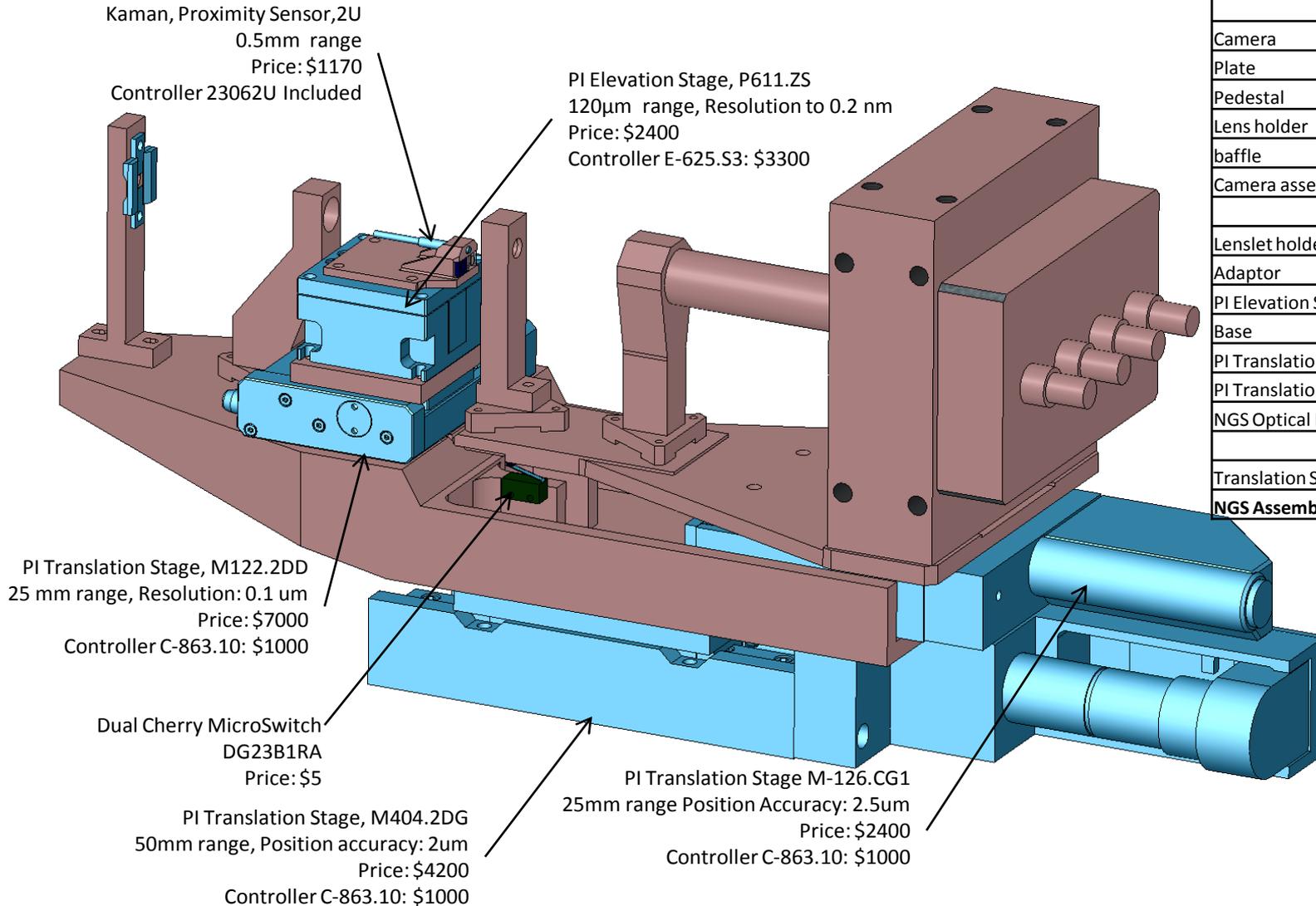


# NGS Motion Control With PI Stages



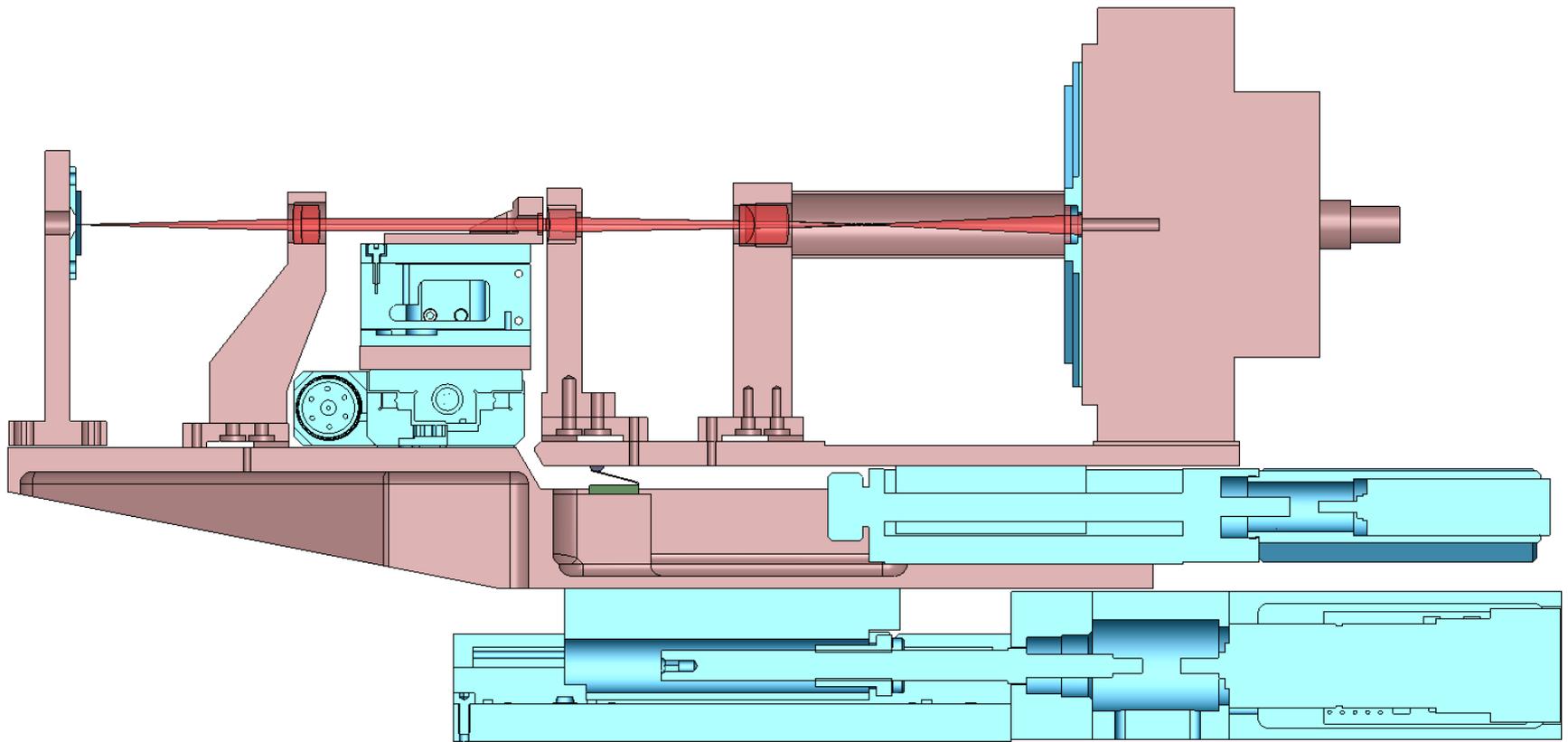
All Stages Rated at -15C  
 Operating Closed loop with integrated encoders



