Thorlabs	purchase	SM05 Threaded adapter to red laser source	<a href="#">AD1109F</a>		1
			FC/PC Fiber Collimation (linked with items f)	<a href="#">F230FC-B</a>		1
14	Thorlabs	purchase	Kinematic cage cube	<a href="#">DFM1T3</a>		1
15	Thorlabs	purchase	Kinematic cage cube base	<a href="#">DFM1B</a>		1
16	Thorlabs	purchase	Lens tubes	<a href="#">SM1L05</a>		4
17	Thorlabs	purchase	End cap for machining	<a href="#">SM1CP2M</a>		1
18	Thorlabs	purchase	Coupler	<a href="#">SM1T2</a>		3
19	Thorlabs	purchase	Optical beam shutter with controller for PMT	<a href="#">SHB1</a>		1
20	Thorlabs	purchase	Post mounting adapter	<a href="#">SHM1/M</a>		1
21	Kavli NTNU	self-made	Coupling box (Al7075 with sand spray)	Github(I)		1
22	Kavli NTNU	self-made	Coupling box cap (Al7075 with sand spray)	Github(I)		1
23	Kavli NTNU	self-made	Coupling holder (Stainless steel)	Github(I)		1

24	Kavli NTNU	self-made	Coupling protector (Al anodized)	Github(1)		1
25	Kavli NTNU	self-made	Collimator assemble tool (Al6061)	Github(1)		1
26	Kavli NTNU	self-made	Collimator holder (Al6061 black anodized)	Github(1)		1
27	Kavli NTNU	self-made	Control box shell (Al6061 black anodized)	Github(1)		1
28	Kavli NTNU	self-made	Control box cap (Al6061 black anodized)	Github(1)		1
<b>Optical components</b>						
29	Toptica	purchase	Laser source	FemtoFiber ultra 920		1
30	Schott	purchase	Tapered fiber bundle (TFB) XMLG, Ø.027"x98.4"[2.5 m] Drawing C54706.04	<a href="#">1838003</a>		1
31	NKT Photonics	purchase	Hollow-core PCF, HC-920 * (≈2.2-2.4m)	<a href="#">K50-060-00</a> *		1
32	Fuzhou Sunlight Technology	purchase	Glass rods (ZF62)	<a href="#">GLA-10x150-AR800-1100</a>		3
33	Fuzhou Sunlight Technology	purchase	Glass flange ** (7mm length Inside Ø 0.155mm)	<a href="#">TUB-1.8x7-0.155</a> **		2
34	Thorlabs	purchase	Prisms *** direct light from the seed laser up to the HC-920 fiber	<a href="#">MRA12-P01</a> ***		8
35	Thorlabs	purchase	Emission filter 525 nm green channel	<a href="#">MF525-39</a>		1
36	Thorlabs	purchase	Emission filter 630 nm red channel	<a href="#">MF630-69</a>		1

37	Thorlabs	purchase	Shortpass filter	<a href="#">FESH0750</a>		2
38	Thorlabs	purchase	Dichroic mirror	<a href="#">DMLP567R</a>		1
39	Thorlabs	purchase	Aspheric condenser lens	<a href="#">ACL25416U-A</a>		3
40	Thorlabs	purchase	Coupling lens	<a href="#">C230TMD-B</a>		1
41	Thorlabs	purchase	Half-Wave plate	<a href="#">WPHSM05-915</a>		1
42	Thorlabs	purchase	Protected silver mirrors	<a href="#">PF05-03-P01</a>		2
43	Edmund Optics	purchase	Collimating lens	<a href="#">#84-128</a>		1







### Electrical components

44	Mirrorcle Technologies	purchase	MEMS driver (controller) BDQ PicoAmp 5.4 T180	<a href="#">DR-11-055-00</a>		1
45	Digikey	purchase	BNC to SMA cables	<a href="#">CCBNS-MM-RG174-36</a>		1
46	RS	purchase	DSUB15 connector plug (male)	<a href="#">472-859</a>		2
47	RS	purchase	Backshell	<a href="#">765-9448</a>		2
48	RS	purchase	DSUB15 Connector Socket (female)	<a href="#">472-865</a>		2

49	Digikey	purchase	6-pin connector for MEMS	<a href="#">FH19C-6S-0.5SH(10)</a>		1
50	Industrifil	purchase	Single wire cables (6 colours of $\approx 2.5$ m)	<a href="#">UAA-3607</a>		6
51	Thorlabs	purchase	$\mu$ TLens Driver	<a href="#">KPZ101</a>		1
52	Thorlabs	purchase	PMT	<a href="#">PMT2101/M</a>		2
53	Thorlabs	purchase	Controller for shutter	<a href="#">SHB1</a>		1

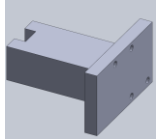

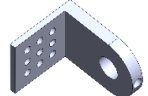
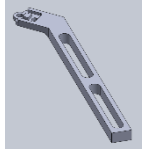





