



FLORIS Calibration Unit

MIP / KIP List

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A = Approval
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Change Record

Modification	Page	Iss.	Rev.	Date
First Issue	all	1	0	16.07.2018
Updated according to MG-06 & MG-17 from PDR. MIPs at motor and harmonic drive level added and MIP at solder joint level added	10	2	0	17.01.2019

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1 Introduction

1.1 Project Overview

The Earth Explorer - Fluorescence Explorer (FLEX) mission will map vegetation fluorescence to quantify photosynthetic activity.

The conversion of atmospheric carbon dioxide and sunlight into energy-rich carbohydrates through photosynthesis is one of the most fundamental processes on Earth – and one on which we all depend.

Information from FLEX will improve our understanding of the way carbon moves between plants and the atmosphere and how photosynthesis affects the carbon and water cycles.

In addition, information from FLEX will lead to better insight into plant health and stress. This is of particular relevance since the growing global population is placing increasing demands on the production of food and animal feed. At the moment, photosynthetic activity cannot be measured from space, but FLEX's novel sensor will observe this faint glow.

The FLEX satellite will orbit in tandem with one of the Copernicus Sentinel-3 satellites, taking advantage of its optical and thermal sensors to provide an integrated package of measurements.

Mission objectives can therefore summarized as follows:

- To assess the quality of fluorescence-derived photosynthesis data against classical optically-based methods (i.e. from fraction of absorbed photosynthetically active radiation times Light Use Efficiency).
- To address in more detail temporal and spatial scaling issues (from towers to satellite footprints).
- To identify and characterize the effects of different types of stress on fluorescence and photosynthesis (especially drought and freezing air temperatures).
- To indicate potential applications of the novel fluorescence observations.

Mission orbit:

- Orbit: Sun-synchronous
- Measurement altitude: 815 km

The FLEX Space Segment consists of a single satellite carrying the FLuORescence Imaging Spectrometer (FLORIS) push-broom instrument. This high-resolution imaging spectrometer will acquire data in the 500– 780 nm spectral range, with a sampling of 0.1 nm in the oxygen bands (759–769 nm and 686–697 nm) and 0.5–2.0 nm in the red edge, chlorophyll absorption and Photochemical Reflectance Index bands.

The monthly global maps will have an on-ground spatial resolution of 300 × 300 m² with a swath width of 150 km.

1.2 Scope of the Document

This document lists the MIPs and KIPs that are applicable to the Calibration unit EQM and PFM.

2 Applicable and Reference Documents

2.1 Applicable Documents

Ref.	Title	Reference	Iss.
AD 105	Cover Letter	FLX-LET-FNM-INS-0003	3
AD 106	Special Condition of Tender	FLX-OF-FNM-INS-0001	4
AD 100	Contract for FLEX Unit/sub-system	Draft Contract	
AD 101	Generic Statement of Work for FLEX Unit/sub-system	FLX-SOW-FNM-INS-0001	2
AD 102	Specific Statement of Work	FLX-SOW-FNM-INS-0005	2
AD 103	Floris Calibration Unit User Requirement Specification	FLX-RS-FNM-INS-0006	5
AD 201	FLORIS Radiation Environment RS	FLX-RS-FNM-INS-0016	4
AD 202	FLEX FEMM Requirements Specification	FLX-RS-FNM-INS-0023	1
AD 203	FLEX GMM &TMM Requirements Specification	FLX-RS-FNM-INS-0024	1
AD 204	FLEX CAD Model Requirements Specification	FLX-RS-FNM-INS-0025	1
AD 205	FLEX Cleanliness Requirements for Sub-contractors	FLX-RS-FNM-INS-0028	3
AD 206	FLEX Instrument General Design Interface Requirements	FLX-RS-FNM-INS-0029	3
AD 208	FLEX PA Requirements for Subcontractors	FLX-RS-FNM-INS-0021	2
AD 209	FLEX PA SW Requirements for Subcontractors	FLX-RS-FNM-INS-0022	1
AD 210	FLEX Configuration Control and Documentation Management Plan	FLX-PL-FNM-INS-0001	3
AD 211	FLEX List of Acronyms and Abbreviations	FLX-LI-FNM-INS-0003	2

2.2 Reference Documents

Ref.	Title	Reference	Iss.	Date
[RD01]	FLORIS Calibration Unit Almatech Proposal	17-10S-225	1.0	15.06.2017
[RD02]	Leonardo Clarification Letter	FLX-LET-FNM-INS-0009	--	18.10.2017
[RD03]	Floris CU Negotiation Meeting #1 between Leonardo and Almatech	FLX-MIN-FNM-INS-0041		15.11.2017

2.3 Acronyms and Abbreviations

The abbreviations and acronyms used in this document are in accordance with [AD 211].

3 MIP / KIP List

In addition to the Incoming inspection of raw materials, traceability information records (on 100% of items) and the source inspections for delivery of the Sun diffuser the following Inspection Points are considered:

- **M.I.P. 1** – At Motor supplier premises (Phytron) before assembly of the rotor and stator together:
 - ✓ Visual inspection of different parts and sub-assemblies
 - ✓ Review of the dimensions of parts
- **M.I.P. 2** – At reception of the Harmonic Drive in three dismantled parts:
 - ✓ Visual inspection of different parts and sub-assemblies
 - ✓ Review of the dimensions of parts
- **M.I.P. 3** – At Syderal and IST AG for solder joints inspection:
 - ✓ Visual inspection of solder joints by certified inspectors
- **K.I.P. 1** – Prior the mounting of the nadir baffle on the carousel:
 - ✓ Visual inspection of different parts and sub-assemblies
 - ✓ Review of the dimensions of telescope assembly
 - ✓ Visual inspection of cleanliness level
- **K.I.P. 2** – After the mounting of the reflective round wall on the carousel:
 - ✓ Visual inspection of different parts and sub-assemblies
 - ✓ Visual inspection of cleanliness level
- **K.I.P. 3** – After the mounting of the housing over the reflective round wall:
 - ✓ Visual inspection of different parts and sub-assemblies
 - ✓ Review of positioning of optical elements assembly
 - ✓ Visual inspection of cleanliness level
- Final Inspection (on 100% of items) before TRR:
 - ✓ Visual inspection of assembly
 - ✓ Review of alignment and dimensional inspection
 - ✓ Traceability information check

- **M.I.P. 3** – Prior the integration of the Sun Diffuser and Black Target.
 - ✓ Visual inspection of unit before integration of parts
 - ✓ Review of test results with dummies
 - ✓ Visual inspection of cleanliness level

Quality Assurance activities and responsibility (on 100% of items):

- ✓ Quality Control activities supervision
- ✓ NCRs management
- ✓ Checking of: Manufacturing documents, Traceability information records and test reports
- ✓ Hardware and packaging visual inspection
- ✓ Issuing of C.O.C.

Key Inspection Points (KIP) are considered as “internal normal work”. In any case, the Customer is invited to these KIPs and is welcome at any moment to perform Audits or Visit the MAIT Facility.