

















P1– Shopping & Machining List

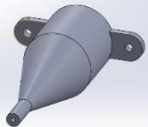
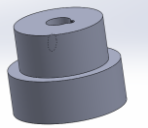
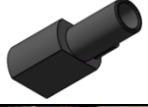
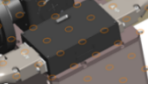
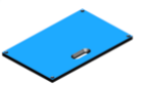
<i>Item ID</i>	<i>Source</i>	<i>Accessibility</i>	<i>Description</i>	<i>Link</i>	<i>Image</i>	<i>Quantity</i>
General tools						
a.	Thorlabs	purchase	Spanner wrench 1	SPW30		1
b.	Thorlabs	purchase	Fiber stripping tool	FTS4		1
c.	Thorlabs	purchase	Fiber cleaver	XL411		1
d.	Thorlabs	purchase	Spanner wrench 2	SPW602		1
e.	Thorlabs	purchase	UV Curing LED system	CD20K2		1
f.	Thorlabs	purchase	Handheld laser source (635nm)	HLS635		1
			Single mode patch cable	P1-630Y-FC-2		1
g.	Thorlabs	purchase	Power and energy meter	PM100D		1
			Photodiode power sensor	SI21C		1

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





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

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

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


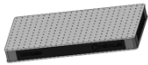


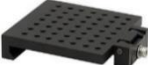






24	Kavli NTNU	self-made	Coupling protector (Al anodized)	Github(1)		1
25	Kavli NTNU	self-made	Collimator assemble tool (Al6061)	Github(1)		1
26	Kavli NTNU	self-made	Collimator holder (Al6061 black anodized)	Github(1)		1
27	Kavli NTNU	self-made	Control box shell (Al6061 black anodized)	Github(1)		1
28	Kavli NTNU	self-made	Control box cap (Al6061 black anodized)	Github(1)		1

Optical components

29	Femtosecond laser with center wavelength at 920nm, 80MHz, pulse width 100-130fs, and average power >1W Example suppliers: TOPTICA, SPARKLASER, COHERENT	purchase	Laser source	Example types: FemtoFiber ultra 920 ALCOR 920 X-Sight		1 OR 1
30	Schott	modify	Tapered fiber bundle (TFB) XMLG, Ø.027"x98.4"[2.5 m] Drawing C54706.04 PRODUCTION DISCONTINUED! Grin Fiber Bundle (GFB) New solution! with items: 30.1 Fiber Bundle Part Number 1840314 Drawing C54706.1X 30.2 AR windows (dia1.8x0.2mm,S1:HT T>99%@450-700nm, AOI=0deg)	1838003 1840314 AR450-700	  	1

			30.3 GRIN lens #64-520 <i>(1.8mm Dia, 670nm DWL, 0.23mm WD)</i> 30.4 GFB holder <i>Note: GFB is compatible with version2 of Scopebody P3 (see item 104.2)</i>	#64-520 GitHub		
31	NKT Photonics	purchase	Hollow-core PCF, HC-920 * <i>(≈2.2-2.4m)</i>	K50-060-00 *		1
32	Fuzhou Sunlight Technology	purchase	Glass rods <i>(ZF62)</i>	GLA-10x150-AR800-1100		3
33	Fuzhou Sunlight Technology	purchase	Glass flange ** <i>(7mm length Inside Ø 0.155mm)</i>	TUB-1.8x7-0.155 **		2
34	Thorlabs	purchase	Prisms*** <i>direct light from the seed laser up to the HC-920 fiber</i>	MRA12-P01 ***		8
35	Thorlabs	purchase	Emission filter 525 nm green channel	MF525-39		1
36	Thorlabs	purchase	Emission filter 630 nm red channel	MF630-69		1
37	Thorlabs	purchase	Shortpass filter	FESH0750		2
38	Thorlabs	purchase	Dichroic mirror	DMLP567R		1
39	Thorlabs	purchase	Aspheric condenser lens	ACL25416U-A		3
40	Thorlabs	purchase	Coupling lens	C230TMD-B		1