	Kg
Camera	1
Plate	0.2
Pedestal	0.006
Lens holder	0.02
baffle	0.01
Camera assembly	1.236
Lenslet holders	0.1
Adaptor	0.04
PI Elevation Stage P611.ZS	0.176
Base	0.6
PI Translation Stage M122.2DD	0.22
PI Translation Stage M126.CG1	0.8
NGS Optical Bench Assy	3.172
Translation Stage M404.2DG	1.8
<b>NGS Assembly</b>	<b>4.972</b>

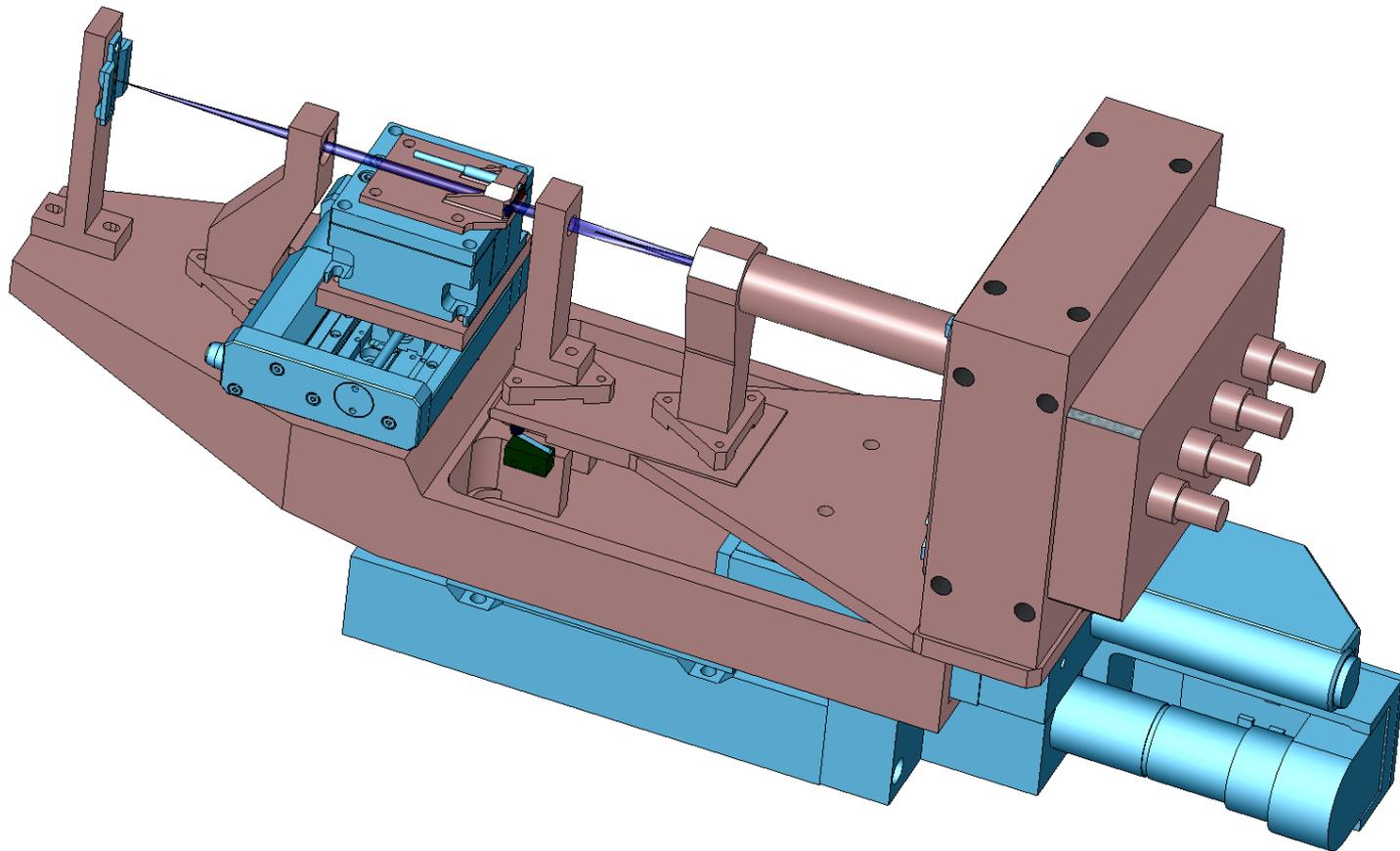
# NGS Motion Control With PI Stages

Cross section



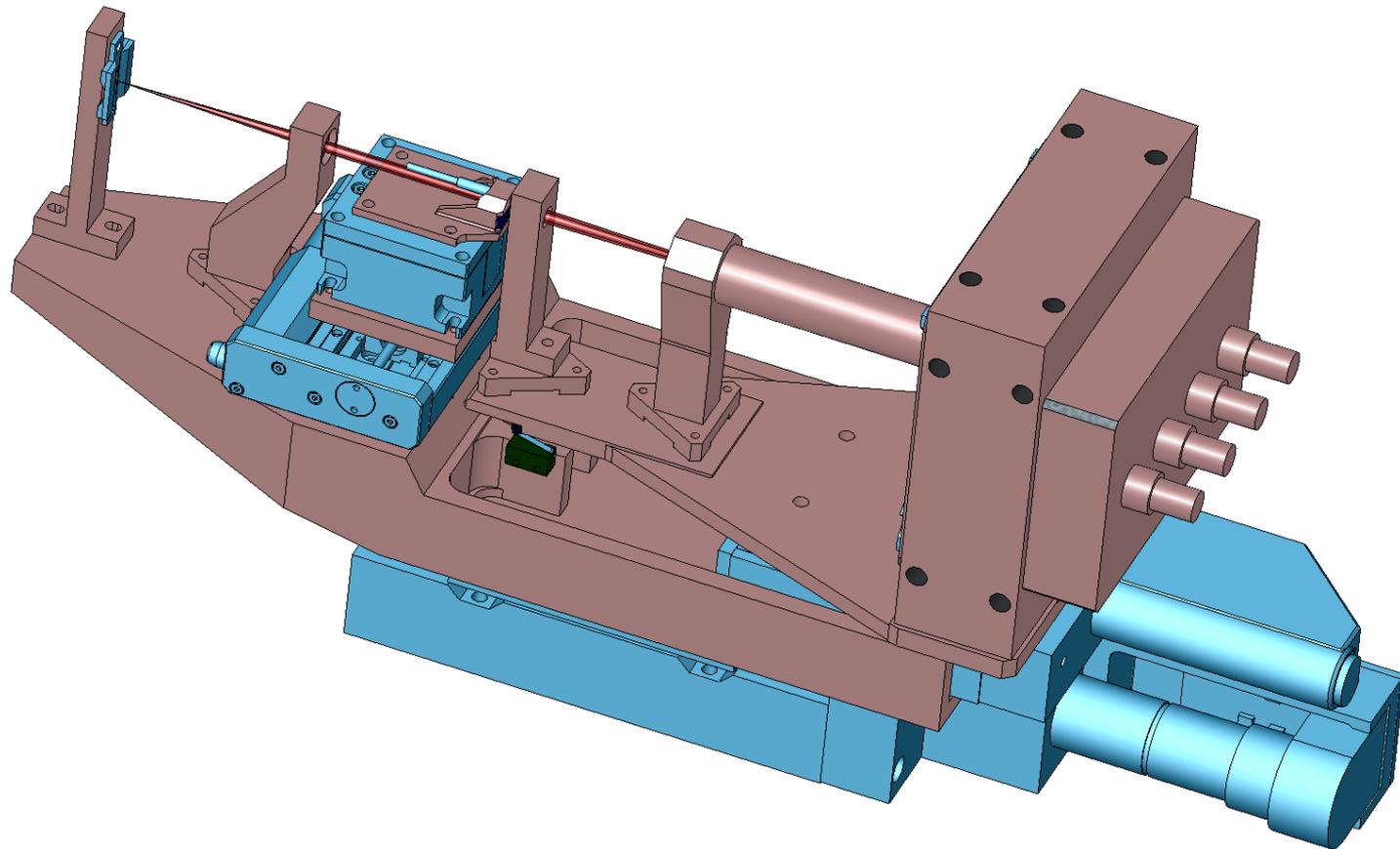
# NGS Motion Control With PI Stages

5 x 5



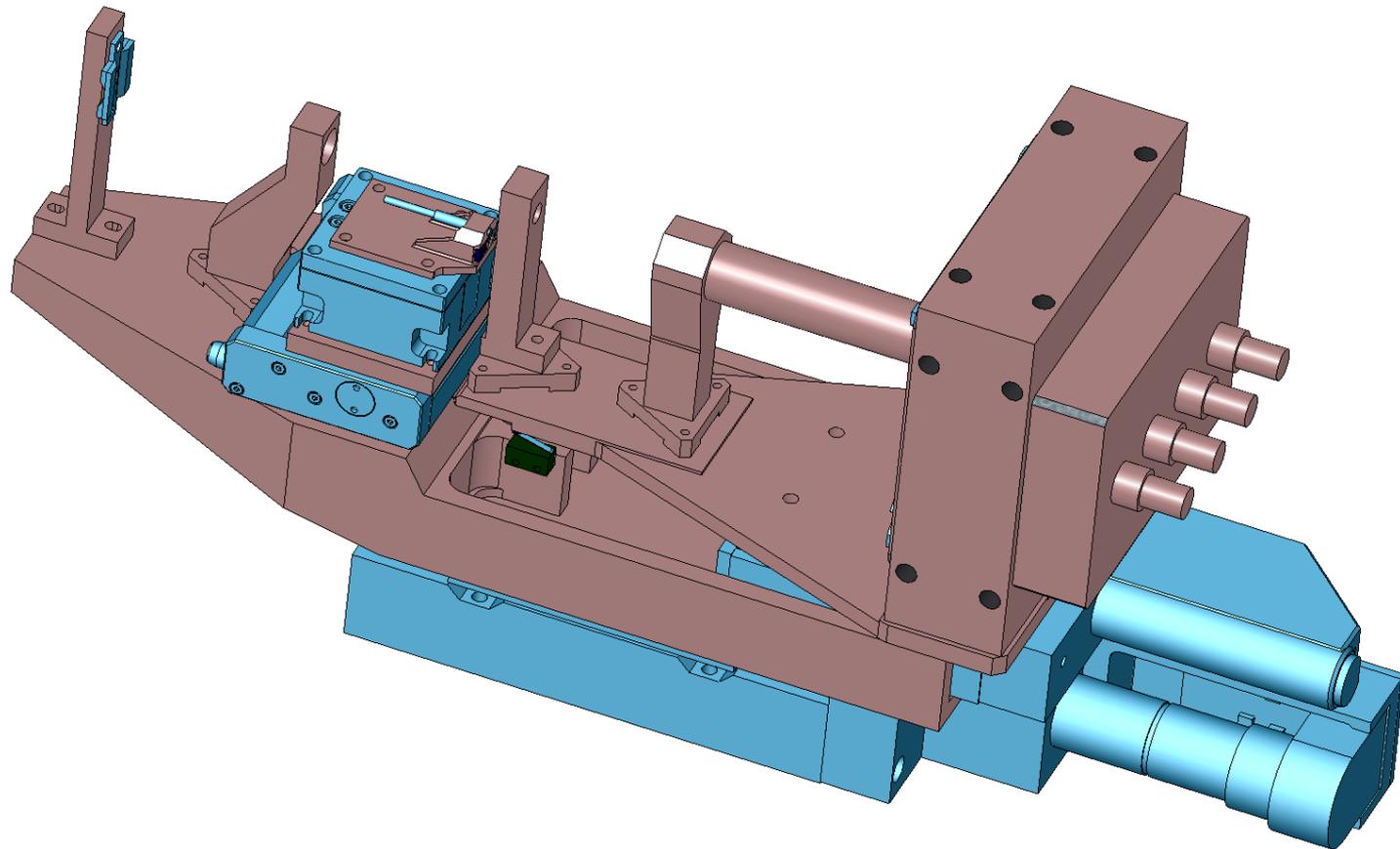
