MRO FTT/NAS & FLC

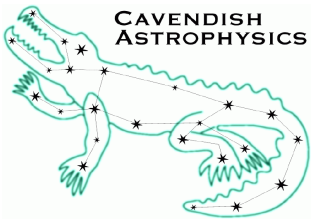
FLC Requirements Compliance Matrix

MRO-TRE-CAM-0000-0105

The Cambridge FTT Team

rev 1.0

3 September 2010



Cavendish Laboratory
JJ Thomson Avenue
Cambridge CB3 0HE
UK

Change Record

Revision	Date	Author(s)	Changes
0.1	2010-08-25	JSY	Initial version
1.0	2010-09-03	JSY	Added references to RD2 sections; minor edits

Objective

To present the compliance status of the FLC conceptual design.

Scope

This document presents the Cambridge FTT team's assessment of whether the conceptual design for the FLC described in RD2 satisfies the top-level requirements specified by MRO in RD1.

Reference Documents

RD1 Technical Requirements: First Light Camera (INT-403-TSP-0107) – rev 1.0, May 20th 2010
RD2 FLC Conceptual Design Report (MRO-TRE-CAM-0000-0103)

Acronyms and Abbreviations

API Application Programming Interface
CSV Comma-Separated Value
FTT Fast Tip-Tilt
FLC First Light Camera
FOV Field-of-View
FWHM Full-Width at Half-Maximum
GUI Graphical User Interface
ISS Interferometer Supervisory System
MROI Magdalena Ridge Observatory Interferometer
NAS Narrow-field Acquisition System
NMT New Mexico Tech
NTP Network Time Protocol
TBC To be confirmed
TBD To be determined
UT Unit Telescope
UTM Unit Telescope Mount

1 Compliance Status

FLC -UR	Description	Status of design at CoDR	See RD2 Sec.	Implementation note
1-01	Provision of system modes: idle, acquisition, acquisition check, dark frame, flatfield	C		
1-02	System mode functionality as FTT/NAS	C		
1-03	Mode switching time < 5 s (Goal < 1 s)	C		Expect to meet goal.
1-04	Testing without ISS and/or UTM	C	9.1	Will use standalone testing capability provided by MRO ISS interface framework
2-01	FOV ≥ 60″ × 60″	C		Expected FOV = 512 × 0.18 = 92″
2-02	Pixel scale 0.15–0.25″/pix	C	4.2	
2-03	Operational wavelength band: any one of V, B, R	C	2.2, 6	

FLC -UR	Description	Status of design at CoDR	See RD2 Sec.	Implementation note
2-04	Support for pointing and tracking tests using manual target acquisition	C		
2-05	Image FWHM ≤ 1″	C	4.2	
2-06	Can focus to meet image FWHM requirement; maintain focus for ΔT ≥ 5 °C	C	6.5	
2-07	Limiting magnitude V ≥ 10	C	2.2	
2-08	Exposure times 5–1000 ms; sampling rates 1–10 Hz	C		
2-09	Remote operation from control room	C	9.3	
2-10	Remote display (full-frame)	C	9.2	
2-11	Remote display (zoom of full frame)	C	9.2	
2-12	Compute centroid of selectable star w.r.t. user-specified fiducial. Display cross-hairs	C		
2-13	Display of computed centroid position on GUI	C	9.2	
2-14	Logging of centroids and timestamps to CSV file	C	9.3	May use local copy of MRO Data Collector
2-15	Image motion ≤ 1″ for ΔT = 5 °C	C	6.2.1	
2-16	Operate in UTM “reduced performance”envelope for T ≥ -15 °C	C	7	
2-17	Designed to fit onto Nasmyth table	C	4.2	
2-18	Operate without external chilled fluid supply	NC	7.1	
3-01	Provision of ISS interface	C		
3-02	Use same ISS interface framework as FTT/NAS	C		FLC software will be subset of FTT/NAS
3-03	GUI display-only mode for use with ISS	C		
3-04	Provision and documentation of API	C		
3-05	Control of system functions using API	C		
3-06	Data transmission to ISS	C		
3-07	Time-stamps on data transmitted to ISS accurate to 1 ms	C		Expect to use “fasttime” software and NTP protocol to determine accurate time-stamps
3-08	Full-data-rate low-latency (≤ 0.2 s) transmission to ISS	C		

FLC -UR	Description	Status of design at CoDR	See RD2 Sec.	Implementation note
3-09	Operation from laptop	C	9.3	

Key

C Compliant

CE Compliance Expected (to be confirmed at PDR)

PC Partially Compliant

NC Not Compliant