

Last Revision: EWH 1.15.24

The purpose of this guide is to help with the setup of an RMC ATUM and with a Leica UC7. This is not meant to be a complete step by step instruction but a rough guide on what hardware is needed to be able to run the pyAGTUM software. All custom part's CAD files are included in the Github repo. You will need to install the appropriate drivers and such for the hardware.

Hardware Needed:

Item	Part Number	QT	Manufacturer	Address
Leica UC7 with an IC90E microscope camera	X	1	Leica	Quote - email
Leica UC7 Cable/Control unit/Control PCB	16655861226	1	Leica	Quote - email
RMC ATUM - from ATUMtome	X	1	RMC	Quote - email
Syringe Pump - Programmable	1000-US	1	New Era Pump Systems	https://www.syringepump.com/NE-1000.php
Multifunction I/O Device	USB-6211	1	National Instruments	http://www.ni.com/en-us/support/model.usb-6211.html
Sensor Opt Slot NPN Module 1M	24371-ND	2	Digikey	https://www.digikey.com/product-detail/en/EE-SX954-W%25201M/Z4371-ND/5003186?WT.z_cid=ref_Globalspec_buynow
24V 120W AC/DC External Desktop (Class II) Adapter Cord Input	1866-3668-ND	1	Digikey	https://www.digikey.com/products/en?keywords=1866-3668-ND
Kingwin KW-HUB-9U3 Multi-Port USB 3.1 Gen 1 Hub with IQ Charging Ports (Black)	KIKWHUB9U3	1	BH Photo	https://www.bhphotovideo.com/c/product/1081216-REG/kingwin_kw_hub_9u3_4_port_usb3_hub.html;jsessionid=CSnWXUK6Tyod5zEk6QEloM8xqzyWjAW!541479283
Comprehensive USB 3.1 Gen 1 Type-A Male to USB Type-B Male Cable (10')	COUSB3AB10ST	1	BH Photo	https://www.bhphotovideo.com/c/product/908792-REG/comprehensive_usb3_ab_10st_usb_3_0_type_a.html
USB3.0 cable, 3m \$25		3	Ximea	Quote -email
- Sync-cables \$65		3	Ximea	Quote -email
TMC Air Table		1	TMC	Quote -email

Later Customized Parts for the ATUM:

Item	Part Number	QT	Manufacturer	Address
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LargeReelAddition.step		1		
- Sync-cables \$65		3	Ximea	Quote -email

Original Customized Parts for the ATUM

Custom Number	Item Name	QT	Manufacturer	Manufacturer Num
1225-10922	MIRROR, RAP	2	EDMUND OPTICS	45-593
1225-10930	WHITE, COAXIAL LED SPOT LIGHT	3	EDMUND OPTICS	66-861
1225-11053	LENS, TELECENTRIC, FOCUSABLE, 0.75 MAG, 85-99WD	1	EDMUND OPTICS	36192
1225-11111	TELECENTRIC LENS, 1X, 40mm WD, IN-LINE COMPACT TL	2	EDMUND OPTICS	67-319
1225-11118	HIROSE FOCUS TUNABLE LENS ELEC DRIVER	1	EDMUND OPTICS	88-940
1225-11119	HIROSE CONNECTOR TUNABLE LENS 1 METER	1	EDMUND OPTICS	88-941
1225-11107	SHCS, 6mm X 14 LG, 18-8 SS	4	MCMaster CARR	91292A070
1225-11116	SHCS, 6mm X 8 LG, 18-8 SS	4	MCMaster CARR	91292A201
1225-11117	SHCS, 6mm X 18 LG, 18-8 SS	2	MCMaster CARR	91292A136
1225-10938-13	SH SHOULDER SCREW, 6mm OD, 13 MMM LG, 4mm THD	1	MCMaster-CARR	93856A211-13
1225-10938-18	SH SHOULDER SCREW, 6mm OD, 18 MMM LG, 4mm THD	2	MCMaster-CARR	93856A211-18
1225-10939	FHSS, 3mm THD, 8mm LG, 18-8 SS	2	MCMaster-CARR	92125A128
1225-10940	SET SCREW, 3mm THD, 4mm LG	2	MCMaster-CARR	92015A102
1225-10941	DOWEL PIN, 3mm OD, 10mm LG, 18-8 SS	2	MCMaster-CARR	91585A351
1225-10942	SHCS, 2mm THD, 8mm LG, 18-8 SS	4	MCMaster-CARR	91292A832
1225-10943	SHCS, 3mm THD, 8mm LG, 18-8 SS	15	MCMaster-CARR	91292A112
1225-10944	SET SCREW, CONE-POINT, 6mm THD X 10 mm LG	2	MCMaster-CARR	91217A220
1225-10945	SPLIT LOCK WASHER, 6.5mm ID, 9.9mm OD, 1.5mm THK, 18-8 SS	3	MCMaster-CARR	91111A129
1225-10946	SH SHOULDER SCREW, 4mm DIA X 10mm LG, 3mm THREAD	9	MCMaster-CARR	90265A121
1225-10949	DOWEL PIN, 1.5 mm OD X 10mm LG, 18-8 SS	1	MCMaster-CARR	91585A142
1225-10952	BHCS, M2 X 0.40 mm THREAD, 4mm LONG, 18-8 SS	6	MCMaster-CARR	92095A451
1225-10953	STANDOFF, F-M, 3mm THD, 6mm LG, 6mm HEX	1	MCMaster-CARR	93655A701