# NGS Motion Control With PI Stages

63 x 63



# NGS Motion Control With PI Stages

Blank

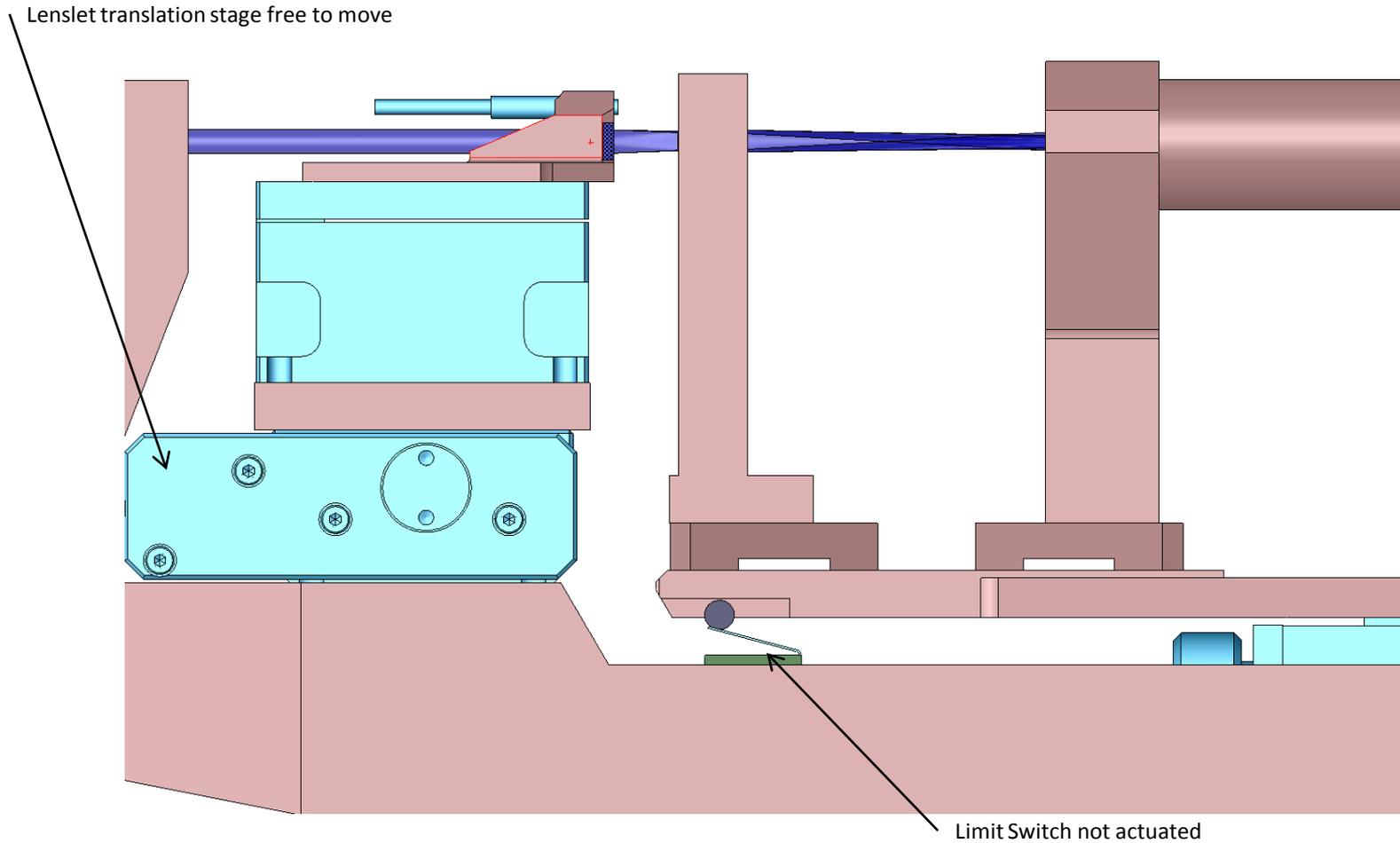


# NGS Motion Control Collision avoidance system

5 x 5



The Limit Switch is not actuated and the lenslet translation stage is free to move across its range.



