



# **FLORIS Calibration Unit**

## **NC, RFx, PAD List**

Doc :	FLX-LI-ALM-CU-0011
Issue:	3:0
Date :	01.02.2019
DRD Code :	PA-07

**Almatech SA**  
EPFL – Innovation Park D  
1015 Lausanne  
Suisse

Tel : +41 21 555 30 00  
Tel : +41 21 555 30 01  
[www.almatech.ch](http://www.almatech.ch) [info@almatech.ch](mailto:info@almatech.ch)

---

## Approval Sheet

Name

Date

Signature

Prepared by: T. Gandy

---

Approved by: M. Lai

---

Approved by: G Capo

---

## Distribution List

Internal reference: ALM-PRO-3813

Person	Organization	Distribution
L. Blecha	Almatech	C
G. Capo	Almatech	O
T. Gandy	Almatech	C
M. Lai	Almatech	C
M. François	ESA	C
A. Capanni	Leonardo	A

A = Approval  
C = Copy  
I = Information  
O = Original  
R = Review

## Change Record

Modification	Page	Iss.	Rev.	Date
First Issue	all	1	0	20.07.2018
Updated PAD to issue 2.0	11	2	0	04.09.2018
Added RFDs for EQM MRR	11	3	0	01.02.2019

---

## Contents

<b>1</b>	<b>Introduction</b>	<b>6</b>
1.1	Project Overview .....	6
1.2	Scope of the Document .....	7
<b>2</b>	<b>Applicable and Reference Documents</b>	<b>8</b>
2.1	Applicable Documents .....	8
2.2	Reference Documents .....	9
2.3	Acronyms and Abbreviations .....	9
<b>3</b>	<b>NCR – RFxs – PAD List</b>	<b>10</b>

## **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 m<sup>2</sup> with a swath width of 150 km.

## **1.2 Scope of the Document**

This document lists all the Non Conformance Report (NCR), Request For Deviation (RFD), Request For Waiver (RFW), Request for Approval (RFA), and Part Approval Documents (PAD) of the FLEX CU already issued or intended to be issued at the date of the present list issue.

## 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            NCR – RFXs – PAD List**

Reference: Almatech NCR-RFD-RFW-RFA-PAD List

ALM Reference	Title	Client Reference	Current Issue		Delivered	Status	Signature Status	Applicability				Decision	Status	Comments
			Issue	Date				STM	CUIS	EQM	PFM			
1	Non Conformance Report	-	-	-	-	-	-	-	-	-	-	-	-	-
ALM-RNC-0614	STM Dummy material changed	FLX-NCR-ALM-CU-0001	1.0	21.01.2019	Y	-	ALM : Y LEO : N/A	x				Accepted as-is	Closed	
-														
2	RFD	-	-	-	-	-	-	-	-	-	-	-	-	-
ALM-PRO-4048	Number of Interface screws different from requirements	FLX-RFD-ALM-CU-0001	1.0	26.11.2018	Y	-	ALM : Y LEO : N	x					Open	
ALM-PRO-4137	Wires used in CU different from requirements	FLX-RFD-ALM-CU-0002	1.0	22.01.2019	Y	-	ALM : Y LEO : N			x	x		Open	
ALM-PRO-4152	Knowledge of position of Observation and Black Target Position	FLX-RFD-ALM-CU-0003	1.0	30.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4157	Envelope violation	FLX-RFD-ALM-CU-0004	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4158	Number of Interface screws different from requirements	FLX-RFD-ALM-CU-0005	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4162	Cleanroom Conditions	FLX-RFD-ALM-CU-0006	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4163	Silicone material	FLX-RFD-ALM-CU-0007	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4164	Wrap on harness	FLX-RFD-ALM-CU-0008	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4165	CU Mass	FLX-RFD-ALM-CU-0009	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4168	Use of extenders on torque wrenches	FLX-RFD-ALM-CU-0010	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4169	Flaking materials	FLX-RFD-ALM-CU-0011	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4170	Coating performance measurement at operational conditions	FLX-RFD-ALM-CU-0012	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4171	Aperture oversizing	FLX-RFD-ALM-CU-0013	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4172	Single Point Failure	FLX-RFD-ALM-CU-0014	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4173	Calibration Unit Center of Gravity position	FLX-RFD-ALM-CU-0015	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4174	Optical Cube	FLX-RFD-ALM-CU-0016	1.0	31.01.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4175	Motor Power Consumption	FLX-RFD-ALM-CU-0017	1.0	01.02.2019	Y		ALM : Y LEO : N			x	x		Open	
ALM-PRO-4180	Notching Random vibration	FLX-RFD-ALM-CU-0018	1.0	01.02.2019	Y		ALM : Y LEO : N			x	x		Open	
-														
3	RFW	-	-	-	-	-	-	-	-	-	-	-	-	-
-														
-														
4	RFA	-	-	-	-	-	-	-	-	-	-	-	-	-
-														
-														
5	PAD	-	-	-	-	-	-	-	-	-	-	-	-	-
ALM-PRO-3820	Hall sensors	FLX-PAD-ALM-CU-0001	3.0	21.01.2019	Y	-	ALM : Y LEO : N		x	x	x		Open	
ALM-PRO-3820	Micro Switch	FLX-PAD-ALM-CU-0002	1.0	21.01.2019	Y	-	ALM : Y LEO : N			x	x		Open	
-	END	-	-	-	-	-	-	-	-	-	-	-	-	-