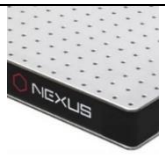
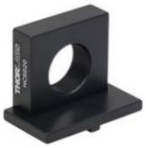
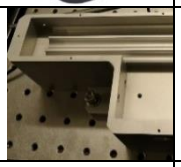
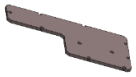
P1– Shopping & Machining List

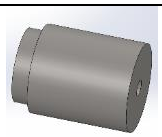
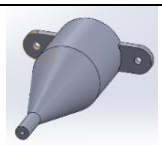
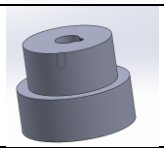
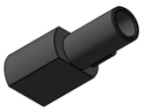
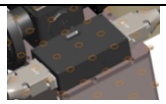
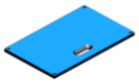
Item ID	***Source***	***Accessibility***	***Name/Description*** *(Material for self-made)*	***Link***	***Image***	***Quantity***
General tools						
a.	*Thorlabs*	*purchase*	*Spanner wrench 1*	*SPW30*		*1*
b.	*Thorlabs*	*purchase*	*Fiber stripping tool*	*FTS4*		*1*
c.	*Thorlabs*	*purchase*	*Fiber cleaver*	*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)* *Single mode patch cable*	*HLS635* *P1-630Y-FC-2*		*1* *1*
g.	*Thorlabs*	*purchase*	*Power and energy meter* *Photodiode power sensor*	*PM100D* *S121C*		*1* *1*

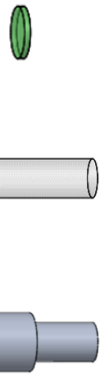
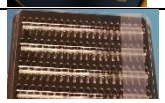
h.	*Thorlabs*	*purchase*	*Green LED (530nm)* *T-Cube LED Driver* *Power supply*	*M530F2* *LEDD1B* *KPS201*		*1* *1* *1*
i.	*Thorlabs*	*purchase*	*NIR detector card*	*VRC4*		*1*
j.	*Thorlabs*	*purchase*	*Lens cleaning tissues*	*MC-5*		*1*
k.	*RS*	*purchase*	*Foam cotton bud & swabs*	*Swabs*		*1*
l.	*Thorlabs*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

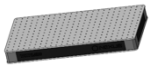
2	*Thorlabs*	*purchase*	*Sorbothane feet*	*AV6/M*		*1*
3	*Thorlabs*	*purchase*	*Fiber adapter plate*	*SM1SMA*		*1*
4	*Thorlabs*	*purchase*	*Adjustable mirror mount*	*POLARIS-K05S2*		*2*
5	*Thorlabs*	*purchase*	*Rotation mount* *& M3 screw*	*MRM05/M*		*1*
6	*Thorlabs*	*purchase*	*M6 cap screws kit*	*HW-KIT2/M*		*>20*
7	*Wolida*	*purchase*	*Heat shrinkage tubings* *Wolida Ø0.6/0.4mm* *2:1 ratio 2.5mm* *Distrelec 3mm*	*Tube1* *Tube2* *Tube3*		*3*
8	*Thorlabs*	*purchase*	*3 axis Microblock stage*	*MBT616D/M*		*1*
9	*Thorlabs*	*Purchase*	*XYZ Translation stage* *&* *right-angle bracket*	*MT3A/M* *AB90E/M*		*1*
10	*Thorlabs*	*Purchase*	*Compatible flexure stage mount*	*HCS020*		*1*
11	*Thorlabs*	*Purchase*	*Fiber clamp* *holds fiber* *Bare fiber adapter* *&Flat base to glue into (e.g.)*	*HFF001* *S140-BFA* *XT95P3*	 	*1* *3* *1*