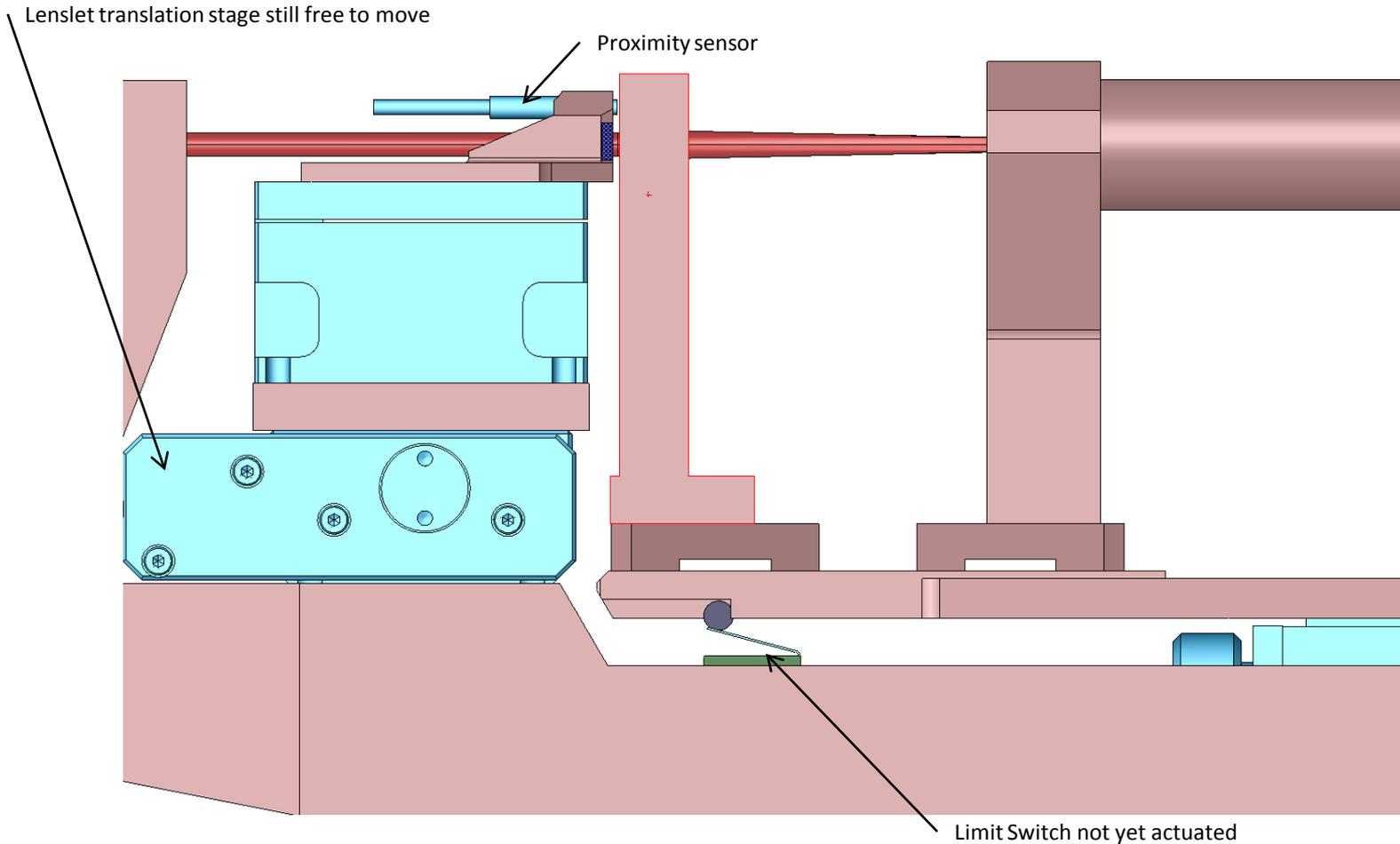
# NGS Motion Control Collision avoidance system

63 x 63



The Limit Switch is not actuated yet, although very close, and the lenslet translation stage is still free to move across its range.

The Proximity sensor is ready to stop the Camera Translation stage if necessary.