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1225-10979	KNOB WITH SCREW HEAD MOUNT, SIX-LOBE, FOR M6 SCREW	2	MCMaster-CARR	91175A071
1225-10925	SENSOR, OPTICAL SLOT, NPN MODULE, 1M	2	OMRON	Z4371-ND
1225-10933	CAMERA, XIMEA XIC, MC050CG-SY-UB	3	XIMEA	MC050CG-SY-UB
1225-10962	MOTORIZED, LEAD-SCREW DRIVEN, LINEAR STAGE, 75 mm	2	ZABER	X-LRQ075AP-E01
1225-10964	ADAPTOR PLATE, XY SPACER FOR LRQXP	1	ZABER	AP165
1225-10965	ANGLE BRACKET, 90 DEGREES, LARGE, LRQ	1	ZABER	AB164
1225-10968	MOTORIZED LINEAR STAGE, LEAD-SCREW DRIVEN, 300 mm	1	ZABER	X-LRQ300AP-E01
1225-10921	MOCK-UP, GRIDTAPE	1		
1225-10923	PULLEY, GRIDTAPE	9		
1225-10926	BRAKE, NOSE	1		
1225-10927	MOUNT, INSPECTION CAMERAS	1		
1225-10928	MOUNT, INSPECTION MODULE ILLUMINATOR	2		
1225-10929	LEICA STAGES AND BREADBOARD	1		
1225-10931	COVER, INSPECTION MODULE MIRRORS	1		
1225-10934	BASE, MOUNT, KNIFE CAM	1		
1225-10935	ATUM, SIMPLIFIED	1		
1225-10936	ARM, MOUNT, KNIFE CAM	1		
1225-10937	CLAMP PLATE, MOUNT, KNIFE CAM	1		
1225-10948	PULLEY, NOSE	1		
1225-10950	NOSE, OUTER PLATE	2		
1225-10951	NOSE, CENTER PLATE	1		
1225-10971	STAGE MOUNTING PLATE, ATUM	1		
1225-10972	CLAMP, ATUM STAGE MOUNTING PLATE	1		
1225-10976	FLAG, HANDWHEEL	1		
1225-10994	MOUNT, SENSOR, HANDWHEEL	1		
1225-11000	BUMPER, MIRROR	2		

1225-11054-01	BASE, MOUNT, KNIFE CAM LENS	1		
1225-11054-02	CLAMP, MOUNT, KNIFE CAM LENS	2		
1225-11055-01	CLAMP, KNIFE CAM ILLUMINATOR, LEFT	1		
1225-11055-02	CLAMP, KNIFE CAM ILLUMINATOR, RIGHT	1		

XYZ Stage:

Construct the XYZ stage so that it aligns with the model in the CAD files. When placing the 3 Axis stage on the Air Table one should ensure there is enough clearance for when the Y stage is moved towards the Leica on the X-track. In the diagram given in the original CAD files this is about 20 mm.

ATUM:

The top camera and light source are not used on the current iteration of pyAGTUM, instead the camera connection to the Leica's microscope camera is used to monitor water level changes and watch the actual cutting of the section.

All screws and their placement should be given in the CAD files provided in the Github repository. The mirrors are glued onto the detachable plate to help feed the tape in when using tape. This is not obvious from the CAD files. Also, there is a newer version, or modification, to the original mounting plate for the ATUM nose / pre and post sectioning Ximea camera. This is found in the "Newer Customized Parts" folder. This has a larger gap in the viewing area after sectioning to prevent water build up. Additionally another modification was a plate was added to the back of the ATUM and the motors were moved further back to allow for larger Luxel reels for Gridtape. This mod can be attached to the existing plate using screws and the given screw holes, but I would also recommend gluing the two plates together to form a strong bond.

Leica:

The chopper plate for the Leica is attached via a zip tie and ensuring the optical blocker is in the position of the cutting window of the Leica.