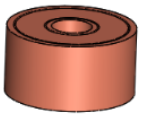
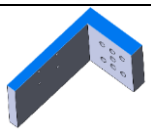
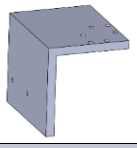
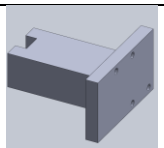
12	*Thorlabs*	*purchase*	*Fixed mounting bracket*	*AMA007/M*		*1*
13	*Thorlabs*	*purchase*	*SM05 Threaded adapter to red laser source* *FC/PC Fiber Collimation (linked to items f)*	*AD1109F* *F230FC-B*	 	*1* *1*
14	*Thorlabs*	*purchase*	*Kinematic cage cube*	*DFM1T3*		*1*
15	*Thorlabs*	*purchase*	*Kinematic cage cube base*	*DFM1B*		*1*
16	*Thorlabs*	*purchase*	*Lens tubes*	*SM1L05*		*4*
17	*Thorlabs*	*purchase*	*End cap for machining*	*SM1CP2M*		*1*
18	*Thorlabs*	*purchase*	*Coupler*	*SM1T2*		*3*
19	*Thorlabs*	*purchase*	*Optical beam shutter with controller for PMT*	*SHB1*		*1*
20	*Thorlabs*	*purchase*	*Post mounting adapter*	*SHM1/M*		*1*
21	*Kavli NTNU*	*self-made*	*Coupling box (Al7075 with sand spray)*	*Github(1)*		*1*
22	*Kavli NTNU*	*self-made*	*Coupling box cap (Al7075 with sand spray)*	*Github(1)*		*1*

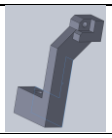
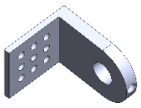
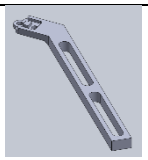
23	*Kavli NTNU*	*self-made*	*Coupling holder (Stainless steel)*	*Github(1)*		*1*
24	*Kavli NTNU*	*self-made*	*Coupling protector (Al anodized)*	*Github(1)*		*1*
25	*Kavli NTNU*	*self-made*	*Collimator assemble tool (Al6061)*	*Github(1)*		*1*
26	*Kavli NTNU*	*self-made*	*Collimator holder (Al6061 black 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* *Spark Laser offers higher positive GDD (up to 120 000 fs^2)*	*Example types:* *FemtoFiber ultra 920* *ALCOR 920 X-Sight*	 	*1* *OR* *1*
30	*LabMaker*	*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 by SCHOTT*** *Part Number 1840314 Drawing C54706.1X*	*1838003* *1840314*	 	*1*

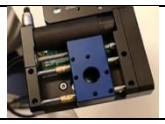
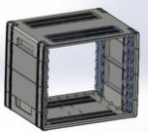
			30.2 AR windows by Sunlight *(dia1.8x0.2mm,S1:HT T>99%@450-700nm, AOI=0deg)* ***30.3 GRIN lens #64-520 Or #64-526*** *(1.8mm Dia, 670nm DWL, 0.23mm WD)* ***30.4 GFB holder*** *Note: GFB is compatible with version2 of Scopebody P3 (see item #104_2023)*	*WIN1.8x0.2-S1AR450-700* *#64-520* Or *#64-526* GitHub		
31	*NKT Photonics*	*purchase*	*Hollow-core PCF, HC-920 * (≈2.2-2.4m)*	*K60-060-PM **		*1*
32	*Fuzhou Sunlight Technology*	*purchase*	*Glass rods (ZF62)*	*GLA-10x150-AR800-1100*		*3*
33	*Fuzhou Sunlight Technology*	*purchase*	*Glass flange ** (6.5mm length Inside Ø 0.126 – 0.128mm)*	*TUB-1.8x6.5-0.127 ***		*2*
34	*Thorlabs*	*purchase*	*Prisms*** direct light from the seed laser up to the HC-920 fiber*	MRA12-E03 ***		*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*	*purchase*	*Half-Wave plate*	*WPHSM05-915*		*1*
42	*Thorlabs*	*purchase*	*Protected silver mirrors*	*PF05-03-P01*		*2*
43	*Edmund Optics*	*purchase*	*Collimating lens*	*#84-128*		*1*
Electrical components						
44	*Mirrorcle Technologies*	*purchase*	*MEMS driver (controller) BDQ PicoAmp 5.4 T180*	*DR-11-055-00*		*1*
45	*Digikey*	*purchase*	*BNC to SMA cables*	*CCBNS-MM-RG174-36*		*1*
46	*RS*	*purchase*	*DSUB15 connector plug (male)*	*472-859*		*2*
47	*RS*	*purchase*	*Backshell*	*765-9448*		*2*
48	*RS*	*purchase*	*DSUB15 Connector Socket (female)*	*472-865*		*2*
49	*Digikey*	*purchase*	*6-pin connector for MEMS*	*FH19C-6S-0.5SH(10)*		*1*
50	*Industrifil*	*purchase*	*Single wire cables (6 colours of ≈2.5m)*	*UAA-3607*		*6*
51	*Thorlabs*	*purchase*	*µTLens Driver*	*KPZ101*		*1*