## Scope mounting module





### Mechanical components

54	Thorlabs	purchase	Aluminum optical breadboard	<a href="#">B3060A</a>		1
55	Thorlabs	purchase	Sorbothane feet	<a href="#">AV6/M</a>		1
56	Thorlabs	purchase	One-sided construction rail Black Anodized (95x500 mm)	<a href="#">XT95SD-500</a>		2
57	Thorlabs	purchase	Rail carriage suitable for sliding onto item 58	<a href="#">XT95RC4/M</a>		2
58	Thorlabs	purchase	Precision construction rail L=400mm	<a href="#">XT95B-400</a>		1
59	Thorlabs	purchase	Post Mounting Clamp	<a href="#">C1545/M</a>		1






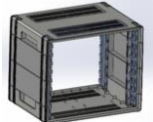




60	Thorlabs	purchase	Manual Rotation Stage	<a href="#">RP03/M</a>		1
61	Thorlabs	purchase	Base for item 58	<a href="#">XT95P3</a>		1
62	Thorlabs	purchase	Optical post	<a href="#">TR75/M</a>		2
63	Thorlabs	modify	Running wheel hardboard	Github, <a href="#">TB4</a>		1/4
64	Thorlabs	purchase	M6 spacers & washers	<a href="#">W25S050</a>		>4
65	Thorlabs	purchase	Spacer on both sides of wheel	<a href="#">PS1M</a>		2
66	SKF	purchase	Bearing OD 19mm ID 6mm	<a href="#">626-2Z</a>		1
67	Thorlabs	purchase	Right-angle clamp	<a href="#">RSA90/M</a>		1
68	Thorlabs	purchase	Pillar posts	<a href="#">RS50/M</a>		2
69	Thorlabs	purchase	Universal post holder	<a href="#">UPH100/M</a>		3
70	Thorlabs	purchase	Locking Ball and Socket Mount; to support LEDs near Tracking Camera	<a href="#">TRB1/M</a>		8
71	Thorlabs	purchase	Adapter camera-lens	<a href="#">SM1A10Z</a>		2
72	Kavli NTNU	self-made	MINI2P Holder P1 (A16061)	Github( <i>I</i> )		1












73	Kavli NTNU	self-made	MINI2P Holder P2 (Al6061)	Github(I)		1
74	Kavli NTNU	self-made	MINI2P Holder P3 (Stainless steel)	Github(I)		1
75	Kavli NTNU  TRfastenings	self-made	MINI2P Holder P4 & screw (Stainless steel)  M2.5x5 cap head hexagon socket drive screw, DIN912	Github(I)  <a href="#">M2.5cap</a>		1  1
76	Kavli NTNU	self-made	Wheel Holder (Stainless steel)	Github		1
77	Kavli NTNU  TRfastenings	self-made	Headbar holder & screw (Titanium alloy)  M3x3mm Pan Head Pozidriv Machine Screw, zinc & clear, DIN7985	Github  <a href="#">M3x3</a>		1  2
<b>Optical and electrical components</b>						
78	Thorlabs  RS	purchase	LED & Accessories  850nm IR LED Array Light Source  LED 5m cable  Adapter  Supply Power for LED	<a href="#">LIU850A</a>  <a href="#">780-0087</a>  <a href="#">301-29-731</a>  <a href="#">136-1345</a>	   	1  1  1  1
79	Thorlabs	purchase	Zelux 1.6 MP Monochrome CMOS Camera  & adapter SM1 to C-Mount	<a href="#">CS165MU/M</a>  <a href="#">SM1A10Z</a>	  	1  1

80	Edmund Optics	purchase	Lens focal length 4.5mm Or 8.5mm for lateral and frontal camera to control head fixation	<a href="#">4.5mm</a> <a href="#">8.5mm</a>		1
81	Edmund Optics	purchase	Basler camera for Animal Tracking	<a href="#">acA2040-90um</a>		1
			16mm EFL Camera Lens	<a href="#">MVL16M23</a>		1
			Shortpass Filter 875nm	<a href="#">#86-106</a>		1
82	Physik Instrumente (PI)	purchase	DC Motors	<a href="#">M-112.2DG</a>		3

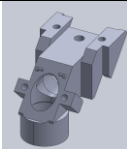
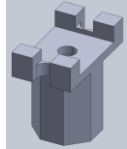
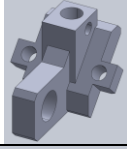
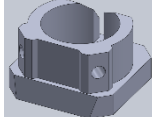
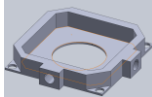
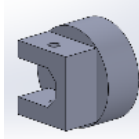




## Mobile cart and controlling system






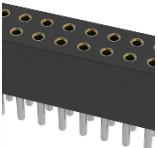
### Mechanical and electrical components

83	Thorlabs	purchase	Mobile cart	<a href="#">POC001</a>		1
84	Thorlabs	purchase	Optical breadboard 600x900x55mm	<a href="#">PBG52506</a>		1
85	Thorlabs	purchase	Optional drawer	<a href="#">POD001</a>		1
86	Schroff	purchase	19-inch rack	<a href="#">Ref 721-2708</a>		1
87	McMASTER-CARR	purchase	Span-in nuts	<a href="#">90680A729</a>		10
88	Dell	purchase	Workstation is an Intel core i9 with operating windows 10 Pro	<a href="#">7080</a>		1
89	Dell	purchase	(32"to 49") curved LED-backlit LCD5K2K monitor	<a href="#">Monitor</a>		1
90	Vidrio Technologies LLC	purchase	vDAQ card provides data acquisition and control of	<a href="#">V-vDAQ.R1</a>		1