41	Thorlabs	<i>purchase</i>	Half-Wave plate	WPHSM05-915		1
42	Thorlabs	<i>purchase</i>	Protected silver mirrors	PF05-03-P01		2
43	Edmund Optics	<i>purchase</i>	Collimating lens	#84-128		1
Electrical components						
44	Mirrorcle Technologies	<i>purchase</i>	MEMS driver (controller) BDQ PicoAmp 5.4 T180	DR-11-055-00		1
45	Digikey	<i>purchase</i>	BNC to SMA cables	CCBNS-MM-RG174-36		1
46	RS	<i>purchase</i>	DSUB15 connector plug (male)	472-859		2
47	RS	<i>purchase</i>	Backshell	765-9448		2
48	RS	<i>purchase</i>	DSUB15 Connector Socket (female)	472-865		2
49	Digikey	<i>purchase</i>	6-pin connector for MEMS	FH19C-6S-0.5SH(10)		1
50	Industrifil	<i>purchase</i>	Single wire cables (6 colours of $\approx 2.5\text{m}$)	UAA-3607		6
51	Thorlabs	<i>purchase</i>	μ TLens Driver	KPZ101		1
52	Thorlabs	<i>purchase</i>	PMT	PMT2101/M		2




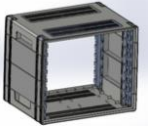

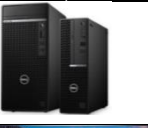





53	Thorlabs	purchase	Controller for shutter	SHB1		1
Scope mounting module						
Mechanical components						
54	Thorlabs	purchase	Aluminum optical breadboard	B3060A		1
55	Thorlabs	purchase	Sorbothane feet	AV6/M		1
56	Thorlabs	purchase	One-sided construction rail Black Anodized (95x500 mm)	XT95SD-500		2
57	Thorlabs	purchase	Rail carriage suitable for sliding onto item 58	XT95RC4/M		2
58	Thorlabs	purchase	Precision construction rail L=400mm	XT95B-400		1
59	Thorlabs	purchase	Post Mounting Clamp	C1545/M		1
60	Thorlabs	purchase	Manual Rotation Stage	RP03/M		1
61	Thorlabs	purchase	Base for item 58	XT95P3		1
62	Thorlabs	purchase	Optical post	TR75/M		2
63	Thorlabs	modify	Running wheel hardboard	Github, TB4		1/4









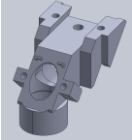
64	Thorlabs	<i>purchase</i>	M6 spacers & washers	W25S050		>4
65	Thorlabs	<i>purchase</i>	Spacer on both sides of wheel	PS1M		2
66	SKF	<i>purchase</i>	Bearing OD 19mm ID 6mm	626-2Z		1
67	Thorlabs	<i>purchase</i>	Right-angle clamp	RSA90/M		1
68	Thorlabs	<i>purchase</i>	Pillar posts	RS50/M		2
69	Thorlabs	<i>purchase</i>	Universal post holder	UPH100/M		3
70	Thorlabs	<i>purchase</i>	Locking Ball and Socket Mount; to support LEDs near Tracking Camera	TRB1/M		8
71	Thorlabs	<i>purchase</i>	Adapter camera-lens	SM1A10Z		2
72	Kavli NTNU	<i>self-made</i>	MINI2P Holder P1 (Al6061)	Github(1)		1
73	Kavli NTNU	<i>self-made</i>	MINI2P Holder P2 (Al6061)	Github(1)		1
74	Kavli NTNU	<i>self-made</i>	MINI2P Holder P3 (Stainless steel)	Github(1)		1
75	Kavli NTNU	<i>self-made</i>	MINI2P Holder P4 & screw (Stainless steel)	Github(1)		1
	TRfastenings		M2.5x5 cap head hexagon socket drive screw, DIN912	M2.5cap		1