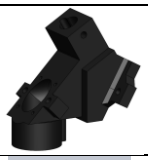
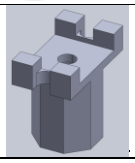
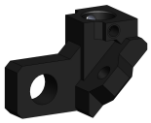
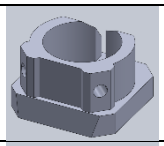
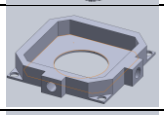
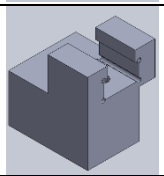
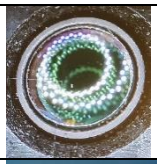
52	*Thorlabs*	*purchase*	*PMT*	*PMT2101/M*		*2*
53	*Thorlabs*	*purchase*	*Controller for shutter*	*SHB1*		*1*
Scope mounting module						
Mechanical components						
54	*Thorlabs*	*purchase*	*Aluminum optical breadboard*	*B3060A*		*1*
55	*Thorlabs*	*purchase*	*Sorbothane feet*	*AV6/M*		*1*
56	*Thorlabs*	*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*

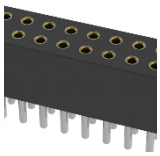
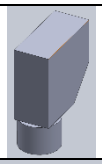
63	*Thorlabs*	*modify*	*Running wheel hardboard*	*Github, TB4*		*1/4*
64	*Thorlabs*	*purchase*	*M6 spacers & washers*	*W25S050*		*>4*
65	*Thorlabs*	*purchase*	*Spacer on both sides of wheel*	*PS1M*		*2*
66	*SKF*	*purchase*	*Bearing OD 19mm ID 6mm*	*626-2Z*		*1*
67	*Thorlabs*	*purchase*	*Right-angle clamp*	*RSA90/M*		*1*
68	*Thorlabs*	*purchase*	*Pillar posts*	*RS50/M*		*2*
69	*Thorlabs*	*purchase*	*Universal post holder*	*UPH100/M*		*3*
70	*Thorlabs*	*purchase*	*Locking Ball and Socket Mount; to support LEDs near Tracking Camera*	*TRB1/M*		*8*
71	*Thorlabs*	*purchase*	*Adapter camera-lens*	*SM1A10Z*		*2*
72	*Kavli NTNU*	*self-made*	*MINI2P Holder P1 (Al6061)*	*Github(1)*		*1*
73	*Kavli NTNU*	*self-made*	*MINI2P Holder P2 (Al6061)*	*Github(1)*		*1*
74	*Kavli NTNU*	*self-made*	*MINI2P Holder P3 (Stainless steel)*	*Github(1)*		*1*
75	*Kavli NTNU* *TRfastenings*	*self-made*	*MINI2P Holder P4 & screw (Stainless steel)* *M2.5x5 cap head hexagon socket drive screw, DIN912*	*Github(1)* *M2.5cap*		*1* *1*

			MINI2P holder P4 version 2 ***(NEW!)*** *Holder for scope assembly*	*Github*		*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* *M3x3*		*1* *2*
Optical and electrical components						
78	 *Thorlabs* *RS*	*purchase*	*LED & Accessories* *850nm IR LED Array Light Source* *LED 5m cable* *Adapter* *Supply Power for LED*	 *LIU850A* *780-0087* *301-29-731* *136-1345*	  	*1* *1* *1* *1*
79	*Thorlabs*	*purchase*	*Zelux 1.6 MP Monochrome CMOS Camera* *& adapter SM1 to C-Mount*	*CS165MU/M* *SM1A10Z*		*1* *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* *16mm EFL Camera Lens* *Shortpass Filter 875nm*	*acA2040-90um* *MVL16M23* *#86-106*	 	*1* *1* *1*