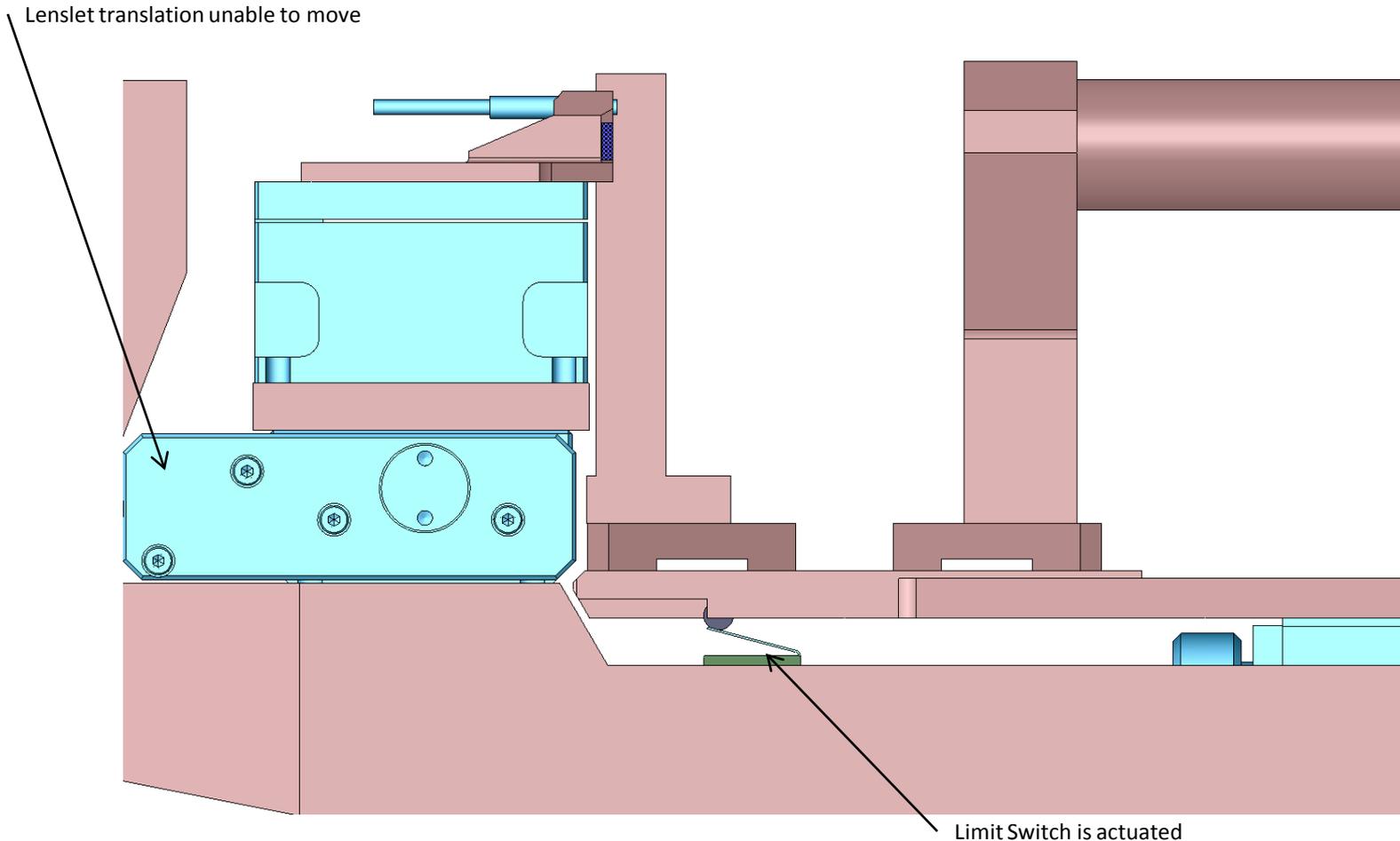


# NGS Motion Control Collision avoidance system

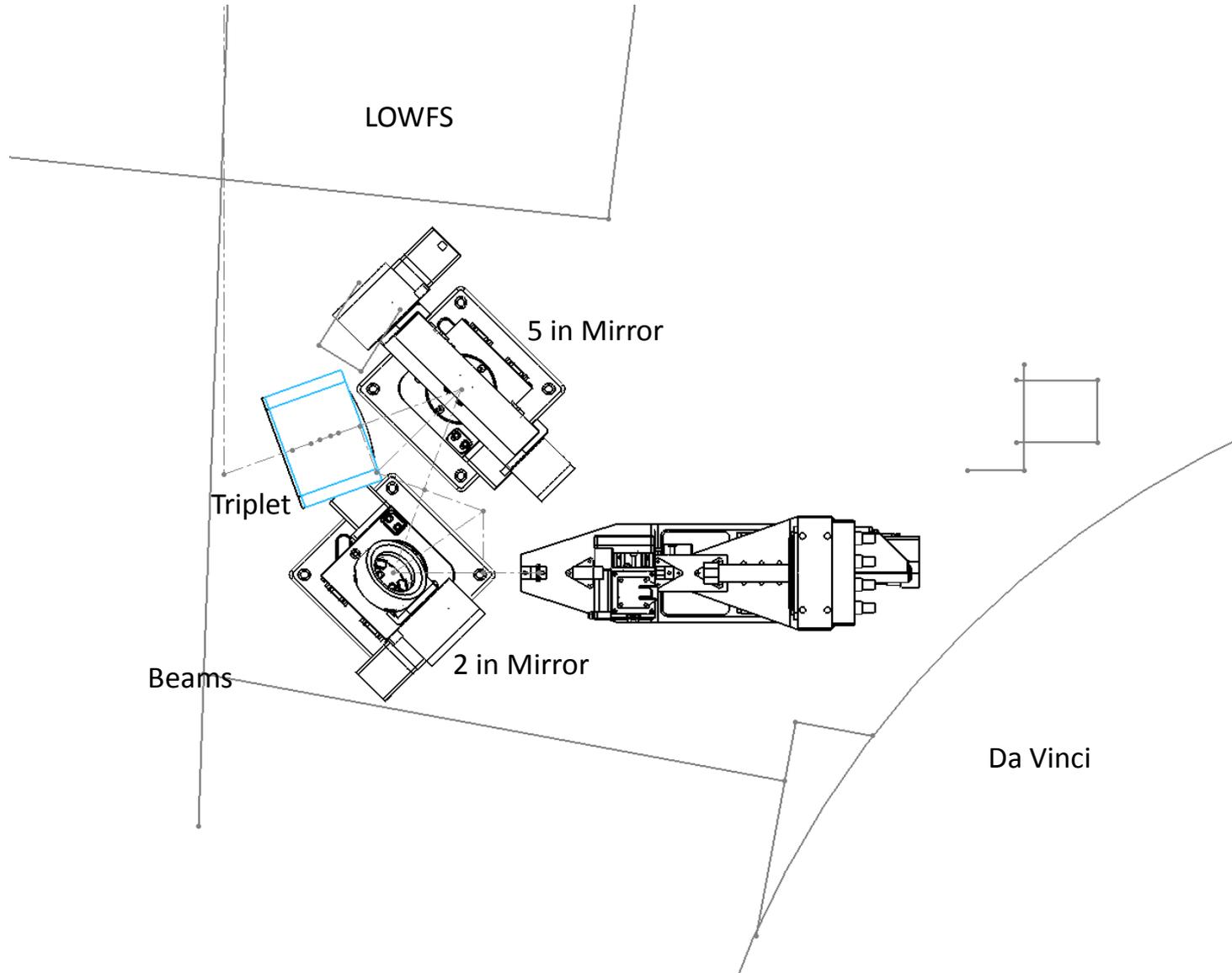


Blank

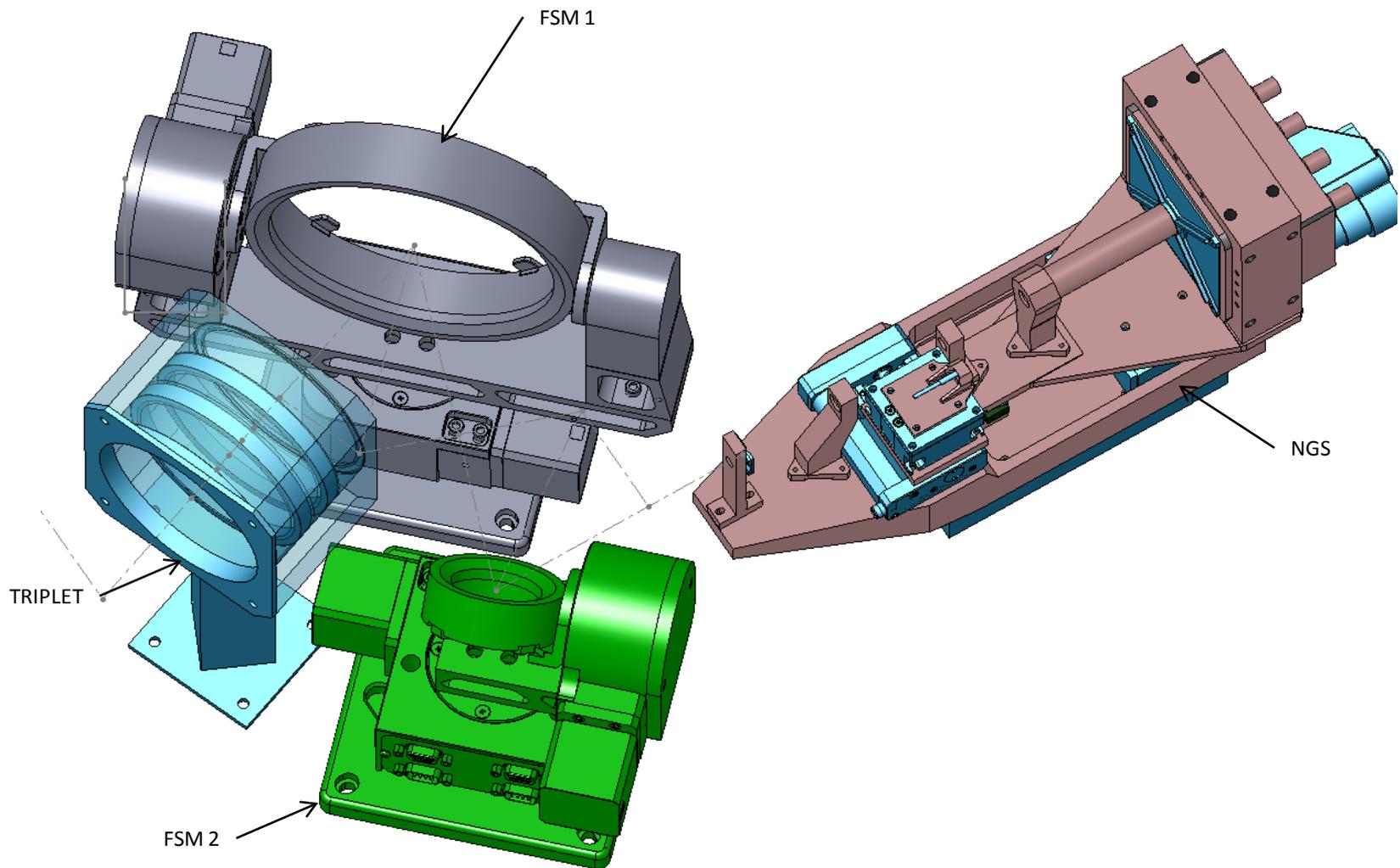
The Limit Switch is actuated and the lenslet translation stage is unable to move across its range.  
The limit switch can either be a Normally Closed switch mounted in series with the Lenslet translation or a Normally Open Switch mounted in parallel through a relay, further preventing unnoticed switch failure.