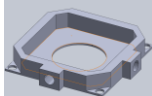

76	Kavli NTNU	self-made	Wheel Holder (Stainless steel)	Github		1
77	Kavli NTNU	self-made	Headbar holder & screw (Titanium alloy)	Github		1
	TRfastenings		M3x3mm Pan Head PoziDriv Machine Screw, zinc & clear, DIN7985	M3x3		2
Optical and electrical components						
78	Thorlabs RS	purchase	LED & Accessories 850nm IR LED Array Light Source	LIU850A		1
			LED 5m cable	780-0087		1
			Adapter	301-29-731		1
			Supply Power for LED	136-1345		1
79	Thorlabs	purchase	Zelux 1.6 MP Monochrome CMOS Camera	CS165MU/M		1
			& adapter SM1 to C-Mount	SM1A10Z		1
80	Edmund Optics	purchase	Lens focal length 4.5mm Or 8.5mm for lateral and frontal camera to control head fixation	4.5mm 8.5mm		1
81	Edmund Optics	purchase	Basler camera for Animal Tracking	acA2040-90um		1
			16mm EFL Camera Lens	MVL16M23		1
			Shortpass Filter 875nm	#86-106		1
82	Physik Instrumente (PI)	purchase	DC Motors	M-112.2DG		3




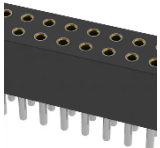
Mobile cart and controlling system

Mechanical and electrical components

83	Thorlabs	<i>purchase</i>	Mobile cart	POC001		1
84	Thorlabs	<i>purchase</i>	Optical breadboard 600x900x55mm	PBG52506		1
85	Thorlabs	<i>purchase</i>	Optional drawer	POD001		1
86	Schroff	<i>purchase</i>	19-inch rack	Ref 721-2708		1
87	McMASTER-CARR	<i>purchase</i>	Span-in nuts	90680A729		10
88	Dell	<i>purchase</i>	Workstation is an Intel core i9 with operating windows 10 Pro	7080		1
89	Dell	<i>purchase</i>	(32" to 49") curved LED-backlit LCD 5K 2K monitor	Monitor		1
90	Vidrio Technologies LLC	<i>purchase</i>	vDAQ card provides data acquisition and control of Laser, μ TLens, shutter, among others	V-vDAQ.R1		1
91	Vidrio Technologies LLC	<i>purchase</i>	vDAQ breadboard	V-vDAQ.R1		1
92	Physik Instrumente (PI)	<i>purchase</i>	Motion controller for PI motors	C-884.4DC		1
93	Femtosecond laser with center wavelength at 920nm, 80MHz, pulse width 100-130fs, and average power >1W	<i>purchase</i>	Controller for 920nm laser	Example types: FFUltra920 OR ALCOR X-Sight		1

	Example suppliers: TOPTICA, SPARKLASE R, COHERENT					
94	Dustin	purchase	USB-hub (7) ports	Deltaco		1
95	Thorlabs	purchase	BNC Male to BNC Male & BNC adapters Female-Female	CA3136 T3283		>10 >10
96	Thorlabs	purchase	BNC to SMA Male Connector	CA2848		2
97	Thorlabs	purchase	SMC connector SMA female to BNC male	PAA101 CA2606	 	2 1
98	Thorlabs	purchase	SMA-to- SMA cable	CA2912		2
99	Thorlabs	purchase	Power supply for μ TLENS driver	TPS002		1
Software						
100	Vidrio Technologies LLC	purchase	Open-source software for the whole system	ScanImage 2021		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	104.1 Scope Body P3 (PEEK CF30 black) <u>New version for GFB!</u> 104.2 Scopebody P3 V2 Adapter for old TFB 104.3	GitHub GitHub-V2 GitHub		1 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)	M1.2cap M1.6set	NA	>10
Optical components						
109	Domilight	purchase	Scan Lens	D0166		1
110	Fuzhou Sunlight Technology	purchase	Dichroic Mirror	DMSP0405		1
111	Domilight	purchase	Objective1 Water+glass	D0213-3X		1
112	Domilight	purchase	Objective2 Air	D0254-3X		1
113	Domilight	purchase	Objective3**** Water/air+glass	D0277-3X ****		1
114	Polight	purchase	μ TLENS & accessories 4 Stacked μ TLENS Male-pin	μTLENS-NIR-D-45 Mill-max1		1 1

						
Electrical components						
115	Mirrorcle	purchase	FAST MEMS (MEMS-F)	A7M10.2-1000AL		1
116	Mirrorcle	purchase	Large-angle MEMS (MEMS-L)	A3I12.2-1200AL		1
117	Kavli NTNU Digi-key	purchase	MEMS PCB & others Female-pin	 Mill-max2		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 was 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.