82	*Physik Instrumente (PI)*	*purchase*	*DC Motors*	*M-112.2DG*		*3*
Mobile cart and controlling system						
Mechanical and electrical components						
83	*Thorlabs*	*purchase*	*Mobile cart*	*POC001*		*1*
84	*Thorlabs*	*purchase*	*Optical breadboard 600x900x55mm*	*PBG52506*		*1*
85	*Thorlabs*	*purchase*	*Optional drawer*	*POD001*		*1*
86	*Schroff*	*purchase*	*19-inch rack*	*Ref 721-2708*		*1*
87	*McMASTER-CARR*	*purchase*	*Span-in nuts*	*90680A729*		*10*
88	*Dell*	*purchase*	*Workstation is an Intel core i9 with operating windows 10 Pro*	*7080*		*1*
89	*Dell*	*purchase*	*(32”to 49”) curved LED-backlit LCD5K2K monitor*	*Monitor*		*1*
90	*Vidrio Technologies LLC*	*purchase*	*vDAQ card provides data acquisition and control of Laser, µTLens, shutter, among others*	*V-vDAQ.R1*		*1*
91	*Vidrio Technologies LLC*	*purchase*	*vDAQ breadboard*	*V-vDAQ.R1*		*1*
92	*Physik Instrumente (PI)*	*purchase*	*Motion controller for PI motors*	*C-884.4DC*		*1*
93	*Femtosecond laser with center wavelength at 920nm, 80MHz, pulse width 100-*	*purchase*	*Controller for 920nm laser*	*Example types:* *FFUltra920* *OR*		*1*

	130fs, and average power >1W *Example suppliers: TOPTICA, SPARKLASER, COHERENT*			*ALCOR X-Sight*		
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 µTLENS driver*	*TPS002*		*1*
Software						
100	*Vidrio Technologies LLC*	*purchase*	*Open-source software for the whole system*	*ScanImage 2021*	ScanImage	*1*
101	*Others*	*free or purchase*	*See Protocol S4*	*NA*	*NA*	*1*
MINI2P miniscope 2023 (new items #A102,B104,C118,D107)						
Mechanical components						

102	*Kavli NTNU*	*self-made*	***#A102_2023*** ***Scope Body P1*** *(PEEK CF30 black)*	*GitHub*		*1*
~~*103*~~	~~*Kavli NTNU*~~	~~*self-made*~~	~~*Scope Body P2*~~ ~~*(PEEK CF30 black)*~~ ~~*MINI2P 2022*~~	~~*GitHub*~~		~~*1*~~
104	*Kavli NTNU*	*self-made*	***#B104_2023*** ***Scopebody P3 V2*** *(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*	***#D107_2023*** ***TLens testing holder*** *(Al6061 black anodized)*	*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*	*2* *>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***** *Air+glass*	*D0309-3X* ****		*1*

114	*Polight*	*purchase*	*µTLENS & accessories* *4 Stacked µTLENS* *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*	*LABmaker* *Mill-max2*		*1* *1*
Others/ New components 2023						
118	*Kavli NTNU*	*Self-made*	***#C118 (new!)*** *MEMs locker* *(PEEK-CF30 black anodized)*	*GitHub*		*1*
119	*Kavli NTNU*	*Self-made*	*Dummy scope*	*GitHub*		*5-10*
120	*Kavli NTNU*	*Self-made*	*Headbars for (3 types)* *CA1* *V1* *MEC + 5mm cannular* *See prism assemble*	*GitHub* *GitHub* *Prism assemble*		*>10*
121	*Sunlight*	*purchase*	*Glass plugs* *4.6x1.9mm*			*>2*
122	*Sunlight*	*purchase*	*Cover slips* *Dia5x0.15mm*			*1*
123	*ThermoFisher*	*purchase*	*Beads* *FluoSpheres sulfate, yellow/green (505-515) (dissolve with ethanol/distilled water)*	*F8823*		*1*

124	Thorlabs	*purchase*	*Kinematic rotation mount (for distortion grid setup)*	*KS1RS*		*1*
125	Thorlabs	*purchase*	*Quick-connect goniometers*	*XRNG2/M*		*2*
126	LabMaker	*purchase*	*Sacrificial connector v1 6-position connector with flex PCB*	*LabMaker*		*1*
127	LabMaker	*purchase*	*Scope cable harness v1 (assembled, replacing items 47-50)*	*LabMaker*		*1*
128	LabMaker	*purchase*	*Coupling box v1 (Mounted with all optical components)*	*LabMaker*		*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 (in protocols referred as HC-920-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-1.8x6.5-0.127. 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-1.8x6.5-0.127.

*** 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.