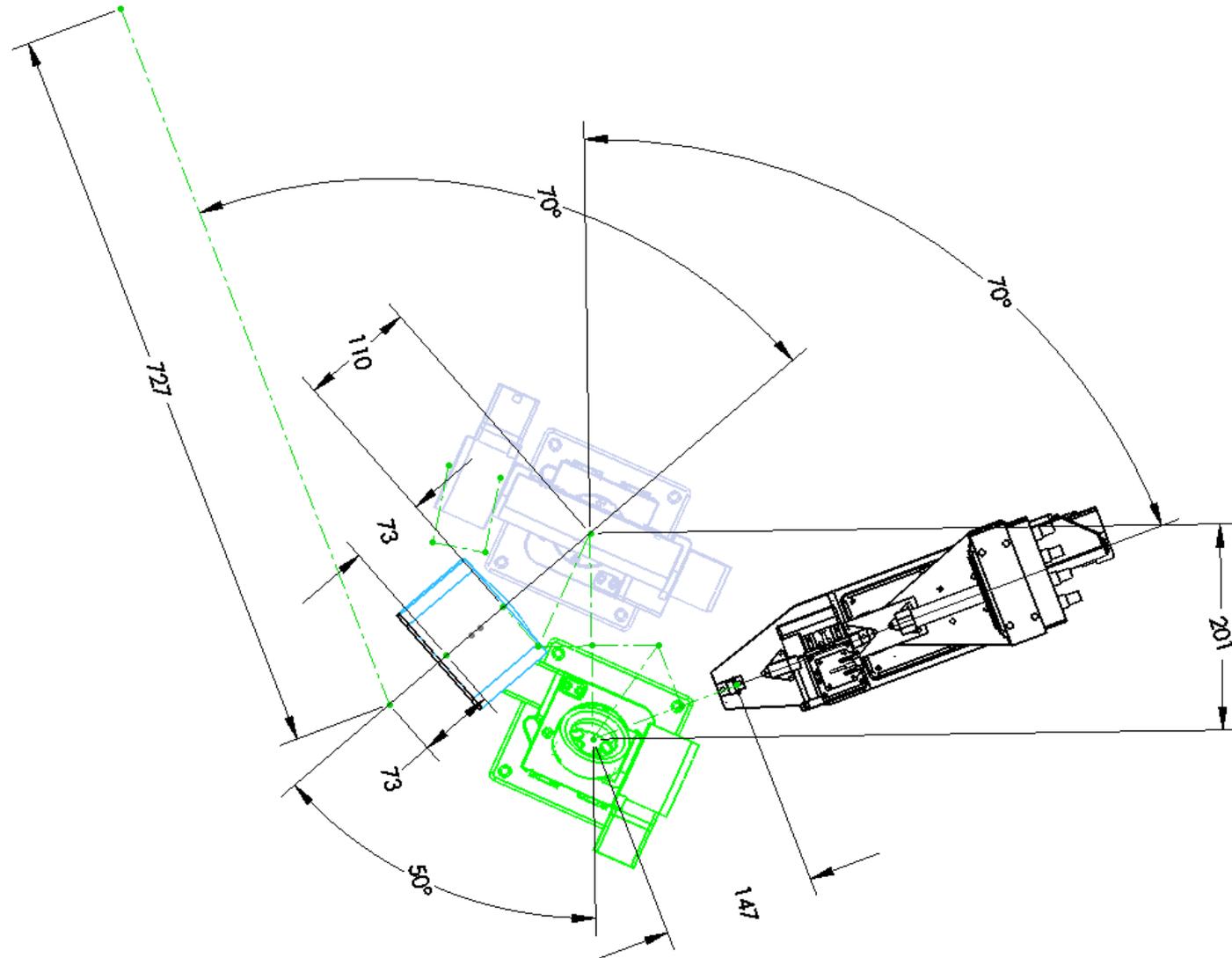
# NGS Integration



# NGS Integration



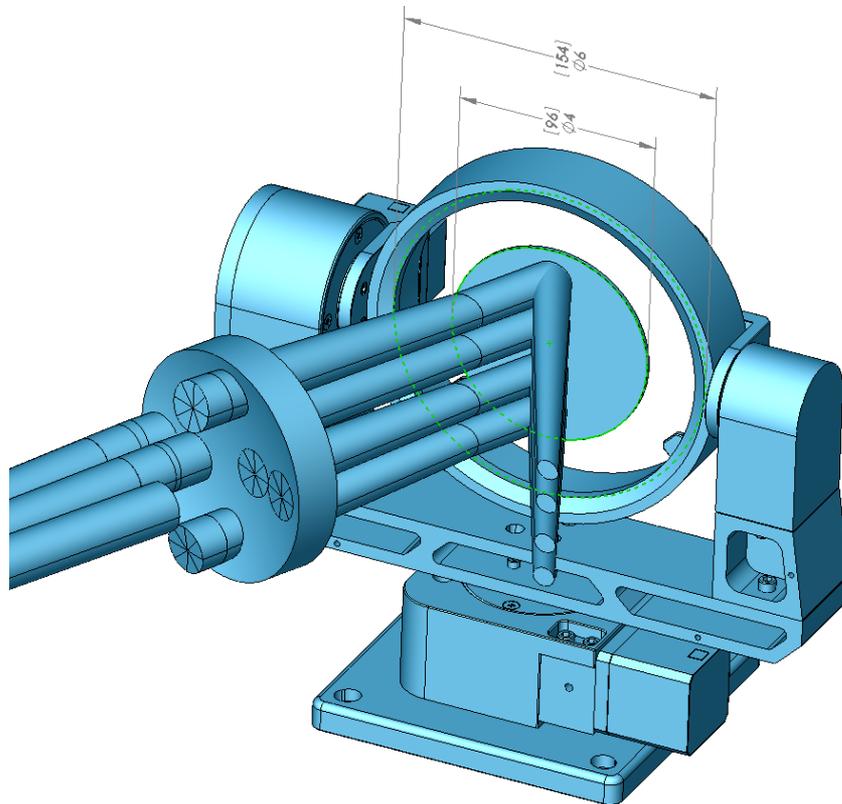
# Optical Layout



# FSM 1



FSM 1 is a GMC-6 Newmark Gimbal with Mirror Cell for 6 inch optics  
 Repeatability: 5 arc seconds  
 Accuracy: 70 arc seconds  
 Resolution: 0.29 arc-sec  
 Elevation range: 360° continuous  
 Azimuth Range:  $\pm 90^\circ$   
 Load capacity: 25 lbs.  
 Operating Temperature: -20 +50C



GM-6 Specifications	
Resolution	0.29 arc-sec (MicroStepping)   3.6 arc-sec (servo motor)
Accuracy	70 arc-sec
Max. Speed	25°/sec (stepper motor)   60°/sec (servo motor)
Maximum Load	25 lbs.
Repeatability Uni-directional	5 arc-sec
Travel Range	Azimuth: $\pm 90^\circ$ Elevation: $\pm 90^\circ$ , 360° continuous with limit switches disabled. Other travel ranges are available.
Limit Switches	Optical, located at $\pm 90^\circ$ on both axes
Origin	Optical home switch located in the middle of travel.
Gear Ratio	90:1
Stage Weight	15 lbs.
Material	Aluminum
Finish	Black Anodize

## FSM 2

FSM 2 is a Custom Newmark Gimbal with Mirror Cell for 2 inch optics

Repeatability: 5 arc seconds

Accuracy: 70 arc seconds

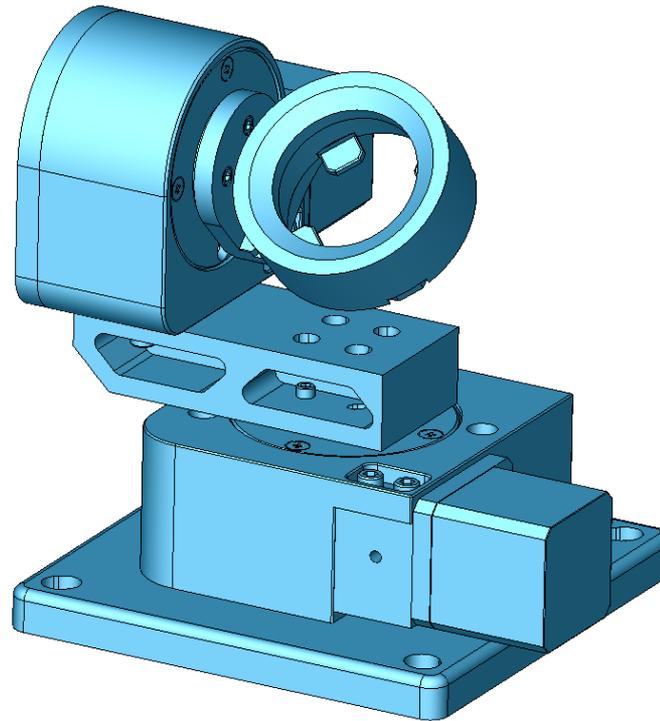
Resolution: 0.36 arc-sec

Elevation range: 360° continuous reduced to 26 °

Azimuth Range:  $\pm 90^\circ$  reduced to 26 °

Load capacity: 25 lbs.

Operating Temperature: -20 +50C



# Triplet Holder



The Triplet Holder is made of 7 Invar Parts:  
The Barrel, the Cover, 2 Spacers, 2 Adaptors and the Stand

