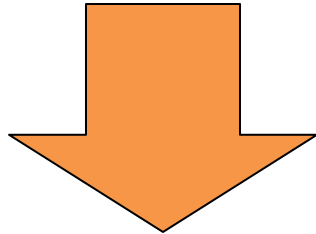
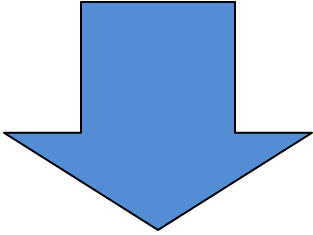


Customer Specifications (Final)

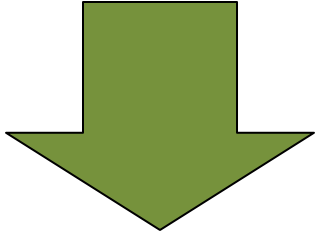


#	Description	Customer Specification	Explanation/Status
1.0	Coarse Actuator(s) Specs.	Click here to expand specs.	Probably negotiable—need to ask customer how important this is.
2.0	Part Sizes	Height ranges (1mm-100mm) Part diameter (40mm max)	Established—not negotiable.
3.0	Air Gap between part surface and fizeau	<=1mm	Established—not negotiable.
4.0	Budget	~\$5000	Customer may allow budget increase if necessary for successful completion of project.
5.0	Mechanical Drift	<1micron during measurement time	Must confirm with customer to refine this number. What is the magic number? How do we measure this?
6.0	Acceptance Tests	TBD by customer (MSD2)	Test plan still in development by customer
7.0	Vibration	No more than 1 st generation LightGage	Customer will judge by measurement quality
8.0	Mechanical Footprint	Must fit LightGage150 granite footprint	Drawings received from Tropel 12/17/08
9.0	Total measurement time	<=1minute	Achievable—may be outside of scope for this project, but we can show how to do it (design refinements, etc.)
10.0	Tip/Tilt and Ambiguity actuator range	Click here to expand specs.	Provided by customer in drawings received 12/17/08.
11.0	Top LightGage head rotation range	Various radial locations (6-10), ideally top head can rotate 360 degrees freely.	Needed for polarization of light.

Note: These specifications have been revised and finalized following visit with Customer on 12/12/08.

1. Coarse Actuator(s) Specs (expanded)

#	Description	Customer Specification
1.1	Operating Voltage	12-24VDC
1.2	Resolution	~1mm
1.3	Travel Range	~200mm
1.4	Travel Rate	500mm/min
1.5	Pitch	0.1-0.4mm
1.6	Gear Ratio	Dependent on Pitch, Travel Rate
1.7	Force/Payload	15 pounds max
1.8	Controller Interface	USB 2.0

10. Tip/Tilt and Ambiguity actuator range (expanded)

#	Description	Customer Specification
10.1	Operating Voltage	12-24VDC
10.2	Resolution	<0.1 micron (<1 Fringe, so <0.32 micron)
10.3	Travel Range	2-10mm
10.4	Travel Rate	~24mm/min
10.5	Pitch	0.3mm (per customer spec. sheet)
10.6	Gear Ratio	On the order of 141:1
10.7	Force/Payload	15 pounds max
10.8	Controller Interface	USB 2.0