			Laser, $\mu$ TLens, shutter, among others			
91	Vidrio Technologies LLC	purchase	vDAQ breadboard	<a href="#">V-vDAQ.R1</a>		1
92	Physik Instrumente (PI)	purchase	Motion controller for PI motors	<a href="#">C-884.4DC</a>		1
93	Toptica	purchase	Controller for 920nm laser	<a href="#">FFUltra920</a>		1
94	Dustin	purchase	USB-hub (7) ports	<a href="#">Deltaco</a>		1
95	Thorlabs	purchase	BNC Male to BNC Male & BNC adapters Female-Female	<a href="#">CA3136</a>  <a href="#">T3283</a>		>10  >10
96	Thorlabs	purchase	BNC to SMA Male Connector	<a href="#">CA2848</a>		2
97	Thorlabs	purchase	SMC connector  SMA female to BNC male	<a href="#">PAA101</a>  <a href="#">CA2606</a>	 	2  1
98	Thorlabs	purchase	SMA-to- SMA cable	<a href="#">CA2912</a>		2
99	Thorlabs	purchase	Power supply for $\mu$ TLENS driver	<a href="#">TPS002</a>		1
<b>Software</b>						
100	Vidrio Technologies LLC	purchase	Open-source software for the whole system	<a href="#">ScanImage 2021</a>		1
101	Others	free or purchase	See Protocol S4	NA	NA	1

## MINI2P miniscope

Mechanical components						
102	Kavli NTNU	self-made	Scope Body P1 (PEEK CF30 black)	GitHub		1
103	Kavli NTNU	self-made	Scope Body P2 (PEEK CF30 black)	GitHub		1
104	Kavli NTNU	self-made	Scope Body P3 (PEEK CF30 black)	GitHub		1
105	Kavli NTNU	self-made	Stitching Adapters (PEEK CF30 black)	GitHub		25
106	Kavli NTNU	self-made	Baseplate (Al6061 black anodized)	GitHub		10
107	Kavli NTNU	self-made	Alignment Tool (Al6061)	GitHub		1
108	FandWay TRfastenings	purchase	Screws for MINI2P: M1.2 x 3.0/4.0 pan head M1.6x 2.5 DIN916 – 45H (black)	<a href="#">M1.2cap</a> <a href="#">M1.6set</a>	NA	>10
Optical components						
109	Domilight	purchase	Scan Lens	<a href="#">D0166</a>		1
110	Fuzhou Sunlight Technology	purchase	Dichroic Mirror	<a href="#">DMSP0405</a>		1
111	Domilight	purchase	Objective1 Water+glass	<a href="#">D0213-3X</a>		1
112	Domilight	purchase	Objective2 Air	<a href="#">D0254-3X</a>		1

113	Domilight	purchase	Objective3**** Water/air+glass	<a href="#">D0277-3X</a> ****		1
114	Polight	purchase	μTLENS & accessories 4 Stacked μTLENS  Male-pin	<a href="#">μTLENS-NIR-D-45</a>  <a href="#">Mill-max1</a>	 	1  1
<b>Electrical components</b>						
115	Mirrorcle	purchase	FAST MEMS (MEMS-F)	<a href="#">A7M10.2-1000AL</a>		1
116	Mirrorcle	purchase	Large-angle MEMS (MEMS-L)	<a href="#">A3I12.2-1200AL</a>		1
117	Kavli NTNU  Digi-key	purchase	MEMS PCB & others  Female-pin	  <a href="#">Mill-max2</a>		1  1

\* NKT updated this product to K50-060-70 since 2021. The outer diameter of the old product (K50-060-00) and the new one (K50-060-70) is different!  
NKT has a new fiber available since 2023: K60-060-PM.

\*\* TUB-1.8x7-0.155 fits HC-920: K50-060-00. If your HC-920 is K50-060-70, the order name of this component should be TUB-1.8x7-0.125. The 3D models for both components are on GitHub now. “33-GlassFlange” is TUB-1.8x7-0.155, “33-GlassFlange-for new HC-920” is for TUB-1.8x7-0.125.

\*\*\* MRA12-P01 for the new K50-060-PM were replaced by [MRA12-E03](#)

\*\*\*\* A lighter version (less 125mg) of this objective is available with ordering name: D0309.

*Note on the 3D Model & 2D Drawings connected to the Machining & Price List above:*

In the attached files are the 3D drawings in STEP format that can be opened in multiple programs where three-dimensional data is represented. These 3D models are available for all the components of the MINI2P platform (both in-house and items bought). However, the 2D drawings given in DWG format are only for home-made components, whereas a link is provided to the 2D drawings of all the other bought components, which are accessible on the supplier's website.