Australian National University

Concept Design Report

Prepared For

Advanced Instrumentation and Technology Centre

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Applicable Documents

ID	Source	Title	Version	Date
1	previous group	System_Subsystem_Requirements_Updated_Ver001.pdf	1	8 Sep 2017
2				

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Acronyms

ANU Australian National University.

EOS Electro-Optic Systems.

GSL Guide Star Laser.

LH Laser Head.

MSIR More Specific Information Required.

SSS System Subsystem Specification.

Abstract

1 Introduction

Text goes here. Acronym: Guide Star Laser (GSL).

2 Project Context

3 System Requirements

Requirements	ANU Laser	Requirements	EOS Laser	Notes
??, ?? ?? ??	Control interface between Australian National University (ANU) GSL and the Electro-Optic Systems (EOS) control room	??,??(2.4.3)	Control interface between EOS GSL and EOS control room	
	Air interface between Dome and ANU GSL		Control interface between Telescope/Dome and EOS control room	
	Power interface between Dome and ANU GSL	??, ??, ??, ??	Power interface between Dome and EOS GSL	
		??, ??	Water interface between Dome and EOS GSL	
		??	Air interface between Dome and EOS GSL	

a) All requirement ID's are from the System Subsystem Specification (SSS) document

Table 1: High Level Interface Description

3.1 Structural Conceptual Design

SSS ID	Requirement	Value	Unit	Notes
??	Maximum obtrusion distance of system from mounting plate	1000	mm	
??	Maximum extension of distance to left of mounting plate	610	mm	
??	The system isn't allowed to extend above the mounting plate on the right	Y/N		
??	Frame mounted using existing holes in the mounting plate	Y/N		
??	EOS GSL Laser Head (LH) carbon fibre breadboards	3		
??	EOS GSL breadboard dimensions (l x w x h)	1500x800x105	mm	

Table 2: Mounting Frame Structural Requirements

SSS ID	Requirement	Value	Unit	Notes
??	EOS GSL minimum space between breadboards	250	mm	
??	EOS GSL breadboards though holes are aligned	Y/N		
??	EOS GSL breadboard weight	150 ± 50	kg	
??	EOS GSL middle breadboard free volume	1/3 ± 1/6	m^3	
??	Total mass of system must keep Observer floor level	Y/N		a)

a) More Specific Information Required (MSIR)

Table 3: Mounting Frame Performance Requirements

3.2 Vibration Reduction

SSS ID	Requirement	Value	Unit	Notes
??	Maximum vibrational input as specified in Figure 3 in SSS doc	2.1997	ms^{-2}	
??	EOS GSL vibration maximum			a)

a) MSIR

Table 4: Vibration Requirements

3.3 Air Quality Management

SSS ID	Requirement	Value	Unit	Notes
??	System shall exist within dirty and dusty environment			a)
??	Air quality	7	ISO Class	

a) Frame will be enclosed with opaque panels and an air filtration system installed

Table 5: Air Quality Requirements

3.4 Temperature

SSS ID	Requirement	Value	Unit	Notes
??	System shall exist within dirty and dusty environment			a)

a) Frame will be enclosed with opaque panels and an air filtration system installed

Table 6: Temperature Requirements

3.5 Laser Cooling Systems

3.6 Interior Configuration and Logistics

3.7 Electronics and Communications

4 Concept Design

Requirement title	Requirement statement	Optical design	Derived mechanical requirements
1	2	3	test
1	2	3	test

Table 7: Something Requirements

5 Risk Management

Reference example: [1].

References

[1] F. Rigaut, B. Neichel, M. Boccas, C. d'Orgeville, F. Vidal, M. A. van Dam, G. Arriagada, V. Fesquet, R. L. Galvez, G. Gausachs, C. Cavedoni, A. W. Ebbers, S. Karewicz, E. James, J. Lhrs, V. Montes, G. Perez, W. N. Rambold, R. Rojas, S. Walker, M. Bec, G. Trancho, M. Sheehan, B. Irarrazaval, C. Boyer, B. L. Ellerbroek, R. Flicker, D. Gratadour, A. Garcia-Rissmann, and F. Daruich, "Gemini multiconjugate adaptive optics system review i. design, trade-offs and integration," *Monthly Notices of the Royal Astronomical Society*, vol. 437, no. 3, p. 2361, 2014. [Online]. Available: +http://dx.doi.org/10.1093/mnras/stt2054